COMPREHENSIVE PLAN UPDATE

# Growth Scenarios Report



MAY 2015 UPDATE

Bureau of Planning and Sustainability
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*City of Portland, Oregon*
*Charlie Hales, Mayor • Susan Anderson, Director*

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# III. EXECUTIVE SUMMARY

The Growth Scenarios report is a background report of the Comprehensive Plan and is a required element of Portland's Periodic Review work program (Task 3). The purpose of this report is to describe how and where Portland is expected to grow over the next 25 years and to measure the performance of different alternate growth patterns and their ability to help meet Portland's goals and objectives. This analysis is rooted in the Measures of Success adopted with the 2012 Portland Plan.

The performance of the Proposed Comprehensive Plan shows how land use and infrastructure investment can help Portland achieve our vision for a prosperous, healthy, equitable and resilient city. The report shows that most of the anticipated new growth and infrastructure investment occurs in a way that makes significant progress towards meeting the Portland Plan's 2035 Measures of Success.

- The expected growth pattern along with planned investments in parks, transit, and the bicycle and pedestrian networks will help to create more complete neighborhoods and increase the number of Portlanders that live in a complete neighborhood.
- The land use and transportation choices made in the Proposed Comprehensive Plan and Transportation System plan reduce vehicle miles traveled per capita, reducing the share of commuter trips in single-occupant vehicles, and help reduce our carbon emissions.
- The land use changes and investments in transit will help increase the number of households with convenient access to family-wage jobs.
- Portland can accommodate the future household growth and do it in ways that will help to meet our goals, but providing enough affordable housing, especially for the lowest income households, will continue to be a challenge.

Portland is expected to add approximately 260,000 people (123,000 households) and 142,000 new jobs between 2010 and 2035. From 2010-2014 Portland added approximately 15,000 households and 25,000 jobs—a rate of growth consistent with this forecast. Portland's existing zoning and Proposed Comprehensive Plan has more than enough development capacity to accommodate future residential growth. This excess capacity creates an opportunity to make choices about where to focus or prioritize that residential growth. This Growth Scenarios Report presents an evaluation of a variety of growth patterns, including the Proposed Comprehensive Plan.

In addition to analyzing the impact of different growth patterns, this report evaluates the benefits of the infrastructure investments and planned public facilities in the Citywide Systems Plan (CSP) and Transportation System Plan (TSP), which are part of the Proposed Comprehensive Plan.

Forecast growth represents only about one-third of the total households and employment in Portland in 2035. Two-thirds of the buildings that will exist in 2035 already exist today. Thus, Portland's existing development pattern defines many of the challenges in achieving the goals identified in the Portland Plan. The city's legacy development pattern has a significant impact on how well Portland will perform over the next 25 years. Large improvements in performance from land use changes will take time, and the City will need to make long term strategic investment and development decisions to meet those goals.



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## CHALLENGES AND OPPORTUNITIES

**Two Investment Strategies** – Portland needs to pursue a public investment strategy on two tracks simultaneously to meet its objectives. One strategy supports growth in high-performing areas that already have a relatively complete infrastructure support system. With the Proposed Plan, 75 percent of the new development is expected to take place in centers and corridors that are ready to accommodate this growth. The other strategy fills gaps in historically underserved areas to reduce disparities and increase equity. This two-track strategy will allow Portland to improve performance across the board by focusing growth in high-performing areas, while at the same time improving conditions in areas previously neglected.

**Transportation Choice** – Transportation investment priorities emphasize active transportation, transit, and freight mobility. Investing in sidewalks, bicycle facilities and transit significantly improves performance across several measures, such as reducing carbon emissions, improving affordability, and improving access to jobs for more Portlanders. Expansion of the frequent transit network will mean that 62 percent of Portland households will have convenient access to frequent transit. Investment in the low-stress bicycle network will mean that 72 percent of Portland household will live within ¼-mile of a bike facility.

The projects in the Proposed TSP create a transportation system that will decrease reliance on automobiles by reducing the single occupant vehicle (SOV) commute rate to 35 percent of trips, which in turn helps reduce per capita daily vehicle miles travelled (VMT) by 27 percent.

**Complete Neighborhoods** – The Portland Plan set the goal of providing most Portlanders with safe, walkable access to services. While most (77%) of the new development is expected to take place in complete neighborhoods, this goal cannot be achieved simply by only focusing growth in existing complete neighborhoods – Portland needs infrastructure investments to create more complete neighborhoods. The combination of the growth pattern and the infrastructure investments in the Proposed Comprehensive Plan increase the number of household in complete neighborhoods to 73 percent by 2035.

**Reducing Carbon Emissions –** The land use and transportation choices made in the Proposed Comprehensive Plan lead to a reduction in per capita daily VMT, increase in non-automobile mode share, and help make progress towards Portland's carbon reduction goals. The City of Portland and Multnomah County will need to take additional action beyond planned land use and transportation investments in order to meet our carbon reduction goals. The CAP identifies additional policy and program actions that go beyond the Comprehensive Plan to help achieve this goal, including: carbon pricing, building energy performance reporting, renewable energy, net zero energy buildings, low carbon transportation fuels, electric vehicles, waste prevention and recovery, and green infrastructure.

**A Central Role for the Central City** – The Central City is expected to accommodate 30 percent of future growth. Focusing growth in and around the Central City may be the most cost-effective way to provide the greatest level of service to the greatest number of Portlanders; each incremental investment in this service-rich area has disproportionate benefits. However, in order to grow as a residential area, it will be necessary to ensure that the needs of a variety of families can be met within the Central City.



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**Jobs and Better Transit Connections in East Portland** – East Portland has Portland's largest pool of affordable housing and is home to a large number of families with children. However, the area does not have many family-wage jobs, and it is not easy or quick to travel from East Portland to major job centers. Convenient and reliable access to work is one of the major contributors to job success (others include overall employment opportunities and relevant education and training). The Proposed Plan includes policies, map changes and transit investments that will increase the number of households with convenient access to jobs by at least 2 percent. Developing more jobs in East Portland and providing better connections to and from East Portland are critical to improving household economic self-sufficiency.

**More Affordable Housing** – Providing enough affordable housing, especially for the lowest income households, will be a challenge. Public investments to increase services can create gentrification pressure. Portland will need to better align growth management, public investment and affordable housing development, anticipate the consequences of investments, minimize displacement and engage communities.

**Prepare for the Future** – While short-term development trends show a market preference for the Central City and Inner Neighborhoods, East Portland has significant growth potential and is home to many households with school-age children. Today, there is a window of opportunity to address the infrastructure gap in East Portland. The timing and location of East Portland infrastructure investments are a pressing issue.

**Access to Parks** – The Proposed Comprehensive Plan shows an increase in the number of households with good access to parks. This is increase can be attributed to parks investment areas identified in the CSP that fill gaps in areas underserved by parks to reduce disparities, especially in East Portland.



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# IV. 2015 UPDATE TO THE GROWTH SCENARIOS REPORT

The Growth Scenarios report was first published in 2013. The purpose was to evaluate and compare different growth scenarios to determine how our choices of where and how growth could occur might impact our community. In addition to public input generated from visionPDX, the Portland Plan and the Comprehensive Plan Update Community Involvement Strategy, the 2013 Growth Scenarios report served to inform many policy choices and land use recommendations made with the Proposed Comprehensive Plan.

The purpose of this update is to evaluate the performance of the Proposed Comprehensive Plan as the preferred scenario to guide future growth in Portland. The 2013 report evaluated four growth scenarios—Default, Centers, Corridors, and Central City-focused. The original 2013 Growth Scenarios Report created a framework for a preferred growth scenario (the Proposed Plan). This new report serves to summarize how well the Proposed Plan performs relative to the scenarios identified in 2013.

The Proposed Comprehensive Plan (the preferred scenario) is different from other scenarios:

- **The preferred scenario combines three scenarios**. Relative to the Default scenario, the land use changes in the Proposed Comprehensive Plan accommodate more growth in Centers, along Corridors and in the Central City and surrounding inner neighborhoods. Density reductions have been proposed in locations farther from identified Centers and Corridors, particularly in outer East Portland.
- **The preferred scenario incorporates infrastructure changes**. If land use changes shape the regulations about where growth can and cannot occur, infrastructure investments shape the capacity to accommodate growth. The Transportation System Plan (TSP) and the Citywide System Plan (CSP) identify which infrastructure projects the City will undertake.

**Accounting for comprehensive plan map changes and infrastructure investments** – The 2013 Growth Scenarios Report provided a starting point for a community discussion about how and where Portland can accommodate future growth. In particular, the performance measures have provided a framework for evaluating different growth and investment options. The Proposed Comprehensive Plan reflects the community discussion of where and how Portland should grow and how to make investments to advance goals and reduce dipartites.

**Model the Effects of Infrastructure Investments** – The scenarios in the first version of this report modeled the likely effects of 25 years of growth (the location of new jobs and housing), but not infrastructure investments. In this update, the corresponding infrastructure investments that are identified in the TSP and CSP have been evaluated.

**Transportation System Plan (TSP)** – The update to this report accounts for financially constrained TSP project list. The TSP projects have increased performance significantly for transportation related performance measures including; low-stress bike network, frequent transit, complete neighborhoods, mode share and greenhouse gas emissions. Examples of projects that have increased performance are north-south frequent transit service on 122nd Avenue, neighborhood greenways and dedicated bicycle facilities in East and North Portland.



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**Transportation Modelling** – The evaluation for transportation related performance measures relied heavily on information from Metro's regional transportation model. Transportation model outputs for 2035 mode split and vehicle miles traveled (VMT) were adjusted further to reflect program investments that support the pedestrian and bicycle network and transportation demand management policies.

**Citywide Systems Plan (CSP)** – The Citywide Systems Plan is a coordinated 20-year plan for the City of Portland's infrastructure (sewer, water, parks) systems that will be necessary to serve anticipated growth. The update to this report reflects the modeled results of infrastructure investments in the CSP where applicable. Accounting for CSP projects has significantly increased performance in the park access and complete neighborhoods measures.

**Community Mapping** – The District Liaison team at BPS has worked with community members to identify Comprehensive Plan map changes to advance goals identified in the Portland Plan. Map changes in have resulted in net positive changes to performance evaluation. The most significant positive outcomes can be attributed to focusing density in identified centers and corridors, bringing non-conforming commercial uses into conformance, and creating or augmenting dispersed commercial areas in neighborhoods with limited access to services.



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# 1. INTRODUCTION

Portland is growing and will continue to grow over the next 25 years. By 2035, there will be approximately 260,000 more people and 142,000 new jobs in Portland.[1] While the forecasted growth rate is consistent with Portland's historical growth rates, these numbers still raise important questions about how and where Portland will grow and the effect that growth will have on Portlanders' quality of life.

## PURPOSE

This report is intended to provide information about the potential implications of growth that will help answer key questions like:

- Where will new housing will be built?
- What types of development will be seen on Portland streets?
- Where will new businesses be located?
- Will existing businesses be able to expand?
- How will this growth affect carbon emissions?
- How will this growth affect significant natural resources?
- Will this growth help reduce disparities and improve access to opportunity for more Portlanders?
- Where and how can Portland focus investments in public facilities and services to improve how well the city functions?

In addition to facilitating discussions about the questions listed above, this report will:

- Provide comparative alternative growth scenarios that illustrate the potential locations and intensity of growth over the next 25 years, given Portland's existing development pattern and development capacity.
- Measure the performance of the alternative growth scenarios, including their effect on the city's ability to meet goals and objectives based on the Portland Plan's Measures of Success.[2]
- Evaluate a Preferred Growth Scenario for the City of Portland (now developed into the Proposed Comprehensive Plan).
- Provide the basis for developing an infrastructure investment approach that will improve Portland's ability to meet its identified goals and objectives (the TSP and CSP).
- Meet the requirements of Task 3 of the City of Portland's State of Oregon-approved Periodic Review Work Program, which calls for the development and analysis of alternative growth scenarios.[3]

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[1] Metro Regional Forecast, January 2013. Forecasts indicate that Portland will grow by approximately 123,000 new households between 2010 and 2035. The average household size in 2010 was 2.35; however, it is expected that Portland's average household size will decrease in coming decades. A proxy household size of 2.1 was used in the calculation.

[2] The Portland Plan is a citywide strategic plan to promote prosperity, education, health and equity. It includes guiding policies, a five-year action plan and measures of success. The goals and objectives used to evaluate the scenarios are adapted from the Portland Plan's Measures of Success. The Portland Plan was adopted in 2012.

[3] In November 2007, the Oregon Department of Land Conservation and Development (DLCD) informed the City of Portland that its Comprehensive Plan is subject to Periodic Review. DLCD has the authority to



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## ORGANIZATION

This report has five primary sections: Introduction, Context, Scenario Alternatives, Performance Measures and Key Findings.

- The **Introduction** provides a brief overview of the report's purpose and organization, as well as basic background and process information.
- The **Context** section provides detailed information on existing conditions, development trends, development capacity and housing and employment growth forecasts.
- The **Scenario Alternatives** section provides information on each of the four growth scenarios considered and their implications.
- The **Performance Measures** addresses how well the four scenarios affect Portland's ability to meet established goals and objectives, as well as options for improving performance. With this updated report, this section now also includes an evaluation of the impacts of the proposed Comprehensive Plan, and planned infrastructure investments (the TSP and CSP)
- The **Key Findings** provides a summary of the lessons learned from this analysis.

The **Appendices** provide additional detailed information on how different areas of the city perform under each of the four alternative growth scenarios, and under the Proposed Plan.

## BACKGROUND AND PROCESSES

### What are growth scenarios?

Growth scenarios reflect choices about growth. They are illustrations of where Portland could choose to grow and develop in different parts of the city over the next 25 years. The scenarios are an opportunity to test how different growth patterns will affect different aspects of livability for Portlanders, such as access to transit, jobs, parks and commercial services. The performance evaluation also looks at carbon emissions, tree canopy, housing affordability and risk of gentrification.

### Why develop growth scenarios?

Growth scenarios help inform decisions in the Proposed Comprehensive Plan. These are decisions about where to focus housing and job development, where to conserve and protect land, where to develop, and where and when to invest to improve services to increase equity, improve performance, and maintain and improve overall quality of life.

As a nearly fully developed city that is both largely surrounded by other cities and in a region with an urban growth boundary, Portland cannot expand by annexing substantial tracts of land outside the city limits, or by developing large areas of vacant land. As a result, nearly all of Portland's growth will occur on smaller underdeveloped parcels or through the redevelopment of previously developed properties.

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compel a local jurisdiction to enter Periodic Review (ORS 197.628 to 197.650 and OAR 660-25). Periodic Review is a substantial evaluation and revision of a local Comprehensive Plan, the purpose of which is to ensure that a city's Comprehensive Plan is up-to-date and responsive to local, regional and state conditions, complies with the Statewide Planning Goals and provides necessary provisions for economic development, needed housing, transportation and urbanization or growth needs.



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## PORTLAND'S GROWTH SCENARIOS

This report includes four previously evaluated growth scenarios as well as the evaluation of the Proposed Comprehensive Plan.

**Default** – The Default Scenario is based on existing development patterns and development trends. This scenario distributes future growth in the same places Portland has seen growth over the past 15 years.

**Centers** – The Centers Scenario focuses more growth in areas like Lents, Hillsdale and Gateway and less growth along the length of commercial and mixed-use streets.

**Corridors** – The Corridors Scenario focuses more development along streets like SE Powell, SE Foster, SW Barbur and N Lombard and less growth in centers.

**Central City Focused** – The Central City Focused Scenario concentrates nearly all new growth in the Central City and the inner neighborhoods near the Central City, both east and west of the Willamette River.

**Proposed Comprehensive Plan** – This report has been updated to evaluate the performance of the Proposed Comprehensive Plan. The evaluation of the Proposed Comprehensive Plan The proposed Comprehensive Plan Update 2035 combines Centers, Corridors and Central City scenarios and incorporates infrastructure investment from the Citywide Systems Plan (CSP) and Transportation Systems Plan (TSP). Relative to the Default scenario, the land use changes in the Proposed Comprehensive Plan accommodate more growth in Centers, along Corridors and in the Central City and surrounding inner neighborhoods. Density reductions have been proposed in locations farther from identified Centers and Corridors, particularly in outer East Portland.



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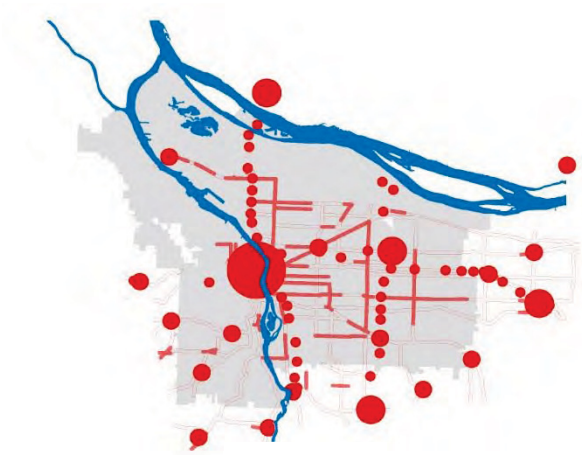
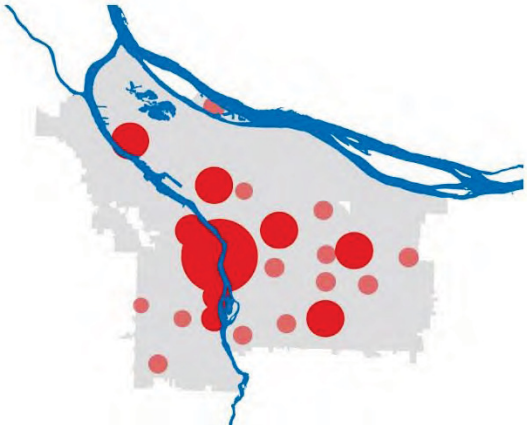
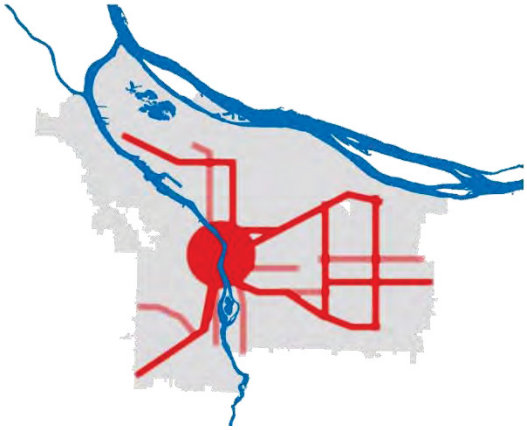
**Figure 1: Growth Scenario Alternatives**



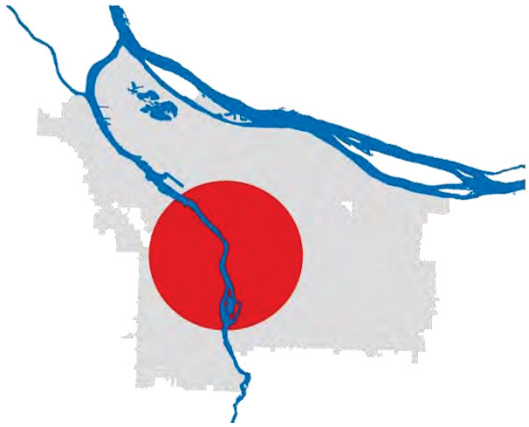
Default



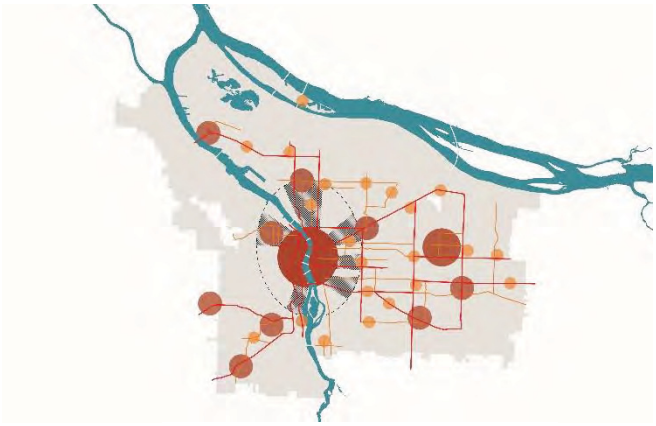
Centers



Corridors



Central City Focused



Proposed Comprehensive Plan



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## HOW ARE THE SCENARIOS AND PROPOSED PLAN EVALUATED?

Each scenario is evaluated according to how well it performs with respect to the following Portland Plan objectives and the associated performance measures.

### Performance Measures

- Access to Family-Wage Jobs
- Housing Mix and Affordability
- Risk of Displacement/Gentrification
- Complete Neighborhoods
- Access to Frequent Transit
- Access to Low-Stress Bikeways
- Vehicle Miles Traveled
- Mode Share
- Greenhouse Gas/Carbon Emissions
- Access to Parks
- Watershed Health
- Tree Canopy
- Access to Nature

For each scenario, and the Proposed Comprehensive Plan, a performance evaluation is used to help answer the following questions:

- Does this development pattern help the city move closer to its goals? For example: Does the Central City Focused scenario make it more likely that the percentage of Portlanders who live in complete neighborhoods will increase? Will it increase the likelihood that more Portlanders will have access to family-wage jobs?
- How do the performance results for each scenario compare to those of the other scenarios? For example: Do the Centers and Corridors scenarios each provide the same mix of affordable housing?

The performance evaluation focuses on how well each scenario performs at the citywide level. Evaluations of how well each scenario performs at the district scale (East, North, Southeast, West and Central City) or neighborhood scale are provided in the appendix.

## HOW ARE THE SCENARIO EVALUATIONS BEING USED?

The evaluations in the 2013 report have been used to support discussions about policies and investments related to issues such as land use, environmental conservation, affordable housing, urban design, and public infrastructure. The evaluations will prompt discussions to consider the following:

- Is there a form of growth that will help Portland advance prosperity, equity and sustainability?
- What investments are needed to support that pattern?
- How do the anticipated development patterns help achieve the goals?
- What problems will these patterns create?
- How and where can investments help to meet specific performance goals?
- Which scenarios bring the greatest benefit to different parts of the city?

This analysis and public input was used to develop a Preferred Development Scenario (the Proposed Comprehensive Plan). This process informed the development of the Comprehensive Plan Map, the Transportation System Plan, the Citywide Systems Plan and the List of Significant Projects.



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# 2. CONTEXT

Developing future growth scenarios involves looking at forecasts of future growth and learning from how the city is performing today in terms of conditions and trends. Portland's existing built environment, recent development trends and current plans and policies, have a tremendous influence on how the city will develop and perform in the future.

The history of the past 30 years shows that thoughtful and intentional land use policies, regulations and investments can help improve quality of life for many. It also offers proof that people who live in areas without high-quality services may find it harder to meet their full potential. Growth often brings challenges, but it also offers opportunities to bring more services to more Portlanders.

This section of the report provides the background information needed to review the growth scenarios and make recommendations about growth and investments to improve livability for all Portlanders. The information includes an overview of the local growth forecasts; a primer on Portland's existing land use patterns, development trends and performance; information on existing development capacity; and ideas about the ways in which new development may benefit different parts of Portland.

## GROWTH FORECASTS

Metro forecasts that the Portland metropolitan region will grow by 410,000 new households and 518,000 new jobs between 2010 and 2035. Metro expects Portland to grow by 123,000 new households and 142,000 new jobs[4]. The Metro forecasted growth rates are consistent with historical trends. From 2010-2015 Portland has added approximately 15,000 households and 25,000 jobs—a rate of growth consistent with this forecast.

Metro develops the forecast and allocates the forecasted growth to each of the jurisdictions within its boundaries. Each local jurisdiction is responsible for determining how to best manage and direct that growth within its boundaries. This means that Portland must figure out how and where to accommodate the future growth forecast.

[4] The original Growth Scenarios Report cited a draft 2010 Metro forecast, which was slightly higher. This new report cites the adopted Metro Regional Forecast, January 2013. Forecasts indicate that Portland will grow by approximately 123,000 new households between 2010 and 2035.



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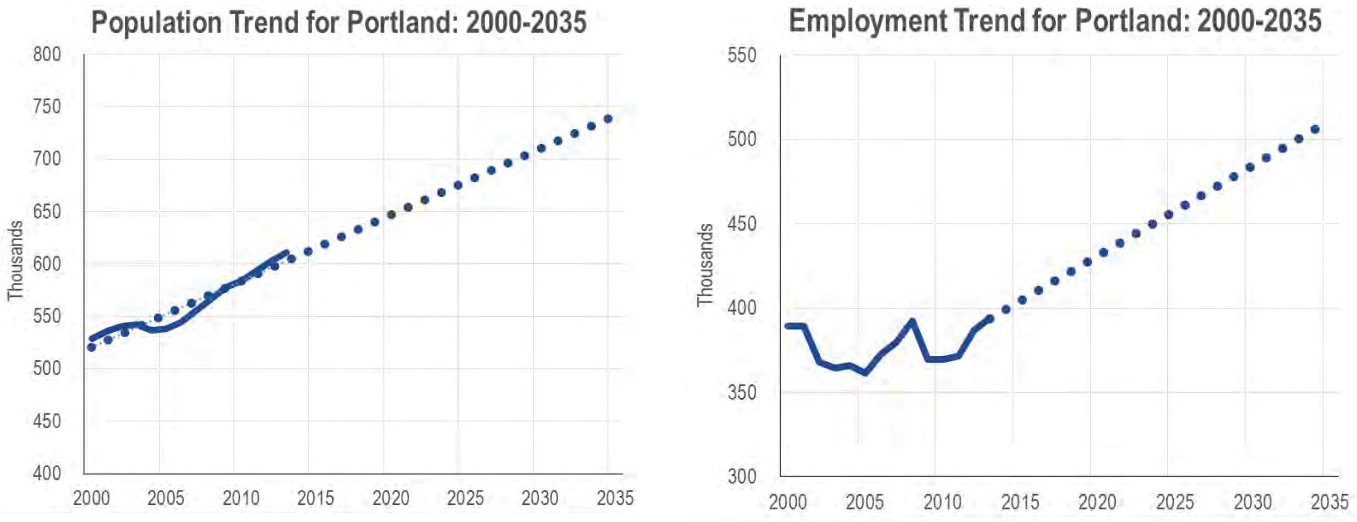
**Figure 2: Population and employment trends for Portland, 2000-2025.**




## Household Forecast

In 2010, Portland had 270,000 households with an average of 2.3 persons per household. Of those households, 28 percent include children. Both the average size of Portland households and the percentage of households with children are expected to continue to decline. By 2035, the average household size is expected to be just over 2 persons per household and the percentage of households with children is expected to decline to 25 percent of all households. At the same time, a greater proportion of Portlanders will be older. These anticipated demographic changes are consistent with national trends and will affect the demand for different types of housing.[5]

In 2010, about 60 percent of the dwellings in Portland were single family detached homes. Although little change is expected to the character of Portland's predominantly single family residential neighborhoods (they will remain single family residential neighborhoods), single family homes are expected to make up a smaller share (47 percent by 2035) of the housing mix in coming years.

Since the recession, a decreasing share of the population can qualify for a mortgage. Across the nation, job growth tends to be concentrated in high- and low-wage jobs with little expansion of family-wage jobs. The shrinking middle class is part of broader trends of income stratification. In addition, banks and other lenders have been restructured following the housing bust, which has led to more conservative lending practices. This has made it increasingly difficult for Portlanders to secure mortgages to purchase homes and will have long-term consequences for homeownership.

The demographic and economic changes described above are driving increased demand for multifamily dwellings, particularly apartments. Estimates suggest that 80 percent of all new housing built in Portland between now and 2035 will be multifamily housing. This change can already be seen in recent development trends: Between 2010 and 2014, 67 percent of new housing units built in Portland were multifamily dwellings. Similarly, the majority of new growth between 2010 and 2035 within the Urban Growth Boundary (61%) will be multifamily dwellings.

[5] More information is available in the Housing Demand and Supply Background Report.



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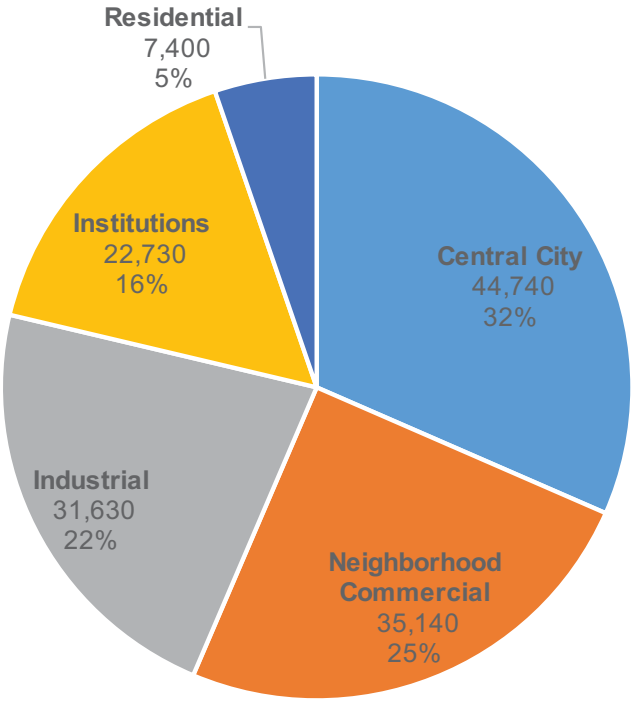
## Employment Demand

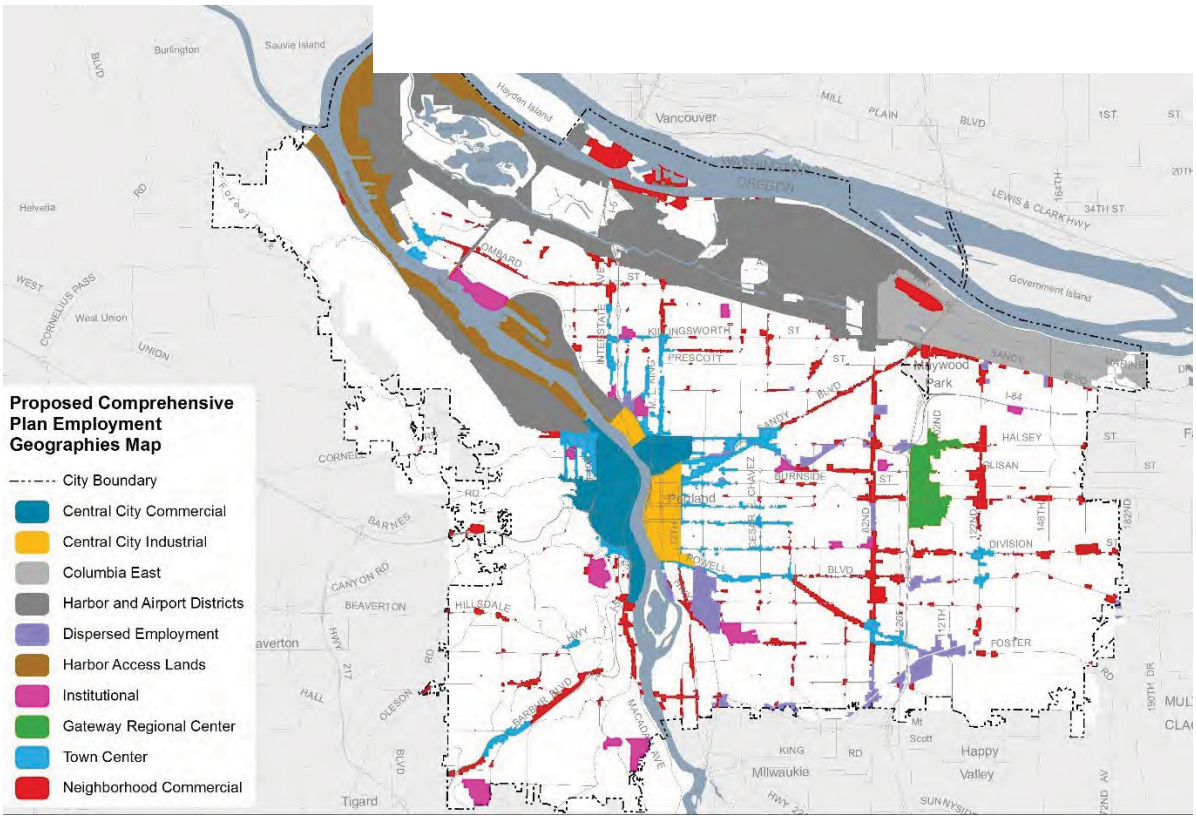
Portland is expected to add 142,000 new jobs by 2035, which is a 26 per capture rate of the regional job similar to Portland's historical 2 capture rate.

These new jobs are anticipatec distributed across the city in a r similar to the current distributio employment. The Central City the largest share (44,740 jobs) growth, with neighborhood com areas (35,140) and industrial a (31,630) seeing significant grov

Institutional campuses are a st growth sector (22,730), and ho employment in residential area remains a relatively small shar employment growth.[6]

**Figure 3: Employment Growth by Geography, 2010-2035.**




[6] More information is available in the Economic Opportunities Analysis.



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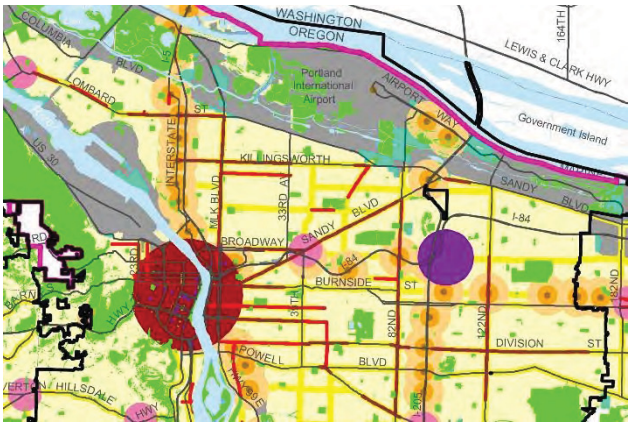
## CURRENT PLANS AND DEVELOPMENT CAPACITY

### Metro 2040 Growth Concept and Portland's Comprehensive Plan

Growth in the Portland metropolitan region is guided by regional land use and transportation plans developed by Metro, including the Metro Regional Framework Plan and the Metro 2040 Urban Growth Concept. The Metro plans provide the region with a preferred regional urban form.[7]

As with the growth forecasts, each jurisdiction is responsible for implementing the regional growth concept in local comprehensive plans.

**Figure 4: Metro 2040 Growth Concept Zoomed to Portland**




The core ideas in the Metro 2040 Growth Concept, which are also reflected in Portland's Comprehensive Plan, include:

- A hierarchy of mixed-use, pedestrian friendly centers. The mixed-use centers identified in both the Metro 2040 Growth Concept and Portland's current Comprehensive Plan include: the Central City, Gateway Regional Center and the Hollywood, St. Johns, Lents, Hillsdale and West Portland town centers.
- Corridors and main streets that are connected to each other and the centers by high-capacity and high-quality transit.
- A multi-modal transportation system that emphasizes transit, bicycle and pedestrian systems to ensure continued mobility of more people and goods throughout the region.
- A jobs/housing balance in centers, protected industrial sanctuaries and stable residential neighborhoods, outside of mixed-use centers, corridors and main streets.

The principles that support Metro 2040 and that are embodied in Portland's current Comprehensive Plan were not new when they were initially adopted. They were built on Portland's legacy and historical development pattern. These principles and Portland's historical development pattern will continue in the Proposed Comprehensive Plan and will continue to influence the physical development of Portland over the next 25 years.

### Development Capacity

Development capacity is defined as the likely number of new dwelling units or jobs that can be accommodated in the city under existing regulations, and considering existing and planned infrastructure.

The Buildable Lands Inventory (BLI) is the estimate of the development potential that is possible under current plans and zoning after considering infrastructure and physical constraints, like

[7] For more information, please visit Metro's website: www.oregonmetro.gov.



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steep slopes.[8] The BLI identifies lands that could potentially be available for development should a market demand exist.

## Residential Capacity

The BLI shows that under the current Comprehensive Plan and existing zoning, the estimated residential capacity is 230,000 dwelling units, which is more than sufficient capacity to accommodate Metro's 2035 housing growth forecast of 123,000 households.

With the Proposed Comprehensive Plan, the estimated residential capacity is 267,000 dwelling units[9]. The increase in total residential capacity in the Proposed Comprehensive Plan is the result of land use changes identified in the mixed use zones in some centers and corridors, a variety of community map changes, and the removal of development constraints that occurred as the result of infrastructure planned with the TSP and CSP.

**Figure 5: Residential Development Capacity (Proposed Plan).**




The surplus capacity enables Portland to accommodate and manage growth and support a development pattern that helps to achieve the goals and objectives. The scenarios explore different ways to use that development capacity to accommodate 25 years of future growth.

Most of this capacity (70 percent) is in mixed-use corridors and neighborhood centers. The Central City (with capacity for 32,000 additional dwellings) has significant growth capacity. Other areas with high growth capacity are the Gateway Regional Center, North Interstate Corridor, the Lents Town Center and some parts of East Portland.

Areas with the least capacity for additional growth are parts of Northeast Portland and most of West Portland. Portland's predominantly single family residential neighborhoods (the areas outside of the centers and corridors) will see limited new housing development, and will remain single family residential neighborhoods. About 11 percent of the development capacity is in land available for single-dwelling residential development (detached or attached homes on their own lot).

[8] City of Portland, Bureau of Planning and Sustainability, Buildable Land Inventory (2012).
[9] This is the capacity of the Comprehensive Plan designations – not all zoning matches these designations. Some areas are zoned for less intensive development than the Comprehensive Plan would allow.



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**Figure 6: BLI Housing Development Capacity (Proposed Plan)**



## Employment Capacity

The employment capacity analysis uses the same approach as the residential capacity analysis. The estimated employment development capacity is about 101 million square feet of new employment floor area citywide. In general, there is adequate capacity in the Central City; a surplus capacity in the neighborhood commercial areas; and shortfalls in industrial areas and for campus institutions, such as colleges and hospitals. The existing Comprehensive Plan provides capacity for 316,100 jobs while the Proposed Comprehensive Plan provides capacity for 391,400 jobs. The increase in employment capacity in the Proposed Comprehensive Plan reflects capacity increases as the result of the new Mixed Use and institutional designations, changes anticipated in the Central Eastside Industrial District, and other land use changes to address employment land shortfalls identified in the EOA.

**Table 1: Employment Allocation**

| Aggregate Geography | Existing Share | Share in 2035 (Existing Comp Plan) | Share in 2035 (Proposed Comp Plan) |
|---|---|---|---|
| Central City | 33.4% | 32.9% | 32.9% |
| Neighborhood Commercial | 25.1% | 27.0% | 25.0% |
| Industrial | 23.5% | 21.9% | 23.2% |
| Institutions | 8.6% | 9.9% | 10.7% |
| Residential | 9.4% | 8.2% | 8.2% |

More important than the total job capacity, the Comprehensive Plan must provide capacity for the different types of jobs and economic activity that exists in different employment geographies. Table 2 compares the existing Comprehensive Plan and Proposed Comprehensive Plan, in terms of how well they provide needed land in each employment geography.



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**Table 2: Employment Capacity.**

| Aggregate Geography | % of Needed Capacity Provided (Existing Plan)[10] | % of Needed Capacity Provided (Proposed Plan)[11] |
|---|---|---|
| Central City | 177% | 260% |
| Neighborhood Commercial | 189% | 216% |
| Industrial | 80% | 105% |
| Institutions | 83% | 141% |

**Figure 7: BLI Employment Development Capacity (Proposed Plan).**



[10] See Figure 27 of Section2/3 of the Economic Opportunities Analysis, March 2015.
[11] See Figure 1 of Section 4 of the Economic Opportunities Analysis, March 2015.



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## PORTLAND'S EXISTING LAND USE PATTERN

Portland and the surrounding areas within our Urban Services Boundary are already urbanized. Portland is located at the center of a larger metropolitan region. There are few opportunities to expand Portland's physical boundaries into rural undeveloped lands. Therefore, new growth and development will primarily occur though infill and redevelopment. Portland's existing development patterns provide the framework for managing future growth and development. A brief description of the overall land use pattern, as well as more detailed information on Portland's "Pattern Areas," is provided below.

### Citywide Development Pattern

Portland's overall development pattern includes a strong Central City, a series of centers (e.g. Hollywood, St. Johns and Hillsdale), and main streets and corridors (e.g. NE Sandy and N Interstate) that connect areas like Hollywood and Hillsdale to the Central City and beyond. The centers and corridors contain a mix of commercial and residential uses. The pattern also includes large swaths of residential development between the centers and corridors and across all areas of the city. Residential areas vary from predominantly single family dwellings to areas with greater concentrations of multifamily dwellings. For detailed information on Portland's existing development pattern, please review the Urban Form Background Report.

**Figure 8: Existing Residential Density.**



**Figure 9: Existing Employment Density.**





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## DEVELOPMENT TRENDS

Growth and development have shaped, and will continue to shape, the character of Portland's neighborhoods, streets, commercial areas, and other key places. Three broad trends have defined development over the past 15 years:

- Robust growth and development have occurred in the Central City.
- East Portland experienced a period of particularly strong residential development activity in the 1990s and early 2000s. This growth occurred after annexation of East Portland and much of this development included multifamily residential development and new subdivisions.
- In the late 2000s, coincident with the deep recession, development activity shifted from East Portland to the Inner Neighborhoods surrounding the Central City. The most intensive development has occurred along frequent transit lines, such as SE Division, North Williams, and North Interstate Avenue. Rising property values and rents have led to some displacement of lower income residents.

**Figure 10: Areas with High Development Activity.**

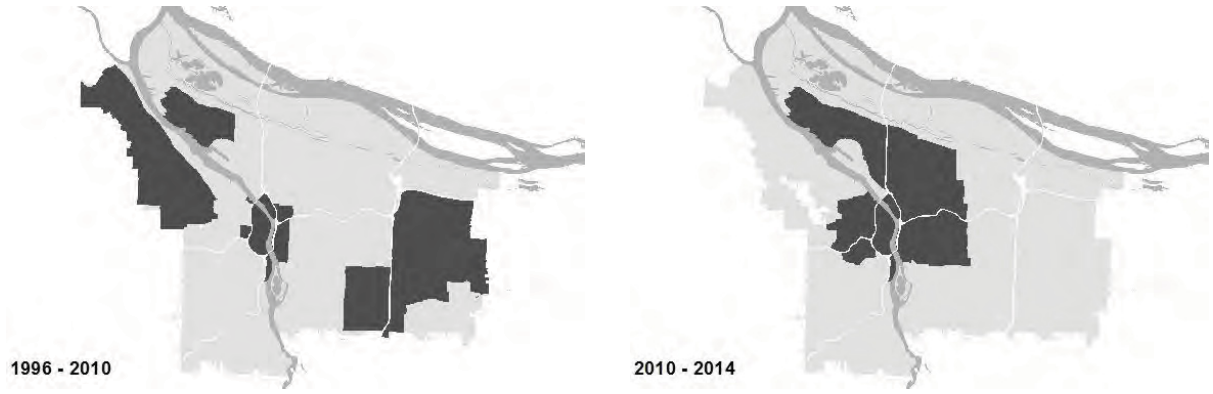


**Table 3: New Dwelling Units by Portland Plan Analysis Area.**

| 15 Year Trend: 1996-2010 | | | | 5 Year Trend: 2010-2014 | | | |
|---|---|---|---|---|---|---|---|
| **Rank** | **Analysis Area** | **New Units** | **Share** | **Rank** | **Analysis Area** | **New Units** | **Share** |
| 1 | Central City | 12,214 | 25% | 1 | Central City | 4,430 | 30% |
| 2 | 122nd-Division | 3,759 | 8% | 2 | Belmont-Hawthorne-Division | 1,834 | 12% |
| 3 | Lents-Foster | 3,013 | 6% | 3 | Interstate Corridor | 1,522 | 10% |
| 4 | St. Johns | 2,931 | 6% | 4 | Northwest | 955 | 6% |
| 5 | Gateway | 2,793 | 6% | 5 | Hollywood | 821 | 6% |
| 6 | Centennial-Glenfair-Wilkes | 2,045 | 4% | 6 | MLK-Alberta | 805 | 5% |
| 7 | Forest Park-Northwest Hills | 2,012 | 4% | 7 | St. Johns | 460 | 5% |
| | **Citywide** | **48,116** | **100%** | | **Citywide** | **14,768** | **100%** |



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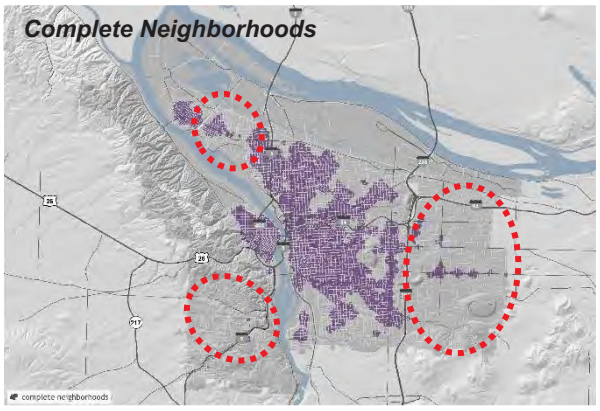
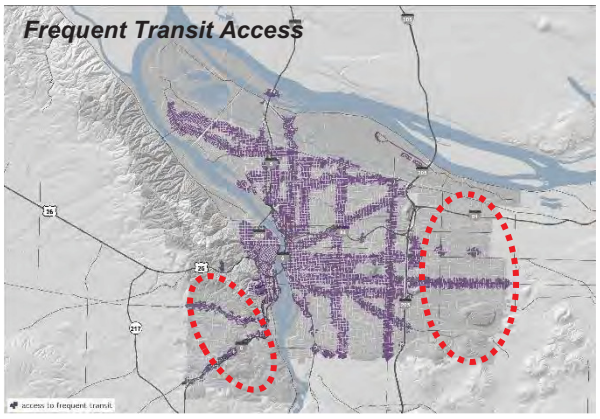
## WHERE AND HOW CAN GROWTH BENEFIT THE CITY IN THE FUTURE?

Growth brings change, but it also offers opportunities to solve problems and bring more services to more Portlanders—making it easier for people to get to work by bus or train, walk to the grocery store or school and get to the park or community center. A few of Portland's key land use and infrastructure-related challenges are highlighted below.

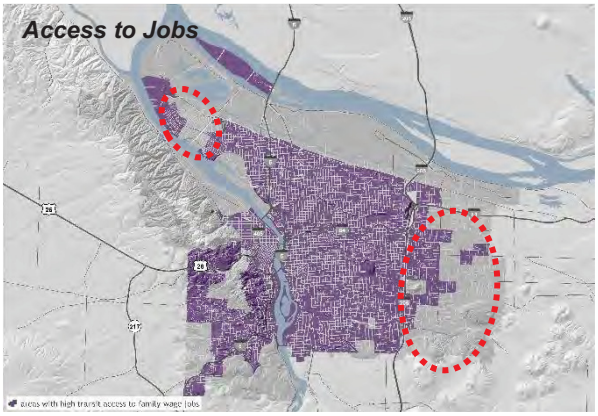
**Complete Neighborhoods**: Today, only 45percent of Portland households are in complete neighborhoods, with significant gaps in East and Southwest Portland.




**Frequent Transit Access**: Currently, 47 percent of Portland households are located within a convenient (1/4-mile) walk to the frequent transit network. While the Central City and most of the Inner Portland neighborhoods have good access to transit, there are significant gaps in coverage in East and Southwest Portland. Access to transit also is an important component of complete neighborhoods and access to employment.




**Access to Jobs**: Households in most of East Portland and parts of North Portland may have a more than 60-minute commute to locations with family-wage jobs.




A good job is one of the keys to household prosperity. The opportunity for a good job is dependent on three major factors: overall employment, education and workforce training, and access – the ability to get to the job. In general, most Portlanders have reasonable access (a 60-minute transit trip) to a number of family-wage jobs.

These are some of the many performance measures against which the growth scenarios will be evaluated. For more information, please review the Portland Plan Measures of Success at www.pdxplan.com.

The challenges highlighted on these maps are but a few of the issues that need to be addressed through the Comprehensive Plan update process.



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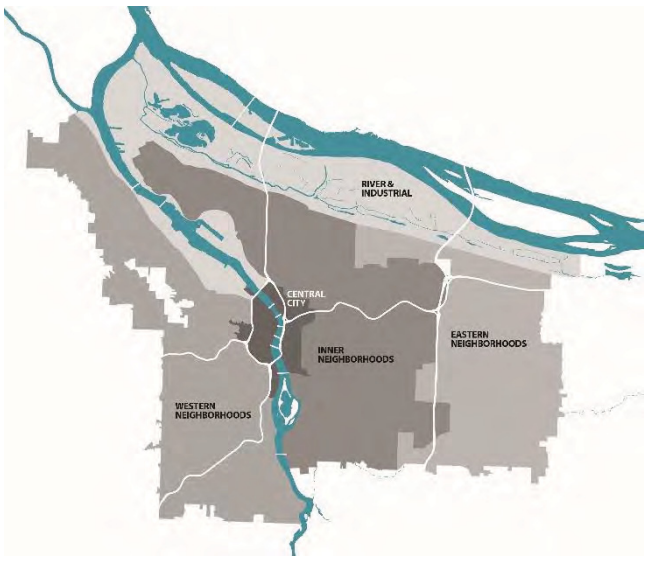
## PATTERN AREAS

Portland has five distinct areas or "Pattern Areas," each with unique needs and characteristics: Central City, Inner Neighborhoods, Eastern Neighborhoods, Western Neighborhoods and the Industrial and River Area.

Pattern Areas are defined by characteristics such as topography and physical features; street, land use, and block pattern; form and intensity of development; character, size, and function of natural resource areas; and the period in which the area was developed. Each area also has conditions and challenges related to its physical environment, development, history and the histories of the people who live there.

**Figure 11: Portland's Five Pattern Areas.**




### Central City

Central City includes the Downtown core, South Waterfront, portions of the east and west banks of the Willamette River, the Central Eastside Industrial District, the Lloyd District and Rose Quarter, Old Town/Chinatown and the Pearl District. The Central City is the region's business center, with an intensely urbanized built form. It also includes some of the city's industrial sanctuaries and higher education institutions. Today, more than 34,000 people live in the Central City, making it Portland's most densely populated residential area. It is a regional cultural hub—home to numerous concert halls, performance venues, museums, schools and universities. The Central City must remain an attractive and highly functional office, education and residential location.

**Figure 12: Central City 2035.**



New development in the Central City may:

- Strengthen its role as the region's center for innovation by increasing education and new entrepreneurial business opportunities.
- Contribute to the region's densest clusters of office, employment and residential districts.
- Enhance the fine-grain patterns of blocks and buildings offering a highly connected system of sidewalks and pathways.
- Improve connections to the Willamette River.



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## Inner Neighborhoods (North, Northeast, Southeast)

From Lents to St. Johns to Northwest Portland, this area primarily includes neighborhoods that were developed in a "streetcar era" pattern. The area is characterized by compact development, a highly connected grid of streets and sidewalks, active main street business districts, buildings that face the streets, street trees and a relatively pedestrian- and bicycle-friendly transportation system. With more than 140,000 households, more than half of Portland's population lives in the Inner Neighborhoods.

In the past 15 years, housing in Inner Neighborhoods has become increasingly expensive. As a result, many long-time residents have needed to move to less expensive, but also less service-rich parts of the Portland region. At the same time, new multifamily residential development has been built along mixed-use corridors, like N Interstate, N Mississippi and SE Hawthorne and SE Division. These trends highlight the need to provide a greater variety of housing types at a much wider variety of prices, to expand and upgrade existing community facilities, like parks and sports fields, and to increase pedestrian and gathering spaces in the public right-of-way.

New development may

- Make it easier for residents to meet their daily needs. More residents can support a broader range of neighborhood-serving businesses.
- Provide more housing at a range of prices, so that more Portlanders can afford to live in areas with access to services and transit.
- Create plazas and community gathering places.

**Figure 13: Inner Neighborhoods 2035.**




**The Impact of Community Amenities on Development Feasibility**

Metro conducted a series of studies on how investments in public amenities, such as parks, sidewalks, bike facilities, and transit affect development feasibility. The studies showed that investment in public amenities can help attract people to a neighborhood, which in turn can increase rents by 10 to 20 percent and can increase sales prices enough to make new development financially feasible, especially for higher density development types.

In the July 2012 report, *Development Feasibility in Portland's 20-Minute Neighborhoods*, Fregonese Associates found that development feasibility dramatically increases with increasing amenities and rents. For example, in the Interstate neighborhood, Fregonese found that amenity investments that resulted in a 10 percent increase in rents increased development potential by 35 percent. However, the analysis also showed that in some neighborhoods with lower property values, amenity investments alone are not enough to spur a significant amount of new development.

As a result, public investments like this can lead to increased property tax revenue to pay for needed urban services, and (in the absence of affordable housing programs) also lead to displacement of the lowest income residents.

*Fregonese Associates. Development Feasibility in Portland's 20-Minute Neighborhoods. July 2012.*



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## Eastern Neighborhoods

This area includes neighborhoods east of I-205. Most of this area was annexed into the City of Portland after the adoption of the 1980 Comprehensive Plan. The Eastern Neighborhoods have a mix of urban and semi-rural development, with towering Douglas firs and multiple buttes. Despite being home to one-quarter of the City's population (about 50,000 households), the area has nearly 40 percent of Portland's youth. During the late 1990s and early 2000s East Portland saw rapid residential growth. This growth highlighted many infrastructure deficiencies in the area, including the need for sidewalks, paved roads, safer street crossings and more frequent transit connections. Development in East Portland dramatically increased the area's population, changed the demographic makeup of the community, and highlighted remaining infrastructure deficiencies. School districts in East Portland have struggled to accommodate the corresponding growth in student enrollment.

Other issues highlighted by growth in East Portland include the need for developed parks and more neighborhood-serving businesses, so that residents can meet their needs close to home, and the need to provide a way to support local entrepreneurs and small businesses.

**Figure 14: Eastern Neighborhoods 2035.**




New development may:

- Help provide needed public infrastructure, such as parks and sidewalks.
- Create safer and friendlier pedestrian environments along major streets.
- Increase the viability of commercial services in areas that have limited access to goods and services.
- Provide space for community markets, business incubators, and start-up space for businesses and entrepreneurs.

**Portland Infrastructure Investment Pilot Study**

The Portland Infrastructure Investment Study examined existing conditions in the Lents and Powellhurst-Gilbert neighborhoods and the potential for public investments to leverage private investment and enhance community livability.

The study assessed the cost of providing the basic infrastructure needed to make each area a more "complete community" (e.g., sidewalks, safe pedestrian crossings, etc.). The study also looked at development readiness indicators, such as housing mix, rents/prices and long-term growth forecasts. A Return on Investment (ROI) analysis compared the cost of providing basic infrastructure with fiscal revenues (property taxes, SDCs, utility revenues, etc.) from forecasted development.

The study found that strategic public investments to provide basic infrastructure, especially pedestrian, bicycle and street networks improvements, are likely to have a net positive fiscal impact for the City, while also improving public health, safety, and neighborhood livability. Opportunity areas that currently have average scores on development readiness indicators are likely to have the greatest potential return on investment.



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## Western Neighborhoods

This area includes neighborhoods west of the Willamette River. The Western Neighborhoods have a mix of urban corridors (including SW Barbur Boulevard, Beaverton-Hillsdale Highway, and SW Capitol Highway) and more suburban development patterns that respond to challenging topography, sensitive natural areas, and lower densities. The Western Neighborhoods' most prominent characteristics are the hilly topography, streams, ravines, forested slopes, variably sized lots, and curvilinear street patterns.

Other issues highlighted by growth in West Portland includes the improved transportation options, more neighborhood-serving businesses so residents can meet their needs close to home, and the need to provide a way to support local vibrant activity centers and support a diversity of small businesses.

**Figure 15: Western Neighborhoods 2035.**




New development can:

- Improve watershed health by daylighting streams and restoring other natural features that builds on the distinctive topography and environmental character of the west side.
- Increase tree canopy by developing green setbacks with new trees and other plants to build on the area's green character and create buffers from busy streets.
- Improve safety for pedestrians, bicyclists, transit riders and motorists where there are limited streets through the hilly topography.

## Industrial and River Area

This pattern area serves a key role as a location for port facilities, the airport, major land-based freight transportation networks such as pipelines and railroads, industry and other employment centers, and river habitat. Hayden Island, Bridgeton and scattered riverfront and houseboat communities have unique identities and a strong river orientation.



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# 3. ALTERNATE GROWTH SCENARIOS

## HOW WERE THE SCENARIOS DEVELOPED?

The scenarios are based on the existing development pattern; current and Proposed Comprehensive Plan designations; the Buildable Lands Inventory (BLI).The BLI provides information on how much land and which land is likely to be redeveloped given market conditions, development constraints and the current level of investment in properties and recent development trends. The scenarios are also based on Metro's 2040 Growth Concept. The different scenarios emphasize different aspects of existing plans. For example, which of these regionally designated centers are expected to develop over the next 25 years, and how much growth is expected in each?

Recognizing the significant influence of the current development and infrastructure, like bridges and light rail lines, each of the scenarios is a variation of Portland's current development pattern:

**Default** – The Default Scenario is based on existing development patterns and development trends. This scenario distributes future growth in the same places Portland has seen growth over the past 15 years.

**Centers** – The Centers Scenario focuses more growth in distinct hubs like Lents, Hillsdale and Gateway and less growth along the length of commercial and mixed use streets.

**Corridors** – The Corridors Scenario focuses more development along streets like SE Powell, SE Foster, SW Barbur and N Lombard and less growth in centers.

**Central City Focused** – The Central City Focused Scenario concentrates nearly all new growth in the Central City and the inner neighborhoods near the Central City, both east and west of the Willamette River.

### How was the Proposed Comprehensive Plan scenario evaluated?

**Proposed Comprehensive Plan** – The proposed Comprehensive Plan combines Centers, Corridors and Central City scenarios and incorporates infrastructure investment from the Citywide Systems Plan (CSP) and Transportation Systems Plan (TSP).

### Housing Growth Allocations

Although each scenario assumes the same level of household growth, the distribution of that growth varies in each scenario. Using the Proposed Comprehensive Plan scenario for comparison, the range of household growth in each district can be significant, especially in the Central City and East Portland. The Proposed Comprehensive Plan household growth allocation reflects land use changes that have increased capacity in some areas while decreasing capacity in others.



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**Table 4: Residential Growth Forecast Allocation.**

| District | Existing Comprehensive Plan (Default Scenario) | Proposed Comprehensive Plan | Other Scenarios |
|---|---|---|---|
| Central City[12] | 24,000 | 36,000 | 24,000 – 40,000 |
| East | 39,000 | 27,000 | 19,000 – 39,000 |
| North | 17,000 | 13,000 | 11,000 – 17,000 |
| Northeast | 13,000 | 15,000 | 12,000 – 19,000 |
| Southeast | 20,000 | 22,000 | 20,000 – 24,000 |
| West | 10,000 | 10,000 | 10,000 – 10,000 |

## Growth Factor

In addition to looking at the number of new households, it can also be helpful to look at the magnitude of expected growth. The magnitude of growth, or growth factor, quantifies the potential amount of change anticipated in a given area. A growth factor of 1.0 means there is little or no growth or change potential. A growth factor of 2.0 is equal to a 100 percent growth rate or doubling of the number of housing units in a given location. For Portland as a whole, the Metro forecast projects a 50 percent increase in the number of households, which is a growth factor of 1.5 (or 123,000 new dwelling units).

If the Metro-projected growth were to be proportionately distributed across Portland, then each district would have a growth factor of 1.5. However, development capacity is not evenly distributed across the city, nor is it expected that growth will be evenly distributed across Portland. Therefore, the scenarios do not assume an even growth pattern across the city. The Central City, East Portland, and North Portland see higher growth factors in most of the scenarios.

[12] The Central City district includes the Northwest District Association to provide accurate comparisons to analyses in the first version of the Growth Scenarios Report.



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**Table 5: Growth Factor Comparison by Scenario.**

| District | Default | Centers | Corridors | Central City Focused | Proposed Plan |
|---|---|---|---|---|---|
| Central City | 1.9 | 2.2 | 2.2 | 2.5 | 2.4 |
| Southeast Portland | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 |
| Northeast Portland | 1.3 | 1.3 | 1.3 | 1.4 | 1.3 |
| North Portland | 1.6 | 1.6 | 1.6 | 1.4 | 1.5 |
| East Portland | 1.7 | 1.6 | 1.6 | 1.3 | 1.5 |
| West Portland | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| **Citywide Average** | **1.5** | **1.5** | **1.5** | **1.5** | **1.5** |

* All scenarios and the Proposed Plan scenario use 2010 as a base year to compute growth estimates. Between 2010 and 2014, about 15,000 new housing units were built in the city. Those units have been incorporated into the forecast growth allocation for the Proposed Plan, with each unit being attributed to the geography where it is located. As a result, only about 110,000 units are allocated using the Buildable Land Inventory and related forecast models.

## Employment Allocation

The five growth scenarios also address the potential location of neighborhood commercial job growth. The distribution of jobs in each scenario does not vary much because many of the employment locations are essentially fixed in place; the Central City, campus institutions and industrial areas are not expected to move or relocate, so all of the scenarios use the same job distribution for these geographies. Instead, it is the employment in neighborhood commercial areas that changes with each scenario. Neighborhood commercial areas will capture about 25 percent of the employment growth in the period of 2010–2035.

Therefore, new neighborhood commercial jobs are allocated to employment areas that are also residential focus growth areas for each scenario. For example, in the Centers scenario, neighborhood commercial jobs are located in centers. This assumption is based on the premise that new employment growth follows new household growth. New households bring more disposable income to an area, which in turn drives the demand for goods and services that creates the employment. Consequently, the scenario descriptions are focused on the differences in residential growth.

The other employment, such as the industrial areas and campus institutions, has been allocated across Portland based on the current employment distribution as identified in the Employment Opportunities Analysis (EOA) 2012 adopted report and the 2015 Update. The scenarios do not address the industrial and campus institution development capacity shortfalls identified in the EOA. These shortfalls are being addressed through map changes in the Comprehensive Plan Update and the Campus Institution Zoning Project.[13]The evaluation of the Proposed Comprehensive Plan accounts for land use changes to address these shortfalls.

[13] https://www.portlandoregon.gov/bps/article/408240



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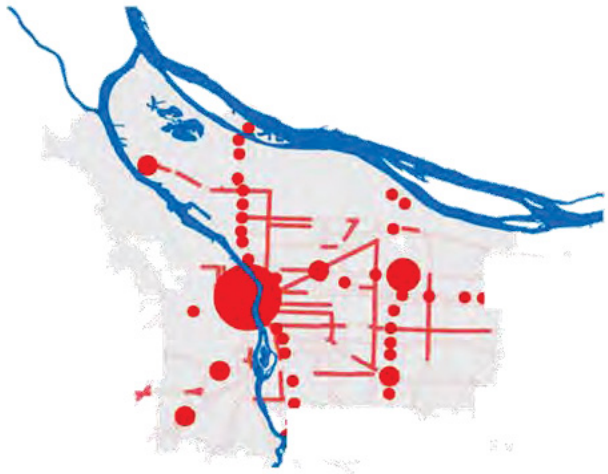
## DEFAULT SCENARIO



The growth distribution in the Default scenario is based on Portland's 15-year development trends (1996-2010). As a result, in this scenario a significant amount of growth is allocated to both East Portland (39,000 new households). However, less growth is allocated to the Central City (24,000).

In East Portland, much of the projected growth is located in Gateway and near SE 122nd Avenue and SE Division Street.

In the Inner Neighborhoods, most growth is expected along corridors and in centers, like Hollywood.

**Figure 16: Default Scenario: New Household Growth Distribution.**



**Table 6: Default Scenario: New Household Growth Distribution.**

| District | New Growth | 2035 Total | Growth Factor |
|---|---|---|---|
| Central City | 24,000 | 50,000 | 1.9 |
| Southeast Portland | 20,000 | 90,000 | 1.3 |
| Northeast Portland | 13,000 | 59,000 | 1.3 |
| North Portland | 17,000 | 44,000 | 1.6 |
| East Portland | 39,000 | 95,000 | 1.7 |
| West Portland | 10,000 | 54,000 | 1.2 |
| **Citywide** | **123,000** | **392,000** | **1.5** |



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**Figure 17: Default Scenario: 2035 Development Pattern.**

## Default Scenario Development Pattern

The resulting development pattern is relatively dispersed. It does not have significant concentrations of mixed-use areas. This dispersed pattern may make it more difficult to provide most Portlanders with walkable access to services, make cost-effective infrastructure investments and provide enhanced transit access.

**Complete Neighborhoods** – Widely distributed growth makes it less likely there will be the critical mass of activity needed to support the development of highly functioning mixed-use centers. Without mixed-use centers, fewer residents will have safe and walkable access to needed goods and services.

**Infrastructure Investment** – This growth pattern may also make it more difficult and less efficient to provide needed infrastructure services to all Portlanders. With a dispersed development pattern, there will be fewer residents within service areas, increasing the need to provide more facilities and services, without increases in financial resources.

**Access to Transit and Jobs** – Transit service is more efficient when there are concentrations of jobs and housing. This pattern will necessitate more transit lines, and may result in less frequent service.



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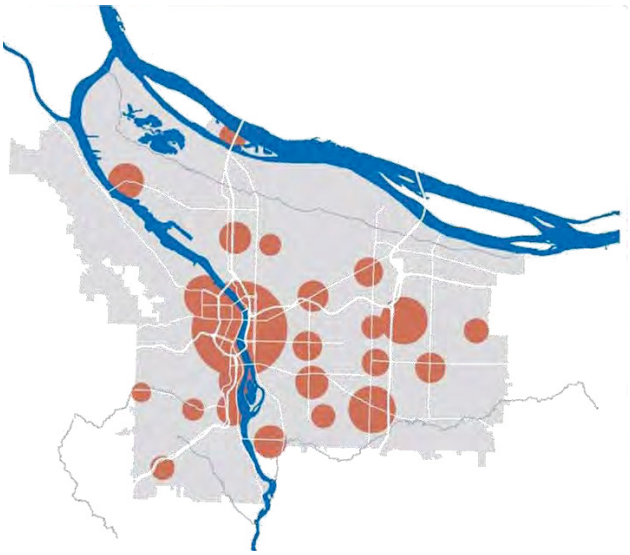
## CENTERS SCENARIO



In this scenario, growth is focused in Centers. Centers are compact mixed-use, walkable areas with shops and services that are well served by transit and connected to employment centers. Centers also have a housing mix that provides a range of choices for various household sizes and income levels. The Centers scenario builds off of the Healthy Connected City strategy in the Portland Plan, as well as the current Comprehensive Plan and Metro's 2040 Growth Concept, all of which prioritize growth in centers.

This scenario has a more compact growth pattern than the Default. It directs approximately 80 percent of new multifamily household growth into a more limited set of existing and emerging urban centers, including SE Lents, St. Johns and Hillsdale, the Central City and SE Hawthorne-Division-Belmont, among others.

**Figure 18: Centers Scenario: New Household Growth Distribution.**



**Table 7: Centers Scenario: New Household Growth Distribution.**

| Districts | New Growth | 2035 Total | Growth Factor |
|---|---|---|---|
| Central City | 30,000 | 56,000 | 2.2 |
| Southeast Portland | 20,000 | 90,000 | 1.3 |
| Northeast Portland | 12,000 | 58,000 | 1.3 |
| North Portland | 17,000 | 44,000 | 1.6 |
| East Portland | 34,000 | 90,000 | 1.6 |
| West Portland | 10,000 | 54,000 | 1.2 |
| **Citywide** | **123,000** | **392,000** | **1.5** |



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**Figure 19: Centers Scenario: 2035 Development Pattern.**

## Centers Scenario Development Pattern

The Centers scenario yields a series of compact, walkable, mixed-use areas with commercial services and residential buildings. Residential areas within centers will see more development, but residential areas outside centers will remain largely unchanged from today.

In order to encourage private development in Centers, the City and other agencies may need to invest in infrastructure facilities, like sidewalks, to improve safety and access to transit and streetscape improvements to create more pleasant walking environments and gathering spaces. These improvements will increase the attractiveness of centers and make it easier for residents in surrounding neighborhoods to safely and easily walk, bike or roll to local services to meet their household needs.



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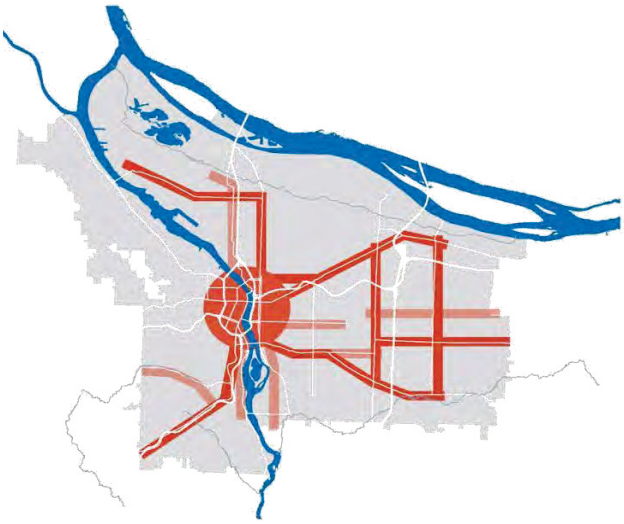
## CORRIDORS SCENARIO



This scenario prioritizes growth along Civic Corridors. Civic Corridors are typically long and significant streets that link different parts of the city together. They have frequent transit service and have the potential for a high level of development on either side.

The Corridors scenario builds off a significant component of the Healthy Connected City strategy in the Portland Plan, as well as the current Comprehensive Plan and Metro's 2040 Growth Concept.

This scenario allocates approximately 80 percent of new multifamily household growth into corridors, such as SW Barbur Boulevard, North Interstate, 82nd Avenue, and 122nd Avenue.

**Figure 20: Corridors Scenario: New Household Growth Distribution.**

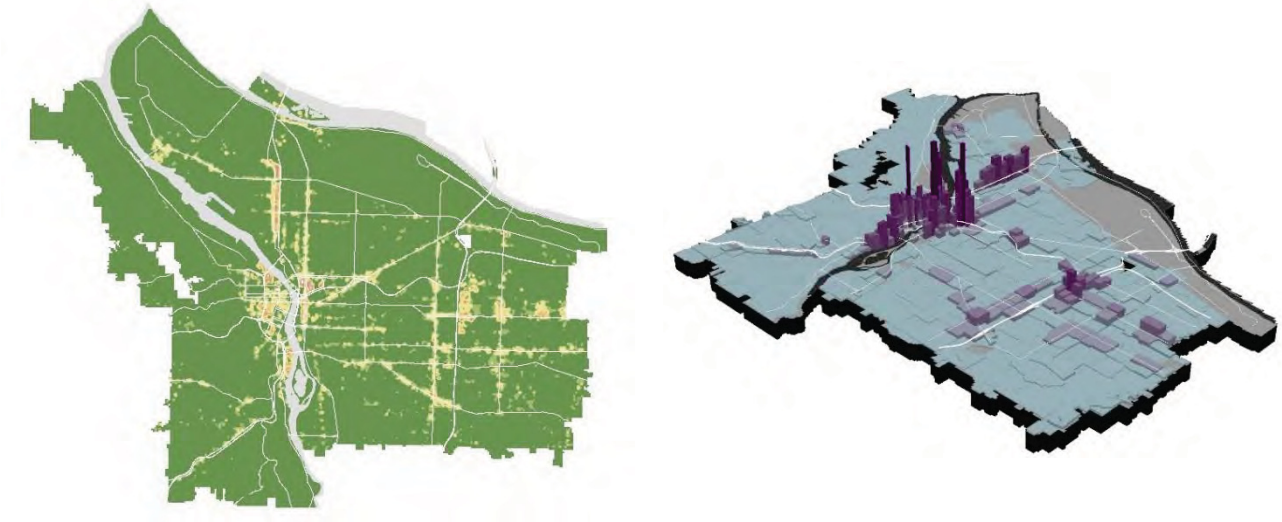


**Table 8: Corridors Scenario: New Household Growth Distribution.**

| Districts | New Growth | 2035 Total | Growth Factor |
|---|---|---|---|
| Central City | 30,000 | 56,000 | 2.2 |
| Southeast Portland | 20,000 | 90,000 | 1.3 |
| Northeast Portland | 12,000 | 58,000 | 1.3 |
| North Portland | 17,000 | 44,000 | 1.6 |
| East Portland | 34,000 | 90,000 | 1.6 |
| West Portland | 10,000 | 54,000 | 1.2 |
| **Citywide** | **123,000** | **392,000** | **1.5** |



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**Figure 21: Corridor Scenario: 2035 Development Pattern.**

## Corridor Scenario Development Pattern

This scenario results in a linear growth pattern with much development along major streets, but with minimized impacts to established single family neighborhoods. It supports distinctly urban corridors with more intense uses and levels of activity than there are today or in the Default.

A corridor growth pattern may improve watershed health by shifting growth from more environmentally sensitive areas into redevelopment of already urbanized corridors. It also may be more cost effective to serve with sewer and water infrastructure.



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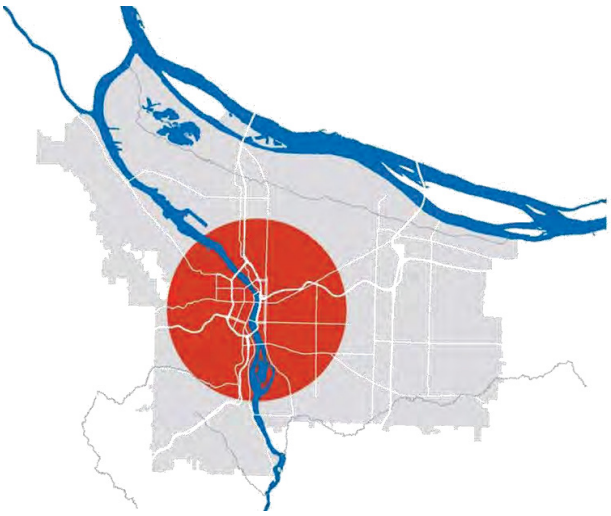
## CENTRAL CITY FOCUSED



This scenario focuses most future household growth into the Central City and Inner Neighborhoods within 3 miles of the Central City (a short transit or bike trip). Some additional growth is also directed to Gateway. This scenario reflects Portland's more recent (2008-2012) five-year development trends.

With this scenario, 16000 more households would be directed to the Central City than in the Default. Inner Southeast and Northeast Portland would see 10,000 more households than in the Default. This distribution alleviates growth pressures in East Portland.

**Figure 22: Central City Focused Scenario: New Household Growth Distribution.**

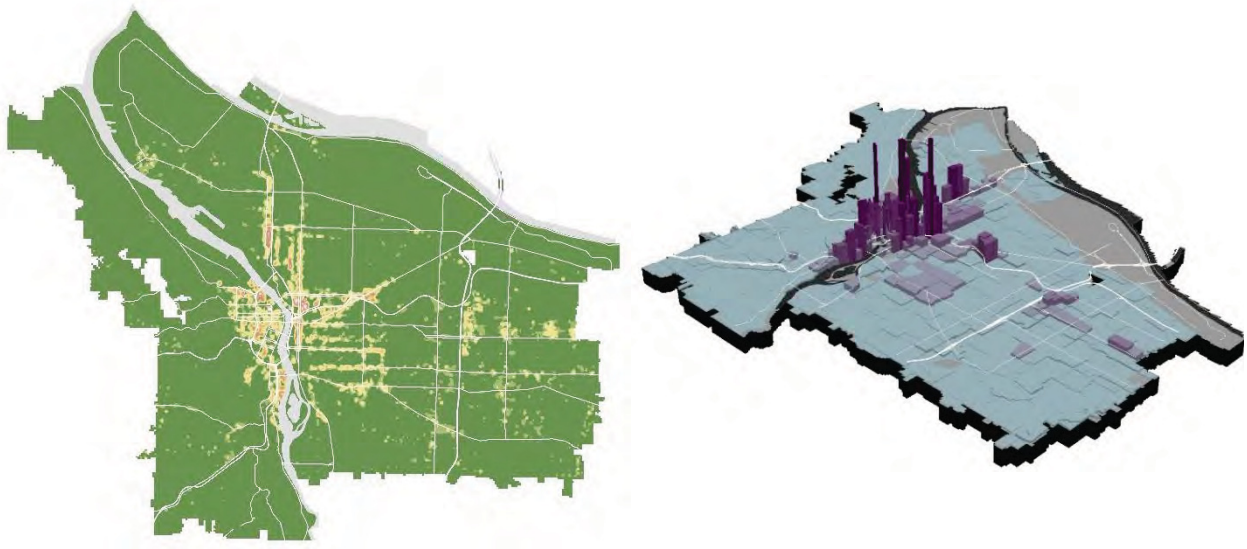


**Table 9: Central City Focused Scenario: New Household Growth Distribution.**

| Districts | New Growth | 2035 Total | Growth Factor |
|---|---|---|---|
| Central City | 40,000 | 66,000 | 2.5 |
| Southeast Portland | 24,000 | 94,000 | 1.3 |
| Northeast Portland | 19,000 | 65,000 | 1.4 |
| North Portland | 11,000 | 38,000 | 1.4 |
| East Portland | 19,000 | 75,000 | 1.3 |
| West Portland | 10,000 | 44,000 | 1.2 |
| **Citywide** | **123,000** | **392,000** | **1.5** |



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**Figure 23: Central City Focused Scenario: 2035 Development Pattern.**

### Central City focused development pattern

The overall land development pattern includes a highly developed Central City, with more tall buildings and significantly more residential development than today. Some additional development in the Central City may be achieved by encouraging the use of height and density bonuses. This scenario also includes developed mixed-use corridors within 3 miles of the Central City.

This scenario represents an opportunity to capitalize on existing infrastructure – these areas have a complete street network and good access to existing bicycle and transit networks. It may require less expensive infrastructure investment with a focus on amenities such as community centers and schools.

At the same time, the decrease in development pressure on East Portland may provide the opportunity to invest in much-needed infrastructure, such as schools and sidewalks.



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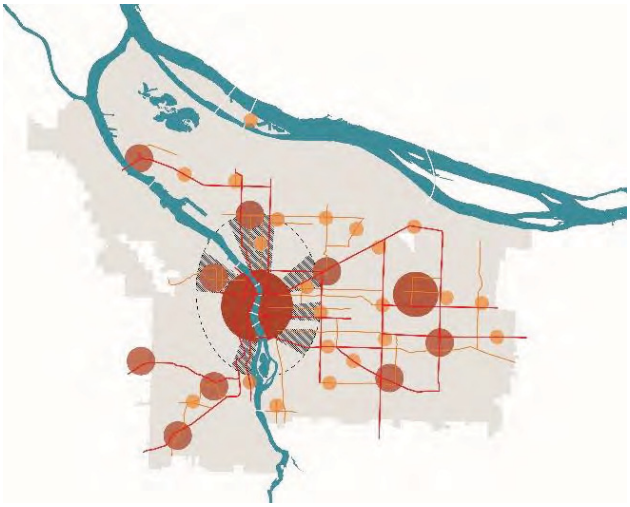
## PROPOSED COMPREHENSIVE PLAN



This scenario reflects the policies and actions supported by the Proposed Comprehensive Plan. This is a blend of three growth strategies – Centers, Corridors and Central City. It takes advantages of the mixed-use, walkable areas that can be created in centers and along Civic Corridors. The Proposed Plan also focuses more future household growth into the Central City and Inner Neighborhoods within 3 miles of the Central City (a short transit or bike trip). Some additional growth is also directed to Gateway and other town centers. This scenario also reflects Portland's most recent (2010-2014) development trends.

With this scenario, 12,000 more households would be directed to the Central City than in the Default. Inner Southeast and Northeast Portland would see 4,000 more households than in the Default. Density reductions have been proposed in locations farther from identified Centers and Corridors, particularly in outer East Portland.

**Figure 24: Proposed Comprehensive Plan Scenario: New Household Growth Distribution.**



**Table 10: Proposed Comprehensive Plan Scenario: New Household Growth Distribution.**

| Districts | New Growth | 2035 Total | Growth Factor |
|---|---|---|---|
| Central City | 36,000 | 62,000 | 2.4 |
| Southeast Portland | 22,000 | 92,000 | 1.3 |
| Northeast Portland | 15,000 | 61,000 | 1.3 |
| North Portland | 13,000 | 40,000 | 1.5 |
| East Portland | 27,000 | 83,000 | 1.5 |
| West Portland | 10,000 | 54,000 | 1.2 |
| **Citywide** | **123,000** | **392,000** | **1.5** |



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**Figure 25: Proposed Comprehensive Plan Scenario: 2035 Development Pattern.**

## Proposed Comprehensive Plan development pattern

The overall land development pattern includes a highly developed Central City, a series of compact, walkable, mixed-use centers with commercial services and residential buildings and some linear growth along major streets and transit corridors. This development pattern supports distinctly urban areas of development with more intense uses and levels of activity than exist today.

This scenario represents an opportunity to capitalize on existing infrastructure – these areas have a complete street network and good access to existing bicycle and transit networks. In order to encourage private development in prioritized centers and corridors City Bureaus and other public agencies will need to invest in infrastructure facilities, like sidewalks, to improve safety and access to transit and streetscape improvements to create more pleasant walking environments.

A critical component of the Proposed Comprehensive Plan Scenario is to accommodate growth by taking advantage of existing infrastructure efficiencies in well served inner neighborhoods while investing to reduce disparities in centers and corridors in East Portland.



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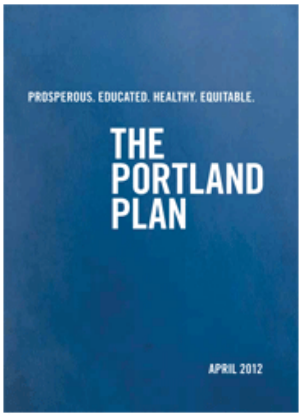
# 4. PERFORMANCE MEASURES




The primary purpose of this report is to establish a framework to evaluate the alternative growth scenarios against a set of performance measures. This framework will allow Portlanders to weigh the tradeoffs between different growth patterns and investment priorities, and evaluate the relative performance of the Proposed Plan.

The performance measures are based on the Portland Plan's Measures of Success and cover a wide range of subjects, from complete neighborhoods to watershed health. This list of measures provides a snapshot or overall sense of current conditions and where Portland will be in 2035. The evaluation identifies challenges and gaps to achieving the performance goals as well as the potential impact of different infrastructure investments. The scenarios also provide an opportunity to evaluate performance at different scales – citywide, district and neighborhood.

Finally, these measures are a starting point. They are not intended to provide a complete analysis of the issues, and some Portland Plan measures, such as high school graduation rates, are not directly dependent on the geographic distribution of growth.

## LONG-TERM VALUE

This evaluation framework was used throughout the development of the Proposed Comprehensive Plan Map.

The preferred growth strategy of the Proposed Comprehensive Plan is also reflected in the Urban Design Framework and the policies, infrastructure projects and maps in the adopted Comprehensive Plan. The performance measures informed those decisions and serve as a framework for ongoing monitoring and evaluation of the plan's implementation. The information in this background report focuses primarily on housing growth in Portland, with an emphasis on highlighting the performance of existing infrastructure and highlighting key opportunities and the relationships between Portland's existing deficiencies and potential future gaps. The evaluation has been used to identify actions to address gaps in performance. This updated analyses summarizes approaches used to overcome performance gaps through the Proposed Comprehensive Plan.

The purpose of this section is to outline to what degree different scenarios affect performance on a series of measures. These measures evaluate how well existing infrastructure and zoning perform under different growth patterns. The results of these measures begin to indicate performance gaps. This, in turn, served to clarify Comprehensive Plan goals, policies, infrastructure, investments, programs and partnerships that can best help Portland to reach performance targets.



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**Table 11: Portland Plan Performance Measures.**

| Portland Plan Objective | Performance Measure |
|---|---|
| **Prosperity and Affordability** | |
| By 2035, extend upward mobility pathways so that at least 90 percent of households are economically self-sufficient. By 2035, Portland has 27 percent of the region's new jobs, more of which provide a living wage, and continues to serve as the largest job center in Oregon. | Access to Family-Wage Jobs |
| By 2035, preserve and add to the supply of affordable housing so that no less than 15 percent of the total housing stock is affordable to low-income households, including seniors on fixed incomes and persons with disabilities. | Housing Mix and Affordability |
| By 2035, no more than 30 percent of city households (owners and renters) are cost burdened, which is defined as spending 50 percent or more of their household income on housing and transportation costs. | Risk of Displacement/ Gentrification |
| **Healthy Connected City** | |
| By 2035, 80 percent of Portlanders live in a complete neighborhood with safe and convenient access to the goods and services needed in daily life. | Complete Neighborhoods |
| By 2035, Portlanders have reduced the number of miles they travel by car to 11 miles per day on average and 70 percent of commuters walk, bike, take transit, carpool or telecommute to work. By 2035, Portland's transportation-related carbon emissions are 50 percent below 1990 levels, and effective strategies to adapt to climate change are in place and being implemented. | Access to Frequent Transit<br>Access to Low-Stress Bikeways<br>Vehicle Miles Traveled (VMT)<br>Mode Share<br>GHG/Carbon Emissions |
| By 2035, all Portlanders live within a half-mile safe walking distance of a park or greenspace. By 2035, all Portlanders can conveniently get to and enjoy the Willamette and Columbia Rivers. The regional Trail System is substantially complete and is an integrated component of a Healthy Connected City network. | Access to Parks<br>Access to Natural Areas |
| By 2035, watershed health is improved, and the Willamette River and local streams meet water quality standards. Tree canopy covers at least one-third of the city and is more equitably distributed. Fewer homes and businesses are at risk from flooding. A diversity of critical habitats (including floodplains, riparian areas, wetlands, oak groves, native forests and remnant meadows) are protected, connected and enhanced to support a rich diversity of native and migratory wildlife. High-quality trees are routinely preserved and planted on development sites. | Watershed Heath<br>Tree Canopy |



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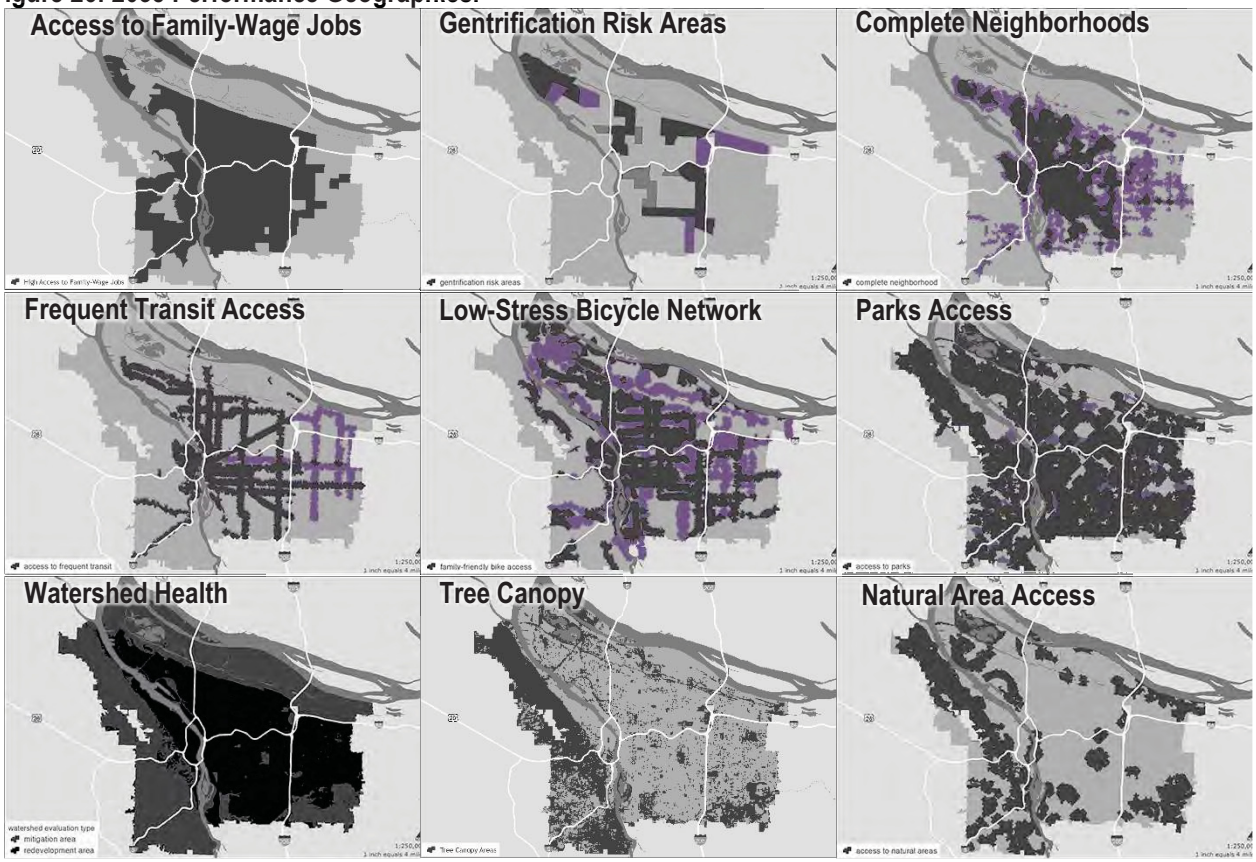
## METHODOLOGY

Most of the performance measures can be mapped as an area or geography that represents a part of Portland that meets the performance objective. This evaluation analyzes the amount of growth and the total number of 2035 households that occur within the high-performance geography. The evaluation includes the existing (2010) households, the 2010-2035 growth, and the total (existing plus growth) 2035 households for each scenario and the Proposed Comprehensive Plan. For example, the Complete Neighborhoods geography represents the parts of Portland that are relatively complete based on an index that measures walkable access to shops, services and civic amenities. The 2035 Portland Plan objective is that 80 percent of Portland households are located in a "complete neighborhood." The performance evaluation shows that 63 percent of current (2010) households are located in complete neighborhoods and the scenarios show a 2 to 6 percent increase for the different scenarios, without considering infrastructure investments. The Proposed Comprehensive Plan brings this number to 73% through a combination of land use changes, and investments to create more complete neighborhoods where they do not currently exist (adding parks, transit, sidewalks, etc. as described in the TSP and CSP).

The dark areas on the maps represent the high-performance geography. For the most part, these measures are positive indicators, which means increasing performance by maximizing the number of households in these geographies or expanding the coverage area of the geographies. The Gentrification Risk Areas is the one exception, where there is not a clear positive or negative associated with the information.

**Figure 26: 2035 Performance Geographies.**



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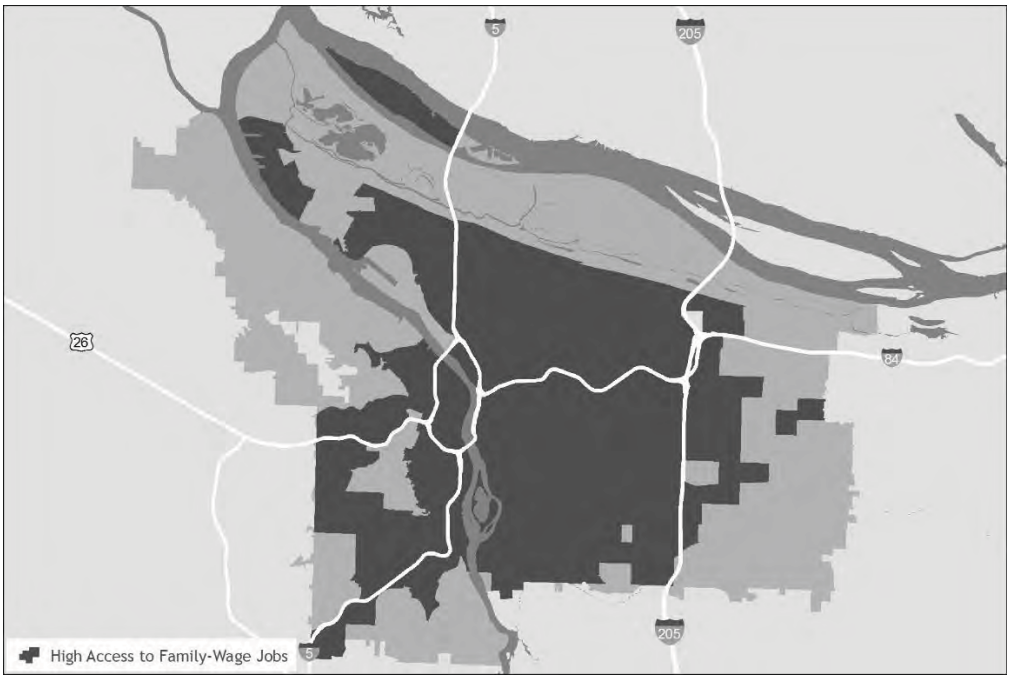
## ACCESS TO FAMILY-WAGE JOBS

**PORTLAND PLAN**

By 2035, extend upward mobility pathways so that at least 90 percent of households are economically self-sufficient.

By 2035, Portland has 27 percent of the region's new jobs, more of which provide a living wage, and continues to serve as the largest job center in Oregon.

Locating housing with access to a variety of higher paying jobs is a critical component of household prosperity. This performance measure is based on the number of family-wage jobs accessible within a 60-minute transit trip. A family-wage job is one that can meet the basic needs of a single-income household of one adult, one infant and one preschooler. In Multnomah County, the family-wage employment threshold is $47,244 per year. This basic measure only accounts for access to the quantity of jobs as an indicator of opportunity, without considering skills, qualifications or education attainment levels. While this analysis is influenced by proximity to the Central City, the region's largest job center, it also accounts for employment destinations accessible by transit in cities throughout the region.




**Family-Wage Job Access Areas** are places where households have good transit access and are reasonably close to employment centers with concentrations of jobs. Prioritizing development, especially affordable housing, in these areas will be beneficial to household prosperity by increasing the number of family-wage jobs that are accessible to a household with reduced dependence on an automobile.

**Family-Wage Job Gap Areas** are places where households have reduced access to family-wage jobs. Focusing public investments to increase access to transit or to support business growth to increase employment opportunities in or near these areas will help to expand the access to family-wage jobs.



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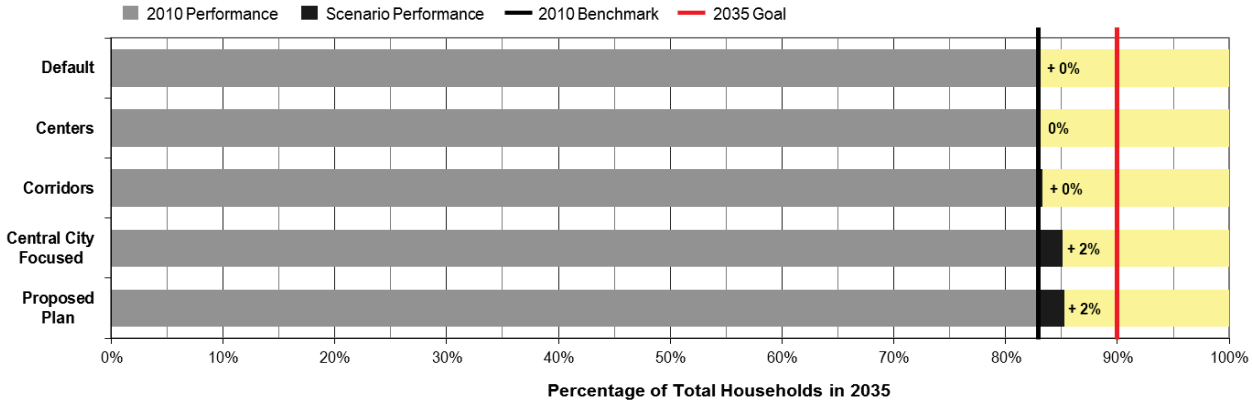
**Chart 1: Performance Measure: Access to Family-Wage Jobs – Households in Job Access Area[14]**




## Performance of the Proposed Comprehensive Plan

The performance goal is a translation of the Portland Plan objective that 90 percent of households are economically self-sufficient – in order to be a prosperous household, wage-earners need access to family-wage jobs. In 2010, 82 percent of Portland households were located in areas with good transit access to family-wage jobs. Policy and investment decisions in the Proposed Comprehensive Plan increase transit access to family-wage jobs by 2 percent. Comprehensive Plan map changes in the Gateway Town Center, along 82nd Avenue and elsewhere in East Portland, as well as the transit and active transportation investments in the TSP will contribute to better access to family-wage jobs in East Portland. Proposed changes in transit service to better connect 122nd Avenue with the Columbia Corridor had a particularly strong impact on this number.

## Options for Improving Performance

In order to meet the 90 percent goal, approximately 38,000 additional households need to have improved access to family-wage jobs. This change could be accomplished by increasing access to transit or creating more job opportunities in or near these low-access areas.

Increase Transit Service in East Portland

This measure is a function of transit travel time to employment centers. One strategy is to increase transit service in East Portland to provide faster or more direct connections to regional employment centers, especially the Columbia Corridor.

**Lesson Learned: More Jobs in East Portland**

If our pool of family-wage jobs is too far away from the pool of affordable housing, access to opportunity is reduced. East Portland is Portland's largest pool of affordable housing, but it lacks access to family-wage employment.

Increase Employment Opportunities in East Portland

Another option is to support business growth in order to increase job opportunities, especially middle-skill, family-wage jobs in East Portland. This business growth could be achieved through continuation and expansion of PDC's Neighborhood Prosperity Initiative. It also could be achieved through zoning changes to increase the amount of land available for light industrial uses and manufacturing.

[14] Performance of the Proposed Plan is will increase in the future as new employment uses are built in new dispersed employment areas in East Portland and new frequent transit service is added. A transit matrix analysis will be updated when new frequent transit stops are identified by Trimet.



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## HOUSING CHOICE

**PORTLAND PLAN**

By 2035, preserve and add to the supply of affordable housing so that no less than 15 percent of the total housing stock is affordable to low-income households, including seniors on fixed incomes and persons with disabilities. By 2035, no more than 30 percent of city households (owners and renters) are cost burdened, which is defined as spending 50 percent or more of their household income on housing and transportation costs.

Housing choice is a complex issue that is shaped by household preferences based on factors such as age, family size and income level. Additionally, discrimination in the housing market influences choice. Such complexities make it difficult to assess the housing choice impact of different scenarios. The housing choice analysis encompasses the mix of housing types (buildings) and how those types are expected to meet forecasted demand for different households (people). On a basic level, Portland has the zoned capacity to enable the private sector to produce a sufficient supply of new housing units to meet forecasted demand. The scenarios also allow for a wide range of housing types that are expected to meet a wide range of household needs. The differences are in the minor shifts in the unit mix of housing types that can affect affordability and gentrification risk.

Expanding housing choice is dependent on three key components:

**Location Diversity** – Location matters. Housing choice in Portland always takes place within the context of the larger regional housing market, which offers different amenities and opportunities. Portland can increase location diversity by (1) targeting growth into key centers and corridors, and (2) creating more complete neighborhoods by improving services and access in areas that are currently not well served.

**Unit Affordability** – Affordability is a function of two components: housing cost/rent and household income. A mismatch between these two factors can result in a cost-burdened household, wherein 50 percent or more of household income is spent on housing and transportation costs. For many low-income households, affordable housing is difficult to find in the private market and they must rely on public programs to keep housing costs below the burden level. Affordability can also be affected by supply and demand. Failing to enable mixed-income housing development in high-demand areas can create tight market conditions, driving prices up.

**Unit Diversity** – Housing unit diversity in an area can support a range of housing choices that respond to changing household needs such as larger family-sized units or multifamily rental opportunities adjacent to established single family neighborhoods.

The interaction of these components affects the level of housing choice available to each household differently. It is important to note that choice can be expanded independent of affordability by building more housing units and creating more complete neighborhoods (attractive locations). These issues have impacts on Portland's performance to the degree that Portland continues to grow. Housing unit diversity offers regional and citywide benefits, including lessening the burden of automobile travel across the region (resulting in fewer vehicle miles traveled), using existing infrastructure efficiently and supporting regional transportation corridors and employment centers.



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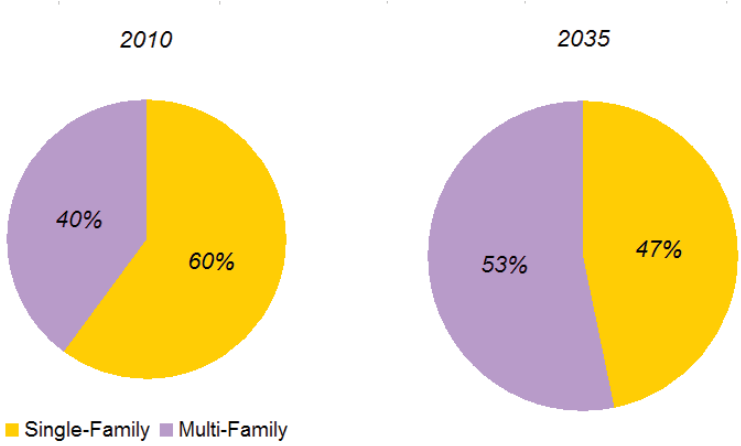
## Housing Mix

Overall, Portland provides a relatively balanced mix of housing types. Currently, single family houses make up nearly 60 percent of Portland's housing stock. As a result of Portland being already urbanized, with limited opportunities for single family residential development, the vast majority (80 percent) of new housing units are expected to be in multifamily units. The supply of multifamily units is expected to grow by 95,000 units, far exceeding the expected single family growth of 26,000 units. Even though the new growth is skewed toward multifamily housing types, the overall mix in 2035 is still relatively balanced, with 47 percent being single family houses.

**Chart 2: Single-Family–Multi-Family Unit Split.**




Although the housing mix will shift, the share of the land area zoned within the City of Portland will remain consistent, with Single Family Residential covering about 42 percent of Portland's land area. The mixed-use commercial areas and multifamily residential areas make up only about 10 percent of the land area, with the balance largely in industrial areas and open space.

**Figure 27: Land Area by Zoning Designation.**



Multi-family & commercial zones



Single-family zones



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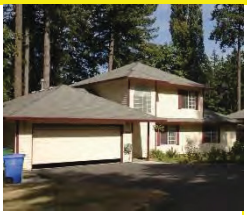
## Table 12: Housing Types.

### SINGLE FAMILY RESIDENCES



**Detached House**

A one- to three-story detached, single family dwelling on its own lot. Typically, lot size is more than 5,000 square feet.



**Small Lot Single Family Residence**

A one- to three-story detached, single family dwelling on its own lot, but a smaller (2500 sq foot) lot.



**Attached House (Medium Density)**

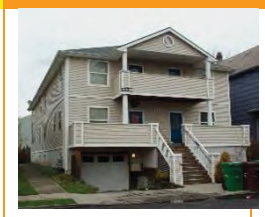
Characterized by individual units that share a common wall, with each unit on its own lot. Examples include townhomes and rowhouses.



**Attached House (High Density)**

Characterized by individual units that share a common wall. Many high-density attached houses include shared open space amenities in backyards or courtyards. Examples include duplexes, triplexes and units with shared courtyards.

### CORRIDOR APARTMENTS



**Plex**

A dwelling having apartments with separate entrances to six or more units. This includes two-story houses having a complete apartment on each floor and side-by-side apartments on a single lot that share a common wall.



**Corridor Apartment**

A four-story residential apartment building, typically with one on-street entrance and internal entrances to individual units.



**Neighborhood Mixed Use**

A four-story residential apartment building with commercial uses on the ground floor.



**Single Room Occupancy Unit (SRO)**

A studio apartment that does not have its own washing, laundry and kitchen facilities. Examples include affordable housing projects, assisted living facilities and college dormitories.

### MID- TO HIGH-RISE APARTMENTS



**Mid-Rise Mixed Use (Small Units)**

A six- to ten-story building with ground floor office or retail uses. Allocated units of this type tend to be predominantly studios and one-bedroom units and tend to have smaller units.



**Mid-Rise Mixed Use (Large Units)**

A six- to ten-story building with ground floor office or retail uses. Typical units are larger, one- to four-bedroom units, and have a smaller number of studio units as part of the overall mix.



**High-Rise Tower**

A 10+ story building containing residential apartments or condominium units. In addition to spectacular views, most high rises offer their residents a full range of amenities. Building features may include 24-hour concierge service, swimming pools, spas, saunas, tennis courts, exercise areas, party rooms and guest suites.



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**Chart 3: Housing Type Production by Scenario.**




**Table 13: Housing Type Production by Scenario.**

| | Default | Centers | Corridors | Central City Focused | Proposed Comprehensive Plan |
|---|---|---|---|---|---|
| SINGLE FAMILY RESIDENCES | | | | | |
| Detached Houses | 14,000 | 14,000 | 13,000 | 14,000 | 14,000 |
| Small-Lot Houses | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 |
| Attached Med Density | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| Attached High Density | 3,000 | 4,000 | 4,000 | 4,000 | 4,000 |
| CORRIDOR APARTMENTS | | | | | |
| Plexes | 8,000 | 8,000 | 7,000 | 6,000 | 7,000 |
| Corridor Apts | 16,000 | 16,000 | 16,000 | 11,000 | 14,000 |
| SRO/Studios | 9,000 | 9,000 | 10,000 | 10,000 | 13,000 |
| Neighborhood Mixed Use | 21,000 | 20,000 | 21,000 | 21,000 | 16,000 |
| MID-TO-HIGH RISE APARTMENTS | | | | | |
| Mid-Rise (small units) | 19,000 | 19,000 | 21,000 | 15,000 | 18,000 |
| Mid-Rise (large units) | 3,000 | 3,000 | 3,000 | 2,000 | 4,000 |
| High-Rise | 19,000 | 19,000 | 18,000 | 30,000 | 22,000 |
| ACCESSORY DWELLING UNITS | | | | | |
| ADUs | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 |



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## Housing Types

Housing types found in Portland fall into three broad categories: single family residential, neighborhood and corridor apartments, and mid- to high-rise units. These categories are based on building types and include both rental and ownership/condos. The analysis shows that Portland expects to produce a wide range of housing types, with all of the scenarios producing a similar mix. The one exception is the Central City Focused scenario, which produces more high-rise towers and fewer plexes and corridor apartments, which could negatively affect housing affordability.

## Household Types

Housing preference is usually shaped by the size and needs of a household. However, the actual choice and eventual place of residence for a household is significantly influenced by household income. Metro's Metroscope model groups current (2010) and future households (2035) into eight different types (See Table 14) based on income, age, and size across the metro region. This grouping is helpful in estimating current and future affordable housing needs by helping identify and describe the household types that are most likely to struggle to meet the cost of housing based on their income.

Metro's most recent household projections provide insight regarding the share and number of households that struggle to find suitable housing today and are likely to face the same challenge through 2035. As can be noted from following table (Table 14), Groups 1, 2, & 3, are households that generally make less than 80% MFI and made-up 45% of households in Portland in 2010. By 2035, the share these household groups is projected to grow an additional three percent. The number of households in the lowest income group alone is projected to grow by 25,000.

**Table 14: Households by Income Type (2010–2035)**

| | Household Type | Income | 2010 Share | 2010 Households | 2035 Share | 2035 Households | Percent Change | Amount Increase |
|---|---|---|---|---|---|---|---|---|
| Low | Group 1 | <$15,000 | 17% | 43,004 | 18% | 67,544 | 1% | 24,540 |
| | Group 2 | $15,000-$24,999 | 13% | 32,885 | 15% | 56,285 | 2% | 23,400 |
| | Group 3 | $25,000-$34,999 | 15% | 37,944 | 16% | 60,039 | 0% | 22,095 |
| Middle | Group 4 | $35,000-$44,999 | 13% | 32,885 | 13% | 48,781 | 0% | 15,896 |
| | Group 5 | $45,000-$59,999 | 13% | 32,885 | 11% | 41,276 | -2% | 8,391 |
| | Group 6 | $60,000-$74,999 | 8% | 20,238 | 7% | 26,268 | 0% | 6,030 |
| High | Group 7 | $75,000-$99,999 | 10% | 25,296 | 10% | 37,523 | 0% | 12,227 |
| | Group 8 | $100,000+ | 11% | 27,826 | 10% | 37,523 | -1% | 9,697 |
| | **Total** | - | **100%** | **252,963** | **100%** | **375,239** | - | **122,276** |

Source: Metroscope, Gamma 2012



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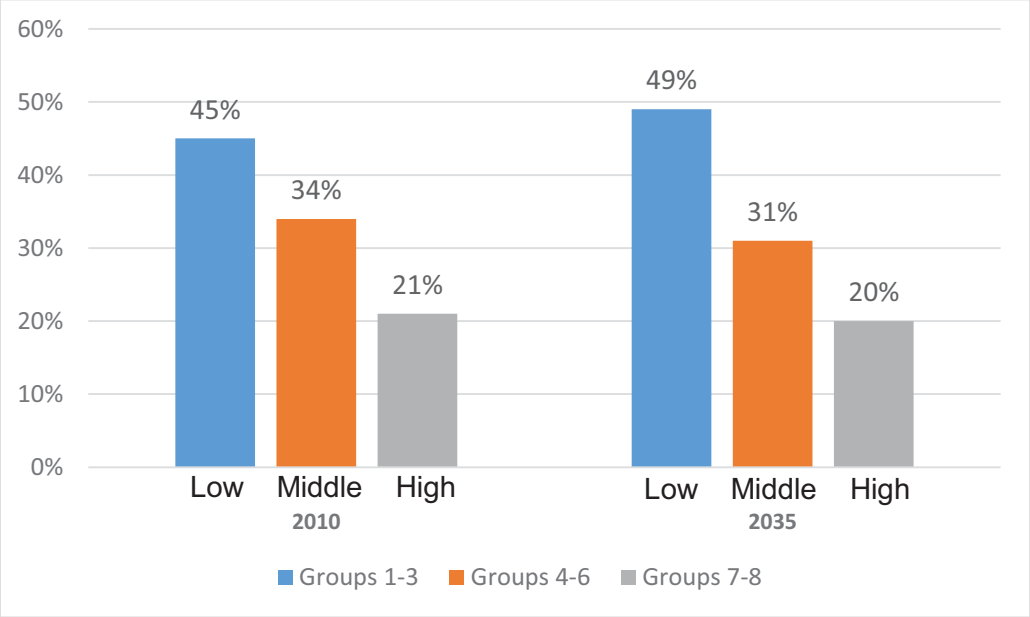
**Figure 28: Household Types**




## Affordability and Cost Burden by Household Type

The nature of the housing stock, both existing and new, will influence the housing choice that households make today and in the future. Not every new household will be matched to a new unit. Older housing stock tends to be more affordable than new construction in many areas, and Portland's existing housing stock will continue to be the predominant housing stock in the market. Market demand, amenity level and location can put increased market pressure on these areas due to low vacancy rates and lack of choice within a particular segment of stock (i.e. family housing, studios, etc.).

In general, the diversity of the housing type production should be sufficient to produce enough housing units to meet the future demand, except for the low-income groups, which will have fewer choices from new development. The illustration (Table 14) provides a cross match between housing unit types and the eight household types based on prevalent housing costs to help us understand the need for types of affordable housing units that will be required. For example, the number of Group 1 households is expected to grow by 25,000, but the scenarios expect to develop only another 8,000-10,000 units of SRO/small studio housing (the only housing type projected to be affordable to that group). This gap will put pressure on the existing affordable units and increase the number of cost-burdened households in this category. For Groups 2 and 3, the housing situation is a little better – they are expected to grow by another 45,000 households by 2035 with the expectation that an additional 68,000 housing units will be developed in categories that could be suitable and affordable to them. However, these households will face competition for that housing from the other higher income groups that will limit their housing choices. Ensuring that excess capacity exists in those housing types could help protect against upward price pressure.



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### Table 15: Household Types

| | |
|---|---|
| **GROUP 1**<br>**<$15,000** | These are the lowest income households, whether they are renters or owners. Of the renters in this group, all live alone, and most are elderly. Among owners in Group 1, age and the number of people in the household are more evenly distributed. Example: A woman in her seventies renting an apartment, living alone on a very low income. |
| **GROUP 2**<br>**$15,000<$25,000** | These households can be any age, but their income is among the lowest. There are more renters than owners. About two-thirds are childless. However, one-third of the renter households in this group have school-age children, while only about one in six of the owners in this group have school-age children. Example: A family renting a home, two adults working at low-wage jobs, raising young children. |
| **GROUP 3**<br>**$25,000<$35,000** | With a bit more income than Group 2 households, these people are primarily in the 25-44 age bracket. The renters are mostly single-person households. Among owners, about half are two-person households, approximately one-third of which are families with school-age children. Example: Two thirty-somethings, both of whom work, and who have just bought their first home. |
| **GROUP 4**<br>**$35,000<$45,000** | With a broad age distribution, these households are usually childless, especially if they are renters. Owner households in Group 4 have more residents than renter households, and almost 40 percent of the group include school-age children. Example: Two people renting a home, both working, and with children who are grown up and living elsewhere. |
| **GROUP 5**<br>**$45,000<$60,000** | Group 5 households are larger and wealthier. People in the renter households of this category are not only older than those in the owner households, but also have smaller household sizes. The owners are more likely than not to have children. Example: Two parents in their late thirties, living in a home they own with children in junior high and high school. |
| **GROUP 6**<br>**$60,000<$75,000** | With more income than Group 5 households, almost half of the people in this group are between 25 and 44. Although the majority do not have school-age children, two- and three-person households are most common. The owner households are larger and more likely to have school-age children. Example: Two adults with well-paying jobs, one working full-time, the other part-time, raising elementary-school-age children and living in a home they own. |
| **GROUP 7**<br>**$75,000<$100,000** | Mostly without children, these households include the very high-income couples, especially for owners. Interestingly, the renter households in Group 7 are more likely to have children than the owner households in the group. Example: Two early-fifties adults working at well-paying jobs, owning their home. |
| **GROUP 8**<br>**>$100,000** | Among owners, most of these households have children; about 60 percent of renter households have children. They are the highest earners, in their prime earning years. Example: A family with two parents in their late forties or early fifties, both working fulltime in high-paying jobs, raising children who are still in school and living with them in the home they own. |

Source: City of Portland. Housing Demand and Supply Background Report, October 2012



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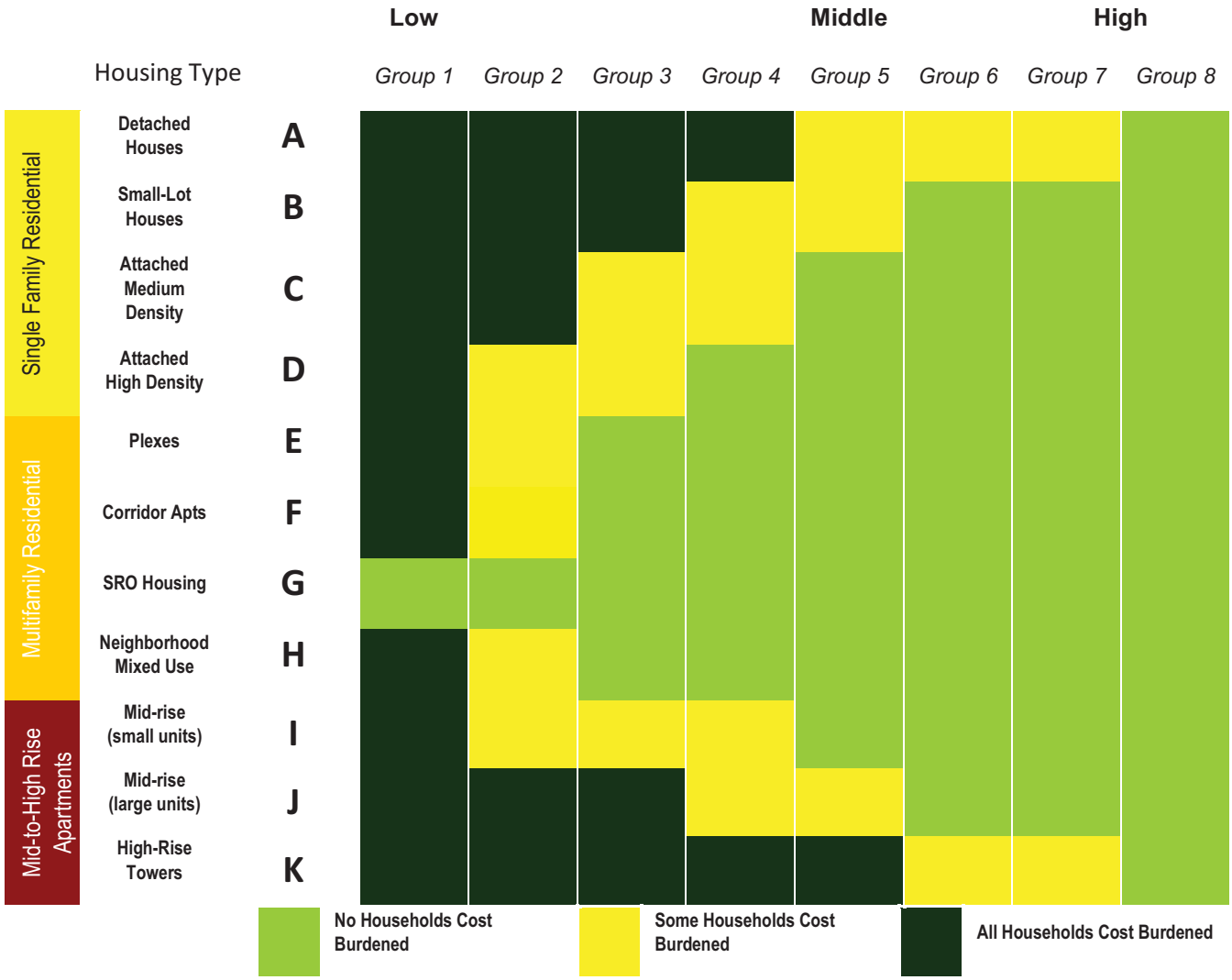
**Table 16: Housing Affordability by Household Type.**




## Performance of the Proposed Comprehensive Plan

The Proposed Comprehensive Plan does not yet ensure a supply of affordable units to the lowest income groups.

For example, while the projected supply of SRO/studio sized apartments has increased slightly relative to other scenarios, it is not yet meeting projected demands. The projected increase in SRO/Studio units can be attributed to the creation of the Campus Institution Zone which significantly increases the capacity for student housing at educational institutions and supportive housing for medical institutions. Additional increases in SRO/Studio units can be attributed to recent development trends in centers and corridors (such as the increasing number of studio and micro apartments being built) that are reflected in the allocation of housing through the Mixed Use Zones project.

Down-designations from R5 to R7 in the Proposed Plan have slightly reduced the supply of more affordable small lot single family development. Down-designations in East Portland and Southeast Portland have also decreased the capacity for duplexes, townhomes, and lower



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density multifamily development types. However, these down-designations were made to respond to infrastructure capacity challenges in East Portland including David Douglas School District capacity issues, access to frequent transit, and access to daily needs services.

Ideally these reductions in the supply of affordable single family and low-cost multifamily options would be offset by increasing the amount of land available for this kind of development in more opportunity-rich locations. For example, adding more R2.5 or R2 zoning near neighborhood centers could increase the supply of small lot single family homes, duplexes, townhomes, and low density multifamily development types. This should be a consideration as refinement plans are developed for centers and corridors.

## Options for Improving Performance

Affordability will continue to be an issue that will need to be addressed, especially to meet the needs of low-income households, communities of color, aging populations and people with disabilities.

### Keep Housing Affordable

The City needs to focus on keeping housing affordable and increasing the ability of the most vulnerable households to live in complete neighborhoods. This can be achieved through meeting the housing needs of households which will not be met by the market, building more affordable units in accessible amenity-rich locations, lowering transportation costs and increasing household prosperity, and improving services in areas that are affordable but not well served.

**School Enrollment**

A growing community raises concerns about school enrollment and the impact on school facilities. The share of households with children is expected to decline by 3 percent, but given the overall growth in households, the total number of children is expected to increase. Forecasting accurate long-range school enrollment is complicated, but to meet the anticipated need it will be important to align strategies to expand choice for households with children while making upgrades to existing school facilities. The Bureau of Planning and Sustainability has been working closely with Portland Public Schools and David Douglas Schools to coordinate growth forecasts.

### Create a Wide Range of Housing Choices

Producing a diverse supply of housing creates diverse communities with the opportunity for households to remain in their neighborhood as their lifestyles and housing needs change, especially in allowing older adults to age within their community.

### Support Development of New and Innovative Housing Types

Changing household needs and preferences will create demand for new and different housing types. Recently, Portland has seen the development of innovative housing types such as co-housing, micro-apartments and accessory dwelling units.



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## GENTRIFICATION RISK AREAS

**PORTLAND PLAN**

By 2035, no more than 30 percent of city households (owners and renters) are cost burdened, which is defined as spending 50 percent or more of their household income on housing and transportation costs.

The Portland Plan provides new direction on the issue of balancing neighborhood revitalization with the ability of residents to stay in place to enjoy the new amenities and benefits of that revitalization. The City has committed to ensuring that all communities are prosperous, healthy and accessible—but with increasing numbers of highly educated and more affluent newcomers coming to Portland, housing pressures rise. As some neighborhoods become more desirable, long-time residents with lower incomes, particularly in communities of color, have found themselves priced out and moving out—often to areas with fewer services, amenities and institutions. A risk assessment based on demographic and housing market changes that are indicators of changes in neighborhood character has identified areas of Portland that are at increased risk of gentrification or displacement. This performance measure assesses the level of risk based on the number of households that are in these areas.




**Gentrification Risk Areas** identify places where there is risk of gentrification or displacement.

**Stable Neighborhoods** identify places where the risk of gentrification is less. These areas represent areas that have had relatively consistent indicators on property values, ownership and rental rates, household income and diversity.



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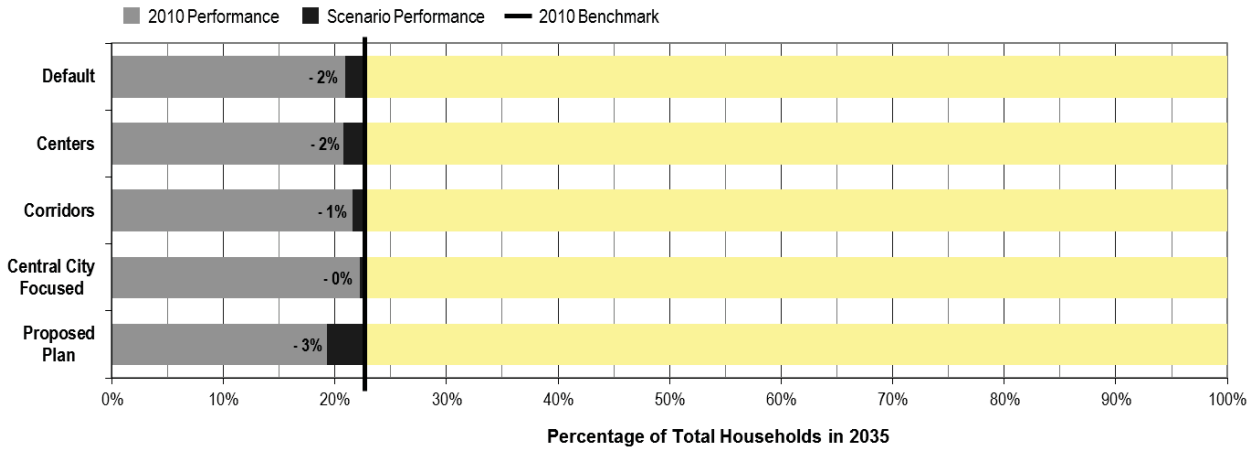
**Chart 4: Performance Measures: Gentrification – Households in Gentrification Risk Areas.**




## Performance of the Proposed Comprehensive Plan

In 2010, the risk of gentrification posed to households was 22 percent. Relative to other scenarios, the Centers and Corridors growth strategy of the Proposed Comprehensive Plan spreads growth allocation more evenly across all parts of Portland with marginally less impact to communities at risk of gentrification. The City of Portland must continue to evaluate the impacts that investment decisions have on communities at risk of gentrification, develop and implement tools to increase the production of affordable housing, and support equitable economic development initiatives.

## Options for Improving Performance

Develop more affordable housing

Development of affordable housing is at the heart of displacement mitigation strategies. The City should focus on creating more affordable housing and increasing the ability of low-income and minority households, and the most vulnerable households, to have the opportunity to stay in the neighborhood.

**Lesson Learned: More Affordable Housing**

Making investments to focus growth in high-performing areas can create more gentrification pressure. This means Portland will need to do a better job of aligning growth management and public investment strategies with affordable housing strategies.

Business development

As development or public investment occurs in at-risk neighborhoods, businesses facing gentrification need assistance through programs such as the City's Neighborhood Prosperity Initiative. The City also could focus workforce development and job training programs to enable lower income residents to qualify for a better job that would enable them to afford the increased housing costs.

Tracking and Program Evaluation

Using the Portland Plan's Framework for Equity as a guide to track neighborhood change, including changes in race, age, disability, ownership and other factors, could help the City anticipate the impacts of new policies and programs.



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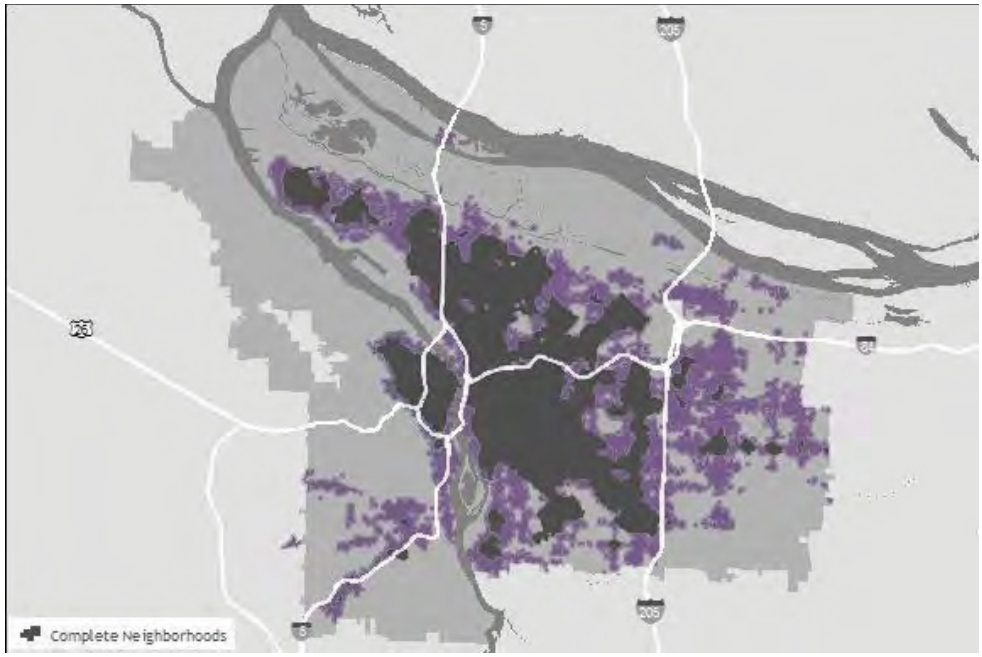
## COMPLETE NEIGHBORHOODS

**PORTLAND PLAN**

By 2035, 80 percent of Portlanders live in a complete neighborhood with safe and convenient access to the goods and services needed in daily life. At least 80 percent of Portland's neighborhood market areas are economically healthy. They promote economic self-sufficiency of households through the strength and performance of local retail markets, job and business growth, and access to transit and nearby services that lower household

A "complete neighborhood" is a neighborhood where people have convenient access to the goods and services needed in daily life, which includes a variety of housing options, grocery stores and other commercial services, high-quality public schools, public open spaces, active transportation options and civic amenities. Providing more opportunities for more households to live in complete neighborhoods can help reduce household transportation costs, improve public health by making it easier to incorporate exercise into daily life and reduce carbon emissions. This performance measure is based on the City's 20-minute neighborhood index. The performance measure is based on the number of households located in a complete neighborhood.




**Complete Neighborhoods** identify places that are considered relatively complete on the 20-minute neighborhood index. Prioritizing development in these high-performing areas will take advantage of the existing infrastructure and services. These areas have a good active transportation system that connects neighborhood business districts, schools, parks and other amenities.

**Complete Neighborhood Gap Areas** identify places that lack access to one or more of the key components of a complete neighborhood. Some areas lack a strong neighborhood business district. Other areas lack a complete transportation system (sidewalks are missing, streets are unimproved, etc.), which can make it take longer or be more difficult to access the services one needs for daily living.



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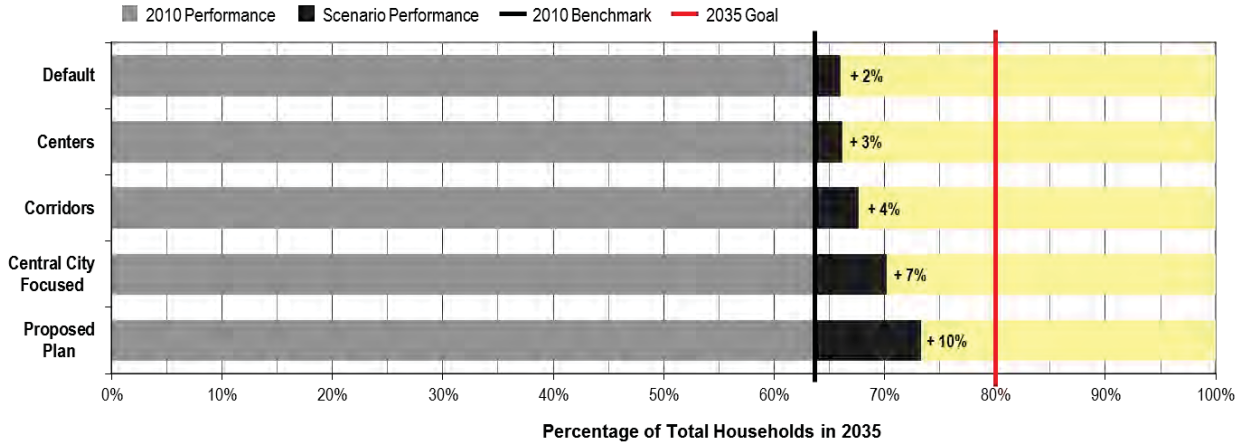
**Chart 5: Performance Measures: Complete Neighborhoods – Households in a Complete Neighborhood.**




## Performance of the Proposed Comprehensive Plan

Today, nearly two-thirds (63 percent) of all Portland households live in complete neighborhoods. Performance of the Proposed Comprehensive Plan increased significantly relative to this measure. This 10% increase in complete neighborhoods is the result of several things. First, the proposed plan places more growth in existing complete neighborhoods than some of the other scenarios. Second, the proposed plan brings more non-conforming commercial uses into conformance - expanding access to commercial services. Finally, investments in frequent transit, the low-stress bike network and parks in parks deficient areas (in the CSP and TSP) also increased the complete neighborhood measure. Completeness increased the most in East Portland due to these investments in infrastructure.

**Lesson Learned: More Complete Neighborhoods**

Portland's legacy development pattern means that to fully achieve this goal requires creating more complete neighborhoods, especially in East and Southwest Portland.

## Options for Improving Performance

Create More Complete Neighborhoods in East Portland

The success in meeting this performance measure is dependent on creating more complete neighborhoods in East Portland, by providing more frequent transit, more sidewalks and bikeways and stronger business districts that serve neighborhood needs.

Create More Complete Neighborhoods in Southwest Portland

Much of Southwest Portland is challenged by topography, densities too low to support frequent transit, a relative scarcity of neighborhood commercial services and an incomplete street network. However, there are opportunities to create more complete neighborhoods along the Barbur Boulevard corridor and existing neighborhood business districts in Hillsdale, Multnomah Village and West Portland.

Expand Access and Create More Housing Options in Complete Neighborhoods

An important element of a complete neighborhood is that it has housing options to accommodate the needs of people of all ages and abilities. Neighborhoods in areas of North, Northeast and Southeast Portland present an opportunity to increase access to existing neighborhood business districts that will expand the coverage of complete neighborhoods. Also, encouraging the development of a range of housing types in these areas can expand the diversity of households that live in these areas.



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## FREQUENT TRANSIT ACCESS

**PORTLAND PLAN**

By 2035, Portlanders have reduced the number of miles they travel by car to 11 miles per day on average and 70 percent of commuters walk, bike, take transit, carpool or telecommute to work

Portland has adopted policies to increase the share of trips made using green and active transportation modes and to make transit the preferred mode for longer commuting trips. The goal of having 70 percent of commuters use active transportation is rooted in the climate action/carbon reduction, air quality and public health goals. The performance measure is based on convenient access to the highest quality elements of the transit network – MAX, Portland Streetcar and frequent TriMet bus service. Providing access by a short, ¼-mile walk can make it convenient for residents to use the transit system for many of their daily needs. This measure is a simple method of determining access to transit based on proximity to the frequent transit network.




**Frequent Transit Access Areas** identify places within ¼ mile of the frequent transit, which represents the best service that Portland has to offer. Development in these areas will have better access and presumably greater transit use than in other areas of the city.

**Transit Access Gap Areas** identify places that lack access to the frequent transit network. A bus route may be available in some areas, but the service levels or frequency may not be enough to represent a true alternative to the automobile.



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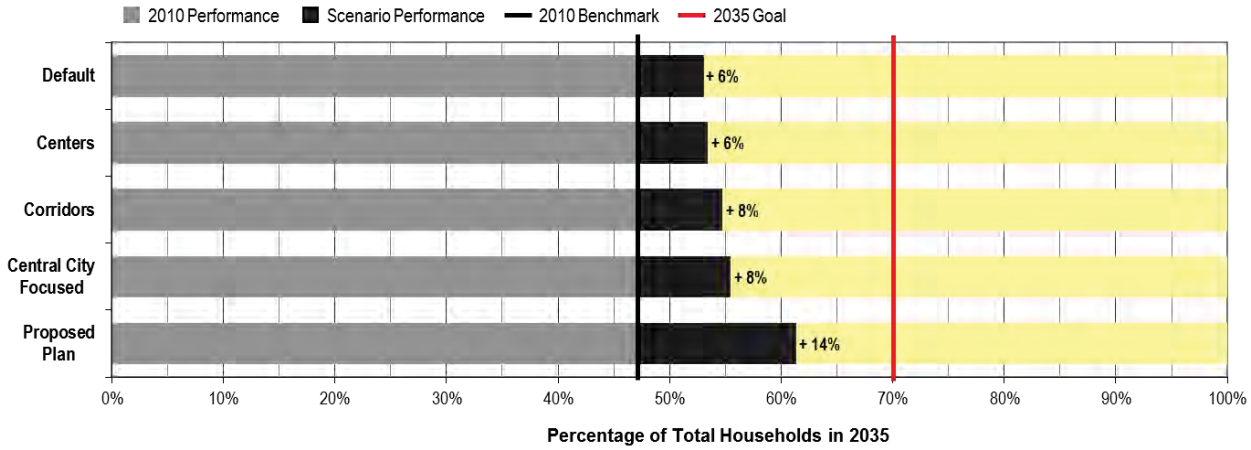
**Chart 6: Performance Measures: Frequent Transit Access – Households within ¼ Mile of Frequent Transit.**




## Performance of the Proposed Comprehensive Plan

In 2010, 47 percent of Portland households had good access to the frequent transit network. Expansion of the network through projects identified in the TSP increased access to frequent transit by 8 percent over the Default scenario. This analysis shows that 62% of households in 2035 will be within ¼ mile of frequent transit. The proposed addition of north/south frequent transit on 122nd Avenue contributed the most to increasing access to frequent transit by filling in transit gap areas in East Portland. Active transportation and safety projects also play a significant role in connecting residents from housing to frequent transit through the creation of low-stress and dedicated bike facilities, sidewalks, and other pedestrian safety projects.

## Options for Improving Performance

Expand the Frequent Transit Network

The existing network does not cover all parts of Portland, even if people are willing to walk longer distances. Even with increased service on 122nd Avenue, there are significant gaps in East Portland, especially on north-south routes such as 136th Avenue and 148th Avenue.

**Lesson Learned: More Transportation Choices**

Increasing transportation choices has multiple benefits beyond the transportation system. Access and mobility play a significant role in creating complete neighborhoods and increasing access to family-wage jobs.

Provide Better Access to Transit

Completing a network of sidewalks and bicycle facilities to and from transit routes can make it easier and more convenient for people to ride transit and can extend the coverage area of a frequent transit route.



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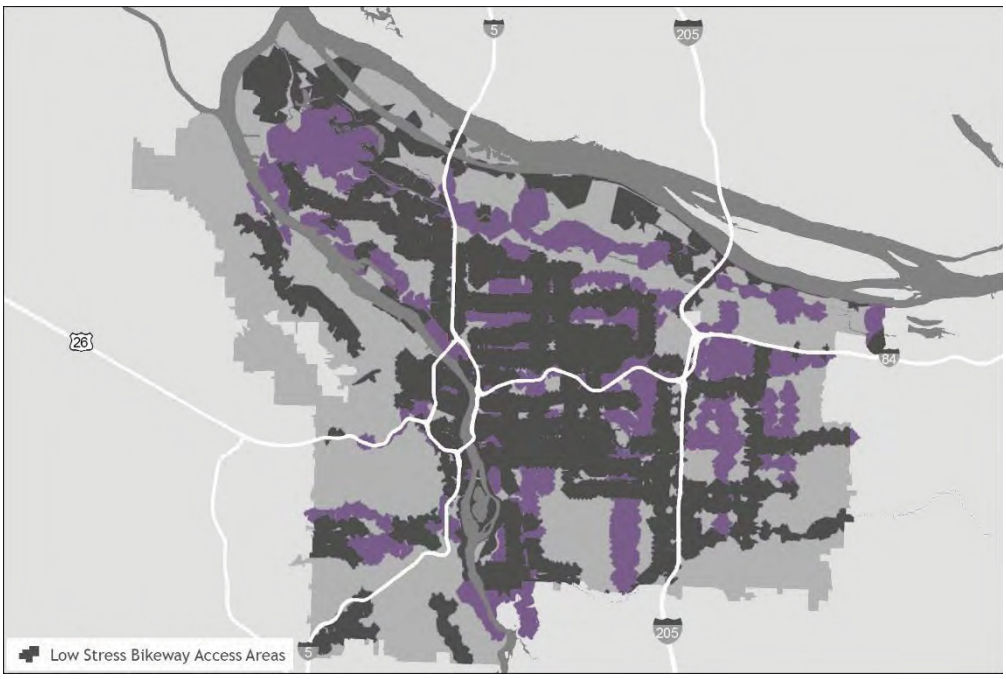
## LOW-STRESS BIKE NETWORK ACCESS

**PORTLAND PLAN**

By 2035, Portland residents have reduced the number of miles they travel by car to 11 miles per day on average and 70 percent of commuters walk, bike, take transit, carpool or telecommute to work.

By 2035, all Portlanders have safe and reliable transportation choices.

The Portland Bicycle Plan for 2030 sets the goal that all Portlanders have equal access to the benefits of bicycling. A low-stress or family-friendly bicycle network, based on the best design practices of great bicycling cities around the world, creates safe, comfortable and attractive bikeways that can carry more bicyclists and serve all types and ages of users. In many parts of Portland, the common destinations of daily life are already within a 20-minute bicycle ride, but some areas lack the bicycle facilities to support such trips. When supported by a well-designed network, the bicycle offers residents a transportation alternative that allows them to access basic services safely and efficiently without reliance on an automobile. Adopted City policies seek to increase the share of trips made using green and active transportation modes and to make bicycling more attractive than driving for short trips. A comprehensive bike network provides equity and access to viable, affordable transportation options and creates fun, vibrant and livable neighborhoods. The performance measure is based on convenient (¼-mile) access to the highest quality elements of the bicycle network.




**Low-Stress Bikeway Access Areas** identify places that are within ¼-mile of a low-stress bike facility that support the widest range of users. These facilities include separated bikeways, neighborhood greenways, and trails.

**Low-Stress Bikeway Gap Areas** identify places where bicycle facilities may be missing, connectivity is poor or the existing bike infrastructure may be attractive only to more confident cyclists due to safety concerns.



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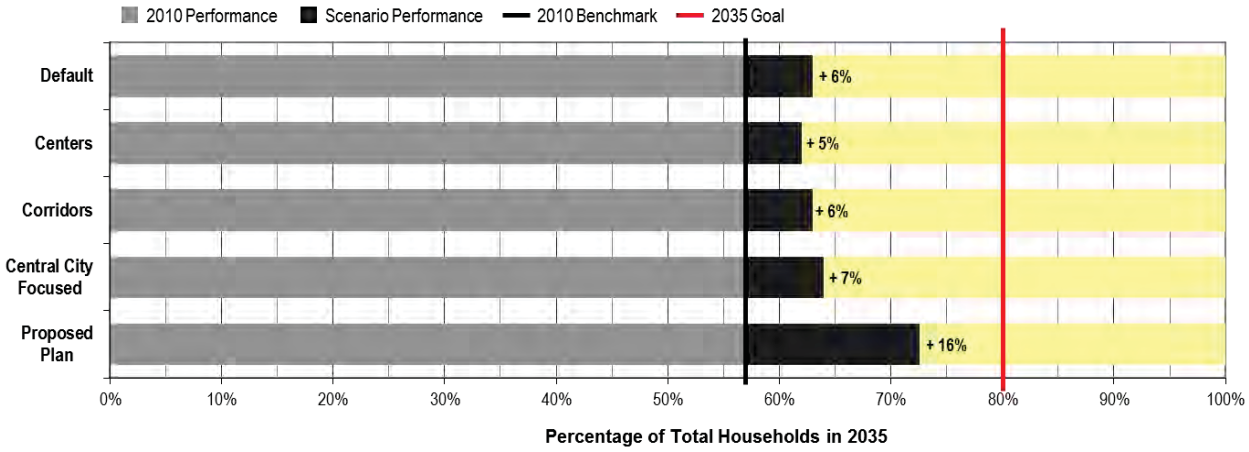
**Chart 7: Performance Measures: Low-Stress Bike Network – Households within ¼ Mile of Low-Stress Bike Network.**




## Performance of the Proposed Comprehensive Plan

The share of Portland households in 2010 that had good access to the existing low-stress bicycle network was 56 percent. The bike projects in the TSP project list provides a 16 percent increase over the 2010 benchmark. While, low-stress bike projects in the TSP are located across Portland, the biggest increase in performance is from expanding the network in East Portland, along with St. Johns and parts of Northeast Portland.

## Options for Improving Performance

Expand Neighborhood Greenways and Bikeway Network to Fill Gaps

The Bicycle Plan for 2030 identifies a network of low-stress facilities to ensure that all neighborhoods have adequate low-stress bicycle facilities that connect to neighborhood commercial corridors and centers so that local residents can safely and comfortably access the destinations by bicycle or on foot.

Strategic Considerations (Age, Income, Communities of Color)

Designing these low-stress facilities to meet the needs of the communities they serve may emphasize connections to neighborhood business districts, parks and open spaces, or community destinations like banks, places of worship and community centers. These considerations will ensure that these places will support transportation choice, recreational opportunities that lead to better health outcomes and expanded access to services or transit.



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## TRANSPORTATION: VEHICLE MILES TRAVELED AND MODE SHARE

**PORTLAND PLAN**

By 2035, Portlanders have reduced the number of miles they travel by car to 11 miles per day on average and 70 percent of commuters walk, bike, take transit, carpool or telecommute to work.

For Portland to achieve the health and carbon reduction goals in the Portland Plan and the Climate Action Plan (CAP), more Portlanders will need to choose alternatives to driving a car to meet their transportation needs. Today, approximately 29 percent of Portland residents walk, bike, take transit to work or work from home, which is a higher level than many other U.S. cities, but it is far below leading cities in Europe and North America.

Performance measures tracking the growth scenario impacts on the transportation system include vehicle miles traveled and mode share. Vehicle miles traveled (VMT) is a measure that is commonly used to describe automobile use on a daily or annual basis. It incorporates both the number of vehicle trips and the length of those trips by residents and businesses (excluding buses, heavy trucks and through trips). Mode share describes the number of trips or the percentage of travelers using a particular mode (or type) of transportation, such as driving alone, carpooling, walking, biking or riding transit.

These measures are calculated using the Metro and City of Portland's transportation models to estimate the changes in travel behavior that result from the different development patterns.

### Vehicle Miles Traveled (VMT)

VMT is reported as a total number of miles per weekday. With all of the previous scenarios, the model results suggested that by 2035 total daily VMT increases by 25 to 30 percent, but not as fast as the household or employment growth rates (33 and 43 percent, respectively). The Proposed Plan performs significantly better than previously evaluated scenarios and shows a 3% reduction in VMT from 2010 to 2035.

**Table 17: Total Change in Vehicle Miles Traveled 2010 to 2035.**

| | Daily VMT | 2010-2035 Change | Daily per Capita VMT | 2010-2035 Change |
|---|---|---|---|---|
| **2008** | 19,300,000 | - | - | - |
| **2010** | 16,210,000 | - | 27.8 | - |
| **2035** | | | | |
| Default | 21,148,000 | + 30% | 27.3 | -2% |
| Centers | 20,786,000 | + 28% | 26.9 | -3% |
| Corridors | 20,754,000 | + 28% | 26.8 | -3% |
| Central City Focused | 20,337,000 | + 25% | 26.3 | -5% |
| Proposed Comprehensive Plan | 15,707,000 | - 3% | 20.3 | -27% |

The Climate Action Plan set a target of reducing 2030 per capita daily vehicle miles traveled by 30 percent from 2008 levels. This reduction must occur in addition to vehicle fuel efficiency improvements and the development of cleaner fuels. Model results project that VMT on a per capita basis drops 27 percent for Portland from 2010 to 2035.



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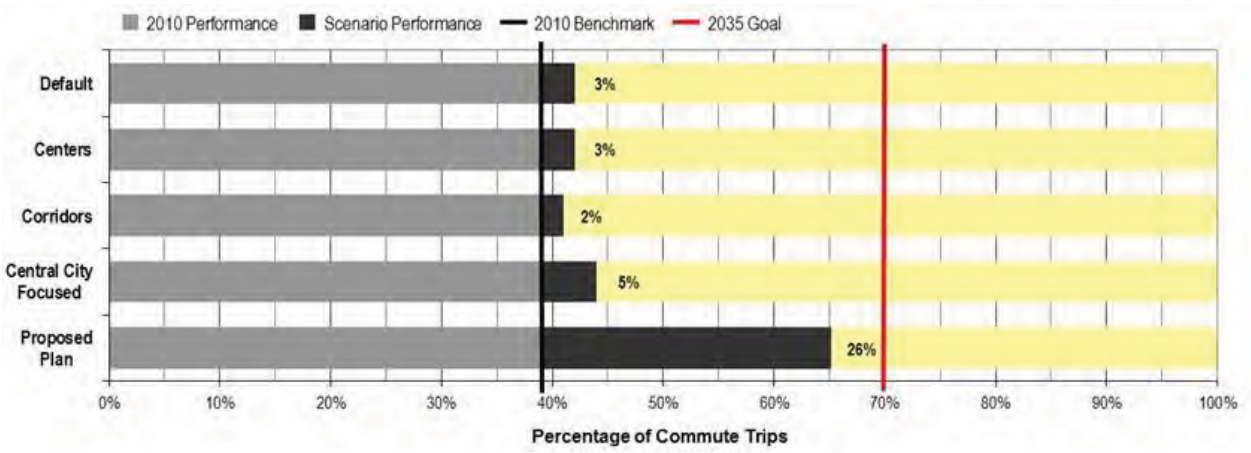
## Mode Share

Mode share measures the share of Portland's travel that is made by different modes of transportation, including driving alone (single-occupancy vehicles), carpooling, transit, biking and walking. In this case, mode share is defined as the share of trips that are not single occupancy vehicle trips. The Portland Plan set an objective that 70 percent of commuters use transit or active transportation, carpool, or work from home. The simple model analysis includes all types of trips, but uses the same overall goal of 70 percent mode share for transit, active transportation and carpool trips. The Proposed Plan indicates a significant increase in mode share for transit, active transportation and carpool trips in 2035.

**Chart 8: Performance Measure: Mode Share – Percent of Trips by Transit, Active Transportation or Carpool**




## Performance of the Proposed Comprehensive Plan

The Proposed Comprehensive Plan performs significantly better than all other scenarios for total change in VMT by 2035. The Proposed Plan indicates a 3% decrease in VMT while accounting for a 33 percent increase in population over the same period of time. Per capita VMT declines by 27 percent of total trips from 2010 to 2035 through the Proposed Plan. Decreases in VMT for the Proposed Plan compared to other scenarios can be attributed to the following changes in development trends and infrastructure investment:

- A post-recession shift in new development from the suburbs to more compact urban areas in Portland
- Continued changes in vehicle ownership patterns. Car ownership rates are declining for younger generations and new residents in Portland.
- Significant investments in bike and transit networks in the TSP. TSP projects that decrease VMT include new low stress bikeways, SW Corridor Rapid Transit, Powell-Division Rapid Transit, and new/enhanced transit service in East Portland.
- A more balanced household to employment ratio in Portland that generates shorter trip distances. Increased housing demand and production in the Central City and inner neighborhoods in close proximity to Central City employment and new employment land in and near East Portland in close proximity to housing.



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**Table 18: Change in Automobile Commute Mode Share 2010 to 2035**

| | Share of Trips by Automobile | Change from 2010 |
|---|---|---|
| **2010** | 79.6% | - |
| **2035** | | |
| Default | 77.2% | -2.4% |
| Centers | 76.7% | -2.9% |
| Corridors | 77.8% | -1.8% |
| Central City Focused | 74.6% | -5.0% |
| Proposed Plan | 64.3% | -15.3% |

The model results project a 15 percent decrease in auto mode share (including both single occupancy and carpool trips) between 2010 and 2035. Single occupancy vehicle mode share declines 26% while bicycle mode share increases by 10% and walking by 5%.

### Options for Improving Performance

Reducing vehicle miles traveled and increasing non-automobile mode share can be achieved by shifting vehicle trips to active transportation trips — walking, bicycling and taking transit — and by shortening trips by providing more destinations close to households.

A variety of land use and transportation strategies, including better transit services, bicycling facilities, pedestrian facilities and amenities, can make these modes more attractive than autos. These measures are closely related to the Complete Neighborhood measure in that improving connectivity and providing more attractive destinations will have complementary impacts on VMT and mode share.



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## GREENHOUSE GAS EMISSIONS

**PORTLAND PLAN**

By 2035, Portland's transportation-related carbon emissions are 50 percent below 1990

Portland and Multnomah County have achieved considerable success in limiting the growth of greenhouse gas or carbon emissions. Land use and transportation policies have resulted in almost no increase in emissions from transportation since 1990, despite a population increase of more than 25 percent. Overall, the Climate Action Plan (CAP) set the goal of an 80 percent reduction of all types of carbon emissions from 1990 levels by 2050. While the CAP identified strategies to reduce emissions from a wide range of sectors, the growth scenarios influence the carbon emissions related to transportation and residential buildings. There are a variety of other City actions that influence emissions, which are outlined in the 2015 Climate Action Plan.

### Transportation

Reducing per capita VMT while maintaining the mobility of Portlanders will require significant increases in walking, bicycling and transit. This shift is expected to produce community health and economic benefits as well. Portland-area residents and businesses reap a "green dividend" of more than $1 billion annually in reduced transportation costs as a result of people driving less than do residents of other comparable American cities. Similarly, evidence is increasingly emerging of the health benefits of reducing vehicle miles traveled, both in terms of improved air quality and increased levels of physical activity.

Total VMT decreased 3% below 2010 levels as the result of the land use and transportation investments in the Proposed Plan. Additionally, improvements in vehicle fuel efficiency standards across all vehicle classes and a reduction of the carbon content of fuels result in a projected 55 percent reduction in carbon emissions from cars and light trucks. While the CAP set a goal of reducing per capita VMT by 30 percent by 2030, the Proposed Plan results show a per capita VMT reduction of 27% by 2035.

**Table 19: Transportation Emissions.**

| | Carbon Emissions (metric tons/year) | Percentage Reduction from 2010 |
|---|---|---|
| **1990** | 2,231,000 | |
| **2010** | 2,340,000 | |
| **2035** | | |
| Default | 1,149,000 | -51% |
| Centers | 1,128,000 | -52% |
| Corridors | 1,127,000 | -52% |
| Central City Focused | 1,105,000 | -53% |
| Proposed Comprehensive Plan | 934,000 | -60% |
| **2050 Target** | 596,000 | -80% |



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## Household energy

Buildings are the single largest contributor to carbon emissions in Multnomah County, accounting for more than 40 percent of total emissions. Reducing carbon emissions from building energy use can result from two types of changes: improving energy efficiency and reducing the carbon intensity of energy supplies, such as by increasing renewable sources of electricity like solar and wind power.

The different variations in housing types in each scenario impacts the overall carbon emissions. The trend to more multifamily housing types leads to lower carbon emissions because those types of units are more likely to be small and have shared walls, which is more energy efficient. There is no significant difference in the projected overall housing mix for each of the scenarios. For the Proposed Plan, this analysis suggests that total residential carbon emissions will increase by 9 percent, which is far less than the anticipated 45 percent increase in the number of households.

**Table 20: Residential Carbon Emissions**

| | Carbon Emissions (metric tons/year) | Share of 2035 Carbon Emissions |
|---|---|---|
| **1990** | 1,292,000 | |
| **2010** | | |
| Existing Single Family | 905,000 | 54% |
| Existing Multifamily | 328,000 | 19% |
| **2010-2035** | | |
| New Single Family | 111,000 | 9% |
| New Multifamily | 226,000 | 18% |
| **2035 Total** | 1,343,000 | |
| **2030 CAP Target** | 517,000 | |

It is important to note that the majority of Portland's 2035 residential carbon emissions are expected to come from the existing (pre-2010) housing stock, which is not affected by the different growth scenarios. The key to meeting the CAP reduction goals is through home energy efficiency retrofits on existing housing. Achieving the combination of CAP objectives could make it possible to reduce residential building carbon emissions by 36 percent, while the number of households increases by 45 percent.

**Table 21: Strategies to Reduce Residential Sector Carbon Emissions.**

| | CAP Reduction Goal | Carbon Emissions (metric tons/year) |
|---|---|---|
| Existing Building Retrofits | 25% | 400,000 |
| Onsite Renewable Energy | 10% | 190,000 |
| Energy Code Improvements | 20% | 140,000 |
| Net Zero Buildings after 2030 | | 100,000 |
| **Total** | | **830,000** |



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## Performance of the Proposed Comprehensive Plan

The share of housing allocation to single family development types and multifamily development types remains largely the same and performs similar to scenarios that were previously evaluated. The Proposed Plan shows slight performance increases for household energy due to the removal of single family housing capacity that was re-allocated to more energy efficient multifamily housing types in the Central City, centers. And corridors. Mode split and VMT performance scores 4 percent better for the Proposed Plan which reduces the carbon footprint relative to the previous Comprehensive Plan. Additional opportunities to reduce greenhouse gas emissions are accounted for through actions in the CAP through existing building retrofits, onsite renewable energy, energy code improvements, and new standards for energy efficiency in new construction.

## Options for Improving Performance

Over the long term, land use and transportation planning can greatly influence transportation-related carbon emissions. Emissions reduction depends critically on coordinated land use policies and the development of infrastructure for low-carbon modes of transportation.

### Expand Complete Neighborhoods

A critical and basic step to reducing automobile dependence is to ensure that residents live in complete neighborhoods, meaning that they can comfortably fulfill most of their daily needs within a 20-minute walk from home. This means providing a wide range of destinations near a diversity of housing types that are connected by a network of sidewalks, bicycle facilities and transit service. Expanding complete neighborhoods involves (1) identifying the land use planning changes and infrastructure investments, including public-private partnerships that are needed for each mixed-use center to achieve a highly walkable and bikeable neighborhood, and (2) developing an implementation action plan.

### More Active Transportation Trips

Expanding pedestrian and bicycle facilities as well as transit service will make these modes more attractive, especially for short trips. Shifting trips to active transportation modes will help reduce emissions. This network expansion also can decrease travel costs for lower income households.

### More Efficient Homes

Because buildings last for many decades, efforts to reduce emissions by improving the energy efficiency of existing buildings will be critical to meeting the reduction goals. The City of Portland, Energy Trust of Oregon, Oregon Department of Energy, utilities and other organizations already have undertaken significant work to increase energy efficiency and decrease energy-related carbon emissions. Much work remains to be done, and it will be important to leverage existing efforts and expertise to accelerate this work.

### Maximize Energy Performance of New Buildings

Buildings that have been designed and built with low-carbon performance as a primary goal can significantly outperforming similar, previously built buildings that have been retrofitted for efficiency. Because total emissions from buildings must be reduced by more than can be accomplished with retrofits alone, it is critical that buildings built after 2030 generate more energy from clean sources than they consume, resulting in a net emissions reduction. The CAP has a goal of net-zero energy use for all new buildings after 2030.



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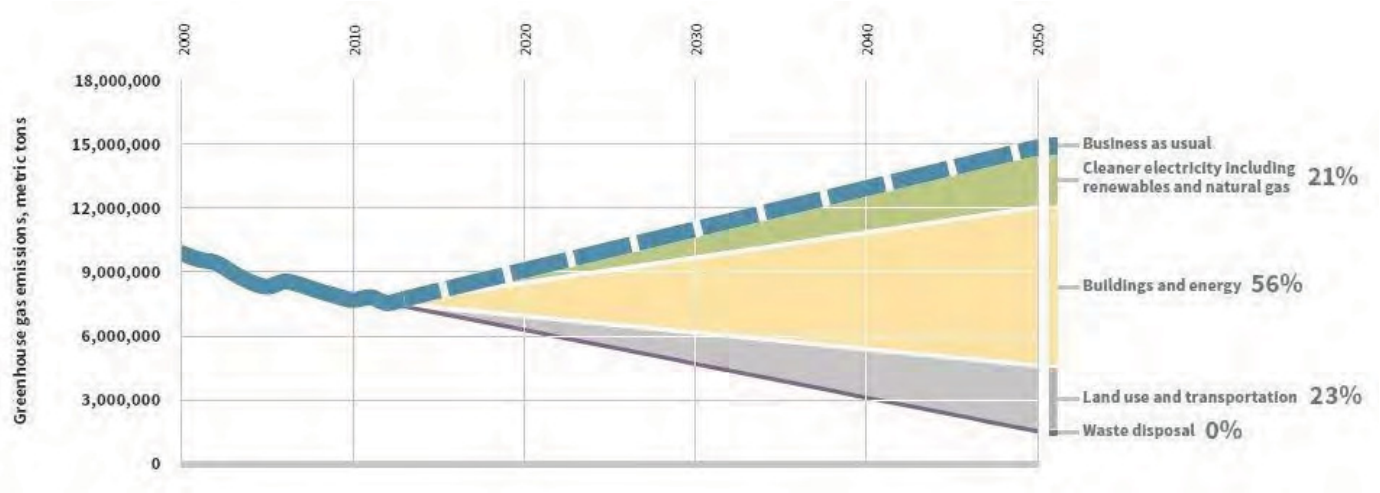
Onsite Renewable Energy

In parallel with the improvements to the building stock, CAP objectives seek to produce 10 percent of the total energy used from on-site renewable sources and clean district energy systems. District- and neighborhood-scale energy systems, as well as on-site renewables and distributed generation sources, also provide opportunities for efficiency gains by reducing transmission losses.

### Connection to the Climate Action Plan

While this report finds that land use choices made in the Proposed Comprehensive Plan and investments made in the TSP improve performance for VMT reduction, carbon emission reduction and mode share goals, the Climate Action Plan identifies additional City and County actions to reduce emissions and move Portland closer to the 2050 goal of an 80 percent reduction in carbon emissions below 1990 levels. The City of Portland and Multnomah County must take additional actions beyond planned land use and transportation investments. The CAP identifies many additional policy and program actions including; carbon pricing, building energy performance reporting, renewable energy, net zero energy buildings, low carbon transportation fuels, electric vehicles, waste prevention and recovery, and green infrastructure.

**Figure 28: Sources of Energy Reduction in Portland for Meeting CAP's 80% Reduction Target.**



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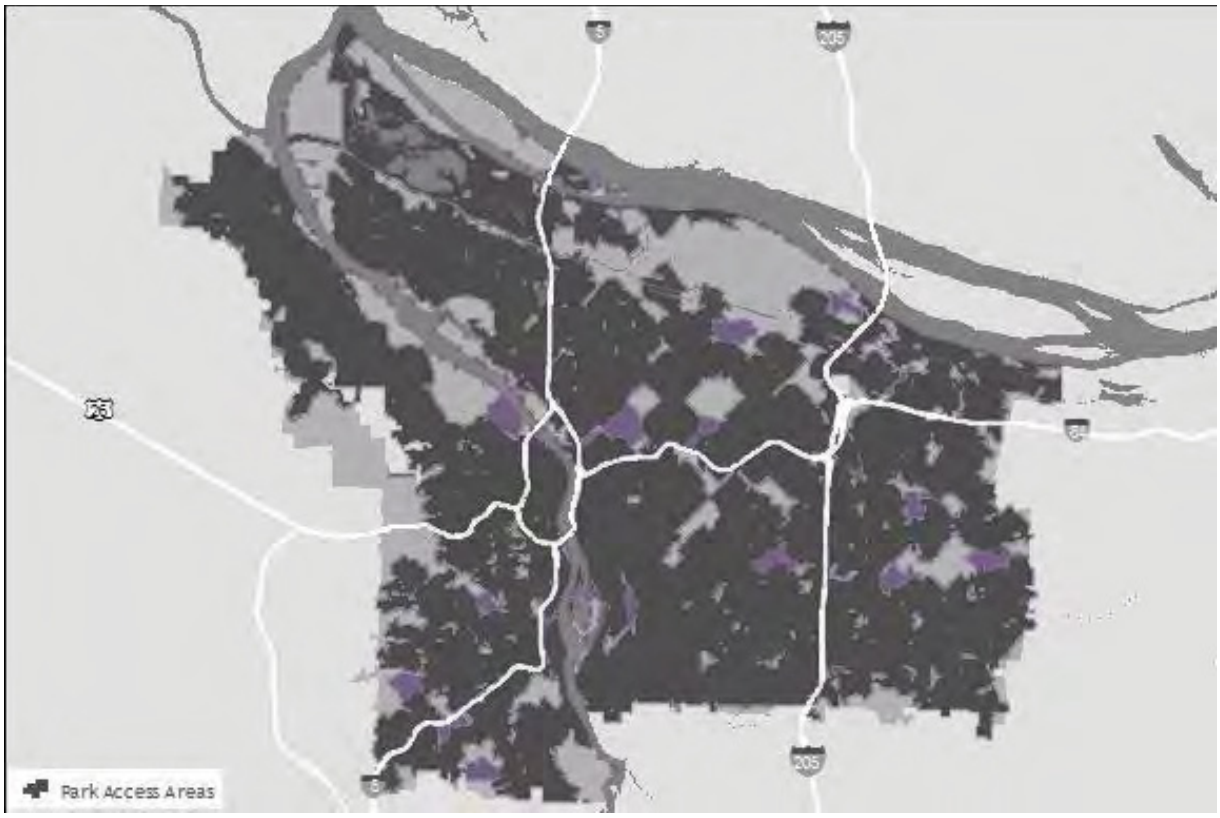
## PARKS ACCESS

**PORTLAND PLAN**

By 2035, all Portlanders live within a half-mile safe walking distance of a park or greenspace. All Portlanders can conveniently get to and enjoy the Willamette and Columbia Rivers. The regional Trail System is substantially complete and is an integrated component of a Healthy Connected City network.

Access to parks and greenspace is a critical component of a healthy complete neighborhood. Nearby parks and natural areas give Portlanders places to recreate, relax and spend time with friends and family. The City of Portland's Parks 2020 Vision set the goal of providing all Portlanders with a recreational opportunity – such as a developed park or access to a natural area – within a ½-mile walk (approximately 15 minutes). The performance measure is about access and is based on the number of households located within a convenient, ½-mile walking distance to a park or greenspace. Parks and greenspace areas used in this analysis are more than one-eighth of an acre and include existing parks, as well as land acquired by Portland Parks and Recreation that will be developed as parks in the future. Public school playgrounds and playing fields are not included in this analysis, although they do supplement the City's park system. Distance was determined from park and greenspace public access points via streets and trails.




**Park Access Areas** identify places with walkable ½-mile access to parks. These areas take into account network connectivity and true walking distance.

**Park Gap Areas** identify places that are lacking convenient access.



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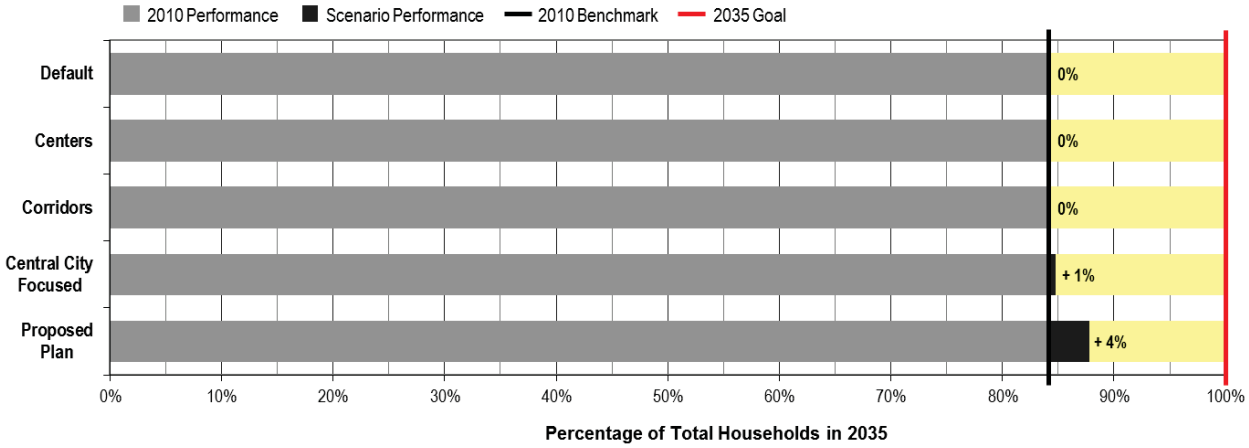
**Chart 9: Performance Measures: Parks Access – Households within ½ Mile of a Park or Natural Area.**




## Performance of the Proposed Comprehensive Plan

The Proposed Comprehensive Plan shows an increase in performance for access to parks. This is increase can be attributed to parks investment areas identified in the CSP that fill gaps in areas underserved by parks to reduce disparities, especially in East Portland. The Proposed Comprehensive Plan and CSP indicates priority for East Portland to increase access to parks.

## Options for Improving Performance

Develop Parks in Gap Areas

New park development will fill gaps and meet the needs of rapidly developing areas. As well-served areas experience growth, existing parks may require more maintenance or re-designed for higher-intensity uses. They will be used more heavily, require additional operations and serve more people.

Create Opportunities for Urban Plazas and Community Gathering Areas

Development of urban plazas and squares can fill gaps in areas where larger parcels may not be available. These smaller community gathering areas can fill in gaps where park needs are high and where other options are not feasible.

Increase Access to Parks through Transit, Trails, Sidewalks and Bicycling Facilities

Improving sidewalks, bicycle lanes, and transit can enable park users to more safely and conveniently access existing park facilities.

Parks in Emerging Centers

Places like Gateway, Hollywood and the Lloyd District have access convenient access to parks, but these higher density mixed-use neighborhoods may need additional park space or consider park designs intended for more high-intensity use.



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## WATERSHED HEALTH

### PORTLAND PLAN

By 2035, watershed health is improved, and the Willamette River and local streams meet water quality standards. Tree canopy covers at least one-third of the city and is more equitably distributed. Fewer homes and businesses are at risk from flooding. A diversity of critical habitats (including floodplains, riparian areas, wetlands, oak groves, native forests and remnant meadows) are protected, connected and enhanced to support a rich diversity of native and migratory wildlife.

Healthy watersheds support clean air and water, help moderate temperatures, reduce the risk of flooding and landslides, preserve places to enjoy nature, and help the city adapt to climate change. Many factors affect the health of Portland's watersheds: the interaction of rainwater with the land, the amount of impervious surface covering the land, chemicals and bacteria that are carried into groundwater and streams, the extent and characteristics of the tree canopy and the number and type of invasive species. This performance measure identifies parts of Portland where, from a watershed health perspective, development may improve conditions by incorporating sustainable stormwater management and other citywide greening efforts. The performance measure is based on the number of households located in these development opportunity areas.




**Development Opportunity Areas** identify places that in general have the ability to accommodate additional growth without significant impact. Future development would trigger stormwater management requirements that would improve conditions by increasing on-site sustainable stormwater infiltration, tree canopy and vegetation.

**Constrained Areas** identify places where natural resources and green infrastructure, such as streams, wetlands, soils and vegetation- have limited capacity to accommodate new growth without detrimental impacts on watershed health. In the most sensitive areas, encroachment from development would likely have negative impacts on natural ecological functions, habitat connectivity and the risk of landslides or flooding.



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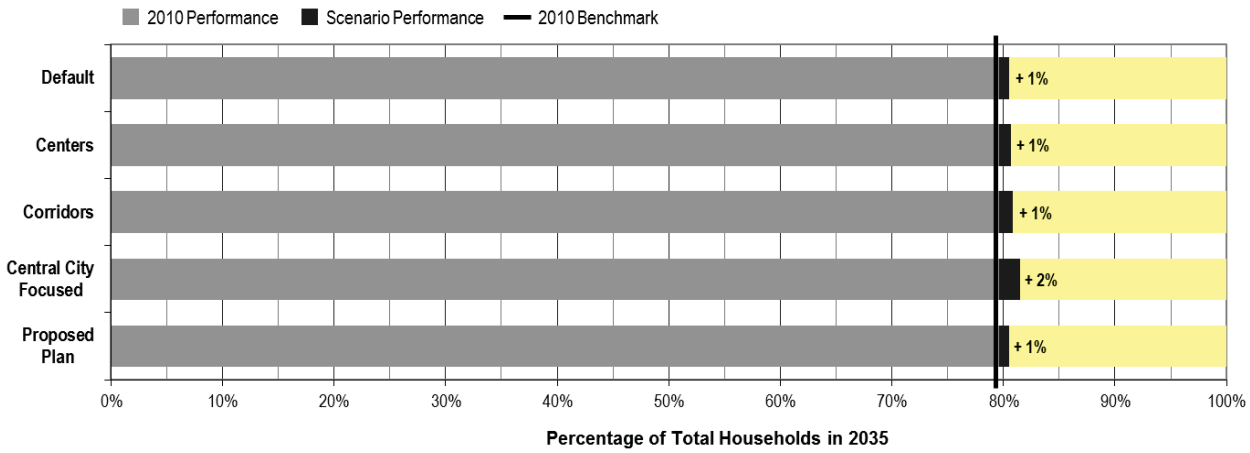
**Chart 10: Performance Measure: Watershed Health – Households in Development Opportunity Areas.**




## Performance of the Proposed Comprehensive Plan

Most of the available growth capacity would be accommodated in urbanized areas that have a high proportion of existing impervious surface. The majority of development capacity is located in the Central City, Centers and along Corridors. Some household growth is allocated to single family residential areas, the majority of which are located in development opportunity areas. Evaluation of the Proposed Plan shows that no significant growth capacity was increased in constrained areas and that 81 percent of growth from 2010 to 2035 will occur in Development Opportunity Areas.

## Options for Improving Performance

Limit Development Impacts in Constrained Areas

Growth in constrained areas needs to be carefully considered because of drainage and infiltration issues, the risk of natural hazards and potential adverse impacts on significant natural resources. Development impacts could be avoided by limiting development in these areas. Where development is allowed, impacts could be minimized by encouraging ecologically sensitive site design, purchasing of land from willing sellers or using of conservation easements.

Encourage Growth in Development Opportunity Areas

Overall, much of North, Northeast and Southeast Portland is well-suited to accommodate new development because of natural conditions and the availability of infrastructure. The City can encourage growth in Development Opportunity areas by promoting development on underutilized sites through a combination of land use plans, infrastructure investments, and by establishing public-private partnerships such as the EcoDistrict efforts.

Shift in Development Approaches

Some development types are better suited to reducing impacts than others. Focusing growth in key centers and corridors could relieve pressure on the most sensitive environmental areas and take full advantage of existing infrastructure. The City can facilitate this by designing with nature, updating development standards and streamlining permitting for ecologically sensitive development. Additional tools include incentives such as the Portland Ecoroof Incentive Program.



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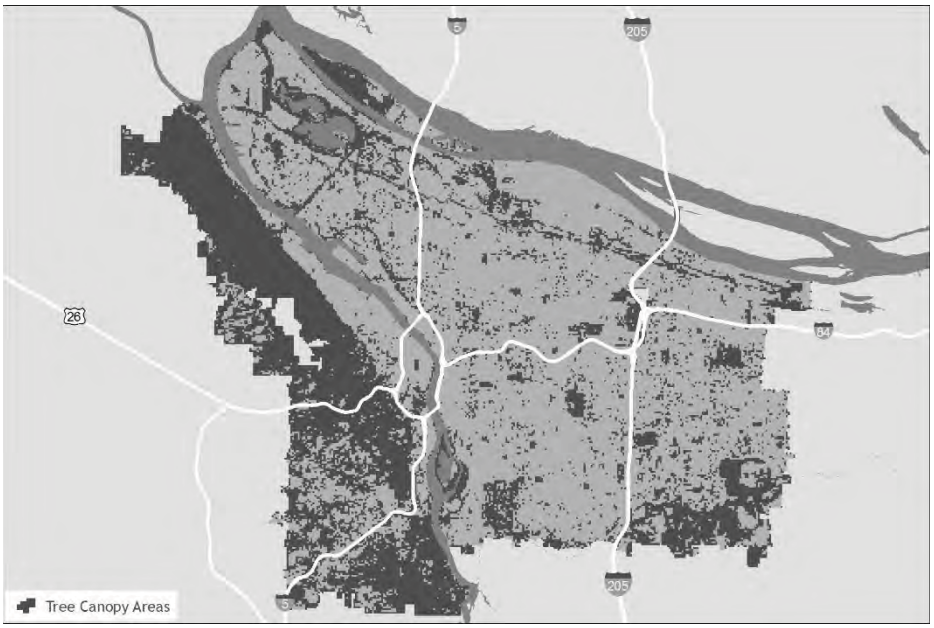
## TREE CANOPY

**PORTLAND PLAN**

By 2035, watershed health is improved, and the Willamette River and local streams meet water quality standards. Tree Canopy covers at least one-third of the city and is more equitably distributed. Fewer homes and businesses are at risk from flooding. A diversity of critical habitats (including floodplains, riparian areas, wetlands, oak groves, native forests and remnant meadows) are protected, connected and enhanced to support a rich diversity of native and migratory wildlife. High quality trees are routinely preserved and planted on development sites.

Portland's trees provide more than a sense of identity as a "green city" – they help manage stormwater, reduce pollution, capture carbon dioxide, decrease flooding and erosion, cool and clean the air and water, provide wildlife habitat and improve neighborhood appearance. The Portland Watershed Management Plan (2005) and the City's Draft Climate Action Plan (2015) call for protecting and expanding the urban forest to improve watershed health and reduce greenhouse gas emissions. The Urban Forestry Management Plan (2004) establishes tree canopy targets for different types of development in Portland. The performance measure is based on the number of households located in areas that do not meet these tree canopy targets. Development in these Canopy Opportunity Areas would have less of an impact on Portland's existing tree canopy than development in areas with more existing canopy and should help add tree canopy over time through new development standards that require additional tree planting.




**Tree Canopy Areas** are places that meet or exceed tree canopy targets identified in the Urban Forestry Plan. Development in these areas may result in loss of tree canopy that could hamper the ability to meet citywide tree canopy targets.

**Canopy Opportunity Areas** are places that do not currently meet the tree canopy targets and where development may result in an increase in canopy over time through tree preservation and mitigation planting.



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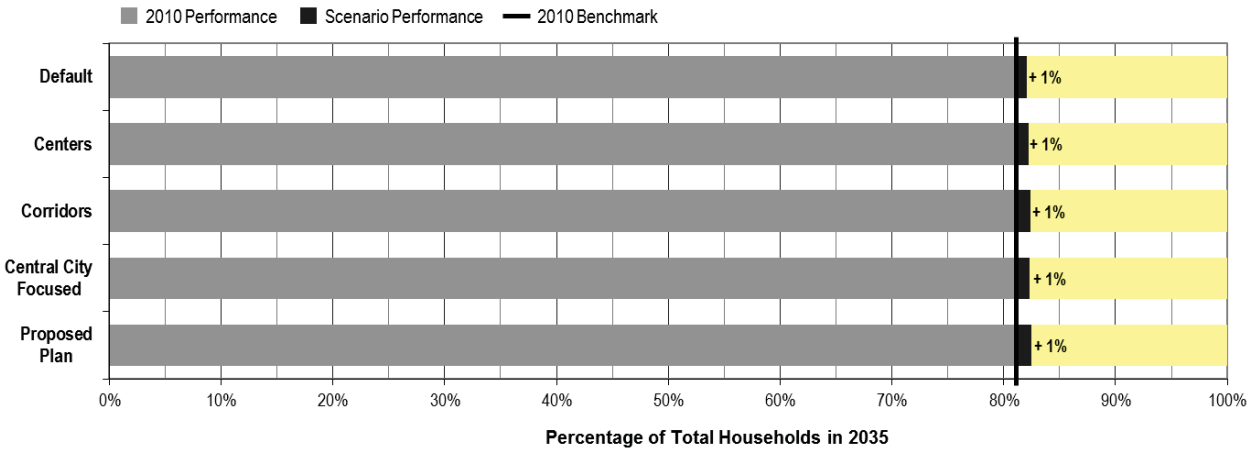
Focusing development in these areas will have less impact on the existing canopy.

**Chart 11: Performance Measures: Tree Canopy – Households in Canopy Opportunity Areas.**




## Performance of the Proposed Comprehensive Plan

Like previously evaluated scenarios, the Proposed Plan locates the majority of new growth in Canopy Opportunity Areas. In many cases redevelopment of underutilized paved areas leads to an increase in tree canopy as new street trees and on-site landscaping standards. With the Proposed Comprehensive Plan:

- 72 percent of the growth capacity is on land with less than 10 percent tree canopy coverage.
- 30 percent of the residential capacity is in the Central City, which has about a 6 percent canopy coverage.
- Half of the City's growth capacity is in the mixed use zones, which as a whole have slightly above a 7 percent canopy coverage.
- In contrast, the R5 zone land has only 2 percent of the total residential growth capacity, but has a 21 percent canopy coverage.
- The other lower density single family zones (R7-RF) represent only 3 percent of the residential growth capacity, but typically have high canopy coverages from 30 to 65 percent. This points to the importance of having tree codes that apply in non-development situations, and rules that prevent needlessly tree removal on large lots (development or not).

## Options for Improving Performance

Plant and Preserve

Many established single family neighborhoods across the city could increase the level of canopy with more tree planting. As development occurs in high-canopy areas, the City can promote design solutions that seek to preserve and maximize the existing canopy.



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Shift Growth to Canopy Opportunity Areas

Focusing development in low canopy areas helps preserve the existing canopy while potentially increasing canopy on development sites. As key civic corridors and centers develop, tree plantings can support place-making, enhance the street experience, shade and cool the street and extend the benefits of trees into more urban areas

Design with Nature

New development can provide opportunities to incorporate new tree plantings onto the site and streetscape. Focusing development along key corridors that lack significant tree canopy, like SW Barbur Boulevard and NE Sandy Boulevard, could increase tree coverage.



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## NATURAL AREA ACCESS

**PORTLAND PLAN**

By 2035, all Portlanders can conveniently get to and enjoy the Willamette and Columbia Rivers. All Portlanders live within a half-mile safe walking distance of a park or greenspace. The regional Trail System is substantially complete and is an integrated component of a Healthy Connected City network.

Access to natural areas is a critical component of a healthy complete neighborhood. Nearby natural areas give Portlanders places to recreate, relax and spend time with friends and family. The Portland region's 40-mile loop and other elements of The Intertwine — the regional trail park system — provide access along rivers and through major natural areas like Forest Park, Johnson Creek and the Columbia Slough. However, this system of trails is incomplete and has few connections to neighborhoods. This performance measure is similar to the Park Access measure but is more focused on access to nature and is based on the number of households located within a convenient, ½-mile walk of a natural area or river.




**Natural Area Access Areas** identify places within a ½-mile walkable distance of natural areas, including the Willamette and Columbia Rivers and Portland's large natural area parks.

**Natural Area Gap Areas** are outside of a ½-mile walkable distance to a major river or a natural area. These areas present a range of opportunities to improve transportation and trail access to natural areas and weave nature into the neighborhoods.



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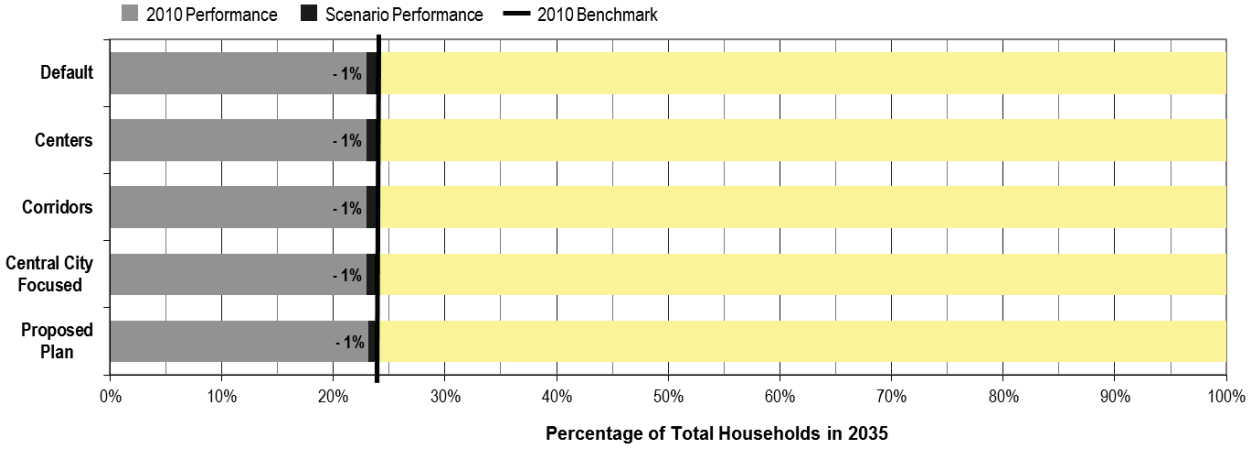
**Chart 12: Performance Measures: Natural Area Access – Households within ½ Mile of a River or Natural Area.**




## Performance of the Proposed Comprehensive Plan

Overall, only 25 percent of Portland households in 2010 had convenient access to a river or natural area. Like other scenarios, the Proposed Comprehensive Plan locates the majority of new growth in mixed-use corridors and centers away from natural areas. Access to Natural Areas decreased under all scenarios, including the Proposed Plan. This decrease in access is due to the fact that the majority of new growth is allocated to amenity rich locations with a more urban character throughout Portland that are further away from Natural Areas. Additionally, some down designations have been applied to reduce density in areas near Natural Areas such as Powell Butte that have decreased overall access.

**Lesson Learned: Connect to Nature**

Development in more urban locations means less impact on natural habitat areas and sensitive watersheds. But these urban locations do not provide direct access to nature for residents. We will need to do more in the future to create other opportunities for Portlanders to experience nature.

## Options for Improving Performance

Weave Nature into the City

Developing habitat corridors, promoting backyard habitats and enhancing neighborhood tree canopy can weave nature into the city. Actions could include enhancement of existing parks through native plantings and creation of habitat for birds, pollinators and other beneficial wildlife.

Habitat Enhancement in Large Parks

Large neighborhood parks can serve as anchor habitats that provide significant natural functions within the city. For example, Mt. Tabor, Powell Butte and Oaks Bottom all are important habitat areas that also provide access to nature for many Portlanders. Coverage gaps between these areas are an opportunity to create connections between places like Alameda Ridge and Rocky Butte.

Development of Neighborhood Greenways and Transit Connections

Neighborhood greenways and civic corridors should be designed to improve public access to Portland's largest natural areas and improved public access to the Willamette and Columbia Rivers. Greenways can provide park-like experiences along streets, paths and trails that emphasize large trees and green streets, modeled after programs like Tabor to the River, which integrate the function of natural areas into urban environments and assist the movement of people, water and wildlife.



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# 5. KEY FINDINGS

The Portland Plan set the expectation that there will be more strategic and more intentional actions in how growth and public investment are made to achieve the vision for a future Portland. The Measures of Success adopted with the Portland Plan established some specific numerical goals. This report examines how growth management can influence those outcomes over the long term and how the Proposed Comprehensive plan advances these goals through land use and infrastructure investment.

**Choices for Prioritizing Growth** – Portland's existing zoning allows for more than enough development capacity to accommodate the future growth forecast of 123,000 new households. This capacity creates an opportunity to make choices about where to focus or prioritize that growth.

**A Legacy Landscape** – As an already urbanized city, Portland's existing development pattern defines many of the challenges. The forecasted growth represents roughly one-third of the total households and employment that will make up Portland in 2035, which means that two-thirds of the future built environment is already in place. This legacy development pattern will have a significant impact and moderating influence on how well future development patterns perform over the next 25 years. Large improvements in performance from land use changes will take more time. Other interventions will be necessary to achieve the goals identified in the Portland Plan.

**Investment Priorities** – The performance of the Proposed Comprehensive Plan shows that most of the anticipated new growth occurs in a way that provides progress towards meeting the objectives. However, it also shows that additional planning and investment is needed in order to meet the Portland Plan's 2035 Measures of Success.

**Two Investment Strategies** – Through the Comprehensive Plan Update, Portland has identified a two track public investment strategy to meet multiple objectives. One strategy supports growth in high-performing areas that already have a relatively complete infrastructure support system. The other fills gaps in historically underserved areas to reduce disparities and increase equity. This two track strategy will allow Portland to improve performance across the board by focusing growth in high-performing areas, while at the same time improving conditions in areas previously neglected.

**Transportation Choice** – Transportation investment priorities emphasize active transportation, transit, and freight mobility. Investing in sidewalks, bicycle facilities and transit significantly improves performance across several measures, such as reducing carbon emissions, improving affordability, and improving access to jobs for more Portlanders. Expansion of the frequent transit network will mean that 62 percent of Portland households will have convenient access to frequent transit. Investment in the low-stress bicycle network will mean that 72 percent of Portland household will live within ¼-mile of a bike facility.

The projects in the Proposed TSP create a transportation system that will decrease reliance on automobiles by reducing the single occupant vehicle (SOV) commute rate to 35 percent of trips, which in turn helps reduce per capita daily vehicle miles travelled (VMT) by 27 percent.

**Complete Neighborhoods** – The Portland Plan set the goal of providing most Portlanders with safe, walkable access to services. While most (77%) of the new development is expected to



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take place in complete neighborhoods, this goal cannot be achieved simply by only focusing growth in existing complete neighborhoods – Portland needs infrastructure investments to create more complete neighborhoods. The combination of the growth pattern and the infrastructure investments in the Proposed Comprehensive Plan increase the number of household in complete neighborhoods to 73 percent by 2035.

**Reducing Carbon Emissions –** The land use and transportation choices made in the Proposed Comprehensive Plan lead to a reduction in per capita daily VMT, increase in non-automobile mode share, and help make progress towards Portland's carbon reduction goals. The City of Portland and Multnomah County will need to take additional action beyond planned land use and transportation investments in order to meet our carbon reduction goals. The CAP identifies additional policy and program actions that go beyond the Comprehensive Plan to help achieve this goal, including: carbon pricing, building energy performance reporting, renewable energy, net zero energy buildings, low carbon transportation fuels, electric vehicles, waste prevention and recovery, and green infrastructure.

**A Central Role for the Central City** – The Central City is expected to accommodate 30 percent of future growth. Focusing growth in and around the Central City may be the most cost-effective way to provide the greatest level of service to the greatest number of Portlanders; each incremental investment in this service-rich area has disproportionate benefits. However, in order to grow as a residential area, it will be necessary to ensure that the needs of a variety of families can be met within the Central City.

**Jobs and Better Transit Connections in East Portland** – East Portland has Portland's largest pool of affordable housing and is home to a large number of families with children. However, the area does not have many family-wage jobs, and it is not easy or quick to travel from East Portland to major job centers. Convenient and reliable access to work is one of the major contributors to job success (others include overall employment opportunities and relevant education and training). The Proposed Plan includes policies, map changes and transit investments that will increase the number of households with convenient access to jobs by at least 2 percent. Developing more jobs in East Portland and providing better connections to and from East Portland are critical to improving household economic self-sufficiency.

**More Affordable Housing** – Providing enough affordable housing, especially for the lowest income households, will be a challenge. Public investments to increase services can create gentrification pressure. Portland will need to better align growth management, public investment and affordable housing development, anticipate the consequences of investments, minimize displacement and engage communities.

**Prepare for the Future** – While short-term development trends show a market preference for the Central City and Inner Neighborhoods, East Portland has significant growth potential and is home to many households with school-age children. Today, there is a window of opportunity to address the infrastructure gap in East Portland. The timing and location of East Portland infrastructure investments are a pressing issue.

**Access to Parks** – The Proposed Comprehensive Plan shows an increase in the number of households with good access to parks. This is increase can be attributed to parks investment areas identified in the CSP that fill gaps in areas underserved by parks to reduce disparities, especially in East Portland.



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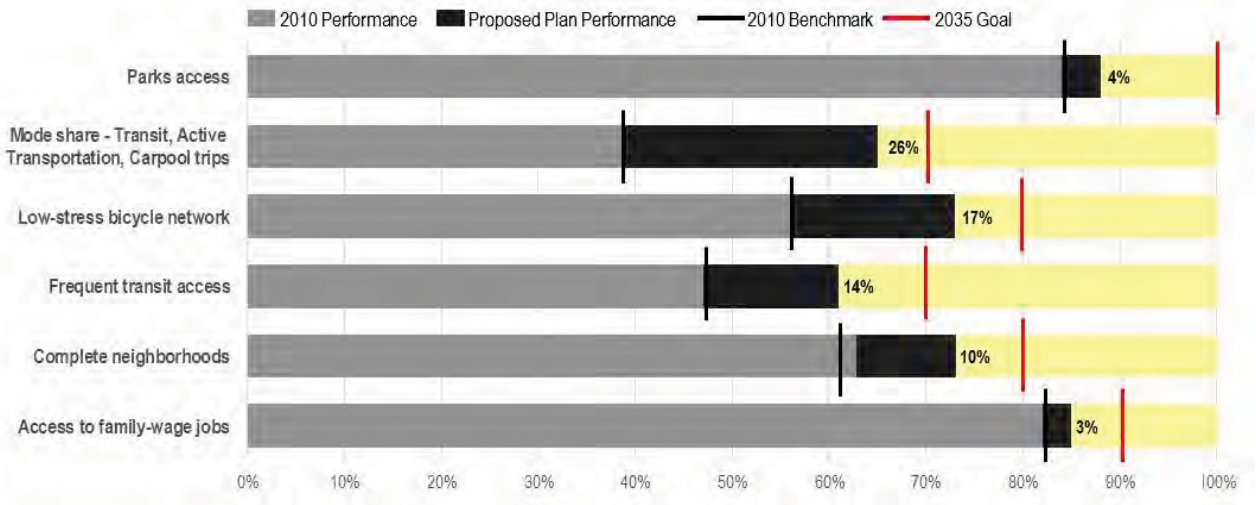
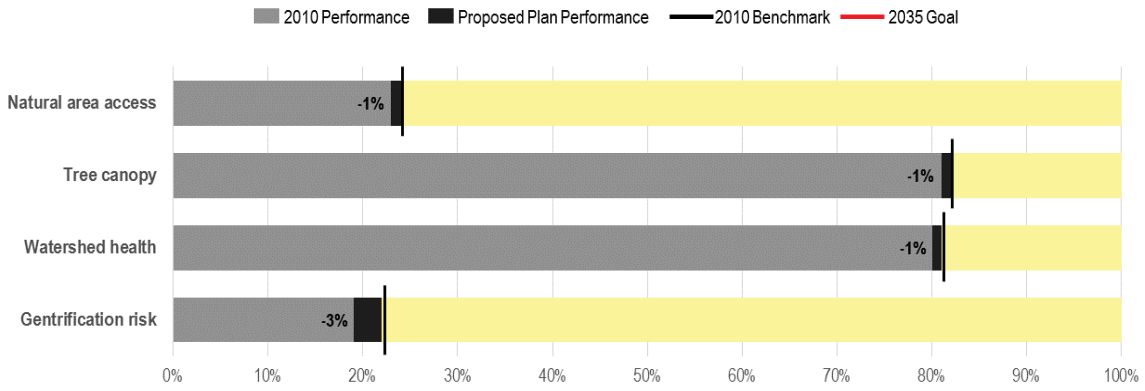
# SUMMARY OF PERFORMANCE MEASURES

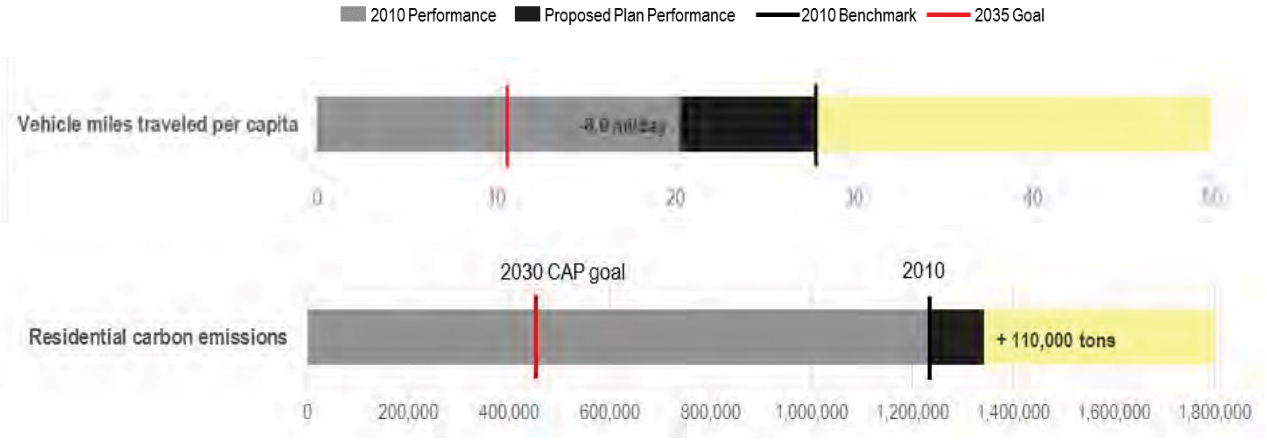
## Household Performance Measures




## Track and Monitor Performance Measures




## Carbon Reduction Performance Measures



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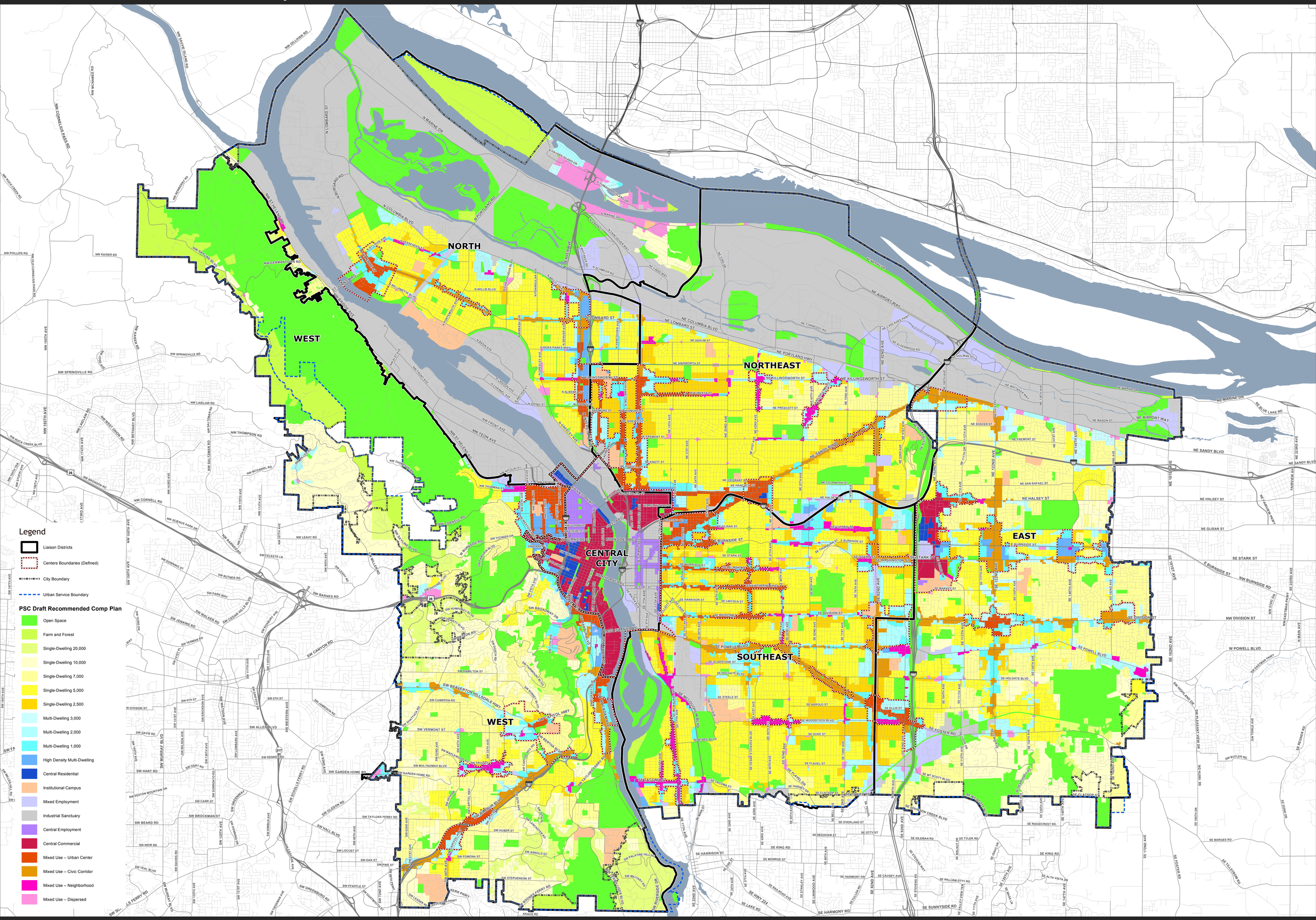
# Draft Recommended Plan Map




June 1, 2015

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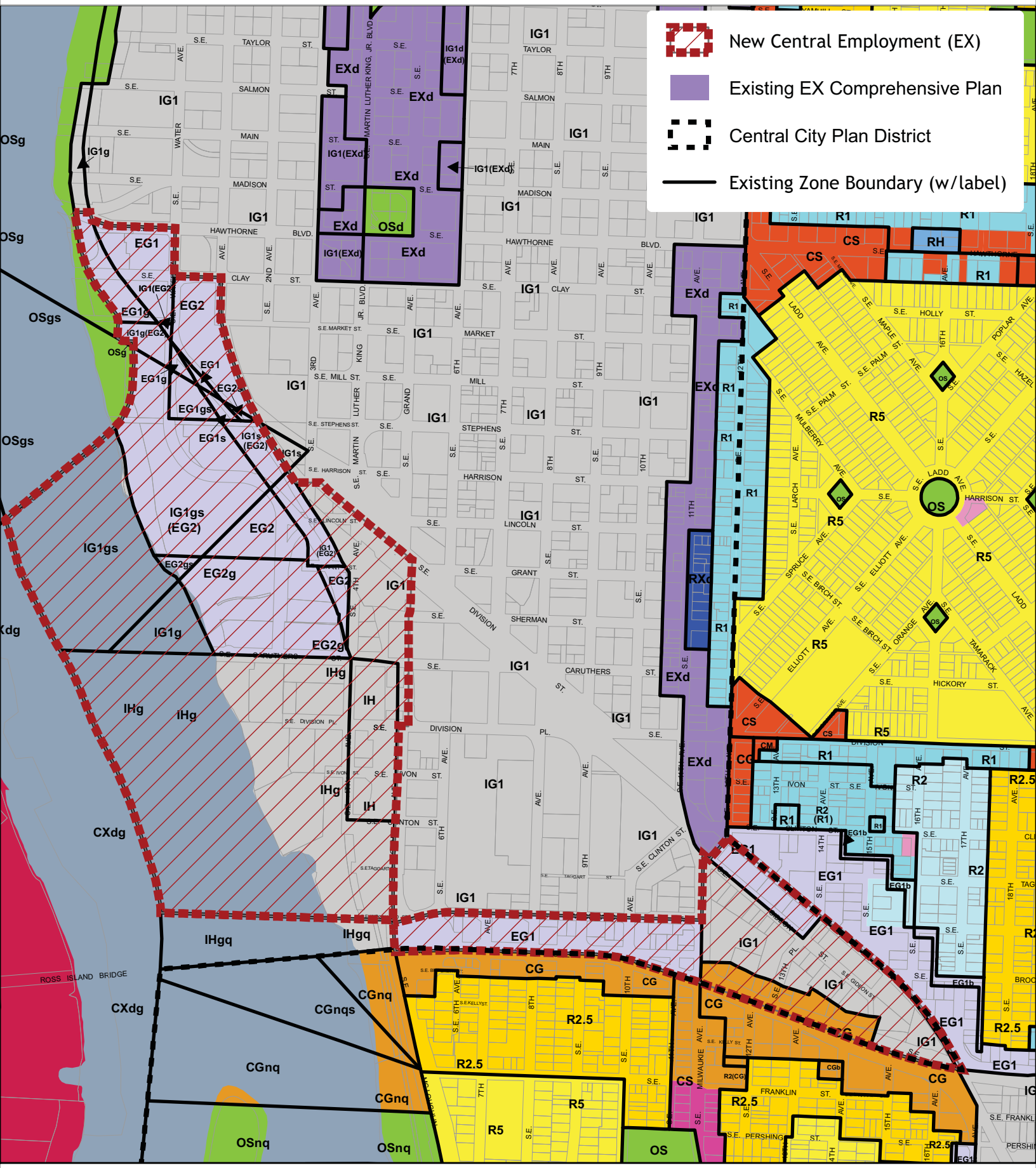
*Charlie Hales, Mayor • Susan Anderson, Director*

# Comprehensive Plan Amendment - New Central Employment




June 15, 2015

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# Draft Recommended Plan Map

West Liaison District--South

WEST

SOUTHEAST

## Legend

- Liaison Districts
- Centers Boundaries (Defined)
- City Boundary
- Urban Service Boundary

**PSC Draft Recommended Comp Plan**

- Open Space
- Farm and Forest
- Single-Dwelling 20,000
- Single-Dwelling 10,000
- Single-Dwelling 7,000
- Single-Dwelling 5,000
- Single-Dwelling 2,500
- Multi-Dwelling 3,000
- Multi-Dwelling 2,000
- Multi-Dwelling 1,000
- High Density Multi-Dwelling
- Central Residential
- Institutional Campus
- Mixed Employment
- Industrial Sanctuary
- Central Employment
- Central Commercial
- Mixed Use – Urban Center
- Mixed Use – Civic Corridor
- Mixed Use – Neighborhood
- Mixed Use – Dispersed

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NORTH

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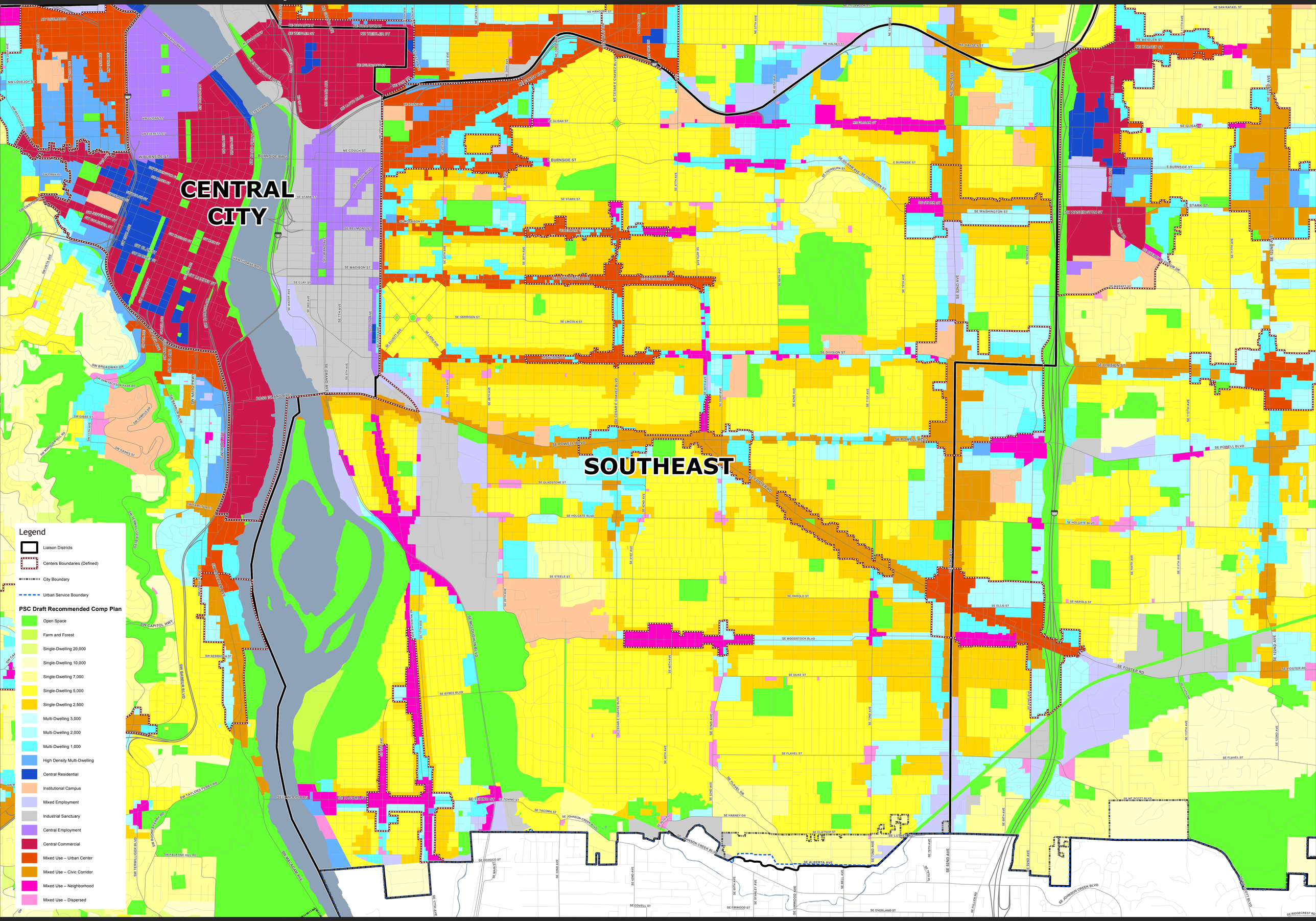
# Draft Recommended Plan Map

Southeast Liaison District

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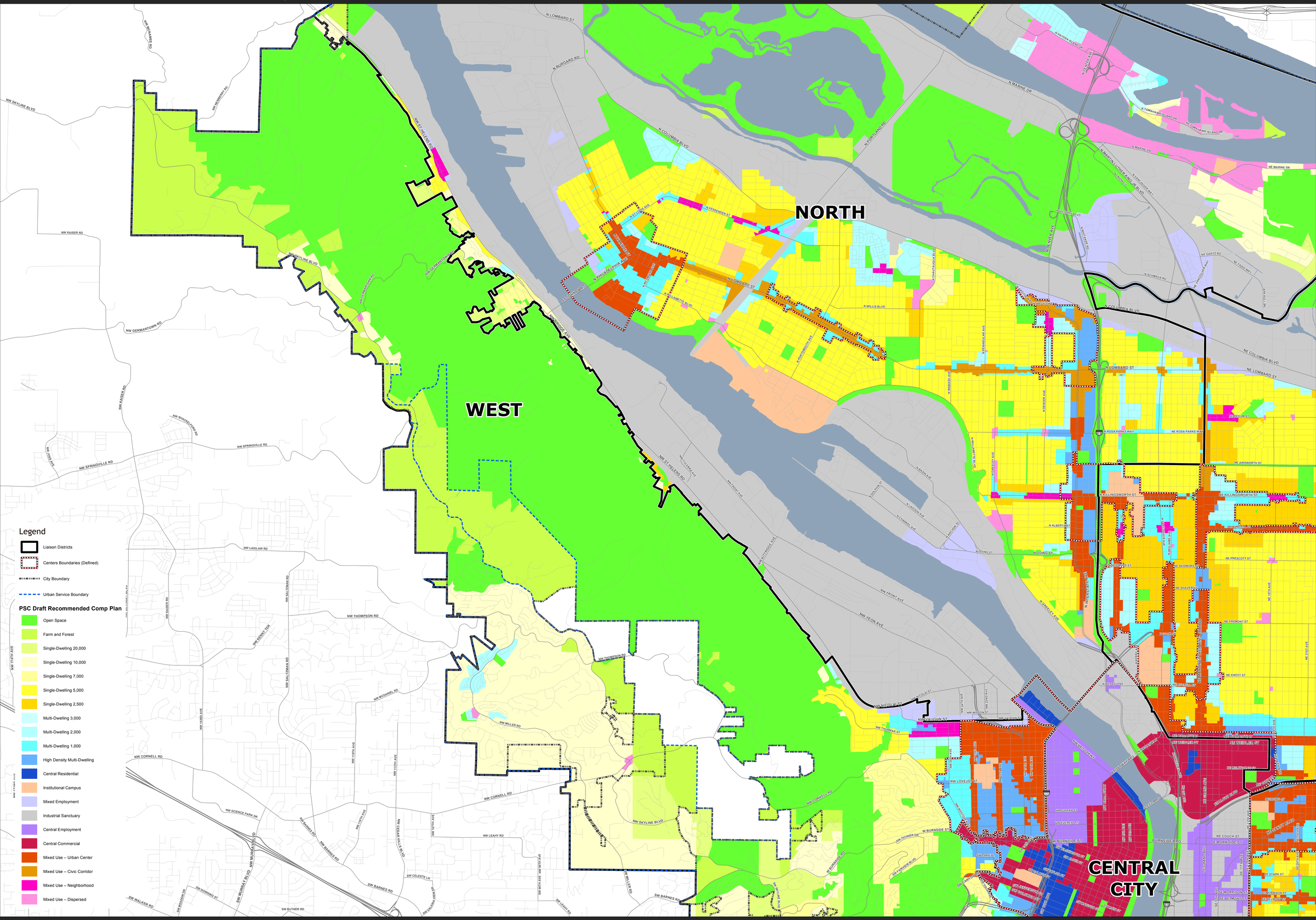
# Draft Recommended Plan Map

West Liaison District--North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CENTRAL CITY
Legend
Liaison Districts
Centers Boundaries (Defined)
City Boundary
Urban Service Boundary
PSC Draft Recommended Comp Plan
Open Space
Farm and Forest
Single-Dwelling 20,000
Single-Dwelling 10,000
Single-Dwelling 7,000
Single-Dwelling 5,000
Single-Dwelling 2,500
Multi-Dwelling 3,000
Multi-Dwelling 2,000
Multi-Dwelling 1,000
High Density Multi-Dwelling
Central Residential
Institutional Campus
Mixed Employment
Industrial Sanctuary
Central Employment
Central Commercial
Mixed Use – Urban Center
Mixed Use – Civic Corridor
Mixed Use – Neighborhood
Mixed Use – Dispersed
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N COLUMBIA BLVD
N MARINE DR
N PORTLAND RD
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SW CEDAR HILLS BLVD
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SW BUTNER RD
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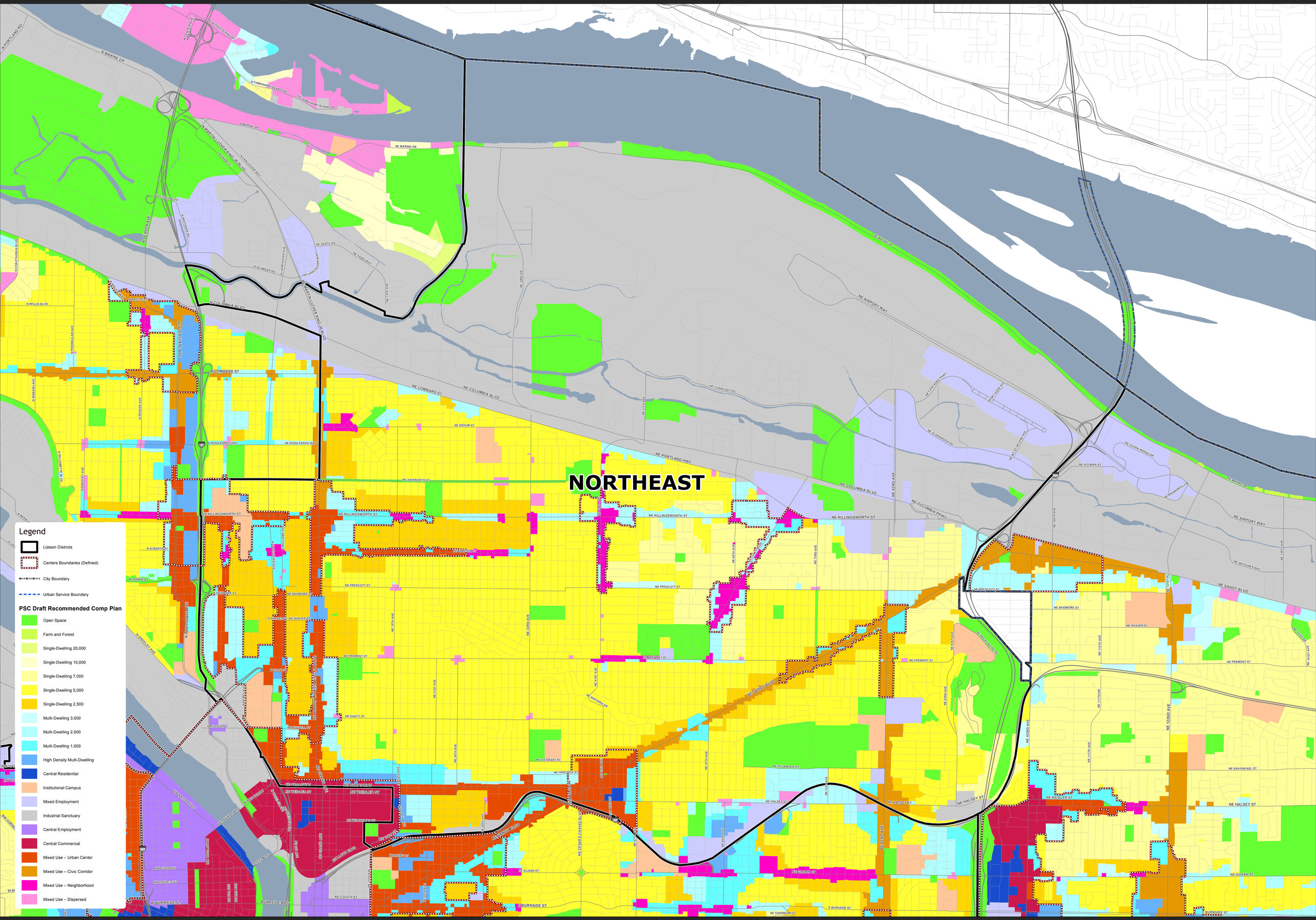
# Draft Recommended Plan Map

Northeast Liaison District


NORTHEAST
N MARINE DR
NE MARINE DR
N COLUMBIA BLVD
NE COLUMBIA BLVD
NE PORTLAND HWY
NE LOMBARD ST
N LOMBARD ST
NE AIRPORT WAY
NE KILLINGSWORTH ST
N KILLINGSWORTH ST
NE PRESCOTT ST
NE FREMONT ST
NE SANDY BLVD
NE HALSEY ST
NE WEIDLER ST
NE 122ND AVE
NE 82ND AVE
NE 42ND AVE
N INTERSTATE AVE
N DENVER AVE
N MARTIN LUTHER KING JR BLVD
NE MLK JR BLVD
N VANCOUVER AVE
NE 33RD AVE
NE 57TH AVE
NE 65TH AVE
NE 72ND AVE
NE 102ND AVE
NE 112TH AVE
NE 148TH AVE
NE ROSA PARKS WAY
NE PORTLAND HWY
NE CESAR E CHAVEZ BLVD
NE GLISAN ST
NE HOLMAN ST
NE SAN RAFAEL ST
NE WHITAKER WAY
NE AIRPORT WAY
NE 185TH DR
NE GLENN WIDING DR
W BURNSIDE ST
E BURNSIDE ST
NE COUCH ST
NE HURST ST
NE JULIA MOOK ST
NE HANCOCK ST
NE KNOTT ST
NE SKIDMORE ST
NE SHAVER ST
NE PRESCOTT ST
NE FREMONT ST
NE ALDERWOOD RD
NE CORNFOOT RD
NE 238TH DR
NE 3RD AVE
NE 7TH AVE
NE 13TH AVE
NE 47TH AVE
NE 60TH AVE
NE 162ND AVE
NE 172ND AVE
NE 181ST AVE
NE 185TH AVE
N PORTLAND RD
N CHAUTAUQUA BLVD
N WILLIS BLVD
N PENINSULAR AVE
N ALBERTA ST
N GOING ST
N SKIDMORE ST
N SHAVER ST
N FREMONT ST
N KNOTT ST
N RUSSET ST
N SCHMEER RD
N CATLIN GULCH RD
N MARINE DR
N TOMAHAWK ISLAND DR
NE TOMAHAWK ISLAND DR
NE GERTZ RD
NE FAZIO WAY
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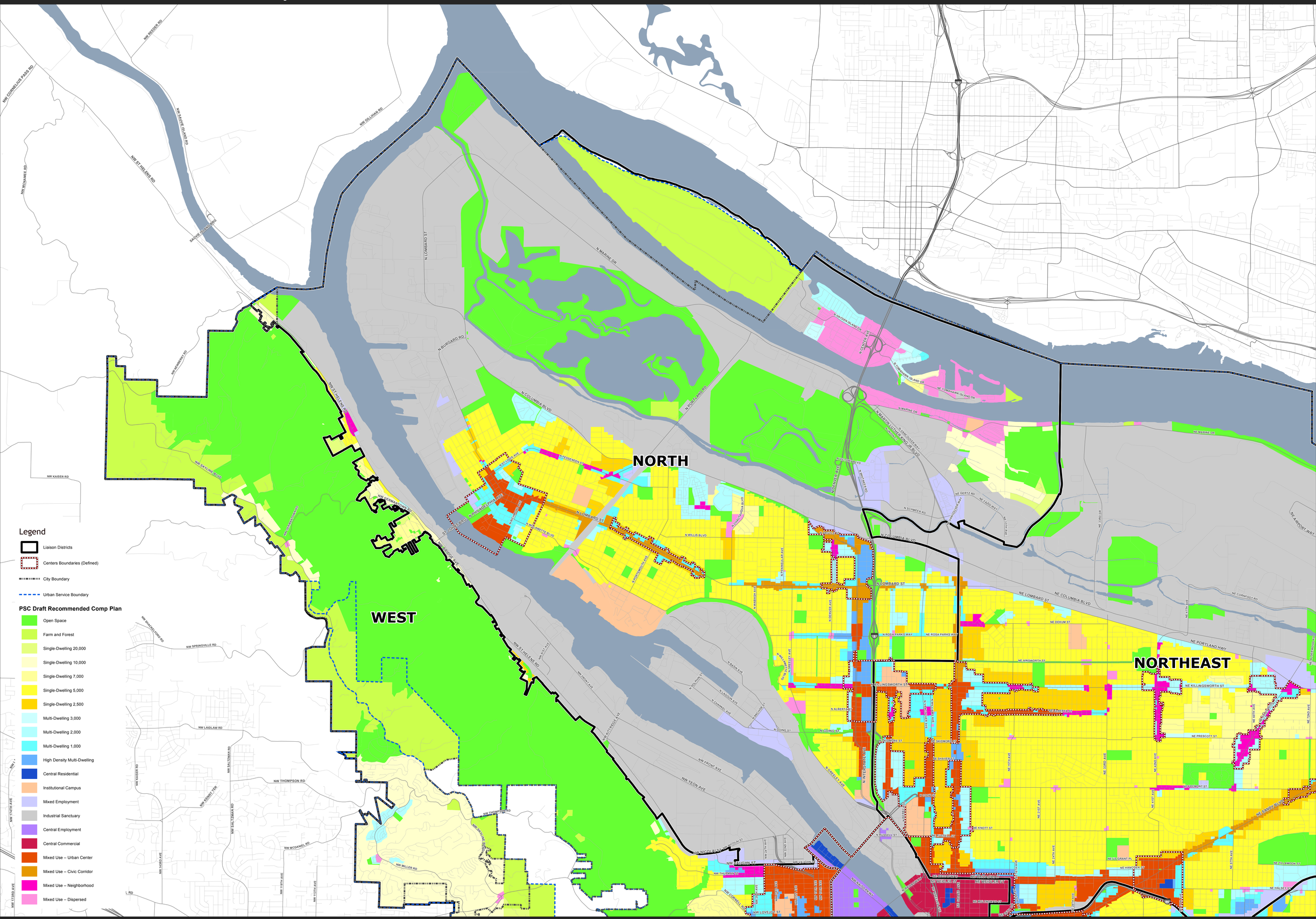
NE 65

# Draft Recommended Plan Map

North Liaison District


NORTH
WEST
NORTHEAST
Legend
Liaison Districts
Centers Boundaries (Defined)
City Boundary
Urban Service Boundary
PSC Draft Recommended Comp Plan
Open Space
Farm and Forest
Single-Dwelling 20,000
Single-Dwelling 10,000
Single-Dwelling 7,000
Single-Dwelling 5,000
Single-Dwelling 2,500
Multi-Dwelling 3,000
Multi-Dwelling 2,000
Multi-Dwelling 1,000
High Density Multi-Dwelling
Central Residential
Institutional Campus
Mixed Employment
Industrial Sanctuary
Central Employment
Central Commercial
Mixed Use – Urban Center
Mixed Use – Civic Corridor
Mixed Use – Neighborhood
Mixed Use – Dispersed
NW CORNELIUS PASS RD
NW REEDER RD
NW GILLIHAN RD
NW MCDANIEL RD
NW ST HELENS RD
NW SAUVIE ISLAND RD
NW KAISER RD
NW SPRINGVILLE RD
NW LAIDLAW RD
NW THOMPSON RD
NW MILLER RD
NW GERMANTOWN RD
NW SKYLINE BLVD
N LOMBARD ST
N MARINE DR
N BURGARD RD
N COLUMBIA BLVD
N PORTLAND RD
NE PORTLAND HWY
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NE FAZIO WAY
N HAYDEN ISLAND DR
NE TOMAHAWK ISLAND DR
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N MARTIN LUTHER KING JR BLVD
NE 33RD DR
NE 42ND CT
NE CORNFOOT RD
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NE 72ND AVE
N CHARLESTON AVE
N ALBERTA ST
N GOING ST
N INTERSTATE AVE
N VANCOUVER AVE
N GREELEY AVE
N MISSISSIPPI AVE
N WILLIAMS AVE
N MONTANA AVE
N KERBY AVE
N KERBY PL
N WABASH AVE
N FLANDERS AVE
N CHAMBERS ST
N BANA AVE
N LAGOON AVE
N DOUGLAS AVE
N CHANNEL AVE
N HAMILTON AVE
N CATHEDRAL PARK PL
N PRINCETON AVE
N OSWEGO AVE
N ST LOUIS AVE
N EDISON ST
N LOMBARD ST
N CHAUTAUQUA BLVD
N ST LOUIS BLVD
N PHILADELPHIA AVE
N MISSISSIPPI

# Draft Recommended Plan Map

East Liaison District

NORTHEAST

EAST

SOUTHEAST

## Legend

- Liaison Districts
- Centers Boundaries (Defined)
- City Boundary
- Urban Service Boundary

**PSC Draft Recommended Comp Plan**

- Open Space
- Farm and Forest
- Single-Dwelling 20,000
- Single-Dwelling 10,000
- Single-Dwelling 7,000
- Single-Dwelling 5,000
- Single-Dwelling 2,500
- Multi-Dwelling 3,000
- Multi-Dwelling 2,000
- Multi-Dwelling 1,000
- High Density Multi-Dwelling
- Central Residential
- Institutional Campus
- Mixed Employment
- Industrial Sanctuary
- Central Employment
- Central Commercial
- Mixed Use – Urban Center
- Mixed Use – Civic Corridor
- Mixed Use – Neighborhood
- Mixed Use – Dispersed

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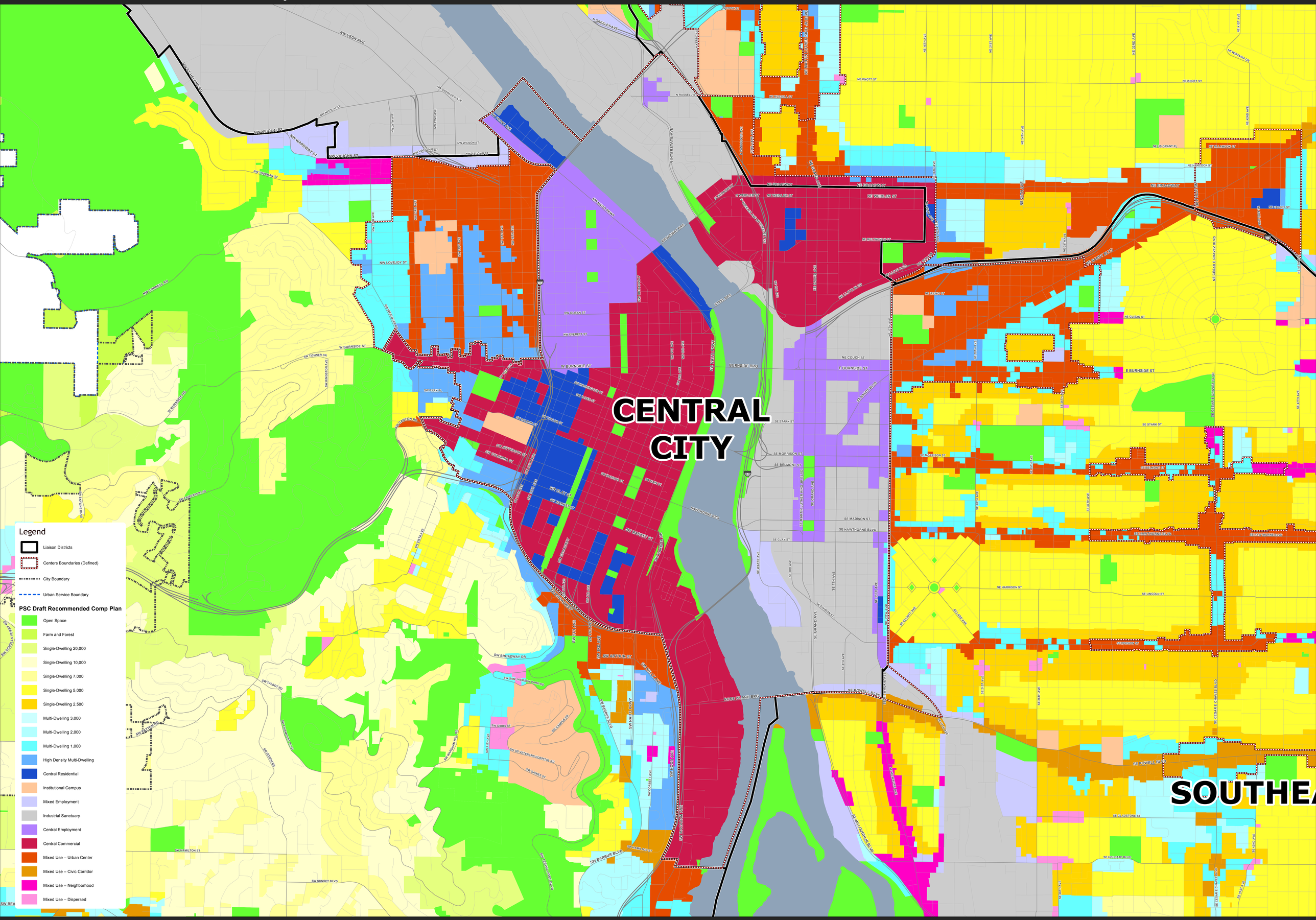
# Draft Recommended Plan Map

Central City Liaison District

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# Draft Recommended Plan Map (Changes)

West Liaison District--South

WEST

SOUTHEAST

## Legend

- Liaison Districts
- Centers Boundaries (Defined)
- City Boundary
- Urban Service Boundary

**PSC Draft Recommended Comp Plan**

- Open Space
- Farm and Forest
- Single-Dwelling 20,000
- Single-Dwelling 10,000
- Single-Dwelling 7,000
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# Draft Recommended Plan Map (Changes)

Southeast Liaison District

CENTRAL CITY

SOUTHEAST

## Legend

- Liaison Districts
- Centers Boundaries (Defined)
- City Boundary
- Urban Service Boundary

**PSC Draft Recommended Comp Plan**

- Open Space
- Farm and Forest
- Single-Dwelling 20,000
- Single-Dwelling 10,000
- Single-Dwelling 7,000
- Single-Dwelling 5,000
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# Draft Recommended Plan Map (Changes)

West Liaison District--North

NORTH

WEST

CENTRAL CITY

## Legend

- Liaison Districts
- Centers Boundaries (Defined)
- City Boundary
- Urban Service Boundary

**PSC Draft Recommended Comp Plan**

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- Farm and Forest
- Single-Dwelling 20,000
- Single-Dwelling 10,000
- Single-Dwelling 7,000
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# Draft Recommended Plan Map (Changes)

Northeast Liaison District

NORTHEAST

## Legend

- Liaison Districts
- Centers Boundaries (Defined)
- City Boundary
- Urban Service Boundary

**PSC Draft Recommended Comp Plan**

- Open Space
- Farm and Forest
- Single-Dwelling 20,000
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# Draft Recommended Plan Map (Changes)

North Liaison District

NORTH

WEST

NORTHEAST

## Legend

- Liaison Districts
- Centers Boundaries (Defined)
- City Boundary
- Urban Service Boundary

**PSC Draft Recommended Comp Plan**

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# Draft Recommended Plan Map (Changes)

East Liaison District

NORTHEAST

EAST

SOUTHEAST

## Legend

- Liaison Districts
- Centers Boundaries (Defined)
- City Boundary
- Urban Service Boundary

**PSC Draft Recommended Comp Plan**

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# Draft Recommended Plan Map (Changes)

Central City Liaison District

CENTRAL CITY

SOUTHEA

## Legend

- Liaison Districts
- Centers Boundaries (Defined)
- City Boundary
- Urban Service Boundary

**PSC Draft Recommended Comp Plan**

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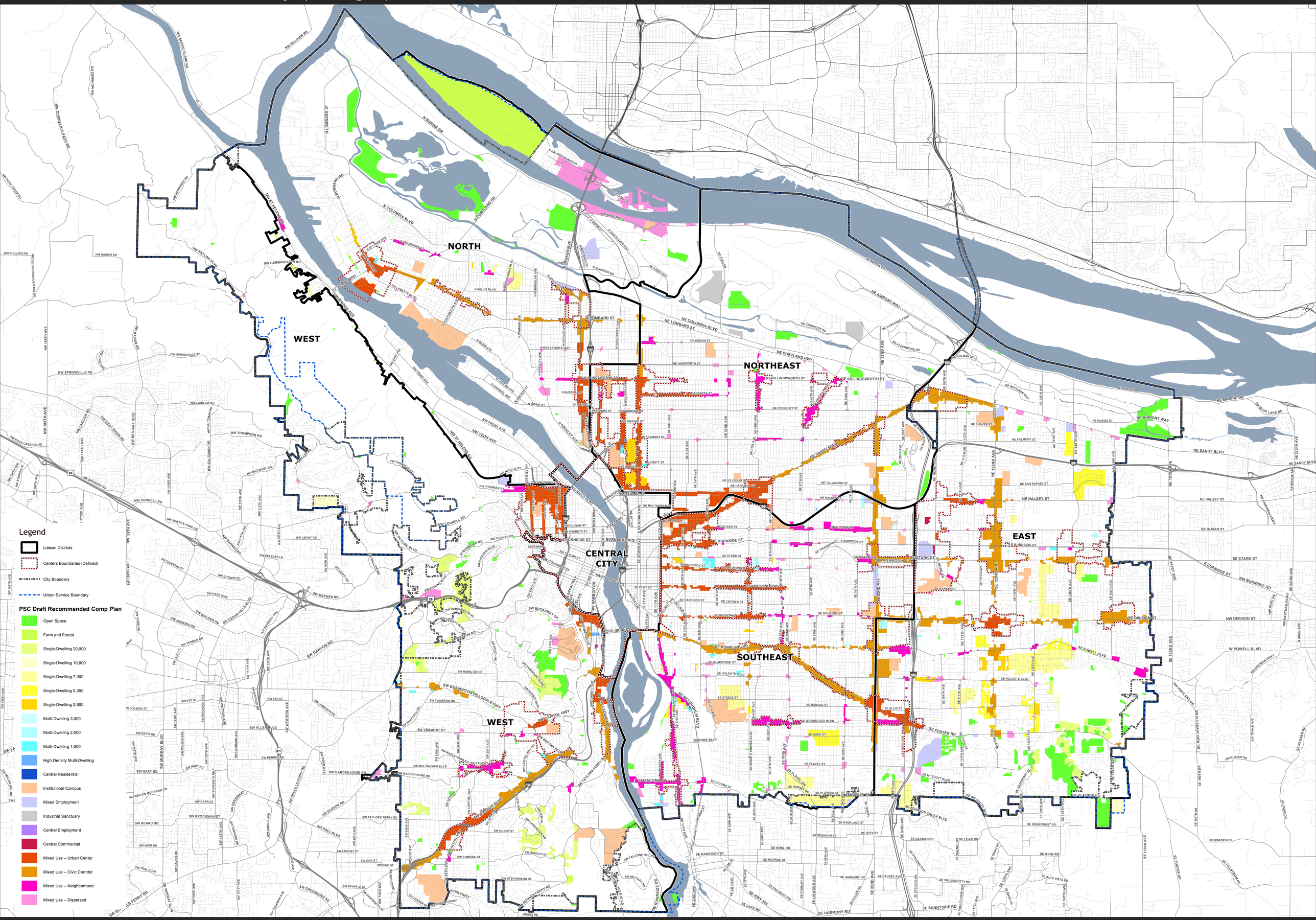
# Draft Recommended Plan Map (Changes)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NE PORTLAND HWY
NE AIRPORT WAY
NE MARINE DR
NE SANDY BLVD
NE KILLINGSWORTH ST
N COLUMBIA BLVD
N MARINE DR
N PORTLAND RD
N DENVER AVE
N VANCOUVER AVE
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N BURLINGTON AVE
N BASIN AVE
N CHANNEL AVE
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N ROSA PARKS WAY
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NE SHAVER ST
NE KNOTT ST
NE RUSSET ST
NE MULTNOMAH ST
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NE STARK ST
NE WASHINGTON ST
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NE 122ND AVE
NE 148TH AVE
NE 181ST AVE
NE 223RD AVE
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NE 57TH AVE
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NE 2273RD AVE
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NE 2328TH AVE
NE 2339TH AVE
NE 2350TH AVE
NE 2361ST AVE
NE 2372ND AVE
NE 2383RD AVE
NE 2394TH AVE
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NE 2416TH AVE
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NE 2680TH AVE
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NE 2757TH AVE
NE 2768TH AVE
NE 2779TH AVE
NE 2790TH AVE
NE 2801ST AVE
NE 2812TH AVE
NE 2823RD AVE
NE 2834TH AVE
NE 2845TH AVE
NE 2856TH AVE
NE 2867TH AVE
NE 2878TH AVE
NE 2889TH AVE
NE 2900TH AVE
NE 2911ST AVE
NE 2922ND AVE
NE 2933RD AVE
NE 2944TH AVE
NE 2955TH AVE
NE 2966TH AVE
NE 2977TH AVE
NE 2988TH AVE
NE 2999TH AVE
NE 3010TH AVE
NE 3021ST AVE
NE 3032ND AVE
NE 3043RD AVE
NE 3054TH AVE
NE 3065TH AVE
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## How to Use the Plan

### What is the Comprehensive Plan?

Portland's Comprehensive Plan guides land use development and public facility investment decisions between now and 2035. This guidance is intended to help make Portland more prosperous, healthy, equitable, and resilient. The Comprehensive Plan includes five elements that work together to accomplish this goal:

1. Vision and Guiding Principles
2. Goals and Policies
3. Comprehensive Plan Map
4. List of Significant Projects
5. Transportation policies, classifications, and street plans

### What is the Plan based on?

The Comprehensive Plan is based on objective data and research into current conditions, issues, and trends. This information can found in the following supporting documents:

- Inventories and Analysis
- Transportation Systems Plan
- Citywide Systems Plan (for non-transportation infrastructure)
- School District Facility Plans

### How is the Plan implemented?

The goals and policies of the Comprehensive Plan are implemented through regulations, land use decisions, agreements, and community development programs including:

- Zoning Code
- Zoning Map
- Service Coordination Agreements
- Annexations
- Urban Renewal Areas
- Development Agreements

*For more information about the plan elements, supporting documents, and implementing tools, see Chapter 1: The Plan.*


Ord. 187831, Vol. 2.4.C, page 8947

**When and how is the Comprehensive Plan used?**
The Comprehensive Plan is used for making land use decisions, primarily legislatively, but sometimes quasi-judicially. This includes decisions about how land is used or developed, and public facility investment decisions related to those planned land uses or developments.

The Comprehensive Plan and these tools are not static, and they are expected to change over time. City Council will consider decisions to adopt, amend or repeal parts of the Comprehensive Plan or implementation tools in the future in respond to changing conditions, needs, trends, and other information.

[sidebar]
**Legislative and Quasi-judicial land use decisions**
Land use decisions are generally made through one of two ways: legislatively or quasi-judicially. Some zoning- and development-related decisions are also made administratively.

**Legislative process –** Legislative decisions establish long-range land use plans, investments, policies, or regulations that can affect large parts of the city and many people. Legislative land use decisions can also be used to change any element of the Comprehensive Plan and change or create new related codes and area plans intended to implement the Plan. These changes are accomplished through adoption of an ordinance by City Council. Part of this process is the review and adoption of findings that the proposal is consistent with the goals and policies of the Comprehensive Plan or with State and Metro rules. Legislative projects typically are:

- Initiated by City Council or City agencies;
- Reviewed by the Planning and Sustainability Commission, which transmits its recommendation to City Council.

**Quasi-Judicial process –** Quasi-judicial decisions are used for site-specific projects that affect one or a limited number of specific properties. They typically are initiated by an applicant, like a private property owner. They tend to impact fewer neighborhoods and people. Examples include site-specific amendments to the Comprehensive Plan Map or Zoning Map, proposals to demolish historic landmarks, Type IV Demolition Reviews, or requests for street vacations, among others.

- City staff or a Hearings Officer reviews and makes decisions on quasi-judicial proposals.
- There is often an opportunity for a public hearing.
- They are reviewed for compliance with specific approval criteria in the Zoning Code.
- In limited cases, the criteria may require findings of compliance with the Comprehensive Plan.

**Administrative process –** Administrative decisions are those made under clear and objective standards without exercise of discretion. An example includes application of numerical setback standards in the Zoning Code, or the determination of needed public improvements based on street classification maps in the Comprehensive Plan, and published engineering standards. Administrative decisions are typically made by City staff and are not individually reviewed against the goals and policies of the Comprehensive Plan.
[end sidebar]

**How are Comprehensive Plan policies weighed and balanced in decision-making?**
With all Legislative changes and some Quasi-Judicial decisions, and the decision-maker must document how the proposed decision complies with the Comprehensive Plan's policies. A decision

"complies" if it can be found to be equally or more supportive of the existing Plan *as a whole*. If these findings cannot be made, City Council has two choices: to not make the change, or to amend the Plan to allow the change. However, the reverse is not true; Council is not compelled to make a decision just because it would meet Plan policy.

The Comprehensive Plan contains a broad range of policies for Council to consider. Each policy describes a desirable outcome. But it is unlikely that all policies are relevant to a particular decision and that a particular decision could be expected to advance all of the policies in the Plan equally well. For this reason, policies are examined for their applicability to the decision at hand, and only applicable policies are considered.

Council must then weigh and balance applicable policies to determine whether a particular decision would "on the whole" comply with the Comprehensive Plan. In virtually all decisions, some applicable policies will weigh — or matter — more than others. For example, a policy that specifically addresses the topic or location of the change being made would probably outweigh a policy that applies to a wide variety of topics or to the city as a whole. Most policies begin with a verb, and some verbs establish stronger imperatives than others. Accordingly, a policy to "require" something may outweigh a policy to "encourage" something else.

But even the strongest policies do not automatically trump other policies. Every decision is different, with different facts. The particular policies that matter more will change from one decision to another. There is no set formula — no particular number of "heavier" policies equals a larger set of "lighter" policies. In cases where there are competing directions embodied by different policies, City Council may choose the direction they believe best embodies the plan as a whole. The Vision and Guiding Principles in this Comprehensive Plan help to provide additional guidance when policies are balanced. Council ordinances do, however, contain a "conclusion on law" explaining how complementary and competing policies have been weighed and balanced in determining whether the proposed decision complies with the Comprehensive Plan.


Ord. 187831, Vol. 2.4.C, page 8949

**The Comprehensive Plan is also used in other ways.**

### City of Portland
The City of Portland uses its Comprehensive Plan more broadly than the State of Oregon requires. The City also refers to the Plan to inform non-land use decisions, to scope projects and assess alternatives, to guide public facility investment choices, and to support grant applications, among other things.

### Other public agencies
Other public agencies, like the State of Oregon or Metro, may refer to the Plan when determining if a project is consistent with the City of Portland's local Comprehensive Plan.

### Community members
The Comprehensive Plan is a community tool that is often used for advocacy and to track accountability. Community members are also encouraged to use the Plan to monitor City projects and decisions. Community members may choose to use the Comprehensive Plan to:

- Advocate for projects and programs to be included in the annual City budget.
- Review, evaluate, and comment on proposed legislative projects.
- Review, evaluate, and comment on Comprehensive Plan-related projects and programs.
- Review, evaluate, and comment on site-specific land use reviews that are subject to Comprehensive Plan review.
- Support or appeal approved land use reviews and legislative projects.
- Apply for a change to the Comprehensive Plan Land Use Map designation for a property they own, apply for a street vacation, or apply for any other land use approval for which a project must be reviewed for compliance with the Comprehensive Plan.
- Serve as background information when applying for grants, funding, or other programs.


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**How does the Comprehensive Plan relate to other plans?**
The Comprehensive Plan is part of a family of state, regional, and local plans. Some, like Oregon's Statewide Planning Goals and Metro 2040, set the overall planning framework and guide the content of the Plan. Others, like topic- and area-specific plans, provide more detailed information about individual topics or smaller parts of the city.

**Oregon's Statewide Planning Program**
Oregon has had a statewide planning program since 1973. This program is built on a set of 19 Statewide Planning Goals that cover a wide range of topics. Portland is required to adopt a Comprehensive Plan that implements the applicable statewide goals at a local level. The state's Land Conservation and Development Commission (LCDC) reviews and approves each local jurisdiction's Comprehensive Plan to ensure compliance with these goals.

The LCDC notifies local jurisdictions when it is time to update all or part of a Comprehensive Plan. This notification is called "Periodic Review." According to the State, the purpose of Periodic Review is to ensure that local comprehensive plans are:

- Updated to respond to changes in local, regional, and state conditions.
- Coordinated with other comprehensive plans and investments.
- In compliance with the statewide planning goals, statutes, and rules.

**Statewide Planning Goals**

1. Citizen Involvement
2. Land Use Planning
3. Agricultural Lands
4. Forest Lands
5. Natural Resources, Scenic and Historic Areas, and Open Spaces
6. Air, Water and Land Resources Quality
7. Areas Subject to Natural Hazards
8. Recreational Needs
9. Economic Development
10. Housing
11. Public Facilities and Services
12. Transportation
13. Energy Conservation
14. Urbanization
15. Willamette River Greenway
16. Estuarine Resources
17. Coastal Shorelands
18. Beaches and Dunes
19. Ocean Resources

The City of Portland is subject to all goals, except 3, 4, 16, 17, 18, and 19. The City's Comprehensive Plan must demonstrate compliance with all remaining goals. During this Comprehensive Plan update, the City was specifically required to, at a minimum, address goals 1, 2, 9, 10, 11, and 14 and was directed to address goals 5 and 7 during the research and inventory phase of the plan update process.


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## Regional Plans

Metro is the Portland metropolitan area's regional government. Portland's Comprehensive Plan must be consistent with three regional plans and implementing regulations established by Metro:

**The Urban Growth Management Functional Plan** – This Plan, along with the Metro Regional Framework Plan and the 2040 Urban Growth Concept, provide the Portland metropolitan region with a coordinated growth management plan and preferred regional urban form. The preferred regional urban form is to contain growth within a carefully managed Urban Growth Boundary (UGB) where growth occurs inside the UGB in the form of infill and redevelopment with higher density developed in areas where it is appropriate.

**The Regional Transportation Plan (RTP) –** The RTP guides and coordinates investments in the regional transportation system, which serves Clackamas, Multnomah, and Washington counties.

**Urban Growth Management Functional Plan –** Cities and counties within Metro's boundaries must be consistent with Metro's adopted Urban Growth Management Functional Plans and the Regional Framework Plan, per Metro's Charter and state law. However, these plans do not dictate how cities accommodate growth and development. It is the responsibility of Portland to figure out where to locate housing and how to create a fertile and sustainable economy, while protecting natural resources. It is Portland's responsibility to guide the city's shape and development. The Comprehensive Plan is one way that the City of Portland is complying with the applicable Metro plans.

## Local Plans

In addition to the Statewide Planning Program and the regional planning program, Portland develops and adopts many plans of its own.

**Area-specific Plans –** The Comprehensive Plan is a plan for the whole city; area-specific planning efforts take place for a smaller part of the city. Planning for smaller geographies — like a district of the city or the neighborhoods along a transit line — provides an opportunity to explore issues at a finer scale and with the local community. This level of planning is often called community or neighborhood planning.

Area-specific plans contain many components, such as information about the area's history and community, vision statements, policies, code amendments, land use or Zoning Map changes, and action plans. All of these components must comply with the Comprehensive Plan in effect at the time the plan is developed. The components of area-specific plans either can be adopted by ordinance or resolution. They can also result in an amendment to the Comprehensive Plan or its implementation tools.

**Topic-Specific Plans –** The City of Portland and other government agencies also adopt plans that are topic-specific or infrastructure-specific, such as the Climate Action Plan, the Consolidated Housing Plan, and Stormwater Management Plan. These plans should follow the ethos of the Comprehensive Plan and should not contradict the goals of the Comprehensive Plan. In general, they are not adopted as part of the Comprehensive Plan. Like the area-specific plans, topic- or infrastructure-specific plans may necessitate an amendment to the Comprehensive Plan and/or its implementation tools to ensure that they stay current over time.

### How do area-specific plans relate to the Comprehensive Plan?

**Plans adopted from 1980 to 2015 –** Over 60 area-specific plans were adopted between the day Portland's first Comprehensive Plan went into effect (January 1, 1981) and the adoption and


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effective date of this 2035 Comprehensive Plan. These plans are listed in Figure 1-2 in Chapter 1: The Plan. These area-specific plans may or may not comply with the new 2035 Comprehensive Plan goals and policies. If there is a conflict between a policy in the 2035 Comprehensive Plan and a policy in a previously adopted area-specific plan, the new 2035 Comprehensive Plan supersedes.

**2016 and later** –The City will adopt new area-specific plans, such as the Central City 2035 Plan, after the 2035 Comprehensive Plan goes into effect. These plans will address local issues, using the 2035 Comprehensive Plan as a starting point for more detailed policies, maps, and actions. These area-specific plans may result in amendments to the Comprehensive Plan and/or its implementation tools and will help the Comprehensive Plan stay current over time


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## How is a Comprehensive Plan developed and approved?

Under state-mandated Periodic Review, there are several steps that must be taken to update a Comprehensive Plan. Below is a summary of Portland's process for updating the Comprehensive Plan, approved by the State of Oregon.

### Assessment

The first step of Periodic Review is assessing the adequacy of the existing plan and background data to determine if conditions have changed enough to require the development of a new Comprehensive Plan or updates to portions of the Comprehensive Plan. The 2008 assessment showed that a significant update to the City's Comprehensive Plan, including new background information, was needed. This direction ultimately resulted in the development of new Comprehensive Plan Goals and Policies, and a substantial update to the Comprehensive Plan Map.

### Periodic Review Work Plan

The next step in Periodic Review is the development of a work plan. As part of periodic review, the City is required to develop and adopt a work plan to guide the update of the Comprehensive Plan. In 2008, after review and recommendations by the Planning and Sustainability Commission, the Portland City Council adopted a work plan by Resolution No. 36626. This document includes the Council-approved Periodic Review Work Program & Public Involvement Plan (August 6, 2008).

### Factual Basis

After the work plan is adopted, the next step is the development of a factual basis, as required by ORS 197.625 and OAR 660-0025. The purpose of this work is to provide a thorough and current analysis of existing conditions in Portland on which to base the content of the Comprehensive Plan. The factual basis includes the following documents:

- Economic Opportunities Analysis
- Housing Needs Analysis
- Natural Resource Inventory
- Infrastructure Condition and Capacity

### Buildable Lands Inventory

The factual basis was adopted by the City Council in October 2012, and all but one of the reports was acknowledged by the State in May 2014. The Economic Opportunities Analysis is being revised by the City and will be re-submitted in 2015.

### Growth Scenarios and Alternatives Analysis

In the Buildable Lands Inventory Report, published in 2012, the City analyzed existing development patterns and intensity, land and development values, and existing land use designations and zoning to determine where there is vacant land and land that is likely to be redeveloped. The report identifies constraints, such as inadequate infrastructure services or natural hazards. The Growth Scenarios Report offers a basis for making informed decisions about which investments and growth patterns will bring the greatest benefit to the most Portlanders while moving the city closer to meeting performance goals. Performance goals include things such as reducing carbon emissions, improving access to living-wage jobs, and providing safe and convenient access to goods and services within walking distance of where people live.

The Growth Scenarios Report uses information from the Buildable Lands Inventory and measures the performance of different possible growth alternatives, and how those choices may impact our ability to meet the Measures of Success adopted with the Portland Plan. Based on analysis in the Growth Scenarios Report, a "preferred scenario" was developed. The proposed Comprehensive Plan Map implements that preferred scenario.


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**Working Draft (Part 1 and Part 2)**
A Working Draft of the Comprehensive Plan was prepared by staff in 2013, in consultation with a group of advisory committees (known as Policy Expert Groups, or PEGs). In total, more than 60 volunteers participated in this process, including business and neighborhood leaders, and a variety of other topic experts and community representatives. The Working Draft was shared with the general public at meetings and events and online. The Working Draft Part 1, which included the Urban Design Framework and the Goals and Policies, was released for public review in January 2013. The Working Draft Part 2, which included the Comprehensive Plan Map and the Citywide Systems Plan, was released for public review in October 2013.

**Proposed Draft**
The Proposed Draft was developed by staff, informed by public feedback and additional analysis. This draft was published in July 2014 and circulated for broad public review. Formal testimony was invited for a 9-month period, July 2014 through March 2015. Testimony occurred in person (at public hearings), in writing (via email and letters), and through an interactive online map application (the Map App). Over 4,000 comments were received and considered by staff and the Planning and Sustainability Commission.

**Recommended Draft**
The Recommended Draft includes all changes to the Proposed Draft approved and recommended by the Planning and Sustainability Commission between July 2014 and June 2015. It will be forwarded to the City Council for consideration, public hearings, and adoption.

**Adopted Plan**
The Adopted Plan will be the final version of the Plan that is adopted by the City Council by ordinance. It includes all changes directed by Council, following an additional round of hearings and City Council deliberation and testimony.

**Early Implementation**
The final step in the state-required Periodic Review process is updating city codes and zoning maps to be consistent with the new Comprehensive Plan. These updates do not go into effect until the Comprehensive Plan is acknowledged.

**State Acknowledgment**
After the City Council adopts the Comprehensive Plan, the City of Portland sends the City's Adopted Plan to the Land Conservation and Development Commission (LCDC). LCDC must review and acknowledge that the Comprehensive Plan adopted by the City meets all applicable State of Oregon requirements. Once the plan is approved by LCDC, it is considered an acknowledged Comprehensive Plan and becomes effective.

**Future updates**
The Comprehensive Plan is a long-range plan to guide land use decisions for a generation. Given the breadth of the plan, its long-term planning horizon, and the amount of work required to update the Plan's components, the full Comprehensive Plan is only updated periodically.

However, it is often necessary to update portions of the plan or to create more focused area plans. When smaller updates are completed or area plans like the Central City 2035 Plan are completed, they must be adopted as "post-acknowledgment plan amendments."

**COVER**
**2035 Comprehensive Plan - Recommended Draft**

**What's inside?**

- Vision and Guiding Principles
- How to Use the Plan
- Goals and Policies
- List of Significant Projects
- Comprehensive Plan Map
- Glossary

July 2015
Portland's Comprehensive Plan Update
For more information, visit: www.portlandoregon.gov/bps/pdxcompplan



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INSIDE COVER

## Portland's 2035 Comprehensive Plan guides how and where land is developed and infrastructure projects are built to prepare for and respond to population and job growth.

All cities and counties in Oregon are required to have a Comprehensive Plan. The new Comprehensive Plan addresses future development, but it also includes expectations for how and when community members will be involved in land use decisions. It helps coordinate policies and actions across City bureaus, as well as with regional and state agencies.

## This plan is built on a solid foundation.

The 2035 Comprehensive Plan is built on the 2012 Portland Plan, the Climate Action Plan, and Portland's 1980 Comprehensive Plan, which was Portland's first Comprehensive Plan developed under the statewide land use planning system. The new Plan continues the commitment to linking land use and transportation decisions. It expands the reasons for, and approaches to, improving Portland as a place that is walkable, bikeable, and transit-friendly with active main streets. The Plan continues Portland's commitment to compact development, with active employment centers, expanded housing choice, and access to parks and open space.

The **Portland Plan** brought together more than 20 agency partners and thousands of residents, businesses, and nonprofits to create a strategic plan to make Portland prosperous, healthy, educated, and equitable. It provides a structure for aligning budgets and projects across numerous public agencies, guiding policies with an eye toward the year 2035, and a five-year action plan to get things started. The Portland Plan is organized around an equity framework, three integrated strategies, and a set of measurable objectives to track progress.

The Comprehensive Plan is Portland's primary tool to implement the Portland Plan. The equity framework and the three integrated strategies — Healthy Connected City and Economic Prosperity and Affordability, in particular — provide the foundation for the Comprehensive Plan's goals and policies, capital project lists, and maps. The Measures of Success for the Portland Plan will also be used to track progress against the Comprehensive Plan.

*To help ensure equal access to City programs, services and activities, the City of Portland will provide translation, reasonably modify policies/procedures and provide auxiliary aids/services/alternative formats to persons with disabilities. For accommodations, translations, complaints, and additional information, contact the Bureau of Planning and Sustainability: 503-823-7700, use City TTYL 503-823-6868, or use Oregon Relay Service: 711.*

*It is the policy of the City of Portland that no person shall be denied the benefits of or be subjected to discrimination in any City program, service or activity on the grounds of race, religion, color, national origin, English proficiency, sex, age, disability, religion, sexual orientation, gender identity, or source of income. The City of Portland also required its contractors and grantees to comply with this policy.*

**Vision**
Portland is a prosperous, healthy, equitable, and resilient city where everyone has access to opportunity and is engaged in shaping decisions that affect their lives.

**Guiding principles — Not just where but HOW Portland will grow.**

The Comprehensive Plan includes five Guiding Principles — to recognize that implementation of this plan must be balanced, integrated and multi-disciplinary. The influence of the Guiding Principles can be seen throughout the Plan, as they shape many of the individual policies and projects.

The Guiding Principles are:

- **Economic prosperity** – Support a low-carbon economy and foster employment growth, competitiveness, and equitably distributed household prosperity.
- **Human health** – Avoid or minimize negative health impacts and improve opportunities for Portlanders to lead healthy, active lives.
- **Environmental health** – Weave nature into the city and foster a healthy environment that sustains people, neighborhoods and wildlife. Recognize the intrinsic value of nature and sustain the ecosystem services of Portland's air, water, and land.
- **Equity** – Promote equity and environmental justice by reducing disparities, minimizing burdens, extending community benefits, increasing the amount of affordable housing, and improving socio-economic opportunities for under-served and under-represented populations. Inform and involve Portlanders in decisions that affect them.
- **Resilience** – Reduce risk and improve the ability of individuals, communities, economic systems, and the natural and built environments to withstand, recover from, and adapt to changes from natural hazards, human-made disasters, climate change, and economic shifts.

*For more information on how the Guiding Principles are used, please see About the Plan and Chapter 1: The Plan.*



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**Portland is expected to grow.**

Portland's economy, neighborhoods, resources, natural setting and the lifestyle options they support continue to attract new residents to the city. Over the next 20 years, Portland is projected to add approximately **260,000 new residents** to the roughly 620,000 people who live here today, and about **140,000 new jobs** to the 370,000 jobs in Portland now.

**If done well, this growth is part of achieving the Comprehensive Plan Vision.**

The longstanding commitment in Portland is to grow UP, not OUT. This course initially was set in 1972 with State Bill 100, and later through the creation of the Metro Urban Growth Boundary. These laws were intended to protect prime farm and forest land, the agricultural economy, natural resources, and environmental health. The Urban Growth Boundary also protects places that Portlanders love and depend on.

Portland also is a City of great neighborhoods. The attractiveness of these neighborhoods to existing and new residents is impacted by housing choices, and the proximity of convenient services, schools, parks and other destinations. Having good access and other connections are also important including transit, safe streets, trails, and other public spaces.

The Comprehensive Plan proposes to use new growth to help expand access to employment and great neighborhoods. The Plan guides growth to Centers and Corridors. Growing up and not out supports the clustering destinations and makes access by transit, walking, wheelchair, and bicycle more practical and desirable. In turn, this helps reduce the amount of driving needed to access work and services.

Focusing growth and investments in centers and along corridors also makes good use of existing infrastructure capacity and encourages efficiency in new infrastructure investments, such as streets, sidewalks, transit lines, water and sewer lines, and parks.

**A city's form matters.**

The Urban Design Framework in the Comprehensive Plan shows how the Vision and Guiding Principles in the 2035 Comprehensive Plan are reflected in the location and form of future change.



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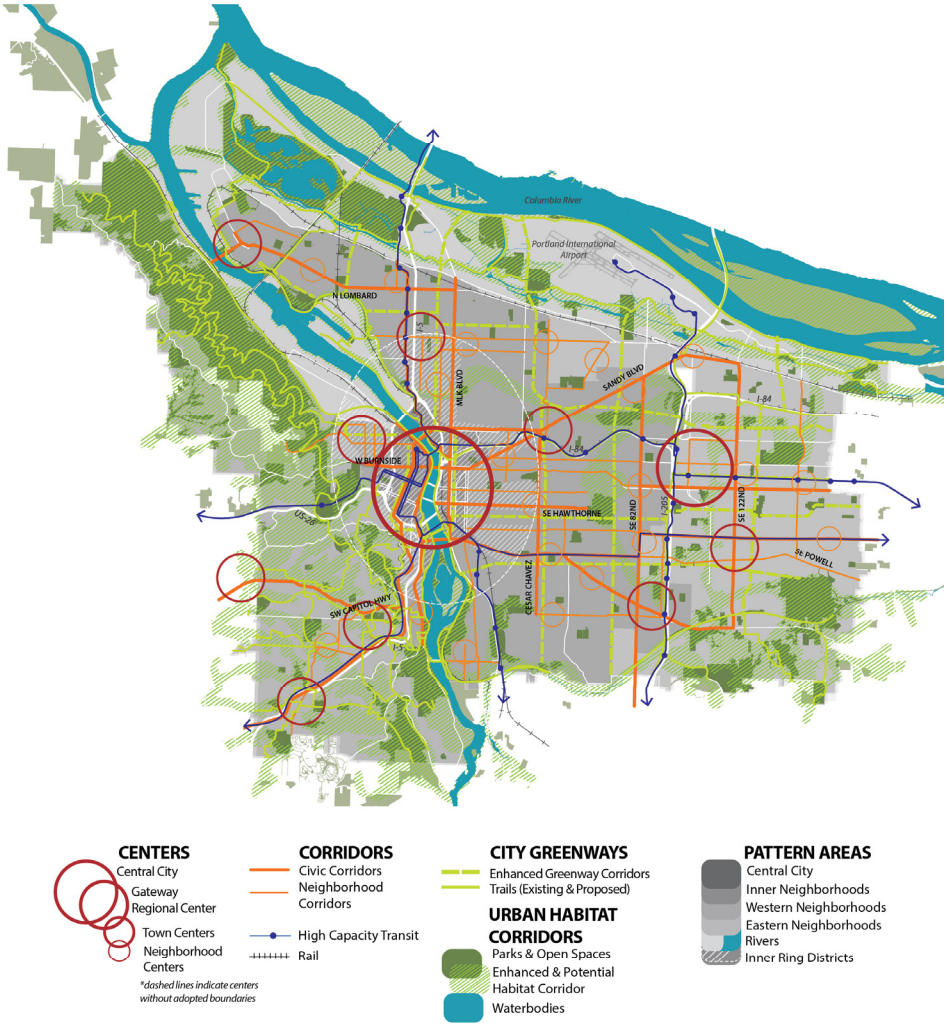
# URBAN DESIGN FRAMEWORK




*For more information on the Urban Design Framework, please see Chapter 3: Urban Form in the Goals and Policies and review the Urban Design Direction document.*

## What the new Comprehensive Plan can accomplish

The following pages summarize what each of the Guiding Principles is intended to accomplish.



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**Economic prosperity** – Support a low-carbon economy and foster employment growth, competitiveness, and equitably distributed household prosperity.

A robust and resilient regional economy, thriving local businesses, and growth in living wage jobs are all critical to ensuring household prosperity. In the past decade, job growth in Portland was relatively flat. While the economy is picking up strength, it is important to plan for the long term, and implement policies and make investments that improve Portland's ability to weather economic change and improve household prosperity for all Portlanders.

Portland's job market is poised to expand by more than 140,000 jobs between now and 2035. This forecast is based on many factors, including past trends and land capacity. Realizing this forecast will take focused work. The 2035 Comprehensive Plan includes policies and projects to support job growth.

- **Re-invest in Brownfields** – Industrial areas have nearly 500 acres of under-utilized contaminated brownfields. New public policies that support brownfield remediation included in this plan support programs that leverage the private investment needed to bring these contaminated properties back into productive use.

- **Increase sites for businesses and employment opportunities, especially in East Portland** – To improve access to living wage jobs in East Portland, the Comprehensive Plan Map shifts some commercial and residential land to employment land.

- **Preserve existing industrial sites and intensify the level of use and development of sites** – The Plan includes policies that encourage businesses to grow on existing sites, as well as policies to ensure that existing industrial land is protected from commercial and residential development encroachment. The Citywide Systems Plan and the Transportation System Plan also include freight-related infrastructure projects that will improve access to employment land, and better connect opportunity sites to the region and to other parts of the state.

- **Provide for employment growth at colleges and hospitals** – Campus institutions like colleges and hospitals are Portland's fastest growing job sector today, and they are expected to continue to grow. This Comprehensive Plan includes policies that facilitate growth within existing institutional campuses and call for the creation of clear rules for maintaining and improving neighborhood compatibility in implementation tools.

- **Recognize prosperity is about more than job growth** – Business and job growth does not take place in a vacuum. It is influenced by the quality of the city as a place to live, the education system, availability of capital, and the natural and built environments. Policies and implementation actions that support Centers and Corridors, Urban Habitat Corridors, and City Greenways, all make Portland a more attractive location for people to work and live, and run businesses.

**The city's success depends on achieving broad community prosperity.** The 2035 Comprehensive Plan recognizes that upward mobility for lower-income households and closing the racial income gap are essential to building a strong, sustainable, and resilient city economy.

The Plan's approach to job development is rooted in the need to help all Portlanders attain economic self-sufficiency, and find long-term economic success. Part of the approach focuses on the needs of business to grow. The Plan provides land for growth of traded sector businesses, educational and health campuses, and small businesses.

The Plan also focuses on increasing living wage opportunities for Portlanders with a wide range of educational backgrounds, aptitudes, and skills. Manufacturing businesses, healthcare facilities and educational institutions all offer these kind of opportunities.

Household prosperity varies greatly by employment type. In 2012, the average wage for retail and service workers in Portland ($26,000) was far below the level needed to sustain a household. The Portland Plan's measure of success for household prosperity uses a self-sufficiency index based on the income needed to meet basic household needs, including the cost of housing, childcare, food, healthcare and transportation. In Portland, this is approximately $36,000 per year for one adult and an infant. By contrast, the average wage for an industrial worker in Portland is $55,000 per year, and the average wage in hospitals is $62,940. Industrial and institutional jobs provide better opportunities for many to earn a living wage, but living wage job creation is critical across all employment sectors.

**Human health –** Avoid or minimize negative health impacts and improve opportunities for Portlanders to lead healthy, active lives.

**Portland's physical environment has a significant effect on health.** The 2035 Comprehensive Plan incorporates consideration of human health into decisions about urban form and growth. It does this in a variety of interconnected ways. Growing in Centers and Corridors to create complete neighborhoods is a core concept that brings together many facets to support human health.

- **Increase access to complete neighborhoods –** Complete neighborhoods are places where people of all ages and abilities have safe and convenient access to more of the goods and services needed in daily life. These are places where they can get to grocery stores, schools, libraries, parks and gathering places safely on foot or by bike. They also are places that are connected by convenient transit to jobs and the rest of the city.

  The conveniences of complete neighborhoods make it easier for people to live active lifestyles and integrate exercise into their daily lives. Complete neighborhoods are places where youth can spend time, learn and play. They are places where people are out and about putting more "eyes on the street" that can help improve one's sense of safety. They also help reduce the amount of time spent doing errands and in a car. All of these things can make living just a little bit easier, and a lot less stressful.

- **Strengthen consideration of environmental justice –** Environmental justice is the equitable treatment and meaningful involvement of all people in public decision-making as it applies to who benefits and who bears the cost of development and growth. This also applies to decisions on how the Plan will be implemented and enforced.

  These policies are particularly relevant to plans and investments that impact communities that have been historically under-served and under-represented in public processes and decisions, and have historically carried the burden of adverse effects from city planning and implantation. Policies throughout the Plan support the meaningful involvement of Portlanders in public decisions.

- **Build City Greenways –** A network of safe, accessible, and attractive streets, trails, parks, and open spaces can make it easier to choose healthier lifestyle choices. This network complements complete communities by encouraging active living, community interaction, and nature in neighborhoods. Walking, biking, and using public transit become the easy choice.

  Driving less reduces household costs, improves personal and environmental health, and lowers carbon emissions and air pollution. A transportation network that integrates nature into neighborhoods, increases access to the outdoors, provides corridors for wildlife movement, and helps manage and clean stormwater will significantly improve environmental health. Access to open spaces and parks increases opportunities for recreation, relaxation, and learning.

**Environmental health –** Weave nature into the city and foster a healthy environment that sustains people, neighborhoods, and wildlife. Recognize the intrinsic value of nature and sustain the ecosystem services of Portland's air, water, and land.

**Portland has a wealth of natural resources –** It is located at the confluence of two major rivers near rich forest and farmland, and between mountain ranges. All these provide a beautiful setting for a city, and important habitat for wildlife. Salmon, beaver, deer, elk, and more than 200 species of birds — including bald eagles and peregrine falcons — live in or travel through Portland. Natural resources and open spaces also perform important services: they clean Portland's air and water, stabilize hillsides, soak up rainwater, and manage floodwaters; and they add to the sense of place and community.

**Portland also has an extensive system and network of public open spaces –** Streets, parks, trails, open spaces, and natural areas link people and wildlife to places around the city and the region. Some of these places are big and busy, connecting people to jobs and businesses to businesses. Others, like the Springwater Corridor, are quieter pathways for walking, jogging, or rolling. Places like Columbia Slough and Smith and Bybee Lakes constitute a network of natural resource areas that support native species of birds, fish, pollinators, and other wildlife. These connections help strengthen sense of place, support the movement of goods, people and wildlife, encourage active lifestyles, and improve ecological health.

**But, many of these natural resources are at risk –** The potential losses are ecological, economic, aesthetic, and spiritual. Urbanization has filled floodplains, causing seasonal flooding. Streams are unable to support healthy fish populations. Trees that trap carbon, reduce heat island effects, and provide habitat may be vulnerable to development. Without thoughtful intervention, natural systems will suffer.

The 2035 Comprehensive Plan includes policies and investments that will expand the public space system, increase mobility and access to services through low-carbon transportation, and reduce the impact of development on natural resource systems.

- **Design development to work with nature –** Development that includes native landscaping, stormwater swales, trees, green roofs, and rain gardens will help clean the air, store water, and reduce energy costs by cooling buildings in the summer. Designing with nature will directly improve water quality, reduce stresses on the stormwater management system, and contribute to cleaner air in the region.

- **Support nature-friendly infrastructure –** The Comprehensive Plan includes policies and investments that manage stormwater, protect resources, and enhance natural areas and open spaces. Trees, natural areas, stormwater swales, and open spaces make up what is referred to as Portland's "green infrastructure." Green infrastructure helps minimize risks from flooding and landslides, helps to cool the city – reducing impacts from the urban heat island effect, and creates an overall healthier and more pleasant environment for people.

- **Preserve and enhance Urban Habitat Corridors –** Public and private spaces around the city — from rivers and streams, to Forest Park and Powell Butte, to

backyards with native plants — provide safe and healthy places for resident and migratory fish and wildlife to move through or stay in the city. They also clean and store water, reduce landslide and flooding risks and provide places for people to learn, play and experience nature. Preserving existing places and enhancing others will weave nature throughout the city.

**Equity –** Promote equity and environmental justice by reducing disparities, minimizing burdens, extending community benefits, increasing the amount of affordable housing, and improving socio-economic opportunities for under-served and under-represented populations. Inform and involve Portlanders in decisions that affect them.

The 2035 Comprehensive Plan provides a framework to ensure Portlanders more equitably share in the benefits and burdens of growth and development. This includes recognizing and taking past inequities into account when making decisions. Several core concepts in the Plan work together to promote equity and environmental justice.

- **Invest to reduce disparities –** High quality basic services are essential to Portland's future success. However not all communities in the city have access to basic services, like sidewalks and developed streets, effective stormwater management systems, parks, and open space. Often, it is low-income households and Portlanders of color who have inadequate services.

  Portland has many miles of unpaved roads and even more miles of streets without sidewalks. Most of these places are east of I-205 or in the Cully and Brentwood-Darlington neighborhoods. This crescent has the greatest concentrations of poverty and greater racial and ethnic diversity than the city as a whole, as well as a high number of transit-dependent residents. Moreover, East Portland is where much of the affordable family housing is located, and where many families who once lived in areas with many amenities have moved, in search of more affordable housing.

- **Make infrastructure decisions that advance equity –** This requires a process by which decisions are made based on awareness of how past decisions have affected equity. This challenges unconscious assumptions about how decisions affect different groups. The core questions are who benefits from an investment, who is burdened, who pays, and who decides. Some form of this approach should be used across the spectrum of infrastructure decisions from big-scale long-range plans, like the Citywide Systems Plan, through project design and implementation.

  Several City bureaus are developing tools to help ask and answer such questions. An equity analysis can help prioritize where and when the City invests in infrastructure to ensure that low-income communities, communities of color and people with disabilities have more equitable access to infrastructure.

- **Include under-served and under-represented populations in decisions that affect them –** Portland has a long history of community involvement and a neighborhood association system. As the city grows, it is becoming more diverse. It is essential that the needs and interests of all community members are considered.

  Efforts must be made to improve services for groups that have not been well represented in past decision making - people of color, immigrants and refugee communities, people with disabilities, renters, low-income Portlanders, older adults, youth, and the lesbian, gay, bisexual, transgender and queer (LGBTQ) community. A new paradigm of



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community involvement and engagement — one that supports intercultural organizing, recognizes that diversity is an advantage, and works to achieve equitable outcomes — must be embraced. This paired with Portland's neighborhood organization network can create a robust and more inclusive community involvement system, informed by principles of environmental justice.

- **Address displacement of residents –** Neighborhood improvement is often the result of public and private investments that increase a neighborhood's livability. This can create many benefits for existing residents, including increased access to services and improved neighborhood walkability. These same improvements also can make a neighborhood more attractive to new and potentially higher-income residents. Greater demand for the limited supply of housing in the neighborhood will increase property values for existing property owners and housing costs for new residents.

  This change can force some existing residents out of revitalizing neighborhoods due to unaffordable increases in the cost of housing. This displacement of lower-income households also often results in a change to the ethnic and racial make-up of a neighborhood's residents and businesses.

  This type of gentrification and displacement is a long-standing concern in Portland. To meet our equity goals, it is essential that efforts are made to work with communities who have and are experiencing inequitable outcomes. It is also essential that more federal, state, and local resources are available to increase the development of permanently affordable housing in high opportunity neighborhoods.

- **Provide for on-going affordability –** Portland is in the midst of a housing development boom. Still, the city has been adding people faster than housing. Since 2010, there are approximately 27,000 new residents in the city, but fewer than 10,000 new housing units have been added to the supply. The number of new dwelling units under construction has rebounded to pre-recession levels in 2014 and 2015, but many of those units are now yet finished and available for rent. This has put pressure on the housing market and increased housing costs across the board. This cost pressure is greatest for lower income families.

  Only a few hundred of these new units have been built under programs for long-term low-income affordability. While 27 percent of Portland households earn less than $36,750 (half of the current median family income for a family of four), only about 7.5 percent (20,300 units) of the housing stock is publicly subsidized and maintained as affordable to these households. Other housing in Portland may be affordable to this group, but there are no protections to ensure it remains that way.

  In the Portland Plan, the City set a goal to increase the existing supply of long-term affordable housing, to reach 15 percent. To meet this ambitious goal, new funding and other approaches to produce affordable housing will be needed.

- **Create regulations that acknowledge that "one size does not fit all" –** Portland has increased in area since 1980 — annexing most of East Portland and some of West Portland. Many of these neighborhoods were developed after WWII. They have

distinct characters that differ from Inner Portland and the Central City. Despite these differences, they were required to meet the same development standards as Inner Portland, and these areas developed without the needed street, sidewalk and stormwater infrastructure. This Plan recognizes that one size does not fit all and includes new policies intended to protect the qualities that people value about East and West Portland, while supporting human and environmental health and safety, and investments that promote transit use, walking, and biking.

**Resilience** – Reduce risk and improve the ability of individuals, communities, economic systems, and the natural and built environments to withstand, recover from, and adapt to changes from natural hazards, human-made disasters, climate change, and economic shifts.

Resilience means reducing the vulnerability of our neighborhoods, businesses, and infrastructure to withstand challenges — environmental, economic, and social — that may result from major hazardous events. A resilient Portland is one that can bounce back, move forward, and become stronger over time.

Prosperity, human health, environmental health, and equity are all essential components of resilience. The 2035 Comprehensive Plan has a spectrum of policies that work together to improve Portland's resilience — growth in compact Centers and Corridors, provision of City Greenways and Urban Habitat Corridors, expansion of living wage employment opportunities, investments to fill the infrastructure gaps in under-represented and under-served communities, and responsiveness to the differences among Portland's neighborhoods.

Portland faces many natural hazards, which can have environmental, economic, and social impacts.

- Floods or landslides can disrupt roads and transit services. They can affect commuting patterns and timely access to jobs or school, as well as the movement of commercial traffic and freight.
- A significant earthquake could threaten lives and seriously affect Portlanders' daily lives for an extended period of time.
- Oregon's climate is changing. Over the past 30 years, average temperatures in the Pacific Northwest have increased about 1.3 degrees Fahrenheit. The number of extreme high nighttime minimum temperatures has increased. Mt. Hood's glaciers have decreased in length as much as 61 percent over the past century. Climate change poses a serious threat not just to Oregon's natural treasures — forests, mountain snows, and rivers — but also to our jobs and our health. Portland's future climate will likely be characterized by hotter, drier summers with more heat waves, and warmer, wetter winters. This will mean increased risk of flooding, wildfire, and landslides.
- Extreme heat events threaten personal health and reduce the viability of construction and other outdoor employment.
- Economic and energy shocks [add more]

Effectively managing risks involves assessing the likelihood that an event will occur, as well as the potential consequences such as injury or fatalities, environmental degradation, or economic loss. Certain populations, including low-income households, communities of color, people with disabilities, renters, and older adults may be less able to prepare for and recover from impacts from natural hazards, economic disruption, and climate change impacts.

The 2035 Comprehensive Plan help manage risks in several ways.

- **Encourage growth in lower-risk areas** – The Plan's Urban Design Framework focuses growth in centers and corridors outside of high-risk areas. Comprehensive Plan Land Use Map changes include downzoning (reduced density) in parts of East and West Portland where there are greater risks of landslides or floods.

- **Invest to reduce risks** – The Comprehensive Plan, including the Citywide Systems Plan, identifies infrastructure investments to reduce risks of failure and increase the city's ability to withstand and respond to a natural disaster. Improvements are planned to protect Portland's critical infrastructure services such as drinking water, sewage treatment, and bridges. These systems are necessary to protect Portlanders' safety and security and support the region's economy. For example, infrastructure investments planned for Portland's secondary groundwater supply in outer northeast Portland enables water to be provided when the primary Bull Run system needs to be supplemented.

- **Neighborhood resilience** – Investments to create complete neighborhoods, including multi-modal streets, grocery stores, and parks can help improve community resiliency to natural hazards by providing access to local services, offering multiple ways to get around, and fostering community connections. Parks, community centers, and other public buildings can also play a role in emergency response — as locations for cooling centers, emergency shelters, and communication centers.

- **Low-carbon economy** – Fossil fuels are a finite resource, and disruptive swings in oil and natural gas prices impact households and businesses. An advanced low-carbon community will be more stable, prosperous, and healthy than one that remains dependent on fossil fuels. With the growing awareness and recognition of the need to reduce carbon emissions to mitigate the effects of climate change, there are, and will continue to be, opportunities to build new businesses to commercialize new, more efficient, and renewable technologies.

  Hundreds of Portland businesses are already exporting products, technologies, and services developed to respond to climate change — from highly efficient building components, to stormwater management tools. As the world moves to a low-carbon economy and invests in climate-ready communities, Portland businesses will reap the rewards of their leadership.

Provide the correct address and information for sending comments to City Council

Questions? Call us:
503-823-xxxx

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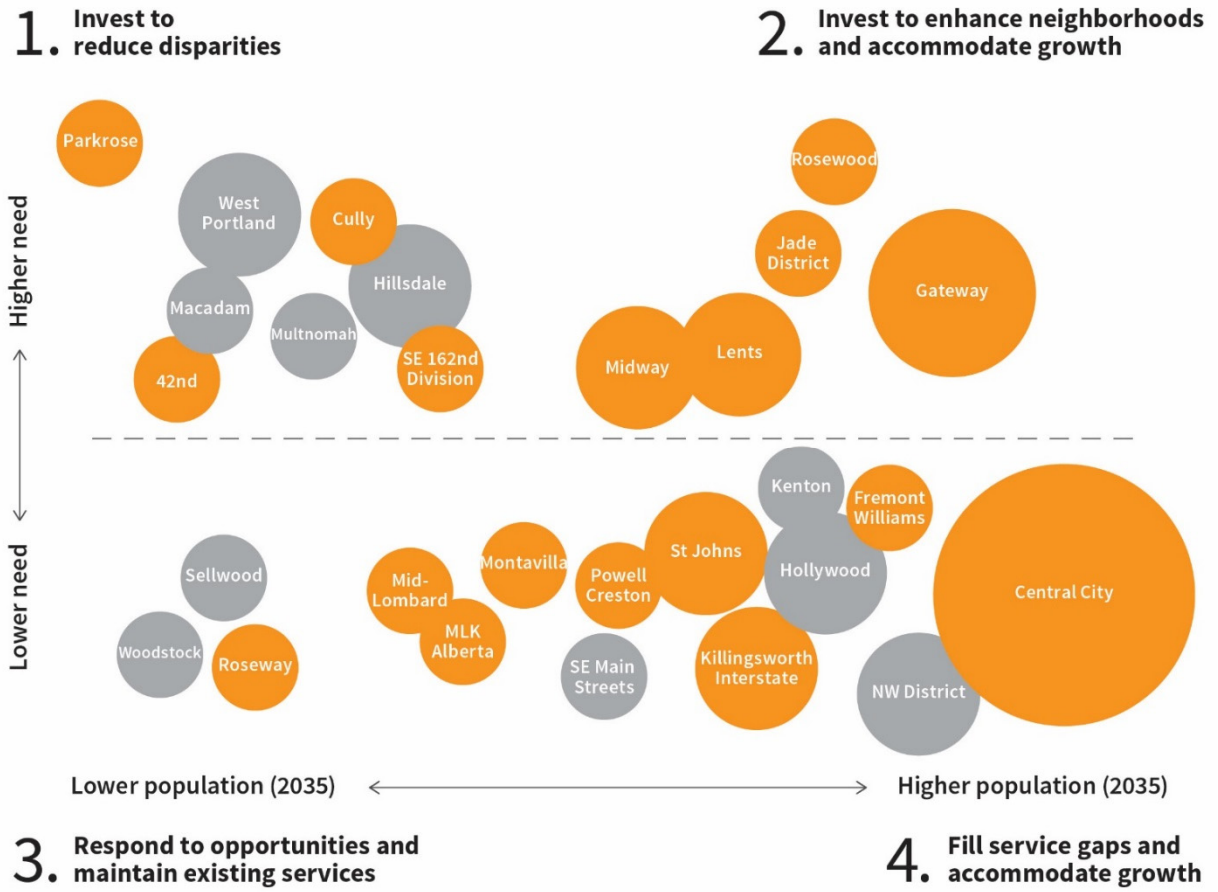
**Accessible documents and events – Staff will make reasonable accommodations for people with disabilities. Please allow no fewer than five (5) business days for staff to prepare materials or notify us no fewer than five (5) business days prior to the event by phone, 503-823-7700; by the TTY line at 503-823-6868; or, by the Oregon Relay Service at 1-800-735-2900.**

Some additional materials we may want to include here or in other parts of the plan…




<<Terminology box>>

**Under-served** means people and places that historically and currently do not have equitable resources, access to infrastructure, healthy environments, housing choice, etc. Due to historical inequitable policies and practices, disparities may be recognized in both access to services and in outcomes.

**Under-represented** recognizes that some communities have historically and currently not had equal voice in institutions and policy-making and have not been served equitably by programs and services. In this Climate Action Plan, the terms under-served and under-represented focus action and implementation attention toward:

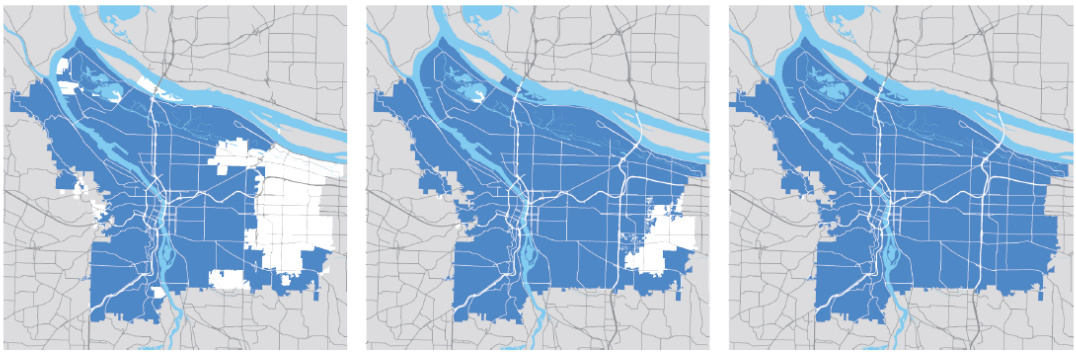
People/Communities of color: Individuals or groups who identify as African and African American, Native American/Indigenous Nation/ Native Hawaiian, Asian-American or Asian/Pacific Islander, and/or Latino/Hispanic/Chicano descent.

Low-income populations: People, households, families and neighborhoods with below-average incomes. Because of socioeconomic patterns, low-income also overlaps with people of

color and many older adults. However, a focus on low-income people does not substitute for a focus on racial and ethnic justice.
<<Terminology box>>

<<Annexation box>>

**Annexations — The shaded areas of the maps show the City of Portland boundary.**



1980 1980–1990 1990–2000

Between 1980 and 2000, the City of Portland annexed nearly all of what is commonly referred to as East Portland and smaller portions of West Portland. These annexations increased Portland's land area by 25 percent. These areas also had very different development patterns from the rest of Portland. Much of the newly annexed areas were developed during and after the post-World War II period in a traditional suburban, auto-oriented style.

In the late 1990s, a swiftly growing economy, newly extended sewer service, and multi-family zoning in annexed East Portland neighborhoods combined to result in rapid redevelopment east of I-205. Quickly, many single-family neighborhoods with houses on deep lots, transformed into apartment buildings and town houses. Unfortunately, the transportation infrastructure and the commercial services needed to create vibrant and accessible neighborhoods was not provided. New development was expected to bring new services. However, for a variety of reasons, many new street connections were not made. Southwest Portland saw significantly less development than East Portland, and also has lower development potential in the future.
<<Annexation box>>

<<Start sidebar>>
**What is infrastructure investment and why is it important**? The City of Portland owns and maintains numerous facilities, from water pipes and reservoirs; to stormwater swales and sewers; to parks, streets, and recreational trails. These are basic systems needed to protect the health, safety and well-being of Portland households and businesses. The ability to meet these basic needs is critical. Infrastructure investments are valuable and represent generations of investment. They also require constant maintenance, repair and attention. In some areas, they highlight generations of disinvestment.

**Caring for Portland's infrastructure**
There are three types of core infrastructure concerns that service providers must always consider:

System maintenance – This is about taking care of existing infrastructure so it can continue to meet community needs and work efficiently.

System deficiencies – This includes determining where systems do not meet basic levels or needs, and analyzing who is and is not being served. It is also about meeting state and federal requirements.

Future needs – This includes assessing which facilities need to be upgraded or replaced to avoid major problems or to meet growing demand.
<<End sidebar>>

# Chapter 1:
# The Plan ~~and Guiding Principles~~

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to ~~convey the City's intent to~~:

- ~~Use Guiding Principles to inform all land use and capital improvement decisions.~~
- ~~Describe~~ Identify and describe ~~and codify~~ the purpose and role of the Comprehensive Plan's ~~components~~elements, supporting documents, and implementation ~~measures~~tools.
- Define how ~~each~~ the ~~component~~ elements of the Comprehensive Plan – ~~the Urban Design Framework,~~the Vision and Guiding Principles, the Goals and Policies, the Comprehensive Plan Map, and the List of Significant Projects – work together.
- Provide direction on how to use the Comprehensive Plan ~~to make land use and capital improvement decisions~~in future amendments to the Plan elements, its supporting documents, and implementation tools.
- Define the relationship between the Comprehensive Plan and federal, state, and regional regulations and plans~~, and between the Comprehensive Plan and implementation tools~~.
- ~~Establish consistency within the Comprehensive Plan and consistency and coordination among agencies.~~



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## Why is this important?

The Comprehensive Plan is a long-range land use and public infrastructure facility investment plan to guide future growth, and the physical development of the City. The goals and policies within the Comprehensive Plan are designed to help Portland become a prosperous, healthy, equitable, and resilient city. This chapter defines the breadth of content included in the Comprehensive Plan. It describes both the scope and limit of the Plan's componentselements and explains how and when supporting documents and implementing measures tools are used. This chapter also reminds users of the Guiding Principles, which aim to realize four key values: prosperity, health, equity and resilience.

The goals and policies in this Plan cover a wide variety of topics, but they are all for the purpose of informing and guiding land use decisions. A land use decision is one that has a significant impact on present or future land uses in the area. Land Examples of land use decisions include, for example, zoning decisions, and adoption of growth-related infrastructure public facility plans.

When applying goals and policies to particular situations, such as specific development proposals or area plans, there may be competing or conflicting policies. Although it would be ideal to always meet each goal and policy, sometimes that is not possible, and so it the proposals or situations must be judged whether proposals or situationsthey meet the goals and policies on balance. This approach recognizes that there are trade-offs and compromises, and allows flexibility while still guiding land use and capital decisions. The Guiding Principles provide an anchor or reference point to consider when making trade-offs and compromises.



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# Goals

**Goal 1.A: ~~Guiding principles~~Multiple goals**
Portland's Comprehensive Plan provides a framework to guide land use, development, and ~~infrastructure~~ public facility investments. It is based on a set of Guiding P~~p~~rinciples that call for integrated approaches, actions, and outcomes that meet multiple ~~objectives~~ goals~~;~~, to ensure Portland is prosperous, healthy, equitable, and resilient.

**Goal 1.B: Regional partnership**
Portland's Comprehensive Plan acknowledges Portland's role within the region,~~-~~and is coordinated with the policies of governmental partners.

**Goal 1.C: A well-functioning plan**
Portland's Comprehensive Plan is effective~~;~~, ~~internally consistent;~~ its elements are aligned,~~consistent with city, local, regional, state, and federal regulations;~~ and it is updated periodically to be current and address mandates, community needs, and identified problems.

**Goal 1.D: Implementation tools**
Portland's Comprehensive Plan is executed through a variety of implementation tools, both regulatory and non-regulatory. Implementation ~~actions~~ tools ~~are to be consistent~~comply with the Comprehensive Plan and are ~~implemented~~ carried out in a coordinated and efficient manner. They ~~are to~~ protect the public's current and future interests~~. They are to~~ and balance the need for providing certainty for future development with the need for flexibility and the opportunity to promote innovation. ~~Implementation tools are listed in Policy 1.8.~~

**Goal ~~10.A~~1.E: Administration**
Portland's Comprehensive Plan is administered efficiently and effectively and in ways that forward the intent of the Plan as a whole. It ~~is implemented~~ is administered in accordance with regional plans and state and federal ~~State~~ law ~~and the goals, policies, and Comprehensive Plan Map contained in the adopted Comprehensive Plan~~.


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# Policies

## The Comprehensive Plan ~~and supporting documents~~

This section identifies the ~~core~~ elements of the Comprehensive Plan ~~and calls for the Plan and its supporting documents to be both internally consistent, and consistent with regional, state, and federal requirements~~. See *Figure 1-1 – Comprehensive Plan Package* at the end of this chapter.

**Policy 1.1** **Comprehensive Plan elements.** Maintain a Comprehensive Plan that includes these elements ~~listed below.~~:

- **Vision and Guiding Principles**. The Vision is a statement of where the City aspires to be in 2035. The Guiding Principles call for decisions that meet multiple goals to ensure Portland is prosperous, healthy, equitable, and resilient.

- **Goals and policies.** The goals and policies of the Comprehensive Plan, including the Urban ~~design~~ Design Framework, provide the long-range planning ~~framework~~ direction ~~and guide~~ for the development and redevelopment of the city.

- **Comprehensive Plan Map.** The Comprehensive Plan Map is the official long-range planning guide for spatially defining the ~~allowed, and in some cases~~ desired~~,~~ land uses and development in Portland. The Comprehensive Plan Map is a series of maps, which together show the boundaries of municipal incorporation, the Urban Service Boundary, land use designations, and the recognized boundaries of the Central City, Gateway regional center, town centers, and neighborhood centers.

- **List of Significant Projects.** The List of Significant Projects identifies the ~~long-term infrastructure~~public facility projects needed to serve ~~the city we expect to be in~~designated land uses through 2035, including expected new housing and jobs. It is based on the framework provided by a supporting Public Facilities Plan (PFP). The Citywide Systems Plan (CSP) is the City's public facilities plan. The Transportation System Plan (TSP) includes the transportation-related list of significant projects. That list element of the TSP is also an element of the Comprehensive Plan.

- **Transportation ~~System Plan~~policies, street classifications, and street plans.** The policies, street classifications, and street plan maps ~~within~~ contained in the Transportation System Plan (TSP) are ~~part~~ an element of the Comprehensive Plan. ~~Elements~~ Other parts of the TSP function as a supporting document ~~and implementation measure~~, as described ~~below~~in Policy 1.2.



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## Supporting documents

The supporting documents contain the factual information or ~~infrastructure~~public facility assessments that are used to develop the Comprehensive Plan ~~goals and policies and are~~ ; they are not ~~an~~ element s of the Comprehensive Plan itself.

**Policy 1.2** **Comprehensive Plan supporting documents.** Maintain and periodically update the following Comprehensive Plan supporting documents.

**1. Inventories and analyses**. The following inventories and analyses are supporting documents to the Comprehensive Plan:

- Economic Opportunities Analysis (EOA)
- Buildable Lands Inventory (BLI)
- Natural Resource Inventory (NRI)
- Housing Needs Analysis (HNA)

**2. Public Facilities Plan**. The Public Facilities Plan (PFP) is a coordinated plan for the provision of urban public facilities and services within Portland's Urban Services Boundary. The Citywide Systems Plan (CSP) is the City's public facilities plan.

**3. Transportation System Plan (TSP)**. The ~~Transportation System Plan (TSP)~~TSP is the detailed long-range plan to guide transportation system functions and investments. The TSP ensures that new development and allowed land uses are consistent with the identified function and capacity of, and adopted performance measures for, affected transportation facilities. The TSP includes a financial plan to identify revenue sources for planned transportation facilities included on the List of Significant Projects. The TSP ~~includes~~ is the transportation element of the Public Facilities Plan. Certain components of the TSP are elements of the Comprehensive Plan~~,~~ (*see Policy 1.1*).

**4. School Facility Plans.** School facility plans that were developed in consultation with the City, adopted by school districts serving the City, and that meet the requirements of ORS 195 are considered supporting documents to the Comprehensive Plan.

## Implementation tools

These policies identify and describe the Comprehensive Plan implementation tools.

~~**Policy 1.7** **Implementation of the Comprehensive Plan.** Implement the Comprehensive Plan through coordinated long-range transportation and land use planning.~~

**Policy 1.3** **Implementation tools subject to the Comprehensive Plan.** Maintain Comprehensive Plan implementation tools ~~must be maintained~~that are~~,~~ derived from, ~~and~~ ~~consistent~~ comply with, the Comprehensive Plan.



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Implementation tools include those identified in Ppolicyies 1.4 through Policy 1.9.:

1. Zoning Map
2. Zoning Code
3. Street policy and design classifications, and street plans in the TSP, described in Chapter 9: Transportation
4. The List of Significant Projects
5. Service coordination agreements
6. Annexations
7. Urban renewal plans
8. Development agreements

**Policy 1.4** **Zoning Code.** Maintain a Zoning Code that establishes the regulations that apply to various zones, districts, uses, and development types.

**Policy 1.5** **Zoning Map.** Maintain a Zoning Map that identifies the boundaries of various zones, districts, and other special features.

**Policy 1.6** **Service coordination agreements.** Maintain coordination agreements with local governments of adjoining jurisdictions concerning mutual recognition of urban service boundaries; special service districts concerning public facilities and services within Portland's Urban Services Boundary; and public school districts concerning educational facilities within Portland's Urban Services Boundary. Major amendments to these service agreements must comply with the Comprehensive Plan. "Comply" means that, on the whole, the proposal strikes a reasonable balance among applicable goals and policies.

**Policy 1.12** **List of Significant Projects.** Develop and maintain a List of Significant Projects based on the framework provided by the supporting Public Facilities Plan and capital improvement plans. Amendments to the List of Significant Projects must comply with the Comprehensive Plan. "Comply" means that, on the whole, the proposal strikes a reasonable balance among applicable goals and policies.

**Policy 1.7** **Annexations.** Provide a process for the incorporation ofincorporating urban and urbanizable land within the City's Urban Services Boundary through annexation.

*See policies 8.119-8.1795 for service extension requirements for annexations.*

**Policy 1.8** **Urban renewal plans.** Coordinate Comprehensive Plan implementation with urban renewal plans and implementation activities. A decision to adopt a new urban renewal district, adopt or amend goals and objectives that will guide investment priorities within a district, or amend the boundaries of an



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existing district, must comply with the Comprehensive Plan. ~~"Comply" means that, on the whole, the proposal strikes a reasonable balance among applicable goals and policies.~~

**Policy 1.9** **Development agreements.** Consider development agreements entered into by the City of Portland and pursuant to Oregon Revised Statute 94 a Comprehensive Plan implementation tool.

## Administration

Future work to update ~~maintain~~ the Comprehensive Plan will generally respond to mandates, community needs, ~~current~~ new information, and/or identified or potential land use problems, and will be based on the best available data, science, ~~or~~ and analytical tools. Projects may be focused on a particular geographic~~al~~ area or may address a particular issue or set of issues, and may result in amendments to the Comprehensive Plan, a supporting document, and/or an implementation tool.

To effectively administer the Comprehensive Plan, amendments to an element of the Plan or an implementation tool must ~~be internally consistent and support the Guiding Principles listed in Chapter 1~~forward the overall intent of the Plan as a whole. The policies in this section ~~direct both~~apply to legislative and, in some cases, ~~-~~quasi-judicial amendments, to the Plan or an implementation tool.

~~**Policy 1.3** **Internal consistency.** Ensure that the components of the Comprehensive Plan are internally consistent.~~

**Policy 1.10** **Compliance with the Comprehensive Plan.** Ensure that amendments to the Comprehensive Plan's elements, supporting documents, and implementation tools comply with the Comprehensive Plan. "Comply" means that amendments must be evaluated against the Comprehensive Plan's applicable goals and policies and on balance be equally or more supportive of the Comprehensive Plan as a whole than the existing language or designation.

1.10.a. Legislative amendments to the Comprehensive Plan's elements and implementation tools must also comply with the Guiding Principles.

1.10.b. Legislative amendments to the Comprehensive Plan's elements should be based on the factual basis established in the supporting documents as updated and amended over time.

1.10.c. Amendments to the Zoning Map are considered to be in compliance with the Comprehensive Plan if they are consistent with the Comprehensive Plan Map. *See Policy 10.3~~x~~ for additional guidance on Zoning Map amendments.*



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**Policy 1.11** **Consistency with Metro Urban Growth Management Functional Plan and Urban Growth Boundary.** Ensure that the Comprehensive Plan ~~is~~ remains consistent with the Metro Urban Growth Management Functional Plan and supports a tight urban growth boundary for the Portland metropolitan area.

**Policy 1.12** **Consistency with Statewide Planning Goals.** Ensure that the Comprehensive Plan, supporting documents, and implementation tools remain consistent with the Oregon Statewide Planning Goals.

**Policy 1.13** **Consistency with state and federal regulations.** Ensure that the Comprehensive Plan ~~is~~ remains consistent with all applicable state and federal regulations, and that implementation measures for the Comprehensive Plan are well coordinated with other City activities that respond to state and federal regulations.

**Policy 1.14** **Public facility adequacy.** Consider impacts on the existing and future availability and capacity of urban public facilities and services when amending Comprehensive Plan elements and implementation tools. Urban public facilities and services include those provided by the City, neighboring jurisdictions, and partners within Portland's urban services boundaries, as established by Policies 8.2 and 8.6.

**Policy 1.15** **Intergovernmental coordination**. Strive to administer the~~Ensure that the~~ Comprehensive Plan elements and implementation tools ~~is implemented~~ in a manner that ~~complements~~ supports the efforts and fiscal health of the City, county and regional governments, and partner agencies ~~including~~ such as school districts and~~,~~ transit agencies~~, and county and regional governments~~.

**Policy 1.16** **Planning and Sustainability Commission review.** Ensure the Planning and Sustainability Commission (PSC) reviews and makes recommendations to the City Council on all proposed legislative amendments to Comprehensive Plan elements, supporting documents, and implementation tools. The PSC advises City Council on the City's long-range goals, policies, and programs for land use, planning, and sustainability. The membership and powers and duties of the PSC are described in the Zoning Code.

**Policy 1.17** **Community Involvement Committee.** Establish ~~the Planning and Sustainability Commission (PSC) as the~~a Community Involvement ~~c~~Committee to oversee the Community Involvement Program as recognized by Oregon Statewide Planning Goal 1 – Community Involvement and ~~policies p~~Policies 2.17 ~~4~~ and 2.18~~5~~ in the Community Involvement chapter of this Comprehensive Plan.

**Policy 1.18** **Quasi-judicial amendments to the Comprehensive Plan Map.** Applicants for quasi-judicial amendments to the Comprehensive Plan Map must show that



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the requested change adheres to Policies 1.10 through 1.15 and:

- Is compatible with the land use pattern established by the Comprehensive Plan Map.
- Is not in conflict with applicable adopted area-specific plans~~,~~ as described in ~~see also~~ Policy 1.19.

The Hearings Officer must review and make recommendations to the City Council on all quasi-judicial amendments to the Comprehensive Plan Map using procedures outlined in the Zoning Code.

**Policy 1.19** **~~Relationship to~~ Area-specific plans. ~~community, area, and neighborhood plans adopted before [date].~~** Use area-specific plans to provide additional detail or refinements applicable at a smaller geographic scale, such as for centers and corridors, within the policy framework provided by the overall Comprehensive Plan.

**1.19.a.** Area-specific plans that are adopted after [date of ~~c~~Comp P~~p~~lan adoption] should clearly identify which components amend Comprehensive Plan elements, supporting documents, or implementation tools. Such amendments should be appropriate to the scope of the Comprehensive Plan; be intended to guide land use decisions; and provide geographically-specific detail. Such amendments could include policies specific to the plan area, land use designation changes, zoning map changes, zoning code changes, and public facility projects necessary to serve designated land uses.

**1.19.b.** Area-specific plan components intended as context, general guidance, or directives for future community-driven efforts should not amend the Comprehensive Plan elements or implementation tools~~,~~ but be adopted by resolution as intent. These components include vision statements, historical context, existing conditions, action plans, design preferences, and other background information.

**1.19.c.** Community, area, ~~and~~ neighborhood, and other area-specific plans that were adopted by ordinance prior to [date of ~~[~~Comp Plan adoption ~~date]]~~ are still in effect~~.~~. ~~h~~However, the ~~goals and policies~~elements of this Comprehensive Plan supersede any goals or policies of a community, area, or neighborhood plan that ~~conflict~~ are inconsistent with ~~a goal or policy in~~ this ~~plan~~Plan. *See Figure 1-2 – Community, area, and neighborhood plans adopted before [date of Comp Plan adoption], and Figure 7-2 —~~,~~ Adopted Environmental Plans.*



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*Figure 1-1. Comprehensive Plan Package*

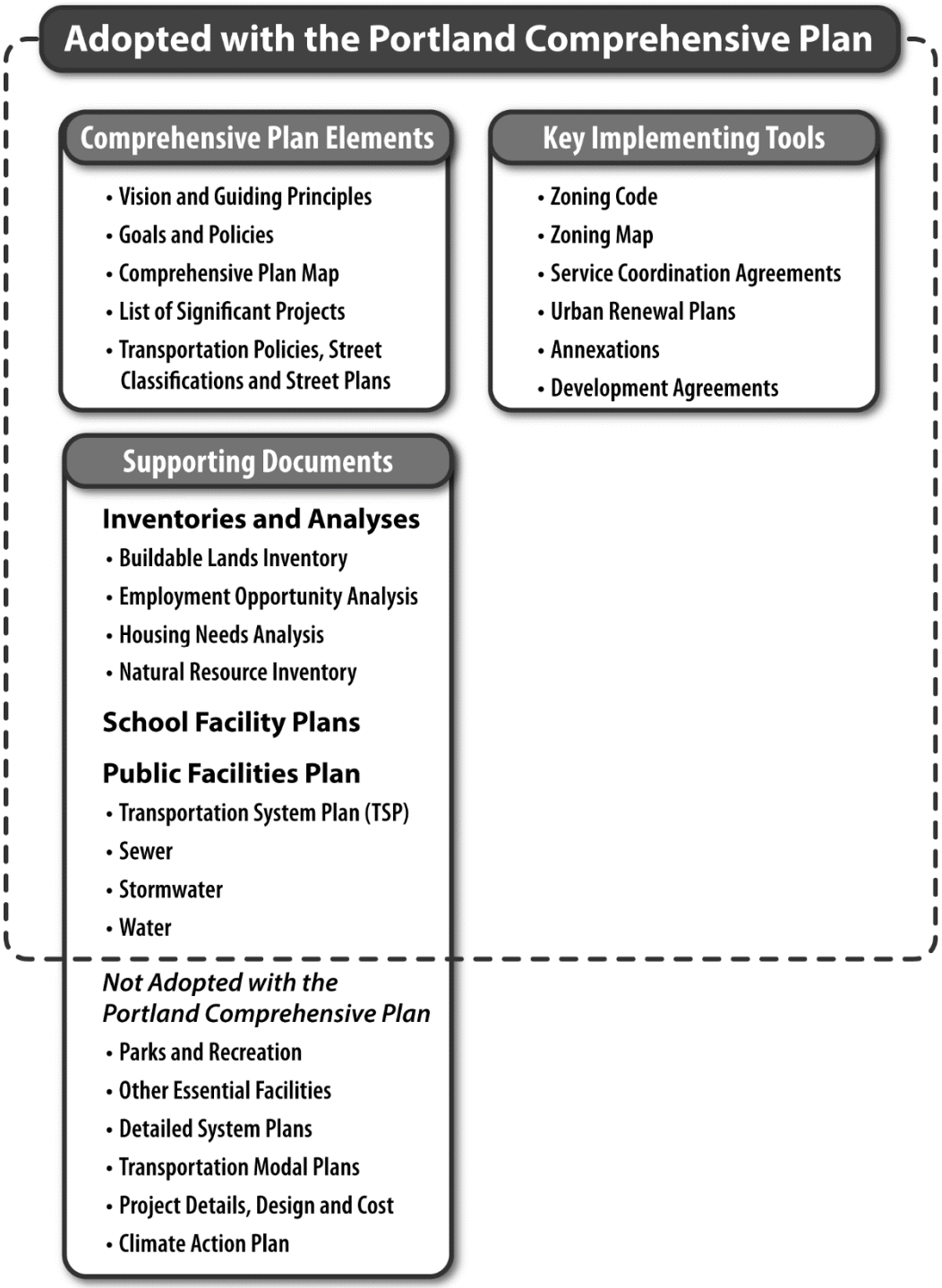




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*Figure 1-2.— Area-Specific Plans Adopted by Ordinance Prior to [date of Comp Plan adoption]*

| Plan | Ordinance No. | Effective dates |
|---|---|---|
| **Downtown Plan**<br>*Amended (1980)* | 150580 | 1972 |
| **Corbett-Terwilliger-Lair Hill Policy Plan** | 150580 | 1977 |
| **Terwilliger Parkway Corridor Plan** | 155244 | 1983 |
| **Cully/Parkrose Community Plan**<br>*Cully portion superseded by Cully Neighborhood Plan (1992)* | 158942 | 1986 |
| **Wilkes Community and Rockwood Corridor Plan** | 160174 | 1987 |
| **Sullivan's Gulch Neighborhood Action Plan** | 159897 | 1987 |
| **Kerns Neighborhood Action Plan** | 159894 | 1987 |
| **Hosford-Abernethy (HAND) Neighborhood Action Plan** | 160471 | 1988 |
| **Central City Plan** | 160606 | 1988 |
| **Buckman Neighborhood Plan** | 164489 | 1991 |
| **Brooklyn Neighborhood Plan** | 163982 | 1992 |
| **Cully Neighborhood Plan** | 164922 | 1991 |
| **Brentwood/Darlington Neighborhood Plan** | 165071 | 1992 |
| **Albina Community Plan** | 166786, 167054 | 1993 |
| **Arbor Lodge Neighborhood Plan** | 166786, 167054 | 1993 |
| **Boise Neighborhood Plan** | 166786, 167054 | 1993 |
| **Concordia Neighborhood Plan** | 166786, 167054 | 1993 |
| **Eliot Neighborhood Plan** | 166786, 167054 | 1993 |
| **Humboldt Neighborhood Plan** | 166786, 167054 | 1993 |
| **Irvington Neighborhood Plan** | 166786, 167054 | 1993 |
| **Kenton Neighborhood Plan**<br>*Amended by Kenton Downtown Plan (2001)* | 166786, 167054 | 1993, 2001 |
| **King Neighborhood Plan** | 166786, 167054 | 1993 |
| **Piedmont Neighborhood Plan** | 166786, 167054 | 1993 |
| **Sabin Neighborhood Plan** | 166786, 167054 | 1993 |
| **Woodlawn Neighborhood Plan** | 166786, 167054 | 1993 |
| **Richmond Neighborhood Plan** | 168280 | 1994 |
| **University District & River District Plans** | 168702 | 1995 |
| **Woodstock Neighborhood Plan** | 169488 | 1995 |
| **Downtown Community Association Residential Plan** | 170347 | 1996 |
| **Goose Hollow Station Community Plan** | 169699 | 1996 |
| **Outer Southeast Community Plan** | 169763 | 1996 |
| **Centennial Neighborhood Plan** | 169763 | 1996 |
| **Foster-Powell Neighborhood Plan** | 169763 | 1996 |



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| Plan | Ordinance No. | Effective dates |
|---|---|---|
| **Lents Neighborhood Plan** | 169763 | 1996 |
| **Mt. Scott-Arleta Neighborhood Plan** | 169763 | 1996 |
| **Mill Park Neighborhood Plan** | 169763 | 1996 |
| **Montavilla Neighborhood Plan** | 169763 | 1996 |
| **Outer Southeast Business Plan** | 169763 | 1996 |
| **Pleasant Valley Neighborhood Plan** | 169763 | 1996 |
| **Powellhurst-Gilbert Neighborhood Plan** | 169763 | 1996 |
| **Hazelwood Neighborhood Plan** | 169763 | 1996 |
| **South Tabor Neighborhood Plan** | 169763 | 1996 |
| **Bridgeton Neighborhood Plan** | 171238 | 1997 |
| **Hillsdale Town Center Plan** ~~(~~ | 171699 | 1997 |
| **Sellwood-Moreland Neighborhood Plan** | 171849 | 1997 |
| **Creston Kenilworth Neighborhood Plan** | 172365 | 1998 |
| **Sunnyside Neighborhood Plan** | 173725 | 1999 |
| | | |
| **Southwest Community Plan Vision, Policies and Objectives** ~~(2000) *Ordinance No. 174667*~~ | 174667 | 2000 |
| **Hollywood and Sandy Plan** ~~(2000) *Ordinance No. 174325*~~ | 174325 | 2000 |
| **Kenton Downtown Plan** (2001) ~~*Ordinance No.175210*~~ | 175210 | 2001 |
| **Guild's Lake Industrial Sanctuary Plan** ~~(2001) *Ordinance No. 176092*~~ | 176092 | 2001 |
| **Portsmouth Neighborhood Plan** ~~(2002) *Ordinance No. 176614*~~ | 176614 | 2002 |
| **Downtown's West End** ~~(2002) *Ordinance No. 176193*~~ | 176193 | 2002 |
| **South Waterfront Plan** ~~(2002) *Ordinance No. 177082*~~ | 177082 | 2002 |
| **Marquam Hill Plan** ~~(2002) *incorporated into plan by Ordinance No. 176742; readopted by Ordinance No. 1777*~~ | 176742, 17777 | 2002 |
| **Northwest District Plan** *Remanded (2005)* | 177920, 177921, 177993, 178020 | 2003 |
| **Amendments to the Cascade Station/Portland International Center Plan District** | 17076 | 2005 |
| **Gateway Planning Regulations** | 178423, 178424 | 2004 |
| **St. Johns/Lombard Plan** | 178452 | 2004 |
| **DivisonVision Green Street/Main Street Plan** | 179925 | 2006 |
| **North Interstate Corridor Plan** | 182072 | 2008 |
| **North Pearl District Plan** | 182319 | 2008 |
| **Hayden Island Plan** | 183124 | 2009 |
| **Airport Futures City Land Use Plan** | 184521 | 2011 |
| **SE 122nd Avenue Rezone Project** | 185682 | 2012 |



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# Chapter 2: Community Involvement

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Provide a wide range of opportunities for involvement in ~~land use~~planning and investment decisions, with targeted access and inclusion in decision- making for those with potential to be adversely affected by the results of those decisions.
- Foster ongoing positive relationships between communities and the City ~~in support of positive land use~~plans ~~and investment decision outcomes~~ by ensuring accountability for improving community well-being and inclusion.
- Recognize that the City has a responsibility to plan for the needs of, and engage with, under-served and under-represented communities to achieve greater equity.
- Expand opportunities for meaningful community engagement in ~~land use~~planning and investment ~~decisions~~processes, from issue identification and project scoping through implementation, monitoring, evaluation, accountability, and enforcement.
- Promote civic responsibility~~,~~ both within communities and at ~~the~~an individual level.
- Require transparent, well-designed, thoughtful, culturally--specific, relevant, representative, and responsive public processes for ~~land use~~planning and investment decisions, implementation, and monitoring.
- Build community capacity to i~~I~~ncrease the community's meaningful participation and leadership in ~~land use~~planning and investment decisions.
- Promote thoughtful consideration of and responses to public comment on ~~land use~~planning and investment decisions.

## Why is this important?

The results are better — more durable, equitable and accountable — when a ~~wide and~~ diver~~r~~s~~e range~~ity of Portlanders are involved in the scoping, development, ~~and~~ implementation, monitoring, and evaluation of plans and investment projects. No one person, agency, organization, or business can provide all things Portland's diverse communities need. Collaborative partnerships and inclusive community participation in ~~land use~~planning and investment decision making are essential to creating and sustaining a prosperous, healthy, equitable, and resilient Portland.



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## COMMUNITY INVOLVEMENT

Portland has a long history of community involvement that gained strength and power in the 1970s and forms the foundation of today's neighborhood system. As the city grows, diversifies, and works to advance equity, it is essential that all community members' needs and concerns are considered. Particular efforts must be made to improve services for people of color, immigrants and refugee communities, people with disabilities, renters, low-income Portlanders, older adults, youth, and the lesbian, gay, bisexual, transgender, and queer (LGBTQ) community.

It is the City's responsibility to promote deep and inclusive community involvement in ~~land use~~planning and investment decisions. A new paradigm of community involvement and engagement — one that supports intercultural organizing, recognizes that diversity is an advantage, and works to achieve equitable outcomes — must be embraced and paired with Portland's neighborhood organizations to create a robust and inclusive community involvement system.



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# Goals

**Goal 2.A: Community involvement as a partnership**
The City of Portland ~~government~~ works together as a genuine partner with all Portland communities and interests. The City promotes, builds, and maintains relationships, and communicates with individuals, communities, neighborhoods, businesses, organizations, institutions, and other governments to ensure meaningful community involvement in ~~land use~~plan and investment decisions.

**Goal 2.B: Social justice and equity**
The City of Portland seeks social justice by working to expand choice and opportunity for all community members, recognizing a special responsibility to identify ~~, orient,~~ and ~~involve~~ engage under-served and under-represented communities in ~~land use~~planning and investment ~~planning~~processes, particularly those with potential to be adversely affected by the results of decisions. ~~.~~ The City actively works to improve its land use-related decisions to achieve more equitable distribution of burdens and benefits.

**Goal 2.C: Value community wisdom and participation**
Portland values and encourages community and civic participation. The City seeks and considers community wisdom ~~,~~ and different cultural perspectives, and integrates ~~it~~ them with sound technical analysis, to strengthen land use decisions.

**Goal 2.D: Transparency and accountability**
City ~~planning, policy, investment, and development~~ planning and investment decision-making processes are clear, open, and documented. Through these processes a diverse range of community interests are heard and balanced. The City makes it clear to the community who is responsible for making decisions ~~,~~ and how community input is taken into account.

**Goal 2.E: Meaningful participation**
Community members have meaningful opportunities to participate in and influence all stages of planning and decision ~~-~~making. Public processes engage the full diversity of affected community members, including under-served and under-represented individuals and communities.

**Goal 2.F: Accessible and effective participation**
City ~~planning, policy, investment, and development~~ planning and investment decision-making processes are designed to be culturally accessible and effective. The City draws from acknowledged best practices and uses a wide variety of tools to promote inclusive, collaborative, and robust
community involvement.

**Goal 2.G: Strong civic infrastructure**
Civic institutions, organizations, and processes encourage active and meaningful community involvement and strengthen the capacity of individuals and communities to participate in planning processes and civic life.



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# Policies

Ongoing community involvement practices, procedures, and programs are a necessary foundation for project-specific community involvement efforts. Many of the policies in this chapter are intended to build on community wisdom, expand community knowledge, and improve City staff capacity to work effectively with an increasingly diverse and growing Portland population.

## Partners in decision making

Portland benefits when community members are meaningfully involved in ~~land use~~planning and investment decisions. By building and maintaining partnerships with individuals and a wide range of formal and informal organizations that represent a variety of interests, the City of Portland government will have a better understanding of various communities' diverse needs and concerns. These policies support building and maintaining strong and supportive relationships with an increasingly diverse and growing Portland population.

**Policy 2.1** **Partnerships and coordination.** Maintain partnerships and coordinate land use engagement with:

**2.1.a.** Individual community members.

**2.1.b.** Communities of color, low-income populations, Limited English Proficient (LEP) communities, and other under-served and under-represented communities.

**2.1.c.** District coalitions, n~~N~~eighborhood associations, and business district associations as local experts and communication channels for place-based projects.

**2.1.d.** Businesses, unions, employees, and related organizations that reflect Portland's diversity as the center of regional economic and cultural activity.

**2.1.e**. Community-based, faith-based, and i~~I~~nterest-based ~~and affinity~~ non-profits, organizations and groups.

**2.1.f.** Institutions, governments, and tribal sovereign nations.

**Policy 2.2** **Broaden partnerships**. Work with district coalitions, neighborhood associations, and business district associations to increase ~~diversity~~ participation and to help them reflect the diversity of the people and institutions they serve. Facilitate greater communication and collaboration among district coalitions, neighborhood associations, business district associations, and community-based organizations.



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## Environmental justice

Environmental justice is the equitable treatment and meaningful involvement of all people in public decision- making, as it applies to the development, implementation, and enforcement of laws, regulations, and policies that govern the uses of air, water, and land. Environmental justice supports equitable distribution of the benefits and burdens of decisions regardless of a person's background. These policies are particularly relevant to plans and investments that impact communities of color, low-income people, Limited English Proficient (LEP) communities, Sovereign Tribes, and other communities that have been historically under-served and under-represented in public processes and decisions, and have historically carried the burden of adverse effects from city planning and implantation. Policies throughout this chapter support the meaningful involvement of Portlanders in public decisions.

**Policy 2.3** **Extend benefits.** Ensure plans and investments promote environmental justice by extending the community benefits associated with environmental assets, land use, and public investments to communities of color, low-income populations, and other under-served or under-represented groups impacted by the decision.

**Policy 2.4** **Eliminate burdens**. Ensure plans and investments eliminate associated disproportionate burdens (e.g. adverse environmental, economic or community impacts) for communities of color, low-income populations, and other under-served or under-represented groups impacted by the decision.

**2.4.a.** Minimize or mitigate disproportionate burdens in cases where they cannot be eliminated.

**2.4.b.** Use plans and investments to address disproportionate burdens of previous decisions, where relevant and practicable.



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## Invest in education and training

Both the community and City of Portland representatives must have the capacity to work together as effective partners. Ongoing investment in education and training leads to better informed community members who then have increased capacity to participate effectively. Community involvement-focused professional development training helps improve City staff's ability to work with and learn from community members. These policies support both community and agency capacity building.

**Policy 2.~~3~~5** **Community capacity building**. Enhance the ability of community members, particularly those in under-served and/or under-represented groups, to develop the relationships, knowledge, and skills to effectively participate in ~~land use~~plan and investment ~~planning~~ processes.

**Policy 2.~~4~~6** **Land use literacy.** Provide training and educational opportunities to build the public's understanding of land use, transportation, housing, and related topics and increase capacity for meaningful participation in ~~land use~~plan and investment~~planning~~ processes.

**Policy 2.~~5~~7** **Agency capacity building.** Increase City staff's capacity, tools, and skills to design and implement processes that engage a broad diversity of affected and interested communities, including under-served and under-represented communities, in meaningful and appropriate ways.

## Community assessment

City staff must build and maintain their understanding of community demographics, trends, and needs. Community members should have opportunities to share how conditions and needs affect quality. The following policies support effective two-way communication between City government and communities and encourage community-level data gathering and information sharing in ~~land use~~planning and investment~~planning~~ processes.

**Policy 2.~~6~~8** **Channels of communication.** Maintain channels of communication among City Council, the Planning and Sustainability Commission (PSC), project advisory committees, City staff, and community members.

**Policy 2.~~8~~9** **Community analysis.** Collect and e~~E~~valuate data, including community~~-verified~~ validated population data and information to understand the needs, priorities, and trends and historical context affecting different communities in Portland.

**Policy 2.10** **Community participation in data collection.** Provide meaningful opportunities for individuals and communities to be involved in ~~inventorying~~inventories, mapping, data analysis, and the development of alternatives.



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**Policy 2.11** **Open Data.** Planning and investment decisions are a collaboration of many stakeholders, including those listed in Policy 2.1. This collaboration is enhanced and opportunities for innovation and value creation are unlocked when:

- Data collected and generated by the City are shared as widely as possible.
- Data is open by default.
- Staff works with others to ensure awareness and accessibility of the data sets
- The City collaborates with the development community and other data providers to maximize the utility of City data sets

## Transparency and accountability

The City is committed to improving transparency in community involvement processes ~~tied~~ related to planning~~land use~~ and investment decisions. When community members have a better understanding of a process, they are better able to participate effectively. Improved transparency and communication allows the City to better understand community opinions and needs.

The following policies articulate how and when ~~land use~~planning and investment decisions are made; the community's role in ~~land use~~ decision-making processes; and what the community can expect from the City of Portland.

**Policy 2.11** **Roles and responsibilities.** Establish clear roles, rights, and responsibilities for participants and decision -makers in ~~land use~~planning and investment processes. -Address roles of City of Portland bureaus, elected officials, and participants, including community and neighborhood leadership, business, organizations, and individuals.

**Policy 2.12** **Project scope.** Establish clear expectations about land use project sponsorship, purpose, design, and how decision -makers will use the process results.

**Policy 2.13** **Community influence.** At each stage of the process, identify which elements of a ~~land use~~planning and investment process can be influenced or changed through community involvement. Clarify the extent to which those elements can be influenced or changed.

**Policy 2.14** **Documentation and feedback.** Provide clear documentation for the rationale supporting decisions in ~~land use planning~~planning and investment processes. Communicate to participants about the issues raised in the community involvement process, how public input affected outcomes, and the rationale



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used to make decisions.

## Community involvement program

Much has changed in Portland in the 35 years since the adoption of the 1980 Comprehensive Plan. Much more will likely change between the adoption of this Pplan and the next one. The following policies challenge City staff and elected officials to assess current practices and develop new tools through ongoing process evaluation and improvement, and direct the City to develop, maintain, and update a manual that details current best practices for community involvement.

**Policy 2.15** **Community Involvement Program.** Maintain a Community Involvement Program that supports community involvement as an integral and meaningful part of the planning and investment decision-making process.

**Policy 2.16** **Community ~~Involvement Program Manual~~Engagement Workbook.** Create, maintain, and actively implement a community ~~involvement program manual~~ engagement workbook that details how to conduct community involvement for ~~land use~~planning and investment projects and decisions.

**Policy 2.17** **Community Involvement Committee.** The Community Involvement Committee (CIC), ~~a subcommittee of the Planning and Sustainability Commission~~ an independent advisory body, will evaluate and provide feedback to City staff on community involvement processes for individual ~~land use~~planning ~~and infrastructure decisions~~ and investment projects, before, during, and at the conclusion of these processes.

**Policy 2.18** **Review bodies.** Maintain review bodies, such as the Planning and Sustainability Commission (PSC), Design Commission, Historic Landmarks Commission, and Adjustment Committee, to provide an opportunity for community involvement and provide leadership and expertise for specialized topic areas.

**Policy 2.19** **Program evaluation.** Periodically evaluate the effectiveness of the community involvement program and recommend and advocate for program and policy improvements. The Community Involvement Committee (CIC) will advise City staff regarding this evaluation.

**Policy 2.20** **Shared engagement methods.** Coordinate and share methods, tools, and technologies that lead to successful engagement practices with both government and community partners and solicit engagement methods from the community.



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## Process design and evaluation

The policies in this section guide the design of project-specific community involvement processes.

These policies will help ensure that community involvement processes for planning ~~land use~~and investment projects fit the scope, character, and impact of ~~land use projects~~the decision. The policies also promote full representation in ~~land use planning~~planning and investment processes and actively involve under-served and under-represented communities. Representation can help ensure that City decisions do not further reinforce the disadvantaged position of under-served and under-presented groups~~,~~ and do not narrowly benefit privileged groups.

**Policy 2.21** **Representation.** Facilitate participation of a cross-section of the full diversity of affected Portlanders during ~~land use planning~~plan ~~and~~planning and investment processes. This diversity includes individuals, stakeholders, and communities represented by race, color, national origin, English proficiency, gender, age, disability, religion, sexual orientation, gender identity, and source of income.

**Policy 2.22** **Early involvement.** Improve opportunities for interested and affected community members to participate early in ~~land use~~planning and investment processes, including~~,~~ identifying and prioritizing issues, needs, and opportunities; participating in process design; and recommending and prioritizing projects and/or other types of implementation.

**Policy 2.23** **Verifying data.** Use data, including ~~community~~ community-verified data, to guide ~~land use~~ planning and investment ~~planning~~ processes and priority setting and to shape community involvement and decision-making ~~processes~~ efforts.

**Policy 2.24** **Demographics.** Identify the demographics of potentially affected communities when initiating a ~~land use~~planning or investment project.

**Policy 2.25** **Historical understanding.** To better understand concerns and conditions when initiating a project, research the history, culture, past plans, and other needs of the affected community, particularly under-represented and under-served groups, and persons with limited English proficiency (LEP). Review preliminary findings with members of the community who have institutional and historical knowledge.

**Policy 2.26** **Project-specific needs.** Customize community involvement processes to meet the needs of those potentially affected by the ~~land use~~planning or investment project. Use community involvement techniques that fit the scope, character, and potential impact of the ~~land use~~planning or investment decision under consideration.



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**Policy 2.27** **Culturally-appropriate processes.** Consult with communities to design ~~culturally~~ culturally-appropriate processes to meet the needs of those affected by a ~~land use~~ planning or investment project. Evaluate, use, and document creative and ~~culturally~~ culturally-appropriate methods, tools, and technologies to inform and engage people from under-served and under-represented groups about ~~land use~~planning or investment projects.

**Policy 2.28** **Innovative engagement methods**. Develop and document innovative methods, tools, and technologies for community involvement processes for ~~land use~~plan and investment projects.

**Policy 2.29** **Inclusive participation beyond Portland residents.** Design public processes for ~~land use~~planning and investment projects to engage affected and interested people who may not live in Portland such as~~,~~ property owners, employees, employers, and students, among others, as ~~appropriate and~~ practicable.

**Policy 2.30** **Inclusive participation in Central City planning.** Design public processes for the Central City that recognize its unique role as the region's center.~~–~~ Engage a wide range of stakeholders from the Central City and throughout the region including employees, employers, social service providers, students, and visitors, as well as regional tourism, institutional, recreation, and transportation representatives, as appropriate.

**Policy 2.31** **Accessibility.** Ensure that community involvement processes for ~~land use~~planning and investment projects are broadly accessible in terms of location, time, and language, and that they support the engagement of individuals with a variety of abilities and limitations on participation.

**Policy 2.32** **Participation monitoring.** Evaluate and document participant demographics throughout ~~land use~~ planning and investment processes to assess whether participation reflects the demographics of affected communities~~, and~~. ~~adapt~~ Adapt involvement practices and activities accordingly to increase effectiveness at reaching targeted audiences.

**Policy 2.33** **Adaptability.** Adapt community involvement processes for ~~land use~~planning and investment projects as appropriate to flexibly respond to changes in the scope and priority of the issues, needs, and other factors that may affect the process.

**Policy 2.34** **Process evaluation.** Evaluate each community involvement process for ~~land use~~planning or investment projects from both the City staff and participants' perspectives, and consider feedback and lessons learned to enhance future



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involvement efforts.

## Information design and notification

These policies will help improve notification procedures for administrative and quasi-judicial reviews, as well as~~,~~ legislative ~~land~~ land use decisions ~~projects~~ and the community's access to processes and technical information related to ~~land use~~planning and investment ~~projects~~decisions. The City of Portland's Civil Rights Title VI Plan requires that information ~~shall be~~is available to the public, with assistance provided as requested to interpret and effectively use technical information. Additionally, the City of Portland must ensure that limited English proficient (LEP) individuals have meaningful access to City land use-related activities.

**Policy 2.35** **Accommodation.** Ensure accommodations to let individuals with disabilities participate in administrative, quasi-judicial, and legislative land use decisions, consistent with federal regulations.

**Policy 2.36** **Notification.** Notify affected and interested community members and recognized organizations ~~and groups~~ about administrative, quasi-judicial, and legislative land use decisions ~~land use and infrastructure projects~~ with enough lead time to enable effective participation~~. As practicable and appropriate, consider~~. Consider notification to both property owners and renters.

**Policy 2.37** ~~**Information**~~ **Tools for effective participation.** Provide ~~community members with~~ clear and easy ~~to~~ access to information about administrative, quasi-judicial, and legislative land use decisions ~~land use and infrastructure projects~~ in multiple formats and through technological advancements and other ways.

**Policy 2.38** **Limited English Proficiency (LEP).** Ensure that limited English proficient (LEP) individuals are provided meaningful access to information about administrative, quasi-judicial, and legislative land use decisions ~~land use projects~~, consistent with federal regulations.



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# Chapter 3: Urban Form

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Foster an equitable system of compact mixed- use and commercial centers across the city to increase access to community services and businesses and create more low-carbon complete healthy connected neighborhoods.
- Improve Portland's major corridors so that they become vibrant urban places and key transportation connections.
- Enhance Portland's public realm, integrate nature into the city, and link people, places, and wildlife through active transportation facilities, green infrastructure investments, urban tree canopy, and habitat connections.
- Describe the city's overall development pattern and area character to inform and guide future plans, investments and development.

## Why is this important?

Portland's identity now and in the future is significantly shaped by the design and physical structure of the city and its neighborhoods. How people live and get around is partly determined by the location of services and other destinations and the arrangement and design of buildings, and connections provided by streets, trails, and other public spaces. Together these design characteristics help determine whether: (1) a community is walkable, (2) children have safe places to play, (3) people have places to gather, and (4) businesses are easy to access.

Where housing and services are built, where street networks are connected, and how all of this is designed provides a key opportunity to: (1) enable people to meet more of their daily needs locally, (2) strengthen neighborhoods, (3) improve equitable access to services, and (4) support healthy, active living.

This chapter includes policies that support enhancing centers and corridors across the city as anchors to complete neighborhoods, providing Portlanders ~~with~~ convenient access to local services. Clustering destinations in centers makes access by transit, walking, wheelchair, and bicycle more practical and reduces the amount of driving needed to ~~access~~ get to services. Focusing growth and investments in centers and along corridors can also make good use of existing infrastructure capacity and encourage efficiency in new infrastructure investments.



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This network of well-functioning centers and corridors will be critical to achieve the Portland Plan goals to make it possible for most Portlanders (80 percent~~%~~) to live in complete neighborhoods by 2035, and to meet goals for travel by transit, walking, and bicycling.



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# Goals

**GOAL 3.A: A city designed for people**
Portland's built environment is designed to serve the needs and aspirations of all Portlanders, promoting prosperity, health, equity, and resiliency. New development, redevelopment, and public investments reduce disparities~~,~~ and encourage social interaction to create a healthy connected city.

**GOAL 3.B: A climate and hazard resilient urban form**
Portland's compact urban form, sustainable building development practices, green infrastructure, and active transportation system reduce carbon emissions, reduce natural hazard risks and impacts, and improve resilience to the effects of climate change.

**GOAL 3.C: Focused growth**
Household and employment growth is focused in the Central City and other centers, corridors, and transit station areas, creating compact urban development in areas with a high level of service and amenities, while allowing the relative stability of lower-density single-family residential areas.

**GOAL 3.D: A system of centers and corridors**
Portland's interconnected system of centers and corridors provides diverse housing options and employment opportunities, robust multimodal transportation connections, access to local services and amenities, and supports low-carbon complete, healthy, and equitable communities.

**GOAL 3.E: Connected public realm and open spaces**
A network of parks, streets, City Greenways, and other public spaces supports community interaction; connects neighborhoods, districts, and destinations; and improves air, water, ~~and~~ land quality, and environmental health.

**GOAL 3.F: Employment districts**
Portland supports job growth in a variety of employment districts to maintain a diverse economy.

**GOAL 3.G: Nature in the city**
A system of habitat corridors weaves nature into the city, enhances habitat connectivity, and preserves natural resources and the ecosystem services they provide.



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# Policies

## Citywide Design and Development

**Policy 3.1** **Urban Design Framework.** Use the Urban Design Framework as a guide to create inclusive and enduring places, while providing flexibility for implementation at the local scale to meet the needs of local communities. *See Figure 3.1~~:~~ — Urban Design Framework*

**Policy 3.2** **Growth and stability.** Direct the majority of growth and change to centers, corridors, and transit station areas, allowing the continuation of the ~~residential~~ scale and characteristics of Portland's residential neighborhoods.

**Policy 3.3** **Equitable development.** Guide development, growth, and ~~infrastructure~~ public facility investment to support positive outcomes for all Portlanders.

**3.3.a.** Avoid ~~or ,~~ reduce, or mitigate negative public facility and development impacts, especially where those impacts inequitably burden communities of color, under-served and under-represented communities, and other vulnerable populations.

**3.3.b.** Make needed investments in areas that are deficient in ~~infrastructure and services~~public facilities to reduce disparities and increase equity.~~.~~

**3.3.c.** Encourage use of negotiated community benefit agreements for development projects that benefit from new public facility investments, increased development allowances, or public financial assistance.

**3.3.d.** Consider use of exactions imposed on development as a means to reduce or mitigate impacts.

**Policy 3.4** **All ages and abilities.** Strive for a built environment ~~designed to provide~~that provides a safe, healthful, and attractive environment for people of all ages and abilities.

**Policy 3.5** **Energy and resource efficiency.** Support energy-efficient, resource-efficient, and sustainable development and transportation patterns through land use and transportation planning.

**Policy 3.6** **Land efficiency**. Provide strategic investments and incentives to leverage infill, redevelopment, and promote intensification of scarce urban land.

**Policy 3.7** **Integrate nature.** Integrate nature and use appropriate green infrastructure throughout Portland.

**Policy 3.8** **Leadership and innovation in design.** Encourage high-quality design and



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development that demonstrates Portland's leadership in the design of the built environment, commitment to a more equitable city, and ability to experiment and generate innovative design solutions.

**Policy 3.9** **Growth and development.** Evaluate the impacts of land use decisions on the physical characteristics of neighborhoods and current residents, particularly under-served and under-represented communities.

**Policy 3.10** **Rural, urbanizable, and urban land.** Preserve the rural character of rural land outside the Regional Urban Growth Boundary. Limit urban development of urbanizable land beyond the City Limits until it is annexed and full urban services are extended.

*Additional service provision and urbanization policies are found in Chapter 8: Public Facilities and Services.*

**Policy 3.12** **Significant places.** Enhance and celebrate significant places throughout Portland with symbolic features or iconic structures that reinforce local identity, histories, and cultures and contribute to way-finding throughout the city. Consider these especially at:

- High-visibility intersections
- Attractions
- Schools, libraries, parks, and other civic places
- Bridges
- Rivers
- Viewpoints and view corridor locations
- Historically or culturally significant places
- Connections to buttes and natural areas
- Neighborhood boundaries and transitions

## Centers

Centers are compact, ~~walkable~~ and pedestrian-oriented urban places. They are connected to public transit and active transportation networks. They anchor complete neighborhoods with retail stores and businesses (grocery stores, restaurants, markets, shops, etc.) civic amenities (libraries, schools, community centers, places of worship, etc.), housing options, health clinics, daycare centers, employment centers, plazas and parks, or other public gathering places.

Centers will be the primary areas for growth and change in Portland over the next 20 years. Focusing new growth in centers helps achieve goals of having more Portlanders live in complete neighborhoods, use public transit and active transportation — walking, biking, and rolling — to commute to work and complete errands, and it will help mitigate and prepare for the effects of climate change. Clustering destinations and housing within



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compact, walkable centers makes access by transit, walking, wheelchair, and bicycle more practical and reduces the amount of driving needed to access services, reducing the impact on roadways, reducing congestion, and helps in facilitating freight movement.

Centers range in scale from the Central City's downtown to small neighborhood centers, providing local access to services and allowing Portlanders across the city to live a healthy, active lifestyle. Neighborhood business districts and the commercial services they provide are the foundation of many centers, but centers, particularly larger centers, will also become a focus for public services, gathering places, and housing growth. In and around all centers, there will be change as areas urbanize and new services, shops and housing are developed.

The UDF identifies four types of centers that vary in size, scale, service area, local versus regional role, and density of residents and businesses. The specific boundaries of these centers is shown on the Comprehensive Plan Map. The four types are:

1. Central City
2. Regional Center (Gateway)
3. Town Center
4. Neighborhood Center

*See Figure 3-2 — Centers*

Policies in this section identify essential elements and functions of centers that will be enhanced over time. Additional policies provide more detailed direction for specific types of centers based on their scale.

**Policy 3.13** **Role of centers.** Enhance centers as anchors of complete neighborhoods that include concentrations of commercial and public services, housing, employment, gathering places, and green spaces.

**Policy 3.14** **Variety of centers.** Plan for a range of centers across the city to enhance local, equitable access to services, and expand housing opportunities.

**Policy 3.15** **Housing in centers.** Provide housing capacity for enough population to support a broad range of commercial services, focusing higher-density housing within a half-mile of the ~~Town C~~center core.

**Policy 3.16** **Investments in centers ~~investments~~.** Encourage public and private investment in infrastructure, economic development, and community services in centers to ensure that all centers will support the populations they serve.

**Policy 3.17** **Government services.** Encourage the placement of services in centers, including schools and colleges, health services, community centers, daycare, parks and plazas, library services, and justice services.



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**Policy 3.18** **Arts and culture.** Ensure that land use plans and infrastructure investments allow for and incorporate arts and culture as central components of centers.

**Policy 3.19** **Accessibility.** Design centers to be compact, safe, attractive, and accessible places, where the street environment makes access by transit, walking, biking, and mobility devices, such as wheelchairs, safe and attractive for people of all ages and abilities.

**Policy 3.20** **Center connections.** Connect centers to each other and to other key local and regional destinations, such as schools, ~~and~~ parks, and employment areas, by frequent and convenient transit, bicycle sharing, bicycle routes, pedestrian trails and sidewalks, and electric ~~and~~ vehicle charging stations.

**Policy 3.21** **Green infrastructure in centers.** Integrate nature and green infrastructure into centers and enhance public views and connections to the surrounding natural features.

*Policies related to the design of centers are in Chapter 4: Design and Development. Policies related to housing in centers are in Chapter 5: Housing. Policies related to businesses and economic development in centers are located in Chapter 6: Economic Development.*

*Additional policies related to transportation and access in centers are in Chapter 9: Transportation.*

## Central City

The Central City is a living laboratory for how the design and function of a dense urban center can provide equitable benefits to human health, the natural environment and the local economy. As Portland is the major center for jobs, transit, services, and civic and cultural institutions for the entire city and region. The Central City houses numerous attractions including Portland State University, the Oregon Convention Center, Tom McCall Waterfront Park and the Willamette River, Pioneer Square and numerous museums and professional sports venues. The Central City's ten unique districts include Downtown, the West End, Goose Hollow, Pearl, Old Town/Chinatown, Lower Albina, Lloyd, the Central Eastside, South Waterfront and South Downtown/University. Together, these districts provide a diversity of opportunities for urban living, economic development, retail and entertainment.

~~The Central City serves as the region's premier center with jobs, services, and civic and cultural institutions that support the entire city and region. It includes attractions, amenities, and institutions not found anywhere else in the city or region, such as Portland State University, the Oregon Convention Center, the Vera Katz Eastbank Esplanade, Rose Quarter Facilities, Providence Park, the Portland 5 Center for the Arts, Portland Art Museum, and the region's Transit Mall.~~

**Policy 3.22** **Role of the Central City.** Encourage continued growth and investment in the



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Central City, ~~recognizing~~and recognize its unique role as the region's premier center for jobs, services, and civic and cultural institutions that support the entire city and region.

**Policy 3.23** **Model Urban Center.** Advance the Central City as a living laboratory that demonstrates how the design and function of a dense urban center can provide equitable benefits to human health, the natural environment, and the local economy.

**Policy 3.24** **Central City employment.** Encourage the growth of the Central City's regional share of employment and continue its growth as the region's unique center for innovation and exchange through commerce, employment, arts, culture, entertainment, tourism, education, and government.

**Policy 3.25** **Central City housing.** Encourage the growth of the Central City as Portland's and the region's largest center with the highest concentrations of housing and with a diversity of housing options and services. *See also Policy 5.32.*

**Policy 3.26** **Transportation hub.** Enhance the Central City as the region's multi-modal transportation hub and optimize regional access ~~to the Central City's~~ as well as the movement of people and goods among key destinations.

**Policy 3.27** **Public places.** Enhance public places and the Willamette River waterfront in the Central City as places of business and social activity and gathering for the people of its districts and the broader region.

## Gateway Regional Center ~~— Gateway~~

Gateway Regional Center is East Portland's major center, providing the area and region with civic, employment, and community services. It includes the city's ~~second~~ largest transit hub outside of downtown and good freeway access to regional destinations~~,~~ such as Portland International Airport.

**Policy 3.28** **Role of Gateway.** Encourage growth and investment in Gateway to enhance its role as East Portland's center of employment, commercial, and public services.

**Policy 3.29** **Housing.** Encourage housing in Gateway, to create East Portland's largest concentration of high-density housing ~~in Gateway~~.

**Policy 3.30** **Transportation.** Enhance Gateway's role as a regional high-capacity transit hub that serves as an anchor for East Portland's multimodal transportation

system.

**Policy 3.31** **Public places.** Enhance the public realm and public places in Gateway to provide a better setting for business and social activity that serves East Portland residents and the region.



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## Town Centers

Town Centers are located throughout Portland to serve broad parts of the city. They are typically anchored by employment centers or institutions, feature a wide range of commercial and community services, and have a wide range of housing options. Development in Town Centers is intended to be up to mid-rise in scale, with larger scale buildings primarily located close to high-capacity transit stations. Mid-rise development ~~includes buildings from five to 10 stories in height, but most frequently ranging from five to six stories~~is typically as high as five to seven stories.

**Policy 3.32** **Role of Town Centers.** Enhance Town Centers as successful places that serve the needs of surrounding neighborhoods ~~and~~ as well as a wider area, and contain higher concentrations of employment, institutions, commercial and community services, and a wide range of housing options.

**Policy 3.33** **Housing.** Provide for a wide range of housing types in Town Centers, which are intended to generally be larger in scale than the surrounding residential areas. There should be sufficient zoning within a half-mile walking distance of a Town Center to accommodate 7,000 households.

**Policy 3.34** **Transportation.** Improve Town Centers as multimodal transportation hubs that optimize access from the broad area of the city they serve and are linked to the region's high-capacity transit system.

**Policy 3.35** **Public places.** Provide parks or public squares within or near Town Centers to support their roles as places of focused business and social activity.

## Neighborhood Centers

Neighborhood Centers are smaller, sometimes village-like centers that include a mixture of higher density commercial and residential buildings. Because these centers are smaller than Town Centers, there are many more of them citywide. Development in Neighborhood Centers is generally intended to be low-rise in scale, although larger scale can be appropriate in locations close to high-capacity transit stations or near the Central City. Low-rise development typically includes buildings up to four stories in height.

**Policy 3.36** **Role of Neighborhood Centers.** Enhance Neighborhood Centers as successful places that serve the needs of surrounding neighborhoods. In Neighborhood Centers, provide for higher concentrations of development, employment, commercial and community services, and a wider range of housing options than the surrounding neighborhoods.

**Policy 3.37** **Housing.** Provide for a wide range of housing types in Neighborhood Centers, which are intended to generally be larger in scale than the surrounding residential areas, but smaller than Town Centers. There should be sufficient zoning within a half-mile walking distance of a ~~Town~~ Neighborhood Center to



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accommodate 3,500 households.

**Policy 3.38** **Transportation.** Design Neighborhood Centers as multimodal transportation hubs that are served by frequent-service transit and optimize pedestrian and bicycle access from adjacent neighborhoods ~~and are served by frequent-service transit~~.

**Policy 3.39** **Public places.** Provide small parks or plazas within or near Neighborhood Centers to support their roles as places of local activity and gathering.

## Inner Ring Districts

The Inner Ring Districts include some of Portland's oldest neighborhoods, with several historic districts and a broad diversity of housing types. These areas include distinct districts, such as Albina and Northwest Portland, that have multiple mixed-use corridors in proximity (*see the shaded areas in the Urban Design Framework*), allowing most residents to live within a short, quarter-mile distance of frequent-service transit and neighborhood businesses. The Inner Ring Districts are also served by a highly interconnected system of streets and sidewalks, and are within a convenient, three-mile biking distance of the Central City's array of services, jobs, and amenities.

These policies acknowledge that growth in the Inner Ring Districts play an important role in allowing more people to have access to their many opportunities, but also acknowledge that this growth should be integrated into these areas' historic urban fabric. The Inner Ring Districts, especially along their corridors, play a similar role to Town Centers in accommodating growth.

**Policy 3.40** ~~**Inner ring districts**~~**Growth.** Expand the range of housing and employment opportunities in the ~~i~~Inner R~~r~~ing D~~d~~istricts~~, which are part of the Inner Neighborhoods and are within walking distance of the Central City~~. Emphasize growth that replaces gaps in the historic urban fabric, such as redevelopment of surface parking lots and 20th century auto-oriented development.

**Policy 3.41** **Corridors.** Guide growth in corridors to transition to mid-rise scale close to the Central City, especially along Civic Corridors.

**Policy 3.42** **Distinct identities.** Maintain and enhance the distinct identities of the Inner Ring Districts and their corridors. Use historic preservation and design review tools to accommodate growth in ways that preserve historic resources and enhance the distinctive characteristics of the Inner Ring Districts, especially in areas experiencing significant development.

**Policy 3.43** **Diverse residential areas.** Provide a diversity of housing opportunities in



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the Inner Ring Districts' residential areas. Encourage approaches that preserve or are compatible with the range of existing historic housing in these areas. Acknowledge that these areas are historic assets and should retain their established characteristics and development patterns, even as Inner Ring centers and corridors grow.

**Policy 3.44** **Transportation.** Enhance the role of the Inner Ring Districts' extensive transit, bicycle, and pedestrian networks in conjunction with land uses that optimize the ability for more people to utilize this network. Improve the safety of pedestrian and bike connections to the Central City. Strengthen transit connections between the Inner Ring Districts and to the Central City.

## Corridors

Corridors, like centers, are areas where Portland will grow and change much over the next ~~25~~ 20 years. They are busy, active streets with redevelopment potential. They are close to neighborhoods and are places with transit, stores, housing, and employers. They need to be planned, designed, and improved to be places that benefit and become successful additions to surrounding neighborhoods. The largest places of focused activity and density along these corridors are designated as centers.

There are ~~three~~ two types of street corridors:

1. Civic Corridors
2. Neighborhood Corridors

~~3. Freight Corridors~~

*See Figure 3-3~~:~~ — Corridors*

**Policy 3.45** **Growth and mobility.** Coordinate transportation and land use strategies along corridors to accommodate growth and mobility needs for people of all ages and abilities.

**Policy 3.46** **Connections.** Improve corridors as multimodal connections providing transit, pedestrian, bicycle, and motor vehicle access and that serve the freight needs of centers and neighborhood business districts.

**Policy 3.47** **Design.** Encourage street design that balances the important transportation functions of corridors with their roles as the setting for commercial activity and residential living.

**Policy 3.48** **Green infrastructure in corridors.** Enhance corridors with distinctive green infrastructure, including landscaped stormwater facilities, extensive tree plantings, and other landscaping that both provide environmental function and contribute to a quality pedestrian environment.



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## Civic Corridors

Civic Corridors are the city's busiest, widest, and most prominent streets. They provide major connections among centers, the rest of the City, and the region. They support the movement of people and goods across the city, with high levels of traffic and~~, in some cases,~~ pedestrian activity. Civic Corridors provide opportunities for growth and transit-supportive densities of housing, commerce, and employment. Development in Civic Corridors is intended to be up to mid-rise in scale, with lower scale generally more appropriate in locations far from the Central City or transit stations~~.~~. Mid-rise development ~~includes buildings from five to 10 stories in height, but most frequently ranging~~typically ranges from five to seven stories.

Abundant trees and high-quality landscaping beautify Civic Corridors and offset the impacts of their large paved areas. These corridors exemplify the benefits of green infrastructure by cleaning and soaking up stormwater runoff and minimizing urban heat island effects, while also being enjoyable places to live, work and gather. Civic corridors are safe for all types of transportation. Civic Corridors policies apply to the roadway, the public realm of the street, and the buildings that line the street.

**Policy 3.49** **Integrated land use and mobility.** Enhance Civic Corridors as distinctive places that are models of ecological urban design, with transit-supportive densities of housing and employment, prominent street trees and other green features, and high-quality transit service and pedestrian and bicycle facilities ~~that are models of ecologically-sensitive urban design~~.

**Policy 3.50** **Design to be great places.** ~~Encourage~~ Improve public streets and sidewalks ~~improvements~~ along Civic Corridors to support the vitality of business districts, create distinctive places, provide a safe, healthy and attractive pedestrian environment, and contribute to ~~creating~~ quality living environments for residents.

**Policy 3.51** **Mobility corridors.** Improve Civic Corridors as key mobility corridors of citywide importance that accommodate all modes of transportation within their right-of-way or on nearby parallel routes.

**Policy 3.52** **Freight.** Maintain freight mobility~~,~~ and ~~freight~~ access~~, and freight capacity~~ on Civic Corridors that are also Major or Priority Truck Streets.

## Neighborhood Corridors

Neighborhood Corridors are narrower main streets that connect neighborhoods with each other and to other parts of the city. They have transportation, land use, and design functions that are important at a neighborhood or district level. They support neighborhood business districts and provide housing opportunities close to local services, amenities, and transit lines. They are streets that include a mix of commercial and higher-density housing



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development. This policy is intended to balance the important transportation functions of Neighborhood Corridors with their roles in supporting the viability of business districts and residential livability.

**Policy 3.53** ~~Multiple roles~~Neighborhood Corridors**.** Enhance Neighborhood Corridors as important places that support vibrant neighborhood business districts with quality multi-family housing while providing transportation connections that link neighborhoods.

## Transit station areas

Transit stations provide access to high-capacity transit, which currently consists of the region's light rail ~~and streetcar~~ system~~,~~s and ~~the TRAM, but~~ in the future may also include bus rapid transit. These policies encourage housing and employment growth in transit station areas to maximize ~~the ability of~~ people's ability~~-~~ to benefit from the regional connections they provide and to increase transit access to employment. The policies support a range of transit station area types, with differing priorities for growth, depending on the station type and context.

Priority is given to growth in station areas located in centers since they provide more people with opportunities to be close to both transit and to commercial and public services. These stations have the highest potential for mixed use development.~~–~~ Center stations benefit from the concentration of local services and businesses as well as connections to other transit routes typically found on corridors. Mixed use development with housing is not the priority for all transit station areas; s~~.~~ ~~S~~ome are locations for employment, or they serve major regional destinations such as the Oregon Zoo.

*See Figure 3-4 — Transit Station Areas*

**Policy 3.54** **Transit-oriented development.** Encourage transit-oriented development and transit-supportive concentrations of housing and jobs, and multimodal connections at and adjacent to high-capacity transit stations.

**Policy 3.55** **Community connections.** Integrate transit stations into surrounding communities and enhance pedestrian and bicycle ~~connections~~ facilities (including bike sharing) to provide safe and accessible connections to key destinations beyond the station area.

**Policy 3.56** **Transit station area safety.** Design transit areas to improve pedestrian, bicycle, and personal safety.

**Policy 3.57** **Center stations.** Encourage transit stations in centers to provide high density concentrations of housing and commercial uses that maximize the ability of residents to live close to both high-quality transit and commercial services.

**Policy 3.58** **Employment stations.** Encourage concentrations of jobs and employment-



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focused land uses in and around stations in employment-zoned areas.

**Policy 3.59** **Transit neighborhood stations.** Encourage concentrations of mixed-income residential development and supportive commercial services close to transit neighborhood stations. Transit neighborhood stations ~~are high-capacity transit station that are not in a center~~serve mixed use areas that are not in major centers.

**Policy 3.60** **Destination stations.** Enhance connections between major destinations and transit facilities and strengthen the role of these station areas as places of focused activity.

## City Greenways

City Greenways are a system of distinctive pedestrian- and bicycle-friendly ~~green~~ streets and trails, enhanced by lush tree canopy and landscaped stormwater facilities that support active living by expanding recreational opportunities and making it easier and more attractive to reach destinations across the city. As Portland continues to grow, the City Greenways system will strengthen connections to nature, weave green elements into neighborhoods, and enhance mobility and recreation.

City Greenways are a network that includes the following types of infrastructure:

1. Enhanced greenway corridors are distinctive ~~green~~ streets with extensive tree canopy and landscaped stormwater facilities that provide connections between major centers, schools, parks, natural areas, and the rivers. Enhanced greenway corridors often involve improvements to existing streets, including wide planting strips and other features that provide space for large-canopy trees.

2. Trails are designated routes on land or water that provide public access for recreation or transportation purposes, such as walking and bicycling. ~~Trails~~ They are often located along rivers ~~or~~, through natural areas, or along rail or highway rights-of-way, with connections to and through neighborhoods.~~providing pedestrian and bicycle connections.~~

3. Heritage parkways are iconic streets or segments of streets with elements such as linear parkways, scenic views, and distinctive landscaping or street design.

4. Neighborhood greenways are an extensive network of streets with low volumes of motor vehicle traffic that are prioritized for bicycles and pedestrians, working in conjunction with the rest of the City Greenways system to extend the system into all neighborhoods.

*See Figure 3-5 – City Greenways*

**Policy 3.61** **Connections.** Create a network of distinctive and attractive City Greenways



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that link centers, parks, schools, rivers, natural areas, and other key community destinations.

**Policy 3.62** **Integrated system.** Create an integrated City Greenways system that includes regional trails through natural areas and along Portland's rivers, connected to neighborhood greenways and heritage parkways.

**Policy 3.63** **Multiple benefits.** Design City Greenways that provide multiple benefits that contribute to Portland's pedestrian, bicycle, green infrastructure, and parks and open space systems.

**Policy 3.64** **Design.** Use design options such as distinctive street design, landscaping, tree plantings, ~~and~~ scenic views, and other appropriate design options, to create City Greenways that extend the experience of open spaces and nature into neighborhoods, while improving stormwater management and calming traffic.

*Additional policies related to City Greenways are provided in Chapter 9: Transportation.*

## Urban habitat corridors

Urban habitats are natural and built areas that provide safe, healthy places for resident and migratory fish and wildlife species that live in and move through the city. Maintaining diverse, connected habitat corridors will help fish and wildlife adapt to continued human population growth, development, and climate change. Urban habitat corridors also benefit Portlanders by keeping air and water clean and cool, reducing the risks from landslides and flooding, and providing places for people to play, learn and experience nature.

Urban habitats encompass the city's most valuable and distinctive natural features – the Willamette and Columbia Rivers, streams and sloughs, wetlands, and large forested areas, such as Tryon Creek State Park, Forest Park and the West Hills, Willamette Bluff, and the East Buttes. Other urban habitats are woven throughout the built environment and include ~~things like~~ street and yard trees, backyard plantings, parks, and bridges that provide opportunities for bird nesting. Enhancing or establishing new urban habitat corridors will involve preserving and restoring existing natural features, creating vegetated connections between tree canopy and greenspaces, and incorporating nature into the design of buildings and landscaping, streetscapes, parking lots, and infrastructure.

These policies support plans, regulations, and investments to restore and reconnect habitat in diverse areas within the city.

*See Figure 3-6 – Urban Habitat Corridors*

**Policy 3.65** **Urban habitat corridors.** Establish a system of connected, well-functioning and diverse habitat corridors that link habitats in Portland and the region, facilitate safe fish and wildlife access and movement through and between



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habitat areas, enhance the quality and connectivity of existing habitat corridors, and establish new habitat corridors in developed areas.

**Policy 3.66** **Habitat connection tools.** Improve habitat corridors using a mix of tools including natural resource protection, property acquisition, natural resource restoration, tree planting and landscaping with native plants, and ecological design integrated with new development.

**Policy 3.67** **Connect habitat corridors.** Ensure that planned connections between habitat corridors, greenways, and trails are located and designed to support the functions of each element, and create positive interrelationships between the elements, while also protecting habitat functions, fish, and wildlife.

*Additional policies related to habitat corridors are provided in Chapter 7: Watershed Health and the Environment.*

## Employment areas

Portland is a major employment center in the region and the state. The diversity of the economy is spread evenly among four types of business sectors that thrive in different parts of the city: industrial, office, institutional, and retail/service. The city's employment geographies are:

**Central City –** The Central City is the region's high-density employment center. It is primarily an office district for professional and business services, finance, information, and government. It is also a key location for the entertainment, small industry, and education sectors.

**Industrial Districts –** Industrial districts are in the low, flat areas along Portland Harbor and the Columbia Corridor, Oregon's freight infrastructure hub. ~~The m~~Manufacturing and distribution sectors concentrate here. They typically need one-story buildings, medium to large sites, and locations buffered from housing. There is also an industrial district in the Central Eastside and smaller industrial areas scattered around the city, mostly adjacent to major transportation hubs.

**Neighborhood Commercial –** Neighborhood Commercial areas are mainly home to the retail, personal service, and related sectors that serve customers on-site. These businesses locate amid their market areas, lining corridors across the city. They generally need ground-floor space along pedestrian or auto-oriented streets.

**Campus Institutions –** Institutions in the health care and education sectors are concentrated in large hospital and college campuses and dispersed smaller facilities. Major institutions are large employers with campuses that vary from pastoral expanses to more concentrated urban grounds. They are located throughout the city, often in or adjacent to residential areas.



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Each of these sectors is growing. E, and each has different land use needs and offers different prosperity benefits. Traded sector (export) businesses bring income and jobs into the region and are mainly in the industrial and office sectors. Middle-wage jobs that require less college education and improve equityoffer upward mobility are concentrated in the industrial sectors. Office jobs offer a wide variety of wages and are mainly concentrated in the Central City, but are also distributed in neighborhood business districts. They offer jobs with a wide variety of wages.

Retail and service sector jobs are concentrated in the Central City and neighborhood business districts. They provide needed services to residents and include many locally-owned businesses; they do not typically offer higher-paying employment opportunities. The health care and education sectors are the leading job growth opportunities, most of which are located on major campuses. Healthcare is one of the city's fastest growing employment sectors.

## Freight Corridors

**Regional Truck Corridors –** Freight CorridorsRegional Truck Corridors are Maintaining the primary truck routes into and through the city that supports Portland's role as an important West Coast hub and a gateway for international and domestic trade. While the forms of tThese streets are not expected to change significantly, they are integral to the growth of traded sector businesses such as manufacturing, warehousing and distribution industries.

*See Figure 3-7 – Employment Areas*

**Policy 3.68** **Employment area geographies.** Consider the land development and transportation needs of Portland's employment geographies when creating and amending land use plans and making infrastructure investments.

**Policy 3.69** **Regional Truck Corridors.** Enhance designated streets to accommodate forecast freight growth and support intensified industrial use in nearby freight districts. *See Figure 3-7, — Employment Areas. Designated regional truckways and priority truck streets (Transportation System Plan classifications) are shown to illustrate this network).*

*Policies for each of the employment areas are provided in Chapter 4: Economic Development.*

*Policies related to the design of the Central City are provided in the Centers section of this chapter.*

*Policies related to the design of industrial areas are provided in Chapter 4: Economic Development, with some river-related policies located in the Rivers Pattern Areas section of this chapter.*



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*Policies related to the design of neighborhood commercial areas are provided in the Centers and Corridors sections of this chapter and in the Pattern Areas section of this chapter.*

*Policies related to freight are provided in Chapter 4: Economic Development and in Chapter 9: ~~Chapter 9:~~ Transportation. ~~and Chapter 6: Economic Development.~~n*

## Pattern Areas

Portland has five distinct Pattern Areas. The development patterns and characteristics of these areas are influenced by the natural landscape and how and when these parts of the city were developed.

1. Rivers
2. Central City
3. Inner Neighborhoods
4. Western Neighborhoods
5. Eastern Neighborhoods

Each Pattern Area has unique physical, social, cultural, and environmental qualities that differentiate them and create their sense of place. In order to maintain and enhance the positive qualities and sense of place in each pattern area, it is desirable to have policies and regulations that respond to each area's unique natural and built assets.

The following policies identify key positive characteristics of each of Portland's Pattern Areas that are relevant to decisions related to future development in these areas. Area and neighborhood plans should be consulted for more detailed guidance on design priorities in different parts of the city.

### Rivers Pattern Area

Human settlement began along and at the confluence of the Willamette and Columbia rivers because they offered Native Americans plentiful food, natural resources, and critically-important trade and transportation ~~functions~~opportunities. After white immigrants began moving to the area, the settlement grew into the city of Portland. As the city's initial form-giving features, the two rivers have continued to shape the city.

Today, the Willamette and Columbia rivers continue to serve multiple functions and roles. ~~They~~The rivers:

- Are features of significant historic and cultural significance to Native American tribes and others throughout the region.
- Serve as essential industrial transportation corridors that support the local and regional economy.
- Support recreational, subsistence and commercial fisheries.



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- Provide important habitat for resident and migratory fish and wildlife.
- Are important scenic, recreational and transportation amenities for Portlanders and visitors.

*See Figure 3-8 ~~—~~: Pattern Areas*

These policies foster development and land stewardship approaches that recognize, support, and balance the varied systems, uses, and activities along the Columbia and Willamette Rivers, including: the Portland Harbor, Columbia Corridor, and other prime industrial lands~~;~~; habitat areas and corridors; distinctive riverfront neighborhoods along the banks~~;~~ and access to, along, and within the rivers.

**Policy 3.70** **Historic and multi-cultural significance.** Recognize, restore, and protect the historic and multi-cultural significance of the Willamette and Columbia Rivers, including current activities such as subsistence fishing of legally-permitted fish species.

**Policy 3.71** **River Transportation.** Recognize and enhance the roles of the Willamette and Columbia rivers as part of Portland's historic, current, and future transportation infrastructure, including for freight, commerce, commuting, and other public and private transportation functions.

**Policy 3.72** **Recreation.** Improve conditions along and within the Willamette and Columbia rivers ~~for~~ to accommodate a diverse mix of recreational users and activities. Designate and invest in strategically-located sites along the length of Portland's riverfronts for passive or active recreation activities that are compatible with nearby land uses, historically and culturally important sites, ~~and~~ significant habitat areas, restoration sites, and native fish~~,~~ and wildlife usage.

**Policy 3.73** **Industry and port facilities.** Enhance the regionally significant economic infrastructure that includes Oregon's largest seaport and largest airport, unique multimodal freight, rail, and harbor access; the region's critical energy hub; and proximity to anchor manufacturing and distribution facilities.

**Policy 3.74** **Habitat.** Enhance the roles of the Willamette and Columbia rivers and their confluence as an ecological hub that provides locally and regionally significant habitat for fish and wildlife and habitat restoration opportunities.

**Policy 3.75** **Commercial activities.** Enhance the roles of the Willamette and Columbia rivers in supporting local and regional business and commerce, including commercial fishing, tourism, recreation, and leisure.

**Policy 3.76** **River neighborhoods.** Enhance the strong river orientation of residential



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areas that are located along the Willamette and Columbia Rivers.

**Policy 3.77** **River access.** Enhance and complete Portland's system of river access points and riverside trails ~~and river access points~~, including the Willamette Greenway Trail, and strengthen active transportation connections between neighborhoods and the rivers.

**Policy 3.78** **River management and coordination.** Coordinate with federal, state, regional, special districts, and other agencies to address issues of mutual interest and concern, including economic development, recreation, water transportation, flood ~~control~~and floodplain management and protection, regulatory compliance, permitting, emergency management, endangered species recovery, climate change preparation, Portland Harbor Superfund, brownfield cleanup, and habitat restoration.

**Policy 3.79** **Columbia River.** Enhance the role of the Columbia River for river dependent industry, fish and wildlife habitat, subsistence and commercial fisheries, floating- and ~~land~~ land-based neighborhoods, recreational uses, and water transportation.

**Policy 3.80** **Willamette River North Reach.** Enhance the role of the Willamette River North Reach for river dependent industry, fish and wildlife habitat, and as an amenity for riverfront neighborhoods and recreational users.

**Policy 3.81** **Willamette River Central Reach.** Enhance the role of the Willamette River Central Reach as ~~a key amenity for~~ the Central City and region's primary riverfront ~~districts~~destination for~~,~~ recreation~~al users~~, history and culture, emergency response, water transportation, and as habitat for fish and wildlife.

**Policy 3.82** **Willamette River South Reach.** Enhance the role of the Willamette River South Reach as fish and wildlife habitat, a place to recreate, and as an amenity for riverfront neighborhoods and others.

**Policy 3.83** **Willamette River Greenway.** Maintain multi-objective plans and regulations to guide development, infrastructure investments, and natural resource protection and enhancement within and along the Willamette Greenway. *See Figure 3-9 —, Willamette Greenway Boundaries.*

*Additional policies related to these topics can be found in Chapter 6: Economic Development, Chapter 7: Watershed Health and the Environment, and Chapter 4: Design and Development.*



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## Central City Pattern Areaa

The Central City ~~is the location of~~is home to Portland's greatest concentrations of employment, and civic, cultural, and higher education institutions. Primary natural features include the Willamette River, large street trees, green streets and landscaping, and corridors of park blocks that further weave nature into the Central City. The area's high-density mixed- use neighborhoods contribute to the distinct identities of different areas within the Central City. These policies highlight some key design priorities for the Central City related to its distinctive urban form. These policies encourage design in the Central City that enhances its role as the region's center of innovation and exchange, in recognition that a healthy city must have a healthy core.

*Additional policies related to the design of the Central City are provided in the Centers section of this chapter.*

**Policy 3.84** **Central City districts.** Enhance the distinct identities of the Central City's districts.

**Policy 3.85** **Central City industrial districts.** Support the long-term success of Central City industrial districts and their evolution in terms of the mix of businesses and higher employment densities.

**Policy 3.86** **Central City river orientation.** Enhance and strengthen access and orientation to the Willamette River in the Central City and increase river-focused activities.

**Policy 3.87** **Central City pedestrian system.** Maintain and expand the Central City's highly interconnected pedestrian system.

**Policy 3.88** **Central City bicycle system.** Expand and improve the Central City's bicycle system.

## Inner Neighborhoods Pattern Area

The Inner Neighborhoods were developed and shaped during the Streetcar Era of the late 19th and early 20th centuries. The Inner Neighborhoods are characterized by a regular pattern of neighborhood business districts located along former streetcar streets interspersed with residential areas. This Pattern Area has a small block pattern with an interconnected street grid that make transit, walking, and bicycling attractive options. Within this Pattern Area is an inner ring of neighborhoods that provide important opportunities for additional housing close to the Central City, but where future growth should be integrated into the existing and historic context *(see the Inner Ring Districts section in this chapter)*. These policies express the overall design approach in Inner Neighborhoods.

**Policy 3.89** **Inner Neighborhoods main streets.** Maintain and enhance the streetcar era



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pattern of street-oriented buildings along Civic and Neighborhood Corridors.

**Policy 3.90** **Inner Neighborhoods street patterns.** Preserve the area's urban fabric of compact blocks and its highly interconnected grid of streets.

**Policy 3.91** **Inner Neighborhoods infill.** Fill gaps in the urban fabric through infill development on vacant and underutilized sites~~,~~ and in the re-use of historic buildings on adopted inventories. ~~Integrate new development into these districts' historic development patterns.~~

**Policy 3.92** **Inner Neighborhoods active transportation.** Use the extensive street, sidewalk, and bikeway~~, and trail~~ system and multiple connections to the Central City as a key part of Portland's active transportation system

**Policy 3.93** **Inner Neighborhoods residential areas.** Continue the patterns of small, connected blocks, ~~and the~~ regular lot patterns, and streets lined by planting strips and street trees in Inner Neighborhood residential areas.

## Eastern Neighborhoods Pattern Area

~~The~~ Portland's Eastern Neighborhoods feature a diverse range of urban and natural landscapes. Many structures in the Eastern Neighborhoods, which also include parts of Brentwood-Darlington and Cully, were developed after World War II. In addition, most of this this area was annexed into the City of Portland after the 1980 Comprehensive Plan was completed. The policies for the Eastern Neighborhoods promote design that responds to and enhances the area's distinctive mix of urban patterns and natural features, such as groves of Douglas firs, the East Buttes, and streams. Some policies address the opportunities and challenges presented by the area's large blocks ~~and~~, deep lots, gaps in pedestrian and bicycle connectivity, and wide street corridors.

The Eastern Neighborhoods provide opportunities for new and distinctive approaches to the design of development and infrastructure that can enhance the area's positive characteristics and improve quality of life. It is important to continue the area's verdant character and provide a more livable environment, while reducing disparities and increasing access to services.

**Policy 3.94** **Eastern Neighborhoods street, block, and lot pattern.** Guide the evolving street and block system in the Eastern Neighborhoods in ways that build on positive aspects of the area's large blocks, such as opportunities to continue mid-block open space patterns and create new connections through blocks that make it easier to access community destinations.

**Policy 3.95** **Eastern Neighborhoods trees and natural features.** Encourage development and right-of-way design that preserves and incorporates Douglas fir trees and groves, and that protects the area's streams, forests, wetlands, steep slopes, and buttes.



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**Policy 3.96** **Eastern Neighborhoods buttes.** Enhance public views of the area's skyline of buttes and stands of tall Douglas fir trees.

**Policy 3.97** **Eastern Neighborhoods corridor landscaping.** Encourage landscaped building setbacks along residential corridors on major streets.

**Policy 3.98** **Eastern Neighborhoods active transportation.** Enhance access to centers, employment areas, and other community destinations in Eastern Neighborhoods by ensuring that corridors have safe and accessible pedestrian and bicycle facilities and creating additional secondary connections that provide low-stress pedestrian and bicycle access.

## Western Neighborhoods Pattern Area

The Western Neighborhoods have been shaped by their location within the terrain of Portland's west hills. Much of this area was developed after World War II. These policies encourage design that responds to area's prominent characteristics, such as its hilly topography, streams, ravines, and forested slopes, while cultivating a built environment that expands mobility and accessibility for all people. These design approaches are intended to apply to a range of development types and locations.

**Policy 3.99** **Western Neighborhoods village character.** Enhance the village character of the Western Neighborhoods' small commercial districts and increase opportunities for more people to live within walking distance of these neighborhood anchors.

**Policy 3.100** **Western Neighborhoods ~~connections~~active transportation.** Provide safe and accessible pedestrian and bicycle connections, ~~along corridors~~ as well as off-street trail connections, to and from residential neighborhoods.

**Policy 3.101** **Western Neighborhoods development.** Encourage new development and infrastructure to be designed to minimize impacts on the area's streams, ravines, and forested slopes.

**Policy 3.102** **Western Neighborhoods hHabitat cCorridors.** Preserve, enhance, and connect the area's network of habitat areas and corridors, streams, parks, and tree canopy.

**Policy 3.103** **Western Neighborhoods trails.** Enhance the Western Neighborhoods' distinctive system of trails to expand mobility, access to nature, and active living opportunities in the area.



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*Figure 3-1. Urban Design Framework. ~~The~~ Locations shown on the diagram are not exact boundaries. Detailed boundaries for centers, corridors, ~~and~~ habitat areas and all other items shown on the map will be defined in supporting plans or through future planning projects.*

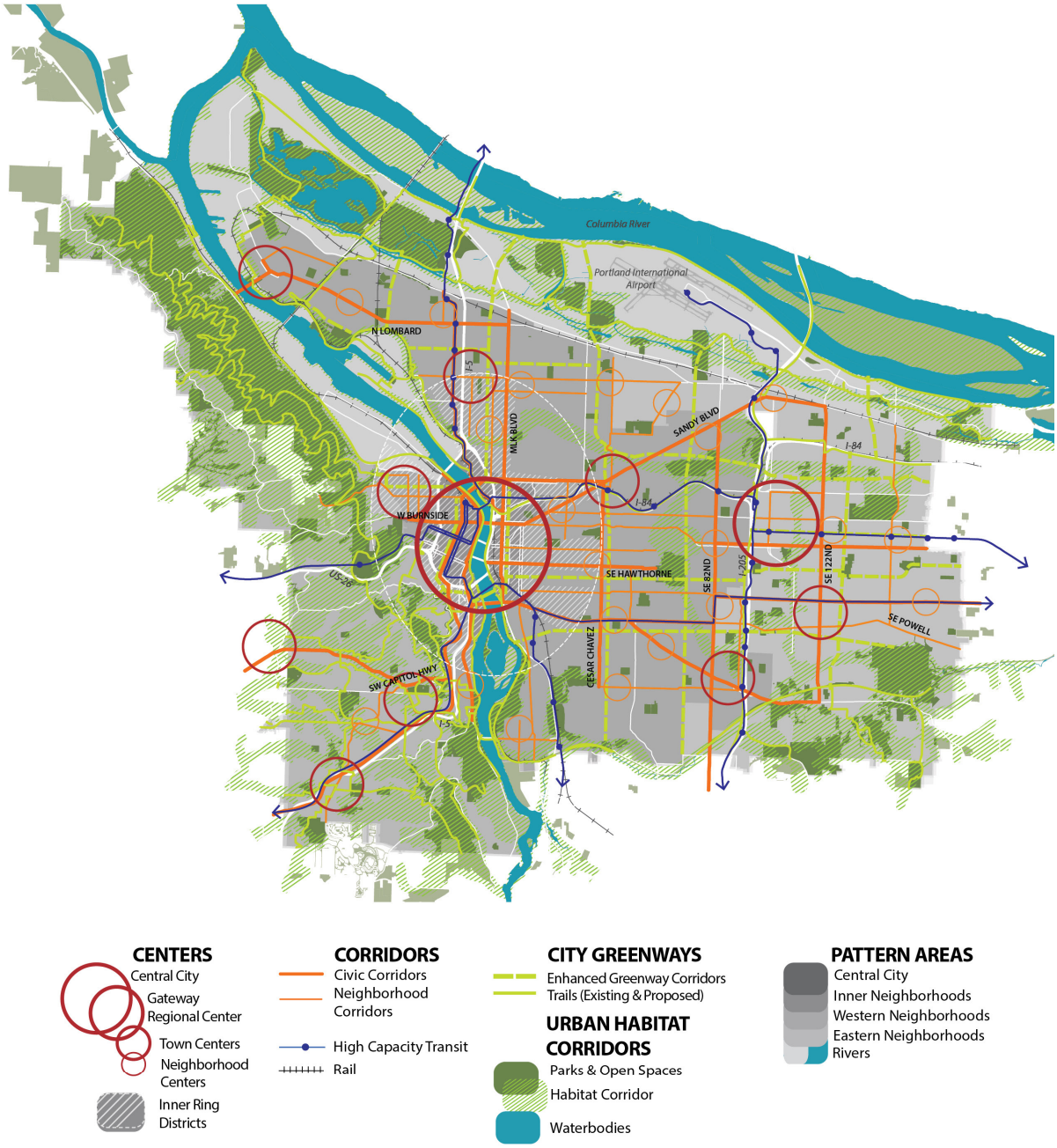




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*Figure 3-2. ~~Centers~~Corridors*

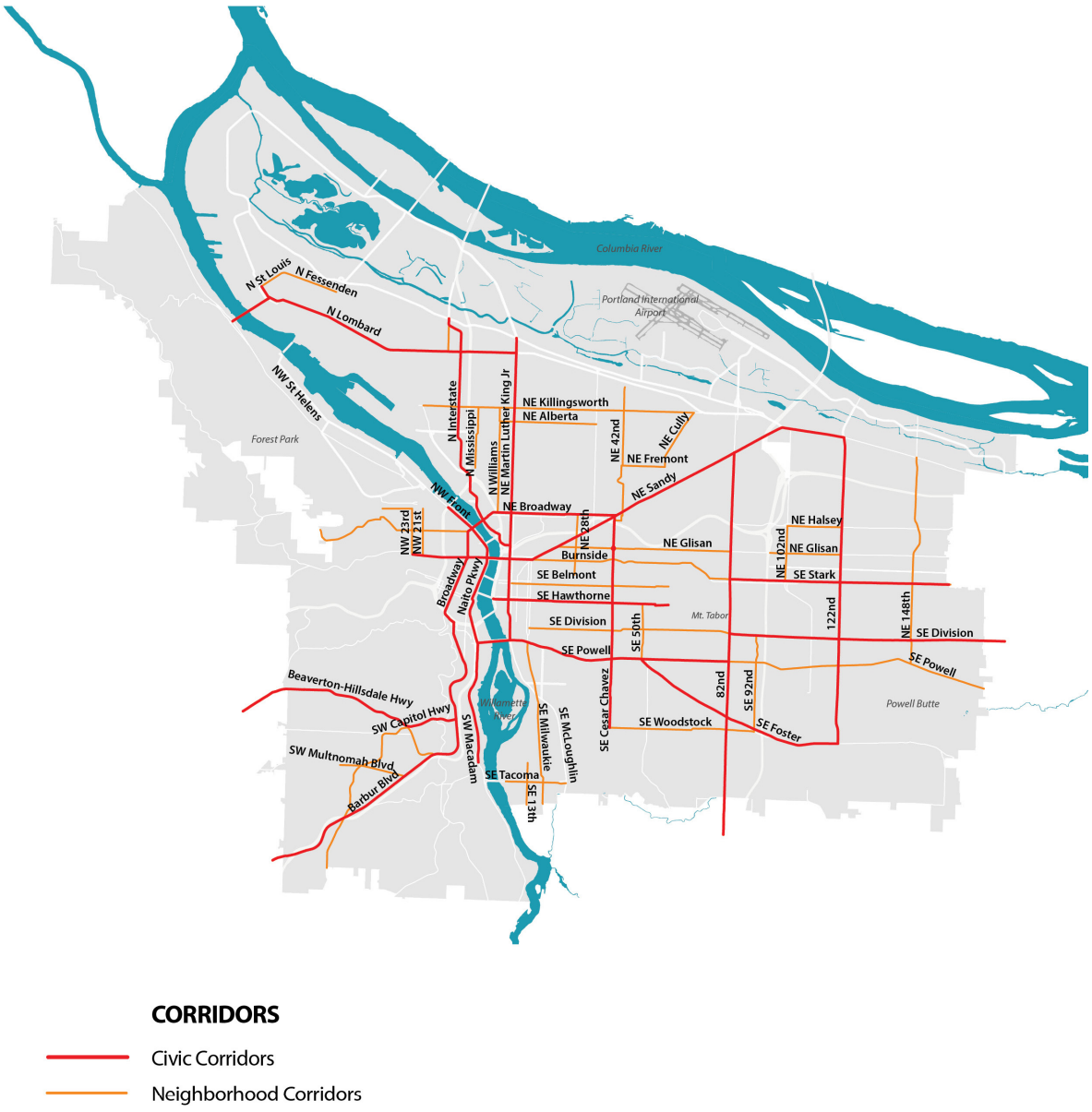




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*Figure 3-3. ~~Corridors~~Centers*

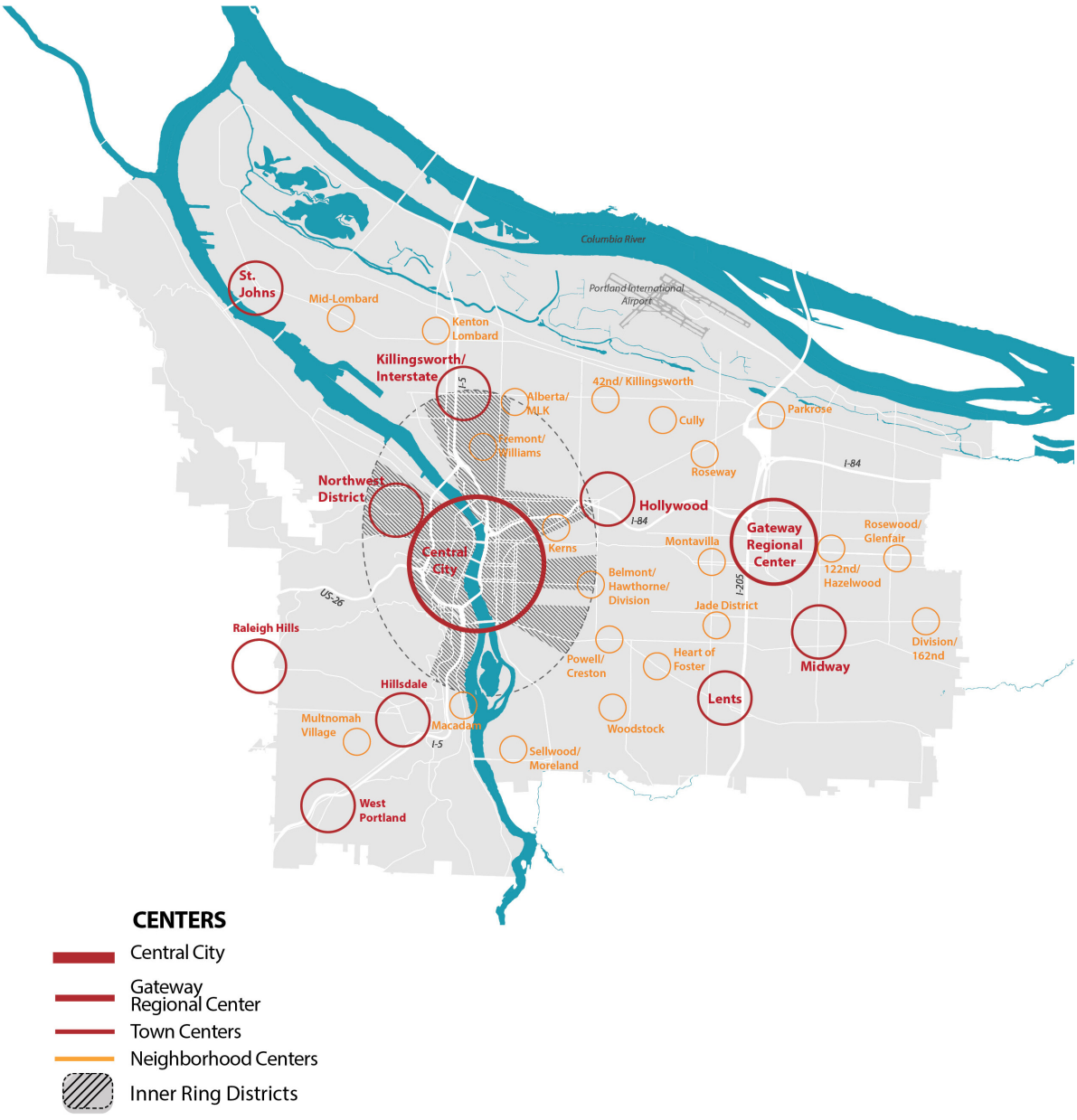




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*Figure 3-4. Transit Station Areas*

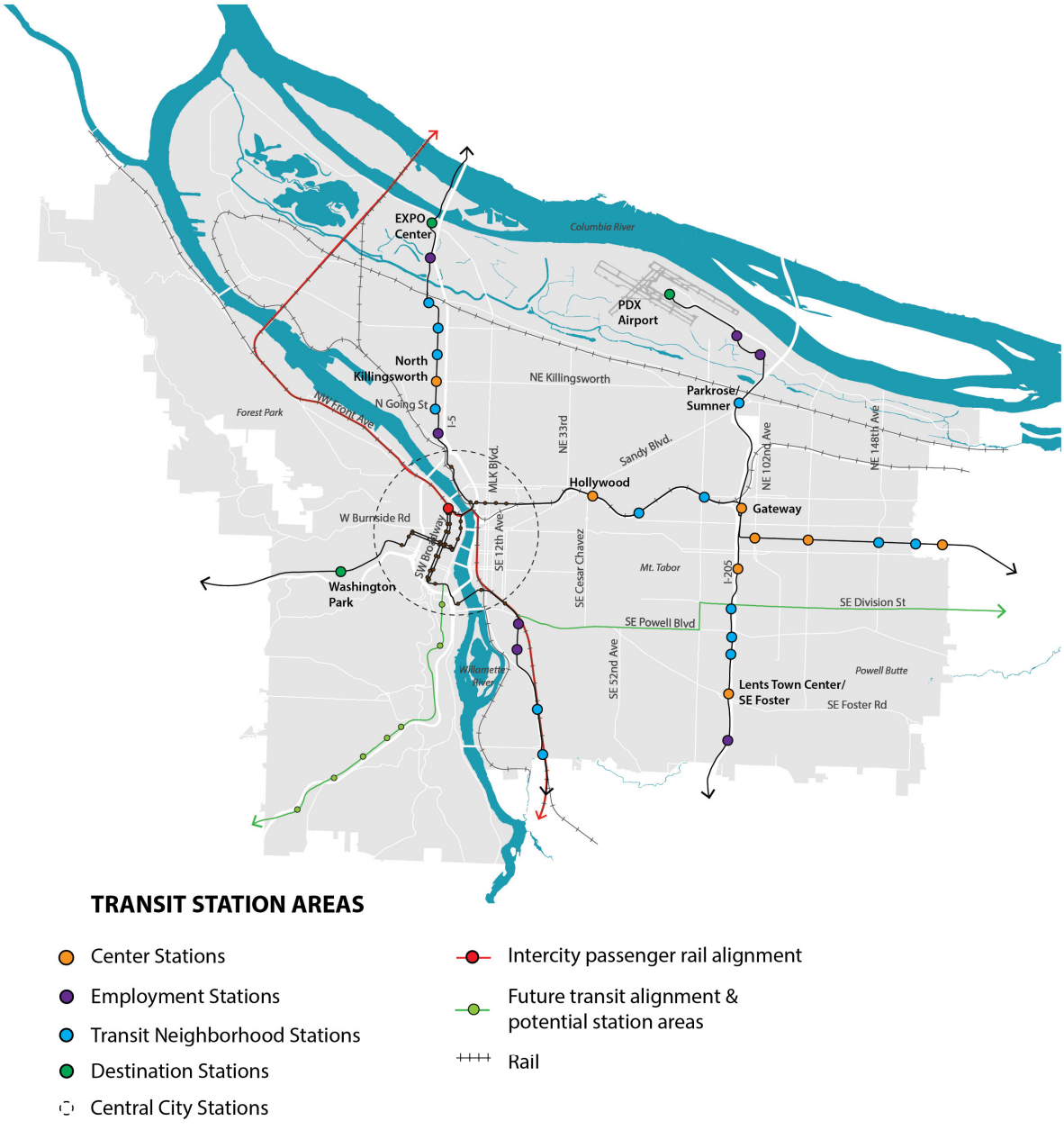




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*Figure 3-5. Greenways*






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*Figure 3-6. Urban Habitat Corridors*




**URBAN HABITAT CORRIDORS**

- Existing / Enhanced Habitat Corridor
- Future / Potential Habitat Corridor
- Parks & Open Space
- Waterbodies
- Elevation over 300'



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*Figure 3-7. Employment Areas*

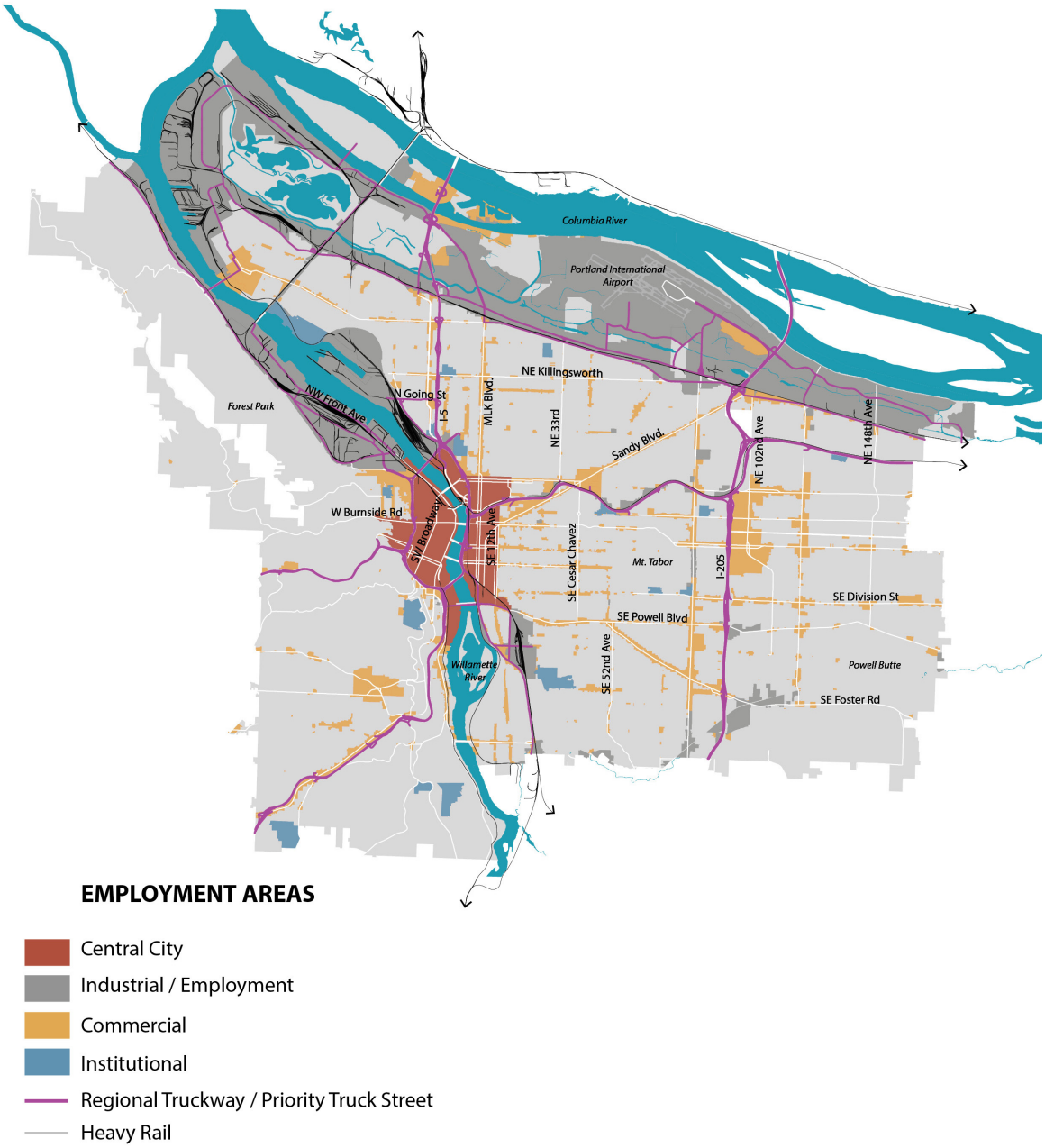




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*Figure 3-8. Pattern Areas*

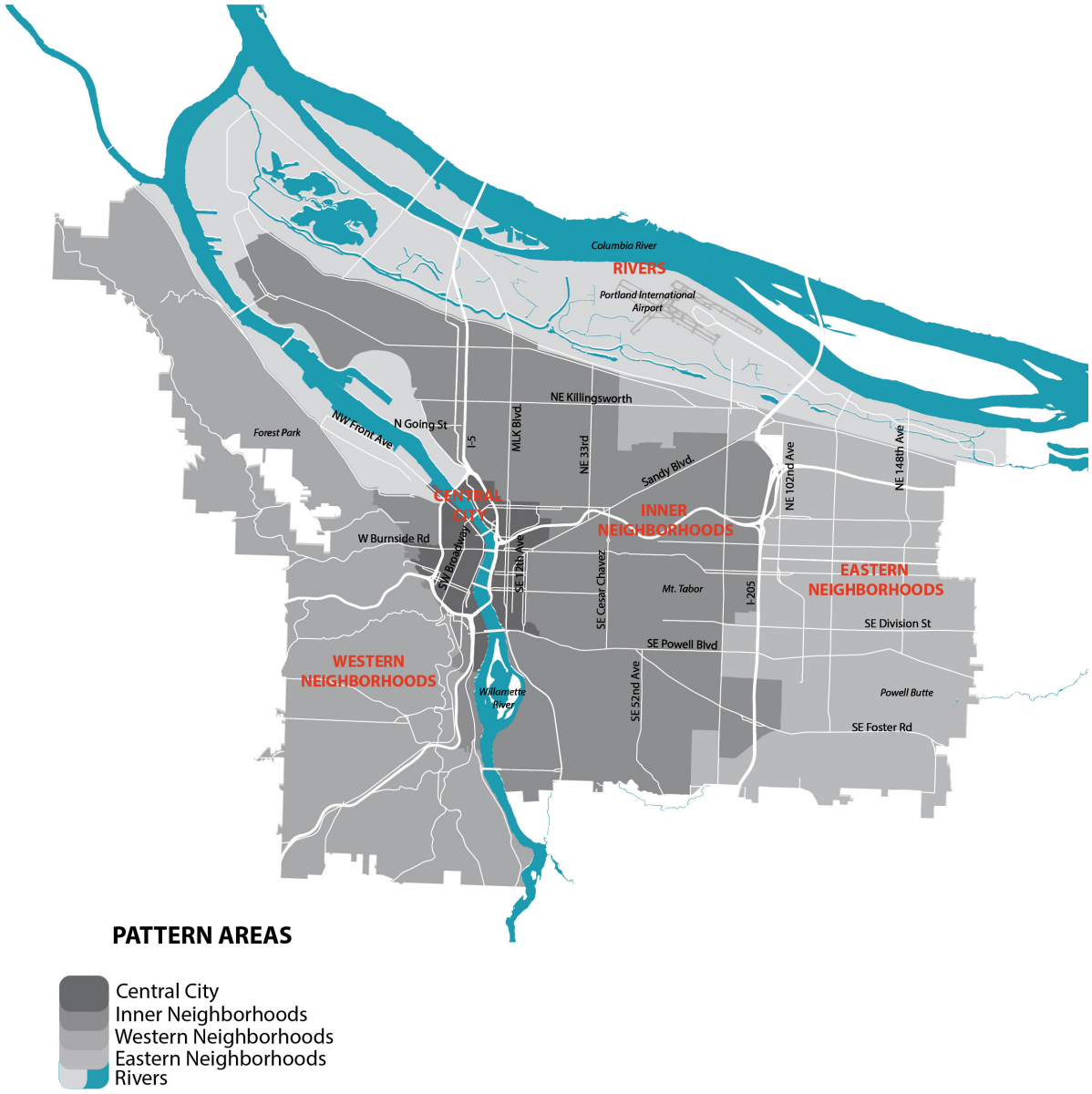




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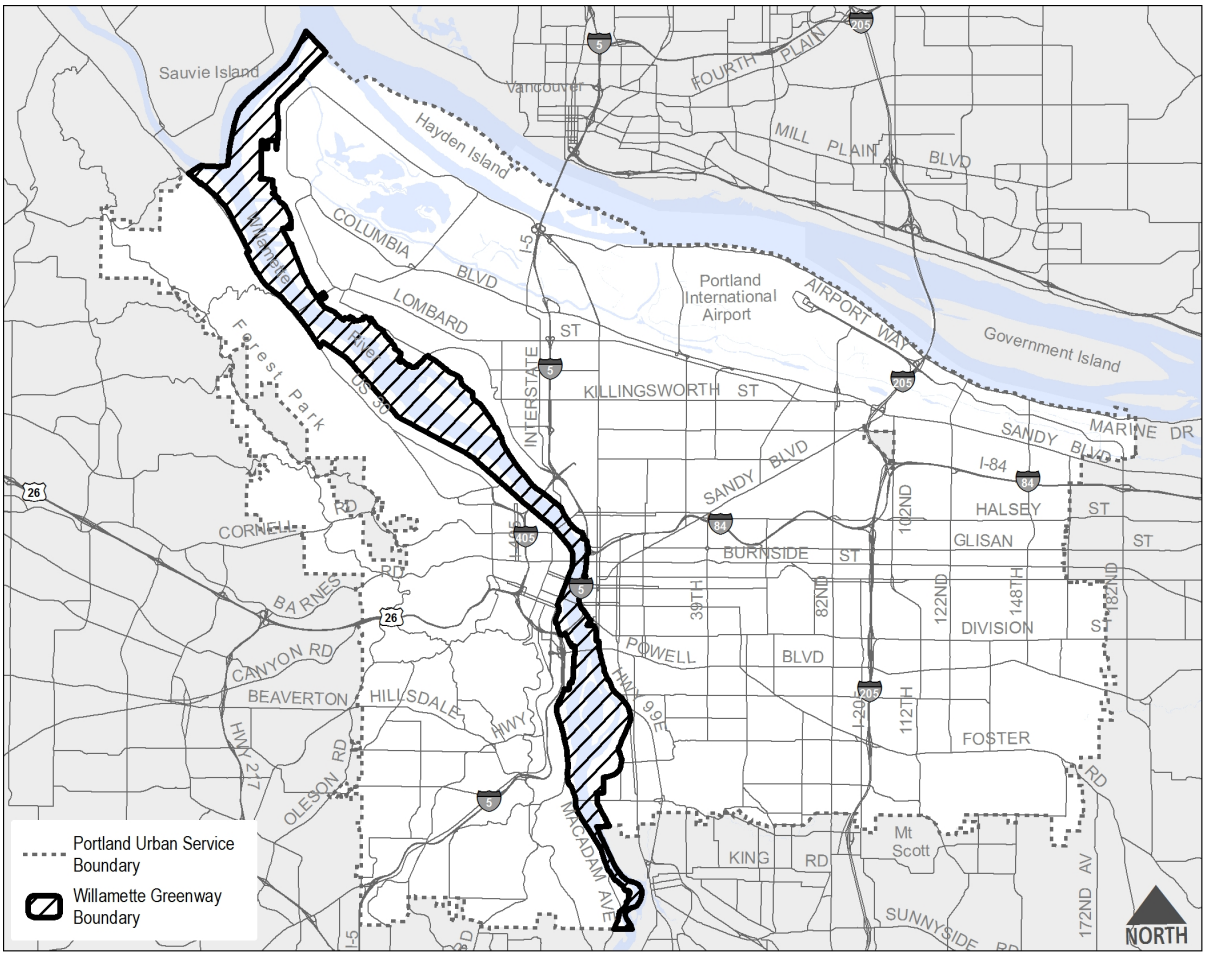
*Figure 3-9. Willamette Greenway Boundaries*



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# Chapter 4: Design and Development

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Encourage building and site design that promotes human and environmental ~~health and safety~~health, public safety, and responds to local context.
- Promote strong links ~~between~~ among building and site design, streets, and the public realm.
- Guide historic and cultural resource and scenic view preservation.
- Encourage the integration of nature into the built environment.
- Reduce carbon emissions and promote energy- and ~~resource~~ resource-efficient neighborhoods and buildings.

## Why is this important?

Development and design shapes how Portland looks and functions. Past development, in combination with the natural landscape, has shaped how the city is experienced. Future development, and the treatment of built and natural heritage, has the potential to create a better, healthier, more efficient, and more pleasant Portland. New development and redevelopment can promote vibrant, accessible urban places for people of all ages, abilities, and backgrounds, while also enhancing natural resources, protecting health and safety, and promoting resilience.

As a growing city, Portland faces design and development challenges~~,~~ as well as opportunities. The policies in this chapter encourage development that respects context, preserves historic and cultural resources, reduces carbon emissions, improves resource efficiency, minimizes risk from natural hazards, limits impacts to wildlife and natural systems, and integrates nature into the urban environment.



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# Goals

**Goal 4.A: Context-sensitive design and development**
New development is designed to respond to and enhance the distinctive physical, historic, and cultural qualities of its location, while accommodating growth and change.

**Goal 4.B: Historic and cultural resources**
Historic and cultural resources are integral parts of an urban environment that continue~~s~~ to evolve and are preserved ~~when possible~~.

**Goal 4.C: Human and environmental health**
Neighborhoods and development are efficiently designed~~,~~ and built to enhance human and environmental health.~~ ~~ They are designed and built to protect safety and livability~~,~~; support local access to healthy food~~,~~; limit negative impacts on water, hydrology, and air quality~~,~~; reduce carbon emissions~~,~~; encourage active and sustainable design~~,~~; protect wildlife; address urban heat islands;~~ ~~and integrate nature and the built environment.

**Goal 4.D: Urban resilience**
Buildings, streets, and open spaces are designed to ensure long-term resilience~~. They are designed~~, and to adjust to changing demographics, climate, and economy, and withstand and recover from natural disasters.

# Policies

## ~~General development principles~~Context

~~The design of buildings and other development can affect the safety, health, and quality of life of building users, neighbors and the environment.~~Portland's neighborhoods have distinctive characteristics and street environments that provide a sense of place and are a setting for public life. The following policies guide building and site design to respond to positive characteristics of their context and promote accessible and attractive public environments. They also support designing development to contribute to the quality of the public realm of streets and other open spaces, and encourage the integration of natural elements into the built environment~~encourage site and building designs that contribute to a welcoming and attractive public realm and respond to current and historical contexts~~.

**Policy 4.1** **Pattern areas.** Encourage building and site designs that respect the unique built natural, historic, and cultural characteristics of Portland's five pattern areas~~,~~ described in ~~the~~ Chapter 3: Urban Form ~~chapter~~.

**Policy 4.2** **Community identity.** Encourage the development of character-giving design features that are responsive to place and the cultures of communities.

**Policy 4.3** **Site and context.** Encourage development that responds to and enhances the positive qualities of site and context ~~—~~ the neighborhood, the block, the


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public realm, and natural features.

**Policy 4.4** **Natural features and green infrastructure ~~in centers and corridors~~.** Integrate natural and green infrastructure~~,~~ such as ~~street~~ trees, green spaces, ecoroofs, gardens, green walls, and vegetated stormwater management systems, into ~~centers and corridors~~the urban environment. Encourage stormwater facilities that are designed to~~–~~ be a functional and attractive element of public spaces, especially in ~~c~~centers and c~~c~~orridors.

**Policy 4.5** **Pedestrian-oriented design.** Enhance the pedestrian experience throughout Portland~~,~~ through public and private development that creates accessible, safe, and attractive places for all those who walk and/or use wheelchairs or other mobility devices.

**Policy 4.6** **Street orientation.** Promote building and site designs that enhance the pedestrian experience ~~in centers and corridors,~~ with windows, entrances, pathways, and other features that provide connections to the street environment.

**Policy 4.7** **Development and public spaces.** Guide development to help create high~~-~~quality public places and street environments, considering the role of adjacent development in framing, shaping, and activating the public space of streets and urban parks.

**Policy 4.8** **Alleys.** Encourage the continued use of alleys for parking access.~~ –~~ ~~and~~ ~~e~~Expand ~~their use as the location of~~the number of alley-facing accessory dwelling units. ~~and as multi-purpose community space.~~

**Policy 4.9** **Transitional urbanism.** Encourage temporary activities and structures in areas that are transitioning to ~~being more~~ urban~~, in order~~ to promote job creation, entrepreneurship, active streets, and human interaction.

## Health and safety

The design of buildings, site layout, and other development choices can affect the safety, health, and quality of life. The following policies guide building and site design to protect the health and livability of building users and neighbors, including minimizing risks of crime and fire. *Related policies specific to residential development are located in ~~the~~Chapter 5: Housing ~~chapter~~.*

**Policy 4.10** **Design for active living.** Encourage development and building and site design that promotes ~~active living~~ a healthy level of physical activity in daily life.

**Policy 4.11** **Access to light and air.** Provide for public access to light and air by managing



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and shaping the height~~,~~ and mass of buildings~~,~~ while accommodating ~~urban~~ urban-scale development.

**Policy 4.12** **Privacy and solar access.** Encourage building and site designs that ~~limit reductions in~~consider privacy and solar access for residents and neighbors~~,~~ while accommodating ~~urban~~ urban-scale development.

**Policy 4.13** **Crime-preventive design.** Encourage building~~, and~~ site, and public infrastructure design approaches that help prevent crime.

**Policy 4.14** **Fire prevention and ~~life~~ safety.** Encourage building and site design that improves fire prevention, safety, and ~~life safety~~reduces seismic risks.

## Residential areas

~~There will be development and change, e~~Even in relatively stable ~~lower~~ lower-density residentially zoned areas, there will be development and change. These policies encourage design~~s~~ and development that ~~continue the~~provides continuity with existing development pattern~~s. They also address design and development~~ in ~~lower~~ lower-density ~~residentially~~residentially zoned areas ~~(see Glossary)~~ outside of ~~centers~~ centers and ~~corridors~~corridors. These policies also support these areas' continuing evolution as places that provide additional housing opportunities to meet the diverse needs of Portlanders~~,~~ but that will not be places of major change in urban form and scale.

**Policy 4.15** **~~Adaptable neighborhoods~~Residential area continuity and adaptability.** Encourage more housing choices to accommodate a wider diversity of family sizes, incomes, and ages, and the changing needs of households over time. Allow adaptive reuse of existing buildings, ~~and~~ the creation of accessory dwelling units, and other arrangements that bring housing diversity that is compatible with the general scale and patterns of residential areas. ~~to serve the changing needs of a household over time.~~

**Policy 4.16** **Scale and patterns.** Encourage design and development that complements the general scale, character, and natural landscape features of neighborhoods. Consider building forms, scale, street frontage relationships, setbacks, open space patterns, and landscaping. Allow for a range of architectural styles and expression~~, and respect existing entitlements~~.

**Policy 4.17** **Demolitions.** Encourage alternatives to the demolition of sound housing, such as rehabilitation and adaptive reuse, especially affordable housing, and when new development would provide no additional housing opportunities beyond replacement.

**Policy 4.18** **Compact single-family options**. Encourage development and preservation of small resource-efficient and affordable single-family homes in all areas of the city.



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**Policy 4.19** **Resource efficient and healthy residential design and development.** Support resource efficient and healthy residential design and development. ~~( (see those polices below also~~ *See other related policies later in this chapter and in ~~the~~ Chapter 5: Housing ~~chapter.~~ ~~)~~.*



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## Design and development of centers and corridors

Centers and corridors are places where large numbers of people live, work, and visit. Careful attention to the design of centers and corridors is necessary to ensure that they become places where people want to live and gather, and where getting around by walking, biking, or wheelchair is an attractive choice. These policies also encourage the development of centers as places that reflect the character and cultures of the surrounding neighborhoods.

**Policy 4.20** **Walkable scale.** Focus services and higher-density housing in the core of centers to support a critical mass of demand for commercial services and more walkable access for customers.

**Policy 4.21** **Street environment.** Encourage development in centers and corridors to include amenities that create a pedestrian-oriented environment and provide places for people to sit, spend time, and gather.

**Policy 4.22** **Relationship between building height and street size.** Encourage development in centers and corridors that is responsive to street space width, thus allowing taller buildings on wider streets.

**Policy 4.23** **Design for pedestrian and bicycle access.** Provide accessible sidewalks, high-quality bicycle access, and frequent street connections and crossings in centers and corridors.

**Policy 4.24** **Residential uses on busy streets.** Improve the livability of places and streets with high motor vehicle volumes. Encourage landscaped front setbacks, street trees, and other design approaches to buffer residents from street traffic.

**Policy 4.25** **Active gathering places.** Locate public squares, plazas, and other gathering places in centers and corridors to provide places for community activity and social connections. Encourage location of businesses and services adjacent to these spaces that relate to and promote the use of the space.

**Policy 4.26** **Protect defining features.** Protect and enhance defining places and features of centers and corridors, including landmarks, natural features, and historic and cultural resources.

**Policy 4.27** **Historic buildings in centers and corridors.** Protect~~, restore, and improve~~ and encourage the restoration and improvement of historic ~~buildings~~ resources in centers and corridors~~ on adopted inventories~~.

**Policy 4.28** **Public art.** Encourage new development and public places to include design elements and public art that contribute to the distinct identities of centers and corridors, and that highlight the history and diverse cultures of



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neighborhoods.

## Transitions ~~and offsite impacts~~

These policies address transitions between areas of differing types of activity and scale of development, such as where centers and corridors interface with adjacent lower-intensity residential zones. ~~These policies also address the consideration and mitigation of offsite impacts from development.~~

**Policy 4.29** **Scale transitions.** Create transitions in building scale in locations where higher-density and higher-intensity development is adjacent to ~~smaller~~ smaller-scale single-dwelling zoning. Ensure that new high-density and large-scale infill development adjacent to single dwelling zones incorporates design elements that soften transitions in scale and ~~strive to protect~~limit light and privacy impacts on~~for~~ adjacent residents.

**Policy 4.30** **Land use transitions.** Improve the interface between non-residential ~~activities~~ uses and residential ~~areas~~uses~~,~~ in areas where commercial or employment ~~areas~~ uses are adjacent to ~~residentially~~ residentially-zoned land.

**Policy 4.31** **Industrial edge.** Protect non-industrially zoned parcels from the adverse impacts of facilities and uses on industrially zoned parcels. Use a variety of tools, including but not limited to vegetation, physical separation, land acquisition, and insulation~~,~~ to ~~Buffer~~ establish buffers between industrial sanctuaries and adjacent residential or mixed use areas to protect both the viability of long-term industrial operations and the livability of adjacent areas.

## Off-site impacts

These policies address the consideration and mitigation of off-site impacts from uses and development.

**Policy 4.32** **Off-site impacts.** ~~Use land use and other regulations to l~~Limit and mitigate public health impacts, such as odor, noise, glare, light pollution, air pollutants, and vibration that ~~the~~ public facilities, land uses,~~ –~~ or development ~~of a site~~ may have on adjacent residential or institutional uses, and on significant fish and wildlife habitat areas. Pay particular attention to limiting and mitigating impacts to under-served and under-represented communities.

**Policy 4.33** **Auto-oriented facilities, uses, and exterior displays.** Minimize the adverse impacts of highways, auto-oriented uses, vehicle areas, drive-through areas,



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signage, and exterior display and storage areas on adjacent residential ~~areas~~uses.

~~4.2831.b. **Minimizing industrial impacts.** Protect non-industrial zoned parcels from the adverse impacts of activities on industrial zoned parcels.~~

**Policy 4.34** **Noise impacts.** Encourage building and landscape design and land use patterns that limit and/or mitigate negative noise impacts to building users and residents, particularly in areas near freeways, regional truckways, major city traffic streets, and other sources of noise.

**Policy 4.35** **Air quality impacts.** Encourage building and landscape design and land use patterns that limit and/or mitigate negative air quality ~~and noise~~ impacts to building users and residents, particularly in areas near freeways, regional truckways, high traffic streets, and other sources of air pollution.

**Policy 4.36** **Diesel emissions.** Encourage best practices to reduce diesel emissions and related impacts ~~W~~when considering land use and public facilities that will increase truck or train traffic~~, encourage best practices to reduce diesel emissions and related impacts~~.

**Policy 4.37** **Light pollution.** Encourage lighting design and practices that reduce the negative impacts of light pollution, including sky glow, glare, energy waste, impacts to public health and safety, disruption of ecosystems, and hazards to wildlife.

**Policy 4.38** **Airport noise.** Partner with the Port of Portland to ~~R~~require compatible land use designations and development within the noise-affected area of Portland International Airport, while providing ~~public notice~~disclosure of the level of aircraft noise and mitigating the potential impact of noise within the affected area.

~~4.2831.g.~~ **Policy 4.39** **Telecommunication facility impacts.** Mitigate the visual impact of telecommunications and broadcast facilities near residentially zoned areas through physical design solutions.

*Additional policies about environmental quality are found in Chapter 7: Environment and Watershed Health.*

## Scenic resources

Portland's signature views of Mt. Hood and other mountain peaks, bridges, and rivers are important to the city's identity. ~~They~~ These views strengthen connections to the local and regional landscape. These policies encourage the recognition, enhancement, and protection of public views and significant scenic resources, as designated in the Scenic Resources Inventory and Protection Plans.

**Policy 4.40** **Scenic resources.** Enhance and celebrate Portland's scenic resources to

reinforce local identity, histories, and cultures and contribute toward way-finding throughout the city. Consider views of mountains, hills, buttes, rivers, streams, wetlands, parks, bridges, the Central City skyline, buildings, roads, art, landmarks, or other elements valued for their aesthetic appearance or symbolism.

**Policy 4.41** **Scenic resource protection.** Protect and manage designated significant scenic resources by maintaining scenic resource inventories, protection plans, regulations, and other tools.~~, including public views and scenic sites and corridors; and update or reconfirm the inventory of significant views, sites, and corridors in the future.~~

**Policy 4.42** **Vegetation management.** Maintain regulations and other tools for managing vegetation in a manner that preserves or enhances designated significant scenic resources.~~Provide allowances for the pruning and cutting of trees and shrubs to maintain or enhance designated public views.~~

~~**Policy 4.32 Utility lines.** Maintain designated scenic views, sites, and corridors by encouraging the placement of utility lines underground.~~

**Policy 4.43** **Building placement, height, and massing.** Maintain regulations and other tools related to building placement, height, ~~or~~and massing in order to preserve designated significant scenic resources.

~~**Policy 4.33 Regulatory guidance.** Avoid adverse impacts to scenic resources as part of land use reviews, where practicable.~~

**Policy 4.~~34~~44** ~~**New public views**~~**Future development.** Encourage new public and private development to ~~contribute to creating~~create new public viewpoints providing views of Portland's rivers, bridges, ~~the~~ surrounding mountains, hills and buttes, the Central City skyline, and other landmark features.

## Historic and cultural resources

Portland has several hundred designated historic landmarks and historic and conservation districts. These special places help create a sense of place, contribute to neighborhood character, and recognize ~~past~~ Portland's history ~~and events~~. More than half of Portland's buildings are over 50 years old, creating a vast pool of potentially significant properties. These policies support the protection ~~of all resources of statewide significance and encourage~~and preservation of historic and culturally significant resources~~, in the context of~~ a city that continues to grow and change.

**Policy 4.45** **Historic and cultural resource protection.** Protect and ~~E~~encourage the ~~protection and~~ restoration of ~~high-quality~~ historic buildings~~, and~~ places, and



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districts that contribute to the distinctive character and history of Portland's evolving urban environment~~, where feasible~~.

**Policy 4.46** **Continuity with established patterns.** Encourage development that fills in vacant and underutilized gaps within the established urban fabric, while preserving and complementing historic resources.

**Policy 4.47** **Demolition.** Protect ~~significant~~ historic ~~structures~~ resources from demolition ~~until and p~~. Provide opportunities ~~can be provided~~ for public comment, and encourage pursuit of alternatives to demolition~~,~~ or other actions that mitigate for the loss.

**Policy 4.48** **City-owned historic resources.** Keep City-owned historic resources in ~~a state of~~ good repair.

**Policy 4.49** **Historic Resources Inventory.** ~~Survey and inventory historic resources as part of future planning projects~~Maintain and periodically update Portland's Historic Resources Inventory to inform historic and cultural resource preservation strategies. ~~, with a focus on areas of anticipated growth and change.~~

**Policy 4.50** **Preservation equity.** Expand historic preservation inventories, regulations, and programs to encourage historic preservation in areas and in communities that ~~are under-represented by~~have not benefited from ~~current~~ past historic preservation efforts, especially areas ~~.~~ with high concentrations of under-served and/or under-represented people.

**Policy 4.51** **Cultural diversity.** Work with Portland's diverse communities to identify and preserve places of historic and cultural significance.

**Policy 4.52** **Cultural ~~heritage~~and social significance.** ~~Encourage the protection and enhancement of cultural heritage structures and sites as valuable and important public assets.~~Encourage awareness and appreciation of cultural diversity and the social significance of historic places and their roles in enhancing community identity and sense of place.

**Policy 4.53** **Community structures.** Encourage the adaptive reuse of historic community structures, such as former schools, meeting halls, and places of worship, for arts, cultural, and community uses that continue their role as anchors for community and culture.

**Policy 4.54** **Archaeological resources.** Protect and preserve archaeological resources ~~in place~~, especially those sites and objects associated with Native American ~~Indian~~ cultures. Work in partnership with tribal governments and the state on avoiding disturbances to Native American archaeological resources.



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## Public art

Public art and cultural amenities enrich people's lives. They offer educational experiences, enliven public spaces, and foster creativity. This helps build a sense of community and identity for an area. ~~These policies~~This policy supports including public art in development.

**Policy 4.55** **Public art and development.** Create incentives for public art as part of public and private development projects.

## Resource-efficient design and development

These policies support resource efficient design and development, from the location of development to the types of building materials. They apply to new development as well as to the continued and adaptive reuse of existing buildings.

**Policy 4.56** **Rehabilitation and adaptive reuse.** Encourage rehabilitation and adaptive reuse of buildings, especially those of historic or cultural significance, to conserve natural resources, reduce waste, and demonstrate stewardship of the built environment.

**Policy 4.57** **Compact housing.** Promote the development of compact, space- and energy-efficient housing types that minimize use of resources~~,~~ such as smaller detached homes or accessory dwellings~~,~~ and attached homes.

~~**Policy 4.4849 Prioritize reuse.** Encourage maintenance, rehabilitation, and/or relocation of viable buildings over demolition and new construction.~~

**Policy 4.58** **Seismic and energy retrofits.** Promote seismic and energy efficiency retrofits of historic buildings and other existing structures to reduce carbon emissions, save money, and improve public safety.

**Policy 4.59** **Life cycle efficiency.** Encourage use of technologies, techniques, and materials in building design, construction, and removal that result in the least environmental impact over the life cycle of the structure.

**Policy 4.60** **Materials and practices.** Encourage use of natural, resource-efficient, recycled, recycled content, and non-toxic building materials and energy-efficient building practices.

**Policy 4.61** **Water use efficiency.** Encourage site and building designs that ~~make~~ use water efficiently ~~use of water~~ and manage stormwater as a resource.

**Policy 4.62** **Optimizing benefits.** Provide mechanisms to evaluate and optimize the range of benefits from solar and renewable resources, tree canopy, ecoroofs, and building design.



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**Policy 4.63** **Energy efficiency.** Encourage and promote energy efficiency significantly beyond the Statewide Building Code and the use of solar and other renewable resources in individual buildings and at a district scale.

**Policy 4.64** **District energy systems.** Encourage and remove barriers to the development and expansion of low-carbon heating and cooling systems that serve multiple buildings or a broader district.

**Policy 4.65** **Ecodistricts.** Encourage ~~the creation of~~ ecodistricts, where multiple partners work together to achieve sustainability and resource efficiency goals at a district scale.

**Policy 4.66** **Energy-producing development.** Encourage and promote development that uses renewable resources, such as solar, wind, and water to generate power on-site and to contribute to the energy grid.

*Goals and policies related to energy infrastructure can be found in Chapter 8: Public Facilities and Services.*

## Designing with nature

Incorporating natural features and functions into development improves human and ecological health, yieldings ~~s~~ tangible social, environmental, and economic benefits. ~~It improves human and watershed health. How this integration looks and functions depends on local conditions and characteristics. Regardless, d~~Designing with nature provides or enhances ecosystem services, such as stormwater management, cooling of air and water, reduction of landslide and flooding risks, protection or ~~improvement~~ enhancement of fish and wildlife habitat, and ~~the ability of~~opportunities for Portlanders to enjoy nature in their daily lives. These policies apply to a broad range of land uses and development sites, ~~encourage~~ encouraging development ~~and design that~~designed to enhance~~s~~ the identity and beauty of Portland's neighborhoods, business districts, and industrial districts, while improving ~~environmental~~ watershed health and ~~preparing for the effects of~~resilience to climate change.

*Additional goals and policies about the integration of nature into the built environment and infrastructure are found in Chapter 7: Environment and Watershed Health, Chapter 8: Public Facilities and Services, and Chapter 9: Transportation.*

**Policy 4.~~58~~ 67 Design with nature.** Encourage design and site development practices that enhance, and avoid the degradation of, watershed health and ecosystem services and that incorporate trees and vegetation.

**Policy 4.~~59~~ 68 Flexible development options.** Encourage flexibility in the division of land, the siting and design of buildings, and other improvements to reduce the impact of development on environmentally sensitive areas and to retain healthy trees.



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**Policy 4.69** **Low-impact development and best practices.** Encourage use of low-impact development, habitat-friendly development, bird-friendly design, and green infrastructure~~, especially for City-owned, managed, or funded facilities~~.

**Policy 4.70** **Impervious surfaces.** Limit use of and strive to reduce impervious surfaces ~~to reduce~~and associated impacts on hydrologic function, air and water quality, habitat connectivity, ~~and~~ tree canopy, and urban heat island effects.

**Policy 4.71** **Hazards to wildlife.** Encourage building, lighting, site, and infrastructure design and practices that provide safe fish and wildlife passage, and reduce or mitigate hazards to birds, bats, and other wildlife.

**Policy 4.72** **Access to nature.** Promote equitable, safe, and well-designed physical and visual access to nature for all Portlanders, while also ~~protecting~~ maintaining the functions and values of significant natural resources, fish, and wildlife. Provide access to major natural features, including:

- Water bodies~~,~~ such as the Willamette and Columbia rivers, Smith and Bybee Lakes, creeks, streams, and sloughs.
- Major topographic features~~,~~ such as the West Hills, Mt. Tabor, and the East Buttes.
- Natural areas~~,~~ such as Forest Park and Oaks Bottom.



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## Hazard-resilient design

Portland has varied topography, with hills, buttes, abundant trees, and vegetation. It is also located at the confluence of two major river systems. As a result, there are periodic floods, wildfires, and landslides. The city is also in a seismically active region, at risk for earthquakes from local faults and the Cascadia Subduction Zone in the Pacific Ocean. These policies direct development away from hazard-prone areas, seek to reduce hazard risks and impacts, and improve resilience to disasters and climate change.

**Policy 4.~~61~~ 73 Reducing natural hazards and climate change risks and impacts.** Limit development in or near areas prone to natural hazards ~~where practicable~~, using the most current hazard and climate change-related information and maps.

**Policy 4.~~60~~ 74 ~~Evaluating~~ Geological hazards.** Evaluate slope and soil characteristics, including liquefaction potential, landslide hazards, and other geologic hazards.

**Policy 4.~~62~~ 75 Disaster ~~recovery~~ resilient development.** Encourage development and site management approaches that reduce the risks and impacts of natural disasters or other major disturbances and that improve ~~will enhance~~ the ability of people, wildlife, natural systems, and property to withstand and recover from ~~a natural disaster or other major disturbance~~such events.

**Policy 4.76 Portland Harbor facilities.** Reduce natural hazard risks to critical public and private energy and transportation facilities in the Portland Harbor.

**Policy 4.~~63~~77 Urban heat islands.** Encourage development, building, landscaping, and infrastructure design that reduces urban heat island effects.

**Policy 4.~~64~~78 Planning and disaster recovery.** Facilitate effective disaster recovery by providing recommended updates to land use designations and development codes~~, as warranted~~, in preparation for natural disasters.

## Healthy Food

Access to healthy food is important for many reasons. A nourishing diet is critical to maintaining good health and avoiding chronic disease later in life. This leads to better long-term public health outcomes and lower healthcare costs. Food behaviors are shaped at an early age; c~~. C~~hildren who are exposed to healthy foods are more likely to develop healthful food behaviors than those who are not.

In spite of these benefits, many Portlanders do not have good access to healthy food. These policies promote a range of approaches for improving access to healthy food through



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buying and growing. The policies help meet the Portland Plan goal for 90 percent of Portlanders to live within a half-mile of a store or market that sells healthy food.

**Policy 4.~~65~~79 Grocery stores in centers.** Facilitate the retention and development of grocery stores and neighborhood-based markets offering fresh produce in centers.

**Policy 4.~~66~~80 Neighborhood food access.** Encourage small, neighborhood-based retail food opportunities, such as corner markets, food co-ops, food buying clubs, and community-supported agriculture pickup/drop off sites, to fill in service gaps in food access across the city.

**Policy 4.~~67~~81 Growing food.** Increase opportunities to grow food for personal consumption, donation, sales, and educational purposes.

**Policy 4.~~68~~82 Access to community gardens.** Ensure that community gardens are allowed in areas close to or accessible via transit to people living in ~~centers and other high-density areas~~areas zoned for mixed use or multi-dwelling development, where residents have few opportunities to grow food in yards.



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# Chapter 5: Housing

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Ensure adequate access to housing for a socially- and economically-diverse population.
- Support fair, equitable, healthy, resource efficient, and physically-accessible housing.
- Establish ways to mitigate gentrification and displacement.
- Concentrate new housing in and around centers and corridors near transit and services to reduce the housing/transportation cost burden.
- Maintain and promote a supply of permanently-affordable housing for Portland's most vulnerable residents.

## Why is this important?

While a place to live is a basic human need, not all Portlanders have safe and healthy housing. Ensuring a fair and equitable housing market is essential to providing the opportunities and security people need to live healthy and successful lives. Economic, social, and physical barriers limit many Portlanders' access to adequate housing. People of color experience housing discrimination at much higher rates than do white Portlanders, and they often have fewer housing choices. Income, immigration status, ~~limited~~ Limited English ~~proficiency~~Proficiency (LEP), sexual orientation, and disability can also limit choices.

In recent years, rising costs and declining incomes have strained household budgets for all but the most well-off. Greater housing and transportation costs mean that the cost burden is being felt not just by low-income households, but also by moderate- and middle-income households. In 2010, nearly one quarter of Portland's renter households were cost burdened, meaning that they spent more than 50 percent of household income on housing and transportation. There were many cost-burdened homeowners as well. Metro's long-range forecasts predict a steep increase in the number of cost-burdened households, particularly among~~st~~ low-income households.



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# HOUSING

The purpose of this chapter is to provide policies that will help Portland meet its need for quality, affordable homes for a growing and socioeconomically-diverse population, and to help ensure equitable access to housing. The Comprehensive Plan Map allows for a more-than-adequate supply of housing to meet the future needs. The challenge is to provide housing with a diverse range of unit types and prices in locations that help meet the needs of all, including low-income populations, communities of color, and people of all ages and abilities.

These goals and policies provide guidance for the regulations, programs, incentives, and partnerships that will help achieve Portland's housing goals.



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# Goals

**Goal 5.A: Housing diversity**
Portlanders have access to high-quality affordable housing that accommodates their needs, preferences, and financial capabilities in terms of different types, tenures, density, sizes, costs, and locations.

**Goal 5.B: Equitable access to housing**
Portland ensures equitable access to housing, making a special effort to remove disparities in housing access for people with disabilities, -people of color, low-income households, diverse household types, and older adults., ~~and households that include people with disabilities.~~

**Goal 5.C: Healthy connected city**
Portlanders live in safe, healthy housing that provides convenient access to jobs and to goods and services that meet daily needs. This housing is connected to the rest of the city and region by safe convenient affordable multimodal transportation.

**Goal 5.D: Affordable housing**
Portland has an adequate supply of affordable housing units to meet the needs of residents vulnerable to increasing housing costs.

**Goal 5.E: High-performance housing**
Portland residents have access to resource efficient and high performance housing for people of all abilities and income levels.


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# Policies

## Diverse and expanding housing supply

About ~~122~~123,000 new households are expected in Portland between 2010 and 2035.

Oregon's Statewide Planning Goal 10 — Housing and the Metropolitan Housing Rule require that cities provide adequate land and plan for a range of housing types that can meet the diverse housing needs of various types of households. The Portland Plan provides additional policy guidance on the benefits of locating high-quality housing in amenity rich centers and corridors.

The policies below set expectations for housing supply and growth. They identify specific types of housing needed to serve a variety of households, including multi-generational families, small and large households with children, older adults and households that include people with disabilities who may need independent living services, assisted living and skilled nursing care facilities.

**Policy 5.1** **Housing supply.** Maintain sufficient residential development capacity to accommodate Portland's projected share of regional household growth.

**Policy 5.2** **Housing growth.** Strive to capture at least 25 percent of the seven-county region's residential growth (Multnomah, Washington, Clackamas, Yamhill, Columbia, Clark, and Skamania counties).

**Policy 5.3** **Housing potential.** Evaluate plans and investments for their impact on housing capacity, particularly the impact on the supply of housing units that can serve low- and moderate-income households.

**Policy 5.4** **Housing types.** Encourage new and innovative housing types that meet the evolving needs of Portland households and expand housing choices in all neighborhoods. These housing types include but are not limited to single dwelling units; multi-dwelling units; accessory dwelling units; small units; pre-fabricated homes such as manufactured, modular, and mobile homes; co-housing; and clustered housing/clustered services.

**Policy 5.5** **Housing in centers.** -Apply zoning in and around centers that allows for and supports a diversity of housing that can accommodate a broad range of households, including multi-dwelling and family-friendly housing options.

**Policy 5.6** **Adaptable housing**. Encourage adaption of existing housing and the development of new housing that can be adapted in the future to accommodate the changing variety of household types.



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**Policy 5.7** **Physically-accessible housing.** Allow and support a robust and diverse supply of affordable, accessible housing to meet the needs of older adults and people with disabilities, especially in centers, station areas, and other places which are ~~in close proximity~~proximate to services and transit.

**Policy 5.8** **Accessible design for all.** Encourage new construction and retrofitting to create physically accessible housing, extending from the individual unit to the community, through the use of Universal Design Principles.

## Housing access

Housing supply and household income are not the only factors determining access to housing. Discrimination in the housing market, gentrification, and the changing nature of households over time also influence access to desired housing.

The following policies address discriminatory barriers to fair and equitable access to housing and the impact of gentrification and displacement, particularly for under-served and under-represented populations.

**Policy 5.9** **Coordination with fair housing programs.** Foster inclusive communities, overcome disparities in access to community assets, and enhance housing choice for people in protected classes throughout the city by coordinating plans and investments with fair housing policies.

**Policy 5.10** **Remove barriers**. Remove potential regulatory barriers to housing choice for people in protected classes ~~in order~~ to ensure freedom of choice in housing type, tenure, and location.

**Policy 5.11** **Impact analysis.** Evaluate plans and investments~~, and other legislative land use decisions~~ to identify potential disparate impacts on housing choice and access for protected classes.

**Policy 5.12** **Housing stability.** Coordinate plans and investments with programs that prevent avoidable, involuntary evictions and foreclosures.

**Policy 5.13** ~~**Preserving**~~ **Preserve communities.** Encourage plans and investments to protect and restore the socioeconomic diversity and cultural stability of established communities.

**Policy 5.14** **Gentrification/displacement risk.** Evaluate plans and investments for the potential to cause gentrification/displacement in areas with concentrations of communities of color, low- and moderate-income households, and renters.



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**Policy 5.15** **Involuntary displacement.** When plans and investments are expected to create neighborhood change, limit the involuntary displacement of those who are under-served and under-represented ~~people~~. Use public investments and programs, and coordinate with nonprofit housing organizations (such as land trusts and housing providers) to create permanently affordable housing in affected communities and to mitigate the impacts of market pressures that cause involuntary displacement.

**Policy 5.16** **Land banking.** Create a land bank of publically owned land to be held in reserve for construction of affordable housing as an anti-displacement tool.

**Policy 5.17** **Rebuild communities**. Coordinate plans and investments with programs that enable communities impacted by involuntary displacement to maintain social and cultural connections, and re-establish a stable presence and participation in the impacted neighborhoods.

**Policy 5.18** **Aging in place.** Encourage a range of housing options and supportive environments to enable older adults to remain in their communities as their needs change.

## Housing location

The Portland Plan's Healthy Connected City strategy provides policy guidance to expand opportunities for Portlanders to live in complete communities offering a mix of desirable services and opportunities. Housing that is located in a walkable neighborhood near active transportation, employment centers, open spaces, high-quality schools, and various services and amenities enhances the general quality of life for its residents. Neighborhoods in Portland offer varying levels of opportunity (~~*See*~~ *see Figure 5-1 – Housing Opportunity Map*), with housing in high opportunity neighborhoods tending to be expensive compared to more affordable housing in areas that offer fewer opportunities. However, there are also small ~~parts~~ areas of Portland that are lacking in both opportunities as well as quality affordable housing units.

The following policies support efforts to provide equitable access to locational opportunities for under-served and under-represented populations in Portland.

**Policy 5.19** **Coordinate housing needs in high poverty areas.** Meet the housing needs of under-served and under-represented populations living in high-poverty areas by coordinating plans and investments with housing programs.

**Policy 5.20** **Access to opportunities.** Improve equitable access to active transportation, jobs, open spaces, high-quality schools, and supportive services and amenities in areas with high concentrations of under-served and under-represented populations and an existing supply of affordable housing.



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**Policy 5.21** **New development in ~~high~~ opportunity areas.** Locate new affordable housing in areas that ~~are opportunity~~have high/medium levels of opportunity ~~-~~in terms of access ~~-rich in terms of acces~~s to active transportation, jobs, open spaces, high-quality schools, and supportive services and amenities (*see Figure 5-1~~:~~ — Housing Opportunity Map*).

**Policy 5.22** **Higher density housing**. Locate higher density housing, including units that are affordable and accessible, in and around centers to take advantage of the access to active transportation, jobs, open spaces, schools, and various services and amenities.

**Policy 5.23** **Impact of housing on schools.** Evaluate plans and investments for the effect of housing development on school enrollment, financial stability, and student mobility.

## Housing affordability

Housing affordability is a growing concern for Portland. Many households in the city have to spend significantly more than the recommended 30 percent of their income on housing. Households are considered cost-burdened if they spend more than 50 percent of their income on housing and transportation. More and more households are falling into this category because of steep increases in home prices, a tight rental market, increases in gasoline prices and transportation costs, and falling household incomes. Population projections for 2030 indicate that 25 to 30 percent of households in several parts of Portland will be housing cost-burdened.

The following policies respond to the challenges of housing affordability through regional cooperation, housing preservation and production efforts that lower housing costs, and provide homeownership opportunities for under-served and under-represented populations.

**Policy 5.24** **Housing preservation**. Preserve and produce affordable housing to meet ~~the~~ needs that are not met by the private market by coordinating plans and investments with housing providers and organizations.

**Policy 5.25** **Regulated affordable housing target. ~~-~~**Strive to produce at least 10,000 new regulated affordable housing units citywide by 2035 that will be affordable to households in the 0-80~~%~~ percent MFI bracket.

**Policy 5.26** **Funding plan~~:~~.** Create a funding plan that includes financial and/or regulatory mechanisms to achieve the regulated affordable housing target set forth for 2035.



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**Policy 5.27** **Inventory of regulated affordable housing~~:~~.** ~~-~~Coordinate periodic inventories of the supply of regulated affordable housing in the four-county (Clackamas, Clark, Multnomah and Washington) region with Metro.

**Policy 5.28** **Permanently affordable housing.** ~~Evaluate plans and investments for their impact on~~Increase the supply of permanently affordable housing.~~ Increase the supply where practicable.~~

**Policy 5.29** **Housing cost burden.** Evaluate plans and investments for their impact on household cost, and consider ways to reduce the combined cost of housing, utilities, and/or transportation.~~–~~ Encourage energy efficiency investments to reduce overall housing costs.

**Policy 5.30** **Household prosperity.** Facilitate expanding the variety of types and sizes of affordable housing units, and do so in locations that provide low-income households with greater access to convenient transit and transportation, education and training opportunities, the Central City, industrial districts, and other employment areas.

**Policy 5.31** **Affordable housing in centers.** Encourage income diversity in and around centers by allowing a mix of housing types and tenures.

**Policy 5.32** **Central City affordable housing**. Encourage the preservation and production of affordable housing in the Central City to take advantage of the area's unique concentration of active transportation access, jobs, open spaces, and supportive services and amenities.

**Policy 5.33** **Affordable housing resources**. Pursue a variety of funding sources and mechanisms including new financial and regulatory tools to preserve and develop housing units and various assistance programs for households whose needs are not met by the private market.

**Policy 5.3~~3~~4** **Inclusionary zoning.** Use the inclusionary zoning tool to effectively link the production of affordable housing to the production of market-rate housing.

**Policy 5.35** **Impact of regulations on affordability**. Evaluate how existing and new regulations affect private development of affordable housing and minimize negative impacts where possible. Avoid regulations that facilitate economically exclusive neighborhoods.

**Policy 5.36** **Mobile home parks.** Evaluate plans and investments for potential redevelopment pressures on existing mobile home parks and impacts on park residents.

**Policy 5.37** **Workforce housing**. Encourage private development of a robust supply of housing that is affordable to moderate-income households located near



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convenient multimodal transportation that provides access to education and training opportunities, the Central City, industrial districts, and other employment areas.

**Policy 5.38** **Compact single-family options.** Encourage development and preservation of small resource-efficient and affordable ~~single~~ single-family homes in all areas of the city.

**Policy 5.39** **Employer-assisted housing**. Encourage employer-assisted affordable housing in conjunction with major employment development.

**Policy 5.~~34~~40** **Affordable homeownership**. Align plans and investments to support improving homeownership rates and locational choice for people of color and other groups who have been historically under-served and under-represented.

**Policy 5.41** **Homeownership retention**. Support opportunities for homeownership retention for people of color and other groups who have been historically under-served and under-represented.

**Policy 5.42** **Variety in homeownership opportunities**. Encourage a variety of ownership opportunities and choices by allowing and supporting including but not limited to ~~the creation of~~ condominiums, cooperatives, mutual housing associations, limited equity cooperatives, land trusts, and sweat equity.

**Policy 5.43** **Regional cooperation**. Facilitate opportunities for greater regional cooperation in addressing housing needs in the Portland metropolitan area, especially for the homeless, low- and moderate-income households, and historically under-served and under-represented communities.

**Policy 5.44** **Regional balance**. Encourage development of a "regional balance" strategy to secure greater regional participation to address the housing needs of homeless people and communities of color, low- and moderate-income households, and historically under-served and under-represented communities throughout the region.

## Homelessness

Understandably, the homeless population is most vulnerable to decreasing affordability and declining household prosperity. Unified guidance by the City of Portland, Multnomah County, and Home Forward is provided through their jointly authored plan, *A Home for Everyone: A United Community Plan to End Homelessness in Multnomah County* (2013). This plan focuses resources to support priority populations, particularly families with children,



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unaccompanied youth, adults with disabilities, women, and veterans. It focuses investments in six program areas to prevent and end homelessness, including housing, income and benefits, health, survival and emergency services, access to services and systems coordination. The purpose of the plan is to prevent homelessness, and reduce the time people spend being homeless. The following policy provides land use support for the priorities identified by this plan.

**Policy 5.45** **Housing continuum**. Prevent homelessness and reduce the time spent being homeless by ensuring that a continuum of safe and affordable housing opportunities and related supportive services are allowed, including but not limited to Permanent Supportive Housing, transitional housing, self-built micro housing communities, emergency shelters, temporary shelters such as warming centers, and transitional campgrounds.

## Health, ~~and~~ safety and well-being

Having a place to live does not guarantee health and safety. A critical connection exists between the quality of the housing unit and the health of its occupants.

A safe housing unit is largely free of hazardous materials~~,~~ such as lead and radon. It is also free of mold, is not in a state of disrepair, and ~~offers~~ has emergency safety features~~,~~ such as carbon monoxide monitors, smoke alarms, and emergency exits. Access to open spaces, opportunities for social interactions, green features, and adaptability also influence the health of a community. The following policies focus on building and maintaining Portland's housing stock in ways that foster community health.

**Policy 5.46** **Healthy housing**. Encourage development and maintenance of all housing, especially multi-dwelling housing, that protects the health and safety of residents and encourages healthy lifestyles and active living.

**Policy 5.47** **Housing safety.** Require safe and healthy housing free of hazardous materials such as lead, asbestos, and radon.

**Policy 5.48** **Housing quality.** Encourage housing that provides high indoor air quality, access to sunlight and outdoor spaces, and is protected from noise, pests, and hazardous environmental conditions~~., and materials.~~

**Policy 5.49** **High-performance housing.** Encourage energy efficiency, green building practices, materials, and design to produce healthy, efficient, durable, and adaptable homes that are affordable or reasonably priced.

**Policy 5.50** **Healthy and active living.** Encourage housing that provides features supportive of healthy eating and active living~~,~~ such as useable open areas, recreation areas, community gardens, crime-preventive design, and community kitchens in multifamily housing.



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**Policy 5.51** **Walkable surroundings.** Encourage active transportation in residential areas through the development of pathways, sidewalks, and high-quality onsite amenities~~,~~ such as secure bicycle parking.

**Policy 5.52** **Responding to social isolation.** Encourage site designs and relationship to adjacent developments that reduce social isolation for groups that often experience it, such as older adults, people with disabilities, communities of color, and immigrant communities.

**Policy 5.53** **Renter well-being.** Enhance renter well-being through education, expansion of enhanced inspections, and support of regulations and incentives that further housing stability.



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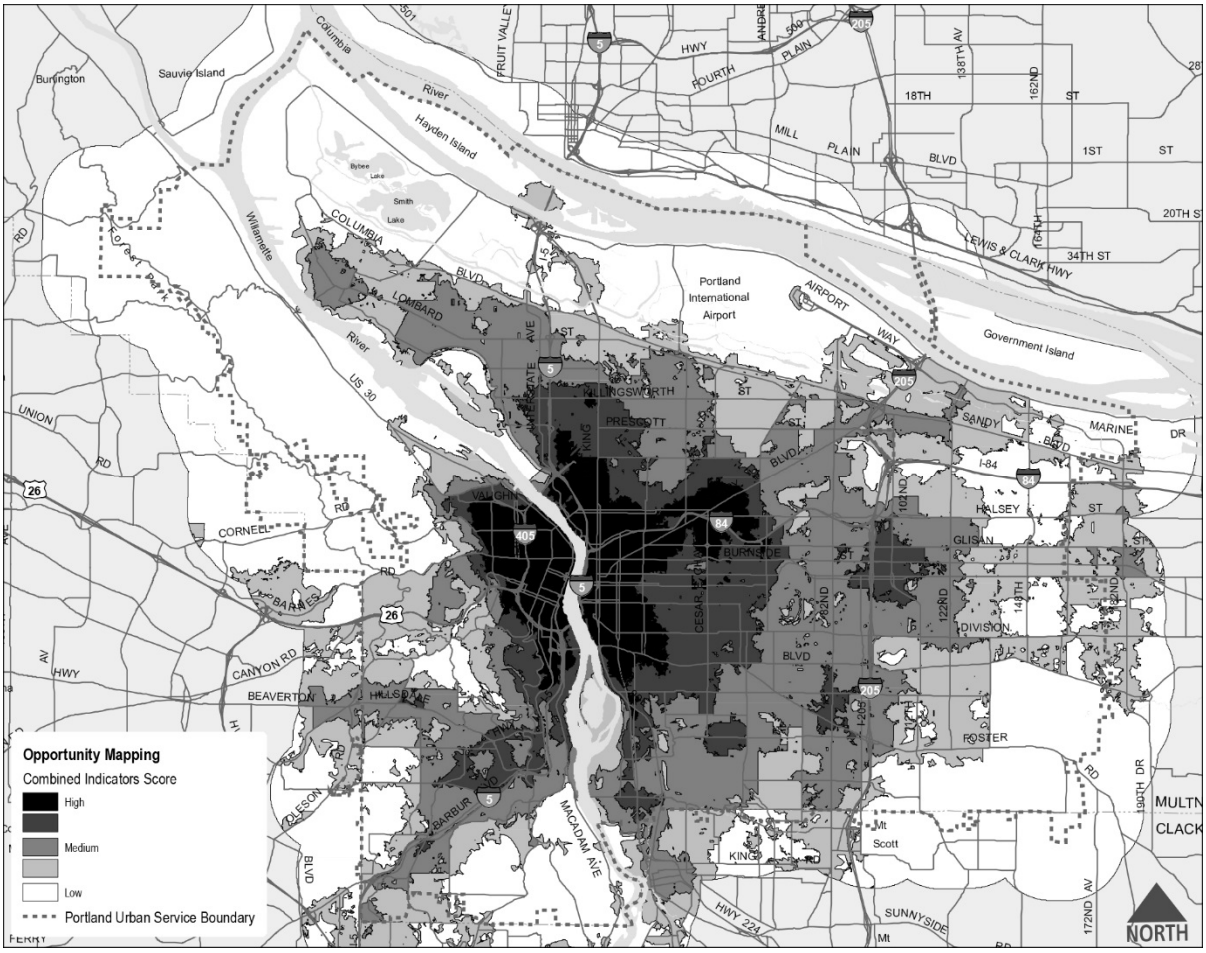
*Figure 5-1. Housing Opportunity Map*



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# Chapter 6: Economic Development

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Provide land supply to support job growth, and to expand the use of tools, such as brownfield redevelopment, to increase efficient use of land.
- Expand economic opportunity and improve economic equity for Portland's growing population through sustained business growth.
- Support traded sector growth, expand exports and retain Portland's position as an innovative industrial and commercial center and a West Coast trade gateway.
- Provide land use policies to support the growth and vitality of business districts.
- Create an environment that encourages innovation and entrepreneurship, builds on local strengths for business success and growth, and offers businesses a functional and attractive place to locate.

## Why is this important?

A healthy economy provides opportunities for people to achieve their full potential and ~~it~~ is the foundation of a livable city. A healthy economy supports the creation of living wage jobs for our growing and increasingly diverse population. It supports a growing tax base for public services. It also improves health and educational outcomes. People with stable jobs and reliable incomes have resources to meet their basic needs, which contributes to their physical and mental health, and to the educational and economic success of youth.

Portland is an innovative employment center in a region with strong economic and export growth. Economic strengths also include a successful Central City and industrial base, a primarily middle-class distribution of jobs that support a diverse community, and livability advantages that attract population growth and talent. However, these strengths mask trends toward declining prosperity for many Portlanders and highlight that economic development must be a high priority in the coming decades.

Since 2000, job growth in the city has fallen far short of housing growth. Rising costs of living have outpaced average wages. The share of middle-wage jobs and resulting upward-mobility opportunities for low-income people has declined. Income growth has been concentrated among the top-earning 20 percent of the workforce. In addition, deep income disparities persist for under-represented and under-served populations~~, such as people of~~


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~~color~~. Research suggests that cities with more equitable economies have stronger economies.

As businesses face an increasingly competitive regional and global marketplace, new directions are needed to sustain job growth and improve economic equity. The region's primarily industrial traded sectors that drive regional prosperity will need more investment in workforce education, land supply, freight infrastructure, and innovation. Improving economic equity and affordability will depend on making equity a more central part of City policy and investments.

New land development approaches are needed to improve local competitiveness in regional markets, including more brownfield redevelopment, low-cost office development, and institutional zoning. ~~Land~~ Land-use programs must address the increasingly blurred lines between commercial, industrial, and creative services sectors. Citywide neighborhood prosperity will depend on new approaches to concentrated commercial growth in centers, neighborhood revitalization, flexibility, affordability, and small business growth. And business climate improvements should be reviewed to keep regulatory burdens and fees competitive in the regional marketplace.

The world economy is a dynamic system. Portland's economy will continue to change in response to technology, social change and global trends. Zoning and land use must respond to these changes. This kind of local economic innovation will be key to Portland being a significant player in the development of the future economy.



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# Goals

**Goal 6.A: Prosperity**
Portland has vigorous economic growth and a healthy, diverse economy that supports prosperity and equitable access to employment opportunities for an increasingly diverse population. A strong economy that is keeping up with population growth and attracting resources and talent can:

- Create opportunity for people to achieve their full potential.
- Improve public health.
- Support a healthy environment.
- Support the fiscal well-being of the city.

**Goal 6.B: Development**
Portland supports an attractive environment for industrial, commercial, and institutional job growth and development by 1) maintaining an adequate land supply; 2) a local development review system that is nimble, predictable, and fair; and 3) high-quality public facilities and services.

**Goal 6.C: Business district vitality**
Portland implements land use policy and investments to:

- Ensure that commercial, institutional, and industrial districts support business retention and expansion.
- Encourage the growth of districts that support productive and creative synergies among local businesses.
- Provide convenient access to goods, services, and markets.
- Take advantage of our location and quality of life advantages as a gateway to Oregon and the Columbia River basin.


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# Policies

## Diverse, expanding city economy

Diverse economic growth is central to Portland's long-term prosperity. It provides jobs for a growing population, improved equity, fiscal stability, neighborhood prosperity, and economic resilience. Moreover, Portland is a statewide economic engine with opportunities and benefits that extend beyond city boundaries.

About 140,000 new jobs are expected in the city between 2010 and 2035, which is consistent with local and national 25-year trends. The policies below set explicit economic growth targets, highlight coordination opportunities, and specify benefits that should be sought through economic growth, and call out important local strengths that support economic growth.

**Policy 6.1** **Diverse and growing community**. Expand economic opportunity and improve economic equity for Portland's diverse, growing population through sustained business growth.

**Policy 6.2** **Diverse and expanding economy**. Align plans and investments to maintain the diversity of Portland's economy and status as Oregon's largest job center with growth across all sectors (commercial, industrial, and institutional) and across all parts of the city.

**Policy 6.3** **Employment growth.** Strive to capture at least 25 percent of the seven-county region's employment growth (Multnomah, Washington, Clackamas, Yamhill, Columbia, Clark, and Skamania ~~Counties~~counties).

**Policy 6.4** **Fiscally-stable city.** Maintain a high citywide jobs-to-households ratio that supports tax revenue growth at pace with residential demand for municipal services.

**Policy 6.5** **Economic resilience.** Improve Portland's economic resilience to impacts from climate change and natural disasters through a strong local economy and equitable opportunities for prosperity.

**Policy 6.6** **Low-carbon economy.** Align plans and investments with efforts to improve energy efficiency and reduce lifecycle carbon emissions from business operations. Promote employment opportunities associated with energy efficiency projects, waste reduction, production of more durable goods, and recycling.

**Policy 6.7** **Competitive advantages**. Maintain and strengthen the city's comparative economic advantages including access to a high-quality workforce, business diversity, competitive business climate, and multimodal transportation infrastructure.



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**Policy 6.8** **Business environment.** Use plans and investments to help create a positive business environment in the city and provide strategic assistance to retain, expand, and attract businesses.

**Policy 6.9** **Small business development.** Facilitate the success and growth of small businesses and coordinate plans and investments with programs that provide technical and financial assistance to promote sustainable operating practices.

**Policy 6.10** **Business innovation.** Encourage innovation, research, development, and commercialization of new technologies, products, and services through responsive regulations and public sector approaches.

**Policy 6.11** **Sharing economy.** Encourage mechanisms that enable~~s~~ individuals, corporations, non-profits, and government to market, distribute, share, and reuse excess capacity in goods and services. ~~-~~This includes ~~peer-~~peer-~~to-~~to-peer transactions, crowd funding platforms, and a variety of business models to facilitate borrowing and renting unused resources.

**Policy 6.12** **Economic role of livability and ecosystem services.** Conserve and enhance Portland's cultural, historic, recreational, educational, food-related, and ecosystem assets and services for their contribution to the local economy and their importance for retention and attraction of skilled workers and businesses.

## Land development

According to forecasts, Portland will continue to have relatively strong demand for employment land development. However, most of Portland's land supply for employment growth is on land that has constraints or is already at least partially developed.

Statewide Planning Goal 9 – Economic Development requires Portland to provide adequate long-term and short-term land supply for economic development and job growth, consistent with an Economic Opportunities Analysis. Forecasted demand for buildable land by 2035 includes 150 acres in the Central City, 1,350 acres in industrial districts, 690 acres in neighborhood business districts, and 370 acres for campus institutions.

New directions to support Portland's land supply for job growth include policies for adequate long-term and short-term development capacity, a targeted increase in brownfield redevelopment, incentives to maintain competitiveness in regional markets, and guidance for streamlining the City's regulatory climate.

**Policy 6.13** **Land supply.** Provide supplies of employment land that are sufficient to meet the long-term and short-term employment growth forecasts, adequate in terms of amounts and types of sites, available and practical for development and intended uses. Types of sites are distinguished primarily by employment geographies identified in the Economic Opportunities Analysis, although



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capacity needs for building types with similar site characteristics can be met in other employment geographies.

~~**Policy 6.13 Land efficiency**. Provide strategic investments and incentives to leverage infill, redevelopment, and promote intensification of scarce urban land.~~



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**Policy 6.14** **Brownfield redevelopment**. Overcome financial-feasibility gaps to c~~C~~leanup and redevelop 60 percent of brownfield acreage by 2035. ~~-~~*Additional related policies are found in the Industrial and employment districts section of this chapter.*

**Policy 6.15** **Annexation.**~~–~~ Facilitate a predictable, equitable process for annexation of employment lands within the urban services area as needed to meet the City's forecasted land needs. ~~See the West Hayden Island policy in the Industrial and Employment Districts section below.~~

**Policy 6.16** **Regionally-competitive development sites.** Improve the competitiveness of ~~the~~ vacant and underutilized sites located in Portland's employment areas through the use of incentives, and regional and state assistance for needed infrastructure and site readiness improvements.

**Policy 6.17** **Regulatory climate.** Improve development review processes and regulations to encourage predictability and support local and equitable employment growth and encourage business retention, including:

**6.17.a.** Assess and ~~monitor~~ understand cumulative regulatory costs to maintain ~~ensure that~~ Portland's ~~is~~ financial~~ly~~ competitiveness with other comparable cities.

**6.17.b.** Promote certainty for new development through appropriate allowed uses and "clear and objective" standards to permit typical development types without a discretionary review.

**6.17.c.** Allow discretionary-review as a way to facilitate flexible and innovative approaches to meet requirements.

**6.17.d.** Design and monitor development review processes to avoid unnecessary delays.

**6.17.e.** Promote cost effective compliance with federal and state mandates, productive intergovernmental coordination, and ~~avoid duplicative~~ efficient, well-coordinated development review and permitting procedures~~ when City policies can be achieved through other means~~.

**Policy 6.18** **Short-term land supply**. Provide for a competitive supply of development-ready sites~~,~~ with different site sizes and types, to meet five-year demand for employment growth in the Central City, industrial areas, campus institutions, and neighborhood business districts.

**Policy 6.19** **Evaluate land needs.** Update the Economic Opportunities Analysis and short-term land supply strategies every ~~5 to 7~~five to seven years.

**Policy 6.20** **Corporate headquarters.** Provide land opportunities ~~in suitable locations~~ for



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development of corporate headquarters campuses in locations with suitable transportation facilities.

## Traded sector competitiveness

Global trends have put increasing pressure on regions to strengthen their competitiveness for traded-sector growth, which drives regional prosperity. Traded sectors are local businesses of all sizes that export goods and services and compete in markets outside of the region, bringing income and jobs into the region. These sectors have become more vulnerable and dynamic in the shifting global marketplace, as they reinvent their supply and distribution lines and concentrate activity in lower cost or higher productivity locations.

The following policies call for focusing limited resources on strategic traded sector specializations with growth prospects. This region's growing export activity is concentrated in high tech and advanced manufacturing, where job growth has been modest but output growth continues to outpace the service sectors. Other growing export specializations include software, apparel, clean-tech, freight-hub distribution, and creative services. While these growing specializations are expected to shift over time with market changes, connecting existing and emerging local business with global markets helps bring new resources into the region.

**Policy 6.21** **Traded sector competitiveness.** Align plans and investments with efforts to improve the city and regional business environment for traded sector and export growth. Participate in regional and statewide initiatives.

**Policy 6.22** **Clusters.** Align plans and investments with efforts that direct strategic business development resources to enhance the competitiveness of businesses in traded sector clusters.

**Policy 6.23** **Trade and freight hub.** Encourage investment in transportation systems and services that will retain and expand Portland's competitive position as a West Coast trade gateway and freight distribution hub.

**Policy 6.24** **Traded sector land supply.** Foster traded sector retention, growth, and competitive advantages in industrial districts and the Central City. Recognize the concentration of traded-sector businesses in these districts.

**Policy 6.25** **Import substitution**. Encourage local goods production and service delivery that substitute for imports and help keep the money Portlanders earn in the local economy.

**Policy 6.26** **Business opportunities in urban innovation**. Strive to have Portland's built environment, businesses, and infrastructure systems showcase examples of best practices of innovation and sustainability.

**Policy 6.27** **Traded sector diversity**. Encourage partnerships to foster the growth, small



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business vitality, and diversity of traded sectors.



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## Equitable household prosperity

National and local trends reveal growing inequities in economic opportunity. Income growth has been concentrated among the top-earning 20 percent of the workforce, as disproportionate barriers to upward mobility persist for people of color and people with disabilities. Since 2000, slower job growth and the decline of middle-wage jobs have further widened economic insecurity, increased unemployment, and reduced upward-mobility opportunities for the working poor. Rising inequality threatens the long-term stability of our economy.

In response, the Portland Plan set a high bar for improving economic equity, targeting increased levels of income self-sufficiency from 77 percent of Multnomah County households to 90 percent by 2035. The new policy directions below support expanded employment, and housing opportunities to increase middle-class prosperity, improve job growth in East Portland, and coordinate efforts to overcome poverty and disparities.

**Policy 6.28** **Income self-sufficiency.** ~~Improve~~ Expand access to self-sufficient wage levels and career ladders for low-income people by maintaining an adequate and viable supply of employment land and public facilities to support and expand opportunities in Portland for middle- and ~~high~~ high-wage jobs that do not require a 4-year college degree.

**6.28.a.** Recognize the role of industrial districts as a leading source of middle-wage jobs that do not require a 4-year college degree and as a major source of wage-disparity reduction for under-served and under-represented communities.

**6.28.b.** Evaluate and limit negative impacts of plans and investments ~~for their impact~~ on middle and high wage job creation and retention.

**Policy 6.29** **East Portland job growth.** Improve opportunities for East Portland to grow as a business destination and source of living wage jobs.

**Policy 6.30** **Poverty reduction**. Encourage investment in, and alignment of, poverty-reduction efforts that address economic development, land use, transportation, housing, social services, public health, community development, and workforce development.

**Policy 6.31** **Disparity reduction**. Encourage investment in, and alignment of, public efforts to reduce racial, ethnic, and disability-related disparities in income and employment opportunity.

**Policy 6.32** **Minority-owned, woman-owned and emerging small business (MWESB) assistance.** Ensure that plans and investments improve access to contracting opportunities for minority-owned, woman-owned, and emerging small businesses.



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**Policy 6.33** **Urban renewal plans.** Ensure urban renewal plans primarily benefit existing residents and businesses within the urban renewal area through:

- the creation of wealth,
- revitalization of neighborhoods,
- expansion of housing choices,
- creation of business and job opportunities,
- provision of transportation linkages,
- protection of residents and businesses from the threats posed by gentrification and displacement, and
- the creation and enhancement of those features which enhance the quality of life within the urban renewal area.

A special emphasis will be placed on providing timely benefits to groups most at risk of displacement.



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## Transportation, public facilities, and economic development

Transportation and other public facilities and services play critical roles in ensuring an adequate land supply for job growth, strengthening competitive location advantages, and providing better access to employment opportunities. *See Chapter 8: Public Facilities and Services and Chapter 9: Transportation for related policies on prosperity objectives, leveraging private investment, and freight mobility.*

## Central City

Central City is the region's and the state's high density employment center. While it is primarily an office district for professional and business services, finance, information, and government, it's also a key location for the entertainment, tourism, ~~small~~ industry, and education sectors. *See the Central City 2035 Plan for the land use and development policies for this part of the city's economy*. The following policies provide overall direction for the Central City's continued employment growth, competitive roles in the region, and land use in the Central City industrial districts.

**Policy 6.34** **Central City.** Maintain the Central City's regional share of employment and continue its growth as the unique center of both the city and the region for innovation and exchange through commerce, employment, arts, culture, entertainment, tourism, education, and government.

**Policy 6.35** **Central City industrial districts**. Protect and facilitate the long-term success of Central City industrial districts, while supporting their evolution into places with a broad mix of businesses with high employment densities.

**Policy 6.36** **Innovation Districts.** Provide for expanding campus institutions in the Central City and Marquam Hill, and encourage business development that builds on their research and development strengths.

## Industrial and Employment Districts

Portland is the core of the region's distribution and diverse manufacturing economy, including the state's (and the Columbia River Basin's) largest seaport, rail hub, and airport. Established "industrial sanctuaries" meet the needs of manufacturing and distribution firms for medium to large sites, and are buffered from housing. Other types of employment areas include flex space developments, incubator districts for emerging local businesses, industrial headquarters offices, and dispersed neighborhood employment areas. The businesses in these districts are a primary source of Portland's middle-wage jobs, upward mobility opportunities, and traded sector activity (*see Figure 6-1 – Industrial and Employment Districts*).

Looking forward to 2035, new strategies are needed to expand capacity for employment growth while also meeting environmental and other objectives. The policies below call for:



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1) new tools to accelerate brownfield redevelopment, 2) make freight investments that expand market access and industrial land intensification, 3) more effectively protect prime industrial land, and 4) strategically expand industrial and flexible neighborhood employment areas.



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**Policy 6.374** **Industrial land**. Provide industrial land that encourages industrial business retention, growth, and traded sector competitiveness as a West Coast trade and freight hub, a regional center of diverse manufacturing, and a widely accessible base of family-wage jobs, particularly for under-served and under-represented people.

**Policy 6.38** **Industrial sanctuaries**. Protect industrial land as industrial sanctuaries identified on the Comprehensive Plan Map primarily for manufacturing and distribution uses and to encourage the growth of industrial activities in the city.

**Policy 6.39** **Prime industrial land retention**. Protect the multimodal freight-hub industrial districts at the Portland Harbor, Columbia Corridor, and Brooklyn Yard as prime industrial land (*see Figure 6-1 – Industrial and Employment Districts*) that is prioritized for long-term retention.~~:~~

**6.39.a.** ~~Strictly limit~~Prohibit quasi-judicial Comprehensive Plan Map amendments that convert prime industrial land and consider the potential for amendments to otherwise diminish the economic competitiveness or viability of prime industrial land.

**6.39.b.** Limit conversion of prime industrial land through land use plans, regulations, or public land acquisition for non-industrial uses, especially land that can be used by river-dependent and river-related industrial uses.

**6.39.c.** Limit regulatory impacts on the capacity, affordability, and viability of industrial uses in the prime industrial area.~~Identify how regulations affect the capacity, affordability, and viability of industrial uses, and limit minimize those impacts~~.

**6.39.d.** Strive to offset the reduction of development capacity as needed, with additional prime industrial capacity that includes consideration of comparable site characteristics. ~~-~~Offsets may include but are not limited to additional brownfield remediation, industrial use intensification, strategic investments, and other innovative tools and partnerships that increase industrial utilization of industrial land.

**6.39.e.** Limit the use of prime industrial land for siting of parks, schools, large-format places of assembly, and large-format retail sales.

**6.39.f.** Promote efficient use of freight hub infrastructure and prime industrial land by limiting non-industrial uses that do not need to be located in the prime industrial area.

**Policy 6.40** **Harbor access lands**. Limit use of harbor access lands to river- or rail-dependent or related industrial land uses due to the unique and necessary



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infrastructure and site characteristics of harbor access lands for river-dependent industrial uses.



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**Policy 6.41** **Portland Harbor Superfund Site**. Take a leadership role in prompt resolution and cleanup of the Portland Harbor Superfund Site and redevelopment of associated brownfields. Encourage a science-based and cost-effective cleanup solution that facilitates re-use of land for river- or rail-dependent or related industrial uses.

~~**Policy 6.41** **West Hayden Island**. Provide for the future annexation of West Hayden Island for a combination of open space and deep water marine industrial uses with supplemental requirements in a plan district or other implementation agreement that ensures mitigation of impacts and provision of public benefits. The annexation ordinance, future zoning, plan districts, and intergovernmental agreements will be used to:~~

- ~~Allow no more than 300 acres for future deep water marine terminal and infrastructure development, with operationally viable rail access.~~
- ~~Permanently protect and enhance at least 500 acres as open space, to be managed primarily for the benefit of the regional ecosystem.~~
- ~~Address local quality of life and public health impacts (especially for residents of the nearby manufactured home community), traffic impacts and needed transportation investments, and opportunities for low impact nature based recreational uses.~~
- ~~Achieve a net increase in ecosystem function over 2012 conditions, including floodplain-associated habitats and habitats for conservation priority species.~~

**Policy 6.42** **Multimodal freight corridors**. Encourage freight-oriented industrial development to locate where it can maximize the use of and support reinvestment in multimodal freight corridors.

**Policy 6.43** **Columbia East.–** Provide a mix of industrial and limited business park development in Columbia East (east of 82nd Avenue) that expand employment opportunities supported by proximity to Portland International Airport and multimodal freight access.

**Policy 6.44** **Dispersed employment areas**. Provide small, dispersed employment areas for a flexible and affordable mix of office, creative services, small scale manufacturing, traded sector and distribution, and other small-format light industrial and commercial uses with access to nearby freeways or truck streets.

**Policy 6.45** **Industrial land use intensification**. Encourage reinvestment and intensification of industrial land use, as measured by output and throughput per acre.



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**Policy 6.46** **Industrial brownfield redevelopment**. Provide incentives, investments, technical assistance and other direct support to overcome financial-feasibility gaps to enable remediation and redevelopment of brownfields for industrial growth.

**Policy 6.47** **Impact analysis.** Evaluate and monitor the impacts on industrial land capacity that may result from land use plans, regulations, public land acquisition, public facility development, and other public actions.

**Policy 6.48** **Clean, safe, and green**. Encourage improvements to the cleanliness, safety, and ecological performance of industrial development and freight corridors by facilitating adoption of market feasible new technology and design.

**Policy 6.49** **Industrial growth and watershed health.** Facilitate concurrent strategies to protect and improve industrial capacity and watershed health in the Portland Harbor and Columbia Corridor areas.

**Policy 6.50** **District expansion**. Provide opportunities for expansion of industrial areas based on evaluation of forecasted need and the ability to meet environmental, social, economic, and other goals.



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**Policy 6.51** **Golf course reuse and redevelopment.** Facilitate a mix of industrial, natural resource, and public open space uses on privately owned golf course sites in the Columbia Corridor that property owners make ~~become~~ available for reuse.

**Policy 6.52** **Residential and commercial reuse.** Facilitate compatible industrial or employment redevelopment on residential or commercial sites that become available for reuse if the site is in or near prime industrial areas, and near a freeway or on a freight street.

~~**Policy 6.50 Public facilities and land acquisition.** Limit the use of prime industrial land for parks or other non-industrial public facilities.~~

**Policy 6.53** **Mitigation banks.** Facilitate industrial site development by promoting and allowing environmental mitigation banks that serve industrial land uses on prime industrial land.

**Policy 6.54** **Neighborhood buffers**. Maintain and enhance major natural areas, open spaces, and constructed features as boundaries and buffers for the Portland Harbor and Columbia Corridor industrial areas.

## Campus institutions

Health care and education sectors are concentrated in large hospital, college, higher education and high school campuses (*see Figure 6-2 – Campus Institutions*) as well as dispersed smaller facilities. Major institutions are large employers with campuses that vary from pastoral expanses to more concentrated urban grounds. Health care and education are projected to be the city's leading job growth sectors, adding more than 50,000 new jobs by 2035 at campus institutions and in other commercial areas. Rapid growth of campus institutions is a national trend, and best practices offer opportunities to plan effectively for this campus growth, and reduce neighborhood impacts. Examples of new directions in the policies below include designation of major campuses as employment land, regulatory improvements, and transportation-related improvements.

**Policy 6.55** **Campus institutions**. Provide for the stability and growth of Portland's major campus institutions (*see Figure 6-2 – Campus Institutions*~~see Figure 6-2: Campus Institutions~~) as essential service providers, centers of innovation, workforce development resources, and major employers.

**Policy 6.56** **Campus land use**. Provide for major campus institutions as a type of employment land, allowing uses typically associated with health care and higher education institutions. Coordinate with institutions in changing campus zoning to provide land supply that is practical for development and intended uses.



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**Policy 6.57** **Development impacts.** Protect the livability of surrounding neighborhoods through adequate infrastructure and campus development standards that foster suitable density and attractive campus design.

**Policy 6.58** **Community amenities and services.** Encourage campus development that provides amenities and services to surrounding neighborhoods, emphasizing the role of campuses as centers of community activity.

**Policy 6.59** **Campus edges**. Provide for context-sensitive, transitional uses and development at the edges of campus institutions to enhance their integration into surrounding neighborhoods, including mixed-use and neighborhood-serving commercial uses where appropriate.

**Policy 6.60** **Satellite facilities**. Encourage opportunities for expansion of uses, not integral to campus functions, to locate in centers and corridors to support their economic vitality.

## Neighborhood business districts

Neighborhood business districts are mixed-use corridors and centers outside of the Central City (*see Figure 6-3 – Neighborhood Business Districts*). Home to retail and related businesses that typically serve customers on-site, they are commonly interspersed with multi-family housing. Many of these districts are experiencing significant growth and change, providing synergistic locations for concentrated housing and commercial growth in "complete neighborhoods" with convenient access to services.

Neighborhood business districts also provide major economic benefits by keeping local dollars circulating within Portland, providing goods and services to nearby residents, defining neighborhood character, supporting small business vitality, and accounting for about ~~one fourth~~a quarter of all jobs in the city. Neighborhood business districts are especially important to Portland because we are a city mainly made up of small business.

New directions to support these multi-functional places include:

- A framework of new centers and civic corridors well-~~-~~served by pedestrian, bicycle, and transit systems.
- Focused public investments that attract concentrated growth and improve equity, and community-based economic development initiatives that broaden access to jobs and prosperity.
- Opportunities for affordable commercial space and affordable housing.



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**Policy 6.61** **Neighborhood business districts**. Provide for the growth, economic equity, and vitality of neighborhood business districts (*see Figure 6-3 – Neighborhood Business Districts*~~Figure 6-3~~).

**Policy 6.62** **District function.** Enhance the function of neighborhood business districts as a foundation of neighborhood livability.

**Policy 6.63** **Small, independent businesses.** Facilitate the retention and growth of small and locally-owned businesses.

**Policy 6.64** **Home based businesses.** Encourage low-impact home based businesses in residential areas.

**Policy 6.65** **Neighborhood-serving business.** Provide for neighborhood business districts and small commercial nodes in areas between centers to expand local access to goods and services. Allow nodes of small-scale ~~neighborhood~~ neighborhood-serving commercial uses in large planned developments and as a ground floor use in high density residential areas.

**Policy 6.66** **Investment priority.** Prioritize commercial revitalization investments in neighborhoods that serve communities with limited access to goods and services.

**Policy 6.67** **Non-conforming neighborhood business uses**. Limit non-conforming uses to reduce adverse impacts on nearby residential uses while avoiding displacement of existing neighborhood businesses.

**Policy 6.68** **Involuntary commercial displacement.** Evaluate plans and investments for their impact on existing businesses.

**6.~~66~~685.a**. Limit involuntary commercial displacement in areas at risk of gentrification and incorporate tools to reduce the cost burden of rapid neighborhood change on ~~vulnerable~~ small business owners vulnerable to displacement.

**6.~~66~~685.b.** Encourage the preservation and creation of affordable neighborhood commercial space to support a broad range of small business owners.

**Policy 6.69** **Temporary and informal markets and structures.** Acknowledge and support the role that temporary markets (farmers markets, craft markets, flea markets, etc.) and other temporary or mobile vending structures play in enabling startup business activity. Also acknowledge that temporary uses ~~are assumed to be replaced~~ may ultimately be replaced by more permanent development and uses.



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**Policy 6.70** **Community economic development.** Encourage collaborative approaches to align land use and neighborhood economic development for residents and business owners to better connect and compete in the regional economy.

**6.70.a.** Encourage broad-based community coalitions to implement land use and economic development objectives and programs.

**6.70.b.** Enhance opportunities for cooperation and partnerships between public and private entities that promote economic vitality in communities most disconnected from the regional economy.

**6.70.c.** Encourage cooperative efforts by area businesses, business associations, and neighborhood associations to work together on commercial revitalization efforts, sustainability initiatives, and transportation demand management.

**Policy 6.71** **Centers**. Encourage concentrations of commercial services and employment opportunities in centers.

**6.71.a.** Encourage a broad range of neighborhood commercial services in centers to help residents and others in the area meet daily needs and/or serve as neighborhood gathering places.

**6.71.b.** Encourage the retention and further development ~~and retention~~ of grocery stores and local markets as essential elements of centers.

**6.71.c.** Enhance opportunities for services and activities in centers that are responsive to the needs of the populations and cultural groups of the surrounding area.

**6.71.d.** Require that ground-level building spaces in core areas of centers accommodate commercial or other street-activating uses and services.

**6.71.e.** Encourage employment opportunities as a key function of centers, including connections between centers, institutions, and other major employers to reinforce their roles as vibrant centers of activity.



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*Figure 6-1. Industrial and Employment Districts*

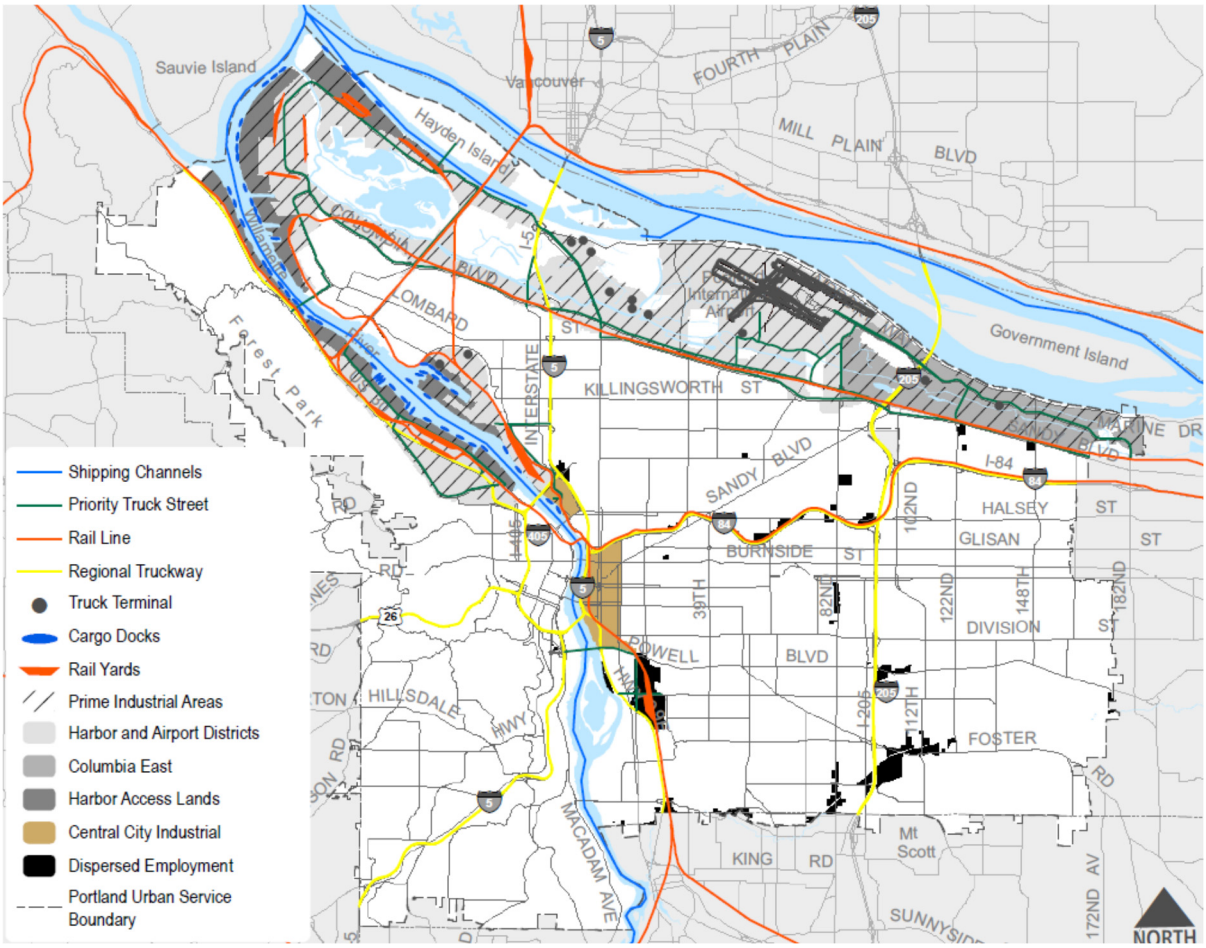




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*Figure 6-2. Campus Institutions*

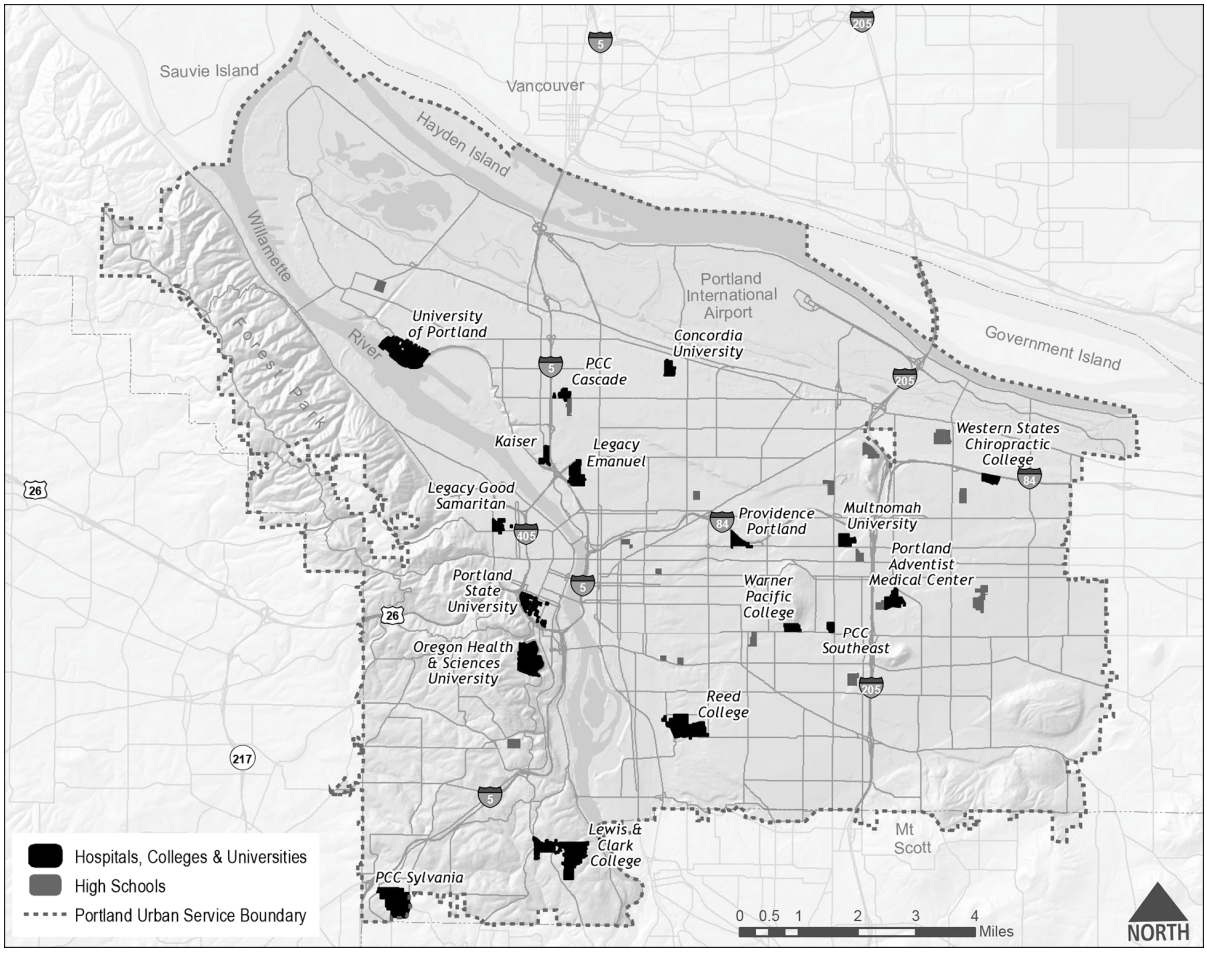




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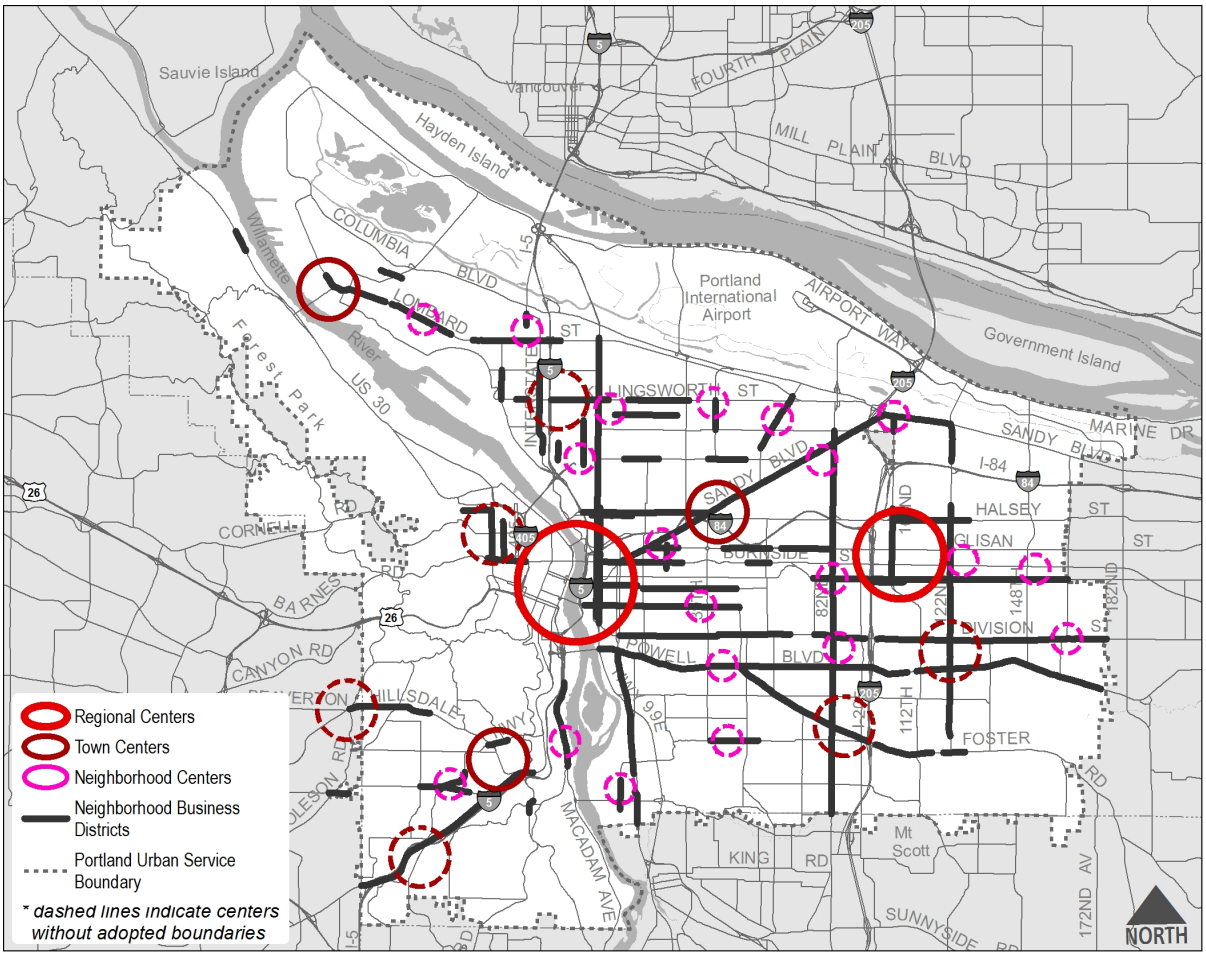
*Figure 6-3. Neighborhood Business Districts*



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# Chapter 7: Environment and Watershed Health

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Recognize the economic, health, cultural, and intrinsic values of nature, and the importance of community stewardship.
- Preserve natural resources and the beneficial functions and services they provide.
- Improve air quality and watershed health, including hydrology, water quality, fish and wildlife habitat, and biodiversity.
- Ensure all Portlanders experience the benefits of a livable environment and healthy watersheds, and reduce environmental disparities affecting under-served and under-represented communities.
- Recognize the city's impact on global climate change, and opportunities to reduce carbon emissions, and sequester carbon.
- Recognize the importance of a healthy urban forest and natural systems in reducing the impacts of natural hazards, such as landslides and, flooding, and wildfire, and in adapting to climate change.
- Prevent incremental environmental degradation including the spread of invasive species, loss of habitat, and adverse impacts of additional impervious surfaces.
- Ensure that environmental protection programs and regulations reflect current data, the best available science, and evaluation of impacts to under-served and under-represented communities.
- Advance good decisions and adaptive management through better data collection.
- Provide guidance that addresses the distinct ecological issues of specific watersheds.
- Ensure that plans and investments are coordinated with relevant policies from other City plans such as the Portland Watershed Management Plan, Urban Forest Management Plan, Climate Action Plan, Climate Change Preparation Strategy, Parks plans, and Natural Hazard Mitigation Plan, and plans addressing environmental equity.



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## Why is this important?

Located at the confluence of two major rivers, between two mountain ranges, and adjacent to some of the most fertile agricultural land in the world, Portland's wealth of natural resources provides an array of ecologically, economically, culturally and aesthetically valuable ecosystem services. ~~Our r~~Rivers, streams, and floodplains convey and store water and provide critical habitat for native fish and aquatic species. ~~Our w~~Wetlands, trees, and vegetation clean and cool Portland's air and water, stabilize hillsides, soak up rainwater, and provide habitat for an abundance of birds and other wildlife. These resources also trap carbon and reduce urban heat island effects, which are increasingly important given the potential impacts of climate change. These natural resources are key contributors to Portland's identity, reputation, and sense of place.

The City has a long-standing commitment to maintaining a high-quality environment; however, many of Portland's natural resources have been lost over time or are currently at risk. Urbanization has filled floodplains, contributing to seasonal flooding damage. Stormwater runoff from paved areas and rooftops has eroded our stream channels and polluted our streams, many of which are unable to support healthy fish populations. There is concern that anticipated growth and development will result in substantial tree removal, increased risks of natural hazards, continued habitat loss, and negative impacts on at-risk plant and animal species. In addition, there is concern that further environmental degradation will disproportionately affect communities of color and other under-served and under-represented communities.

The City's land use plans and investments have been, and will continue to be, instrumental in helping ~~contribute to~~ improve~~ments in~~ air and water quality over time, ~~and in~~ preserve~~ing~~ natural resources and the benefits they provide, and reduce environment~~ly~~-related disparities. In addition, the City and community have made substantial investments of time and money to restore our watersheds. The goals and policies in this chapter protect these investments and help the City meet various regulations to protect public health and the environment. With thoughtful guidance, we can achieve and sustain healthy watersheds and a healthful environment as the city grows.



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# Goals

**Goal 7.A: Climate**
Carbon emissions are reduced ~~by~~ to 50~~%~~ percent below 1990 levels by 2035.

**Goal 7.B: Healthy watersheds and environment**
~~Ecological~~ Ecosystem services and ecosystem functions~~,~~ are maintained and watershed conditions have improved over time, supporting public health and safety, environmental quality, fish and wildlife, cultural values, economic prosperity, and the intrinsic value of nature.

**Goal 7.C: Resilience**
Portland's built and natural environments function in complementary ways and are resilient in the face of climate change~~,~~ and natural hazards.

**Goal 7.D: Environmental equity**
All Portlanders have access to clean air and water, can experience nature in their daily lives, and benefit from development designed to lessen the impacts of natural hazards and environmental contamination.

**Goal 7.E: Community stewardship**
Portlanders actively participate in efforts to maintain and improve the environment, including watershed health.


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# Policies

## Improving environmental quality and resilience ~~preventing degradation~~

The following policies are intended to support improving environmental quality and watershed health over time as the city grows. ~~They provide direction to enhance the condition, capacity, and resilience of Portland's air and water.~~ They support Portland's watershed plan goals to restore hydrology, water quality, habitat and biological communities.

~~These policies~~ This section calls for ~~more effectively~~ preventing incremental environmental degradation, including the spread of invasive species, soil loss, habitat fragmentation, and introduction of hazards to wildlife. Like preventive medicine, preventing environmental degradation is more successful and cost-effective than addressing problems as they increase in severity. These polices also~~y~~ support~~s~~ a healthy urban forest and recognizes that healthy natural systems reduce natural hazard risks; t~~.~~ They also help the City mitigate and adapt to climate change.

~~Like preventive medicine, preventing additional environmental degradation will be more successful and cost-effective than addressing problems as they increase in severity.~~ These policies recognize that degraded environmental conditions disproportionally affect under-served and under-represented communities. They provide guidance to avoid future disparities and their implementation can help improve existing environmental conditions and the well-being of under-served and under-represented communities.

~~These policies recognize existing disparities and the need to will help the City avoid exacerbating adverse and, disproportionate environmental impacts on under-served and under-represented communities.~~ While some of the impact areas listed below are regulated by other agencies, the City's land use plans and investments can help avoid or reduce impacts, while also improving or supporting efforts to improve~~ing~~ conditions over time.

**Policy 7.1** **Environmental quality.** Protect or support efforts to protect air, water, and soil quality, and associated benefits to public and ecological health and safety, through plans and investments.

**Policy 7.2** **Environmental equity.**– Prevent or reduce adverse environment-related disparities affecting under-served and under-represented communities through plans and investments, including disparities relating to air and water quality, natural hazards, contamination, climate change, and access to



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nature.

**Policy 7.3** **Ecosystem services.** Consider the benefits provided by healthy ecosystems that contribute to the livability and economic health of the city.

**Policy 7.4** **Climate change.** Update and implement strategies to reduce carbon emissions and increase resilience through plans and investments, and public education.

**7.4.a. Carbon sequestration.** Enhance the capacity of Portland's urban forest, soils, wetlands, and other water bodies to serve as carbon reserves.

**7.4.b. Climate adaptation and resilience.** Enhance the ability of rivers, streams, wetlands, floodplains, urban forest, habitats, and wildlife to ~~temper~~ limit and adapt to climate-exacerbated flooding, landslides, wildfire, and urban heat island effects.

**Policy 7.5** **Air quality.** ~~Ensure that plans and investments are consistent with and advance efforts to l~~improve, ~~or~~ support efforts to improve, ~~e~~ air quality through plans and investments, including ~~and~~ reduc~~e~~ exposure to air toxics, criteria pollutants, and urban heat island effects. Consider the impacts of air quality ~~related~~ on the health ~~impacts o~~f ~~n~~ all Portlanders~~, with an emphasis on under-served and under-represented communities~~.

**Policy 7.6** **Hydrology.** ~~Ensure that plans and investments are consistent with and advance efforts to~~ Through plans and investments, improve or support efforts to improve watershed hydrology to achieve more natural flow and enhance conveyance and storage capacity in rivers, streams, floodplains, wetlands, and aquifers. Minimize impacts from development and associated impervious surfaces, especially in areas with poorly infiltrating soils and limited public stormwater discharge points, and encourage restoration of degraded hydrologic functions~~, where practicable~~.

**Policy 7.7** **Water quality.** ~~Ensure that plans and investments are consistent with and advance efforts to l~~improve, or support efforts to improve, water quality in rivers, streams, floodplains, groundwater, and wetlands through land use plans and investments, to address water quality issues including ~~reducing~~ toxics, bacteria, temperature, metals, and sediment pollution. Consider the impacts of water quality ~~related~~ on the health ~~impacts o~~f ~~n~~ all Portlanders~~, especially under-served and under-represented communities~~.

**Policy 7.8** **Biodiversity.** Strive to achieve and maintain self-sustaining populations of native species , including native plants, native resident and migratory fish,



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and wildlife species, at-risk species, and beneficial insects (such as pollinators) through plans and investments.

**Policy** ~~Maintain self-sustaining populations of native plants, native resident and migratory fish, and wildlife species, including at-risk species, and beneficial insects such as pollinators.~~

**7.9** **Habitat and biological communities.** ~~Ensure that plans and investments are consistent with and advance efforts to l~~Improve, or support efforts to improve fish and wildlife habitat and biological communities. Use plans and investments to enhance ~~the~~ habitat diversity, quantity, ~~and~~ quality, ~~of fish and wildlife habitat~~ and ~~-~~ habitat corridors, and especially habitats that:

- Are rare and declining. ~~habitat types, and habitats that~~
- Support at-risk plant and animal species and communities.
- Support recovery of species under the Endangered Species Act, and prevent new listings.
- Provide culturally important food sources, including those associated with Native American fishing rights. ~~.~~

**Policy 7.10** **Habitat connectivity.** ~~Ensure that plans and investments are consistent with and advance efforts to l~~Improve or support efforts to improve terrestrial and aquatic habitat connectivity for fish and wildlife by using plans and investments, ~~by~~to:

- Prevent~~ing~~ and ~~repairing~~repair habitat fragmentation.
- Improve~~ing~~ habitat quality.
- Weave~~ing~~ habitat into sites as new development occurs.
- Enhance~~ing~~ or create~~ing~~ habitat corridors that allow fish and wildlife to safely access and move through and between habitat areas.

Promote restoration and protection of floodplains.

-

**Policy 7.11** **Urban forest.** ~~Ensure that plans and investments are consistent with and advance efforts to l~~Improve, or support efforts to improve ~~-~~ the quantity, quality, and equitable distribution of Portland's urban forest through plans and investments:

**7.11~~9~~.a.** **Tree preservation.** Require or encourage preservation of large healthy trees, native trees and vegetation, tree groves, and



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forested areas ~~as an element of discretionary land use reviews~~.

**7.11.b.** **Urban forest diversity.** Coordinate plans and investments with efforts to improve tree species diversity and age diversity.

**7.11.c.** **Tree canopy.** Support progress toward meeting City tree canopy targets.

**7.11.d.** **Tree planting.** Invest in tree planting and maintenance, especially in ~~low~~ low-canopy areas, neighborhoods with under-served or under-represented communities, and within and near urban habitat corridors.

**7.11.e.** **Vegetation in natural resource areas.** Require native trees and vegetation in significant natural resource areas.

**7.11.f.** **Resilient urban forest.** Encourage planting of Pacific Northwest hardy and climate change resilient native trees and vegetation generally, and especially in urban habitat corridors.

**7.11.g.** **Trees in land use planning.** Identify priority areas for tree preservation and planting in land use plans.

**7.11.h.** **Managing wildfire risk**~~.~~ – Address wildfire hazard risks and management priorities through plans and investments.

**Policy 7.12** **Invasive species.** ~~Ensure that plans and investments are consistent with and advance efforts to prevent~~ Prevent the spread of invasive plants, and support~~ing~~ efforts to reduce the impacts of invasive animals and insects, through plans, investments, and education.

**Policy 7.13** **Soils.** Coordinate plans and investments with programs that address human-induced soil loss, erosion, contamination, or other impairments to soil quality and function.

**Policy 7.14** **Natural hazards.** Prevent development-related degradation of natural systems and associated increases in landslide, wildfire, flooding, and earthquake risks~~, especially as they affect under-served and under-represented communities~~.

**Policy 7.15** **Brownfield remediation.** Improve environmental quality and watershed health by promoting and facilitating brownfield remediation and redevelopment that incorporates ecological site design and resource enhancement.



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**Policy 7.16** **Adaptive management.** Evaluate trends in watershed and environmental health using current monitoring data and information to guide and support improvements in the effectiveness of City plans , ~~regulations, and infrastructure~~ and investments.

**Policy 7.17** **Restoration partnerships.** Coordinate plans and investments with other jurisdictions, air and water quality regulators, watershed councils, soil and water conservation ~~organizations~~districts, sovereign nations, and community organizations and groups~~,~~ including under-served and under-represented communities, to ~~maximize~~ optimize the benefits, distribution, and cost-effectiveness of watershed ~~environmental~~ restoration and enhancement efforts ~~and investments~~.

**Policy 7.18** **Community stewardship.** Encourage voluntary cooperation between property owners, community organizations, and public agencies to restore or re-create habitat on their property, including removing invasive plants and planting native species.

*Other polices in Chapters 3: Urban Form and Chapter 4: Design and Development are essential counterparts to policies in the section above.*

## Planning for natural resource protection

Portland's quality of life depends on maintaining clean air, water, soil, and a healthy environment overall. The policies in this section will preserve and maintain environmental quality by emphasizing protection of natural resources and their functions, consistent with widely accepted ecological principles and scientific literature. These policies call for an up-to-date natural resource inventory, and ~~actions~~ plans, regulations, and coordinated land acquisition programs to protect ~~air, water, soil, climate, biodiversity, and existing~~ significant natural resources and watershed health. They also call for ~~consideration of tradeoffs such as~~considering potential impacts on public health and safety, equity, and the economy ~~in developing environmental protection programs~~.

**Policy 7.19** **Natural resource protection.** Protect the quantity, quality, and function of significant natural resources identified in the City's natural resource inventory, including:

- Rivers, streams, sloughs, and drainageways.
- Floodplains.
- Riparian corridors.
- Wetlands.
- Groundwater.
- Native and other beneficial vegetation species and communities.



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- Aquatic and terrestrial habitats, including special habitats or habitats of concern, ~~including~~ large anchor habitats, habitat complexes and corridors, rare and declining habitats such as wetlands, native oak, bottomland hardwood forest, grassland habitat, shallow water habitat, and habitats that support special-status or at-risk plant and wildlife species. ~~—~~
- Other resources identified in natural resource inventories.

**Policy 7.20** **Natural resource inventory.**
Maintain an up-to-date inventory by identifying the location and evaluating the relative quantity and quality of natural resources.

**Policy 7.21** **Environmental ~~protection programs~~plans and regulations.** ~~Adopt~~ Maintain up-to-date environmental protection plans and regulations that specify the significant natural resources to be protected and the types of protections to be applied, based on the best data and science available~~,~~ and on an evaluation of ~~the potential consequences of allowing conflicting uses~~cumulative environmental, social, and economic impacts and tradeoffs. *See Figure 7-2~~, — Adopted Environmental Plans.~~*

**7.21.a.** Improve the effectiveness of environmental protection plans and regulations to protect and encourage enhancement of ecological functions and ecosystem services.

**7.21.b.** Prevent or reduce disproportionate environmental impacts on under-served and under-represented communities.

~~**Policy 7.217 Environmental protection program updat. Improve the effectiveness of environmental protection plans and regulations. Updates will reflect current data and science, consider impacts on under-served and under-represented communities, and meet multiple city goals.**~~

~~**Policy 7.13 Ecosystem services. Consider the benefits provided by healthy ecosystems that contribute to the livability and economic health of the city.**~~

**Policy 7.22** **Land acquisition priorities and coordination.** Maintain a land acquisition program as a tool to protect and support natural resources and their



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functions. Coordinate land acquisition with the programs of City bureaus~~,~~ and other agencies~~,~~ and organizations.



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~~Maintain a prioritized list of natural resource types, target areas, or properties desirable for public acquisition to support long-term natural resource protection, and establish a process for coordinating acquisition with other programs including strategies to maintain employment land capacity, programs to protect water quality, and programs to reduce exposure to flooding hazards.~~.

## Protecting natural resources in development situations

The following policies provide guidance for land use regulations that address significant natural resources where new development is proposed. They will help ensure that the potential adverse impacts of development are well understood, and avoided where practicable. These policies also call for an evaluation of design alternatives to minimize negative impacts, and the use of mitigation approaches that fully mitigate unavoidable impacts.

**Policy 7.23** **Impact evaluation.** Evaluate the potential adverse impacts of proposed development on significant natural resources, their functions, and the ecosystem services they provide.

**Policy 7.24** **Regulatory hierarchy: avoid, minimize, mitigate.** Maintain regulations requiring ~~Require~~ that the potential adverse impacts of new development on significant natural resources and their functions first be avoided where practicable, then minimized, then lastly, mitigated.

**Policy 7.25** **Mitigation effectiveness.** Require that mitigation approaches ~~that~~ compensate fully for adverse impacts on locally and regionally significant natural resources and functions.~~–~~ ~~maximize the intended natural resource-related benefits.~~ Require ~~on-site~~ mitigation to be located as close to the impact as possible.~~–~~ Mitigation must also take place within the same watershed or portion of the watershed that is within the Portland Urban Services Boundary, unless mitigating outside of these areas will provide a greater local ecological benefit.~~–~~ Mitigation will be subject to the following preference hierarchy~~.~~:

1. On the site of the resource subject to impact~~,~~ with the same kind of resource~~;~~; if that is not possible, then~~;~~
2. Off-site~~,~~ with the same kind of resource;~~ ;~~ if that is not possible, then~~;~~
3. On-site with a different kind of resource~~;~~; if that is not possible, then~~;~~
4. Off-site with a different kind of resource.

~~unless off-site mitigation within the same watershed will improve mitigation effectiveness.~~



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**Policy 7.26** **Improving environmental conditions through development.**– Encourage ecological site design, site enhancement, or other tools to improve ecological functions and ecosystem services in conjunction with new development and alterations to existing development.



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~~Policy 7.12 State and federal coordination. Coordinate implementation of these policies to ensure consistency with state and federal permitting authorities.~~

## Aggregate resources

**Policy 7.27** **Aggregate resource protection.** Protect aggregate resource sites for current and future use~~,~~ where there are no major conflicts with urban needs, or where these conflicts may be resolved**.**

**Policy 7.28** **Aggregate resource development**. Ensure that development of aggregate resources minimizes adverse environmental impacts and impacts on adjacent land uses.

**Policy 7.29** **Mining site reclamation.** Ensure that the reclamation of mining sites protects public health and safety, protects fish and wildlife (including at-risk species), enhances or restores habitat (including rare and declining habitat types), restores ~~the site to~~ adequate watershed conditions and functions on the site, and is compatible with the surrounding land uses and conditions of nearby land.



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## Watershed specific policies

The policies above guide planning, actions, and investments citywide. The following policies are intended to augment the citywide Watershed Health and Environment policies, by providing additional guidance relating and responding to the characteristics within each of Portland's distinctive watersheds. They address watershed-specific habitat types, hydrology, water quality issues, and stormwater management challenges. Together, the citywide and watershed-specific policies support the close coordination of watershed health and land use programs, guiding land use planning-related activities and future infrastructure investments. While these watersheds are not entirely within Portland's urban services boundary, Portland's actions can have significant benefits for the watershed as a whole.

### Columbia River Watershed

**Policy 7.30** **In-water habitat.** Enhance in-water habitat for native fish and wildlife, particularly in the Oregon Slough and near-shore environments along the Columbia River.

**Policy 7.31** **Sensitive habitats.** Enhance grassland, beach, riverbanks, wetlands, bottomland forests, shallow water habitats, and other key habitats for wildlife traveling along the Columbia River migratory corridor, while continuing to manage the levees and floodplain for flood control.

~~**Policy 7.40 Floodplain protection and restoration.** Promote restoration and protection of floodplain habitats as a flood protection strategy.~~

**Policy 7.32** **River-dependent and river-related uses.** Maintain plans and regulations that recognize the needs of river-dependent and river-related uses, while also supporting ecologically-sensitive site design and practices.

## Willamette River Watershed

**Policy 7.33** **Fish habitat.** Provide adequate intervals of ecologically-functional shallow-water habitat for native fish along the entire length of the Willamette River within the city, and at the confluences of its tributaries.

**Policy 7.34** **Stream connectivity.** Improve stream connectivity between the Willamette River and its tributaries.

**Policy 7.35** **River bank conditions.** Preserve existing river bank habitat and encourage the rehabilitation of river bank sections that have been significantly altered due to development with more fish and wildlife friendly riverbank conditions.



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**Policy 7.36** **South Reach ecological complex.** Enhance habitat quality and connections between Ross Island, Oaks Bottom, and riverfront parks and natural areas south of the Central City, to enhance the area as a functioning ecological complex.

**Policy 7.37** **Contaminated sites.** ~~Ensure that plans and investments are consistent with and advance~~ Promote and support programs that facilitate the cleanup, reuse, and restoration of the Portland Harbor Superfund site and other contaminated upland sites.

**Policy 7.38** **Sensitive habitats.** Protect and enhance ~~grasslands,~~ beaches, floodplains, wetlands, remnant native oak, bottomland hardwood forest, and other key habitats for native wildlife including shorebirds, waterfowl, and species that migrate along the Pacific F~~f~~lyway and the Willamette River corridor.

**Policy 7.39** **Riparian corridors.** Increase the width and quality of vegetated riparian buffers along the Willamette River ~~where practicable~~.

**Policy 7.40** **Connected upland and river habitats.** Enhance habitat quality and connectivity between the Willamette riverfront and upland natural resource areas.

**Policy 7.41** **River-dependent and river-related uses.** Maintain plans and regulations that recognize the needs of river-dependent and river-related uses, while also supporting ecologically-sensitive site design and practices.

**Policy 7.42** **Forest Park.** Enhance Forest Park as an anchor habitat and recreational resource.



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## Columbia Slough Watershed

**Policy 7.43** **Fish passage.** Restore in-stream habitat and improve fish passage within the Columbia Slough, including for salmonids in the lower slough.

**Policy 7.44** **Flow constriction removal.** Reduce constriction, such as culverts, in the slough channels, to improve the flow of water and water quality.

**Policy 7.45** **Riparian corridors.** Increase the width ~~and~~ , quality, and native plant diversity of vegetated riparian buffers along Columbia Slough channels and other drainageways within the watershed, ~~where practicable,~~ while also managing the slough for flood control.

**Policy 7.46** **Sensitive habitats.** Enhance grasslands and wetland habitats in the Columbia Slough, such as those found in the Smith and Bybee Lakes and at the St. Johns Landfill site, to provide habitat for sensitive species, and for wildlife traveling along the Columbia and Willamette river migratory corridors.

**Policy 7.47** **Connected rivers habitats.** Enhance upland habitat connections to the Willamette and Columbia rivers.

**Policy 7.48** **Contaminated sites.** Ensure that plans and investments are consistent with and advance programs that facilitate the cleanup, reuse, and restoration of contaminated sites that are adjacent, or that discharge stormwater, to the Columbia Slough.

**Policy 7.49** **Portland International Airport.** Protect, restore, and enhance natural resources and functions in the Portland International Airport plan district, as identified in Portland International Airport/Middle Columbia Slough Natural Resources Inventory. Accomplish this through regulations, voluntary strategies, and the implementation of special development standards.



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## Fanno and Tryon Creek Watersheds

**Policy 7.50** **Stream connectivity.** Encourage the daylighting of piped portions of Tryon and Fanno creeks and their tributaries.

**Policy 7.51** **Riparian and habitat corridors.** Protect and enhance riparian habitat quality and connectivity along Tryon and Fanno creeks and their tributaries. Enhance connections between riparian areas, parks, anchor habitats, and areas with significant tree canopy. Enhance in-stream and upland habitat connections between Tryon Creek State Natural Area and the Willamette River.

**Policy 7.52** **Reduced hazard risks.** Reduce the risks of landslides and streambank erosion by protecting trees and vegetation that absorb stormwater, especially in areas with steep slopes or limited access to stormwater infrastructure.

## Johnson Creek Watershed

**Policy 7.53** **In-stream and riparian habitat.** Enhance in-stream and riparian habitat and improve fish passage for salmonids along Johnson Creek and its tributaries.

**Policy 7.54** **Floodplain restoration.** Enhance Johnson Creek floodplain functions to increase flood-storage capacity, improve water quality, and enhance fish and wildlife habitat.

**Policy 7.55** **Connected floodplains, springs, and wetlands.** Enhance hydrologic and habitat connectivity between the Johnson Creek floodplain and its springs and wetlands.

**Policy 7.56** **Reduced natural hazards.** Reduce the risks of landslides, streambank erosion and downstream flooding by protecting seeps, springs, trees, vegetation, and soils that absorb stormwater in the East Buttes.

**Policy 7.57** **Greenspace network.** Enhance the network of parks, trails, and natural areas near the Springwater Corridor Trail and the East Buttes to enhance habitat connectivity and nature-based recreation in East Portland.

*For additional policy guidance regarding geographically-specific issues and opportunities, see Chapter 4: Design and Development. More specific flood management policies are in Chapter 8: Public Facilities and Services.*



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*Figure 7-1. Portland's Watersheds*

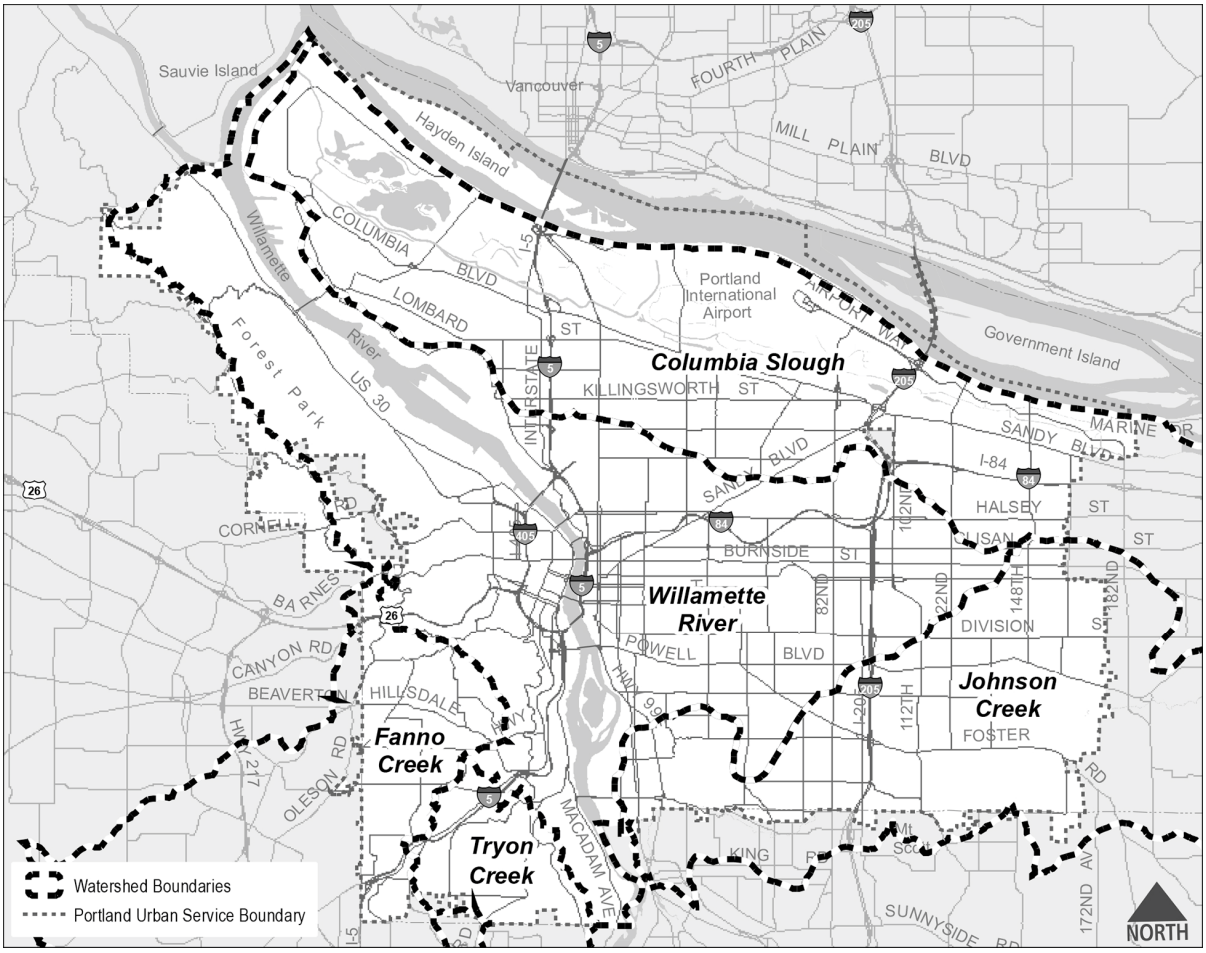




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*Figure 7-2~~1~~. Adopted Environmental Plans*

| Plan | Ordinance No. | Effective dates |
|---|---|---|
| Columbia Corridor Industrial and Environmental Mapping Project | NA | 1989 |
| Balch Creek Watershed Protection Plan | 163770 | 1990 |
| Columbia South Shore Plan | 163609, 167127 | 1990, 1993 |
| Johnson Creek Basin Protection Plan | 164472 | 1991 |
| Northwest Hills Natural Areas Protection Plan | 164517, 168699 | 1991, 1995 |
| Southwest Hills Resource Protection Plan | 165002 | 1992 |
| East Buttes, Terraces and Wetlands Conservation Plan | 166572 | 1993 |
| Fanno Creek and Tributaries Conservation Plan | 167293 | 1994 |
| Skyline West Conservation Plan | 168154 | 1994 |
| Boring Lava Domes Supplement to the Johnson creek Basin Protection Plan | 171740 | 1997 |
| Portland International Raceway Plan | 172978 | 1999 |
| Multnomah County-Portland Unincorporated Urban Areas Functional Plan Compliance Project | County Ordinance No. 967 | 2001 |
| Pleasant Valley Plan | 178961 | 2004 |
| Cascade Station/Portland International Center Plan | 179076 | 2005 |
| Portland International Airport Plan | 184521 | 2011 |



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# Chapter 8: Public Facilities and Services

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Set clear standards for service delivery and system expansion for public rights-of-way, sanitary and stormwater systems, water, parks and recreation, public safety and emergency response, solid waste management, school facilities, technology access, and energy infrastructure.
- Emphasize the development of facilities that serve multiple goals.
- Affirm methods for interagency and intergovernmental coordination.
- Advance an adaptive management approach to improve reliability and resilience.
- Provide more equitable service delivery.
- Reduce risks to human and environmental health and safety.

## Why is this important?

High-quality and dependable basic public services, like clean water and reliable sewer and stormwater management services, are essential to Portland's future success. Cost-effective and dependable services improve quality of life, affordability, and make Portland a more attractive place to do business. Well-built and well-maintained facilities also help the city recover from damaging natural events and emergencies. The City's public facilities and services can also help create a vibrant public realm.

The City's public facility systems provide water, sewer, transportation, parks, and civic services. Public facilities include the varied and extensive networks of streets and pipes, as well as parks and natural ~~areas, that~~areas, which not only manage stormwater and flooding, but also help provide places for recreation. Public services include things like public transportation and police, fire, and emergency response. In addition, services such as access to broadband technology, electricity and natural gas, and comprehensive waste, recycling, and composting services are essential for households and businesses. It takes the collective and coordinated effort of multiple agencies and regulated utilities to maintain and operate the complex systems used to manage and provide these necessities to Portlanders.

Public agencies aim to provide basic services to all Portlanders. However, for a variety of reasons, not all services are distributed equitably across the city. The agencies charged with managing public facility systems must balance the need to maintain existing services and infrastructure with the need to bring new or improved services to more recently annexed



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areas of the city, to under-served and under-represented communities, and to new residents and businesses.
In addition, these improvements must be made in ways that meet federal, state, and regional regulations.

Given the likelihood of environmental, economic, and technological change in the next ~~twenty~~ 20 years, the agencies that deliver, build, and manage services and facilities must reinvent systems and facilities to satisfy multiple uses, withstand environmental stress, and adapt to changing circumstances. The goals and policies in this chapter support the equitable, efficient, and adaptive management approaches that are needed to provide high-quality facilities and services to all Portlanders, including those in future generations.



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# Goals

**~~GOAL~~ Goal 8.A: Quality public facilities and services**
High-quality public facilities and services provide Portlanders with optimal levels of service throughout the city, based on system needs and community goals, and in compliance with regulatory mandates.

**Goal ~~GOAL~~ 8.B: Multiple benefits**
Public facility and service investments improve equitable service provision, support economic prosperity, and enhance human and environmental health.

**Goal ~~GOAL~~ 8.C: Reliability and resiliency**
Public facilities and services are reliable, able to withstand or recover from catastrophic natural and manmade events, and are adaptable and resilient in the face of long-term changes in the climate, economy and technology.

**Goal ~~GOAL~~ 8.D: Public rights-of-way**
Public rights-of-way enhance the public realm and provide a multi-purpose, connected, safe, and healthy physical space for ~~safe~~ movement and travel, public~~,~~ and private utilities, and other appropriate public ~~purposes~~functions and uses.

**Goal ~~GOAL~~ 8.E: Sanitary and stormwater systems**
Wastewater and stormwater are managed, conveyed, and/or treated to protect public health, safety, and the environment, and to meet the needs of the community on an equitable, efficient, and sustainable basis.

**Goal ~~GOAL~~ 8.F: Flood management**
Flood management systems and facilities support watershed health and manage flooding to reduce adverse impacts on Portlanders' health, safety, and property.

**Goal ~~GOAL~~ 8.G: Water**
Reliable and adequate water supply and delivery systems provide sufficient quantities of high-quality water at adequate pressures to meet the needs of the community on an equitable, efficient, and sustainable basis.

**Goal ~~GOAL~~ 8.H: Parks, natural areas, and recreation**
All Portlanders have safe, convenient, and equitable access to high-quality parks, natural areas, trails, and recreational opportunities in their daily lives, which contribute to their health and well-being. The City manages its natural areas and urban forest to protect unique urban habitats and offer Portlanders an opportunity to connect with nature.

**Goal ~~GOAL~~ 8.I: Public safety and emergency response**
Portland is a safe, resilient, and peaceful community where public safety, emergency response, and emergency management facilities and services are coordinated and able to effectively and efficiently meet community needs.


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**Goal ~~GOAL~~ 8.J: Solid waste management**
Residents and businesses have access to waste management services and are encouraged to be thoughtful consumers to minimize upstream impacts and avoid generating waste destined for the landfill. Solid waste — including food, yard debris, recyclables, electronics, and construction and demolition debris — is managed, recycled, and composted to ensure the highest and best use of materials.

**Goal ~~GOAL~~ 8.K: School facilities**
Public schools are honored places of learning as well as multifunctional neighborhood anchors serving Portlanders of all ages, abilities, and cultures.

**Goal ~~GOAL~~ 8.L: Technology and communications**
All Portland residences, businesses, and institutions~~ers~~ have access to universal, affordable, and reliable state-of-the-art communication and technology services.

**Goal ~~GOAL~~ 8.M: Energy infrastructure and services**
Residents, businesses, and institutions are served by reliable energy infrastructure that provides efficient, low-carbon, affordable energy through decision-making based on integrated resource planning.


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# Policies

## Service provision and urbanization

The policies in this section support the maintenance of an urban services boundary to coordinate planning and provision of public facilities. These policies also identify which urban facilities and services are and will be provided by the City of Portland within this boundary. This section supports Statewide Planning Goal 11 — Public Facilities.

The Portland Comprehensive Plan addresses three distinct types of land: rural, urbanizable, and urban. Some rural land is within the City Limits, having been annexed prior to establishment of the Regional Urban Growth Boundary. This land must maintain its rural character, and public facilities and services in this area should be planned accordingly. Urbanizable land is beyond the City Limits, within the Regional Urban Growth Boundary and within the City's Urban Services Boundary. Urbanizable land will eventually to be annexed to the City of Portland and full urban services may then be extended. Urban land is within the City Limits, the Regional Urban Growth Boundary, and the City's Urban Services Boundary.

**Policy 8.1** **Urban services boundary.** Maintain an ~~urban~~ Urban ~~services~~ Services ~~boundary~~ Boundary for the City of Portland that is consistent with the regional urban growth policy, in cooperation with neighboring jurisdictions. The Urban Services Boundary is shown on the Comprehensive Plan Map.

**Policy 8.2** **Rural, urbanizable, and urban public facility needs.** Recognize the different public facility needs in rural, urbanizable and urban land as defined by the Regional Urban Growth Boundary, the City Urban Services Boundary, and the City Boundaries of Municipal Incorporation (*s~~.~~ ~~See~~ Figure 8-1 — Urban, Urbanizable, and Rural Lands*).

**Policy 8.3** **Urban s~~S~~ervice delivery.** Provide the following public facilities and services at urban levels of service to urban lands within the City's boundaries of incorporation:

- ~~Comprehensive planning.~~
- Public rights-of-way, ~~including~~ streets and public trails
- Sanitary sewers and wastewater treatment
- Stormwater management and conveyance
- Flood management
- Protection of the waterways of the state
- Water supply
- Police, fire, and emergency response
- Parks, natural areas, and recreation
- Solid waste regulation



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**Policy 8.4** **Supporting facilities and systems.** Maintain supporting facilities and systems, including public buildings, technology, fleet, and internal service infrastructure, to enable the provision of public facilities and services.

**Policy 8.5** **Planning service delivery**. Provide planning, zoning, building, and subdivision control services within the City's ~~boundaries of incorporation~~Urban Services Boundary.


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## Service coordination

While the City of Portland is the primary provider of many urban facilities and services within city limits, other public and private agencies also provide public facilities and services. The City has a responsibility for, and an interest in, the planning, coordination, provision, and, in some cases, regulation of these facilities and services. The following policies identify other public facility providers and encourage planning and service coordination — both within the city boundaries and between the City and partner agencies — to meet the needs of people and businesses.

**Policy 8.6** **Interagency coordination**. Maintain interagency coordination agreements with neighboring jurisdictions and partner agencies that provide urban public facilities and services within the C~~c~~ity of Portland's ~~u~~Urban ~~s~~Services ~~b~~Boundary to ensure effective and efficient service delivery. *See Policy 8.3 for the list of services included.* Such jurisdictions and agencies include, but may not be limited to:

- Multnomah County for transportation facilities, and public safety.
- State of Oregon for transportation and parks facilities and services.
- TriMet for public transit facilities and services.
- Port of Portland for air and marine facilities and services.
- Metro for regional parks and natural areas, and for solid waste, composting, and recycling facilities and transfer stations.
- Gresham, Milwaukie, Clackamas County Service District #1, and Clean Water Services for sanitary sewer conveyance and treatment.
- Multnomah County Drainage District No. 1, Peninsula Drainage District No 1, and Peninsula Drainage District No. 2 for stormwater management and conveyance, and for flood mitigation, protection, and control.
- Rockwood People's Utility District; Sunrise Water Authority; and the Burlington, Tualatin Valley, Valley View, West Slope, Palatine Hill, Alto Park, and Clackamas River Water Districts for water distribution.
- Portland Public Schools and the David Douglas, Parkrose, Reynolds, Centennial, and Riverdale school districts for public education, park, trail, and recreational facilities.
- ~~Private utilities for energy, technology, and communications facilities and services.~~

**Policy 8.7** **Outside contracts**. Coordinate with jurisdictions and agencies outside of Portland where the City provides services under agreement.

**Policy 8.8** **Public service coordination**. Coordinate with the planning efforts of agencies providing public education, public health services, community centers, urban forest management, library services, justice services~~, flood protection~~, energy, and technology and communications services~~, as appropriate~~.



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**Policy 8.9** **Internal coordination**. Coordinate planning and provision of public facilities and services, including land acquisition, among City agencies, including internal service bureaus, as appropriate.

**Policy 8.10** **Co-location**. Encourage co-location of public facilities and services across providers where co-location improves service delivery efficiency and equityaccess for historically underserved communities.

## Service extension

The policies in this section outline the City's approach towards annexation and service extension to newly-incorporated areas.

**Policy 8.11** **Annexation**. Require annexation of unincorporated urbanizable areas within the City's urban services boundary as a prerequisite to receive urban services.

**Policy 8.12** **Feasibility of service**. Evaluate the physical feasibility and cost-effectiveness of extending urban public services to candidate annexation areas.

**Policy 8.13** **Orderly service extension**. Establish or improve urban public services in newly-annexed areas to serve designated land uses at established levels of service, as funds are available and as responsible engineering practice allows.

**Policy 8.14** **Coordination of service extension.** Coordinate provision of urban public services to newly-annexed areas so that provision of any given service does not stimulate development that significantly hinders the City's ability to provide other urban services at uniform levels.

**Policy 8.15** **Services to unincorporated urban pockets**. Plan for future delivery of urban services to urbanizable areas that are within the urban services boundary but outside the city limits.

**Policy 8.16** **Orderly urbanization.** Coordinate with counties, neighboring jurisdictions, and other special districts to ensure consistent management of annexation requests, and to establish rational and orderly process of urbanization that maximize efficient use of public funds.

**Policy 8.17** **Services outside the city limits**. Prohibit City provision of new urban services, or expansion of the capacity of existing services, in areas outside the city's municipal limits, except in cases where the City has agreements or contracts in place.

**Policy 8.18** **Service district expansion**. Prohibit service district expansion or creation within the City's urban services boundary without the City's expressed consent.



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**Policy 8.19** **Rural service delivery.** Provide the public facilities and services identified in Policy 8.3 in rural areas only at levels necessary to support designated rural residential land uses and protect public health and safety. Prohibit sanitary sewer extensions into rural land and limit other urban services.

## Public investment

The following policies support investments in Portland's public facility systems to maintain and improve system capacity, resolve service deficiencies and properly manage assets. They also reduce risks to the economy, environment, and community. Such investments enable the City to provide levels-of-service to meet the needs of residents and businesses.

**Policy 8.20** **Regulatory compliance.** Ensure public facilities and services remain in compliance with state and federal regulations. Work toward cost-effective compliance with federal and state mandates through intergovernmental coordination and problem solving.

**Policy 8.21** **System capacity**. Establish, improve, and maintain public facilities and services at levels appropriate to support land use patterns, densities, and anticipated residential and employment growth, as physically feasible and as sufficient funds are available.

**Policy 8.22** **Equitable service**. Provide public facilities and services to alleviate service deficiencies and meet level-of-service standards for all Portlanders, including individuals, businesses, and property owners.

**8.20.a.** In places that are not expected to grow significantly, but have existing deficiencies, invest to reduce disparity and improve livability.

**8.20.b.** In places that lack basic public facilities or services and also have significant growth potential, invest to enhance neighborhoods, fill gaps, maintain affordability, and accommodate growth.

**8.20.c.** In places that are not expected to grow significantly and already have access to complete public facilities and services, invest primarily to maintain existing facilities and retain livability.

**8.20.d.** In places that already have access to complete public facilities and services, but also have significant growth potential, invest to fill remaining gaps, maintain affordability, and accommodate growth.

**Policy 8.23** **Asset management.** Improve and maintain public facility systems using asset management principles to optimize preventative maintenance, reduce unplanned reactive maintenance, achieve scheduled service delivery, and protect the quality, reliability, and adequacy of City services.



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**Policy 8.24** **Risk management**. Maintain and improve Portland's public facilities to minimize or eliminate economic, social, public health and safety, and environmental risks.

**Policy 8.25** **Critical infrastructure**. Increase the resilience of high-risk and critical infrastructure through monitoring, planning, maintenance, investment, adaptive technology, and continuity planning.

**Policy 8.26** **Capital programming.** Maintain long-term capital improvement programs that balance acquisition and construction of new public facilities with maintenance and operations of existing facilities.

## Funding

Portland's investments in the public facility systems necessary to serve designated land uses are funded through a variety of mechanisms, including taxes, user rates and fees, system development charges, and partnerships. The policies in this section acknowledge and support cost-effective service provision, maintenance of diverse funding streams to support the public's investments, and equitable sharing of the costs of investing in and maintaining the City's public facilities.

**Policy 8.27** **Cost-effectiveness**. Establish, improve, and maintain the public facilities necessary to serve designated land uses in ways that cost-effectively provide desired levels of service, consider facilities' lifecycle costs, and maintain the City's long-term financial sustainability.

**Policy 8.28** **Shared costs**. Ensure the costs of constructing and providing public facilities and services are equitably shared by those who benefit from the provision of those facilities and services.

**Policy 8.29** **System development ~~charges~~**. Require private or public entities whose prospective development or redevelopment actions contribute to the need for public facility improvements, extensions, or construction to bear a proportional share of the costs.

**Policy 8.30** **Partnerships.** Maintain or establish public and private partnerships for the development, management, or stewardship of public facilities necessary to serve designated land uses, as appropriate.

~~**Policy 8.306** **Partnerships.** Maintain or establish public and private partnerships for the development, management, or stewardship of infrastructure public facilities necessary to serve designated land uses, as appropriate.~~

## ~~Community~~ Public benefits

The following policies support ~~infrastructure~~ investments to improve equity, economic prosperity, human and watershed health, and resiliency while minimizing negative impacts. They also recognize that the public facility and service needs, and the appropriate approaches to meeting those needs, vary throughout the city. *See Chapter 2: Community Involvement for policies related to community engagement in public facility decisions.*

~~**Policy 8.27** **Community involvement.** Encourage effective community engagement in public facilities and services planning and budgeting decisions, as appropriate.~~

**Policy 8.31** **Application of Guiding Principles**. ~~Establish, improve, and maintain~~Plan and invest in public facilities in ways that promote and balance the Guiding



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Principles established in ~~Chapter 1: The Plan~~The Vision and Guiding Principles ~~of this Comprehensive Plan~~.

**Policy 8.32** **Community Benefit Agreements.** Encourage the use of negotiated community benefit agreements for large public facility projects as appropriate to address environmental justice policies in Chapter 2: Community Involvement.

**Policy 8.33** **Resource efficiency**. Reduce the energy and resource use, waste, and carbon emissions from facilities necessary to serve designated land uses to meet adopted City goals and targets.

**Policy 8.34** **Natural systems**. Protect, enhance, and restore natural systems and features for their infrastructure service and other values.

**Policy 8.35** **Context-sensitive infrastructure**. Design, improve, and maintain public rights-of-way and facilities in ways that are compatible with, and that minimize negative impacts on, their physical, environmental, and community context.

**Policy 8.36** **Site- and area-specific needs.** Allow for site-specific and area-specific public facility standards, requirements, tools, and policies as needed to address distinct topographical, geologic, environmental, and other conditions.

## Public rights-of-way

The policies in this section support the role of public rights-of-way in providing multiple public services, including multimodal transportation access and movement, stormwater management, water distribution, private utilities, tree canopy, and community use, among others. Current practices and the Portland Plan regard public rights-of-way as a coordinated and interconnected network that provides a place for these multiple public facilities and functions.

**Policy 8.37** **Interconnected network**. Establish a connected rights-of-way system that equitably provides infrastructure services throughout the city.

**Policy 8.38** **Transportation function**. Improve and maintain the right-of-way to support multimodal transportation mobility and access to goods and services as is consistent with the designated street classification.

**Policy 8.39** **Utility function**. Improve and maintain the right-of-way to support equitable distribution of utilities, including water, sanitary sewer, stormwater management, energy, and communications, as appropriate.

**Policy 8.40** **Stormwater management function**. Improve rights-of-way to integrate green infrastructure and other stormwater management facilities to meet



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desired ~~infrastructure~~ levels-of-service and economic, social, and environmental objectives.

**Policy 8.41** **Trees in rights-of-way.** Integrate trees in public rights-of-way to support City canopy goals, transportation functions, and economic, social, and environmental objectives.

**Policy 8.42** **Community uses**. Allow community use of rights-of-way for purposes such as public gathering space, events, or temporary festivals, as long as the community uses are integrated in ways that balance and minimize conflict with the designated through movement and access roles of rights-of-ways.

**Policy 8.43** **Commercial uses**. ~~Allow~~ Accommodate allowable commercial uses of the rights-of-way for the purpose of enhancing commercial vitality, if the commercial uses can be integrated in ways that balance and minimize conflict with the other functions of the right-of-way.

**Policy 8.44** **Flexible design**. Allow flexibility in right-of-way design and development standards to appropriately ~~accommodate~~ reflect the pattern area and other relevant physical, community, and environmental contexts and local needs.

**Policy 8.45** **Corridors and City Greenways**. Ensure public facilities located along Civic Corridors, Neighborhood Corridors, and City Greenways support the multiple objectives established for these corridors.

*Corridor and City Greenway goals and policies are listed in Chapter 3: Urban Form.*

**Policy 8.46** **Coordination**. Coordinate the planning, design, development, improvement, and maintenance of public rights-of-way ~~and associated facilities~~ among appropriate public agencies, private providers, and adjacent landowners~~, as appropriate~~.

8.4~~3~~6.a. Coordination efforts should include the public facilities necessary to support the uses and functions of rights-of-way, as established in Policies 8.3~~5~~8 to 8.4~~0~~1.

~~**Policy 7.32 Coordinated stormwater management.**~~ 8.4~~3~~6.b. Coordinate transportation and stormwater system ~~planning~~plans and investments, especially in ~~areas with~~ unimproved or substandard rights-of-way, to improve water quality, public safety, including for pedestrians and bicyclists, ~~pedestrian safety,~~ and ~~enhance~~ neighborhood livability.

**Policy 8.47** **Undergrounding**. Encourage undergrounding of electrical and



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telecommunications facilities within public rights-of-way, especially in c~~C~~enters and along Civic C~~c~~orridors ~~where multi-story development is allowed~~.

**Policy 8.48** **Right-of-way vacations**. ~~Adopt and maintain City code that identifies when street vacations are appropriate. That code should:~~Maintain existing rights-of-way ~~unless there is no~~if there is an established existing or future need for them, such as for transportation facilities or other public functions established in Policies 8.3~~5~~8 to 8.3~~7~~41.

- ~~Require pedestrian or bicycle facilities, if needed.~~
- ~~Consider appropriateness of other public uses.~~
- ~~Require preservation and/or maintenance of existing view corridors, easements, and viewpoints.~~

**Policy 8.49** **Rail rights-of-way.** Preserve existing and abandoned rail rights-of-way for future rail or ~~recreational~~ public trail uses.

## Transportation system

*Additional goals and policies specifically related to transportation can be found in ~~the~~ Chapter 8: Transportation ~~chapter~~ of this Comprehensive Plan.*

## Trails

The City of Portland's trail system is a key part of both the City's multi-modal transportation system and its recreation system. Trails within this system take many different forms and are located both within the right-of-way and on public and private property. Trails provide Portlanders with local and regional pedestrian and bicycle connections and access to many key destinations within the city. They also provide a place to recreate and allow Portlanders to experience the city's parks and natural areas. The policies in this section support continued improvement, management, and coordination of the trail system.

**Policy 8.50** **Public Trails.** Establish, improve, and maintain a citywide system of public trails that provide transportation and/or recreation options and are a component of larger ~~networks~~ network of facilities for bicyclists~~of bicycle~~, pedestrians, and recreational ~~facilities~~users.

**Policy 8.51** **Trail system connectivity.** Plan, improve, and maintain the citywide trail system so that it connects and improves access to Portland's neighborhoods, commercial areas, employment centers, schools, parks, natural areas, recreational facilities, regional destinations, the regional trail system, and other key places that Portlanders access in their daily lives.



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**Policy 8.52** **Trail coordination**. Coordinate planning, design, improvement and maintenance of the trail system among City agencies, other public agencies, non-governmental partners, and adjacent landowners.

**Policy 8.53** **Trail diversity.** Allow a variety of trail types to reflect a trail's transportation and recreation roles, requirements, and physical context.

**Policy 8.54** **Public access requirements**. Require public access and~~/or~~ improvement of public trails along the future public trail alignments shown in Figure 8-~~12.~~ — Future P~~p~~ublic T~~t~~rail A~~a~~lignments.

**Policy 8.55** **Trail and City Greenway coordination.** Coordinate the planning and improvement of trails as part of the ~~and~~ City Greenways system~~s~~. *See Chapter 3: Urban Form for additional policies related to City Greenways.*

**Policy 8.56** **Trail and Habitat Corridor coordination.** Coordinate the planning and improvement of trails with the establishment, enhancement, preservation, and access to habitat corridors.

*See Chapter 3: Urban Form for additional policies related to Habitat Corridors.*

## Sanitary and stormwater systems

The City's sewer and drainage system accommodates Portland's current and future needs. It also protects public health, water quality, and the environment. Using asset management and watershed health as goals and guides, the City considers the whole watershed as an interconnected hydrologic system.

The City manages sanitary sewage through an extensive piped collection and treatment system, including two wastewater treatment plants that discharge to the Columbia and Willamette rivers. Stormwater is managed and conveyed through a variety of ~~infrastructure~~facilities, including pipes, sumps, surface facilities, and natural drainageways. Green infrastructure, including landscaped stormwater facilities and natural resources such as trees and natural areas, is an important part of the stormwater system. Private property investments and public-private partnerships also play key roles in the management of stormwater.

The policies below ensure effective sanitary and stormwater systems.

## Sanitary system

**Policy 8.57** **Sewer connections**. Require all developments within the city limits to be connected to sanitary sewers unless the public sanitary system is not physically or legally available per City Code and state requirements; or the



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existing onsite septic system is functioning properly without failure or complaints per City Code and state requirements; and the system has all necessary state and county permits.

**Policy 8.58** **Combined sewer overflows**. Provide adequate public facilities to limit combined sewer overflows to frequencies established by regulatory permits.

**Policy 8.59** **Sanitary sewer overflows**. Provide adequate public facilities to prevent sewage releases to surface waters as consistent with regulatory permits.

**Policy 8.60** **Private sewage treatment systems.** Adopt land use regulations that require any proposed private sewage treatment system to demonstrate that all necessary state and county permits are obtained.

**Policy 8.61** **Sewer extensions**. Prioritize sewer system extensions to areas that are already developed at urban densities and where health hazards exist.

**Policy 8.62** **Pollution prevention**. Reduce the need for wastewater treatment capacity through land use programs and public facility investments that manage pollution as close to its source as practical and that reduce the amount of pollution entering the sanitary system.

**Policy 8.63** **Treatment**. Provide adequate wastewater treatment facilities to ensure compliance with effluent standards established in regulatory permits.

## Stormwater system

**Policy 8.64** **Stormwater facilities**. Provide adequate stormwater facilities for conveyance, flow control, and pollution reduction.

**Policy 8.65** **Stormwater as a resource**. Manage stormwater as a resource for watershed health and public use in ways that protect and restore the natural hydrology, water quality, and habitat of Portland's watersheds.

**Policy 8.66** **Natural systems.** Protect and enhance the stormwater management capacity of natural resources such as rivers, streams, creeks, drainageways, wetlands, and floodplains.

**Policy 8.67** **Green infrastructure**. Promote the use of green infrastructure, such as natural areas, the urban forest, and landscaped stormwater facilities, to manage stormwater.

**Policy 8.68** **Stormwater discharge.** Avoid or minimize the impact of stormwater discharges on the water and habitat quality of rivers and streams.

**Policy 8.69** **Onsite stormwater management**. Encourage on-site stormwater



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management, or management as close to the source as practical, through land use decisions and public facility investments.

**Policy 8.70** **Pollution prevention.** Coordinate policies, programs, and investments with partners to prevent pollutants from entering the stormwater system by managing point and non-point pollution sources through public and private facilities, local regulations, and education.

**Policy 8.71** **Stormwater partnerships**. Provide stormwater management through coordinated public and private ~~infrastructure~~facilities, public-private partnerships, and community stewardship.

## Flood management

Portland's floodplain areas are primarily along the Columbia River, Willamette River, Columbia Slough, Johnson Creek, and low elevation areas along smaller tributary streams. In accordance with state and federal regulations, the City of Portland, Multnomah County Drainage District, and Peninsula Drainage Districts No. 1 and No. 2 manage floodplains to reduce public safety risks, prevent property damage, support economic activity, and protect watershed health.

The City of Portland's flood management activities primarily focus on restoring natural floodplain functions to reduce the risk of riverine flooding for adjacent developed property. In addition, the City of Portland owns and maintains a seawall along the Willamette River through central Portland. Drainage Districts provide flood control and protection services for portions of North and Northeast Portland along the Columbia River, through a network of flood control facilities (e.g. levees, drainage ditches, and pump stations).

These policies ensure proper floodplain management and compliance.

**Policy 8.72** **Flood management**. Improve and maintain the functions of natural and managed drainageways, wetlands, and floodplains~~, and flood management facilities,~~ to protect health, safety, and property, provide water conveyance and storage, improve water quality, and maintain and enhance fish and wildlife habitat.

**Policy 8.73** **Floodplain management.** Manage floodplains to protect and restore associated natural resources and functions and to minimize the risk to life and property from flooding. ~~**compliance.** Maintain compliance with federal and state floodplain-related requirements.~~

**Policy 8.74** **Flood management facilities.** Establish, improve, and maintain flood management facilities to serve designated land uses through planning, investment and regulatory requirements.



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**Policy 8.75** **Drainage district coordination.** Coordinate with drainage districts that provide stormwater management, conveyance, and flood mitigation, protection, and control services within the City's urban services boundary.

**Policy 8.76** **Levee coordination.** Coordinate plans and investments with special districts and agencies responsible for managing and maintaining certification of levees along the Columbia River.

## Water systems

The City works to provide reliable water service that meets or exceeds both customer and regulatory standards through sound business, management, and operational practices; appropriate application of innovation and technology; responsible stewardship of water infrastructure and fiscal and natural resources; and by supporting community objectives and overall vision for the City of Portland.

The policies below are intended to protect the quality of the water supply while delivering clean drinking water and meeting user needs.

**Policy 8.77** **Primary supply source**. Protect the Bull Run watershed as the primary water supply source for Portland.

**Policy 8.78** **Bull Run protection.** Maintain a source protection program and practices to safeguard the Bull Run watershed as a drinking water supply.

**Policy 8.79** **Secondary supply sources**. Protect, improve, and maintain the Columbia South Shore wellfield groundwater system, the Powell Valley wellfield groundwater system, and any other alternative water sources designated as secondary water supplies.

**Policy 8.80** **Groundwater wellfield protection**. Maintain a groundwater protection program and practices to safeguard the Columbia South Shore wellfield and the Powell Valley wellfield as drinking water supplies.

**Policy 8.81** **Water quality**. Maintain compliance with state and federal drinking water quality regulations.

**Policy 8.82** **Storage**. Provide sufficient in-city water storage capacity to serve designated land uses, meet demand fluctuations, maintain system pressure, and ensure supply reliability.

**Policy 8.83** **Fire protection.** Provide adequate water facilities to serve the fire protection needs of all Portlanders and businesses.

**Policy 8.84** **Water pressure**. Provide adequate water facilities to maintain water pressure in order to protect water quality and provide for the needs of

customers.

**Policy 8.85** **Water efficiency**. Reduce the need for additional water facility capacity and maintain compliance with state water resource regulations by encouraging efficient use of water by customers within the city.

**Policy 8.86** **Service interruptions**. Maintain and improve water facilities to limit interruptions in water service to customers.

**Policy 8.87** **Outside user contracts**. Coordinate long-term water supply planning and delivery with outside-city water purveyors through long-term wholesale contracts.

## Parks and recreation

The City of Portland manages more than 11,000 acres of developed parks and natural areas, as well as local and regional trails, the urban tree canopy, and the City of Portland's community gardens. It offers thousands of programs for all ages at its community centers, swimming pools, and other recreational facilities. Parks and natural areas give life and beauty to the city and are essential assets that connect people to place, self, and others. The following policies ensure this legacy is preserved for all Portlanders and future generations.

**Policy 8.88** **Acquisition, development, and maintenance**. Provide and maintain an adequate supply and variety of parkland and recreational facilities to serve the city's current and future population based on identified level-of-service standards and community needs.

**Policy 8.89** **Service equity.** Invest in acquisition and development of parks and recreation facilities in areas where service-level deficiencies exist.

~~**Policy 8.74** **Acquisition of surplus properties**. Evaluate opportunities to acquire and/or develop lands declared surplus by other public agencies, or offered as donation by private owners, if consistent with policies 8.72 and 8.73.~~

**Policy 8.90** **Capital programming**. Maintain a long-range park capital improvement program that balances acquisition, development, and operations; provides a process and criteria for capital improvement project selection; and emphasizes creative and flexible financing strategies.

**Policy 8.91** **Park planning.** Improve parks, recreational facilities, ~~and~~ natural areas, and the urban forest in accordance with current master plans, management plans, or adopted strategies that reflect user group needs, development priorities, development and maintenance costs, program opportunities, financing strategies, and community input.



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**Policy 8.92** ~~**Public** **Recreational** **Trails.** –~~Establish, improve, and maintain a ~~citywide~~ complete and connected system of public recreational trails, consistent with Portland Parks & Recreation's trail strategy. ~~that are a component of a larger network of bicycle and pedestrian facilities. This citywide trail system should connect Portland's neighborhoods, employment centers, schools, parks, natural areas, recreational facilities, commercial areas, regional trail system, and other key places that Portlanders access in their daily lives. See *Figure 8-1: Citywide Trails Map*.~~

**Policy 8.93** **Natural resources**. Preserve, enhance, and manage City-owned natural areas and resources to protect and improve their ecological health, in accordance with both the natural area acquisition and restoration strategies, and to provide compatible public access.

**Policy 8.94** **Urban forest management.** Manage urban trees as green infrastructure with associated ecological, community and economic functions, through planning, planting and maintenance activities, education, and regulation. *See also Policy 7.19~~0~~.*

**Policy 8.95** **Recreational facilities**. Provide a variety of recreational facilities and services that contribute to the health and well-being of Portlanders of all ages and abilities.

**Policy 8.96** **Special recreational facilities**. Establish and manage specialized recreational facilities within the park system to respond to unique, identified public needs and~~,~~ take advantage of land assets. Manage specialized recreational facilities to~~, and~~ meet cost recovery goals, including financially self-sufficient enterprise facilities (such as for golf and motorsports).

~~**Policy 8.82** **Enterprise facilities.** Maintain special recreational facilities (such as for golf and motorsports) as enterprises to meet public needs and ensure maximum use and financial self-sufficiency.~~

**Policy 8.97** **Public-private partnerships.** Encourage public-private partnerships to develop and operate publicly-accessible recreational facilities that meet identified public needs.

## Public safety and emergency response

Coordinated, effective, and efficient public safety and emergency response services are essential for a safe and resilient city. They help the community prepare for and respond to medical and fire emergencies, hazards, and natural- and human-made disasters. The policies in this section reflect the variety of public safety and emergency response services provided by the City that must be maintained and enhanced as the city grows, including police, fire and rescue, emergency communications, and emergency management.



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**Policy 8.98** **Emergency preparedness, response, and recovery coordination.** Coordinate land use plans~~, programs~~ and public facility investments between City bureaus, other public and jurisdictional agencies, businesses, community partners, and other emergency response providers, to ensure coordinated and comprehensive emergency and disaster risk reduction, preparedness, response, and recovery.

**Policy 8.99** **Emergency management facilities**. Provide adequate public facilities – such as emergency coordination centers, communications infrastructure, and dispatch systems – to support emergency management, response and recovery.

**Policy 8.100** **Police facilities**. Improve and maintain police facilities to allow police personnel to efficiently and effectively respond to public safety needs and serve designated land uses.

**Policy 8.101** **Community safety centers**. Establish, coordinate, and co-locate public safety and other community services in c~~C~~enters.

**Policy 8.102** **Fire facilities**. Improve and maintain fire facilities to serve designated land uses, ensure equitable and reliable response, and provide fire and life safety protection that exceeds minimum established service levels.

**Policy 8.103** **Mutual aid.** Maintain mutual aid coordination with regional emergency response providers as appropriate to protect life and ensure safety.

**Policy 8.104** **Community preparedness**. Enhance community preparedness and capacity to prevent, withstand, and recover from emergencies and natural disasters through land use decisions and public facility investments.

**Policy 8.105** **Continuity of operations**. Maintain and enhance the City's ability to withstand and recover from natural disasters and human-made disruptions in order to minimize disruptions to public services.

## Solid waste management

Solid waste, composting and recycling facilities and services are regulated and provided through a partnership between the City of Portland, Metro, franchised haulers and private companies. The following policy supports sustainable waste reduction, recovery, and management, and the use and reuse of materials prior to disposal. This policy relates to the aspects of Oregon's Statewide Planning Goal 13 – Energy Conservation, which focuses on systems and incentives for collection, reuse, and recycling of waste.

**Policy 8.106** **Waste management**. Ensure land use programs, rights-of-way regulations, and public facility investments allow the City to manage waste effectively and prioritize waste management in the following order: waste reduction,



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recycling, anaerobic digestion, composting, energy recovery, ~~then~~and then landfill.

## School facilities

Public education is provided by Portland Public Schools and the David Douglas, Parkrose, Reynolds, Centennial, and Riverdale school districts, as well as ~~public~~ by colleges and universities. The City partners with school districts on school facility planning and siting. By encouraging school facilities to be multi-functional neighborhood anchors, designed and programmed to serve community members of all generations and abilities, these policies also help implement the concept of Portland as an age-friendly city.

**Policy 8.107** **School district capacity**. Consider the overall enrollment capacity of a school district – as defined in an adopted school facility plan that meets the requirements of Oregon Revised Statute 195 – as a factor in land use decisions that increase capacity for residential development.

**Policy 8.108** **Co-location.** Encourage public school districts, Multnomah County, the City of Portland, and other providers to co-locate facilities and programs in ways that optimize service provision and intergenerational and intercultural use.

**Policy 8.109** **Community use.** Encourage public use of public school grounds for community purposes while meeting educational and student safety needs and balancing impacts on surrounding neighborhoods.

**Policy 8.110** **Recreational use**. Encourage publicly-available recreational amenities (e.g. athletic fields, green spaces, community gardens, and playgrounds) on public school grounds for public recreational use, particularly in neighborhoods with limited access to parks.

**Policy 8.111** **Schools as emergency aid centers**. Encourage the use of seismically-safe school facilities as gathering and aid-distribution locations during natural disasters and other emergencies.

**Policy 8.112** **Facility adaptability.** Ensure that public schools may be upgraded to flexibly accommodate multiple community-serving uses and adapt to changes in educational approaches, technology, and student needs over time.

**Policy 8.113** **Leverage public investment.** Encourage City ~~infrastructure~~ public facility investments that complement and leverage local public school districts' major capital investments.

**Policy 8.114** **School access.** Encourage public school districts to consider the ability of students to safely walk and bike to school when making decisions about the site locations and attendance boundaries of schools.



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**Policy 8.115** **Private institutions.** Encourage collaboration with private schools and educational institutions to support community and recreational use of their facilities.

## Technology and communications

Private utilities and companies provide technology and communication facilities and services to the general public. The City regulates limited aspects of these services, such as the siting of new facilities. The City also provides specific technology and communications services to support City and partner agency service delivery. The City promotes access to affordable and reliable technology and communications for all Portlanders.

The policies in this section embrace innovation to ensure all Portlanders are able to access and benefit from emerging technologies and systems that have the potential to make Portland a cleaner, safer, and more efficient, resilient and affordable city. This section acknowledges that information and technology services have become essential infrastructure, and supports investments and partnerships to keep Portland competitive and build on the City's tradition of open-source collaboration and innovation.

**Policy 8.116** **Technology and communication systems.** Maintain and enhance the City's technology and communication facilities to ensure public safety, facilitate access to information, and maintain City operations.

**Policy 8.117** **Equity, c~~C~~apacity, ~~-~~and reliability**. Encourage regulatory approaches and investments in technology and communication infrastructure, such as broadband, to reduce disparities in capacity, access, and affordability and provide high-performance, reliable service for Portland's residents and businesses.

## Energy infrastructure

Energy facilities and services in Portland are primarily provided by private utilities and companies. While the City of Portland does not directly provide energy facilities and services, it does promote efficient, sustainable, and resilient energy resources, production, distribution, and consumption. The following policies relate to energy infrastructure and support Oregon's Statewide Planning Goal 13 – Energy Conservation, which includes planning guidelines for renewable energy sources. They ensure that as the City makes land use decisions it removes barriers to promoting efficient and sustainable energy practices.

**Policy 8.118** **Energy efficiency**. ~~–~~ ~~Encourage~~ Promote efficient and sustainable production and use of energy resources by residents and businesses, including low-carbon renewable energy sources, district energy systems, and distributed generation, through land use plans, zoning, and other legislative land use decisions.

**Policy 8.119** **Coordination**. Coordinate with energy providers to encourage investments



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that ensure reliable, equitable, efficient, and affordable energy for Portland ~~'s~~ residents and businesses.


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*Figure 8-1. Urban, Urbanizable, and Rural Lands*

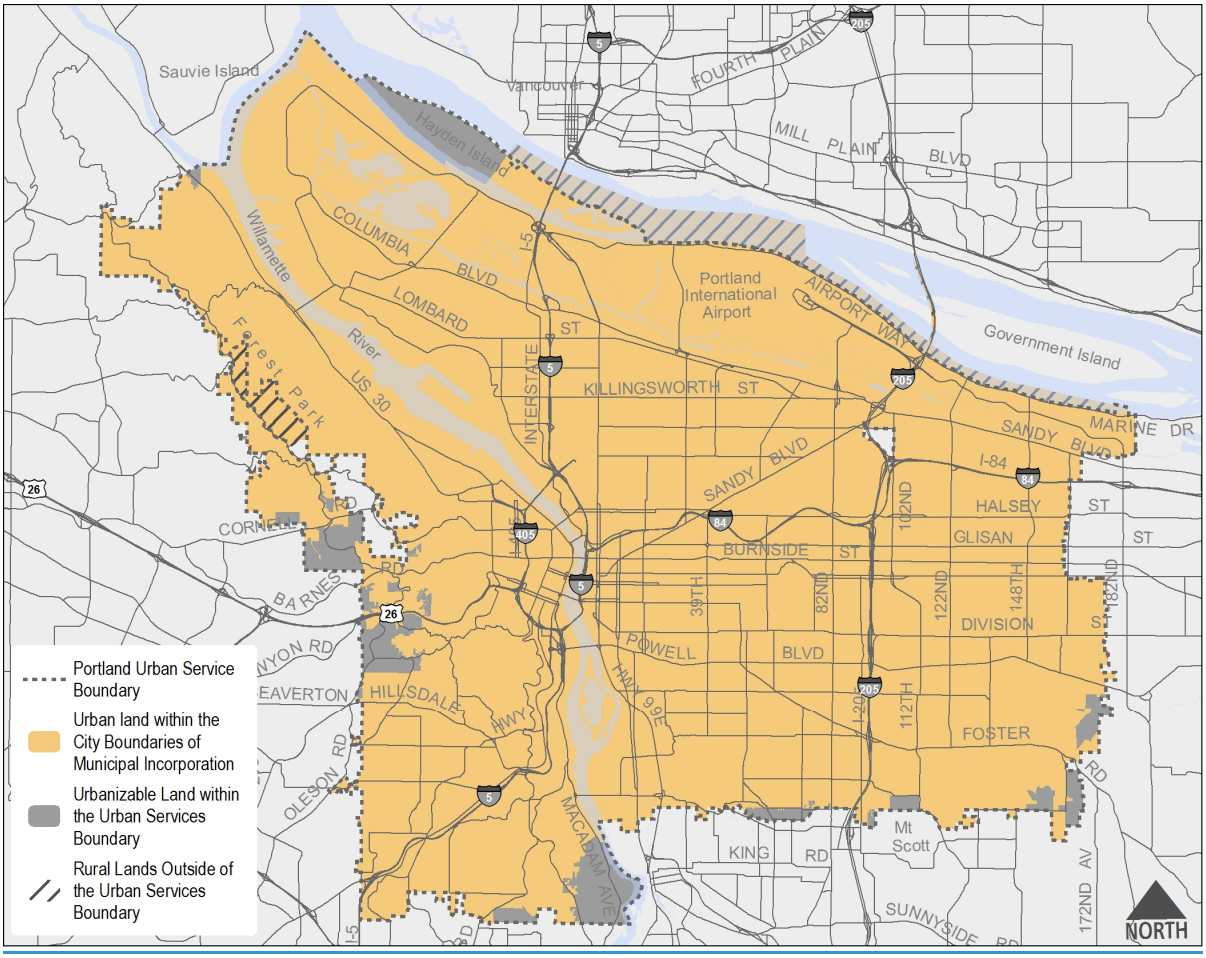




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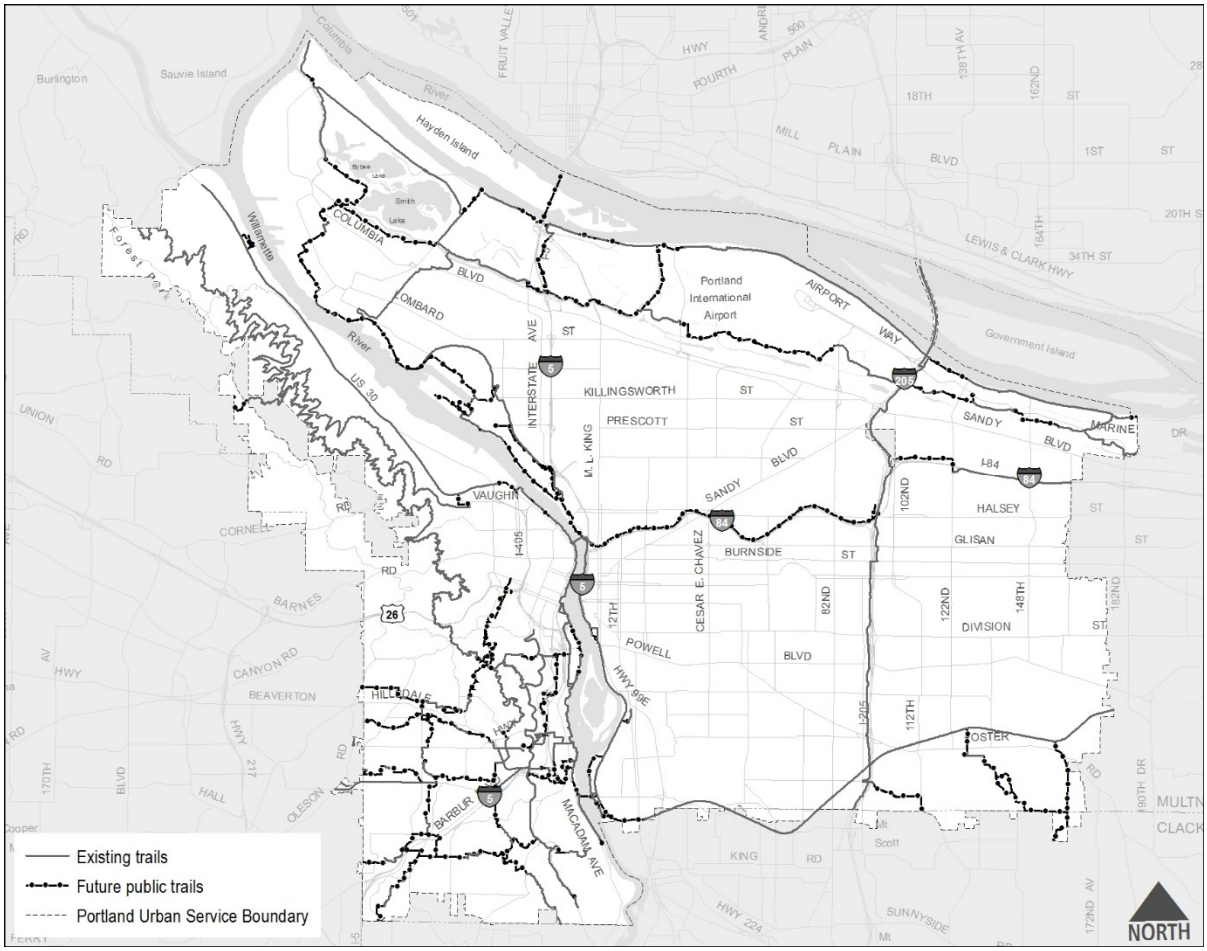
*Figure 8-~~12~~2. ~~Citywide Trails Map~~Future Public Ttrail Aalignments*



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# Chapter 9: Transportation

## What is this chapter about?

The goals and policies in this chapter ~~show~~ convey the City's intent to:

- Create a coordinated, efficient, and more affordable multimodal transportation system.
- Make cost-effective investments and system management decisions that encourage people to choose healthy, active, and low-carbon transportation modes and systems, and enhance the economic competitiveness of the region.
- Reduce service disparities and achieve equitable access to all types of facilities and transportation modes.
- Ensure safety for users of all transportation modes, with attention to the most vulnerable road users, including people with disabilities, those using mobility devices, the young, and the elderly.
- Guide the location and design of new street infrastructure.
- Direct how and when transportation infrastructure is managed and maintained.
- Provide policy guidance for developing and implementing the Transportation System Plan.

## Why is this important?

The transportation system is essential to the functioning of the city and the well-being and prosperity of the community. It connects people and businesses to goods and services, and links them to the region, state, nation, and world. Although transportation is often measured in terms of mobility, it also creates access to opportunity. These goals and policies also reflect the role of transportation planning in reducing carbon emissions~~,~~ and improving public health. Finally, this chapter acknowledges the role that streets can play in providing great civic and recreational spaces. The way we build our city has an impact on our mobility and, by extension, our access to opportunity.

With its 1980 Comprehensive Plan, the City of Portland became a national leader in the integration of land use and transportation. The 2035 Comprehensive Plan ~~carries~~ builds on that tradition ~~forward~~ and adds new innovations. The goals and policies in this chapter increase the focus on complete multimodal transportation systems. The historical emphasis on automobile mobility is increasingly creating a cost burden on households and the



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community as a whole. For the city to successfully meet its transportation system goals for the future, other more affordable choices must be widely available and safe.

## What is the Transportation System Plan?

The Transportation System Plan (TSP) is the 20-year plan to guide transportation investments in Portland. The TSP meets state and regional planning requirements and addresses local transportation needs. It includes:

- Policies that guide the maintenance, development, and implementation of Portland's transportation system.
- A list of projects necessary to accommodate 20 years of growth in population and employment, ~~with~~ including a financial plan.
- Master street plans and modal plans.
- Strategies and regulations for implementation, including street classification maps.

Elements of the TSP — the policies, the projects included in the List of Significant Projects, street classification maps, and ~~the~~ street plan maps — are adopted as part of the Comprehensive Plan. ~~The TSP contains the transportation element of the City's Public Facilities Plan, and the List of Significant Projects.~~ The TSP itself is adopted concurrently with the Comprehensive Plan~~,~~ but published under a separate cover.~~–~~ For ease of use and transparency, the citywide policies from the TSP are also included in ~~Chapter 9 (Transportation) of the~~this chapter of the Comprehensive Plan~~ document and are also part of the Comprehensive Plan~~. ~~The TSP also includes additional sub-policies and area-specific policies.~~

~~The TSP is both an implementation tool and a supporting document to the Comprehensive Plan. The TSP contains the transportation element of the City's Public Facilities Plan, and the List of Significant Projects.~~ The TSP also provides more detail than the Comprehensive Plan by including ~~The TSP also includes~~ additional sub-policies and area-specific policies~~.~~, and additional supporting information about transportation system conditions. The TSP contains the transportation element of the City's Public Facilities Plan~~, and the List of Significant Projects.~~ Figure 9-1 — Transportation System Plan: Relationship to Other Policies and Plans illustrates the relationship between the TSP and other policies and plans.



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# Goals

**GOAL 9.A~~G~~: Safety**

~~Transportation safety contributes to a livable city and ensures that people of all ages and abilities feel comfortable and secure using City streets. Human impact and economic costs are reduced by comprehensive efforts to improve traffic safety, including engineering, education, enforcement, and evaluation, all of which will move Portland toward zero traffic-related fatalities and no serious injuries.~~Transportation safety impacts the livability of a city and the comfort and security of those using City Streets. Comprehensive efforts to improve transportation safety through engineering, education, enforcement and evaluation will be used to eliminate traffic related fatalities and serious injuries from Portland's transportation system.

**Goal 9.B: ~~Achieve m~~Multiple goals**

Portland's transportation system is funded and maintained to achieve multiple goals and measureable outcomes for people and the environment. The transportation system is complete, interconnected, multimodal, and fulfills daily needs for people and businesses.

**GOAL 9.C: ~~Support g~~Great places**

Portland's transportation system enhances quality of life for all Portlanders, reinforces existing neighborhoods and great places, and helps make new great places in town centers, neighborhood centers and corridors, and civic corridors~~, placemaking, and quality of life for all Portlanders~~.

**GOAL 9.D: Environmentally sustainable**

The transportation system increasingly uses renewable energy, or electricity from renewable sources, achieves adopted carbon reduction targets, and reduces air pollution, water pollution, noise, and Portlanders' reliance on private vehicles.

**GOAL 9.E: Equitable transportation**

The transportation system provides all Portlanders options to move about the city and meet their daily needs by using a variety of efficient, convenient, and affordable modes of transportation.~~–~~ Transportation investments are responsive to the distinct needs of each community.

**GOAL 9.F: Positive health outcomes**

The transportation system promotes positive health outcomes and minimizes negative impacts for all Portlanders by supporting active transportation, physical activity, and community and individual health.

**GOAL 9.G: Opportunities for prosperity**

The transportation system supports a strong and diverse economy, enhances the competitiveness of the city and region, and maintains Portland's role as a West Coast trade



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gateway and freight hub, by providing efficient and reliable goods movement, multimodal access to employment areas and educational institutions, as well as enhanced freight access to industrial areas and intermodal freight facilities. The transportation system helps people and businesses reduce spending and keep money in the local economy by providing affordable alternatives to driving.


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**GOAL 9.H: Cost ~~effective~~effectiveness**
The City analyzes and prioritizes capital and operating investments to cost effectively achieve the above goals while responsibly managing and protecting our past investments in existing assets.

**GOAL 9.I: Airport ~~f~~Futures**
Promote a sustainable airport (PDX) by meeting the region's air transportation needs without compromising livability and quality of life for future generations.

# Policies

## Design and planning policies

The City of Portland's transportation system is a key public facility. The following policies describe what the transportation system is, what it does, and what factors to consider for how the overall system is used. *Policies 8.1-8.~~51~~ 56 in ~~the~~ Chapter 8: Public Facilities also apply to the need for quality facilities and services, multiple benefits, reliability, and creating a multi-purpose and safe right-of-way.*

**Policy 9.1** **Street design classifications**. Maintain and implement street design classifications consistent with land use plans, environmental context, urban design pattern areas, and the Neighborhood Corridor and Civic Corridor Urban Design Framework designations.

**Policy 9.2** **Street policy classifications.** Maintain and implement street policy classifications for pedestrian, bicycle, transit, freight, emergency vehicle, and automotive movement, while considering access for all modes, connectivity, adjacent planned land uses, and state and regional requirements.

**9.2.a.** Designate district classifications that emphasize freight mobility and access in industrial and employment areas serving high levels of truck traffic and to accommodate the needs of intermodal freight movement.

**9.2.b.** Designate district classifications that give priority to pedestrian access in areas where high levels of pedestrian activity exist or are planned, including the Central City, Gateway regional center, town centers, and station communities.

**Policy 9.3** **Transportation System Plan.** Maintain and implement the Transportation System Plan (TSP) as the decision-making tool for transportation-related projects, policies, programs, and street design.

**Policy 9.4** **Use of classifications.** Plan, develop, implement, and manage the



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transportation system in accordance with street design and policy classifications outlined in the Transportation System Plan.

**Policy 9.5** **Mode share goals and Vehicle Miles Travelled (VMT) reduction.** Increase the share of trips made using active and low-carbon transportation modes. ~~and r~~Reduce VMT to achieve targets set in the most current Climate Action Plan and Transportation System Plan~~. M~~, and meet or exceed Metro's mode share and VMT targets ~~in Neighborhood Centers and 2040 Growth Concept areas~~.



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**Policy 9.6** **Transportation ~~hierarchy~~ strategy for people movement.** Implement a ~~hierarchy~~ prioritization of modes for people movement by making transportation system decisions according to the following ~~prioritization~~ordered list:

~~1.~~1. Right of way users requiring special accommodation under the American's with Disabilities Act

2. Walking

~~2~~3. ~~Cycling~~ Bicycling

~~3. Special Accommodations~~

~~4~~3. Transit

~~4~~5. Taxi / commercial transit / shared vehicles

6~~5~~. Zero emission vehicles

6~~7~~. Other ~~private,~~ single occupancy ~~,~~ vehicles

When implementing ~~the~~ this prioritization ~~hierarchy,~~ ensure that:

- The needs and safety of each group of ~~road~~ right of way users are considered, and changes do not make existing conditions worse for the most vulnerable users higher on the hierarchy.
- All users' needs are balanced with the intent of optimizing the right of way for multiple modes on the same street.~~, and~~
- W~~w~~hen necessary to ensure safety, accommodate some users on parallel streets as part of multi-street corridors.
- Land use and system plans, network functionality for all modes, other street functions, and complete street policies, are maintained.
- Rationale is provided if modes lower in the ~~hierarchy~~ ordered list are prioritized.

*Specific modal policies are found below in policies 9.~~18~~ 16 to 9.~~41~~39*

**Policy 9.7** **~~Moving~~ Movement of goods and ~~delivering~~ delivery of services.** In tandem with people movement~~;~~, ~~Maintain~~ maintain efficient and reliable movement of goods and services as a critical transportation system function. Prioritize freight system reliability improvements over general motor vehicle mobility where there are solutions that distinctly address those different needs.



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*Multimodal freight policies are found below in policies 9.~~31~~ 32 to 9.~~39~~34.*

**Policy 9.8** **Affordability.** Improve and maintain the transportation system to increase access to convenient and affordable transportation options for all Portlanders, especially those who have traditionally been under-served or under-represented or have historically borne unequal burdens.

**Policy 9.9** **Geographic policies.** Adopt geographically-specific policies in the Transportation System Plan, to ensure that transportation infrastructure reflects the ~~differing~~ unique topography, historic character, natural features, system gaps, economic needs, demographics, and land uses of each area. Use the Pattern Areas identified in Chapter 3: Urban ~~Design~~ Form as the basis for area policies.



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## Land use, development, and placemaking

Land use patterns and connections among different land uses are key elements defining the form and character of places. In tandem with the Urban Form and Design and the Design and Development chapters, the policies in this section give direction for designing and building a transportation system that supports, complements, and meets the needs of different places. These policies acknowledge development adjacent to transportation as a critical component in shaping the future of Portland's public spaces and places.

**Policy 9.10** **Land use and transportation coordination.** Implement the Comprehensive Plan Map and the Urban Design Framework though coordinated long-range transportation and land use planning. Ensure that street policy and design classifications and land uses complement one another.

~~**Policy 9.11 Growth strategy.** Implement street design and policy classifications to support a Centers and Corridors growth strategy.~~

**Policy 9.11** ~~**G**~~**Growth strategy.** ~~**Centers, Corridors, and Transit Station Areas, and Greenways.**~~ Use street design and policy classifications ~~Enhance~~ to support Goals 3A-3G in Chapter 3: Urban Form. Consider the different design context and transportation functions in Town Centers, Neighborhood Centers, Neighborhood Corridors, Employment Areas, Freight Corridors, Civic Corridors, Transit Station Areas, and Greenways ~~as highlighted in Chapter 3, Urban Form and Design~~.

**Policy 9.12** **Development and street design.** Evaluate adjacent land uses to help inform street classifications in framing, shaping, and activating the public space of streets. Guide development and land use to create the kinds of places and street environments intended for different types of streets.

## Streets as public spaces

Streets, including sidewalks and planting strips, provide critical transportation and utility functions. In Portland, streets are the most abundant type of public space, occupying nearly 20 percent of land area in the city. The following policies support community desire to expand the use of streets beyond their transportation functions. See ~~the~~ Chapter8: Public Facilities and Services and Chapter 4: Design and Development ~~chapters~~ for further use and streetscape policies.

**Policy 9.13** **Streets for transportation and public spaces.** Integrate both the placemaking and transportation functions when designing and managing streets by encouraging design, development, and operation of streets to enhance opportunities for them to serve as places for community interaction,



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environmental function, open space, tree canopy, recreation, and other community purposes.

**Policy 9.14** **Repurposing street space.** Encourage repurposing street segments that are not critical for transportation connectivity to other community purposes.



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**Policy 9.15** **Design with nature.** Promote street alignments and designs that respond to topography and natural features, when feasible, and protect streams, wildlife habitat, and native trees.

~~**Policy 9.17** **Street views.** Maintain public views of prominent landmarks and buildings that serve as visual focal points within streets or that terminate views at the end of streets.~~

## Modal policies

Portland is committed to providing a multimodal transportation system that ~~provides~~ offers affordable and convenient travel options within the city, region, and outside the Metro area. Because trips are made for different reasons, they vary in length and type of vehicle (mode) needed to make them. Different modes create different kinds of impacts — on neighborhood livability and carbon emissions, for example. These policies recognize that some modes are more appropriate than others for different types of trips.

**Policy 9.16** **Pedestrian transportation**. Encourage walking as the most attractive mode of transportation for most short trips, within and to centers, corridors, and major destinations, and as a means for accessing transit.

**Policy 9.17** **Pedestrian networks.** Create more complete networks of pedestrian facilities and improve the quality of the pedestrian environment.

**Policy 9.18** **Pedestrian safety and accessibility.** Improve pedestrian safety, accessibility, and convenience for people of all ages and abilities.

**Policy 9.19** **Bicycle transportation**. Create conditions that make bicycling more attractive than driving for most trips of approximately three miles or less.

**Policy 9.20** **Accessible bicycle system.** Create a bicycle transportation system that is safe, comfortable, and accessible to people of all ages and abilities.

**Policy 9.21** **Bicycle classifications.** Develop and implement classifications that emphasize the movement of bicycles on a citywide network of designated streets that safely and efficiently provides access to the Central City, Gateway, Town Centers, and Neighborhood Centers.

**Policy 9.22** **Public transportation**. Coordinate with public transit agencies to create conditions that make transit the preferred mode of travel for trips that are not made by walking or bicycling.

**Policy 9.23** **Transportation to job centers.** Encourage transit as the preferred transportation mode for people travelling more than three miles to and from the Central City and Gateway. Enhance regional access to the Central City and access from Portland other regional job centers.



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**Policy 9.24** **Transit service.** In partnership with ~~Trimet~~TriMet, develop a public transportation system that conveniently, safely, comfortably, and equitably serves residents and workers 24 hours a day, 7 days a week.

**Policy 9.25** **Transit equity.** In partnership with ~~Trimet~~TriMet, maintain and expand high-quality frequent transit service to all Town Centers, Civic Corridors, Neighborhood Centers, Neighborhood Corridors, and other major concentrations of employment, and improve service to areas with high concentrations of poverty and historically under-served and under-represented communities.

**Policy 9.26** ~~**Prosperity and growth**~~**Transit service to centers and corridors.** Use transit investments as a means to shape the city's growth and increase transit use. In partnership with ~~Trimet~~ TriMet and Metro**,** maintain, expand, and enhance Portland Streetcar, frequent service bus, and high capacity transit, ~~and bus rapid transit~~ to better serve centers and corridors with the highest intensity of potential employment and household growth. ~~Use transit investments as a means to shape the city's growth.~~

**Policy 9.27** **Intercity passenger service**. Coordinate planning and project development to expand intercity passenger transportation services in the Willamette Valley, and from Portland to Seattle and Vancouver, BC.

**Policy 9.28** **Regional trafficways and transitways**. ~~Enhance~~ Maintain capacity of regional transitways and existing regional trafficways to accommodate ~~future increases in regional~~ through-traffic.

**Policy 9.29** **Multimodal goods movement.** Develop, maintain, and enhance a multimodal freight transportation system for the safe, reliable, sustainable, and efficient movement of goods within and through the city.

**Policy 9.30** **Economic development and industrial lands.** Ensure that the transportation system supports traded sector economic development plans and full utilization of prime industrial land, including brown-field redevelopment.~~.~~

**Policy 9.31** **Multimodal system and hub.** Maintain Portland's role as a multimodal hub for global and regional movement of goods. Enhance Portland's network of multimodal freight corridors.

**Policy 9.32** **Freight network.** Develop, manage, and maintain a safe, efficient, and reliable freight street network to provide freight access to and from intermodal freight facilities, industrial and commercial districts, and the regional transportation system. Invest to accommodate forecasted growth of interregional freight volumes and provide access to truck, marine, rail, and air transportation systems. Ensure designated routes and facilities are



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adequate for over-dimensional trucks and emergency equipment.

**Policy 9.33** **Sustainable freight system.** Support the efficient delivery of goods and services to businesses and neighborhoods, while also reducing environmental and neighborhood impacts. Encourage the use of energy efficient and clean delivery vehicles, and manage on- and off-street loading spaces to ensure adequate access for deliveries to businesses, while maintaining access to homes and businesses.

**Policy 9.34** **Freight rail network.** Coordinate with stakeholders and regional partners to support continued reinvestment in, and modernization of, the freight rail network.

**Policy 9.35** **Portland Harbor.** Coordinate with the Port of Portland, private stakeholders, and regional partners to improve and maintain access to marine terminals and related river-dependent uses in Portland Harbor.

**9.36.a.** Support continued reinvestment in, and modernization of, marine terminals in Portland Harbor.

**9.36.b.** Facilitate continued maintenance of the shipping channels in Portland Harbor and the Columbia River.

**9.36.c.** Support shifting more long-distance, high-volume movement of goods to river and oceangoing ships and rail.

*See Policy 3.71 for the river transportation policy*

**Policy 9.36** **Portland Heliport.** Maintain Portland's Heliport functionality in the Central City.

**Policy 9.37** **Automobile transportation.** Maintain acceptable levels of mobility and access for private automobiles while reducing overall vehicle miles traveled (VMT) and negative impacts of private automobiles on the environment and human health.

**Policy 9.38** **Automobile efficiency.** Coordinate land use and transportation plans and programs with other public and private stakeholders to encourage vehicle technology innovation, shifts toward electric and other cleaner, more ~~energy~~ energy-efficient vehicles and fuels, integration of smart vehicle technology with intelligent transportation systems, and greater use of options such as car-share, carpool, and taxi.

**Policy 9.39** **Emergency response**. Maintain a network of accessible emergency



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response streets to facilitate safe and expedient emergency response and evacuation. Ensure that police, fire, ambulance, and other emergency providers can reach their destinations in a timely fashion, without negatively impacting traffic calming and other measures intended to reduce crashes and improve safety.

## Airport Futures

The Port of Portland manages the Portland International Airport (PDX) as a regional, national, and international air transportation hub. The Port partnered with the City of Portland and Multnomah, Washington, and Clackamas Counties to prepare the Airport Futures Plan (2010) and guide airport development to 2035. -Policy direction set in this project include Goal 9.I and the following policies. *Additional airport-related policies are found in Chapter 4: Design and Development and Chapter 7: Environment and Watershed Health.*

**Policy 9.40** **Portland International Airport.** Maintain the Portland International Airport as an important regional, national, and international transportation hub serving the bi-state economy.

**Policy 9.41** **Airport regulations.** Implement the Airport Futures Plan through the implementation of the Portland International Airport Plan District.

**9.41.a.** Prohibit the development of a potential third parallel runway at PDX. Ensure a transparent, thorough, and regional planning process if the Port of Portland demonstrates a need for its construction.

**9.41.b.** Support implementation of the Aircraft Landing Zone to provide safer operating conditions for aircraft in the vicinity of Portland International Airport by limiting the height of structures, vegetation, and construction equipment.

**9.41.c.** Support the Port of Portland's Wildlife Hazard Management Plan by implementing airport-specific landscaping requirements in the Portland International Airport Plan District to reduce conflicts between wildlife and aircraft.

**Policy 9.42** **Airport partnerships.** Partner with the Port of Portland and the regional community to address the critical interconnection between economic development, environmental stewardship, and social responsibility. Support an ongoing public advisory committee for PDX to:

**9.42.a.** Support meaningful and collaborative public dialogue and engagement on airport related planning and development.



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**9.42.b.** Provide an opportunity for the community to inform the decision-making related to the airport of the Port, the City of Portland, and other jurisdictions/organizations in the region.

**9.42.c.** Raise public knowledge about PDX and impacted communities.

**Policy 9.43** **Airport investments.** Ensure that new development and redevelopment of airport facilities supports the City's and the Port's sustainability goals and policies, and is in accordance with Figure 9-3~~, — Portland International Airport~~. Allow the Port flexibility in configuring airport facilities to preserve future development options, minimize environmental impacts, use land resources efficiently, maximize operational efficiency, ensure development can be effectively phased, and address Federal Aviation Administration's airport design criteria.

## System management

Portland's transportation system is an integrated network of roads, rails, sidewalks, bicycle paths, and other facilities within and through the city. These modal networks intersect and are often located within the same right-of-way. These policies provide direction to manage the system in ways that:

- Allow different modes to interact safely.
- Maximize the capacity of the existing network.
- Identify where additional capacity might be needed.

*Also see Policies 8.~~33~~ 37 through 8.~~43~~ 49 in Chapter 8: Public Facilities and Services*

**Policy 9.44** **System management**. Give preference to transportation improvements that use existing roadway capacity efficiently and that improve the safety of the system for all users.

**Policy 9.45** **Traffic management**. Evaluate and encourage traffic speed and volume to be consistent with street classifications and desired land uses to improve safety, preserve and enhance neighborhood livability, and meet system goals of calming vehicle traffic through a combination of enforcement, engineering, and education efforts.

**Policy 9.46** **Connectivity**. Establish an interconnected, multimodal transportation system to serve centers and other significant locations. Promote a logical, direct, and connected street system through street spacing guidelines and district-specific street plans found in the Transportation System Plan and prioritize access to specific places by certain modes in accordance with ~~the transportation hierarchy.~~ policies 9.6 and 9.7.



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**Policy 9.47** **Technology.** Encourage the use of emerging ~~technology,~~ vehicle ~~technology,~~ and parking technology to improve real-time management of the transportation network and to manage and allocate parking supply and demand.

**Policy 9.48** **Performance measures.** Establish multimodal performance measures and measures of system completeness to evaluate and monitor the adequacy of transportation services. ~~Base~~ based on performance measures ~~o~~in goals 9.A. ~~to~~through 9.~~H~~I. Use these measures to evaluate overall system performance, inform corridor and area-specific plans and investments, identify project and program needs, evaluate and prioritize investments, and regulate development, institutional campus growth, zone changes, Comprehensive Plan Map amendments, and conditional uses.

**Policy 9.49** **Regional congestion management**. Coordinate with Metro to establish new regional multimodal mobility standards that prioritize transit and freight, and system completeness. – C~~c~~reate a regional congestion management approach, including a market-based system, to price or charge for auto trips and parking, better account for the cost of auto trips, and to more efficiently manage the regional system.

**Policy 9.50** **Central City Mixed Use Multimodal Transportation Area (MMA).** Develop, implement, and maintain alternative mobility targets and policies for the Central City MMA in the geography indicated in Figure 9-2 – Central City MMA.



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## Transportation Demand Management

Providing residents and employees information and incentives to walk, bicycle, use transit, and otherwise reduce the need to own and use private vehicles can be one of the quickest, least expensive, and most effective strategies to achieve city goals and to prevent traffic and parking impacts.– Transportation and parking demand management (TDM) programs can cost-effectively increase the modal share of walking, bicycling, and shared vehicle trips.

**Policy 9.52** **Outreach.–** Create and maintain TDM outreach programs that work with ~~t~~Transportation ~~m~~Management ~~a~~Associations (TMA), residents, employers, and employees that increase the modal share of walking, bicycling, and shared vehicle trips while reducing private vehicle ownership, parking demand, and drive-alone trips, especially during peak periods.

**Policy 9.53** **New Development.–** Create and maintain TDM regulations and services that prevent and reduce traffic and parking impacts from new development and redevelopment.– Encourage coordinated area-wide delivery of TDM programs.– Monitor and improve the performance of private-sector TDM programs.

**Policy 9.54** **Projects and Programs.–** Integrate TDM information into transportation project and program development and implementation to increase use of new multimodal transportation projects and services.

## Parking management

Vibrant urban places link people and activities. As Portland grows, we must manage both the demand and supply of parking to achieve climate, health, livability, and prosperity goals. Providing too much and/or underpriced parking can lead to more driving~~,~~ and less walking, cycling, and transit use, inefficient land use patterns, and sprawl. Insufficient parking can negatively affect neighborhood livability and economic vitality. These policies provide guidance to manage parking demand and supply to meet a variety of public objectives, including achieving compact walkable communities, reducing private vehicle ownership and overall vehicle use, enhancing livability, reducing pollution, and expanding economic opportunity.

**Policy 9.54** **Parking management.** Reduce~~Manage~~ parking demand and manage supply to ~~achieve transportation policy objectives for~~improve~~–~~ pedestrian, bicycle and transit mode share, neighborhood livability, safety, business district vitality, vehicle miles traveled (VMT) reduction, and ~~and improved~~ air quality. Implement strategies that reduce demand for new parking and private vehicle ownership, and to help maintain optimal parking occupancy and availability.



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~~Policy 9.49 Central City, and centers parking. Limit the growth of off-street parking spaces and manage supply and demand for parking, loading, and unloading in the public right-of-way in the Central City, Gateway, Town Centers, and Station Areas.~~

**Policy 9.55** **Curb Zone.**– Recognize that the ~~c~~Curb ~~z~~Zone is a public space, a physical and spatial asset that has value and cost.– Evaluate whether, when, and where parking is the highest and best use of this public space in support of broad City policy goals and local land use context.– Establish thresholds to utilize parking management and pricing tools in areas with high parking demand to ensure adequate on-street parking supply during peak periods.

**Policy 9.56** **On-street parking.** Manage parking and loading demand, supply, and operations in the public right of way to achieve mode share objectives, and to encourage safety, economic vitality, and livability.– Recognize that the ~~curb~~ Curb ~~zone~~ Zone is a public space, ~~and as such,~~ a physical and spatial asset that has value and cost.– Allocate and manage ~~on-street parking and loading within~~ the curb zone in a manner that achieves the ~~highest and~~ best use of this public space in support of broad City policy goals and local land use context.– U~~tilize~~se transportation demand management and pricing of parking in areas with high parking demand.

**Policy 9.57** **Off-street parking.** Limit the development of new parking spaces to achieve land use, transportation, and environmental goals, especially in locations with frequent transit service.– Regulate off-street parking to achieve mode share objectives, promote compact and walkable urban form, encourage lower rates of car ownership, and promote the vitality of commercial and employment areas.– ~~Utilize~~ Use transportation demand management and pricing of parking in areas with high parking demand.

**Policy 9.58** **Share space and resources.** Encourage the shared use of parking and vehicles to maximize the efficient use of limited urban space.

**Policy 9.59** **Cost and price.**– Recognize the high public and private cost of parking by encouraging prices that reflect the cost of providing parking and balance demand and supply.– Discourage employee and resident parking subsidies.

**Policy 9.60** **Bicycle parking.** Promote the development of new bicycle parking facilities~~,~~ including dedicated bike parking in the public right-of-way. Provide sufficient bicycle parking at High-Capacity Transit stations to enhance bicycle connection opportunities. Require provision of adequate off-street bicycle parking for new development and redevelopment~~s~~.

## Finance, programs, and coordination

Programs and funding are required to build and maintain the transportation system, and they are necessary to help decide what projects to build. They also provide public

information about what facilities are available and how they can be used. Agencies outside ~~of~~ the City also own and operate facilities ~~in the city~~within Portland and provide funding for new facilities. These policies address essential funding and coordination opportunities with other agencies, as well outreach and education programming.

**Policy 9.61** **Coordination**. Coordinate with state and federal agencies, local and regional governments, special districts, other City bureaus, and providers of transportation services when planning for, developing, and funding transportation facilities and services.

**Policy 9.62** **New ~~D~~development ~~I~~impacts.~~–~~** Prevent, reduce, and mitigate the impacts of new development and redevelopment on the transportation system.~~–~~ Utilize strategies including transportation and parking demand management, transportation system analysis, and system and local impact mitigation improvements and fees.

**Policy 9.63** **Education and encouragement.** Create, maintain, and coordinate educational and encouragement programs that support multimodal transportation and that emphasize safety for all modes of transportation. Ensure that these programs are accessible to under-served and under-represented populations.

~~**Policy 9.56 Transportation Demand Management (TDM).** Create and maintain Transportation Demand Management (TDM), programs that increase the modal share of walking, bicycle, and transit trips. Integrate TDM with other programs, including parking management.~~

**Policy 9.64** **Telecommuting.** Promote telecommuting and the use of communications technology to reduce travel demand.

**Policy 9.65** **Project and program selection criteria.** Establish transportation project and program selection criteria consistent with goals 9A through ~~9H~~9I, to ~~cost~~ cost-effectively achieve access, place making, sustainability, equity, health, prosperity, and safety goals.~~–~~ ~~Coordinate transportation project selection with other capital planning programs impacted by work in the public right of way, including sewer and water utilities.~~

**Policy 9.66** **Funding.** Encourage the development of a range of stable transportation funding sources that provide adequate resources to build and maintain an equitable and sustainable transportation system.



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*Figure 9-1. Transportation System Plan: Relationship to Other Policies and Plans*

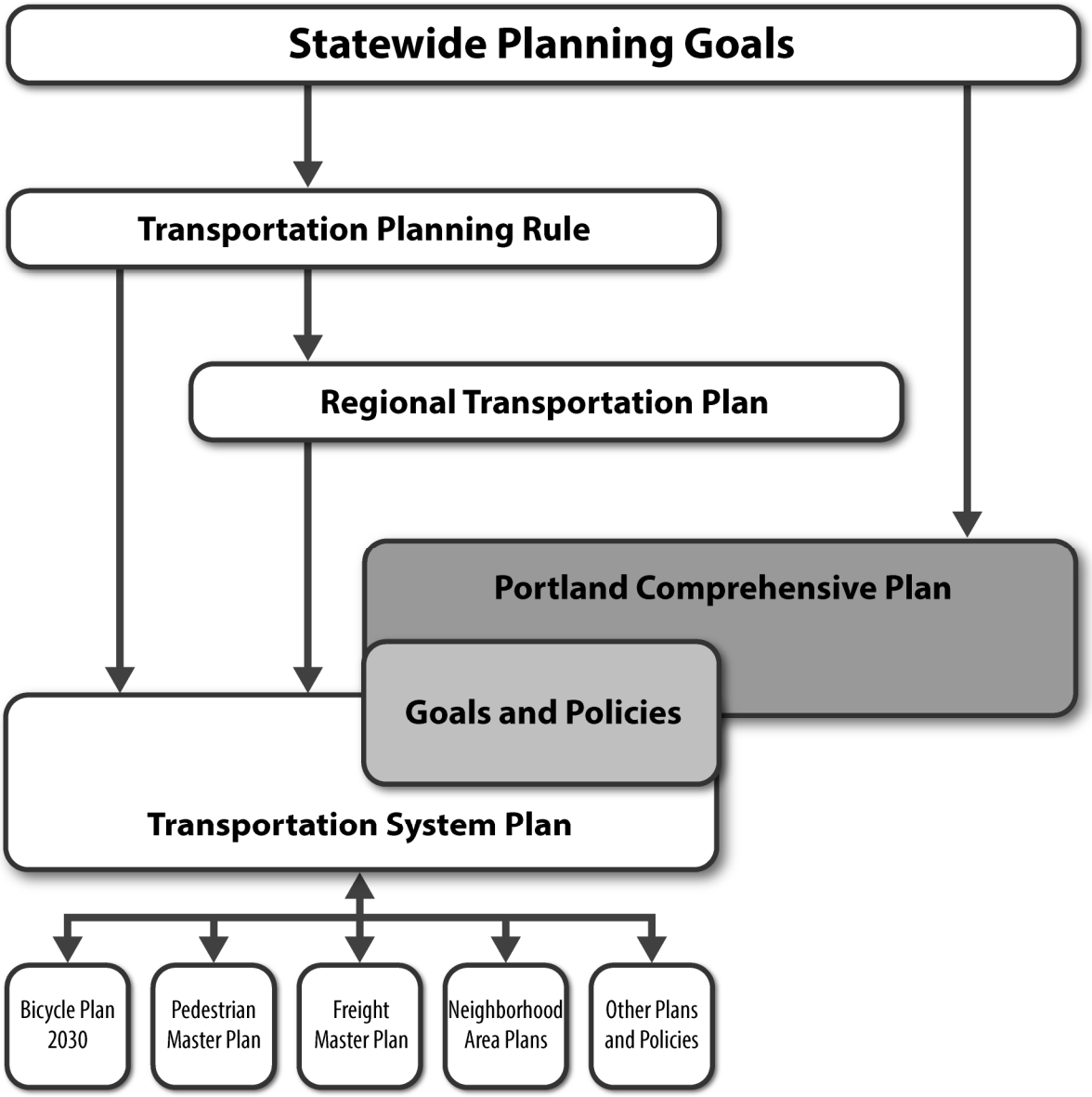




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*Figure 9-2. Central City Multimodal Transportation Area (MMA)*

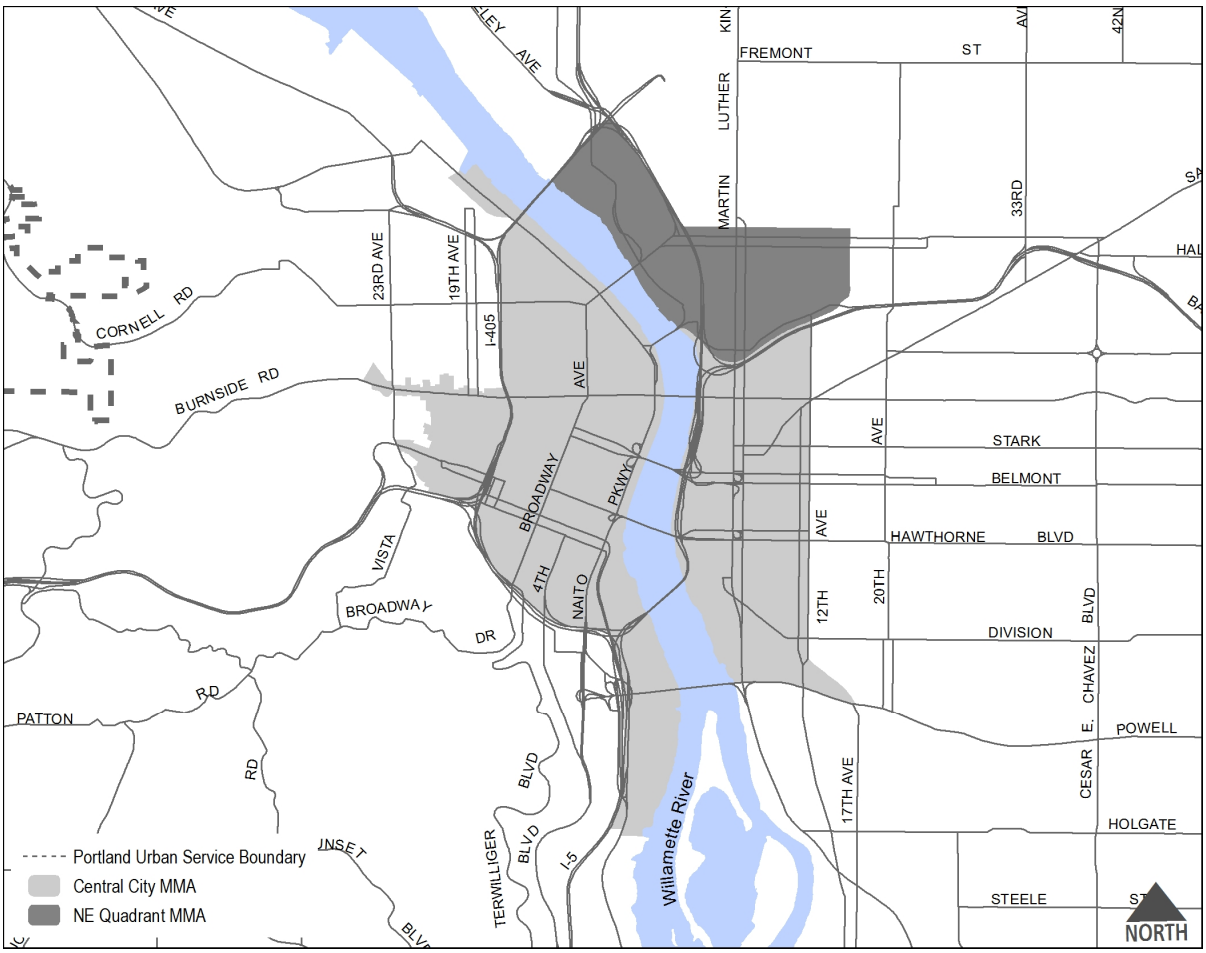




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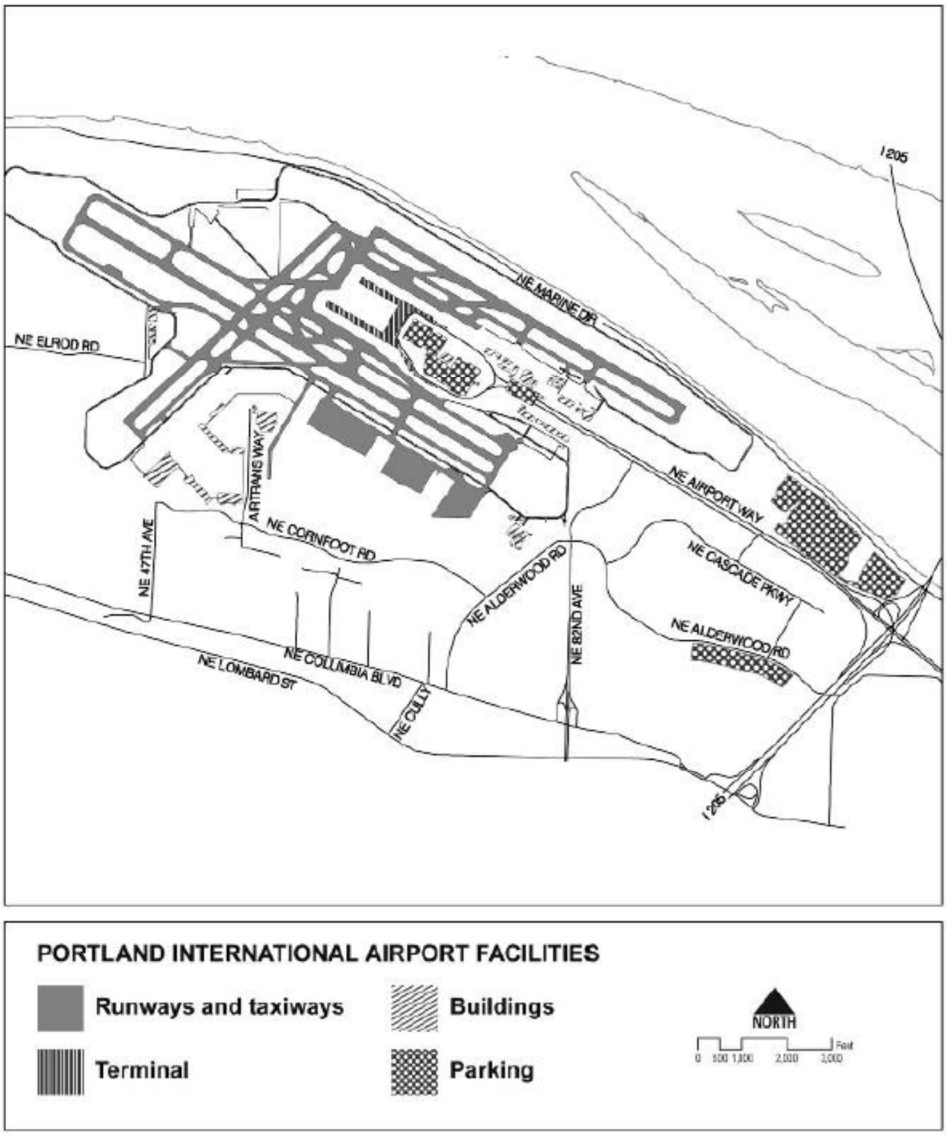
*Figure 9-3. Portland International Airport*



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# ~~Chapter 10: Administration and Implementation~~ Land Use Designations and Zoning

## What is this chapter about?

The goals and policies in this chapter ~~serve~~ convey the City's intent to:

- ~~Provide guidance for how to update the Comprehensive Plan and develop implementation measures.~~
- Provide a clear definition of each ~~Comprehensive Plan Map D~~land use designation.
- Provide guidance for how to update the Zoning Map and Zoning Code.

## Why is this important?

This chapter describes the land use designations and how they relate to zoning. It is important for the relationship between land use designations and zoning to be clear so that as base zones and the ~~z~~Zoning ~~c~~Code are amended over the life of Comprehensive Plan, the goals and policies of the plan are consistently carried out.

~~Although the Comprehensive Plan anticipates land use and significant capital project investment needs for the next 20 years, no plan that is as broad in scope or as comprehensive in its application as this Comprehensive Plan can be wholly relevant for 20 years. Changing needs, new technologies and innovations, and shifting perceptions may make it necessary and reasonable to update parts of the Comprehensive Plan over the next 20 years.~~

~~This chapter provides guidance on how to amend the Plan while maintaining consistency with the Plan's vision.~~



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~~Policy 10.2 Amending the Comprehensive Plan Map (moved to Chapter 1)~~
Policy 10.~~3~~2 Relationship of land use designations to base zones ~~Amending the Zoning Map~~
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# Goals

**Goal 10.A.: Land Use Designations and Zoning**
Effectively and efficiently carry out the goals and policies of the Comprehensive Plan through the land use designations, zoning map, and the Zoning Code.

# Policies

## Land use designations

The Comprehensive Plan Map is one of the Comprehensive Plan's implementation tools. The map includes land use designations, which are used to carry out the Comprehensive Plan. The land use designation that best implements the goals and policies of the Plan is applied to each area of the city. This section contains general descriptions of the land use designations. Each description includes:

- Type of place or Pattern Area for which the designation is intended.
- General use and intensity expected within the area. In some cases, alternative development options allowed in single-dwelling residential zones (e.g. duplexes and attached houses on corner lots; accessory dwelling units) may allow additional residential units beyond the general density described below.
- Level of public services provided or planned.
- Level of constraint.

**Policy 10.51 Land use designations.** Apply a land use designation to all land and water within the City's Urban Services Boundary. Apply the designation that best advances the Comprehensive Plan goals and policies. The land use designations are shown on the adopted Land Use Map and on official Zoning Maps.

*Note: The pending Central City 2035 Plan will revise the Central City-specific land use descriptions or will create new corresponding zones.*

**Open Space**

**1. Open Space**
This designation is intended for lands that serve a recreational, public open space, or ecological function, or provide visual relief. Lands in this designation are primarily publicly-owned but can be in private ownership. Lands intended for the Open Space designation include parks, public plazas, natural areas, scenic lands,



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golf courses, cemeteries, open space buffers along freeway margins, railroads or abutting industrial areas, and large water bodies. The corresponding zone is OS.

**Single-Dwelling Residential**

**2. Farm and Forest**
This designation is intended for agricultural and forested areas far from centers and corridors, where urban public services are extremely limited or absent, and future investment ~~in~~ to establish an urban level of public services ~~are~~ is not planned. Areas within this designation generally have multiple significant development constraints that may pose health and safety risks if the land were more densely developed. The designation can be used where larger lot sizes are necessary to enable on-site sanitary or stormwater disposal. It also may be used in locations that may become more urban in the future, but where plans are not yet in place to ensure orderly development. Agriculture, forestry, and very low-density single-dwelling residential will be the primary uses. ~~-~~The maximum density is generally 1 unit per 2 acres. The corresponding zone is RF.

**3. Single-Dwelling — 20,000**
This designation is intended for areas that are generally far from centers and corridors where urban public services are extremely limited or absent, and future investments in urban public services ~~are not planned~~will be limited. Areas within the designation generally have multiple significant development constraints that may pose health and safety risks if the land were more densely developed. Very low-density single-dwelling residential and ~~A~~agriculture~~, forestry, and very low-density single-dwelling residential~~ will be the primary uses. The maximum density is generally ~~will range from 1 unit per 2 acres to~~ 2.2 units per acre. The corresponding zone~~s are~~ is ~~RF and~~ R20. ~~RF is often used where larger lot sizes are necessary to enable on-site sanitary or stormwater disposal.~~

**4. Single-Dwelling — 10,000**
This designation is intended for areas far from centers and corridors where urban public services are available or planned but complete local street networks or transit service is limited. This designation is also intended for areas where ecological resources or public health and safety considerations warrant lower densities. Areas within this designation generally have development constraints, but the constraints can be managed through appropriate design during the subdivision process. Single-dwelling residential will be the primary use. The maximum density is generally 4.4 units per acre. The corresponding zone is R10.

**5. Single-Dwelling — 7,000**
This designation is intended for areas that are~~near, but~~ not adjacent to ~~,~~ centers and corridors, where urban public services are available or planned, but complete local street networks or transit service is limited. This designation is also intended for areas where ecological resources or public health and safety considerations warrant lower densities. Areas within this designation may have minor development constraints, but the constraints can be managed through appropriate



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design during the subdivision process. This designation ~~is also intended for~~may also be applied in areas where urban public services~~, generally including complete local street networks and access to frequent transit,~~ are available or planned, but the development pattern is already predominantly built-out ~~at~~ at 5 to 6 units per acre~~7,000 square feet or more per dwelling unit~~. ~~Areas within this designation generally have only minor development constraints.~~ Single-dwelling residential will be the primary use. The maximum density is generally 6.2 units per acre. The corresponding zone is R7.

**6. Single-Dwelling — 5,000**
This designation is Portland's most common pattern of single-dwelling development, particularly in the city's inner neighborhoods. It is intended for areas ~~near, in, and along centers and corridors~~ where urban public services, generally including complete local street networks and access to frequent transit, are available or planned. Areas within this designation generally have few or very ~~limited~~ minor development constraints. Single-dwelling residential will be the primary use. The maximum density is generally 8.7 units per acre. The corresponding zone is R5.

**7. Single-Dwelling — 2,500**
This designation allows a mix of housing types that are single-dwelling in character. This designation is intended for areas near, in, and along centers and corridors, near transit station areas, where urban public services, generally including complete local street networks and access to frequent transit, are available or planned. Areas within this designation generally do not have development constraints. This designation often serves as a transition between mixed use or multi-dwelling designations and lower density single dwelling designations. The maximum density is generally 17.4 units per acre. The corresponding zone is R2.5.

**Multi-Dwelling Residential**

**8. Multi-Dwelling — 3,000**
This designation allows a mix of housing types, including multi-dwelling structures, in a manner similar to the scale of development anticipated within the ~~Attached~~ Single-Dwelling — 2,500 designation. This designation is intended for areas near, in, and along centers and corridors where urban public services, generally including complete local street networks and access to frequent transit, are available or planned. Areas within this designation generally do not have development constraints~~,~~ and may include larger development sites. The maximum density is generally 14.5 units per acre, but may go up to 21 units per acre in some situations. The corresponding zone is R3.

**9. Multi-Dwelling — 2,000**
This designation allows multi-dwelling development mixed with single-dwelling housing types but at a scale greater than for single-dwelling residential. This designation is intended for areas near, in, and along centers and corridors~~,~~ and transit station areas, where urban public services, generally including complete



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local street networks and access to frequent transit, are available or planned. Areas within this designation generally do not have development constraints. The maximum density is generally 21.8 units per acre, but may be as much as 32 units per acre in some situations. The corresponding zone is R2.

**10. Multi-Dwelling — 1,000**

Thise designation ~~continues a common development pattern for~~allows medium density ~~apartments~~multi-dwelling development. The scale of development is intended to reflect the allowed densities while being compatible with nearby single-dwelling residential. ~~This~~ The designation is intended for areas near, in, and along centers and corridors, and transit station areas, where urban public services, generally including complete local street networks and access to frequent transit, are available or planned. Areas within this designation generally do not have development constraints. The maximum density is generally 43 units per acre, but may be as much as 65 units per acre in some situations. The corresponding zone is R1.

**11. High-Density Multi-Dwelling**

This designation is intended for the Central City, Gateway Regional Center, ~~t~~Town ~~centers~~Centers, and transit station areas where a residential focus is desired and urban public services including access to high-capacity transit, very frequent bus service or streetcar service are available or planned. This designation is intended to allow high-density multi-dwelling structures at an urban scale. Maximum density is based on a floor-area-ratio, not on a unit-per-square-foot basis. Densities will range from 80 to 125 units per acre. The corresponding zone is RH.

**12. Central Residential**

This designation allows the highest density and most intensely developed multi-dwelling structures. Limited commercial uses are also allowed as part of new development. The designation is intended for the Central City and Gateway Regional Center where urban public services are available or planned including access to high-capacity transit, very frequent bus service, or streetcar service. Development will generally be oriented to pedestrians. Maximum density is based on a floor area ratio, not on a units-per-square-foot basis. Densities allowed exceed 100 units per acre. The corresponding zone is RX.

**Mixed- Use and Commercial**

**13. Mixed- Use — Dispersed**

This designation allows mixed use, multi-dwelling, or commercial development that ~~are~~ is small in scale, ~~have~~ has little impact, and provides services for the nearby residential areas. Development will be similar in scale to nearby residential development to promote compatibility with the surrounding area. This designation is intended for areas where urban public services are available or planned. Areas within this designation are generally small nodes~~,~~ rather than large areas or corridors. The corresponding zones are Commercial Mixed- Use 1 (CM1) and Commercial Employment (CE)~~Neighborhood Commercial 1 (CN1), Neighborhood~~



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~~Commercial 2 (CN2), Office Commercial 1 (CO1), Office Commercial 2 (CO2), Mixed Commercial/Residential (CM), and Storefront Commercial (CS)~~.

**14. Mixed~~-~~ Use — Neighborhood**

This designation promotes mixed-use development in neighborhood centers and along neighborhood corridors to preserve or cultivate locally serving commercial areas with a storefront character. This designation is intended for areas where urban public services, generally including complete local street networks and access to frequent transit, are available or planned, and development constraints do not exist. Areas within this designation are generally pedestrian-oriented~~,~~ and are predominantly built~~-up~~ at low- to mid-rise scale, often with buildings close to and oriented towards the sidewalk. The corresponding zones are Commercial Mixed~~-~~ Use 1 (CM1), Commercial Mixed~~-~~ Use 2 (CM2), and Commercial Employment (CE)~~Neighborhood Commercial 1 (CN1), Neighborhood Commercial 2 (CN2), Office Commercial 1 (CO1), Office Commercial 2 (CO2), Mixed Commercial/Residential (CM), Storefront Commercial (CS), and General Commercial (CG)~~.

**15. Mixed Use — Civic Corridor**

This designation allows for transit-supportive densities of commercial, residential, and employment uses, including a full range of housing, retail, and service businesses with a local or regional market. This designation is intended for areas along ~~key civic~~major corridors where urban public services are available or planned including access to high-capacity transit, frequent bus service, or streetcar service. The Civic Corridor designation is applied along some of the City's busiest, widest, and most prominent streets. As the city grows, these corridors also need to become places that can succeed as attractive locations for more intense, mixed-use development. They need to become places that are attractive and safe for pedestrians while continuing to play a major role in the City's transportation system. Civic Corridors, as redevelopment occurs, are also expected to achieve a high level of environmental performance and design. The corresponding zones are Commercial Mixed~~-~~ Use 1 (CM1), Commercial Mixed~~-~~ Use 2 (CM2), Commercial Mixed~~-~~ Use 3 (CM3), Commercial Employment (CE)~~Neighborhood Commercial 1 (CN1), Neighborhood Commercial 2 (CN2), Office Commercial 1 (CO1), Office Commercial 2 (CO2), Mixed Commercial/Residential (CM), Storefront Commercial (CS), General Commercial (CG), and Central Employment (EX)~~.

**16. Mixed Use — Urban Center**

This designation is intended for areas that are close to the Central City and within Town Centers where urban public services are available or planned including access to high-capacity transit, very frequent bus service, or streetcar service. The designation allows a broad range of commercial and employment uses, public services, and a wide range of housing options. Areas within this designation are generally mixed-use and very urban in character. Development will be pedestrian-oriented with a strong emphasis on design and street level activity, and will range from low- to mid-rise in scale. The range of zones and development scale associated with this designation are intended to allow for more intense development in core



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areas of centers and corridors and near transit stations, while providing transitions to adjacent residential areas. The corresponding zones are Commercial Mixed- Use 1 (CM1), Commercial Mixed- Use 2 (CM2), Commercial Mixed- Use 3 (CM3), and Commercial Employment (CE)~~Neighborhood Commercial 1 (CN1), Neighborhood Commercial 2 (CN2), Office Commercial 1 (CO1), Office Commercial 2 (CO2); Mixed Commercial/Residential (CM), Storefront Commercial (CS), General Commercial (CG), Central Employment (EX), and Central Commercial (CX)~~.

**17. Central Commercial**

This designation is intended to provide for commercial development within Portland's Central City and Gateway Regional Center. A broad range of uses is allowed to reflect Portland's role as a commercial, cultural, and governmental center. Development is intended to be very intense with high building coverage, large buildings, and buildings placed close together along a pedestrian-oriented, safe, and attractive streetscape. The corresponding zone is Central Commercial (CX).

**Employment**

~~**18. Central Employment**~~

~~The designation allows for a full range of residential, commercial, and light-industrial uses. This designation is intended to provide for mixed-use areas within the Central City and Gateway Regional Center where urban public services are available or planned including access to high-capacity transit or streetcar service. The intensity of development will be higher than in other mixed-use land designations. The corresponding zone is Central Employment (EX).~~

~~**Employment**~~

**19. Mixed Employment**

This designation encourages a wide variety of office, creative services, manufacturing, distribution, traded sector, and other light-industrial employment opportunities, typically in a low-rise, flex-space development pattern. Most employment uses are allowed but limited in impact by the small lot size and adjacency to residential neighborhoods. Retail uses are allowed but are limited in intensity so as to maintain adequate employment development opportunities. Residential uses are not allowed to reserve land for employment uses, to prevent conflicts with the other uses, and to limit the proximity of residents to truck traffic and other impacts. The corresponding zones are General Employment 1 (EG1)~~,~~ and General Employment 2 (EG2)~~, and Neighborhood Employment (EN)~~.

**18. Central Employment**

The designation allows for a full range of commercial, light-industrial, and residential uses. This designation is intended to provide for mixed- use areas within the Central City and Gateway Regional Center where urban public services are available or planned including access to high-capacity transit or streetcar service. The intensity of development will be higher than in other mixed- use land designations. The corresponding zone is Central Employment (EX).



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**20. Institutional Campus**

This designation is intended for large institutional campuses that are centers of employment and serve a population from a larger area than the neighborhood or neighborhoods in which the campus is located. This designation is intended for areas where urban public services are available or planned. This designation includes medical centers, colleges, schools, and universities. ~~A variety of other uses are allowed, including residential, to support the mission of the campus.~~ A variety of other uses are allowed that support the mission of the campus, such as residences for students, staff, or faculty. Neighborhood-serving commercial uses and other services are also encouraged. The designation is intended to foster the growth of the institution while enhancing the livability of surrounding residential neighborhoods and the viability of nearby business areas. Corresponding zones are Campus Institution 1 (CI1), Campus Institution 2 (CI2), and Institutional Residential (IR)~~, Central Employment (EX), Campus Institution 1 (CI1), and Campus Institution 2 (CI2)~~.

**Industrial**

**21. Industrial Sanctuary**

This designation is intended to reserve areas that are attractive for manufacturing and distribution operations and encourage the growth of industrial activities in the parts of the city where important freight and distribution infrastructure exists, including navigable rivers, airports, railways, and pipelines. A full range of industrial uses are permitted and encouraged. Nonindustrial uses are significantly restricted to facilitate freight mobility, retain market feasibility for industrial development, prevent land use conflicts, reduce human exposure to freight traffic and potential air quality, noise, and pedestrian safety impacts, and to preserve land for sustained industrial use. The corresponding zones are General Industrial 1 (IG1), General Industrial 2 (IG2), and Heavy Industrial (IH).



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~~**22. West Hayden Island Urban Services Area**~~

~~This designation is intended to provide for a combination of open space and deep water marine industrial uses in anticipation of future annexation, infrastructure extension, and rezoning. This designation implements Metro's Urban Growth Management Functional Plan. The interim zoning before annexation will be Multnomah County Multiple Use Forest (MUF). The implementing zoning after annexation will be Open Space (OS) and Heavy Industrial (IH).~~

## ~~Amending t~~The Zoning Map and Zoning Code

The zoning map and the zoning code are important tools that carry out the goals and policies of the Comprehensive Plan. ~~-~~This section describes the relationship between the land use designations and the base zones, and how base zones and the zoning maps can be amended. ~~-~~The policies are intended to provide a framework and clarity around zoning map and zoning code amendments. ~~-~~The Zoning Code contains the use and development regulations associated with each base zone.

*Policies 1.5 through 1.16 ~~, which~~ may also apply to zoning map amendments.~~>~~*

**Policy 10.2** **Relationship of land use designations to base zones.** Apply a base zone to all land and water within the City's urban services boundary. The base zone applied must either be a zone that corresponds to the land use designation or be a zone that does not correspond but is allowed according to Figure 10-1. ~~-~~In some situations there are long-term or short-term obstacles to achieving the level of development intended by the land use designation (e.g., an infrastructure improvement to serve the higher level of development is planned but not yet funded). In these situations, a less intense zone (listed in Figure 10-1) may be applied. When a land use designation is amended the zone may also have to be changed to a corresponding zone or a zone that does not correspond but is allowed.

**Policy 10.3** **Amending the Zoning Map.**

**10.3.a.** Amending a base zone may be done legislatively or quasi-judicially.

**10.3.b** When amending a base zone quasi-judicially, the amendment must be to a corresponding zone (*see Figure 10-1 ~~for corresponding zones~~— Corresponding and Allowed Zones for each Land Use Designation*)~~Amendments to a base zone in compliance~~consistent ~~with the Comprehensive Plan land use designation must be to the corresponding zone stated in the designation~~. When a designation has more than one corresponding zone, the most appropriate zone, based on the purpose of the zone and the zoning and general land uses of surrounding lands, will be applied.

**10.3.c.** When amending a base zone legislatively, the amendment may be to a corresponding zone or to a zone that is does not correspond but is allowed (*see Figure 10-1 — Corresponding and Allowed Zones for each Land Use Designation ~~see 10-1~~ for zones that are allowed*).~~–~~ A legislative zoning map amendment may not be



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to a zone that is not allowed.

**10.3.~~bd~~.** An amendment to a base zone ~~in compliance~~consistent with the land use designation must be approved when it is found that current public services are capable of supporting the uses allowed by the zone, or that public services can be made capable by the time the development is complete. The adequacy of services is based on the proposed use and development. If a specific use and development proposal is not submitted, services must be able to support the range of uses and development allowed by the zone. For the purposes of this requirement, services include water supply, sanitary sewage disposal, stormwater management, transportation, school district capacity (where a school facility plan exists), and police and fire protection.

**10.3.~~ce~~.** An amendment to apply or remove an overlay zone or plan district may be done legislatively or quasi-judicially, and must be based on a study or plan document that identifies a specific characteristic, situation, or problem that is not adequately addressed by the base zone or other regulations.

~~**Policy 10.63 Relationship of land use designations to base zones.** Base zones must either be the zone that corresponds to the land use designation or be a zone that is less intense. In some situations there are long-term or short-term obstacles to achieving the level of development intended by the land use designation (e.g., an infrastructure improvement to serve the higher level of development is planned but not yet funded). In these situations, a less intense zone may be applied. Base zones that are corresponding, less intense, and more intense for each land use designation are shown in Figure 10-1. When a land use designation is amended, the zone may have to be changed to correspond or be less intense than the new designation.~~

**Policy 10.4** **Amending the Zoning Code.** Amendments to the zoning regulations must be done legislatively, and should be clear, concise, and applicable to a broad range of development situations faced by a growing city. Amendments should:

- ~~Promote good planning:~~
  - ~~Comply with the Comprehensive Plan goals and policies. "Comply" means that, on the whole, the proposal strikes a reasonable balance among applicable goals and policies.~~
- ~~Demonstrate that reasonable consideration was given to the Guiding Principles outlined in Chapter 1.~~
- ~~Promote equity:~~
  - ~~Extend benefits associated with environmental assets, land uses, and public investments to communities of color, low-income populations, and other under-served or under-represented groups impacted by the decision.~~
  - ~~Eliminate, where practicable, disproportionate burdens (e.g. adverse environmental, economic or community impacts) associated with land use and public investment decisions for communities of color, low-~~



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~~income populations, and other under-served or under-represented groups impacted by the decision. In cases where disproportionate burdens cannot be eliminated, they should be minimized or mitigated.~~

- ~~Use, where relevant and practicable, land use and investment decisions to address disproportionate burdens of previous decisions.~~
- ~~Effectively include impacted communities in the decision-making process (see the Community Involvement chapter of this Comprehensive Plan).~~

**~~A~~10.4.a.** ~~———~~Promote good planning:

1. Effectively and efficiently implement the Comprehensive Plan.
2. Address existing and potential land use problems.
3. Balance the benefits of regulations against the costs of implementation and compliance.
4. ~~Ensure that~~Maintain Portland~~'s remains~~ competitiveness with other jurisdictions as a location in which to live, invest, and do business.

**~~B~~10.4.b.** Ensure good administration of land use regulations:

1. Keep regulations as simple as possible.
2. Use clear and objective standards wherever possible.
3. Maintain consistent procedures and limit their number.
4. Establish specific approval criteria for land use reviews.
5. Establish application requirements that are as reasonable as possible, and ensure they are directly tied to approval criteria.
6. Emphasize administrative procedures for land use reviews.
7. Avoid overlapping reviews.

**~~C.~~ 10.4.c.** Strive to improve the code document:

1. Use clear language.
2. Maintain a clear and logical organization.
3. Use a format and layout that enables use of the document by lay people as well as professionals.
4. Use tables and drawings to clarify and shorten the document.
5. Identify and act on regulatory improvement suggestions.



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*~~Table~~Figure 10-1-. Corresponding and Allowed Zones for each Land Use Designation*

| LU Designation | Corresponding Zone(s) | Non-corresponding zone(s) that are allowed |
|---|---|---|
| Open Space | OS | none |
| | | |
| Farm and Forest | RF | OS |
| Single-Dwelling 20,000 | R20 | RF, OS |
| Single-Dwelling 10,000 | R10 | R20, RF, OS |
| Single-Dwelling 7,000 | R7 | R10, R20, RF, OS |
| Single-Dwelling 5,000 | R5 | R7, R10, R20, RF, OS |
| Single-Dwelling 2,500 | R2.5 | R5, R7, R10, R20, RF, OS |
| | | |
| Multi-Dwelling 3,000 | R3 | R2.5, R5, R7, R10, R20, RF, OS |
| Multi-Dwelling 2,000 | R2 | R3, R2.5, R5, R7, R10, R20, RF, OS |
| Multi-Dwelling 1,000 | R1 | R2, R3, R2.5, R5, R7, R10, R20, RF, OS |
| High- Density Multi-Dwelling | RH | R1, R2, R3, R2.5, R5, R7, R10, R20, RF, OS |
| Central Residential | RX | RH, R1, R2, R3, R2.5, R5, R7, R10, R20, RF, OS |
| | | |
| Mixed-Use—Dispersed | CM1, CE | R2, R3, R2.5, R5, R7, OS |
| Mixed-Use—Neighborhood | CM1, CM2, CE | R2, R3, R2.5, R5, OS |
| Mixed-Use—Civic Corridor | CM1, CM2, CM3, CE | R1, R2, R3, R2.5, R5, OS |
| Mixed-Use—Urban Center | CM1, CM2, CM3, CE | RH, R1, R2, R2.5, OS |
| Central Commercial | CX | IH, IG1, IG2, EG1, EG2, EX, CM1, CM2, CM3, CE, RX, RH, R1, R2, R3, R2.5, R5, R7, R10, R20, RF, OS |
| | | |
| Mixed Employment | EG1, EG2 | IH, IG1, IG2, CM1, CM2, CM3, CE, RF |
| Central Employment | EX | none |
| Institutional Campus | CI1, CI2, IR | EG2, EX, CX, CM1, CM2, CM3, CE, R1, R2, R3, R,2.5, R5, R7, R10, R20, RF, OS |
| | | |
| Industrial Sanctuary | IH, IG1, IG2 | RF |



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# Glossary

The Comprehensive Plan uses clear, everyday language as much as possible. Words and terms in the glossary have the specific meaning stated below when used in the Comprehensive Plan, unless the context clearly indicates another meaning. Words not included in this Glossary are defined by their dictionary meaning, or in some cases, by their meaning in state or federal law.

**Accountability:** The ability to identify and hold public officials responsible for their actions.

**Access**: 1) The ability to approach or make use of transportation facilities, parks and open space, public infrastructure, or businesses and services that are open to the public. Good access means within close proximity (up to ~~½~~ a half mile) that is free from physical barriers for those with limited mobility. 2) Providing a wide variety of information and involvement opportunities, activities, and settings as part of meaningful community engagement in public decision-making.

**Accessory dwelling unit:** A second dwelling unit on a lot with a house, attached house, or manufactured home. The second unit is created auxiliary to, and is always smaller than, the house, attached house, or manufactured home. The unit includes its own independent facilities including provisions for sleeping, cooking, and sanitation, and is designed for occupancy by one or more people independent of the primary dwelling unit.

**Active transportation:** Transportation that involves physical activity, including walking, biking, ~~and~~ or using transit.

**Adaptive management:** A dynamic planning and implementation process that applies scientific principles, methods, and tools to incrementally improve management activities. Management strategies change as decision makers learn from experience and better information, and as new analytical tools become available. Adaptive management can involve frequent modification of planning and management strategies, goals, objectives, and benchmarks.

**Adopt:** This directs the City to adopt a specific plan or regulation.

**Affordable housing:** Housing that serves extremely low, very low, and low-income households. In determining affordability, the cost of housing, utilities, and transportation are considered. The U.S. Department of Housing and Urban Development (HUD) defines “affordable” as housing that costs no more than 30 percent of a household’s monthly income.

**Aggregate resources:** Naturally occurring concentrations of stone, rock, sand and gravel, decomposed granite, lime, pumice, cinders and other naturally occurring solid materials used in road building.

**Air Toxins.** Air toxics are air pollutants known or suspected to cause cancer or other serious health problems. Air toxics include diesel soot, benzene, polycyclic aromatic hydrocarbons (tar-like by-products from auto exhaust and other sources), and metals including manganese, nickel,



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and lead. Air toxics come from a variety of sources including cars and trucks, all types of burning (including fireplaces and woodstoves), businesses, and consumer products such as paints. There are currently no federal standards for air toxics. Oregon has adopted ambient benchmark concentrations that serve as clean air goals for 52 air toxics known to be present in the state. Each air toxic of concern has a benchmark set based on its non-cancer or cancer causing effects, whichever level would be more protective. An ambient benchmark concentration is the annual average concentration of a toxic chemical in air that individuals, including more sensitive groups such as children or the elderly, could breathe continuously for a lifetime without experiencing any non-cancer health effects or without Air pollution monitor 2 increasing their risk above the background cancer rate by greater than one chance in a million.

**Archaeological resource:** Part of the physical record of an indigenous or other culture. Archaeological resources are material remains of past human life or activity, including, but not limited to, monuments, symbols, tools, facilities, technological by-products, and dietary by-products. As defined under state law, archaeological objects are more than 75 years old.

**Asset management:** The continuous cycle of asset inventory, condition, and performance assessment that aims to provide cost-effective provision of a desired level of service for physical assets. Asset management includes planning, design, construction, maintenance, operation, rehabilitation, and replacing assets on a sustainable basis, while considering social, economic, and environmental impacts.

**Best practice:** An activity that has proven its effectiveness in multiple situations and may have applicability in other situations.

**Bird-friendly building design:** Structural design approaches and management practices that reduce the risk of mortality or harm to resident and migratory birds from collisions, entrapment, or other hazards. Approaches and practices ~~may~~ include but are not limited window and building façade treatments that deter bird strikes (such as patterned glass or reduced exterior glass), exterior and interior lighting designs that direct light downward or otherwise avoid light spill, and turning lights off at night during specified periods.

**Brownfield:** Real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

**Business Associations:** An autonomous non-profit organization with membership guidelines in its bylaws formed by people in business within a defined geographic boundary for the purpose of promoting the general well-being of their business community~~.~~ ~~S~~*(see City Code Section 3.96.020).*

**Carbon emissions:** Carbon dioxide and other greenhouse gas equivalents from the mining and use of fossil fuels in homes, industry, business, transportation, and electricity generators.



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**Centers:** Places with concentrations of commercial and community services, housing, gathering places, and transit connections. Centers provide services to surrounding neighborhoods and are intended to be enhanced as places because they are a focus of housing and job growth. There are four types of centers with varying functions, levels of activity, and scales and intensities of development:

- **Central City:** Corresponds to the Central City plan district, which serves as the region's premier center, anchoring an interconnected system of centers.
- **Gateway Regional Center:** Corresponds to the Gateway plan district, East Portland's largest center, which is intended to be enhanced as an employment and community service hub within the area and region.
- **Town Centers:** Large centers that serve a broad area of the city and have an important role in accommodating growth. They provide a full range of commercial and community services, high-density housing, mid-rise commercial and mid-rise mixed-use buildings (typically up to five to seven stories in height), are served by high-capacity transit connections, and have a substantial employment component. Town Centers provide housing opportunities for enough population to support a full-service business district.
- **Neighborhood Centers:** Centers that primarily serve adjacent neighborhoods and provide opportunities for additional housing and low- to mid-rise commercial and mixed-use buildings (typically up to three to five stories in height). They provide a range of local commercial and community services and transit connections. Neighborhood Centers provide housing opportunities for about half the population needed to support a neighborhood business district.

**Centers and corridors:** When used together, "centers and corridors" refers generally to places where development is concentrated, including the Central City and the Gateway Regional Center, Town Centers, and Neighborhood Centers, and along Civic Corridors and Neighborhood Corridors, and at Transit Station Areas.

**City:** City is capitalized when it refers specifically to City of Portland government. When it is used to designate a geographic area it is not capitalized.

**City Greenways:** A system of distinctive pedestrian- and bicycle-friendly ~~green~~ streets and trails, enhanced by lush tree canopy and landscaped stormwater facilities that support active living by expanding recreational opportunities and making it easier and more attractive to reach destinations across the city. City Greenways are a network that includes the following types of infrastructure:

1. Enhanced greenway corridors are distinctive green streets with extensive tree canopy and landscaped stormwater facilities that provide connections between major centers, schools, parks, natural areas, and the rivers.



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2. Trails are often located along rivers or through natural areas, providing pedestrian and bicycle connections.

3. Heritage parkways are iconic streets or segments of streets with elements such as linear parkways, scenic views, and distinctive landscaping or street design.

4. Neighborhood greenways are an extensive network of streets with low volumes of motor vehicle traffic that are prioritized for bicycles and pedestrians, working in conjunction with the rest of the City Greenways system to extend the system into all neighborhoods.

**Clustered housing/clustered services:** This is a non-traditional housing model that refers to housing that is built, planned, or organized to offer long-term living services. Housing options range from cottages to multi-unit high rises and can be on single lots or campus settings. In most cases the service provider, rather than the housing provider, is responsible for delivery of services**.**

**Cohousing:** This is a non-traditional housing model that is designed to foster an intentional community and cooperation, while preserving independence. Cohousing combines the autonomy of private dwellings with the advantages of community living by clustering private residences near shared facilities. The members typically design and manage all aspects of their community.



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**Community:** A group of people with a shared sense of identity or belonging.

**Community validated population data:** Historically, the US Census has undercounted communities of color and culturally specific communities. This is particularly true for the Native American community. One way to redress this issue is to find other options for getting a more realistic estimate. The community-validated population data, an evidence based approach is one such method that involves the use of an independent primary source (like the tribal registry numbers in case of the Native American community) and triangulating that data with other available sources/research to arrive at an estimate.

**Complete neighborhood**: A neighborhood where people have safe and convenient access to the goods and services needed in daily life, which include a variety of housing options, grocery stores and other commercial services, high-quality public schools, and parks. Complete neighborhoods are also easily accessible by foot, wheelchair, bike, and transit for people of all ages and abilities.

**Complete streets:** Complete streets provide accessibility to all users of the right-of-way regardless of age, ability, or mode of transportation. They are designed and operated to make better places and to enable safe access for all modes, including people walking and bicycling, those using a mobility device, motorists, and transit riders.

**Comply:** Has been evaluated against the Comprehensive Plan's applicable goals and policies and on balance is equally or more supportive of the Comprehensive Plan as a whole than the existing language or designation.

**Conflict with:** ~~–~~ Incompatible or irreconcilable with.

**Consider:** Take into account when planning or making decisions.

**Consistent with:** The subject meets the requirements of, satisfies, or adheres to the regulations, mandate, or plan listed in the goal or policy.

**Continue:** Persist in an activity or process.

**Coordinate:** Work together with others toward a common goal; collaborate.

**Corridor:** An area that may be a single major street, or a broad mobility corridor that provides connections for a range of transportation modes (transit, pedestrians, cyclists, freight, motor vehicles, ~~and so forth~~etc.), not necessarily on the same street. There are three types of corridors:

- **Civic Corridor:** These are a prioritized subset of the city's most prominent transit and transportation streets. They connect centers, provide regional connections, and include segments where commercial development and housing are focused. Civic Corridors are intended to continue their important transportation functions while providing livable environments for people, and evolving into distinctive places that are models of ecological design.



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- **Neighborhood Corridor:** Main streets that connect neighborhoods with each other and to other parts of the city. They support neighborhood business districts and provide housing opportunities close to local services, amenities, and transit lines. ~~They~~ Neighborhood Corridors are streets that include a mix of commercial and higher-density housing development. They have less intense development and transportation function than Civic Corridors.

- **Freight Corridor:** Primary routes into and through the city that support Portland as an important West Coast hub and a gateway for international and domestic trade. These facilities are integral to the growth of traded sector businesses such as manufacturing, warehousing, and distribution industries.



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**Cost burdened households:** As defined by ~~According to~~ the U.S. Department of Housing and Urban Development (HUD), any household that spends more than 30~~%~~ percent of its income on housing is categorized as a "cost burdened household." Because they are burdened by housing costs, such households may have difficulty affording other necessities such as food, clothing, transportation, and medical care.

**Critical infrastructure:** Systems that are essential for the functioning of society and the economy, including energy generation, transmission and distribution; telecommunications; water supply and wastewater; transportation systems; public health; and security and emergency response services.

**Criteria pollutants (CACs)**. A set of air pollutants that cause smog, acid rain, and other health hazards. CACs are typically emitted from many sources in industry, construction, open burning/fires, mining, transportation, electricity generation, and agriculture. In most cases they are the products of the combustion of fossil fuels or industrial processes.– The Clean Air Act requires the EPA to set US National Ambient Air Quality Standards (NAAQS) for the six CACs. They include ozone, particulate matter, lead, carbon monoxide, ~~surfur~~sulfur oxides, and nitrogen oxides.– The criteria pollutants of most concern in Portland are ozone and fine particulate matter.

**Cultural resource:** Aspects of cultural systems that contain significant information about a culture. These resources include, but are not limited to, districts, sites, buildings, structures, and objects that are associated with people, cultures, and human activities and events, either in the present or in the past.

**Design:** Determine the shape or configuration of something. This verb is used for physical outcomes for which the City will establish parameters for plans and through implementation.

**Discourage:** ~~To try to d~~Deter or prevent from happening by showing disapproval or creating disincentives.

**Displacement:** Households or businesses involuntarily forced to move from a neighborhood because of increasing market values, rents, or changes in the neighborhood's ability to meet basic needs in the case of households or erosion of traditional client base in the case of businesses.

**District Coalitions:** An organization which supports participation services for Neighborhood Associations and everyone within a geographically defined area, and is subject to City Code Chapter 3.96.

**Ecodistricts:** Areas, typically located in centers, where energy, water, and resource efficiency approaches are undertaken at a district scale, sometimes including district energy systems and other shared systems.



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**Ecological function:** The physical, chemical, and biological functions of a watershed such as flow conveyance and storage, channel dynamics, nutrient cycling, microclimate, filtration, control of pollution and sedimentation, water quality, terrestrial and aquatic habitat, and biodiversity.

**Ecosystem services:** The contribution of ecosystem conditions and processes to human well-being, including the production of goods and processes that control variability, support life, health, and safety, enrich cultural life, and preserve options. Examples include pollination of trees and plants, climate regulation, flood mitigation, stormwater management, clean air and water, recreational opportunities, and satisfaction of aesthetic and spiritual needs.

**Enable:** To supply with the means, knowledge, or opportunity; make able.

**Encourage:** Promote or foster ~~something~~ using some combination of voluntary approaches, regulations, or incentives. ~~that people or other organizations are already doing or could do.~~

**Engagement:** A process that strives to build collaboration between local government and the community. Engagement is an umbrella term to describe all levels of public participation including education, outreach, involvement, collaboration, and shared decision-making.

**Ensure:** To make something certain; to make sure that something will happen or be available.

**Environmental justice:** The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

**Equity:** Equity is when everyone has access to the opportunities necessary to satisfy their essential needs, advance their well-being, and achieve their full potential.

**Establish:** Create something, such as a program or project ~~,~~ that does not yet exist.

**Expand:** Make something that already exists more extensive.

**Evaluate:** Assess the range of outcomes, and identify costs and benefits.

**Facilitate:** To make something easier; to help bring about or make run more smoothly.

**Family wage:** The minimum income necessary, depending on family size, for a person working forty hours a week to meet their basic needs, such as housing, food, health care, childcare, and transportation.

**Foster:** ~~This directs the City to e~~Encourage or guide the incremental development of something over a long period of time.

**Gentrification**: An under-valued neighborhood that becomes desirable, resulting in rising property values and changes to demographic and economic conditions of the neighborhood. These changes include a shift from lower-income to higher-income households, and often there is a change in racial and ethnic make-up of the neighborhood's residents and businesses.



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**Green infrastructure:** Public or private assets — either natural resources or engineered green facilities — that protect, support, or mimic natural systems to provide stormwater management, water quality, public health and safety, open space, and other complementary ecosystem services. Examples include trees, ecoroofs, green street facilities, wetlands, and natural waterways.

**Green street:** A green street is a street with a landscaped ~~street side~~ planter or bioswale that captures stormwater runoff from the street and allows it to soak into the ground as soil and vegetation filters out pollutants. A green street is not the same as a City Greenway, though a City Greenway may include green street elements.

**Guide:** Shape or direct actions over time to achieve certain outcomes. This verb is used when the City has a role in shaping outcomes~~,~~ but implementation involves multiple other implementers and actions taking place over a long period of time.

**Urban Habitat Corridor:** Natural and built areas that provide safe, healthy places for resident and migratory fish and wildlife species that live in and move through the city. As a system they link habitats in Portland and the region, facilitating safe fish and wildlife access and movement through and between habitat areas. Enhanced habitat corridors are places where there is existing significant fish or wildlife habitat, as identified in the Natural Resource Inventory, and where habitat connectivity will be improved over time. Potential habitat corridors will be established over time. They are places where habitat features and functions (e.g., trees, vegetation, nesting and perching sites, ~~and~~ food, etc.) will be integrated into generally more developed areas of the city.

**Habitat-friendly development:** Strategies to provide habitat for and prevent harm to native resident and migratory wildlife. Examples include habitat-oriented ecoroofs, bridges, buildings, and sites, including features such as nest platforms and bat boxes. Strategies also involve development design and practices that: limit the amount of light, noise, vibration, and other disturbance or hazards that negatively affect wildlife and wildlife habitat, especially during vulnerable wildlife life cycles (such as mating/nesting season and migration); improve wildlife access and passage, by limiting fencing, roads, culverts and other barriers between important habitats (e.g., desirable feeding and watering sites~~, for example~~); and minimize the impact of construction on and in rivers, and on terrestrial species (such as nesting birds).

**High-capacity transit:** High capacity transit is public transit that has an exclusive right of way, a non-exclusive right of way, or a combination of both. Vehicles make fewer stops, travel at higher speeds, have more frequent service, and carry more people than local service transit such as typical bus lines. High-capacity transit can be provided by a variety of vehicle types including light rail, commuter rail, streetcar, and bus.

**High-density housing:** Refers generally to higher-density housing that is mid- to high-rise in building scale.

**High performance and green homes:** High performance and green homes conserve energy and water, are healthier for the occupants and the environment, have lower utility bills, manage



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stormwater, and are more durable and adapt to the long-term needs of their residents through design that accommodates people of all ages and abilities. To ensure performance, high performance and green homes must be assessed and rated by a third-party green building certification program.

**High-rise:** ~~Buildings~~ A building more than 10 stories in height.

**High-risk infrastructure:** Infrastructure assets that have a high risk of failure, based on the likelihood and consequence of that failure.

**Historic resource:** A structure, place, or object that has a relationship to events or conditions of the human past. Historic resources may be significant for architectural, historical, and cultural reasons. Examples include historic landmarks, conservation landmarks, historic districts, conservation districts, and structures or objects that are identified as contributing to the historic significance of a district, including resources that are listed in the National Register of Historic Places. Structures, places, and objects that are included in historic inventories are potential historic resources.

**Housing + transportation (H+T) cost burden:** A household's ability to afford a house or apartment is most often measured by calculating the percentage of household income devoted to housing costs, the single biggest expense for most households. However, transportation costs are typically the second-biggest draw on household income. Current thinking suggests that to get a true measure of household cost burden, ~~you~~ we need to combine housing (H) and transportation (T) cost. The measure for the Portland Metro area is that households spending more than 50 percent of their income on housing and transportation are considered cost burdened.

**Hydrologic:** Of or pertaining to ~~water~~ the properties, circulation, or distribution of water on or below the ~~earth~~ surface, in the soils and aquifers, ~~-~~or in the atmosphere.

~~**Hydrologic cycles:** The movement of water on, in, and above the earth.~~

**Implement:** To put something into effect.

**Improve:** Make the current situation better; increase; enhance; expand services, ~~or~~ facilities, or resources~~;~~ to become better in terms of quality ~~or~~, condition, effectiveness, or functionality.

**Income self-sufficiency:** Households with adequate income, based on family type, to cover local costs of basic needs, such as housing, food, health care, childcare, and transportation.

**Include:** Incorporate as part of a whole.

**Infrastructure**: Necessary municipal or public services, provided by the government or by private companies and defined as long-lived capital assets that normally are stationary and can be preserved for a significant number of years. Examples are streets, bridges, tunnels, drainage systems, water and sewer lines, parks, pump stations and treatment plants, dams, and lighting systems. Beyond transportation and utility networks, Portland includes buildings, green



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infrastructure, communications, and information technology as necessary infrastructure investments that serve the community.

~~**Infrastructure:** Consists of assets in two general networks that serve whole communities — transportation modalities (roads, rail, etc.) and utilities. These are necessary municipal or public services, provided by the government or by private companies and defined as long-lived capital assets that normally are stationary and can be preserved for a significant number of years. Examples are streets, bridges, tunnels, drainage systems, water and sewer lines, parks, pump stations and treatment plants, dams, and lighting systems. Beyond transportation and utility networks, Portland includes buildings, green infrastructure, communications, and information technology as necessary infrastructure investments that serve the community.~~

**Inner Ring Dd~~istricts:** Parts of the Inner Neighborhoods that are within walking distance of the Central City, as shown on the Pattern Areas map in the Chapter 3~~,~~ : Urban Form.

**Invest:** Spend money and/or other resources.

**Lessons learned:** Insights drawn from past actions, projects, and operations that are applied to or inform current and future projects. Lessons can be positive or negative, in that they may recommend that an approach be replicated or avoided in the future.

**Level of service:** A defined standard against which the quality and quantity of service can be measured. A level of service can take into account reliability, responsiveness, environmental acceptability, customer values, and cost.

**Limit:** Minimize or reduce something or the effects of something relative to the current situation or to a potential future situation.

**Living wage:** The minimum income necessary for a person working forty hours a week to meet their basic needs, such as housing, food, health care, childcare, and transportation.

**Low-density areas:** Refers generally to residential areas outside centers and corridors that are predominantly zoned for single-dwelling housing and lower-density multi-dwelling housing.

**Low-impact development:** Strategies to reduce the environmental impact of development on natural systems, including hydrology and vegetation. These strategies include using paving and roofing materials that reduce impervious area; clustered or small lot development that reduces disturbance area; vegetated stormwater management that mimics pre-development site hydrology; alternative road layout and narrower streets; natural area protection; and landscaping with native plants.

**Low and moderate income:** Typically based on annual Median Family Income (MFI) limits published by HUD. Households earning: 0-30~~%~~ percent MFI are “extremely low-income”; 31-50~~%~~ percent MFI are “very low- income”; 51-80~~%~~ percent MFI are “low-income”; 81-120~~%~~ percent MFI are “moderate-income”.

**Low-rise:** ~~Buildings~~ A building that is up to four stories in height.



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**Maintain:** Keep what you have; conserve; preserve; continue.

**Mid-rise:** ~~Buildings~~ A building between ~~from~~ five ~~to 10~~ and seven stories in ~~height~~height.

**Needed housing units:** Statewide Planning Goal 10 – Housing defines needed housing units as housing types determined to meet the need shown for housing within an urban growth boundary at particular price ranges and rent levels. The term also includes government-assisted housing. For cities having populations larger than 2,500 people and counties having populations larger than 15,000 people, "needed housing units" include (but are not limited to) attached and detached single-family housing, multiple-family housing, and manufactured homes, whether occupied by owners or renters**.**

**Neighborhoods:** Broad areas of the city that typically include residential, commercial, and mixed-use areas. Neighborhoods are physical communities located outside of the Central City and large industrial areas. In general, the word “neighborhoods” is not intended to refer to specific neighborhood association geographies.

**Neighborhood Association:** An autonomous organization formed by people for the purpose of considering and acting on issues affecting the livability and quality of their ~~N~~neighborhood, formally recognized by the Office of Neighborhood Involvement, and subject to City Code Chapter 3.96.

**Neighborhood business districts:** Commercial areas outside the Central City, usually adjacent to neighborhood residential areas. A subset of neighborhood business districts are designated as centers, which, in addition to their commercial functions, are prioritized as a focus for residential growth and community amenities and services. Other neighborhood business districts allow residential development, providing additional housing options close to services, but are not a prioritized focus for this growth.

**Non-traditional housing types:** Housing types and models that do not conform to existing practices or standards of housing development and household living. A unit can be non-traditional based on its construction materials or the living arrangements of its occupants. Cohousing is one non-traditional housing type.

**Older adults:** Population over 65 (as defined by the Age-Friendly City Action Plan).

**Pattern Areas:** Five primary geographies in Portland that have differing physical characteristics, needs, and assets. Each of these areas has unique topographies and natural features, patterns and types of development, street and other infrastructure characteristics, and histories that have shaped their urban form. The five primary Pattern Areas are:

- **Central City:** This area corresponds to the Central City plan district and is also a major center.
- **Inner Neighborhoods:** This area includes inner portions of the city that originally developed during the streetcar era, prior to World War II. It includes a large part of the



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city east of the Willamette River, extending roughly to 82nd Avenue, and also the inner westside "flats," located between the river and the West Hills.

- **Western Neighborhoods:** This area includes the West Hills (Tualatin Mountains) and areas to the west.
- **Eastern Neighborhoods:** This area includes eastern portions of the city, mostly located east of 82nd Avenue and largely annexed to Portland in the 1980s and 1990s.
- ~~**Industrial and**~~ **River:** This area includes the land along the Willamette and Columbia Rivers and the Columbia Slough~~This area includes land along the Columbia River and Columbia Slough, and areas along the Willamette River north of the Central City~~.

**Permanently affordable housing:** This refers to a housing status which means that a certain unit, whether rented or owned, continues to remain affordable to lower income households. A variety of programs and strategies are used to keep the unit mostly below market price. For example, properties with homes that are rented are owned and operated by nonprofit charitable corporations that agree to hold this real estate to provide affordable shelter in perpetuity. Similarly, for homeownership units, the land remains public while the unit is sold below market price with restrictions on resale.

**Placemaking:** The collaborative act of identifying current or creating new, distinctive public environments or places to be experienced by people. These places build on existing assets that include physical, social, or natural characteristics.

**Plans and investments:** Legislatively adopted land use plans, zoning maps, zoning regulations, comprehensive plan map designations, the T~~t~~ransportation S~~s~~ystem P~~p~~lan, and changes to the List of Significant Projects. ~~-~~The phrase "planning and investment decisions" is also used to mean decisions about plans and Investments as defined here.

**Portlanders:** People who live, work, do business, own property, or visit Portland, including people of any race, ethnicity, sex, gender or gender identity, sexual orientation, belief system, political ideology, ability, socioeconomic status, educational status, veteran status, place of origin, language spoken, age, or geography.

**Promote:** Further the progress of, advance, or raise.

**Prevent:** Proactively avoid or hinder adverse impacts or outcomes. ~~Don't allow at all; stop from happening; prohibit.~~

**Prime industrial land:** As defined by ~~According to~~ Statewide ~~Land Use~~ Planning Goal 9 – Economic Development, land that is suited for traded sector industries and possesses site characteristics that are difficult or impossible to replace elsewhere in the region.

**Prioritize:** To treat something as more important than something else. Policies that use this verb must identify the thing that will be treated as more important, and the thing that will be treated as less important.



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**Priority populations:** For housing, a program implementation approach designed to improve access and outcomes and eliminate disparities based on race and ethnicity for those who currently and have historically been under-served.

**Prohibit:** Don't allow at all; stop from happening; prevent.

**Prosperity:** When the term prosperity is used, it includes prosperity for households not just for businesses.

**Protect:** To defend or guard against loss, injury, or destruction. Policies calling for protection apply to multiple topic areas and can be accomplished or supported using various tools, such as regulations to prohibit or limit an action, investments such as land acquisition, agreements, and community partnerships.

**Provide:** To supply, offer, or make available. The City must be able to supply the item or service in question.

**Public facility**: Any facility, including buildings, property, and capital assets, that is owned, leased, or otherwise operated, or funded by a governmental body or public entity. Examples of public facilities include sewage treatment and collection facilities, stormwater and flood management facilities, water supply and distribution facilities, streets and other transportation assets, parks, and public buildings. *See also "Infrastructure".*

**Public realm:** The system of publicly accessible spaces that is made up of parks and other open spaces, streets, trails, public or civic buildings, and publicly-accessible spaces in private buildings (such as lobbies or courtyards). This system works with, and is framed by, adjacent development and building edges that help energize and define the public spaces of streets, sidewalks, and parks.

**Recognized organization:** An organization formally recognized by the Office of Neighborhood Involvement (ONI) pursuant to City Code 3.96.060, and organizations participating in the Office of Neighborhood InvolvementONI's Diversity and Civic Leadership Program.

**Reduce:** Have less Lessen of something than inrelative to the current situation.

**Regulated affordable housing.** Housing that is made affordable through public subsidies and/or agreements or statutory regulations that restrict or limit resident income levels and/or rents. Regulated affordable housing generally provides housing for households that otherwise could not afford adequate housing at market rates.

**Remove:** To do away with; eliminate.

**Require:** Compel; demand something.

**Residential areas:** Predominantly residential areas located outside centers, civic corridors, and transit station areas.



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**Resilience/resiliency:** – The capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment.

**Restore:** Recreate elements that are missing; move something back to its original condition; rehabilitate.

**Rural Land.** Land that is within the City Limits but outside the Regional Urban Growth Boundary, having been annexed prior to establishment of the boundary.

**Shared governance:** Shared decision making between the community and the City of Portland. Shared governance is based on partnerships, equity, accountability, and community ownership. This model empowers all Portlanders to have a voice in decision making, thus encouraging diverse and creative input that will help advance the vision and goals of the City of Portland.

**Short-term supply of employment land:** ~~According to~~As defined by Statewide ~~Land Use~~ Planning Goal 9 – Economic Development, suitable land that is ready for construction within one year of an application for a building permit or request for service extension. Engineering feasibility is sufficient to qualify land for short-term supply, and funding availability is not required.

**Special service district:** An independent governmental unit that exists separately from the general purpose government. Special service districts provide specialized services to persons living within a geographic area. Examples include drainage districts, port authorities, and mass transit agencies.

**Strive:** Devote serious effort or energy to; work to achieve over time.

**Support:** ~~To keep from weakening~~To aid the cause of.

**Traded sector:** A business sector consisting of companies that compete in markets extending beyond the metropolitan region. These companies include exporters to markets outside the region, suppliers to regional exporters, and businesses whose products substitute for regional imports.

**Trails:** Designated routes on land or water that provide public access for recreation or transportation purposes, like walking and bicycling. Trails are often located along rivers, through natural areas, or along rail or highway rights-of-way, with connections to and through neighborhoods.

**Transit Station Areas:** Areas within ~~½~~ a half-mile of light rail and other high-capacity transit stations. Some transit station communities are located within centers or civic corridors and are subject to policies for those types of places.

**Transparency:** Reliable, relevant, and timely publicly available information about government activities and decision making.



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**Under-served:** People and places that historically and currently do not have equitable resources, access to infrastructure, healthy environments, housing choice, etc. Disparities may exist both in services and outcomes.

**Under-represented:** People and communities that historically and currently do not have an equal voice in institutions and policy-making, and have not been served equitably by programs and services.

**Universal Design principles:** Underlying Universal Design is the principle that buildings and their sites should be built or renovated in ways that can work for all — for a "universal" population. People have varying abilities, temporary or permanent, throughout life. Rather than doing special or separate design to accommodate differences in age and ability, Universal Design principles foster design that works for all. The seven principles of Universal Design are: equitable use~~,~~; flexibility in use~~,~~; simple and intuitive use~~,~~; perceptible information~~,~~; tolerance for error~~,~~; low physical effort~~,~~; and size and space for approach and use.

**Urbanizable land.** Land that is beyond the City Limits, within the Regional Urban Growth Boundary and within the City's Urban Services Boundary.

**Urban land.** Land that is within the City Limits, the Regional Urban Growth Boundary, and the City's Urban Services Boundary.

**Urban heat island:** The urban heat island effect is a measurable increase in ambient urban air temperatures resulting primarily from the replacement of vegetation with buildings, roads, and other heat-absorbing infrastructure. The heat island effect can result in significant temperature differences between rural and urban areas.

**Utilize:** To put to use; to make practical or worthwhile use of. Conveys intention to apply a resource toward a purpose.

**Watershed:** ~~A watershed is t~~The area that catches rain and snow and drains into a corresponding river, stream, or other waterbody. ~~It~~ A watershed is a geographic area that begins at ridge tops (highest elevations) and ends at a river, lake, or wetland (lowest elevation). Within a watershed, there can also be sub-watersheds. These drainage areas are smaller and are defined by their tributaries.



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# List of Significant Projects

The List of Significant Projects includes significant projects necessary to support the land uses designated in the Comprehensive Plan. This list is subset of projects included in the Citywide System Plan's Investment Strategy.

## Sanitary Sewer and Stormwater Management

The list of significant projects for sanitary sewer and stormwater management is based on existing system plans and includes treatment plant upgrades for capacity and regulatory compliance; pipe capacity projects by sanitary and combined sewer basins; a sanitary sewer extension program; watershed programs to improve stormwater management; and a stormwater program area to address system connectivity and water quality.

## Water

The list of significant projects for water is based on system plans and includes projects and programs to address supply, storage, transmission and distribution needs to ensure short and long-term provision of clean water and compliance with drinking water regulations.

## Transportation

The transportation list of significant projects includes multi-modal projects to address the needs of pedestrians, bicyclists, transit users, freight, and motorists. Investments in the City's transportation system are needed to maintain existing facilities and to ensure the system meets the needs of Portlanders for decades to come.



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## Sanitary and Combined Sewer

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| SS-1 | CBWTP Improvements | Program includes mid-size improvements at the Columbia Boulevard Wastewater Treatment Plant such as: seismic improvements, outfall diffuser extension, access / egress improvements, bio-solids dryer, dewatered sludge hopper, TWAS piping upgrade, centrifuge. Includes expansion to secondary treatment, if required. All are consistent with the Facilities Plan and the Conditional Use Master Plan. | Columbia Blvd Wastewater Treatment Plant | $171,808,000 |
| SS-2 | TCWTP Improvements | Improvements identified in the facilities plan. Anticipated projects include property acquisition, new headworks/screenhouse, upgrades to the primary clarifier, and construction of an additional secondary clarifier. | Tryon Creek Wastewater Treatment Plant, Lake Oswego | $55,926,000 |
| SS-3 | Pump Station Improvement Program | Program to refurbish or upgrade pump stations not in compliance with current codes, not operating reliably, need improvement due to growth in the receiving basin, and/or over 20 years old with out-of-date equipment. The Pump Station Improvement Plan guides project selection. Program will also address the 57 miles of force mains. | Citywide | $132,901,000 |
| SS-4 | Holladay/Stark/ Sullivan - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Spans NE Broadway, narrowly to 24th; N to Fremont; S to Stark. S of I-84, extends to I-205 | $34,700,000 |
| SS-5 | Beech/Essex - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Willamette River east to Grand between Knott and Alberta | $18,500,000 |
| SS-6 | Oak - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Willamette River to NE 24th, between Irving and Stark | $22,600,000 |
| SS-7 | Taggart/Insley - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Willamette River to NE 60th between Stark and the south city limit. | $60,800,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|
| SS-8 | Wheeler - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Willamette River, Grand, Prescott, 24th, Hancock. | $10,300,000 |
| SS-9 | Lloyd District - capacity upgrades | Based on Systems Plan and redevelopment activity, adds capacity by creating a separated stormwater system and/or upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Includes high priority pipe rehabilitation if located in project area. | Lloyd District | $18,500,000 |
| SS-10 | Alder - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Includes high priority pipe rehabilitation if located in project area. | Willamette River to SE 42nd bw Stark & Hawthorne; inc. Ladds Addition. | $41,000,000 |
| SS-11 | NE 13th Ave Basin - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Vancouver, Columbia Blvd, NE 42nd, Prescott | $17,400,000 |
| SS-12 | Northwest Neighborhoods - capacity upgrades | Based on Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | NW including hills to ridgeline, excluding downtown | $41,000,000 |
| SS-13 | North Portland - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | West of Peninsular Ave. | $5,000,000 |
| SS-14 | Sanitary Sewer Collection System Capacity (Infiltration & Inflow) | Series of projects to address infiltration and inflow in the sanitary sewer system in SW Portland. Projects typically involve rehabilitation of main lines and laterals and disconnecting storm inlets from the sanitary sewer. | SW | $56,340,000 |
| n/a | Sewer Capacity Upgrades | Based on Systems Plan, adds capacity in small combined sewer system areas not addressed by specific basin projects, by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work may include high priority pipe rehabilitation. | Various | $50,000,000 |
| n/a | Sewer Extensions | Sewer extensions to relieve septic systems at risk of failure, correct party sewer situations, and provide service where development will be occurring soon and service is not available. | Various | 83,462,000 |


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## Stormwater Management

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|
| SM-1 | Johnson Creek Willing Seller Ph. 2 | Based on the Johnson Creek Restoration Plan, acquisition of land in four target areas for floodplain restoration. Properties are purchased at fair market value and used to implement restoration projects detailed in other capital projects on list. | Johnson Creek Target Areas | 10,000,000 |
| SM-2 | West Lents Flood Mitigation | Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the West Lents target area for flood storage and water quality, stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations. | West Lents target area | 6,417,000 |
| SM-3 | East Lents Area Flood projects | Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the East Lents target area for flood storage and water quality, stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations. | East Lents target area | 8,240,000 |
| SM-4 | Other Johnson Creek Target Area Floodplain Projects | Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the Tideman Johnson and Powell Butte target areas, and smaller floodplain restoration in partnership with creek-side property owners in other targeted areas, for flood storage and water quality, stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations. | Tideman and Powell Butte Target areas plus CRP | 5,045,000 |
| SM-5 | Johnson Creek Restoration Program Projects | Priority projects along the main stem and tributaries of Johnson Creek to mitigate flooding, improve water quality and wildlife habitat, address stormwater outfalls and culverts, and sanitary sewer protection. Includes restoration of floodplain and wetlands, construction of stream enhancements, and partnership projects with other agencies to meet the objectives of the 2001 Johnson Creek Restoration Plan. Projects address TMDL requirements, ESA plans and other regulations. | Johnson Creek Watershed, various | 9,025,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|
| SM-6 | Columbia Slough Outfalls | Design and construction of pollution control facilities for separated stormwater areas flowing through 220-city owned outfalls to the Columbia Slough to address DEQ Sediment Order. Program prioritizes outfalls draining Columbia Boulevard and other high traffic City roadways. | Columbia Boulevard area | 14,250,000 |
| SM-7 | Columbia Slough Restoration Projects | Culvert replacement, water quality facilities and wetland and habitat restoration and enhancement to improve water quality, habitat and hydrology. Projects address TMDL requirements, infrastructure deficiencies, ESA plans and other regulations and may include partnership with other agencies. Includes in-stream restoration as well as stormwater system improvements. | Columbia Slough Watershed, various | 11,121,000 |
| SM-8 | Fanno Creek Stormwater System Improvements | Projects to address TMDLs, recommended by the Fanno/Tryon TMDL predesign. 1-5 year projects include stormwater retrofits along the Beaverton-Hillsdale Highway, addressing deficient stormwater outfalls, and other stormwater system improvements. | Fanno Watershed: Beaverton-Hillsdale corridor and various | 2,700,000 |
| SM-9 | Tryon Creek Stormwater System Improvements | Projects to address TMDLs, recommended by the Fanno/Tryon TMDL predesign. 1-5 year projects include stormwater retrofits along the I-5 and Barbur Blvd. corridors, addressing deficient stormwater outfalls, and other stormwater system improvements. | Tryon Watershed: I-5/Barbur area, and various | 2,675,000 |
| SM-10 | Fanno/Tryon Drainage Shoulder Improvements | Drainage improvements for high priority City maintained roadside ditches along arterial streets in the Fanno and Tryon watersheds. Projects address water quality, as recommended by the Fanno/Tryon TMDL predesign. Includes SW Hamilton and SW Stephenson and future projects. | Fanno and Tryon Creeks watersheds (various) | 5,401,000 |
| SM-11 | Fanno/Tryon Restoration Projects | In-stream restoration and improvements to address water quality, hydrology and habitat, including TMDL requirements, ESA plans and other regulations. Includes culvert replacement, stream daylighting, sanitary sewer protection and other restoration in both the Fanno and Tryon creek watersheds. Projects recommended by the Fanno/Tryon TMDL predesign and watershed plans. | Fanno and Tryon Creeks watersheds, various | 7,557,000 |
| SM-12 | Willamette River Restoration Projects | Projects to improve water quality, habitat and hydrology along the main stem river and tributaries (subwatersheds) to address TMDL requirements, ESA plans and other regulations. Includes in-stream and floodplain restoration and enhancement. | Willamette River Watershed | 17,600,000 |


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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|
| SM-13 | Stephens Creek Stormwater System Improvements | Address stormwater issues in the Stephens Creek subwatershed, including unmanaged stormwater discharge, pollution reduction and detention facilities, restoration of riparian and wetland functions, erosion and sediment loading at outfalls. | Stephens Creek Subwatershed | 14,323,000 |
| n/a | Stormwater Management Program Implementation | Improvements to the stormwater management system beginning with the Stephens Creek subwatershed. Other areas of particular concern include elsewhere in SW, outer east, and the Columbia Slough. Specific improvements have not been identified. | Various | 56,300,000 |
| n/a | Culvert Replacement Program | Replace or improve stream culverts citywide to improve fish passage and water quality, and address flooding and maintenance needs. Includes completion of culvert replacements on Crystal Springs Creek and other priority projects to address ESA plans and other system needs. | Various/ Citywide | 14,302,000 |
| n/a | Watershed Land Acquisition Ph. 1 & 2 | Program targets acquisition of medium to high functioning natural resource lands in support of watershed health and stormwater management. | Various/ Citywide | 16,000,000 |

## Flood Management

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|
| FM-1 | Columbia River Levee Improvement Project | Identify and implement necessary improvements to the levees within the Multnomah County No 1, Peninsula No 2, and Peninsula No 2 Drainage Districts, so that they are certified as being protective of a 1% chance flood. | MCDD No 1, Peninsula No 1 and No 2 Drainage Districts | 100,000,000 – 200,000,000 |



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## Water

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| n/a | Dodge Park | Improvements will continue to address security and visitor amenities at the site, trespass/hazard warning signs, alternative park management arrangements, and visitor management. The bureau is committed to improving the maintenance of the park including preservation of existing infrastructure, repairs, replacements and upgrades. New uses for the park include an amphitheater, camping, training area, facility upgrade to the existing building, and special needs assistance for using the park amenities. | Dodge Park | 1,200,000 |
| W-1 | Emergency Coordination Center | This project designs and constructs the City's Emergency Coordination Center. The bureau will locate its emergency response and security staff at the location. The project location is adjacent to the City's 911 Call Center at SE 99th Ave and Powell Blvd. The total project cost is $19.85M and PWB is a contributing bureau. | Emergency Coordination Center (SE 99th and Powell) | 1,807,000 |
| W-2 | Bertha Service Area Improvements | This project will connect the Bertha 962 pressure zone with the 937 pressure zone with new 8-inch and 4-inch main and a new regulator. This work will allow for the abandonment of the existing main that passes through steep, unimproved right-of-way while maintaining an adequate level of service to the Bertha Service Area. | Bertha Service Area | 856,000 |
| W-3 | Burnside Pump Station Replacement | This project will decommission the old undersized pump station and modify the nearby Verde Vista pump station to serve the Burnside pumping needs for the next 50 years. The project will also acquire property for the future Burnside pump station to be built 50 years from now. | Burnside Pump Station | 2,000,000 |
| W-4 | Carolina Pump Main Extension, Phase II | This project will connect the existing Carolina Pump Main (Westwood Tanks) and the Fulton Pump Main (Burlingame Tanks) together. This will be a pump main from the intersection of SW Capitol Hwy and SW Terwilliger Blvd to the Burlingame Tank site. | SW Capitol Hwy – SW Terwilliger | 3,184,000 |



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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| n/a | Distribution Mains | This program includes rehabilitation and replacement of substandard mains, expansion due to applications from private developers, increasing supply for fire protection, improving water quality and water system upgrades due to local improvement districts (LIDs), and street improvements. Main replacements also include appurtenances (e.g. fire hydrants, valves, pressure regulators, service branches, and other facilities). | Various/Citywide | 300,738,000 |
| W-5 | Division Street Piping | This project will design and construct improvements located in the ROW for the Tabor Reservoir Adjustments project. Improvements will be made to the distribution and transmission systems as well as to Conduits 2 and 3 in SE Division St. | SE Division St | 1,680,000 |
| W-6 | Forest Park Low Tank | This project will plan, design and construct a single 1.3 million gallon AWWA D110 type 1 tank. This storage is to augment regular system capacity and increase fire flow. | Forest Park Low Tank | 2,210,000 |
| n/a | Fountains | The bureau has responsibility for 27 decorative fountains, including repairs, replacements and upgrades. Funding includes provisions for repair of drain lines and valves, replacement of liners, repair and replacement of electrical equipment and lighting systems, repair and replacement of pumps, addition of telemetry, and various improvements to exterior surfaces. | Various/Citywide | 3,000,000 |
| W-7 | Fulton Pump Station | This project will replace the Fulton Pump Station with a new pump station located in Willamette Park. | Fulton Pump Station | 9,060,000 |
| W-8 | Greenleaf Pump Station | This project will plan, design and construct a replacement Greenleaf pump station at the existing site. Flow upgrades will remove the Penridge tank from the system. The new pump station will pump directly to the distribution system. | Greenleaf Pump Station | 3,500,000 |
| n/a | Hydrants | This project provides for the replacement of fire hydrants that are no longer repairable. Replacements may also occur as part of the bureau's ongoing efforts to standardize hydrant types for more efficient and effective management of maintenance and repair activities. | Various/Citywide | 23,900,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| W-9 | Interstate Facility Renovation | This project consists of comprehensive reconstruction and improvements to the bureau's System Control Center and Operations and Maintenance Facility, located on North Interstate Avenue, to address seismic and other site vulnerabilities and bring the facility up to current safety and building codes. | Interstate Facility (NE Interstate) | 35,323,812 |
| W-10 | Portland-Milwaukie Light Rail Project | This project consists of planning, design and construction for relocation of over 5,000 feet of main required for the Portland-Milwaukie Light Rail project. PWB Construction crews and Construction Management Team will assist during the construction phase of the project. | PMLR alignment, SW/SE | 1,100,000 |
| n/a | Meters | This project funds the purchase and installation of water meters. The Bureau objective is to maintain meter accuracy to within 3% of actual values. | Various/Citywide | 35,690,000 |
| n/a | Pump Stations and Tanks | This program maintains a large variety of infrastructure consisting of water storage tanks, pumps, and pump and control facilities. The bureau uses a reliability centered maintenance (RCM) analysis to prioritize projects in these areas. A key focus of the next five years will be to replace the remote telemetry units at over 140 remote sites. The existing units are over 15 years old, and are becoming obsolete. The servers are at the end of their service cycle, and must also be replaced. | Various/Citywide | 20,003,000 |
| W-11 | Rose City Sewer Rehabilitation | The project will install new 1207 feet of 8 inch DI, 2 hydrants and 39 services 2 inches or smaller. | Rose City area | 2,000 |
| W-12 | Raymond Tank Supply Improvements | This project will design and construct improvements at Raymond Tank Site and at an intersection of SE Holgate Boulevard and SE 136th. | Raymond Tank, vicinity | 535,000 |
| W-13 | Sam Jackson Pump Station | This project will add multiple capital improvements including seismic improvements, replacement of RTU and motor controllers, installation of pump control and check valves, extension of the crane rail, a concrete pad, and installation of a security fence and gate. | Sam Jackson Pump Station | 1,400,000 |
| n/a | Services | This project constructs replacement and customer requested water services. A water service is the connection between the water main and any given customer's service meter. Service connections are always performed by Water Bureau crews directed by a certified Water Service Mechanic. An ongoing budget of approximately $4 million per fiscal year provides for installation of about 1,000 water service connections annually and other upgrades to existing water services. | Various/Citywide | 80,000,000 |


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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| W-14 | Willamette River Pipe Crossings | The project replaces major pipelines to strengthen the transmission link between Powell Butte and the service areas west of the Willamette River, including downtown and the storage reservoirs at Washington Park. It includes construction of a new seismically strengthened river crossing to replace the first one of potentially two Willamette River crossings, and new transmission piping on both sides of the river. | Various, Powell Butte – Washington Park | 111,600,000 |
| n/a | Water Quality and Regulatory Compliance | The bureau recognizes the Bull Run watershed as a diverse ecosystem. The bureau is committed to preserving this habitat and complying with federal regulations using practical, locally driven solutions. Many of the projects in this subprogram respond to the Endangered Species Act (ESA), including the implementation of the Bull Run Habitat Conservation Plan (HCP) as adopted by City Council and approved by the National Marine Fisheries Service. Consistent with HCP commitments, this program funds easements, purchases land, and also supports projects jointly conducted with other watershed partners. | Bull Run | 48,596,000 |
| n/a | Bull Run Watershed | The bureau is committed to updating the Bull Run watershed protection and maintenance procedures and agreements based on the 2007 Bull Run Agreement with the Mt. Hood National Forest. The function of this program is to allocate funds for the capital projects necessary to maintain, improve, and protect the watershed facilities that are not directly related to the water supply system facilities. This includes Bull Run Watershed road reconstruction to ensure continuous, reliable, and safe access to all facilities, as well as maintenance of other city-owned infrastructure within the watershed. | Bull Run | 38,410,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| n/a | Dams and Headworks Repair and Rehabilitation | This program provides for assessment of the condition and rehabilitation of dams and other facilities at Headworks. As many of these facilities are between 50 and 70 years old, their safe and reliable operation requires ongoing investment. The program includes preliminary engineering and design of needed repairs, rehabilitation of these facilities, and actual repair work. | Bull Run | 3,000,000 |
| W-15 | Groundwater Improvements | The Columbia South Shore Wellfield (CSSW) is Portland's alternative supply of water should the Bull Run watershed supply be interrupted for any reason. Projects improve the maintenance of this aging infrastructure, including repairs, selective replacements and upgrades. | CSSW | 9,700,000 |
| W-16 | Groundwater Collection Main Hardening | Much of the piping connecting the wells to the Groundwater Pump Station is located in liquefiable soils which are vulnerable during a seismic event. This project would design and install measures to "harden" the piping and reduce this vulnerability. | CSSW | 20,000,000 |
| W-17 | Groundwater Electrical Supply Improvements | This project designs and constructs a new 115kV/4160V transformer and other components to complete a double-ended electrical substation at the Groundwater Pump Station. It will also design and construct a 5kV main breaker replacement and purchase selected spare components. | CSSW | 2,071,000 |
| W-18 | Groundwater Pump Station Expansion | As water demand increases, the bureau will need to increase the available flows from the groundwater system. The system expansion will include upgrade of the Groundwater Pump Station to provide additional capacity. | CSSW | 10,000,000 |
| W-19 | Groundwater Wellfield Expansion | As water demand increases, the bureau will need to increase the available flows from the groundwater system. The system expansion will include additional well development and collection mains in the Columbia South Shore area. | CSSW | 12,000,000 |
| W-20 | Groundwater Wellfield Reliability Enhancements | The bureau is attempting to increase flexibility and preparedness to meet the challenge of an interruption of Bull Run water. It is evaluating electrical vulnerability for the pumping system, reviewing flood inundation vulnerability, and development of a Groundwater Intertie to reduce transmission system vulnerability. Inundation review may be partially completed in partnership with Multnomah County Drainage District. | CSSW | 3,000,000 |


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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| W-21 | Powell Valley Well Improvements | The project includes upgrade of the facilities in the previous Powell Valley Road Water District area and connection and integration of these facilities to the PWB water system. | Powell Valley wellfield | 3,000,000 |
| n/a | Road 1008 | This project will design and construct an overlay for the Bull Run 1008 road. | Bull Run | 710,000 |
| n/a | Road 10 MP 0.6-1.8 | Design and construct walls, widening, culverts and repave this portion of the Bull Run 10 road. | Bull Run | 900,000 |
| n/a | Building Maintenance | The bureau maintains hundreds of structures from the Bull Run watershed to Downtown Portland. These structures range in size from small pump houses to the maintenance hub on Interstate Avenue. The necessary work involves structural repairs and maintenance. | Various/Citywide | 3,000,000 |
| n/a | Sandy River Station Upgrade | This project consists of upgrades to the Sandy River Station facilities including an evaluation of a potential move to a different site. | Sandy River station | 5,000,000 |
| n/a | West Side Maintenance Facility | A hub is needed on the west side of the Willamette River for maintenance and construction crews, vehicles, equipment and materials, and emergency operations. This project includes construction of the facility within the next 20 years. | West of Willamette River, tbd | 5,000,000 |
| n/a | Conduit 5 | This project would include installation of sections of a new Conduit 5 as growth occurs and the condition of the existing conduits worsens. | Conduit 5, east of city limits | 75,000,000 |
| n/a | Conduits and Transmission Mains | The conduits that bring water to Portland from the Bull Run watershed are pipes 56 to 72 inches in diameter. This program funds repairs, replacements and upgrades to these key pipelines. Reliable service to the City and the City's wholesale customers is the key reason for the bureau's commitment to improve maintenance of this aging infrastructure. | Various/Citywide | 63,525,000 |
| W-22 | Kelly Butte Reservoir | The purpose of this project is to increase storage capacity from 10MG to 25MG by replacing the existing tank with a buried reservoir. This includes site access, construction access and easements, staging areas, and on-site storage areas. This project establishes Kelly Butte as the key facility that will be used for system pressure equalization and in-town terminal storage in lieu of the Mt. Tabor open reservoirs. | Kelly Butte | 66,970,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| n/a | New Conduit Intertie | This project would address concerns about the capability of the conduit system to withstand hazards and deliver an uninterruptible supply to the City. The project will improve reliability of flow during emergency conditions and for maintenance by providing additional isolation and interconnectivity. | Conduit, east of city limits | 10,000,000 |
| W-23 | Powell Butte Reservoir 2 | This LT2 project is being constructed in 2 phases – Phase 1 is complete. The project is currently in Phase 2, the construction of a 50 million gallon buried reservoir at Powell Butte. It includes a short section of Conduit 5, construction of a maintenance and storage facility, replacing the caretaker's house, construction of an interpretive center and restrooms, reservoir overflow, park improvements and mitigation requirements as part of the conditions for approval in the 2003 LUR Type III CUMP. | Powell Butte | 35,220,000 |
| W-24 | Powell Butte Reservoir 3 | This project constructs a third reservoir at Powell Butte and possible bypass piping around the Butte. | Powell Butte | 100,000,000 |
| n/a | Sandy River Conduit Relocation, Phase II | The bureau is committed to increasing the flexibility and preparedness to meet the future challenge of a natural disaster. This project will relocate the Sandy River crossings of Conduit 3. The crossings of Conduit 2 and 4 have already been completed. These conduits were identified in the system vulnerability study as vulnerable to seismic, volcanic, flooding, and other natural and manmade hazards. | Sandy River crossing | 5,000,000 |
| W-25 | Tabor Reservoir Adjustments | This project includes adjustments to piping, structures and other features at Mt. Tabor in order to move storage elsewhere and physically disconnect the open reservoirs from the public water system for compliance with LT2. Project does not include disposition of the reservoirs after they have been disconnected from the public water system. | Mt. Tabor | 3,355,000 |
| W-26 | Washington Park Reservoir 3 | The project will plan, design and construct a new buried reservoir to replace open reservoir No. 3. This project is one solution toward compliance with LT2 replacement of the open reservoirs. It is assumed that Reservoir # 4 will be used as the overflow detention structure. We envision that the buried reservoir would be topped with a reflecting pond and historical features would be protected to retain its visual appeal. | Washington Park | 52,100,000 |


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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| W-27 | West Side Transmission Main Improvements | These mains include the Sam Jackson to Downtown Pipeline and the Jefferson Street Supply mains. These large transmission mains are needed to strengthen the supply to terminal storage located on the west side of the Willamette River. | Various, SW Portland | 20,000,000 |
| n/a | Treatment Facilities Improvements | Treatment of Portland's drinking water is the most complex activity the bureau engages in while operating the water system. This project would include several related projects for the Bull Run water supply, at Bull Run Headworks and the Lusted Hill Facility. Projects would likely be driven by State and Federal regulations | Bull Run | 150,000,000 |



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# Transportation

***Planning and Sustainability Commission:***

To review the Draft Recommended List of Significant Projects for Transportation, please see the project list included in the Transportation System Plan packet.

A copy of the final List of Significant Projects for Transportation will be inserted here and forwarded as part of the PSC Recommended Plan.



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Ord. 187831, Vol. 2.4.C, page 9236

# Campus Institution Zoning Update
# Project Concept Report

Bureau of Planning and Sustainability
Innovation. Collaboration. Practical Solutions.

*City of Portland, Oregon*
*Charlie Hales, Mayor • Susan Anderson, Director*

**Public Draft – April 2015**


















# Campus Institution Zoning Update Project Concept Report – Public Draft

**February 2015**

## For more information

**www.portlandoregon.gov/bps/institutions**

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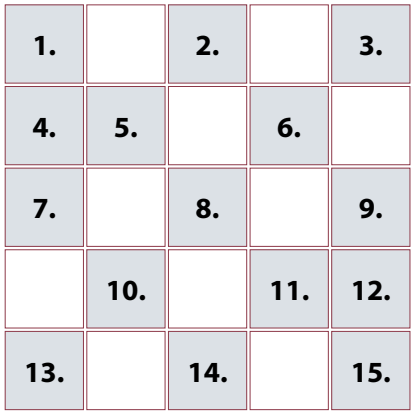
**Pictured on cover:**

1. Concordia University
2. Legacy Emanuel Hospital and Health Center
3. Legacy Good Samaritan Hospital and Health Center
4. Kaiser Medical Centers
5. Lewis and Clark College
6. Multnomah University
7. Portland Community College – Cascade
8. Portland Community College – Southeast Center
9. Portland Community College – Sylvania
10. Adventist Medical Center
11. Providence Portland Medical Center
12. Reed College
13. University of Portland
14. Warner Pacific University
15. University of Western States

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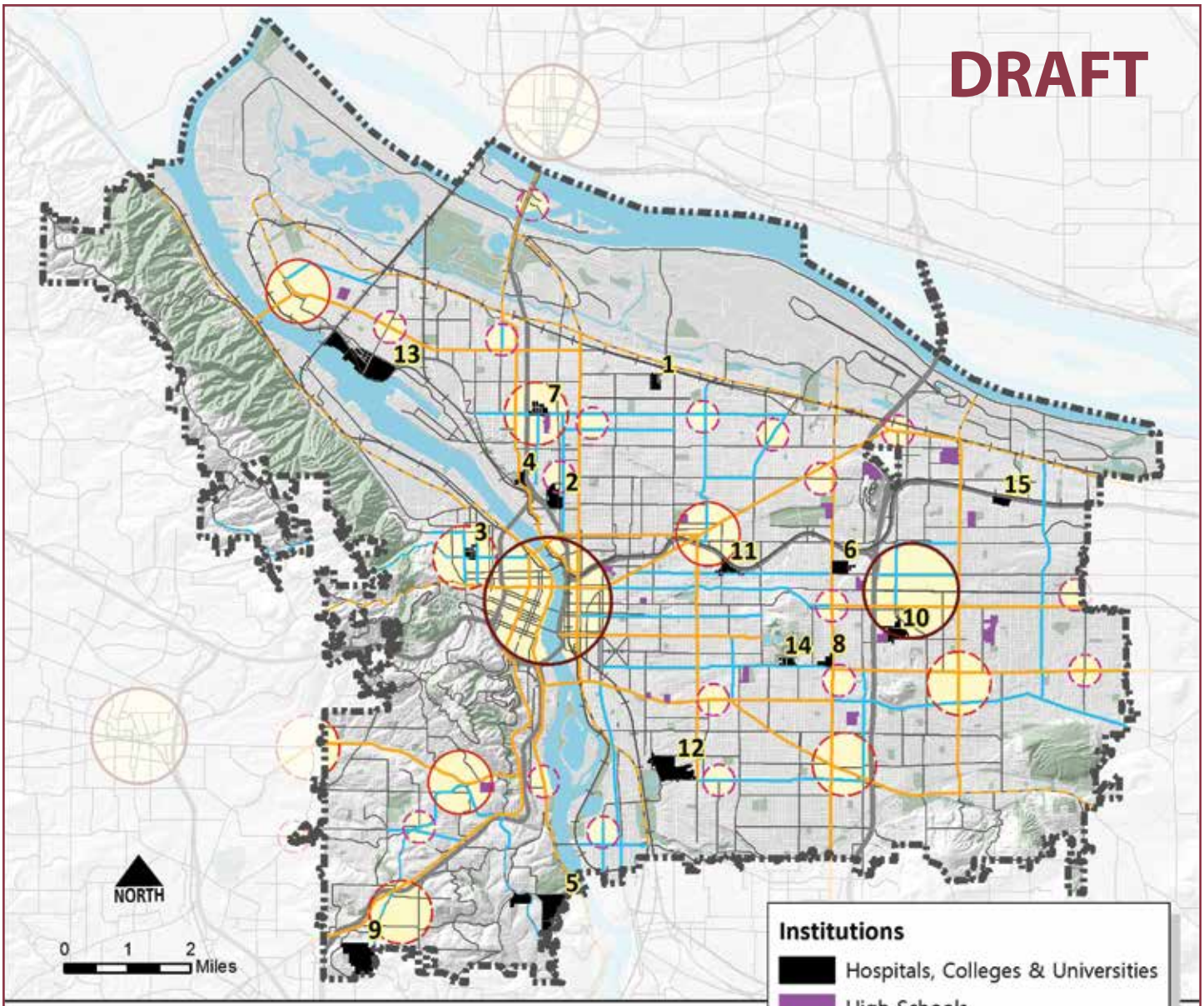
# Campus Institutions / Centers and Corridors




| Map Number | Institution |
|---|---|
| 1 | Concordia University |
| 2 | Legacy Emanuel Hospital & Health Center |
| 3 | Legacy Good Samaritan Hospital & Health Center |
| 4 | Kaiser Medical Centers |
| 5 | Lewis and Clark College |
| 6 | Multnomah University |
| 7 | Portland Community College--Cascade |
| 8 | Portland Community College--Southeast Center |
| 9 | Portland Community College--Sylvania |
| 10 | Adventist Medical Center |
| 11 | Providence Portland Medical Center |
| 12 | Reed College |
| 13 | University Of Portland |
| 14 | Warner Pacific University |
| 15 | University of Western States |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*Legacy Emanuel, N Portland*

# Executive Summary

Healthcare and higher education employment sectors are expected to be significant engines of economic activity and job creation over the next 20 years. Despite their importance, there is a shortage of available development capacity to accommodate the projected growth of these campus institutions within the city limits. Additionally, the ***Conditional Use Master Plan(CUMP)*** and ***Impact Mitigation Plan (IMP)*** land use reviews currently required to obtain development approval from the City of Portland are considered cumbersome and expensive. They also can generate conflict between an institution and its adjoining neighborhoods.

The Campus Institution Zoning Update Project proposes to increase the amount of development potential for Portland's campus institutions while protecting adjacent neighborhoods from offsite impacts that such development might cause.

For the past year, the Bureau of Planning and Sustainability (BPS) has worked with a project advisory group of representatives from institutions and adjoining neighborhoods to evaluate possible changes to the City's zoning regulations. The resulting proposed concept includes three major elements:

1. A new Comprehensive Plan Map designation for campus institutions.
2. Two new base zones applicable to campus institutions added to the zoning code.
3. Institutions may choose to rezone to one of the appropriate base zones as an alternative to updating their CUMP or IMP during a transition period.


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*Reed College, SE Portland*

# Proposed Concept

## Project Goals

A shortfall in development capacity on the dispersed institutional campuses was identified by the ***2012 Employment Opportunity Analysis (EOA)*** (see Note 1). In order to address this shortfall under state land use law the City undertook the Campus Institution Zoning Update Project as part of early implementation of the Comprehensive Plan Update. Other project goals that evolved from public and project advisory group input include:

- **Conformance with Comprehensive Plan policies –** Policies specific to campus institutions are expressed in ***Chapter 6: Economic Development of the Comprehensive Plan*** (see Note 2).
- **Permanence –** Entitlements and restrictions applied to an institution should be permanent, not subject to the 10-year expiration now applicable to CUMPs and often to IMPs.
- **Focused development on existing campuses –** Encourage development within existing campus boundaries rather than spread out into the surrounding neighborhoods.
- **Compatible campus edge –** Land use and building design at the edge of institutional campuses have greater potential impact on the adjoining neighborhood than what occurs in the interior. Require adequate buffers between an institution and adjoining residential uses as well as institutional participation in development of adjoining neighborhood business districts.
- **Minimize offsite impacts –** The most common neighborhood concerns involve offsite impacts, including (but not limited to) traffic and parking. A successful zoning update project will continue to provide neighborhood input into transportation issues and opportunities to assess, avoid or mitigate offsite impacts.
- **Ease of administration –** Create a zoning structure that is easy to understand by applicants and interested participants. It should also be straightforward for City staff to administer.

**The Campus Institutions draft concepts address the project goals through a three-part approach:**

1. Designate 15 dispersed institutional campuses as **(IC) Institutional Campus** on the Comprehensive Plan Map.
2. Draft two new campus institution base zones for inclusion in the Zoning Code.
3. Allow individual institutions to submit an application to rezone to the appropriate campus institution base zone as an alternative to updating their CUMP/IMP.


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## New Campus Institution Comprehensive Plan Map Designation

The Comprehensive Plan Update includes a future land use map that establishes land use designations for all land in Portland's Urban Services Boundary. It provides a structure for determining where various uses (residential, commercial, etc.) will be allowed as well as development intensity (e.g., density, height). It is the basis for the Zoning Map. The proposed Comprehensive Plan Map assigns 15 dispersed campus institutions and 16 high school campuses an ***Institutional Campus*** land use designation. Institutions included in this update are at least ten acres in size and employ at least 100 people. Detailed maps of the 15 medical center and higher education campuses are provided in the appendix of this report.

***The following language pertaining to designated institutional campuses is included in Chapter 10 of the Proposed Draft Comprehensive Plan:***

### Institutional Campus

This designation is intended for large institutional campuses that are centers of employment and serve a population from a larger area than the neighborhood or neighborhoods in which the campus is located. This designation is intended for areas where urban public services are available or planned. This designation includes medical centers, colleges, schools, and universities. A variety of other uses are allowed, including residential, to support the mission of the campus. Neighborhood-serving commercial uses and other services are also encouraged. The designation is intended to foster the growth of the institution while enhancing the livability of surrounding residential neighborhoods and the viability of nearby business areas. Corresponding zones are Institutional Residential (IR), Central Employment (EX), General Employment (EG2), Campus Institution 1 (CI1), and Campus Institution 2 (CI2).



*Portland Providence Medical Center, NE Portland*

*The hospitals on Marquam Hill are also being assigned the (IC) Institutional Campus designation in recognition of their current land use but are not candidates for either the (CI1) Urban Campus or (CI2) Residential Campus zone. This is because the Marquam Hill campuses are currently zoned (EX) Central Employment with a specific plan district assigned that provides development standards and entitlements specific to these particular institutions.*

***High Schools** are also being designated as Institutional Campus (IC) land uses on the Comprehensive Plan Map as part of the Task 4; Comprehensive Plan Update in addition to the colleges and hospitals that are the focus of this effort. This is intended to be an interim measure until such time as a high school base zone or alternative regulatory approach is developed in cooperation with the high schools and relevant stakeholders.*



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## Two New Campus Institution Base Zones Proposed

After a review of existing campus typology and location factors — such as the presence of business zoning in the neighborhood and public transportation options as well as relationship to centers and corridors — staff is proposing two new campus institution base zones.

### CI-1 Urban Campus

CI-1 zoning will apply to medical centers and college campuses located along civic and/or neighborhood corridors, accessible by frequent service public transit and adjacent to, or within Regional, Town or Neighborhood Centers. This zone is designed to accommodate building height and floor area ratios supportive of modern medical facilities, educational campuses and accessory commercial activity in an urban environment. Use and development standards acknowledge that such institutions may be adjacent to and contribute towards commercial corridors as well as residential neighborhoods.

### CI-2 Residential Campus

CI-2 zoning is intended for academic institutions with campuses larger than 10 acres in size located in neighborhoods that are otherwise predominantly residential in character. Due to the larger size and generous open space of these campuses, a lower floor area ratio supports traditional academic site planning and architecture. These campuses are typically not located in or adjacent to designated Town or Neighborhood Centers. Access to frequent service public transit may be limited.



*CI-1 Urban Campus example: Providence Portland Medical Center*



*CI-2 Residential Campus example: Reed College*


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## New Land Use and Development Standards Proposed for Institutions

The tables on the following pages highlight allowed use and development standards associated with the two proposed zones. The use allowances, height, FAR, and other code features are conceptual and require additional refinement, testing and development that will take place during the code development phase of this project.

## Allowed Use Highlights

The CI-1 Urban Campus zone allows a range of retail and office uses in addition to institutional uses. The CI-2 Residential Campus zone allows for the full range of institutional uses and limited neighborhood commercial activity as a conditional use. Language describing accessory uses will clarify that an expanded list of group living, research and development and manufacturing uses can occur on institutional campuses supporting their role as centers of innovation.



*Reed College, coffee shop on campus*

### Table 1: Allowed Use

| | CI-1 Urban Campus | CI-2 Residential Campus |
|---|---|---|
| Scale and Character | Urban healthcare and higher education | Residential academic and open space |
| Commercial Uses | Retail, service and office uses allowed | Limited retail, service use allowed as conditional use |
| Residential Uses | Accessory to institutional use only | Accessory to institutional use only |
| Employment / Industrial Uses | Limited manufacturing, research and development allowed over and above accessory use | Limited manufacturing, research and development allowed over and above accessory use |
| Institutional Uses | Allow | Allow |

**Commercial Uses –** Retail sales and services are allowed uses in the CI-1 Urban Campus zone. Buildings fronting civic or neighborhood corridors will be designed for active ground floor uses facing the street. Retail sales and service in the CI-2 Residential Campus zone are considered accessory uses if they are to serve the on-campus population and not oriented to the perimeter of the campus such as a cafeteria or bookstore. In the CI-2 zone limited retail sales and service up to 5,000 square feet in size that is oriented towards the perimeter of the campus (total) can be allowed. Retail activity of this size is unlikely to generate additional traffic into a residential neighborhood but may provide a neighborhood serving commercial amenity such as a coffee shop. Additional externally focused retail and service uses may be permitted as a conditional use.

Office uses that are not accessory to the primary institutional mission are permitted in the CI-1 Urban Campus zone while all office uses in the CI-2 Residential campus zone must be accessory to the institutional use.


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**Residential Uses –** Dormitories and similar student, patient or employee housing are considered accessory uses to institutions. Additional residential uses such as assisted living facilities may also be permitted as accessory uses but other multifamily residential uses are prohibited in order to preserve development capacity on campuses for institutional uses.

**Employment and Industrial Uses –** Limited light manufacturing and production facilities are permitted in both the CI-1 and CI-2 zones to accommodate commercial research and business incubator activities that may be associated with but not strictly accessory to colleges and hospitals. Such facilities are limited to 10,000 square feet as an allowed use (by right) with an option to increase the size of such facilities in the CI-1 Urban Campus zone through a conditional use review. This is similar to size limitations placed on manufacturing and production facilities located within existing urban and general commercial zones.

**Major Entertainment Uses –** Uses that draw large numbers of the public to specific events such as performance halls and organized athletic facilities will remain a conditional use in both zones..



*Student housing and recreation courts at Reed College, SE Portland*

## Development Standard Highlights

The distinction in character between the urban and residential campus zones is reflected in their allowed development standards while both attempt to provide incentives for the institutions to build up not out into their surrounding neighborhoods. Specific standards are subject to change.

### Table 2: Development Standards

| | CI-1 Urban Campus | CI-2 Residential Campus |
|---|---|---|
| Maximum Building Height (Campus Interior) | Up to 150' within prescribed building envelope or as allowed by CUMP/IMP | Up to 75' within prescribed building envelope or as allowed by CUMP/IMP |
| Minimum Setback and Building Height Transition | Match adjoining district setback and height at perimeter | Match adjoining district setback and height at perimeter |
| Floor Area Ratio (FAR) | 3 to1 | 0.5 to1 |
| Maximum Building Coverage | 85% | 50% |
| Required Landscaping adjoining Res Zone | 5 ft. at L3 | 15 ft. at L3 |
| Required Landscaping Across ROW from Res Zone | 5 ft. at L1 | 15 ft. at L1 |
| Maximum building Setback | Yes, along transit streets | No |
| Minimum first floor glazing | 30-60% TBD | No |
| Direct Pedestrian access | Required 50-100' along transit streets | No |
| Building Wall Articulation | Yes | No |

**Building Height –** Building heights of up to 150' towards the interior of campuses or adjacent to freeways are allowed in the CI-1 Urban Campus zone to support modern in-patient nursing tower design. Educational campus buildings are less likely to exceed four stories in height but a maximum building height of 75' (based on the existing IR zone allowance) in the CI-2 Residential Campus zone will allow for signature buildings at the interior of these campuses.


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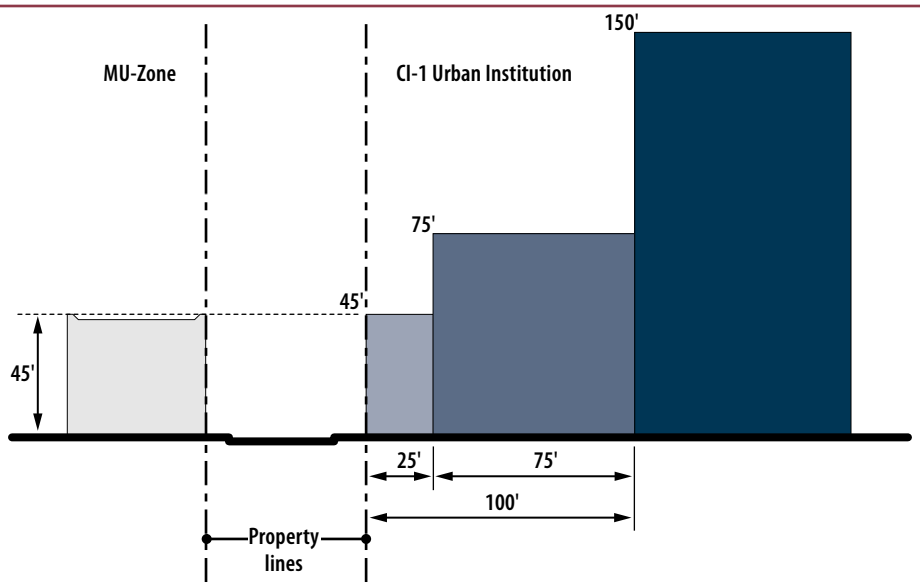
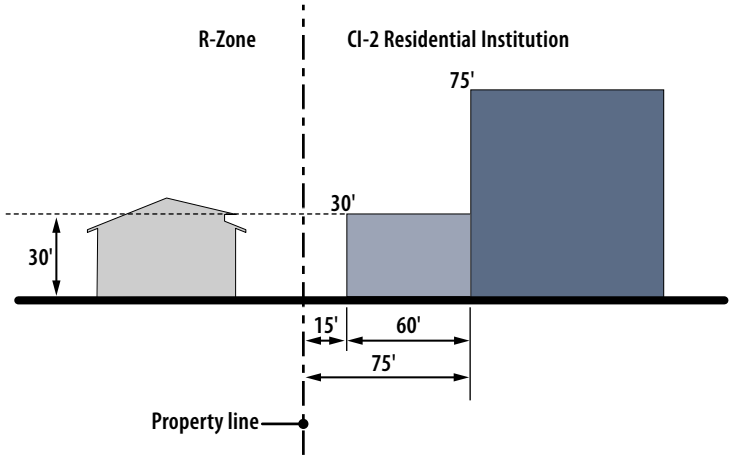
**Setback and Building Envelope** – Building setback requirements for both zones are designed to match their surrounding neighborhoods. Taller buildings in both districts are pushed towards the interior of the campus (or towards freeways) limiting building height along the perimeter of the campus to that of the adjoining zone. Maximum building setbacks are incorporated into the CI-1 Urban Campus zone where campuses abut identified neighborhood commercial streets.

**Floor Area Ratio (FAR) –** A maximum 3:1 Floor Area Ratio assigned to the CI-1 Urban Campus zone combined with the available building heights allows for significant development potential on all of the urban campuses. The 0.5:1 FAR allowed for CI-2 residential campus zones is a reduction from existing development allowed in the IR zone but still results in significant development potential beyond what is currently built on these residential campuses. Together the proposed zones will meet the City's Goal 9 obligation to provide for additional campus institution development capacity.




*CI-1 Urban Institution, mixed use zone abutting right-of-way*




*CI-2 Residential Institution, single-dwelling residential abutting property line*

**Commercial Edge Standards –** Minimum ground floor window requirements, maximum setbacks, pedestrian access requirements and required articulation of building walls for the CI-1 Urban Campus zone will coordinate with the mixed use zoning update standards. These edge standards, in combination with an expanded list of allowed commercial uses in the CI-1 zone, will promote hospitals' and colleges' participation in the development of active neighborhood commercial districts. Final standards will be coordinated with the mixed use zoning project.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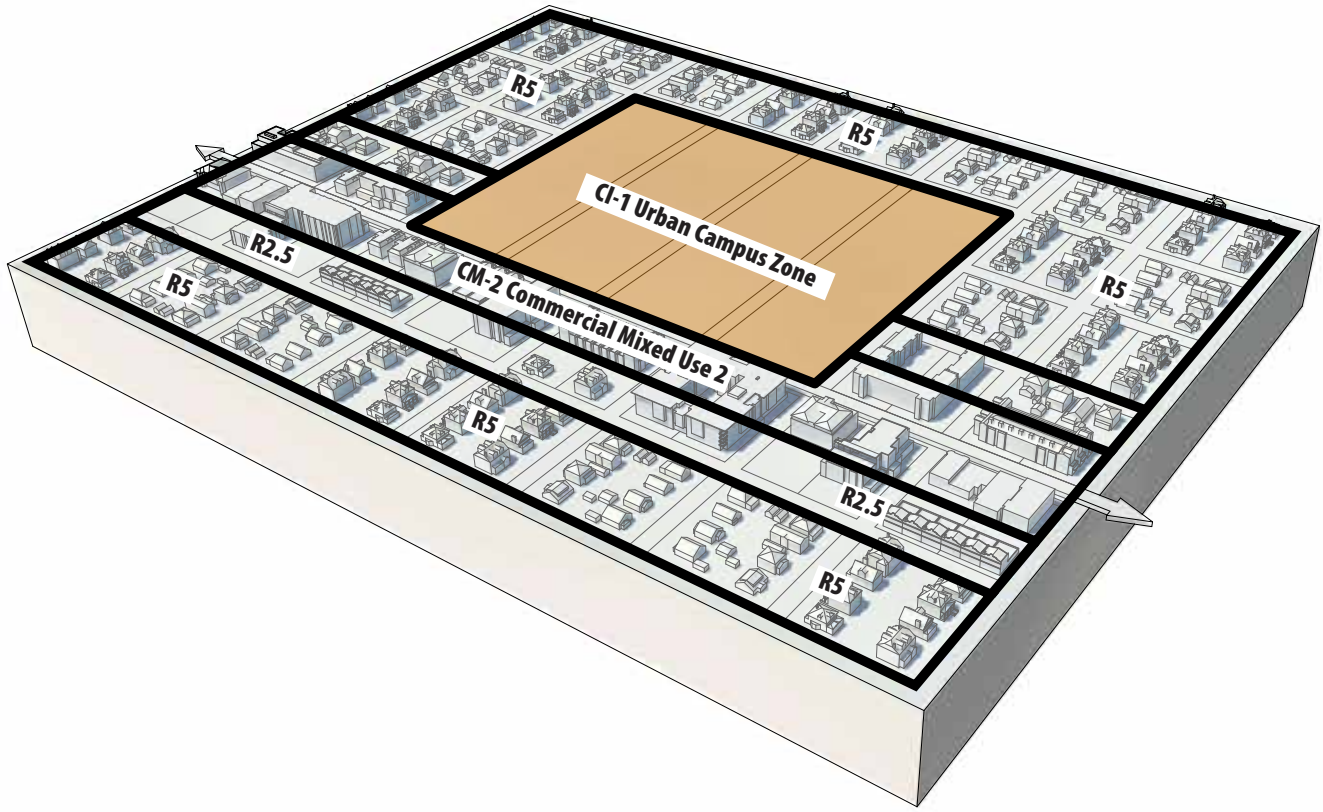
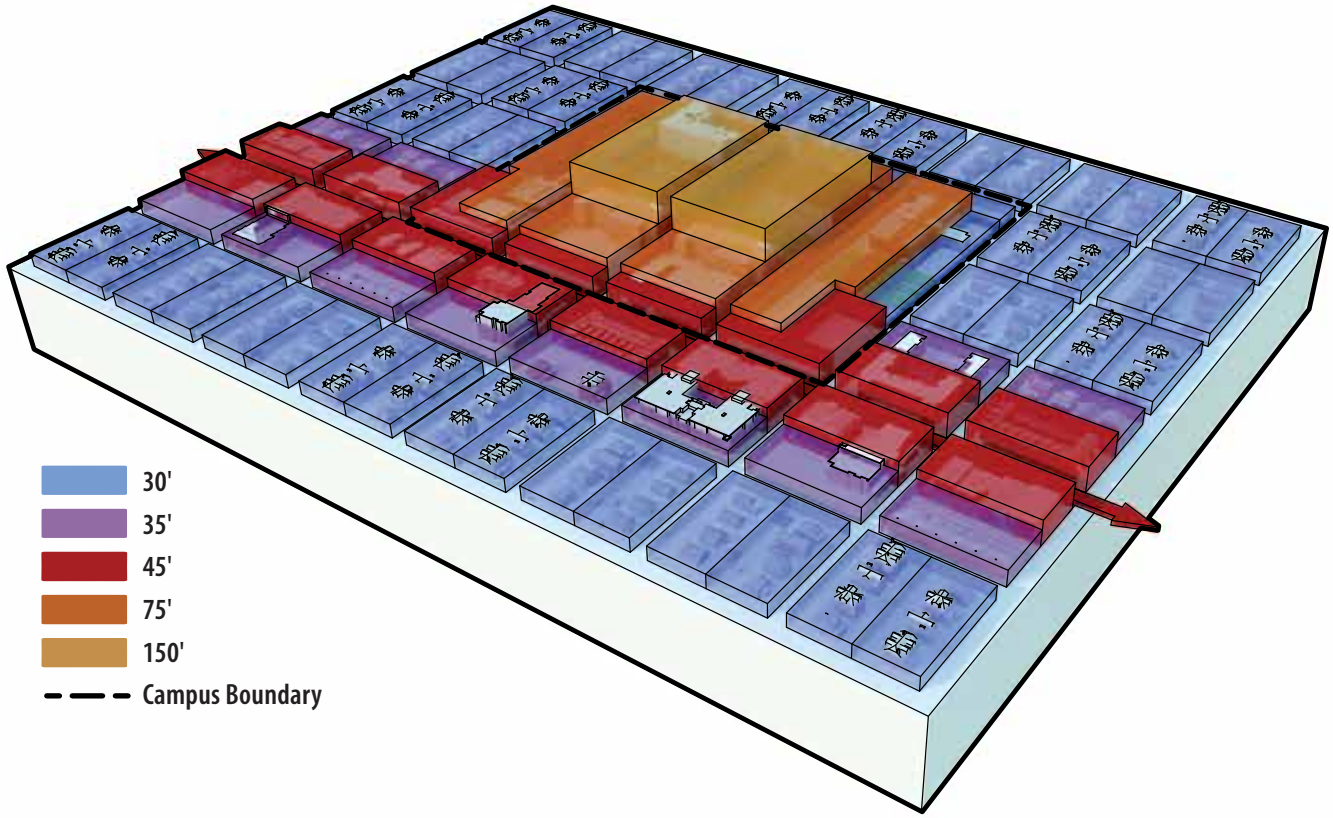



*URBAN CAMPUS BUILDOUT HEIGHT AND SETBACK EXAMPLE: CI-1 Urban Campus on commercial mixed use street with transition to residential neighborhood.*




*URBAN CAMPUS BUILDOUT HEIGHT AND SETBACK EXAMPLE: Building height at campus perimeter matches adjacent zone and steps up toward campus interior.*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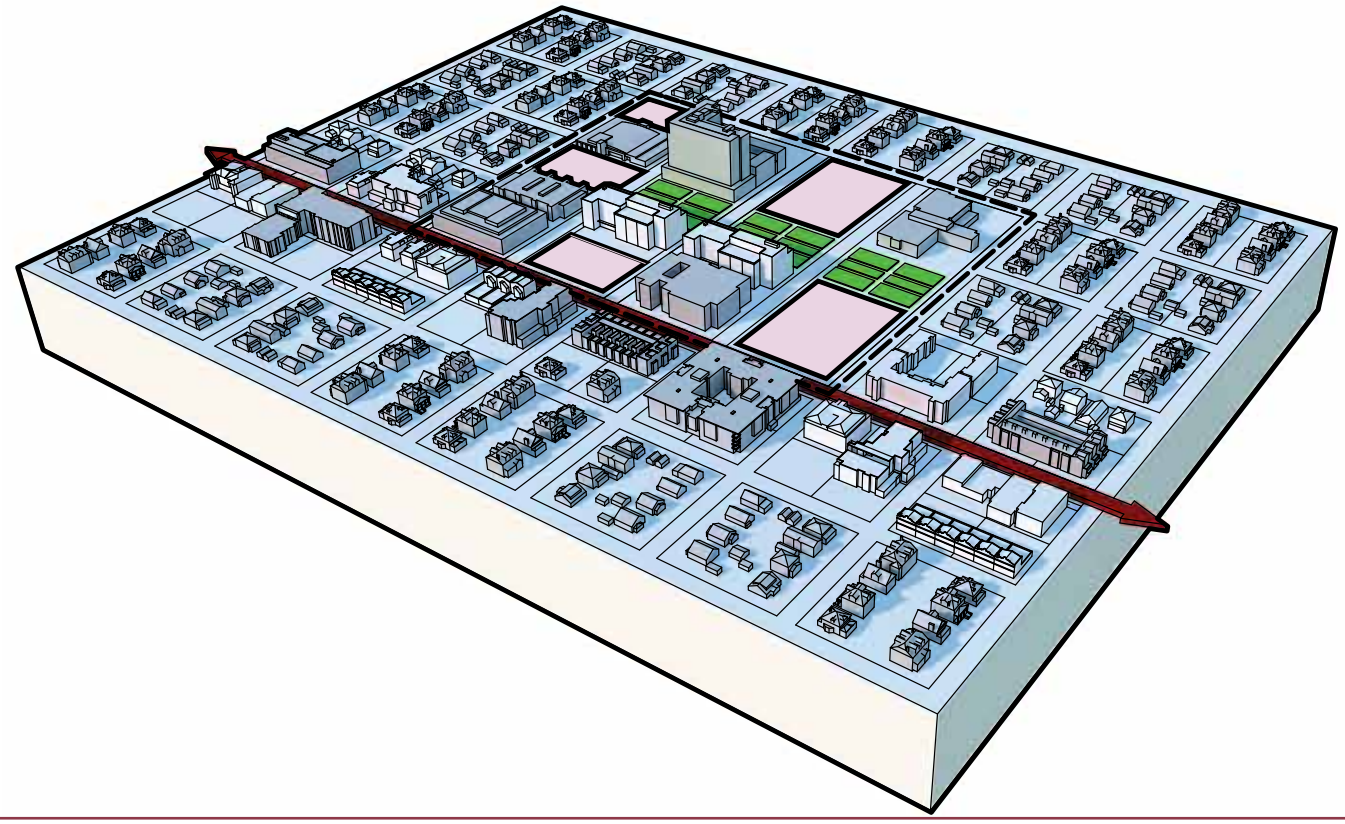
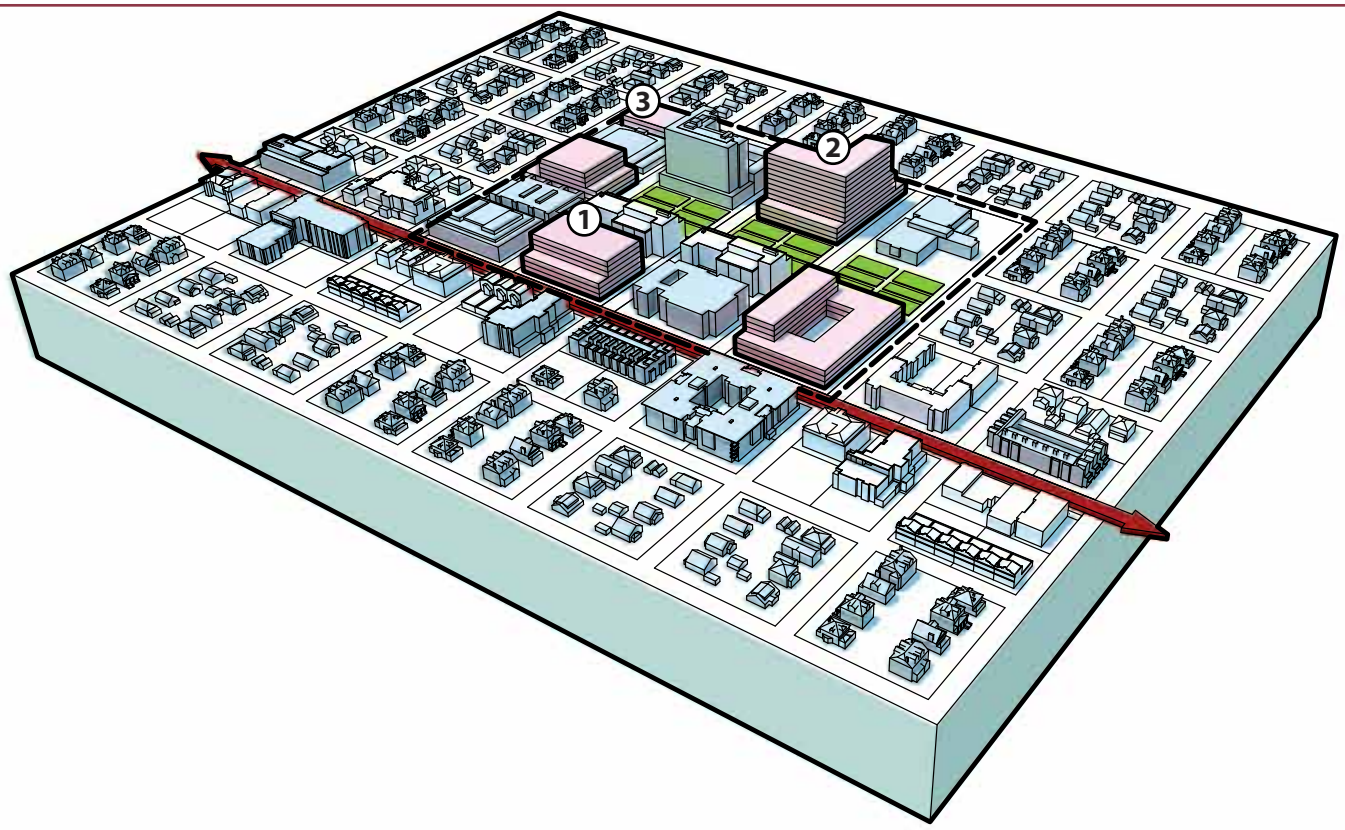


*URBAN CAMPUS BUILDOUT HEIGHT AND SETBACK EXAMPLE: Potential building sites.*




*URBAN CAMPUS BUILDOUT HEIGHT AND SETBACK EXAMPLE: Possible buildings that meet setbacks and height standards. See examples 1, 2 and 3 on the next page.*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## Additional Zoning Regulations Remain in Effect

The Development Code contains other significant regulations that will continue to apply to developments on CI zoned property. These regulations include but are not limited to the following:

| | |
|---|---|
| 33.243 Helicopter Landing Facilities | Helicopter landing facilities operated as an accessory use to a medical center or educational campus will remain a conditional use subject to use restrictions, noise attenuation and other development standards. |
| 33.262 Off-Site Impacts | Standards and enforcement procedures related to noise, vibration, odors and glare will apply to campus institutions. |
| 33.266 Parking and Loading | Parking lot design, landscape/screening requirements and space requirements will continue to apply. |
| 33.279 Recreational Fields for Organized Sports | Development standards and type II/III Conditional Use Review procedures will apply to the construction use and lighting of organized athletic fields. |
| 33.293 Superblock | Regulations related to walkways, landscaped areas and plazas will apply continue to apply to oversized blocks that are the result of street vacations. |
| 33.420 Design Overlay | Staff is proposing to eliminate the "d" design overlay from those campuses where it is applied (only) as a requirement of the IR zone. The Design overlay will remain applicable in those instances where the campus is located within a larger "d" design overlay area, such as the Good Samaritan Hospital campus located within the larger Northwest District Plan District. |
| 33.430 Environmental Overlay(s) | Environmental conservation and preservation overlay zones with attendant environmental protections continue. |

A number of the campus institutions are also within the boundaries of an existing plan district. Campus institutions that opt for a (CI) campus institution base zone will remain subject to the development standards described by the applicable plan district.

## Transportation Issues

Transportation issues are of paramount concern to both institutions and their surrounding neighborhoods. Effective transportation and parking management strategies are vital for an institution's successful integration into its surrounding neighborhood as are opportunities for public input throughout the initiation and administration of these programs.

### Traffic Impact Analyses

Transportation impact analyses (TIA) are currently required as a component of both conditional use master plans and impact mitigation plans. Such impact analysis will also be a requirement of any future rezoning application. A transportation impact analysis isolates an institution's share of traffic on its surrounding transportation network; identifies needed multimodal transportation services and capacity shortfalls, and recommends mitigation strategies. Required mitigation may include: on or offsite street improvements that increase system capacity or improve safety; system management improvements that increase the efficiency of existing street networks; and transportation demand management strategies that reduce travel demand or shift such demand from single occupancy vehicles to public or active transportation options.


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### Transportation Demand Management Plans

Transportation demand management (TDM) encompasses a variety of strategies to encourage more efficient use of the existing transportation system and reduce reliance on the personal automobile. This is achieved by encouraging people through education, outreach, incentives, and pricing to choose other modes, share rides, travel outside peak times, and telecommute, among other methods. Effective transportation demand management also incorporates management of parking supply and demand.

Transportation demand management (TDM) programs are also currently required as components of conditional use master plans and impact mitigation plans and will be ongoing requirements with the proposed new zones. While the specific components of a TDM plan vary by institution they all include a set of incentives, disincentives and resources made available to move persons from their single occupancy vehicle to active transportation options, public transit, or otherwise reduce their impact on the transportation network.

TDM programs can represent real savings for an institution if it allows them to forego a new parking structure or avoid a street improvement but they also represent an ongoing expense and administrative responsibility. There will be an ongoing City requirement for these institutions to maintain robust TDM programs, in coordination with the City.

### Future Transportation Review and Coordination

Beyond the initial rezoning application, there is an ongoing need to coordinate campus growth with the City's Transportation plans. Both the City and the campus institutions may benefit from more frequent ongoing coordination, rather than the episodic coordination that occurs via the current CUMP/IMP process. There are several mechanisms that could be explored to ensure this ongoing coordination, and provide accountability:

- Both a Transportation Impact Analysis and TDM program will also be required components of a complete zone change application.
- The City could adopt regulations (in Title 17 or elsewhere) to mandate institutions above a certain size maintain ongoing TDM programs that meet prescribed standards or funding levels. Such codes could include provisions that mandate periodic performance reporting.
- The Zoning Code could include requirements for periodic Transportation Impact Reviews, as a land use review. Such a review would include updated Transportation Impact Analysis, and an opportunity to review and refine approved TDM plans. Such a review would be much narrower in scope than the current CUMP/IMP process, but still enable City and public review of campus transportation needs and responsibilities. This review would be triggered by new development over a certain size (trips or floor area), or scheduled to occur on a regular basis (akin to the current 10-year period for CUMP/IMP).
- The City and the subject institutions could also use formal development agreements as a mechanism to assign responsibility for identified transportation improvements. Where needed projects primarily benefit the institution, they would have primary financial responsibility. Where the project has a wider public benefit, the institutions would contribute to a larger funding strategy.

## Quasi-Judicial Rezone (option to rezone to new base zone rather than update CUMP or IMP)

The proposed campus institution zone regulations will be added to the zoning code and become effective upon the final acknowledgment of the Comprehensive Plan by the State Department of Land Conservation and Development anticipated to occur in 2016. After the effective date of these new zones, individual institutions can either continue to operate under their conditional use master plans, impact mitigation plans, or base zone standards as applicable for the duration of these approvals. At the expiration of these approved plans or at such time as a major plan amendment is sought, institutions will have the option of either updating their CUMP/IMP according to the procedures currently in the development code or they can apply to rezone their campus from its existing zoning designations to one of the new campus institution zones.

It is the intention of the Bureau to phase out the use of conditional use master plans and impact mitigation plans over time and replace them with the proposed base zones. Such transition may be enforced through a limitation on the number of times an existing CUMP/IMP can be updated, through a subsequent legislative rezoning effort for all dispersed campuses or other cooperative effort coordinated with the campus institutions.


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Quasi-judicial applications for a zone map amendment to a CI zone will be in compliance with the Comprehensive Plan provided they do not extend beyond the established boundary of the Comprehensive Plan Map "CI" designation. Adding property beyond the existing approved CUMP/IMP boundaries as reflected on the Comprehensive Plan Map would require a Comprehensive Plan Amendment as well as a zone change.

Rezoning applications must demonstrate that there are adequate public facilities to serve the development allowed under the campus institution zoning including police and fire protection, sanitary and stormwater sewers, water, and transportation facilities. A schedule of infrastructure improvements may be required of the institution at the time of such rezoning to document their ability to meet this rezoning approval criterion.

A rezoning application in conformance with the Comprehensive Plan is a Type III application.

## Neighborhood Communication and Coordination

To encourage clear lines of communication as an effective means of reducing conflicts, staff is proposing that institutions develop a process for ongoing neighborhood communication and coordination as part of a complete rezoning application. At the minimum, this requirement will:

- Identify a point of contact at the institution.
- Establish a protocol for neighborhood/institution communication and conflict resolution.

## Subsequent Development Review

Once a campus institution base zone has been approved, subsequent building proposals and other development activity will be subject to the procedures and development standards of that zone. Some uses will be allowed *by right*, some will have limitations further described in code and some, because of their perceived potential impact on the surrounding neighborhoods, will be classified as a *Conditional Use*. Allowed uses will be required to either meet the development standards established by the base zones and other pertinent chapters of the zoning code or successfully demonstrate that adjustments from these standards are warranted.

The adjustment review process described in section 33.805 provides a mechanism by which the regulations of the zoning code as applied to the CI zones may be modified if the proposed development continues to meet the intended purpose of the regulation. Evaluation criteria include findings that the proposed adjustment will not detract from the livability of adjoining residential neighborhoods, that any impacts from the adjustment are mitigated and that granting the adjustment will equally or better meet the purpose of the regulation to be modified.

In those circumstances where adjustments from zoning standards have been granted as a component of a conditional use master plan review or an impact mitigation plan review, such adjustments will carry over to the new zone.

Once the Campus Institution zones are adopted and applied to individual campuses there may be structures that do not conform to the development standards (building height, setbacks etc.) or there may be uses that are listed as conditional uses or prohibited within the zone. In general, non-conforming uses are allowed to continue but may not be expanded without additional land use review. Non-conforming development features generally can be continued but not expanded and efforts to bring the project closer to conformance with the base zone standards is sought at such time as building or site alterations are made.


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*Aerial view of the Willamette River and the University of Portland Campus and surrounding neighborhood. N. Portland*

## Equity Considerations

The college and hospital campuses subject to this review are located across the city including developments that have had a historic impact on Portland's communities of color and existing campuses that are located in neighborhoods of color, (see Map 16 on page 41). Institutional development in Portland includes a history of displacement and subsequent land-banking in what some community members believe is an unproductive use of land. At the same time, these institutions provide important investment, educational and employment opportunities that can have a positive impact on the larger city's vulnerable populations.

The Campus Institution Zoning Update Project attempts to balance these concerns by providing a regulatory structure that encourages institutions to develop on their existing campuses while limiting the further acquisition of property and expansion of campus boundaries out into the surrounding neighborhoods.


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# Existing Conditions

## Campus Institutions

There are 15 medical center and higher education campus institutions designated as (CI) Campus Institution on the Comprehensive Plan Map that would be eligible for rezoning to one of the two proposed campus institution zones. Of these campus institutions four are college campuses more than 100 acres in size, six are college campuses between 10 and 25-acres in size and five are medical centers. These individual campuses can further be distinguished by the character of their campuses, their surrounding neighborhoods and available transportation infrastructure.

**Table 3: Campus Institutions**

| Proposed Residential Campus | Acres | Current Approval | Duration |
|---|---|---|---|
| Reed College | 117 | CUMP | 2008-2018 |
| University of Portland | 188 | CUMP | 2013-2023 |
| Lewis and Clark College | 137 | CUMP | 2009-2019 |
| PCC Sylvania | 118 | CUMP | 1993-2003 |
| Concordia University | 27 | IMP | 2003-2017 |
| Warner Pacific University | 16 | CUMP | 2001-2013 |
| Multnomah University | 24 | IMP | 2000-2025 |
| University of Western States | 21 | CUMP | 1998-2008 |
| **Proposed Urban Campus** | **Acres** | **Current Approval** | **Duration** |
| Providence Medical Center | 26 | CUMP | 2012-2022 |
| Kaiser Medical Center | 13 | CUMP | 1989-2000 |
| Legacy Emanuel | 41 | IMP | 1994-2024 |
| Legacy Good Samaritan | 16 | CUMP | 2005-2015 |
| Adventist Medical Center | 42 | CUMP | 2005-2015 |
| PCC Cascade | 23 | IMP | 2001-2021 |
| PCC Southeast | 18 | Base Zone | NA |

The hospitals located on Marquam Hill and the University of Portland are not a part of this zoning update project because they have already been assigned central city zoning designations and fall within plan districts that establish adequate capacity to meet their projected growth through 2035.

The four 100-acre college campuses are located primarily on local service streets within single-family residential neighborhoods that are not well served by frequent service public transportation. In contrast, the five medical center campuses are typically located adjacent to a neighborhood or civic corridors and fall within or adjacent to a neighborhood or town center. These are all locations where the City is anticipating mixed use development within the next 25 years and are typically well served by frequent service public transportation.

Of the remaining six 10 to 25-acre college campuses, Portland Community College's Cascade and Southeast campuses are distinguished by their location within or adjacent to a town or neighborhood center with frontage on designated corridors served by frequent bus lines. Each includes commercially zoned property within its boundary and on adjacent properties. The remaining campus institutions of this size may be located on a neighborhood corridor having frequent bus service but do not contain significant commercial property and are otherwise surrounded by residential zoning and land uses.


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## Existing Regulatory Process

Under existing zoning regulations the dispersed campuses typically operate under either a conditional use master plan or an impact mitigation plan.

### Conditional Use Master Plan

A conditional use master plan is a plan for the future development of a use that is subject to the conditional use regulations. A master plan is required as part of a conditional use review where the conditional use contains over 500,000 square feet of floor area and proposes to expand its floor area or site area. The development of a master plan is intended to:

- Provide the surrounding neighborhoods and the City with information about, and an opportunity to comment on, the use's plans for future development.
- Enable the institution and the City to address the effects of the future development.
- Ensure that develop will be allowed in a manner consistent with the plan.

The more specific the plan, the less subsequent review is required as future development occurs. The master plan must include proposed uses and possible future uses that might be proposed for at least 3 years and up to 10 years. At the end of this time period the plan expires and must be renewed or updated prior to any new development.



*Portland Community College along SE Division Street*

### Impact Mitigation Plan

An impact mitigation plan is similar to a conditional use master plan in that it begins with a comprehensive proposal for the future development of a campus. In contrast to a conditional use master plan, an impact mitigation plan provides only a conceptual site plan while establishing a set of impact metrics such as vehicular trips, required parking spaces or student enrollment with corresponding impact mitigation requirements. Subsequent development in conformance with the conceptual layout can proceed subject to design review and Type II development review procedures provided it is in conformance with the proposed mitigation schedule established under the larger impact mitigation plan.

Both initial conditional use master plans and impact mitigation plans are processed through a Type III review procedure wherein city staff drafts a recommendation and the Hearings Officer renders a final decision that may be appealed to City Council. Subsequent development on campus may proceed by right or subject to a type I, II or III review procedure depending on a variety of factors including the size and nature of a proposed development, whether it will expand the boundary of the recognized campus and the detail contained in the original master plan or impact mitigation plan.


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## Existing Development Standards

Conditional Use Master Plans **for hospitals and colleges currently take place across a broad range of underlying residential** base zones and are subject to a combination of development standards that apply both to the underlying zones and standards specific to institutional uses. Existing Institutional Development Standards in most multi-dwelling zones are shown below.

### Table 4: Selected Existing Multi-dwelling Development Standards for Institutions in the R3-RX Zones

| | |
|---|---|
| Maximum Building Height | 75 ft |
| Setback and Building Envelope | 10 ft min. 1 ft for each 2 ft Building Height |
| Maximum FAR | 2 to 1 |
| Maximum Site Coverage | 70% |
| Minimum Landscape Coverage | 20% |
| Buffering From Abutting Residential Zone | 10 ft to L3 Standard |
| Buffering Across a Street From a Residential Zone | 10 ft to L1 Standard |

Impact Mitigation Plans are applicable to campuses located on land zoned (IR) Institutional Residential. All property assigned an IR zoning designation is also assigned a "d" Design Review overlay requiring new development and significant remodeling efforts to undergo a formal design review.

### Table 5: Selected Existing Development Standards for Institutions in the IR Zone

| | |
|---|---|
| Maximum Building Height | 75 ft |
| Setback and building envelope | 10 ft minimum + 1 ft for each 2 ft building height |
| Maximum FAR | NA |
| Maximum Site Coverage | 70% |
| Minimum Landscape Coverage | 20% |
| Buffering from abutting Residential Zone | NA |
| Buffering Across a Street from a Residential Zone | NA |


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# What We've Heard So Far

The results of this project have been informed by a Project Advisory Group comprised of representatives from institutions, adjoining neighborhoods, transportation and land use consultants and city staff. This group met 9 times (every other month) since its inception December 2013. A roster of advisory group members, agendas, meeting notes and materials from these meetings are available on the project webpage at ***www.portlandoregon.gov/bps/institutions***

Staff also gathered input from review of the public record, outreach to individual institutions and neighborhood associations and discussion with City of Portland service bureaus. The most widely shared comments and concerns are generally described below:

## Institutions

Institutional representatives expressed numerous concerns about the current review process including the expense involved in preparing and submitting an adequate application and the conflict such reviews invariably generate between the institutions and their surrounding neighborhoods. Many of these concerns as well as an early proposal for administrative reform are contained in a 2012 report, ***Institutional Uses Analysis and recommended alternatives: City of Portland's regulatory regime for college institutions*** (see Note 3).



*Students on campus at the University of Portland*



*Randall Children's Hospital at the Legacy Emanuel Campus*

Given the realities of institutional funding and evolving trends in both healthcare and higher education, long range development forecasts are imperfect planning tools for the institutions. The recurring, complex nature of City reviews however lead institutions to provide worst-case proposals and accept conditions of approvals that conflict with their business interests. Ultimately, land use approvals are not permanent and institutional operations are up for review every 10 years. Institutions seek a zoning designation that recognizes them as a permanent presence befitting their tenure in the neighborhoods that in some cases date back 100 years.

Subsequent development thresholds that trigger a Type II or Type III review are set too low to effectively provide the flexibility that is supposed to be provided through both the CUMP and IMP processes. This makes it difficult for institutions to respond to changing demands that may be the result of changes in the industry, unexpected funding opportunities or even requests from neighborhood representatives.

Institutions expressed concerns that they are often assigned more than their fair share of neighborhood traffic impact and the resulting mitigation expense.

Some participants advocate for legislatively rezoning the campuses as part of the Task 5 implementation effort. Individual institutions could then choose to run out their CUMP or IMP. Alternatively institutions want to retain the option as to when, or if, they apply to rezone their campuses.

Much has been said about the negative impacts of institutions on their surrounding neighborhoods but little is said regarding the benefits institutions provide to the neighborhoods such as open space, access to community facilities and programs - not to mention jobs and services. The conditional use process does not recognize these contributions.


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*Students at bus stop at PCC Cascade, NE Portland*



*Warner Pacific University near Mt. Tabor, SE Portland*



*Busy intersection, Legacy Good Samaritan Hospital and Health Center, NW Portland*

## Neighborhoods

There remains considerable support for the CUMP and IMP plan review process among neighborhood associations and individual neighbors despite the recurring effort required of these volunteer organizations to engage in complex negotiations with institutions through their attorneys, engineers and architects. Those in support of the status quo value the existing review processes' ability to address unique circumstances that accrue to individual institutions and neighborhoods. They also support the Hearings Officer as an independent authority who is able to review the evidence submitted against the applicable law and render a fair judgment. Broader public outreach including better public notice would improve the review process.

Traffic and parking issues related to institutional expansion and operations are the most predominant substantive concerns of neighbors. Neighbors care less about the source of the increased traffic in their neighborhoods than they do about meaningful strategies and infrastructure investments that improve safety and capacity on their local streets.

Other offsite impacts such as athletic field lighting, noise, off-campus housing, public safety and campus boundary expansions are also common concerns.

Neighbors are concerned that the correct metrics are used in adopted transportation demand management (TDM) programs. Increasing the mode-split share of traffic arriving at an institution by active transportation or public transit can still result in an actual increase in car traffic for a growing institution. Adequate enforcement also remains a concern because the City has not assigned adequate resources to TDM oversight. Institutions are not keeping up with their ongoing TDM operational obligations.

Building design and land use at the periphery of a campus are of interest to the surrounding neighborhood, while the design of individual buildings at the interior of a campus less so. Edge standards and land use strategies should contribute to the adjoining neighborhood character whether that means accommodating a quiet single-family residential neighborhood or activating a neighborhood commercial district.

Satellite facilities within nearby commercially zoned centers and corridors may meet underlying zoning district use and development standards but consideration should also be given to their relationship to the main campus, specifically where transportation issues are concerned, such as a requirement for a shuttle bus to reduce traffic.

Development that may good for the region is not necessarily good for the neighborhood. Use of Community Benefit Agreements or other appropriate tools should be explored that would promote local hiring, contracting and procurement policies as components of the institutions business operations.


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### Service Bureaus

Service bureaus support development code options that are straightforward to administer including conditions of approval as necessary to meet their respective review criteria. The Bureau of Transportation is particularly interested in their continued ability to review transportation impacts from campus institutions and require proportional improvements to the affected transportation network. PBOT also wants to retain the requirement for institutions to develop and administer ongoing TDM Programs. The Bureau of Environmental Services also wants to retain its ability to review comprehensive stormwater management plans on a campus wide basis.

## Conclusion

The Campus Institution Zoning Update Project began as an effort to increase the amount of development potential available to the City's dispersed campus institutions while protecting against or mitigating for offsite impacts that such development might cause. After a review of the City's existing regulatory structure and in conversation with a wide range of institutional, neighborhood and city regulatory interests, BPS is proposing a two base zone option as a straight forward approach to integrate the competing interests and promote positive outcomes related to future campus development.

The (CI1) Urban Campus and (CI2) Residential Campus base zones allow the City to distinguish between types of campuses based on their principal use, campus typology and surrounding neighborhood characteristics. Unlike plan districts, overlay zones or amending the existing review processes, the recommended approach designates campus institutions as a form of employment land on the Comprehensive Plan Map and recognizes institutions as permanent, unique land uses within the city.

The proposed list of allowed uses prioritizes medical and educational activities. An expanded list of accessory and conditional uses facilitates additional commercial activities that contribute to neighborhood serving commercial enterprise and entrepreneurial activity. This is consistent with these institutions' roles as centers of creativity and engines of employment.

Development standards being crafted in support of the two base zones will result in development capacity sufficient to meet the projected shortfall. Two base zones allow for development standards that conform to the prevailing development requirements of both hospitals and colleges. Establishing the existing campus boundaries on the Comprehensive Plan Map will encourage institutions to build up not out into the surrounding neighborhoods thereby reducing the potential for displacement or other neighborhood conflict.

Finally, requiring a quasi-judicial rezone application while allowing existing CUMP/IMPs to be renewed gives institutions control over their regulatory futures and the timing of when they are best able to transition to a new base zone. At the same time the proposed Type III rezoning application process allows for robust neighborhood participation. Application requirements such as Transportation Impact Analyses, Transportation Demand Management Programs and Good Neighbor Agreements establish ongoing regulatory and communications tools that consider neighborhood interests.



*Dawson Park is adjacent, but outside of the Legacy Emanuel Hospital Campus*



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# Next Steps

Project Staff is actively seeking input from interested stakeholders on the campus institution zoning and will be preparing a report and proposed code amendments according to the following table:

### Table 6: Project Timeline

| | |
|---|---|
| **March – April 2015** | Public outreach |
| **April 9, 2015** | Final Project Advisory Group meeting |
| **May 29, 2015** | Staff report to Planning and Sustainability Commission published |
| **June 9, 2015** | PSC briefing |
| **July 14, 2015** | PSC public hearing (testimony) |
| **August 18, 2015** | PSC work session, vote and direction to staff |

Note: All dates are tentative

City Council consideration of the PSC's recommended draft will be coordinated with the adoption of the Comprehensive Plan Update (Task 4) and related early implementation (Task 5) projects tentatively scheduled in the winter of 2015. The effective date of any new development code language (the date at which an institution could actually apply for one of the new campus zones) would be after the State Department of Land Conservation and Development acknowledges the City's new Comprehensive Plan and related code amendments. Such acknowledgement is anticipated in 2016.


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# Notes

## Note 1.

According to the City's adopted Economic Opportunity Analysis (EOA) healthcare and higher education are expected to remain significant engines of economic activity and employment over the next 20 years.

- 24 percent of the total jobs in the City of Portland are within the healthcare and higher education employment sectors (2010).
- Almost half of these jobs are located within 19 large campuses located across the city including PSU and Marquam Hill.
- The Institutional Employment Geography (excluding PSU and Adventist Hospital) is forecast to add 22,730 jobs between 2010 and 2035.

The EOA identifies a shortage of available development capacity to accommodate this projected growth. Development capacity provided for in adopted Conditional Use Master Plan and Impact Mitigation Plans accounted for approximately 83 percent of the projected demand on the 15 dispersed campuses.

The Portland Plan recognizes this development shortfall and the benefits that these institutions provide to the community and instructs the City to "provide capacity for Portland's campus institutions to grow and to remain competitive." In support of this goal the Bureau of Planning and Sustainability is instructed to "develop, as part of the new Comprehensive Plan, new land use and investment approaches to support the growth and neighborhood compatibility of college and hospital campuses".

A full copy of the ***Economic Opportunity Analysis*** is available online at ***www.portlandoregon.gov/bps/59297***


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## Note 2.

The proposed Comprehensive Plan Update includes policy language directing the City to "provide for the growth of Portland's major campus institutions as essential service providers, centers of innovation, and major employers." Expanded policy language specific to campus institutions from the proposed ***Comprehensive Plan, Chapter 6: Economic Development*** is included below:

### Campus institutions

Health care and education sectors are concentrated in large hospital, college, and higher education and high school campuses as well as dispersed smaller facilities. Major institutions are large employers with campuses that vary from pastoral expanses to more concentrated urban grounds. Health care and education are projected to be the city's leading job growth sectors, adding more than 50,000 new jobs by 2035 at campus institutions and in other commercial areas. Rapid growth of campus institutions is a national trend, and best practices offer opportunities to plan effectively for this campus growth, and reduce neighborhood impacts. Examples of new directions in the policies below include designation of major campuses as employment land, regulatory improvements, and Transportation-related improvements.

| | |
|---|---|
| Policy 6.53 Campus institutions | Provide for the stability and growth of Portland's major campus institutions as essential service providers, centers of innovation, workforce development resources, and major employers. |
| Policy 6.54 Campus land use | Provide for major campus institutions as a type of employment land, allowing uses typically associated with health care and higher education institutions. |
| Policy 6.55 Development impacts | Protect the livability of surrounding neighborhoods through adequate infrastructure and campus development standards that foster suitable density and attractive campus design. |
| Policy 6.56 Community amenities and services | Encourage campus development that provides amenities and services to surrounding neighborhoods, emphasizing the role of campuses as centers of community activity. |
| Policy 6.57 Campus edges | Provide for context-sensitive, transitional uses and development at the edges of campus institutions to enhance their integration into surrounding neighborhoods, including mixed-use and neighborhood-serving commercial uses where appropriate. |
| Policy 6.58 Satellite facilities | Encourage opportunities for expansion of uses, not integral to campus functions, to locate in centers and corridors to support their economic vitality. |

## Note 3.

In 2012 a consortium of Portland public and private colleges prepared a briefing paper to inform the City of Portland's understanding of land use regulatory issues specific to institutions of higher education. As part of their supporting documentation the College Coalition conducted a regulatory survey, supported by interviews with relevant city agencies and comparable institutions, in three jurisdictions: St. Paul, Minnesota; Seattle, Washington; and Boston, Massachusetts.

Among the regulatory changes recommended by the college coalition:

- Create an institutional overlay zone with mandatory master plan requirement based on the current CUMP regulations.
- Change the duration of the master plan to move away from a set number of years to one that would remain in effect until the development forecast in the plan is complete or certain specified metrics such as student enrollment is met.
- Increase the threshold of development not conforming to the master plan(s) that could be built without an amendment.

A full copy of the ***College Coalition Report*** is available online at ***www.portlandoregon.gov/bps/63977***


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# Appendix

| | |
|---|---|
| Map 1: | Concordia University |
| Map 2: | Legacy Emanuel Hospital and Health Center |
| Map 3: | Legacy Good Samaritan Hospital and Health Center |
| Map 4: | Kaiser Medical Centers |
| Map 5: | Lewis and Clark College |
| Map 6: | Multnomah Bible College and Biblical Seminary |
| Map 7: | Portland Community College – Cascade |
| Map 8: | Portland Community College – Southeast Center |
| Map 9: | Portland Community College – Sylvania |
| Map 10: | Adventist Medical Center |
| Map 11: | Providence Portland Medical Center |
| Map 12: | Reed College |
| Map 13: | University of Portland |
| Map 14: | Warner Pacific University |
| Map 15: | University of Western States |
| Map 16: | Communities of Color |


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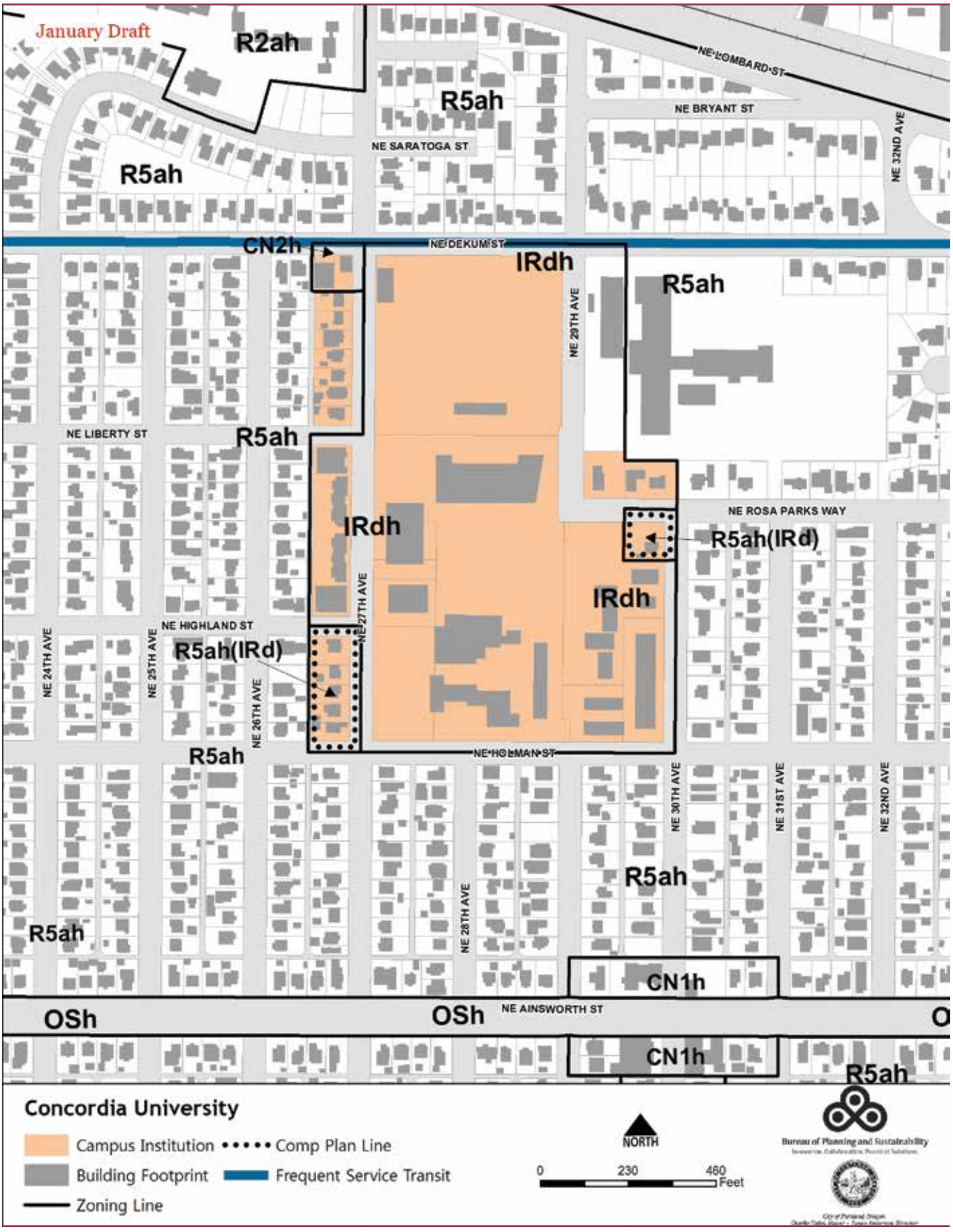
# Map 1: Concordia University





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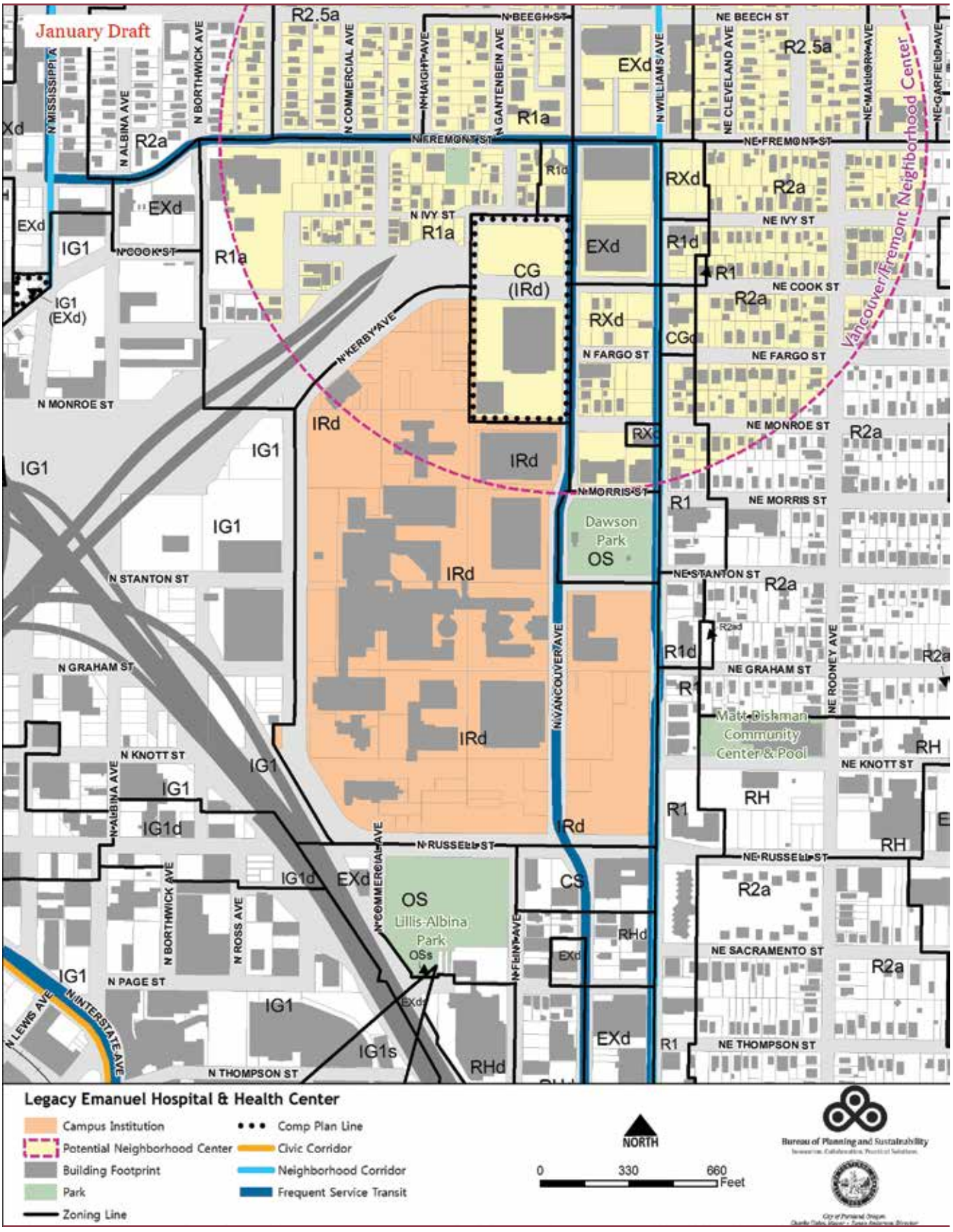
# Map 2: Legacy Emanuel Hospital and Health Center





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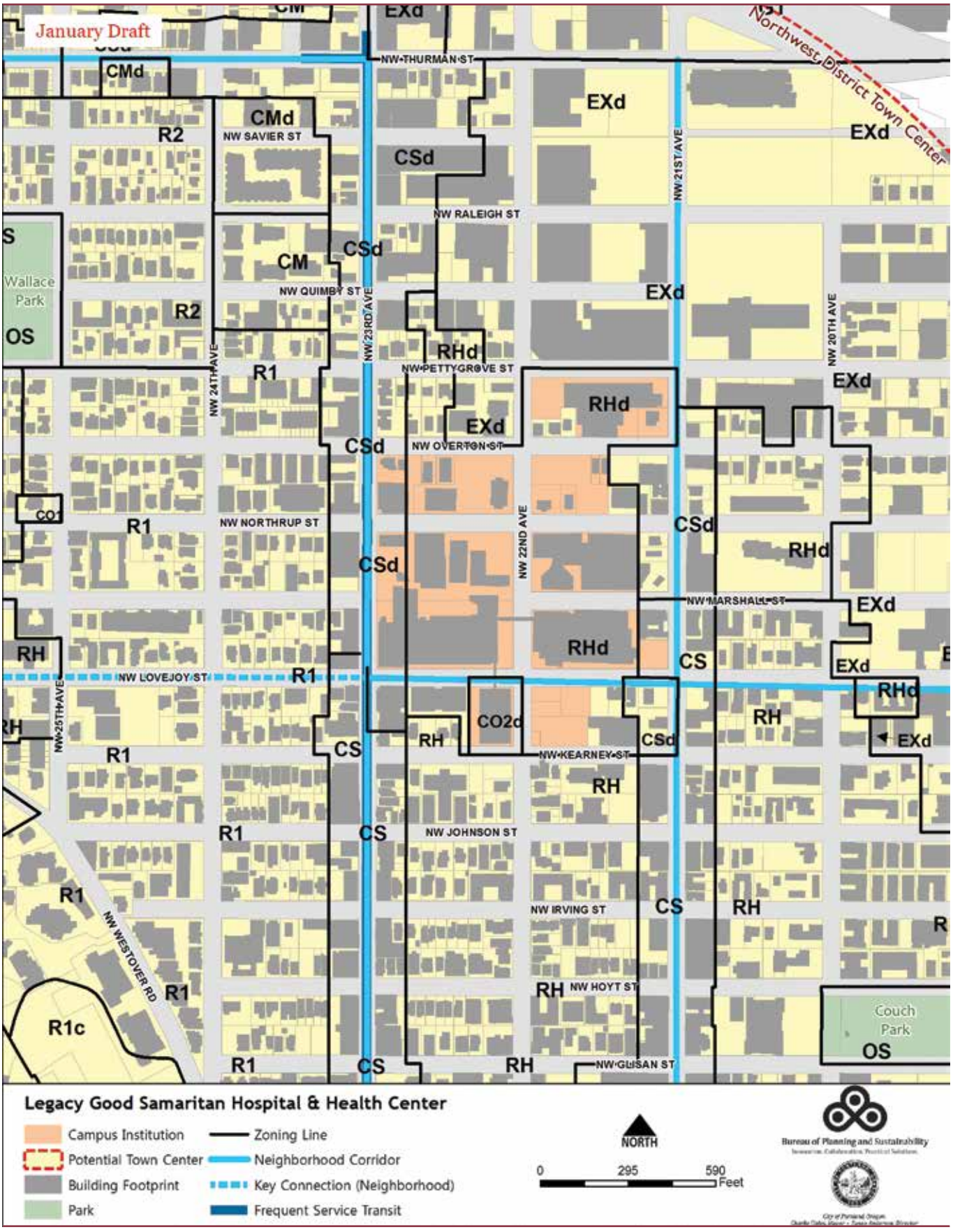
# Map 3: Legacy Good Samaritan Hospital and Health Center





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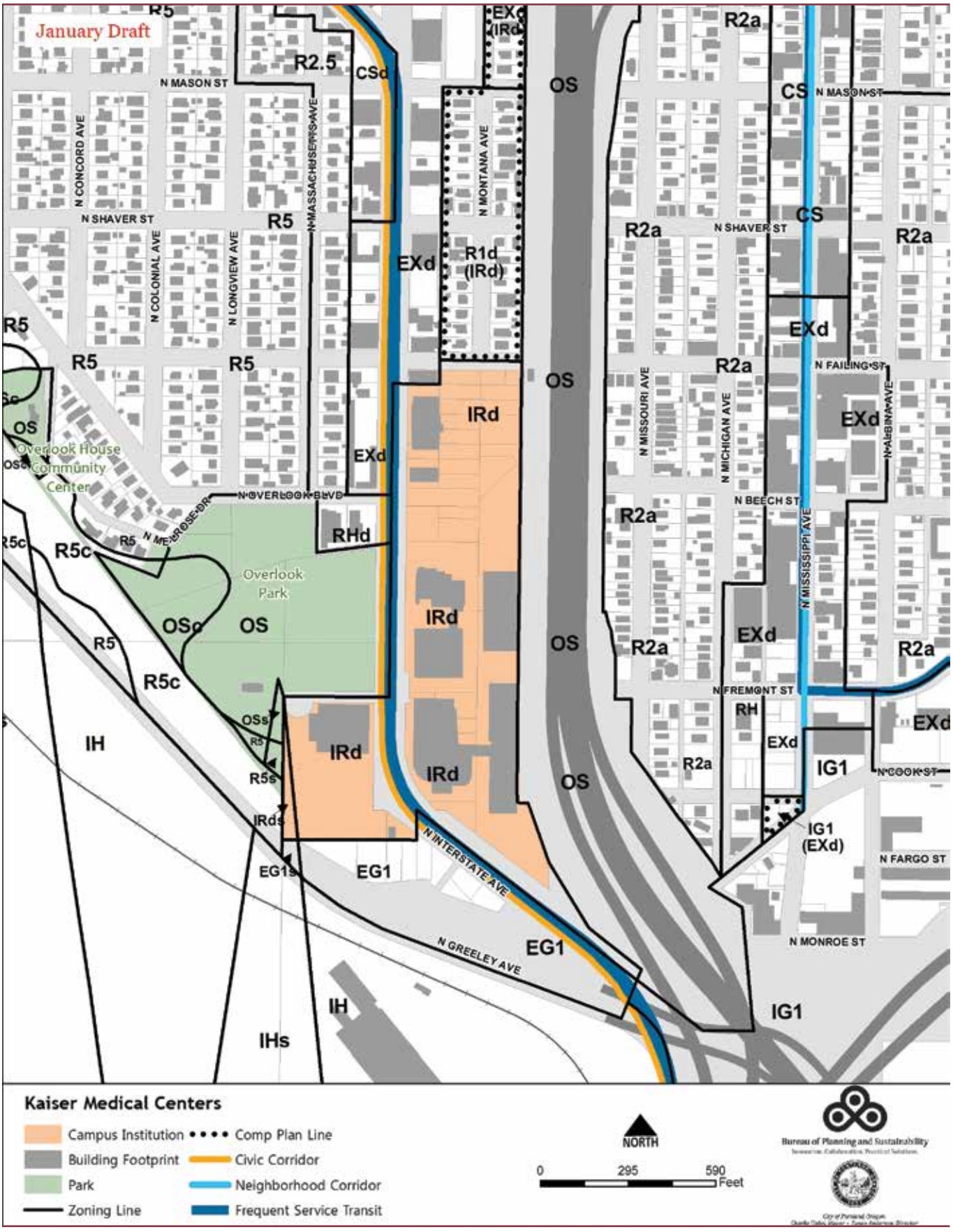
# Map 4: Kaiser Medical Centers





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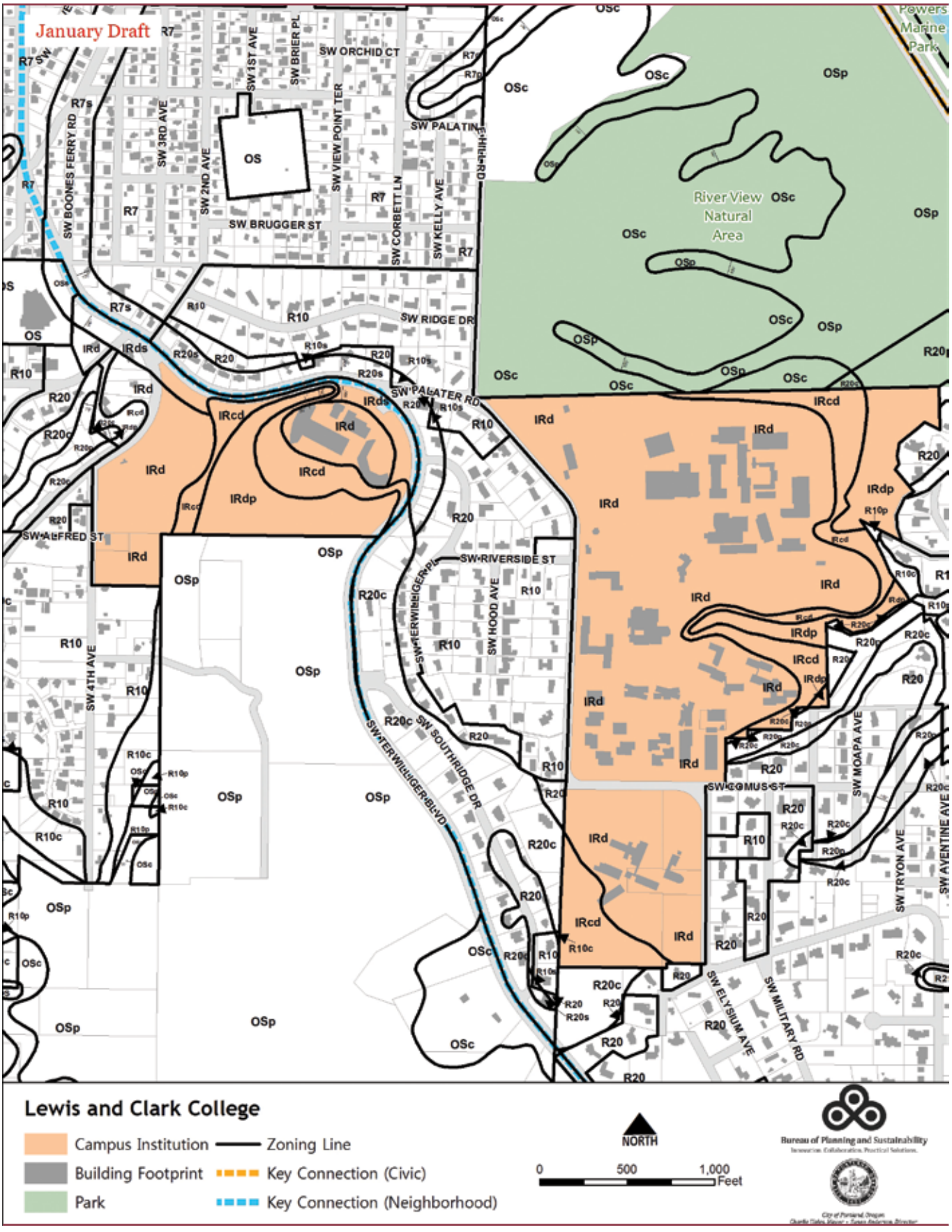
# Map 5: Lewis and Clark College





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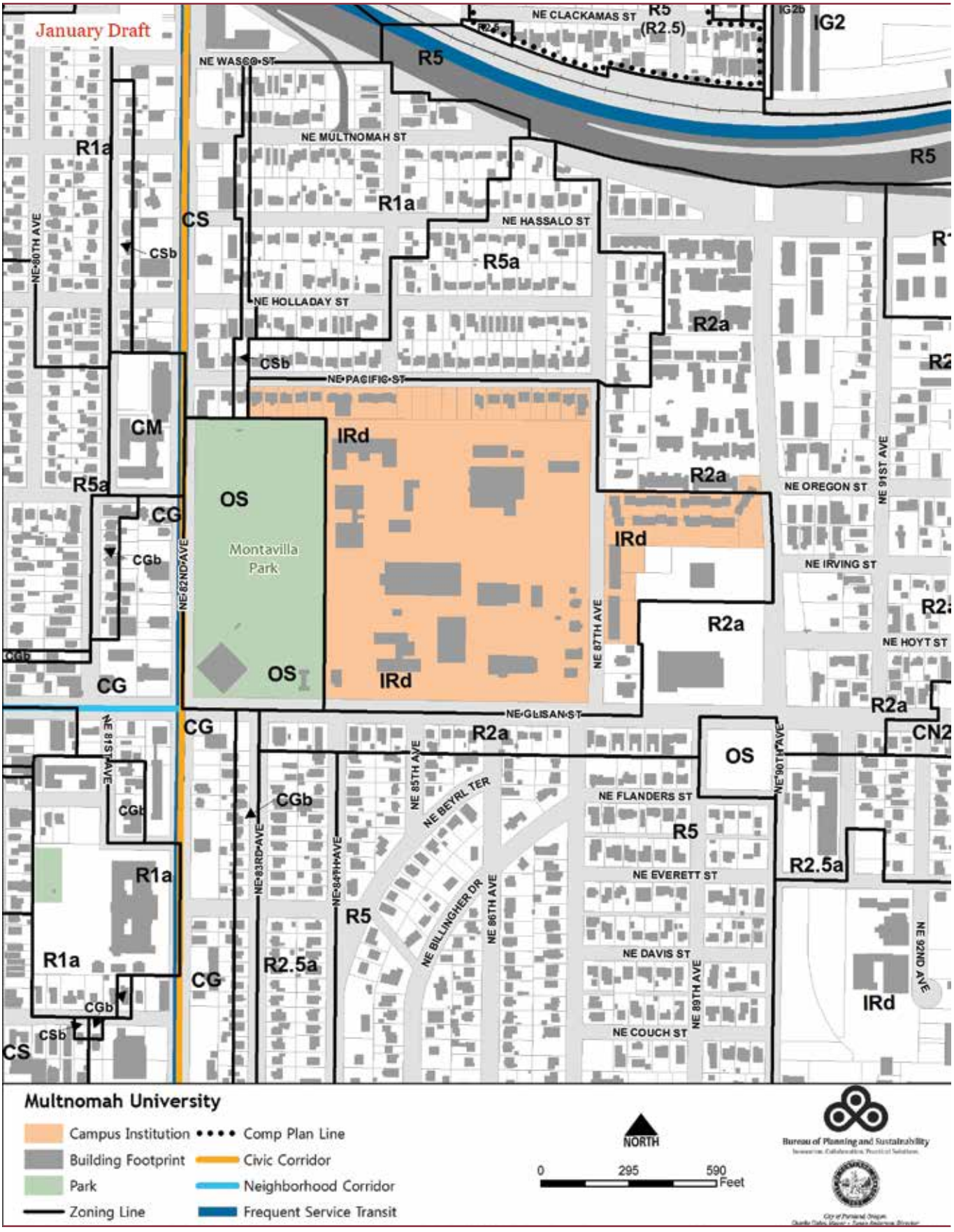
# Map 6: Multnomah University





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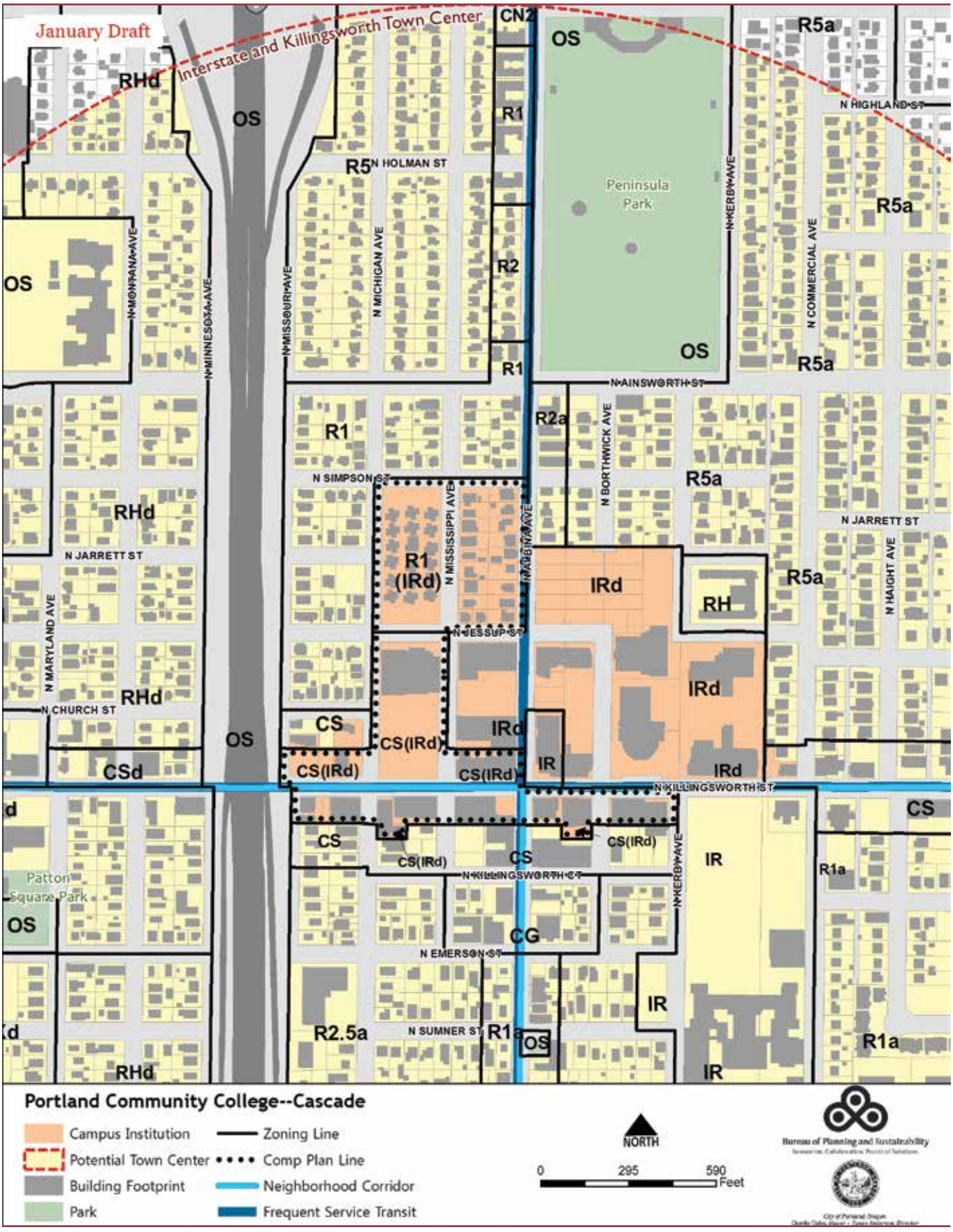
# Map 7: Portland Community College – Cascade





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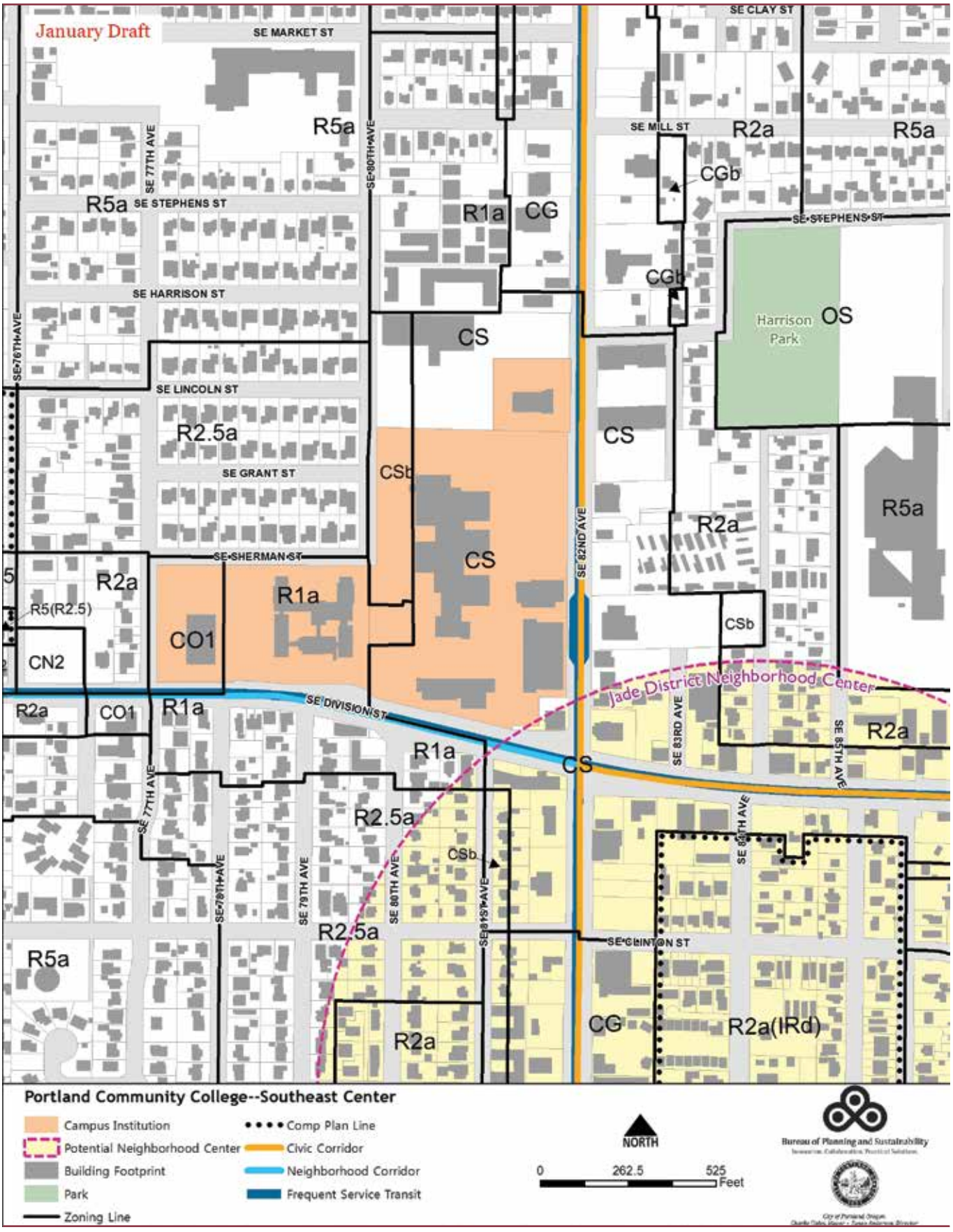
# Map 8: Portland Community College – Southeast Center





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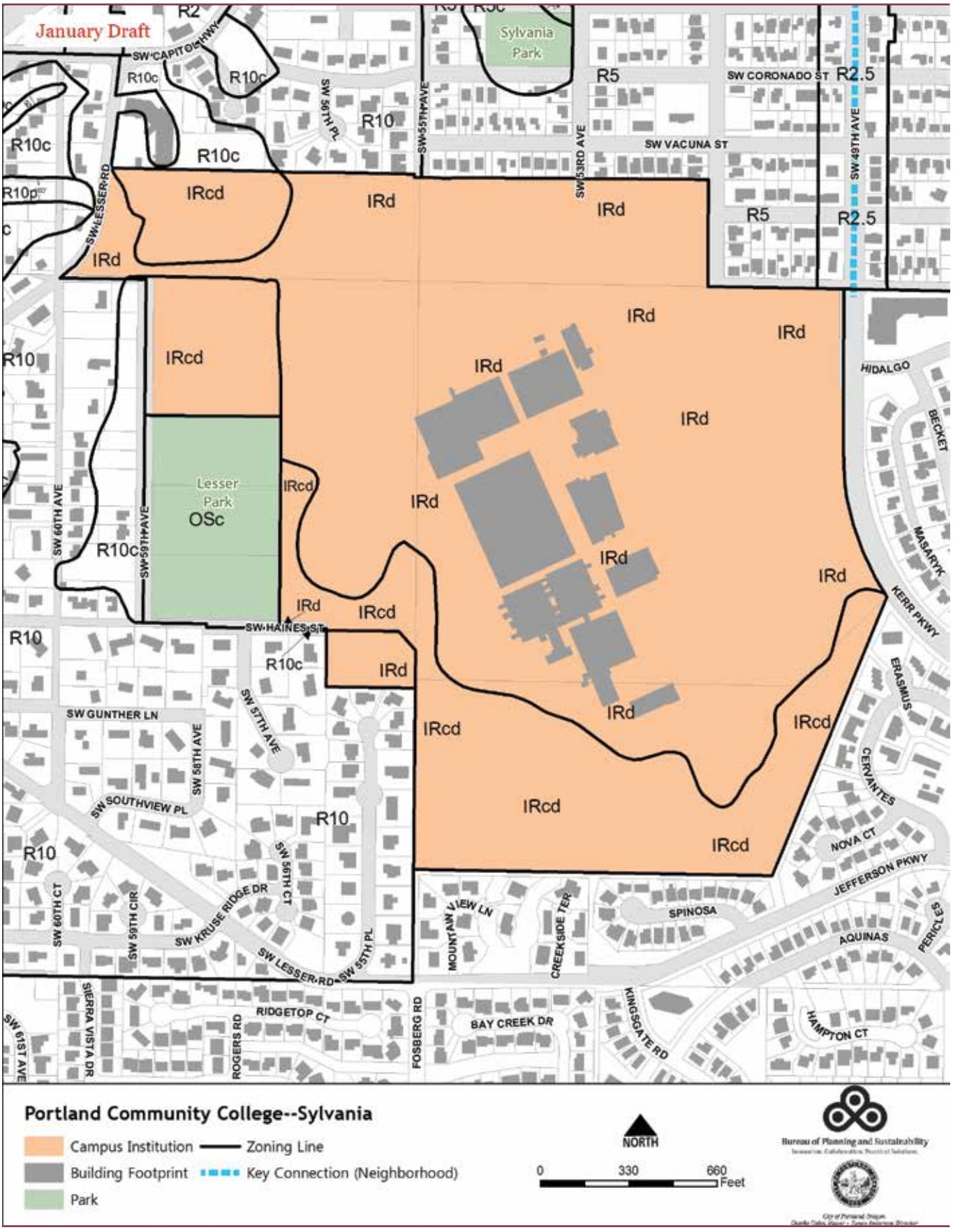
# Map 9: Portland Community College – Sylvania





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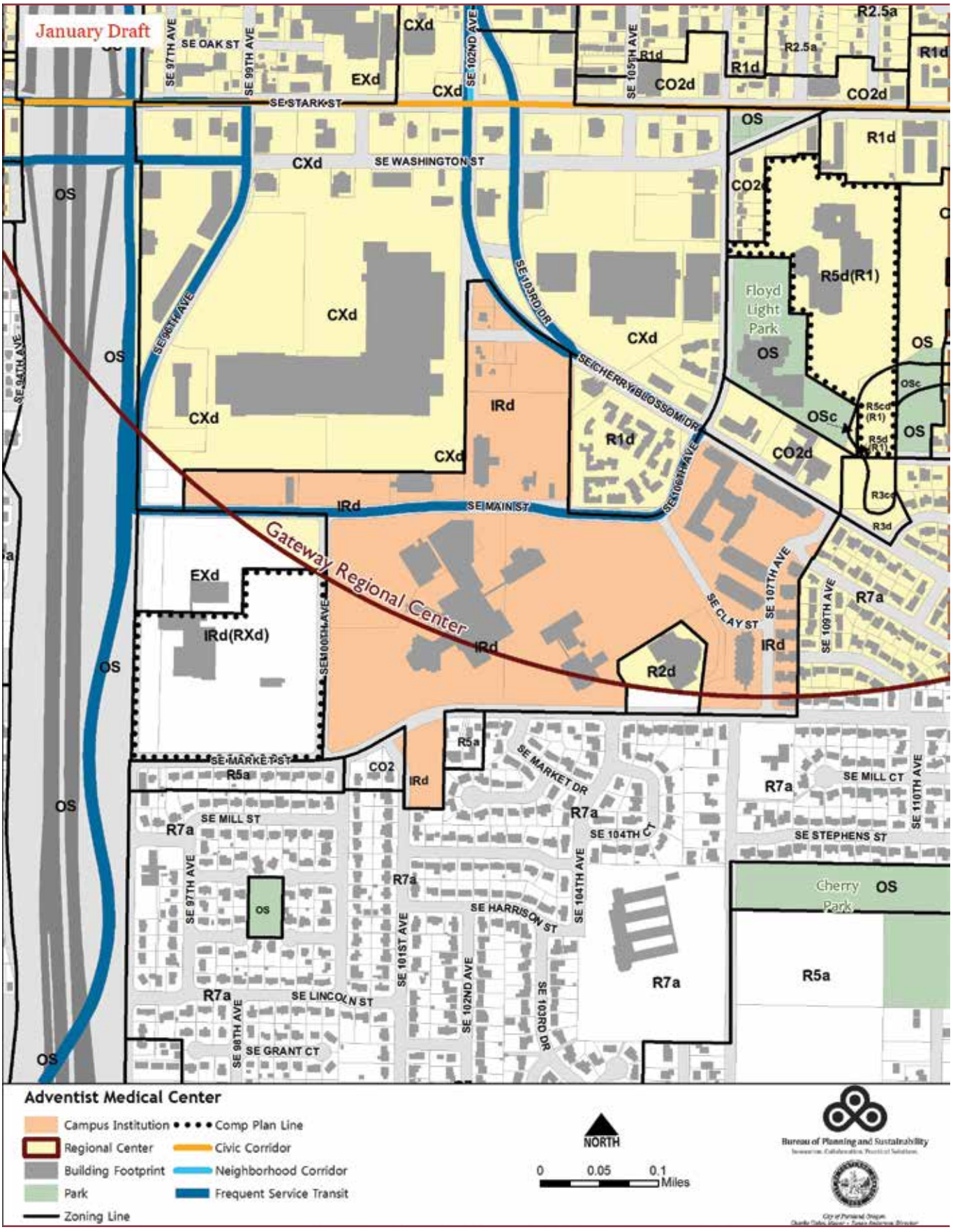
# Map 10: Adventist Medical Center





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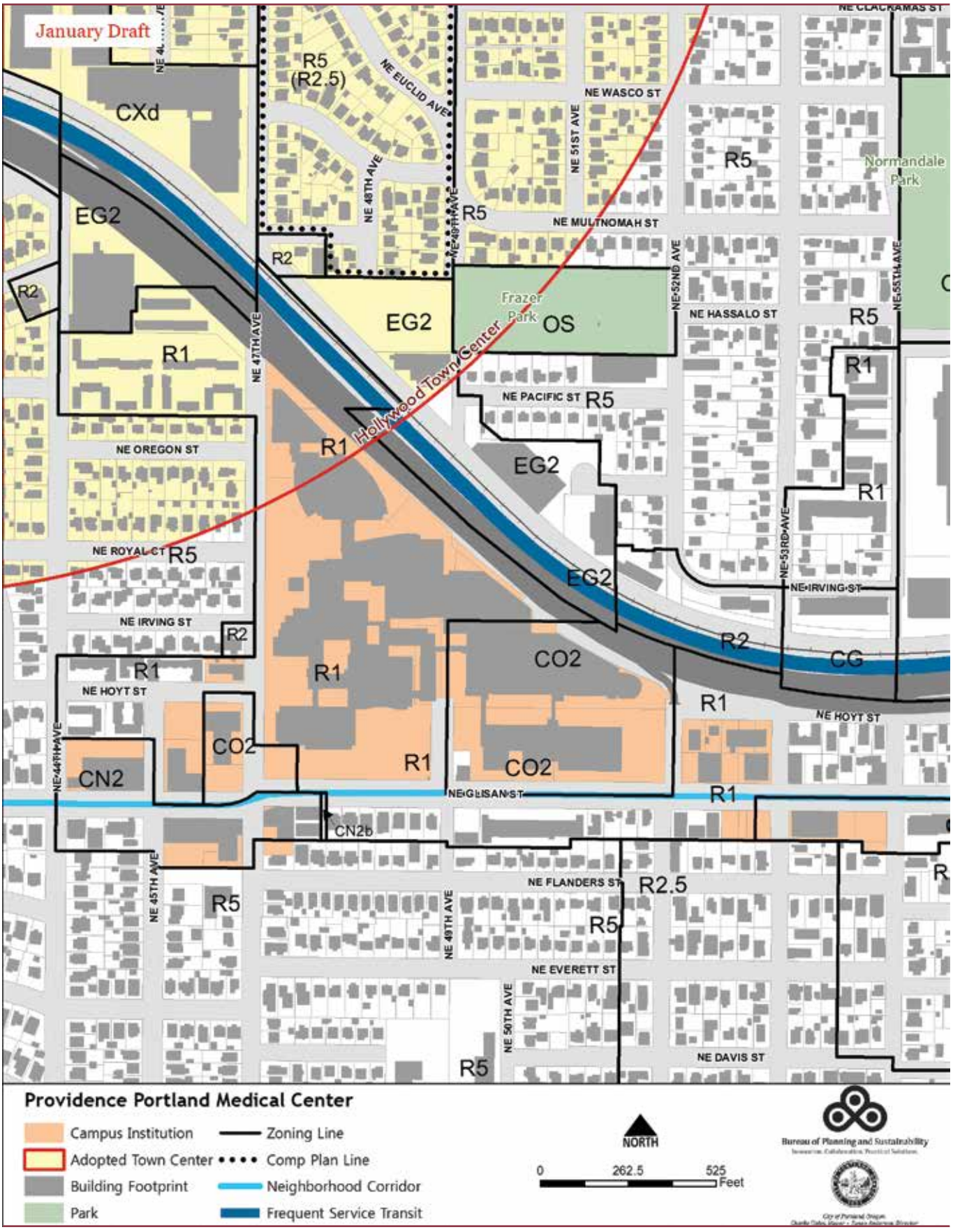
# Map 11: Providence Portland Medical Center





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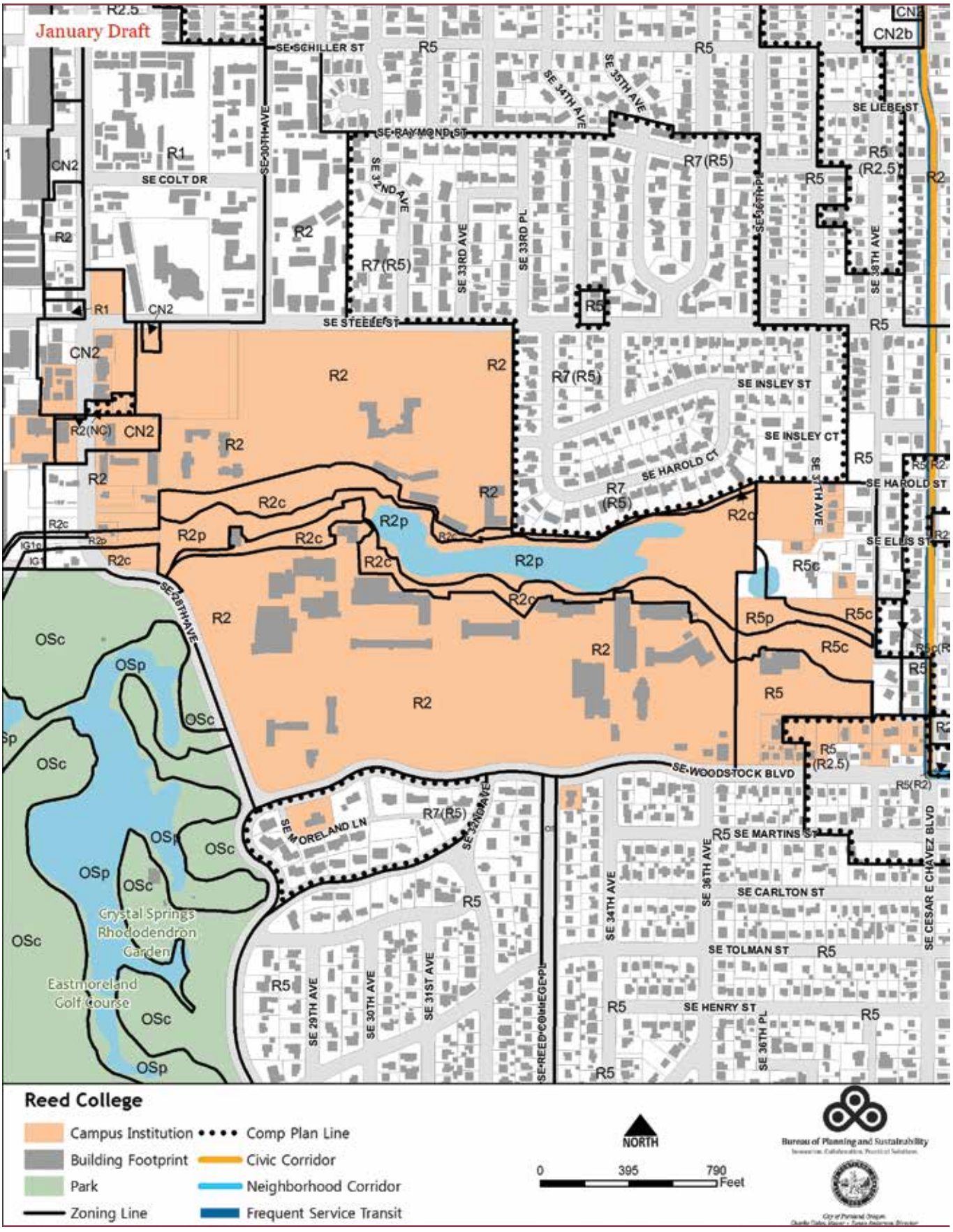
# Map 12: Reed College





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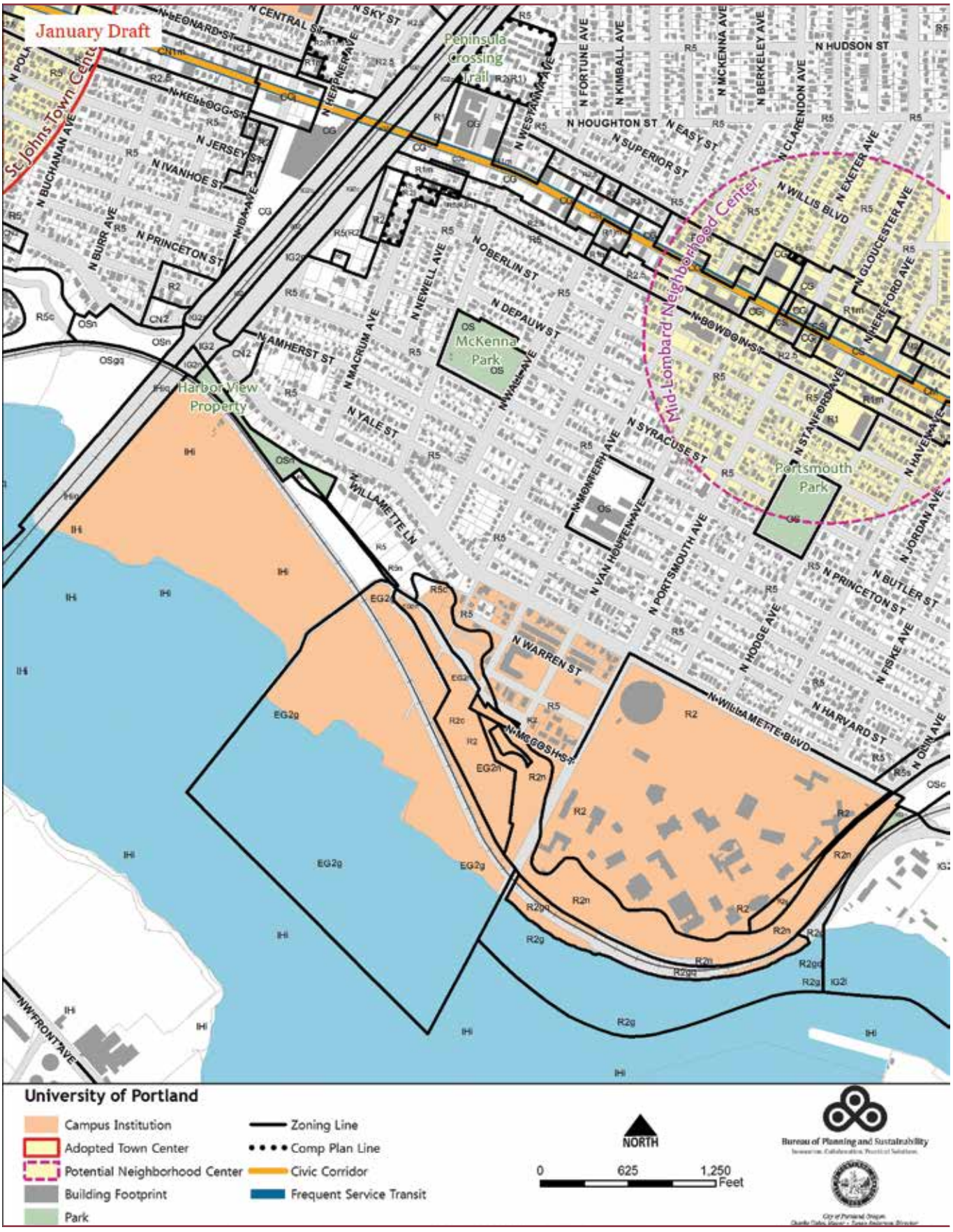
# Map 13 University of Portland





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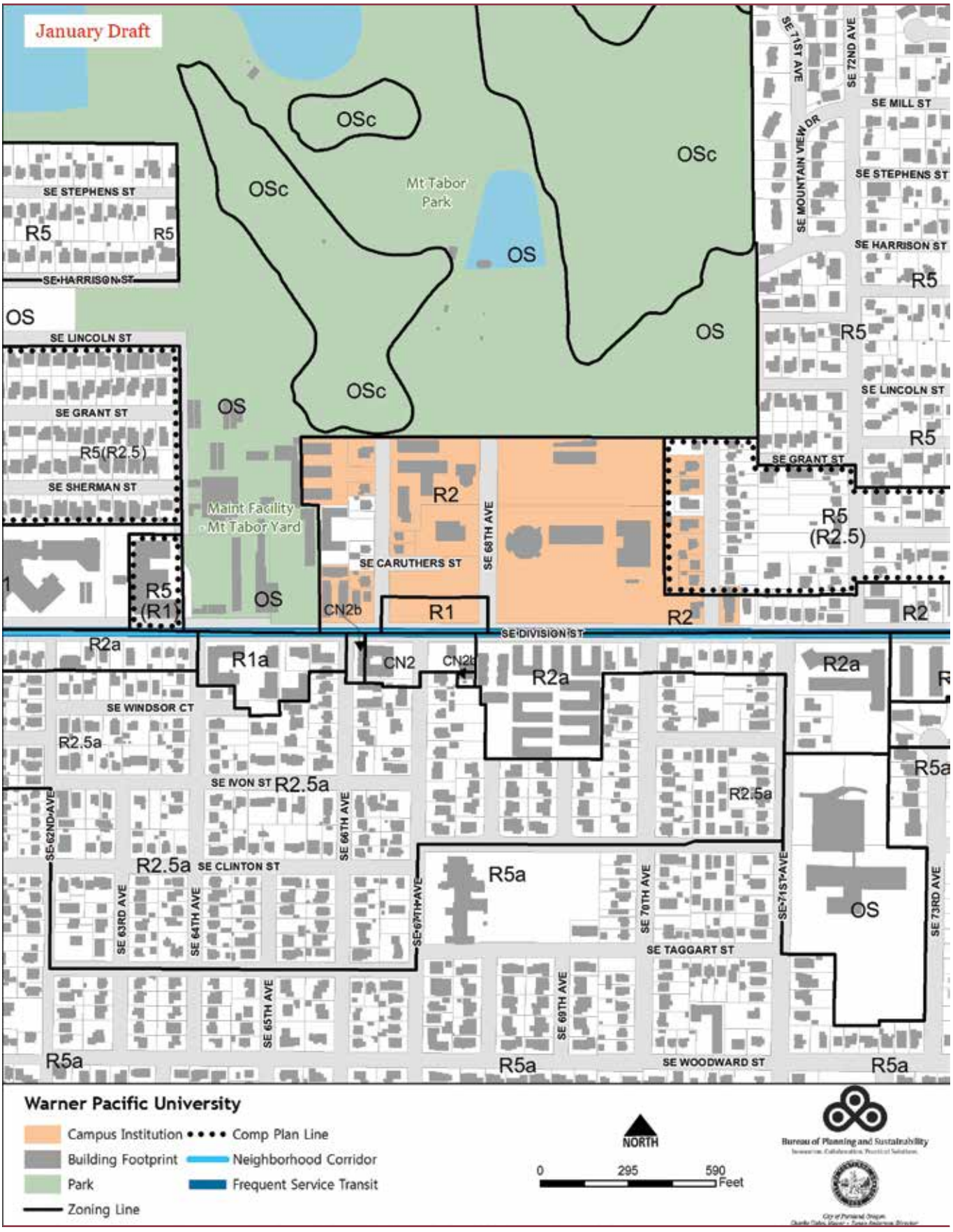
# Map 14: Warner Pacific University





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# Map 15: University of Western States





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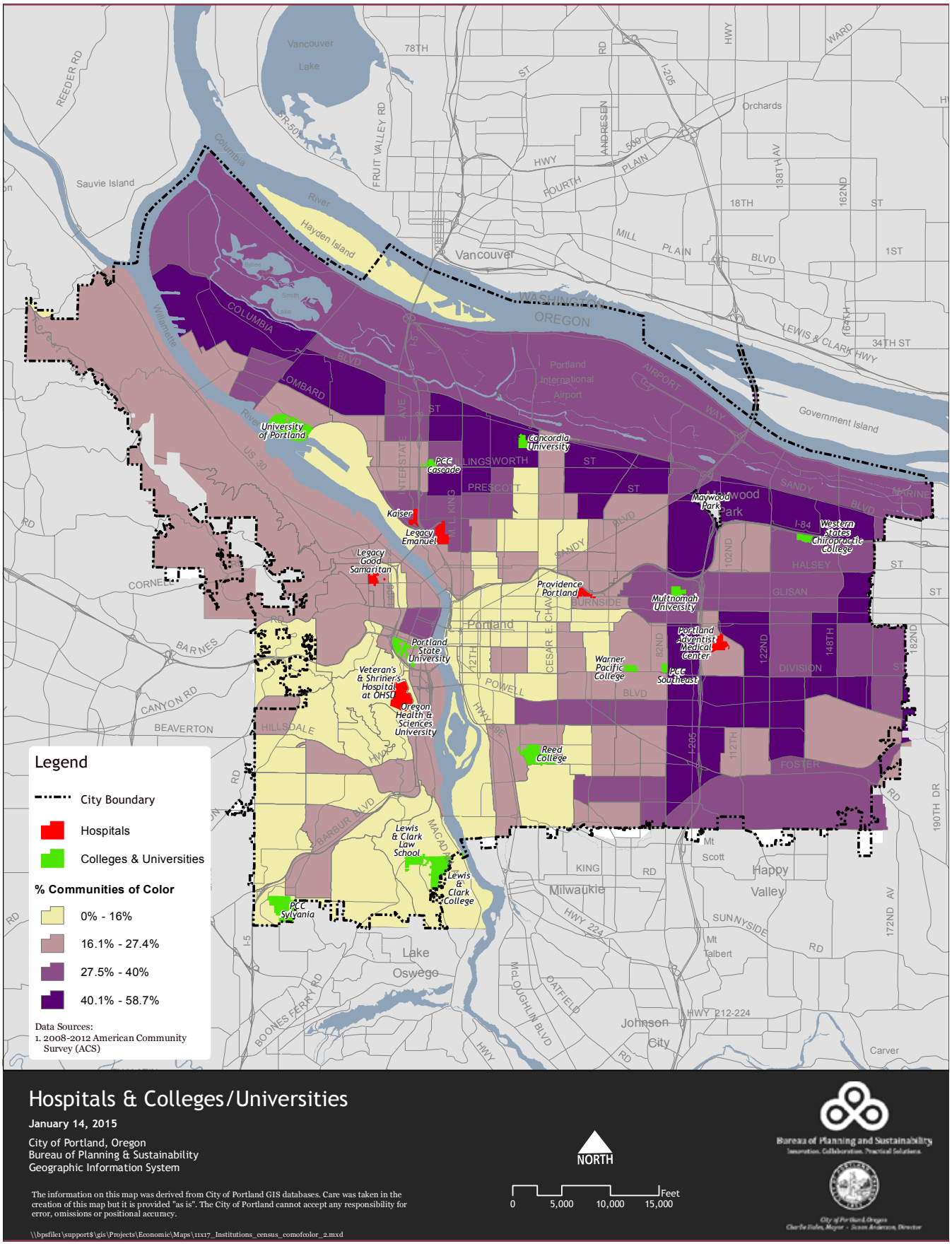
# Map 16: Communities of Color





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# BLI Changes in Land Designated as "Underutilized" between 2012 and 2015*

March 23, 2015

City of Portland, Oregon // Bureau of Planning & Sustainability // Geographic Information System

*These designations are based on the City of Portland's 2012 and 2015 Buildable Lands Inventory (BLI) Models.

The information on this map was derived from City of Portland GIS databases. Care was taken in the creation of this map but it is provided "as is".
The City of Portland cannot accept any responsibility for error, omissions or positional accuracy.

S:\gis\Projects\Buildable_Lands\Maps\Other_Maps\2q144_previously_vacant_developed_land.mxd

Legend

- Additions
- Removals
- City Boundary

NORTH

0 3,000 6,000 9,000 Feet

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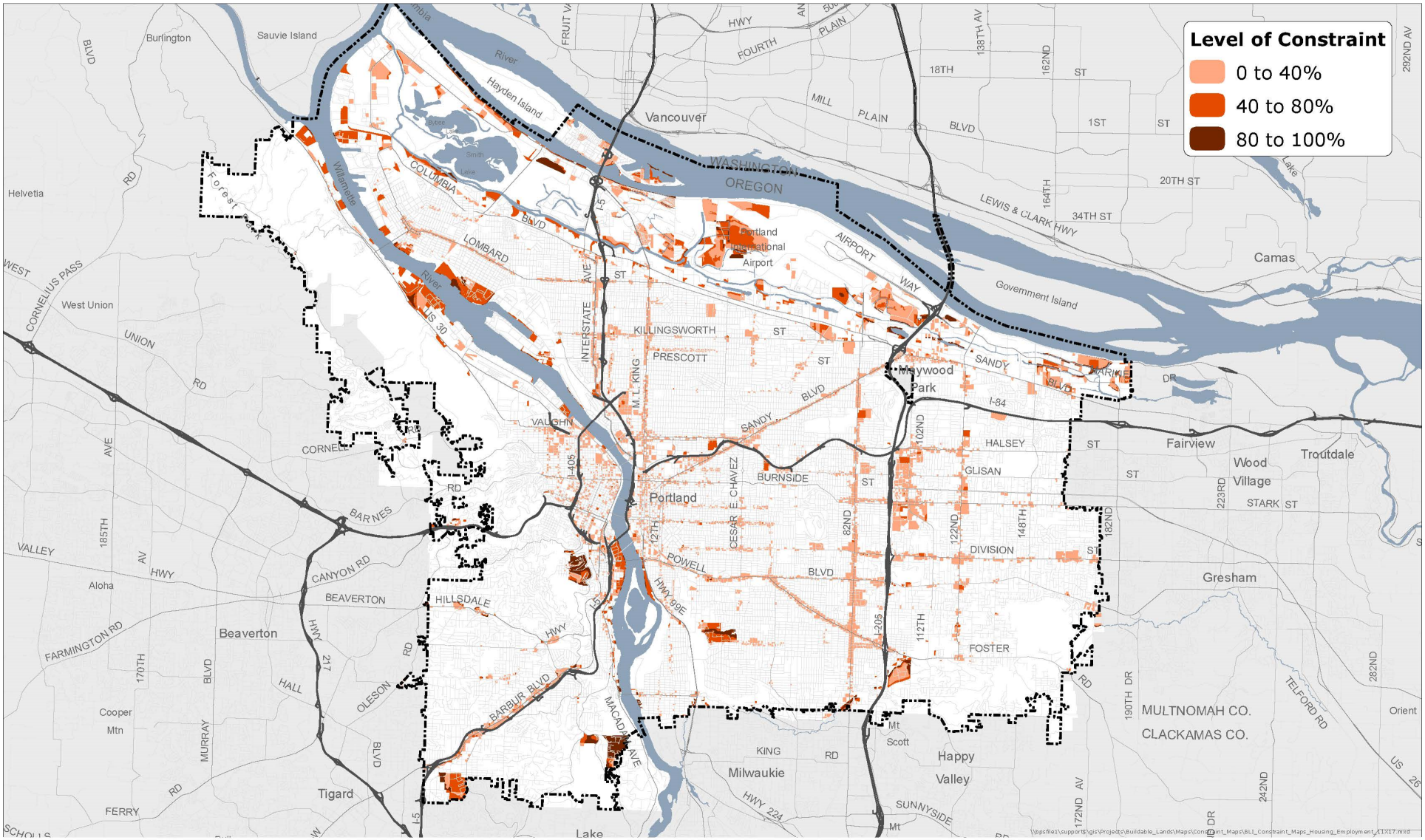
*City of Portland, Oregon*
*Charlie Hales, Mayor • Susan Anderson, Director*




**Buildable Lands Inventory | Employment Buildable Lands**

**City of Portland | Bureau of Planning and Sustainability | Geographic Information System**

*This work was supported, in part, by a grant from the Oregon Department of Land Conservation and Development.*

March 13, 2015

The information on the map was derived from digital data-bases on the City of Portland, Bureau of Planning and Sustainability GIS. Care was taken in the creation of this map but it is provided "as is". The City of Portland cannot accept any responsibility for error, omissions, or positional accuracy, and therefore, there are no warranties which accompany this product. However, notification of any errors will be appreciated.

NORTH

0 0.5 1 2 Miles

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# CITY OF PORTLAND
# ECONOMIC OPPORTUNITIES ANALYSIS:
## Section 1. Trends, Opportunities & Market Factors





**Prepared for:**

**City of Portland Bureau of Planning & Sustainability**

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**E. D. Hovee & Company, LLC**

Economic & Development Services

# EXECUTIVE SUMMARY

The EOA is an analysis of the 20-year supply and demand for employment development and land in the city. It is prepared according to State Administrative Rule OAR 660-09-0015 and consists of four sections:

1. Trends, Opportunities & Market Factors
2. Long Range Employment Forecast (Demand)
3. Buildable Land Inventory (Supply)
4. Community Choices (Comprehensive Plan proposals to meet employment land needs)

This report is Section 1 and provides a review of national, regional, and local employment trends, opportunities and market factors. The report documents existing conditions and current trends in employment that will serve as a basis for the future employment forecast.

## KEY FINDINGS

- National employment trends indicate leading job growth in health, education and professional and business services.
- The 2000-2008 business cycle was a period of unusually slow job growth, not only for Portland but for the 7-county metro region and the nation. However, the pace of job growth in the 2008-2013 period, averaging 1.3% per year in Portland and 1.4% in the region, has already exceeded the previous business cycle. Despite the depth of job losses during the great recession (2008-2010), the city and region have since led the state's economic recovery.
- A pivotal question is whether the city will continue to generate a stable share of the region's job growth, outperforming national job-sprawl trends. Multnomah County's long-term 25% capture rate of regional job growth over the 1980-2008 period has fluctuated widely since 2000. Portland had a nearly flat 5% capture rate of regional growth during the sluggish 2000-2008 business cycle and then rebounded to 23% capture rate in the 2008-2013 period.
- It is apparent that the "hot spot" locations where job growth is occurring within the City have shifted in recent years. Business districts with the most robust job growth rates since 2000 have been the hospital and college campuses, Central City's subdistricts outside of Downtown, some town centers with substantial health care and education employment, and the Columbia Corridor east of 82nd Avenue.
- Industrial employment declined in the 2000s at the same time that the city experienced increases in industrial land development, freight volumes, and added value of manufacturing products. Industrial employment is also a primary source of middle-wage jobs that have been shrinking nationally and regionally since 1980.

- The EOA identifies ten categories of employment areas (locations, sites and types of space) referred to in the report as "employment geographies". Among these, the institutional geography is experiencing the strongest job growth, followed by urban centers (primarily due to institutional growth) and then the Central City, neighborhood commercial and industrial geographies.

## NATIONAL TRENDS & FORECAST REVIEW

Following a period of relatively rapid growth in the 1980s, the rate of job growth slowed in the 1990s and further slowed in the early part of this decade. Job growth picked up after 2010 during a period of economic recovery, but is then projected to further slow to about 0.9% annual growth between 2025 and 2035.

Manufacturing is projected to decline from about 16% of all non-farm jobs in 1990 to between 6% and 7% by 2035. Service sector jobs have increased from about 67% of the nation's non-farm job base in 1990 to 73% as of 2005. While all service sectors are expected to add jobs, only professional services, education and health are projected to increase their share of the employment base over the next 25 years.

## REGIONAL EMPLOYMENT TRENDS

The pattern of the 7-county Portland metro area (PMSA) employment has followed that of the nation, slowing considerably post-2000 to a rate of approximately 0.8% per year (to 2008). Metro has prepared an updated forecast of job growth to 2040 (with 2035 established as the pertinent growth target for the City of Portland). Metro's regional forecast indicates a more robust job growth rate averaging 1.8% per year from 2010 to2035, consistent with long-term trends. PMSA employment grew at an average annual rate of 2.1% from 1980 to 2008, spanning the last three business-cycle periods. Job growth rates are expected to range from 0.6% for manufacturing to 2.3% for professional services and 2.6% to 2.7% in education and health services in the 2010-2035 period.

## PORTLAND EMPLOYMENT TRENDS

In 2013, there were 393,742 covered jobs in Portland, equivalent to 38% of the 1.02 million employment base of the 7-county PMSA. To understand long term growth trends, the EOA focused on the 1980-2008 and 2000-2008 periods, since they reflect the peak-to-peak periods of the recent business cycles – timeframes that reduce the short-term business cycle distortions of the growth trend. From 1980 to 2008, Multnomah County added approximately 114,800 new jobs, resulting in a 1.1% average annual growth rate and a 25% capture rate of PMSA job growth. The city's share of Multnomah County employment increased slightly in this period. After 2000, both region and city job growth slowed substantially.

From 2000-2008, Portland employment increased by approximately 3,120 jobs. This reflects a 5% capture rate of PMSA job growth in that period and an overall job growth rate averaging only about 0.1% per year. In comparison, statewide and PMSA job growth rates averaged 0.8% per year. However, local job growth has rebounded since 2008, recovering the 23,000 jobs lost in Portland and 63,000 jobs lost in the region from 2008 to 2010. In the 2008-2013 period,

Portland had 1.3% average annual job growth, compared to 1.4% in the region, and the city's capture rate was 23%.

The 2000-2008 period also provides an insight into shifts between different employment sectors within the region. Manufacturing jobs declined by about 3.3% per year, with all industrial employment dropping at an annual rate of 2.6%. At the same time, the city experienced increases in industrial land development, freight volumes and added value of manufacturing products. Retail jobs also declined. Employment in education and health care sectors increased at a rate averaging 2.3% per year. The loss of the share of employment in the industrial sectors may be exaggerated due to 2001 changes in the way employment data is classified.

When looking at *geographic subareas*, Portland's Central City commercial areas accounted for 27% of the city's employment base as of 2008; regional and town centers (or urban centers) accounted for 5%; neighborhood commercial areas comprised another 18%; industrial districts represented 30%; and with institutional and residential areas each contributing 9-10%. As noted, institutional areas experienced the city's strongest job growth, adding 8,800 jobs at an average annual rate of 3.6%.

However, employment varies greatly within these broad geographic groupings. For example, in the Central City, employment declined somewhat in the downtown and South Waterfront subareas, while increasing for the River and Lloyd Districts. Within industrial areas, employment has declined within Harbor and Airport Districts and Harbor Access Lands while increasing for Columbia East of 82nd, the Dispersed Employment areas, and for the Central City Industrial (or incubator) districts of Central Eastside and Lower Albina.

For urban centers, strong gains have been experienced for Hollywood, Gateway and Lents, focused in health care and education, while St. Johns, Hillsdale and West Portland have experienced stable or declining employment. Of the neighborhood commercial areas, employment within dispersed commercial areas has increased while the job count has declined for commercial corridors and nodes.

## DEMAND ANALYSIS ISSUES – FOCUS GROUP INPUT

In 2009, the City organized six focus groups involving 58 participants to provide input on the demand for different types of employment - central city office, close-in incubator, manufacturing and distribution, neighborhood commercial, transit oriented development/mixed use corridors, and campus institutional. The findings included the following:

- *Recent trends*- Despite relatively slow employment growth over the last several years, the mid-decade was relatively good for Portland's major employment generators – at least up to the point of the economic downturn starting in 2007-08.
- *Emerging trends* - the overarching theme is "change". There is a promising long-term outlook provided that the pending economic recovery proves sustainable with the view that the City and region respond to shape this change in ways that keep Portland competitive for added investment and employment. Specific types of change include:

- ✓ The Central City office market becoming more diverse with strong growth in lower cost incubator space.
- ✓ Industry concerns that skilled workforce development and the freight transportation system will not be able to keep pace with their changing needs.
- ✓ Neighborhood commercial corridors seeing more mixed-use development and high densities along major transit streets.
- ✓ Health care providers expect "tremendous" growth.

- *Business space and location needs* – Expected space needs are relatively diverse, and there seem to be growing opportunities for more mixed-use and denser commercial space versus more traditional manufacturing and distribution activity.
- *Density and redevelopment* – Opinions on the potential for greater density uses and redevelopment of existing uses ranged from extreme caution expressed by manufacturing and distribution focus group participants to bullish support from /mixed-use corridor participants. All the focus groups discussed the practical implications and means by which employment uses could grow up rather than out.
- *Economic prosperity and creative vitality* – There are different strategies for creating and maintaining prosperity. A key challenge is to harness these diverse interests into a coherent whole. For example:
  - ✓ Emphasizing the Central City as a critical component to a healthy regional economy.
  - ✓ Balancing goals of sustainability and job growth.
  - ✓ Small neighborhood businesses as a primary economic engine.
- *Public role in economic development* – Participants argued that public strategies should emphasize a more business-friendly environment in general with more flexible regulations, more reliance on public-private partnerships, new business incentives, and less "picking winners" with targeted efforts.

## DEMAND ANALYSIS ISSUES – DATA ASSESSMENT

Key findings:

- *High rise office development* – There is solid potential for additional mid to high-rise development primarily in the Central City but also elsewhere. Mid-/high-rise development outside the Central City has been limited to adaptive reuse in close-in areas and medical/health care facilities at campus institutions and urban centers such as Gateway and Hollywood. Proximity to retail and housing is increasingly important for future office development. The Central City reports a relatively slow overall job growth rate (0.3%) from 2000-08 – with strongest growth in the River and Lloyd Districts and some employment loss in the CBD.
- *Incubator and manufacturing districts* – These two types of space can contribute to future export-oriented job growth in Portland. Harbor and Airport Districts and Harbor Access Lands remain strongly oriented to manufacturing, transportation and distribution but service employment has been the dominant source of job growth in recent years. The Central City incubator districts of Central Eastside and Lower Albina have a more

diverse job base and have been experiencing job growth above the citywide rate – albeit concentrated in service sector activities together with information/design and construction. Overall, employment within industrial areas declined slightly.

- *Neighborhood commercial districts* – These dispersed concentrations of employment space have been a significant contributor to the city's job base, but with somewhat surprising job loss indicated over the 2000-08 time period, primarily within residential zones and along commercial corridors. Commercial corridors (including those with TOD/mixed use potential) still account for 27% of jobs outside of the city's urban centers and industrial areas, despite a net loss of nearly 5,200 jobs from 2000-08. Neighborhood-serving services and retail generally appear well distributed throughout the city; with just a few gaps.
- *Institutional development* –These sites include 7 colleges and 10 hospitals (each on 10+ acre sites) but excluding Portland State University and Adventist Medical Center which are included with in the Central City and Gateway employment geographies respectively. These 17 institutions together accounted for about 35,200 in-city jobs as of 2008 and represent the city's fastest growing employment geography.

## LOCAL SECTOR SPECIALIZATION

Two related analyses were conducted that are relevant to this EOA. Metro evaluated the region's comparative advantage in *employment* relative to the nation, finding that this region has a comparative advantage in manufacturing despite net job losses. Overall, non-manufacturing sectors show little to any substantial comparative advantage relative to the rest of the nation. However, Metro is projecting increased regional capture of national employment for finance activities, education and health care, and some management and personal services.

ECONorthwest also evaluated the City of Portland comparative advantage based on industry *value added* rather than employment. This analysis corroborates the results of the regional employment-base analysis. Both analyses indicate that Portland's comparative advantages are higher in the manufacturing sectors. Although, these sectors make up smaller shares of total economic activity, they generate larger overall economic impacts in value added and export value added, particularly professional services, wholesale trade, and management of companies. Consequently the ECONorthwest analysis indicates that the manufacturing sector's output may be insufficient as an *exclusive engine* for continued economic growth into the future.

## EOA IMPLICATIONS

Key implications for subsequent EOA work tasks include:

- Long-term job growth trends have fluctuated and create uncertainty for forecasting growth in the coming decades. The 2000's were a period of relatively slow job growth not only for Portland but for the metro region and nationally. Despite an economic downturn experienced just after 2000, followed by modest growth and a major recession at end of the decade, Metro is projecting that the nation and region should expect to return to a more normalized pattern of job recovery and stronger growth over the long-term horizon of next 25 years.

- For Portland, another question is whether the city will maintain the 25% capture rate of regional job growth that Multnomah County experienced over the 1980-2008 period. Portland's capture rate fell to 5% in the 2000-2008 business cycle and has since rebounded to 23% in the 2008-2013 period.
- Finally, it is apparent that the "hot spot" locations where job growth is occurring within the City have shifted in recent years. The focus of added Central City job gains has shifted from the traditional downtown core toward adjacent areas in the River and Lloyd commercial / mixed use districts and the emerging incubators of the Central Eastside and Lower Albina. Similar shifts are occurring within and between the City's industrial, urban center and neighborhood commercial areas. In numerical terms, by far the strongest growth has been in Portland's institutions.

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# I. INTRODUCTION

The City of Portland is required to complete an Economic Opportunities Analysis (EOA) to comply with Oregon Statewide Planning Goal 9 and supporting administrative rules. State statutes also require the City's Comprehensive Plan to be coordinated with Metro's regional population and employment forecasts and allocations. The EOA rules also allow Portland the opportunity to shape its plan in a way that fits not only state and regional goals but also locally determined priorities and choices.

The intent of this EOA is to address both current and emerging market trends while at the same time addressing distinctive state, regional and City-defined policy objectives for employment and associated land development requirements. The economic analysis also addresses short-term employment demand and resulting land supply needs consistent with Goal 9 and reconciles buildable land supply with demand over a longer term time horizon to 2035.

## APPROACH

This report covers economic trends, opportunities and market factors, including an assessment of local sector specializations, submarket real estate analysis, freight terminal demand, and wage distribution.

The analysis has drawn from a review of quantitative economic data for the U.S., state of Oregon, and Portland metro region as well as data specific to the City of Portland. The analysis also considers qualitative information affecting future opportunities and market factors, including results of six focus groups organized around demand analysis issue topics.[1]

Subsequent EOA reports are informed by the results of this initial trends analysis.

## ORGANIZATION OF TRENDS, OPPORTUNITIES, AND MARKET FACTORS ANALYSIS

The remainder of this Task 1 report is organized to cover the following topics:

- National Trends & Forecast Review
- Portland Employment Trends
- Demand Analysis Issue – Focus Group Input
- Demand Analysis Issues – Data Assessment
- Local Sector Specializations
- Intensification Analysis
- Multiplier Analysis
- EOA Implications

[1] Information in this report has been drawn from sources generally deemed to be reliable. However, the accuracy of information from third party sources is not guaranteed, and is subject to change.

The observations and findings contained in this report are those of the authors. They should not be construed as representing the opinion of any other party prior to their express approval, whether in whole or part.

# II. NATIONAL TRENDS & FORECAST REVIEW

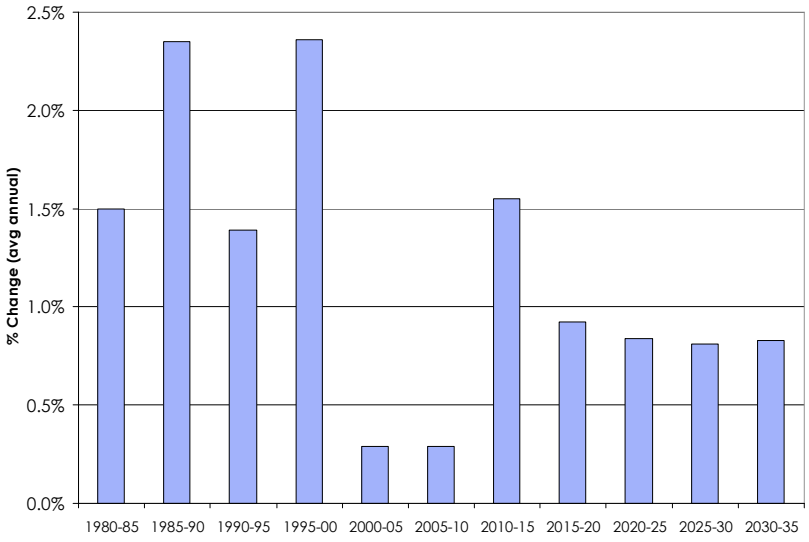
Consistent with Oregon Administrative Rules (OAR 660), Portland's EOA is set within the context of nationwide trends and projected future employment. Recent and forecast conditions are considered first for total employment, then with more detailed discussion of employment by sector.

## NATIONAL EMPLOYMENT TREND & FORECAST

From 1980 to 2005, the nationwide job count grew by 48% to approximately 133.7 million non-farm jobs in 2005:

- Over the 25 year period of 1980-2005, employment across the U.S. increased at an average annual rate of 1.6% per year, reflecting a particularly rapid 1.9% rate of job growth during the 1980s. The 1980-90 time period also coincided with entry of a large baby boom cohort into the job market.

**Figure 1. U.S. Non-Farm Employment Growth Rates (1980-2035)**




Source: Global Insight, *2008 QR US Long-Term Outlook,* as compiled by Metro.

- Since 1990, job growth nationally has slowed to a more modest 1.3% annual rate from 1990-2005. During the first half of this decade (2000-2005), job growth was even more modest averaging 0.3% per year, reflecting a post-2001 period of economic contraction followed by a slow recovery.
- The national forecast predicts an economic recovery period for 2010-2015 with relatively strong anticipated job growth (1.5-1.6% per year) that declines over time to a rate of about 0.9% by 2025-2035. At these rates of projected employment growth, the U.S. would have about 173.5 million non-farm jobs by 2035, an increase of just under 40 million jobs (or 30% gain) compared to 2005 conditions.

## Employment Sector Growth

When viewed by major employment sector, the most noteworthy change has been the continued shift of the nation's economy to less industrial and more service-related employment. This trend is expected to continue through 2035. However, several caveats are noted related to this shift.

Past employment sector shifts are difficult to quantify due to a 2001 change in how industries are classified in (from the Standard Industrial Classification system to the North American Industrial Classification System). The new NAICS system created two new sectors, management of companies and information, which are considered services but which encompass firms (or portions of firms) previously classified as industrial. While employment data from the year 2000 has been converted to NAICS (by the Oregon Employment Department), this conversion was not perfect. Some portion of the reported employment shift away from manufacturing is attributable to this change in job classification, although the exact portion is unknown.

Also of note is that while the focus of this trends assessment is employment, manufacturing has in many regions held a steadily increasing share of GDP. At least since 2000, there appears to be a contradictory relationship between industry output and industry employment. Consequently, job growth represents only one lens through which to assess an industry's economic contribution. Other measures of economic activity are addressed later in this report.

That said, the following changes are reported for job trends within the manufacturing sector nationwide:

*Manufacturing:*

- Nationally, manufacturing has declined from just over 16% of all non-farm jobs in 1990 to 10-11% of non-farm jobs in 2005 and is projected to decline to 6-7% of employment by 2035.
- Manufacturing has been declining not just as a share of the total but also in terms of numbers of jobs – from close to 18 million jobs in 1990 to just over 14 million in 2005 and to a projected 11 million by 2035.
- Every major manufacturing category except lumber experienced job losses between 1990 and 2005, and all sectors are forecast for job loss through 2035. Durable goods manufacturing, which tends to be more capital intensive, has experienced less rapid job loss than non-durables.

*Other Industrial-Related Employment:*

- With the exception of natural resources, all other *industrial-related* sectors experienced job growth from 1990-2005 and are projected for continued job growth through 2035. These other sectors include natural resources, construction, wholesale trade, transportation/warehousing/utilities (TWV), and information.[2]

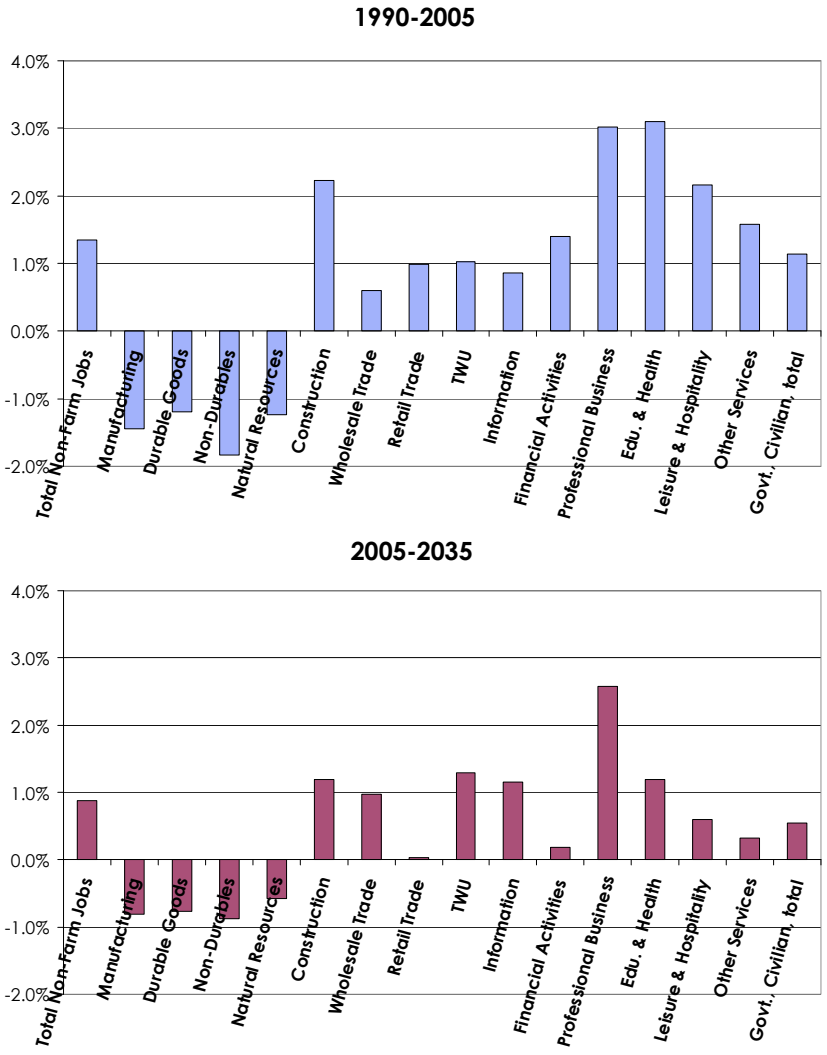
[2] Information is a new sector defined by NAICS that includes some previous industrially related SICs such as printing combined with more service sector related functions such as internet and software.

- Between 1990 and 2005 the other industrial-related sectors declined slightly in total employment share, from 16.6% to 16.2%, as growth was below rates experienced in non-industrial (service) sectors. However, through 2035 the non-manufacturing industrial sectors are projected to increase their share of the nation's employment to 17.4% by 2035.
- From 1990-2005, the fastest growing industrial sector was construction, with jobs increasing an average of 2.5% per year. From 2005-2035, the biggest gainer is forecast for jobs in transportation/warehousing/utilities (at 1.3% annually), followed closely by the construction and information sectors.

*Service Sector Employment:*

- Service sector jobs have increased rapidly since 1990. The most rapid growth rates are reported for education and health (up by 3.1% per year) and professional services (3%). The slowest growing service job sectors have been retail (up by just 1.0% per year) and government (1.1%). Finance, leisure and hospitality, and other services have increased at rates of 1.4%, 2.2% and 1.6% respectively.
- Overall, these service sectors have increased from about two-thirds (67%) of the nation's non-farm employment in 1990 to 73% as of 2005. The largest single service-related sector is government at 16.3% as of 2005.

**Figure 2. Forecasted U.S. Job Growth Rates (1990-2035)**




Source: Global Insight, *2008 QR US Long-Term Outlook,* as compiled by Metro.

- While all service sectors (except retail) are expected to add jobs, only professional services, education and health are projected to increase their share of the employment base over the next 25 years. Declining shares (slower growth) are projected for retail trade, financial activities, leisure and hospitality, and government.

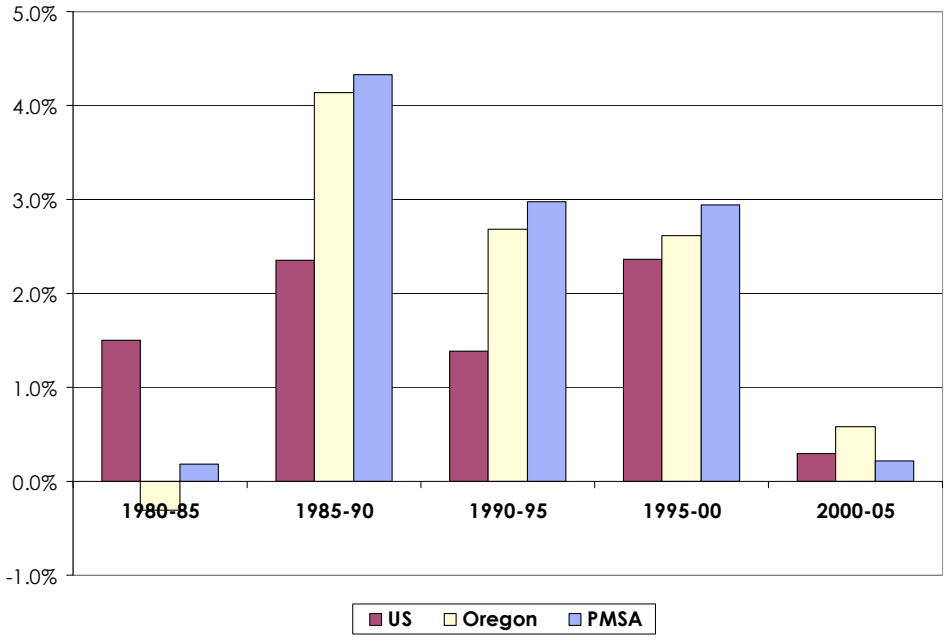
## STATEWIDE & REGIONAL EMPLOYMENT CONTEXT

### *Statewide & Metro Area Employment Growth Trends*

Over a 25-year period extending from 1980-2005, patterns of employment growth for the nation, Oregon, and the Portland metro area have been similar. Exceptions include:

- In the first half of the 1980s, Oregon and the Portland metro area were harder hit than the nation during a period of overall economic slowdown. In the latter half of the decade, this pattern was reversed as employment growth rates accelerated, exceeding 4% per year both statewide and for the metro region.

**Figure 3. Employment Growth Rates – U.S., Oregon & Portland PMSA (1980-2005)**




Source: Metro, Oregon Employment Department, and E. D. Hovee & Company, LLC.

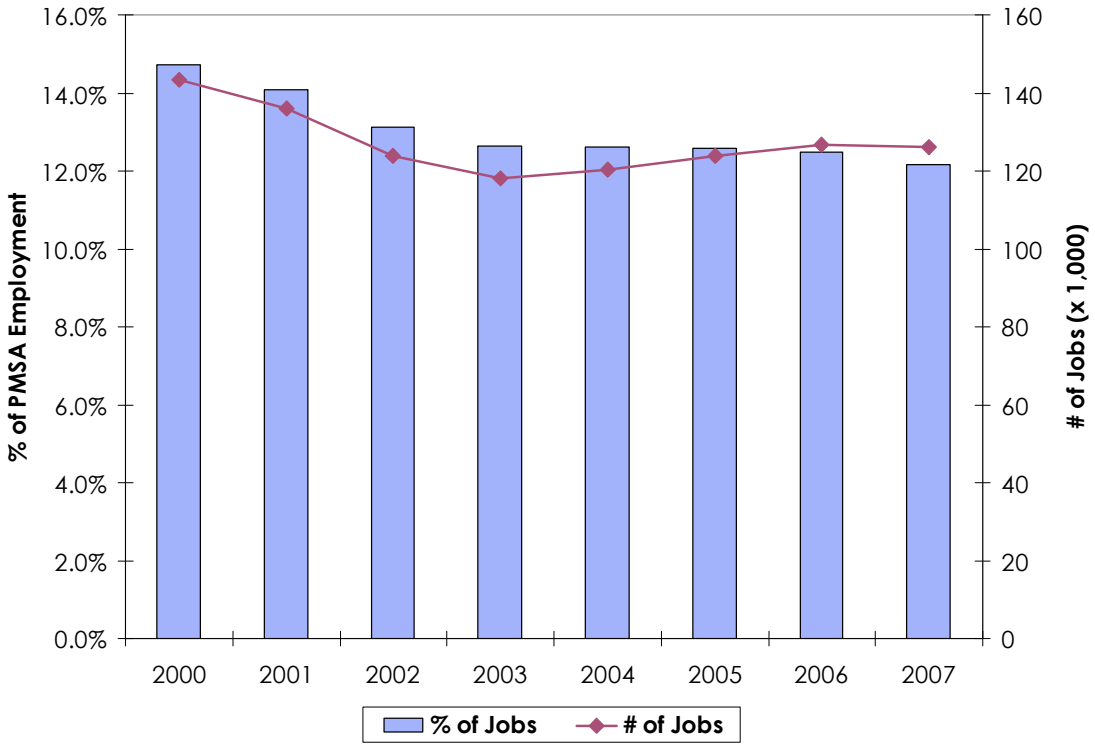
- This pattern of strong employment growth statewide and regionally continued (though at somewhat slower rates) through the 1990s, with the nation nearly catching up to the state and region in the latter half of that decade.
- In the 2000s, employment stagnated – nationally, statewide and regionally – through a recession with a slow job recovery. While at fairly modest levels, employment growth statewide exceeded that of the PMSA, the only such 5-year period since 1980.

## Manufacturing Focus?

Manufacturing often receives particular attention because of its historic role as a pivotal traded sector and as source of relatively high wage jobs, both nationally and in this region. As a share of PMSA employment, manufacturing has not reversed its declining share of the region's job base – at best holding its own from 2003-2005 at 12.6% of total non-farm jobs (Figure 4). The experience of the last several years offers the hint of a possible opportunity for slowing the now decades long slide in U.S. manufacturing. This is illustrated by a year-to-year review of manufacturing employment in the Portland metro area from 2000-07. This period is chosen as it essentially extends from the recession just after 2000 back to a subsequent peak in 2006.

As indicated by the following graph, the metro region experienced a sharp drop in manufacturing jobs during the economic recession of 2001-2003. This was then followed by a post-recovery increase of about 7% back to a peak year of 2006. This recovery nationally was aided by a weak dollar encouraging added exports, especially for durable goods manufacturing.

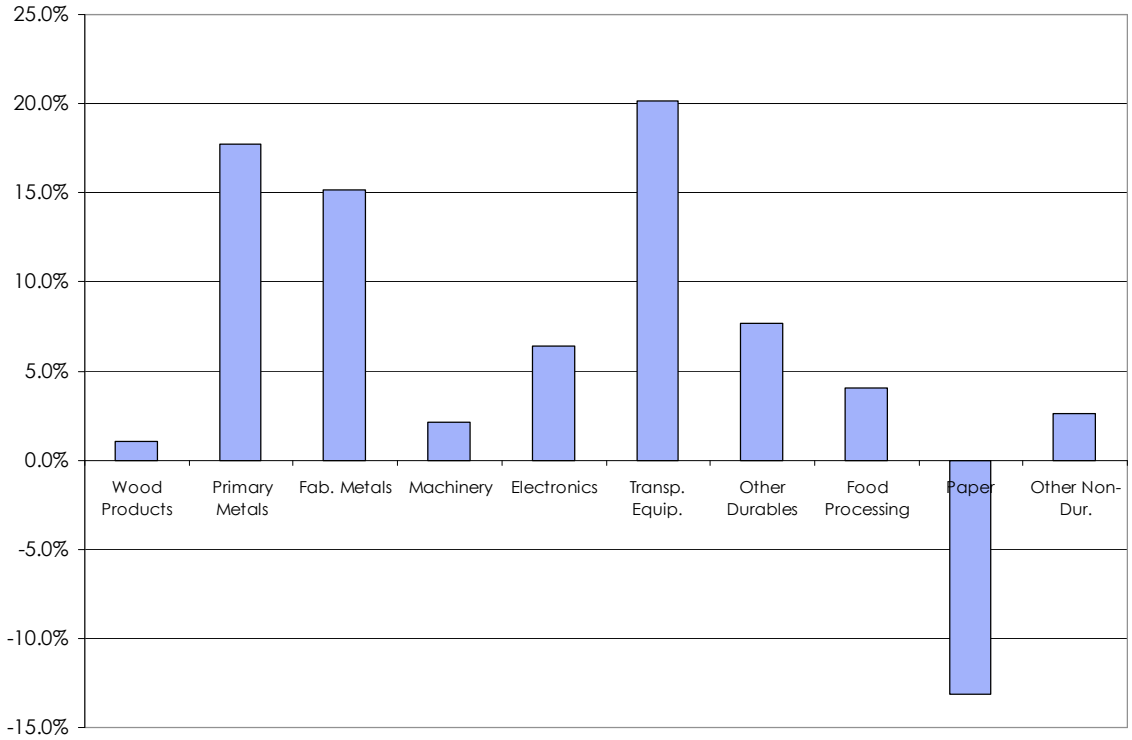
**Figure 4. Portland PMSA Manufacturing Job Trend (2000-2007)**




Source: Metro.

A more detailed look at the 2003-2007 period shows the differences in this manufacturing employment resurgence by sector. While there was considerable employment contraction in the 2000-2003 time period, the strongest post-2003 gains were indicated for transportation equipment and primary/fabricated metals, followed by more modest gains for electronics and food processing.

**Figure 5. Portland PMSA Manufacturing Job Surge (2003-2007)**




Source: Metro.

A key question with economic recovery in the years ahead is whether this resurgence proves to be temporary. Alternatively the question is whether there are opportunities for continued longer lasting competitive gains for durable goods as with metals, transportation equipment and/or electronics.

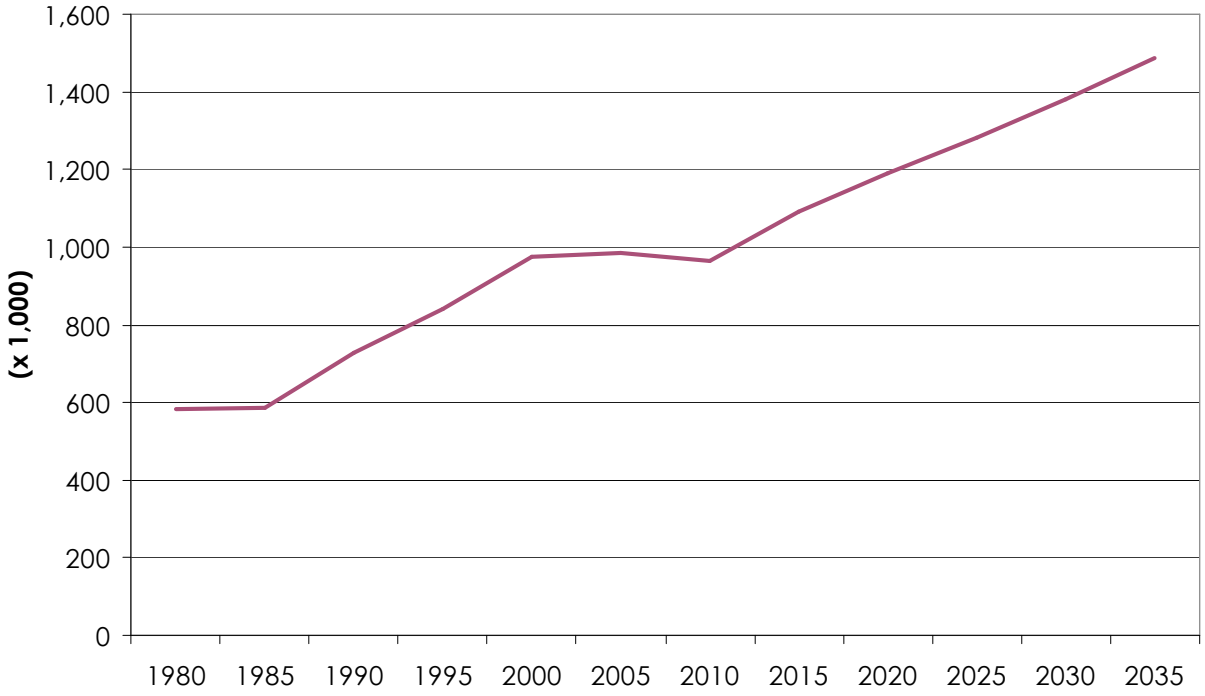
With non-durables, a question is whether the recent observed growth in regional food processing can be sustained. Opportunities may be linked to greater emphasis on consuming products grown and manufactured closer to home.

Metro projects that manufacturing's share of the region's total job base will be 8.3% of total employment by 2035. The total number of manufacturing jobs is projected to stabilize at between 120,000 and 125,000 between over the 2020-35 time period.

## Metro Area Employment Growth Forecast

Looking to the future, Metro developed a range of low, moderate and high growth employment forecast alternatives to the year 2040 and has selected an official forecast slightly less than the moderate forecast. The following chart displays trends from 1980 to 2005, and then resulting revised forecast to 2035 (the forecast period for this EOA).

**Figure 6. Portland PMSA Employment Forecast Range (to 2035)**




Source: Metro. Data for 2010 reflect BLS actual employment, with subsequent years as Metro forecast results.

With the baseline forecast, Portland PMSA non-farm employment would increase from recession dampened figure of less than 1 million jobs in 2010 to nearly 1.5 million in 2035, a gain of over 520,000 (for 54% job growth) with an average annual growth rate in the range of 1.7% per year over the 2010-2035 time period.

# III. PORTLAND EMPLOYMENT TRENDS

This section analyzes recent City of Portland employment trends within the national and regional context. While some citywide changes parallel those of the nation and/or region, it is clear that Portland's position as the largest city in the region and state has created distinctive market niches as well as future opportunities and limitations.

Topics covered by this initial data review are:

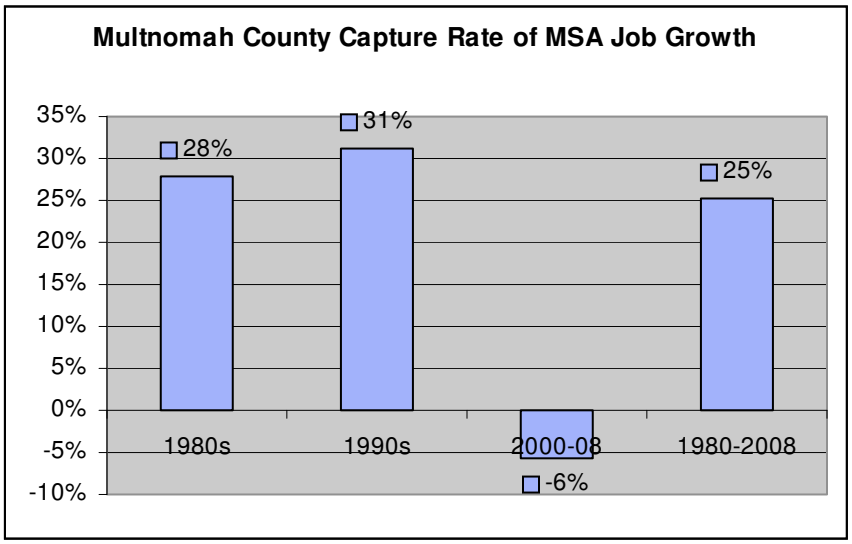
- Citywide Employment Trends
- Detailed Development & Employment Trends:
  - ✓ Employment by City Subarea
  - ✓ Employment & Development by Expansion Type
  - ✓ Development by Valuation, Density & Site Type

Geographic and sector employment trends will be used to inform the distribution of projected employment in later tasks for this EOA.

## CITY AND COUNTY EMPLOYMENT TRENDS

The following long-term employment trends analysis is based on county data because reliable, comparable city data is not available before 2000, due to changes in data reporting and major city annexations in the 1980s and 1990s. Figure 7 shows that the short-term (2000-08) job losses are inconsistent with long-term trends.

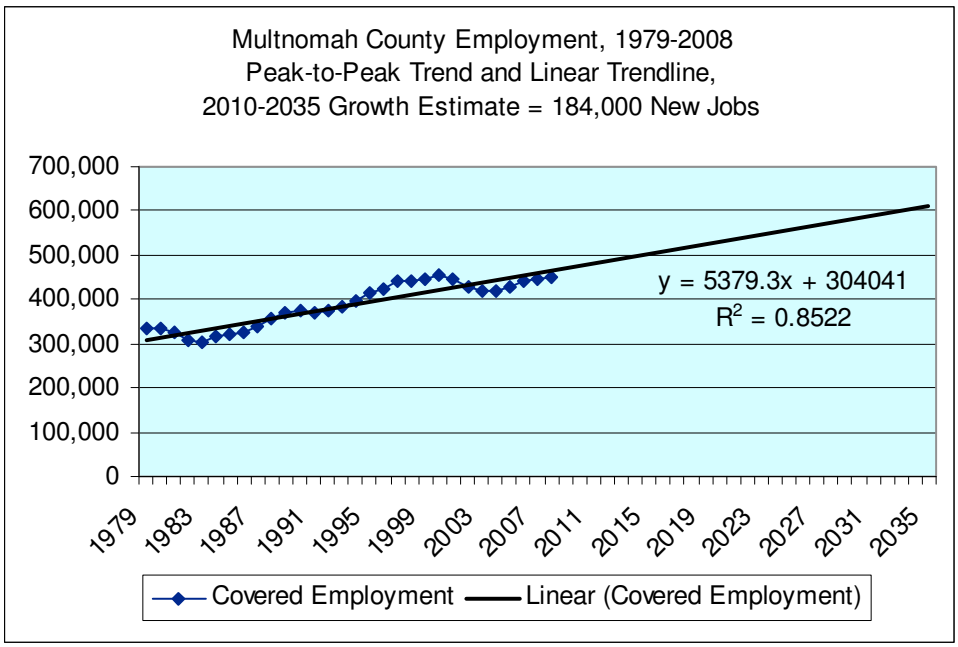
**Figure 7. Multnomah County Capture Rate of Regional Job Growth (1980-2008)**




Source: Bureau of Planning and Sustainability from Oregon Employment Department QCEW data.

Despite slower job growth after 2000, long-term employment trends in Multnomah County reveal a general linear growth pattern, as shown in Figure 8. Given this linear pattern, a commonly used forecasting method is a linear trendline, which is a best-fit straight line through a series of historical data points (regression analysis). The trendline shown in Figure 8 is based on 1979-2008 annual employment data, representing county peak-to-peak data periods of the last three business cycles. A trendline is most reliable when its R-squared value is at or near 1, and this trendline results in a generally close-fit R-squared value of .85. The years when actual employment levels varied most from the trendline resulted particularly from the employment fluctuations of short-term business cycles.

**Figure 8. Multnomah County Employment Trendline, 1979-2035**

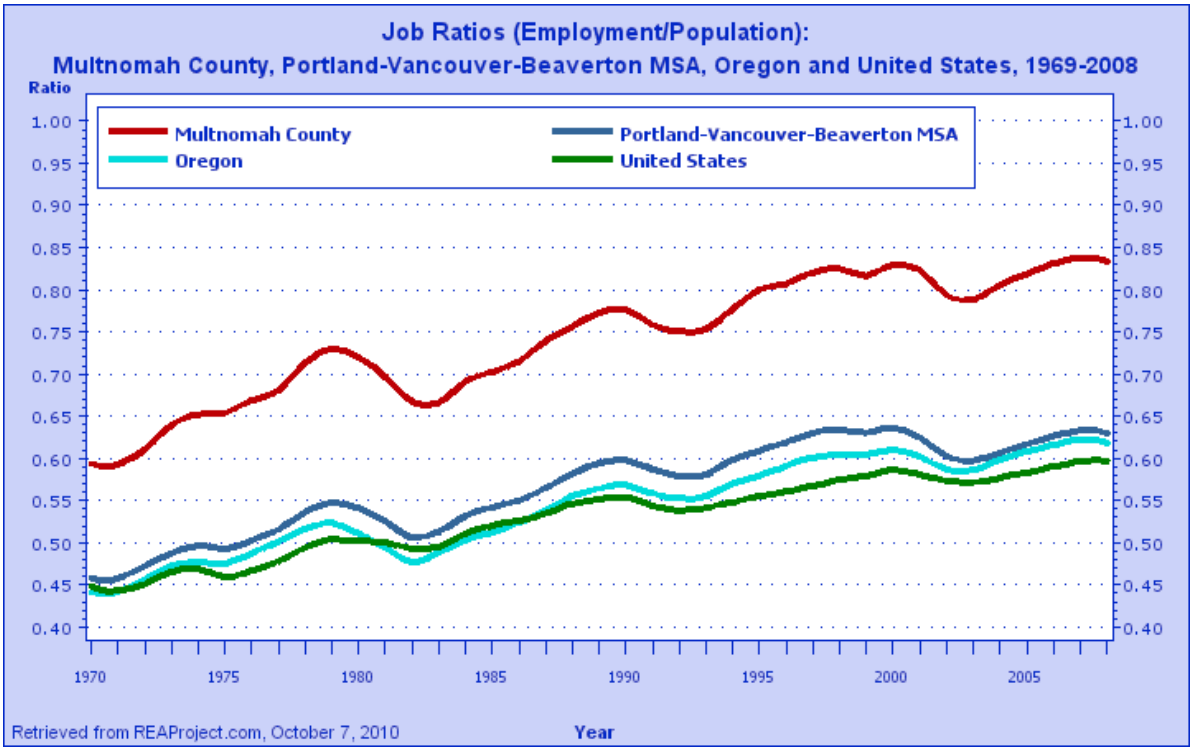



Source: Bureau of Planning and Sustainability from Oregon Employment Department QCEW data.

If Multnomah County's long-term linear job growth pattern continues along this trendline, 184,000 new countywide jobs will be added between 2010 and 2035, which reflects a 34% county capture rate of new PMSA Covered Employment in this forecast period. In 2008, the City of Portland accounted for 87% of Multnomah County employment, up from 86% in 2000. Assuming a slightly declining city share of county jobs over time, estimated at 82% of new Multnomah County jobs from 2010 to 2035, the trendline in Figure 8 indicates that 151,000 new Portland jobs will be added in the forecast period. This growth level would represent a 28% city capture rate of PMSA job growth to 2035.

Employment trends are also linked to population trends at the regional level, but Multnomah County has long been a job center in the region and has substantially more jobs than resident workers, such as shown on the following graph.

## Figure 9. Employment-to-Population Job Ratios




Source: Oregon Regional Economic Analysis Project from U.S. Bureau of Labor Statistics data.

Geocoded (mapped) employment data is available for 2000 and 2008, allowing a review both of citywide and sub-city employment trends. This employment dataset is based on jobs covered by unemployment insurance, which generally equates to an estimated 85% of the total workforce.

### 2008-2013 Employment Trends

In 2013, there were 393,742 covered jobs in Portland, equivalent to 38% of the 1.02 million employment base of the 7-county PMSA. Since 2000, employment in Portland has fluctuated substantially. Analysis of recent City employment trends in this report focuses on the 2000-2008 period, because it is the most recent complete business-cycle. However, the 2000-2008 business cycle was a period of unusually slow job growth, averaging 0.1% annual growth in Portland, 0.8% in the 7-county metro region, and 0.5% nationally. However, the pace of job growth in the 2008-2013 period has already exceeded the previous business cycle, averaging 1.3% per year in Portland and 1.4% in the region. Despite the depth of job losses during the great recession (2008-2010), the city and region have since led the state's economic recovery. Portland had a nearly flat 5% capture rate of regional growth during the sluggish 2000-2008 business cycle and then rebounded to 23% in the 2008-2013 period.

## 2000-08 Employment by Sectors

Figure 10 reports employment at the detailed sector level with the 2008 distribution and net change both in terms of numerical change and annual average growth rate (AAGR). Throughout the remainder of the report, employment sectors are aggregated to broader categories to provide a more manageable amount of information.

### Figure 10. Portland Citywide Employment (2000-2008)

| | NAICS | | 2000 | 2008 | 2008 Distrib. | Change Net | AAGR |
|---|---|---|---|---|---|---|---|
| Industrial | 11 | Agriculture | 180 | 210 | 0% | 30 | 1.9% |
| | 22 | Utilities | 3,960 | 2,580 | 1% | (1,380) | -5.2% |
| | 23 | Construction | 19,840 | 18,380 | 5% | (1,460) | -1.0% |
| | 31 | Man: food, textile, apparel | 5,990 | 5,800 | 1% | (190) | -0.4% |
| | 32 | Man: wood, petrol, chemicals | 9,120 | 6,740 | 2% | (2,380) | -3.7% |
| | 33 | Man: metal, machine, computer | 24,670 | 17,800 | 5% | (6,870) | -4.0% |
| | | *Manufacturing subtotal* | *39,780* | *30,340* | 8% | *(9,440)* | *-3.3%* |
| | 42 | Wholesale Trade | 25,510 | 20,380 | 5% | (5,130) | -2.8% |
| | 48 | Transportation | 19,770 | 15,650 | 4% | (4,120) | -2.9% |
| | 49 | Transport & Warehousing | 9,160 | 8,010 | 2% | (1,150) | -1.7% |
| | | *Industrial subtotal (21-42, 48,49)* | *118,200* | *95,550* | *24%* | *(22,650)* | *-2.6%* |
| Retail | 44 | Retail | 22,130 | 22,200 | 6% | 70 | 0.0% |
| | 45 | Retail: Dept, misc. | 14,940 | 10,830 | 3% | (4,110) | -3.9% |
| | | *Retail subtotal (44,45)* | *37,070* | *33,030* | *8%* | *(4,040)* | *-1.4%* |
| Services | 51 | Information | 12,350 | 11,570 | 3% | (780) | -0.8% |
| | 52 | Finance & Insurance | 21,390 | 18,810 | 5% | (2,580) | -1.6% |
| | 53 | Real Estate | 9,870 | 8,580 | 2% | (1,290) | -1.7% |
| | 54 | Prof., Scientific, Tech Services | 25,530 | 27,200 | 7% | 1,670 | 0.8% |
| | 55 | Management | 6,820 | 14,590 | 4% | 7,770 | 10.0% |
| | 56 | Admin Support, Waste | 14,020 | 21,770 | 6% | 7,750 | 5.7% |
| | 61 | Education | 29,640 | 35,510 | 9% | 5,870 | 2.3% |
| | 62 | Health & Social Asst. | 40,960 | 49,150 | 13% | 8,190 | 2.3% |
| | 71 | Arts, Enter., Recreation | 6,200 | 6,280 | 2% | 80 | 0.2% |
| | 72 | Accommodation & Food | 30,410 | 35,770 | 9% | 5,360 | 2.0% |
| | 81 | Other Services | 17,190 | 17,210 | 4% | 20 | 0.0% |
| | | *Service subtotal (51-81)* | *214,380* | *246,440* | *63%* | *32,060* | *1.8%* |
| Public | 92 | Public Administration | 17,110 | 17,500 | 4% | 390 | 0.3% |
| Other | 99 | Unclassified? | 2,760 | 120 | 0% | (2,640) | -32.4% |
| | | Total | 389,520 | 392,640 | 100% | 3,120 | 0.1% |

Source: Oregon Employment Department, E. D. Hovee & Company, LLC. Employment in all categories has been rounded to the nearest 10 employees.

## Observations

The 2000-2008 time period corresponds to the most recent complete economic cycle of the region and nation, representing a peak-to-peak period in Multnomah County employment. This has been a period of economic downturn early in the decade, followed by rebounding job growth through mid-decade and then substantial job losses with the recession after 2008.

Consequently, for the entire 2000-08 time period, job growth was experienced at relatively low rates for the city as well as for the state and nation, certainly in comparison with the prior decade of the 1990s:

- Within the City of Portland, post-2000 job growth has occurred at a rate of just 0.1% annually. Oregon's statewide growth rate post-2000 was at 0.8% per year, comparable to a similar growth rate in both non-farm and covered employment for the 7-county metro area (PMSA) over the same time period.
- Over this time period, Portland captured only about 5% of the net job growth in the region, a pattern of performance better than that of Multnomah County but well below city and county rates of job growth capture in prior decades.
- As of 2008, the City of Portland reported about 392,640 covered jobs, representing 38% of the 1.02 million employment base of the 7-county PMSA. This represents a relatively nominal increase of about 3,120 jobs over a six year period in Portland. Job declines are reported across multiple sectors, including every industrial sector for which data is provided.
- Taken together, the industrial sectors report job declines averaging 2.6% per year over the eight year period (for a combined loss of 22,650 jobs), despite a brief resurgence experienced mid-decade. There was a somewhat more rapid shift away from manufacturing employment – a subset of the overall industrial sector – of 3.3% annually, equating to a total loss of 9,440 manufacturing jobs over the 2000-2008 period. It is notable, however, that the Portland region lost a smaller share of its manufacturing jobs that the nation as a whole did. In addition, the value of manufacturing output rose by more than $9 billion for the 7-county region (Figure 23). The region's manufacturing sector is growing, but is becoming less labor intensive.
- Over this eight year period, retail employment in Portland changed little – with a nominal gain of about 70 jobs.
- The growth sectors – strong enough to more than offset industrial job losses – occurred across service sectors. The sector showing the strongest growth was health and social assistance (up by 8,190 jobs), followed by management, administrative support and waste management, education, accommodation and food, and professional/scientific/technical services – with minor gains noted for arts, entertainment and recreation.
- A major portion of the growth occurring within the administrative support sector has been for temporary employment agencies. While reported with this NAICS job classification, temporary employees actually may be placed in any sector and also likely serve to offset at least some portion of the reported industrial employment decline. Also noted is that much of the growth in the management sector is likely related to business sector reclassifications with new NAICS coding coming into place between 2000 and 2008.

- Not all service sectors experienced employment growth over the past decade. Loss of 2,580 jobs is indicated through 2008 for finance and insurance, with job losses also noted for the real estate and information sectors. [3]

## Data Limitations

While the Quarterly Census of Employment and Wages or QCEW (also known as ES202) data is the most comprehensive and timely source available, there are at least two important data limitations, as they may affect the portrayal of job change over time: [4]

1) Employment has been parceled out to sites for employers with multiple sites, and this process may be more or less accurate in one of the two years for which data is drawn (with a tendency towards greater accuracy in more recent years).
2) Inconsistent NAICS classification by individual firms within the two comparison years, as industry classification largely represents self-reporting by firms to the Oregon Employment Department (OED).

A second set of issues related to changing employment classification is perhaps of greater concern:

- National changeover from the Standard Industrial Classification (SIC) to North American Industry Classification System (NAICS) occurred between 2000 and 2008, leading to new classifications and an inexact bridge between the two systems.
- The net result of this change in classification systems has been to accentuate a reported shift away from the industrial sectors, as the newly added service sectors of management of companies and information both encompass firms that often were previously classified as industrial. It is unknown exactly what portion of the shift away from what is reported manufacturing is attributable to the new NAICS system.
- There is also a trend toward companies reporting more than one NAICS, with a separate NAICS assigned to groups of employees. It is likely that this greater detail has led to the reported jump in employment within the NAICS category "management of companies". This trend results in a shift away from the industrial sectors, as employment appears to be increasingly split between a company's "primary" industry (e.g. warehousing, manufacturing) and other classifications (such as management or headquarters operations), which falls within the service sectors.
- Companies self-report NAICS, and sometimes are inconsistent over time.

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[3] The Information sector was established with the transition from the Standard Industrial Classification (SIC) to North American Industry Classification System (NAICS) from what were a mix of industrial and service components.

[4] Alternative data sources include the Covered Employment Statistics, a sample survey-based time series that is adjusted to match ES 202 data, and the Economic Census, completed once every five years (with a several year lag before data release and not available at a sub-regional level).

Because of these issues, sector-level changes (for instance, the reported decline in manufacturing jobs and increase in service jobs) are best understood as shifts in the nature of the region's employment rather than necessarily as job growth or decline within individual firms. Employment data should also be viewed as most reliable when summed within a geographic subarea or to broad sector groupings, rather than when detailed sector-level data is compared over time.[5]

## PORTLAND EMPLOYMENT GEOGRAPHIES

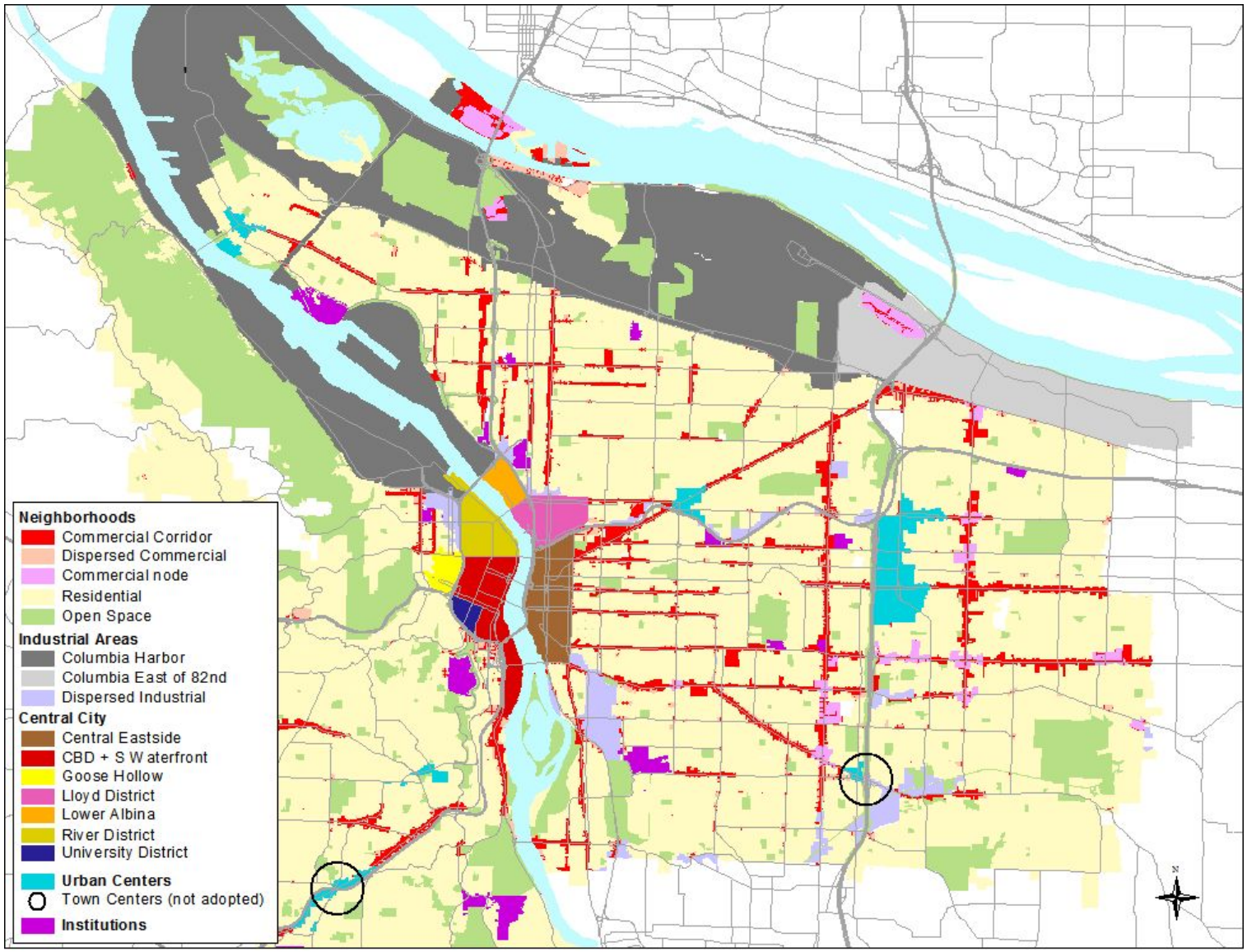
This section includes an analysis of Portland employment areas at a finer level of detail – geographic subareas that group together similar employment uses with common site characteristics and development patterns (Figures 8 and 9). Subareas are broadly grouped into categories of Central City, industrial, neighborhood commercial, institutional, and residential categories.

[5] The reliability of sector comparisons over time should also improve in the future, as more years of data and experience with the NAICS classification system take place. This will especially be the case when it is not as important to provide time series comparison with the 2000-2002 time period when much of the SIC to NAICS changeover occurred.

## Figure 8. Employment Geographies

| Subarea | Boundary Methodology |
|---|---|
| **Central City Commercial** | |
| CBD + South Waterfront | Central City Plan District subareas |
| University District | Central City Plan District subarea |
| River District | Central City Plan District subarea |
| Goose Hollow | Central City Plan District subarea |
| Lloyd District | Central City Plan District subarea |
| **Central City Industrial/ Incubator** | |
| Central Eastside | Central City Plan District subarea |
| Lower Albina | Central City Plan District subarea |
| **Urban Centers** | |
| Hillsdale Town Center | Plan District |
| Hollywood Town Center | Plan District |
| St. Johns Town Center | Plan District |
| Gateway Regional Center | Plan District |
| Lents Town Center | |
| West Portland Town Center | |
| **Industrial Areas** | |
| Harbor & Airport Districts | Industrial Sanctuary + adjacent ME comp plan designation |
| Harbor Access Lands | |
| Columbia East of 82nd | Industrial Sanctuary + adjacent ME comp plan designation east of 82nd |
| Dispersed Employment | Dispersed IS + ME comp plan designations |
| **Neighborhood Commercial** | |
| Commercial Corridors | Commercial corridors designated by BPS |
| Commercial Nodes | Tax lots surrounding key commercial intersections identified by BPS |
| Dispersed Commercial | Other tax lots in commercial zoning (auto-oriented, storefront or mixed employment) |
| **Institutions** | 10 colleges and 7 hospitals with campus areas larger than 10 acres and more than 100 employees, except for Portland State University, which is included in the Central City's University District; and the Adventist Medical Center, which is included in Gateway Regional Center |

## Figure 9. Portland Geographic Subareas

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### *Trend Observations by Employment Geography*

Major observations from each employment geography are summarized below. As noted, submarkets are defined for each of the major employment geographies of Central City, urban centers, institutions, industrial, neighborhood commercial, and residential/open space employment activity. Added discussion of employment sector changes within geographies and accompanying graphs are located within the Demand Analysis – Data Assessment Topics section of this report.

- With 107,600 jobs, the **Central City Commercial** geography encompassed 27% of the city's job base in 2008. With a 0.1% average annual growth rate between 2000-2008, employment increased at about the same rate as employment increased citywide over the same time period.

  With nearly 66,400 jobs, the CBD + South Waterfront not surprisingly comprises the largest Central City subarea, although this core submarket experienced a loss of an estimated 3,100 jobs from 2000-08. The most rapid job growth occurred within the River District submarket (up by 2.1% per year), followed by the Lloyd District.

  Two Central City subdistricts – Central Eastside and Lower Albina – are included within the Central City Industrial/Incubator geography. These are often referred to as "incubator" rather than general industrial districts and have out-performed the overall Central City area with annual job gains of 3.2% and 2.3% per year respectively.
- **Urban centers** comprised just 5% of citywide employment in 2008 and experienced job growth averaging 1.4% per year. Of the six urban center submarkets profiled, Gateway has the largest employment base with about 9,500, followed by Hollywood at 6,500 and West Portland at 2,600.

  The highest levels of employment growth since 2000 are indicated for Hollywood and Lents Town Center, both averaging employment gains of better than 5% per year. Gateway also experienced employment growth, but at a much lower growth rate. The other urban centers experienced relatively flat to declining employment.
- **Institutions,** excluding PSU and Adventist Hospital, accounted for over 35,200 jobs in 2008 (nearly 9% of citywide employment), with job growth averaging 3.6% from 2000-08.
- **Industrial** areas comprise a total of 119,500 jobs (or better than 30% of employment citywide). Overall job growth has occurred at about the citywide average of 0.1% per year but with wide variation between districts.

  With more than 52,200 employees, the Harbor and Airport Districts geography accounts for more than two-fifths (44%) of the industrial total (or 13% of all employment citywide). The Columbia Corridor East of NE 82nd Avenue accounts for more than 19,400 jobs with Dispersed Employment at 17,200. The two Central City Industrial (or incubator) districts account for 18,000 and 3,300 jobs respectively.

  Harbor and Airport Districts report some job loss averaging less than 1% per year, with even more rapid attrition for Dispersed Employment. Job gains of close to 3% per year are noted for Columbia East of 82nd. Employment has increased 0.1% per year in all the

industrial areas combined. As noted, both the Central City incubator districts have experienced employment gains.

**Harbor Access Lands** are riverfront industrial lands in the Portland Harbor and along the Columbia River. As of 2008, Harbor Access Lands accounted for an estimated 9,300 jobs. From 2000-08, Harbor Access Lands experienced declining employment at a rate averaging 2.2% per year – a substantially more rapid rate of job loss than of the Harbor and Airport Districts geography. Reported employment losses were most substantial in manufacturing, followed by transportation, warehousing and wholesale trade. It is notable that a separate analysis indicates that the economic output (value added) in the Portland Harbor grew at 1.6% per year during approximately the same timeframe - 2002 to 2008. During that same time period, cargo volumes increased by 4.8% per year.[6] As discussed later in this report, employment may not be the best indicator of land needs in the harbor.

- With 70,400 jobs or 18% of citywide employment, the **neighborhood commercial** geography has experienced net job loss since 2000. Of the neighborhood-related employment activity, nearly 56% of jobs are indicated as located in Commercial Corridors, followed by Dispersed Commercial. Commercial Corridors account for the largest base of neighborhood activity with just over 39,000 jobs but lost jobs at a rate averaging 1.5% per year. Commercial Nodes (about 20 key intersections) supported 9,600 jobs in 2008 or 14% of the neighborhood-related jobs total. Taken together, neighborhood commercial areas experienced a net loss of 1,900 employees from 2000 to 2008 – coming primarily from reduced employment in Commercial Corridors. Job losses are noted for 6 out of 10 employment sectors, led by construction which decreased by more than 1,700 jobs. A countertrend is indicated for Dispersed Commercial, with close to 3,900 more jobs reported in 2008 than 2000.
- More than 38,900 jobs are reported for **residential** areas plus **open space.** The majority of these jobs are in residential areas which account for just under 10% of citywide employment. Job losses are exhibited in every employment sector, except public sector employment.

More detailed data for these submarkets is provided by the tables on the next two pages.

[6] EcoNorthwest, Portland Harbor Industrial Land Supply Analysis, February 2012)

## Figure 10. Urban Centers & Institutions Employment (2000-2008)

| | Central City - Non Industrial | | | | | Urban Centers | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CBD + S Waterfront | University District | River District | Goose Hollow | Lloyd District | Gateway | Hollywood | St Johns | Hillsdale | Lents | West Portland | Institutions |
| **Total Employment 2008** | | | | | | | | | | | | |
| Utilities | 26 | - | * | - | * | * | - | - | - | - | - | - |
| Construction | 682 | - | 900 | 268 | 61 | 118 | 36 | 89 | * | 34 | 194 | * |
| Manufacturing | 275 | * | 481 | * | * | 150 | * | * | * | * | * | - |
| Trans, Wareh. & Whlsle | 800 | * | 2,478 | 24 | 341 | 242 | 46 | 95 | 5 | * | 36 | * |
| Retail, Arts, Accommod. | 11,033 | 353 | 4,337 | 1,935 | 5,616 | 2,705 | 950 | 388 | 286 | 89 | 292 | 353 |
| Services | 30,496 | 341 | 3,319 | 1,079 | 6,000 | 1,403 | 589 | 335 | 135 | 102 | 1,584 | 132 |
| Information & Design | 11,937 | * | 2,569 | 645 | 1,020 | * | 140 | 36 | 33 | - | 189 | 153 |
| Education + Health | 3,241 | * | 1,066 | 272 | 819 | 4,187 | 4,733 | 142 | 254 | 56 | 291 | 34,575 |
| Public | 7,740 | 182 | 95 | - | 1,684 | 487 | * | * | - | * | * | - |
| Other/No NAICS | 11 | - | 2 | - | 4 | 1 | - | - | - | - | - | 1 |
| Total | 66,365 | 3,925 | 16,162 | 4,444 | 16,704 | 9,514 | 6,513 | 1,313 | 742 | 324 | 2,605 | 35,234 |
| *2008 Distribution* | *16.9%* | *1.0%* | *4.1%* | *1.1%* | *4.3%* | *2.4%* | *1.7%* | *0.3%* | *0.2%* | *0.1%* | *0.7%* | *9.0%* |
| **Employment Change 2000-2008** | | | | | | | | | | | | |
| Utilities | (474) | - | * | - | (799) | - | - | - | - | - | * | - |
| Construction | (1,230) | (9) | 787 | 10 | (87) | (29) | (66) | 23 | 4 | 12 | 140 | 1 |
| Manufacturing | (576) | (26) | (672) | (186) | (39) | (13) | (25) | (3) | 14 | * | 2 | - |
| Trans, Wareh. & Whlsle | (1,039) | (8) | (2,495) | (139) | (435) | (628) | (22) | (64) | (27) | * | (98) | * |
| Retail, Arts, Accommod. | (592) | 132 | 1,986 | 382 | 465 | 51 | 395 | (50) | (133) | (11) | 30 | 155 |
| Services | 1,732 | (184) | 1,538 | (158) | 2,672 | (42) | (232) | 120 | 24 | 45 | (509) | 36 |
| Information & Design | (20) | * | 825 | (71) | 13 | (124) | 75 | 6 | (29) | - | (70) | (264) |
| Education + Health | 635 | 222 | 590 | (144) | (44) | 995 | 2,147 | 116 | (0) | 56 | 108 | 8,792 |
| Public | (1,243) | * | * | (797) | 346 | * | (5) | (133) | * | * | - | - |
| Other/No NAICS | (372) | (6) | (45) | (15) | (33) | (41) | (30) | (3) | (6) | - | (27) | (23) |
| Total | (3,098) | 255 | 2,527 | (1,119) | 2,059 | 380 | 2,237 | 12 | (168) | 105 | (429) | 8,710 |
| *2000 Distribution* | *17.8%* | *0.9%* | *3.5%* | *1.4%* | *3.8%* | *2.3%* | *1.1%* | *0.3%* | *0.2%* | *0.1%* | *0.8%* | *6.8%* |
| *00-08 Annual Growth* | *-0.6%* | *0.8%* | *2.1%* | *-2.8%* | *1.7%* | *0.5%* | *5.4%* | *0.1%* | *-2.5%* | *5.1%* | *-1.9%* | *3.6%* |
| **Employment Distribution 2008** | | | | | | | | | | | | |
| Utilities | 0% | 0% | 6% | 0% | 7% | 1% | 0% | 0% | 0% | 0% | 0% | 0% |
| Construction | 1% | 0% | 6% | 6% | 0% | 1% | 1% | 7% | 1% | 11% | 7% | 0% |
| Manufacturing | 0% | 0% | 3% | 5% | 0% | 2% | 0% | 2% | 3% | 2% | 0% | 0% |
| Trans, Wareh. & Whlsle | 1% | 1% | 15% | 1% | 2% | 3% | 1% | 7% | 1% | 0% | 1% | 0% |
| Retail, Arts, Accommod. | 17% | 9% | 27% | 44% | 34% | 28% | 15% | 30% | 39% | 27% | 11% | 1% |
| Services | 46% | 9% | 21% | 24% | 36% | 15% | 9% | 26% | 18% | 32% | 61% | 0% |
| Information & Design | 18% | 0% | 16% | 15% | 6% | 1% | 2% | 3% | 4% | 0% | 7% | 0% |
| Education + Health | 5% | 77% | 7% | 6% | 5% | 44% | 73% | 11% | 34% | 17% | 11% | 98% |
| Public | 12% | 5% | 1% | 0% | 10% | 5% | 0% | 16% | 0% | 11% | 1% | 0% |
| Other/No NAICS | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

Source: Oregon Employment Department (OED), Portland Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC. Agricultural jobs are not detailed. Asterisks (*) denote data not disclosed to meet OED confidentiality provisions.

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## Figure 11. Industrial Areas & Neighborhood Employment (2000-2008)

| | Non-Central City Industrial | | | | Central City Industrial | | Neighborhoods | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Harbor & Airport Districts | Harbor Access Lands | Columbia East | Dispersed Employment | Central Eastside | Lower Ablina | Commercial Corridor | Commercial Nodes | Dispersed Commercial | Residential |
| **Total Employment 2008** | | | | | | | | | | |
| Utilities | * | - | - | * | - | - | - | * | - | * |
| Construction | 3,573 | 571 | 1,830 | 1,527 | 2,227 | 418 | 1,020 | 64 | 1,959 | 2,800 |
| Manufacturing | 11,752 | 4,828 | 3,743 | 3,186 | 2,056 | 343 | 1,342 | * | 1,110 | 740 |
| Trans, Wareh. & Whlsle | 22,334 | 2,605 | 4,686 | 2,260 | 3,577 | 314 | 1,589 | 80 | 828 | 1,651 |
| Retail, Arts, Accommod. | 4,388 | 67 | 2,786 | 1,552 | 3,126 | 189 | 18,756 | 6,863 | 5,601 | 3,407 |
| Services | 7,257 | 1,186 | 3,606 | 6,017 | 3,118 | 191 | 8,966 | 1,511 | 5,052 | 7,494 |
| Information & Design | 1,127 | 9 | 888 | 1,484 | 1,406 | 101 | 2,383 | 154 | 3,160 | 2,277 |
| Education + Health | 849 | 54 | 559 | 696 | 1,659 | * | 4,881 | 621 | 3,690 | 17,501 |
| Public | 945 | - | 1,327 | * | 821 | * | 62 | 284 | * | 2,981 |
| Other/No NAICS | 2 | 1 | 4 | - | 2 | 2 | 25 | - | 13 | 49 |
| **Total** | **52,227** | **9,321** | **19,429** | **17,183** | **17,992** | **3,254** | **39,050** | **9,589** | **21,718** | **38,928** |
| *2008 Distribution* | *13.3%* | *2.4%* | *4.9%* | *4.4%* | *4.6%* | *0.8%* | *9.9%* | *2.4%* | *5.5%* | *9.9%* |
| **Employment Change 2000-2008** | | | | | | | | | | |
| Utilities | (15) | - | - | 7 | - | - | - | (15) | - | * |
| Construction | 520 | 250 | 714 | 186 | 772 | (160) | (1,347) | (60) | (323) | (1,586) |
| Manufacturing | (5,559) | (939) | (6) | 14 | (90) | (176) | (1,035) | (25) | 665 | (773) |
| Trans, Wareh. & Whlsle | (1,094) | (1,124) | 1,045 | (3,267) | (217) | (25) | (297) | (341) | (5) | (133) |
| Retail, Arts, Accommod. | 425 | (450) | 12 | (1,691) | 608 | 23 | (1,216) | (21) | 1,825 | (944) |
| Services | 2,372 | 399 | 1,261 | 2,287 | 957 | 163 | (148) | 133 | 455 | (2,073) |
| Information & Design | (2) | (102) | 318 | 313 | 930 | 69 | (72) | (113) | 660 | (601) |
| Education + Health | 36 | 42 | 236 | (173) | 5 | 429 | (434) | 14 | 966 | (537) |
| Public | 706 | * | 473 | (437) | 821 | * | (140) | * | (218) | 492 |
| Other/No NAICS | (185) | (23) | (75) | (88) | (82) | (7) | (432) | (46) | (180) | (918) |
| **Total** | **(2,796)** | **(1,977)** | **3,944** | **(2,849)** | **3,703** | **502** | **(5,132)** | **(576)** | **3,853** | **(7,078)** |
| *2000 Distribution* | *14.1%* | *2.9%* | *4.0%* | *4.9%* | *3.7%* | *0.4%* | *11.3%* | *2.5%* | *4.5%* | *11.8%* |
| *00-08 Annual Growth* | *-0.6%* | *-2.2%* | *3.2%* | *-1.8%* | *3.2%* | *2.3%* | *-1.5%* | *-0.7%* | *2.7%* | *-1.9%* |
| **Employment Distribution 2008** | | | | | | | | | | |
| Utilities | 0% | 0% | 0% | 2% | 0% | 0% | 0% | 0% | 0% | 0% |
| Construction | 7% | 6% | 9% | 9% | 12% | 13% | 3% | 1% | 9% | 7% |
| Manufacturing | 23% | 52% | 19% | 19% | 11% | 11% | 3% | 0% | 5% | 2% |
| Trans, Wareh. & Whlsle | 43% | 28% | 24% | 13% | 20% | 10% | 4% | 1% | 4% | 4% |
| Retail, Arts, Accommod. | 8% | 1% | 14% | 9% | 17% | 6% | 48% | 72% | 26% | 9% |
| Services | 14% | 13% | 19% | 35% | 17% | 6% | 23% | 16% | 23% | 19% |
| Information & Design | 2% | 0% | 5% | 9% | 8% | 3% | 6% | 2% | 15% | 6% |
| Education + Health | 2% | 1% | 3% | 4% | 9% | 46% | 12% | 6% | 17% | 45% |
| Public | 2% | 0% | 7% | 1% | 5% | 6% | 0% | 3% | 1% | 8% |
| Other/No NAICS | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| **Total** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** |

Source: Oregon Employment Department (OED), Portland Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.
Agricultural jobs are not detailed. Asterisks (*) denote data not disclosed to meet OED confidentiality provisions.

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# IV. DEMAND ANALYSIS ISSUES – FOCUS GROUP INPUT

A key component of this economic opportunities analysis has centered on six *demand analysis topics* of particular interest to the City of Portland with this EOA and Comprehensive Plan update. To assist with this assessment, focus groups were organized and conducted in 2009 to cover each topic area, with each group hosted by a business or community organization:

- *Central City Office* – hosted by the Portland Business Alliance
- *Close-In Incubator* – hosted by the Central Eastside Industrial Council
- *Manufacturing & Distribution* – hosted by the Columbia Corridor Association
- *Neighborhood Commercial* – hosted by the Alliance of Portland Neighborhood Business Associations
- *Commercial Corridor/Mixed Use/Transit Oriented Development (TOD)* – hosted by the Portland Streetcar, Inc.
- *Campus Institutional* – hosted by the Institutional Facilities Coalition

A total of 58 business and non-profit organization representatives participated in these six focus groups (including two who participated in two sessions). Participants are identified in Appendix A.

Focus group discussions covered recent and emerging trends, business space and location needs, questions regarding density and development, opportunities for economic prosperity and creative vitality, and economic development focus. This summary of focus group results has been organized around major themes that emerged across multiple groups in response to specific topic areas. The comments are reported without attribution of comments to specific individuals or organizations.

A separate report provides more detailed discussion of items of more particular interest within each of these six areas of demand analysis groupings (Appendix B).

## SUMMARY THEMES BY DEMAND TOPIC

To summarize, Figure 15 provides an overview of major observations for each of the six demand analysis groupings covered. This chart is followed by a more detailed narrative describing focus group responses for each of the demand topics in more detail.

## Figure 12. Focus Group Themes by Demand Topics

| Discussion Question | Central City Office | Close In Incubator | Manufacturing & Distribution | Neighborhood Commercial | TOD/Mixed Use Corridors | Campus Institutional |
|---|---|---|---|---|---|---|
| **Recent Trends** | •Resurgent Central City office leasing has been realized (until the recession)<br>•Tenants are drawn back in from the suburbs<br>•Live-work options create added urban synergy | •Districts like Central Eastside are *on a roll* for diverse industry plus creative and tech oriented business<br>•Close-in incubator space offers *grittier appeal* to young creatives | •Finding qualified labor and distance from U.S. markets are major industry issues<br>•De-consolidation of distribution nationally with higher fuel prices works to Portland business advantage | •Neighborhood districts are finding their niche<br>•Growth is organic and entrepreneurial<br>•Business success depends on serving a mix of local and destination clientele | •Retail opportunity is driven by more residents moving back to the city<br>•Diverse mixed use settings are available – Central City, mid-rise transit corridors, distinctive urban neighborhoods | •Regional institutions are investing in facility renewal to remain competitive<br>•Locally oriented education and health care are moving closer to where clientele live or work |
| **Emerging Trends** | •Office market is becoming more diverse with entrepreneurial and sustainable business emphases<br>•Central City has greater potential to increase its capture of the regional office market | •Businesses are *hyper-local,* serving each other and the downtown<br>•A mix of business, from industrial to arts and dining, is supported<br>•Desire is expressed for incubator needs to evolve naturally and organically | •Businesses draw needed labor both locally and nationally<br>•There is a broad trend to sustainable design and business practices<br>•A major concern is that freight transport capacity is not keeping up | •Increased area residential density is anticipated, but more infrastructure is needed<br>•Increased orientation to the concept of a *20-minute neighborhood* is strongly endorsed | •Further intensification of development is expected with economic recovery<br>•Successful TOD is all about reducing vehicle miles traveled (VMT) and location efficient development | •Locally-oriented education providers are decentralizing<br>•Strong health care growth is expected to continue<br>•Increased transit orientation of institutions is more critical with facility investment |
| **Business Space & Location Needs** | •New and alternate office locations are desired, especially close to the core<br>•The *life cycle* of each business means changing choices over time for type and cost of space, for a more diverse office mix | •Options are desired for business condo arrangements and inexpensive space<br>•Permitting & SDCs are cited as recurring issues with rehab of existing building space | •Increased cost of doing business is cited as a growing competitive concern for the Portland area<br>•Maintaining the industrial sanctuary is critical for manufacturing and distribution | •Participants are *bullish* on options for increasing business vitality<br>•More business tools/incentives together with robust planning for employment concentration are recommended | •More focus on job-related as well as residential mixed use development is encouraged<br>•A new City of Portland job density paradigm | •Current impact mitigation process and mixed use limitations frustrate reinvestment<br>•Affordable housing options are needed for students, faculty, workers |

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| Discussion Question | Central City Office | Close In Incubator | Manufacturing & Distribution | Neighborhood Commercial | TOD/Mixed Use Corridors | Campus Institutional |
|---|---|---|---|---|---|---|
| **Density & Redevelopment** | •Desired are options for added density (FAR) and multi-block campus developments<br>•A need is expressed to *think big enough* for greatly expanded jobs potential<br>•Improving the city's business climate is cited as a priority initiative | •Streetcar extension will be the impetus for added development density<br>•Multi-level manufacturing still exists, but widespread applicability is questionable<br>•Code flexibility is key to maintaining close-in industrial | •Industrial site and transport needs make it difficult to exceed 35% site coverage (or FAR)<br>•Distributors build *high-cube* space to get more product in the same building footprint<br>•Requiring too much density may result in business leaving Portland | •Support for more housing density is viewed as generating positive business impacts<br>•Rather than mandating commercial density, the suggestion is to *let density float* to what the market supports | •Density will come with transit service extension<br>•More emphasis is recommended for mixed use development with a strong jobs mix<br>•Live/work incubator opportunity is cited for as yet untapped resources (such as Gateway) | •More multi-story buildings are expected with medical; cautious interest is also expressed for higher education (out of downtown)<br>•Increased density of development is predicated on better transit accessibility and service |
| **Economic Prosperity & Creative Vitality** | •Portland's Central City is viewed as vital to defining the *PDX brand*<br>•PSU and housing are more important as future economic engines to Central City office vitality | •Incubator districts are integral for the centrality of a regional service supplier role<br>•Close in business offers local networking and technology transfer capability | •Recommended is emphasis on balancing goals of sustainability and job growth<br>•For Portland, sustainability can mean being both green and efficient | •Small business is described as the engine of the Portland economy<br>•For increased economic contribution, offer more training for small and ethnic firms | •Portland offers the appeal of a village environment<br>•Economic recovery depends on sustainability and greater emphasis to build *creative, tenacious minds* | •Expect institutions to remain critical as a major future job source<br>•Higher ed and health care play a more important role in cultivating Portland area health & vitality |
| **Economic Development Focus** | •Marketing Portland as a competitive place to do business<br>•Prioritize public investment in infrastructure and zoning flexibility | •Foster private investment in businesses, not just buildings<br>•Restore the linkage between the City and private sector | •Prioritize multi-modal freight and worker transport infrastructure<br>•Provide balanced support for industry with traded sector focus | •Offer improved access to resources for small business<br>•Plan for change with less emphasis on mandates | •Foster creativity and job density on transit corridors<br>•Re-tool the planning and zoning process<br>•Build the urban university | •Recognized and support institutional contributions<br>•Transition from regulatory emphasis to partnership roles |

Source: Economic Opportunity Analysis focus groups conducted February-March, 2009.

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## RECENT TRENDS

Each focus group session began with the question: *What are the most important trends that have affected business, investment and development for your firm or organization over the past 3-5 years?*

Portland had been a dynamic place to be conducting business up to the point of the economic downturn starting in 2007-08. Major themes emerging from the six focus group conversations include the following:

- *Central City* office has, in recent years, experienced a resurgence of leasing activity (with the economic downturn only recently beginning to be felt). Some tenants have been drawn back in from the suburbs by the vitality and transit accessibility of the urban core, Portland is attracting and growing the sustainability industry, and the core area has benefited from the synergy of providing options for housing and work in close proximity.
- *Close-in incubator* areas (notably Central Eastside) have also been on a roll – but in a "grittier, more Portland" setting that is now home to businesses ranging from open source tech to distributors/brokers to destination retail. How to accommodate parking and diverse freight versus people transit is cited as the #1 issue. Bus and bike access is ever more important.
- *Manufacturing and distribution* firms of Portland's harbor and Columbia Corridor have found that obtaining qualified workers is a growing challenge, even in a time of economic downturn. The Pacific Northwest is still a small market; getting to market is a competitive challenge and competitors are primarily out of state. Distribution may be deconsolidating to more and smaller centers across the U.S., offering added market activity for Portland.
- *Neighborhood business districts* are finding their niche and for some (like the Pearl and Mississippi) the niche has rapidly matured. Portland is still "under-retailed, national chains want in." Much of the city's neighborhood business development has taken off on its own. The "coolest stuff is organic," responding to local entrepreneurial initiative and often "happened in spite of government." While businesses often start by serving a primarily local neighborhood clientele, success means that customers increasingly are "not from the neighborhood itself" but also drawn from the rest of the city and region.
- *Mixed use/TOD* discussion paralleled much of what was heard with neighborhood business districts. From empty nesters to young professionals, people are coming "back to the city." Portland's resurgence is based on residents "coming for character and texture" with diverse options ranging from high-rise Central City districts to mid-rise transit corridors to distinctive urban neighborhoods. "More rooftops" with greater discretionary income has served to drive much of the growth with in-city retail and dining – at least up to the time of the recession.
- *Campus institutional* activities are identified as primarily including education and medical institutions (outside Portland's Central City). Some nationally recognized education institutions in Portland face substantial reinvestment aimed at "renewal of facilities" to better meet science and technology needs and house more students (or faculty) on or near campus.

Locally oriented higher education institutions are increasingly focused on training for specific workforce needs – from nursing to welding – and look for locations and partnerships to get closer to the neighborhoods where the students are or will be. Similarly, medical institutions are looking to medium and smaller size facilities closer to where people live or work (including preparation for an aging demographic).

## EMERGING TRENDS

The next question asked participants to look toward the future: *What do you see on the horizon as potentially important emerging trends for employment growth or change?* Participants were asked to comment on the next 3-5 years through a period of recovery from the current economic downturn and then beyond over the next 10-25 years (to 2035).

From virtually every group, the overarching theme is one of change. Portland's economic opportunities can be expected to be different in 2035 than they are today. Even as of 2009, the outlook appeared promising, provided that economic recovery proves sustainable and that the City and region respond to shape this change in ways that keep Portland competitive for added investment and employment:

- *Central City office* specialists see the market becoming "more diverse" with increased emphasis on serving and stimulating business entrepreneurs, including those in the still expanding sustainability sector. Much of this need for lower cost and more flexible space is expected to be met on the fringes of or outside of the Central City, in places such as the Central Eastside and Gateway. Assuming that metro urban growth boundary expansions continue to be limited, the Central City and other Portland locations can be expected to compete for increasing shares of regional office employment. Resurgent commuter interest in transit dovetails with and buttresses this trend. As one focus group participant said: "Now we're going to have to perform."
- *Central Eastside/close-in incubator* interests express a wide range of thoughts. Some see more restaurants, craft businesses, theaters, and smaller 2-story infill. OMSI and some private owners have large multi-block holdings that could redevelop once land prices go high enough to support redevelopment. Some strongly suggested that the district should be supported as zoned.

  The assumption that manufacturing will go away to be replaced with the creative class "is flawed." Because of proximity to the rest of the Central City, vendors are "hyperlocal." Doing business with neighbors next door or across the river downtown is part of the business culture. A common theme expressed is to not pick business winners; rather let this incubator environment "evolve naturally and organically."
- *Manufacturing and distribution* focus group participants see continuing impetus to draw from both within and outside the Portland labor market for needed workforce skills and experience. More sustainable building design and business practices also are a priority – affecting stormwater management, air quality, transportation efficiency and internal heating, ventilation and air conditioning (HVAC) systems. A major concern is that freight transport capacity is not keeping up – due to rail networks operating at capacity and increased local freeway and street congestion.

- *Neighborhood business districts* see their communities generally becoming more densely developed with added planning to "identify necessary infrastructure" as an increasingly important focus. The concept of a "20-minute neighborhood" radius for walking to achieve a broad range of day-to-day needs is strongly endorsed. Much of what happens within these business districts depends on neighborhood demographics and housing development including anticipated trends for smaller houses.
- *Mixed use corridors and transit oriented development* can expect to intensify with economic recovery. As with neighborhood business districts, much of the development potentially can be expected to be residentially driven – at somewhat higher levels of density. For the next half century, TOD is about reducing vehicle miles traveled (VMT) – creating location efficient mixed use real estate opportunities.
- *Campus institutional* users see the need to think "more broadband" with more evening and weekend classes closer to where students live and/or work for work force oriented educators. Health care providers expect "tremendous growth" over the next five years and new partnerships with educational institutions.

  Access to public transportation is a shared objective, with many of the institutions not currently well served by transit. Students at local colleges want to be able to commute into downtown; others (such as nursing students) go all over the city for work experience and rely on auto travel. To the extent that transit mode share can increase, needs for expensive (and increasingly structured) parking can be reduced.

## BUSINESS SPACE & LOCATION NEEDS

This question and resulting discussion was aimed to better understand: *What are the most important requirements for business success at this type of location in Portland?*

Not surprisingly, space and location needs expressed through these focus group sessions were relatively diverse. However, common themes that emerged include opportunities for more mixed use and density with commercial-related uses versus strong desire for protection of more traditional manufacturing and distribution activity. More detailed notes follow:

- *Central city office* interests would like to seem more blocs of developable land – including at new or alternate locations close to the downtown core. For example, if the Vestas office project happens, it can be expected to draw added interest for office development to South Waterfront. Other opportunities may include sites at the edge of the River (Pearl) District and Central Eastside. EX employment or similar zoning is viewed as pivotal –offering a greater range of mid-rise development options. The Central Eastside (MLK to the waterfront) is cited as perhaps the "hottest market," Portland's new location for digital jobs.

  Incentives were discussed but not widely embraced for office development. Suggested instead: "Don't give me money, give me infrastructure."

  The life cycle of a business can involve several phases of space use – starting with funky, low cost creative space, transitioning (for some) to more traditional Class A office as the business matures. An emerging trend (not yet captured) in Portland is for business owned buildings, whether condo or stand-alone.

Proximity to work-force housing and residential amenities including schools is also seen as key to which office locations offer the best bets to prosper. One focus group participant put it this way: "if there were a decent elementary school, I'd be living (as well as working) in downtown Portland now."

- *Close-in incubator* focus group participants also cite the as-yet unmet opportunity for business condos. The ability to rehab a former warehouse as inexpensive shell space fits a definite tenant need; the Central Eastside can expect more success "if downtown fills up." Permitting and SDCs with reuse of existing space are cited as definite issues, to the point of keeping "Portland at a competitive disadvantage." Particularly problematic code issues cited include seismic retrofits, sidewalk standards, and needs for greater consistency and predictability in the permitting process.
- *Manufacturing and distribution* firms cite costs of doing business as a competitive concern with doing business in Portland. Costs include water/sewer rates and absence of performance based tax incentives for employers rather than for development. In the words of one participant: "Oregon doesn't even get the short look." Maintenance of the industrial sanctuary and limiting residential encroachment is viewed a pivotal – for reasons including maintenance of plant safety and security. Firms want a more solid and proactive message linked to work force opportunity in traditional industry: "We don't tell our story very well."
- *Neighborhood business district* participants are generally "bullish" on opportunities for increasing business vitality. Small business needs tools for storefront improvements and commercial development, tools to "really make our place special." PDC storefront loans and access to incentives/tax breaks are identified as desired. Interest is also expressed in a more "robust" planning process. A plan that is "set in stone doesn't work."
- *Mixed use and transit oriented development* should begin to focus more on employment as well as residential development potential. One focus group participant commented that employment policy is as crude today as housing policy in Portland once was – with not much changing since the 1980s. With this focus group, continuation of the current industrial sanctuary policy has been called into question. Recommended is that the City adapt to a paradigm for more concentrated employment.

  Noted as an example is computer chip manufacture in a multi-story setting in Hong Kong. Codes. Live/work development should be adapted to allow occupants to live "and/or" work on site as long as fire/life/safety requirements are met.
- *Campus institutional* users express frustration with the Impact Mitigation Plan (IMP) provisions of conditional use and/or institutional/residential zone requirements for project approval. Specifically cited as a concern limiting mixed use opportunity is the prohibition on commercial use in excess of 30% – a constraint on medical offices and/or on-site retail. Colleges are not an allowed in a commercial zone. Stated as a desire would be the creation of a higher education zone or perhaps a form-based code placing emphasis on characteristics and performance of development rather than use.

  Also noted is a desire for an affordable/workforce housing policy in conjunction with institutional uses. Suggested is City initiative for a more streamlined permitting process, perhaps offering a central point of contact for larger projects.

Portland's land use and permitting process received considerable discussion throughout all of the focus groups. Two themes of importance emerged: a) the desire for more flexibility to better respond to specific business or needs; and b) the desire for a more predictable and faster approval process. Recognizing that these two objectives can be in conflict with each other, one suggestion was to offer a two track approach: assurance of rapid-fire review and approvals for the standard project with the option for a very flexible but admittedly longer review process for the non-standard or pioneering application.

## DENSITY & REDEVELOPMENT

The City and metro area have placed increased emphasis on building up rather than out as a means to better realize objectives for community livability and containment of urban sprawl. The question posed is: *In terms of market and financial feasibility, how viable are (varied) options as possible priorities with the next update of Portland's Comprehensive Plan?*

Some group discussions were asked and/or addressed this question more directly than others. While opinions are varied, this topic received thoughtful discussion with regard to the practical implications and mechanisms for growing up rather than out:

- *Central City office* developers, brokers and businesses reported increased pressure to go up again – not just in the downtown core but elsewhere in the Central City and beyond. Old Town should be prepared for higher buildings, but getting transfers of development rights (TDRs) is a "hassle." Another stated need is for sites that could accommodate large employer campuses. In the words of one participant, "we don't think big enough." While incentives do not appear to generate broad support, there is interest in marketing and related initiatives to "make the business climate more appealing."

  For nearby districts like Central Eastside, something like a 4-5 story cap might make sense to assure that each office product serves a distinct market niche. Also identified as having longer term office development opportunity is Gateway, based on proximity to affordable workforce housing.
- *Close-in incubator* opportunities also exist for higher density, even possibly for some manufacturing uses. The Pratt and Larson tile company is cited as an example of a manufacturer operating on more than one floor. Firms may be more willing to do multi-level industrial if they can set up cost-effective systems to get the product in and out. Greater flexibility on city code requirements – as for seismic and sidewalk standards – would also be required. Streetcar extension is expected to provide further impetus for greater density of employment. More supportive infrastructure will be needed – perhaps with MOUs for City investment much as happened in the Pearl and South Waterfront areas.
- *Manufacturing and distribution* areas of the Portland Harbor and Columbia Corridor see it challenging to exceed 35% site coverage if functional on-site parking and transportation (freight handling) capacities are to be adequately provided. The concept of industrial density is termed an "oxymoron" by one participant. There is concern with industries getting land-locked if site use is pushed too far. However, some distribution firms are going to higher cube space with up to 40 foot ceilings and high-rack distribution systems.

As one participant said, if density "economically makes sense, industry will do it." However, pushing density and industrial prices too rapidly could cause some firms to relocate from the Portland area.

- *Neighborhood business district* representatives indicate support more nearby residential density to support continuing commercial revitalization. Rather than mandating commercial density of development, the suggestion is to "let density float" to what the market will support. Another suggestion: "Give corridors the highest degree of flexibility."
- *Mixed use and transit oriented development* interests express strong support for increased density of development along and near transit. Specifically emphasized was greater attention to increased employment as well as housing and retail with mixed use development. Areas of Portland like Macadam that were developed with low-rise suburban densities could go from FARs of 2:1 to 3-4:1. Gateway was seen as an as-yet untapped resource with similar density potential – described by one participant as perhaps the "nation's largest live/work" opportunity.
- *Campus institutional* participants also expressed interest in greater density of development, a phenomenon already occurring with medical facilities. Colleges have approached this topic more cautiously due to concerns over student, alumni and neighborhood appeal. However, interest was expressed in considering more height if it is not overly visible and accompanied by better transit service. As was indicated for one institution, the question is: how does one "build a six-story building in a neighborhood?"

## ECONOMIC PROSPERITY & CREATIVE VITALITY

As part of the Portland Plan process now underway, a critical issue and question is: *How can we position Portland in the world economy to remain a prosperous city, building on our competitive strengths and core values of equity and sustainability?*

This question was read verbatim in all of the 2009 focus group sessions. It is probably not surprising that each demand group can lay claim to its sector's importance to the future economic and creative vitality of the city and region. A key challenge for the plan updates may be how to harness these diverse activities into a coherent whole capable of enhancing Portland's economic prosperity and sustainability:

- *Central city office* participants noted that every healthy regional economy is accompanied by a strong Central City. What's more, the downtown, Pearl and SoWa are integral to the "Portland brand" – a city known for being comfortable, walkable and emphasizing quality of life. Enhancing the brand appeal requires strengthening the reputation of Portland State University as an "engine" of economic development.

  Also emphasized: "Get more mixed use downtown." Mixing in more residential with added building height and FAR capability is seen as pivotal to further strengthening of both retail and office competitiveness in Portland's Central City.
- *Close-in incubator* functions at the edge of the Central City are viewed as serving an integral economic role by facilitating the flow of goods and services citywide and regionally. Because it is increasingly challenging to pick the economic winners of the

next economic cycle, keep the district "malleable." In the words of another participant, because Portland does not have internationally tech education, "we are the sponge" providing the tech know-how and knowledge transfer capacity both in times of prosperity and even during the current downturn.

- *Manufacturing and distribution* firms of the Portland Harbor and Columbia Corridor place primary emphasis on balancing the twin goals of sustainability and added employment. Maintain the integrity of the industrial sanctuary; invest in the function of this area as the region's transportation and freight hub. A reminder: "Sustainability means more than green, it also means efficient."
- *Neighborhood business districts* see small business as the "engine" of the Portland economy – especially in a community that values quality of life as well as job growth. The public sector should be "more opportunity seeking." Rather than competing for large employees in a globally incentivized market, focus on a different strategy emphasizing training for small business. To contribute more, small business needs strengthened advocacy – both mainstream and especially ethnic firms.
- *Mixed use and transit oriented* development is pointing the way in Portland to a greener and more prosperous economic future. One focus group participant said that this is "one of the few places in the U.S. to be sustainable." Another observed that: "People want back into the village environment." And this: "Portland – we're more of a brand than we think we are."

  In the absence of major economic drivers, the region has no clear idea how people employ themselves today – the "market is always ahead of us." The composition of the economy is likely to be totally different again in 20 years – in ways that are as yet not readily determined. While a lower level of economic activity might be expected for much of the next decade, the region will be healthy again in 10 years if it emphasizes "creative, tenacious minds." Encourage industry to be more sustainable – looking for green opportunities not only in design but also business operations.
- *Institutional* uses are expected to be "critical" as an increasingly important source of employment in the future. Higher education and health care together play an increasingly important role in cultivating community health and vitality – both with an aging population and as a source of drawing new talent into Portland. Institutions are also proving to be leaders with green design – increasingly committed to achieving LEED standards with new buildings.

## ECONOMIC DEVELOPMENT FOCUS

The final question asked was intended as a means to recap and summarize the focus group sessions: *What do you see as the single most important action that the City of Portland can take for improved business and employment opportunity with this Comprehensive Plan update?*

Unlike the other questions that involved open discussion, participants in each group were asked to identify their top suggestion on an individual basis – going around the table one-by-one. Not surprisingly, a wide range of suggestions were received. However, these responses appear to have fallen into a few major categories. Some were mentioned in virtually every group, while

others were identified less frequently albeit were of significant importance in a certain specific demand issues.

### *Mentioned Most Frequently:*

- Need for greater regulatory flexibility better tailored to unique needs of individual businesses and/or business demand groupings (important across all six focus groups).
- More clearly demonstrated recognition of the contribution of business to Portland's vitality – a change from regulators to partners – asking "what can we do to help" (a theme expressed across all but the TOD/Mixed Use Corridors group).
- Greater City emphasis on cultivating business opportunity in Portland – with active marketing but without "picking winners" (a theme across all but the institutional group).
- Need for better business access to resources, incentives and/or tax structure reform – ranging from desired reform of the business income tax, to loan/incentive programs for small business to a point person/advocate for business in City Hall (identified by in some fashion by all but the manufacturing and distribution group).

### *Mentioned Less Frequently (but important with some focus groups):*

- Investment in multi-modal transportation, utility and livability infrastructure for business competitiveness and density (of importance for Central City office, manufacturing and distribution, neighborhood commercial and campus institutional).
- Setting aspirational goals that are City-driven but with regional cooperation – getting Portland "back to a visionary place" (important for Central City office, neighborhood commercial and TOD/mixed use corridors).

# V. DEMAND ANALYSIS ISSUES – DATA ASSESSMENT

Focus groups were intended to provide a qualitative assessment of recent and emerging trends as well as opportunities for future job development in Portland. The qualitative review is supplemented with a more quantitative, data driven assessment of recent trends and current conditions. Taken together, the quantitative and qualitative assessments are intended to better inform the determination of future opportunities and employment forecasting for subsequent phases of the Portland Plan process.

Demand topics considered with this more in-depth data analysis are similar to those of the focus groups, organized to cover:

- High rise office development
- Incubator & manufacturing districts
- Neighborhood commercial districts
- Institutional development

Incubator and industrial/manufacturing activity are reviewed together. Transit-oriented and mixed-use development is considered in conjunction with both high-rise and neighborhood commercial. As employment data has now been updated from 2006 (with the 2009 draft EOA) to 2008 (with this report), all data as well as related focus group perspectives provided with this demand analysis discussion is now as of the 2008-09 time period.

## A. HIGH RISE OFFICE DEVELOPMENT

This topic is concerned with the extent to which high density central city product can be expected to grow over the forecast period, and the extent to which similar product will be realized outside of the Central City. The guiding question of this analysis is: *What is the demand for high density office product?* Questions that inform this central theme include:

- Where has high rise development occurred in the recent past?
- What has been the historic pace of new development and absorption of higher density office products?
- What areas of the region outside of the city are competing for dense products/top rents?
- How has employment changed within districts zoned for high rise development?

### *Location Trends: Mid-High Rise Office Development*

The City of Portland's mid-high rise product (focused on development of 4+ stories) is still very much clustered within the Central City: the downtown, River District and Lloyd District. The Central City has supported 28 newly constructed 4+ story buildings over the past 20 years, and the renovation of an additional 43 buildings. Outside of these districts, recently constructed buildings of this size are more limited: eight mid-high rise buildings have been newly constructed and 11 renovated.

### *Non-Central City Office*

Since 1990, office development or renovation of more than four stories outside Portland's Central City area are dispersed (Figure 16). However, all but two buildings fall within neighborhoods adjacent to the downtown and Lloyd District: Northwest, the Central Eastside (which has primarily seen renovations rather than new construction), North Macadam and the Adidas headquarters buildings near Swan Island. Outlying buildings consist of one four-story southeast medical building (at the Clackamas County border) and one four story mixed tenant office product at Airport Way.

Of the newly constructed (versus renovated) buildings, half are classified as Class A and half as Class B office product. The only buildings served by structured parking, however, are medical and corporate headquarter campus (Adidas).

Both multi-story development and either structured parking or reduced parking ratios are necessary to increase the employment capacity of Portland's land base. Without structured parking, even high-rise buildings will not achieve greater land efficiency as typical office parking provisions allow for roughly an equivalent square footage in parking as is provided in building space. Reduced parking ratios represent another approach to increasing efficiency of site utilization, but this is only achievable in areas that are well served by transit.

### Figure 13. Non-Central City Office Development 4+ Stories (post 1990)

| Year Built | Building Name | Use | Stories | Building Class | Parking | Building Address | Avg Weighted Rent | Rentable Building Area |
|---|---|---|---|---|---|---|---|---|
| **Outer Southeast** | | | | | | | | |
| 2008 | Mt. Scott Professional Center | medical | 4 | A | surface | 9300 SE 91st Ave | $30.00 | 52,500 |
| **Inner Southeast** | | | | | | | | |
| 2003 | Central Eastside Office Blding | mixed | 4 | B | surface | 3611 SE 20th Ave | $20.00 | 20,000 |
| 1952/2007 | RiverEast Center | mixed | 4 | B | surface | 49 SE Clay St | NA | 100,800 |
| 1928/2003 | The Weatherly | mixed | 12 | B | surface | 516-540 SE Morrison St | $21.00 | 69,900 |
| 1925/2004 | Eastbank Commerce Center | mixed | 4 | B | surface | 1001 SE Water Ave | $15.99 | 60,000 |
| 1920/2007 | Olympic Mills Commerce Center | mixed | 8 | B | surface | 107 SE Washington St | $18.15 | 108,300 |
| **Inner NW** | | | | | | | | |
| 2005 | NW Cntr for Orthopedics & Rehab. | medical | 4 | B | mixed | 1515 NW 18th Ave | $24.00 | 33,300 |
| 2000 | CNF Campus: Ad Tech 2 | corporate HQ | 5 | A | surface | 2055 NW Savier St | $25.50 | 248,200 |
| 1900/1998 | Bridgetown Bldg | mixed | 4 | C | surface | 1631 NW Thurman | $24.00 | 67,300 |
| **Inner North/Northeast** | | | | | | | | |
| 2002 | Adidas Village: Rome Blding | corporate HQ | 4 | A | structured | 5055 N Greeley Ave | NA | 67,300 |
| 2002 | Adidas Village: Chamonix Blding | corporate HQ | 4 | B | structured | 5055 N Greeley Ave | NA | 54,000 |
| 1960/2002 | Adidas Village: Athens Blding | corporate HQ | 6 | A | structured | 5055 N Greeley Ave | NA | 147,000 |
| 1960/2002 | Adidas Village: Mexico City Blding | corporate HQ | 4 | B | structured | 5055 N Greeley Ave | NA | 22,200 |
| **Outer North/Northeast** | | | | | | | | |
| 1996/2006 | One Airport Center | mixed | 4 | A | surface | 7700 NE Ambassador Pl | NA | 73,300 |
| **Inner Southwest** | | | | | | | | |
| 1989/2008 | River Forum II | mixed | 4 | B | surface | 4386 SW Macadam Ave | $24.50 | 38,600 |
| 1985/2004 | River Forum I | mixed | 5 | A | surface | 4380 SW Macadam Ave | $24.49 | 145,700 |
| 1996 | PCG Corporate Center | corporate HQ | 4 | B | surface | 4650 SW Macadam Ave | NA | 41,400 |
| 1982/1991 | ADP Plaza | mixed medical | 4 | B | surface | 2525 SW First Ave | $24.60 | 180,800 |
| 1979/1991 | Raleigh West Executive Bldg | mixed | 4 | B | surface | 6443 SW Beav Hillsdale Hwy | $17.00 | 56,900 |

Source: CoStar March 2009, E. D. Hovee & Company, LLC.

### *Urban Centers Office*

Portland's eastside urban centers (Hollywood Town Center and Gateway Regional Center) have supported a cluster of mostly three story buildings but very little new office construction and no Class A office product. Only two new office buildings have been constructed in Hollywood since 1981: the Providence Healthcare building and a small amount of leasable space associated with a new multi-story 24 Hour fitness club. Older multi-story office product is largely leased to medical users.

Medical/health care activity also appears to be the driver for Gateway office development. Two new medical buildings have been constructed since 1990 and one small (18,000 square feet) mixed-tenant building. Medical users – like educational institutions – are now a pivotal driver in many non Central locations, as they can support higher rents, are often concerned with conserving land for future expansions, and are interested in dispersing to serve both population growth areas and areas currently underserved.

### Figure 14. Centers Office Development 4+ Stories

| Center | Building Name | Building Use | Stories | Building Class | Building Address | Average Weighted Rent | Reliable Building Area |
|---|---|---|---|---|---|---|---|
| **Hollywood Town Center** | | | | | | | |
| 1927/2007 | K-2 Building | mixed | 4 | C | 4152 NE Sandy Blvd | NA | 26,000 |
| 2006 | Phase I | | 3 | B | 4218 NE Halsey St | NA | 76,400 |
| 1981 | Hollywood Professional Bldg | | 3 | B | 3939 NE Hancock St | NA | 19,200 |
| 1970 | Building B | medical | 3 | C | 5228 NE Hoyt St | NA | 19,700 |
| 1966 | | | 3 | C | 3835 NE Hancock St | NA | 10,200 |
| 1965 | Providence Medical Office Build | medical | 3 | C | 545 NE 47th Ave | $34.00 | 32,200 |
| 1947 | Hollywood Square | | 3 | B | 1827 NE 44th Ave | $14.50 | 26,800 |
| 1941 | | medical | 3 | B | 1235 NE 47th Ave | NA | 178,200 |
| 1923 | | medical | 3 | C | 2106 NE 47th Ave | NA | 2,800 |
| **Gateway Regional Center** | | | | | | | - |
| 2008 | | | 3 | B | 11006 SE Division St | $21.00 | 18,000 |
| 2007 | Oregon Clinic | medical | 4 | B | 1111 NE 99th Ave | NA | 101,600 |
| 1994 | Gateway Medical Plaza | medical | 3 | B | 10535 NE Glisan St | $29.57 | 23,100 |
| 1988 | Multnomah Plaza | | 3 | B | 305 NE 102nd Ave | $18.18 | 46,600 |
| 1987 | Columbia East Bldg | | 3 | B | 10011 SE Division St | $15.00 | 32,200 |
| 1979 | Lincoln Bldg | | 3 | B | 9955 SE Washington | NA | 25,300 |
| 1967 | Parkway Plaza Professional Bldg | medical | 3 | C | 10105 SE Division St | NA | 8,900 |

Source: CoStar March 2009, E. D. Hovee & Company, LLC.

### *Office Drivers*

Focus group participants suggested that proximity to both housing and retail is increasingly pivotal to attracting new office investment. The success of the Pearl and the River District is widely attributed to the mixed use environments of these districts – first for residential and more recently as a premier office address. These areas realized over one million square feet of office development from 1990-2009 as well as the bulk of newly development residential units.

The downtown, however – which supports less market rate housing – realized over 2.8 million square feet of office development over this time period, a greater volume although a significantly smaller rate of growth compared to the existing building stock. Lloyd District realized just under one million square feet of new development. One-quarter of the square footage developed within these areas was driven by institutional users (public and education).

Beyond housing, recent themes in office development activity include the Central City streetcar alignment, availability of low-cost historic building stock and institutional end-users. Only 13 office buildings of four or more stories have been developed in the city since 2000. Three of these were multi-tenant towers built in 2000 – 2002 (in the CBD, Lloyd and River District). Four additional buildings were developed by end-users (three for corporate headquarters). Of the six remaining buildings, four are 50,000 square feet or fewer. Other than updates that regularly occur within the office building stock, investment in renovated office product has focused on lower cost buildings in transitional districts such as Old Town and the Central Eastside.

### Figure 15. Citywide Office Development Since 2000

| | Development Post 2000 | | |
|---|---|---|---|
| Geography | New Construction | Renovation | Description |
| River District | 3 | 6 | New: 1 smaller flex, 1 mid-sized office property in 2008-2009 along streetcar; 1 new Brewery Block tower in 2002. Rehabs include the Brewery Blocks, Old Town's Creative Services Center (public), U of Oregon's White Stag renovation and an update to an Old Town tower. |
| Gateway | 1 | 0 | Mid-sized medical |
| Downtown | 3 | 18 | New: 1 smaller office condo along streetcar, 1 built for non-profit end-user, 1 tower in 2000. Renovation: largely upgrading of historic properties already in office use. |
| Lloyd | 1 | 0 | 1 tower in 2001 |
| Close-in | 4 | 0 | 1 smaller medical, 3 corporate headquarters buildings |
| Central Eastside | 1 | 4 | Renovation of three mid-sized former industrial buildings into office/flex use and update of 1 mid-sized office tower. New: 1 smaller multi-tenant space in industrial area |
| Hollywood | 0 | 1 | Small historic office rehab |
| Airport Way | 0 | 1 | Update of mid-sized office |
| John's Landing | 0 | 2 | Small and mid-sized office updates |
| Total | 13 | 32 | |

Source: CoStar, E. D. Hovee & Company, LLC.

In general, office development has not been significant over the past decade. Larger towers were only recently (as of 2009) being initiated again and exclusively within the CBD: the ZGF tower, the Morrison Bridgehead project and Park Avenue West.

### *Density Realized vs. Zoned*

The following map illustrates building square footage, per site, as a percentage of total square footage allowable by zone (base zone, without bonuses). This is displayed to inform conversations on whether zoned capacity should be increased in any areas.

Only Central City subareas, key commercial corridors and the Northwest neighborhood are identified as being developed at more than 10% of zoned capacity. The largest density of taxlots in which development approaches zoned capacity appears to be within the Northwest neighborhood, west of I-405 and north of Burnside.

### *Comparative Development Feasibility*

High rise development typically is associated with a rent or price premium. The caveat to this would be renovation of historic buildings which may have originally been designed for office, warehouse or some other use. Available data indicates that the top tier of office rents is above $26 per square foot (as of 2009), down from a peak above $30 in 2006 and paradoxically below what is required to support market rate high rise construction despite office towers recently constructed or planned.

Other areas that have succeeded in attracting top of the market rents beyond Portland and include:

- St Vincent's Providence Medical Center (Hwy 26/Beaverton)
- Kruse Way (Lake Oswego)
- Cascade Park (east Clark County)
- Dispersed product in outlying southwest (Tigard, Tualatin, Wilsonville)

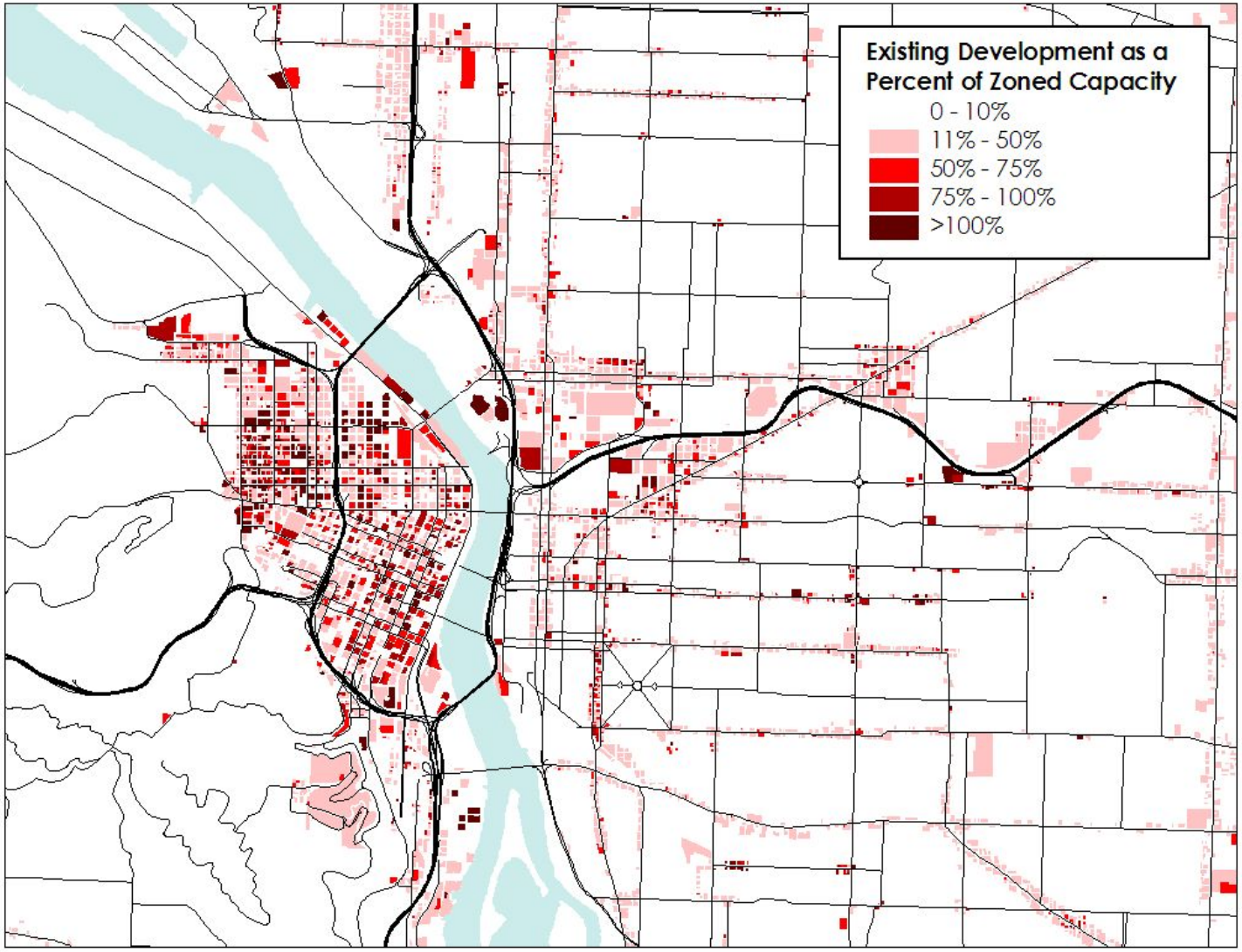
As of 2008, however, Portland's Central City still encompassed more than half of the region's total office product and close to 60% of its Class A office product. Continued investment in new buildings and reinvestment in Portland's historic building stock is expected to continue over the 25 year forecast period.

Portland has successfully retained a critical mass of employment activity within its historic core and thus far at least limited the development of major competing fringe centers. Kruse Way would be the primary exception, but remaining land within that office cluster is now relatively limited.

However, future high rise construction within the City of Portland will increasingly compete with office clusters located elsewhere throughout the region. There is recent evidence of an emerging trend for a more dispersed pattern of office center development, Class A office development since 2000 has been fairly equally dispersed throughout the region, with Portland's Central City capturing about one-third of new construction.

Midrise construction and renovation of office space appears to be the primary Central City opportunity to compete for a larger share of the regional office space market, according to a 2011 study by ZGF and ECONorthwest (*Cost Competitiveness of the Central City*). Comparing office tenant types by their location preferences, the types that were found most likely to shift to or away from the Central City are "cost conscious" tenants motivated primarily by rent levels and "urban character" tenants especially in creative services attracted by urban amenities. The study compared the cost competitiveness of Central City and suburban locations for five development prototypes, finding higher Central City development costs for each prototype. Cost gaps could

**Figure 16. Existing Development as a Percent of Zoned Capacity**




Source: Portland Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.

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be overcome by a range of location incentives or amenities for developers, office tenants and office employees. The study distinguishes the high-density core and mid-density edge areas of the Central City, and the latter appears best suited to compete in these expanding office markets.

## EMPLOYMENT TRENDS WITHIN PORTLAND'S URBAN GEOGRAPHIES

Job change is the final lens used to gauge current and potential demand within Portland's mid and high-rise districts. These *urban geographies* include the Central City districts (both non-industrial and industrial/incubator) plus urban centers outside the Central City area.

### *2008 Employment*

In 2008 there were nearly 108,000 jobs within the primarily commercial areas of the Central City, with another 21,000 jobs in the Central City incubator/industrial districts of the Central Eastside and Lower Albina. The majority of Central City jobs – over 66,000 – have been situated within the Central Business District (including South Waterfront). In terms of job numbers, the Lloyd District is the second largest subdistrict which is approaching 17,000 jobs followed closely by the River District at just over 16,000.

### *2000-08 Employment Change*

Both in and outside the Central City, the service sector has dominated Portland's job gains from 2000-08. This pattern has held for traditional commercial areas as well as the city's industrial districts.

Industrial areas accounted for 9,000 (or 28%) of the net citywide gain of over 32,000 service sector jobs. Much of the demand for service sector employment within industrial districts is being accommodated by 1-2 story rise business park and flex space, rather than by traditional multi-level office buildings.

As noted, at least some portion of the service sector job growth reported with employment data for industrial areas likely represents reclassification of industrial employment to service sector activities. For example, within the management sector (newly created with NAICS) which included holding company and corporate activities, reported employment more than doubled from 6,800 to 14,600 jobs; a portion of this increase is undoubtedly due to industry reclassification.

The major drivers of office demand in mid and high-rise office districts for Portland's urban geographies vary somewhat by district. Significant changes occurring between 2000 and 2008 are noted as follows:

- Within Portland's CBD (including South Waterfront), service sector employment increased by more than 1,700 jobs over this period, with another 635 jobs added in education and health services. These gains were not adequate to offset a net CBD job loss of nearly 3,100 jobs.

- The River District experienced a net gain of more than 2,500 jobs from 2000-08, with office-related job gains concentrated in services (+1,500), information and design (+825), and education and health (+590) – offset in part by net loss of industrial employment with legacy manufacturing and transportation, warehousing and wholesale firms. Strong growth of non-office employment (+2,000) is also noted for Pearl District activity in retail, arts and accommodations (including dining).
- Portland's Lloyd District also realized a substantial reported net job gain (up by more than 2,000). This was led by gains of office-related service sector jobs (+2,700), partially offset by some loss of industrial job base.
- Goose Hollow reported nominal employment growth in construction with job losses in nearly ever other industry sector, for a total employment decrease of 1,100.
- Of the non-Central City Commercial geographies, Hollywood is noted for the largest employment gain (over 2,200), indicated as being primarily related to education and health (+2,150).
- While overall employment increased only nominally in the Gateway area, strong growth was indicated for education and health (up by almost 1,000 jobs), offset by losses in a number of other job categories.
- Other urban geographies – including the University District in the Central City and other Urban Centers of St. Johns, Hillsdale, Lents, and West Portland – appear to have experienced very little job change over the 2000-08 period.

Figure 19 depicts the components of employment change across each of Portland's urban geographies from 2000 to 2008.

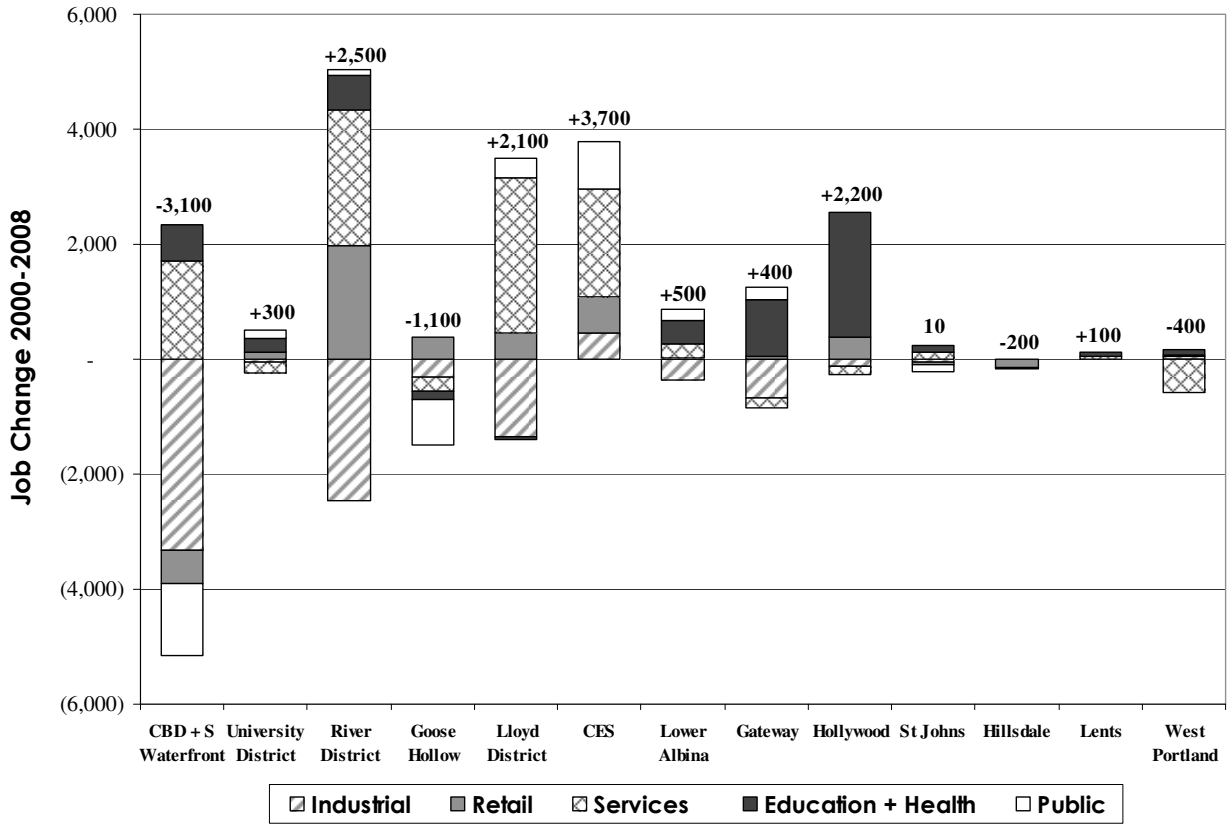
### *Employment Mix*

Portland's urban geographies differ not only in terms of recent employment gain or loss, but also with regard to the 2008 mix (or distribution) of employment:

- Approximately 46% of CBD employment is comprised of service businesses (ranging from professional to financial services), with 17-18% each in sectors of information and design and retail, arts and accommodations activity and 12% in the public sector. Together, these functions account for 92% of CBD employment.
- River District employment is relatively diverse, with retail, arts and accommodations accounting for 27% of employment, followed by services (at 21%), then information and design (16%), and with a still significant (15%) portion in transportation, warehousing and wholesaling activity.
- Services and retail (including arts and entertainment) account for about 70% of the Lloyd District employment.
- Central City incubator districts have an increasingly diverse mix of employment activity. Industrial accounts for 44% of Central Eastside employment, with strong added components of retail and service activities (at 17% each). In Lower Albina, industrial use accounts for a lesser 33% of district employment; education and health accounts for nearly half (at 46%).

- Retail represents the largest employment sector (at 30-44% of job base) for Goose Hollow, St. Johns and Hillsdale. For Gateway and Hollywood, education and health services are dominant employment activities, followed by retail. For Lents and West Portland, services represent the sector with the highest levels of district employment.

## Figure 17. Sectoral Trends within Urban Geographies




Source: Oregon Employment Dept., Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.

While retail is important across all of the urban geographies, it is the #1 employment sector for only four of the urban geographies – River District, Goose Hollow, St. Johns and Hillsdale. Other districts have experienced some level of business specialty and concentration – based on a combination of historical location decisions and ongoing agglomeration benefits (attracting similar businesses). Dominant or major forms of employment across all urban geographies require some form of office or related building space – though the configuration and density of development varies substantially both within and between Central City and other Urban Centers outside the city core.

## INDUSTRIAL AREAS

Portland has several different kinds of industrial areas: manufacturing/distribution, incubator and mixed. For this section of the EOA analysis, the *Columbia Harbor* geography includes the geographies of Harbor and Airport Districts and Harbor Access Lands combined. Columbia Harbor has been classified as a manufacturing/distribution industrial district. The Central City industrial districts of Central Eastside and Lower Albina are considered incubator, meaning they include a broader mix of industries. This mix is reflected in recent zoning amendments allowing greater amounts of office product – normally restricted within industrial sanctuaries – for information and design services. The Columbia Corridor (east of NE 82nd Ave) and the Dispersed Employment areas are considered mixed industrial areas.

The guiding question for this discussion is: *What competitive advantages are offered by the City's manufacturing/distribution and incubator districts – both currently and prospectively?* More specific aspects of this guiding question are:

- What job trends are observed within these districts?
- In what ways are job patterns similar or different between the manufacturing/distribution and incubator districts?
- What niches are forming within the incubator districts? Are they distinct from Columbia Harbor or other employment districts?
- How do incubator districts complement the Central City business district activity?
- What have absorption trends (demand) been in these districts?

### *Industrial/Incubator Employment Trends*

Employment within Portland's five industrial areas totaled close to 119,500 in 2008, representing 30% of employment citywide. In total, industrial areas report a net increase of approximately 500 jobs 2000-08, a gain averaging 0.1% annually. Employment losses were greatest in manufacturing (-6,800 jobs), followed by a net loss of nearly 4,700 transportation, warehouse and wholesale jobs. It should be noted that the employment trends in industrial geographies are contradicted by trends showing increased manufacturing output and cargo volumes over roughly the same time period. This is discussed later in this section.

Off-setting job losses in the industrial areas were an increase of approximately 9,100 service sectors jobs excluding retail and public administration (but including education and health). Again, some portion of these jobs likely reflects re-classification of jobs classified as industrial in 2000. An increase in utilizing temporary employment agencies has also likely caused some industrial areas jobs to be reported in other geographies (where temp agency offices are located).

### *District-Specific Trends*

One of the most important distinguishing factors between these districts – and the driver behind the "incubator" classification applied to the Central City districts – lies with their employment composition. Despite recent shifts towards service sector employment, Columbia Harbor retains close to 75% of its job base within the industrial sectors. Manufacturing represents 27% of total

employment with transportation, warehousing and wholesale activities at 40%; construction accounts for another 7% of Columbia Harbor employment.

As noted, this district is particularly distinguished by its high share of employment within the transportation and warehousing sectors. Columbia Harbor is also by far the largest industrial area, comprising 52% of total industrial area employment citywide. However, employment has declined in recent years, especially for the Harbor Access Lands portion of the Columbia Harbor geography.

Within the city's other industrial areas, industrial jobs represent a range of 33% of district employment in Lower Albina to 53% in Columbia East of 82nd. Retail accounts for 17% of employment in Central Eastside and 14% in Columbia East of 82nd. In the other industrial districts, retail accounts for less than 10% of the job total.

In Dispersed Employment areas, just 42% of jobs are associated with industrial sectors. At 35%, services are almost double their share as in any other industrial district, indicating that land use may have diverged from the zoning designation of these areas.

Service businesses (including information/design and education/health but excluding public administration employment) range from 17% of the job base in the Columbia Harbor to 55% in Lower Albina (for which Portland Public Schools is a major educational anchor employer). Service employment also exceeds industrial employment for the city's Dispersed Employment areas.

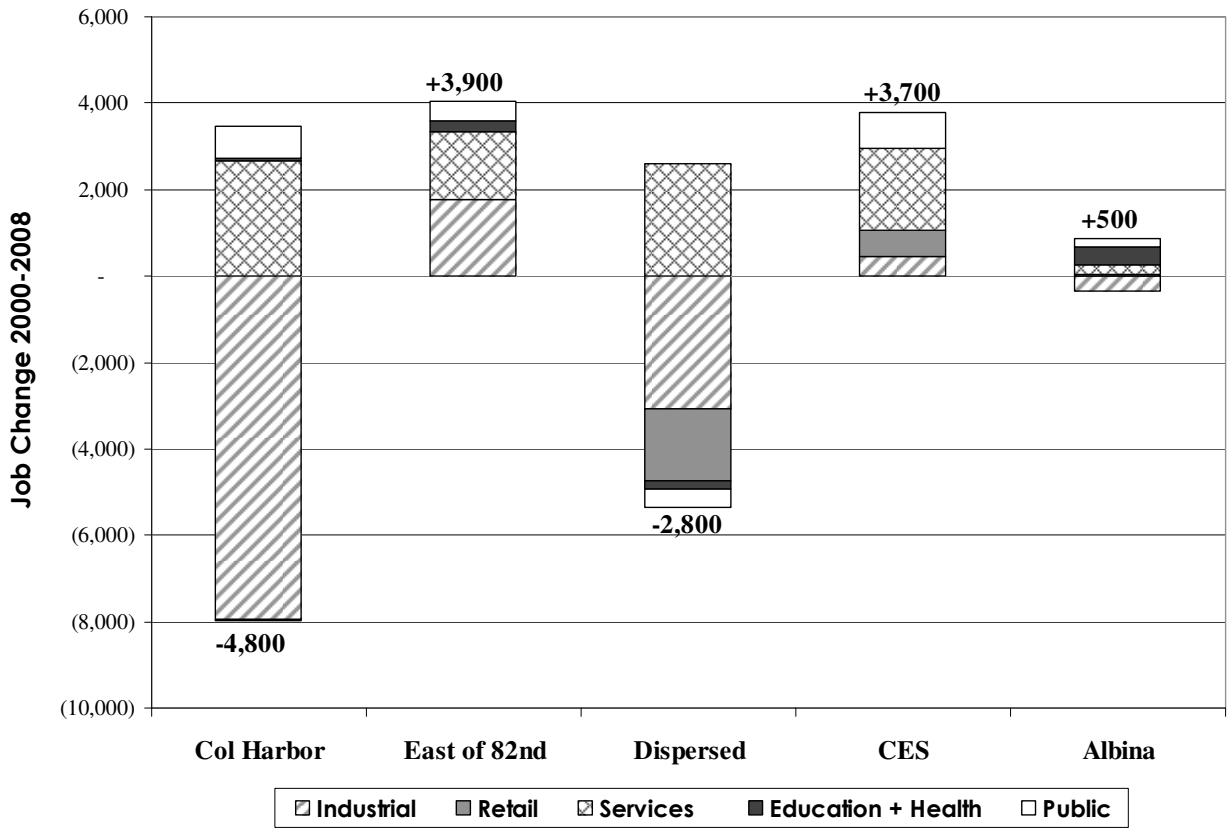
### *Net Job Gains vs. Losses*

As illustrated by the following graph, the Columbia Harbor and Dispersed Employment areas experienced net job loss from 2000-08. While not directly depicted by the graph, job losses (in percentage terms) where most substantial for Harbor Access Lands, a subset of the Columbia Harbor geography.

Conversely, the Columbia East of 82nd area as well as Central Eastside and Lower Albina incubator districts realized employment gains. Despite declining industrial employment, the Columbia Harbor and Dispersed Employment areas experienced some partial offsets with service sector job gains. Employment growth in the East of 82nd Avenue area was fairly balanced between service and industrial sector activity; a lesser proportion of industrial job growth is noted for Central Eastside.

Overall, Portland lost an estimated 22,700 industrial jobs between 2000 and 2008 (albeit with some portion likely reflecting a classification shift into the service sectors). Of this total, about 11,450 of the industrial job loss (or 50%) occurred within the city's five identified industrial districts; the remaining 50% is associated with declining industrial employment or shifts away from industrial employment classifications experienced elsewhere in the city.

## Figure 18. Industrial Areas Sector Changes (2000-2008)




Note: As "hybrid" or incubator districts, information for Central Eastside (CES) and Lower Albina is also shown with the Central City Commercial geographies.

Source: Oregon Employment Dept., Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.

### *Information & Design Services Trends*

This sector has been identified as being of particular relevance in the industrial districts, especially the City's emerging incubator districts. The Employment Opportunity Subarea within the Central Eastside Industrial Sanctuary allows out-right greater amounts of office space if occupied by information and design business types. The change sought to recognize the compatibility of business-serving businesses within the Central Eastside, the desire of these businesses to locate within the district, and the difficulty of reusing the district's historic multi-level industrial building stock for traditional industrial uses.

Information and Design Services (NAICS 51 and 54) consist of the information sector (except movie theaters), and the professional and technical services sector (except lawyers and accountants). The Central Eastside increased employment within this sector by about 930 jobs. However, it added an equivalent number of "traditional" service business jobs, and another 600 retail jobs, suggesting district attraction that extends beyond information and design. It should also be noted that the Central Eastside includes commercial as well as industrial sanctuary zoning; sector growth has not been cross-tabulated with zoning within the district.

Also of interest is how this sector changed in other city geographies. With a net gain of 825 jobs, the River District attracted almost as much of the employment growth in this sector as the Central Eastside. Another net gainer with this sector was Dispersed Commercial – up by 660 jobs from 2000-08. In contrast, information and design employment declined slightly (by about 20 jobs) in the CBD.

Participants in the focus groups conducted in 2009 described both the importance of keeping residential uses out of the Central Eastside and increasing zoning flexibility, recognizing its role as a complement to the CBD. The growth rates within the CES indicate that it is successfully attracting new jobs, with somewhat greater net job gains through 2008 than for the River District (the closest contender as a CBD business alternative).

### *Building Development Trends*

Despite job losses across the industrial sectors, Portland has realized development of new industrial building construction at an average rate of 1.5 million square feet per year (resulting in an end of 2008 in-city industrial building inventory of 81 million square feet). The amount of new industrial construction realized is significantly greater than the amount of development that occurred within either the retail or office building sectors (which realized 170,000 and 400,000 square feet annually citywide).

### Figure 19. Recent Industrial Development Trends (2003-2008)

| Subarea | Annual Average New Construction | Annual Absorption | Total Rentable Building Area |
|---|---|---|---|
| **Central City** | | | |
| CBD | - | (7,000) | 1,176,000 |
| Lloyd District | - | 53,000 | 2,671,000 |
| NW Close In | - | 3,000 | 1,044,000 |
| Johns Landing | - | 6,000 | 386,000 |
| **Inner Neighborhoods** | | | |
| SW Close In | - | - | 217,000 |
| NE Close In | 1,400 | 45,000 | 3,813,000 |
| SE Close In | - | 253,000 | 7,171,000 |
| **Industrial Areas** | | | |
| Hayden Island/Swan Island | - | 226,000 | 9,570,000 |
| Rivergate | 540,000 | 513,000 | 11,810,000 |
| Guild's Lake | 1,200 | 77,200 | 12,137,000 |
| **East Portland** | | | |
| Airport Way | 54,000 | 246,000 | 11,550,000 |
| Mall 205 | - | (300) | 231,000 |
| Gateway | - | 16,000 | 1,615,000 |
| East Columbia | 832,000 | 730,600 | 17,641,000 |
| Total | 1,428,600 | 2,161,500 | 81,032,000 |

Source: CoStar, E. D. Hovee & Company, LLC.

Observations of note from these data have included the following:

- Industrial development activity has located primarily within the Columbia Corridor: East Columbia (which includes some properties outside of the city), Rivergate and Airport Way. East Columbia and Rivergate report significant annual average new construction at 830,000 and 540,000 square feet per year (through 2008) respectively.
- Business park activity has dominated East Columbia development, whereas Airport Way was more equally split between stand-alone buildings (averaging around 25,000 square feet annually) and business park development.
- Recent development within both East Columbia and Rivergate also has had a significantly larger format, averaging 70,000 and 160,000 square feet respectively (reflecting Rivergate's distribution emphasis).
- The apparent disconnect between industrial jobs and industrial development may be related to high rates of industrial vintage relocation (existing businesses moving to new buildings, potentially leaving empty buildings unfilled – although vacancy rates have steadily fallen over the past five years to under 8% today) or changes in building use (with increased square feet per employee).

Thus far, Portland's manufacturing and distribution space does not appear to have realized the change in form and density that has been occurring with office and retail product, which are moving towards denser urban forms both within the Central City and along commercial corridors. While focus group participants cited a Central Eastside manufacturer that functions in a multi-story environment, this appears to be an anomaly. [7] A more common trend observed within the region's industrial parks is high cube space, in which building footprints are reduced by developing very high ceiling, single story warehouses (which can store more product in a given amount of building floor area).

### *Beyond Employment Trends*

The recent disconnect between employment and real estate trends is especially pronounced within the industrial sectors. While this Trends, Opportunities and Market Factors report is primarily concerned with employment trends and employment as a driver of land needs, it is important to note that jobs are not the only land driver or measure of an industry's economic contribution.

For instance, during this most recent period of industrial job loss, the Bureau of Economic Analysis reports that the value of manufacturing output increased by more than $9 billion for the 7-county region (Figure 23). More specifically, the economic activity in the Portland Harbor grew at 1.6% per year during approximately the same timeframe - 2002 to 2008. During that same time period, cargo volumes increased by 4.8% per year. Within the manufacturing sector at least, business growth (or profit) appears to contradict job growth, due in part to high commodity

[7] The firm involved cited with multi-story Central Eastside manufacturing activity is an example of a long-time business located in historic building stock. New industrial or warehouse development has yet to replicate the multi-story patterns of the first half of the last century.

pricing and strong export markets. Equivalent data for other industrial sectors such as transportation and warehousing is suppressed due to confidentiality.

**Figure 20. Portland-Vancouver MSA Gross Domestic Product Trends (2001-2006)**

| | ($ millions) | | Change | |
|---|---|---|---|---|
| Industry | 2001 | 2006 | Net | AAGR |
| All industry total | 77,200 | 103,400 | 26,200 | 6.0% |
| Private industries | 69,600 | 94,000 | 24,400 | 6.2% |
| Manufacturing | 12,000 | 21,000 | 9,000 | 11.8% |
| Transportation and utilities | 3,600 | 4,300 | 700 | 3.6% |
| Retail trade | 4,300 | 4,900 | 600 | 2.6% |
| Professional and business services | 8,700 | 11,000 | 2,300 | 4.8% |
| Education and health services | 5,400 | 7,600 | 2,200 | 7.1% |
| Leisure and hospitality | 2,300 | 3,000 | 700 | 5.5% |
| Information, Communication, and Technc | 8,200 | 15,800 | 7,600 | 14.0% |
| Government | 7,500 | 9,400 | 1,900 | 4.6% |
| *Private goods-producing industries* | *16,600* | *26,700* | *10,100* | *10.0%* |
| *Private services-providing industries* | *53,100* | *67,300* | *14,200* | *4.9%* |

Source: Portland Bureau of Planning and Sustainability, Bureau of Economic Analysis, April 2009.

Focus Group participants – both for this study and for the 2006 Working Harbor Reinvestment Strategy – offer some suggestions into how industrial employment trends, complicated by data inconsistencies, can be interpreted:

- For at least some industries, productivity improvements have led to growing output while employment has declined. For industrial uses, this activity was especially pronounced during a period when the value of the U.S. dollar was relatively low, stimulating export demand.
- Both industrial real estate brokers and City permit data report that the bulk of recent demand has been for warehouse and distribution uses; these typically are associated with lower employment densities than manufacturing.
- Distribution and wholesale activity in Portland may have benefitted from some "deconsolidation" of the national and global distribution industry, especially as higher fuel prices re-emerge with economic recovery. Having more but smaller distribution centers across the nation in smaller metro markets (such as Portland) can result in reduced transport costs.
- In older industrial areas and waterfront industrial areas, site reuse (and associated employment growth) is limited by a number of issues. These include:
  - ✓ *Contamination:* owners aren't yet lowering prices sufficiently to reflect the full cost of clean up, and in many cases the full extent of liability has yet to be resolved (as with Willamette River superfund sites).
  - ✓ *Retrofitting:* Building retrofitting is expensive, and the industrial sector typically seeks the lowest cost land and space of any sector.
  - ✓ *Zoning:* requiring a business to utilize either rail or water access limits the pool of qualifying businesses and will slow land absorption.

- ✓ *Flood plain:* particularly smaller sites become more expensive on a per square foot basis when floodplain or other environmental regulations are in play.

Regional data indicates that recent industrial sector growth has concentrated on the outskirts of the region, where greenfield development is more prevalent. Portland could capture this growth in the future if site re-use could be facilitated, stabilizing its industrial job base.

- Participants in the 2009 focus groups conducted for this EOA also added weight to the idea that employment in the harbor area has shifted towards the service sector: modern industry is described as "service-oriented" rather than needing heavy industrial space (e.g., retailers needing auxiliary warehouse space). In many cases, future demand was described as more likely to reflect industrial design and sales and marketing, with less space devoted to on-site manufacturing. Flex space – with a larger office component, higher parking ratios, and a broad range of space sizes – was described as a building product more in demand (especially in the Columbia Corridor east of I-205).

## NEIGHBORHOOD COMMERCIAL DISTRICTS

Neighborhood subareas incorporate the majority of areas outside of the Central City, Urban Centers, Institutions, and Industrial districts. Three different types of neighborhood subareas are covered: Commercial Corridors, Commercial Nodes, and Dispersed Commercial.

These Neighborhood districts account for close to half (42%) of the city's retail jobs and also a broad mix of employment across almost all sectors. The key guiding question for this sector is: *What is the current and future role of neighborhood commercial in Portland's changing economy?* Related questions for this demand analysis issue topic are:

- What trends have neighborhoods realized in employment?
- What broad demand trends can be predicted for additional neighborhood retail, either from a market or planning perspective?
- What trends have neighborhoods realized in building development?
- What are the implications of neighborhood employment and building development for realizing greater amounts of Transit Oriented Development?

### *Neighborhood Commercial Growth Trends*

In total, Neighborhood subareas accounted for an estimated 70,400 jobs as of 2008, 18% of the citywide job total. The sectors in which neighborhoods capture the greatest share of citywide covered employment are:

- Retail, arts, accommodation & food service: 42%
- Information & design: 19%
- Construction: 17%
- Services: 17%

While a significant contributor to the city's jobs base, employment data indicates that neighborhood commercial subareas lost an estimated 1,900 jobs between 2000 and 2008. Neighborhood district job losses appear to be pulling down the city's overall employment performance; this loss dwarfs that of any other geography except residential and open space.

Neighborhood district employment losses occurred in the majority of sectors except retail, arts, accommodation & food service (up by nearly 590), services (+440), information and design (+475), education and health services (+550). Net job losses were greatest with Commercial Corridors (-5,100 jobs) and Commercial Nodes (-580). Only Dispersed Commercial is indicated as experiencing net job growth (+3,900).

### *Commercial Corridors*

The city's Commercial Corridors encompass the largest share of Neighborhood jobs, accounting for 56% of Neighborhood district jobs.

The corridor designation indicates areas in which the City seeks to concentrate commercial activity. Commercial Corridors encompass both general commercial (auto-oriented) and storefront commercial zones, as well as much denser central employment and central housing zones. For this analysis, the corridors geography includes only corridors outside of plan areas and industrial areas, although many of those areas contain designated commercial corridors as well.

However, employment within the city's Commercial Corridors declined by more than 5,100 net jobs from 2000-08, reflecting a rate of job loss averaging 1.5% per year. Job losses were experienced across all sectors and particularly pronounced for construction, retail, and manufacturing activities.

Job losses indicated by employment data are somewhat surprising given that the focus groups have been bullish on neighborhood commercial growth potential and continued consumer support for these districts. The discrepancy could be due to perception or varying definitions of neighborhood business districts (as this definition of Commercial Corridors excludes nodes as well as town and regional centers).

### *Commercial Nodes*

These areas have covered about 12 intersections and, at 9,600 jobs, represent the least overall employment of the neighborhood geographies considered. Employment declined by nearly 600 jobs from 2000-08, for job loss averaging 0.7% per year. Similar to corridors, these Commercial Nodes experienced reduced employment across most sectors (except education and health).

### *Dispersed Commercial*

This geography is zone-based and includes both auto-oriented and storefront commercial zones that are not in designated commercial corridors. Dispersed commercial areas tend to cluster as "second tier" corridor space and also constitute small areas of discrete zoning (commercial corners).

Dispersed Commercial areas accounted for about 21,700 jobs in 2008 (or 31% of neighborhood employment). A net gain of 3,900 jobs is noted for 2000-08 (up by 2.5% per year) – the only one of the neighborhood geographies for which an employment increase is reported.

Nearly one-half of the employment increase occurred with retail, arts and accommodations (including dining) uses. Job gains are also noted for education and health, manufacturing, information and design, and service sector businesses

Dispersed Commercial areas appear to function somewhat differently with a broader mix of job types compared to the other neighborhood geographies. Both industrial sectors and services are more prevalent within this geography. Retail is less important as a share of the total as compared with Commercial Corridors and Nodes.

Corridors, Nodes and Dispersed Commercial include both auto-oriented and storefront commercial zones.

## RESIDENTIAL & OPEN SPACE ZONES

As of 2008, these non-employment geographies make up a surprising 10% of covered employment citywide, a total of over 38,900 jobs. Employment within residential zones includes schools, some institutions, home-based businesses and non-conforming uses. Not counted with employment data are individuals not covered by unemployment insurance (likely including many home occupations as sole proprietors, a factor that is likely of greater significance within residential zones).

Covered employment within residential zones is dominated by education and health care (at 45% of total covered employment). This likely reflects those institutional users to which special institutional or employment designations have not been applied (particularly as with neighborhood schools). Services account for another 19% of residential jobs, and retail comprises only 9%.Retail Growth Potential

As previously noted, close to half (42%) of the city's retail jobs are located within the City's neighborhoods-based employment geographies. Retail growth is a driver for neighborhood business districts and commercial corridors, but not the primary driver. Jobs data indicates that retail comprises just under one-third of neighborhood jobs across all subareas.

Generally, Portland is adequately retailed. Focus group participants tied retail growth potential to household growth and leakage data supports this assessment. As of 2008, the national demographics firm ERSI Business Analyst estimates that the city supports about $6.5 billion annually in resident-generated demand for retail, food and drink, but generates $7.6 billion in yearly sales volume. This indicates that, in addition to serving local resident needs the city serves as a regional destination market, attracting and supported by residents of surrounding communities throughout the metro region and beyond.

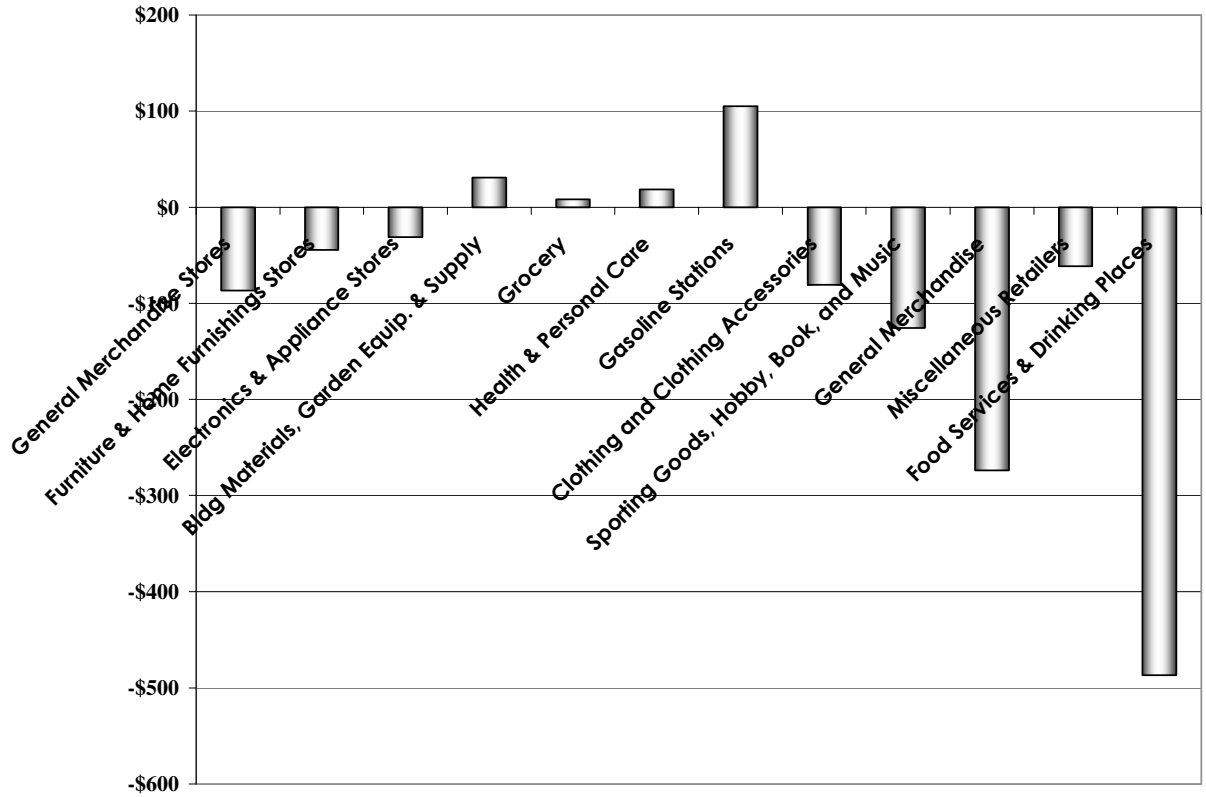
The following graph illustrates citywide retail leakage by store type. Negative numbers indicate store types in which supply exceeds demand: there is no sales leakage, or dollars spent by Portland residents outside of the city (in reality of course, residents shop in a variety of

jurisdictions, but the *net* result indicates that Portland retail supply is adequate to meet the shopping needs of Portland residents).

Retail sales leakage is reported within four retail categories, indicating there may be room for growth to meet residents' needs for building materials and garden supply (an estimated $87 million in sales leakage); grocery ($7.8 million); health and personal care ($18.5 million), and gas stations (over $100 million).

Retail types estimated to have captured the greatest share of non-resident as well as resident spending potential are restaurants and bars, general merchandise (department stores), and sporting good stores.

**Figure 21. City of Portland Leakage by Store Type (2008)**




Source: ESRI, E. D. Hovee & Company, LLC.

These numbers may in also reflect shopping patterns for Portland residents or store classifications that diverge from the national average (for instance, Portland residents may spend less on gas). On the 4-county metro level (including Clark County), retail demand appears to be more in line with supply. In 2008 there was an estimated $24 billion in retail demand and $23 billion in retail sales.

Given that greater retail supply is not needed to meet the needs of residents (of either the city or the 4-county region), retail development over the longer term is dependent primarily on some

combination of population and/or income growth coupled with destination tourism activity. Portland can also increase its capture of the regional retail market available by strengthening its destination districts and out-competing surrounding communities.

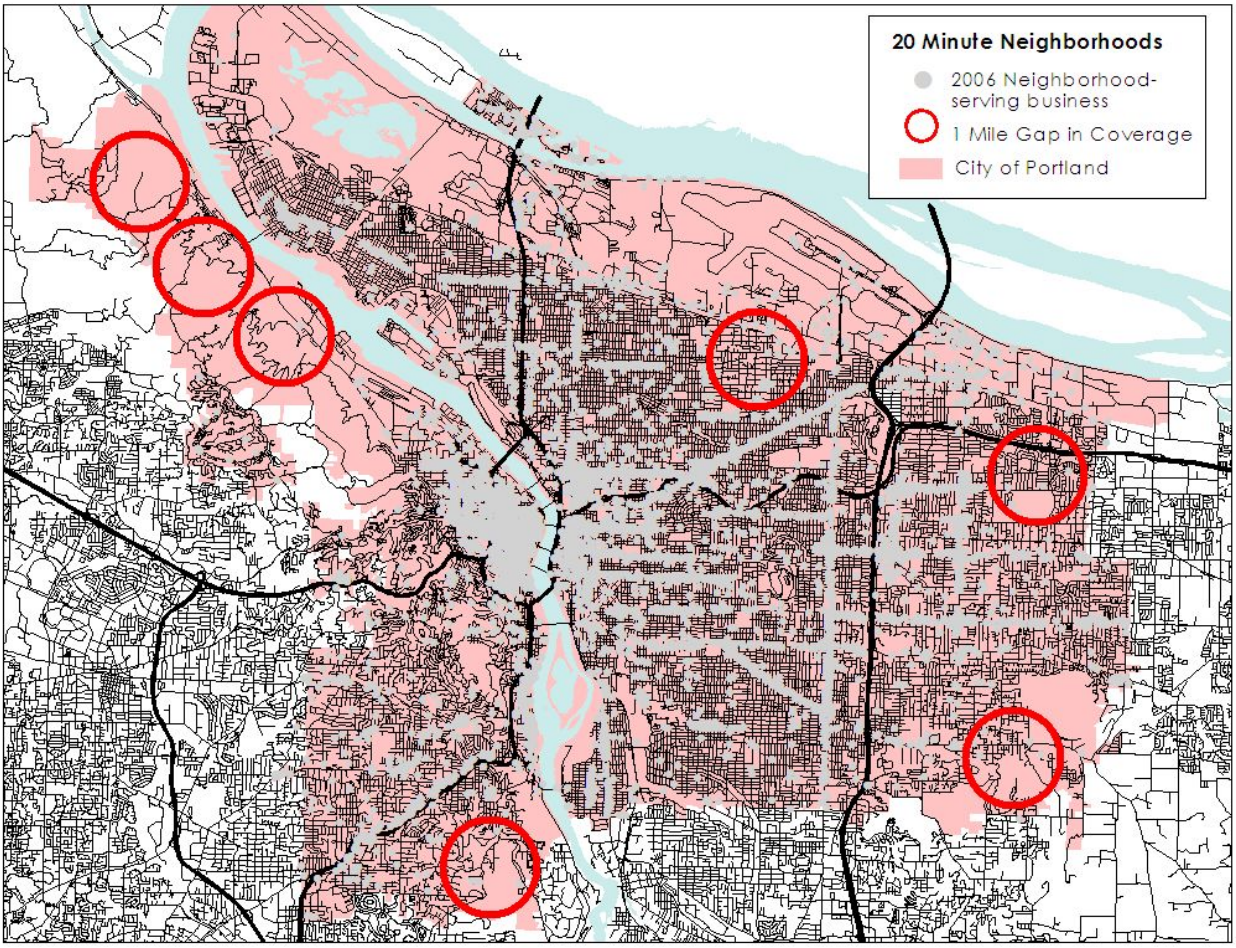
### *Complete Neighborhoods*

Portland's retail districts and corridors are a mix of neighborhood-serving and destination businesses, a distinction deriving as much from a business's product or service mix as from its NAICS classification. Some businesses function as destinations purely because of their status within a business cluster (e.g., as with retailers along NW 23rd or within Lloyd Center Mall); other businesses – such as dry cleaners or convenience markets – are located within a destination business cluster but may primarily serve adjacent households. Many of Portland's commercial corridors function as destination shopping districts, or as a mix of local and destination shopping.

One of the City's planning objectives is to encourage complete or "20 minute" neighborhoods, meaning that daily goods and services are available to households within a walkable distance (equating to roughly one mile). Figure 24 shows these neighborhood serving businesses, which comprise about ¼ of total employment, and identifies areas of gaps in retail coverage.

Based on this visual overview, retail opportunities appear to be reasonably well distributed throughout the city except for a few areas that have more than one mile gap between businesses. Neighborhood-serving businesses blanket the city's commercial corridors and virtually duplicate the arterial street grid. Retail densities decrease east of I-205 (outside of Gateway and SE 122nd), within the Cully neighborhood (west of I-205) and along the narrow but limited residentially populated Northwest corridor between the Willamette River and Forest Park.

## Figure 22. Neighborhood Serving Retail Locations



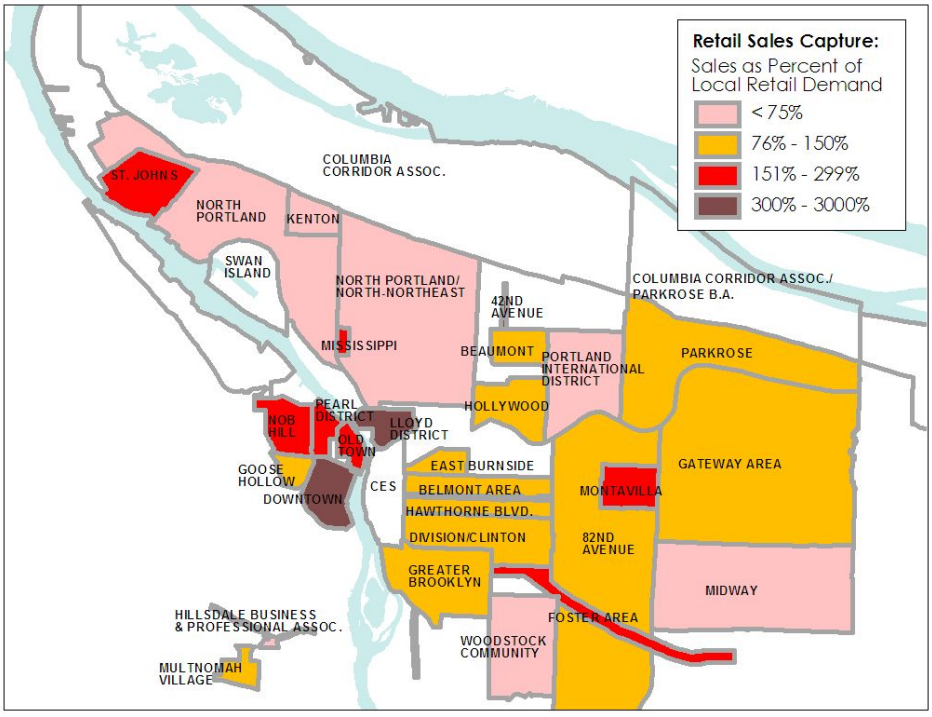

Source: Oregon Employment Department, E. D. Hovee & Company, LLC.

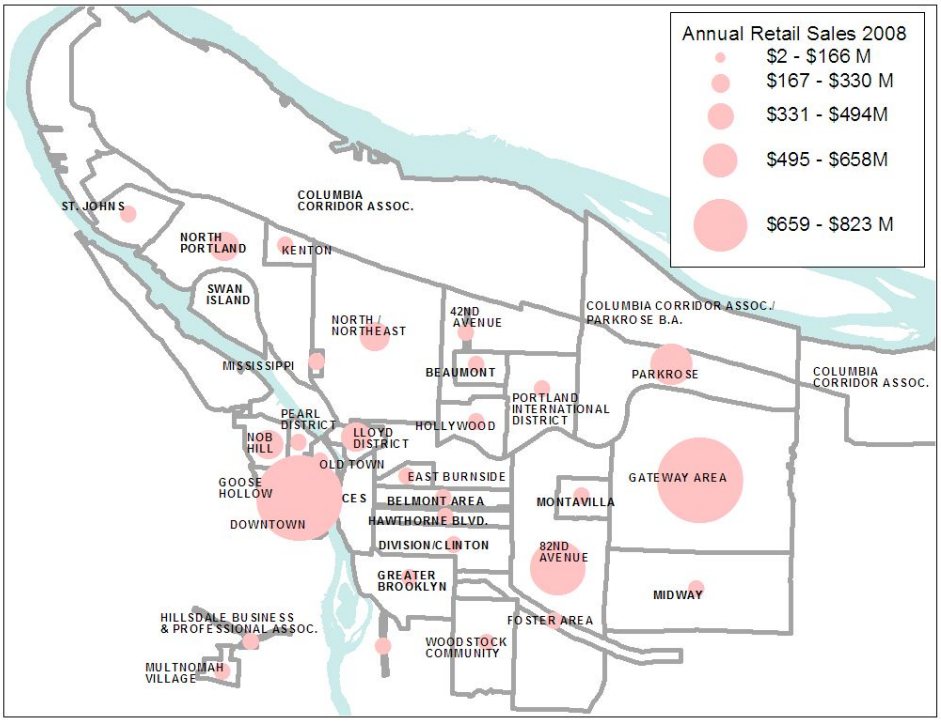
### *Business Associations*

Portland's Business Associations provide another way to analyze retail distribution. Out of the 34 associations, five are predominantly industrial and sales do not represent retail. Of the remaining 29 business associations, 17 reported sales in excess of estimated household demand – these districts function as destinations.

Central City districts top the list for sales capture, given the destination status of downtown retail in general. Neighborhoods with the highest capture rates include Montavilla, Mississippi, St. Johns and Nob Hill. In terms of sales volume, Gateway, 82nd Avenue, North/Northeast and the North Portland Business Association top the list.

## Figure 23. Non-Industrial Business District Capture Rates & Sales Volumes (2008)



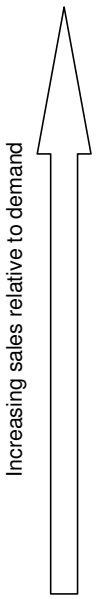




Note: Data is only displayed for non-industrial business associations.

Source: ESRI, Portland Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.

## Figure 24. Business Association Supply & Demand (2008)

| Type | Business Association | (in $ millions) Demand | Supply | Supply Rank | Sales Capture (Supply/Demand) |
|---|---|---|---|---|---|
| Industrial | Swan Island Business Association | $1.5 | $157.6 | 12 | 10630% |
| Central City | Lloyd District Business Association | $11.4 | $264.7 | 8 | 2328% |
| Industrial | Central Eastside Industrial Council | $14.6 | $260.2 | 10 | 1785% |
| Industrial | Columbia Corridor Business Association | $136.7 | $1,212.9 | 1 | 887% |
| Neighborhood | 42nd Avenue Business Association | $2.0 | $16.4 | 31 | 819% |
| Central City | Downtown Retail Council | $131.4 | $822.8 | 2 | 626% |
| Central City | Old Town Chinatown | $32.9 | $85.4 | 24 | 259% |
| Central City | Pearl District Business Association | $60.7 | $151.7 | 13 | 250% |
| Neighborhood | Foster Area Business Association | $49.9 | $120.4 | 18 | 241% |
| Neighborhood | Montevilla Business Association | $45.8 | $101.1 | 20 | 221% |
| Neighborhood | Historic Mississippi | $6.4 | $12.4 | 32 | 192% |
| Town Center | St Johns | $62.8 | $102.5 | 19 | 163% |
| Neighborhood | Nob Hill Business Association | $168.9 | $261.8 | 9 | 155% |
| Regional Center | Gateway Area Business Association | $495.3 | $744.8 | 3 | 150% |
| Industrial | Columbia Corridor Association and Parkrose I | $236.4 | $349.7 | 5 | 148% |
| Central City | Goose Hollow Business Association | $71.1 | $86.1 | 23 | 121% |
| Neighborhood | Hawthorne Business Association | $106.8 | $124.9 | 16 | 117% |
| Town Center | Hollywood Boosters | $106.5 | $121.9 | 17 | 114% |
| Neighborhood | Greater Brooklyn Business Association | $141.0 | $146.9 | 14 | 104% |
| Neighborhood | East Burnside Business Association | $51.6 | $53.7 | 27 | 104% |
| Neighborhood | Multnomah Village Business Association | $25.9 | $26.4 | 29 | 102% |
| Neighborhood | Westmoreland Business Association | $6.4 | $5.8 | 33 | 90% |
| Neighborhood | 82nd Avenue Business Association | $627.9 | $550.2 | 4 | 88% |
| Neighborhood | Belmont Business Association | $114.9 | $99.3 | 21 | 86% |
| Neighborhood | Beaumont Business Association | $42.7 | $36.1 | 28 | 84% |
| Neighborhood | Division-Clinton Business Association | $165.4 | $128.7 | 15 | 78% |
| Neighborhood | Kenton Business Association | $34.2 | $25.6 | 30 | 75% |
| Neighborhood | North Portland Business Association | $399.3 | $273.5 | 7 | 68% |
| Neighborhood | International Business District | $151.5 | $90.6 | 22 | 60% |
| Neighborhood | North-Northeast Business Association | $571.2 | $317.7 | 6 | 56% |
| Neighborhood | Midway Business Association | $296.9 | $165.0 | 11 | 56% |
| Neighborhood | Woodstock Business Association | $135.5 | $74.4 | 25 | 55% |
| Town Center | Hillsdale Business Association | $14.1 | $1.7 | 34 | 12% |
| Industrial | NW Industrial | $0.0 | $72.5 | 26 | NA |




Source: ESRI, Portland Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.

Neighborhoods with relatively lower retail capture include Hillsdale, Woodstock, Midway, North-Northeast, North and Kenton. North-Northeast and North appear to be large districts with lower capture rates despite relatively larger sales volumes. The caveat is that some business associations have been narrowly defined to include a commercial corridor only and not the surrounding households (such as NE 42nd Avenue and Foster Area); sales capture rates for these business districts are therefore not a good estimate for whether surrounding neighborhoods are adequately served. High capture rates can also describe areas with relatively little housing, such as Old Town or Lloyd District (which has a relatively low residential mix and supports a regional mall).

To encourage added retail in areas where existing stores or related customer services are more limited, identifying *market drivers* to each specific neighborhood district represents a key opportunity and challenge:

- Retail is drawn to areas with high household density or high household income and offering good traffic/pedestrian counts plus street visibility. Existing retail locations reflect these market preferences.
- As referenced by focus group participants, neighborhood commercial growth will require greater household density. Encouraging household density – through zoning and project subsidies – may have a greater impact on retail site selection than either introducing commercial zoning or supporting commercial development in areas in which these are now missing.
- Since most (though not all) of the city currently has 20-minute coverage, a priority opportunity may be more to encourage locating critical urban retail services (e.g. grocery) and supportive infill rather than to create new or expanded retail districts.

### *Neighborhood Commercial Growth Trends: Building Development*

Retail space has dominated the inventory of newly developed commercial space within Portland's neighborhoods, averaging about 300,000 new square feet annually over a five year period (from 2003-08) outside of the Central City. However, retail employment fell by about 4,000 jobs with 2/3 of that loss coming from the neighborhoods despite significant new building development.

The disconnect between these two trends may in part be due to service jobs locating within retail spaces. Also noted is that a significant contributor to neighborhood retail has been dining, which is no longer defined with retail (for employment classification purposes) but with arts, accommodations and food services. This sector is as large within the neighborhood geographies as the retail sector; however, it too declined over the study time frame.

Rather than corresponding necessarily to retail users (as defined by NAICS), retail space is increasingly becoming defined as either a) ground floor space within densely developed districts, with office or residential above, or b) a lower density or smaller footprint product (in comparison with office) within more suburban or main street settings.

Citywide, retail building development over the 2003-08 time period was dominated by Cascade Station, within the Airport Way subarea. That subarea has seen over 620,000 square feet of new large format/power center retail development over this five year period. This is close to twice the square footage added to the CBD (356,000 square feet) over the same time period, about 2/3 of which was ground floor space in residential buildings.

## Figure 25. Recent Retail Development Trends (2003-2008)

| Subarea | Annual Average New Construction | Absorption | Total Rentable Building Area |
|---|---|---|---|
| **Central City** | | | |
| CBD | 71,200 | 39,400 | 9,195,000 |
| Lloyd District | 6,900 | 17,100 | 4,689,000 |
| Johns Landing | 6,000 | 2,400 | 335,000 |
| NW Close In | 8,400 | 15,700 | 1,803,000 |
| **Inner Neighborhoods** | | | |
| SW Close In | 8,600 | 6,600 | 902,000 |
| NE Close In | 24,700 | 26,200 | 2,810,000 |
| SE Close In | 20,500 | 40,000 | 4,085,000 |
| **Industrial Areas** | | | |
| North Portland | 47,700 | 39,600 | 2,506,000 |
| Rivergate | - | (1,300) | 349,000 |
| **East Portland** | | | |
| Airport Way | 124,100 | 139,000 | 2,710,000 |
| Mall 205 | 30,500 | 53,700 | 3,760,000 |
| Gateway | 14,900 | 32,500 | 3,720,000 |
| East Columbia | 39,500 | 55,600 | 3,060,000 |
| Total | 403,000 | 466,500 | 39,924,000 |

Source: E. D. Hovee & Company, LLC.

The other top subareas for attracting new (and inventoried) retail development were neighborhoods, with almost all growth locating along commercial corridors such as Killingsworth, Alberta, Lombard, MLK, Belmont, Division and Hawthorne. In-fill development along commercial corridors may also be classified as commercial retail/service by default due to the typical smaller building size.

- North Portland: 140,000 square feet
- Mall 205: 153,000 square feet (a submarket extending beyond the Mall property only)[8]
- Inner Northeast: 125,000
- Inner Southeast: 100,000

Office development has been both more limited and more concentrated than retail over the study time frame, with only 800,000 square feet developed citywide compared with 1.7 million square feet of new retail space. In contrast with retail trends, about 60% of newly developed office space was located within the CBD + Lloyd District, another 24% in Gateway and the remainder consisted largely of Class B buildings of less than 35,000 square feet each dispersed throughout the city.

[8] Mall 205 is a submarket defined by CoStar and encompasses an area larger than the mall property.

### *Implications for Transit Oriented Development*

Transit Oriented Development (TOD) describes dense development (a relative descriptor), either commercial or residential, with lower than average parking ratios and in close proximity to transit routes, either bus or fixed rail. TOD is also often viewed as occurring within a mixed use setting – as with residential (or in some cases office) above ground floor retail and related active use commercial space.

From a business owner's perspective, TOD offers commercial space that is probably on the leading edge of the density to which the private market is willing to develop. "Denser" development may command a cost premium associated with steel vs. wood frame construction, although buildings up to five stories can be achieved via wood framing, and this quality of development may be acceptable for certain users outside of the Central City.

Businesses will desire space within an area or corridor suitable for TOD if:

- The space is well-located and visible to target customers
- The space is affordable
- The business' customers can and will access the building in the absence of expansive parking options

The answer to these questions is not dictated by a building's status as a TOD, although TODs are likely to be well-located (on commercial corridors) and well-served by transit. Rather than business demand, the extent to which this region sees additional TODs along its commercial corridors will be influenced by:

- Continued density increases within Portland's neighborhoods;
- Continued resident and visitor preference for mixed use neighborhood retail districts (a vision to which participants in focus groups generally adhere, despite the indicated job losses);
- Flexibility with building uses allowed within commercial zones; and
- Over-all economic vitality and growth of the Portland metro region.

Continued growth in commercial rents to support more expensive construction techniques is also a consideration. In recent years Portland has seen significant market-driven in-fill commercial development occurring along relatively low-rent commercial corridors such as NE Alberta. The bulk of this development to date has been single story, indicating that the market will likely bring TOD projects – as opposed to infill – to those corridors now capable of achieving the highest rental rates.

Corridors reporting rents above $20 per square foot as of March 2009 include SE Bybee, NE Broadway/Weidler, N Williams, John's Landing, SE Belmont, N Mississippi and SE Division. While not a threshold that indicates certain development feasibility (which will vary according to construction technique, building configuration and building use mix), these reported rents have been on a par with the range reported for many Central City properties in the Pearl District, the West End and the CBD.

## INSTITUTIONAL DEVELOPMENT

For this analysis, the focus is education and health institutions (but with secondary consideration of other public agency jobs). The key question for this topic is: *How will rapid growth of institutional employment and building needs be both accommodated within and potentially reshape development in Portland?* Related questions around this topic are:

- What job growth has occurred within Portland's major institutional campuses?
- What job growth has occurred for institutional users that may not be located on institutional campuses?
- What are the unique land requirements of institutional users, and how are those changing?

### *Institutional Definitions & Associated Employment*

This section of the report tracks institutional-related employment in two distinct ways:

- Campuses for 10 colleges and 7 hospitals on sites of more than 10 acres, which account for an estimated 35,200 jobs as of 2008, excluding Portland State University (Central City) and Adventist Medical Center(Gateway Regional Center). This *campus institutional* category is a primary frame of reference for the EOA analysis.
- All institutional uses throughout the City, consisting of schools and hospitals in all Comprehensive Plan zones and all businesses in the IR zone – account for 2008 employment estimated at 54,400.

- A third, broader indicator of institutional employment is the combined education and health care sectors, which totaled 84,660 jobs citywide in 2008.

### *Employment Associated with Institutional Uses*

As depicted by the chart on the following page, the discussion in this section begins more broadly on the 54,400 jobs represented by schools and hospitals throughout all zones of the City plus other businesses within the City's IR zone.

- From 2000-08, employment associated with these institutional uses within this zone increased at a rate averaging about 2.5% per year – well above the citywide job growth rate of just 0.1% per year.
- In 2008, 24% of employment situated within the IR zone was outside of hospitals and schools. The bulk of this was health-related (doctors offices, HMOs) and the remainder a mix of supportive uses such as retail and un-related businesses.

Institutional employment growth from 2000-08 has been stronger outside of institutional zoning than within this zone. These sectors averaged 2.5% annual growth citywide, compared with a growth rate of close to 2% within the IR zone. This appears to be primarily due to relatively flat employment with schools, while hospital and related IR zone employment increased more substantially.

## Figure 26. Institutional Employment Trends (2000-2008)

| | General Commercial CG | Central Commercial CX | Central Employment EX | Institution IR | Industrial Sanctuary IS | Mixed Employment ME | Commercial Storefront NC,OC,UC | Open Space OS | SFR R2.5,R5, R7,R10 | MFR R1,R2,R3, RH,RX | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2008** | | | | | | | | | | | |
| Institutions (defined by NAICS) | | | | | | | | | | | |
| Schools | 448 | 3,257 | 12,821 | 4,968 | 1,402 | 140 | 358 | 583 | 5,513 | 4,383 | 33,873 |
| *Primary* | *103* | *228* | *114* | *1,110* | *1,380* | *1* | *251* | *583* | *5,214* | *1,760* | *10,744* |
| *College* | *345* | *3,029* | *12,707* | *3,858* | *22* | *139* | *107* | - | *299* | *2,623* | *23,129* |
| Hospitals | - | 3,330 | 3,181 | 5,430 | 1 | - | 99 | - | - | 5,232 | 17,273 |
| Other businesses within IR Zone | | | | | | | | | | | |
| Health related | | | | 2,771 | | | | | | | 2,771 |
| Other | | | | 531 | | | | | | | 531 |
| | 448 | 6,587 | 16,002 | 13,700 | 1,403 | 140 | 457 | 583 | 5,513 | 9,615 | 54,448 |
| *2008 Share* | *1%* | *12%* | *29%* | *25%* | *3%* | *0%* | *1%* | *1%* | *10%* | *18%* | *100%* |
| *AAGR 00-08* | *5%* | *4%* | *4%* | *2%* | *3%* | *-1%* | *22%* | *26%* | *-2%* | *3%* | *2.5%* |
| **2000** | | | | | | | | | | | |
| Institutions (defined by NAICS) | | | | | | | | | | | |
| Schools | 297 | 3,009 | 9,313 | 4,586 | 1,080 | 154 | 92 | 91 | 6,691 | 2,313 | 27,626 |
| Hospitals | - | 1,866 | 2,441 | 4,378 | - | - | - | - | 35 | 5,395 | 14,115 |
| Other businesses within IR Zone | | | | | | | | | | | |
| Health related | - | - | - | 1,666 | - | - | - | - | - | - | 1,666 |
| Other | - | - | - | 1,174 | - | - | - | - | - | - | 1,174 |
| | 297 | 4,875 | 11,754 | 11,804 | 1,080 | 154 | 92 | 91 | 6,726 | 7,708 | 44,581 |
| *2000 Share* | *1%* | *11%* | *26%* | *26%* | *2%* | *0%* | *0%* | *0%* | *15%* | *17%* | *100%* |

Source: Oregon Employment Department, Portland Bureau of Planning, E. D. Hovee & Company, LLC.

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### *Trends within Key Institutions*

Rather than reflect zoning designation, the institutional geography reported in Figure 14 (earlier in the report) reflects land owned by 17 hospitals and colleges on sites of at least 10 acres and 100 employees each. Total employment of 35,200 is more than double the 13,700 jobs located within IR-designated zoning. For these 17 large site institutions, employment grew at about 3.6% per year, above the average of 2.5% for citywide institutional employment.

**Hospitals**

- Oregon Health & Science University
- Shriners Hospital
- Portland Veteran's Hospital
- Providence Portland Medical Center
- Legacy Emanuel Hospital & Health Center
- Legacy Good Samaritan Hospital
- Kaiser Medical Centers

**Colleges**

- Portland Community College (Sylvania)
- Portland Community College (Cascade)
- Portland Community College (Southeast)
- Reed College
- Lewis & Clark College
- University of Portland
- Multnomah Bible College
- Concordia University
- Western States Chiropractic College
- Warner Pacific University

Note: Adventist Medical Center and Portland State University (PSU) are not included in the Institutional employment geography – Adventist is part of the Gateway Regional Center and PSU is included with the Central City University District.

Many of these institutional uses are located on what could be considered as legacy sites that are in or near residential neighborhoods. Site decisions made decades ago for what typically began as relatively modest uses may have been for reasons unrelated to factors that would be considered today if these institutions were to start anew.

### *Implications for Future Development*

Taken together, the city's 54,400 institutional use jobs account for about 14% of its jobs base. The bulk of these are associated with the city's colleges and hospitals. Institutions are key employment drivers and now among the fastest growing economic sectors in Portland.

With its moderate growth (mid-case) scenario, Metro forecasts that education and health care employment will increase by a combined average rate of 2.8% per year. This is well above the average projected growth rate of 1.7% for all regional employment and more than double anticipated public agency job growth.

To the degree that Portland continues to capture a relatively high share of medical and educational employment (particularly for higher education), growth needs for this sector can be

expected to account for an increasing share of the city's total job base and associated building space requirements.

Based on the combination of this quantitative review and qualitative assessment from the institutional focus group, key challenges for the city's institutions (both larger and smaller) will include:

- Opportunities for maintaining a strong in-city presence as a key economic development driver – offset by growing impetus for decentralization to get closer to residential populations.
- Improved transit access or other transportation options to better serve patrons and employees – especially for institutions currently not conveniently located near transit.
- Potential for increased density of development – as an alternative to expanded site area.
- Consistency of land use approach and approval process for institutional users – especially those situated within or near residential neighborhoods.

# VI. LOCAL SECTOR SPECIALIZATIONS

This analysis considers local sector specializations both for the Portland metro area and the City of Portland. A common approach to defining comparative advantage is via location quotient (or LQ), which compares a geography's concentration of employment with the national average.

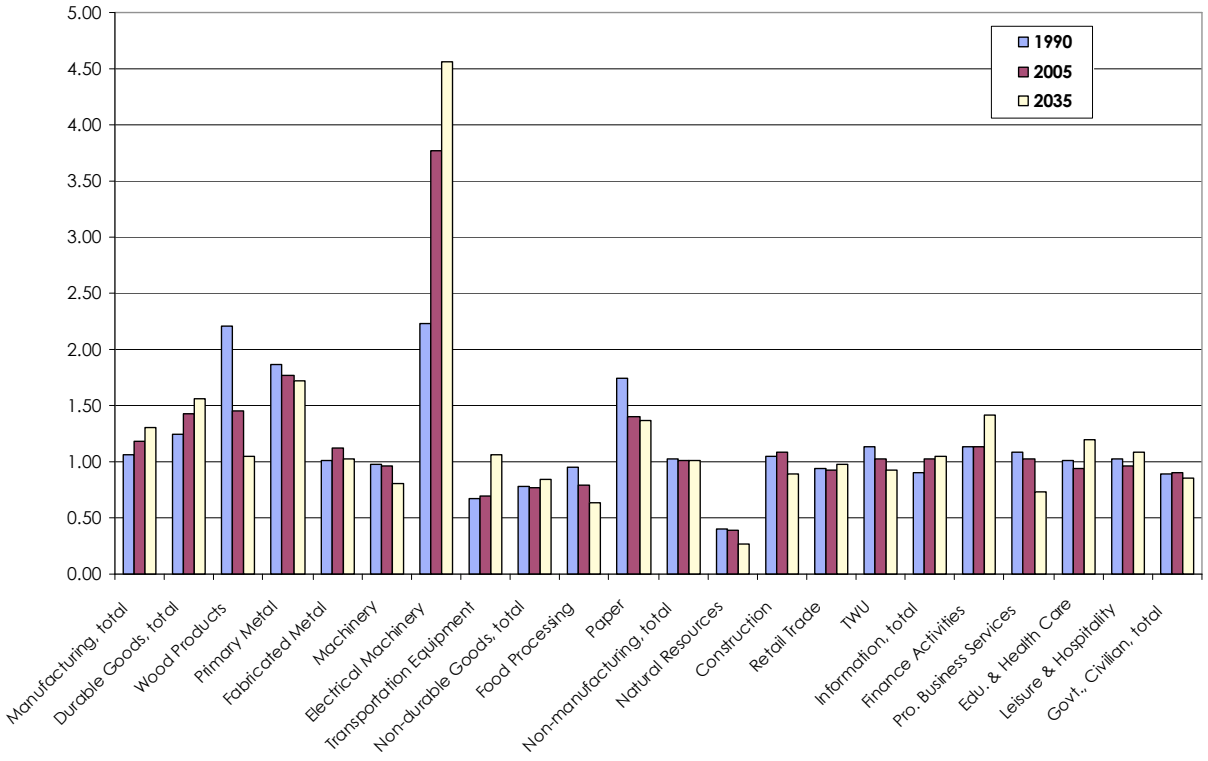
Portland can be defined as having a comparative advantage for sectors in which employment concentration is above the national average: a LQ of one or above.[9] For example, if 20% of the region's employment is in a particular sector versus just 10% of the nation's job base, the location would be 2.0 – meaning that this region has twice the concentration of employment in that sector as the nation.

## PORTLAND METRO SPECIALIZATIONS

The following chart illustrates changes in LQ by major job sector for the historic period 1990-2005 and as projected by Metro to 2035. The greatest detail is provided for manufacturing sub-sectors.

[9] While comparative advantage analysis offers a snapshot of the relative concentration of employment in a region compared to the U.S. at a point in time, that advantage may be a reflection of both historic and current competitive advantage of the region relative to the nation. This changing competitive position can be indicated by the *shift* portion of *shift-share* analysis – with the shift indicated as the change in location quotient (LQ) between two or more different points in time.

**Figure 27. Changing Portland Competitive Advantage – All Industries (1990-2035)**




Source: Global Insight, *2008 QR US Long-Term Outlook* and Metro.

## Manufacturing LQ

The Portland metro area has gone from a slight comparative advantage relative to the nation in *manufacturing* in 1990 (LQ – 1.06) to a more substantial position as of 2005 (LQ – 1.18). This indicates that the region better maintained its manufacturing job count while net job loss was experienced across the nation as a whole. Metro has forecast that this comparative advantage may increase by 2035 to an LQ of as much as 1.30. If realized, this forecast would allow for a net manufacturing job gain of about 7% between 2005 and 2035.

LQs have increased since 1990 for manufacturing sectors of electrical machinery and transportation equipment, while declining for wood products, food processing and paper. Metals and machinery have about held their own relative to the nation. Looking forward to 2035, Metro has forecast continued LQ gains for electrical machinery and transportation equipment; the other manufacturing sectors are projected to hold steady or decline.

## Non-Manufacturing LQ

Overall, non-manufacturing industrial sectors show relatively little comparative advantage relative to the rest of the nation. These sectors have experienced relatively minor changes in LQ since 1990, with slight gains noted for construction and information and losses for natural resources, transportation and warehousing, and utilities. These trends are largely expected to

continue forward except for construction where declining LQ is forecast (albeit after a continued surge that was projected to about 2010). Also noted is that Metro projects a growing LQ potential for publishing (a subsector of the information sector).

For most service sectors, Portland does not show any substantial comparative advantage relative to the rest of the U.S. – with the modest exceptions of finance activities (especially real estate) and professional business services (notably management of companies). Looking forward, Metro is projecting increased comparative advantage for finance activities, education and health care and other services (including personal services), but reduced LQ for professional business services (except management of companies).

## CITYWIDE VALUE ADDED CLUSTERS

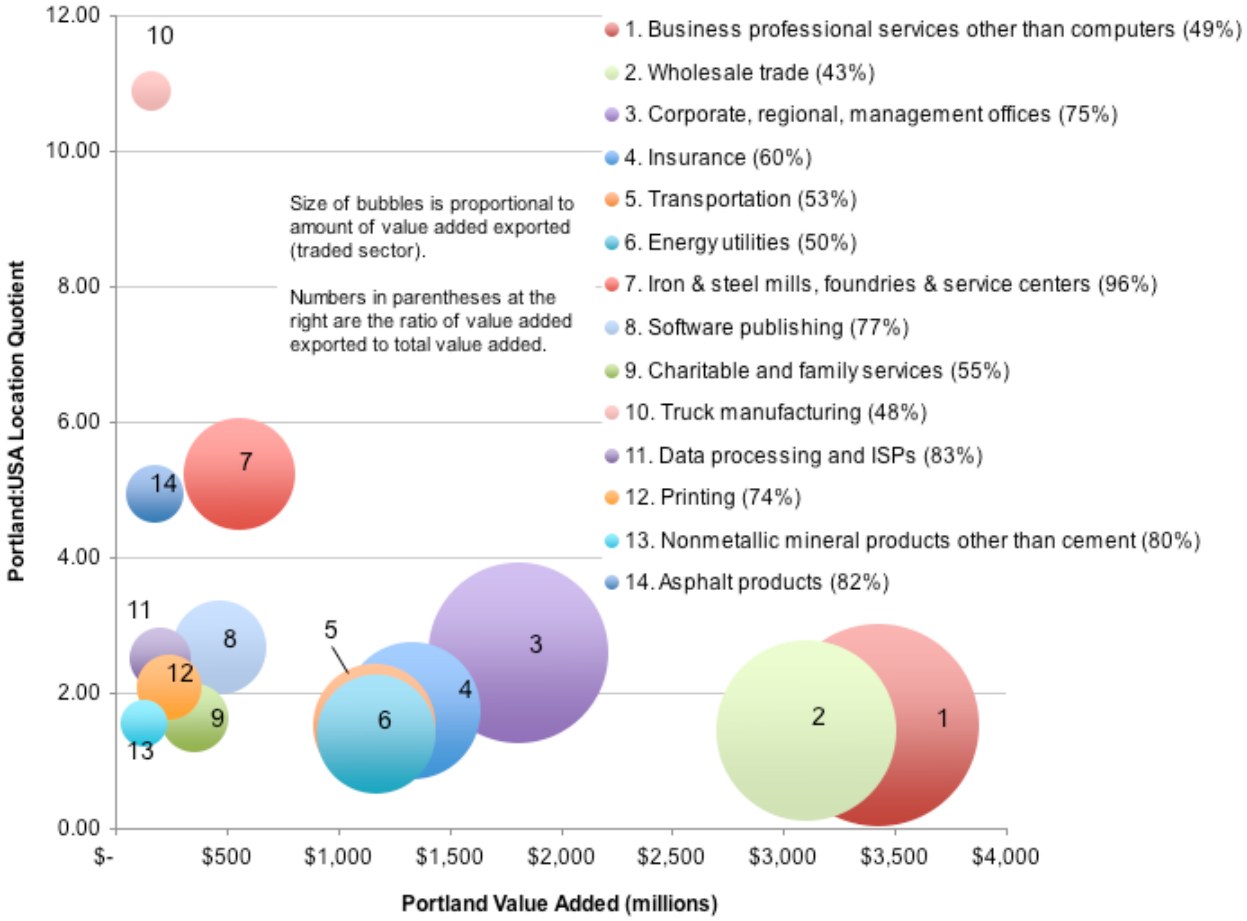
In a 2009 study for the Portland Development Commission, ECONorthwest has investigated LQ on the basis of an industry's valued added (output) rather than employment, identifying city specializations relative to the nation rather than regional specializations. Value added describes the market value of a business' production of goods and services, including payroll and the contributions of capital, land and property. This approach elevates the importance of industry output, in addition to considering employment levels.

ECONorthwest's conclusions are that Portland supports two kinds of clusters:

- Specialized firms with high location quotients – such as truck manufacturing, iron and steel mills, insurance and software publishing – but that are relatively small contributors to the overall Portland economy in terms of value added and export amounts; and
- Firms with above-average but lower location quotients (1.5 – 2.5) that generate much larger amounts of industry output, as well as export output from sales outside the region. These are dominated by professional services and wholesale trade, many of which tend to serve the regional and statewide markets (although professional firms with national scope can also serve as local economic engines). These moderate city specializations also include management of companies, insurance, transportation, and energy utilities.

ECONorthwest's results tend to corroborate the employment-base results released by Metro in 2008: both LQ analyses indicate that Portland's location quotients are higher in the manufacturing sectors. However, these are smaller shares of total economic activity than in the past. Consequently, the ECONorthwest analysis indicates that manufacturing's output may be insufficient as an *exclusive engine* for continued economic growth into the future.

## Figure 28. Value Added Portland Clusters (2007)




Source: ECONorthwest, 2009.

# VII. INDUSTRIAL LAND DEMAND ANALYSIS

The primary method for determining land demand is employment growth. However, in the industrial areas there are indications that employment may not be the best measure of economic performance and the future demand for industrial land. Additional research has been compiled to supplement the industrial land demand forecast based on employment growth to analyze additional land demand drivers.

### *Absorption Trend Comparison*

Reviewing long-term industrial land absorption trends is one method to estimate future industrial land needs, although this approach does not account for possible future shifts between industrial sectors.

Historic absorption is available only for properties along the Willamette and Columbia (west of the rail bridge) between the river and the nearest parallel street or railroad right-of-way. This area represents about one-third of the City's industrial areas, but likely a greater portion of land absorption. The other primary area that has realized industrial development during this time frame (post 1960) is the Columbia Corridor east of 82nd Avenue and north of Sandy Boulevard. A land absorption trend estimate is currently being completed for this second geography so that a citywide industrial absorption trend can be approximated.

### Figure 29. Industrial Land Demand Comparison with Past Trends

| Absorption Trends | Acres per year |
|---|---|
| Portland Harbor 1960-1997 absorption trends, all industrial uses (source: PHILS) | 45 |
| Portland Harbor 1960-1990, marine uses (Portland only. Source: Port of Portland) | 24 |
| Portland Harbor 1960-1990, all uses (including parks and residential. Source: Port of Portland) | 39 |
| Portland Harbor 2002-2008, developed industrial land | 18 |

**Absorption Forecast**

| | All Industrial Areas | | Columbia Harbor | |
|---|---|---|---|---|
| | driven | terminals | driven | terminals |
| Low | (9) | (9) | (5) | (5) |
| Mid | 45 | 45 | 30 | 30 |
| High | 104 | 104 | 69 | 69 |

Source: Portland Harbor Industrial Lands Study Feb 2003, Bureau of Planning; E.D. Hovee & Company, LLC. Portland Harbor Industrial Land Supply Analysis, Feb 2012, ECONorthwest

The historic absorption figures available indicate an increase in annual absorption between 1990 and 1997. The bulk of this absorption occurred within the Port's Rivergate development and on Swan Island.

### *Commodity Flows*

Commodity flows provide another indicator of economic activity and terminal and distribution facility needs. The overall freight volume handled in the Portland region is forecast to roughly double in tonnage and triple in value between 2007 and 2040 (see Draft Portland/Vancouver Commodity Flow Forecast, 2014).

There are two studies that analyze the cargo moving through the Portland Harbor. The 2003 *Portland Harbor Industrial Land Study* (PHILS) reports that cargo volumes increased at an average annual rate of 2.3% between 1960 and 2000. Marine terminal investments of note that accompanied this increase include the 85 acre Portland Bulk Terminal facility at Port of Portland and a 20-acre expansion of the container terminal at T-6. The 2012 *Portland Harbor Industrial Land Supply Analysis* found cargo volume growth continues to be robust in recent years. From 2002-2008, cargo volumes increased by 4.8% per year. This study of marine terminal cargo volumes and land absorption needs plus the 2010 *West Hayden Island Economic Foundation Study* take a cargo-specific approach, factoring in the known size and capacity of existing terminals, existing cargo volumes, cargo forecasts, and the size requirements of modern terminal facilities. With the goal of understanding these factors in more depth, the City also commissioned a study of the operational characteristics of different marine terminal types, which includes case studies of best-in-class facilities with land area and cargo throughput information.[10] More information about marine cargo forecasts, and associated land needs can be found later in this section.

The Port of Portland notes that land needs associated with commodity flows an inherently difficult to forecast. Over the past 10 years, the Port has twice been the fastest growing on the West Coast, and also the fastest declining. This short-term fluctuation results from decisions within the handful of steamship line companies on whether or not to utilize Port of Portland facilities, and is independent of shipping growth associated with business activity. For this reason, longer term trend data is more reliable. There is also some level of opportunistic growth that can be driven by a specific opportunity, driven by the competitive market. For example, other ports in the lower Columbia River have recently announced new projects to ship coal. Local ports are able to respond to these opportunities not because growth of that commodity had been forecast, but because they had an inventory available development-ready land. If the Port of Portland waits for a specific business opportunity to arise before land can made available, as long as other Ports have more readily developable land supply, Portland will probably not be competitive.

### *Gross Domestic Product Output*

Industry output provides a third measure of the health and growth of an industry. Data on industry output is available (via the Bureau of Economic Analysis) on a metro area level.

Between 2001 and 2006 there was a substantial increase in output among many industries, including manufacturing and information and technology. Manufacturing output (across the seven county PMSA, the smallest geography for which data is available) increased at an annual rate of close to 12%, compared to an annual average increase of 6% for the PMSA economy as a whole.

[10] Worley Parsons, Operational Efficiencies of Ports/Terminals World--Wide, February 2012

GDP data portrays manufacturing as a growth industry, rather than the declining industry that employment trends suggest. Industry stakeholders describe several factors that influenced this sector's recent profitability gains, including:

- Substantial increases in commodity and product pricing;
- Substitution of technology for labor, and
- A low valued dollar that fueled export growth.

These factors may continue in future years. However, the challenge remains of predicting land needs based on industry output; as yet no clear quantitative relationship between the two measures has been identified.

### Figure 30. Portland-Vancouver PMSA Gross Domestic Product Trends (01-06)

| | | | Change | |
|---|---|---|---|---|
| **Industry** | **2001** | **2006** | **Net** | **AAGR** |
| All industry total | 77,200 | 103,400 | 26,200 | 6.0% |
| Private industries | 69,600 | 94,000 | 24,400 | 6.2% |
| Manufacturing | 12,000 | 21,000 | 9,000 | 11.8% |
| Transportation and utilities | 3,600 | 4,300 | 700 | 3.6% |
| Retail trade | 4,300 | 4,900 | 600 | 2.6% |
| Professional and business services | 8,700 | 11,000 | 2,300 | 4.8% |
| Education and health services | 5,400 | 7,600 | 2,200 | 7.1% |
| Leisure and hospitality | 2,300 | 3,000 | 700 | 5.5% |
| Information, Communication, and Technol | 8,200 | 15,800 | 7,600 | 14.0% |
| Government | 7,500 | 9,400 | 1,900 | 4.6% |
| *Private goods-producing industries* | *16,600* | *26,700* | *10,100* | *10.0%* |
| *Private services-providing industries* | *53,100* | *67,300* | *14,200* | *4.9%* |

Source: Bureau of Economic Analysis, US Dept. of Commerce, April 2009

## *Other Indicators*

In order to better understand this dynamic, ECONorthwest examined trends in land efficiency from 2002-2008 in the Portland Harbor using several different measures. They calculated the economic activity measured in terms of employment, real market value, value added, and cargo tonnage. The value added and real market value measures appear to grow, however the US Consumer Price Index grew by 3.0%, indicating that these measure grew less than the rate of inflation, while the cargo tonnage grew at a faster pace (Table 30).[11]

[11] ECONorthwest, Portland Harbor Industrial Land Supply Analysis, February 2012 (Appendix C)

## Figure 30. Portland Harbor Measures of Economic Activity (per acre)

| Measure | 2002 | 2008 | AAGR |
|---|---|---|---|
| Value Added | $1,147,614 | $1,217,713 | 1.0% |
| Real Market Value | $776,715 | $838,091 | 1.3% |
| Employment (jobs) | 6.21 | 5.75 | -1.3% |
| Cargo Tonnage | 3,873 | 4,928 | 4.1% |

Source: ECONorthwest, Portland Harbor Industrial Land Supply Analysis, February 2012

# VIII. ECONOMIC MULTIPLIER ANALYSIS

As discussed above, there can be a disconnection between employment growth and the demand for new building space and development sites, especially within the industrial sectors. Another way to look at the situation is economic multipliers, which represents the relationship between direct investment in economic activity at a particular site and the resulting multiplier (or ripple effect) throughout Portland and the metro region. The three most common types of economic multipliers are provided within this EOA report are measures of:

- Employment
- Personal income (to residents of the region)
- Output (or added gross receipts)

For example, an employment multiplier of 2.00 indicates that for every job directly associated with a place-specific investment, another job is created off-site through indirect and induced economic effects elsewhere in the region. Indirect effects occur as the new economic activity makes purchases from other businesses in the region. Induced effects occur as the direct employees of the new economic activity are able to make added purchases from increased disposable income from local retail and services.

Multipliers are based on the nationally recognized IMPLAN input-output model. IMPLAN data is available for every county in the U.S. Multipliers used with this analysis are those for the seven-county metro region (PMSA) as of 2009. Economic multipliers are typically reported by NAICS employment sector. For the Portland EOA, NAICS specific multipliers have been aggregate to six industrial/commercial building types based on the City of Portland's projected 2035 mix of sector employment and anticipated allocation of employment sectors to building types.

This essentially reflects weighted averaging of specific building types. For example, the General Industrial building type is associated with a relatively high 3.15 overall jobs multiplier. The key components of the General Industrial multiplier are manufacturing (with a 3.69 multiplier) and construction (2.04). Other building types involve different employment sectors but with a similar weighting methodology applied.

## Figure 31. Economic Multipliers By Building Type

| | Economic Multiplier | | |
|---|---|---|---|
| **Building Type** | **Jobs** | **Income** | **Output** |
| Office | 1.95 | 1.87 | 1.98 |
| Institution | 1.62 | 1.69 | 2.13 |
| Flex / BP | 2.19 | 2.12 | 1.91 |
| General Industrial | 3.15 | 2.50 | 2.15 |
| Warehouse | 2.36 | 1.95 | 1.95 |
| Retail | 1.64 | 1.76 | 1.97 |

Source: E. D. Hovee & Company, LLC based on IMPLAN

Multipliers are relevant to district-specific land supply decisions because they suggest the importance of looking beyond direct site-specific employment opportunities. For example, although job density is low on industrial land, the General Industrial and Warehouse multipliers are high. That is, industrial acres have the potential to generate a greater number of secondary and tertiary off-site jobs that an acre of retail. All other things being equal, this could be a factor if one must allocate a limited supply of land to different industry types. Or, put another way, some of our retail and office job growth is dependent on having an adequate industrial land supply.

# IX. LAND EFFICIENCY ANALYSIS

The purpose of this analysis is to estimate the portion of future employment-related development that will take place on parcels with a significant amount of existing building square footage – sites that are not included in the Buildable Land Inventory.

## METHODOLOGY

The analysis is based on development activity from 1999-2011 to assign it to the type of site in 1999 – vacant, LoFAR, or HiFAR.[12] The LoFAR category corresponds to the underutilized or redevelopable sites in the BLI and is defined as sites with less than 20% of the building square footage allowed by zoning (based on applicable zoned FARs) based on existing building square footage in 1999. For industrial properties, only vacant parcels are considered buildable.

RLIS assessor data is used to create a side-by-side comparison of tax lots with a "new year built" or for which there was more than 50% building square footage added (as opposed to a minor addition). A review of the assessor data revealed a number of parcels for which there was no building square footage indicated in 1999 but had a 1999 building value of over $25,000, which indicated some kind of improvement. Tax parcels greater than 10,000 square feet in size with missing data have been cross-checked with development permit data to better determine which parcels were: a) previously developed in 1999 with no added building space developed through 2011, or b) previously developed but added some amount of net new building space since 1999. This analysis was limited to parcels for which there was comparable data regarding building square footage, land and improvements valuation with matching tax records in 1999 and 2011. Excluded are parcels for which there is not a matching tax parcel identifier or for which other data is missing in either year. Also excluded are parcels for which building square footage was increased by less than 50%, but with no new built data between 1999-2011 indicated. For these reasons, the analysis should be viewed as representing a conservative representation of development activity on employment lands over this time period.

Using the revised parcel dataset, development activity is assigned to the type of site in 1999 – vacant, LoFAR, or HiFAR (Figure 32). The proportion of development activity that occurs on vacant or LoFAR is development that would occur on sites in the BLI (industrial geographies are limited to vacant sites). Development that takes place on HiFAR parcels is on parcels that are not included in the BLI.

The data analysis shows that the campus institutions present a unique case. These campuses consist of large parcels with existing development that places them in the HiFAR category. So as to not skew the overall results, the campus institutions were eliminated from this analysis because these areas are treated differently in the BLI (development capacity based on master plans, not vacant/underutilized parcels).

[12] The initial method was to analyze employment data (ES202) data to identify job growth that took place on sites with existing development and no new development from 2000-2008. This analysis proved to be too difficult to manage because of employers with multiple tax parcels and dispersed employment that was reported to different tax parcels over the analysis period.

## Figure 32. Land Efficiency Analysis (Net Added Building Space 1999-2011)

| Forecast Geographies | On Sites that Were Previously Vacant | LoFAR | HiFAR | Total | % on Vac/Lo | |
|---|---|---|---|---|---|---|
| Central City Commercial | 4,753,957 | 286,431 | 3,605,539 | 8,645,927 | 58% | |
| Central City Incubator | 589,616 | 230,191 | 41,871 | 861,678 | 95% | |
| Columbia Harbor | 4,259,890 | 2,262,671 | 91,150 | 6,613,711 | 64% | Vacant |
| Columbia East | 3,932,091 | 502,344 | 75,646 | 4,510,081 | 87% | Vacant |
| Dispersed Employment | 543,702 | 241,891 | 491,278 | 1,276,871 | 43% | Vacant |
| Neighborhood Commercial | 3,111,419 | 12,073 | 2,236,145 | 5,359,637 | 58% | |
| Town Centers | 135,913 | 0 | 341,128 | 477,041 | 28% | |
| Regional Center | 694,329 | 0 | 160,986 | 855,315 | 81% | |
| Institutions | 407,270 | 4,800 | 2,164,726 | 2,576,796 | 16% | |
| Total | 18,428,187 | 3,540,401 | 9,208,469 | 31,177,057 | 70% | |
| Total (w/o Institutions) | 18,020,917 | 3,535,601 | 7,043,743 | 28,600,261 | 75% | |
| | | | | | | |
| % of Change | 59% | 11% | 30% | 100% | 70% | |
| % of Change w/o Institutions | 63% | 12% | 25% | 100% | 75% | |
| | | | | | | |
| **Aggregate Geographies** | | | | | | |
| Central City | 5,343,573 | 516,622 | 3,647,410 | 9,507,605 | 62% | |
| Industrial | 8,735,683 | 3,006,906 | 658,074 | 12,400,663 | 70% | Vacant |
| Commercial | 3,941,661 | 12,073 | 2,738,259 | 6,691,993 | 59% | |
| Institutions | 407,270 | 4,800 | 2,164,726 | 2,576,796 | 16% | |
| Total | 18,428,187 | 3,540,401 | 9,208,469 | 31,177,057 | 70% | |
| Total w/o Institutions | 18,020,917 | 3,535,601 | 7,043,743 | 28,600,261 | 75% | |

Source: E.D Hovee & Company

## OBSERVATIONS

This supplemental analysis provides added insight into development patterns for different employment geographies. From a market perspective, the data indicates that newly built sites tend to occur on vacant or low value property. However, considerable acreage has experienced building expansion on properties with existing high value improvements. The overall results show that roughly 60% of Central City and Commercial development took place on vacant or LoFAR land and approximately 70% of industrial development took place on vacant land. A significant portion of new development (30-40%) is occurring on parcels with a significant amount of existing development (HiFAR) that is not included in the BLI.

Both for newly built sites and expansions, the market evidences continued preference for unconstrained sites. The market can shift to support development of environmentally constrained and/or potential brownfield sites where fewer unconstrained property opportunities are available. This analysis is useful as a means to better refine realistic land needs in employment land supply and demand analysis.

# X. MARINE CARGO FORECAST

## PORTLAND HARBOR MARINE TERMINALS

The Harbor Access Lands geography benefits from its superior connectivity: the confluence of two rivers, access to domestic markets via two major rail lines (UP and BNSF), and interstate freeway access to I-5 (north-south) and I-84 (east-west), and access to global markets via the Pacific Ocean. Having all of this connectivity in the heart of the City of Portland, with strong local and regional policies in place to preserve harbor land for industrial use, creates a special place for water-dependent industrial firms. However, the industrial harbor land supply in the Portland region is fixed, and vacant developable land is rare and usually constrained. (See Appendix C. ECONorthwest, *Portland Harbor Industrial Land Supply Analysis*, May 2012)

A primary source of past economic growth in Portland has been marine-related economic activity, including marine industrial and marine cargo uses. These uses are projected to continue to grow over the next 30-years, with particular growth forecasted in the marine cargo and related transportation, warehousing, utility, and wholesale trade sectors. The Portland Harbor serves as a major economic engine for the regional economy. Studies indicate that cargo and manufacturing activities dependent on waterborne transportation contribute significantly to the metro region's economy. These studies indicate that marine-related economic activity generates from 20,000 to 100,000 jobs and from $1.4 to 3.4 billion annually in regional income.[13]

The Port of Portland has four marine terminals located along the Willamette and Columbia Rivers. These terminals accommodated 575 ocean-going vessels in 2010, though over the past two decades it was not uncommon for the Port to accommodate 800 to 1,000 ocean-going vessels in a year. Not counting cargos received or shipped via inland barges, the Port of Portland shipped over 13 million short tons of cargo in 2010.

Harbor industrial development tends to have low floor-to-area ratios (FAR) and a relatively low number of jobs per acre. But despite declining employment in recent years, the Portland Harbor experienced an increase in cargo tonnage at a faster pace than the rate of industrial land development in the area. [14] Therefore, given the disconnected relationship between employment growth and cargo activity in the harbor, there is a need to base the need for additional marine terminals on cargo forecasts as a supplement to any land needed to support future industrial employment growth in the Harbor Access Lands geography.

## MARINE CARGO FORECAST

While employment forecasts traditionally form the basis of employment land supply analysis, as noted earlier, employment is not a very good indicator of the long-term land needs of the freight and distribution sectors of the economy. Despite a general decline in industrial employment between 2002 and 2008 (-1.3% AAGR), cargo tonnage handled in the Portland Harbor went up

[13] Entrix, West Hayden Island Economic Foundation Study, July 2010

[14] ECONorthwest, Portland Harbor Industrial Land Supply Analysis, May 2012.

4.1% per year during that same period. An average of 18 acres of land was developed each year during that period.[15]

There have been several attempts to understand how cargo tonnage trends may impact future land needs in the Portland Harbor. Extrix studied this topic in 2010, based on cargo forecasts completed in 2009. The most recent cargo forecasts are based on a 2010 study by BST, refined to specifically call out cargo demand for Portland and Vancouver and updated with the most recent economic data.[16] Cargo forecasts generally assume an adequate land supply will be made available (that is, they do not attempt to predict how any land supply constraint might impact growth). The most recent BST forecast demand for the region in 2040 (including both Portland and Vancouver) ranges from 39 million to 66 million metric tons. For the Portland Harbor, the forecast range is 28 million to 43 million metric tons. For context, in 2010 the Port of Portland moved 13 million metric tons of cargo, and approximately 27 million tons moved through the region as a whole (including private terminals and both public Ports).

**Figure 33. 2040 Portland Harbor Cargo Volume Forecast Scenarios**

| Cargo Type | Low | Medium | High |
|---|---|---|---|
| Automobiles (units) | 811,000 | 912,500 | 1,014,000 |
| Containers (TEUs) | 379,000 | 452,500 | 526,000 |
| **Metric Tons** | | | |
| Automobiles | 1,076,000 | 1,206,000 | 1,336,000 |
| Containers | 2,162,000 | 2,583,500 | 3,005,000 |
| Breakbulk | 1,132,000 | 1,242,000 | 1,352,000 |
| Grain | 6,686,000 | 9,078,000 | 11,470,000 |
| Dry Bulk | 10,278,000 | 14,093,500 | 17,909,000 |
| Liquid Bulk | 6,912,000 | 7,461,500 | 8,011,000 |
| **Total** | **28,246,000** | **35,664,500** | **43,083,000** |

Source: ECONorthwest and BST Associates
Note: Low and High forecasts were made by BST Associates for the Portland and Vancouver Harbor Forecast Update, 2012. Medium scenario is calculated by ECONorthwest.

Factoring in the capacity of existing marine terminals, ECONorthwest estimated the need by 2040 for additional marine terminal facilities by cargo type, shown in Figure 34.[17] With the low scenario forecast, they estimated that existing terminals could handle all commodity types except automobiles. With the high scenario forecast, additional new terminals would be needed for automobiles, containers, grains, and dry bulk commodity types. With the mid-range scenario forecast, additional terminals would be needed for automobiles, grain, and dry bulk commodities.

Based on the size trends of new terminals being constructed on the West Coast, most of the land need for marine cargo is expected to be for parcels larger than 100 acres to accommodate rail access and ensure competitiveness.[18] The actual acres needed to accommodate the projected

[15] EcoNorthwest, Portland Harbor Industrial Land Supply Analysis, May 2012

[16] BST Associates, Portland and Vancouver Harbor Forecast Update, February 2012

[17] EcoNorthwest, Portland Harbor Industrial Land Supply Analysis, May 2012

[18] Entrix, West Hayden Island Economic Foundation Study, July 2010

marine terminal need varies, depending on the commodity type, and depending on how important it is to have an optimal terminal design. For example, it is possible to operate a grain terminal on less than 10 acres, but a modern rail-served terminal would likely require 100+ acres.

**Figure 34. 2040 Portland Harbor Forecast Cargo Capacity Shortfall**

| Cargo Type | Low | Medium | High |
|---|---|---|---|
| Automobiles (units) | -136,000 | -310,000 | -554,000 |
| Containers (TEUs) | | | -196,000 |
| **Metric Tons** | | | |
| Automobiles | -187,000 | -410,000 | -730,000 |
| Containers | | | -1,120,000 |
| Breakbulk | | | |
| Grain | | -2,390,000 | -4,370,000 |
| Dry Bulk | | -2,960,000 | -10,949,000 |
| Liquid Bulk | | | |
| **Total** | **-187,000** | **-5,760,000** | **-17,169,000** |
| **Acreage Needs** | | | |
| Minimum | 51 | 170 | |
| Practical | **150** | 390 | |
| With Rail Loop | | **470** | **977** |

Source: ECONorthwest (see Appendix C)

At the City's request, Worley Parsons completed a detailed analysis of the operational and land consumption characteristics of modern ports.[19] The report included case studies of innovative international facilities. Provision of efficient rail operations is one of the primary ways that modern terminals maximize cargo throughput for a given terminal. The report also includes discussion of auto terminals with multi-deck parking structures (shown as minimum acreage needs of the low scenario in Figure 34), but concludes that they would be very difficult to make cost-competitive in the context of the current Lower Columbia River market.

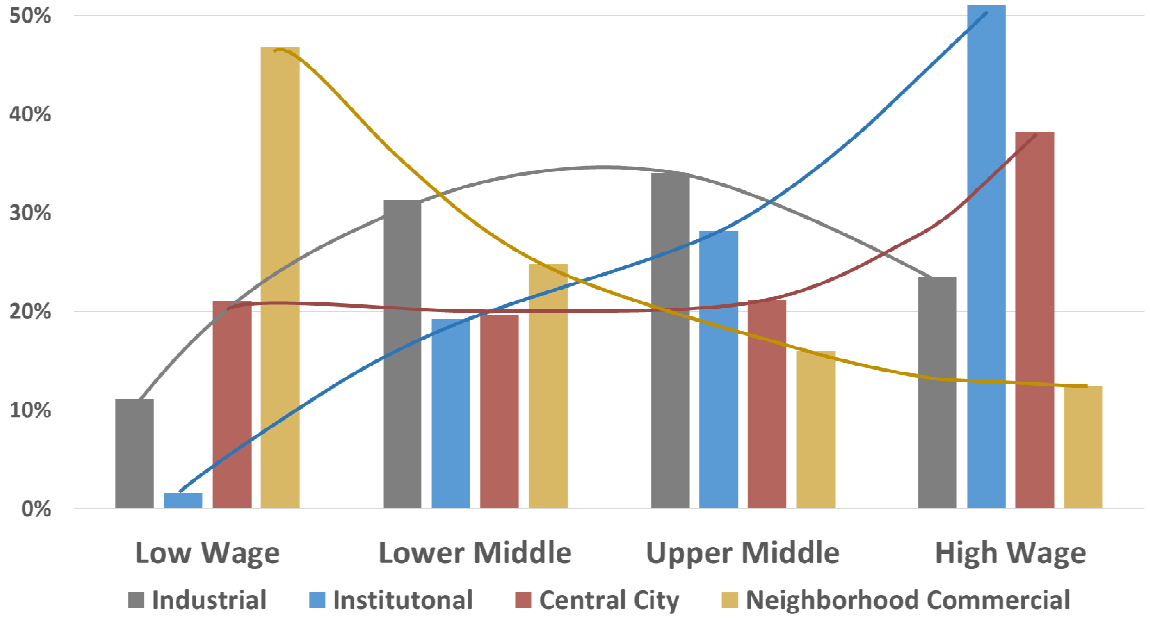
Using information collected from Worley Parsons, and the forecast information described above, ECONorthwest estimated the land need through 2040 for the Port of Portland ranges from 150 acres (practical terminal size) to 977 acres, with a mid-range land need of approximately 470 acres (Figure 34).

[19] Worley Parsons, Operational Efficiencies of Ports/Terminals Worldwide, 2012

# XI. WAGE DISTRIBUTION AND JOB POLARIZATION

The mix of businesses and employment geographies in the local economy shapes the income-distribution and economic equity of the population. As shown in Figure 35, employment in the Central City and institutional geographies is concentrated in high-wage occupations that primarily require college education; industrial geography employment is concentrated in middle-wage occupations; and neighborhood commercial employment is concentrated in low-wage occupations.

**Figure 35. Wage Quartile Comparison of Portland's Employment Geographies, 2012**

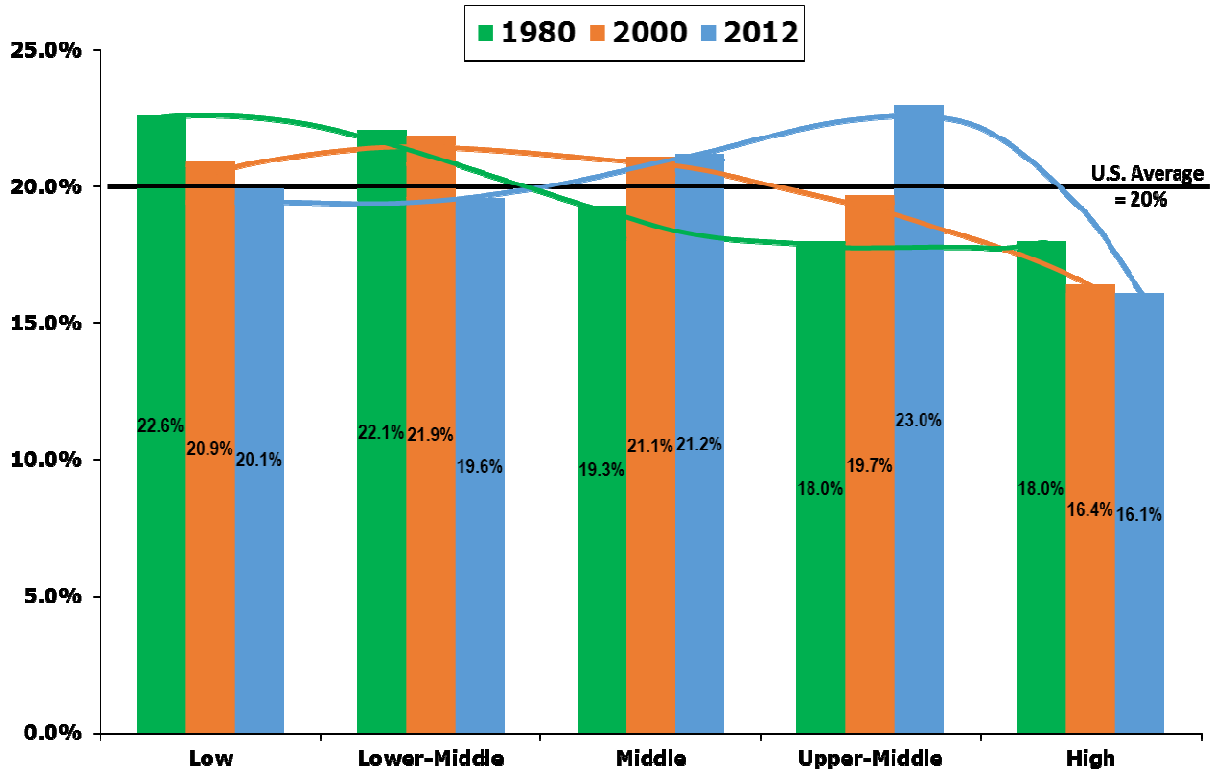



Source: Bureau of Planning and Sustainability. The wage distribution of covered employment in Portland's EOA employment geographies is grouped by citywide wage quartiles. The Low Wage quartile is less than $26,400 annually; Lower Middle is $26,400-46,400; Upper Middle is $46,400-67,600; and High Wage is more than $67,600.

Since 1980, the wage distribution of the economy has been changing, and job growth has become increasingly polarized in low- and high-wage occupations with shrinking middle-wage job opportunities (Josh Lehrer, 2012). This national trend is mirrored in the state and the region. For the majority of the workforce that doesn't have a 4-year college degree, middle-wage job opportunities are primarily in industrial and administrative-support occupations.

Portland has been less affected by this trend, having a relatively balanced economy that supports a predominantly middle-class population (Brookings Institution, Berube and Tiffany, 2004). Nevertheless, Portland's primarily lower-middle income distribution of households in 2000 has shifted to a more upper-middle income distribution by 2012, as shown in Figure 36.

**Figure 36. Proportion of Households in Portland by National Quintile Income Category**

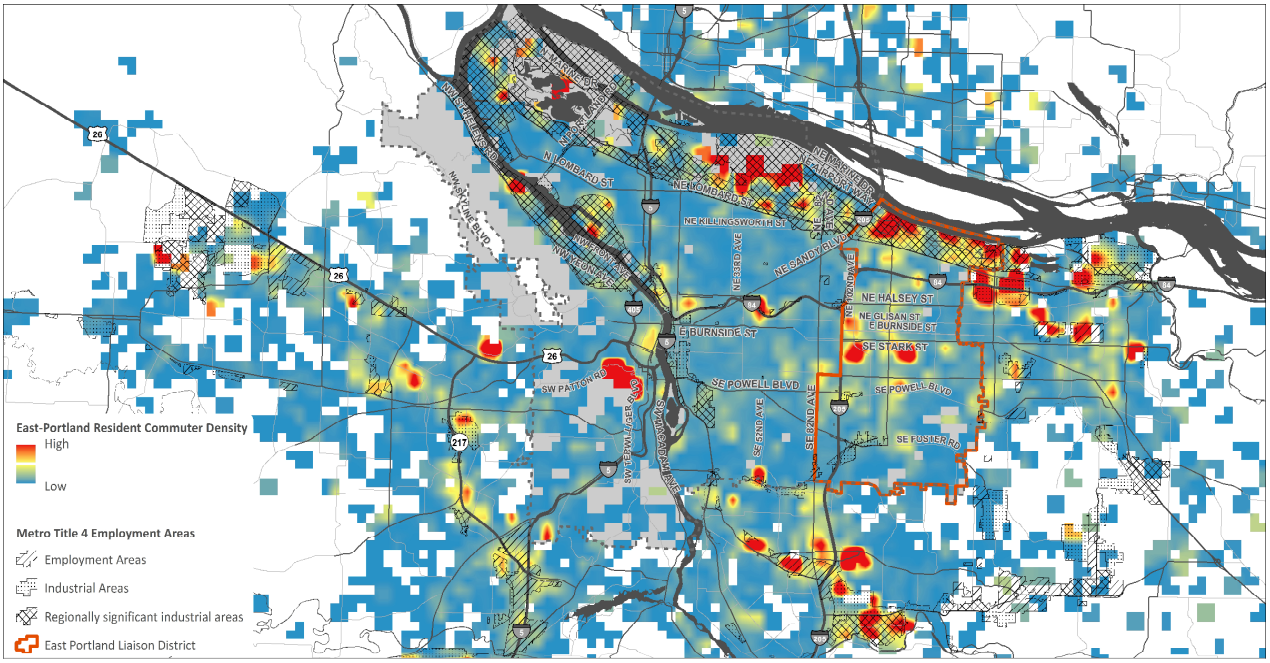



Source: Bureau of Planning and Sustainability and Brookings Institution (Alan Berube and Thatcher Tiffany, The Shape of the Curve, August 2004) from U.S. Census data. The income distribution of Portland households is grouped by national income quintile categories.

Industrial job growth also provides an important equity role in expanding income self-sufficiency for Portland's diverse population and reducing income disparities for people of color and East Portland residents. For example, 27% of the workers of color in Multnomah County are employed in middle-wage industrial occupations, compared to 17% of white workers (Coalition of Communities of Color, 2010). In contrast, only 23% of workers of color are employed in the high-wage professional and management occupations, compared to 44% of white workers. As a result, people of color are disproportionately impacted by job-polarization trends and slower industrial job growth.

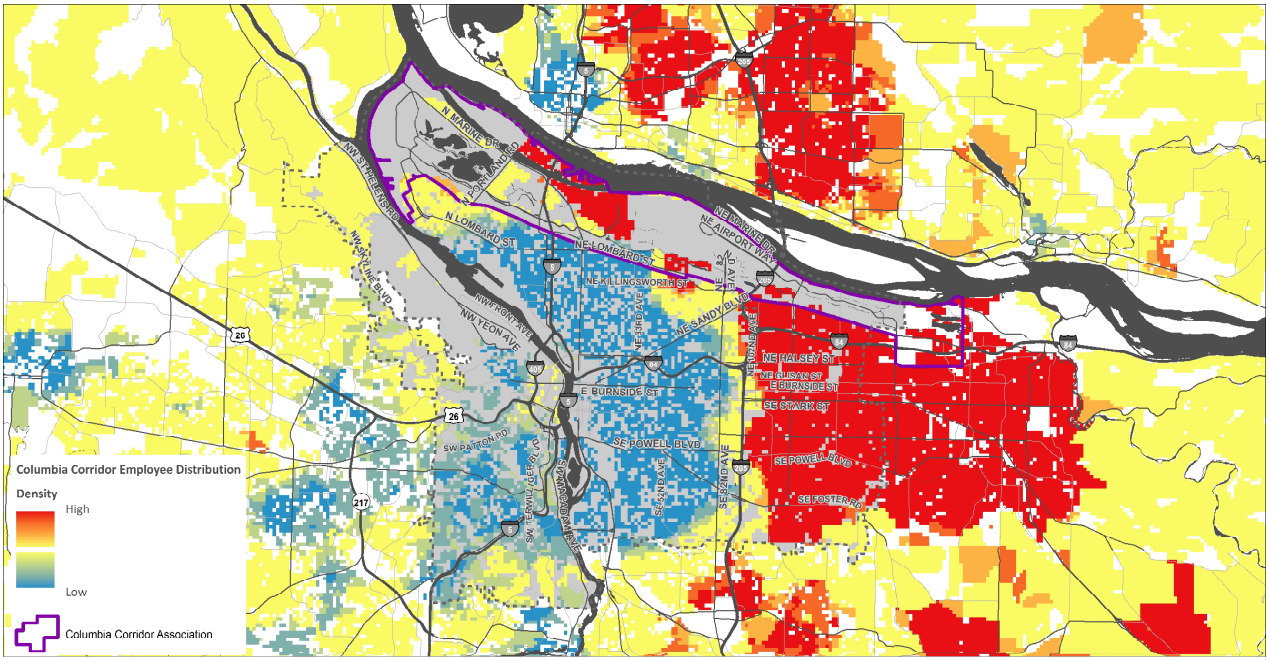
Similarly, residents of the East Portland neighborhoods work disproportionately in industrial districts and especially the Colombia Corridor, as shown in Figure 37. Conversely, workers in the Colombia Corridor industrial districts live primarily east of I-205 and are underrepresented in inner and West Portland neighborhoods, as shown on Figure 38. While labor markets are commonly considered to be regional in scale, there also appears to be substantial interdependence between East Portland's predominantly middle-/moderate-income neighborhoods and Portland's large middle-wage industrial districts.

## Figure 37. Where East Portland Residents Work




Source: Bureau of Planning and Sustainability (August 2014) from Longitudinal Employment and Housing data, U.S. Census.

## Figure 38. Where Columbia Corridor Workers Reside




Source: Bureau of Planning and Sustainability (August 2014) from Longitudinal Employment and Housing data, U.S. Census.

# XII. EOA IMPLICATIONS

This section is intended to *set the stage* for the next steps of this economic opportunities analysis. Key implications of this trends and opportunities analysis for remaining portions of the economic opportunities analysis are summarized as follows:

- Long-term job growth trends have fluctuated and create uncertainty for forecasting growth in the coming decades. The 2000's were a period of relatively slow job growth not only for Portland but for the metro region and nationally. Despite an economic downturn experienced just after 2000, followed by modest growth and a major recession at end of the decade, Metro is projecting that the nation and region should expect to return to a more normalized pattern of job recovery and stronger growth over the long-term horizon of the next 25 years.
- For Portland, another question is whether the city will maintain the 25% capture rate of regional job growth that Multnomah County experienced over the 1980-2008 period. Portland's capture rate fell to 5% in the 2000-2008 business cycle and has since rebounded to 23% in the 2008-2013 period. The answer to this question has significant ramifications not only for Portland's economic vitality but for regional urban growth management.
- Finally, it is apparent that the "hot spot" locations where job growth is occurring within the City have shifted in recent years. The focus of added Central City job gains has shifted from the traditional downtown core toward adjacent areas in the River and Lloyd commercial / mixed use districts and the emerging incubators of the Central Eastside and Lower Albina. Similar shifts are occurring within and between the City's industrial, urban center and neighborhood commercial areas. In numerical terms, by far the strongest growth has been within Portland's institutional geography.

As a final note, this Task 1 report has focused on employment in terms of Goal 9 requirements for an Economic Opportunities Analysis. The resulting employment analysis addresses trends with respect to the number and types of jobs including categorization by land use designation. However, it is important to note that employment is one of many approaches to measuring economic activity.

Because the focus of this report is how business uses land, employment and building development are emphasized. Other factors – such as wage levels, technology and capital intensiveness, monetary output and comparative regional advantage (or location quotients) – are not directly considered. This report also does not evaluate which industries and jobs the region should endeavor to encourage, but rather reports past trends as illustrated via employment data.

# APPENDIX A. FOCUS GROUP PARTICIPANTS

As identified by the following listing, a total of 58 individuals participated in six focus groups conducted in 2009 for this Economic Opportunities Analysis. The interest and time given by all participants is gratefully acknowledged.

### Figure 39. Focus Group Participants

| Participant Name | Firm/Organization |
|---|---|
| **Central City Office:** | |
| Gregory Goodman | City Center Parking |
| Ted Gilbert | Gilbert Brothers |
| David Lake | Liberty NW |
| Scott Andrews | Melvin Mark Companies |
| Jeff Bourlag | NBS Realtors |
| Brian Owendoff | Opus NW |
| Steve Pfeiffer | Perkins Coie |
| Bernie Bottomly | Portland Business Alliance |
| Carly Riter | Portland Business Alliance |
| Josh Schlesinger | Schlesinger Companies |
| Matt Cole | Shorenstein |
| **Close In Incubator:** | |
| Pete Eggspuehler | Beam Development |
| Eva Schweber | Cube Space |
| Debbie Kitchin | Inter Works |
| Mickael Zokoych | Michael's Italian Beef & Sausage |
| Peter F. Fry | Planning Consultant |
| Daniel Yates | Portland Spirit |
| Bob Rogers | Robert R. Rogers Co. |
| David Lorati | School Specialty Co. |
| **Manufacturing & Distribution:** | |
| Corky Collier | Columbia Corridor Alliance |
| D. A. Albrecht | Concordia University |
| Jay Griffith | Evraz Inc NA |
| Wayne Matulich | ITT Technical |
| Linda Craig | Norris & Stevens |
| Gary Hunt | Oregon Transfer |
| Ann Gardner | Schnitzer Steel |
| Mike Williams | Silver Eagle Manufacturing |
| Deon Kampfer | WM |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| Participant Name | Firm/Organization |
|---|---|
| **Neighborhood Commercial:** | |
| Michael Zokoych | Central Eastside Industrial Council |
| Cindy Sturm | Cindy Sturm Real Estate |
| Bob LeFeber | Commercial Realty Advisors |
| Jean Baker | Division Clinton |
| Tony Fuentes | NW Children's Business/Fox Chase Alliance |
| Michelle Marx | SERA Architects |
| Gerry Boeher | St. Johns Boosters |
| **TOD/Mixed Use Corridors:** | |
| Pete Eggspuehler | Beam Development |
| John Carroll | Carroll Investments |
| Kevin Cavenaugh | Cavenaugh Development |
| Jeana Woolley | JM Woolley & Associates |
| Tom Kemper | Kemper Company, LLC |
| Vern Rifer | Rifer Development |
| Kim Knox | Shiels Obletz Johnsen |
| Rick Gustafson | Shiels Obletz Johnsen |
| **Campus Institutional:** | |
| Theresa Paulson | Concordia University |
| Michael Sestric | Institutional Facilities Coalition |
| Scott Davis | Kaiser Permanente |
| Richard Bettega | Lewis & Clark College |
| David Groff | Linfield College |
| Glenn Ford | Linfield College |
| Gary Andeen | Oregon Independent Colleges Association |
| Wing-Kit Chung | Portland Community College |
| Ty Wyman | Providence Medical Center |
| Edwin McFarlane | Reed College |
| Jennifer Baters | Reed College |
| Townsend Angel | Reed College |
| Andrea Cook | Warner Pacific College |
| Steve Stenberg | Warner Pacific College |

# APPENDIX B. SUPPLEMENTAL DATA TABLES

On the following pages are provided supplemental detailed U.S. employment trend and projection data covering:

- U. S. Non-Farm Employment Trend and Projection (by employment sector and covering the 1980 – 2035 time period
- Portland Metro Location Quotients Relative to the U.S. (by employment sector and covering the 1990 – 2035 time period)

## Figure 40. U.S. Non-Farm Employment Trend & Projection (1980-2035)

| | U. S. Employment (in millions) | | | | | | | | | | | | Annual % Change | | % of Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 1990-05 | 2005-35 | 1990 | 2005 | 2035 |
| Total Non-Farm Jobs | 90.53 | 97.51 | 109.49 | 117.31 | 131.79 | 133.69 | 135.62 | 146.5 | 153.33 | 159.9 | 166.49 | 173.54 | 1.3% | 0.9% | 100.0% | 100.0% | 100.0% |
| Private Employment | 74.15 | 80.98 | 91.08 | 97.87 | 111 | 111.89 | 113.24 | 123.29 | 129.36 | 135.4 | 141.28 | 147.88 | 1.4% | 0.9% | 83.2% | 83.7% | 85.2% |
| Manufacturing | 18.73 | 17.82 | 17.70 | 17.24 | 17.27 | 14.23 | 11.99 | 12.78 | 12.63 | 12.00 | 11.52 | 11.14 | -1.4% | -0.8% | 16.2% | 10.6% | 6.4% |
| Durable Goods | 11.68 | 11.03 | 10.74 | 10.37 | 10.88 | 8.96 | 7.46 | 8.20 | 8.04 | 7.57 | 7.28 | 7.10 | -1.2% | -0.8% | 9.8% | 6.7% | 4.1% |
| Lumber | N/A | N/A | 0.54 | 0.57 | 0.61 | 0.56 | 0.43 | 0.55 | 0.53 | 0.49 | 0.46 | 0.47 | 0.2% | -0.6% | 0.5% | 0.4% | 0.3% |
| Primary Metals | N/A | N/A | 0.69 | 0.64 | 0.62 | 0.47 | 0.37 | 0.38 | 0.37 | 0.37 | 0.33 | 0.29 | -2.5% | -1.6% | 0.6% | 0.4% | 0.2% |
| Fabricated Metals | N/A | N/A | 1.61 | 1.62 | 1.75 | 1.52 | 1.29 | 1.47 | 1.50 | 1.45 | 1.39 | 1.30 | -0.4% | -0.5% | 1.5% | 1.1% | 0.7% |
| Machinery | N/A | N/A | 1.41 | 1.44 | 1.46 | 1.17 | 1.05 | 1.20 | 1.18 | 1.11 | 1.05 | 1.00 | -1.2% | -0.5% | 1.3% | 0.9% | 0.6% |
| Electronics | N/A | N/A | 1.90 | 1.69 | 1.82 | 1.32 | 1.15 | 1.01 | 0.94 | 0.90 | 0.94 | 1.01 | -2.4% | -0.9% | 1.7% | 1.0% | 0.6% |
| Transport. Equipment | N/A | N/A | 2.13 | 1.98 | 2.06 | 1.77 | 1.39 | 1.61 | 1.47 | 1.24 | 1.11 | 1.10 | -1.2% | -1.6% | 1.9% | 1.3% | 0.6% |
| Oth. Durables | N/A | N/A | 2.45 | 2.43 | 2.56 | 2.15 | 1.79 | 1.99 | 2.05 | 2.01 | 1.99 | 1.92 | -0.9% | -0.4% | 2.2% | 1.6% | 1.1% |
| Non-Durables | 7.05 | 6.78 | 6.96 | 6.87 | 6.39 | 5.27 | 4.53 | 4.58 | 4.59 | 4.43 | 4.25 | 4.04 | -1.8% | -0.9% | 6.4% | 3.9% | 2.3% |
| Food Proc. | N/A | N/A | 1.51 | 1.56 | 1.55 | 1.48 | 1.45 | 1.55 | 1.62 | 1.62 | 1.62 | 1.61 | -0.1% | 0.3% | 1.4% | 1.1% | 0.9% |
| Paper | N/A | N/A | 0.65 | 0.64 | 0.60 | 0.48 | 0.41 | 0.42 | 0.43 | 0.42 | 0.40 | 0.38 | -2.0% | -0.8% | 0.6% | 0.4% | 0.2% |
| Other Non-Dur. | N/A | N/A | 4.80 | 4.67 | 4.23 | 3.31 | 2.67 | 2.61 | 2.55 | 2.39 | 2.22 | 2.05 | -2.4% | -1.6% | 4.4% | 2.5% | 1.2% |
| Non-Manufacturing | 71.79 | 79.69 | 91.79 | 100.07 | 114.53 | 119.45 | 123.63 | 133.71 | 140.71 | 147.90 | 154.95 | 162.39 | 1.8% | 1.0% | 83.8% | 89.3% | 93.6% |
| Natural Resources | 1.08 | 0.97 | 0.76 | 0.64 | 0.60 | 0.63 | 0.72 | 0.66 | 0.56 | 0.55 | 0.53 | 0.53 | -1.2% | -0.6% | 0.7% | 0.5% | 0.3% |
| Construction | 4.45 | 4.79 | 5.27 | 5.28 | 6.79 | 7.33 | 6.52 | 7.61 | 8.11 | 8.74 | 9.57 | 10.47 | 2.2% | 1.2% | 4.8% | 5.5% | 6.0% |
| Wholesale Trade | 4.56 | 4.91 | 5.27 | 5.43 | 5.93 | 5.76 | 5.76 | 6.35 | 6.98 | 7.66 | 7.87 | 7.69 | 0.6% | 1.0% | 4.8% | 4.3% | 4.4% |
| Retail Trade | 10.24 | 11.73 | 13.18 | 13.90 | 15.28 | 15.28 | 15.40 | 15.59 | 15.38 | 15.38 | 15.32 | 15.44 | 1.0% | 0.0% | 12.0% | 11.4% | 8.9% |
| Auto parts | N/A | N/A | 1.49 | 1.63 | 1.85 | 1.92 | 1.95 | 1.91 | 1.81 | 1.79 | 1.78 | 1.80 | 1.7% | -0.2% | 1.4% | 1.4% | 1.0% |
| Food & Bev. | N/A | N/A | 2.78 | 2.88 | 2.99 | 2.82 | 2.94 | 2.78 | 2.61 | 2.60 | 2.55 | 2.52 | 0.1% | -0.4% | 2.5% | 2.1% | 1.5% |
| Other Retail | N/A | N/A | 8.91 | 9.39 | 10.44 | 10.54 | 10.51 | 10.89 | 10.96 | 11.00 | 10.99 | 11.12 | 1.1% | 0.2% | 8.1% | 7.9% | 6.4% |
| TWU | 3.61 | 3.73 | 4.22 | 4.51 | 5.01 | 4.92 | 4.95 | 5.76 | 6.38 | 6.88 | 7.19 | 7.23 | 1.0% | 1.3% | 3.9% | 3.7% | 4.2% |
| Information | 2.36 | 2.44 | 2.69 | 2.84 | 3.63 | 3.06 | 2.78 | 2.96 | 3.15 | 3.44 | 3.80 | 4.32 | 0.9% | 1.2% | 2.5% | 2.3% | 2.5% |
| Printing | N/A | N/A | 0.87 | 0.91 | 1.03 | 0.90 | 0.80 | 0.82 | 0.84 | 0.86 | 0.89 | 0.95 | 0.2% | 0.2% | 0.8% | 0.7% | 0.5% |
| Internet, etc. | N/A | N/A | 1.82 | 1.93 | 2.59 | 2.16 | 1.98 | 2.14 | 2.32 | 2.58 | 2.91 | 3.37 | 1.1% | 1.5% | 1.7% | 1.6% | 1.9% |
| Financial Activities | 5.02 | 5.81 | 6.61 | 6.83 | 7.69 | 8.15 | 8.24 | 8.57 | 8.42 | 8.44 | 8.44 | 8.61 | 1.4% | 0.2% | 6.0% | 6.1% | 5.0% |
| Finance & Ins. | N/A | N/A | 4.98 | 5.07 | 5.68 | 6.02 | 6.11 | 6.33 | 6.22 | 6.21 | 6.22 | 6.39 | 1.3% | 0.2% | 4.5% | 4.5% | 3.7% |
| Real Estate | N/A | N/A | 1.64 | 1.76 | 2.01 | 2.13 | 2.13 | 2.24 | 2.20 | 2.23 | 2.22 | 2.22 | 1.8% | 0.1% | 1.5% | 1.6% | 1.3% |
| Professional Business | N/A | N/A | 10.85 | 12.85 | 16.67 | 16.94 | 17.73 | 21.96 | 25.16 | 28.42 | 32.30 | 36.37 | 3.0% | 2.6% | 9.9% | 12.7% | 21.0% |
| Pro., Sci., Tech. | N/A | N/A | 4.54 | 5.08 | 6.70 | 7.02 | 7.88 | 8.98 | 10.20 | 12.29 | 14.79 | 17.96 | 2.9% | 3.2% | 4.1% | 5.3% | 10.3% |
| Mgmt. of Companies | N/A | N/A | 1.67 | 1.69 | 1.80 | 1.76 | 1.80 | 1.72 | 1.60 | 1.53 | 1.45 | 1.39 | 0.4% | -0.8% | 1.5% | 1.3% | 0.8% |
| Admin & Waste | N/A | N/A | 4.64 | 6.08 | 8.17 | 8.16 | 8.05 | 11.26 | 13.36 | 14.60 | 16.06 | 17.02 | 3.8% | 2.5% | 4.2% | 6.1% | 9.8% |
| Edu. & Health | 7.07 | 8.66 | 10.98 | 13.29 | 15.11 | 17.37 | 19.90 | 21.61 | 22.87 | 23.64 | 24.09 | 24.81 | 3.1% | 1.2% | 10.0% | 13.0% | 14.3% |
| Education | N/A | N/A | 1.69 | 2.01 | 2.39 | 2.83 | 3.24 | 3.06 | 3.01 | 3.05 | 3.06 | 3.09 | 3.5% | 0.3% | 1.5% | 2.1% | 1.8% |
| Health Care | N/A | N/A | 9.30 | 11.28 | 12.72 | 14.54 | 16.66 | 18.55 | 19.86 | 20.60 | 21.03 | 21.73 | 3.0% | 1.3% | 8.5% | 10.9% | 12.5% |
| Leisure & Hospitality | 6.72 | 7.87 | 9.29 | 10.50 | 11.86 | 12.81 | 13.53 | 14.12 | 14.39 | 14.73 | 14.95 | 15.33 | 2.2% | 0.6% | 8.5% | 9.6% | 8.8% |
| Arts & Entertain. | N/A | N/A | 1.13 | 1.46 | 1.79 | 1.89 | 1.97 | 1.95 | 2.09 | 2.29 | 2.42 | 2.54 | 3.5% | 1.0% | 1.0% | 1.4% | 1.5% |
| Accomm. & Food Ser. | N/A | N/A | 8.15 | 9.04 | 10.07 | 10.92 | 11.56 | 12.17 | 12.30 | 12.44 | 12.53 | 12.79 | 2.0% | 0.5% | 7.4% | 8.2% | 7.4% |
| Other Services | 2.75 | 3.37 | 4.26 | 4.57 | 5.17 | 5.39 | 5.72 | 5.31 | 5.34 | 5.52 | 5.69 | 5.93 | 1.6% | 0.3% | 3.9% | 4.0% | 3.4% |
| Govt., Civilian, total | 16.38 | 16.53 | 18.41 | 19.43 | 20.79 | 21.81 | 22.38 | 23.21 | 23.97 | 24.50 | 25.20 | 25.66 | 1.1% | 0.5% | 16.8% | 16.3% | 14.8% |

Source: Global Insight, *2008 QR US Long-Term Outlook*, as compiled by Metro.

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## Figure 41. Portland Metro Location Quotients Relative to U.S. (1990-2035)

| | 1990 | 1995 | 2000 | 2005 | 2008 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Manufacturing, total | 1.06 | 1.09 | 1.12 | 1.18 | 1.22 | 1.27 | 1.23 | 1.22 | 1.26 | 1.28 | 1.30 |
| Durable Goods, total | 1.25 | 1.29 | 1.34 | 1.43 | 1.45 | 1.53 | 1.45 | 1.45 | 1.51 | 1.54 | 1.56 |
| Wood Products | 2.21 | 1.54 | 1.31 | 1.45 | 1.34 | 1.22 | 1.15 | 1.12 | 1.14 | 1.12 | 1.05 |
| Primary Metal | 1.86 | 1.47 | 1.68 | 1.77 | 2.09 | 2.22 | 2.03 | 1.82 | 1.67 | 1.66 | 1.72 |
| Fabricated Metal | 1.01 | 1.13 | 1.06 | 1.12 | 1.11 | 1.16 | 1.07 | 1.01 | 1.00 | 1.00 | 1.02 |
| Machinery | 0.98 | 1.01 | 0.97 | 0.96 | 0.95 | 0.96 | 0.85 | 0.80 | 0.80 | 0.80 | 0.81 |
| Electrical Machinery | 2.23 | 2.70 | 3.07 | 3.77 | 3.75 | 3.63 | 4.38 | 4.79 | 5.01 | 4.86 | 4.56 |
| Transportation Equipment | 0.67 | 0.67 | 0.73 | 0.69 | 0.71 | 0.83 | 0.74 | 0.82 | 0.97 | 1.07 | 1.06 |
| Non-durable Goods, total | 0.78 | 0.79 | 0.76 | 0.77 | 0.80 | 0.85 | 0.84 | 0.82 | 0.82 | 0.83 | 0.84 |
| Food Processing | 0.95 | 0.86 | 0.77 | 0.79 | 0.83 | 0.85 | 0.79 | 0.72 | 0.68 | 0.65 | 0.64 |
| Paper | 1.75 | 1.55 | 1.46 | 1.40 | 1.32 | 1.45 | 1.47 | 1.39 | 1.36 | 1.35 | 1.37 |
| Non-manufacturing, total | 1.03 | 1.03 | 1.01 | 1.01 | 1.00 | 1.00 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Natural Resources | 0.40 | 0.44 | 0.42 | 0.39 | 0.28 | 0.31 | 0.31 | 0.32 | 0.30 | 0.29 | 0.27 |
| Construction | 1.05 | 1.20 | 1.06 | 1.08 | 1.17 | 1.22 | 1.09 | 1.03 | 0.99 | 0.93 | 0.89 |
| Retail Trade | 0.94 | 0.93 | 0.95 | 0.93 | 0.95 | 0.94 | 0.98 | 0.96 | 0.96 | 0.97 | 0.98 |
| Motor Vehicle & Parts | 1.09 | 1.04 | 1.04 | 1.00 | 0.97 | 0.92 | 1.01 | 1.07 | 1.08 | 1.09 | 1.08 |
| Food & Beverage Stores | 0.82 | 0.80 | 0.85 | 0.89 | 0.93 | 0.89 | 0.97 | 1.01 | 1.01 | 1.03 | 1.05 |
| Other Retail | 0.96 | 0.95 | 0.96 | 0.93 | 0.95 | 0.96 | 0.97 | 0.93 | 0.93 | 0.94 | 0.94 |
| Transp., Warehouse, & Utilities | 1.13 | 1.08 | 1.04 | 1.02 | 0.98 | 1.01 | 1.00 | 0.95 | 0.91 | 0.90 | 0.93 |
| Information, total | 0.90 | 0.93 | 0.97 | 1.02 | 1.09 | 1.08 | 1.11 | 1.14 | 1.14 | 1.12 | 1.05 |
| Publishing | 0.78 | 0.99 | 1.27 | 1.37 | 1.56 | 1.66 | 1.86 | 2.14 | 2.36 | 2.51 | 2.48 |
| Internet & Other | 0.97 | 0.90 | 0.85 | 0.87 | 0.90 | 0.85 | 0.83 | 0.78 | 0.74 | 0.69 | 0.64 |
| Finance Activities | 1.14 | 1.13 | 1.14 | 1.14 | 1.13 | 1.12 | 1.20 | 1.28 | 1.34 | 1.39 | 1.42 |
| Finance & Insurance | 0.91 | 0.91 | 0.99 | 0.99 | 0.95 | 0.96 | 1.04 | 1.11 | 1.17 | 1.21 | 1.24 |
| Real Estate | 1.84 | 1.77 | 1.57 | 1.55 | 1.62 | 1.61 | 1.63 | 1.74 | 1.80 | 1.89 | 1.96 |
| Pro. Business Services | 1.08 | 1.14 | 1.06 | 1.03 | 1.01 | 1.01 | 0.93 | 0.88 | 0.83 | 0.78 | 0.73 |
| Pro., Sci., & Tech. | 1.21 | 1.20 | 0.98 | 0.95 | 0.91 | 0.90 | 0.89 | 0.85 | 0.76 | 0.67 | 0.59 |
| Mgmt. of Companies | 0.92 | 1.23 | 1.52 | 1.56 | 1.62 | 1.61 | 1.95 | 2.32 | 2.66 | 3.10 | 3.56 |
| Admin. Support | 1.01 | 1.05 | 1.02 | 0.99 | 0.96 | 0.99 | 0.81 | 0.73 | 0.70 | 0.67 | 0.65 |
| Edu. & Health Care | 1.01 | 0.92 | 0.92 | 0.94 | 0.92 | 0.90 | 0.95 | 1.01 | 1.07 | 1.14 | 1.19 |
| Educational | 1.04 | 0.98 | 1.02 | 1.00 | 0.96 | 0.96 | 1.09 | 1.21 | 1.29 | 1.38 | 1.45 |
| Health Care | 1.00 | 0.91 | 0.90 | 0.92 | 0.91 | 0.89 | 0.92 | 0.98 | 1.03 | 1.10 | 1.15 |
| Leisure & Hospitality | 1.03 | 1.01 | 0.98 | 0.96 | 0.96 | 0.95 | 0.99 | 1.03 | 1.05 | 1.08 | 1.09 |
| Arts, Entertainment & Rec. | 1.32 | 1.13 | 0.99 | 0.95 | 0.92 | 0.91 | 0.98 | 0.99 | 0.96 | 0.96 | 0.95 |
| Accommodation & Food | 0.99 | 0.99 | 0.98 | 0.96 | 0.97 | 0.96 | 0.99 | 1.03 | 1.07 | 1.10 | 1.12 |
| Other Services | 0.91 | 0.89 | 0.88 | 0.87 | 0.88 | 0.83 | 1.04 | 1.15 | 1.21 | 1.27 | 1.28 |
| Government, Civilian total | 0.89 | 0.85 | 0.90 | 0.90 | 0.91 | 0.91 | 0.86 | 0.85 | 0.85 | 0.83 | 0.85 |
| Federal, Civilian | 0.89 | 0.85 | 0.89 | 0.91 | 0.87 | 0.87 | 0.85 | 0.81 | 0.78 | 0.75 | 0.73 |
| State & Local | 0.81 | 0.79 | 0.84 | 0.85 | 0.86 | 0.86 | 0.82 | 0.81 | 0.82 | 0.81 | 0.83 |

Source: Global Insight, *2008 QR US Long-Term Outlook* and Metro.

# APPENDIX C. PORTLAND HARBOR INDUSTRIAL LAND SUPPLY ANALYSIS

# CITY OF PORTLAND
# ECONOMIC OPPORTUNITIES ANALYSIS:

## Section 2 and 3 – Employment Land Needs and Supply Analysis





## MARCH 2015 Proposed Draft

This EOA report has been funded through a grant from the State of Oregon Department of Land Conservation and Development.

**City of Portland Bureau of Planning & Sustainability**

**E. D. Hovee & Company, LLC**

Economic & Development Services

# EXECUTIVE SUMMARY

The EOA is an analysis of the 20-year supply and demand for employment development and land in the city. It is prepared according to State Administrative Rule OAR 660-09-0015 and consists of four sections:

1. Trends, Opportunities & Market Factors
2. Long Range Employment Forecast (Demand)
3. Buildable Land Inventory (Supply)
4. Community Choices (Comprehensive Plan proposals to meet employment land needs)

This report includes the second and third sections and presents the 2010-2035 employment forecast and resulting demand for employment land as well as the inventory of buildable employment land.

## KEY FINDINGS

- The Metro regional employment forecast allocates 511,000 jobs to the City of Portland in 2035, an addition of 141,600 new jobs in the 2010-2035 period.
- This job forecast translates into a demand for 70 million square feet of floor area in typical commercial and industrial building types, the equivalent of 2,560 acres of employment land.
- Portland's traded-sector economy needs an additional 350-580 acres of land for marine terminals, rail yards, and airport facilities. The range relates to two scenarios analyzed for marine terminal growth.
- Buildable Land Inventory identifies a supply of 3,200 acres of vacant and underutilized employment land, but it is not always the right type or in the right location.
- The City of Portland will need additional development capacity for industrial land, especially for Harbor Access Lands and in the Harbor and Airport Districts.
- Additional development capacity is also needed on the major institutional campuses, Central City Industrial, and Dispersed Employment geographies.

## EMPLOYMENT FORECAST AND LAND DEMAND

The City of Portland employment forecast is based on the Metro regional forecast of job growth. According to this forecast, Metro has prepared a baseline forecast for the Portland region in which employment is expected to increase from just under 1 million jobs in 2010 to nearly 1.5 million in 2035 - a gain of over 537,000 jobs with an average annual growth rate in the range of 1.8% per year over the 2010-2035 period.

Metro allocates 511,000 of these projected 1.5 million total jobs expected in 2035 to the City of Portland. When compared with actual 2010 employment of 370,000 jobs, the projected Portland job gain is approximately 141,600 jobs over the 2010-35 forecast period – an annual average growth rate of 1.3% and a 26% capture rate of regional employment growth.

The Economic Opportunity Analysis translates this forecast growth into demand for additional employment related development and land supply. After accounting for jobs that locate in residential areas (schools, home occupations, non-conforming uses), there is an estimated demand for 2,560 acres of employment land citywide in six typical commercial and industrial building types (such as office buildings or warehouse/distribution buildings).

Portland is a key freight distribution hub on the West Coast. As such, substantial additional land is needed for air, marine, and rail terminals that support the overall traded-sector economy. These specialized types of freight transportation facilities are treated as separate line items of land demand, because they are estimated primarily by transportation throughput. They also represent specialized, land-intensive building types that do not match the typical building needs of other transportation sector employment growth. An additional 350 to 580 acres of land is needed for these facilities and is added to the demand for industrial land in other building types.

### Figure 1. 2010-2035 Employment Forecast and Land Demand Summary

| | Jobs | | Acres | |
|---|---|---|---|---|
| **Aggregate Geography** | **#** | **%** | **#** | **%** |
| Central City | 44,740 | 32% | 150 | 6% |
| Industrial | 31,630 | 22% | 1,350 | 53% |
| Neighborhood Commercial | 35,140 | 25% | 690 | 27% |
| Institutions | 22,730 | 16% | 370 | 14% |
| Residential | 7,400 | 5% | NA | - |
| **Total** | **141,640** | **100%** | **2,560** | **100%** |

| **Traded Sector Support Facilities** | **Additional Acres** |
|---|---|
| Rail Yards | 200 |
| Marine Terminals* | 110/340 |
| Airport Facilities | 40 |
| **Total** | **350/580** |

* Two marine terminal forecast scenarios are analyzed. See Figure 17.

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability

## BUILDABLE LAND INVENTORY

The Buildable Land Inventory (BLI) is based on a GIS model developed by the Bureau of Planning and Sustainability (BPS) that looks at the difference between existing and allowed development to determine the remaining development capacity under the current comprehensive plan. The capacity is reduced to account for constraints such as infrastructure, brownfields, and natural resources protection. It also reduces capacity if the site is likely to be developed as a mixed-use employment/residential building by discounting the portion of building space that would be residential space based on past development trends. The development capacity is also adjusted for market factors in some areas to reflect zoned capacity that is more than is currently being developed or expected to be developed in the foreseeable future.

The citywide employment development capacity of the existing Comprehensive Plan is about 152 million square feet, which is distributed across the different employment geographies. The employment land supply is presented in three stages – the base supply (vacant and underutilized parcels), the constrained supply, and the (final) adjusted market supply (see Figure 2).

### Figure 2. Summary of 2035 Employment Development Capacity

| Aggregate Geography | Acres | Bldg SQFT | % of Base |
|---|---|---|---|
| Central City | 266 | 49,297,000 | 85% |
| Industrial | 1,365 | 59,442,000 | 52% |
| Neighborhood Commercial | 1,303 | 32,506,000 | 24% |
| Institutions | 306 | 10,676,000 | 100% |
| **Total** | **3,240** | **151,921,000** | **48%** |

Source: Bureau of Planning and Sustainability

## LAND NEEDS RECONCILIATION

By subtracting effective land supply from demand, it is possible to determine whether and to what extent Portland's employment land base will be adequate to serve forecast needs over the 2035 planning horizon. In cases where there is adequate inventory, a land surplus is indicated; where the inventory is not adequate, a resulting deficit is calculated.

### Figure 3. 2035 Employment Land Needs Summary

| Employment Geography | Added Jobs | Land Demand | Existing Supply | Surplus/ Deficit | % Capacity |
|---|---|---|---|---|---|
| Central City Commercial | 34,120 | 60 | 201 | 141 | 335% |
| Central City Industrial | 10,620 | 90 | 65 | **-25** | **72%** |
| Harbor & Airport Districts* | 16,050 | 1,013 | 774 | **-239** | **76%** |
| Harbor Access Lands* | 2,070 | 207/437 | 113 | **-94/-324** | **55%/26%** |
| Columbia East | 9,310 | 350 | 356 | 6 | 102% |
| Dispersed Employment | 4,200 | 130 | 121 | **-9** | **93%** |
| Gateway Regional Center | 3,970 | 50 | 137 | 87 | 274% |
| Town Centers | 6,160 | 130 | 304 | 174 | 234% |
| Neighborhood Centers & Corridors | 25,010 | 510 | 863 | 353 | 169% |
| Institutions | 22,730 | 370 | 306 | **-64** | **83%** |
| Residential | 7,400 | - | - | **-** | **-** |
| **Total** | **141,640** | **2,910/3,140** | **3,240** | | |
| **Aggregate Geography** | | | | | |
| Central City | 44,740 | 150 | 266 | 116 | 177% |
| Industrial* | 31,630 | 1,700/1,930 | 1,365 | **-335/-565** | **80%/71%** |
| Neighborhood Commercial | 35,140 | 690 | 1,303 | 613 | 189% |
| Institutions | 22,730 | 370 | 306 | **-64** | **83%** |
| Residential | 7,400 | - | - | - | - |
| **Total** | **141,640** | **2,910/3,140** | **3,240** | | |

* Total land demand shown here includes Traded Sector Support Facilities in marine, rail and air terminals. Harbor Access Lands demand is shown with two marine-terminal forecast scenarios (see Figure 17).

Source: Bureau of Planning and Sustainability

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability

There are specific geographies that have a deficit or shortfall that will need to be addressed to provide an adequate supply of development capacity to meet the forecasted employment growth. Specifically, additional policy changes, zoning capacity, public investments, and development incentives will be needed to address capacity shortfalls in the **Central City Industrial, Harbor & Airport Districts, Harbor Access Lands, Dispersed Employment,** and **Institutions** geographies. The Comprehensive Plan update will need to identify changes to policy or zoning, public investments, development incentives or other means to address these deficits and meet the forecast demand.

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# I. INTRODUCTION

As part of Periodic Review, the City of Portland is required to complete an Economic Opportunities Analysis (EOA) to comply with Oregon Statewide Planning Goal 9. The EOA evaluates the types and amounts of employment land needed to accommodate expected growth to 2035. The EOA is intended to inform the Comprehensive Plan Update, consistent with Statewide Planning Goal 9 and regional capacity analysis.

## ORGANIZATION OF EMPLOYMENT LAND NEEDS ANALYSIS

The Task 2 / 3 supply and demand analysis report is organized to cover the following topics:

- Employment Forecast and Land Demand Analysis
- Buildable Land Inventory
- Land Needs and Supply Reconciliation
- Short-Term Land Needs Analysis
- Lot Size Analysis

## METHODOLOGY

The EOA methodology of evaluating the adequacy of current development capacity has two parallel steps for estimating land demand to 2035 and current supply available to meet it, as summarized in (Figure 4). The first part determines the demand for developable land based on a future employment forecast. The process of estimating demand has many steps to translate Metro's regional employment forecast (jobs) into a demand for land (building square footage/acres) by employment geography types. The second part establishes the amount of the employment land supply available for development and is based on the Buildable Land Inventory (BLI). The BLI estimates the development capacity of vacant and underutilized land that is available for development, while factoring various constraints on development such as lack of infrastructure, natural resources, or brownfields. The final step is a reconciliation or comparison between the demand for employment land and the available supply to identify any unmet land needs – the shortfalls or gaps. Measures to address these gaps to ensure an adequate supply of land to meet forecasted demand will be addressed through the comprehensive plan update process.

This report was updated in 2015. Appendix C of the EOA Section 4 Report includes a detailed description of revisions in the 2015 update. The citywide employment forecast was reduced to be consistent with Metro's adopted employment allocation to the City of Portland in 2012. The short-term land supply demand horizon was extended to 2020 to address 5-year land needs. Harbor Access Lands was identified as a distinct employment geography and two marine terminal demand scenarios were analyzed there. The Employment Geographies map was revised to be consistent with the proposed update of the Comprehensive Plan. And the Buildable Land Inventory was updated, including revisions to the employment geographies, vacant and underutilized land map, and constraints mapping.

## Figure 4. EOA Methodology

### Demand

Forecast land demand to 2035

#### Region/City Forecast

Metro forecasts 537,000 new jobs in 7-county MSA from 2010 to 2035 and a 26% capture rate for Portland, consistent with post-1980 growth trends. Portland's employment forecast is for 141,600 new jobs by 2035

#### Sector Growth

Allocate employment to different employment sectors (manufacturing, finance, retail, etc.). Growth rates of different sectors are estimated from national and regional trends and adjusted by 2000-2008 city trends.

#### Building Space Needs by Type

Job growth by sector is allocated to six building types (e.g., office, warehouse), based on sector--to-building-type and jobs-per-square-foot assumptions.

#### Land Demand by Employment Geography

Building space needs are allocated to nine employment geographies (e.g., Central City Commercial). Each geography represents areas with a distinct mix of jobs, building types, and sites. Special needs for marine, airport, and rail terminals are based on throughput trends.

### Supply

Inventory current land capacity

#### Buildable Land Inventory

Underutilized land was inventoried as the sites most likely to accommodate new building space, based on development trends. The inventory consists of vacant land (undeveloped) and redevelopable sites (buildings with less than 20% of allowable zoning density). Industrial land is limited to vacant land.

#### Effective Supply of Constrained Land

The capacity of constrained sites were reduced to reflect the difficulty in developing sites with infrastructure needs, brownfields, environmental resources, historic sites, etc.

#### Adjustments

Mixed- Use - zoning districts can allow for mixed use development, which requires an allocation between employment and residential capacity.

Market Factor - in some areas, land is zoned to allow more development or taller buildings than the real estate market can support by 2035.

#### Land Supply by Employment Geography

Estimate available land supply for each employment geography.

### Demand/Supply Reconciliation

Forecast demand and effective supply were compared by employment geography. Supply shortfalls were identified in geographies where additional capacity is needed to meet projected demand.

# II. EMPLOYMENT & LAND DEMAND FORECAST

This chapter details the methodology used to forecast employment-related land needs within the City of Portland through 2035.

As stipulated by Statewide Planning Goal 9 (Economy of the State), the intent of the Economic Opportunities Analysis is to "compare the demand for industrial and other employment uses to the existing supply of such land." This section details the employment forecast that drives the demand for employment land. While employment growth serves as a major driver for land demand, the forecast process also recognizes that some needs (such as regional transportation facilities) require industrial land that can be more accurately estimated by the transportation throughput (e.g, marine cargo or airport passengers) handled at these facilities.

## EMPLOYMENT FORECAST METHODOLOGY

Metro prepares a regional forecast of population and employment growth for the 7-county PMSA region and then allocates that forecast to individual jurisdictions.[1] The Portland allocation anticipated job growth is translated into land demand via an excel worksheet model. The key steps in translating job growth into land demand are outlined below. The Portland employment forecast is dependent on two main factors – the total employment forecast for the region and the percent share of forecast growth assigned to Portland. In 2012, Metro adopted a single point regional forecast of 1.49 million total jobs in the region by 2035.[2] Supporting data tables are provided in Appendix C.

1. **Portland Metro Regional Employment Forecast.** The City of Portland employment forecast is based on the Metro regional forecast of job growth. With the baseline forecast, Portland PMSA non-farm employment would increase from recession dampened figure of less than 1 million jobs in 2010 to nearly 1.5 million in 2035, a gain of approximately 537,000 jobs with an average annual growth rate in the range of 1.8% per year over the 2010-2035 time period. Metro uses a forecasted employment figure as the starting point year (2010) of approximately 943,100 non-farm workers. For this EOA, the starting point has been adjusted to actual 2010 covered employment of 949,700 as reported by the Oregon Employment Department (OED) using the Quarterly Census of Employment and Wages (QCEW). Sector specific data is aggregated to cover 18 broad employment classifications consistent with the North American Industry Classification System (NAICS).

2. **Allocation of Metro Employment Forecast to City of Portland.** Metro allocates 517,000 total jobs by 2035 to the City of Portland. When compared with actual 2010 employment of 370,000 jobs, this results in a projected Portland job gain of

[1] The U.S. Census Bureau defines the Portland PMSA as a 7-county region consisting of Multnomah, Washington, Clackamas, Yamhill and Columbia Counties in Oregon together with Clark and Skamania Counties in Washington.

[2] Previously, Metro had used a range forecast. This forecast is based on Metro's "GAMMA" run of the 2035 forecast that was provided to the City of Portland in October 2011. Metro continues to refine the local jurisdiction allocation process, which is expected to be finalized in June 2012. The final allocation may vary, but is not expected to materially change the results of this analysis.

approximately 141,600 over the 2010-35 forecast period – an annual average growth rate of 1.3%.

3. **Allocation of Job Growth by Employment Geography.** The employment forecast is geo-coded to each of 10 employment geographies and a remainder "residential" geography based on actual covered employment records in 2010. An additional geographic-shift factor is also applied to the employment forecast for each geography, calculated by their relative employment trends between 2000 and 2008 (the peak-to-peak period of the last business cycle). Thus, the forecast reflects both sector trends at the national and regional level and local geography trends at the employment district level. Resulting detailed working data tables provide employment by geography and NAICS categories.

4. **Allocation of Job Growth by Building Type.** While Metro forecasts are classified by NAICS-specific employment or industrial sectors, the employment growth is translated to the demand of building square footage and acres of land for commercial and industrial land uses by allocating sector-specific job growth to each of six building types. General industrial, warehouse and flex space/business park categories are building types common to industrial employment uses. Office, retail and institutional building types are for commercial uses.

   The job growth allocations by geography (Step 3) are matched to the distribution of jobs by building type. Shifting geographic shares of employment accounted for by a particular building type are forecast forward to 2035. For example, geographies that have increased their share of the city's office employment are expected to continue to do so over the next 25 years – but at a rate of change slower than that of the last decade.

   This allocation is consistent with the Metro forecast distribution with minor adjustments based on a more detailed analysis of employment sector trends in Portland. For forecast steps 4-6, city-specific forecast modeling includes inputs from Metro (including the Metroscope model) together with results of an *Employment & Economic Trends Analysis* conducted by E. D. Hovee & Company, LLC for Metro in 2009, as further refined with input from the City of Portland Bureau of Planning and Sustainability.

5. **Building Space per Employee.** Industry standard estimates of the building square footage that houses a typical employee are applied to each of the six building types and to Portland's 10 employment geographies. These estimates are consistent with the Metro analysis with City-provided adjustments, especially with respect to analysis conducted for the City of Portland's industrial areas.[3]

[3] City of Portland, 2004 Industrial Districts Atlas

6. **Intensity of Development.** Floor area ratios (FARs) are a measure of building square footage on a site divided by site area (in square feet). FARs in this analysis reflect results of Metro employment study research together with input from the City of Portland Industrial Atlas (providing overall data for employees per acre as a composite control check on results of steps 5 and 6).

   Anticipated intensity of development is intended to increase somewhat over the 25-year forecast period, as available vacant sites are in shorter supply. The rate of FAR increase is greater for commercial than industrial building types and geographies.

7. **Building square feet is translated into land area** via Floor Area Ratios (FAR). A separate FAR is assumed for each building type and each geography. FARs are based on actual FARs that are increased over the 25 year forecast period to reflect increasing densities as the land supply becomes limited over time.

## Figure 5. Forecast Employment Lands Assumptions Summary

| Forecast Variable | Assumptions | Calculations in Appendix A |
|---|---|---|
| ***Employment Growth:*** | | |
| 1. Metro PMSA Job Forecast (2010-35) | 537,000 jobs (1.8% AAGR) | Figure 28 |
| 2. Portland Capture of PMSA Job Growth (% Portland Growth) | 26% Capture (1.3% AAGR) | Figure 29 |
| 1+2 Resulting Portland Job Forecast (25 Year) | 141,600 | Figure 30 |
| ***Building- Land Need:*** | | |
| 3. Job Allocation to Building Types | Does not vary | Figure 31 |
| 4. Typical Building Square Feet per Job | Does not vary | Figure 33 |
| 5. Floor Area Ratios (FARs) | Central City increases by 34%<br>Other non-industrial by 10%<br>Industrial constant. | Figure 34 |

Note: AAGR depicts average annual growth rate, calculated as a compound average.

Source: E. D. Hovee & Company, LLC.

8. **Employment Land Demand Results.** Results of this forecast and allocation process are presented in terms of added employment, building space needs, gross land acreage needs, and associated FARs over the 2010-35 horizon for each of the city's 10 employment geographies.

9. **Traded-Sector Support Facilities.** In addition to typical land absorption corresponding to employment growth in each standard building type, the City of Portland will need land set aside for atypical regional transportation facilities that support the regional economy such as airport aviation support, rail yard, and marine terminal needs. These added industrial land needs are more accurately estimated by the transportation throughput

handled at these significant regional transportation facilities (e.g., marine cargo and airport passengers). To prevent double counting, the typical land needs associated with the job growth of the sectors at these facilities (which are already counted in the forecast) are deducted from the total land forecast estimated by transportation throughput.

10. **Total Land Demand for Employment.** The overall demand for employment land is the combination of the demand for land for employment growth and traded-sector transportation facilities.

## EMPLOYMENT GEOGRAPHIES

The results of the employment forecast and resulting demand for development land are reported by ten summary employment land geographies, allowing development assumptions to vary across the City and provide more detail in describing job growth trends and forecasts together with associated building and anticipated land acreage needs. The employment geographies are subareas of the city that represent types of business districts as examined and defined in Section 1. While each geography has a mix of sectors, some geographies also have clear sector specializations. For example, 62% of the Central City Commercial jobs in 2008 were in the office sectors, 64% of industrial area jobs were in the industrial sectors, and 98% of the institutional campus jobs were in health care and education (see Figure 11 in EOA Section 1).

Each "employment land geography" represents (1) a collection of established business districts by type that reflects business location preferences (agglomeration) and community location preferences (comprehensive plan); (2) a segment of citywide demand for employment land, consisting of a distinct mix of business sectors and building types; and (3) a segment of the city's current developable land supply (see Figures 6, 7 and 8). Methodologically, the geographies represent a way of linking 25-year demand by site type to location advantages and developable land supply.

Figure 8 shows the employment geographies of the proposed Comprehensive Plan. It also depicts map changes from the existing Comprehensive Plan employment geographies that were used in EOA Section 1 to describe current conditions and trends. The proposed Comprehensive Plan geographies were used to estimate adequate existing and proposed capacity to meet the forecasted demand. Figure 9 depicts the configuration of the Harbor & Airport Districts and Harbor Access Lands geographies and the related multimodal freight infrastructure located there.

These employment geographies are summarized into four larger aggregate categories of: Central City, industrial, neighborhood commercial, and institutions. The residential geography is primarily associated with institutional uses occurring in residential areas, home occupations, non-conforming uses and ancillary employment with open space areas (ranging from golf courses to public parks).

.

## Figure 6. Employment Geographies

| Category | Employment Geography |
|---|---|
| **Central City** | Central City Commercial |
| | Central City Industrial |
| **Industrial** | Harbor & Airport Districts |
| | Harbor Access Lands |
| | Columbia East (east of 82nd Ave) |
| | Dispersed Employment |
| **Commercial** | Gateway Regional Center |
| | Town Centers |
| | Neighborhood Centers & Corridors |
| **Institutions** | Institutions |
| **Residential** | Residential areas and open space not included in the other geographies |

**Institutional Campuses**

| **Universities** | **Hospitals** |
|---|---|
| Reed College | Oregon Health & Science University |
| University of Portland | Shriner's Hospital |
| Concordia University | Portland Veteran's Hospital |
| Warner Pacific University | Providence Portland Medical Center |
| Lewis and Clark College | Kaiser Medical Centers |
| Portland Community College – Southeast | Legacy Emanuel Hospital |
| Portland Community College – Cascade | Legacy Good Samaritan Hospital |
| Portland Community College – Sylvania | |
| Multnomah University | |
| Western States Chiropractic College | |

Institutions included in other employment geographies:

*Portland State University (Central City)* *Adventist Medical Center (Gateway)*

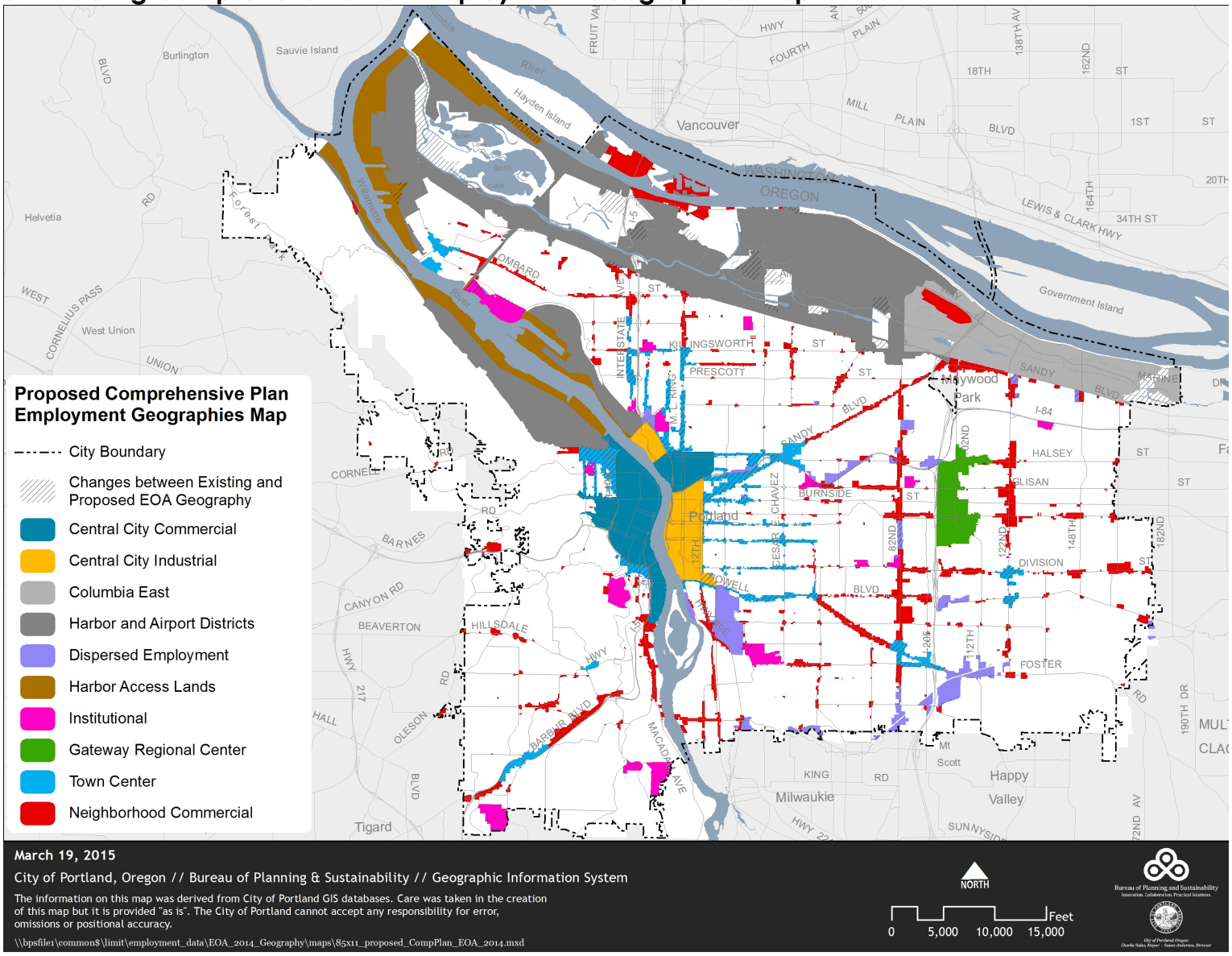
## Figure 7. Predominant Site Conditions of Employment Geographies

| Location | Types of Businesses | Density/site size | Features |
|---|---|---|---|
| **Central City** | | | |
| **Central City Commercial** | | | |
| Central City westside, Lloyd | Office, mixed employment | High, <1 acre | Regional CBD |
| **Central City Industrial** | | | |
| Central Eastside, L. Albina | Industrial, mixed employment | Medium, <3 acres | Incubator/industrial |
| **Industrial** | | | |
| **Harbor & Airport Districts** | | | |
| Harbor upland & Airport* | Distribution, manufacturing | Low, 1-100+ acres | Marine/rail/air hub |
| **Harbor Access Lands** | | | |
| Harbor frontage* | River-dependent/related industry | Low, 5-100+ acres | Deepwater channel |
| **Columbia East** | | | |
| Col. Corridor E of 82nd | Industrial, mixed employment | Low, 1-20 acres | Flex industrial parks |
| **Dispersed Employment** | | | |
| Neighborhoods | Industrial, mixed employment | Low, <1-10 acres | Freeway proximity |
| **Commercial** | | | |
| **Gateway Regional Center** | | | |
| I-84 at I-205 | Mixed employment | Medium, <1-6 acres | Transit/freeway hub |
| **Town Centers** | | | |
| Neighborhoods | Institutional, mixed commercial | Low/med., <1-3 acres | Mixed-use centers |
| **Neighborhood Centers & Corridors** | | | |
| Neighborhoods | Retail, mixed employment | Low, <1-10 acres | Commercial corridors |
| **Institutions** | | | |
| **Institutions** | | | |
| Neighborhoods | Hospitals, colleges | Low/med., >10 acres | 17 large campuses |

* The Harbor & Airport Districts includes the Northwest, Swan Island, Rivergate, and Airport industrial districts, excluding Harbor Access Lands that extends generally one block from the deepwater channel.

Source: Bureau of Planning and Sustainability

## Figure 8. Existing Comprehensive Plan Employment Geographies Map




Source: E.D. Hovee & Company, LLC, City of Portland Bureau of Planning & Sustainability.

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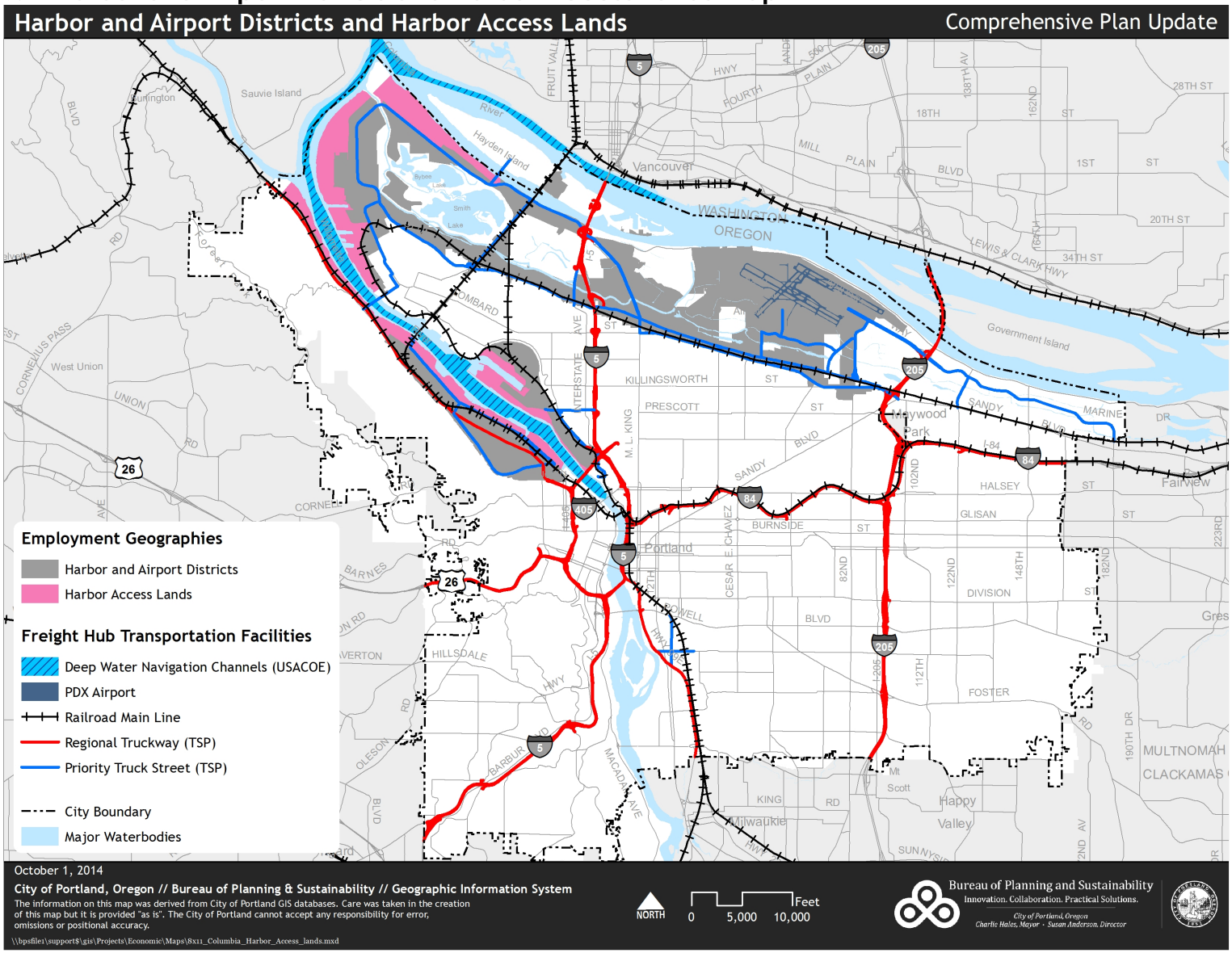
## Figure 9. Harbor and Airport Districts and Harbor Access Lands Map




Source: E.D. Hovee & Company, LLC, City of Portland Bureau of Planning & Sustainability.

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## EMPLOYMENT FORECAST RESULTS

Overall, Portland's employment growth is expected to capture approximately 26% of the region's employment growth. The forecast reflects an expectation of continued, but relatively slower, decline in the City's overall share of regional employment. In 2010 Portland had nearly 39% of the region's job base. This forecast estimates that share will decline to 34% by 2035. While each of Portland's 18 job sectors have varied shares of regional employment, the allocation assumes that each sector's proportion of corresponding regional employment declines at a similar rate over the 25-year forecast period. Figure 10 shows the distribution of the employment forecast by sector. The institutional sectors (health and education) account for nearly 52,000 new jobs or 36% of the growth. While the manufacturing sector declines slightly as consistent with national and regional forecast expectations, the warehousing and distribution sectors are expected to see strong growth with over 16,000 new jobs by 2035.

### Figure 10. City of Portland Employment Forecast by Sector

| Employment Sector | 2010 | 2035 | Job Change 2010-35 | Avg Rate of Growth 2010-35 |
|---|---|---|---|---|
| Agriculture & Mining | 392 | 353 | (39) | -0.4% |
| Construction | 14,224 | 21,539 | 7,315 | 1.7% |
| Manufacturing | 25,035 | 24,076 | (959) | -0.2% |
| Wholesale Trade | 18,009 | 23,009 | 5,000 | 1.0% |
| Retail Trade | 31,060 | 32,963 | 1,903 | 0.2% |
| Transportation, Warehousing & Utilities | 23,676 | 34,978 | 11,302 | 1.6% |
| Information | 9,640 | 13,761 | 4,121 | 1.4% |
| Finance | 17,048 | 24,270 | 7,222 | 1.4% |
| Real Estate | 7,946 | 15,366 | 7,420 | 2.7% |
| Professional Services | 26,943 | 38,861 | 11,918 | 1.5% |
| Management | 14,322 | 21,683 | 7,361 | 1.7% |
| Administrative & Waste Services | 18,449 | 28,110 | 9,661 | 1.7% |
| Educational Services | 37,937 | 61,196 | 23,259 | 1.9% |
| Health & Social Services | 50,616 | 78,876 | 28,260 | 1.8% |
| Arts, Entertainment & Recreation | 6,741 | 8,493 | 1,752 | 0.9% |
| Accomodation & Food Services | 35,102 | 44,222 | 9,120 | 0.9% |
| Other Services | 16,802 | 23,076 | 6,274 | 1.3% |
| Government (Civilian) | 15,498 | 16,251 | 753 | 0.2% |
| **TOTAL EMPLOYMENT** | **369,440** | **511,083** | **141,643** | **1.3%** |
| City Share of Portland Metro Employment | 39% | 34% | 26% | |

Source: E. D. Hovee & Company, LLC based on Metro projection and City/Metro forecast 2035 allocation.

The City of Portland employment forecast allocation of 141,600 additional jobs is distributed to the employment geographies based on actual employment distribution in 2010 and trends from the recent 2000-2008 business cycle (Figure 11).

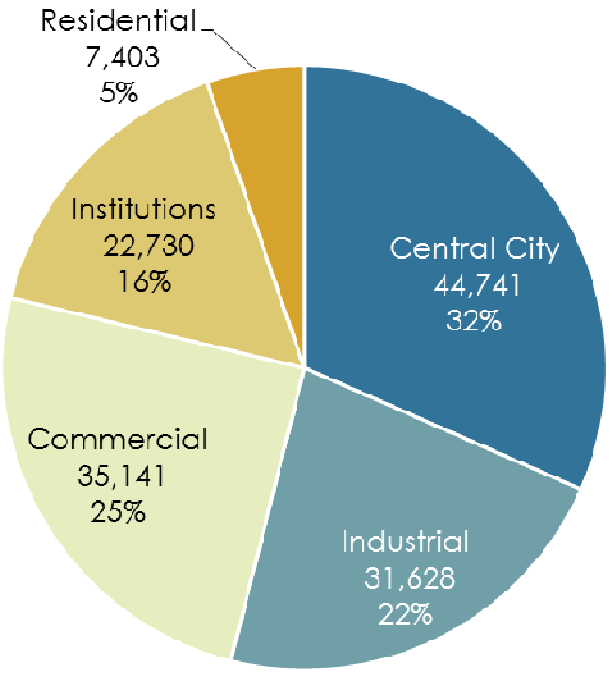
## Figure 11. Employment Forecast by Employment Geography

| Employment Geography | 2010 Actual Jobs Number | 2010 Actual Jobs Share | Added Jobs Number | Added Jobs Share | 2035 Total Number | 2035 Total Share |
|---|---|---|---|---|---|---|
| Central City Commercial | 104,394 | 28% | 34,124 | 24% | 138,518 | 27% |
| Central City Industrial | 19,171 | 5% | 10,617 | 7% | 29,788 | 6% |
| Harbor & Airport Districts | 45,274 | 12% | 16,046 | 11% | 61,320 | 12% |
| Harbor Access Lands | 8,579 | 2% | 2,074 | 1% | 10,653 | 2% |
| Columbia East | 17,764 | 5% | 9,308 | 7% | 27,072 | 5% |
| Dispersed Employment | 15,286 | 4% | 4,200 | 3% | 19,486 | 4% |
| Gateway Regional Center | 10,059 | 3% | 3,970 | 3% | 14,029 | 3% |
| Town Centers | 11,557 | 3% | 6,160 | 4% | 17,717 | 3% |
| Neighborhood Centers & Corridors | 71,233 | 19% | 25,011 | 18% | 96,244 | 19% |
| Institutions | 31,868 | 9% | 22,730 | 16% | 54,598 | 11% |
| Residential | 34,675 | 9% | 7,403 | 5% | 42,078 | 8% |
| **Total** | **369,860** | **100%** | **141,643** | **100%** | **511,503** | **100%** |
| **Aggregate Geography** | | | | | | |
| Central City | 123,565 | 33% | 44,741 | 32% | 168,306 | 33% |
| Industrial | 86,903 | 23% | 31,628 | 22% | 118,531 | 23% |
| Commercial | 92,849 | 25% | 35,141 | 25% | 127,990 | 25% |
| Institutions | 31,868 | 9% | 22,730 | 16% | 54,598 | 11% |
| Residential | 34,675 | 9% | 7,403 | 5% | 42,078 | 8% |
| **Total** | **369,860** | **100%** | **141,643** | **100%** | **511,503** | **100%** |

Source: E.D. Hovee & Company, LLC

The share of employment distributed to different areas is not expected to change very much. About one-third or 45,000 new jobs are expected in the Central City (Figure 12). Industrial area jobs are forecast to account for about 22% of citywide employment growth. Campus institutions are expected to expand with about 23,000 new jobs or 16% of the job growth, which will raise their share of the City's overall employment.

**Figure 12. 2010-2035 Employment Growth Distribution**




Source: E.D. Hovee & Company, LLC

## EMPLOYMENT LAND DEMAND

The employment forecast allocation is translated into a resulting demand for building square footage and land (Figure 13). The employment growth is expected to generate the demand for nearly 77 million square feet of building space, requiring approximately 2,560 acres of buildable land area. The Central City land demand is 150 acres, and an additional 690 acres of land is needed for development in the Neighborhood Commercial geographies elsewhere in Portland. Job growth on institutional campuses will need capacity for about 13 million square feet of buildings or about 370 acres of buildable land. The largest demand for land will be for approximately 1,400 acres of industrial land (excluding freight terminals), which is to be expected given the lower employment densities (jobs per acre) and FARs for industrial buildings.

Also, approximately 7,400 of the new jobs created (or 5% of the total job growth) is allocated to residential and open-space designated areas of the city. This growth is primarily associated with institutional uses occurring in residential areas. It also includes schools, churches, home occupations and non-conforming uses and ancillary employment with open space areas (ranging from golf courses to public parks). For the purposes of forecasting future demand for employment land, it is assumed that the jobs in the residential areas locate on residential land that is not part of the employment buildable land supply and not considered further in the EOA.

## Figure 13. Employment Forecast Land Demand (2010-2035)

| Employment Geography | Added Jobs | Square Feet | Total Acres* | FAR* |
|---|---|---|---|---|
| Central City Commercial | 34,124 | 13,598,000 | 60 | 5.20 |
| Central City Industrial | 10,617 | 5,218,000 | 90 | 1.33 |
| Harbor & Airport Districts* | 16,046 | 11,909,000 | 773 | 0.35 |
| Harbor Access Lands* | 2,074 | 1,494,000 | 97 | 0.35 |
| Columbia East | 9,308 | 6,140,000 | 350 | 0.40 |
| Dispersed Employment | 4,200 | 2,060,000 | 130 | 0.36 |
| Gateway Regional Center | 3,970 | 1,996,000 | 50 | 0.92 |
| Town Centers | 6,160 | 3,199,000 | 130 | 0.56 |
| Neighborhood Centers & Corridors | 25,011 | 11,549,000 | 510 | 0.52 |
| Institutions | 22,730 | 12,892,000 | 370 | 0.80 |
| Residential | 7,403 | NA | NA | NA |
| **Total** | **141,643** | **70,055,000** | **2,560** | |
| **Aggregate Geography** | | | | |
| Central City | 44,741 | 18,816,000 | 150 | 2.88 |
| Industrial | 31,628 | 21,603,000 | 1,350 | 0.37 |
| Neighborhood Commercial | 35,141 | 16,744,000 | 690 | 0.56 |
| Institutions | 22,730 | 12,892,000 | 370 | 0.80 |
| Residential | 7,403 | NA | NA | NA |
| **Total** | **141,643** | **70,055,000** | **2,560** | |

* Total land and FAR shown here do not include Traded Sector Support Facilities in marine, rail and air terminals. See Figures 16 and 17.
Source: E.D. Hovee & Company, LLC

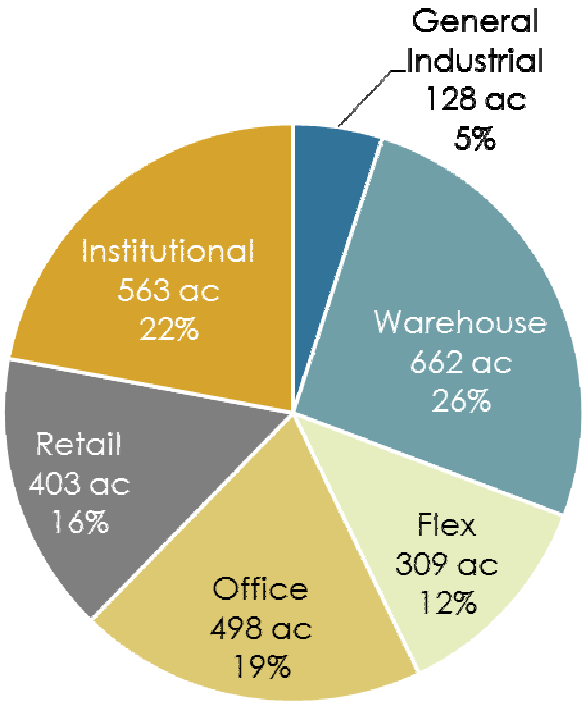
## EMPLOYMENT LAND NEED BY BUILDING TYPE

Figure 14 and 15 disaggregate projected employment land need (in terms of jobs, building square feet and land acres) by building type. Building types roughly correspond to industrial or commercial sectors, however, each geography has a mix of these building types. For example, while much of professional services employment is accommodated by office space, a portion of the demand ends in street-level retail spaces, and another portion in flex (or business park) space.

The table also illustrates that most employment-related demand – even within some industrial areas – derives from the commercial building types (office, retail and institutional). Citywide, 57% of the land demand forecasted is associated with commercial building types – including office, retail and institutional space.

Figure 15 provides the detail for the different types of job growth and land demand within each of Portland's major employment geographies. For industrial buildings, major sources of demand are expected to be associated with warehouse and flex space, with little added net demand projected for general industrial space. With commercial buildings, the primary need is anticipated to be for institutional space (including education and health care) followed by office and retail space.

**Figure 14. Employment Land Demand by Building Type**




Source: E.D. Hovee & Company, LLC.

Commercial building types comprise smaller but still substantial shares of anticipated land need within industrial geographies. For example, in the Central City Incubator geography (the Central Eastside and Lower Albina) commercial building types account for two-thirds of projected land demand; and for the Columbia Harbor geography this proportion accounts for one-quarter of the land demand.

The employment forecast projects that a significant 36% of new employment is expected to be within the health and education sectors. A significant portion of these jobs will be within institutional campuses with about one-half of the institutional building space and land demand allocated for the 17 campuses that make up the institutional employment geography, with the other half spread across the other employment geographies. This distribution and demand is consistent with recent trends in which institutions, especially heath care, appear to be decentralizing and bringing services closer to where people live.

Land demand is also influenced by FARs, as less dense building types (such as retail and warehousing) generate more land demand than building types such as office for an equivalent number of jobs. The FAR assumptions utilized in the forecast are presented in Figure 36 of Appendix A.

## Figure 15. Employment Land Demand by Building Type

| | Industrial Uses | | | Commercial Uses | | |
|---|---|---|---|---|---|---|
| | Jobs | Bldg Sq Ft | Acres | Jobs | Bldg Sq Ft | Acres |
| | **General Industrial** | | | **Office** | | |
| Central City Commercial | (178) | (62,000) | (0) | 22,272 | 7,795,000 | 24 |
| Central City Industrial | 516 | 478,000 | 11 | 5,222 | 1,828,000 | 19 |
| Harbor & Airport Districts* | 347 | 322,000 | 21 | 6,044 | 2,115,000 | 133 |
| Harbor Access Lands* | 173 | 160,000 | 10 | 733 | 257,000 | 16 |
| Columbia East | 765 | 708,000 | 41 | 3,618 | 1,266,000 | 70 |
| Dispersed Employment | 561 | 519,000 | 34 | 3,129 | 1,095,000 | 69 |
| Gateway Regional Center | 16 | 5,000 | 0 | 1,062 | 372,000 | 5 |
| Town Centers | 54 | 19,000 | 1 | 1,328 | 465,000 | 16 |
| Neighb. Centers & Corridors | 106 | 98,000 | 9 | 10,372 | 3,630,000 | 128 |
| Institutions | (0) | 0 | (0) | 1,927 | 675,000 | 18 |
| **Total** | **2,255** | **2,247,000** | **128** | **57,892** | **19,498,000** | **498** |
| | **Warehouse & Distribution*** | | | **Retail** | | |
| Central City Commercial | 134 | 47,000 | 0 | 6,015 | 2,827,000 | 21 |
| Central City Industrial | 995 | 775,000 | 17 | 1,479 | 695,000 | 31 |
| Harbor & Airport Districts* | 5,296 | 6,687,000 | 437 | 1,745 | 820,000 | 54 |
| Harbor Access Lands* | 477 | 601,000 | 40 | 157 | 74,000 | 5 |
| Columbia East | 1,825 | 2,304,000 | 132 | 1,535 | 722,000 | 41 |
| Dispersed Employment | (12) | (15,000) | (1) | (280) | (131,000) | (9) |
| Gateway Regional Center | (29) | (10,000) | (0) | 920 | 432,000 | 27 |
| Town Centers | (4) | (1,000) | (0) | 932 | 438,000 | 32 |
| Neighb. Centers & Corridors | 497 | 388,000 | 35 | 7,591 | 3,568,000 | 158 |
| Institutions | 11 | 4,000 | 0 | 2,013 | 946,000 | 42 |
| **Total** | **9,457** | **10,780,000** | **662** | **22,657** | **10,391,000** | **403** |
| | **Flex*** | | | **Instititutional** | | |
| Central City Commercial | 2,150 | 752,000 | 3 | 3,731 | 2,239,000 | 10 |
| Central City Industrial | 1,026 | 615,000 | 7 | 1,379 | 827,000 | 9 |
| Harbor & Airport Districts* | 2,357 | 1,812,000 | 118 | 256 | 153,000 | 10 |
| Harbor Access Lands* | 477 | 367,000 | 24 | 58 | 35,000 | 2 |
| Columbia East | 1,191 | 915,000 | 53 | 373 | 224,000 | 13 |
| Dispersed Employment | 659 | 506,000 | 33 | 143 | 86,000 | 6 |
| Gateway Regional Center | 19 | 7,000 | 0 | 1,983 | 1,190,000 | 17 |
| Town Centers | 124 | 44,000 | 2 | 3,725 | 2,235,000 | 82 |
| Neighb. Centers & Corridors | 1,520 | 910,000 | 68 | 4,924 | 2,954,000 | 107 |
| Institutions | 5 | 3,000 | 0 | 18,775 | 11,265,000 | 308 |
| **Total** | **9,831** | **5,931,000** | **309** | **39,552** | **21,208,000** | **563** |
| | **Total Industrial** | | | **Total Commercial** | | |
| Central City Commercial | 2,106 | 737,000 | 3 | 32,018 | 12,861,000 | 54 |
| Central City Industrial | 2,537 | 1,868,000 | 36 | 8,081 | 3,350,000 | 59 |
| Harbor & Airport Districts | 8,001 | 8,821,000 | 576 | 8,045 | 3,088,000 | 197 |
| Harbor Access Lands | 1,127 | 1,128,000 | 74 | 947 | 366,000 | 23 |
| Columbia East | 3,781 | 3,927,000 | 225 | 5,527 | 2,212,000 | 124 |
| Dispersed Employment | 1,208 | 1,010,000 | 66 | 2,992 | 1,050,000 | 66 |
| Gateway Regional Center | 5 | 2,000 | (0) | 3,965 | 1,994,000 | 50 |
| Town Centers | 175 | 62,000 | 3 | 5,985 | 3,138,000 | 130 |
| Neighb. Centers & Corridors | 2,124 | 1,396,000 | 112 | 22,887 | 10,152,000 | 393 |
| Institutions | 16 | 7,000 | 0 | 22,715 | 12,886,000 | 368 |
| **Total** | **21,542** | **18,958,000** | **1,098** | **120,101** | **51,097,000** | **1,465** |

* Total land demand shown here includes Traded Sector Support Facilities in marine, rail and air terminals.

Source: E.D. Hovee & Company, LLC.



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## ADDITIONAL DEMAND FOR INDUSTRIAL LAND

Additional land demand is projected for freight terminals, a prominent land use in Portland, because their building density does not match typical industrial building types and their growth is more accurately estimated by transportation throughput than employment trends.

Portland is a key freight distribution hub and export gateway on the West Coast and is Oregon's largest seaport, rail hub, and airport. As such, air, marine, and rail terminals are prominent land uses in Portland's industrial districts. These freight terminals support the overall traded-sector economy by enhancing access of regional exporters to international and domestic markets, supporting local access and continuing investment in national-system freight infrastructure, and attracting diverse distribution and manufacturing businesses to the region. In turn, goods production industries (distinct from services) make up 81% of the export income in this region's "trade-dependent" economy, in contrast to the 71% national average (see Brookings Institution export analysis, 2013).

The adopted 2009 Climate Action Plan notes the importance of freight system efficiency, and included the following objective:

> *"Improve the efficiency of freight movement within and through the Portland metropolitan area (Urban Form and Mobility Objective 7)."*

Central to the efficiency of the freight system is the location of industrial areas and the integration with the regional transportation system. Minimizing emissions from freight movement requires protecting and improving intermodal facilities and continuing to connect them to the transportation system. Enhancing strong connections to marine and rail shipment is particularly important because movement of freight with those modes requires a much lower energy cost per ton. In the absence of strong rail and marine connections, more freight will be moved long distance through the Portland region in trucks.

Freight terminal land uses are exceptionally land-intensive. On-site employment is very low at these national/international transportation facilities, but substantial direct and supported job impacts of these facilities is located at other sites in the city, region, and Pacific Northwest.[4] An alternative method is used here to estimate their land needs for two reasons. First, the warehouse and other standard building types used to estimate the land needs of job growth at these freight terminals (see Figure 15) do not match their large site size and low building density. Second, their land needs are more closely related to the volume of transportation throughput handled at these facilities than to related sector employment trends. The overall freight volume handled in the Portland region is forecast to roughly double in tonnage and triple in value between 2007 and 2040 (see EOA Section 1 and the Draft Portland/Vancouver Commodity Flow Forecast, 2014). The resulting additional land demand for these traded-sector support facilities is summarized in Figure 16.

[4] Martin Associates, *Economic Impact of the Port of Portland*, 2011

## Figure 16. Additional Land Demand for Traded Sector Support Facilities

| Traded Sector Support Facilities | Demand (acres) |
|---|---|
| PDX Aviation Support | 40 |
| Rail Yard Expansion | 200 |
| Marine Terminals (Scenarios A/B) | 110/340 |
| **Total** | **350/580** |

Source: Bureau of Planning and Sustainability.

In order to avoid double counting, the estimated land needs of freight terminals are calculated as the difference between their employment-based land need and the land need attributable to transportation throughput, as shown in Figure 17. Marine terminal land needs are expected to be met in the Harbor Access Lands geography, and the rail yard and airport-support facility land needs apply to the Harbor and Airport Districts geography. The overall employment forecast in these geographies reflects existing employers and does not change with this additional land demand.

## Figure 17. Estimation of Land Demand for Traded-Sector Support Facilities

| Traded Sector Support Facilities | Transportation-Trend Forecast (Acres) | Employment-Trend Forecast | | Additional Land Need (Difference) |
|---|---|---|---|---|
| | | New Jobs | Acres | |
| **PDX Aviation Support Facilities*** | | | | |
| Air Transportation and Terminal Services | 72 | 2,450 | 136 | -64 |
| Air Cargo and Car Rental | 135 | 670 | 29 | 106 |
| Other Airport Employers | | 140 | 4 | -4 |
| Total | 207 | 3,260 | 169 | 37 |
| **Rail Yard Expansion** | | | | |
| Rail Yards | 200 | ** | ** | 200 |
| **Marine Terminals** | | | | |
| Scenario A: Low Cargo Forecast*** | 125 | 325 | 19 | 106 |
| Scenario B: Mid-range Cargo Forecast*** | 392 | 850 | 50 | 342 |

* The Airport Futures Plan (2010) used transportation-trend forecasts to estimate these land needs.
** Railroads are not included in Covered Employment data used in employment trends forecast.
*** Marine terminal growth scenarios compare (A) ECONW's "low" capacity need estimate (auto terminals only) and (B) ECONW's mid-range capacity need estimate for new auto, grain, and dry bulk facilities (EOA Task 1 Appendix C).
Source: Bureau of Planning and Sustainability

### *PDX Airport*

The PDX Airport today occupies approximately 2,800 acres, excluding the adjacent Cascade Station and Portland International Center areas. The 2010 Airport Futures Plan and PDX Master Plan were adopted in 2011 by the City of Portland and Port of Portland as a long-range development plan for PDX. These plans included a detailed analysis of airport land needs to 2035 based on an aviation demand forecast (passengers and air cargo) and analysis of specific facility expansion needs. The PDX Master Plan identifies 207 acres of additional land need for new and expanded facilities. However, there is an overlap or double-counting with the

employment-based forecast. The employment located in the airport geography is forecast to generate 175 acres of land demand in standard building types. This employment land demand is deducted from the land need estimated in the Airport Futures Plan, which is derived from air travel demand forecasts rather than employment forecasts.

Figure 17 compares these forecast methods by types of airport facilities. The Airport Futures Plan found that projected passenger travel growth by 2035 can be accommodated by existing runways, so the employment growth associated with air transportation and terminal services can be accommodated. However, land needs for air cargo couriers, general aviation (non-scheduled flights), and rental car lots are more land-intensive than estimated by the employment-based forecast (see Appendix A, Figure 37). Combining the net result of all airport facilities, Airport Futures found an additional 37 acres of 2010-2035 land demand for airport facilities beyond the employment-based forecast. This additional demand for aviation support facilities is rounded to 40 acres and applied as a separate line item in the land demand forecast.

### *Rail Yard Expansion*

Portland is the Pacific Northwest's rail transportation hub, and seven larger rail yards currently occupy approximately 700 acres in Portland's industrial districts. The employment-based forecast allocates no land for railroad or rail yard expansion, because rail transportation employment is not included in Covered Employment data used for the forecast. Rail yard expansion since 2004 has consisted of the Port of Portland's Ramsey Yard and South Rivergate Yard, providing approximately 25 acres of new yard space. While long-term needs and railroad investment plans remain uncertain, likely demand for expansion and modernization of yard facilities is estimated at approximately 200 acres, based on projected rail tonnage growth and the typical size of new rail yards.

Long-term rail transportation forecasts anticipate robust growth. BST Associates projected 2010-2030 freight rail tonnage growth by type for the Oregon Lower Columbia and Oregon Coast areas[5]:

- 4.1% (moderate) to 7.3% (high) average annual growth rate (AAGR) for marine-related rail, such as the trains served by Barnes, Ramsey and South Rivergate Yards in Portland;
- 2% AAGR for merchandise trains, such as those served by Albina Yard in Portland; and
- 3.5% AAGR for domestic intermodal trains, such as those served by Brooklyn and Lake Yards in Portland.

Put in context, growth at 2.9% AAGR would approximately double the local rail tonnage handled in 25 years.

In addition to the recent expansion at Ramsey and South Rivergate Yards, construction of a new domestic intermodal yard at Troutdale was discussed and met community objections. Afterward, Union Pacific moved their domestic intermodal operations from Albina Yard to Brooklyn Yard, to improve efficient use of available yard capacity. Nationally, Union Pacific constructed 5

[5] BST Associates, *Pacific NW Marine Cargo Forecast Update and Rail Capacity Assessment*, October, 2011

intermodal yards between 2000 and 2005, ranging from 130 to 320 acres in size and averaging 224 acres. To accommodate increasing rail operations, rail yard land demand to 2035 is estimated at 200 acres, which conceptually could consist of a new domestic intermodal yard or the combined expansion of existing yards and smaller new yards.

A Union Pacific representative commented that a 200-acre rail demand forecast to 2035 is not unreasonable. The railroad's long-term plans are unclear in the current economic climate. Expansion for energy-related cargo exports is a wildcard that was not factored into local demand forecasts. The organization has a five-year plan that describes track capacity. For the Portland area, short-term plans assume working within their existing land holdings. The railroad generally focuses on consolidation and efficiencies within urban areas, and if necessary, relocation, such as the recent relocation of intermodal facilities to Brooklyn Yard.

### *Marine Terminals*

Portland Harbor serves as a major economic engine for the regional economy. These port terminals function as public infrastructure, facilitating economic activity for other industries in the region. Studies indicate that cargo and manufacturing activities dependent on waterborne transportation contribute significantly to the metro region's economy. Estimates of the economic impacts generated by marine-related activity in Portland range from 20,000 to 100,000 jobs and from $1.4 to 3.4 billion annually in regional income.[6]

Harbor industrial development tends to have low floor-to-area ratios (FAR) and a relatively low number of on-site jobs per acre. But industrial lands in general, and harbor lands in particular, are an important piece of the regional economic base, which supports a much larger number of jobs in other economic sectors. Despite declining employment in the Harbor Access Lands geography during the 2000-2008 business cycle, like the employment losses in Downtown Portland and some other geographies in this period, Portland Harbor experienced an increase in cargo tonnage at a faster pace than the rate of industrial land development in the area.[7] Employment losses during this period are partly associated with the listing of the extensive Portland Harbor Superfund Project in 2000, which has constrained vacant land development that would typically result from business turnover on affected sites.

Given the robust cargo forecasts and projected marine terminal needs described in EOA Section 1 and the disconnected relationship between employment growth and cargo activity in the harbor, an alternative land needs forecast is particularly needed for marine terminal development. ECONorthwest identifies several forecast scenarios for marine cargo tonnage and associated land needs in Portland in EOA Section 1, Appendix C.[8] The commodity forecasts summarized by ECONorthwest are expressed as a range. To inform community choices, two harbor growth scenarios are analyzed here. Scenario A is the low end of the demand forecast. Scenario B is the mid-range demand forecast. The impacts of these choice are described in more detail in Section 4.

6 Entrix, Inc., West Hayden Island (WHI) Economic Foundation Study, July 2010.

7 ECONorthwest, Portland Harbor: Industrial Land Supply Analysis, May 2012.

8 ECONorthwest, Portland Harbor: Industrial Land Supply Analysis, May 2012.

**Harbor Growth Scenario A** is derived from the low end of the demand forecast estimated by ECONorthwest at 187,000 metric tons for automobile cargo only (see Exhibit 3-6 in EOA Section 1, Appendix C). For "practical" site sizes of auto terminals (a conservative land need assumption), this tonnage results in 150 acres of overall land need by 2040, adjusted to 125 acres by 2035. The 125-acre overall land need for marine terminal growth is further adjusted to 106 acres (rounded to 110) to avoid double-counting land needs estimated by the employment-trends forecast (see Figure 17). This scenario could potentially be met in the existing Harbor Access Lands geography by vacant and redevelopable land development at T-6 (approximately 40 vacant acres), T-4 (approximately 30 redevelopable acres at the former Cargill terminal), and/or an assembled brownfield development site around the former Time Oil terminal (an assembled site of up to 84 acres is analyzed by ECONorthwest in EOA Section 1, Appendix C).

**Harbor Growth Scenario B** consists of ECONorthwest's mid-range demand forecast (5,760,000 metric tons) with an expected land need of 470 acres (see Exhibit 3-7 in EOA Section 1, Appendix C), which is adjusted for the year 2035 to 392 acres (rounded to 390). Based on the development trends of new terminals being constructed on the West Coast, land need for marine cargo is typically expected to be for parcels larger than 100 acres to accommodate some form of rail access and ensure facility competitiveness.[9] This scenario anticipates the need for 270 acres of land need for auto terminal development and 100-acre grain and dry bulk terminal sites large enough for conventional unit-train rail loop access. Again, as with Scenario A, these combined land needs are adjusted to approximately 340 acres (see Figure 17) to avoid double-counting land needs estimated by the employment-trends forecast. West Hayden Island is the only site in the Portland Urban Services Area where this combined need could potentially be met, due to the geometric requirements for a modern rail loop. The new on-site marine terminal employment in Scenario B is estimated to be 850 jobs.

## TOTAL EMPLOYMENT LAND DEMAND

The employment growth forecast demand is combined with the traded sector transportation facilities to determine the total land need (Figure 18).

[9] Entrix, Inc., West Hayden Island (WHI) Economic Foundation Study, July 2010.

## Figure 18. 2035 Employment Development Capacity Demand

| Employment Geography | Added Jobs | Building SQFT | Total Acres | Avg FAR |
|---|---|---|---|---|
| Central City Commercial | 34,124 | 13,598,000 | 60 | 5.20 |
| Central City Industrial | 10,617 | 5,218,000 | 90 | 1.33 |
| Harbor & Airport Districts | 16,046 | 11,909,000 | 773 | 0.35 |
| Harbor Access Lands | 2,074 | 1,494,000 | 97 | 0.35 |
| Columbia East | 9,308 | 6,140,000 | 350 | 0.40 |
| Dispersed Employment | 4,200 | 2,060,000 | 130 | 0.36 |
| Gateway Regional Center | 3,970 | 1,996,000 | 50 | 0.92 |
| Town Centers | 6,160 | 3,199,000 | 130 | 0.56 |
| Neighborhood Centers & Corridors | 25,011 | 11,549,000 | 510 | 0.52 |
| Institutions | 22,730 | 12,892,000 | 370 | 0.80 |
| Residential | 7,403 | NA | NA | NA |
| **Total** | **141,643** | **70,055,000** | **2,560** | |
| **Aggregate Geography** | | | | |
| Central City | 44,741 | 18,816,000 | 150 | 2.88 |
| Industrial | 31,628 | 21,603,000 | 1,350 | 0.37 |
| Neighborhood Commercial | 35,141 | 16,744,000 | 690 | 0.56 |
| Institutions | 22,730 | 12,892,000 | 370 | 0.80 |
| Residential | 7,403 | NA | NA | NA |
| **Total** | **141,643** | **70,055,000** | **2,560** | |
| **Additional Land Need for Traded Sector Support Facilities** | | | | |
| PDX Aviation Support | 3,220 | | 40 | |
| Rail Yard Expansion | NA | | 200 | |
| Marine Terminals (Scenarios A/B) | 325/850 | | 110/340 | |
| **Total** | | | **350/580** | |
| **Total Land Demand** | | | **2,910/3,140** | |

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability.

## SHORT-TERM EMPLOYMENT FORECAST AND LAND DEMAND

The State of Oregon Administrative Rules also require cities to provide an adequate short-term land supply "to respond to economic development opportunities as they arise." The Metro regional forecast predicts a robust recovery from the national recession. Consequently, the City of Portland is expected to add 95,000 jobs or 67% of the forecasted employment growth in the 2010-2020 period. If this predicted growth occurs, it will generate the demand for about 2,000 acres of employment land. Land demand over the remainder of the planning period is projected to grow at lower rates, following the job-growth trajectory shown in Figure 32. Additional freight terminal demand is expected to occur episodically after 2020 through individual terminal investment decisions, except that a currently proposed marine terminal (Pembina) is included in short-term demand. Short-term land need for this marine terminal is estimated at 36 acres, which assumes an approximate 40-acre development site and excludes 4 acres to prevent double-counting of land need estimated by the employment-trends forecast.

**Figure 19. 2010-2020 Short-Term Employment Forecast and Land Demand**

| Employment Geography | Added Jobs | Building SQFT | Total Acres |
|---|---|---|---|
| Central City Commercial | 22,600 | 8,951,000 | 40 |
| Central City Industrial | 7,560 | 3,885,000 | 75 |
| Harbor & Airport Districts | 12,660 | 10,067,000 | 659 |
| Harbor Access Lands | 1,630 | 1,263,000 | 118 |
| Columbia East | 6,980 | 4,867,000 | 279 |
| Dispersed Employment | 3,030 | 1,673,000 | 109 |
| Gateway Regional Center | 2,460 | 1,220,000 | 33 |
| Town Centers | 3,860 | 1,985,000 | 86 |
| Neighborhood Centers & Corridors | 16,280 | 7,658,000 | 362 |
| Institutions | 13,440 | 7,562,000 | 224 |
| Residential | 4,110 | NA | NA |
| **Total** | **94,610** | **49,131,000** | **1,985** |

Source: E.D. Hovee & Company, LLC., and Bureau of Planning and Sustainability

## PARCEL SIZE DEMAND ASSESSMENT

This assessment is based on the same parcel distribution by geography as demand experienced 1999-2011 for parcels experiencing new construction (year built as of 2000 or later) but with smoothing (or interpolation) of demand to in-between sizes with no demonstrated demand from 1999-2011.

This parcel size distribution reflects the pattern of activity that occurred during the last decade, a period of slower job growth regionally and in Portland than is forecast over the next 25 years. Future parcel size requirements may well vary from experience of recent years.

A pivotal factor suggesting a need for a greater mix of large parcels is the need to accommodate more job growth than has occurred in the last decade. To the extent that achieving more aggressive job growth targets depends on ability to accommodate larger employers (especially within industrial geographies), more large acreage sites may be required. Otherwise, Portland runs a greater risk of losing these large employers to sites elsewhere in the region or outside the Portland metro area altogether. Also noted is that presence of constrained sites (as with brownfields and environmental constraints) within the remaining inventory may require larger sites in terms of gross acreage to get to the same net yield as may have been experienced previously with less constrained sites. Therefore, this demand assessment includes the additional need for one large (50 acre) site in the Harbor and Airport Districts. This demand assessment also includes the traded sector land needs, which are expected to be located in the area as well.

## Figure 20. Land Demand by Parcel Size (acres)

| EOA Geographies | Gross Acreage Land Need (2010-35) by Parcel Size | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | < 1 | 1 - 3 | 3 - 5 | 6 - 10 | 10-20 | 20-50 | 50-100 | > 100 | Total | Total >1 |
| Central City Commercial | 33 | 9 | 9 | 10 | 0 | 0 | 0 | 0 | 60 | 27 |
| Central City Industrial | 54 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 90 | 36 |
| Harbor & Airport Districts | 71 | 135 | 213 | 166 | 126 | 52 | 50 | 200 | 1,013 | 942 |
| Harbor Access Lands | 1 | 6 | 9 | 11 | 11 | 49 | 50 | 300 | 437 | 435 |
| Columbia East | 9 | 85 | 78 | 67 | 111 | 0 | 0 | 0 | 350 | 341 |
| Dispersed Employment | 38 | 26 | 23 | 23 | 20 | 0 | 0 | 0 | 130 | 92 |
| Gateway Regional Center | 18 | 13 | 11 | 9 | 0 | 0 | 0 | 0 | 50 | 32 |
| Town Centers | 84 | 46 | 0 | 0 | 0 | 0 | 0 | 0 | 130 | 46 |
| Neighb. Centers & Corridors | 276 | 77 | 91 | 65 | 0 | 0 | 0 | 0 | 510 | 234 |
| **Total** | **584** | **432** | **434** | **350** | **269** | **101** | **100** | **500** | **2,770** | **2,186** |
| **Aggregate Geographies** | | | | | | | | | | |
| Central City | 86 | 45 | 9 | 10 | 0 | 0 | 0 | 0 | 150 | 64 |
| Industrial | 119 | 252 | 322 | 266 | 269 | 101 | 100 | 500 | 1,930 | 1,811 |
| Neighborhood Commercial | 379 | 136 | 102 | 74 | 0 | 0 | 0 | 0 | 690 | 311 |
| **Total** | **584** | **432** | **434** | **350** | **269** | **101** | **100** | **500** | **2,770** | **2,186** |

* Harbor Access Lands demand shown here includes marine terminal forecast Scenario B for 340 acres (see Figure 17). Scenario A would exclude the 100+ acre site demand and add 70 acres to the 20-100 acre categories.

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability.

Conversely, there are factors which suggest at least some potential that demand will adjust to available supply over time on smaller parcels that previously may have been bypassed. These factors include increasing interest by firms already heavily invested in Portland to make do with existing sites and/or acquire smaller, nearby (and in some cases multiple) sites for incremental expansion. This approach can be facilitated with greater regulatory flexibility and targeted infrastructure investments to make more efficient use of a shrinking supply of remaining vacant as well as redevelopable in-city inventory.

This assessment also suggests the need for monitoring of actual development site sizes over the course of the forecast period – with capacity for plan adjustments if warranted by demonstrated site size demand not being met by the remaining site inventory.

# III. SUPPLY: BUILDABLE LAND INVENTORY

As stipulated by Goal 9 (Economy of the State), the intent of the Economic Opportunities Analysis is to "compare the demand for industrial and other employment uses to the existing supply of such land." This section analyzes the Buildable Land Inventory as Portland's measure of employment land supply.

The Buildable Land Inventory (BLI) is based on a GIS model developed by the Bureau of Planning and Sustainability (BPS) that looks at the difference between existing and allowed development to determine the development capacity of the current comprehensive plan. This report summarizes the methodology and results of the employment land portion of the BLI. A full description of the BLI with supporting maps can be found in the *Buildable Land Inventory* background report.

## METHODOLOGY

The BPS Development Capacity Analysis (DCA) model is a series of steps or filters to identify the acreage of land that is available for development or redevelopment in Portland.

1. Identify vacant land.
2. Identify land likely to redevelop.
3. Discount capacity based on physical constraints
4. Adjust capacity for mixed use development and market factors

### *Base Land Supply – Vacant and Redevelopable Land*

The first step to inventory buildable land is a relatively straightforward process to identify vacant sites or land utilizing tax assessment data, Metro's vacant land inventory, and verification process utilizing aerial photos and field checking. Parcels under 0.5 acres were not considered viable for industrial geographies and parcels less than 1,500 square feet were not considered viable for commercial development.

The development analysis in the Task 1 report shows that only 50-70% of the development activity in Portland is taking place on totally vacant sites. The second step in the inventory is a more complicated process to identify non-vacant parcels that are significantly under-developed or underutilized and are likely to redevelop. The DCA model uses existing building area to calculate the likelihood of redevelopment based on the rationale that parcels with smaller building coverage compared to what is allowed by current zoning regulations are likely to redevelop given the potential for a new larger building to absorb the value of the existing building into the development costs. Within the Central City, a parcel must have less than 20% of the allowed floor area and have an improvement-to-land ratio (I/L ratio) of less than 50%. I/L ratios are used because improvement and land values are more accurately recorded in the Central City. Outside the Central City, parcels within 500 feet of a "frequent service" transit line are mapped as underutilized if they are using less than 20% of their allowed floor area (regardless of the improvement-to-land ratio). Frequent service transit lines are defined as bus and light rail lines that run every 15 minutes or better during weekday peak hours. All other parcels are

mapped as underutilized if they are using less than 10% of their allowed floor area (regardless of the improvement-to-land ratio). For underutilized parcels that will redevelop, the existing building square footage is deducted from the zoned capacity, so only the net new development capacity is counted.

For the Industrial areas, underutilized parcels are treated differently. Industrial Sanctuary designated parcels are limited to vacant parcels. Underutilized parcels are not included in this analysis because there are no FAR limits in the Portland industrial zones and industrial development tends to have lower building coverage with large areas for outdoor storage and vehicle maneuvering areas. However, developed parcels designated Central Employment and Mixed Employment that currently utilize less than 10% of their allowed floor area (regardless of the improvement-to-land ratio) are considered underutilized and included in the land supply because these parcels tend to include a wider mix of uses with more intensive development.

Institutional uses warrant special consideration because their land use patterns are distinct from other employers. Medical and higher education institutions often tend to cluster all or a significant portion of their activity into campuses, requiring larger parcels or aggregations of parcels, developing land more intensively (e.g. with structured parking) and locating in a variety of zones other than commercial and industrial (such as residential). For the BLI, 17 individual campuses are identified and the development capacity is determined through an assessment of current land use approvals and base zoning minus existing buildings.

### *Development Constraints*

Constrained lands include sites that lack needed infrastructure (e.g. sites without sewer service) or have other physical or regulatory constraints on development, such as environmentally sensitive areas, historic landmarks, steep slopes, and flood hazards. Each constraint is defined and mapped and a discount factor is determined to reflect the degree of site utilization expected on land affected by each constraint.

The discount factor is determined in a two-step process. The first step is characterizing the constraint as high, medium, or low based on consultation with the City of Portland's development review staff at the Bureaus of Development Services, Transportation, Water, and Environmental Services.[10] Then this factor is adjusted based on a review of development rates of various constrained sites compared to unconstrained sites for the 1999-2011 period (Appendix B). This analysis included both the rate of development (avoidance) as well as the overall amount of development to determine the level of constraint. The constraint analysis considered the impact of 52 different characteristics that are grouped into six categories and sorted by geographic area.[11] An additional discount factor of -10% is applied to sites with two overlapping constraints or -20% for sites with more than three constraints. Institutional campuses are not included in this adjustment factor because the master planning process to establish the development capacity has already factored most of these constraints.

[10] BPS, 2012 Buildable Land Inventory, Appendix A

[11] Constraint discount factors are not calculated for the Institutional geography because it assumed that these constraints are factored into the campus master plans that are the basis for determining the development capacity of the 17 campuses.

## Figure 21. Development Constraint Factors

| Constraint | Adjusted Capacity Utilization | Constraint | Adjusted Capacity Utilization |
|---|---|---|---|
| **Environmental** | | **Historic Landmarks** | |
| Central City | 75% | Central City | 55% |
| Industrial | 50% | Industrial | 55% |
| Commercial | 35% | Commercial | 55% |
| | | | |
| **Infrastructure** | | **Low** | |
| Central City | 75% | Central City | 85% |
| Industrial | 75% | Industrial | 85% |
| Commercial | 75% | Commercial | 85% |
| | | | |
| **Brownfields** | | **Greenway** | |
| Central City | 90% | Central City | 75% |
| Industrial | 40% | Industrial | 50% |
| Commercial | 50% | Commercial | 55% |

Source: E.D. Hovee & Company, LLC and Bureau of Planning and Sustainability

### *Adjustments*

### Mixed-Use Zoning

In most of the City of Portland's commercial land use zones residential uses are an allowed use, and over the last 15 years Portland has seen a significant amount of mixed use, residential development in these areas, especially in the Central City. Therefore, in this capacity analysis a certain amount of the development capacity is assumed to develop as residential space and therefore not available for employment uses. The residential share is based on a review of building permit activity in commercial areas from 2002-2008.[12]

## Figure 22. Mixed Use Zoning Residential Share Factors

| | Comprehensive Plan Designation | Residential Share | Central City Residential Share |
|---|---|---|---|
| EX | Central Employment | 75% | 63% |
| CX | Central Commercial | 55% | 40% |
| UC | Urban Commercial | 75% | 40% |
| CG | General Commercial | 25% | 40% |
| NC | Neighborhood Commercial | 30% | 40% |
| IR | Institutional Residential | 5% | 78% |
| ME | Mixed Employment | 0% | 63% |

Source: Bureau of Planning and Sustainability

[12] The most robust permit data was in the EX, CX, and UC designations. For the GC, NC, IR, and ME designations there was less mixed use data, so the factors are more conservative and assume less mixed use residential space.

### Market Development Rates

This factor adjusts the land supply to reflect market supportable building capacity for the commercial geographies. In the commercial areas outside the Central City, the commercial development capacity allowed by zoning regulations is greater than what the private market is expected to develop. For example, most town centers and commercial corridors allow for 3:1 FARs. Even after some of the floor area is allocated to residential space (see above), the commercial space is greater than what the private sector typically develops. Parking plays a substantial factor in these determinations because FARs over 0.50 typically require some mix of structured parking and/or high transit mode split. Future market conditions are difficult to predict. These market factors are based on the average FARs estimated by the demand forecast in these geographies (total building area divided by total land area). Therefore, the commercial or employment capacity is capped at a maximum market-supportable FAR.

### Figure 23. Commercial FAR Market Factor

| Employment Geography | Commercial FAR Cap |
|---|---|
| Gateway Regional Center | 0.95 |
| Town Centers | 0.54 |
| Neighborhood Commercial | 0.52 |

Source: E.D. Hovee & Company, LLC

A review of development trends in the Central City shows that most development incorporates floor area bonuses that exceed the base standards in the BLI, therefore no market factor is needed in the Central City.[13] The development capacity of industrial areas is not regulated by FARs so no factor is needed there. The Institutional campus capacity has been determined by the campus master plan process, so the market factor does not apply.

## EMPLOYMENT LAND SUPPLY

The employment development capacity is about 152 million square feet, which is distributed across the different employment geographies. The employment land supply is presented in three stages – the base supply (vacant and underutilized parcels), the constrained supply (capacity after constraint deductions), and the (final) adjusted market supply (Figure 24). Appendix C includes a more detailed analysis of the land supply with vacant and redevelopment capacity distributed by lot size.

[13] 2012 Central City Development Capacity Analysis

## Figure 24. Buildable Land Inventory by Employment Geography

| Employment Geography | Base Supply Bldg Sq Ft | Constrained Supply Bldg Sq Ft | Constrained Supply % of Base | Market Adjusted Supply Bldg Sq Ft | Market Adjusted Supply % of Base | Acres |
|---|---|---|---|---|---|---|
| Central City Commercial | 54,137,000 | 45,517,000 | 84% | 45,517,000 | 84% | 201 |
| Central City Industrial | 4,161,000 | 3,780,000 | 91% | 3,780,000 | 91% | 65 |
| Harbor & Airport Districts | 66,215,000 | 35,664,000 | 54% | 33,704,000 | 51% | 774 |
| Harbor Access Lands | 15,374,000 | 4,932,000 | 32% | 4,932,000 | 32% | 113 |
| Columbia East | 23,330,000 | 15,519,000 | 67% | 15,519,000 | 67% | 356 |
| Dispersed Employment | 8,906,000 | 5,287,000 | 59% | 5,287,000 | 59% | 121 |
| Gateway Regional Center | 12,588,000 | 8,992,000 | 71% | 5,483,000 | 44% | 137 |
| Town Centers | 25,875,000 | 22,644,000 | 88% | 7,485,000 | 29% | 304 |
| Neighborhood Centers & Corridors | 97,316,000 | 72,838,000 | 75% | 19,538,000 | 20% | 863 |
| Institutions | 10,676,000 | 10,676,000 | 100% | 10,676,000 | 100% | 306 |
| **Total** | **318,578,000** | **225,849,000** | **71%** | **151,921,000** | **48%** | **3,240** |
| **Aggregate Geography** | | | | | | |
| Central City | 58,298,000 | 49,297,000 | 85% | 49,297,000 | 85% | 266 |
| Industrial | 113,825,000 | 61,402,000 | 54% | 59,442,000 | 52% | 1,365 |
| Neighborhood Commercial | 135,779,000 | 104,474,000 | 77% | 32,506,000 | 24% | 1,303 |
| Institutions | 10,676,000 | 10,676,000 | 100% | 10,676,000 | 100% | 306 |
| **Total** | **318,578,000** | **225,849,000** | **71%** | **151,921,000** | **48%** | **3,240** |

Source: Bureau of Planning and Sustainability

Ord. 187831, Vol. 2.4.C, page 9415

The City of Portland has about 3,200 acres of buildable land. Approximately 68% of the development capacity is vacant land and 32% is underutilized, redevelopable land.

The Central City Commercial geography has a significant amount of zoned development capacity for employment uses – 54 million square feet. Various constraints reduce that capacity by 16% to 46 million square feet, the equivalent of 201 acres. The Central City Industrial geography is composed primarily of industrial zoned land, so there is less capacity – about 4.2 million square feet of base supply that constraints reduce by 9% to 3.8 million square feet, or 65 acres of buildable land.

The City of Portland's industrial areas have about 2,472 acres of vacant land and 135 acres of redevelopable land, but 48% of that capacity is constrained, leaving about 1,365 acres available for future employment growth. Harbor & Airport Districts has the bulk of this industrial capacity – 774 acres, and about 113 acres are located along the waterfront in the Harbor Access Lands. The Columbia East geography has 356 acres of capacity, and another 121 acres is scattered through the Dispersed Employment areas.

The neighborhood commercial areas outside the Central City have a tremendous amount of development capacity, even after accounting for mixed use residential development, totaling about 136 million square feet. Constraints reduce this capacity by 23%, but it is the market adjustment factor (based largely on patterns of development activity experienced in recent years) that reduces the capacity by another 53%. The net result is capacity for 33 million square feet, or 1,303 acres.

Institutional campuses have the potential for about 10.7 million square feet of development, or 306 acres of capacity.

## SHORT-TERM EMPLOYMENT LAND SUPPLY

The State of Oregon Administrative Rules also requires cities to assess the short-term land demand and supply. As defined in these rules, "engineering feasibility is sufficient to qualify land for the short term supply" and funding availability is not required. For the most part, the land within Portland has services available or proximate to the sites such that development is not dependent on major public infrastructure investments. The major short-term constraint will be brownfields, especially within the Portland Harbor Superfund area. Due to overlapping constraints with infrastructure deficiencies and natural resource protections, the overall impact to the land supply is relatively minor – about 360 acres of development capacity.

## Figure 25. Short-Term Land Supply

| | Building Square Feet | | | |
|---|---|---|---|---|
| Employment Geography | Base Supply | Constrained Supply | Adjusted Supply | Acres |
| Central City Commercial | 54,137,000 | 40,309,000 | 40,309,000 | 178 |
| Central City Industrial | 4,161,000 | 3,439,000 | 3,439,000 | 59 |
| Harbor & Airport Districts | 66,215,000 | 29,169,000 | 27,209,000 | 625 |
| Harbor Access Lands | 15,374,000 | 2,578,000 | 2,578,000 | 59 |
| Columbia East | 23,330,000 | 14,832,000 | 14,832,000 | 340 |
| Dispersed Employment | 11,434,000 | 6,907,000 | 6,907,000 | 105 |
| Gateway Regional Center | 12,588,000 | 7,965,000 | 4,456,000 | 111 |
| Town Centers | 25,875,000 | 21,685,000 | 7,095,000 | 288 |
| Neighborhood Centers & Corridors | 97,316,000 | 69,915,000 | 18,368,000 | 811 |
| Institutions | 9,045,000 | 7,048,000 | 7,048,000 | 306 |
| **Total** | **319,475,000** | **203,847,000** | **132,241,000** | **2,883** |
| | | | | |
| **Aggregate Geography** | | | | |
| Central City | 58,298,000 | 43,748,000 | 43,748,000 | 237 |
| Industrial | 116,353,000 | 53,486,000 | 51,526,000 | 1,129 |
| Neighborhood Commercial | 135,779,000 | 99,565,000 | 29,919,000 | 1,210 |
| Institutions | 9,045,000 | 7,048,000 | 7,048,000 | 306 |
| **Total** | **319,475,000** | **203,847,000** | **132,241,000** | **2,883** |

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability

## PARCEL SIZE ASSESSMENT

The parcel size assessment distributes the employment development capacity across the same range as demand assessment. This assessment does not include the Institutional campus geography because that capacity was calculated using master plan methodology. The industrial geographies only include parcels greater than 0.5 acres

As to be expected with a virtually land-locked, developed city, most of the development capacity is in smaller parcels. In fact, no vacant parcels greater than 100 acres are currently identified in the industrial geographies. About 51% of the Central City capacity and 30% of the Neighborhood Commercial capacity is tied up in small parcels that are less than one acre.

## Figure 26. Land Supply by Parcel Size (acres)

| | Existing Buildable Land Inventory by Parcel Size (acres) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **EOA Geographies** | **< 1** | **1 - 3** | **3 - 5** | **6 - 10** | **10-20** | **20-50** | **50-100** | **> 100** | **Total** | **Total >1** |
| Central City Commercial | 90 | 39 | 32 | 6 | 10 | 24 | 0 | 0 | 201 | 111 |
| Central City Industrial | 45 | 13 | 6 | 2 | 0 | 0 | 0 | 0 | 65 | 21 |
| Harbor & Airport Districts | 8 | 76 | 64 | 86 | 111 | 164 | 310 | 0 | 774 | 811 |
| Harbor Access Lands | 0 | 4 | 0 | 3 | 23 | 42 | 41 | 0 | 113 | 113 |
| Columbia East | 6 | 23 | 19 | 27 | 45 | 96 | 140 | 0 | 356 | 350 |
| Dispersed Employment | 7 | 22 | 19 | 2 | 6 | 21 | 45 | 0 | 121 | 114 |
| Gateway Regional Center | 14 | 61 | 33 | 14 | 15 | 0 | 0 | 0 | 137 | 123 |
| Town Centers | 153 | 88 | 35 | 21 | 5 | 2 | 0 | 0 | 304 | 151 |
| Neighb. Centers & Corridors | 227 | 218 | 101 | 59 | 91 | 96 | 71 | 0 | 863 | 636 |
| **Total** | **550** | **543** | **308** | **220** | **305** | **445** | **607** | **0** | **2,934** | **2,429** |
| **Aggregate Geographies** | | | | | | | | | | |
| Central City | 135 | 52 | 38 | 8 | 10 | 24 | 0 | 0 | 266 | 131 |
| Industrial | 21 | 125 | 102 | 118 | 185 | 324 | 536 | 0 | 1,365 | 1,388 |
| Neighborhood Commercial | 394 | 367 | 169 | 94 | 111 | 98 | 71 | 0 | 1,303 | 909 |
| **Total** | **550** | **543** | **308** | **220** | **305** | **445** | **607** | **0** | **2,934** | **2,429** |

* Industrial geography parcels smaller than 1/2 acre are not included in the total supply.

Source: Bureau of Planning and Sustainability

# IV. DEMAND & SUPPLY RECONCILIATION

As stipulated by Goal 9 (Economy of the State), the intent of the Economic Opportunities Analysis is to "compare the demand for industrial and other employment uses to the existing supply of such land." This section compares the demand for employment land from the employment forecast with the land supply from BLI to identify gaps or land needs to meet future employment growth.

## EMPLOYMENT LAND NEEDS

By subtracting effective land supply from demand, it is possible to determine whether and to what extent Portland's employment land base will be adequate to serve forecast needs over the 2035 planning horizon. In cases where there is adequate inventory, a land surplus is indicated; where the inventory is not adequate, a resulting deficit is calculated.

Because calculations are made by employment geography, there may be an adequate land supply for some inventory categories, with deficits noted for others.

### Figure 27. Employment Land Needs

| Employment Geography | Added Jobs | Land Demand | Existing Supply | Surplus/ Deficit | % Capacity |
|---|---|---|---|---|---|
| Central City Commercial | 34,120 | 60 | 201 | 141 | 335% |
| Central City Industrial | 10,620 | 90 | 65 | **-25** | **72%** |
| Harbor & Airport Districts* | 16,050 | 1,013 | 774 | **-239** | **76%** |
| Harbor Access Lands* | 2,070 | 207/437 | 113 | **-94/-324** | **55%/26%** |
| Columbia East | 9,310 | 350 | 356 | 6 | 102% |
| Dispersed Employment | 4,200 | 130 | 121 | **-9** | **93%** |
| Gateway Regional Center | 3,970 | 50 | 137 | 87 | 274% |
| Town Centers | 6,160 | 130 | 304 | 174 | 234% |
| Neighborhood Centers & Corridors | 25,010 | 510 | 863 | 353 | 169% |
| Institutions | 22,730 | 370 | 306 | **-64** | **83%** |
| Residential | 7,400 | - | - | **-** | **-** |
| **Total** | **141,640** | **2,910/3,140** | **3,240** | | |
| **Aggregate Geography** | | | | | |
| Central City | 44,740 | 150 | 266 | 116 | 177% |
| Industrial* | 31,630 | 1,700/1,930 | 1,365 | **-335/-565** | **80%/71%** |
| Neighborhood Commercial | 35,140 | 690 | 1,303 | 613 | 189% |
| Institutions | 22,730 | 370 | 306 | **-64** | **83%** |
| Residential | 7,400 | - | - | - | - |
| **Total** | **141,640** | **2,910/3,140** | **3,240** | | |

* Total land demand shown here includes Traded Sector Support Facilities in marine, rail and air terminals. Harbor Access Lands demand is shown with two marine-terminal forecast scenarios (see Figure 17).

Source: Bureau of Planning and Sustainability

## Figure 28. 2010-2035 Parcel Size Assessment Reconciliation

| EOA Geographies | Gross Acreage Land Need (2010-35) by Parcel Size | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | < 1 | 1 - 3 | 3 - 5 | 6 - 10 | 10-20 | 20-50 | 50-100 | > 100 | Total | Total >1 |
| Central City Commercial | 58 | 30 | 23 | -3 | 10 | 24 | 0 | 0 | 141 | 83 |
| Central City Industrial | -9 | -24 | 6 | 2 | 0 | 0 | 0 | 0 | -25 | -16 |
| Harbor & Airport Districts | -63 | -59 | -149 | -80 | -15 | 112 | 260 | -200 | -240 | -131 |
| Harbor Access Lands | -1 | -2 | -9 | -8 | 12 | -7 | -9 | -300 | -323 | -322 |
| Columbia East | -3 | -63 | -59 | -39 | -66 | 96 | 140 | 0 | 6 | 9 |
| Dispersed Employment | -31 | -4 | -4 | -22 | -15 | 21 | 45 | 0 | -9 | 22 |
| Gateway Regional Center | -4 | 48 | 22 | 5 | 15 | 0 | 0 | 0 | 87 | 90 |
| Town Centers | 69 | 42 | 35 | 21 | 5 | 2 | 0 | 0 | 174 | 105 |
| Neighb. Centers & Corridors | -50 | 141 | 10 | -5 | 91 | 96 | 71 | 0 | 353 | 402 |
| **Total** | **-34** | **111** | **-126** | **-129** | **37** | **344** | **507** | **-500** | **164** | **243** |
| **Aggregate Geographies** | | | | | | | | | | |
| Central City | 48 | 7 | 29 | -1 | 10 | 24 | 0 | 0 | 116 | 68 |
| Industrial | -98 | -127 | -221 | -149 | -84 | 222 | 436 | -500 | -565 | -422 |
| Neighborhood Commercial | 16 | 231 | 66 | 21 | 111 | 98 | 71 | 0 | 613 | 598 |
| **Total** | **-34** | **111** | **-126** | **-129** | **37** | **344** | **507** | **-500** | **164** | **243** |

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability

## OBSERVATIONS BY EMPLOYMENT GEOGRAPHY

These observations are based on an assessment of the overall capacity and demand to determine the land needs, as well as the range of parcel sizes. In cases where there is a shortfall, there may be a secondary analysis of the employment demand to determine the type of space/use that will be needed in the future.

**Central City Commercial**: The Central City Commercial areas have a surplus of capacity, even after accounting for mixed-use residential space, primarily due to the high FARs and continued availability of development sites in the Pearl and South Waterfront sub-districts.

**Central City Industrial**: The Central Eastside and Lower Albina districts have a strong demand for building space, especially for emerging small business that are seeking cheaper, Class B and C office space that account for about 49% of the employment growth. The existing buildable land supply only covers 72% of the demand. To effectively overcome the shortfall, additional capacity should be targeted to the specific demand opportunities of this "incubator" geography, particularly for Class B/C office and flex space development attractive to cost-conscious tenants. Additional development capacity could be provided through rezoning, such as to expand allowances for industrial office development, and/or incentives to leverage higher rates of redevelopment. These actions are discussed in the EOA Section 4 report.

**Harbor Access Lands**: This geography is the Portland Harbor industrial area, where sites generally have dock access to the deep-water navigation channel. This distinctive geography is the land area available for continuing growth of marine terminals and other marine industrial facilities at Portland Harbor. Two marine terminal growth scenarios are analyzed in this

geography to inform community choices. Under the low forecast scenario, the existing buildable land supply in the Harbor Access Lands geography meets 55% of forecast demand, leaving an estimated 94-acre shortfall in growth capacity to 2035. Under the mid-range forecast scenario, existing buildable land meets only 26% of forecast demand, resulting in a 324-acre shortfall. Options to meet these shortfalls involve policy tradeoffs addressing public spending priorities, environmental protection, neighborhood compatibility, economic development, transportation infrastructure, and equity, as described in the EOA Section 4 report.

**Harbor and Airport Districts**: The Harbor and Airport Districts contain more gross developable land (1,520 acres) than any other geography, though much of it is constrained by brownfield contamination, infrastructure deficiencies, and environmental protection regulations that reduce the effective supply to 774 acres. The Harbor and Airport Districts are also a distinctive geography with 24% of the land demand associated with traded-sector transportation support facilities for railroad and airport growth. The existing buildable land supply in this geography meets 76% of forecast demand, leaving an estimated 239-acre shortfall in 25-year growth capacity. Like Harbor Access Lands, options to meet these shortfalls involve policy tradeoffs as described in the EOA Section 4 report.

**Columbia East**: This industrial area has a minor surplus of 6 acres. There is a surplus of larger 20-50 acre and 50-100 acres sites, which is balanced by a deficit for some of the small to medium sized sites. Constraints, such as infrastructure deficiencies and brownfields, account for 33% of the base supply. If these constraints are partially remedied through public investment and incentives, additional surplus capacity could be available to meet comparable demand for warehouse and flex space development in the Harbor and Airport Districts.

**Dispersed Employment**: Forecast land demand for this relatively small employment geography results in a shortfall of 9 acres. Existing growth capacity meets approximately 93% of forecast demand. While this "business park" geography typically includes substantial landscaping and building amenities to attract office tenants, neighborhood compatibility concerns can limit options for expansion of this geography. Over two-thirds of forecast job growth and building area in the Dispersed Employment geography is for office sector businesses.

**Gateway Regional Center**: This geography has a surplus of 87 acres of development capacity, even after discounting the zoned capacity by 56% for constraint and market factors. The Gateway supply consists predominantly (55%) of smaller parcels of less than 3 acres, but this capacity is generally matched to the expected demand.

**Town Centers**: This mixed-use geography consists of the eight town centers. Five existing town centers are designated in Metro's 2040 Plan, and the Comprehensive Plan Update proposes additional town center designations in the Northwest District, Killingsworth/Interstate, and Midway (122nd/Division). Strong employment growth is forecast in this geography, driven particularly by the institutional space needs that account for 70% of forecast Town Centers demand. The forecast land needs for town centers is based on the five existing town centers, and has not been updated to match those currently proposed. However, the capacity needs of the Town Centers and Neighborhood Commercial geographies are interrelated and more than amply met in the 25-year planning horizon. Specifically, the existing buildable land inventory meets an

estimated 274% of forecast demand for town center land needs and 234% of the related neighborhood commercial land needs. Moreover, demand for town center densities may be more accurately estimated by the existing town centers. Also, the level of existing development and market trends in these town centers varies widely. In the 2000-2008 business cycle, for example, most of the town center job growth was in Hollywood, attributable primarily to medical office expansion from the nearby Providence hospital campus.

**Neighborhood Centers & Corridors**: Nearly 18% of citywide employment growth is allocated to this extensive geography, which drives a demand for over 510 acres of employment land. This geography also has a surplus of about 350 acres of capacity, even after discounting the zoned capacity for mixed use residential and market factors. As with the Town Centers geography, most of the Neighborhood Commercial capacity is in smaller, underutilized, redevelopable sites. To the extent that capacity shortages are not effectively addressed in other geographies (especially for commercial and institutional uses), some of the unmet demand might be shifted to this employment geography.

**Institutions**: The larger campus institutions have strong demand corresponding to 16% of the city's projected employment growth. The unused portion of development capacity under current master plans and zoning accounts for a significant amount of development capacity, but still leaves a shortfall of about 2.2 million square feet of development or about 64 acres.

## OTHER ISSUES

### *Short-Term Forecast and Land Needs*

The Metro regional forecast predicts a robust recovery from the national recession. Consequently, the City of Portland is expected to add 95,000 jobs or 67% of the forecasted employment growth between 2010 and 2020. If this predicted growth occurs, it will generate the demand for 1,950 acres of employment land. The traded-sector transportation facilities represent a longer term investment in the regional economy, so that land demand is not included in the short-term forecast, except for one currently proposed marine terminal. Fortunately, most of Portland's land supply is available for development in the short-term, with the exception of brownfields. The constraint and market factor analysis of the Buildable Land Inventory also removes 52% of the gross development capacity of vacant and underutilized land. The remaining market-effective supply is expected to be generally available as short-term supply with the exception of brownfields. Relatively diverse surplus capacity in the Columbia East geography can likely meet short-term land needs in the Harbor and Airport Districts, but additional efforts will be needed to meet short-term capacity shortfalls in the Central City Industrial, Dispersed Employment, and Harbor Access Lands geographies.

## Figure 29. 2010-2020 Short-Term Employment Land Needs

| Employment Geography | 2010-2020 Added Jobs | 2010-2020 Land Demand | Land Supply | Surplus/ Deficit |
|---|---|---|---|---|
| Central City Commercial | 22,600 | 40 | 178 | 138 |
| Central City Industrial | 7,560 | 75 | 59 | -15 |
| Harbor & Airport Districts | 12,660 | 659 | 625 | -35 |
| Harbor Access Lands | 1,630 | 118 | 59 | -59 |
| Columbia East | 6,980 | 279 | 340 | 62 |
| Dispersed Employment | 3,030 | 109 | 105 | -4 |
| Gateway Regional Center | 2,460 | 33 | 111 | 78 |
| Town Centers | 3,860 | 86 | 288 | 202 |
| Neighborhood Centers & Corridors | 16,280 | 362 | 811 | 449 |
| Institutions | 13,440 | 224 | 306 | 82 |
| Residential | 4,110 | NA | NA | NA |
| **Total** | **94,610** | **1,985** | **2,883** | **898** |

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability
Note: Harbor and Airport Districts demand does not include land for traded-sector support facilities.

### *Lot Size Assessment*

The reconciliation of the lot size assessment varies widely, but overall about 53% of the demand is for parcels of less than 6 acres while 48% of the supply consists of small parcels less than 6 acres. Each of the employment geographies with a capacity shortfall has a different need for lot sizes.

In the Central City Industrial geography, the need is for small parcels of less than 3 acres, which matches the supply, but there is not enough overall capacity. The Harbor and Airport Districts and Harbor Access Lands are unique in that there is a need for smaller parcels of less than 20 acres with a small surplus of medium sized parcels of 20-100 acres, but large (550 acres) demand for 100+ acre sites, primarily for marine terminal and rail yard development. Columbia East and Dispersed Employment have a similar pattern of a need for small parcels with slight surpluses in the medium sized parcels. The town centers have a need for small parcels. Overall, there is a lot of surplus capacity of small parcels in the Neighborhood Commercial geography that could provide some relief for the smaller, incubator businesses and services forecasted for the other geographies.

Portland's land supply of larger sites will tighten over the long term as a land-locked city, and other jurisdictions in the metropolitan area can generally be expected to address that regional demand. Land-assembly and site-assistance efforts also provide opportunities to meet location-specialized demand in Portland, such as freight terminal expansion.

# APPENDIX A. EMPLOYMENT FORECAST DETAILS

The tables in this appendix provide detail on five forecast elements:

- Metro's forecast, the basis of the Portland forecast;
- 2008 City employment share, and the decreasing share trend employed in the low and mid forecasts;
- The allocation of jobs to building types (consistent across scenarios)
- Square foot per employee assumptions (consistent across scenarios)
- Floor Area Ratios (varies across scenarios)

## Figure 30. Metro's Seven County PMSA Forecast: Total Jobs by 2035

| NAICS | Employment Sector | Actual QCEW 2010 | 7-County PMSA Forecast Employment 2015 | 2020 | 2025 | 2030 | 2035 | Job Change 2010-35 | % of Growth 2010-35 |
|---|---|---|---|---|---|---|---|---|---|
| 11 & 21 | Agriculture & Mining | 1,100 | 1,530 | 1,400 | 1,320 | 1,250 | 1,200 | 100 | 0.3% |
| 23 | Construction | 43,620 | 61,550 | 65,010 | 69,010 | 74,060 | 79,930 | 36,310 | 2.5% |
| 31-33 | Manufacturing | ###### | 117,100 | 119,740 | 121,040 | 122,360 | 123,890 | 17,431 | 0.6% |
| 42 | Wholesale Trade | 52,961 | 61,130 | 66,600 | 71,600 | 76,800 | 81,880 | 28,919 | 1.8% |
| 44-45 | Retail Trade | ###### | 113,200 | 114,820 | 118,270 | 123,490 | 129,200 | 28,597 | 1.0% |
| 22, 48-49 | Transportation, Warehousing & Utilities | 32,051 | 43,090 | 47,140 | 50,180 | 53,580 | 57,300 | 25,249 | 2.4% |
| 51 | Information | 22,426 | 24,560 | 27,930 | 31,470 | 35,250 | 38,740 | 16,314 | 2.2% |
| 52 | Finance | 39,322 | 49,170 | 53,710 | 58,110 | 62,370 | 67,740 | 28,418 | 2.2% |
| 53 | Real Estate | 15,940 | 27,160 | 29,800 | 32,210 | 34,700 | 37,300 | 21,360 | 3.5% |
| 54 | Professional Services | 51,937 | 59,540 | 67,390 | 74,590 | 82,340 | 90,650 | 38,713 | 2.3% |
| 55 | Management | 23,067 | 24,960 | 28,700 | 32,590 | 37,140 | 42,260 | 19,193 | 2.5% |
| 56 | Administrative & Waste Services | 51,601 | 68,100 | 75,430 | 82,280 | 88,790 | 95,140 | 43,539 | 2.5% |
| 61 | Educational Services | 19,718 | 24,960 | 28,350 | 31,630 | 34,870 | 38,490 | 18,772 | 2.7% |
| 62 | Health & Social Services | ###### | 127,390 | 150,540 | 170,610 | 192,050 | 214,710 | 100,849 | 2.6% |
| 71 | Arts, Entertainment & Recreation | 13,571 | 14,240 | 16,030 | 17,700 | 19,260 | 20,690 | 7,119 | 1.7% |
| 72 | Accommodation & Food Services | 80,675 | 89,630 | 98,440 | 106,410 | 114,550 | 122,990 | 42,315 | 1.7% |
| 81 | Other Services | 39,254 | 40,920 | 47,660 | 53,740 | 59,760 | 65,240 | 25,986 | 2.1% |
| 92 | Government (Civilian) | ###### | 142,570 | 150,950 | 159,400 | 167,560 | 179,590 | 38,060 | 1.0% |
| Total Employment | | ###### | ######## | ######## | ######## | ######## | ######## | **537,244** | **1.8%** |

Notes: QCEW is the Quarterly Census of Employment and Wages, Oregon Employment Department (OED).
All Metro gamma forecast numbers rounded to nearest ten employees.
2010 are Metro modeled forecast outcomes.
AAGR denotes annual average growth rate (compounded).
Source: Metro 2012 Adopted Forecast.

## Figure 31. City Share of PMSA Employment: 2008 and Projected

| | | Portland as Share of Metro Area | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Actual Jobs | | Forecast City of Portland Employment | | | | |
| NAICS | Employment Sector | 2008 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
| 11 & 21 | Agriculture & Mining | 1.5% | 35.6% | 35.2% | 34.3% | 33.0% | 31.4% | 29.4% |
| 23 | Construction | 30.9% | 32.6% | 32.2% | 31.4% | 30.2% | 28.7% | 26.9% |
| 31-33 | Manufacturing | 24.7% | 23.5% | 23.2% | 22.6% | 21.8% | 20.7% | 19.4% |
| 42 | Wholesale Trade | 35.4% | 34.0% | 33.6% | 32.7% | 31.5% | 30.0% | 28.1% |
| 44-45 | Retail Trade | 30.6% | 30.9% | 30.5% | 29.7% | 28.6% | 27.2% | 25.5% |
| 22, 48-49 | Transportation, Warehousing & Utilities | 72.7% | 73.9% | 73.0% | 71.1% | 68.5% | 65.1% | 61.0% |
| 51 | Information | 46.4% | 43.0% | 42.5% | 41.4% | 39.9% | 37.9% | 35.5% |
| 52 | Finance | 44.7% | 43.4% | 42.8% | 41.8% | 40.2% | 38.2% | 35.8% |
| 53 | Real Estate | 47.7% | 49.8% | 49.2% | 48.0% | 46.2% | 43.9% | 41.2% |
| 54 | Professional Services | 50.6% | 51.9% | 51.2% | 50.0% | 48.1% | 45.7% | 42.9% |
| 55 | Management | 60.4% | 62.1% | 61.3% | 59.8% | 57.6% | 54.7% | 51.3% |
| 56 | Administrative & Waste Services | 37.9% | 35.8% | 35.3% | 34.4% | 33.1% | 31.5% | 29.5% |
| 61 | Educational Services* | 194.2% | 192.4% | 190.0% | 185.3% | 178.4% | 169.5% | 159.0% |
| 62 | Health & Social Services | 45.2% | 44.5% | 43.9% | 42.8% | 41.2% | 39.2% | 36.7% |
| 71 | Arts, Entertainment & Recreation | 43.6% | 49.7% | 49.1% | 47.8% | 46.1% | 43.8% | 41.0% |
| 72 | Accomodation & Food Services | 42.2% | 43.5% | 43.0% | 41.9% | 40.3% | 38.3% | 36.0% |
| 81 | Other Services | 43.1% | 42.8% | 42.3% | 41.2% | 39.7% | 37.7% | 35.4% |
| 92 | Government (Civilian)* | 12.5% | 11.0% | 10.8% | 10.5% | 10.2% | 9.6% | 9.0% |
| **Total** | | **38.3%** | **38.9%** | **39.4%** | **39.0%** | **37.9%** | **36.4%** | **34.4%** |

Notes: * Metro public education re-allocated to educational services to match OED.
All Metro gamma forecast numbers rounded to nearest ten employees.
2010 are Metro modeled forecast outcomes.
AAGR denotes annual average growth rate (compounded).
Source: Metro, Oregon Employment Department, and E. D. Hovee & Company, LLC.

## Figure 32. City of Portland Employment Forecast by Sector

| NAICS | Employment Sector | QCEW 2010 | Jobs within City of Portland: Forecast Employment by Year 2015 | 2020 | 2025 | 2030 | 2035 | Job Change 2010-35 | Avg Rate of Growth 2010-35 |
|---|---|---|---|---|---|---|---|---|---|
| 11 & 21 | Agriculture & Mining | 392 | 538 | 480 | 436 | 392 | 353 | (39) | -0.4% |
| 23 | Construction | 14,224 | 19,821 | 20,416 | 20,864 | 21,279 | 21,539 | 7,315 | 1.7% |
| 31-33 | Manufacturing | 25,035 | 27,195 | 27,118 | 26,391 | 25,353 | 24,076 | (959) | -0.2% |
| 42 | Wholesale Trade | 18,009 | 20,529 | 21,810 | 22,574 | 23,010 | 23,009 | 5,000 | 1.0% |
| 44-45 | Retail Trade | 31,060 | 34,515 | 34,139 | 33,855 | 33,593 | 32,963 | 1,903 | 0.2% |
| 22, 48-49 | Transportation, Warehousing & Utilities | 23,676 | 31,435 | 33,535 | 34,368 | 34,873 | 34,978 | 11,302 | 1.6% |
| 51 | Information | 9,640 | 10,426 | 11,562 | 12,542 | 13,351 | 13,761 | 4,121 | 1.4% |
| 52 | Finance | 17,048 | 21,053 | 22,425 | 23,358 | 23,825 | 24,270 | 7,222 | 1.4% |
| 53 | Real Estate | 7,946 | 13,371 | 14,306 | 14,887 | 15,241 | 15,366 | 7,420 | 2.7% |
| 54 | Professional Services | 26,943 | 30,504 | 33,668 | 35,876 | 37,636 | 38,861 | 11,918 | 1.5% |
| 55 | Management | 14,322 | 15,305 | 17,161 | 18,761 | 20,318 | 21,683 | 7,361 | 1.7% |
| 56 | Administrative & Waste Services | 18,449 | 24,045 | 25,972 | 27,275 | 27,971 | 28,110 | 9,661 | 1.7% |
| 61 | Educational Services | 37,937 | 47,426 | 52,529 | 56,423 | 59,112 | 61,196 | 23,259 | 1.9% |
| 62 | Health & Social Services | 50,616 | 55,927 | 64,448 | 70,319 | 75,223 | 78,876 | 28,260 | 1.8% |
| 71 | Arts, Entertainment & Recreation | 6,741 | 6,985 | 7,668 | 8,152 | 8,429 | 8,493 | 1,752 | 0.9% |
| 72 | Accomodation & Food Services | 35,102 | 38,514 | 41,249 | 42,927 | 43,915 | 44,222 | 9,120 | 0.9% |
| 81 | Other Services | 16,802 | 17,298 | 19,646 | 21,327 | 22,538 | 23,076 | 6,274 | 1.3% |
| 92 | Government (Civilian) | 15,498 | 15,418 | 15,919 | 16,183 | 16,167 | 16,251 | 753 | 0.2% |
| **Total Employment** | | **369,440** | **430,306** | **464,052** | **486,518** | **502,226** | **511,083** | **141,643** | **1.3%** |
| City Share of Portland Metro Employment | | 38.9% | 39.4% | 39.0% | 37.9% | 36.4% | 34.4% | **26.4%** | |

Source: E. D. Hovee & Company, LLC based on Metro projection and City/Metro forecast 2035 allocation.

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## Figure 33. Employment to Building Types

| NAICS | Employment Sector | General Industrial | Warehouse | Flex/BP | Office | Retail | Institution |
|---|---|---|---|---|---|---|---|
| 11 & 21 | Ag, Mining | 3% | 3% | 3% | 72% | 18% | - |
| 23 | Construction | 41% | - | 14% | 28% | 17% | - |
| 31-33 | Manufacturing | 76% | - | 11% | 5% | 8% | - |
| 42 | Wholesale | - | 65% | 13% | 13% | 9% | - |
| 44-45 | Retail | - | - | - | - | 100% | - |
| 22, 48-49 | Transport, Warehouse & Utilities | - | 55% | 11% | 31% | 3% | - |
| 51 | Information | - | - | 35% | 45% | 20% | - |
| 52 | Finance | - | - | 5% | 88% | 7% | - |
| 53 | Real Estate | - | - | 24% | 67% | 8% | - |
| 54 | Professional Services | - | - | 3% | 91% | 6% | - |
| 55 | Management | - | - | - | 100% | - | - |
| 56 | Admin, Waste | - | - | 31% | 57% | 12% | - |
| 61 | Education | - | - | - | 10% | 5% | 85% |
| 62 | Health & Social Services | - | - | - | 15% | 15% | 70% |
| 71 | Arts, Entertainment, Recreation | - | - | - | 79% | 21% | - |
| 72 | Accommodation & Food Service | - | - | - | 45% | 55% | - |
| 81 | Other Services | - | - | - | 34% | 66% | - |
| 92 | Government | - | - | - | 87% | 13% | - |

Source: Metro, BPS, and E. D. Hovee & Company, LLC.

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## Figure 34. Net Job Growth by Building Type & Employment Geography (2010-35)

| Employment Geography | General Industrial | Warehouse | Flex/BP | Office | Retail | Institution | Total |
|---|---|---|---|---|---|---|---|
| Central City Commercial | (178) | 134 | 2,150 | 22,272 | 6,015 | 3,731 | 34,124 |
| Central City Industrial | 516 | 995 | 1,026 | 5,222 | 1,479 | 1,379 | 10,617 |
| Harbor & Airport Districts | 347 | 5,296 | 2,357 | 6,044 | 1,745 | 256 | 16,046 |
| Harbor Access Lands | 173 | 477 | 477 | 733 | 157 | 58 | 2,074 |
| Columbia East | 765 | 1,825 | 1,191 | 3,618 | 1,535 | 373 | 9,308 |
| Dispersed Employment | 561 | (12) | 659 | 3,129 | (280) | 143 | 4,200 |
| Gateway Regional Center | 16 | (29) | 19 | 1,062 | 920 | 1,983 | 3,970 |
| Town Centers | 54 | (4) | 124 | 1,328 | 932 | 3,725 | 6,160 |
| Neighb. Centers and Corridors | 106 | 497 | 1,520 | 10,372 | 7,591 | 4,924 | 25,011 |
| Residential | (105) | 266 | 303 | 2,184 | 550 | 4,205 | 7,403 |
| Institutions | (0) | 11 | 5 | 1,927 | 2,013 | 18,775 | 22,730 |
| **Total** | **2,255** | **9,457** | **9,831** | **57,892** | **22,657** | **39,552** | **141,643** |
| **Aggregate Geography** | | | | | | | |
| Central City | (178) | 134 | 2,150 | 22,272 | 6,015 | 3,731 | 34,124 |
| Industrial | 1,846 | 7,587 | 4,684 | 13,524 | 3,157 | 830 | 31,628 |
| Incubator | 516 | 995 | 1,026 | 5,222 | 1,479 | 1,379 | 10,617 |
| Neighborhoods | 70 | 731 | 1,966 | 14,947 | 9,993 | 14,837 | 42,544 |
| Institutions | (0) | 11 | 5 | 1,927 | 2,013 | 18,775 | 22,730 |
| **Total** | **2,255** | **9,457** | **9,831** | **57,892** | **22,657** | **39,552** | **141,643** |

Source: Metro, BPS, and E. D. Hovee & Company, LLC.

Note: Figures exclude employment allocated to non-employment geographies including areas designated for residential and open space use.

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## Figure 35. Square Feet per Employee

| Employment Geography | General Industrial | Warehouse | Flex/BP | Office | Retail | Institution |
|---|---|---|---|---|---|---|
| Central City Commercial | 350 | 350 | 350 | 350 | 470 | 600 |
| Central City Industrial | 926 | 780 | 599 | 350 | 470 | 600 |
| Harbor & Airport Districts | 926 | 1,263 | 769 | 350 | 470 | 600 |
| Harbor Access Lands | 926 | 1,263 | 769 | 350 | 470 | 600 |
| Columbia East | 926 | 1,263 | 769 | 350 | 470 | 600 |
| Dispersed Employment | 926 | 1,263 | 769 | 350 | 470 | 600 |
| Gateway Regional Center | 350 | 350 | 350 | 350 | 470 | 600 |
| Town Centers | 350 | 350 | 350 | 350 | 470 | 600 |
| Neighborhood Centers and Corridors | 926 | 780 | 599 | 350 | 470 | 600 |
| Residential | 926 | 780 | 599 | 350 | 470 | 600 |
| Institutions | 350 | 350 | 599 | 350 | 470 | 600 |
| *Notes* | *Atlas + acts like office in urban geogs* | *Atlas + acts like office in urban geogs* | *Atlas + acts like office in urban geogs* | *Industry standard range: 250-350* | *Industry standard assumption* | *Metro assumption* |

Sources: Metro, Portland Bureau of Planning & Sustainability, and E. D. Hovee & Company, LLC.

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## Figure 36. Floor Area Ratios

**2010 Base Floor Area Ratios (FARs)**

| Employment Geography | General Industrial | Warehouse | Flex/BP | Office | Retail | Institution |
|---|---|---|---|---|---|---|
| Central City Commercial | 5.00 | 5.00 | 5.00 | 7.00 | 3.00 | 5.00 |
| Central City Industrial | 1.00 | 1.00 | 2.00 | 2.00 | 0.50 | 2.00 |
| Harbor & Airport Districts | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |
| Harbor Access Lands | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |
| Columbia East | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 |
| Dispersed Employment | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |
| Gateway Regional Center | 0.60 | 0.60 | 1.50 | 1.50 | 0.35 | 1.50 |
| Town Centers | 0.50 | 0.50 | 0.50 | 0.60 | 0.30 | 0.60 |
| Neighb. Centers and Corridors | 0.30 | 0.25 | 0.30 | 0.60 | 0.50 | 0.60 |
| Residential | 0.40 | 0.40 | 0.40 | 0.55 | 0.40 | 0.55 |
| Institutions | 0.50 | 0.50 | 0.50 | 0.80 | 0.50 | 0.80 |

**2035 Floor Area Ratios (FARs)**

| Employment Geography | General Industrial | Warehouse | Flex/BP | Office | Retail | Institution |
|---|---|---|---|---|---|---|
| Central City Commercial | 5.79 | 5.79 | 5.79 | 9.38 | 3.47 | 5.79 |
| Central City Industrial | 1.16 | 1.16 | 2.32 | 2.68 | 0.58 | 2.32 |
| Harbor & Airport Districts | 0.35 | 0.35 | 0.35 | 0.41 | 0.35 | 0.35 |
| Harbor Access Lands | 0.40 | 0.40 | 0.40 | 0.46 | 0.40 | 0.40 |
| Columbia East | 0.40 | 0.40 | 0.40 | 0.46 | 0.40 | 0.40 |
| Dispersed Employment | 0.35 | 0.35 | 0.35 | 0.41 | 0.35 | 0.35 |
| Gateway Regional Center | 0.69 | 0.69 | 1.74 | 2.01 | 0.41 | 1.74 |
| Town Centers | 0.58 | 0.58 | 0.58 | 0.80 | 0.35 | 0.69 |
| Neighb. Centers and Corridors | 0.35 | 0.29 | 0.35 | 0.80 | 0.58 | 0.69 |
| Residential | 0.46 | 0.46 | 0.46 | 0.74 | 0.46 | 0.64 |
| Institutions | 0.58 | 0.58 | 0.58 | 1.07 | 0.58 | 0.93 |

Source: Metro, Portland Bureau of Planning & Sustainability, and E. D. Hovee & Company, LLC.

## Figure 37. Estimated 2010-2035 Land Need for Airport Facilities

| Facility | Airport Futures Need | Acres | Job Trend Demand Acres | Additional Land Demand for Airport Facilities |
|---|---|---|---|---|
| **Air Transportation & Terminal Services** | | **52** | **136** | **-84** |
| Customer Parking | 11,372 spaces | 16 | | |
| Employee Parking | 556 spaces | 6 | | |
| RON Aircraft Parking | 23 acres | 23 | | |
| Airport Maintenance | 2 acres | 2 | | |
| Airport Fire & Rescue | 3 acres | 3 | | |
| Aircraft Fuel Storage | 2 acres | 2 | | |
| **Rental Car Agencies** | | **21** | **11** | **10** |
| Rental Car Ready/Return | 1219 spaces | 12 | | |
| Rental Car Service | 9.2 acres | 9 | | |
| **General Aviation** | 20 acres | **20** | **0.2** | **20** |
| **Air Cargo Couriers** | | **113** | **18** | **95** |
| Air Cargo Warehouse | 613,000 s.f. | 14 | | |
| Air Cargo Landside | 1,005,000 s.f. | 23 | | |
| Air Cargo Ramp | 369,000 s.y. | 76 | | |
| **Other Airport Employers** | | | **4** | **-4** |
| **Total** | | **207** | **169** | **37** |

Source: Bureau of Planning and Sustainability


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# APPENDIX B. CONSTRAINED LANDS DEVELOPMENT RATES

The constraint analysis considered the impact of different characteristics that are grouped into seven broad categories and mapped according to the BLI.

## Figure 38. BLI Constraints

**Infrastructure**

*Transportation*
2008 Volume to Capacity Ratios
Streets Connectivity Standards
ODOT Highway Interchanges
Improved and Unimproved Streets
Pedestrian System
*Water Service*
Water Deficient Service Areas
*Sewer Service*
Infrastructure Constrained Areas: Sewer
*Stormwater*
Stormwater System
Depth to Seasonal High Water
Soil Infiltration Capability
Wellfield Protection Areas

**Environmental**

Wetlands
Environmental Conservation Overlay Zones
All slopes over 25%
FEMA 100-Year Floodplain Map

**Brownfields**

DEQ Environmental Cleanup Sites I (ECSI)
DEQ Confirmed Release Sites (CRL)
DEQ Underground Storage Tank Cleanup Sites (UST)

**Greenway**

Willamette Greenway Setback

**Low**

Scenic Area View Corridors
Historic and Conservation Districts
Archaeological Areas

**Historic**

Historic and Conservation Landmarks

**Full**

OS Comprehensive Plan Map Designation
Environmental Protection Zones
FEMA Floodway Map
Beds and banks of navigable waterways
Public rights-of-way
Land within the City but outside the Urban Growth Boundary

Source: Bureau of Planning and Sustainability

A discount factor is determined to reflect the degree of impact each constraint has on development. The first step is characterizing the constraint as high, medium, or low based on consultation with the City of Portland's development review staff at the Bureaus of Development Services, Transportation, Water, and Environmental Services. Then the factor is adjusted based on a review of development rates of various constrained sites compared to unconstrained sites for the 1999-2011 period. This analysis included both the rate of development (avoidance) as well as the overall amount of development to determine the level of constraint by type of constraint and by geographic area.

## Figure 39. Development Rate Calculations by Constraint Type and Aggregated Geography

| | 1999-2011 Land Development Rate | Development Rate as % of Unconstrained | 1999-2011 FAR | 1999-2011 FAR % of Unconstrained | 2010-2035 Composite Rate | Jun 2011 BLI Constraint | Adjusted Constraint | Comments |
|---|---|---|---|---|---|---|---|---|
| **Environmental** (Wetlands, C zones, Floodplain, Slopes) | | | | | | | | |
| Central City | 5.1% | 31.1% | 1.02 | 44.1% | 13.7% | 55% | 75% | |
| Industrial | 20.6% | 40.8% | 0.15 | 47.4% | 19.4% | 55% | 50% | |
| Commercial | 18.0% | 38.5% | 0.28 | 71.0% | 27.4% | 55% | 35% | |
| **Infrastructure** | | | | | | | | |
| Central City | 9.2% | 55.4% | 0.36 | 15.7% | 8.7% | 85% | 75% | |
| Industrial | 14.1% | 27.8% | 0.17 | 53.5% | 14.9% | 85% | 75% | |
| Commercial | 20.8% | 44.5% | 0.21 | 52.4% | 23.3% | 85% | 75% | |
| **Brownfields** | | | | | | | | |
| Central City | 39.0% | 100.0% | 2.14 | 92.1% | 92.1% | 85% | 90% | |
| Industrial | 31.3% | 61.8% | 0.20 | 62.9% | 38.9% | 85% | 40% | |
| Commercial | 48.8% | 100.0% | 0.19 | 47.9% | 47.9% | 85% | 50% | |
| **Historic Landmarks** | | | | | | | | |
| Central City | 17.6% | 100.0% | 4.32 | 186.3% | 186.3% | 55% | 55% | Too few cases |
| Industrial | 0.0% | 0.0% | 0.00 | 0.0% | 0.0% | 55% | 55% | |
| Commercial | 100.0% | 100.0% | 0.39 | 100.1% | 100.1% | 55% | 55% | |
| **Low** (Historic Districts, View Corridors) | | | | | | | | |
| Central City | 4.5% | 27.2% | 0.69 | 29.6% | 8.1% | 85% | 85% | Too few cases |
| Industrial | 0.0% | 0.0% | 0.00 | 0.0% | 0.0% | 85% | 85% | |
| Commercial | 32.4% | 69.6% | 0.76 | 192.6% | 134.0% | 85% | 85% | |
| **Greenway** | | | | | | | | |
| Central City | 11.0% | 66.5% | 1.81 | 78.1% | 51.9% | 55% | 75% | |
| Industrial | 30.1% | 59.6% | 0.23 | 72.1% | 42.9% | 55% | 50% | |
| Commercial | 4.7% | 10.1% | 0.82 | 207.9% | 21.0% | 55% | 55% | |
| **Unconstrained** | | | | | | | | |
| Central City | 16.6% | 100.0% | 2.32 | 100.0% | 100.0% | | | |
| Industrial | 50.6% | 100.0% | 0.32 | 100.0% | 100.0% | | | |
| Commercial | 46.6% | 100.0% | 0.39 | 100.0% | 100.0% | | | |

Source: E.D. Hovee & Company, LLC and Bureau of Planning and Sustainability

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# APPENDIX C. BUILDABLE LAND INVENTORY TABLES

Detailed tables of the Buildable Land Inventory, March 9, 2015, are provided in the following pages.

The net building square footage is the total building square footage allowed under current comprehensive plan designations less existing building square footage.

In the industrial geographies, vacant land and underutilized parcels smaller than 0.5 acres are not included. Vacant land supply in the Harbor and Airport Districts excludes 45 acres of land held as long-term aviation reserve that exceeds forecast airport land demand.

Institutional campus capacity is based on approved master plans, although vacant and underutilized parcels are reported.


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## Figure 40. Existing Buildable Land Inventory – Net Building Square Footage (part 1)

| | Less than .5 acres | | | .5 to 1 acre | | | 1 to 3 acres | | | 3 to 5 acres | | | 6 to 10 acres | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Employment Geography | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment |
| **Central City Commercial** | 7,458,954 | 7,168,395 | 7,168,395 | 15,082,741 | 13,262,744 | 13,262,744 | 10,562,071 | 8,838,975 | 8,838,975 | 8,043,441 | 7,165,619 | 7,165,619 | 1,467,324 | 1,466,445 | 1,466,445 |
| Vacant | 5,024,102 | 4,831,410 | 4,831,410 | 9,613,958 | 8,300,630 | 8,300,630 | 6,776,999 | 5,754,933 | 5,754,933 | 5,729,395 | 5,232,750 | 5,232,750 | 1,467,324 | 1,466,445 | 1,466,445 |
| Redevelopment | 2,434,852 | 2,336,985 | 2,336,985 | 5,468,783 | 4,962,114 | 4,962,114 | 3,785,072 | 3,084,042 | 3,084,042 | 2,314,045 | 1,932,868 | 1,932,868 | 0 | 0 | 0 |
| **Central City Industrial** | 869,924 | 813,310 | 813,310 | 1,935,945 | 1,768,046 | 1,768,046 | 779,761 | 735,157 | 735,157 | 418,253 | 355,991 | 355,991 | 156,725 | 107,390 | 107,390 |
| Vacant | 517,375 | 481,089 | 481,089 | 1,588,023 | 1,443,271 | 1,443,271 | 669,450 | 624,846 | 624,846 | 377,287 | 318,407 | 318,407 | 71,119 | 37,267 | 37,267 |
| Redevelopment | 352,549 | 332,221 | 332,221 | 347,922 | 324,775 | 324,775 | 110,310 | 110,310 | 110,310 | 40,965 | 37,584 | 37,584 | 85,606 | 70,123 | 70,123 |
| **Columbia East** | 68,322 | 48,329 | 48,329 | 433,726 | 273,239 | 273,239 | 1,733,500 | 994,145 | 994,145 | 1,276,242 | 813,788 | 813,788 | 1,688,867 | 1,185,501 | 1,185,501 |
| Vacant | 68,322 | 48,329 | 48,329 | 433,726 | 273,239 | 273,239 | 1,696,117 | 980,738 | 980,738 | 1,222,732 | 760,279 | 760,279 | 1,631,745 | 1,128,378 | 1,128,378 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 37,383 | 13,408 | 13,408 | 53,510 | 53,510 | 53,510 | 57,122 | 57,122 | 57,122 |
| **Dispersed Employment** | 574,417 | 486,760 | 486,760 | 392,721 | 302,229 | 302,229 | 1,058,976 | 964,494 | 964,494 | 1,243,260 | 815,384 | 815,384 | 87,417 | 68,362 | 68,362 |
| Vacant | 411,765 | 341,904 | 341,904 | 278,923 | 199,532 | 199,532 | 673,107 | 619,556 | 619,556 | 891,055 | 557,954 | 557,954 | 77,736 | 58,680 | 58,680 |
| Redevelopment | 162,653 | 144,856 | 144,856 | 113,798 | 102,697 | 102,697 | 385,869 | 344,938 | 344,938 | 352,205 | 257,430 | 257,430 | 9,681 | 9,681 | 9,681 |
| **Harbor Access Lands** | 15,401 | 4,121 | 4,121 | 58,769 | 19,678 | 19,678 | 792,719 | 159,444 | 159,444 | 0 | 0 | 0 | 712,955 | 137,162 | 137,162 |
| Vacant | 15,401 | 4,121 | 4,121 | 58,769 | 19,678 | 19,678 | 792,719 | 159,444 | 159,444 | 0 | 0 | 0 | 712,955 | 137,162 | 137,162 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Harbor & Airport Districts** | 322,017 | 222,379 | 222,379 | 546,823 | 333,418 | 333,418 | 5,305,626 | 3,305,611 | 3,305,611 | 4,200,872 | 2,795,405 | 2,795,405 | 6,116,175 | 3,733,979 | 3,733,979 |
| Vacant | 296,115 | 203,042 | 203,042 | 471,523 | 287,332 | 287,332 | 4,356,793 | 2,491,811 | 2,491,811 | 3,460,304 | 2,137,397 | 2,137,397 | 6,116,175 | 3,733,979 | 3,733,979 |
| Redevelopment | 25,902 | 19,338 | 19,338 | 75,300 | 46,086 | 46,086 | 948,833 | 813,800 | 813,800 | 740,568 | 658,007 | 658,007 | 0 | 0 | 0 |
| **Institutions** | 115,142 | 98,993 | 98,993 | 185,281 | 150,267 | 150,267 | 547,201 | 501,121 | 501,121 | 211,523 | 211,523 | 211,523 | 413,929 | 408,680 | 408,680 |
| Vacant | 27,763 | 24,876 | 24,876 | 70,722 | 50,512 | 50,512 | 82,478 | 79,853 | 79,853 | 0 | 0 | 0 | 73,174 | 67,925 | 67,925 |
| Redevelopment | 87,379 | 74,117 | 74,117 | 114,559 | 99,755 | 99,755 | 464,723 | 421,268 | 421,268 | 211,523 | 211,523 | 211,523 | 340,754 | 340,754 | 340,754 |
| **Neighb. Centers & Corridors** | 8,369,894 | 7,377,669 | 2,529,903 | 10,486,461 | 9,013,718 | 2,604,137 | 24,239,252 | 20,999,875 | 4,940,778 | 11,458,184 | 9,500,028 | 2,289,372 | 6,910,433 | 5,622,587 | 1,345,485 |
| Vacant | 2,207,670 | 1,893,701 | 941,703 | 2,404,360 | 2,053,136 | 868,822 | 4,930,012 | 3,906,226 | 1,345,207 | 2,784,657 | 2,373,626 | 899,379 | 2,257,363 | 1,703,804 | 578,799 |
| Redevelopment | 6,162,224 | 5,483,968 | 1,588,199 | 8,082,102 | 6,960,582 | 1,735,315 | 19,309,240 | 17,093,649 | 3,595,571 | 8,673,528 | 7,126,402 | 1,389,993 | 4,653,070 | 3,918,782 | 766,686 |
| **Gateway Regional Center** | 424,413 | 345,002 | 209,110 | 634,386 | 516,248 | 360,687 | 4,840,996 | 4,064,126 | 2,436,215 | 3,537,351 | 2,476,419 | 1,311,382 | 1,641,898 | 875,837 | 572,277 |
| Vacant | 195,649 | 177,630 | 115,674 | 296,577 | 233,587 | 202,328 | 1,784,821 | 1,319,622 | 888,452 | 1,490,073 | 994,080 | 656,292 | 115,187 | 81,550 | 57,594 |
| Redevelopment | 228,764 | 167,371 | 93,437 | 337,809 | 282,662 | 158,359 | 3,056,175 | 2,744,505 | 1,547,763 | 2,047,279 | 1,482,339 | 655,090 | 1,526,711 | 794,287 | 514,683 |
| **Town Centers** | 4,250,089 | 3,889,602 | 1,779,372 | 5,302,560 | 4,845,755 | 1,995,748 | 7,945,151 | 7,308,225 | 2,166,396 | 3,111,738 | 2,815,239 | 857,304 | 3,213,218 | 2,799,527 | 506,588 |
| Vacant | 1,385,433 | 1,277,955 | 757,187 | 1,389,458 | 1,292,599 | 714,408 | 2,092,273 | 1,859,454 | 886,967 | 914,607 | 770,198 | 339,456 | 385,765 | 217,689 | 94,835 |
| Redevelopment | 2,864,656 | 2,611,648 | 1,022,185 | 3,913,102 | 3,553,156 | 1,281,340 | 5,852,878 | 5,448,771 | 1,279,429 | 2,197,131 | 2,045,042 | 517,848 | 2,827,453 | 2,581,838 | 411,753 |
| **Outside Geographies** | 411,917 | 318,675 | 318,675 | 100,780 | 87,148 | 87,148 | 770,814 | 644,578 | 644,578 | 818,086 | 342,668 | 342,668 | 189,055 | 125,799 | 125,799 |
| Vacant | 133,059 | 94,644 | 94,644 | 60,953 | 47,490 | 47,490 | 408,609 | 352,498 | 352,498 | 699,068 | 246,903 | 246,903 | 93,604 | 48,648 | 48,648 |
| Redevelopment | 278,858 | 224,031 | 224,031 | 39,827 | 39,657 | 39,657 | 362,205 | 292,080 | 292,080 | 119,018 | 95,766 | 95,766 | 95,452 | 77,151 | 77,151 |
| **Grand Total** | **22,764,189** | **20,604,783** | **13,510,895** | **35,764,084** | **31,139,496** | **21,724,346** | **58,814,298** | **48,664,567** | **25,835,730** | **34,368,815** | **27,418,001** | **17,084,374** | **22,603,527** | **16,529,177** | **9,655,576** |
| | | | | | | | | | | | | | | | |
| **Aggregate Geography** | | | | | | | | | | | | | | | |
| Central City | 8,328,878 | 7,981,705 | 7,981,705 | 17,018,686 | 15,030,791 | 15,030,791 | 11,341,831 | 9,574,132 | 9,574,132 | 8,461,693 | 7,521,609 | 7,521,609 | 1,624,049 | 1,573,835 | 1,573,835 |
| Industrial | 980,158 | 761,589 | 761,589 | 1,432,039 | 928,564 | 928,564 | 8,890,821 | 5,423,694 | 5,423,694 | 6,720,374 | 4,424,577 | 4,424,577 | 8,605,414 | 5,125,003 | 5,125,003 |
| Neighborhood Commercial | 13,044,396 | 11,612,273 | 4,518,385 | 16,423,408 | 14,375,722 | 4,960,572 | 37,025,399 | 32,372,226 | 9,543,389 | 18,107,274 | 14,791,686 | 4,458,059 | 11,765,549 | 9,297,951 | 2,424,349 |
| Institutions | 115,142 | 98,993 | 98,993 | 185,281 | 150,267 | 150,267 | 547,201 | 501,121 | 501,121 | 211,523 | 211,523 | 211,523 | 413,929 | 408,680 | 408,680 |
| Outside Geographies | 411,917 | 318,675 | 318,675 | 100,780 | 87,148 | 87,148 | 770,814 | 644,578 | 644,578 | 818,086 | 342,668 | 342,668 | 189,055 | 125,799 | 125,799 |
| **Total** | **22,880,490** | **20,773,235** | **13,679,347** | **35,160,193** | **30,572,491** | **21,157,342** | **58,576,067** | **48,515,751** | **25,686,913** | **34,318,950** | **27,292,063** | **16,958,436** | **22,597,996** | **16,531,268** | **9,657,666** |

Source: Bureau of Planning and Sustainability

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## Figure 41. Existing Buildable Land Inventory – Net Building Square Footage (part 2)

| | 10 to 20 acres | | | 20 to 50 acres | | | More than 50 acres | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Employment Geography | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Total Before Constraints | Total After Constraints | Total Adjusted Capacity | Employment Geography |
| **Central City Commercial** | 3,846,700 | 2,211,264 | 2,211,264 | 7,676,187 | 5,403,200 | 5,403,200 | 0 | 0 | 0 | 54,137,418 | 45,516,641 | **45,516,641** | **Central City Commercial** |
| Vacant | 2,577,380 | 1,498,461 | 1,498,461 | 6,204,834 | 4,358,700 | 4,358,700 | 0 | 0 | 0 | 37,393,992 | 31,443,329 | **31,443,329** | Vacant |
| Redevelopment | 1,269,320 | 712,803 | 712,803 | 1,471,352 | 1,044,500 | 1,044,500 | 0 | 0 | 0 | 16,743,426 | 14,073,312 | **14,073,312** | Redevelopment |
| **Central City Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,160,607 | 3,779,894 | **3,779,894** | **Central City Industrial** |
| Vacant | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,223,255 | 2,904,880 | **2,904,880** | Vacant |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 937,352 | 875,014 | **875,014** | Redevelopment |
| **Columbia East** | 4,175,124 | 1,962,393 | 1,962,393 | 5,582,630 | 4,197,991 | 4,197,991 | 8,439,811 | 6,091,741 | 6,091,741 | 23,329,900 | 15,518,799 | **15,518,799** | **Columbia East** |
| Vacant | 4,175,124 | 1,962,393 | 1,962,393 | 5,582,630 | 4,197,991 | 4,197,991 | 8,439,811 | 6,091,741 | 6,091,741 | 23,181,885 | 15,394,759 | **15,394,759** | Vacant |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 148,015 | 124,040 | **124,040** | Redevelopment |
| **Dispersed Employment** | 448,556 | 246,238 | 246,238 | 1,381,040 | 929,710 | 929,710 | 4,294,052 | 1,960,903 | 1,960,903 | 8,906,021 | 5,287,319 | **5,287,319** | **Dispersed Employment** |
| Vacant | 429,890 | 228,733 | 228,733 | 1,297,140 | 862,041 | 862,041 | 3,869,291 | 1,792,295 | 1,792,295 | 7,517,142 | 4,318,790 | **4,318,790** | Vacant |
| Redevelopment | 18,665 | 17,505 | 17,505 | 83,899 | 67,669 | 67,669 | 424,762 | 168,608 | 168,608 | 1,388,880 | 968,528 | **968,528** | Redevelopment |
| **Harbor Access Lands** | 3,828,944 | 1,013,492 | 1,013,492 | 3,136,373 | 1,812,583 | 1,812,583 | 6,844,578 | 1,790,058 | 1,790,058 | 15,374,339 | 4,932,417 | **4,932,417** | **Harbor Access Lands** |
| Vacant | 3,762,054 | 982,785 | 982,785 | 3,136,373 | 1,812,583 | 1,812,583 | 6,844,578 | 1,790,058 | 1,790,058 | 15,307,449 | 4,901,710 | **4,901,710** | Vacant |
| Redevelopment | 66,891 | 30,706 | 30,706 | 0 | 0 | 0 | 0 | 0 | 0 | 66,891 | 30,706 | **30,706** | Redevelopment |
| **Harbor & Airport Districts** | 8,733,231 | 4,831,675 | 4,831,675 | 13,293,376 | 7,161,036 | 7,161,036 | 28,019,141 | 13,502,903 | 13,502,903 | 66,215,243 | 35,664,026 | **33,703,826** | **Harbor & Airport Districts** |
| Vacant | 7,052,983 | 3,825,774 | 3,825,774 | 12,489,855 | 6,604,339 | 6,604,339 | 27,970,408 | 13,485,842 | 13,485,842 | 61,918,039 | 32,566,474 | **30,606,274** | Vacant |
| Redevelopment | 1,680,248 | 1,005,901 | 1,005,901 | 803,521 | 556,697 | 556,697 | 48,733 | 17,061 | 17,061 | 4,297,204 | 3,097,552 | **3,097,552** | Redevelopment |
| **Institutions** | 1,358,631 | 1,355,693 | 1,355,693 | 2,660,874 | 1,606,056 | 1,606,056 | 3,551,957 | 3,524,122 | 3,524,122 | 9,044,538 | 7,856,455 | **7,856,455** | **Institutions** |
| Vacant | 520,681 | 517,864 | 517,864 | 2,020,558 | 989,912 | 989,912 | 441,122 | 413,287 | 413,287 | 3,236,498 | 2,144,230 | **2,144,230** | Vacant |
| Redevelopment | 837,950 | 837,830 | 837,830 | 640,317 | 616,144 | 616,144 | 3,110,835 | 3,110,835 | 3,110,835 | 5,808,039 | 5,712,225 | **5,712,225** | Redevelopment |
| **Neighb. Centers & Corridors** | 13,024,936 | 10,210,661 | 2,052,426 | 14,185,307 | 5,892,257 | 2,166,026 | 8,641,139 | 4,221,700 | 1,609,674 | 97,315,607 | 72,838,494 | **19,537,802** | **Neighb. Centers & Corridors** |
| Vacant | 1,386,237 | 1,061,958 | 377,167 | 5,825,183 | 3,093,500 | 1,460,730 | 6,842,496 | 3,159,166 | 1,350,845 | 28,637,977 | 19,245,118 | **7,822,652** | Vacant |
| Redevelopment | 11,638,699 | 9,148,703 | 1,675,259 | 8,360,124 | 2,798,756 | 705,296 | 1,798,643 | 1,062,534 | 258,829 | 68,677,630 | 53,593,377 | **11,715,149** | Redevelopment |
| **Gateway Regional Center** | 1,508,503 | 714,299 | 593,382 | 0 | 0 | 0 | 0 | 0 | 0 | 12,587,548 | 8,991,931 | **5,483,052** | **Gateway Regional Center** |
| Vacant | 54,086 | 40,564 | 29,301 | 0 | 0 | 0 | 0 | 0 | 0 | 3,936,393 | 2,847,033 | **1,949,640** | Vacant |
| Redevelopment | 1,454,417 | 673,734 | 564,081 | 0 | 0 | 0 | 0 | 0 | 0 | 8,651,155 | 6,144,897 | **3,533,412** | Redevelopment |
| **Town Centers** | 1,930,580 | 879,940 | 129,169 | 121,958 | 105,822 | 50,243 | 0 | 0 | 0 | 25,875,294 | 22,644,111 | **7,484,820** | **Town Centers** |
| Vacant | 135,278 | 132,585 | 37,636 | 41,030 | 24,894 | 23,441 | 0 | 0 | 0 | 6,343,844 | 5,575,374 | **2,853,931** | Vacant |
| Redevelopment | 1,795,302 | 747,355 | 91,532 | 80,928 | 80,928 | 26,802 | 0 | 0 | 0 | 19,531,450 | 17,068,738 | **4,630,889** | Redevelopment |
| **Outside Geographies** | 1,613,378 | 1,217,133 | 1,217,133 | 3,857,675 | 1,034,533 | 1,034,533 | 2,596,463 | 328,994 | 328,994 | 10,358,169 | 4,099,528 | **4,099,528** | **Outside Geographies** |
| Vacant | 825,582 | 664,947 | 664,947 | 2,539,353 | 462,267 | 462,267 | 2,565,797 | 298,328 | 298,328 | 7,326,024 | 2,215,725 | **2,215,725** | Vacant |
| Redevelopment | 787,796 | 552,186 | 552,186 | 1,318,323 | 572,266 | 572,266 | 30,666 | 30,666 | 30,666 | 3,032,145 | 1,883,804 | **1,883,804** | Redevelopment |
| **Grand Total** | **41,698,012** | **25,633,974** | **16,604,051** | **52,255,670** | **28,404,655** | **24,622,845** | **62,428,303** | **31,231,722** | **28,619,696** | **327,304,683** | **227,129,615** | **153,200,553** | **Grand Total** |
| | | | | | | | | | | | | | |
| **Aggregate Geography** | | | | | | | | | | | | | **Aggregate Geography** |
| Central City | 3,846,700 | 2,211,264 | 2,211,264 | 7,676,187 | 5,403,200 | 5,403,200 | 0 | 0 | 0 | 58,298,025 | 49,296,535 | **49,296,535** | Central City |
| Industrial | 17,185,855 | 8,053,798 | 8,053,798 | 23,393,419 | 14,101,320 | 14,101,320 | 47,597,583 | 23,345,606 | 23,345,606 | 113,825,503 | 61,402,561 | **59,442,361** | Industrial |
| Neighborhood Commercial | 16,464,019 | 11,804,900 | 2,774,977 | 14,307,265 | 5,998,078 | 2,216,269 | 8,641,139 | 4,221,700 | 1,609,674 | 135,778,449 | 104,474,536 | **32,505,674** | Neighborhood Commercial |
| Institutions | 1,358,631 | 1,355,693 | 1,355,693 | 2,660,874 | 1,606,056 | 1,606,056 | 3,551,957 | 3,524,122 | 3,524,122 | 9,044,538 | 7,856,455 | **7,856,455** | Institutions |
| Outside Geographies | 1,613,378 | 1,217,133 | 1,217,133 | 3,857,675 | 1,034,533 | 1,034,533 | 2,596,463 | 328,994 | 328,994 | 10,358,169 | 4,099,528 | **4,099,528** | Outside Geographies |
| **Total** | **40,468,584** | **24,642,788** | **15,612,865** | **51,895,420** | **28,143,187** | **24,361,377** | **62,387,142** | **31,420,422** | **28,808,396** | **327,304,683** | **227,129,615** | **153,200,553** | **Total** |

Source: Bureau of Planning and Sustainability

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## Figure 42. Existing Buildable Land Inventory – Net Land Acres (part 1)

| | Less than .5 acres | | | .5 to 1 acre | | | 1 to 3 acres | | | 3 to 5 acres | | | 6 to 10 acres | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Employment Geography | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment |
| **Central City Commercial** | 33 | 32 | 32 | 67 | 59 | 59 | 47 | 39 | 39 | 36 | 32 | 32 | 6 | 6 | 6 |
| Vacant | 22 | 21 | 21 | 42 | 37 | 37 | 30 | 25 | 25 | 25 | 23 | 23 | 6 | 6 | 6 |
| Redevelopment | 11 | 10 | 10 | 24 | 22 | 22 | 17 | 14 | 14 | 10 | 9 | 9 | 0 | 0 | 0 |
| **Central City Industrial** | 15 | 14 | 14 | 33 | 31 | 31 | 13 | 13 | 13 | 7 | 6 | 6 | 3 | 2 | 2 |
| Vacant | 9 | 8 | 8 | 27 | 25 | 25 | 12 | 11 | 11 | 7 | 5 | 5 | 1 | 1 | 1 |
| Redevelopment | 6 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Columbia East** | 2 | 1 | 1 | 10 | 6 | 6 | 40 | 23 | 23 | 29 | 19 | 19 | 39 | 27 | 27 |
| Vacant | 2 | 1 | 1 | 10 | 6 | 6 | 39 | 23 | 23 | 28 | 17 | 17 | 37 | 26 | 26 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Dispersed Employment** | 13 | 11 | 11 | 9 | 7 | 7 | 24 | 22 | 22 | 29 | 19 | 19 | 2 | 2 | 2 |
| Vacant | 9 | 8 | 8 | 6 | 5 | 5 | 15 | 14 | 14 | 20 | 13 | 13 | 2 | 1 | 1 |
| Redevelopment | 4 | 3 | 3 | 3 | 2 | 2 | 9 | 8 | 8 | 8 | 6 | 6 | 0 | 0 | 0 |
| **Harbor Access Lands** | 0 | 0 | 0 | 1 | 0 | 0 | 18 | 4 | 4 | 0 | 0 | 0 | 16 | 3 | 3 |
| Vacant | 0 | 0 | 0 | 1 | 0 | 0 | 18 | 4 | 4 | 0 | 0 | 0 | 16 | 3 | 3 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Harbor & Airport Districts** | 7 | 5 | 5 | 13 | 8 | 8 | 122 | 76 | 76 | 96 | 64 | 64 | 140 | 86 | 86 |
| Vacant | 7 | 5 | 5 | 11 | 7 | 7 | 100 | 57 | 57 | 79 | 49 | 49 | 140 | 86 | 86 |
| Redevelopment | 1 | 0 | 0 | 2 | 1 | 1 | 22 | 19 | 19 | 17 | 15 | 15 | 0 | 0 | 0 |
| **Institutions** | 3 | 2 | 2 | 4 | 3 | 3 | 13 | 12 | 12 | 5 | 5 | 5 | 10 | 9 | 9 |
| Vacant | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 2 | 2 | 2 |
| Redevelopment | 2 | 2 | 2 | 3 | 2 | 2 | 11 | 10 | 10 | 5 | 5 | 5 | 8 | 8 | 8 |
| **Neighb. Centers & Corridors** | 370 | 326 | 112 | 463 | 398 | 115 | 1,070 | 927 | 218 | 506 | 419 | 101 | 305 | 248 | 59 |
| Vacant | 97 | 84 | 42 | 106 | 91 | 38 | 218 | 172 | 59 | 123 | 105 | 40 | 100 | 75 | 26 |
| Redevelopment | 272 | 242 | 70 | 357 | 307 | 77 | 852 | 755 | 159 | 383 | 315 | 61 | 205 | 173 | 34 |
| **Gateway Regional Center** | 11 | 9 | 5 | 16 | 13 | 9 | 121 | 101 | 61 | 88 | 62 | 33 | 41 | 22 | 14 |
| Vacant | 5 | 4 | 3 | 7 | 6 | 5 | 45 | 33 | 22 | 37 | 25 | 16 | 3 | 2 | 1 |
| Redevelopment | 6 | 4 | 2 | 8 | 7 | 4 | 76 | 68 | 39 | 51 | 37 | 16 | 38 | 20 | 13 |
| **Town Centers** | 173 | 158 | 72 | 215 | 197 | 81 | 323 | 297 | 88 | 126 | 114 | 35 | 131 | 114 | 21 |
| Vacant | 56 | 52 | 31 | 56 | 53 | 29 | 85 | 76 | 36 | 37 | 31 | 14 | 16 | 9 | 4 |
| Redevelopment | 116 | 106 | 42 | 159 | 144 | 52 | 238 | 221 | 52 | 89 | 83 | 21 | 115 | 105 | 17 |
| **Outside Geographies** | 9 | 7 | 7 | 2 | 2 | 2 | 18 | 15 | 15 | 19 | 8 | 8 | 4 | 3 | 3 |
| Vacant | 3 | 2 | 2 | 1 | 1 | 1 | 9 | 8 | 8 | 16 | 6 | 6 | 2 | 1 | 1 |
| Redevelopment | 6 | 5 | 5 | 1 | 1 | 1 | 8 | 7 | 7 | 3 | 2 | 2 | 2 | 2 | 2 |
| **Grand Total** | **635** | **565** | **262** | **834** | **724** | **321** | **1,808** | **1,528** | **569** | **941** | **748** | **321** | **697** | **522** | **233** |
| | | | | | | | | | | | | | | | |
| **Aggregate Geography** | | | | | | | | | | | | | | | |
| Central City | 48 | 46 | 46 | 100 | 89 | 89 | 60 | 52 | 52 | 43 | 38 | 38 | 9 | 8 | 8 |
| Industrial | 23 | 17 | 17 | 33 | 21 | 21 | 204 | 125 | 125 | 154 | 102 | 102 | 198 | 118 | 118 |
| Neighborhood Commercial | 553 | 492 | 189 | 694 | 608 | 205 | 1,514 | 1,325 | 367 | 721 | 596 | 169 | 477 | 384 | 94 |
| Institutions | 3 | 2 | 2 | 4 | 3 | 3 | 13 | 12 | 12 | 5 | 5 | 5 | 10 | 9 | 9 |
| Outside Geographies | 9 | 7 | 7 | 2 | 2 | 2 | 18 | 15 | 15 | 19 | 8 | 8 | 4 | 3 | 3 |
| **Total** | **635** | **565** | **262** | **834** | **724** | **321** | **1,808** | **1,528** | **569** | **941** | **748** | **321** | **697** | **522** | **233** |

Source: Bureau of Planning and Sustainability

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## Figure 43. Existing Buildable Land Inventory – Net Land Acres (part 2)

| | 10 to 20 acres | | | 20 to 50 acres | | | More than 50 acres | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Employment Geography | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Total Before Constraints | Total After Constraints | Total Adjusted Capacity | Employment Geography |
| **Central City Commercial** | 17 | 10 | 10 | 34 | 24 | 24 | 0 | 0 | 0 | 239 | 201 | **201** | **Central City Commercial** |
| Vacant | 11 | 7 | 7 | 27 | 19 | 19 | 0 | 0 | 0 | 165 | 139 | **139** | Vacant |
| Redevelopment | 6 | 3 | 3 | 6 | 5 | 5 | 0 | 0 | 0 | 74 | 62 | **62** | Redevelopment |
| **Central City Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72 | 65 | **65** | **Central City Industrial** |
| Vacant | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 50 | **50** | Vacant |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 15 | **15** | Redevelopment |
| **Columbia East** | 96 | 45 | 45 | 128 | 96 | 96 | 194 | 140 | 140 | 536 | 356 | **356** | **Columbia East** |
| Vacant | 96 | 45 | 45 | 128 | 96 | 96 | 194 | 140 | 140 | 532 | 353 | **353** | Vacant |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | **3** | Redevelopment |
| **Dispersed Employment** | 10 | 10 | 6 | 6 | 32 | 21 | 21 | 99 | 45 | 45 | 204 | **121** | **Dispersed Employment** |
| Vacant | 10 | 10 | 5 | 5 | 30 | 20 | 20 | 89 | 41 | 41 | 173 | **99** | Vacant |
| Redevelopment | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 10 | 4 | 4 | 32 | **22** | Redevelopment |
| **Harbor Access Lands** | 88 | 23 | 23 | 72 | 42 | 42 | 157 | 41 | 41 | 353 | 113 | **113** | **Harbor Access Lands** |
| Vacant | 86 | 23 | 23 | 72 | 42 | 42 | 157 | 41 | 41 | 351 | 113 | **113** | Vacant |
| Redevelopment | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | **1** | Redevelopment |
| **Harbor & Airport Districts** | 200 | 111 | 111 | 305 | 164 | 164 | 643 | 310 | 310 | 1,520 | 819 | **774** | **Harbor & Airport Districts** |
| Vacant | 162 | 88 | 88 | 287 | 152 | 152 | 642 | 310 | 310 | 1,421 | 748 | **703** | Vacant |
| Redevelopment | 39 | 23 | 23 | 18 | 13 | 13 | 1 | 0 | 0 | 99 | 71 | **71** | Redevelopment |
| **Institutions** | 31 | 31 | 31 | 61 | 37 | 37 | 82 | 81 | 81 | 208 | 180 | **180** | **Institutions** |
| Vacant | 12 | 12 | 12 | 46 | 23 | 23 | 10 | 9 | 9 | 74 | 49 | **49** | Vacant |
| Redevelopment | 19 | 19 | 19 | 15 | 14 | 14 | 71 | 71 | 71 | 133 | 131 | **131** | Redevelopment |
| **Neighb. Centers & Corridors** | 575 | 451 | 91 | 626 | 260 | 96 | 381 | 186 | 71 | 4,296 | 3,216 | **863** | **Neighb. Centers & Corridors** |
| Vacant | 61 | 47 | 17 | 257 | 137 | 64 | 302 | 139 | 60 | 1,264 | 850 | **345** | Vacant |
| Redevelopment | 514 | 404 | 74 | 369 | 124 | 31 | 79 | 47 | 11 | 3,032 | 2,366 | **517** | Redevelopment |
| **Gateway Regional Center** | 38 | 18 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 314 | 224 | **137** | **Gateway Regional Center** |
| Vacant | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 98 | 71 | **49** | Vacant |
| Redevelopment | 36 | 17 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 216 | 153 | **88** | Redevelopment |
| **Town Centers** | 78 | 36 | 5 | 5 | 4 | 2 | 0 | 0 | 0 | 1,051 | 920 | **304** | **Town Centers** |
| Vacant | 5 | 5 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 258 | 227 | **116** | Vacant |
| Redevelopment | 73 | 30 | 4 | 3 | 3 | 1 | 0 | 0 | 0 | 794 | 694 | **188** | Redevelopment |
| **Outside Geographies** | 37 | 28 | 28 | 89 | 24 | 24 | 60 | 8 | 8 | 238 | 94 | **94** | **Outside Geographies** |
| Vacant | 19 | 15 | 15 | 58 | 11 | 11 | 59 | 7 | 7 | 168 | 51 | **51** | Vacant |
| Redevelopment | 18 | 13 | 13 | 30 | 13 | 13 | 1 | 1 | 1 | 70 | 43 | **43** | Redevelopment |
| **Grand Total** | **1,171** | **763** | **364** | **1,326** | **683** | **506** | **1,538** | **864** | **695** | **8,872** | **6,393** | **3,209** | **Grand Total** |
| | | | | | | | | | | | | | |
| **Aggregate Geography** | | | | | | | | | | | | | **Aggregate Geography** |
| Central City | 17 | 10 | 10 | 34 | 24 | 24 | 0 | 0 | 0 | 311 | 266 | **266** | Central City |
| Industrial | 395 | 190 | 185 | 511 | 334 | 324 | 1,015 | 590 | 536 | 2,454 | 1,493 | **1,365** | Industrial |
| Neighborhood Commercial | 691 | 504 | 111 | 631 | 264 | 98 | 381 | 186 | 71 | 5,662 | 4,360 | **1,303** | Neighborhood Commercial |
| Institutions | 31 | 31 | 31 | 61 | 37 | 37 | 82 | 81 | 81 | 208 | 180 | **180** | Institutions |
| Outside Geographies | 37 | 28 | 28 | 89 | 24 | 24 | 60 | 8 | 8 | 238 | 94 | **94** | Outside Geographies |
| **Total** | **1,171** | **763** | **364** | **1,326** | **683** | **506** | **1,538** | **864** | **695** | **8,872** | **6,393** | **3,209** | **Total** |

Source: Bureau of Planning and Sustainability

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# APPENDIX D. BUILDABLE LAND INVENTORY MAP

A map of the Buildable Land Inventory, March 2015, by constraint levels is provided below. The underutilized parcels and constraint levels identified are based on the proposed Comprehensive Plan, including proposed land use designations on the plan map and 60% brownfield redevelopment capacity in Industrial and Neighborhood Commercial geographies.



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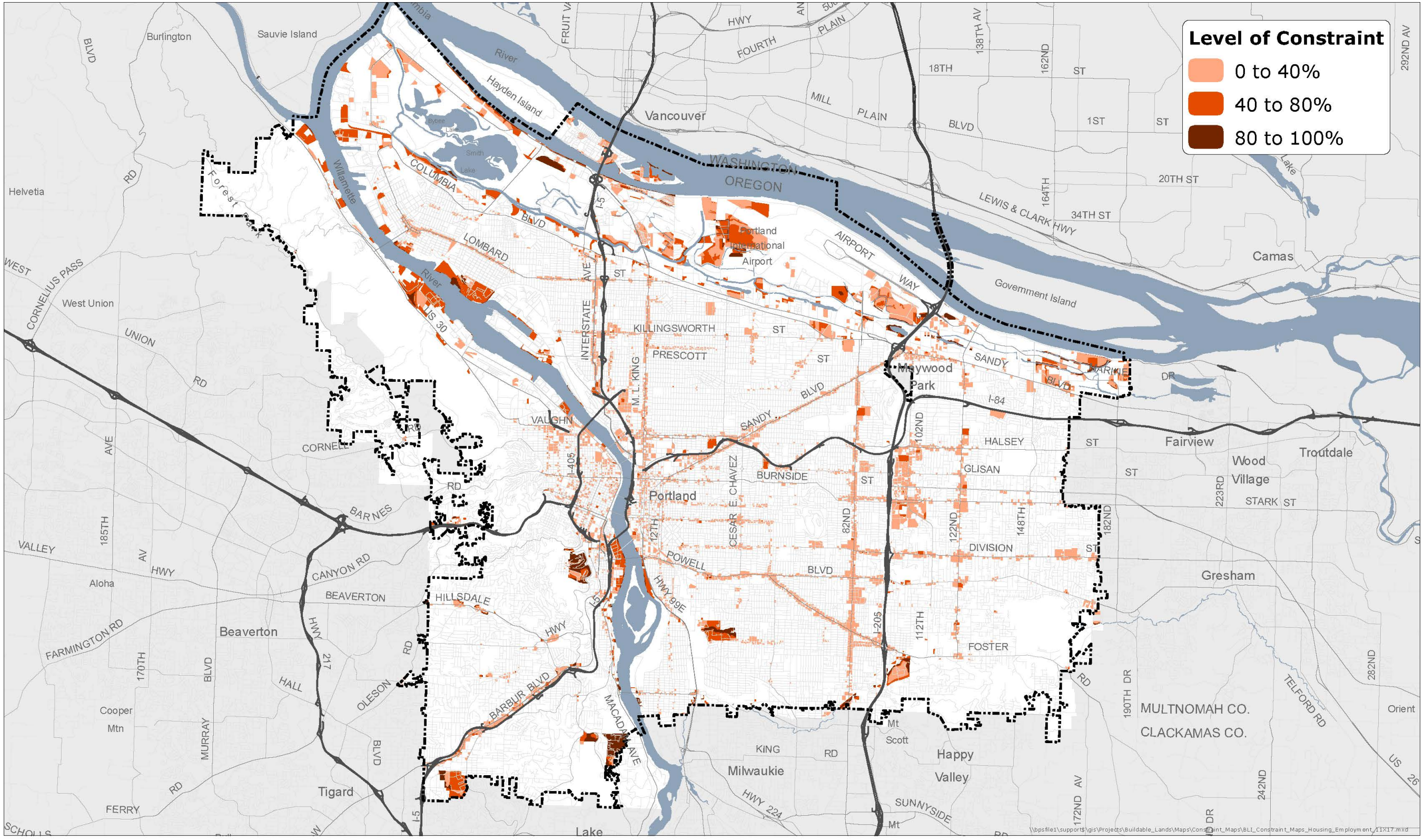
**Figure 44. Buildable Land Inventory Map of Proposed Comprehensive Plan**




**Buildable Lands Inventory | Employment Buildable Lands**

**City of Portland | Bureau of Planning and Sustainability | Geographic Information System**

*This work was supported, in part, by a grant from the Oregon Department of Land Conservation and Development.*

March 13, 2015

The information on the map was derived from digital data-bases on the City of Portland, Bureau of Planning and Sustainability GIS. Care was taken in the creation of this map but it is provided "as is". The City of Portland cannot accept any responsibility for error, omissions, or positional accuracy, and therefore, there are no warranties which accompany this product. However, notification of any errors will be appreciated.

NORTH

0 0.5 1 2 Miles

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# CITY OF PORTLAND
# ECONOMIC OPPORTUNITIES ANALYSIS:
## Section 4 – Community Choices





## March 2015 Proposed Draft

This Economic Opportunities Analysis has been funded through a grant from the State of Oregon Department of Land Conservation and Development.

**City of Portland Bureau of Planning & Sustainability**

# EXECUTIVE SUMMARY

The EOA is an analysis of the 20-year supply and demand for employment land in the city. It is prepared according to State Administrative Rule OAR 660-09-0015 and consists of four sections:

1. Trends, Opportunities & Market Factors
2. Long Range Employment Land Forecast (Demand)
3. Buildable Land Inventory (Supply)
4. Community Choices

This report is the fourth section of the EOA. It assesses the likely development capacity of the community choices proposed in the updated Comprehensive Plan map, policies, and investments to support and meet the employment land needs identified in Sections 1-3. Section 4 also summarizes additional implementation strategies expected to implement the proposed policies and meet identified employment land needs.

## KEY FINDINGS

- The 2012 Metro regional employment forecast allocates 141,600 new jobs to the City of Portland by 2035.
- This forecast job growth translates to a demand for 2,910 acres of employment land by 2035.
- The proposed Comprehensive Plan provides for adequate development capacity to meet this employment land demand through:
    - 427 acres of additional development capacity in existing industrial districts through map changes, public infrastructure investments (for example, transportation access improvements near vacant land), and strategies to improve industrial land retention, brownfield redevelopment, intensified use of developed land, and expansion. Taken together, these actions make it possible to use the existing gross land supply more efficiently by removing existing constraints.
    - 216 acres of additional development capacity for major campus institutions, the Central City industrial areas (Central Eastside and Lower Albina), and the town centers.
    - 350 acres of total land capacity for marine terminals, rail yards, and airport facilities. This is adjusted from the previous draft EOA to reflect a policy decision to meet the lower end of the marine terminal commodity movement forecast, rather than the middle or higher end of the forecast range.

## KEY OPPORTUNITIES

The proposed Comprehensive Plan includes key opportunities to support forecast job growth and meet employment land needs. The Comprehensive Plan provides a broader framework for economic development to support job growth and prosperity, including business development,


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sector initiatives, innovation, workforce development, poverty reduction, and other interrelated programs.

**Figure 1. Proposed Employment Land Development Capacity Summary**

| | 2010-35 Demand | | Supply (acres) | | | Reconciliation | |
|---|---|---|---|---|---|---|---|
| Aggregate Geography | Added Jobs | Land (acres) | Existing Plan BLI | Proposed Plan BLI* | Other Gains** | Surplus/ Deficit | Supply/ Demand |
| Central City | 44,740 | 150 | 266 | 390 | 390 | 240 | 260% |
| Industrial | 31,630 | 1,700 | 1,365 | 1,521 | 1,792 | 92 | 105% |
| Neighborhood Commercial | 35,140 | 690 | 1,303 | 1,492 | 1,492 | 802 | 216% |
| Institutions | 22,730 | 370 | 306 | 522 | 522 | 152 | 141% |
| **Total** | 141,640 | 2,910 | 3,240 | 3,925 | 4,195 | | |

* Proposed Plan BLI (Buildable Land Inventory) includes gains from plan map changes, planned infrastructure projects, and brownfield strategy proposals.

** Other gains result from proposed strategies for industrial land intensification, retention, and site-assistance.

Source: Bureau of Planning and Sustainability

To fill the need for all types of employment land, the following strategies have been identified:

### *Citywide*

- Establish a job capture rate target to help measure Portland's performance over time.
- Create a strong business climate through regulatory improvements, cost-competitiveness, and business development.
- Provide a competitive employment land supply with a wide range of types, sizes and locations.
- Expand exports and grow traded sector businesses as an impetus to overall economic growth and prosperity.

### *Central City*

- Promote and invest in the Central City as the region's and state's office, employment, and cultural center.
- Protect and facilitate the long-term success of the Central City Industrial districts, and facilitate their evolution into a higher density mix of employment uses.
- Expand industrial office overlay zoning and office development incentives to meet development capacity needs of the Central City Industrial districts.
- Support initiatives to advance Portland as a national leader in urban innovation and sustainability, supporting higher density mixed use development in the Central City and entrepreneurship in the expanding creative and green sectors of the economy.



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### *Industrial and Employment Districts*

- Promote industrial retention, growth, and traded sector competiveness as a West Coast freight hub and the state's largest industrial area.
- Protect Prime Industrial Areas for long-term retention and reduce non-industrial use allowances in industrial and employment zones.
- Create and implement a comprehensive toolkit of brownfield redevelopment incentives and tools, and support prompt resolution and cleanup of the Portland Harbor Superfund Site and associated brownfields.
- Implement strategic freight investments and business climate improvements to support industrial land intensification and reinvestment.
- Designate portions of airport area golf courses for a mix of industrial use, natural resource area, and public access to open space, to help meet industrial development capacity needs.
- Designate additional Dispersed Employment areas, particularly in East Portland, to meet development capacity needs.
- Expand natural resource protection, restoration and enhancement, and ecological site design to support concurrent improvement of watershed health and industrial capacity.

### *Neighborhood Business Districts*

- Promote the growth, economic equity and vitality of Neighborhood Business Districts as dynamic areas of small business development and a foundation of neighborhood livability.
- Designate additional Town Centers and Neighborhood Centers to meet capacity needs in Town Centers, provide for concentrated employment and residential density, and foster healthy and connected neighborhoods.
- Designate neighborhood commercial areas between centers to expand local access to goods and services and promote neighborhood-serving business.
- Prioritize commercial revitalization investments in underserved neighborhoods.

### *Campus Institutions*

- Promote the stability and growth of campus institutions as essential service providers and major employers.
- Designate campus institutions as employment land with associated zoning to accommodate capacity needs.
- Create campus development regulations that support projected institutional growth and neighborhood livability through suitable density, adequate infrastructure, context-supportive edges, and attractive amenities.
- Invest in transportation improvements that acknowledge and accommodate forecast institutional growth.

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# I. INTRODUCTION

This report is the fourth and concluding section of the EOA. It assesses the likely development capacity that could result from the community choices proposed in the updated Comprehensive Plan. These include changes to Comprehensive Plan map land use designations, policy changes, and new investments. Section 4 also summarizes additional implementation strategies expected to implement the proposed policies and meet identified employment land needs. This draft is based on the Proposed Draft of the Comprehensive Plan.

Statewide Planning Goal 9 and the associated administrative rules require cities to provide for economic development and job growth in their comprehensive plans. Goal 9 requires cities to show they can meet employment land needs through adopted policies and implementation measures. They must provide for an adequate number of sites of suitable sizes, types and locations needed to accommodate the forecasted employment growth.

The proposed Portland Comprehensive Plan proposes a variety of approaches to meet these requirements:

- Policies to maintain an adequate supply of land with the necessary supporting public facilities.
- Policies and programs to implement brownfield redevelopment strategies.
- Comprehensive plan map and zoning code changes.
- Capital improvement programming and funding.
- Regulatory and fee improvements.
- Tax incentives and other assistance.
- Property acquisition and parcel assembly.
- Public-private partnerships.

The overall objectives for economic development in the proposed Comprehensive Plan mirror those in the Portland Plan. They call for a growing city economy, traded sector competitiveness, and equitable household prosperity. They seek continuing growth of a balanced, diverse economy that supports a socially and economically diverse population. In turn, the Comprehensive Plan proposes land use and development policies to meet the varying land needs across the employment geographies identified in the EOA, including the Central City, Industrial and Employment Districts, Campus Institutions, and Neighborhood Business Districts.

This report starts with a brief section on citywide opportunities and then focuses on proposed policies and strategies addressing each employment geography to support its growth potential. The Comprehensive Plan identifies a broad range of community choices that guide and support employment land development. The summary of those choices described here center on key policies, infrastructure investments and land use map changes that will ensure Portland will provide adequate growth capacity to meet 20-year forecast for employment growth.

# II. CITYWIDE CHOICES

The Comprehensive Plan proposes new policy directions in four areas that support job growth and related development capacity:

1. A clear job growth target
2. A strong business climate
3. A competitive land supply
4. Competitive traded sectors

## EMPLOYMENT GROWTH TARGET

> *Proposed Comprehensive Plan Policy 6.2.* Strive to capture at least 25 percent of the seven-county region's employment growth (Multnomah, Washington, Clackamas, Yamhill, Columbia, Clark, and Skamania Counties).

The City of Portland has had a housing growth policy since the early 1990s to capture 20% of the region's housing growth, which has been successfully met. At one time Portland was thought to be running out of capacity to develop new housing. Setting a housing growth target was used to support finding new ways to reach the goal – expanding multifamily housing capacity, expanding tax incentives and tools to support multi-family housing development, and supporting livability investments that expand demand for housing growth in Portland.

Setting a job-growth target in Policy 6.2 provides a comparable opportunity to respond to emerging economic challenges and measure success in our responses. Additional policies that contribute to meeting this growth target include 6.1 Diverse and Expanding Economy, 6.6 Competitive Advantages, 6.9 Business Innovation, and policies cited in the sections below on improved business climate, traded sector competitiveness, and specific employment geographies.

In contrast to most of Oregon, Portland by 2013 had recovered all of the jobs it lost during the Great Recession. Multnomah County added about 31,000 jobs between 2010 and 2013, leading the region's recovery with an average annual job-growth rate of 2.4% during this upswing period. This recent job growth in Portland is consistent with long-term trends, and signals an upturn from the relatively flat job growth over the 2000-2008 business cycle, when the City captured only 5% of regional employment gains.

Despite Portland's strong historic and continued role as a major job center for the entire regional labor market, the experience of the last two economic downturns (since 2000) indicates that this continued role is not assured. Portland is typical of large cities that support a diverse and growing population attracted by economic opportunity.

With 370,000 jobs as of 2010, Portland accounts for 39% of the jobs in the 7-county metro area (PMSA), much higher than its 26% share of the region's 2.2 million residents. Long-term trends and forecast growth indicate moderate erosion of Portland's role as a regional job center, expected to decline from 39% of regional employment in 2010 to 34% by 2035.

The proposed job-growth target in Policy 6.2 is consistent with the historic capture rate for Multnomah County from 1980-2008 of 25%, with a high of 31% in the 1990s.[1] The trend-line analysis in EOA Section 1 indicates a job growth level that would represent a 28% city capture rate of PMSA job growth to 2035. The Metro regional employment forecast of 141,600 new jobs for the City of Portland by 2035 equates to a 26% capture rate of regional employment growth.

The proposed job growth target is complemented by Policy 6.27, which addresses increasing Income Self Sufficiency. It adds further guidance on job growth, supporting adequate land supply and public facilities to expand access to self-sufficient wages and career ladders for low-income people. This policy implements similar direction set in the Portland Plan. Policy 6.27 responds to the increasing job-polarization trends of recent decades, during which job growth has been in the low- and high-wage occupations with shrinking job opportunities in middle-wage occupations.

Middle-wage jobs are particularly concentrated in the industrial districts. In contrast, employment in the Central City and campus institutions is concentrated in high-wage occupations requiring college education, and neighborhood business districts are concentrated in low-wage occupations. In turn, workers of color and residents in East Portland rely disproportionately on industrial district jobs for self-sufficient wages and upward mobility (see EOA Section 1).

## STRONG BUSINESS CLIMATE

> *Proposed Comprehensive Plan Policy 6.7. Use plans and investments to help create a positive business environment in the city and provide strategic assistance to retain, expand, and attract businesses.*
>
> *Policy 6.17. Improve development review processes and regulations to encourage predictability and support local and equitable employment growth and encourage business retention.* Five sub-policies provide a framework of direction on regulatory improvements.

Improving Portland's regulatory and overall business climate was a primary theme of the Portland Plan Business Survey (2010) results and the Economic Development Policy Expert Group comments and business workshop comments on the Comprehensive Plan Working Draft.

In the business focus group results, described in Section 1 of the EOA, the most frequently mentioned responses to the question about how to position Portland to remain a prosperous city were the following:

[1] The long-term employment trends analysis is based on county data because reliable, comparable city data is not available before 2000.

- Need for greater regulatory flexibility better tailored to unique needs of individual businesses and/or business types.
- More recognition of the contribution of business to Portland's vitality – a change from regulators to partners asking "what can we do to help".
- Greater emphasis on cultivating business opportunity in Portland – with active marketing but without "picking winners."
- Need for better business access to resources, incentives and/or tax structure reform – ranging from reforming the business income tax to loan/incentive programs for small business to a point person/advocate for business in City Hall.

Business owners and real estate investors make decisions about where and how to invest based on the alternatives available. For many commercial businesses, the choice is between Portland and other communities in the metro area. For industrial and other traded sector businesses that compete globally, choices are often with locations well beyond the Portland metro area.

Making Portland's business districts more attractive and competitive to a broader range of businesses will help diversify and expand the economy. Portland's Central City, freight-oriented industrial areas, large hospital and college campuses, and other commercial centers and corridors make up a varied urban economy. In order to overcome constraints and strengthen location advantages to remain Oregon's largest job center, the Comprehensive Plan includes policies and actions that will help Portland's business districts be more attractive and support job growth.

In addition to Policies 6.7 and 6.17 cited above, other proposed policies that support a stronger business climate are 6.8 Small Business Development, 6.18 Short-Term Land Supply, 6.22 Clusters, 6.26 Traded Sector Diversity, and 6.31 Minority-Owned, Woman-Owned and Emerging Small Business (MWESB) Assistance.

## COMPETITIVE LAND SUPPLY

> *Policy 6.12 Land Supply. Provide supplies of employment land that are sufficient to meet the long-term and short-term employment growth forecasts, adequate in terms of amounts and types of sites, available and practical for development. Types of sites are distinguished primarily by EOA employment geographies, although capacity needs for building types with similar site characteristics can be met in other employment geographies.*

The Oregon statewide planning rules require that all cities have an adequate land supply to meet the needs for future job growth. Policy 6.2 is an overall response to meet this state requirement. The Comprehensive Plan recommends changes needed for the employment land supply to be sufficient to meet forecast job growth through 2035. These changes address shortfalls identified in five of the city's ten employment geographies.

This policy is implemented by a variety of measures in the proposed Comprehensive Plan:

- Designation of additional land area for employment development in each of the EOA employment geographies as shown in Figure 1.

- New policy support for brownfield redevelopment, providing regionally competitive development sites, and land supply for near-term development.

- Policies and strategies that allow additional development capacity to meet identified shortfalls.

Resulting development capacity in each employment geography is shown in Figure 2. A map of the ten employment geographies is included as Figure 3. The increase in development capacity that could result from investments identified in the Transportation System Plan (TSP) will be estimated in an upcoming 2015 draft of this report, after the PSC reviews the proposed TSP project list.

## Figure 2. Proposed Employment Land Development Capacity

| | 2010-35 Demand | | Supply (acres) | | | Reconciliation | |
|---|---|---|---|---|---|---|---|
| Employment Geography | Added Jobs | Land (acres) | Existing Plan BLI | Proposed Plan BLI* | Other Gains** | Surplus/ Deficit | Supply/ Demand |
| Central City Commercial | 34,120 | 60 | 201 | 201 | 201 | 141 | 336% |
| Central City Industrial | 10,620 | 90 | 65 | 188 | 188 | 98 | 209% |
| Harbor & Airport Districts | 16,050 | 1,013 | 774 | 898 | 1,065 | 52 | 105% |
| Harbor Access Lands | 2,070 | 207 | 113 | 136 | 169 | -38 | 82% |
| Columbia East | 9,310 | 350 | 356 | 346 | 416 | 66 | 119% |
| Dispersed Employment | 4,200 | 130 | 121 | 141 | 141 | 11 | 109% |
| Gateway Regional Center | 3,970 | 50 | 137 | 164 | 164 | 114 | 328% |
| Town Centers | 6,160 | 130 | 304 | 381 | 381 | 251 | 293% |
| Neighb. Centers & Corridors | 25,010 | 510 | 863 | 947 | 947 | 437 | 186% |
| Institutions | 22,730 | 370 | 306 | 522 | 522 | 152 | 141% |
| Residential | 7,400 | | | | | | |
| **Total** | 141,640 | 2,910 | 3,240 | 3,925 | 4,195 | | |
| **Aggregate Geography** | | | | | | | |
| Central City | 44,740 | 150 | 266 | 390 | 390 | 240 | 260% |
| Industrial | 31,630 | 1,700 | 1,365 | 1,521 | 1,792 | 92 | 105% |
| Neighborhood Commercial | 35,140 | 690 | 1,303 | 1,492 | 1,492 | 802 | 216% |
| Institutions | 22,730 | 370 | 306 | 522 | 522 | 152 | 141% |
| **Total** | 141,640 | 2,910 | 3,240 | 3,925 | 4,195 | | |

* Proposed Plan BLI (Buildable Land Inventory) includes gains from plan map changes, planned infrastructure projects, and brownfield strategy proposals.

** Other gains result from proposed strategies for industrial land intensification, retention, and site-assistance.

Source: Bureau of Planning and Sustainability



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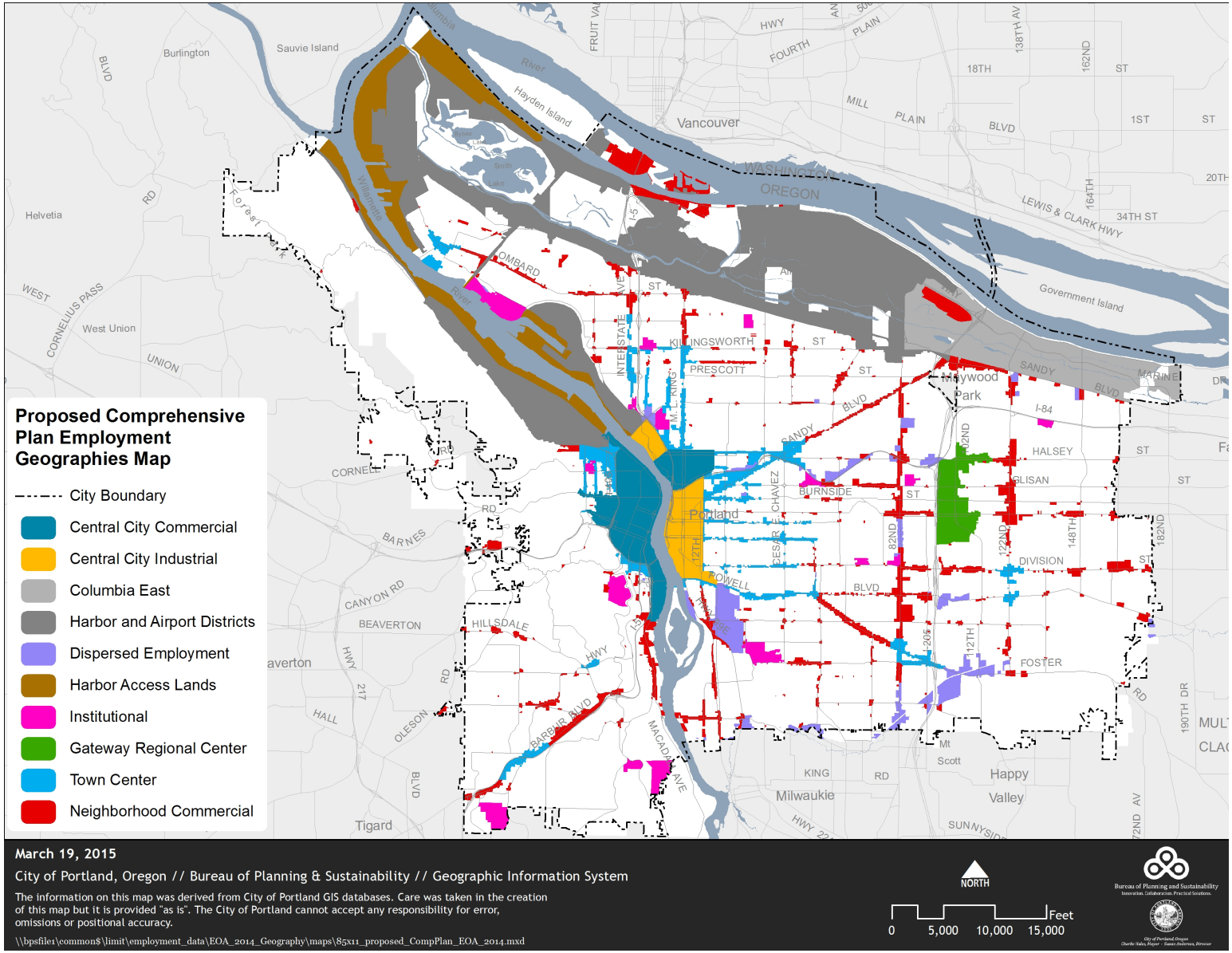
## Figure 3. Proposed Comprehensive Plan Employment Geographies Map

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**Policy 6.14 Brownfield Redevelopment** calls for the cleanup and redevelopment of 60% of the city's brownfield acreage by 2035. In contrast, continuation of current approaches and trends would support a brownfield redevelopment rate of 40% by 2035.

This policy target is based on the 2012 Portland Brownfield Assessment, which includes a citywide brownfield inventory, financial feasibility analysis, and recommendations of national best practices. Strategies to develop a comprehensive local brownfield toolkit of incentives and best practices are described below in the industrial districts section of this report.

**Policy 6.16 Regionally Competitive Development Sites** broadly supports use of incentives, investments, and other efforts to improve the regional competitiveness of vacant and underutilized sites in Portland.

These measures aim to moderate the long-term national and regional trend for job sprawl. The city's declining regional share of employment and commercial/industrial space, especially during the 2000-08 business cycle, suggest significant opportunity for improvement in regional markets. Further policy direction on cost-competitiveness is discussed below addressing specific employment geographies and their growth-capacity needs.

**Policy 6.18 Short-Term Land Supply** calls for a competitive and diverse supply of development-ready sites to meet 5-year increments of demand. The proposed Comprehensive Plan proposes two approaches to meet this policy.

First, while short-term land needs between 2010 and 2020 are already met in most geographies, actions are needed to meet identified needs in the others. The most challenging geography for meeting short-term land needs is Harbor Access Lands. Here the City has limited ability to resolve, by 2020, Superfund and brownfield constraints on vacant sites; however, recent and planned transportation investments and site-development assistance have supported redevelopment and infill that appear sufficient to be meet forecast growth. In the Central City Industrial and Dispersed Employment geographies, short-term land supply needs will be met by rezoning for expanded development capacity. Second, **Policy 6.19. Evaluate Land Needs** proposes that the City update its short-term land supply analysis and strategy every 5-7 years to coincide with regional forecast updates. These updates are expected to include specific actions to replenish short-term land supply as needed in each employment geography.

## EXPORT AND TRADED SECTOR COMPETITIVENESS

> *Policy 6.21 Traded Sector Competitiveness. Align plans and investments with efforts to improve the city and regional business environment for traded sector and export growth. Participate in regional and statewide initiatives.*

Traded sector businesses have a central role in driving and expanding the regional economy across the board.[2] To succeed and grow, these businesses must stay competitive in the changing

[2] Traded sector businesses are companies that sell many of their products and services to people and businesses outside the Portland region, nationally and globally. Examples include most manufacturing and many professional and business service companies as well as smaller craft businesses with local and global customers. Traded sector businesses may be locally owned and can be small, medium or large in size.

global marketplace. Traded sector companies and related industries tend to collect in regions where they have competitive advantages, a phenomenon called industry clusters. This supports greater access to specialized services and suppliers, a strong industry knowledge base, and skilled, experienced workers.

Global trends have put increasing pressure on regions to strengthen their competitiveness for traded sector growth, which drives regional prosperity. In response, the Oregon Business Plan, regional economic development strategies, and the Portland Economic Development Strategy all focus their attention on traded sector competitiveness and growth. Portland's Economic Development Strategy concentrates the City's business development resources on a targeted set of traded sector clusters in advanced manufacturing, athletic and outdoor, clean tech, and software.

Proposed Comprehensive Plan policies reinforce this state and regional economic development direction in Policy 6.21 (above), 6.22. Clusters, 6.23. Trade and Freight Hub, 6.24. Import Substitution, 6.25. Business Opportunities in Urban Innovation, and 6.26 Traded Sector Diversity.

# III. CENTRAL CITY

***Currently, the Central City accounts for 123,500 jobs – about one-third of the jobs in Portland. By 2035, more than 44,700 additional jobs are projected for the area, requiring 150 acres of development capacity in the city center.***

**What types of businesses locate here?** Central City businesses are concentrated in the "office sectors" – professional and business services, headquarters offices, finance, information, and government. Central City is also a diverse business district with specializations in higher education, small-scale industry, and entertainment/tourism/retail services. The EOA identifies two types of Central City employment geographies, each having a different mix of businesses, facilities, and land needs:

- The "Central City Commercial" geography is the region's high-density core, consisting of Downtown (the Central Business District), Lloyd, South Waterfront, and the University and River Districts. Office sectors make up 72% of Downtown jobs and 58% in the Lloyd District (see EOA Section 1). Entertainment, restaurants, retail, and higher education are also major parts of this employment geography.

- The Central City Industrial geography, consisting of the Central Eastside and Lower Albina, has a mix of small-scale industrial, lower-cost office, and diverse commercial space. These districts meet demand for close-in industrial space and have become a dynamic "incubator" location for new and expanding businesses.

**Why are these employment geographies important?** While nationally other central cities have lost out to suburban competition, Central City Portland is experiencing strong growth as a high-density mixed use neighborhood. It contains over half of the regional office market and has benefited from an emphasis on access, especially transit, and livability for residents, workers and visitors. This is the preferred location for faster-growing office sector businesses that make up 34% of forecast citywide job growth. Land use and infrastructure policies prioritize Central City as the region's core location for concentrated growth and increasing density.

**2010-2035 job growth potential: 45,000 net new jobs**. Central City accounts for 32% of the citywide job forecast. Metro's robust regional job growth forecast in the office sectors suggests substantial opportunity to compete for a larger Central City share of office development that has been occurring primarily in suburban locations, where lower land costs, larger sites, and less-expensive surface parking patterns prevail.

## EMPLOYMENT LAND CAPACITY OF THE PROPOSED COMPREHENSIVE PLAN

While the Central City Commercial geography easily has the development capacity to meet 2035 demand, the EOA forecasts that, without action, the Central City Industrial geography would meet only 72% of demand (a 25-acre shortfall).

The Central City 2035 plan, and specifically the Southeast Quadrant Plan, is proposing to increase employment capacity in the Central Eastside through expansion of the land area allowing industrial office development and other land use changes. These proposed changes are

estimated to result in an additional 123 acres of Central City Industrial capacity, accommodating 209% of forecast demand.

Similarly, the 15-acre deficit in "short-term" land supply needed by 2020 in the Central City Industrial geography is expected to be met by plan map amendments and expected rezoning by 2017.

## Central City Growth and Land Use Direction

> *Policy 6.32 Central City. Maintain the Central City's regional share of employment and continue its growth as the unique center of both the city and the region for innovation and exchange through commerce, employment, arts, culture, entertainment, tourism, education, and government.*

The land use and development policies for the Central City are being developed in the Central City 2035 Plan Update, which is underway as a separate process from the Comprehensive Plan Update; however, the proposed Comprehensive Plan does include key policy directions emphasizing accelerated job growth, the innovation and exchange advantages of being a large-scale economic center, diversity as a business and cultural center, and industrial retention.

**Over the last 20 years, the development focus of the Central City Commercial geography has shifted from office to residential and mixed use as new drivers of core area development.** In recent years, this has had the previously unanticipated effect of generating new office demand closer to residential, notably in the Pearl District. The increased role that a mixed residential-commercial neighborhood can play for the downtown core area received particular attention and recommended priority from developers participating in the Central City office focus group.

Downtown Portland has 49% of the multi-tenant office space in the region. On average, the CBDs in eight peer cities (including Denver, Austin, and Charlotte) have a 27% share of the multi-tenant office space in their respective regions. In the 2000-08 business cycle, the Central City's average annual job growth rate of 0.7% exceeded the national average of 0.5%. **Proposed policies reinforce this competitive position of the Central City as the dominant office center in the region.**

## Retention and Evolution of Central City Industrial Areas

> *Policy 6.33. Central City industrial districts. Protect and facilitate the long-term success of Central City industrial districts, while supporting their evolution into places with a broad mix of businesses with high employment densities.*

The Central City Industrial districts are a preferred, close-in location for many warehouse, manufacturing, and industrial service business. The industrial setting also provides a cost-competitive "incubator" location for new and expanding businesses, creative services, and cost-conscious offices. The combination of these competitive roles has made these districts a dynamic job growth center. This strong job growth trend has continued through the Great Recession and recent recovery period.

**Proposed land use direction in the Central City Industrial geography supports the retention and continuing evolution as industrial/incubator districts, recognizing the strong market niche and job growth advantages of these land use roles.** Much of the recent job growth within these districts has been fueled by the renovation of multi-story buildings into uses that support higher (largely service sector) job densities while offering competitive rents. In effect, incubator space and incubator districts represent an increasingly important hybrid or crossover product positioned between traditional office and industrial-service segments of employment building space spectrum. Incubator space is intended to:

- Offer greater flexibility to the user including pure office, exclusive industrial-distribution, and also mixed office-industrial functions.
- Be oriented to information and design applications for which Portland is becoming better known both on the West Coast and nationally.
- Offer employment and functional business space at a cost below that of prime office but with better finishes and in a more urbanized setting than would be possible in an exclusively industrial sanctuary setting.

There is a question as to how this adaptive reuse model can also be applied to leverage new construction, once the stock of the most prime existing multi-story older industrial spaces has been renovated. The primary challenge for creating new incubator space is to deliver a product that meets current business needs at rental rates low enough to be competitive for start-up and emerging creative firms. The alternative would be to forego this opportunity for in-city incubator areas, with more potential demand transferred to other parts of Portland, the region or outside the metro area. For example, additional employment land along SE 82nd Avenue and in the Gateway Regional Center could potentially serve this function.

## EXPAND CENTRAL CITY INDUSTRIAL DEVELOPMENT CAPACITY

Existing development capacity in the Central City Industrial geography meets only 72% of forecast demand. In 2002, capacity was expanded in part of the Central Eastside by establishing the EOS Overlay (Employment Opportunity Subarea of the Central City Plan District), which defined and allowed "industrial office" uses there. Industrial office uses are limited primarily to information sector businesses, such as graphics and software. This zoning innovation helped accelerate job growth in the Central Eastside by reuse of underutilized second-floor space. The predominant industrial zoning in this geography has created an affordable environment for robust job growth by cost-conscious office tenants. Continued growth in this market appears to be reliant on hybrid zoning that retains industrial sanctuary cost levels while expanding development capacity of Class C office tenants.

The Central City 2035 Plan update underway will be designating additional capacity in these industrial areas by expanding the area allowing industrial office development and site assistance to overcome development constraints for new construction. Changes will be made to existing Employment Opportunity Subarea (EOS) overlay to preserve building square footage for industrial and industrial office use by limiting retail sales and services to 5,000 square feet per site and allowing additional industrial office in rehabilitated multi-story structures. EOS will be expanded to the ODOT blocks, North of Burnside, the Southern Triangle, and IG zoned properties along Hawthorne, Madison, Main, Yamhill and Belmont. On EOS sites 20,000 square

feet or larger, industrial office uses are limited to a maximum floor area ratio of 3:1. In core areas of the Central Eastside, industrial office capacity will be allowed with a FAR of up to 3:1 only when ground floor use is dedicated to manufacturing and production, warehouse and freight movement, wholesale sales or industrial services. A significant increase in employment capacity is gained through a flexible employment zone (EX no housing) that will be applied to the OMSI station area to promote Employment Transit-Oriented Development. Resulting capacity gains are included in the Buildable Land Inventory of the proposed Comprehensive Plan, adding 123 acres of Central City Industrial development capacity. This resulting capacity will accommodate 209% of forecast demand by 2035.

## URBAN INNOVATION INITIATIVES

> *Policy 6.25. Business opportunities in urban innovation. Strive to have Portland's built environment, businesses, and infrastructure systems showcase examples of best practices of innovation and sustainability.*

Portland universities and businesses are active in research and development and the commercialization of new technologies. The development of the South Waterfront and University districts are directly linked to efforts to create a world-class educational and research complex anchored by OHSU and PSU with increasing opportunities for research commercialization.

Policies and programs, such as Clean Energy Works Oregon and Solarize Portland have contributed to growing the market for green building technologies and practices and have demonstrated how job creation can be part of reducing energy use and resource consumption.

Portland has a solid record of business growth related to urban innovation including startups and niche product development. Examples are bicycle manufacturing, green building and stormwater products and services, local food businesses, planning and design, and international tourism. Connections to other cities, nationally and internationally, and widening recognition of Portland as a sustainability leader have contributed to making the region and city more innovative and prosperous.

***The proposed Comprehensive Plan will provide a 25-year supply of additional employment land in the Central City by preserving and enhancing the area's industrial districts while increasing their development capacity, and making the city center even more attractive for research and development, new technologies and healthcare.***

# IV. INDUSTRIAL AND EMPLOYMENT DISTRICTS

***Currently, Industrial and Employment Districts account for 87,000 jobs – about 25% of the jobs in Portland. By 2035, more than 31,600 additional jobs are projected for these areas, requiring 1,700 acres of developable industrial land.***

**What types of businesses locate here?** Industrial employers, mainly in manufacturing and distribution, concentrate along the Portland Harbor and the Columbia Corridor, which make up Oregon's freight infrastructure hub and largest industrial area. They particularly need one-story buildings, medium to large sites, and locations buffered from housing. Central City Industrial and Dispersed Employment areas also have a range of commercial and industrial businesses. The EOA identifies four types of Industrial and Employment District geographies (counting Central City separately), each representing a different mix of businesses, facilities and land needs:

- The Harbor and Airport Districts geography is a heavy industrial setting occupied primarily by manufacturing and distribution businesses that need multimodal freight access.
- Harbor Access Lands along the deep-water shipping channel are occupied almost entirely by river- or rail-dependent industry, including marine terminals, manufacturing, construction, vessel services, and accessory uses, including headquarters offices associated with nearby industry.
- The Columbia East district, located east of the Portland Airport and 82nd Ave., is a mix of industrial and business flex space.
- The Dispersed Employment geography consists of primarily small business-park and flex-space sites occupied by low-density office and light industrial businesses in residential settings near freeways or truck routes.

**Why are these geographies important?** Portland is the core of the region's distribution and manufacturing economy. It includes the state's (and the Columbia River Basin's) largest seaport, rail hub, and airport.

The region's traded sectors, which bring income into the region and drive regional prosperity, are primarily industrial. The 87,000 jobs in these districts are also Portland's primary middle-wage job base and provide upward-mobility opportunities that expand income self-sufficiency and reduce racial disparities. The higher employment "multiplier" impact of industrial activity (see explanation in EOA Section 1), compared to commercial activity, means that industrial district jobs generate additional employment and prosperity benefits in the region.

**2010-2035 job growth potential: 31,600 net new jobs**. These districts account for 22% of the citywide job forecast. Compared to commercial sectors, industrial sector trends are complicated by slower job growth and faster output growth, driven by global market pressures to raise productivity. Portland's industrial job growth forecast is moderate, faster than national trends and slower than regional trends. Portland remains a preferred location for general industrial and warehouse development in the region, drawing on its advantages of multimodal freight-hub infrastructure, proximity to customers and suppliers in diverse industrial districts, and established industrial sanctuary zoning.

## EMPLOYMENT LAND CAPACITY OF THE PROPOSED COMPREHENSIVE PLAN

The existing Comprehensive Plan does not provide adequate capacity to meet forecast demand in the combined industrial and employment districts to 2035. Forecast land needs exceed the existing supply of buildable land by 335 to 565 acres in these districts (the range relates to marine terminal commodity forecasts), providing only 71% to 80% of the needed growth capacity.

Local options to expand industrial development capacity are limited by various factors: the prevalent demand for one-story buildings on large sites; Portland's inability to annex industrial land beyond West Hayden Island; and the budget tradeoffs of increasing public investment in brownfields and freight transportation infrastructure to facilitate industrial land intensification. Moreover, these geographies are regionally significant locations for both industry and natural resources, and Comprehensive Plan policies support allocating more land to meet the needs of both.

The new Comprehensive Plan proposes a balanced package of policies, map changes, and infrastructure investment strategies to meet forecast land needs in Portland's industrial and employment districts. These strategies are intended to support both industrial growth and improved watershed health in industrial districts while meeting other plan objectives. This package of strategies was shaped with advice from the Industrial Land/Watershed Health Working Group, which included members from a broad mix of affected stakeholders, and which met for over a year.

Overall, the estimated industrial land capacity of the proposed Comprehensive Plan is expected to be adequate to meet forecast demand, based on the following three general assumptions:

1. *The plan accommodates the low end of the marine-terminal commodity movement forecast of 150 acres for marine terminal land demand.*

   Community agreement is lacking at this time to designate 300 acres of Industrial Sanctuary on West Hayden Island to accommodate the mid-range forecast for marine terminal development to 2035. West Hayden Island is proposed to be designated Rural Farm Forest pending future annexation and a Comprehensive Plan amendment to determine the industrial and open space designations.

   Forecast demand under the mid-range marine terminal demand scenario would be expected to occur after in the 20-year planning horizon. The proposed Comprehensive Plan policy direction continues to support future consideration of a marine terminal development proposal as needed at West Hayden Island that mitigates adverse environmental and community impacts, consistent with the industrial designation of the site in Metro's 2040 Plan. If clear demand emerges, there is policy context in the Comprehensive Plan to consider annexation to meet that demand.

2. *The Comprehensive Plan can meet overall 2035 demand for industrial development and job growth across all of the industrial geographies even with the Harbor Access Lands geography meeting only 82% of forecast demand.*

Not all of the job growth (and land demand) in the Harbor Access Lands geography is river-related. Some elements, such as administrative support, can be located in other geographies. Portland's combined industrial geographies provide a diverse supply of industrial development sites to meet overlapping demand for industrial building types, and the aggregate industrial geographies are expected to maintain adequate capacity to meet forecast demand.

3. *The City must act to retain prime industrial land and to continue to get greater development and productivity from its supply of sites.*

Future industrial capacity depends on getting more industrial growth on less land by 2035. This requires rules for industrial land retention, new incentives and programs to increase brownfield redevelopment, and public investments and efforts to encourage more intensified use of developed sites.

Significant land use actions that reduce industrial district capacity below forecast demand are expected to explain how those reductions will be addressed through long-range programs (e.g., brownfield remediation), be offset with equivalent capacity gains, or seek a Goal 9 exception. Five-year updates of the EOA are proposed to monitor effectiveness, adjust strategies, and maintain an adequate short-term land supply.

Figure 5 provides a summary of the capacity impacts of the proposed strategies to provide adequate industrial development capacity and improve watershed health. These capacity impacts are analyzed by geography and strategy. The "Periodic Review" section of the table includes the forecasted demand, the capacity in the proposed Comprehensive Plan from the map changes, brownfields cleanup, intensification and retention, and the resulting surplus or deficit.

The "Integrated 2035 Strategies" section of the table reflects the potential capacity impact of future watershed health improvements. Improvements include the rezoning of approximately 550 acres of land from industrial to open space. The Watershed Health Strategies also identify significant natural resources that should be protected through future updates to the City's environmental and greenway overlay zones. These capacity estimates are intended as placeholders and are not intended to be binding. The estimates are based on natural resource information from the adopted 2012 Natural Resource Inventory (NRI), however the City expects to update the NRI as part of future legislative projects. The capacity estimates also have a placeholder for future acquisition sites to accommodate restoration projects required to Portland Harbor Superfund Natural Resources Damages Assessment (NRDA) mitigation requirement.

Taking into consideration the strategies to both improve employment capacity and to improve watershed health, the analysis indicates there is an expected shortfall of development capacity in the Harbor Access Lands and Harbor & Airport Districts geographies. Future post-acknowledgement plan amendments to protect these natural resources will need to explain how industrial development capacity needs will be met, or take an exception to Goal 9.

## Figure 4. Proposed Industrial and Employment Districts Capacity

| Employment Geography | Land Demand (acres) | Supply (acres) Existing Plan BLI | Proposed Plan BLI (1) | Other Gains (2) | Integrated Strategies (3) | Reconciliation Surplus/ Deficit | Supply/ Demand |
|---|---|---|---|---|---|---|---|
| **Proposed Capacity Summary by Employment Geography** | | | | | | | |
| Harbor & Airport Districts | 1,013 | 774 | 898 | 1,065 | 967 | -46 | 95% |
| Harbor Access Lands | 207 | 113 | 136 | 169 | 132 | -75 | 64% |
| Columbia East | 350 | 356 | 346 | 416 | 376 | 26 | 108% |
| Dispersed Employment | 130 | 121 | 141 | 141 | 141 | 11 | 109% |
| Total | 1,700 | 1,365 | 1,521 | 1,792 | 1,617 | -83 | 95% |

| Proposed Strategies to Provide Growth Capacity and Improve Watershed Health | Capacity Impacts of Proposed Strategies Harbor & Airport | Harbor Access | Columbia East | Dispersed Empl. | Total Industrial |
|---|---|---|---|---|---|
| Industrial land retention - prime industrial area retention, reduced non-industrial use allowances | 27 | 2 | 21 | | 50 |
| Brownfiield redevelopment - comprehensive program and incentives, Superfund, land bank | 89 | 23 | 8 | 4 | 124 |
| Industrial land intensification - strategic freight projects, Kenton line, regulatory improvements | 112 | 30 | 50 | | 192 |
| Airport golf courses - map designation, rezoning, investments, site assistance, restoration | 123 | | | | 123 |
| New Mixed Employment areas - map designation, rezoning, investments | | | | 9 | 9 |
| Other plan map changes - OS designation on natural areas and parks | -53 | | | | |
| Watershed health improvements - environmental zoning, NRDA, enhancement, ecological design | -98 | -37 | -40 | | -175 |
| Total | 200 | 19 | 39 | 14 | 271 |

1. Proposed Plan BLI (Buildable Land Inventory) includes gains from plan map changes, planned infrastructure projects and brownfield proposals.
2. Other gains result from proposed strategies for industrial land intensification, retention, and site-assistance.
3. Integrated strategies include estimated capacity impacts of proposed watershed health improvement strategies, including 25-acre capacity impact from NRDA (Natural Resources Damages) requirements of harbor Superfund.

Source: Bureau of Planning and Sustainability

The existing Buildable Land Inventory of 113 acres in the Harbor Access Lands geography meets only 55% of forecast land needs. Development opportunities exist to meet the 125-acre marine terminal demand estimate, including approximately 40 acres at Port of Portland's T-6 (proposed Pembina development site), 30 acres at T-4 (former Cargill site), and 55-84 acres at the former Time Oil terminal and aggregated nearby sites. Proposed public investments (e.g., improvements at Suttle Road and Time Oil Road) and site assistance are expected to help overcome development constraints at these sites. The small 38-acre Harbor Access Land shortfall can be accommodated in other industrial areas. Not all of the existing jobs in the area are dependent on access to the Portland Harbor. With a tight land supply, over time some of the industrial demand will relocate in industrial areas nearby. For example, expanding harbor businesses like Evraz Steel have grown on nearby sites off of the harbor. A capacity-

management approach is proposed to maintain a diverse supply of industrial sites overall to meet the short-term and 2035 land needs of the aggregated industrial geographies citywide.

## INDUSTRIAL GROWTH AND LAND USE DIRECTION

> *Policy 6.34. Industrial land. Provide industrial land that encourages industrial business retention, growth, and traded sector competitiveness as a West Coast trade and freight hub, a regional center of diverse manufacturing, and a widely accessible base of family-wage jobs, particularly for under-served and under-represented people.*
>
> *Policy 6.35. Industrial sanctuaries. Protect industrial land as industrial sanctuaries identified on the Comprehensive Plan Map primarily for manufacturing and distribution uses and to encourage the growth of industrial activities in the city.*

These policies support continuing industrial growth and acknowledge its household and regional prosperity benefits. Proposed industrial land use policies respond to the range of forecast land demand in different types of industrial and employment areas, including Policy 6.35. Industrial Sanctuaries, 6.37. Harbor Access Lands, 6.42 Multimodal Freight Corridors, and 6.43 Dispersed Employment Areas. The proposed Comprehensive Plan retains its 1980 "Industrial Sanctuary" designation and policy as the primary land use direction for industrial districts. The Industrial Sanctuary concept is designed to limit non-industrial uses in order to encourage industrial retention, reinvestment and growth. Other large cities have also adopted similar, more restrictive industrial zoning approaches in recent years, including Seattle, Vancouver B.C., and Los Angeles on the West Coast.

## INDUSTRIAL LAND RETENTION

> *Policy 6.36. Prime industrial land retention. Protect the multimodal freight-hub industrial districts at Portland Harbor, Columbia Corridor, and Brooklyn Yard as prime industrial land that is prioritized for long-term retention.* (This policy goes on to call for limiting conversion of prime industrial land and offsetting capacity reductions with additional capacity.)

These policies prioritize Prime Industrial areas (see map in Comprehensive Plan Figure 6.1) for long-term retention, and they support reduction of zoning allowances for non-industrial uses. Since 1990, approximately 400 acres of former industrial or mixed employment land in or adjacent to Prime Industrial areas has been rezoned for non-industrial use. In addition, substantial public acquisition of designated Industrial Sanctuary land has occurred in these areas for natural areas, parks, jails, and other public facilities that do not serve industrial uses.

The following proposed actions will implement the industrial land retention policies with corresponding increases in development capacity due to shifting non-industrial development demand to other geographies, such as Central City Commercial or Neighborhood Commercial, where there is a surplus of capacity to accommodate that demand.

- Amend zoning regulations to prohibit quasi-judicial map amendments from Industrial Sanctuary to another designation on Prime Industrial land. Future legislative projects are expected to analyze and estimate the loss of prime industrial land capacity, including existing industrial development and vacant capacity. Findings will need to explain how forecast demand for Prime Industrial development capacity will be met. An industrial capacity inventory system based on the BLI will be used to track program activities that are or are expected to increase, reduce, or mitigate for loss of industrial land capacity to conversion, regulation, or acquisition for other purposes.

- Amend zoning regulations to reduce allowance for non-industrial uses in industrial zones; reduce land-intensive non-industrial allowances in IH and IG zones, such as parks and open areas, self-service storage, commercial outdoor recreation and major event entertainment; and reduce retail allowances and prohibit residential use in EG zones.

- Develop inter-governmental coordination procedures for proposed public acquisitions to track and mitigate impacts on industrial land supply.

**Proposed land retention policies and these implementation actions are expected to result in development capacity gains of 27 acres in the Harbor and Airport Districts, 2 acres in Harbor Access Lands, and 21 acres in Columbia East.** Calculation of these gains is based on two primary assumptions. First, industrial land conversion trends through rezoning and public acquisition for non-industrial use are not expected to continue without offsetting capacity losses by equivalent gains elsewhere in Portland. Second, a 50-acre capacity gain is expected from shifting an estimated 50% of forecast retail land development in these districts to other employment geographies. To implement this change, zoning code amendments are expected to substantially reduce future retail allowances in General Employment (EG) zones to approximately 20,000 square feet per site.

## BROWNFIELD REDEVELOPMENT

*Policy 6.39. Industrial brownfield redevelopment. Provide incentives, technical assistance and direct support to overcome financial-feasibility gaps to enable remediation and redevelopment of brownfields for industrial growth.*

*Policy 6.40. Portland Harbor Superfund Site. Take a leadership role in prompt resolution and cleanup of the Portland Harbor Superfund Site and redevelopment of associated brownfields. Encourage a science-based and cost-effective cleanup solution that facilitates re-use of land for river- or rail-dependent or related industrial uses.*

Brownfields are vacant or underutilized properties where real or potential contamination complicates redevelopment. Proposed Policies 6.39 and 6.40 provide direction for a broad-ranging brownfield strategy to substantially increase industrial brownfield redevelopment as outlined below. Further direction is provided in proposed Policies 6.14. Brownfield Redevelopment and 7.29. Brownfield Remediation. Increasing brownfield redevelopment is a broadly supported option to increase industrial land capacity because it meets multiple objectives, including improvement of public health and environmental quality, reduction of urban sprawl, and expansion of industrial development capacity in advantageous locations.

**Portland's industrial districts contain an estimated 620 acres of brownfields,** accounting for over 60% of brownfields on employment lands citywide, as inventoried in the 2012 Portland Brownfield Redevelopment Assessment. The pace of recent development trends in Portland reviewed in EOA Sections 1 and 3 indicate that only 40% of the city's industrial brownfield acreage is likely to redevelop by 2035 under current conditions. Essentially, cleanup costs and financial risks exceed potential redevelopment revenues on most brownfields; however, other states have adopted aggressive tax incentives and a variety of other brownfield tools to overcome this financial gap. The Portland Brownfield Assessment estimated the total financial feasibility gap of the current citywide brownfield inventory at about $210 million, out of a total estimated cleanup cost of $240 million. That study also analyzed the return on investment of applying tax incentives to cover $210 million gap, estimating that future state income and property taxes after redevelopment would typically recover the costs of these incentives within one to four years.

In addition to on-site contamination, liability for future cleanup of river sediment contamination in the Portland Harbor Superfund Site has been a significant deterrent to brownfield redevelopment along the harbor. While progress on this Superfund project has been long delayed, it is anticipated that the U.S. Environmental Protection Agency will issue a Record of Decision, allocate liability among responsible parties, and move forward with cleanup actions well within the 2035 planning horizon. Proposed Comprehensive Plan Policy 6.40. Portland Harbor Superfund Site supports City efforts toward prompt resolution and cleanup.

The following proposed actions are expected responses to implement brownfield policies. Estimates of resulting development-capacity gains in the proposed Comprehensive Plan assume implementation of these actions. While the City can influence brownfield redevelopment, cooperation with state and federal agencies is also necessary, including legislative changes and new funding sources to accelerate brownfield cleanup.

- Create an industrial/commercial brownfield redevelopment program to implement a comprehensive brownfield toolkit of incentives and best practices. Hire staff to develop and implement the program.

- Draft and lobby for enabling legislation and funding to substantially expand brownfield redevelopment, including tax incentives, authorization of land banks with liability protection, and other brownfield best practices.

- Create and fund financial gap incentives for cleanup and redevelopment of underutilized, contaminated sites. Design incentives to substantially increase industrial redevelopment but not be available to entities identified as being responsible for the contamination.

- Obtain Superfund liability relief for brownfield purchasers. Obtain EPA commitment and staff resources to provide prospective purchaser agreements and de minimis settlements on harbor brownfields. Consider a city insurance pool or other incentives to minimize in-water liability cost gaps for innocent purchasers.

- Take a leadership role and promote prompt resolution and cleanup of the Portland Harbor Superfund site.

- Create a local industrial land bank. Facilitate strategic brownfield and other industrial redevelopment unlikely to occur in the private market, such as large industrial sites.

**Proposed brownfield policies and these implementation actions are expected to result in development capacity gains of 89 acres in the Harbor and Airport Districts, 23 acres in Harbor Access Lands, 8 acres in Columbia East, and 4 acres in Dispersed Employment areas.** Calculation of these capacity gains is based on increasing the brownfield redevelopment rate from 40% (estimate used in existing Buildable Land Inventory) to 60% by 2035, consistent with the 60% target set in Policy 6.14 Brownfield Redevelopment. This gain appears to be realistic, based on the estimated capacity impacts of recommended "best practice" incentives and tools in the Portland Brownfield Redevelopment Assessment.

## INDUSTRIAL LAND INTENSIFICATION

> *6.38. Industrial land use intensification. Encourage reinvestment and intensification of industrial land use, as measured by output and throughput per acre.*
>
> *Policy 6.23. Trade and freight hub. Encourage investment in transportation systems and services that will retain and expand Portland's competitive position as a West Coast trade gateway and freight distribution hub.*

Not all job growth will be accommodated on vacant or underutilized land. Strategic freight investments and business climate improvements offer key opportunities to encourage industrial reinvestment and more intensive use of existing buildings and developed land by raising the City's value proposition among competing industrial locations. Proposed Policies 6.38 and 6.23 (above) and Policy 6.17. Regulatory Climate and 8.26. Public-Private Partnerships provide supporting direction to pursue these opportunities. Business community participation in public investment planning and regulatory improvement processes can help to further target public actions to industry priorities and intensification opportunities, as supported by proposed Policy 2.1. Partnerships and Coordination.

**Industrial land "intensification" means more intensive use of existing industrial buildings and businesses on already developed sites.** For example, the heavy industrial, freight-hub location advantages that characterize most of Portland's Prime Industrial areas are unique in the region. However, retention and expansion of capacity in these heavy industrial geographies enables the region to more effectively compete for and efficiently serve these types of employment land demand. Policy 6.38 acknowledges that floor area or employment density are not the only measures of productivity and that intensification through productivity gains in output-per-acre on manufacturing facilities or throughput-per-acre on distribution facilities is appropriate.

In North America and Europe, significant examples of new and modern, multi-story industrial development have been limited. Building elevators are an efficiency bottleneck for most manufacturing and warehousing. Instead, industry preferences and development trends have shifted toward more large, single-story buildings and more outdoor maneuvering area to accommodate efficient truck movement and bigger trains and ships, driven by increasingly competitive global markets (see business focus group results in EOA Section 1). Within this

context, however, various recent development examples in Portland indicate opportunities to increase intensification through business expansion, infill, or redevelopment:

- Site investments that expand output capacity at developed sites are common. The recent expansion of South Rivergate Rail Yard (TSP Project 30047) improved unit-train access and encouraged capacity expansion at nearby Canpotex and Columbia Grain marine terminals. The proposed Rivergate Overcrossing (TSP Project 115610) nearby is similarly expected to facilitate continuing expansion at Evraz Steel.
- Underused or obsolete facilities can be redeveloped. Proposed site improvements (TSP Project 112080) at Port of Portland T-4 will facilitate redevelopment of the former Cargill terminal.
- Office functions are expanding at industrial headquarters sites, such as the proposed redevelopment of Daimler offices on Swan Island.
- The proposed double-tracking improvements and eight proposed overcrossings along Union Pacific's Kenton Line (TSP Projects 40085 and others) will alleviate congestion from forecast rail volume growth on this corridor and improve rail yard capacity.
- An expanding market for micro-business incubator facilities has spurred reuse of underutilized upper floors and redevelopment in the Central Eastside District. Another example that extends beyond the Central City is the recently developed five-story industrial building on NW York St. in the Harbor and Airport Districts geography.

To implement Policies 6.38 and 6.23 (above) and freight transportation policies 9.30 – 9.37, an extensive program of strategic freight investments are proposed in the Transportation System Plan, consistent with the Regional Transportation Plan. These infrastructure projects address identified deficiencies, accommodate forecast growth, improve Portland's competitiveness as a leading export region, and some of them facilitate development or intensification of particular sites. Freight volumes handled in the region are expected to roughly double in tonnage and triple in value between 2007 and 2040 (2014 Commodity Flow Forecast). In addition to the freight projects proposed in the TSP, the following proposed actions are expected responses to implement industrial land intensification and related freight infrastructure and regulatory climate policies. Estimates of resulting development-capacity gains in the proposed Comprehensive Plan assume implementation of these actions.

1. Update the Portland Freight Master Plan project list and incorporate changes into the Transportation System Plan Update. Develop a list of priority freight projects that improve Portland's industrial location value and freight district access.

2. Pursue funding sources to increase freight system improvements. Expand opportunities for public-private funding partnerships.

3. Improve Portland's industrial regulatory climate to support job growth (see further explanation above on new citywide directions). Conduct a study to evaluate cumulative city regulatory and fee costs, and develop implementation strategies. Explore process improvements to reduce uncertainty, timing, complexity, other transactions costs, and emphasize regional competitiveness in new regulations and fees without rolling back regulatory standards.

4. Consider establishing an industrial land bank and incentives to facilitate more intensive industrial redevelopment on underutilized sites.

**Proposed policies and these implementation actions are expected to result in industrial land intensification with estimated development capacity gains of 112 acres in the Harbor and Airport Districts, 30 acres in Harbor Access Lands, and 50 acres in Columbia East.** Calculation of these capacity gains is based on two factors. First, the redevelopment/infill rate is expected to increase to 15% from the current estimates in the Buildable Land Inventory (BLI) of 8% in Harbor and Airport Districts, 1% in Harbor Access Lands, and 7% in Columbia East. Existing BLI estimates are based on the amount of underdeveloped land with General Employment (EG) zoning. The 15% target represents conservative expansion of the 13% redevelopment/infill trend in Columbia East from 1999 to 2011 (see EOA Section 1), taking into account expected tightening transportation budgets for freight investments and proposed environmental zoning on developed land described in the next section. The Columbia East development trend is used here because the associated job growth trends during this period approximate forecast growth much closer than in the other industrial geographies.

Second, the 15% intensification rate is applied to the total land demand forecast of the industrial geographies, including additional acreage needs for marine, air, and rail terminals. For example, approximately 50 acres of the forecast 200-acre land need for railroad yards is expected to be met in the Harbor and Airport Districts by the proposed Kenton Line double-tracking and associated overcrossing improvements (TSP Projects 40085, 30055, 40001, and others). The Port of Portland's 2013 Rail Plan identified the Kenton Line as the only rail segment in Portland where forecast growth is expected to exceed practical capacity by 2030, and the proposed double-tracking improvements are recommended as a major regional project to address this congestion. These improvements are also expected to improve rail yard efficiency and functional capacity in Portland through substantial train storage capacity and improved rail mobility, which is the basis for the 50-acre estimate of railroad land needs to be met by infill and redevelopment.

## INDUSTRIAL DISTRICT EXPANSION

> *Policy 6.48. Golf course reuse and redevelopment. Facilitate a mix of industrial, natural resource, and public open space uses on privately owned golf course sites in the Columbia Corridor that become available for reuse.*
>
> *Policy 6.41. West Hayden Island. Provide for the future annexation of West Hayden Island for a combination of open space and deep water marine industrial uses with supplemental requirements in a plan district or other implementation agreement that ensures mitigation of impacts and provision of public benefits.* (This policy goes on to call for an annexation ordinance, future zoning, plan districts, and intergovernmental agreements to allow up to 300 acres for marine terminal and infrastructure development and protecting and enhancing at least 500 acres as open space).

New Industrial Sanctuary areas are designated on the proposed Comprehensive Plan Map at three airport area golf courses (Colwood, Riverside, and Broadmoor). These map changes represent 35% of the development capacity gains in the Harbor and Airport District. Proposed Policy 6.48 provides further direction for their land use and development. An employment

designation at West Hayden Island is not proposed in the Comprehensive Plan Update, although Policy 6.41 provides direction for future reconsideration of the proposed Farm and Forest designation. These proposed policies advance a multi-objective planning approach to accommodate a mix of new industrial areas, existing and enhanced natural resource areas, and public access to open space at these sites. The plan map also designates various additional sites as Mixed Employment land to meet capacity needs in Dispersed Employment areas.

Capacity impact estimates of map changes are based on assumptions that development of buildable land in new industrial and employment areas is expected to be (1) serviceable by public facilities and (2) financially viable on average to meet forecast demand within the 2035 planning horizon. The serviceability of sites is supported by proposed investments in the Citywide Systems Plan and Transportation System Plan and proposed Policy 8.17. System Capacity. Site assistance to accommodate financial feasibility of development on these sites by 2035 is also supported by Policy 6.16. Regionally Competitive Development Sites. Implementation efforts are expected to address development feasibility constraints as needed.

**Airport Area Golf Courses**

The Trust for Public Land and property owners of the 138-acre Colwood golf course obtained conditional approval of a quasi-judicial plan map and zoning amendment in 2014 to rezone 49 acres for industrial uses with the remainder as public open space and natural area. The proposed Comprehensive Plan includes this map change at the Colwood site and similar land use proposals at two nearby golf courses, designating approximately 90 additional acres at Riverside and 15 acres at Broadmoor as Industrial and retaining the Open Space designation on 215 acres.

These map designations were drawn to avoid encroaching on natural resources protected through existing environmental overlay zones, and to create large, functional industrial sites and open spaces with opportunities for substantial environmental restoration. The buildable land inventory estimates 95 acres of capacity after constraints at these sites. The assumed capacity of these map changes includes 28 additional acres, accounting for the entire 49-acre site at Colwood where development is underway, rather than the 21 acres of capacity included in the BLI. With public infrastructure investment and site assistance, the full 155 acres of industrially designated land at these sites may be available for development, assuming that street access is existing and all of the designated industrial area is available for development.

While the Broadmoor and Riverside golf courses could potentially remain in operation indefinitely, national market trends indicate an oversupply of golf courses in the coming years relative to population demographics, particularly in inner city locations. Given these trends and continuing intensification of industrial development in the surrounding area, it is reasonable to expect potential reuse of these sites in the 2035 planning horizon and the proposed Comprehensive Plan proposal would accommodate that change. Proposed public investments (e.g., improvements at 33rd Avenue) and site assistance are expected to help overcome development constraints at these sites. Development requirements are expected to include adequate infrastructure improvements, natural resource protection and enhancement, and expanded public access to open space, consistent with proposed Policy 6.48. Golf Course Reuse and Redevelopment.

**West Hayden Island**
As noted above, an employment map designation is not proposed at West Hayden Island in the Comprehensive Plan update. This reflects a policy choice to accommodate the low end of the marine terminal commodity movement forecast. A demand scenario of 150 acres for marine terminal development is used here to estimate land needs for the Harbor Access Lands geography. West Hayden Island represents the only opportunity to meet the mid-range marine terminal commodity movement forecast as described in EOA Sections 1-2.

West Hayden Island was brought into the Urban Growth Boundary in 1983 for marine industrial development, and Metro designates the site as Regionally Significant Industrial Area in the Urban Growth Management Functional Plan (Title 4), as well as a regionally significant fish and wildlife habitat (Title 13). Proposed Policy 6.41. West Hayden Island provides City direction for future reconsideration of the proposed Farm and Forest designation, consistent with this regional land use designation. Future development of West Hayden Island still could occur beyond the 20-year planning horizon, and marine terminal land needs can potentially be reevaluated at that time. Policy 6.41 anticipates a future marine terminal development proposal of up to 300 acres at West Hayden Island, mitigation of adverse environmental and community impacts from development, and designation of at least 500 acres as open space, based on the 2010 City Council Resolution #36805.

**New Mixed Employment Areas**
A variety of map changes are proposed in the Comprehensive Plan Update to expand capacity and improve the land use efficiency and functions of Dispersed Employment areas:

- New Mixed Employment areas have been designated at development opportunity sites near freeway interchanges or truck routes in East Portland, including existing farm sites (currently designated residential or commercial) and underutilized commercial sites.

- New Mixed Employment areas have been designated as transition areas between industrial districts and residential neighborhoods at NW Vaughn St. and N Columbia Blvd. at Denver St.

- Existed General Commercial areas with redevelopment potential for higher employment density have been changed to Mixed Employment designations, including portions of SE 82nd Ave. and N Hayden Meadows Dr.

- Existing Central Employment sites in employment use have been changed to Mixed Employment designations in Dispersed Employment areas (e.g., Freeway Lands and Montgomery Park sites) and in Central Gateway (see explanation in Neighborhood Business Districts section below), focusing their development potential on employment uses rather than mixed use/residential use.

The Employment Capacity Zoning Project is underway as part of the Periodic Review Task 5 Implementation to propose zoning map and code changes that implement these new Comprehensive Plan designations.

## WATERSHED HEALTH IMPROVEMENTS

> *Policy 6.46. Industrial growth and watershed health. Facilitate concurrent strategies to protect and improve industrial capacity and watershed health in the Portland Harbor and Columbia Corridor areas.*

Development capacity impacts are also expected to result from actions to meet City environmental policies and regulatory obligations. As noted above, Portland's industrial districts along the Willamette and Columbia Rivers serve as regionally significant industrial and natural resource locations. Recognizing the parallel public objectives for limited land in these geographies, Policy 6.46 above describes expectations for concurrent improvements in both industrial capacity and watershed health. Other proposed Comprehensive Plan Policies to protect and improve watershed health include 7.4. Natural Resource Protection, 7.6. and 7.7 pertaining to Environmental Protection Programs, 7.8. Land Acquisition Priorities and Coordination, additional policies specific to the Willamette, Columbia, and Columbia Slough watersheds, and policies calling for designing with nature, resource efficient development, and hazard resilient development.

**To implement watershed health policies on balance with economic development policies, a strategy of additional natural resource protection, enhancement and ecological site design is proposed as summarized below.** This multi-faceted strategy was developed in consultation with the Industrial Land/Watershed Health Working Group described above. Implementation of this strategy is expected to be pursued concurrently with actions to support industrial capacity gains, in accordance with Policy 6.46. Industrial Growth and Watershed Health. **Update Environmental and Greenway Overlay Zones and Regulations**

- Complete multi-objective plans for the River Plan/North Reach and Columbia Corridor, to address some combination of the following:
    - Applying new overlays to unprotected higher functioning or priority resources (e.g. high- and medium-ranked natural resources in the City's Natural Resource Inventory (NRI), potential off-site mitigation and restoration sites).
    - Removing overlays from land with no NRI resources.
    - Adjusting the protection level to better correspond to the level of natural resource function and improve program consistency (e.g. c-zone to p-zone or vice versa).
    - Updating area-specific environmental and greenway regulations that improve natural resource function through industrial development and redevelopment (e.g., streamlined procedures for site enhancements or ecological site design (see section D below), and allow prospective mitigation credit for proactive restoration activities, etc.).
- Pursue targeted update of Environmental Overlay Zone chapter of the Zoning Code (citywide regulations) including streamlining for resource enhancement, streamlining to encourage industrial intensification, clarification of mitigation requirements (e.g.,

potential standards, additional flexibility for off-site mitigation or participation in mitigation bank), and provisions needed to respond to new ESA listings.

- Complete future regulatory and/or program updates as needed to comply with the Endangered Species Act in response to litigation against FEMA relating to floodplain development.

**Enhance/Restore Protected Natural Resources**

- Identify priorities, estimated costs, and funding options (revenue sources, partnerships, incentives) in the Columbia Corridor and Portland Harbor. Specifically explore and pursue the following:
    - Restoration investments in public or land trust ownership or conservation easements.
    - Dedicated, long-term revenue sources for acquisition, restoration, and maintenance.
    - Options for public/private partnerships and investments.
    - Incentives for natural resource enhancement, such as tax credits.
    - Innovative institutional and funding structures.
    - Community and political support and commitment for proactive, long-term restoration investments.
- Prioritize target mitigation/restoration sites in the Columbia Corridor and Portland Harbor.
- Work with private mitigation bankers and other partners to explore and develop banks that sell wetland, riparian, in-water and grassland-related mitigation credits for City-required mitigation or NRDA/Superfund mitigation.

**Advance Ecological Site Design**

- Encourage ecological site design through best practices research and seeking partnerships and pilot projects.
- Establish or reinstate financial incentives, such as the eco-roof incentive program
- Provide education and technical assistance.
- Evaluate and pursue, as appropriate, code amendments, including regulatory incentives and performance based approaches.

- Develop resource handbook or design competition to encourage eco-industrial site design.

**Capacity Assumptions for Additional Natural Resource Protection**

The following analysis is intended to estimate the potential development capacity impacts of future legislative projects that will among other items, update the City's existing greenway and environmental overlay zones. The analysis also estimates potential development capacity impacts associated with Portland Harbor Superfund's Natural Resources Damages Assessment required restoration activities. This analysis and associated assumptions do not specifically dictate or bind future City decisions. In the future, when specific regulatory actions are proposed, development capacity impacts and Goal 9 compliance will be addressed along with other goals as part of that project.

It is estimated that future updates to the City's environmental and greenway overlay zones could reduce development capacity by 150 acres on vacant and underutilized sites:

- 98 acres in the Harbor and Airport Districts
- 12 acres in Harbor Access Lands
- 40 acres in Columbia East

These capacity impacts represent the potential incremental impact of updated regulations beyond the capacity reductions attributed to physical features (floodplains, wetlands, etc.) that have already been applied as part of the Buildable Land Inventory methodology.

An additional 25 acres of capacity reduction is assumed in anticipation of the use of some vacant or underutilized sites for restoration to meet Natural Resource Damage Assessment requirements associated with Portland Harbor Superfund.

Future regulatory updates are also expected to expand environmental overlay zoning on developed sites in Columbia East and in the Harbor and Airport Districts. These overlay zone expansions are estimated to apply to approximately 2% of the developed sites in Columbia East, and 3.5% of the developed sites in the Harbor and Airport Districts, respectively.

An additional 1% of the developed sites in Columbia East, and 2% of the developed sites in the Harbor and Airport Districts, are assumed to shift from existing environmental conservation zone to environmental protection zone. These areas are within 50 feet of a stream or wetland. Most of these natural resource areas on developed sites have existing environmental constraints other than or in addition to environmental overlay zones.

In the Harbor Access Lands, greenway and environmental overlay zone updates are expected to apply to approximately 12% of developed sites; however, in each of these geographies, the regulatory updates would apply to natural resources that are currently constrained and subject to existing regulations (e.g., Willamette greenway overlay zones, balanced cut and fill) or other environmental constraints. As a result, the incremental impact of future regulations on developed sites is expected to be negligible.

More detailed descriptions of these analyses are provided in Appendix A.

Other elements of the strategy to improve watershed health are not assumed to have significant impacts on development capacity. Restoration efforts are assumed to focus primarily on protected natural resource or open space areas. Efforts to encourage ecological site design are assumed to include a mix of non-regulatory and regulatory tools that will support both development and watershed goals for certainty and overall cost-effectiveness.

## SHORT-TERM LAND SUPPLY

EOA Section 3 identifies significant deficits of short-term development capacity in the Harbor and Airport Districts, Harbor Access Lands, and Dispersed Employment areas. These short-term deficits are expected to be met by announced development projects, intensified use of developed sites, and proposed map amendments and rezoning.

In the Harbor and Airport Districts, an estimated 39-acre deficit in existing short-term land supply estimated geography can be amply met by proposed investments and efforts to encourage intensified use of developed land (estimated at 15% of demand, as discussed above) and the proposed 49-acre development project at Colwood Golf Course. Surplus short-term capacity of 62 acres in the Columbia East geography is also available to partially meet demand for comparable building types.

In the Harbor Access Lands geography, most of the vacant land supply consists of brownfields affected by Portland Harbor Superfund liability. These harbor brownfield sites are not included in the short-term land supply, and the City has limited ability to overcome those development constraints by 2020; however, substantial development is underway or proposed in this geography that appears to be generally at pace to meet short-term forecast demand for 114 acres by 2020, leaving an estimated 10-acre shortfall (see Figure 8 in Appendix B). This shortfall can potentially be met by surplus capacity available in other industrial geographies; for example, the large Evraz steel foundry in the Harbor Access Lands geography has accommodated substantial expansion over the last decade at nearby sites away from the river.

- Redevelopment of the Daimler Trucks headquarters offices broke ground in 2014 on a new 269,000 square foot nine-story building that is expected to result in approximately 400 new jobs. This development represents equivalent capacity of approximately 18 acres (measured by floor area, or 21 acres measured by expected jobs).

- The proposed Pembina terminal development by 2017 at an approximately 40-acre vacant portion of Port of Portland T-6 is another example of recent development in the Harbor Access Lands geography.

- The Canpotex potash terminal at Port of Portland T-5 has proposed plans to double their existing storage capacity, consisting of a 320,000 square foot storage building, by 2020. This intensified use of non-vacant land represents an approximate capacity gain of 21 acres, since this site is not included in the Buildable Land Inventory.

The modest 4-acre deficit in short-term land supply estimated in the Dispersed Employment areas is expected to be met rezoning projects underway in Task 5 of the Comprehensive Plan Update, including new areas of General Employment zoning and increases in industrial development allowances in the Neighborhood Commercial geography.

***The proposed Comprehensive Plan will provide a 20-year supply of additional employment land capacity in Portland's industrial districts through brownfield redevelopment, intensification of land uses, and expansion of industrial sanctuaries.***

# V. NEIGHBORHOOD BUSINESS DISTRICTS

***Currently, Neighborhood Business Districts account for 93,000 jobs – about 25% of the jobs in Portland. By 2035, more than 35,000 additional jobs are projected for these areas, requiring 700 acres of business commercial capacity.***

**What types of businesses locate here?** Neighborhood business districts are mainly home to the retail, personal service, and related sectors that serve customers on-site. These businesses generally need ground-floor space along pedestrian- or auto-oriented streets. The EOA identifies three types of Neighborhood Business District geographies:

- Gateway is designated by Metro as a Regional Center and is planned to transition to a high-density, mixed use area. Gateway has concentrations of businesses in health care and retail.
- Town Centers are planned for midrise, mixed-use development and include concentrations of institutional, retail, and office sector businesses. They include Hillsdale, Hollywood, Lents, St. Johns, and West Portland, which are designated in Metro's 2040 Growth Concept, and new town centers are proposed in Northwest District, Killingsworth/Interstate, and Midway (122nd/Division).
- The numerous mixed use commercial corridors across Portland have a diverse business mix and concentrations of small businesses. These districts are designated as Neighborhood Centers, Civic Corridors, Neighborhood Corridors, and interspersed nodes.

**Why are these employment geographies important?** Neighborhood Business Districts are a foundation of neighborhood livability in attracting pedestrian and social activity, defining neighborhood character, providing diverse destinations, and conveniently serving daily shopping needs. The 93,000 jobs in these districts account for 25% of the citywide employment. Neighborhood business districts also provide major economic benefits by keeping local dollars circulating within Portland, particularly through small business vitality. Small businesses are concentrated in this employment geography more than others, supporting Portland's identity as a small business city.

**2010-2035 job growth potential: 35,100 net new jobs**. These districts account for 25% of the citywide job forecast. Many of these districts are experiencing significant growth and change, providing synergistic locations for concentrated housing and commercial growth in "complete neighborhoods" with convenient access to services.

## EMPLOYMENT LAND CAPACITY OF THE PROPOSED COMPREHENSIVE PLAN

**The Neighborhood Business Districts currently have surplus development capacity to accommodate nearly twice their aggregate forecast demand by 2035.** Substantial surplus capacity exists in the Gateway, Town Centers, and Neighborhood Centers and Corridors geographies. Surplus short-term capacity to meet demand by 2020 is also available in these three geographies (see EOA Task 2/3 Report).

## NEIGHBORHOOD BUSINESS GROWTH AND LAND USE DIRECTION

*Policy 6.59. Neighborhood business districts. Provide for the growth, economic equity, and vitality of neighborhood business districts.*

*Policy 6.63. Neighborhood-serving business. Provide for neighborhood business districts and small commercial nodes in areas between centers to expand local access to goods and services. Allow nodes of small-scale neighborhood serving commercial uses in large planned developments and as a ground floor use in high density residential areas.*

The primary land use and development policies for this employment geography are summarized in the section below on centers and corridors. The areas are designated for mixed residential and employment uses and higher densities to support complete neighborhoods and healthy communities. Policies 6.59 and 6.63 provide further land use direction on their primary commercial market function of neighborhood serving businesses. The livability and economic equity of Portland neighborhoods rely on these neighborhood serving businesses.

## PROPOSED COMPREHENSIVE PLAN MAP CHANGES

Numerous map changes are proposed in the Comprehensive Plan to implement the centers and corridors framework. A Mixed Use Zoning Project is underway as part of the Comprehensive Plan Update (in Task 5 in the periodic review work plan) to clarify and implement these new designations. Existing commercial zones already allow multifamily residential use and densities that are generally consistent with these designations. The proposed plan designates:

- Three new Town Centers at Northwest District, Killingsworth/Interstate, and Midway. Town Centers are intended to accommodate low-rise to midrise density of up to 10 stories.

- Twenty-two Neighborhood Centers throughout the city, supporting the objectives of healthy and complete neighborhoods. Neighborhood Centers are intended to accommodate low-rise density of up to 4 stories.

- A network of Civic Corridors and Neighborhood Corridors for midrise and low-rise densities, respectively, which take advantage of their redevelopment potential and transit connections. Civic corridors are the city's busiest, widest and most prominent streets.

- A Mixed Employment area in Central Gateway that supplements the tightening capacity for industrial-office incubator space in the Central City and compete more effectively in the regional office development market.

## SYSTEM OF CENTERS AND CORRIDORS

> *Goal 3.D. A system of centers and corridors. Portland's interconnected system of centers and corridors provides diverse housing options and employment opportunities, robust multimodal transportation connections, access to local services and amenities, and supports low-carbon complete, healthy, and equitable communities.*
>
> *Policy 3.9. Role of centers. Enhance centers as anchors of complete neighborhoods that include concentrations of commercial and public services, housing, employment, gathering places, and green spaces.*
>
> *Policy 3.12. Investments in centers. Encourage public and private investment in infrastructure, economic development, and community services in centers to ensure that all centers will support the populations they serve.*

One of the primary themes of the proposed Comprehensive Plan is the urban form framework of centers and corridors that are well served by pedestrian, bicycle, and transit systems. Centers and mixed use corridors are places with concentrations of businesses and services, housing, gathering places and green spaces that provide residents with options to live a healthy, active lifestyle. When services and other destinations are clustered in compact areas economic viability is strengthened and walking, transit and bicycling become more practical. The proposed of Neighborhood and Town Centers and Civic and Residential Corridors vary in size and character depending on their location, but all of them contribute to increasing economic opportunities and neighborhood vitality.

**Currently, only 64% of Portlanders live in complete neighborhoods with frequent transit service, schools, parks or greenspaces, and businesses and other amenities close enough to safely and easily walk or bike for meeting.** In some areas, services are scattered or missing, or streets may lack sidewalks, bikeways or other safe connections providing local access. The Portland Plan set the objective that 80% of Portlanders live in a complete neighborhood by 2035. The proposed Comprehensive Plan supports this objective by concentrating growth in centers and corridors that are dispersed across Portland neighborhoods.

In the past, Portland has primarily used zoning that promotes a compact mix of commercial uses and housing to cultivate places with a sufficient mix of uses and services; however, zoning alone has not been successful in producing these results evenly across the city. Emerging opportunities to increase development of centers and corridors include expanding demand for multifamily housing in close-in locations, associated retail and service needs as well as continuing expansion of the health care and education sectors in centers and corridors. Policy 3.12 and the Transportation System Plan and Citywide Systems Plan propose concentrated investments in centers and corridors that make them more attractive and affordable locations to develop. Additionally, the Portland Plan's Healthy Connected City strategy introduces a broader range of tools, including community partnerships and investments that will help achieve these objectives.

## SMALL BUSINESS SUPPORT AND NEIGHBORHOOD REVITALIZATION

*Policy 6.8. Small business development. Facilitate the success and growth of small businesses and coordinate plans and investments with programs that provide technical and financial assistance to promote sustainable operating practices.*

*Policy 6.64 Investment priority. Prioritize commercial revitalization investments in neighborhoods that serve communities with limited access to goods and services.*

*Policy 6.61 Small, independent businesses. Facilitate the retention and growth of small and locally-owned businesses.*

Community-driven revitalization efforts underway offer potential to increase small business development, improve economic equity, and reduce retail and service disparities among Portland neighborhoods. **Small businesses are at the core of Portland's neighborhood business districts. Collectively, they offer diverse potential to improve job growth, increase self-employment, and add to the city's economic resiliency.**

Policies 6.64 and 6.61 reinforce new directions for commercial revitalization set in the Portland Neighborhood Economic Development Strategy and Portland Plan. These strategies propose a community-driven neighborhood economic development approach to build local capacity, minimize involuntary displacement and spur commercial activity in underserved neighborhoods. This approach includes support for entrepreneurship and microenterprise development, as well as expanding community partnerships to leverage more public investments to advance neighborhood economic development goals.

While much of the public sector role has focused on one-time capital investments and incentives, a pivotal difference can be in the form of day-to-day technical, marketing, and related business assistance. Portland has a solid base of business districts with supportive community organizing and small business resources. Recent initiatives include the East Portland Action Plan, the Neighborhood Economic Development Strategy, and the Neighborhood Prosperity Initiative. PDC's Neighborhood Economic Development Strategy includes a multi-pronged approach to measuring neighborhood business vitality, including new business licenses, new business growth, positive job growth, resident income, transit access, and retail needs satisfaction.[3]

## GATEWAY AS PORTLAND'S SECOND BUSINESS CENTER

*Policy 3.22. Role of Gateway. Encourage growth and investment in Gateway to enhance its role as East Portland's center of employment, commercial and public services.*

For the Gateway Regional Center, substantial new office development has not yet occurred despite direct proximity to east-west and north-south freeway (I-84/I-205) and light rail transit service coupled with availability of tax increment funding through the urban renewal area. Barriers to successful office development have included lack of a critical mass of professional and financial sector office activity, lower market rents that are inadequate to support mid-to-high

[3] For detailed information on the neighborhood vitality index, please read the Neighborhood Economic Development strategy: http://www.pdc.us/bus_serv/ned.asp

rise construction costs, and relative fragmentation of many of the vacant and lesser valued property holdings.

Policy 3.22 supports a range of demand opportunities in Gateway to expand low/mid-rise institutional and office development:

- Institutional development accounts for 60% of the forecast building area in Gateway to 2035, building on the expansion potential of Adventist hospital and a variety of other health care and education facilities there.

- The Mixed Employment area designated in Central Gateway takes advantage of the area's potential to accommodate spillover demand from the tightening capacity for industrial office incubator space in the Central City.

- Gateway and the nearby Portland International Center at PDX are Portland's largest concentrated area of office development capacity, outside of the Central City, available to establish a critical mass of office activity that could compete more effectively with lower-rise and larger footprint office parks currently focused in the suburban market around Portland. Greater diversity of office products would better enable Portland to recapture its competitive share of the office space market that has been lost over the last couple of decades. Gateway's relative affordability and proximity to PDX is among its location advantages for businesses requiring immediate access to air transport through personnel, customers, or high-value freight.

The majority of the land supply is associated with smaller, underutilized redevelopment sites rather than vacant sites; however, the current development trends indicate that the market is developing at a relatively low 0.5 FAR, which is consistent with a significant existing amount of surface parking lot area. **Achieving higher FARs in Gateway and the town centers will depend on opportunities to reduce the proportion of land in surface parking.** One of the key elements will be to find innovative approaches to reduce the parking footprint while assuring customer and employee accessibility. These strategies include support for prototype developments to show market viability. Innovations could include taking advantage of the reduced parking standards already in place, un-bundling of parking in real-estate transactions (for example, listing the price of a parking space separate from the residential or commercial lease, as an add-on), maintaining on-street parking, and initial structured parking with major development projects outside of the Central City.

## COMMERCIAL CAPACITY IN UNDERSERVED NEIGHBORHOODS

Commercial vitality is widely uneven among neighborhood business districts, and only 60% of Portlanders currently live within a half-mile of a full-service grocery store or market that sells healthy, fresh food. The Portland Plan's Healthy Connected City goal emphasizes creating complete neighborhood centers that provide access to services and destinations, locally and across the city. In response, **the proposed Comprehensive Plan map designates new Neighborhood Commercial areas in underserved areas.** Policy 6.63 Neighborhood-Serving Business also supports adding commercial and mixed use development capacity in underserved neighborhoods. Related policies that further support reducing neighborhood retail and service

disparities include Policy 6.8. Small Business Development, 6.66. Temporary and Informal Markets and Structures, and 4.66 Neighborhood Food Access.

***The proposed Comprehensive Plan will provide a 20-year supply of additional commercial land in neighborhood business districts by enhancing the capacity of existing centers and corridors, investing in new centers and corridors, providing small business support and neighborhood revitalization programs, and addressing the needs of underserved neighborhoods.***

# VI. CAMPUS INSTITUTIONS

***Currently, institutional campuses (hospitals, colleges and universities) account for 31,900 jobs – about 9% of the jobs in Portland. By 2035, 22,730 additional jobs are projected for these areas, requiring 370 acres of development capacity for campus institutions.***

**What types of businesses locate here?** The health care and education sectors are concentrated in large hospital and college campuses and smaller neighborhood facilities. The institutional geography consists of 17 of Portland's 19 large hospital and college campuses (excluding PSU in the Central City Commercial geography and Adventist hospital in Gateway). Their campuses vary from large pastoral expanses (some exceed 100 acres) to concentrated urban complexes of mid-rise buildings.

**Why is this geography important?** Portland has an exceptional collection of higher education and health care institutions that provide access to essential services, such as education and workforce training and health care. They are centers of innovation and learning in the community. These institutions are also major employers, anchoring the health care and education sectors, which accounted for 88,500 jobs, or 24% of the employment in the city in 2010, and have been leading sources of job growth locally, regionally, and nationally. The jobs in this geography are also relatively stable, continuing to grow during the 2008-2010 Great Recession, and are concentrated in high-wage occupations.

**2010-2035 job growth potential: 22,700 net new jobs**. The Institutional geography accounts for 16% of the citywide job forecast. The health care and education sectors concentrated in this geography have been the city's biggest job growth sectors, making up 36% of forecast job growth and 27% of forecast citywide employment in 2035.

## EMPLOYMENT LAND CAPACITY OF THE PROPOSED COMPREHENSIVE PLAN

The current growth capacity in most of the Campus Institutions geography consists of the maximum development allowance set in their conditional use master plans and impact mitigation plans. This existing capacity meets only 83% of forecast demand by 2035, leaving a 64-acre shortfall of needed developable land. The proposed Comprehensive Plan meets this capacity shortfall primarily by designating each campus as employment land with expected development (FAR) allowances that exceed forecast development. The draft floor area allowances being considered in the Institutional Zoning Project now underway meet an estimated 141% of forecast demand overall, as described further below.

## INSTITUTIONAL GROWTH AND LAND USE DIRECTION

> *Policy 6.53 Campus institutions. Provide for the stability and growth of Portland's major campus institutions as essential service providers, centers of innovation, workforce development resources, and major employers.*
>
> *Policy 6.54 Campus land use. Provide for major campus institutions as a type of employment land, allowing uses typically associated with health care and higher education institutions.*

These policies and the Comprehensive Plan Map propose a major shift in land use direction for campus institutions, designating them as employment districts, where uses typically associated with their operations are allowed, rather than conditional uses in residentially designated areas. The average age of the 15 residentially designated institutions at their current locations is nearly 80 years. **The average size of these campuses in total employment is comparable to Town Centers.**

This policy shift also supports the forecast job growth at campus institutions. Implementation of these policies is expected to include zone changes to allow forecast development, as well as transportation and other infrastructure projects to adequately serve these campuses.

## PROPOSED COMPREHENSIVE PLAN MAP CHANGES

The current residential land use designation on most of this geography in the Comprehensive Plan Map is proposed to be changed to Institutional Campus, a new employment land designation. This map designation is generally applied to the current master planned campus boundaries. Proposed Policy 10.5.20 Institutional Campus describes the intended use, intensity and public services provision at these map designations, including the intent to foster the growth of the institution while enhancing the livability of surrounding residential neighborhoods and the viability of nearby business areas. The Portland Plan specifically supports this map change in Action 69, calling for new land use and investment approaches to support the growth and neighborhood compatibility of college and hospital campuses.

Continuing development of Portland's campus institutions is complicated by the historic development of these campuses in unusual locations not consistent with typical commercial siting criteria. As a result, campus institutions commonly have limited transit or arterial street access, proximity to residential neighborhoods that constrain campus expansion, and zoning regulations that appear to increasingly impede effective site planning to respond to rapidly changing educational and health care needs. The current residential map designations contribute to this mismatch.

Meeting forecast institutional land needs is challenging, not only because of the size of the gap (64 acres) but also the physical setting of many institutions, often bounded by residential neighborhoods. Options generally include:

- Increased density of development within the existing footprint through infill and redevelopment.
- Increasing the campus footprint (with land acquisition), often requiring re-zoning and conditional use master plan (CUMP) approval processes.
- Creating satellite campuses taking advantage of opportunities elsewhere in Portland, such as designated mixed use centers and corridors.

The approach proposed in the Comprehensive Plan combines each of these options. Moderate campus-wide densities can accommodate substantial growth, while limiting development at campus edges near single-family neighborhoods. The proposed map designations are based on the current master plans, which can extend outward from the current footprint, such as inclusion of the planned riverfront expansion area at the University of Portland. Policy 6.58. Satellite

Facilities also encourages continuing off-site expansion where practical for some types of uses, such as OHSU outpatient and research facilities in nearby South Waterfront and Providence offices in nearby Hollywood.

## REGULATORY REFORM

> *Policy 6.55 Development impacts. Protect the livability of surrounding neighborhoods through adequate infrastructure and campus development standards that foster suitable density and attractive campus design.*
>
> *Policy 6.56 Community amenities and services. Encourage campus development that provides amenities and services to surrounding neighborhoods, emphasizing the role of campuses as centers of community activity.*
>
> *Policy 6.57 Campus edges. Provide for context-sensitive, transitional uses and development at the edges of campus institutions to enhance their integration into surrounding neighborhoods, including mixed-use and neighborhood-serving commercial uses where appropriate.*

These proposed policies provide balanced direction for new development standards to accommodate institutional growth and neighborhood compatibility and livability. Implementation of these policies is underway in the Campus Institutional Zoning Project as part of the Comprehensive Plan Update (Task 5).

The current zoning regulatory approach of conditional use master plans and impact mitigation plans has been widely criticized. This zoning approach does not designate adequate 20-year growth capacity for campus institutions. Representatives of long-established institutions have objected that their conditional use status treats them as "guests in the neighborhood." Required ten-year and interim updates of master plans entail extensive Type 3 review and tend to hamper flexibility for technological and market changes in the rapidly growing health care and education fields. In response, institutions may overestimate planned development to meet potential future needs, which can contribute to protracted neighborhood disputes from development impacts in these discretionary review processes.

The current conditional-use status of campus institutions, requiring campus master plans and periodic updates, is expected to be replaced by institutional campus base zones that allow typical institutional uses and establish development standards to protect surrounding neighborhood livability, consistent with proposed Policies 6.55 - 6.57.

Draft zoning concepts in the Campus Institutional Zoning Project propose new zones to implement the Institutional Campus map designations. Two to three types of campus zones will encompass the broad range of conditions and suitable development capacity among campuses, such as the following: a medical campus zone allowing 3:1 Floor Area Ratio (FAR), or up to 4:1 in Regional and Town Centers; an urban higher education campus zone allowing 2:1 FAR or up to 3:1 in designated Regional and Town Centers; and a lower density higher education campus zone allowing 0.5:1 FAR. **The resulting development capacity will be adequate to meet forecast land needs for each type of campus** (see Figure 2).

## SATELLITE AND SMALLER URBAN CAMPUSES IN CENTERS AND CORRIDORS

> *Policy 6.58 Satellite facilities. Encourage opportunities for expansion of uses, not integral to campus functions, to locate in centers and corridors to support their economic vitality.*

Policy 6.58 encourages expansion of less integral institutional facilities in satellite locations, which in turn frees up space for core services on the campuses. For example, Providence Hospital has taken this approach by locating some of their administrative office facilities in nearby Hollywood Town Center. Another example is the location of OHSU outpatient and research facilities at satellite facilities in nearby South Waterfront, linked to the OHSU hospital by an aerial tram. These institutional satellite facilities can be a source of both services and employment in mixed-use centers and corridors.

A related trend and capacity-expansion opportunity is the location of smaller standalone campuses in centers and corridors. For example, PCC is making significant investments in its Cascade and Southeast campuses that integrate the campus into the existing commercial corridors. Other related examples include proposed expansion of the University of Oregon and Oregon State University facilities in the Central City.

## ADEQUATE TRANSPORTATION ACCESS AND SERVICE

> *Policy 8.17. System capacity. Establish, improve, and maintain public facilities and services at levels appropriate to support land use patterns, densities, and anticipated residential and employment growth, as physically feasible and as sufficient funds are available.*

Traffic impacts and related transportation system deficiencies are commonly cited as the most challenging compatibility issue of campus institutional growth on neighborhood livability. Additionally, EOA focus groups identified improved transit service as the single greatest public infrastructure need. Because most of Portland's major medical and educational institutions have been in place for many years, the need for continued public investment and service reconfiguration can be easily overlooked.

The proposed designation of campus institutions on the Comprehensive Plan Map has helped to specifically account for institutional growth in transportation modeling for the Transportation System Plan (TSP) update. In turn, proposed projects in the TSP are expected to be implemented as needed to provide adequate system capacity.

As major employers, transportation demand management (TDM) plans offer another significant opportunity to more efficiently serve transportation needs of institutions and reduce traffic impacts on surrounding neighborhoods. Proposed Policy 9.56. Transportation Demand Management supports creation and maintenance of ongoing TDM programs.

***The proposed Comprehensive Plan will provide a 20-year supply of additional land for campuses and institutions through regulatory reform, encouraging satellite facilities, and addressing traffic impacts and transportation deficiencies.***

# APPENDIX A. INDUSTRIAL CAPACITY IMPACTS OF NATURAL RESOURCE PROTECTION REGULATIONS

## ESTIMATING THE DEVELOPMENT CAPACITY IMPACTS OF POTENTIAL FUTURE NATURAL RESOURCE PROTECTION

The impacts of potential future regulations have been estimated to inform City strategies to meet Statewide Planning Goal 9 and relevant Comprehensive Plan policies. The development capacity impact estimates are incremental, accounting for existing environmental constraints and associated capacity reductions applied by the Buildable Land Inventory (BLI).

Specifically, for vacant and underutilized sites, the BLI already deducts 100% of development capacity for floodways and environmental protection overlay zones, and 50% of the capacity for environmental conservation overlay zones, steep slopes, wetlands, and the 100-year floodplain. The BLI also deducts 50% of the site area from development capacity for nearly all vacant and underutilized sites that contain existing greenway overlay zones.

The incremental development capacity impact of potential future regulations is estimated in Figures 6, 7, and 8 below, based on the following assumptions and analysis. This analysis provides a reasonable basis for planning, given City goals, policies, recent planning analyses, and regulatory obligations, but is not intended to bind future City policy and regulatory decisions.

## HARBOR AND AIRPORT DISTRICTS, AND COLUMBIA EAST

In the Harbor and Airport Districts, and in Columbia East, environmental overlay zones are assumed to be applied to land with natural resources that rank high or medium in the Natural Resources Inventory (NRI). For purposes of this analysis it is assumed that:

- The environmental protection overlay zone (p-zone) would be applied to protect natural resources within 50 feet of rivers, streams, drainageways, and wetlands; and the p-zone would be applied to the wetlands and waterways themselves. It is assumed that the p-zone would be applied to these natural resource areas if they are currently unprotected by environmental overlay zones. It is also assumed that the environmental conservation zone (c-zone) would be converted to the p-zone to provide additional protection for natural resources within 50 feet of water bodies.

- The environmental conservation overlay zone would be applied to high- and medium-ranked natural resources located more than 50 feet from rivers, streams, drainageways, and wetlands.

- The BLI constraint methodology would be applied to estimate the incremental impacts of the expanded or modified environmental overlay zones.

- Environmental overlay zones would not be applied to low-ranked natural resources or to natural resources in the Airport Districts that rank high in the NRI, solely because they are Special Habitat Areas (SHAs) that support grassland associated wildlife species. This is because environmental program updates for those SHAs were addressed relatively recently in the Airport Futures project (adopted in 2011).

Applying these assumptions to vacant and under-utilized sites in the Harbor and Airport Districts, the p-zone would be applied to an additional 136 acres of acres of high- and medium-ranked natural resources within 50 feet of water bodies (88 acres of which are currently within the c-zone). The c-zone would be applied to an additional 66 acres of high- and medium-ranked natural resources located more than 50 feet from water bodies. The employment capacity impact of these regulatory updates is estimated to be an additional 97 acres beyond the capacity reductions already applied by the BLI constraints.

Applying these assumptions to vacant and under-utilized sites in Columbia East, the p-zone would apply to an additional 45 acres of high- and medium-ranked natural resources within 50 feet of water bodies (27 acres of which are in the existing c-zone). The c-zone would be applied to an additional 27 acres of high- and medium-ranked natural resources located more than 50 feet from water bodies. The employment capacity impact of these regulatory updates is estimated to be an additional 39 acres beyond the capacity reductions already applied by the BLI constraints.

## HARBOR ACCESS LANDS

In the Harbor Access Lands geography, nearly all the vacant and underutilized sites contain Willamette River Greenway overlay zones. For these sites, it is assumed that:

- Future updates to the greenway overlay zones will retain key elements of existing regulations, including the greenway setback, greenway review for development on vacant and under-utilized sites that must establish river-dependent or river-related uses, and a planting or landscape requirement.

- A new natural resource-focused overlay zone will be applied to the 115 acres of high- and medium-ranked natural resources on vacant or underutilized sites containing existing greenway overlay zones. It is assumed that this new overlay zone would be similar in construct to the environmental conservation zone, but would be specifically designed for areas with river-related and river-dependent uses in the Portland Harbor.

- The updated regulations will include a new, streamlined standards-based review track for new development, as well as clearer mitigation requirements that would allow mitigation to occur on- or off-site. A new clear and objective standards track should significantly reduce the frequency in which a land use review is triggered by new development or redevelopment projects on already developed sites.

Given that the BLI already deducted at least 50% of the development capacity for entire vacant and underutilized sites within the existing Greenway overlay zones, and because it is assumed

future greenway regulations would contain similar elements as the existing Greenway overlay zones, no incremental impact on development capacity is assumed for future regulatory updates on sites within the Willamette Greenway.

The only high- and medium-ranked natural resources that are in the Harbor Access Lands geography but outside the Willamette Greenway are located on Port of Portland-owned Terminal 6 (T-6). To estimate the potential development capacity impact of future environmental regulatory updates on the vacant and underutilized portions of T-6, it is assumed that the environmental conservation overlay zone would be applied to high- and medium-ranked significant natural resources that are not within the existing overlay zone, including Special Habitat Areas. Applying this analysis, the c-zone would be applied to an additional 28 acres, with a capacity impact of an additional12 acres, beyond the environmental constraints already applied by the BLI.

### IMPACTS OF FUTURE CITY ENVIRONMENTAL REGULATIONS ON DEVELOPED PROPERTIES

As noted above, the BLI and EOA assigned potential new employment capacity only to vacant or under-utilized properties in the Columbia East and Columbia Harbor EOA geographies, including the Harbor Access Lands portion of the Columbia Harbor geography. Potential new employment capacity was not assigned to developed properties in these geographies.

Given that the BLI did not allot future development capacity to developed industrial sites it is appropriate to view the impact of future regulations in terms of impacts on intensification of existing uses. Like the analysis of impacts on vacant and underutilized sites, it is appropriate to view the impacts of potential future environmental regulations as incremental relative to existing regulations and other constraints.

It is also assumed that the updated regulations would strike a balance among City policies for economic development and watershed health, for example, while it is expected that existing regulations will be improved and/or expanded to address unprotected natural resources, the updated regulations are also expected to include streamlined provisions, such as new or updated standards, or clearer allowances for off-site mitigation, that improve development and certainty, reduce the number of discretionary land use reviews required, and facilitate intensification of existing uses.

In terms of developed sites potentially affected by future environmental and greenway overlay zone updates, analysis suggests that these updates would have a relatively minimal impact, as summarized in the following bullets:

- There are 7,661 acres of developed sites in the Harbor and Airport Districts. Of the 615 acres of high- and medium-ranked NRI resources on these sites, (315 acres high, 300 acres medium) 340 acres or about 55% are within existing environmental overlay zones. The approximately 275 acres that are not within existing environmental overlay zones represent 3.5% of the developed site area in this portion of the geography. In addition, the vast majority of this area is currently constrained by existing wetlands, floodway, floodplain, or other environmental constraints.

- There are 1,705 acres of developed sites in the Columbia East geography. Of the 258 acres of high- and medium-ranked NRI resources these sites (139 acres high, 119 acres medium), 221 acres or about 86% are within existing environmental overlay zones. The 37 acres of high- and medium ranked NRI resources that are not within existing environmental overlay zones represent about 2% of the developed land in Columbia East. Some of this area is currently constrained by existing wetlands, floodway, floodplain, or other physical environmental constraints.

- There are approximately 1,996 acres of developed sites in the Harbor Access Lands, including sites in the greenway-i and greenway-g, overlay zones, and at Terminal 6. This area includes 237 acres of high and medium-ranked natural resources, or about 12% of the developed site area. Of these acres, 226 acres are on sites with existing greenway overlay zone or are affected by other environmental constraints. The area of currently unconstrained high and medium-ranked natural resources is about 11 acres or less than 1% of the developed sites in the Harbor Access Lands.

## CAPACITY IMPACTS OF NATURAL RESOURCE DAMAGE ASSESSMENT AND RESTORATION

In addition to cleaning up contamination at the Portland Harbor Superfund site, responsible parties will be required to meet the Natural Resource Damage Assessment (NRDA) requirements of Superfund. Under NRDA, responsible parties must sponsor environmental restoration on their property or other designated sites to remedy past damages to fish, wildlife, and users of the Willamette River (e.g., boaters, fishers, etc.). A list of potential NRDA restoration sites has been identified by the Portland Harbor Natural Resource Trustees. A number of these sites have industrial or employment zoning. To account for the potential employment capacity impacts of future NRDA restoration, an additional 25-acre reduction in employment capacity is assumed as a contingency. This number reflects the employment capacity allocated by the BLI to the Linnton Plywood Site (~25 acres) and vacant portions of the site owned by Portland General Electric, including the Harborton Wetlands (~42 acres). NRDA restoration opportunities are currently being planned for both of these sites, or portions of the sites. The 25 acres also reflects an additional increment of capacity reduction based on the vacant portion of the Owens Corning site which is largely in the floodplain (~11 acres). For purposes of this analysis it is assumed that these sites are at least 70% constrained by a combination of greenway regulations and other constraints.

## Figure 5. Harbor and Airport Districts - Capacity Impacts of Potential Environmental Zoning Changes on Vacant and Underutilized Land

**Natural Resources Inventory (NRI) resources and environmental overlay zones within 50 feet of streams and wetlands (acres) (1)**

| NRI Ranking | Environmental Conservation Zone | Environmental Protection Zone | No Environmental Overlay Zone | Total |
|---|---|---|---|---|
| High | 61.56 | 0.00 | 17.88 | 79.44 |
| Medium | 26.10 | 0.00 | 30.85 | 56.95 |
| **Total** | **87.66** | **0.00** | **48.73** | **136.39** |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources within 50 feet of streams (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (2) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (4) | Yes Env. Conservation Zone | Emp. Capacity Impact (5) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 2.82 | -2.82 | 2.99 | -1.50 | 25.83 | -11.62 | -15.94 | 31.64 |
| Medium | 9.82 | -9.82 | 8.90 | -4.45 | 20.83 | -9.37 | -23.64 | 39.55 |
| **Totals** | **12.64** | **-12.64** | **11.89** | **-5.95** | **46.66** | **-21.00** | **-39.58** | 71.19 |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources within wetlands and 50 feet of wetlands (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (2) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (4) | Yes Env. Conservation Zone | Emp. Capacity Impact (5) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 2.34 | -2.34 | 10.25 | -5.13 | 35.73 | -16.08 | -23.54 | 48.32 |
| Medium | 10.73 | -10.73 | 1.40 | -0.70 | 5.25 | -2.36 | -13.79 | 17.38 |
| **Totals** | **13.07** | **-13.07** | **11.65** | **-5.83** | **40.98** | **-18.44** | **-37.34** | **65.70** |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources more than 50 feet from streams and wetlands (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (6) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (7) | Yes Env. Conservation Zone | Emp. Capacity Impact (8) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 1.17 | -0.59 | 2.29 | -0.23 | 19.78 | 0.00 | -0.81 | 23.24 |
| Medium | 33.33 | -16.67 | 29.26 | -2.93 | 52.44 | 0.00 | -19.59 | 115.03 |
| **Totals** | **34.50** | **-17.25** | **31.55** | **-3.16** | **72.22** | **0.00** | **-20.41** | **138.27** |
| **Total Employment Capacity Impacts** | | | | | | | **-97.32** | |

(1) Acreage includes wetlands and land within 50 feet of wetlands and streams, but does not include the area of streams. Land within 50 feet of streams and wetlands receive either a High or Medium NRI rank in this geography.
(2) It is assumed that environmental protection zone (p-zone) would be applied to significant natural resources within 50 feet of streams and wetlands. For resources with no BLI constraints the capacity reduction would be 100% of the resource area, consistent with the BLI and EOA methdology which eliminated 100% of employment capacity for land within the pzone.

(3) Calculated by subtracting the area of natural resources in the environmental conservation overlay from the total area of land with environmental BLI constraints.
(4) It is assumed that the p-zone would be applied to High and Medium ranked natural resources within 50 feet of streams and wetlands. For resources with BLI environmental constraints but no environmental overlay zone, the employment capacity impact would be -50%. The BLI and EOA deducted 50% employment capacity for 1 environmental constraint, and 10% each for up to 2 more constraints. This assumes the resources have 1 BLI environmental constraint, and that applying the p-zone would remove the remaining 50% capacity.

(5) The impact on employment capacity impact of applying the p-zone to significant natural resources that are within 50 feet of streams and wetlands, and within the environmental conservation overlay zone (c-zone) is - 45%. The BLI/EOA deducted 50% capacity to the portion of properties within the environmental conservation overlay zone (c-zone). Deducting an additonal 45% (rather than 50%) accounts for the likelihood that these natural resources in the c-zone have more than one BLI environmental constraint.
(6) The impacts on employment capacity impact of applying or modifying environmental overlay zoning on land that is further than 50 feet from streams and wetlands, and that has no BLI environmental constraints, are: - 50% for High-ranked NRI resources (assumes c-zone is applied); -50% for Medium-ranked resources (assumes c-zone is applied).
(7) The impacts on employment capacity impact of applying the environmental overlay zone to High and Medium ranked resources further than 50 feet from streams and wetlands, and that has BLI environmental constraints but no overlay zone are is -10% (assumes c-zone is applied).

(8) The impact on employment capacity impact of applying the environmental overlay zone to High and Medium ranked resources further than 50 feet from streams and wetlands, and that is within the c-zone is -0% since no change in overlay zone is anticipated.

Source: Bureau of Planning and Sustainability

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## Figure 6. Harbor Access Lands (T-6 only) - Capacity Impacts of Potential Environmental Zoning Changes on Vacant and Underutilized Land

**Natural Resources Inventory (NRI) resources and environmental overlay zones (acres)**

| NRI Ranking | Environmental Conservation Zone | Environmental Protection Zone | No Environmental Overlay Zone | Total |
|---|---|---|---|---|
| High | 3.56 | 0 | 4.41 | 7.97 |
| High - SHA 0nly | 0 | 0 | 10.43 | 10.43 |
| Medium | 2.44 | 0 | 12.86 | 15.3 |
| **Total** | **6.0** | **0** | **27.7** | **33.7** |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (1) | Yes BLI Env. Constraints, No Env. Zone (2) | Emp. Capacity Impact (3) | Yes Env. Conservation Zone | Emp. Capacity Impact (4) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 1.76 | -0.88 | 2.65 | -1.33 | 3.52 | 0.00 | -2.21 | 7.93 |
| High - SHA only | 10.43 | -5.22 | 0.00 | 0.00 | 0.00 | 0.00 | -5.22 | |
| Medium | 7.75 | -3.88 | 5.11 | -0.51 | 2.36 | 0.00 | -4.39 | 15.22 |
| **Totals** | **19.94** | **-9.97** | **7.76** | **-1.84** | **5.88** | **0.00** | **-11.81** | 33.58 |

(1) Capacity reduction = -0.5 x area of natural resources with no BLI environmental constraints, consistent with the BLI methodology, assuming that c-zone would be applied here.

(2) Calculated by subtracting the area of natural resources in the environmental conservation overlay from the total area of land with environmental BLI constraints.

(3) Capacity reduction of -0.1 x the area of natural resources with BLI constraints and no overlay zone, reflects the assumption that c-zone would be applied here, and is consistent with the BLI and EOA methodology.

(4) It is assumed that natural resources already within the c-zone would remain so, with no incremental impact on development capacity.

Source: Bureau of Planning and Sustainability

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## Figure 7. Columbia East - Capacity Impacts of Potential Environmental Zoning Changes on Vacant and Underutilized Land

**Natural Resources Inventory (NRI) resources and environmental overlay zones within 50 feet of streams and wetlands (acres) (1)**

| NRI Ranking | Environmental Conservation Zone | Environmental Protection Zone | No Environmental Overlay Zone | Total |
|---|---|---|---|---|
| High | 10.27 | 0 | 6.89 | 17.16 |
| Medium | 17.06 | 0 | 11.68 | 28.74 |
| **Total** | **27.33** | **0** | **18.57** | **45.9** |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources within 50 feet of streams (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (2) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (4) | Yes Env. Conservation Zone | Emp. Capacity Impact (5) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 0.29 | -0.29 | 0.01 | -0.01 | 1.20 | -0.54 | -0.84 | 1.50 |
| Medium | 2.05 | -2.05 | 2.65 | -1.33 | 3.18 | -1.43 | -4.81 | 7.88 |
| **Totals** | **2.34** | **-2.34** | **2.66** | **-1.33** | **4.38** | **-1.97** | **-5.64** | 9.38 |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources within wetlands and 50 feet of wetlands (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (2) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (4) | Yes Env. Conservation Zone | Emp. Capacity Impact (5) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 1.49 | -1.49 | 5.10 | -2.55 | 9.07 | -4.08 | -8.12 | 15.66 |
| Medium | 6.98 | -6.98 | 0.00 | 0.00 | 13.88 | -6.25 | -13.23 | 20.86 |
| **Totals** | **8.47** | **-8.47** | **5.10** | **-2.55** | **22.95** | **-10.33** | **-21.35** | **36.52** |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources more than 50 feet from streams and wetlands (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (6) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (7) | Yes Env. Conservation Zone | Emp. Capacity Impact (8) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 1.01 | -0.51 | 0.18 | -0.02 | 0.11 | 0.00 | -0.52 | 1.30 |
| Medium | 23.30 | -11.65 | 2.01 | -0.20 | 8.52 | 0.00 | -11.85 | 33.83 |
| **Totals** | **24.31** | **-12.16** | **2.19** | **-0.22** | **8.63** | **0.00** | **-12.37** | **35.13** |
| **Total Employment Capacity Impacts** | | | | | | | **-39.36** | |

(1) Acreage includes wetlands and land within 50 feet of wetlands and streams, but does not include the area of streams. Land within 50 feet of streams and wetlands receive either a High or Medium NRI rank in this geography.
(2) It is assumed that environmental protection zone (p-zone) would be applied to significant natural resources within 50 feet of streams and wetlands. For resources with no BLI constraints the capacity reduction would be 100% of the resource area, consistent with the BLI and EOA methdology which eliminated 100% of employment capacity for land within the pzone.
(3) Calculated by subtracting the area of natural resources in the environmental conservation overlay from the total area of land with environmental BLI constraints.
(4) It is assumed that the p-zone would be applied to High and Medium ranked natural resources within 50 feet of streams and wetlands. For resources with BLI environmental constraints but no environmental overlay zone, the employment capacity impact would be -50%. The BLI and EOA deducted 50% employment capacity for 1 environmental constraint, and 10% each for up to 2 more constraints. This assumes the resources have 1 BLI environmental constraint, and that applying the p-zone would remove the remaining 50% capacity.
(5) The impact on employment capacity impact of applying the p-zone to significant natural resources that are within 50 feet of streams and wetlands, and within the environmental conservation overlay zone (c-zone) is - 45%. The BLI/EOA deducted 50% capacity to the portion of properties within the environmental conservation overlay zone (c-zone). Deducting an additonal 45% (rather than 50%) accounts for the likelihood that these natural resources in the c-zone have more than one BLI environmental constraint.
(6) The impacts on employment capacity impact of applying or modifying environmental overlay zoning on land that is further than 50 feet from streams and wetlands, and that has no BLI environmental constraints, are: - 50% for High-ranked NRI resources (assumes c-zone is applied); -50% for Medium-ranked resources (assumes c-zone is applied).
(7) The impacts on employment capacity impact of applying the environmental overlay zone to High and Medium ranked resources further than 50 feet from streams and wetlands, and that has BLI environmental constraints but no overlay zone are is -10% (assumes c-zone is applied).

(8) The impact on employment capacity impact of applying the environmental overlay zone to High and Medium ranked resources further than 50 feet from streams and wetlands, and that is within the c-zone is -0% since no change in overlay zone is anticipated.

Source: Bureau of Planning and Sustainability

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# APPENDIX B. CAPACITY DETAILS OF THE PROPOSED COMPREHENSIVE PLAN


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## Figure 8. Proposed Short-Term Land Development Capacity

| | Building Square Feet | | | | | | |
|---|---|---|---|---|---|---|---|
| Employment Geography | Base Supply | Constrained Supply | Adjusted Supply | BLI Acres | Other Gains* | 2010-20 Demand | Surplus/ Deficit |
| Central City Commercial | 54,137,000 | 40,309,000 | 40,309,000 | 178 | | 40 | 138 |
| Central City Industrial | 11,499,971 | 9,815,388 | 9,815,388 | 169 | | 75 | 95 |
| Harbor & Airport Districts | 66,215,000 | 29,169,000 | 27,209,000 | 625 | 89 | 659 | 54 |
| Harbor Access Lands | 15,374,000 | 2,578,000 | 2,578,000 | 59 | 49 | 118 | -10 |
| Columbia East | 23,330,000 | 14,832,000 | 14,832,000 | 340 | 39 | 279 | 101 |
| Dispersed Employment | 11,434,000 | 6,907,000 | 6,907,000 | 105 | 10 | 109 | 6 |
| Gateway Regional Center | 12,588,000 | 7,965,000 | 4,456,000 | 111 | | 33 | 78 |
| Town Centers | 25,875,000 | 21,685,000 | 7,095,000 | 288 | | 86 | 202 |
| Neighborhood Centers & Corridors | 97,316,000 | 69,915,000 | 18,368,000 | 811 | | 362 | 449 |
| Institutions | 9,045,000 | 7,048,000 | 7,048,000 | 306 | | 224 | 82 |
| **Total** | **326,813,971** | **210,223,388** | **138,617,388** | **2,993** | **188** | **1,985** | **1,196** |
| **Aggregate Geography** | | | | | | | |
| Central City | 65,636,971 | 50,124,388 | 50,124,388 | 347 | | 114 | 233 |
| Industrial | 116,353,000 | 53,486,000 | 51,526,000 | 1,129 | 188 | 1,165 | 152 |
| Neighborhood Commercial | 135,779,000 | 99,565,000 | 29,919,000 | 1,210 | | 482 | 729 |
| Institutions | 9,045,000 | 7,048,000 | 7,048,000 | 306 | | 224 | 82 |
| **Total** | **326,813,971** | **210,223,388** | **138,617,388** | **2,993** | **188** | **1,985** | **1,196** |

* Assume gains from meeting 15% of demand by industrial land intensification, proposed Harbor Access Land projects (Daimler, Canpotex, and Pembina), and expansion of Dispersed Employment development allowances in Neighborhood Commercial corridors.

Source: Bureau of Planning and Sustainability

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## Figure 9. Buildable Land Inventory of Proposed Comprehensive Plan Designations and Constraint Assumptions – Net Building Square Footage

| | Less than .5 acres | | | .5 to 1 acre | | | 1 to 3 acres | | | 3 to 5 acres | | | 6 to 10 acres | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Employment Geography | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment |
| **Central City Commercial** | 7,497,811 | 7,197,059 | 7,197,059 | 15,159,776 | 13,330,873 | 13,330,873 | 10,559,634 | 8,854,404 | 8,854,404 | 8,027,270 | 7,167,651 | 7,167,651 | 1,467,613 | 1,466,108 | 1,466,108 |
| Redevelopment | 2,484,177 | 2,377,157 | 2,377,157 | 5,548,327 | 5,032,736 | 5,032,736 | 3,783,209 | 3,099,972 | 3,099,972 | 2,331,958 | 1,956,998 | 1,956,998 | 643 | 0 | 0 |
| Vacant | 5,013,635 | 4,819,902 | 4,819,902 | 9,611,449 | 8,298,137 | 8,298,137 | 6,776,424 | 5,754,433 | 5,754,433 | 5,695,311 | 5,210,654 | 5,210,654 | 1,466,969 | 1,466,108 | 1,466,108 |
| **Central City Industrial** | 3,361,652 | 3,162,509 | 3,162,509 | 3,780,408 | 3,434,098 | 3,434,098 | 2,992,892 | 2,432,880 | 2,432,880 | 1,419,501 | 1,199,283 | 1,199,283 | 1,094,996 | 628,213 | 628,213 |
| Redevelopment | 750,856 | 715,121 | 715,121 | 843,766 | 767,459 | 767,459 | 643,237 | 509,799 | 509,799 | 24,840 | 24,495 | 24,495 | 85,606 | 70,123 | 70,123 |
| Vacant | 2,610,796 | 2,447,388 | 2,447,388 | 2,936,642 | 2,666,639 | 2,666,639 | 2,349,655 | 1,923,080 | 1,923,080 | 1,394,661 | 1,174,788 | 1,174,788 | 1,009,390 | 558,090 | 558,090 |
| **Columbia East** | 68,322 | 50,988 | 50,988 | 433,737 | 265,545 | 265,545 | 1,675,314 | 1,027,609 | 1,027,609 | 1,276,778 | 862,286 | 862,286 | 1,276,977 | 885,539 | 885,539 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 37,160 | 21,176 | 21,176 | 53,536 | 39,381 | 39,381 | 57,099 | 57,099 | 57,099 |
| Vacant | 68,322 | 50,988 | 50,988 | 433,737 | 265,545 | 265,545 | 1,638,154 | 1,006,432 | 1,006,432 | 1,223,242 | 822,904 | 822,904 | 1,219,877 | 828,440 | 828,440 |
| **Dispersed Employment** | 552,062 | 435,062 | 435,062 | 443,425 | 354,999 | 354,999 | 673,933 | 558,874 | 558,874 | 919,217 | 593,121 | 593,121 | 282,189 | 255,512 | 255,512 |
| Redevelopment | 188,812 | 171,992 | 171,992 | 176,043 | 161,535 | 161,535 | 342,403 | 261,434 | 261,434 | 265,292 | 149,945 | 149,945 | 105,462 | 105,462 | 105,462 |
| Vacant | 363,250 | 263,070 | 263,070 | 267,381 | 193,463 | 193,463 | 331,530 | 297,440 | 297,440 | 653,924 | 443,176 | 443,176 | 176,727 | 150,049 | 150,049 |
| **Harbor Access Lands** | 15,401 | 5,314 | 5,314 | 58,775 | 22,322 | 22,322 | 792,697 | 197,720 | 197,720 | 0 | 0 | 0 | 712,955 | 205,003 | 205,003 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vacant | 15,401 | 5,314 | 5,314 | 58,775 | 22,322 | 22,322 | 792,697 | 197,720 | 197,720 | 0 | 0 | 0 | 712,955 | 205,003 | 205,003 |
| **Harbor & Airport Districts** | 376,787 | 271,277 | 271,277 | 582,570 | 388,889 | 388,889 | 4,653,472 | 2,972,371 | 2,972,371 | 3,229,148 | 2,111,735 | 2,111,735 | 5,983,080 | 4,172,686 | 4,172,686 |
| Redevelopment | 41,731 | 27,578 | 27,578 | 45,428 | 28,848 | 28,848 | 307,896 | 183,806 | 183,806 | 148,650 | 118,343 | 118,343 | 0 | 0 | 0 |
| Vacant | 335,056 | 243,699 | 243,699 | 537,142 | 360,041 | 360,041 | 4,345,576 | 2,788,566 | 2,788,566 | 3,080,497 | 1,993,392 | 1,993,392 | 5,983,080 | 4,172,686 | 4,172,686 |
| **Institutions** | 260,311 | 191,840 | 191,840 | 500,753 | 385,580 | 385,580 | 1,830,164 | 1,446,792 | 1,446,792 | 188,806 | 188,806 | 188,806 | 432,724 | 418,800 | 418,800 |
| Redevelopment | 134,000 | 94,064 | 94,064 | 303,572 | 269,733 | 269,733 | 1,698,317 | 1,332,945 | 1,332,945 | 188,806 | 188,806 | 188,806 | 340,764 | 340,764 | 340,764 |
| Vacant | 126,310 | 97,776 | 97,776 | 197,180 | 115,847 | 115,847 | 131,847 | 113,847 | 113,847 | 0 | 0 | 0 | 91,959 | 78,036 | 78,036 |
| **Neighb. Centers & Corridors** | 11,178,460 | 10,107,567 | 2,849,455 | 11,975,107 | 10,639,592 | 3,025,003 | 23,535,660 | 20,462,265 | 6,000,511 | 9,689,025 | 8,189,013 | 2,532,413 | 7,735,522 | 5,976,336 | 1,714,647 |
| Redevelopment | 8,574,632 | 7,816,335 | 1,911,413 | 9,305,598 | 8,363,288 | 2,139,317 | 18,435,304 | 16,409,813 | 4,447,992 | 7,075,891 | 5,980,156 | 1,528,964 | 5,368,495 | 4,268,800 | 1,053,559 |
| Vacant | 2,603,827 | 2,291,232 | 938,042 | 2,669,508 | 2,276,303 | 885,686 | 5,100,356 | 4,052,452 | 1,552,519 | 2,613,134 | 2,208,858 | 1,003,449 | 2,367,027 | 1,707,536 | 661,088 |
| **Gateway Regional Center** | 532,092 | 447,243 | 289,118 | 881,477 | 736,477 | 424,659 | 5,422,965 | 4,608,982 | 2,488,758 | 4,248,019 | 3,019,688 | 1,356,047 | 2,147,191 | 1,270,414 | 647,569 |
| Redevelopment | 269,797 | 203,585 | 130,752 | 522,078 | 440,278 | 216,938 | 3,478,927 | 3,178,590 | 1,491,006 | 2,729,399 | 1,980,013 | 714,992 | 1,928,941 | 1,124,937 | 589,976 |
| Vacant | 262,295 | 243,658 | 158,366 | 359,399 | 296,200 | 207,722 | 1,944,038 | 1,430,392 | 997,752 | 1,518,620 | 1,039,674 | 641,055 | 218,250 | 145,478 | 57,594 |
| **Town Centers** | 4,131,514 | 3,776,144 | 1,689,717 | 5,672,299 | 5,201,874 | 2,437,300 | 7,182,080 | 6,450,308 | 2,857,003 | 2,782,392 | 2,517,923 | 1,047,974 | 1,978,882 | 1,756,415 | 708,315 |
| Redevelopment | 2,977,045 | 2,716,417 | 1,097,342 | 4,231,019 | 3,871,481 | 1,694,702 | 5,270,561 | 4,742,222 | 1,882,284 | 2,075,750 | 1,902,516 | 705,215 | 1,600,662 | 1,450,370 | 524,594 |
| Vacant | 1,154,468 | 1,059,728 | 592,375 | 1,441,280 | 1,330,393 | 742,598 | 1,911,519 | 1,708,086 | 974,719 | 706,643 | 615,407 | 342,759 | 378,220 | 306,045 | 183,720 |
| **Outside Geographies** | 480,778 | 400,941 | 400,941 | 343,255 | 261,067 | 261,067 | 1,231,534 | 913,626 | 913,626 | 0 | 0 | 0 | 4,517,552 | 3,179,676 | 3,179,676 |
| Redevelopment | 395,899 | 334,423 | 334,423 | 285,361 | 222,229 | 222,229 | 165,961 | 122,424 | 122,424 | 0 | 0 | 0 | 1,823,062 | 1,231,195 | 1,231,195 |
| Vacant | 84,879 | 66,518 | 66,518 | 57,893 | 38,839 | 38,839 | 1,065,573 | 791,202 | 791,202 | 0 | 0 | 0 | 2,694,491 | 1,948,481 | 1,948,481 |
| **Grand Total** | **28,455,190** | **26,045,946** | **16,543,281** | **39,831,581** | **35,021,316** | **24,330,334** | **60,550,345** | **49,925,831** | **29,750,548** | **31,780,155** | **25,849,505** | **17,059,315** | **27,629,680** | **20,214,704** | **14,282,070** |
| | | | | | | | | | | | | | | | |
| **Aggregate Geography** | | | | | | | | | | | | | | | |
| Central City | 10,859,463 | 10,359,569 | 10,359,569 | 18,940,184 | 16,764,972 | 16,764,972 | 13,552,526 | 11,287,284 | 11,287,284 | 9,446,770 | 8,366,934 | 8,366,934 | 2,562,609 | 2,094,321 | 2,094,321 |
| Industrial | 1,012,573 | 762,640 | 762,640 | 1,518,507 | 1,031,754 | 1,031,754 | 7,795,415 | 4,756,574 | 4,756,574 | 5,425,142 | 3,567,141 | 3,567,141 | 8,255,200 | 5,518,741 | 5,518,741 |
| Neighborhood Commercial | 15,842,065 | 14,330,955 | 4,828,290 | 18,528,882 | 16,577,943 | 5,886,962 | 36,140,705 | 31,521,555 | 11,346,272 | 16,719,437 | 13,726,623 | 4,936,434 | 11,861,595 | 9,003,165 | 3,070,531 |
| Institutions | 260,311 | 191,840 | 191,840 | 500,753 | 385,580 | 385,580 | 1,830,164 | 1,446,792 | 1,446,792 | 188,806 | 188,806 | 188,806 | 432,724 | 418,800 | 418,800 |
| Outside Geographies | 480,778 | 400,941 | 400,941 | 343,255 | 261,067 | 261,067 | 1,231,534 | 913,626 | 913,626 | 0 | 0 | 0 | 4,517,552 | 3,179,676 | 3,179,676 |
| **Total** | **28,455,190** | **26,045,946** | **16,543,281** | **39,831,581** | **35,021,316** | **24,330,334** | **60,550,345** | **49,925,831** | **29,750,548** | **31,780,155** | **25,849,505** | **17,059,315** | **27,629,680** | **20,214,704** | **14,282,070** |

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## Figure 9. Buildable Land Inventory of Proposed Comprehensive Plan Designations and Constraint Assumptions – Net Building Square Footage (Part 2)

| | 10 to 20 acres | | | 20 to 50 acres | | | More than 50 acres | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Employment Geography | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Total Before Constraints | Total After Constraints | Total Adjusted Capacity | Employment Geography |
| **Central City Commercial** | 3,846,801 | 2,211,257 | 2,211,257 | 7,676,155 | 5,403,093 | 5,403,093 | 0 | 0 | 0 | 54,235,060 | 45,630,446 | 45,630,446 | **Central City Commercial** |
| Redevelopment | 1,269,311 | 712,804 | 712,804 | 1,471,303 | 1,044,455 | 1,044,455 | 0 | 0 | 0 | 16,888,929 | 14,224,123 | 14,224,123 | Redevelopment |
| Vacant | 2,577,490 | 1,498,452 | 1,498,452 | 6,204,853 | 4,358,637 | 4,358,637 | 0 | 0 | 0 | 37,346,131 | 31,406,322 | 31,406,322 | Vacant |
| **Central City Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 127,685 | 52,273 | 52,273 | 12,777,134 | 10,909,257 | 10,909,257 | **Central City Industrial** |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,348,304 | 2,086,998 | 2,086,998 | Redevelopment |
| Vacant | 0 | 0 | 0 | 0 | 0 | 0 | 127,685 | 52,273 | 52,273 | 10,428,830 | 8,822,258 | 8,822,258 | Vacant |
| **Columbia East** | 4,175,044 | 2,035,727 | 2,035,727 | 5,180,616 | 3,668,344 | 3,668,344 | 9,314,254 | 6,322,373 | 6,322,373 | 23,332,719 | 15,067,422 | 15,067,422 | **Columbia East** |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 147,795 | 117,657 | 117,657 | Redevelopment |
| Vacant | 4,175,044 | 2,035,727 | 2,035,727 | 5,180,616 | 3,668,344 | 3,668,344 | 9,314,254 | 6,322,373 | 6,322,373 | 23,184,924 | 14,949,765 | 14,949,765 | Vacant |
| **Dispersed Employment** | 448,579 | 184,401 | 184,401 | 1,866,765 | 1,519,106 | 1,519,106 | 5,445,874 | 2,692,871 | 2,692,871 | 10,079,981 | 6,158,882 | 6,158,882 | **Dispersed Employment** |
| Redevelopment | 18,786 | 16,369 | 16,369 | 83,849 | 64,493 | 64,493 | 522,717 | 220,194 | 220,194 | 1,514,553 | 979,432 | 979,432 | Redevelopment |
| Vacant | 429,793 | 168,032 | 168,032 | 1,782,917 | 1,454,613 | 1,454,613 | 4,923,156 | 2,472,677 | 2,472,677 | 8,565,428 | 5,179,450 | 5,179,450 | Vacant |
| **Harbor Access Lands** | 3,239,663 | 968,988 | 968,988 | 3,136,372 | 1,865,138 | 1,865,138 | 7,433,578 | 2,665,507 | 2,665,507 | 15,374,040 | 5,924,678 | 5,924,678 | **Harbor Access Lands** |
| Redevelopment | 66,891 | 30,706 | 30,706 | 0 | 0 | 0 | 0 | 0 | 0 | 66,891 | 30,706 | 30,706 | Redevelopment |
| Vacant | 3,172,773 | 938,282 | 938,282 | 3,136,372 | 1,865,138 | 1,865,138 | 7,433,578 | 2,665,507 | 2,665,507 | 15,307,149 | 5,893,972 | 5,893,972 | Vacant |
| **Harbor & Airport Districts** | 7,901,184 | 4,844,617 | 4,844,617 | 16,598,345 | 9,271,066 | 9,271,066 | 31,784,535 | 17,311,199 | 17,311,199 | 70,732,333 | 41,072,563 | 39,112,363 | **Harbor & Airport Districts** |
| Redevelopment | 1,112,133 | 825,551 | 825,551 | 803,524 | 577,067 | 577,067 | 0 | 0 | 0 | 2,417,632 | 1,733,613 | 1,733,613 | Redevelopment |
| Vacant | 6,789,050 | 4,019,067 | 4,019,067 | 15,794,821 | 8,693,999 | 8,693,999 | 31,784,535 | 17,311,199 | 17,311,199 | 68,314,702 | 39,338,950 | 37,378,750 | Vacant |
| **Institutions** | 2,960,939 | 2,723,286 | 2,723,286 | 7,402,342 | 3,554,702 | 3,554,702 | 4,773,038 | 4,548,641 | 4,548,641 | 18,349,076 | 13,458,448 | 13,458,448 | **Institutions** |
| Redevelopment | 2,022,538 | 1,795,029 | 1,795,029 | 431,334 | 415,437 | 415,437 | 3,426,636 | 3,373,966 | 3,373,966 | 8,545,968 | 7,810,744 | 7,810,744 | Redevelopment |
| Vacant | 938,401 | 928,257 | 928,257 | 6,971,008 | 3,139,265 | 3,139,265 | 1,346,402 | 1,174,676 | 1,174,676 | 9,803,107 | 5,647,704 | 5,647,704 | Vacant |
| **Neighb. Centers & Corridors** | 8,115,699 | 6,195,248 | 1,699,976 | 10,634,789 | 5,445,272 | 2,103,842 | 6,912,501 | 3,402,058 | 1,529,542 | 89,776,763 | 70,417,352 | 21,455,390 | **Neighb. Centers & Corridors** |
| Redevelopment | 6,729,748 | 5,050,320 | 1,243,412 | 4,947,060 | 2,330,411 | 712,464 | 1,517,823 | 945,355 | 286,336 | 61,954,552 | 51,164,478 | 13,323,456 | Redevelopment |
| Vacant | 1,385,951 | 1,144,928 | 456,564 | 5,687,729 | 3,114,862 | 1,391,379 | 5,394,678 | 2,456,703 | 1,243,206 | 27,822,211 | 19,252,874 | 8,131,934 | Vacant |
| **Gateway Regional Center** | 5,712,160 | 3,934,805 | 1,205,412 | 321,216 | 321,216 | 153,952 | 0 | 0 | 0 | 19,265,120 | 14,338,824 | 6,565,516 | **Gateway Regional Center** |
| Redevelopment | 5,297,136 | 3,623,811 | 1,116,157 | 305,698 | 305,698 | 144,124 | 0 | 0 | 0 | 14,531,977 | 10,856,912 | 4,403,944 | Redevelopment |
| Vacant | 415,024 | 310,993 | 89,255 | 15,517 | 15,517 | 9,828 | 0 | 0 | 0 | 4,733,143 | 3,481,913 | 2,161,572 | Vacant |
| **Town Centers** | 1,045,474 | 581,820 | 286,118 | 249,702 | 213,707 | 114,389 | 841,102 | 238,260 | 236,280 | 23,883,446 | 20,736,450 | 9,377,096 | **Town Centers** |
| Redevelopment | 950,437 | 486,871 | 234,958 | 161,215 | 150,325 | 66,615 | 207,892 | 37,442 | 37,442 | 17,474,580 | 15,357,644 | 6,243,151 | Redevelopment |
| Vacant | 95,038 | 94,948 | 51,160 | 88,487 | 63,382 | 47,775 | 633,210 | 200,818 | 198,838 | 6,408,866 | 5,378,806 | 3,133,945 | Vacant |
| **Outside Geographies** | 3,145,894 | 2,056,443 | 2,056,443 | 19,778,661 | 12,891,689 | 12,891,689 | 2,961,045 | 2,890,305 | 2,890,305 | 32,458,719 | 22,593,748 | 22,593,748 | **Outside Geographies** |
| Redevelopment | 3,069,917 | 1,993,074 | 1,993,074 | 16,105,932 | 9,808,787 | 9,808,787 | 1,586,989 | 1,567,846 | 1,567,846 | 23,433,122 | 15,279,979 | 15,279,979 | Redevelopment |
| Vacant | 75,977 | 63,369 | 63,369 | 3,672,728 | 3,082,901 | 3,082,901 | 1,374,056 | 1,322,459 | 1,322,459 | 9,025,597 | 7,313,769 | 7,313,769 | Vacant |
| **Grand Total** | **40,591,438** | **25,736,591** | **18,216,225** | **72,844,964** | **44,153,331** | **40,545,320** | **69,593,612** | **40,123,488** | **38,248,992** | **370,264,391** | **266,308,071** | **196,253,246** | **Grand Total** |
| | | | | | | | | | | | | | |
| **Aggregate Geography** | | | | | | | | | | | | | **Aggregate Geography** |
| Central City | 3,846,801 | 2,211,257 | 2,211,257 | 7,676,155 | 5,403,093 | 5,403,093 | 127,685 | 52,273 | 52,273 | 67,012,194 | 56,539,703 | 56,539,703 | Central City |
| Industrial | 15,764,471 | 8,033,733 | 8,033,733 | 26,782,098 | 16,323,653 | 16,323,653 | 53,978,240 | 28,991,950 | 28,991,950 | 119,519,074 | 68,223,546 | 66,263,346 | Industrial |
| Neighborhood Commercial | 14,873,333 | 10,711,872 | 3,191,506 | 11,205,707 | 5,980,195 | 2,372,184 | 7,753,603 | 3,640,318 | 1,765,822 | 132,925,329 | 105,492,627 | 37,398,002 | Neighborhood Commercial |
| Institutions | 2,960,939 | 2,723,286 | 2,723,286 | 7,402,342 | 3,554,702 | 3,554,702 | 4,773,038 | 4,548,641 | 4,548,641 | 18,349,076 | 13,458,448 | 13,458,448 | Institutions |
| Outside Geographies | 3,145,894 | 2,056,443 | 2,056,443 | 19,778,661 | 12,891,689 | 12,891,689 | 2,961,045 | 2,890,305 | 2,890,305 | 32,458,719 | 22,593,748 | 22,593,748 | Outside Geographies |
| **Total** | **40,591,438** | **25,736,591** | **18,216,225** | **72,844,964** | **44,153,331** | **40,545,320** | **69,593,612** | **40,123,488** | **38,248,992** | **370,264,391** | **266,308,071** | **196,253,246** | **Total** |

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## Figure 10. Buildable Land Inventory of Proposed Comprehensive Plan Designations and Constraint Assumptions – Net Land Area in Acres

| | Less than .5 acres | | | .5 to 1 acre | | | 1 to 3 acres | | | 3 to 5 acres | | | 6 to 10 acres | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Employment Geography** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** |
| **Central City Commercial** | 33 | 32 | 32 | 67 | 59 | 59 | 47 | 39 | 39 | 35 | 32 | 32 | 6 | 6 | 6 |
| Redevelopment | 11 | 10 | 10 | 24 | 22 | 22 | 17 | 14 | 14 | 10 | 9 | 9 | 0 | 0 | 0 |
| Vacant | 22 | 21 | 21 | 42 | 37 | 37 | 30 | 25 | 25 | 25 | 23 | 23 | 6 | 6 | 6 |
| **Central City Industrial** | 58 | 55 | 55 | 65 | 59 | 59 | 52 | 42 | 42 | 25 | 21 | 21 | 19 | 11 | 11 |
| Redevelopment | 13 | 12 | 12 | 15 | 13 | 13 | 11 | 9 | 9 | 0 | 0 | 0 | 1 | 1 | 1 |
| Vacant | 45 | 42 | 42 | 51 | 46 | 46 | 41 | 33 | 33 | 24 | 20 | 20 | 17 | 10 | 10 |
| **Columbia East** | 2 | 1 | 1 | 10 | 6 | 6 | 38 | 24 | 24 | 29 | 20 | 20 | 29 | 20 | 20 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| Vacant | 2 | 1 | 1 | 10 | 6 | 6 | 38 | 23 | 23 | 28 | 19 | 19 | 28 | 19 | 19 |
| **Dispersed Employment** | 13 | 10 | 10 | 10 | 8 | 8 | 15 | 13 | 13 | 21 | 14 | 14 | 6 | 6 | 6 |
| Redevelopment | 4 | 4 | 4 | 4 | 4 | 4 | 8 | 6 | 6 | 6 | 3 | 3 | 2 | 2 | 2 |
| Vacant | 8 | 6 | 6 | 6 | 4 | 4 | 8 | 7 | 7 | 15 | 10 | 10 | 4 | 3 | 3 |
| **Harbor Access Lands** | 0 | 0 | 0 | 1 | 1 | 1 | 18 | 5 | 5 | 0 | 0 | 0 | 16 | 5 | 5 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vacant | 0 | 0 | 0 | 1 | 1 | 1 | 18 | 5 | 5 | 0 | 0 | 0 | 16 | 5 | 5 |
| **Harbor & Airport Districts** | 9 | 6 | 6 | 13 | 9 | 9 | 107 | 68 | 68 | 74 | 48 | 48 | 137 | 96 | 96 |
| Redevelopment | 1 | 1 | 1 | 1 | 1 | 1 | 7 | 4 | 4 | 3 | 3 | 3 | 0 | 0 | 0 |
| Vacant | 8 | 6 | 6 | 12 | 8 | 8 | 100 | 64 | 64 | 71 | 46 | 46 | 137 | 96 | 96 |
| **Institutions** | 6 | 4 | 4 | 11 | 9 | 9 | 42 | 33 | 33 | 4 | 4 | 4 | 10 | 10 | 10 |
| Redevelopment | 3 | 2 | 2 | 7 | 6 | 6 | 39 | 31 | 31 | 4 | 4 | 4 | 8 | 8 | 8 |
| Vacant | 3 | 2 | 2 | 5 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 2 | 2 | 2 |
| **Neighb. Centers & Corridors** | 494 | 446 | 126 | 529 | 470 | 134 | 1,039 | 903 | 265 | 428 | 362 | 112 | 342 | 264 | 76 |
| Redevelopment | 379 | 345 | 84 | 411 | 369 | 94 | 814 | 724 | 196 | 312 | 264 | 68 | 237 | 188 | 47 |
| Vacant | 115 | 101 | 41 | 118 | 100 | 39 | 225 | 179 | 69 | 115 | 98 | 44 | 104 | 75 | 29 |
| **Gateway Regional Center** | 13 | 11 | 7 | 22 | 18 | 11 | 135 | 115 | 62 | 106 | 75 | 34 | 54 | 32 | 16 |
| Redevelopment | 7 | 5 | 3 | 13 | 11 | 5 | 87 | 79 | 37 | 68 | 49 | 18 | 48 | 28 | 15 |
| Vacant | 7 | 6 | 4 | 9 | 7 | 5 | 49 | 36 | 25 | 38 | 26 | 16 | 5 | 4 | 1 |
| **Town Centers** | 168 | 153 | 69 | 230 | 211 | 99 | 292 | 262 | 116 | 113 | 102 | 43 | 80 | 71 | 29 |
| Redevelopment | 121 | 110 | 45 | 172 | 157 | 69 | 214 | 193 | 76 | 84 | 77 | 29 | 65 | 59 | 21 |
| Vacant | 47 | 43 | 24 | 59 | 54 | 30 | 78 | 69 | 40 | 29 | 25 | 14 | 15 | 12 | 7 |
| **Outside Geographies** | 11 | 9 | 9 | 8 | 6 | 6 | 28 | 21 | 21 | 0 | 0 | 0 | 104 | 73 | 73 |
| Redevelopment | 9 | 8 | 8 | 7 | 5 | 5 | 4 | 3 | 3 | 0 | 0 | 0 | 42 | 28 | 28 |
| Vacant | 2 | 2 | 2 | 1 | 1 | 1 | 24 | 18 | 18 | 0 | 0 | 0 | 62 | 45 | 45 |
| **Grand Total** | **806** | **728** | **319** | **968** | **856** | **400** | **1,814** | **1,525** | **688** | **836** | **678** | **327** | **804** | **594** | **347** |
| | | | | | | | | | | | | | | | |
| **Aggregate Geography** | | | | | | | | | | | | | | | |
| Central City | 91 | 86 | 86 | 132 | 118 | 118 | 98 | 81 | 81 | 60 | 52 | 52 | 25 | 17 | 17 |
| Industrial | 23 | 18 | 18 | 35 | 24 | 24 | 179 | 109 | 109 | 125 | 82 | 82 | 190 | 127 | 127 |
| Neighborhood Commercial | 675 | 611 | 202 | 781 | 699 | 243 | 1,466 | 1,280 | 443 | 647 | 539 | 188 | 475 | 367 | 121 |
| Institutions | 6 | 4 | 4 | 11 | 9 | 9 | 42 | 33 | 33 | 4 | 4 | 4 | 10 | 10 | 10 |
| Outside Geographies | 11 | 9 | 9 | 8 | 6 | 6 | 28 | 21 | 21 | 0 | 0 | 0 | 104 | 73 | 73 |
| **Total** | **806** | **728** | **319** | **968** | **856** | **400** | **1,814** | **1,525** | **688** | **836** | **678** | **327** | **804** | **594** | **347** |

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## Figure 10. Buildable Land Inventory of Proposed Comprehensive Plan Designations and Constraint Assumptions – Net Land Area in Acres (Part 2)

| | 10 to 20 acres | | | 20 to 50 acres | | | More than 50 acres | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Employment Geography | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Total Before Constraints | Total After Constraints | Total Adjusted Capacity | Employment Geography |
| **Central City Commercial** | 17 | 10 | 10 | 34 | 24 | 24 | 0 | 0 | 0 | 239 | 201 | 201 | **Central City Commercial** |
| Redevelopment | 6 | 3 | 3 | 6 | 5 | 5 | 0 | 0 | 0 | 75 | 63 | 63 | Redevelopment |
| Vacant | 11 | 7 | 7 | 27 | 19 | 19 | 0 | 0 | 0 | 165 | 139 | 139 | Vacant |
| **Central City Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 221 | 188 | 188 | **Central City Industrial** |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 36 | 36 | Redevelopment |
| Vacant | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 180 | 152 | 152 | Vacant |
| **Columbia East** | 96 | 47 | 47 | 119 | 84 | 84 | 214 | 145 | 145 | 536 | 346 | 346 | **Columbia East** |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | Redevelopment |
| Vacant | 96 | 47 | 47 | 119 | 84 | 84 | 214 | 145 | 145 | 532 | 343 | 343 | Vacant |
| **Dispersed Employment** | 10 | 4 | 4 | 43 | 35 | 35 | 125 | 62 | 62 | 231 | 141 | 141 | **Dispersed Employment** |
| Redevelopment | 0 | 0 | 0 | 2 | 1 | 1 | 12 | 5 | 5 | 35 | 22 | 22 | Redevelopment |
| Vacant | 10 | 4 | 4 | 41 | 33 | 33 | 113 | 57 | 57 | 197 | 119 | 119 | Vacant |
| **Harbor Access Lands** | 74 | 22 | 22 | 72 | 43 | 43 | 171 | 61 | 61 | 353 | 136 | 136 | **Harbor Access Lands** |
| Redevelopment | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | Redevelopment |
| Vacant | 73 | 22 | 22 | 72 | 43 | 43 | 171 | 61 | 61 | 351 | 135 | 135 | Vacant |
| **Harbor & Airport Districts** | 181 | 111 | 111 | 381 | 213 | 213 | 730 | 397 | 397 | 1,624 | 943 | 898 | **Harbor & Airport Districts** |
| Redevelopment | 26 | 19 | 19 | 18 | 13 | 13 | 0 | 0 | 0 | 56 | 40 | 40 | Redevelopment |
| Vacant | 156 | 92 | 92 | 363 | 200 | 200 | 730 | 397 | 397 | 1,568 | 903 | 858 | Vacant |
| **Institutions** | 68 | 63 | 63 | 170 | 82 | 82 | 110 | 104 | 104 | 421 | 309 | 309 | **Institutions** |
| Redevelopment | 46 | 41 | 41 | 10 | 10 | 10 | 79 | 77 | 77 | 196 | 179 | 179 | Redevelopment |
| Vacant | 22 | 21 | 21 | 160 | 72 | 72 | 31 | 27 | 27 | 225 | 130 | 130 | Vacant |
| **Neighb. Centers & Corridors** | 358 | 274 | 75 | 470 | 240 | 93 | 305 | 150 | 68 | 3,963 | 3,109 | 947 | **Neighb. Centers & Corridors** |
| Redevelopment | 297 | 223 | 55 | 218 | 103 | 31 | 67 | 42 | 13 | 2,735 | 2,259 | 588 | Redevelopment |
| Vacant | 61 | 51 | 20 | 251 | 138 | 61 | 238 | 108 | 55 | 1,228 | 850 | 359 | Vacant |
| **Gateway Regional Center** | 143 | 98 | 30 | 8 | 8 | 4 | 0 | 0 | 0 | 481 | 358 | 164 | **Gateway Regional Center** |
| Redevelopment | 132 | 90 | 28 | 8 | 8 | 4 | 0 | 0 | 0 | 363 | 271 | 110 | Redevelopment |
| Vacant | 10 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 87 | 54 | Vacant |
| **Town Centers** | 42 | 24 | 12 | 10 | 9 | 5 | 34 | 10 | 10 | 970 | 843 | 381 | **Town Centers** |
| Redevelopment | 39 | 20 | 10 | 7 | 6 | 3 | 8 | 2 | 2 | 710 | 624 | 254 | Redevelopment |
| Vacant | 4 | 4 | 2 | 4 | 3 | 2 | 26 | 8 | 8 | 260 | 219 | 127 | Vacant |
| **Outside Geographies** | 72 | 47 | 47 | 454 | 296 | 296 | 68 | 66 | 66 | 745 | 519 | 519 | **Outside Geographies** |
| Redevelopment | 70 | 46 | 46 | 370 | 225 | 225 | 36 | 36 | 36 | 538 | 351 | 351 | Redevelopment |
| Vacant | 2 | 1 | 1 | 84 | 71 | 71 | 32 | 30 | 30 | 207 | 168 | 168 | Vacant |
| **Grand Total** | **1,062** | **699** | **421** | **1,760** | **1,033** | **878** | **1,758** | **997** | **914** | **9,785** | **7,093** | **4,231** | **Grand Total** |
| | | | | | | | | | | | | | |
| **Aggregate Geography** | | | | | | | | | | | | | **Aggregate Geography** |
| Central City | 17 | 10 | 10 | 34 | 24 | 24 | 2 | 1 | 1 | 460 | 390 | 390 | Central City |
| Industrial | 362 | 184 | 184 | 615 | 375 | 375 | 1,239 | 666 | 666 | 2,744 | 1,566 | 1,521 | Industrial |
| Neighborhood Commercial | 543 | 395 | 117 | 488 | 257 | 101 | 339 | 160 | 77 | 5,415 | 4,309 | 1,492 | Neighborhood Commercial |
| Institutions | 68 | 63 | 63 | 170 | 82 | 82 | 110 | 104 | 104 | 421 | 309 | 309 | Institutions |
| Outside Geographies | 72 | 47 | 47 | 454 | 296 | 296 | 68 | 66 | 66 | 745 | 519 | 519 | Outside Geographies |
| **Total** | **1,062** | **699** | **421** | **1,760** | **1,033** | **878** | **1,758** | **997** | **914** | **9,785** | **7,093** | **4,231** | **Total** |

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# APPENDIX C. 2015 UPDATE OF ECONOMIC OPPORTUNITIES ANALYSIS

On October 3, 2012, Portland City Council adopted the Portland Economic Opportunities Analysis (EOA) by Ordinance No. 185657, which also included the other background reports required as factual basis for the Comprehensive Plan Update. In January 2014, the Port of Portland withdrew their annexation application for marine terminal development at West Hayden Island, which was anticipated to address industrial land and marine terminal capacity needs identified in the EOA. In April 2014, the City of Portland asked the Oregon Land Conservation and Development Commission (LCDC) to withdraw the 2012 EOA and resubmit a revised version with Task 3 of the Comprehensive Plan Update work plan, in order to consider changes that address marine terminal land needs, Metro's updated employment forecast, and an updated Buildable Land Inventory. The 2015 EOA Update consists of the following groups of amendments to the 2012 EOA.

## HARBOR ACCESS LANDS GEOGRAPHY AND MARINE TERMINAL FORECAST

> "Harbor Access Lands" was identified as a distinct employment geography in the 2015 EOA update, and a lower marine terminal demand scenario was analyzed and applied there to be consistent with community choices concerning development of West Hayden Island.

The 2012 EOA (adopted version) identified harbor access lands, located generally between the deepwater navigation channel and the nearest parallel street, as a subarea of the "Columbia Harbor" employment geography. The 2015 EOA splits Columbia Harbor into two distinct geographies, Harbor Access Lands and the Harbor and Airport Districts. This change simplifies analysis of this marine industrial geography and responds to an issue raised in the LCDC objection of the 2012 EOA by Schnitzer Steel Industries, Inc. The marine-related functional distinction of land demand in the Harbor Access Lands geography is reinforced by Portland's "River Industrial" zoning overlay that applies to nearly all of this geography, requiring that primary uses be river-dependent or river-related.

The boundary of Harbor Access Lands was refined to include larger portions of Port of Portland Terminals 4 and 6. This boundary change resulted in a small 7-acre shift in forecast demand (along with corresponding job growth and building area) from the Harbor and Airport Districts into the Harbor Access Lands geography, from what was calculated in the January 2015 EOA.

The description of the marine terminal commodity movement forecast was also revised in the 2015 update of the EOA to consider two growth scenarios: (A) a scenario that accommodates the low end of the marine terminal commodity movement forecast, and (B) a scenario that accommodates the mid-range marine terminal commodity movement forecast used in the 2012 EOA. The scenarios are explained further in EOA Section 2 (see Figure 17) and are based on an industrial land supply analysis of Portland Harbor prepared by ECONorthwest and incorporated into the EOA in Section 1, Appendix C. Land availability to meet the most likely forecast

depends particularly on community choices concerning annexation and zoning of West Hayden Island for marine terminal development. As described earlier in this report, staff has presented revised Farm and Forest land use recommendations for West Hayden Island. This corresponds to a policy recommendation to accommodate the low end of the marine terminal commodity movement forecast.

## REGIONAL FORECAST UPDATE

The citywide employment forecast was reduced to be consistent with Metro's adopted employment allocation to the City of Portland in 2012.

The 2012 EOA was based on a Metro's draft "Gamma" forecast, and the subsequent version adopted by Metro later in 2012 reduced Portland's allocation from 147,000 to 141,600 new jobs. The 2015 EOA Update applies Metro's adopted regional 2035 employment forecast and Portland's citywide allocation of projected job growth. The resulting 4% reduction in the citywide employment forecast has a fairly even impact on forecast growth across employment geographies, based on the forecast methodology described in EOA Section 2.

## SHORT-TERM LAND SUPPLY

The demand horizon for short-term land supply was extended to 2020, since the previous forecast to 2015 is now out of date.

The 2000-2015 forecast in the 2012 EOA was replaced with a 2010-2020 forecast in the 2014 EOA update, in order to evaluate the adequacy of the current short-term land supply to accommodate forecast growth over the next five years. The short-term land supply, which is intended to represent development-ready sites, is identified in the EOA by removing brownfields from the full Buildable Land Inventory (see EOA Section 3). The estimate of short-term land supply has also been updated with the December 31, 2014 Buildable Land Inventory revision, reflecting continuing updates by Oregon DEQ in their inventories of potentially contaminated sites used to identify brownfields. The short-term land supply does not include additional capacity identified in the March 9, 2015 BLI, which will result from planned infrastructure improvements, because those infrastructure projects will only be partially completed by 2020.

## EMPLOYMENT GEOGRAPHIES MAP UPDATE

The EOA map of employment geographies was revised to be consistent with the proposed update of the Comprehensive Plan.

Employment geographies are used to estimate segments of employment land demand and supply, in order to evaluate the growth capacity of the city's primary types of business districts. Employment geography boundaries are based on business location preferences (recent inventories) and community location preferences reflected by the Comprehensive Plan map. The 2012 EOA identified employment geographies, consistent with the existing Comprehensive Plan map. The employment geographies map was revised in the 2015 EOA update to be consistent with the proposed Comprehensive Plan map and remain relevant over the coming 20 years of business and job growth.

EOA Section 1 applies the 2012 version of the employment geographies map, which was used to evaluate job growth and development trends. The Proposed Employment Geographies Map is used in EOA Section 2-3 (Figure 8) and Section 4 (Figure 1) to evaluate the existing (baseline) and proposed land supply to meet demand to 2035. Figure 8 in EOA Section 2-3 depicts the specific changes between the existing and proposed employment geographies maps.

The updated BLI uses the proposed employment geography boundaries and distinguishes the existing and proposed capacity by two factors: the existing and proposed land use designations on the plan map and reduced brownfield constraint assumptions. For example, the golf courses added to the Harbor and Airport Districts geography have no existing capacity under the current Open Space designation and about 95 acres of proposed plan capacity in the proposed industrial designations. The demand forecast has not been revised to reflect the proposed employment geographies, because (1) geography demand is arguably better estimated by the existing mix of businesses and (2) the map changes consist primarily of vacant and underutilized sites and have relatively minimal impact on forecast demand in the industrial and institutional geographies where growth capacity is at issue.

## BUILDABLE LAND INVENTORY (BLI) UPDATE

> The BLI was revised in the 2015 EOA update to include updated employment geographies, vacant and underutilized sites, and constraints mapping.

The 2012 Buildable Land Inventory (BLI) that was used in the 2012 EOA has been updated to the March 9, 2015 version of the BLI in the 2015 EOA update. While the BLI methodology has not changed, several changes have occurred since 2012 in the mapping of vacant and underutilized sites and relative constraints mapping on those sites. Changes include removal of sites that developed in the intervening period, addition of brownfield sites from more up-to-date DEQ inventories, and revised mapping of substandard street constraints, wetlands, and DOGAMI landslide data.

The January 2015 draft of the EOA used results from the December 31, 2014 BLI, which was completed prior to identification and impact modeling of planned transportation projects in the proposed draft of the Transportation System Plan (TSP) and Citywide Systems Plan (CSP). Transportation capacity is one of a number of land constraints included in the BLI methodology. Specifically, some employment land is constrained by traffic congestion that will be remedied through a TSP project. The March 2015 BLI has been updated to include capacity impacts of the BLI transportation constraints and the proposed TSP project list.

## CAPACITY IMPACTS OF PROPOSED COMPREHENSIVE PLAN

> This report, EOA Section 4, was rewritten to describe the proposed policies, map designations, investments and strategies that address employment land supply and evaluate their capacity impacts.

The purpose of EOA Section 4 has shifted in the 2015 EOA update. In the 2012 EOA, Section 4 reviewed a range of plan implementation options to meet forecast demand in each forecast geography. In the 2015 EOA update, Section 4 has been rewritten to (1) specifically describe the

community choices proposed in the updated Comprehensive Plan that address employment land demand and capacity and (2) assess the likely development capacity impacts of those choices.

Proposed community choices include specific policies, plan map changes, infrastructure projects, and expected implementation strategies that affect land demand and capacity in each employment geography. For example, a balanced program of Industrial Land/Watershed Health strategies is summarized in Section 4 that is expected to meet forecast industrial demand while improving watershed health. These strategies are intended to clarify the expected results of interrelated economic development and environmental policies proposed in the updated Comprehensive Plan.

The BLI methodology is used to estimate capacity impacts of most of these proposed measures. An updated summary of proposed BLI capacity is included in Appendix B. Estimated impacts of potential environmental zoning changes in industrial districts, consistent with the adopted Natural Resources Inventory, is included in Appendix A. Proposed capacity of the Institutions geography is estimated by the proposed density allowances being considered in the Institutional Zoning Project in Periodic Review Task 5 of the Comprehensive Plan Update.

# PBOT-BES Coordination Charter

## Introduction

Within City of Portland right of way, PBOT has primary responsibility for the right-of-way and the transportation system. BES has primary responsibility for the City's stormwater conveyance and management system. Both bureaus have respective authority during the development review and permitting process to ensure that public and private infrastructure meets current standards and future needs. Both bureaus invest in operations and maintenance of existing assets in addition to investing in new assets that reduce risk to citizens, ratepayers, and the environment.

As stormwater conveyance and management facilities became more visible in the right-of-way, BES and PBOT committed to coordinating around the shared use of this space. The Stormwater Advisory Team (SWAT) and the Greenstreets Leadership Team were the first interbureau efforts to support green streets implementation and lasted for 10 years. With the retirement of the SWAT, both BES and PBOT agreed to coordinate on re-assessing priorities to support more comprehensive program and project implementation. The purpose of this effort is to increase efficiency and effectiveness in supporting and implementing both bureau's priorities while building lasting and improved working relationships across both bureaus.

High priority coordination issues were identified through three joint BES and PBOT meetings. Issues that were categorized as needing near to mid-term resolution are called out for direct resource allocation. Each issue will be addressed by focused work teams over the next 12-18 months with the goal of having new or updated policies and technical standards in the next Stormwater Management Manual (SWMM) or internal standard operating procedures/policies.

## Purpose

The primary purpose of this Coordination Charter is to support resolution of the high-priority stormwater issues identified by both BES and PBOT. It proposes a 3 tiered structure where Focused Work Teams will be assigned issues to work through to resolution. The Coordination Committee will review and provide feedback on work plans, identify barriers and resolve conflicts where possible. As necessary, larger policy issues or conflicts will be brought to the Leadership Committee as appropriate. The outcome of this work will be collaborative and accountable working relationships between the two bureaus that result in improved and integrated transportation and stormwater systems solutions.

## Context

Stormwater system planning, Street by Street, and individual development, CIP and maintenance projects have shown the strong linkage between transportation systems and stormwater systems. Service improvements to either system cannot be implemented without affecting the other. Both bureaus recognize that new procedures, policies, and standards are needed to cost effectively improve service to our customers.

## Success Indicators

This coordination effort can be measured through resolution of the selected high priority issues that are acceptable to the Leadership Committee.

## Roles and Responsibilities

Each Focused Work Team will have an assigned leader that is responsible for providing general project management throughout the established life of the team. The team lead will be responsible for developing a team work plan, producing deliverables, managing conflict resolution, and bringing the work team to a close. Leads should also ensure active participation from both bureau's development review and capital improvement programs. Participation or review from other work groups, such as maintenance, construction or other bureaus will be issue specific. Participants are expected to be representative for their respective programs and work groups and act as a two-way conduit for information sharing. Teams will likely meet at least monthly, and the leads will report monthly progress to the Coordination Team.

The Coordination Team will meet every two months to ensure progress on deliverables and will be responsible for taking improvements to technical standards to the Inter-Bureau Team (IBT) for final review following internal bureau approval. The Coordination Team will review focused work team plans and ensure that teams have appropriate representation from both bureaus and other pertinent City staff. The Coordination Team will also act as the primary point of contact for conflict resolution. The Coordination Team Chair will send meeting invites and develop draft agendas.

The Leadership Team will meet twice-yearly to receive updates from the Coordination Committee, including any suggested improvements for staff procedures and policies. The Coordination and Leadership Teams will jointly re-assess priorities.

Meeting times and frequencies will be adjusted as necessary and anyone can add additional items to the issue list for consideration.

## Operating Guidelines

All teams will have staff representation from both bureaus, each of which has its own cultures, sub-cultures, practices, and conventions. The guidelines below offer a consistent way for staff to interact and conduct business and can be refined over time.

> *Communication:* Making improvements to existing policies, processes and standards or developing new policies, processes or standards will require feedback and interaction with internal staff and stakeholders. Committee and Team members should frequently interact with their respective stakeholders and team members to request feedback. The Coordination Team has the added responsibility to communicate internally to keep each other informed and aware of changes and updates to bureau staffing, priorities, or external activities that may impact the work.
>
> *Documentation:* Working documents will be shared through email. Draft documents available for wider review and final documents will be put on the BES website on a dedicated location until superseded. Policies and standards related to the Stormwater Management Manual

(SWMM) will be incorporated into the next SWMM revision, which will then be the official adopted version.

*Decision Making:* Ideally, consensus occurs at the lowest possible level. If consensus can be reached within the focused work teams about how to resolve an issue, then that proposal will be brought to the Coordination Committee for approval prior to being brought to the Leadership Team for approval. If consensus cannot be reached or a variety of options are developed, then those will be brought to the Coordination Committee. The Coordination Committee will work to refine or frame the decisions before bringing a recommendation to the Leadership Committee. The IBT will provide direction regarding technical standards for work in the right-of-way, and will involve the bureau Chief Engineers for the final decisions as needed. The PBOT-BES Leadership Team will be the final decision making body for policy and procedural standards.

*Change Management:* Primary sources of change will include schedule and staffing. Changes should be identified as early as possible and a plan made to mitigate any risks. Proposed changes to scope or staffing must be approved by the Coordination Committee.

## Endorsement

As members of the Coordination Committee, we have read and agree with the contents of this charter. We will work to provide guidance and direction to ensure that this effort has the necessary environment to be successful.

Amber Clayton

Elisabeth Reese-Cadigan

Alex Bejarano

Dan Layden

Guy Alvis

Michael Magee

Bill Owen

Lola Gailey

As members of the Leadership Committee, we have read and agree with the contents of this charter. We will work to provide guidance and direction to ensure that this effort has the necessary environment to be successful.

Dawn Uchiyama

Bill Ryan

Steve Townsen

Sue Williams

Christine Leon

Scott Gibson

Art Pearce

Gary Irwin

Suzanne Kahn

# Letter of Intent

The City of Portland and TriMet have a shared intention to work in partnership to identify the transit service and supporting land use and transportation policies, programs and projects needed to support planned growth, consistent with the region's 2040 adopted vision and plans.

The City of Portland is currently updating its Comprehensive Plan and Transportation System Plan (TSP), which will prioritize transit-oriented centers and corridors to accommodate expected population and employment growth while minimizing traffic growth. TriMet is also developing its Service Enhancement Plans to work with communities to create long-term visions for the future development of the transit system. These three planning efforts, combined with funding, can lead to high-quality transit to areas identified for growing residential and employment land uses.

In order to help achieve the climate, health, environmental, economic, and equity goals and objectives of regional and City plans, the City and TriMet are committing to a joint work plan to address areas where coordination is necessary for success, such as where City facilities are used by TriMet vehicles or where City plans call for intensified transit service to meet job and housing demands.

This work plan will inform the development and adoption of a service agreement or Memorandum of Understanding (MOU) showing how the City and TriMet will coordinate on transit service in the City. We intend to complete this by the end of 2016 to coincide with the City's completion of Periodic Review.

This service agreement or MOU would strengthen coordination of three mutually-reinforcing responsibilities:

- Adoption of transit-supportive land use plans (City, Bureau of Planning and Sustainability)
- Investments that provide transit-supportive infrastructure, such as sidewalks and safe crossings, and programs, such as transit signal priority, and transportation and parking demand management (City, Bureau of Transportation)
- Transit operations, vehicles and infrastructure (TriMet)

Additional background and details on proposed and supporting activities are provided in Attachment A.

_____ Date: _____
Susan Anderson, Director
Portland Bureau of Planning & Sustainability

_____ Date: _____
Leah Treat, Director
Portland Bureau of Transportation

_____ Date: _____
Neil McFarlane, General Manager
TriMet

**Attachment A.**

DRAFT

**Background**

A fundamental guiding policy behind this effort is the Region 2040 Growth Concept, which calls for housing and employment growth to be focused into more active, mixed use, pedestrian-friendly activity centers that are connected by high-frequency or high-capacity transit corridors. One of the key ingredients to success for these activity centers is providing a multi-modal transportation system that ensures transportation choices and the continued mobility of people and goods throughout the region.

Frequent, high quality transit service is essential to supporting strong job centers and healthy neighborhoods. The existing transit system has facilitated the growth of regional and neighborhood centers, in keeping with the regional vision. This has helped create vibrant downtowns and neighborhoods where employees, residents and visitors can meet many of their needs with transit, on foot, or by bike, thereby reducing congestion, cutting greenhouse gas emissions, and allowing more economic activity and population and employment growth in these areas at a lower cost than expanding state and local roadways.

Transit is an essential ladder of opportunity to help people reach economic security. Expanding high quality, frequent transit will improve low-cost access to daily needs, jobs, and education for all, especially those who have limited or no access to a private vehicle. In order to ensure greater fairness, an equity lens is, and will be, used to improve safe, reliable access to quality transit service in a way that is inclusive of all Portlanders.

The City of Portland desires to deliver on the 2040 vision and has expectations to capture a significant share of the region's projected population growth and to efficiently serve that growth long into the future without a major increase in highway or road capacity. The extent of existing infrastructure makes the City well poised to address its growth potential by increasing transportation capacity with a balanced, multimodal system based on transit, bicycles, and pedestrians. The transit portion of this system will be a seamless balance of bus, light rail, streetcars, ADA paratransit and related services.

Under Oregon law, there are legal mechanisms to ensure that Transportation System Plans and Land Use Plans are coordinated. Transportation System Plans, however, traditionally focus on capital investment plans, not ongoing transit operations. The City and TriMet are seeking a mechanism to more clearly express and acknowledge that land use, capital investments, and ongoing operations are bound together.

**Proposed Activities**

The City of Portland and TriMet have a long history of partnership on the planning, funding, construction and operations of this integrated transit network. The City has been a major supporter and financial contributor to TriMet transit system expansions. TriMet has consistently invested in operating high-frequency service along Portland's main streets and through its centers. In addition, TriMet has supported the City's pursuit of developing the Streetcar system and has taken on a larger share of its operations.

It is in this spirit of continuing partnership that we now embark on this workplan to formalize understanding of our mutual commitments so that both parties have a promise of stability for future planning where transit service, land use plans and uses, infrastructure are all mutually dependent for success.

Transit and higher density zoning alone are not sufficient to produce the levels of development and transit use to meet regional goals. Without safe pedestrian and bicycle access to transit, high-quality transit stops, fast and reliable transit operations, parking management, and effective demand management, the City, TriMet and the region are unlikely to meet their goals.

TriMet's future investment and improving and expanding the frequent transit network will be prioritized based on considerations that include the level of local access investments, transit-supportive policies and regulations, and priority treatments. TriMet and the City will work together to update corridors with

transit-supportive investments to help support both frequent transit service and transit-oriented development.

With this understanding, the City and TriMet envision the following types of activities will be part of the workplan:

- Transit-supportive land use commitments by the City, reflective of Comprehensive Plan and Regional Growth Vision
- Policy and program commitments by the City that support the use of transit, including parking and travel demand management (TDM)
- Operational and capital investments by the City and other partners that support the performance of transit in terms of safety, efficiency, reliability and accessibility, including:
    - Sidewalks, crossings and other treatments to make accessing transit safer and more desirable
    - Transit signal priority, right of way and other system management treatments to improve speed and reliability
- Service commitments by TriMet that support the City's plans, tied to designated land uses and prioritized in alignment with TriMet's Board-adopted Service Guidelines Policy, which emphasizes five priority considerations to provide the framework for service planning decision-making: Equity, Demand, Productivity, Connections and Growth.

These activities recognize the specialized roles played by the various parties involved in the work plan:

- Bureau of Planning & Sustainability – Land Use Planning and Policy
- Bureau of Transportation – Transportation Infrastructure, Operations, Programs, Planning and Policy
- TriMet – Transit Service, Infrastructure, Planning and Policy

**Supporting Activities**

In order to inform the work in the areas above, TriMet is collaborating with the City on its "Growing Transit Communities" project funded by the Transportation and Growth Management (TGM) grant program administered by ODOT and DLCD. Over the next 18 months, this planning process will develop transit-supportive investment plans for 2 to 5 transit corridors. The corridors will be selected using criteria from a pool of potential corridors. A suite of corridor-level analysis tools for prioritizing investments will be developed and applied in each corridor. The suite of tools will be developed with the intention of being replicable for use in other corridors and by other jurisdictions.

One place where this type of partnership approach is already being applied is prioritizing service improvements on SE 122nd Avenue to improve connections for nearby residents to concentrations of jobs (such as in the Columbia Corridor) and other activity centers:

- The City is providing transit-supportive land use designations and including necessary sidewalk and crossing safety improvements in its proposed Comprehensive Plan and TSP.
- TriMet is developing service improvement plans through its Service Enhancement Plan process and is implementing improvements on an annual basis as budget allows.

The City and TriMet will also collaborate and seek funding to develop an Enhanced Transit Corridors study, which would identify corridors where projected growth may require new and innovative service models be deployed to meet demand, combined with enhanced safety, access and operational treatments, travel and parking demand management, to help ensure the benefits of the new service model are fully realized.

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More generally, moving forward, the City and TriMet will seek to jointly develop plans, projects and funding requests for federal, state and regional opportunities to advance the objectives described herein.

As a regional agency, TriMet has the responsibility to balance investments across all of the jurisdictions it serves in line with regional and agency policy. Nothing in this proposed workplan is designed to limit TriMet's ability to fulfill that responsibility. This working arrangement and agreements also can consciously serve as a template for other partnerships between TriMet and other jurisdictions it serves in the region.

DRAFT

# CITY OF PORTLAND
# ECONOMIC OPPORTUNITIES ANALYSIS:
## Section 1. Trends, Opportunities & Market Factors





**Prepared for:**

**City of Portland Bureau of Planning & Sustainability**

**JANUARY 2015 Proposed Draft**

This EOA report has been funded through a grant from the State of Oregon Department of Land Conservation and Development.

**E. D. Hovee & Company, LLC**

Economic & Development Services

# EXECUTIVE SUMMARY

The EOA is an analysis of the 20-year supply and demand for employment development and land in the city. It is prepared according to State Administrative Rule OAR 660-09-0015 and consists of four sections:

1. Trends, Opportunities & Market Factors
2. Long Range Employment Forecast (Demand)
3. Buildable Land Inventory (Supply)
4. Community Choices (Comprehensive Plan proposals to meet employment land needs)

This report is Section 1 and provides a review of national, regional, and local employment trends, opportunities and market factors. The report documents existing conditions and current trends in employment that will serve as a basis for the future employment forecast.

## KEY FINDINGS

- National employment trends indicate leading job growth in health, education and professional and business services.
- The 2000-2008 business cycle was a period of unusually slow job growth, not only for Portland but for the 7-county metro region and the nation. However, the pace of job growth in the 2008-2013 period, averaging 1.3% per year in Portland and 1.4% in the region, has already exceeded the previous business cycle. Despite the depth of job losses during the great recession (2008-2010), the city and region have since led the state's economic recovery.
- A pivotal question is whether the city will continue to generate a stable share of the region's job growth, outperforming national job-sprawl trends. Multnomah County's long-term 25% capture rate of regional job growth over the 1980-2008 period has fluctuated widely since 2000. Portland had a nearly flat 5% capture rate of regional growth during the sluggish 2000-2008 business cycle and then rebounded to 23% capture rate in the 2008-2013 period.
- It is apparent that the "hot spot" locations where job growth is occurring within the City have shifted in recent years. Business districts with the most robust job growth rates since 2000 have been the hospital and college campuses, Central City's subdistricts outside of Downtown, some town centers with substantial health care and education employment, and the Columbia Corridor east of 82nd Avenue.
- Industrial employment declined in the 2000s at the same time that the city experienced increases in industrial land development, freight volumes, and added value of manufacturing products. Industrial employment is also a primary source of middle-wage jobs that have been shrinking nationally and regionally since 1980.

- The EOA identifies ten categories of employment areas (locations, sites and types of space) referred to in the report as "employment geographies". Among these, the institutional geography is experiencing the strongest job growth, followed by urban centers (primarily due to institutional growth) and then the Central City, neighborhood commercial and industrial geographies.

## NATIONAL TRENDS & FORECAST REVIEW

Following a period of relatively rapid growth in the 1980s, the rate of job growth slowed in the 1990s and further slowed in the early part of this decade. Job growth picked up after 2010 during a period of economic recovery, but is then projected to further slow to about 0.9% annual growth between 2025 and 2035.

Manufacturing is projected to decline from about 16% of all non-farm jobs in 1990 to between 6% and 7% by 2035. Service sector jobs have increased from about 67% of the nation's non-farm job base in 1990 to 73% as of 2005. While all service sectors are expected to add jobs, only professional services, education and health are projected to increase their share of the employment base over the next 25 years.

## REGIONAL EMPLOYMENT TRENDS

The pattern of the 7-county Portland metro area (PMSA) employment has followed that of the nation, slowing considerably post-2000 to a rate of approximately 0.8% per year (to 2008). Metro has prepared an updated forecast of job growth to 2040 (with 2035 established as the pertinent growth target for the City of Portland). Metro's regional forecast indicates a more robust job growth rate averaging 1.8% per year from 2010 to2035, consistent with long-term trends. PMSA employment grew at an average annual rate of 2.1% from 1980 to 2008, spanning the last three business-cycle periods. Job growth rates are expected to range from 0.6% for manufacturing to 2.3% for professional services and 2.6% to 2.7% in education and health services in the 2010-2035 period.

## PORTLAND EMPLOYMENT TRENDS

In 2013, there were 393,742 covered jobs in Portland, equivalent to 38% of the 1.02 million employment base of the 7-county PMSA. To understand long term growth trends, the EOA focused on the 1980-2008 and 2000-2008 periods, since they reflect the peak-to-peak periods of the recent business cycles – timeframes that reduce the short-term business cycle distortions of the growth trend. From 1980 to 2008, Multnomah County added approximately 114,800 new jobs, resulting in a 1.1% average annual growth rate and a 25% capture rate of PMSA job growth. The city's share of Multnomah County employment increased slightly in this period. After 2000, both region and city job growth slowed substantially.

From 2000-2008, Portland employment increased by approximately 3,120 jobs. This reflects a 5% capture rate of PMSA job growth in that period and an overall job growth rate averaging only about 0.1% per year. In comparison, statewide and PMSA job growth rates averaged 0.8% per year. However, local job growth has rebounded since 2008, recovering the 23,000 jobs lost in Portland and 63,000 jobs lost in the region from 2008 to 2010. In the 2008-2013 period,

Portland had 1.3% average annual job growth, compared to 1.4% in the region, and the city's capture rate was 23%.

The 2000-2008 period also provides an insight into shifts between different employment sectors within the region. Manufacturing jobs declined by about 3.3% per year, with all industrial employment dropping at an annual rate of 2.6%. At the same time, the city experienced increases in industrial land development, freight volumes and added value of manufacturing products. Retail jobs also declined. Employment in education and health care sectors increased at a rate averaging 2.3% per year. The loss of the share of employment in the industrial sectors may be exaggerated due to 2001 changes in the way employment data is classified.

When looking at *geographic subareas*, Portland's Central City commercial areas accounted for 27% of the city's employment base as of 2008; regional and town centers (or urban centers) accounted for 5%; neighborhood commercial areas comprised another 18%; industrial districts represented 30%; and with institutional and residential areas each contributing 9-10%. As noted, institutional areas experienced the city's strongest job growth, adding 8,800 jobs at an average annual rate of 3.6%.

However, employment varies greatly within these broad geographic groupings. For example, in the Central City, employment declined somewhat in the downtown and South Waterfront subareas, while increasing for the River and Lloyd Districts. Within industrial areas, employment has declined within Harbor and Airport Districts and Harbor Access Lands while increasing for Columbia East of 82nd, the Dispersed Employment areas, and for the Central City Industrial (or incubator) districts of Central Eastside and Lower Albina.

For urban centers, strong gains have been experienced for Hollywood, Gateway and Lents, focused in health care and education, while St. Johns, Hillsdale and West Portland have experienced stable or declining employment. Of the neighborhood commercial areas, employment within dispersed commercial areas has increased while the job count has declined for commercial corridors and nodes.

## DEMAND ANALYSIS ISSUES – FOCUS GROUP INPUT

In 2009, the City organized six focus groups involving 58 participants to provide input on the demand for different types of employment - central city office, close-in incubator, manufacturing and distribution, neighborhood commercial, transit oriented development/mixed use corridors, and campus institutional. The findings included the following:

- *Recent trends*- Despite relatively slow employment growth over the last several years, the mid-decade was relatively good for Portland's major employment generators – at least up to the point of the economic downturn starting in 2007-08.
- *Emerging trends* - the overarching theme is "change". There is a promising long-term outlook provided that the pending economic recovery proves sustainable with the view that the City and region respond to shape this change in ways that keep Portland competitive for added investment and employment. Specific types of change include:

- ✓ The Central City office market becoming more diverse with strong growth in lower cost incubator space.
- ✓ Industry concerns that skilled workforce development and the freight transportation system will not be able to keep pace with their changing needs.
- ✓ Neighborhood commercial corridors seeing more mixed-use development and high densities along major transit streets.
- ✓ Health care providers expect "tremendous" growth.

- *Business space and location needs* – Expected space needs are relatively diverse, and there seem to be growing opportunities for more mixed-use and denser commercial space versus more traditional manufacturing and distribution activity.
- *Density and redevelopment* – Opinions on the potential for greater density uses and redevelopment of existing uses ranged from extreme caution expressed by manufacturing and distribution focus group participants to bullish support from /mixed-use corridor participants. All the focus groups discussed the practical implications and means by which employment uses could grow up rather than out.
- *Economic prosperity and creative vitality* – There are different strategies for creating and maintaining prosperity. A key challenge is to harness these diverse interests into a coherent whole. For example:
  - ✓ Emphasizing the Central City as a critical component to a healthy regional economy.
  - ✓ Balancing goals of sustainability and job growth.
  - ✓ Small neighborhood businesses as a primary economic engine.
- *Public role in economic development* – Participants argued that public strategies should emphasize a more business-friendly environment in general with more flexible regulations, more reliance on public-private partnerships, new business incentives, and less "picking winners" with targeted efforts.

## DEMAND ANALYSIS ISSUES – DATA ASSESSMENT

Key findings:

- *High rise office development* – There is solid potential for additional mid to high-rise development primarily in the Central City but also elsewhere. Mid-/high-rise development outside the Central City has been limited to adaptive reuse in close-in areas and medical/health care facilities at campus institutions and urban centers such as Gateway and Hollywood. Proximity to retail and housing is increasingly important for future office development. The Central City reports a relatively slow overall job growth rate (0.3%) from 2000-08 – with strongest growth in the River and Lloyd Districts and some employment loss in the CBD.
- *Incubator and manufacturing districts* – These two types of space can contribute to future export-oriented job growth in Portland. Harbor and Airport Districts and Harbor Access Lands remain strongly oriented to manufacturing, transportation and distribution but service employment has been the dominant source of job growth in recent years. The Central City incubator districts of Central Eastside and Lower Albina have a more

diverse job base and have been experiencing job growth above the citywide rate – albeit concentrated in service sector activities together with information/design and construction. Overall, employment within industrial areas declined slightly.

- *Neighborhood commercial districts* – These dispersed concentrations of employment space have been a significant contributor to the city's job base, but with somewhat surprising job loss indicated over the 2000-08 time period, primarily within residential zones and along commercial corridors. Commercial corridors (including those with TOD/mixed use potential) still account for 27% of jobs outside of the city's urban centers and industrial areas, despite a net loss of nearly 5,200 jobs from 2000-08. Neighborhood-serving services and retail generally appear well distributed throughout the city; with just a few gaps.
- *Institutional development* –These sites include 7 colleges and 10 hospitals (each on 10+ acre sites) but excluding Portland State University and Adventist Medical Center which are included with in the Central City and Gateway employment geographies respectively. These 17 institutions together accounted for about 35,200 in-city jobs as of 2008 and represent the city's fastest growing employment geography.

## LOCAL SECTOR SPECIALIZATION

Two related analyses were conducted that are relevant to this EOA. Metro evaluated the region's comparative advantage in *employment* relative to the nation, finding that this region has a comparative advantage in manufacturing despite net job losses. Overall, non-manufacturing sectors show little to any substantial comparative advantage relative to the rest of the nation. However, Metro is projecting increased regional capture of national employment for finance activities, education and health care, and some management and personal services.

ECONorthwest also evaluated the City of Portland comparative advantage based on industry *value added* rather than employment. This analysis corroborates the results of the regional employment-base analysis. Both analyses indicate that Portland's comparative advantages are higher in the manufacturing sectors. Although, these sectors make up smaller shares of total economic activity, they generate larger overall economic impacts in value added and export value added, particularly professional services, wholesale trade, and management of companies. Consequently the ECONorthwest analysis indicates that the manufacturing sector's output may be insufficient as an *exclusive engine* for continued economic growth into the future.

## EOA IMPLICATIONS

Key implications for subsequent EOA work tasks include:

- Long-term job growth trends have fluctuated and create uncertainty for forecasting growth in the coming decades. The 2000's were a period of relatively slow job growth not only for Portland but for the metro region and nationally. Despite an economic downturn experienced just after 2000, followed by modest growth and a major recession at end of the decade, Metro is projecting that the nation and region should expect to return to a more normalized pattern of job recovery and stronger growth over the long-term horizon of next 25 years.

- For Portland, another question is whether the city will maintain the 25% capture rate of regional job growth that Multnomah County experienced over the 1980-2008 period. Portland's capture rate fell to 5% in the 2000-2008 business cycle and has since rebounded to 23% in the 2008-2013 period.
- Finally, it is apparent that the "hot spot" locations where job growth is occurring within the City have shifted in recent years. The focus of added Central City job gains has shifted from the traditional downtown core toward adjacent areas in the River and Lloyd commercial / mixed use districts and the emerging incubators of the Central Eastside and Lower Albina. Similar shifts are occurring within and between the City's industrial, urban center and neighborhood commercial areas. In numerical terms, by far the strongest growth has been in Portland's institutions.

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# I. INTRODUCTION

The City of Portland is required to complete an Economic Opportunities Analysis (EOA) to comply with Oregon Statewide Planning Goal 9 and supporting administrative rules. State statutes also require the City's Comprehensive Plan to be coordinated with Metro's regional population and employment forecasts and allocations. The EOA rules also allow Portland the opportunity to shape its plan in a way that fits not only state and regional goals but also locally determined priorities and choices.

The intent of this EOA is to address both current and emerging market trends while at the same time addressing distinctive state, regional and City-defined policy objectives for employment and associated land development requirements. The economic analysis also addresses short-term employment demand and resulting land supply needs consistent with Goal 9 and reconciles buildable land supply with demand over a longer term time horizon to 2035.

## APPROACH

This report covers economic trends, opportunities and market factors, including an assessment of local sector specializations, submarket real estate analysis, freight terminal demand, and wage distribution.

The analysis has drawn from a review of quantitative economic data for the U.S., state of Oregon, and Portland metro region as well as data specific to the City of Portland. The analysis also considers qualitative information affecting future opportunities and market factors, including results of six focus groups organized around demand analysis issue topics.[1]

Subsequent EOA reports are informed by the results of this initial trends analysis.

## ORGANIZATION OF TRENDS, OPPORTUNITIES, AND MARKET FACTORS ANALYSIS

The remainder of this Task 1 report is organized to cover the following topics:

- National Trends & Forecast Review
- Portland Employment Trends
- Demand Analysis Issue – Focus Group Input
- Demand Analysis Issues – Data Assessment
- Local Sector Specializations
- Intensification Analysis
- Multiplier Analysis
- EOA Implications

[1] Information in this report has been drawn from sources generally deemed to be reliable. However, the accuracy of information from third party sources is not guaranteed, and is subject to change.

The observations and findings contained in this report are those of the authors. They should not be construed as representing the opinion of any other party prior to their express approval, whether in whole or part.

# II. NATIONAL TRENDS & FORECAST REVIEW

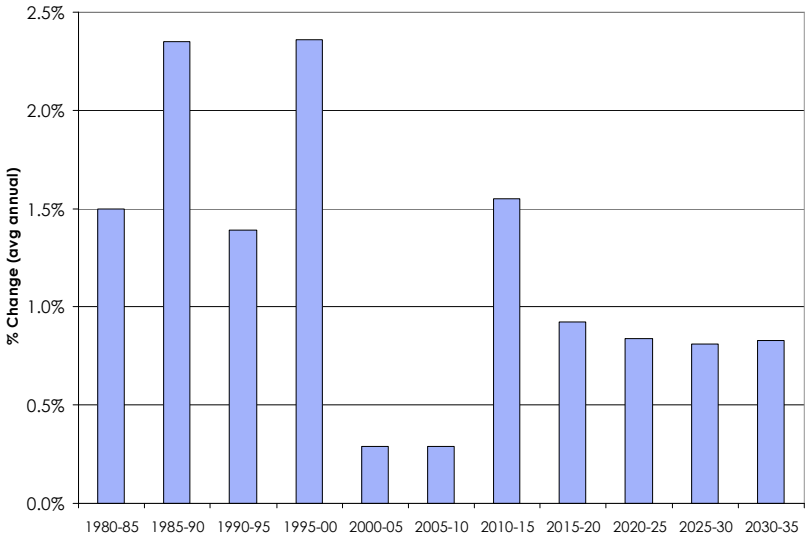
Consistent with Oregon Administrative Rules (OAR 660), Portland's EOA is set within the context of nationwide trends and projected future employment. Recent and forecast conditions are considered first for total employment, then with more detailed discussion of employment by sector.

## NATIONAL EMPLOYMENT TREND & FORECAST

From 1980 to 2005, the nationwide job count grew by 48% to approximately 133.7 million non-farm jobs in 2005:

- Over the 25 year period of 1980-2005, employment across the U.S. increased at an average annual rate of 1.6% per year, reflecting a particularly rapid 1.9% rate of job growth during the 1980s. The 1980-90 time period also coincided with entry of a large baby boom cohort into the job market.

**Figure 1. U.S. Non-Farm Employment Growth Rates (1980-2035)**




Source: Global Insight, *2008 QR US Long-Term Outlook,* as compiled by Metro.

- Since 1990, job growth nationally has slowed to a more modest 1.3% annual rate from 1990-2005. During the first half of this decade (2000-2005), job growth was even more modest averaging 0.3% per year, reflecting a post-2001 period of economic contraction followed by a slow recovery.
- The national forecast predicts an economic recovery period for 2010-2015 with relatively strong anticipated job growth (1.5-1.6% per year) that declines over time to a rate of about 0.9% by 2025-2035. At these rates of projected employment growth, the U.S. would have about 173.5 million non-farm jobs by 2035, an increase of just under 40 million jobs (or 30% gain) compared to 2005 conditions.

## Employment Sector Growth

When viewed by major employment sector, the most noteworthy change has been the continued shift of the nation's economy to less industrial and more service-related employment. This trend is expected to continue through 2035. However, several caveats are noted related to this shift.

Past employment sector shifts are difficult to quantify due to a 2001 change in how industries are classified in (from the Standard Industrial Classification system to the North American Industrial Classification System). The new NAICS system created two new sectors, management of companies and information, which are considered services but which encompass firms (or portions of firms) previously classified as industrial. While employment data from the year 2000 has been converted to NAICS (by the Oregon Employment Department), this conversion was not perfect. Some portion of the reported employment shift away from manufacturing is attributable to this change in job classification, although the exact portion is unknown.

Also of note is that while the focus of this trends assessment is employment, manufacturing has in many regions held a steadily increasing share of GDP. At least since 2000, there appears to be a contradictory relationship between industry output and industry employment. Consequently, job growth represents only one lens through which to assess an industry's economic contribution. Other measures of economic activity are addressed later in this report.

That said, the following changes are reported for job trends within the manufacturing sector nationwide:

*Manufacturing:*

- Nationally, manufacturing has declined from just over 16% of all non-farm jobs in 1990 to 10-11% of non-farm jobs in 2005 and is projected to decline to 6-7% of employment by 2035.
- Manufacturing has been declining not just as a share of the total but also in terms of numbers of jobs – from close to 18 million jobs in 1990 to just over 14 million in 2005 and to a projected 11 million by 2035.
- Every major manufacturing category except lumber experienced job losses between 1990 and 2005, and all sectors are forecast for job loss through 2035. Durable goods manufacturing, which tends to be more capital intensive, has experienced less rapid job loss than non-durables.

*Other Industrial-Related Employment:*

- With the exception of natural resources, all other *industrial-related* sectors experienced job growth from 1990-2005 and are projected for continued job growth through 2035. These other sectors include natural resources, construction, wholesale trade, transportation/warehousing/utilities (TWV), and information.[2]

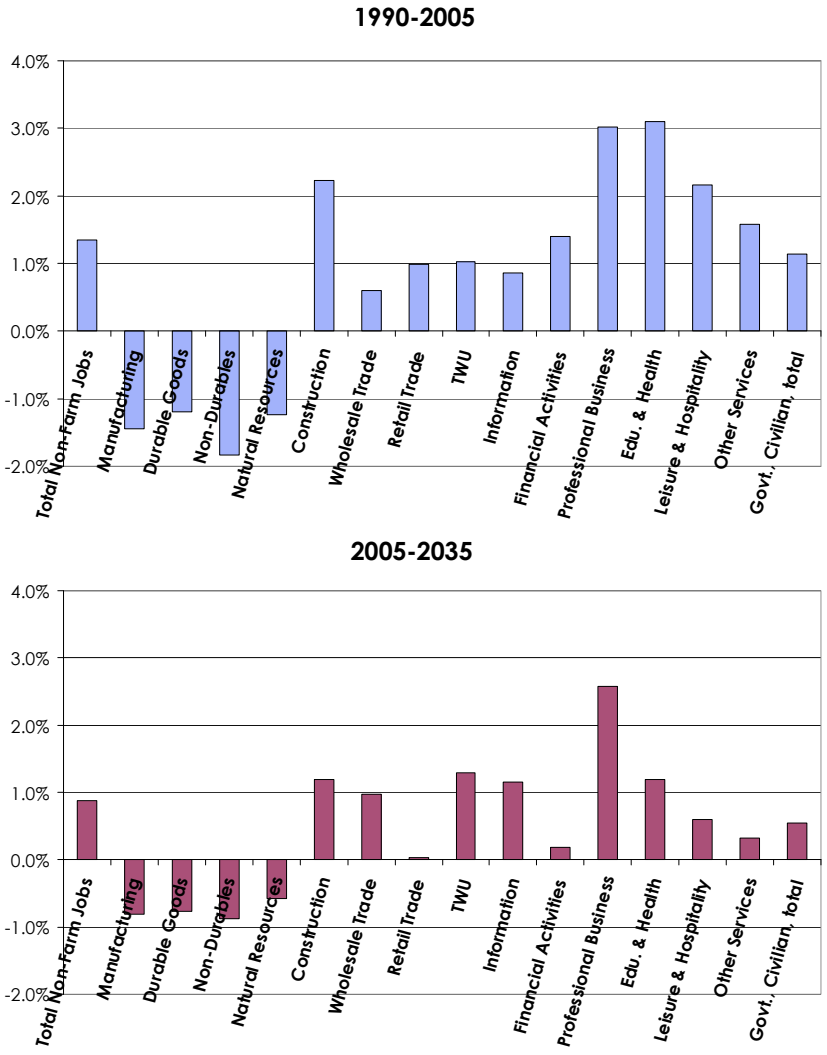
[2] Information is a new sector defined by NAICS that includes some previous industrially related SICs such as printing combined with more service sector related functions such as internet and software.

- Between 1990 and 2005 the other industrial-related sectors declined slightly in total employment share, from 16.6% to 16.2%, as growth was below rates experienced in non-industrial (service) sectors. However, through 2035 the non-manufacturing industrial sectors are projected to increase their share of the nation's employment to 17.4% by 2035.
- From 1990-2005, the fastest growing industrial sector was construction, with jobs increasing an average of 2.5% per year. From 2005-2035, the biggest gainer is forecast for jobs in transportation/warehousing/utilities (at 1.3% annually), followed closely by the construction and information sectors.

*Service Sector Employment:*

- Service sector jobs have increased rapidly since 1990. The most rapid growth rates are reported for education and health (up by 3.1% per year) and professional services (3%). The slowest growing service job sectors have been retail (up by just 1.0% per year) and government (1.1%). Finance, leisure and hospitality, and other services have increased at rates of 1.4%, 2.2% and 1.6% respectively.
- Overall, these service sectors have increased from about two-thirds (67%) of the nation's non-farm employment in 1990 to 73% as of 2005. The largest single service-related sector is government at 16.3% as of 2005.

**Figure 2. Forecasted U.S. Job Growth Rates (1990-2035)**




Source: Global Insight, *2008 QR US Long-Term Outlook,* as compiled by Metro.

- While all service sectors (except retail) are expected to add jobs, only professional services, education and health are projected to increase their share of the employment base over the next 25 years. Declining shares (slower growth) are projected for retail trade, financial activities, leisure and hospitality, and government.

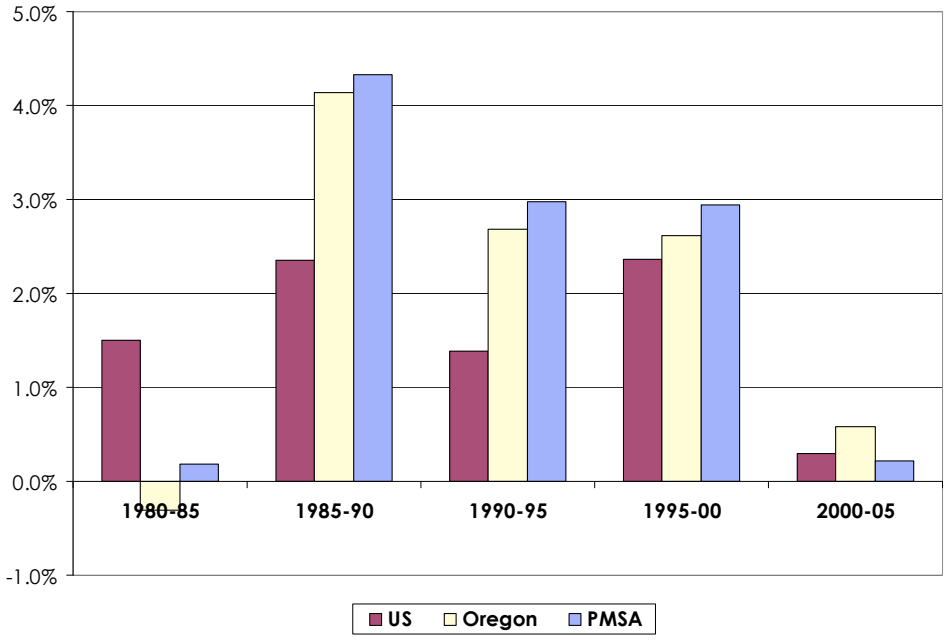
## STATEWIDE & REGIONAL EMPLOYMENT CONTEXT

### *Statewide & Metro Area Employment Growth Trends*

Over a 25-year period extending from 1980-2005, patterns of employment growth for the nation, Oregon, and the Portland metro area have been similar. Exceptions include:

- In the first half of the 1980s, Oregon and the Portland metro area were harder hit than the nation during a period of overall economic slowdown. In the latter half of the decade, this pattern was reversed as employment growth rates accelerated, exceeding 4% per year both statewide and for the metro region.

**Figure 3. Employment Growth Rates – U.S., Oregon & Portland PMSA (1980-2005)**




Source: Metro, Oregon Employment Department, and E. D. Hovee & Company, LLC.

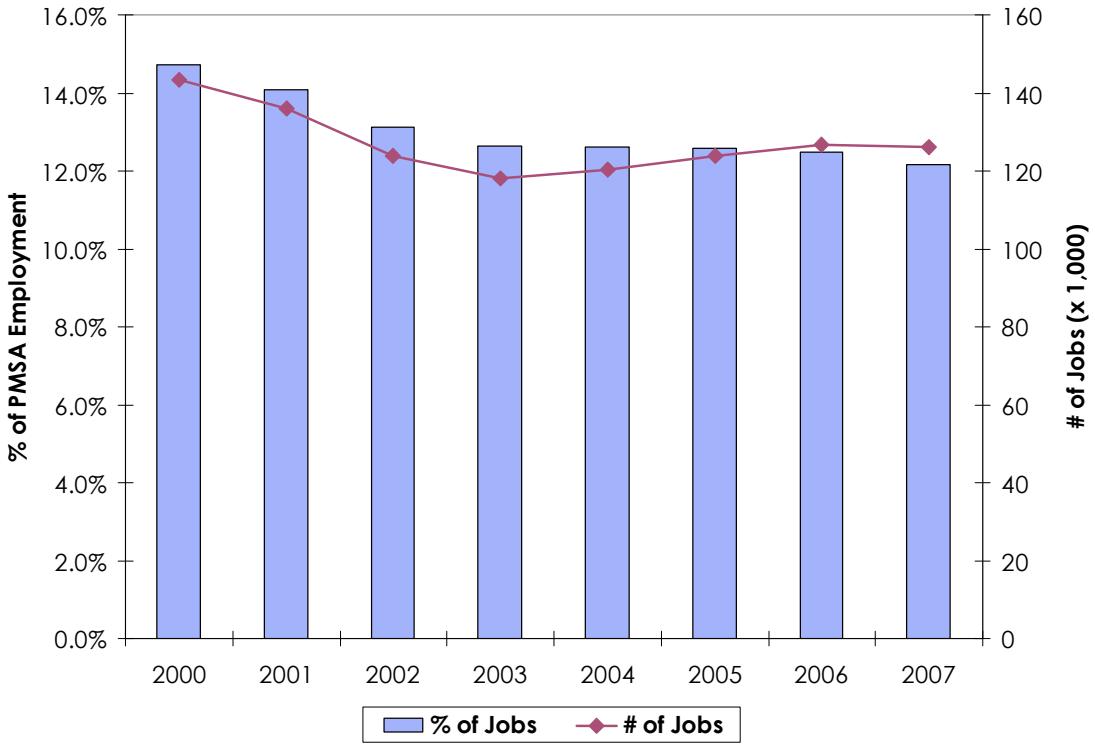
- This pattern of strong employment growth statewide and regionally continued (though at somewhat slower rates) through the 1990s, with the nation nearly catching up to the state and region in the latter half of that decade.
- In the 2000s, employment stagnated – nationally, statewide and regionally – through a recession with a slow job recovery. While at fairly modest levels, employment growth statewide exceeded that of the PMSA, the only such 5-year period since 1980.

## Manufacturing Focus?

Manufacturing often receives particular attention because of its historic role as a pivotal traded sector and as source of relatively high wage jobs, both nationally and in this region. As a share of PMSA employment, manufacturing has not reversed its declining share of the region's job base – at best holding its own from 2003-2005 at 12.6% of total non-farm jobs (Figure 4). The experience of the last several years offers the hint of a possible opportunity for slowing the now decades long slide in U.S. manufacturing. This is illustrated by a year-to-year review of manufacturing employment in the Portland metro area from 2000-07. This period is chosen as it essentially extends from the recession just after 2000 back to a subsequent peak in 2006.

As indicated by the following graph, the metro region experienced a sharp drop in manufacturing jobs during the economic recession of 2001-2003. This was then followed by a post-recovery increase of about 7% back to a peak year of 2006. This recovery nationally was aided by a weak dollar encouraging added exports, especially for durable goods manufacturing.

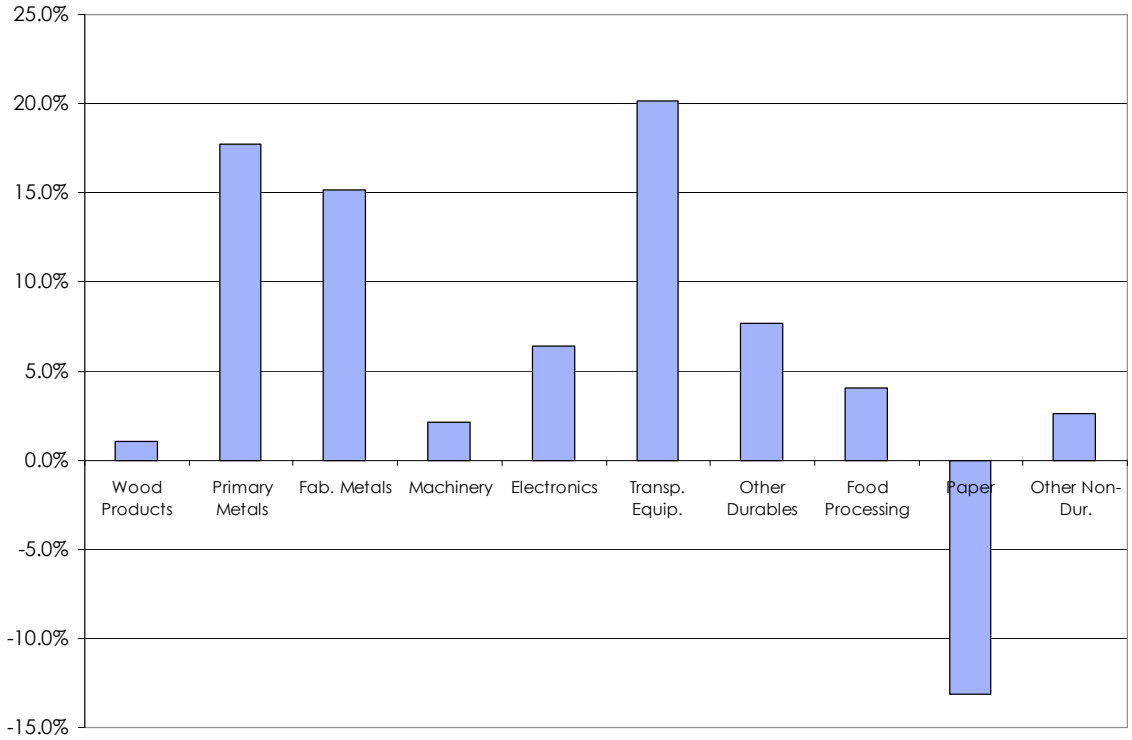
**Figure 4. Portland PMSA Manufacturing Job Trend (2000-2007)**




Source: Metro.

A more detailed look at the 2003-2007 period shows the differences in this manufacturing employment resurgence by sector. While there was considerable employment contraction in the 2000-2003 time period, the strongest post-2003 gains were indicated for transportation equipment and primary/fabricated metals, followed by more modest gains for electronics and food processing.

**Figure 5. Portland PMSA Manufacturing Job Surge (2003-2007)**




Source: Metro.

A key question with economic recovery in the years ahead is whether this resurgence proves to be temporary. Alternatively the question is whether there are opportunities for continued longer lasting competitive gains for durable goods as with metals, transportation equipment and/or electronics.

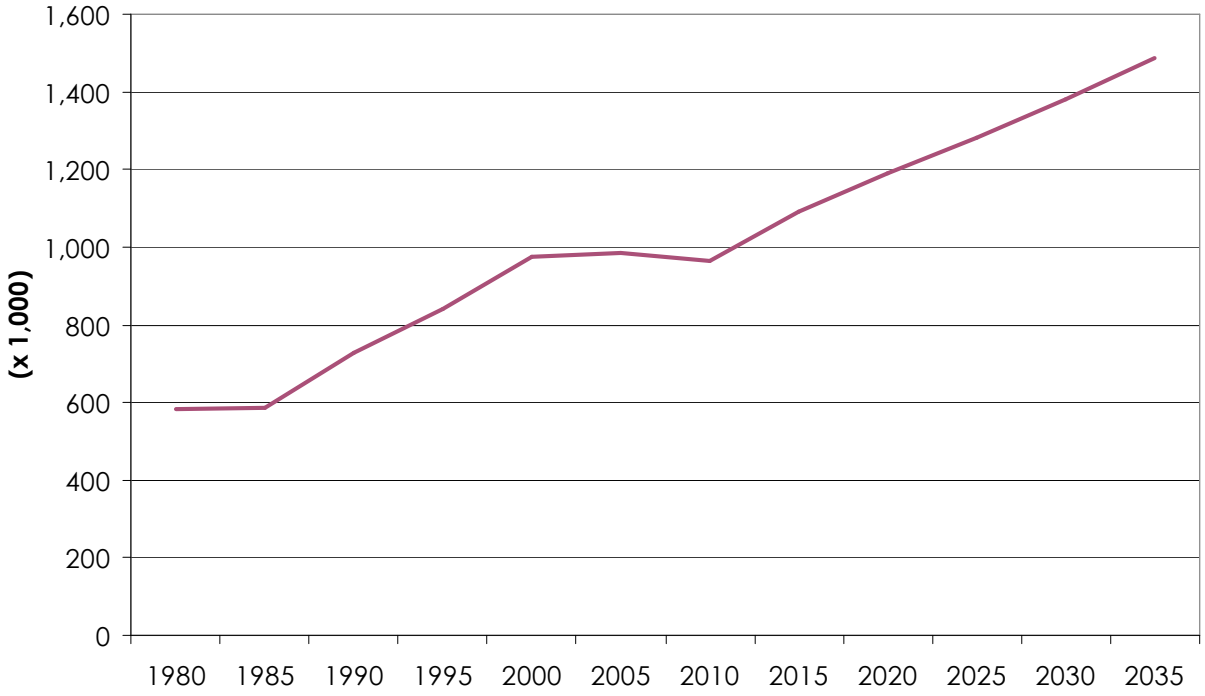
With non-durables, a question is whether the recent observed growth in regional food processing can be sustained. Opportunities may be linked to greater emphasis on consuming products grown and manufactured closer to home.

Metro projects that manufacturing's share of the region's total job base will be 8.3% of total employment by 2035. The total number of manufacturing jobs is projected to stabilize at between 120,000 and 125,000 between over the 2020-35 time period.

## Metro Area Employment Growth Forecast

Looking to the future, Metro developed a range of low, moderate and high growth employment forecast alternatives to the year 2040 and has selected an official forecast slightly less than the moderate forecast. The following chart displays trends from 1980 to 2005, and then resulting revised forecast to 2035 (the forecast period for this EOA).

**Figure 6. Portland PMSA Employment Forecast Range (to 2035)**




Source: Metro. Data for 2010 reflect BLS actual employment, with subsequent years as Metro forecast results.

With the baseline forecast, Portland PMSA non-farm employment would increase from recession dampened figure of less than 1 million jobs in 2010 to nearly 1.5 million in 2035, a gain of nearly 540,000 with an average annual growth rate in the range of 1.8% per year over the 2010-2035 time period.

# III. PORTLAND EMPLOYMENT TRENDS

This section analyzes recent City of Portland employment trends within the national and regional context. While some citywide changes parallel those of the nation and/or region, it is clear that Portland's position as the largest city in the region and state has created distinctive market niches as well as future opportunities and limitations.

Topics covered by this initial data review are:

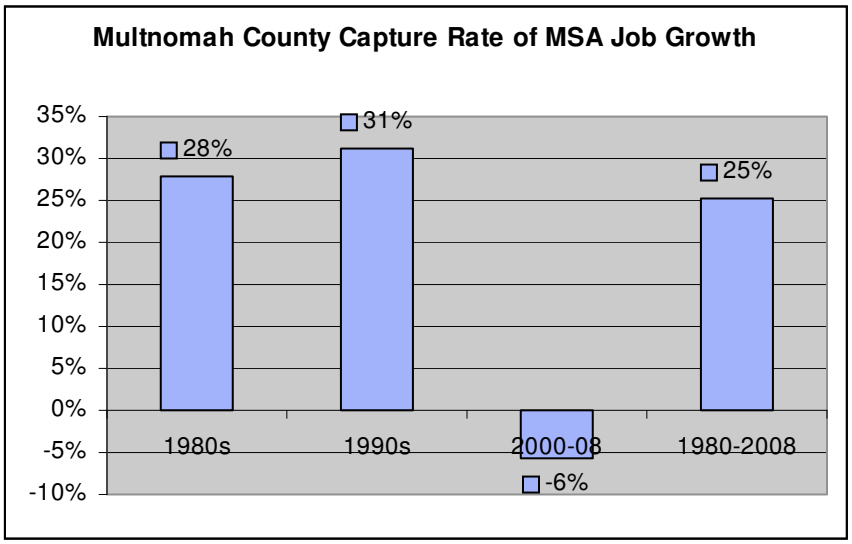
- Citywide Employment Trends
- Detailed Development & Employment Trends:
  - ✓ Employment by City Subarea
  - ✓ Employment & Development by Expansion Type
  - ✓ Development by Valuation, Density & Site Type

Geographic and sector employment trends will be used to inform the distribution of projected employment in later tasks for this EOA.

## CITY AND COUNTY EMPLOYMENT TRENDS

The following long-term employment trends analysis is based on county data because reliable, comparable city data is not available before 2000, due to changes in data reporting and major city annexations in the 1980s and 1990s. Figure 7 shows that the short-term (2000-08) job losses are inconsistent with long-term trends.

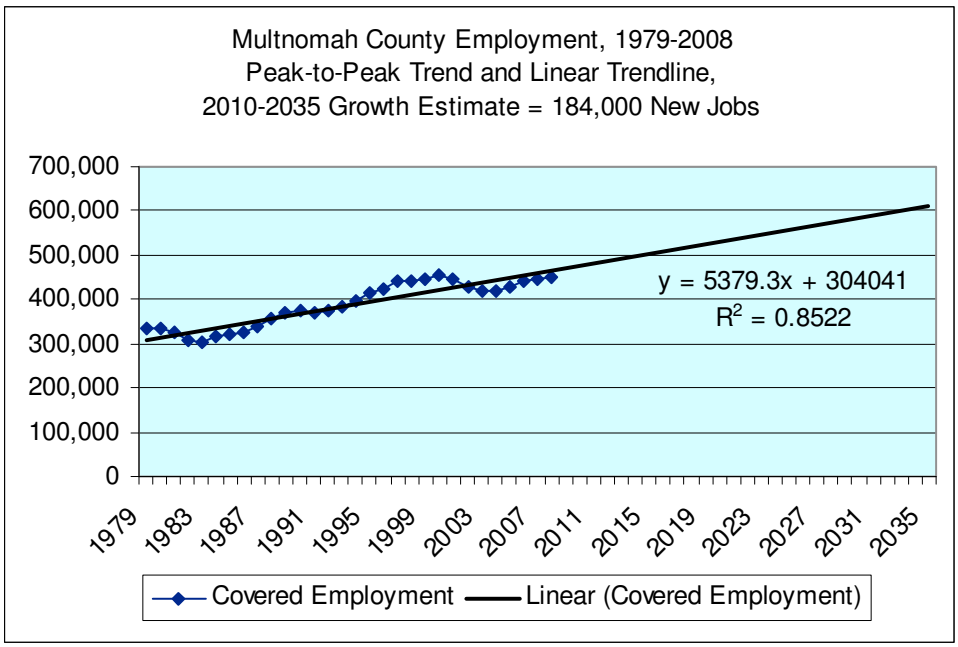
**Figure 7. Multnomah County Capture Rate of Regional Job Growth (1980-2008)**




Source: Bureau of Planning and Sustainability from Oregon Employment Department QCEW data.

Despite slower job growth after 2000, long-term employment trends in Multnomah County reveal a general linear growth pattern, as shown in Figure 8. Given this linear pattern, a commonly used forecasting method is a linear trendline, which is a best-fit straight line through a series of historical data points (regression analysis). The trendline shown in Figure 8 is based on 1979-2008 annual employment data, representing county peak-to-peak data periods of the last three business cycles. A trendline is most reliable when its R-squared value is at or near 1, and this trendline results in a generally close-fit R-squared value of .85. The years when actual employment levels varied most from the trendline resulted particularly from the employment fluctuations of short-term business cycles.

**Figure 8. Multnomah County Employment Trendline, 1979-2035**

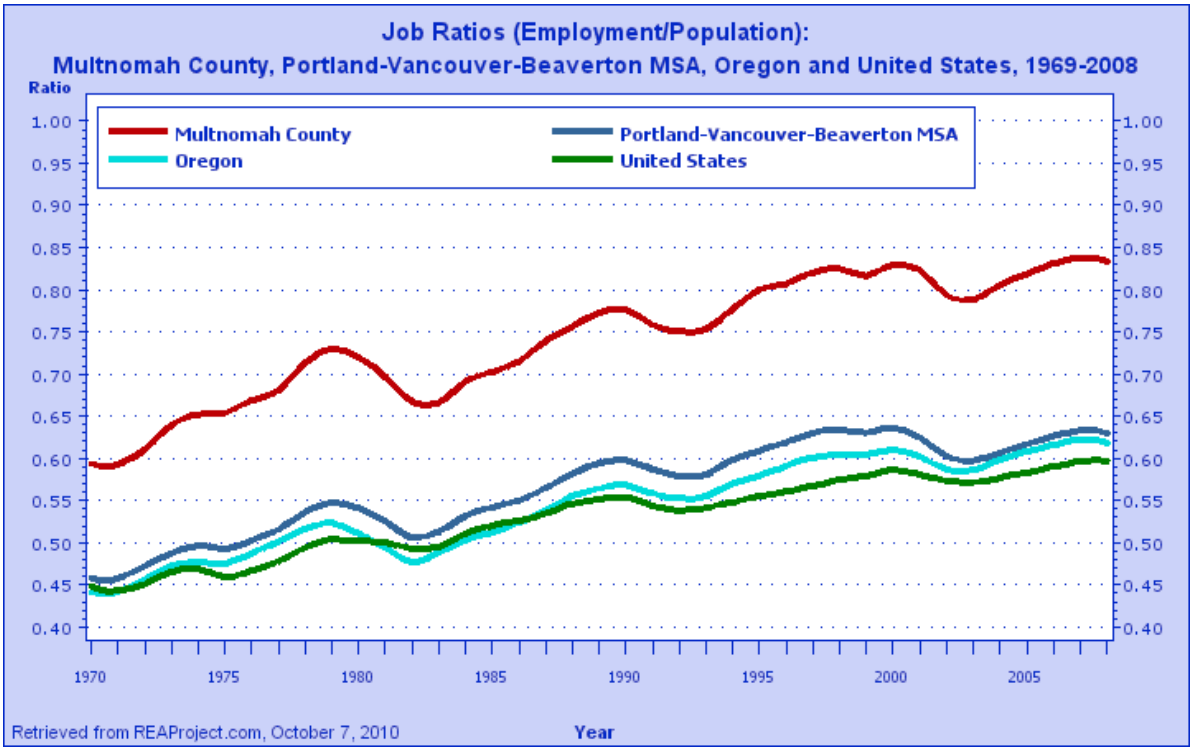



Source: Bureau of Planning and Sustainability from Oregon Employment Department QCEW data.

If Multnomah County's long-term linear job growth pattern continues along this trendline, 184,000 new countywide jobs will be added between 2010 and 2035, which reflects a 34% county capture rate of new PMSA Covered Employment in this forecast period. In 2008, the City of Portland accounted for 87% of Multnomah County employment, up from 86% in 2000. Assuming a slightly declining city share of county jobs over time, estimated at 82% of new Multnomah County jobs from 2010 to 2035, the trendline in Figure 8 indicates that 151,000 new Portland jobs will be added in the forecast period. This growth level would represent a 28% city capture rate of PMSA job growth to 2035.

Employment trends are also linked to population trends at the regional level, but Multnomah County has long been a job center in the region and has substantially more jobs than resident workers, such as shown on the following graph.

## Figure 9. Employment-to-Population Job Ratios




Source: Oregon Regional Economic Analysis Project from U.S. Bureau of Labor Statistics data.

Geocoded (mapped) employment data is available for 2000 and 2008, allowing a review both of citywide and sub-city employment trends. This employment dataset is based on jobs covered by unemployment insurance, which generally equates to an estimated 85% of the total workforce.

### 2008-2013 Employment Trends

In 2013, there were 393,742 covered jobs in Portland, equivalent to 38% of the 1.02 million employment base of the 7-county PMSA. Since 2000, employment in Portland has fluctuated substantially. Analysis of recent City employment trends in this report focuses on the 2000-2008 period, because it is the most recent complete business-cycle. However, the 2000-2008 business cycle was a period of unusually slow job growth, averaging 0.1% annual growth in Portland, 0.8% in the 7-county metro region, and 0.5% nationally. However, the pace of job growth in the 2008-2013 period has already exceeded the previous business cycle, averaging 1.3% per year in Portland and 1.4% in the region. Despite the depth of job losses during the great recession (2008-2010), the city and region have since led the state's economic recovery. Portland had a nearly flat 5% capture rate of regional growth during the sluggish 2000-2008 business cycle and then rebounded to 23% in the 2008-2013 period.

## 2000-08 Employment by Sectors

Figure 10 reports employment at the detailed sector level with the 2008 distribution and net change both in terms of numerical change and annual average growth rate (AAGR). Throughout the remainder of the report, employment sectors are aggregated to broader categories to provide a more manageable amount of information.

### Figure 10. Portland Citywide Employment (2000-2008)

| | NAICS | | 2000 | 2008 | 2008 Distrib. | Change Net | AAGR |
|---|---|---|---|---|---|---|---|
| Industrial | 11 | Agriculture | 180 | 210 | 0% | 30 | 1.9% |
| | 22 | Utilities | 3,960 | 2,580 | 1% | (1,380) | -5.2% |
| | 23 | Construction | 19,840 | 18,380 | 5% | (1,460) | -1.0% |
| | 31 | Man: food, textile, apparel | 5,990 | 5,800 | 1% | (190) | -0.4% |
| | 32 | Man: wood, petrol, chemicals | 9,120 | 6,740 | 2% | (2,380) | -3.7% |
| | 33 | Man: metal, machine, computer | 24,670 | 17,800 | 5% | (6,870) | -4.0% |
| | | *Manufacturing subtotal* | *39,780* | *30,340* | 8% | *(9,440)* | *-3.3%* |
| | 42 | Wholesale Trade | 25,510 | 20,380 | 5% | (5,130) | -2.8% |
| | 48 | Transportation | 19,770 | 15,650 | 4% | (4,120) | -2.9% |
| | 49 | Transport & Warehousing | 9,160 | 8,010 | 2% | (1,150) | -1.7% |
| | | *Industrial subtotal (21-42, 48,49)* | *118,200* | *95,550* | *24%* | *(22,650)* | *-2.6%* |
| Retail | 44 | Retail | 22,130 | 22,200 | 6% | 70 | 0.0% |
| | 45 | Retail: Dept, misc. | 14,940 | 10,830 | 3% | (4,110) | -3.9% |
| | | *Retail subtotal (44,45)* | *37,070* | *33,030* | *8%* | *(4,040)* | *-1.4%* |
| Services | 51 | Information | 12,350 | 11,570 | 3% | (780) | -0.8% |
| | 52 | Finance & Insurance | 21,390 | 18,810 | 5% | (2,580) | -1.6% |
| | 53 | Real Estate | 9,870 | 8,580 | 2% | (1,290) | -1.7% |
| | 54 | Prof., Scientific, Tech Services | 25,530 | 27,200 | 7% | 1,670 | 0.8% |
| | 55 | Management | 6,820 | 14,590 | 4% | 7,770 | 10.0% |
| | 56 | Admin Support, Waste | 14,020 | 21,770 | 6% | 7,750 | 5.7% |
| | 61 | Education | 29,640 | 35,510 | 9% | 5,870 | 2.3% |
| | 62 | Health & Social Asst. | 40,960 | 49,150 | 13% | 8,190 | 2.3% |
| | 71 | Arts, Enter., Recreation | 6,200 | 6,280 | 2% | 80 | 0.2% |
| | 72 | Accommodation & Food | 30,410 | 35,770 | 9% | 5,360 | 2.0% |
| | 81 | Other Services | 17,190 | 17,210 | 4% | 20 | 0.0% |
| | | *Service subtotal (51-81)* | *214,380* | *246,440* | *63%* | *32,060* | *1.8%* |
| Public | 92 | Public Administration | 17,110 | 17,500 | 4% | 390 | 0.3% |
| Other | 99 | Unclassified? | 2,760 | 120 | 0% | (2,640) | -32.4% |
| | | Total | 389,520 | 392,640 | 100% | 3,120 | 0.1% |

Source: Oregon Employment Department, E. D. Hovee & Company, LLC. Employment in all categories has been rounded to the nearest 10 employees.

## Observations

The 2000-2008 time period corresponds to the most recent complete economic cycle of the region and nation, representing a peak-to-peak period in Multnomah County employment. This has been a period of economic downturn early in the decade, followed by rebounding job growth through mid-decade and then substantial job losses with the recession after 2008.

Consequently, for the entire 2000-08 time period, job growth was experienced at relatively low rates for the city as well as for the state and nation, certainly in comparison with the prior decade of the 1990s:

- Within the City of Portland, post-2000 job growth has occurred at a rate of just 0.1% annually. Oregon's statewide growth rate post-2000 was at 0.8% per year, comparable to a similar growth rate in both non-farm and covered employment for the 7-county metro area (PMSA) over the same time period.
- Over this time period, Portland captured only about 5% of the net job growth in the region, a pattern of performance better than that of Multnomah County but well below city and county rates of job growth capture in prior decades.
- As of 2008, the City of Portland reported about 392,640 covered jobs, representing 38% of the 1.02 million employment base of the 7-county PMSA. This represents a relatively nominal increase of about 3,120 jobs over a six year period in Portland. Job declines are reported across multiple sectors, including every industrial sector for which data is provided.
- Taken together, the industrial sectors report job declines averaging 2.6% per year over the eight year period (for a combined loss of 22,650 jobs), despite a brief resurgence experienced mid-decade. There was a somewhat more rapid shift away from manufacturing employment – a subset of the overall industrial sector – of 3.3% annually, equating to a total loss of 9,440 manufacturing jobs over the 2000-2008 period. It is notable, however, that the Portland region lost a smaller share of its manufacturing jobs that the nation as a whole did. In addition, the value of manufacturing output rose by more than $9 billion for the 7-county region (Figure 23). The region's manufacturing sector is growing, but is becoming less labor intensive.
- Over this eight year period, retail employment in Portland changed little – with a nominal gain of about 70 jobs.
- The growth sectors – strong enough to more than offset industrial job losses – occurred across service sectors. The sector showing the strongest growth was health and social assistance (up by 8,190 jobs), followed by management, administrative support and waste management, education, accommodation and food, and professional/scientific/technical services – with minor gains noted for arts, entertainment and recreation.
- A major portion of the growth occurring within the administrative support sector has been for temporary employment agencies. While reported with this NAICS job classification, temporary employees actually may be placed in any sector and also likely serve to offset at least some portion of the reported industrial employment decline. Also noted is that much of the growth in the management sector is likely related to business sector reclassifications with new NAICS coding coming into place between 2000 and 2008.

- Not all service sectors experienced employment growth over the past decade. Loss of 2,580 jobs is indicated through 2008 for finance and insurance, with job losses also noted for the real estate and information sectors. [3]

## Data Limitations

While the Quarterly Census of Employment and Wages or QCEW (also known as ES202) data is the most comprehensive and timely source available, there are at least two important data limitations, as they may affect the portrayal of job change over time: [4]

1) Employment has been parceled out to sites for employers with multiple sites, and this process may be more or less accurate in one of the two years for which data is drawn (with a tendency towards greater accuracy in more recent years).
2) Inconsistent NAICS classification by individual firms within the two comparison years, as industry classification largely represents self-reporting by firms to the Oregon Employment Department (OED).

A second set of issues related to changing employment classification is perhaps of greater concern:

- National changeover from the Standard Industrial Classification (SIC) to North American Industry Classification System (NAICS) occurred between 2000 and 2008, leading to new classifications and an inexact bridge between the two systems.
- The net result of this change in classification systems has been to accentuate a reported shift away from the industrial sectors, as the newly added service sectors of management of companies and information both encompass firms that often were previously classified as industrial. It is unknown exactly what portion of the shift away from what is reported manufacturing is attributable to the new NAICS system.
- There is also a trend toward companies reporting more than one NAICS, with a separate NAICS assigned to groups of employees. It is likely that this greater detail has led to the reported jump in employment within the NAICS category "management of companies". This trend results in a shift away from the industrial sectors, as employment appears to be increasingly split between a company's "primary" industry (e.g. warehousing, manufacturing) and other classifications (such as management or headquarters operations), which falls within the service sectors.
- Companies self-report NAICS, and sometimes are inconsistent over time.

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[3] The Information sector was established with the transition from the Standard Industrial Classification (SIC) to North American Industry Classification System (NAICS) from what were a mix of industrial and service components.

[4] Alternative data sources include the Covered Employment Statistics, a sample survey-based time series that is adjusted to match ES 202 data, and the Economic Census, completed once every five years (with a several year lag before data release and not available at a sub-regional level).

Because of these issues, sector-level changes (for instance, the reported decline in manufacturing jobs and increase in service jobs) are best understood as shifts in the nature of the region's employment rather than necessarily as job growth or decline within individual firms. Employment data should also be viewed as most reliable when summed within a geographic subarea or to broad sector groupings, rather than when detailed sector-level data is compared over time.[5]

## PORTLAND EMPLOYMENT GEOGRAPHIES

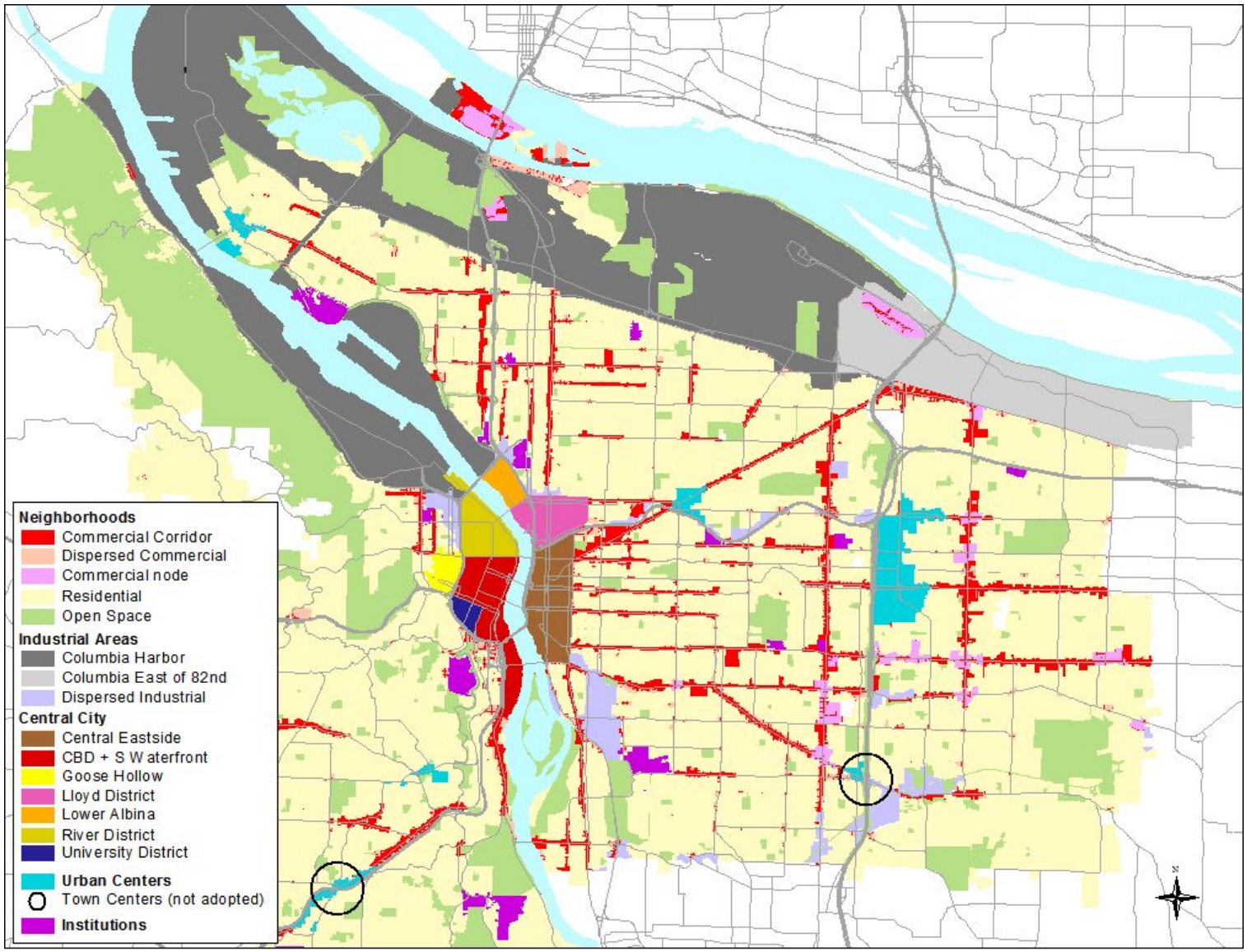
This section includes an analysis of Portland employment areas at a finer level of detail – geographic subareas that group together similar employment uses with common site characteristics and development patterns (Figures 8 and 9). Subareas are broadly grouped into categories of Central City, industrial, neighborhood commercial, institutional, and residential categories.

[5] The reliability of sector comparisons over time should also improve in the future, as more years of data and experience with the NAICS classification system take place. This will especially be the case when it is not as important to provide time series comparison with the 2000-2002 time period when much of the SIC to NAICS changeover occurred.

## Figure 8. Employment Geographies

| Subarea | Boundary Methodology |
|---|---|
| **Central City Commercial** | |
| CBD + South Waterfront | Central City Plan District subareas |
| University District | Central City Plan District subarea |
| River District | Central City Plan District subarea |
| Goose Hollow | Central City Plan District subarea |
| Lloyd District | Central City Plan District subarea |
| **Central City Industrial/ Incubator** | |
| Central Eastside | Central City Plan District subarea |
| Lower Albina | Central City Plan District subarea |
| **Urban Centers** | |
| Hillsdale Town Center | Plan District |
| Hollywood Town Center | Plan District |
| St. Johns Town Center | Plan District |
| Gateway Regional Center | Plan District |
| Lents Town Center | |
| West Portland Town Center | |
| **Industrial Areas** | |
| Harbor & Airport Districts | Industrial Sanctuary + adjacent ME comp plan designation |
| Harbor Access Lands | |
| Columbia East of 82nd | Industrial Sanctuary + adjacent ME comp plan designation east of 82nd |
| Dispersed Employment | Dispersed IS + ME comp plan designations |
| **Neighborhood Commercial** | |
| Commercial Corridors | Commercial corridors designated by BPS |
| Commercial Nodes | Tax lots surrounding key commercial intersections identified by BPS |
| Dispersed Commercial | Other tax lots in commercial zoning (auto-oriented, storefront or mixed employment) |
| **Institutions** | 10 colleges and 7 hospitals with campus areas larger than 10 acres and more than 100 employees, except for Portland State University, which is included in the Central City's University District; and the Adventist Medical Center, which is included in Gateway Regional Center |

## Figure 9. Portland Geographic Subareas

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### *Trend Observations by Employment Geography*

Major observations from each employment geography are summarized below. As noted, submarkets are defined for each of the major employment geographies of Central City, urban centers, institutions, industrial, neighborhood commercial, and residential/open space employment activity. Added discussion of employment sector changes within geographies and accompanying graphs are located within the Demand Analysis – Data Assessment Topics section of this report.

- With 107,600 jobs, the **Central City Commercial** geography encompassed 27% of the city's job base in 2008. With a 0.1% average annual growth rate between 2000-2008, employment increased at about the same rate as employment increased citywide over the same time period.

  With nearly 66,400 jobs, the CBD + South Waterfront not surprisingly comprises the largest Central City subarea, although this core submarket experienced a loss of an estimated 3,100 jobs from 2000-08. The most rapid job growth occurred within the River District submarket (up by 2.1% per year), followed by the Lloyd District.

  Two Central City subdistricts – Central Eastside and Lower Albina – are included within the Central City Industrial/Incubator geography. These are often referred to as "incubator" rather than general industrial districts and have out-performed the overall Central City area with annual job gains of 3.2% and 2.3% per year respectively.
- **Urban centers** comprised just 5% of citywide employment in 2008 and experienced job growth averaging 1.4% per year. Of the six urban center submarkets profiled, Gateway has the largest employment base with about 9,500, followed by Hollywood at 6,500 and West Portland at 2,600.

  The highest levels of employment growth since 2000 are indicated for Hollywood and Lents Town Center, both averaging employment gains of better than 5% per year. Gateway also experienced employment growth, but at a much lower growth rate. The other urban centers experienced relatively flat to declining employment.
- **Institutions,** excluding PSU and Adventist Hospital, accounted for over 35,200 jobs in 2008 (nearly 9% of citywide employment), with job growth averaging 3.6% from 2000-08.
- **Industrial** areas comprise a total of 119,500 jobs (or better than 30% of employment citywide). Overall job growth has occurred at about the citywide average of 0.1% per year but with wide variation between districts.

  With more than 52,200 employees, the Harbor and Airport Districts geography accounts for more than two-fifths (44%) of the industrial total (or 13% of all employment citywide). The Columbia Corridor East of NE 82nd Avenue accounts for more than 19,400 jobs with Dispersed Employment at 17,200. The two Central City Industrial (or incubator) districts account for 18,000 and 3,300 jobs respectively.

  Harbor and Airport Districts report some job loss averaging less than 1% per year, with even more rapid attrition for Dispersed Employment. Job gains of close to 3% per year are noted for Columbia East of 82nd. Employment has increased 0.1% per year in all the

industrial areas combined. As noted, both the Central City incubator districts have experienced employment gains.

**Harbor Access Lands** are riverfront industrial lands in the Portland Harbor and along the Columbia River. As of 2008, Harbor Access Lands accounted for an estimated 9,300 jobs. From 2000-08, Harbor Access Lands experienced declining employment at a rate averaging 2.2% per year – a substantially more rapid rate of job loss than of the Harbor and Airport Districts geography. Reported employment losses were most substantial in manufacturing, followed by transportation, warehousing and wholesale trade. It is notable that a separate analysis indicates that the economic output (value added) in the Portland Harbor grew at 1.6% per year during approximately the same timeframe - 2002 to 2008. During that same time period, cargo volumes increased by 4.8% per year.[6] As discussed later in this report, employment may not be the best indicator of land needs in the harbor.

- With 70,400 jobs or 18% of citywide employment, the **neighborhood commercial** geography has experienced net job loss since 2000. Of the neighborhood-related employment activity, nearly 56% of jobs are indicated as located in Commercial Corridors, followed by Dispersed Commercial. Commercial Corridors account for the largest base of neighborhood activity with just over 39,000 jobs but lost jobs at a rate averaging 1.5% per year. Commercial Nodes (about 20 key intersections) supported 9,600 jobs in 2008 or 14% of the neighborhood-related jobs total. Taken together, neighborhood commercial areas experienced a net loss of 1,900 employees from 2000 to 2008 – coming primarily from reduced employment in Commercial Corridors. Job losses are noted for 6 out of 10 employment sectors, led by construction which decreased by more than 1,700 jobs. A countertrend is indicated for Dispersed Commercial, with close to 3,900 more jobs reported in 2008 than 2000.
- More than 38,900 jobs are reported for **residential** areas plus **open space.** The majority of these jobs are in residential areas which account for just under 10% of citywide employment. Job losses are exhibited in every employment sector, except public sector employment.

More detailed data for these submarkets is provided by the tables on the next two pages.

[6] EcoNorthwest, Portland Harbor Industrial Land Supply Analysis, February 2012)

## Figure 10. Urban Centers & Institutions Employment (2000-2008)

| | Central City - Non Industrial | | | | | Urban Centers | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CBD + S Waterfront | University District | River District | Goose Hollow | Lloyd District | Gateway | Hollywood | St Johns | Hillsdale | Lents | West Portland | Institutions |
| **Total Employment 2008** | | | | | | | | | | | | |
| Utilities | 26 | - | * | - | * | * | - | - | - | - | - | - |
| Construction | 682 | - | 900 | 268 | 61 | 118 | 36 | 89 | * | 34 | 194 | * |
| Manufacturing | 275 | * | 481 | * | * | 150 | * | * | * | * | * | - |
| Trans, Wareh. & Whlsle | 800 | * | 2,478 | 24 | 341 | 242 | 46 | 95 | 5 | * | 36 | * |
| Retail, Arts, Accommod. | 11,033 | 353 | 4,337 | 1,935 | 5,616 | 2,705 | 950 | 388 | 286 | 89 | 292 | 353 |
| Services | 30,496 | 341 | 3,319 | 1,079 | 6,000 | 1,403 | 589 | 335 | 135 | 102 | 1,584 | 132 |
| Information & Design | 11,937 | * | 2,569 | 645 | 1,020 | * | 140 | 36 | 33 | - | 189 | 153 |
| Education + Health | 3,241 | * | 1,066 | 272 | 819 | 4,187 | 4,733 | 142 | 254 | 56 | 291 | 34,575 |
| Public | 7,740 | 182 | 95 | - | 1,684 | 487 | * | * | - | * | * | - |
| Other/No NAICS | 11 | - | 2 | - | 4 | 1 | - | - | - | - | - | 1 |
| Total | 66,365 | 3,925 | 16,162 | 4,444 | 16,704 | 9,514 | 6,513 | 1,313 | 742 | 324 | 2,605 | 35,234 |
| *2008 Distribution* | *16.9%* | *1.0%* | *4.1%* | *1.1%* | *4.3%* | *2.4%* | *1.7%* | *0.3%* | *0.2%* | *0.1%* | *0.7%* | *9.0%* |
| **Employment Change 2000-2008** | | | | | | | | | | | | |
| Utilities | (474) | - | * | - | (799) | - | - | - | - | - | * | - |
| Construction | (1,230) | (9) | 787 | 10 | (87) | (29) | (66) | 23 | 4 | 12 | 140 | 1 |
| Manufacturing | (576) | (26) | (672) | (186) | (39) | (13) | (25) | (3) | 14 | * | 2 | - |
| Trans, Wareh. & Whlsle | (1,039) | (8) | (2,495) | (139) | (435) | (628) | (22) | (64) | (27) | * | (98) | * |
| Retail, Arts, Accommod. | (592) | 132 | 1,986 | 382 | 465 | 51 | 395 | (50) | (133) | (11) | 30 | 155 |
| Services | 1,732 | (184) | 1,538 | (158) | 2,672 | (42) | (232) | 120 | 24 | 45 | (509) | 36 |
| Information & Design | (20) | * | 825 | (71) | 13 | (124) | 75 | 6 | (29) | - | (70) | (264) |
| Education + Health | 635 | 222 | 590 | (144) | (44) | 995 | 2,147 | 116 | (0) | 56 | 108 | 8,792 |
| Public | (1,243) | * | * | (797) | 346 | * | (5) | (133) | * | * | - | - |
| Other/No NAICS | (372) | (6) | (45) | (15) | (33) | (41) | (30) | (3) | (6) | - | (27) | (23) |
| Total | (3,098) | 255 | 2,527 | (1,119) | 2,059 | 380 | 2,237 | 12 | (168) | 105 | (429) | 8,710 |
| *2000 Distribution* | *17.8%* | *0.9%* | *3.5%* | *1.4%* | *3.8%* | *2.3%* | *1.1%* | *0.3%* | *0.2%* | *0.1%* | *0.8%* | *6.8%* |
| *00-08 Annual Growth* | *-0.6%* | *0.8%* | *2.1%* | *-2.8%* | *1.7%* | *0.5%* | *5.4%* | *0.1%* | *-2.5%* | *5.1%* | *-1.9%* | *3.6%* |
| **Employment Distribution 2008** | | | | | | | | | | | | |
| Utilities | 0% | 0% | 6% | 0% | 7% | 1% | 0% | 0% | 0% | 0% | 0% | 0% |
| Construction | 1% | 0% | 6% | 6% | 0% | 1% | 1% | 7% | 1% | 11% | 7% | 0% |
| Manufacturing | 0% | 0% | 3% | 5% | 0% | 2% | 0% | 2% | 3% | 2% | 0% | 0% |
| Trans, Wareh. & Whlsle | 1% | 1% | 15% | 1% | 2% | 3% | 1% | 7% | 1% | 0% | 1% | 0% |
| Retail, Arts, Accommod. | 17% | 9% | 27% | 44% | 34% | 28% | 15% | 30% | 39% | 27% | 11% | 1% |
| Services | 46% | 9% | 21% | 24% | 36% | 15% | 9% | 26% | 18% | 32% | 61% | 0% |
| Information & Design | 18% | 0% | 16% | 15% | 6% | 1% | 2% | 3% | 4% | 0% | 7% | 0% |
| Education + Health | 5% | 77% | 7% | 6% | 5% | 44% | 73% | 11% | 34% | 17% | 11% | 98% |
| Public | 12% | 5% | 1% | 0% | 10% | 5% | 0% | 16% | 0% | 11% | 1% | 0% |
| Other/No NAICS | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

Source: Oregon Employment Department (OED), Portland Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.
Agricultural jobs are not detailed. Asterisks (*) denote data not disclosed to meet OED confidentiality provisions.

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## Figure 11. Industrial Areas & Neighborhood Employment (2000-2008)

| | Non-Central City Industrial | | | | Central City Industrial | | Neighborhoods | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Harbor & Airport Districts | Harbor Access Lands | Columbia East | Dispersed Employment | Central Eastside | Lower Ablina | Commercial Corridor | Commercial Nodes | Dispersed Commercial | Residential |
| **Total Employment 2008** | | | | | | | | | | |
| Utilities | * | - | - | * | - | - | - | * | - | * |
| Construction | 3,573 | 571 | 1,830 | 1,527 | 2,227 | 418 | 1,020 | 64 | 1,959 | 2,800 |
| Manufacturing | 11,752 | 4,828 | 3,743 | 3,186 | 2,056 | 343 | 1,342 | * | 1,110 | 740 |
| Trans, Wareh. & Whlsle | 22,334 | 2,605 | 4,686 | 2,260 | 3,577 | 314 | 1,589 | 80 | 828 | 1,651 |
| Retail, Arts, Accommod. | 4,388 | 67 | 2,786 | 1,552 | 3,126 | 189 | 18,756 | 6,863 | 5,601 | 3,407 |
| Services | 7,257 | 1,186 | 3,606 | 6,017 | 3,118 | 191 | 8,966 | 1,511 | 5,052 | 7,494 |
| Information & Design | 1,127 | 9 | 888 | 1,484 | 1,406 | 101 | 2,383 | 154 | 3,160 | 2,277 |
| Education + Health | 849 | 54 | 559 | 696 | 1,659 | * | 4,881 | 621 | 3,690 | 17,501 |
| Public | 945 | - | 1,327 | * | 821 | * | 62 | 284 | * | 2,981 |
| Other/No NAICS | 2 | 1 | 4 | - | 2 | 2 | 25 | - | 13 | 49 |
| **Total** | **52,227** | **9,321** | **19,429** | **17,183** | **17,992** | **3,254** | **39,050** | **9,589** | **21,718** | **38,928** |
| *2008 Distribution* | *13.3%* | *2.4%* | *4.9%* | *4.4%* | *4.6%* | *0.8%* | *9.9%* | *2.4%* | *5.5%* | *9.9%* |
| **Employment Change 2000-2008** | | | | | | | | | | |
| Utilities | (15) | - | - | 7 | - | - | - | (15) | - | * |
| Construction | 520 | 250 | 714 | 186 | 772 | (160) | (1,347) | (60) | (323) | (1,586) |
| Manufacturing | (5,559) | (939) | (6) | 14 | (90) | (176) | (1,035) | (25) | 665 | (773) |
| Trans, Wareh. & Whlsle | (1,094) | (1,124) | 1,045 | (3,267) | (217) | (25) | (297) | (341) | (5) | (133) |
| Retail, Arts, Accommod. | 425 | (450) | 12 | (1,691) | 608 | 23 | (1,216) | (21) | 1,825 | (944) |
| Services | 2,372 | 399 | 1,261 | 2,287 | 957 | 163 | (148) | 133 | 455 | (2,073) |
| Information & Design | (2) | (102) | 318 | 313 | 930 | 69 | (72) | (113) | 660 | (601) |
| Education + Health | 36 | 42 | 236 | (173) | 5 | 429 | (434) | 14 | 966 | (537) |
| Public | 706 | * | 473 | (437) | 821 | * | (140) | * | (218) | 492 |
| Other/No NAICS | (185) | (23) | (75) | (88) | (82) | (7) | (432) | (46) | (180) | (918) |
| **Total** | **(2,796)** | **(1,977)** | **3,944** | **(2,849)** | **3,703** | **502** | **(5,132)** | **(576)** | **3,853** | **(7,078)** |
| *2000 Distribution* | *14.1%* | *2.9%* | *4.0%* | *4.9%* | *3.7%* | *0.4%* | *11.3%* | *2.5%* | *4.5%* | *11.8%* |
| *00-08 Annual Growth* | *-0.6%* | *-2.2%* | *3.2%* | *-1.8%* | *3.2%* | *2.3%* | *-1.5%* | *-0.7%* | *2.7%* | *-1.9%* |
| **Employment Distribution 2008** | | | | | | | | | | |
| Utilities | 0% | 0% | 0% | 2% | 0% | 0% | 0% | 0% | 0% | 0% |
| Construction | 7% | 6% | 9% | 9% | 12% | 13% | 3% | 1% | 9% | 7% |
| Manufacturing | 23% | 52% | 19% | 19% | 11% | 11% | 3% | 0% | 5% | 2% |
| Trans, Wareh. & Whlsle | 43% | 28% | 24% | 13% | 20% | 10% | 4% | 1% | 4% | 4% |
| Retail, Arts, Accommod. | 8% | 1% | 14% | 9% | 17% | 6% | 48% | 72% | 26% | 9% |
| Services | 14% | 13% | 19% | 35% | 17% | 6% | 23% | 16% | 23% | 19% |
| Information & Design | 2% | 0% | 5% | 9% | 8% | 3% | 6% | 2% | 15% | 6% |
| Education + Health | 2% | 1% | 3% | 4% | 9% | 46% | 12% | 6% | 17% | 45% |
| Public | 2% | 0% | 7% | 1% | 5% | 6% | 0% | 3% | 1% | 8% |
| Other/No NAICS | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| **Total** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** |

Source: Oregon Employment Department (OED), Portland Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.
Agricultural jobs are not detailed. Asterisks (*) denote data not disclosed to meet OED confidentiality provisions.

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# IV. DEMAND ANALYSIS ISSUES – FOCUS GROUP INPUT

A key component of this economic opportunities analysis has centered on six *demand analysis topics* of particular interest to the City of Portland with this EOA and Comprehensive Plan update. To assist with this assessment, focus groups were organized and conducted in 2009 to cover each topic area, with each group hosted by a business or community organization:

- *Central City Office* – hosted by the Portland Business Alliance
- *Close-In Incubator* – hosted by the Central Eastside Industrial Council
- *Manufacturing & Distribution* – hosted by the Columbia Corridor Association
- *Neighborhood Commercial* – hosted by the Alliance of Portland Neighborhood Business Associations
- *Commercial Corridor/Mixed Use/Transit Oriented Development (TOD)* – hosted by the Portland Streetcar, Inc.
- *Campus Institutional* – hosted by the Institutional Facilities Coalition

A total of 58 business and non-profit organization representatives participated in these six focus groups (including two who participated in two sessions). Participants are identified in Appendix A.

Focus group discussions covered recent and emerging trends, business space and location needs, questions regarding density and development, opportunities for economic prosperity and creative vitality, and economic development focus. This summary of focus group results has been organized around major themes that emerged across multiple groups in response to specific topic areas. The comments are reported without attribution of comments to specific individuals or organizations.

A separate report provides more detailed discussion of items of more particular interest within each of these six areas of demand analysis groupings (Appendix B).

## SUMMARY THEMES BY DEMAND TOPIC

To summarize, Figure 15 provides an overview of major observations for each of the six demand analysis groupings covered. This chart is followed by a more detailed narrative describing focus group responses for each of the demand topics in more detail.

## Figure 12. Focus Group Themes by Demand Topics

| Discussion Question | Central City Office | Close In Incubator | Manufacturing & Distribution | Neighborhood Commercial | TOD/Mixed Use Corridors | Campus Institutional |
|---|---|---|---|---|---|---|
| **Recent Trends** | •Resurgent Central City office leasing has been realized (until the recession)<br>•Tenants are drawn back in from the suburbs<br>•Live-work options create added urban synergy | •Districts like Central Eastside are *on a roll* for diverse industry plus creative and tech oriented business<br>•Close-in incubator space offers *grittier appeal* to young creatives | •Finding qualified labor and distance from U.S. markets are major industry issues<br>•De-consolidation of distribution nationally with higher fuel prices works to Portland business advantage | •Neighborhood districts are finding their niche<br>•Growth is organic and entrepreneurial<br>•Business success depends on serving a mix of local and destination clientele | •Retail opportunity is driven by more residents moving back to the city<br>•Diverse mixed use settings are available – Central City, mid-rise transit corridors, distinctive urban neighborhoods | •Regional institutions are investing in facility renewal to remain competitive<br>•Locally oriented education and health care are moving closer to where clientele live or work |
| **Emerging Trends** | •Office market is becoming more diverse with entrepreneurial and sustainable business emphases<br>•Central City has greater potential to increase its capture of the regional office market | •Businesses are *hyper-local,* serving each other and the downtown<br>•A mix of business, from industrial to arts and dining, is supported<br>•Desire is expressed for incubator needs to evolve naturally and organically | •Businesses draw needed labor both locally and nationally<br>•There is a broad trend to sustainable design and business practices<br>•A major concern is that freight transport capacity is not keeping up | •Increased area residential density is anticipated, but more infrastructure is needed<br>•Increased orientation to the concept of a *20-minute neighborhood* is strongly endorsed | •Further intensification of development is expected with economic recovery<br>•Successful TOD is all about reducing vehicle miles traveled (VMT) and location efficient development | •Locally-oriented education providers are decentralizing<br>•Strong health care growth is expected to continue<br>•Increased transit orientation of institutions is more critical with facility investment |
| **Business Space & Location Needs** | •New and alternate office locations are desired, especially close to the core<br>•The *life cycle* of each business means changing choices over time for type and cost of space, for a more diverse office mix | •Options are desired for business condo arrangements and inexpensive space<br>•Permitting & SDCs are cited as recurring issues with rehab of existing building space | •Increased cost of doing business is cited as a growing competitive concern for the Portland area<br>•Maintaining the industrial sanctuary is critical for manufacturing and distribution | •Participants are *bullish* on options for increasing business vitality<br>•More business tools/incentives together with robust planning for employment concentration are recommended | •More focus on job-related as well as residential mixed use development is encouraged<br>•A new City of Portland job density paradigm | •Current impact mitigation process and mixed use limitations frustrate reinvestment<br>•Affordable housing options are needed for students, faculty, workers |

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| Discussion Question | Central City Office | Close In Incubator | Manufacturing & Distribution | Neighborhood Commercial | TOD/Mixed Use Corridors | Campus Institutional |
|---|---|---|---|---|---|---|
| **Density & Redevelopment** | •Desired are options for added density (FAR) and multi-block campus developments<br>•A need is expressed to *think big enough* for greatly expanded jobs potential<br>•Improving the city's business climate is cited as a priority initiative | •Streetcar extension will be the impetus for added development density<br>•Multi-level manufacturing still exists, but widespread applicability is questionable<br>•Code flexibility is key to maintaining close-in industrial | •Industrial site and transport needs make it difficult to exceed 35% site coverage (or FAR)<br>•Distributors build *high-cube* space to get more product in the same building footprint<br>•Requiring too much density may result in business leaving Portland | •Support for more housing density is viewed as generating positive business impacts<br>•Rather than mandating commercial density, the suggestion is to *let density float* to what the market supports | •Density will come with transit service extension<br>•More emphasis is recommended for mixed use development with a strong jobs mix<br>•Live/work incubator opportunity is cited for as yet untapped resources (such as Gateway) | •More multi-story buildings are expected with medical; cautious interest is also expressed for higher education (out of downtown)<br>•Increased density of development is predicated on better transit accessibility and service |
| **Economic Prosperity & Creative Vitality** | •Portland's Central City is viewed as vital to defining the *PDX brand*<br>•PSU and housing are more important as future economic engines to Central City office vitality | •Incubator districts are integral for the centrality of a regional service supplier role<br>•Close in business offers local networking and technology transfer capability | •Recommended is emphasis on balancing goals of sustainability and job growth<br>•For Portland, sustainability can mean being both green and efficient | •Small business is described as the engine of the Portland economy<br>•For increased economic contribution, offer more training for small and ethnic firms | •Portland offers the appeal of a village environment<br>•Economic recovery depends on sustainability and greater emphasis to build *creative, tenacious minds* | •Expect institutions to remain critical as a major future job source<br>•Higher ed and health care play a more important role in cultivating Portland area health & vitality |
| **Economic Development Focus** | •Marketing Portland as a competitive place to do business<br>•Prioritize public investment in infrastructure and zoning flexibility | •Foster private investment in businesses, not just buildings<br>•Restore the linkage between the City and private sector | •Prioritize multi-modal freight and worker transport infrastructure<br>•Provide balanced support for industry with traded sector focus | •Offer improved access to resources for small business<br>•Plan for change with less emphasis on mandates | •Foster creativity and job density on transit corridors<br>•Re-tool the planning and zoning process<br>•Build the urban university | •Recognized and support institutional contributions<br>•Transition from regulatory emphasis to partnership roles |

Source: Economic Opportunity Analysis focus groups conducted February-March, 2009.

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## RECENT TRENDS

Each focus group session began with the question: *What are the most important trends that have affected business, investment and development for your firm or organization over the past 3-5 years?*

Portland had been a dynamic place to be conducting business up to the point of the economic downturn starting in 2007-08. Major themes emerging from the six focus group conversations include the following:

- *Central City* office has, in recent years, experienced a resurgence of leasing activity (with the economic downturn only recently beginning to be felt). Some tenants have been drawn back in from the suburbs by the vitality and transit accessibility of the urban core, Portland is attracting and growing the sustainability industry, and the core area has benefited from the synergy of providing options for housing and work in close proximity.
- *Close-in incubator* areas (notably Central Eastside) have also been on a roll – but in a "grittier, more Portland" setting that is now home to businesses ranging from open source tech to distributors/brokers to destination retail. How to accommodate parking and diverse freight versus people transit is cited as the #1 issue. Bus and bike access is ever more important.
- *Manufacturing and distribution* firms of Portland's harbor and Columbia Corridor have found that obtaining qualified workers is a growing challenge, even in a time of economic downturn. The Pacific Northwest is still a small market; getting to market is a competitive challenge and competitors are primarily out of state. Distribution may be deconsolidating to more and smaller centers across the U.S., offering added market activity for Portland.
- *Neighborhood business districts* are finding their niche and for some (like the Pearl and Mississippi) the niche has rapidly matured. Portland is still "under-retailed, national chains want in." Much of the city's neighborhood business development has taken off on its own. The "coolest stuff is organic," responding to local entrepreneurial initiative and often "happened in spite of government." While businesses often start by serving a primarily local neighborhood clientele, success means that customers increasingly are "not from the neighborhood itself" but also drawn from the rest of the city and region.
- *Mixed use/TOD* discussion paralleled much of what was heard with neighborhood business districts. From empty nesters to young professionals, people are coming "back to the city." Portland's resurgence is based on residents "coming for character and texture" with diverse options ranging from high-rise Central City districts to mid-rise transit corridors to distinctive urban neighborhoods. "More rooftops" with greater discretionary income has served to drive much of the growth with in-city retail and dining – at least up to the time of the recession.
- *Campus institutional* activities are identified as primarily including education and medical institutions (outside Portland's Central City). Some nationally recognized education institutions in Portland face substantial reinvestment aimed at "renewal of facilities" to better meet science and technology needs and house more students (or faculty) on or near campus.

Locally oriented higher education institutions are increasingly focused on training for specific workforce needs – from nursing to welding – and look for locations and partnerships to get closer to the neighborhoods where the students are or will be. Similarly, medical institutions are looking to medium and smaller size facilities closer to where people live or work (including preparation for an aging demographic).

## EMERGING TRENDS

The next question asked participants to look toward the future: *What do you see on the horizon as potentially important emerging trends for employment growth or change?* Participants were asked to comment on the next 3-5 years through a period of recovery from the current economic downturn and then beyond over the next 10-25 years (to 2035).

From virtually every group, the overarching theme is one of change. Portland's economic opportunities can be expected to be different in 2035 than they are today. Even as of 2009, the outlook appeared promising, provided that economic recovery proves sustainable and that the City and region respond to shape this change in ways that keep Portland competitive for added investment and employment:

- *Central City office* specialists see the market becoming "more diverse" with increased emphasis on serving and stimulating business entrepreneurs, including those in the still expanding sustainability sector. Much of this need for lower cost and more flexible space is expected to be met on the fringes of or outside of the Central City, in places such as the Central Eastside and Gateway. Assuming that metro urban growth boundary expansions continue to be limited, the Central City and other Portland locations can be expected to compete for increasing shares of regional office employment. Resurgent commuter interest in transit dovetails with and buttresses this trend. As one focus group participant said: "Now we're going to have to perform."
- *Central Eastside/close-in incubator* interests express a wide range of thoughts. Some see more restaurants, craft businesses, theaters, and smaller 2-story infill. OMSI and some private owners have large multi-block holdings that could redevelop once land prices go high enough to support redevelopment. Some strongly suggested that the district should be supported as zoned.

  The assumption that manufacturing will go away to be replaced with the creative class "is flawed." Because of proximity to the rest of the Central City, vendors are "hyperlocal." Doing business with neighbors next door or across the river downtown is part of the business culture. A common theme expressed is to not pick business winners; rather let this incubator environment "evolve naturally and organically."
- *Manufacturing and distribution* focus group participants see continuing impetus to draw from both within and outside the Portland labor market for needed workforce skills and experience. More sustainable building design and business practices also are a priority – affecting stormwater management, air quality, transportation efficiency and internal heating, ventilation and air conditioning (HVAC) systems. A major concern is that freight transport capacity is not keeping up – due to rail networks operating at capacity and increased local freeway and street congestion.

- *Neighborhood business districts* see their communities generally becoming more densely developed with added planning to "identify necessary infrastructure" as an increasingly important focus. The concept of a "20-minute neighborhood" radius for walking to achieve a broad range of day-to-day needs is strongly endorsed. Much of what happens within these business districts depends on neighborhood demographics and housing development including anticipated trends for smaller houses.
- *Mixed use corridors and transit oriented development* can expect to intensify with economic recovery. As with neighborhood business districts, much of the development potentially can be expected to be residentially driven – at somewhat higher levels of density. For the next half century, TOD is about reducing vehicle miles traveled (VMT) – creating location efficient mixed use real estate opportunities.
- *Campus institutional* users see the need to think "more broadband" with more evening and weekend classes closer to where students live and/or work for work force oriented educators. Health care providers expect "tremendous growth" over the next five years and new partnerships with educational institutions.

  Access to public transportation is a shared objective, with many of the institutions not currently well served by transit. Students at local colleges want to be able to commute into downtown; others (such as nursing students) go all over the city for work experience and rely on auto travel. To the extent that transit mode share can increase, needs for expensive (and increasingly structured) parking can be reduced.

## BUSINESS SPACE & LOCATION NEEDS

This question and resulting discussion was aimed to better understand: *What are the most important requirements for business success at this type of location in Portland?*

Not surprisingly, space and location needs expressed through these focus group sessions were relatively diverse. However, common themes that emerged include opportunities for more mixed use and density with commercial-related uses versus strong desire for protection of more traditional manufacturing and distribution activity. More detailed notes follow:

- *Central city office* interests would like to seem more blocs of developable land – including at new or alternate locations close to the downtown core. For example, if the Vestas office project happens, it can be expected to draw added interest for office development to South Waterfront. Other opportunities may include sites at the edge of the River (Pearl) District and Central Eastside. EX employment or similar zoning is viewed as pivotal –offering a greater range of mid-rise development options. The Central Eastside (MLK to the waterfront) is cited as perhaps the "hottest market," Portland's new location for digital jobs.

  Incentives were discussed but not widely embraced for office development. Suggested instead: "Don't give me money, give me infrastructure."

  The life cycle of a business can involve several phases of space use – starting with funky, low cost creative space, transitioning (for some) to more traditional Class A office as the business matures. An emerging trend (not yet captured) in Portland is for business owned buildings, whether condo or stand-alone.

Proximity to work-force housing and residential amenities including schools is also seen as key to which office locations offer the best bets to prosper. One focus group participant put it this way: "if there were a decent elementary school, I'd be living (as well as working) in downtown Portland now."

- *Close-in incubator* focus group participants also cite the as-yet unmet opportunity for business condos. The ability to rehab a former warehouse as inexpensive shell space fits a definite tenant need; the Central Eastside can expect more success "if downtown fills up." Permitting and SDCs with reuse of existing space are cited as definite issues, to the point of keeping "Portland at a competitive disadvantage." Particularly problematic code issues cited include seismic retrofits, sidewalk standards, and needs for greater consistency and predictability in the permitting process.
- *Manufacturing and distribution* firms cite costs of doing business as a competitive concern with doing business in Portland. Costs include water/sewer rates and absence of performance based tax incentives for employers rather than for development. In the words of one participant: "Oregon doesn't even get the short look." Maintenance of the industrial sanctuary and limiting residential encroachment is viewed a pivotal – for reasons including maintenance of plant safety and security. Firms want a more solid and proactive message linked to work force opportunity in traditional industry: "We don't tell our story very well."
- *Neighborhood business district* participants are generally "bullish" on opportunities for increasing business vitality. Small business needs tools for storefront improvements and commercial development, tools to "really make our place special." PDC storefront loans and access to incentives/tax breaks are identified as desired. Interest is also expressed in a more "robust" planning process. A plan that is "set in stone doesn't work."
- *Mixed use and transit oriented development* should begin to focus more on employment as well as residential development potential. One focus group participant commented that employment policy is as crude today as housing policy in Portland once was – with not much changing since the 1980s. With this focus group, continuation of the current industrial sanctuary policy has been called into question. Recommended is that the City adapt to a paradigm for more concentrated employment.

  Noted as an example is computer chip manufacture in a multi-story setting in Hong Kong. Codes. Live/work development should be adapted to allow occupants to live "and/or" work on site as long as fire/life/safety requirements are met.
- *Campus institutional* users express frustration with the Impact Mitigation Plan (IMP) provisions of conditional use and/or institutional/residential zone requirements for project approval. Specifically cited as a concern limiting mixed use opportunity is the prohibition on commercial use in excess of 30% – a constraint on medical offices and/or on-site retail. Colleges are not an allowed in a commercial zone. Stated as a desire would be the creation of a higher education zone or perhaps a form-based code placing emphasis on characteristics and performance of development rather than use.

  Also noted is a desire for an affordable/workforce housing policy in conjunction with institutional uses. Suggested is City initiative for a more streamlined permitting process, perhaps offering a central point of contact for larger projects.

Portland's land use and permitting process received considerable discussion throughout all of the focus groups. Two themes of importance emerged: a) the desire for more flexibility to better respond to specific business or needs; and b) the desire for a more predictable and faster approval process. Recognizing that these two objectives can be in conflict with each other, one suggestion was to offer a two track approach: assurance of rapid-fire review and approvals for the standard project with the option for a very flexible but admittedly longer review process for the non-standard or pioneering application.

## DENSITY & REDEVELOPMENT

The City and metro area have placed increased emphasis on building up rather than out as a means to better realize objectives for community livability and containment of urban sprawl. The question posed is: *In terms of market and financial feasibility, how viable are (varied) options as possible priorities with the next update of Portland's Comprehensive Plan?*

Some group discussions were asked and/or addressed this question more directly than others. While opinions are varied, this topic received thoughtful discussion with regard to the practical implications and mechanisms for growing up rather than out:

- *Central City office* developers, brokers and businesses reported increased pressure to go up again – not just in the downtown core but elsewhere in the Central City and beyond. Old Town should be prepared for higher buildings, but getting transfers of development rights (TDRs) is a "hassle." Another stated need is for sites that could accommodate large employer campuses. In the words of one participant, "we don't think big enough." While incentives do not appear to generate broad support, there is interest in marketing and related initiatives to "make the business climate more appealing."

  For nearby districts like Central Eastside, something like a 4-5 story cap might make sense to assure that each office product serves a distinct market niche. Also identified as having longer term office development opportunity is Gateway, based on proximity to affordable workforce housing.
- *Close-in incubator* opportunities also exist for higher density, even possibly for some manufacturing uses. The Pratt and Larson tile company is cited as an example of a manufacturer operating on more than one floor. Firms may be more willing to do multi-level industrial if they can set up cost-effective systems to get the product in and out. Greater flexibility on city code requirements – as for seismic and sidewalk standards – would also be required. Streetcar extension is expected to provide further impetus for greater density of employment. More supportive infrastructure will be needed – perhaps with MOUs for City investment much as happened in the Pearl and South Waterfront areas.
- *Manufacturing and distribution* areas of the Portland Harbor and Columbia Corridor see it challenging to exceed 35% site coverage if functional on-site parking and transportation (freight handling) capacities are to be adequately provided. The concept of industrial density is termed an "oxymoron" by one participant. There is concern with industries getting land-locked if site use is pushed too far. However, some distribution firms are going to higher cube space with up to 40 foot ceilings and high-rack distribution systems.

As one participant said, if density "economically makes sense, industry will do it." However, pushing density and industrial prices too rapidly could cause some firms to relocate from the Portland area.

- *Neighborhood business district* representatives indicate support more nearby residential density to support continuing commercial revitalization. Rather than mandating commercial density of development, the suggestion is to "let density float" to what the market will support. Another suggestion: "Give corridors the highest degree of flexibility."
- *Mixed use and transit oriented development* interests express strong support for increased density of development along and near transit. Specifically emphasized was greater attention to increased employment as well as housing and retail with mixed use development. Areas of Portland like Macadam that were developed with low-rise suburban densities could go from FARs of 2:1 to 3-4:1. Gateway was seen as an as-yet untapped resource with similar density potential – described by one participant as perhaps the "nation's largest live/work" opportunity.
- *Campus institutional* participants also expressed interest in greater density of development, a phenomenon already occurring with medical facilities. Colleges have approached this topic more cautiously due to concerns over student, alumni and neighborhood appeal. However, interest was expressed in considering more height if it is not overly visible and accompanied by better transit service. As was indicated for one institution, the question is: how does one "build a six-story building in a neighborhood?"

## ECONOMIC PROSPERITY & CREATIVE VITALITY

As part of the Portland Plan process now underway, a critical issue and question is: *How can we position Portland in the world economy to remain a prosperous city, building on our competitive strengths and core values of equity and sustainability?*

This question was read verbatim in all of the 2009 focus group sessions. It is probably not surprising that each demand group can lay claim to its sector's importance to the future economic and creative vitality of the city and region. A key challenge for the plan updates may be how to harness these diverse activities into a coherent whole capable of enhancing Portland's economic prosperity and sustainability:

- *Central city office* participants noted that every healthy regional economy is accompanied by a strong Central City. What's more, the downtown, Pearl and SoWa are integral to the "Portland brand" – a city known for being comfortable, walkable and emphasizing quality of life. Enhancing the brand appeal requires strengthening the reputation of Portland State University as an "engine" of economic development.

  Also emphasized: "Get more mixed use downtown." Mixing in more residential with added building height and FAR capability is seen as pivotal to further strengthening of both retail and office competitiveness in Portland's Central City.
- *Close-in incubator* functions at the edge of the Central City are viewed as serving an integral economic role by facilitating the flow of goods and services citywide and regionally. Because it is increasingly challenging to pick the economic winners of the

next economic cycle, keep the district "malleable." In the words of another participant, because Portland does not have internationally tech education, "we are the sponge" providing the tech know-how and knowledge transfer capacity both in times of prosperity and even during the current downturn.

- *Manufacturing and distribution* firms of the Portland Harbor and Columbia Corridor place primary emphasis on balancing the twin goals of sustainability and added employment. Maintain the integrity of the industrial sanctuary; invest in the function of this area as the region's transportation and freight hub. A reminder: "Sustainability means more than green, it also means efficient."
- *Neighborhood business districts* see small business as the "engine" of the Portland economy – especially in a community that values quality of life as well as job growth. The public sector should be "more opportunity seeking." Rather than competing for large employees in a globally incentivized market, focus on a different strategy emphasizing training for small business. To contribute more, small business needs strengthened advocacy – both mainstream and especially ethnic firms.
- *Mixed use and transit oriented* development is pointing the way in Portland to a greener and more prosperous economic future. One focus group participant said that this is "one of the few places in the U.S. to be sustainable." Another observed that: "People want back into the village environment." And this: "Portland – we're more of a brand than we think we are."

  In the absence of major economic drivers, the region has no clear idea how people employ themselves today – the "market is always ahead of us." The composition of the economy is likely to be totally different again in 20 years – in ways that are as yet not readily determined. While a lower level of economic activity might be expected for much of the next decade, the region will be healthy again in 10 years if it emphasizes "creative, tenacious minds." Encourage industry to be more sustainable – looking for green opportunities not only in design but also business operations.
- *Institutional* uses are expected to be "critical" as an increasingly important source of employment in the future. Higher education and health care together play an increasingly important role in cultivating community health and vitality – both with an aging population and as a source of drawing new talent into Portland. Institutions are also proving to be leaders with green design – increasingly committed to achieving LEED standards with new buildings.

## ECONOMIC DEVELOPMENT FOCUS

The final question asked was intended as a means to recap and summarize the focus group sessions: *What do you see as the single most important action that the City of Portland can take for improved business and employment opportunity with this Comprehensive Plan update?*

Unlike the other questions that involved open discussion, participants in each group were asked to identify their top suggestion on an individual basis – going around the table one-by-one. Not surprisingly, a wide range of suggestions were received. However, these responses appear to have fallen into a few major categories. Some were mentioned in virtually every group, while

others were identified less frequently albeit were of significant importance in a certain specific demand issues.

### *Mentioned Most Frequently:*

- Need for greater regulatory flexibility better tailored to unique needs of individual businesses and/or business demand groupings (important across all six focus groups).
- More clearly demonstrated recognition of the contribution of business to Portland's vitality – a change from regulators to partners – asking "what can we do to help" (a theme expressed across all but the TOD/Mixed Use Corridors group).
- Greater City emphasis on cultivating business opportunity in Portland – with active marketing but without "picking winners" (a theme across all but the institutional group).
- Need for better business access to resources, incentives and/or tax structure reform – ranging from desired reform of the business income tax, to loan/incentive programs for small business to a point person/advocate for business in City Hall (identified by in some fashion by all but the manufacturing and distribution group).

### *Mentioned Less Frequently (but important with some focus groups):*

- Investment in multi-modal transportation, utility and livability infrastructure for business competitiveness and density (of importance for Central City office, manufacturing and distribution, neighborhood commercial and campus institutional).
- Setting aspirational goals that are City-driven but with regional cooperation – getting Portland "back to a visionary place" (important for Central City office, neighborhood commercial and TOD/mixed use corridors).

# V. DEMAND ANALYSIS ISSUES – DATA ASSESSMENT

Focus groups were intended to provide a qualitative assessment of recent and emerging trends as well as opportunities for future job development in Portland. The qualitative review is supplemented with a more quantitative, data driven assessment of recent trends and current conditions. Taken together, the quantitative and qualitative assessments are intended to better inform the determination of future opportunities and employment forecasting for subsequent phases of the Portland Plan process.

Demand topics considered with this more in-depth data analysis are similar to those of the focus groups, organized to cover:

- High rise office development
- Incubator & manufacturing districts
- Neighborhood commercial districts
- Institutional development

Incubator and industrial/manufacturing activity are reviewed together. Transit-oriented and mixed-use development is considered in conjunction with both high-rise and neighborhood commercial. As employment data has now been updated from 2006 (with the 2009 draft EOA) to 2008 (with this report), all data as well as related focus group perspectives provided with this demand analysis discussion is now as of the 2008-09 time period.

## A. HIGH RISE OFFICE DEVELOPMENT

This topic is concerned with the extent to which high density central city product can be expected to grow over the forecast period, and the extent to which similar product will be realized outside of the Central City. The guiding question of this analysis is: *What is the demand for high density office product?* Questions that inform this central theme include:

- Where has high rise development occurred in the recent past?
- What has been the historic pace of new development and absorption of higher density office products?
- What areas of the region outside of the city are competing for dense products/top rents?
- How has employment changed within districts zoned for high rise development?

### *Location Trends: Mid-High Rise Office Development*

The City of Portland's mid-high rise product (focused on development of 4+ stories) is still very much clustered within the Central City: the downtown, River District and Lloyd District. The Central City has supported 28 newly constructed 4+ story buildings over the past 20 years, and the renovation of an additional 43 buildings. Outside of these districts, recently constructed buildings of this size are more limited: eight mid-high rise buildings have been newly constructed and 11 renovated.

### *Non-Central City Office*

Since 1990, office development or renovation of more than four stories outside Portland's Central City area are dispersed (Figure 16). However, all but two buildings fall within neighborhoods adjacent to the downtown and Lloyd District: Northwest, the Central Eastside (which has primarily seen renovations rather than new construction), North Macadam and the Adidas headquarters buildings near Swan Island. Outlying buildings consist of one four-story southeast medical building (at the Clackamas County border) and one four story mixed tenant office product at Airport Way.

Of the newly constructed (versus renovated) buildings, half are classified as Class A and half as Class B office product. The only buildings served by structured parking, however, are medical and corporate headquarter campus (Adidas).

Both multi-story development and either structured parking or reduced parking ratios are necessary to increase the employment capacity of Portland's land base. Without structured parking, even high-rise buildings will not achieve greater land efficiency as typical office parking provisions allow for roughly an equivalent square footage in parking as is provided in building space. Reduced parking ratios represent another approach to increasing efficiency of site utilization, but this is only achievable in areas that are well served by transit.

### Figure 13. Non-Central City Office Development 4+ Stories (post 1990)

| Year Built | Building Name | Use | Stories | Building Class | Parking | Building Address | Avg Weighted Rent | Rentable Building Area |
|---|---|---|---|---|---|---|---|---|
| **Outer Southeast** | | | | | | | | |
| 2008 | Mt. Scott Professional Center | medical | 4 | A | surface | 9300 SE 91st Ave | $30.00 | 52,500 |
| **Inner Southeast** | | | | | | | | |
| 2003 | Central Eastside Office Blding | mixed | 4 | B | surface | 3611 SE 20th Ave | $20.00 | 20,000 |
| 1952/2007 | RiverEast Center | mixed | 4 | B | surface | 49 SE Clay St | NA | 100,800 |
| 1928/2003 | The Weatherly | mixed | 12 | B | surface | 516-540 SE Morrison St | $21.00 | 69,900 |
| 1925/2004 | Eastbank Commerce Center | mixed | 4 | B | surface | 1001 SE Water Ave | $15.99 | 60,000 |
| 1920/2007 | Olympic Mills Commerce Center | mixed | 8 | B | surface | 107 SE Washington St | $18.15 | 108,300 |
| **Inner NW** | | | | | | | | |
| 2005 | NW Cntr for Orthopedics & Rehab. | medical | 4 | B | mixed | 1515 NW 18th Ave | $24.00 | 33,300 |
| 2000 | CNF Campus: Ad Tech 2 | corporate HQ | 5 | A | surface | 2055 NW Savier St | $25.50 | 248,200 |
| 1900/1998 | Bridgetown Bldg | mixed | 4 | C | surface | 1631 NW Thurman | $24.00 | 67,300 |
| **Inner North/Northeast** | | | | | | | | |
| 2002 | Adidas Village: Rome Blding | corporate HQ | 4 | A | structured | 5055 N Greeley Ave | NA | 67,300 |
| 2002 | Adidas Village: Chamonix Blding | corporate HQ | 4 | B | structured | 5055 N Greeley Ave | NA | 54,000 |
| 1960/2002 | Adidas Village: Athens Blding | corporate HQ | 6 | A | structured | 5055 N Greeley Ave | NA | 147,000 |
| 1960/2002 | Adidas Village: Mexico City Blding | corporate HQ | 4 | B | structured | 5055 N Greeley Ave | NA | 22,200 |
| **Outer North/Northeast** | | | | | | | | |
| 1996/2006 | One Airport Center | mixed | 4 | A | surface | 7700 NE Ambassador Pl | NA | 73,300 |
| **Inner Southwest** | | | | | | | | |
| 1989/2008 | River Forum II | mixed | 4 | B | surface | 4386 SW Macadam Ave | $24.50 | 38,600 |
| 1985/2004 | River Forum I | mixed | 5 | A | surface | 4380 SW Macadam Ave | $24.49 | 145,700 |
| 1996 | PCG Corporate Center | corporate HQ | 4 | B | surface | 4650 SW Macadam Ave | NA | 41,400 |
| 1982/1991 | ADP Plaza | mixed medical | 4 | B | surface | 2525 SW First Ave | $24.60 | 180,800 |
| 1979/1991 | Raleigh West Executive Bldg | mixed | 4 | B | surface | 6443 SW Beav Hillsdale Hwy | $17.00 | 56,900 |

Source: CoStar March 2009, E. D. Hovee & Company, LLC.

### *Urban Centers Office*

Portland's eastside urban centers (Hollywood Town Center and Gateway Regional Center) have supported a cluster of mostly three story buildings but very little new office construction and no Class A office product. Only two new office buildings have been constructed in Hollywood since 1981: the Providence Healthcare building and a small amount of leasable space associated with a new multi-story 24 Hour fitness club. Older multi-story office product is largely leased to medical users.

Medical/health care activity also appears to be the driver for Gateway office development. Two new medical buildings have been constructed since 1990 and one small (18,000 square feet) mixed-tenant building. Medical users – like educational institutions – are now a pivotal driver in many non Central locations, as they can support higher rents, are often concerned with conserving land for future expansions, and are interested in dispersing to serve both population growth areas and areas currently underserved.

### Figure 14. Centers Office Development 4+ Stories

| Center | Building Name | Building Use | Stories | Building Class | Building Address | Average Weighted Rent | Reliable Building Area |
|---|---|---|---|---|---|---|---|
| **Hollywood Town Center** | | | | | | | |
| 1927/2007 | K-2 Building | mixed | 4 | C | 4152 NE Sandy Blvd | NA | 26,000 |
| 2006 | Phase I | | 3 | B | 4218 NE Halsey St | NA | 76,400 |
| 1981 | Hollywood Professional Bldg | | 3 | B | 3939 NE Hancock St | NA | 19,200 |
| 1970 | Building B | medical | 3 | C | 5228 NE Hoyt St | NA | 19,700 |
| 1966 | | | 3 | C | 3835 NE Hancock St | NA | 10,200 |
| 1965 | Providence Medical Office Build | medical | 3 | C | 545 NE 47th Ave | $34.00 | 32,200 |
| 1947 | Hollywood Square | | 3 | B | 1827 NE 44th Ave | $14.50 | 26,800 |
| 1941 | | medical | 3 | B | 1235 NE 47th Ave | NA | 178,200 |
| 1923 | | medical | 3 | C | 2106 NE 47th Ave | NA | 2,800 |
| **Gateway Regional Center** | | | | | | | - |
| 2008 | | | 3 | B | 11006 SE Division St | $21.00 | 18,000 |
| 2007 | Oregon Clinic | medical | 4 | B | 1111 NE 99th Ave | NA | 101,600 |
| 1994 | Gateway Medical Plaza | medical | 3 | B | 10535 NE Glisan St | $29.57 | 23,100 |
| 1988 | Multnomah Plaza | | 3 | B | 305 NE 102nd Ave | $18.18 | 46,600 |
| 1987 | Columbia East Bldg | | 3 | B | 10011 SE Division St | $15.00 | 32,200 |
| 1979 | Lincoln Bldg | | 3 | B | 9955 SE Washington | NA | 25,300 |
| 1967 | Parkway Plaza Professional Bldg | medical | 3 | C | 10105 SE Division St | NA | 8,900 |

Source: CoStar March 2009, E. D. Hovee & Company, LLC.

### *Office Drivers*

Focus group participants suggested that proximity to both housing and retail is increasingly pivotal to attracting new office investment. The success of the Pearl and the River District is widely attributed to the mixed use environments of these districts – first for residential and more recently as a premier office address. These areas realized over one million square feet of office development from 1990-2009 as well as the bulk of newly development residential units.

The downtown, however – which supports less market rate housing – realized over 2.8 million square feet of office development over this time period, a greater volume although a significantly smaller rate of growth compared to the existing building stock. Lloyd District realized just under one million square feet of new development. One-quarter of the square footage developed within these areas was driven by institutional users (public and education).

Beyond housing, recent themes in office development activity include the Central City streetcar alignment, availability of low-cost historic building stock and institutional end-users. Only 13 office buildings of four or more stories have been developed in the city since 2000. Three of these were multi-tenant towers built in 2000 – 2002 (in the CBD, Lloyd and River District). Four additional buildings were developed by end-users (three for corporate headquarters). Of the six remaining buildings, four are 50,000 square feet or fewer. Other than updates that regularly occur within the office building stock, investment in renovated office product has focused on lower cost buildings in transitional districts such as Old Town and the Central Eastside.

### Figure 15. Citywide Office Development Since 2000

| | Development Post 2000 | | |
|---|---|---|---|
| Geography | New Construction | Renovation | Description |
| River District | 3 | 6 | New: 1 smaller flex, 1 mid-sized office property in 2008-2009 along streetcar; 1 new Brewery Block tower in 2002. Rehabs include the Brewery Blocks, Old Town's Creative Services Center (public), U of Oregon's White Stag renovation and an update to an Old Town tower. |
| Gateway | 1 | 0 | Mid-sized medical |
| Downtown | 3 | 18 | New: 1 smaller office condo along streetcar, 1 built for non-profit end-user, 1 tower in 2000. Renovation: largely upgrading of historic properties already in office use. |
| Lloyd | 1 | 0 | 1 tower in 2001 |
| Close-in | 4 | 0 | 1 smaller medical, 3 corporate headquarters buildings |
| Central Eastside | 1 | 4 | Renovation of three mid-sized former industrial buildings into office/flex use and update of 1 mid-sized office tower. New: 1 smaller multi-tenant space in industrial area |
| Hollywood | 0 | 1 | Small historic office rehab |
| Airport Way | 0 | 1 | Update of mid-sized office |
| John's Landing | 0 | 2 | Small and mid-sized office updates |
| Total | 13 | 32 | |

Source: CoStar, E. D. Hovee & Company, LLC.

In general, office development has not been significant over the past decade. Larger towers were only recently (as of 2009) being initiated again and exclusively within the CBD: the ZGF tower, the Morrison Bridgehead project and Park Avenue West.

### *Density Realized vs. Zoned*

The following map illustrates building square footage, per site, as a percentage of total square footage allowable by zone (base zone, without bonuses). This is displayed to inform conversations on whether zoned capacity should be increased in any areas.

Only Central City subareas, key commercial corridors and the Northwest neighborhood are identified as being developed at more than 10% of zoned capacity. The largest density of taxlots in which development approaches zoned capacity appears to be within the Northwest neighborhood, west of I-405 and north of Burnside.

### *Comparative Development Feasibility*

High rise development typically is associated with a rent or price premium. The caveat to this would be renovation of historic buildings which may have originally been designed for office, warehouse or some other use. Available data indicates that the top tier of office rents is above $26 per square foot (as of 2009), down from a peak above $30 in 2006 and paradoxically below what is required to support market rate high rise construction despite office towers recently constructed or planned.

Other areas that have succeeded in attracting top of the market rents beyond Portland and include:

- St Vincent's Providence Medical Center (Hwy 26/Beaverton)
- Kruse Way (Lake Oswego)
- Cascade Park (east Clark County)
- Dispersed product in outlying southwest (Tigard, Tualatin, Wilsonville)

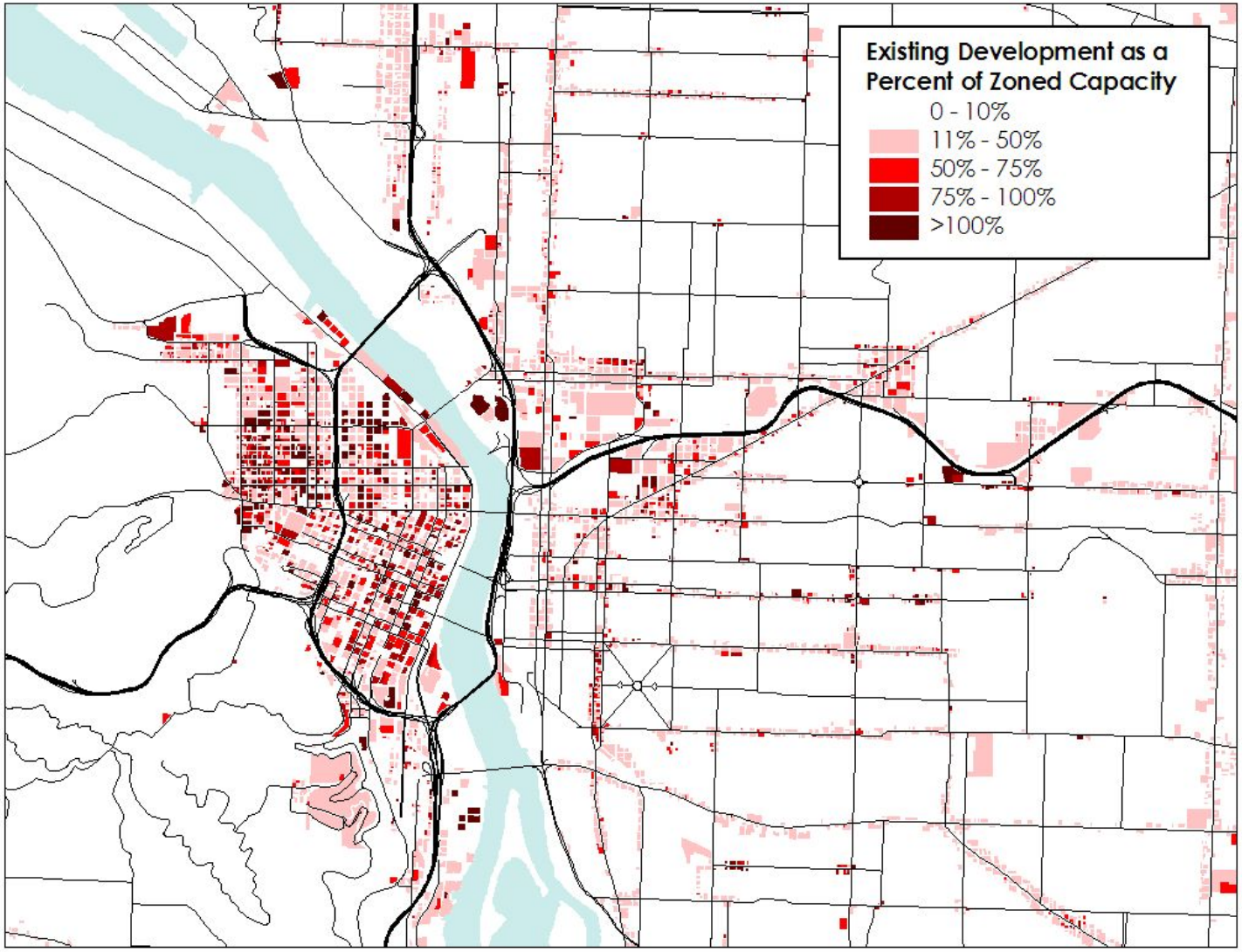
As of 2008, however, Portland's Central City still encompassed more than half of the region's total office product and close to 60% of its Class A office product. Continued investment in new buildings and reinvestment in Portland's historic building stock is expected to continue over the 25 year forecast period.

Portland has successfully retained a critical mass of employment activity within its historic core and thus far at least limited the development of major competing fringe centers. Kruse Way would be the primary exception, but remaining land within that office cluster is now relatively limited.

However, future high rise construction within the City of Portland will increasingly compete with office clusters located elsewhere throughout the region. There is recent evidence of an emerging trend for a more dispersed pattern of office center development, Class A office development since 2000 has been fairly equally dispersed throughout the region, with Portland's Central City capturing about one-third of new construction.

Midrise construction and renovation of office space appears to be the primary Central City opportunity to compete for a larger share of the regional office space market, according to a 2011 study by ZGF and ECONorthwest (*Cost Competitiveness of the Central City*). Comparing office tenant types by their location preferences, the types that were found most likely to shift to or away from the Central City are "cost conscious" tenants motivated primarily by rent levels and "urban character" tenants especially in creative services attracted by urban amenities. The study compared the cost competitiveness of Central City and suburban locations for five development prototypes, finding higher Central City development costs for each prototype. Cost gaps could

## Figure 16. Existing Development as a Percent of Zoned Capacity




Source: Portland Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.

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be overcome by a range of location incentives or amenities for developers, office tenants and office employees. The study distinguishes the high-density core and mid-density edge areas of the Central City, and the latter appears best suited to compete in these expanding office markets.

## EMPLOYMENT TRENDS WITHIN PORTLAND'S URBAN GEOGRAPHIES

Job change is the final lens used to gauge current and potential demand within Portland's mid and high-rise districts. These *urban geographies* include the Central City districts (both non-industrial and industrial/incubator) plus urban centers outside the Central City area.

### *2008 Employment*

In 2008 there were nearly 108,000 jobs within the primarily commercial areas of the Central City, with another 21,000 jobs in the Central City incubator/industrial districts of the Central Eastside and Lower Albina. The majority of Central City jobs – over 66,000 – have been situated within the Central Business District (including South Waterfront). In terms of job numbers, the Lloyd District is the second largest subdistrict which is approaching 17,000 jobs followed closely by the River District at just over 16,000.

### *2000-08 Employment Change*

Both in and outside the Central City, the service sector has dominated Portland's job gains from 2000-08. This pattern has held for traditional commercial areas as well as the city's industrial districts.

Industrial areas accounted for 9,000 (or 28%) of the net citywide gain of over 32,000 service sector jobs. Much of the demand for service sector employment within industrial districts is being accommodated by 1-2 story rise business park and flex space, rather than by traditional multi-level office buildings.

As noted, at least some portion of the service sector job growth reported with employment data for industrial areas likely represents reclassification of industrial employment to service sector activities. For example, within the management sector (newly created with NAICS) which included holding company and corporate activities, reported employment more than doubled from 6,800 to 14,600 jobs; a portion of this increase is undoubtedly due to industry reclassification.

The major drivers of office demand in mid and high-rise office districts for Portland's urban geographies vary somewhat by district. Significant changes occurring between 2000 and 2008 are noted as follows:

- Within Portland's CBD (including South Waterfront), service sector employment increased by more than 1,700 jobs over this period, with another 635 jobs added in education and health services. These gains were not adequate to offset a net CBD job loss of nearly 3,100 jobs.

- The River District experienced a net gain of more than 2,500 jobs from 2000-08, with office-related job gains concentrated in services (+1,500), information and design (+825), and education and health (+590) – offset in part by net loss of industrial employment with legacy manufacturing and transportation, warehousing and wholesale firms. Strong growth of non-office employment (+2,000) is also noted for Pearl District activity in retail, arts and accommodations (including dining).
- Portland's Lloyd District also realized a substantial reported net job gain (up by more than 2,000). This was led by gains of office-related service sector jobs (+2,700), partially offset by some loss of industrial job base.
- Goose Hollow reported nominal employment growth in construction with job losses in nearly ever other industry sector, for a total employment decrease of 1,100.
- Of the non-Central City Commercial geographies, Hollywood is noted for the largest employment gain (over 2,200), indicated as being primarily related to education and health (+2,150).
- While overall employment increased only nominally in the Gateway area, strong growth was indicated for education and health (up by almost 1,000 jobs), offset by losses in a number of other job categories.
- Other urban geographies – including the University District in the Central City and other Urban Centers of St. Johns, Hillsdale, Lents, and West Portland – appear to have experienced very little job change over the 2000-08 period.

Figure 19 depicts the components of employment change across each of Portland's urban geographies from 2000 to 2008.

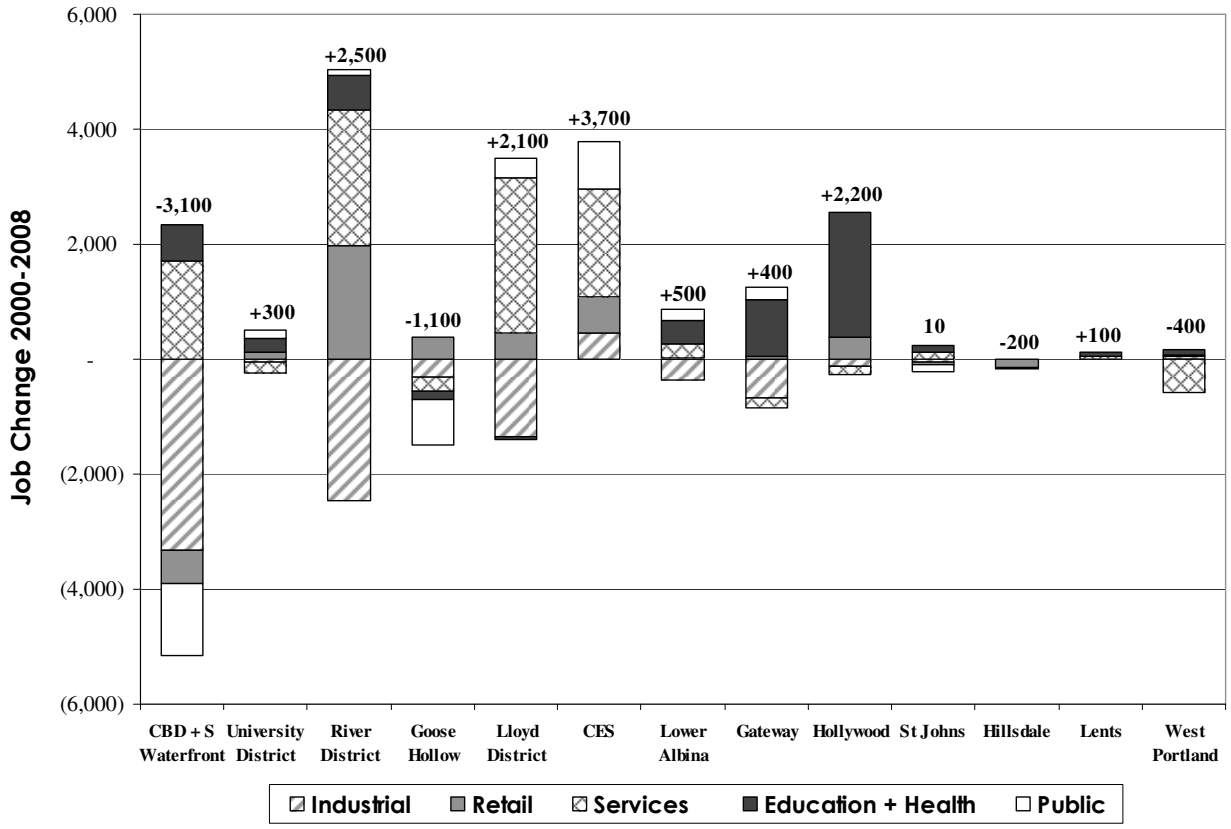
### *Employment Mix*

Portland's urban geographies differ not only in terms of recent employment gain or loss, but also with regard to the 2008 mix (or distribution) of employment:

- Approximately 46% of CBD employment is comprised of service businesses (ranging from professional to financial services), with 17-18% each in sectors of information and design and retail, arts and accommodations activity and 12% in the public sector. Together, these functions account for 92% of CBD employment.
- River District employment is relatively diverse, with retail, arts and accommodations accounting for 27% of employment, followed by services (at 21%), then information and design (16%), and with a still significant (15%) portion in transportation, warehousing and wholesaling activity.
- Services and retail (including arts and entertainment) account for about 70% of the Lloyd District employment.
- Central City incubator districts have an increasingly diverse mix of employment activity. Industrial accounts for 44% of Central Eastside employment, with strong added components of retail and service activities (at 17% each). In Lower Albina, industrial use accounts for a lesser 33% of district employment; education and health accounts for nearly half (at 46%).

- Retail represents the largest employment sector (at 30-44% of job base) for Goose Hollow, St. Johns and Hillsdale. For Gateway and Hollywood, education and health services are dominant employment activities, followed by retail. For Lents and West Portland, services represent the sector with the highest levels of district employment.

## Figure 17. Sectoral Trends within Urban Geographies




Source: Oregon Employment Dept., Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.

While retail is important across all of the urban geographies, it is the #1 employment sector for only four of the urban geographies – River District, Goose Hollow, St. Johns and Hillsdale. Other districts have experienced some level of business specialty and concentration – based on a combination of historical location decisions and ongoing agglomeration benefits (attracting similar businesses). Dominant or major forms of employment across all urban geographies require some form of office or related building space – though the configuration and density of development varies substantially both within and between Central City and other Urban Centers outside the city core.

## INDUSTRIAL AREAS

Portland has several different kinds of industrial areas: manufacturing/distribution, incubator and mixed. For this section of the EOA analysis, the *Columbia Harbor* geography includes the geographies of Harbor and Airport Districts and Harbor Access Lands combined. Columbia Harbor has been classified as a manufacturing/distribution industrial district. The Central City industrial districts of Central Eastside and Lower Albina are considered incubator, meaning they include a broader mix of industries. This mix is reflected in recent zoning amendments allowing greater amounts of office product – normally restricted within industrial sanctuaries – for information and design services. The Columbia Corridor (east of NE 82nd Ave) and the Dispersed Employment areas are considered mixed industrial areas.

The guiding question for this discussion is: *What competitive advantages are offered by the City's manufacturing/distribution and incubator districts – both currently and prospectively?* More specific aspects of this guiding question are:

- What job trends are observed within these districts?
- In what ways are job patterns similar or different between the manufacturing/distribution and incubator districts?
- What niches are forming within the incubator districts? Are they distinct from Columbia Harbor or other employment districts?
- How do incubator districts complement the Central City business district activity?
- What have absorption trends (demand) been in these districts?

### *Industrial/Incubator Employment Trends*

Employment within Portland's five industrial areas totaled close to 119,500 in 2008, representing 30% of employment citywide. In total, industrial areas report a net increase of approximately 500 jobs 2000-08, a gain averaging 0.1% annually. Employment losses were greatest in manufacturing (-6,800 jobs), followed by a net loss of nearly 4,700 transportation, warehouse and wholesale jobs. It should be noted that the employment trends in industrial geographies are contradicted by trends showing increased manufacturing output and cargo volumes over roughly the same time period. This is discussed later in this section.

Off-setting job losses in the industrial areas were an increase of approximately 9,100 service sectors jobs excluding retail and public administration (but including education and health). Again, some portion of these jobs likely reflects re-classification of jobs classified as industrial in 2000. An increase in utilizing temporary employment agencies has also likely caused some industrial areas jobs to be reported in other geographies (where temp agency offices are located).

### *District-Specific Trends*

One of the most important distinguishing factors between these districts – and the driver behind the "incubator" classification applied to the Central City districts – lies with their employment composition. Despite recent shifts towards service sector employment, Columbia Harbor retains close to 75% of its job base within the industrial sectors. Manufacturing represents 27% of total

employment with transportation, warehousing and wholesale activities at 40%; construction accounts for another 7% of Columbia Harbor employment.

As noted, this district is particularly distinguished by its high share of employment within the transportation and warehousing sectors. Columbia Harbor is also by far the largest industrial area, comprising 52% of total industrial area employment citywide. However, employment has declined in recent years, especially for the Harbor Access Lands portion of the Columbia Harbor geography.

Within the city's other industrial areas, industrial jobs represent a range of 33% of district employment in Lower Albina to 53% in Columbia East of 82nd. Retail accounts for 17% of employment in Central Eastside and 14% in Columbia East of 82nd. In the other industrial districts, retail accounts for less than 10% of the job total.

In Dispersed Employment areas, just 42% of jobs are associated with industrial sectors. At 35%, services are almost double their share as in any other industrial district, indicating that land use may have diverged from the zoning designation of these areas.

Service businesses (including information/design and education/health but excluding public administration employment) range from 17% of the job base in the Columbia Harbor to 55% in Lower Albina (for which Portland Public Schools is a major educational anchor employer). Service employment also exceeds industrial employment for the city's Dispersed Employment areas.

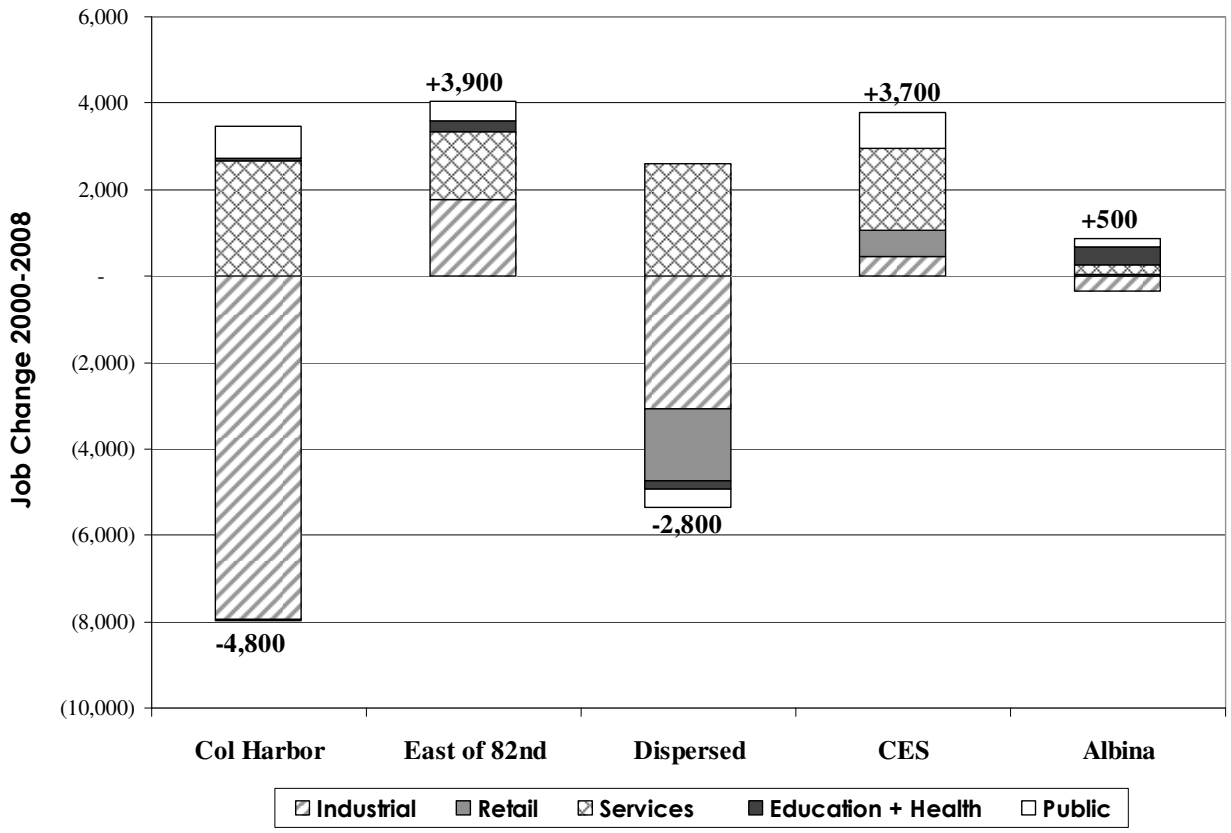
### *Net Job Gains vs. Losses*

As illustrated by the following graph, the Columbia Harbor and Dispersed Employment areas experienced net job loss from 2000-08. While not directly depicted by the graph, job losses (in percentage terms) where most substantial for Harbor Access Lands, a subset of the Columbia Harbor geography.

Conversely, the Columbia East of 82nd area as well as Central Eastside and Lower Albina incubator districts realized employment gains. Despite declining industrial employment, the Columbia Harbor and Dispersed Employment areas experienced some partial offsets with service sector job gains. Employment growth in the East of 82nd Avenue area was fairly balanced between service and industrial sector activity; a lesser proportion of industrial job growth is noted for Central Eastside.

Overall, Portland lost an estimated 22,700 industrial jobs between 2000 and 2008 (albeit with some portion likely reflecting a classification shift into the service sectors). Of this total, about 11,450 of the industrial job loss (or 50%) occurred within the city's five identified industrial districts; the remaining 50% is associated with declining industrial employment or shifts away from industrial employment classifications experienced elsewhere in the city.

## Figure 18. Industrial Areas Sector Changes (2000-2008)




Note: As "hybrid" or incubator districts, information for Central Eastside (CES) and Lower Albina is also shown with the Central City Commercial geographies.

Source: Oregon Employment Dept., Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.

### *Information & Design Services Trends*

This sector has been identified as being of particular relevance in the industrial districts, especially the City's emerging incubator districts. The Employment Opportunity Subarea within the Central Eastside Industrial Sanctuary allows out-right greater amounts of office space if occupied by information and design business types. The change sought to recognize the compatibility of business-serving businesses within the Central Eastside, the desire of these businesses to locate within the district, and the difficulty of reusing the district's historic multi-level industrial building stock for traditional industrial uses.

Information and Design Services (NAICS 51 and 54) consist of the information sector (except movie theaters), and the professional and technical services sector (except lawyers and accountants). The Central Eastside increased employment within this sector by about 930 jobs. However, it added an equivalent number of "traditional" service business jobs, and another 600 retail jobs, suggesting district attraction that extends beyond information and design. It should also be noted that the Central Eastside includes commercial as well as industrial sanctuary zoning; sector growth has not been cross-tabulated with zoning within the district.

Also of interest is how this sector changed in other city geographies. With a net gain of 825 jobs, the River District attracted almost as much of the employment growth in this sector as the Central Eastside. Another net gainer with this sector was Dispersed Commercial – up by 660 jobs from 2000-08. In contrast, information and design employment declined slightly (by about 20 jobs) in the CBD.

Participants in the focus groups conducted in 2009 described both the importance of keeping residential uses out of the Central Eastside and increasing zoning flexibility, recognizing its role as a complement to the CBD. The growth rates within the CES indicate that it is successfully attracting new jobs, with somewhat greater net job gains through 2008 than for the River District (the closest contender as a CBD business alternative).

### *Building Development Trends*

Despite job losses across the industrial sectors, Portland has realized development of new industrial building construction at an average rate of 1.5 million square feet per year (resulting in an end of 2008 in-city industrial building inventory of 81 million square feet). The amount of new industrial construction realized is significantly greater than the amount of development that occurred within either the retail or office building sectors (which realized 170,000 and 400,000 square feet annually citywide).

### Figure 19. Recent Industrial Development Trends (2003-2008)

| Subarea | Annual Average New Construction | Annual Absorption | Total Rentable Building Area |
|---|---|---|---|
| **Central City** | | | |
| CBD | - | (7,000) | 1,176,000 |
| Lloyd District | - | 53,000 | 2,671,000 |
| NW Close In | - | 3,000 | 1,044,000 |
| Johns Landing | - | 6,000 | 386,000 |
| **Inner Neighborhoods** | | | |
| SW Close In | - | - | 217,000 |
| NE Close In | 1,400 | 45,000 | 3,813,000 |
| SE Close In | - | 253,000 | 7,171,000 |
| **Industrial Areas** | | | |
| Hayden Island/Swan Island | - | 226,000 | 9,570,000 |
| Rivergate | 540,000 | 513,000 | 11,810,000 |
| Guild's Lake | 1,200 | 77,200 | 12,137,000 |
| **East Portland** | | | |
| Airport Way | 54,000 | 246,000 | 11,550,000 |
| Mall 205 | - | (300) | 231,000 |
| Gateway | - | 16,000 | 1,615,000 |
| East Columbia | 832,000 | 730,600 | 17,641,000 |
| Total | 1,428,600 | 2,161,500 | 81,032,000 |

Source: CoStar, E. D. Hovee & Company, LLC.

Observations of note from these data have included the following:

- Industrial development activity has located primarily within the Columbia Corridor: East Columbia (which includes some properties outside of the city), Rivergate and Airport Way. East Columbia and Rivergate report significant annual average new construction at 830,000 and 540,000 square feet per year (through 2008) respectively.
- Business park activity has dominated East Columbia development, whereas Airport Way was more equally split between stand-alone buildings (averaging around 25,000 square feet annually) and business park development.
- Recent development within both East Columbia and Rivergate also has had a significantly larger format, averaging 70,000 and 160,000 square feet respectively (reflecting Rivergate's distribution emphasis).
- The apparent disconnect between industrial jobs and industrial development may be related to high rates of industrial vintage relocation (existing businesses moving to new buildings, potentially leaving empty buildings unfilled – although vacancy rates have steadily fallen over the past five years to under 8% today) or changes in building use (with increased square feet per employee).

Thus far, Portland's manufacturing and distribution space does not appear to have realized the change in form and density that has been occurring with office and retail product, which are moving towards denser urban forms both within the Central City and along commercial corridors. While focus group participants cited a Central Eastside manufacturer that functions in a multi-story environment, this appears to be an anomaly. [7] A more common trend observed within the region's industrial parks is high cube space, in which building footprints are reduced by developing very high ceiling, single story warehouses (which can store more product in a given amount of building floor area).

### *Beyond Employment Trends*

The recent disconnect between employment and real estate trends is especially pronounced within the industrial sectors. While this Trends, Opportunities and Market Factors report is primarily concerned with employment trends and employment as a driver of land needs, it is important to note that jobs are not the only land driver or measure of an industry's economic contribution.

For instance, during this most recent period of industrial job loss, the Bureau of Economic Analysis reports that the value of manufacturing output increased by more than $9 billion for the 7-county region (Figure 23). More specifically, the economic activity in the Portland Harbor grew at 1.6% per year during approximately the same timeframe - 2002 to 2008. During that same time period, cargo volumes increased by 4.8% per year. Within the manufacturing sector at least, business growth (or profit) appears to contradict job growth, due in part to high commodity

[7] The firm involved cited with multi-story Central Eastside manufacturing activity is an example of a long-time business located in historic building stock. New industrial or warehouse development has yet to replicate the multi-story patterns of the first half of the last century.

pricing and strong export markets. Equivalent data for other industrial sectors such as transportation and warehousing is suppressed due to confidentiality.

## Figure 20. Portland-Vancouver MSA Gross Domestic Product Trends (2001-2006)

| | ($ millions) | | Change | |
|---|---|---|---|---|
| Industry | 2001 | 2006 | Net | AAGR |
| All industry total | 77,200 | 103,400 | 26,200 | 6.0% |
| Private industries | 69,600 | 94,000 | 24,400 | 6.2% |
| Manufacturing | 12,000 | 21,000 | 9,000 | 11.8% |
| Transportation and utilities | 3,600 | 4,300 | 700 | 3.6% |
| Retail trade | 4,300 | 4,900 | 600 | 2.6% |
| Professional and business services | 8,700 | 11,000 | 2,300 | 4.8% |
| Education and health services | 5,400 | 7,600 | 2,200 | 7.1% |
| Leisure and hospitality | 2,300 | 3,000 | 700 | 5.5% |
| Information, Communication, and Technc | 8,200 | 15,800 | 7,600 | 14.0% |
| Government | 7,500 | 9,400 | 1,900 | 4.6% |
| *Private goods-producing industries* | *16,600* | *26,700* | *10,100* | *10.0%* |
| *Private services-providing industries* | *53,100* | *67,300* | *14,200* | *4.9%* |

Source: Portland Bureau of Planning and Sustainability, Bureau of Economic Analysis, April 2009.

Focus Group participants – both for this study and for the 2006 Working Harbor Reinvestment Strategy – offer some suggestions into how industrial employment trends, complicated by data inconsistencies, can be interpreted:

- For at least some industries, productivity improvements have led to growing output while employment has declined. For industrial uses, this activity was especially pronounced during a period when the value of the U.S. dollar was relatively low, stimulating export demand.
- Both industrial real estate brokers and City permit data report that the bulk of recent demand has been for warehouse and distribution uses; these typically are associated with lower employment densities than manufacturing.
- Distribution and wholesale activity in Portland may have benefitted from some "deconsolidation" of the national and global distribution industry, especially as higher fuel prices re-emerge with economic recovery. Having more but smaller distribution centers across the nation in smaller metro markets (such as Portland) can result in reduced transport costs.
- In older industrial areas and waterfront industrial areas, site reuse (and associated employment growth) is limited by a number of issues. These include:
  - ✓ *Contamination:* owners aren't yet lowering prices sufficiently to reflect the full cost of clean up, and in many cases the full extent of liability has yet to be resolved (as with Willamette River superfund sites).
  - ✓ *Retrofitting:* Building retrofitting is expensive, and the industrial sector typically seeks the lowest cost land and space of any sector.
  - ✓ *Zoning:* requiring a business to utilize either rail or water access limits the pool of qualifying businesses and will slow land absorption.

- ✓ *Flood plain:* particularly smaller sites become more expensive on a per square foot basis when floodplain or other environmental regulations are in play.

Regional data indicates that recent industrial sector growth has concentrated on the outskirts of the region, where greenfield development is more prevalent. Portland could capture this growth in the future if site re-use could be facilitated, stabilizing its industrial job base.

- Participants in the 2009 focus groups conducted for this EOA also added weight to the idea that employment in the harbor area has shifted towards the service sector: modern industry is described as "service-oriented" rather than needing heavy industrial space (e.g., retailers needing auxiliary warehouse space). In many cases, future demand was described as more likely to reflect industrial design and sales and marketing, with less space devoted to on-site manufacturing. Flex space – with a larger office component, higher parking ratios, and a broad range of space sizes – was described as a building product more in demand (especially in the Columbia Corridor east of I-205).

## NEIGHBORHOOD COMMERCIAL DISTRICTS

Neighborhood subareas incorporate the majority of areas outside of the Central City, Urban Centers, Institutions, and Industrial districts. Three different types of neighborhood subareas are covered: Commercial Corridors, Commercial Nodes, and Dispersed Commercial.

These Neighborhood districts account for close to half (42%) of the city's retail jobs and also a broad mix of employment across almost all sectors. The key guiding question for this sector is: *What is the current and future role of neighborhood commercial in Portland's changing economy?* Related questions for this demand analysis issue topic are:

- What trends have neighborhoods realized in employment?
- What broad demand trends can be predicted for additional neighborhood retail, either from a market or planning perspective?
- What trends have neighborhoods realized in building development?
- What are the implications of neighborhood employment and building development for realizing greater amounts of Transit Oriented Development?

### *Neighborhood Commercial Growth Trends*

In total, Neighborhood subareas accounted for an estimated 70,400 jobs as of 2008, 18% of the citywide job total. The sectors in which neighborhoods capture the greatest share of citywide covered employment are:

- Retail, arts, accommodation & food service: 42%
- Information & design: 19%
- Construction: 17%
- Services: 17%

While a significant contributor to the city's jobs base, employment data indicates that neighborhood commercial subareas lost an estimated 1,900 jobs between 2000 and 2008. Neighborhood district job losses appear to be pulling down the city's overall employment performance; this loss dwarfs that of any other geography except residential and open space.

Neighborhood district employment losses occurred in the majority of sectors except retail, arts, accommodation & food service (up by nearly 590), services (+440), information and design (+475), education and health services (+550). Net job losses were greatest with Commercial Corridors (-5,100 jobs) and Commercial Nodes (-580). Only Dispersed Commercial is indicated as experiencing net job growth (+3,900).

### *Commercial Corridors*

The city's Commercial Corridors encompass the largest share of Neighborhood jobs, accounting for 56% of Neighborhood district jobs.

The corridor designation indicates areas in which the City seeks to concentrate commercial activity. Commercial Corridors encompass both general commercial (auto-oriented) and storefront commercial zones, as well as much denser central employment and central housing zones. For this analysis, the corridors geography includes only corridors outside of plan areas and industrial areas, although many of those areas contain designated commercial corridors as well.

However, employment within the city's Commercial Corridors declined by more than 5,100 net jobs from 2000-08, reflecting a rate of job loss averaging 1.5% per year. Job losses were experienced across all sectors and particularly pronounced for construction, retail, and manufacturing activities.

Job losses indicated by employment data are somewhat surprising given that the focus groups have been bullish on neighborhood commercial growth potential and continued consumer support for these districts. The discrepancy could be due to perception or varying definitions of neighborhood business districts (as this definition of Commercial Corridors excludes nodes as well as town and regional centers).

### *Commercial Nodes*

These areas have covered about 12 intersections and, at 9,600 jobs, represent the least overall employment of the neighborhood geographies considered. Employment declined by nearly 600 jobs from 2000-08, for job loss averaging 0.7% per year. Similar to corridors, these Commercial Nodes experienced reduced employment across most sectors (except education and health).

### *Dispersed Commercial*

This geography is zone-based and includes both auto-oriented and storefront commercial zones that are not in designated commercial corridors. Dispersed commercial areas tend to cluster as "second tier" corridor space and also constitute small areas of discrete zoning (commercial corners).

Dispersed Commercial areas accounted for about 21,700 jobs in 2008 (or 31% of neighborhood employment). A net gain of 3,900 jobs is noted for 2000-08 (up by 2.5% per year) – the only one of the neighborhood geographies for which an employment increase is reported.

Nearly one-half of the employment increase occurred with retail, arts and accommodations (including dining) uses. Job gains are also noted for education and health, manufacturing, information and design, and service sector businesses

Dispersed Commercial areas appear to function somewhat differently with a broader mix of job types compared to the other neighborhood geographies. Both industrial sectors and services are more prevalent within this geography. Retail is less important as a share of the total as compared with Commercial Corridors and Nodes.

Corridors, Nodes and Dispersed Commercial include both auto-oriented and storefront commercial zones.

## RESIDENTIAL & OPEN SPACE ZONES

As of 2008, these non-employment geographies make up a surprising 10% of covered employment citywide, a total of over 38,900 jobs. Employment within residential zones includes schools, some institutions, home-based businesses and non-conforming uses. Not counted with employment data are individuals not covered by unemployment insurance (likely including many home occupations as sole proprietors, a factor that is likely of greater significance within residential zones).

Covered employment within residential zones is dominated by education and health care (at 45% of total covered employment). This likely reflects those institutional users to which special institutional or employment designations have not been applied (particularly as with neighborhood schools). Services account for another 19% of residential jobs, and retail comprises only 9%.Retail Growth Potential

As previously noted, close to half (42%) of the city's retail jobs are located within the City's neighborhoods-based employment geographies. Retail growth is a driver for neighborhood business districts and commercial corridors, but not the primary driver. Jobs data indicates that retail comprises just under one-third of neighborhood jobs across all subareas.

Generally, Portland is adequately retailed. Focus group participants tied retail growth potential to household growth and leakage data supports this assessment. As of 2008, the national demographics firm ERSI Business Analyst estimates that the city supports about $6.5 billion annually in resident-generated demand for retail, food and drink, but generates $7.6 billion in yearly sales volume. This indicates that, in addition to serving local resident needs the city serves as a regional destination market, attracting and supported by residents of surrounding communities throughout the metro region and beyond.

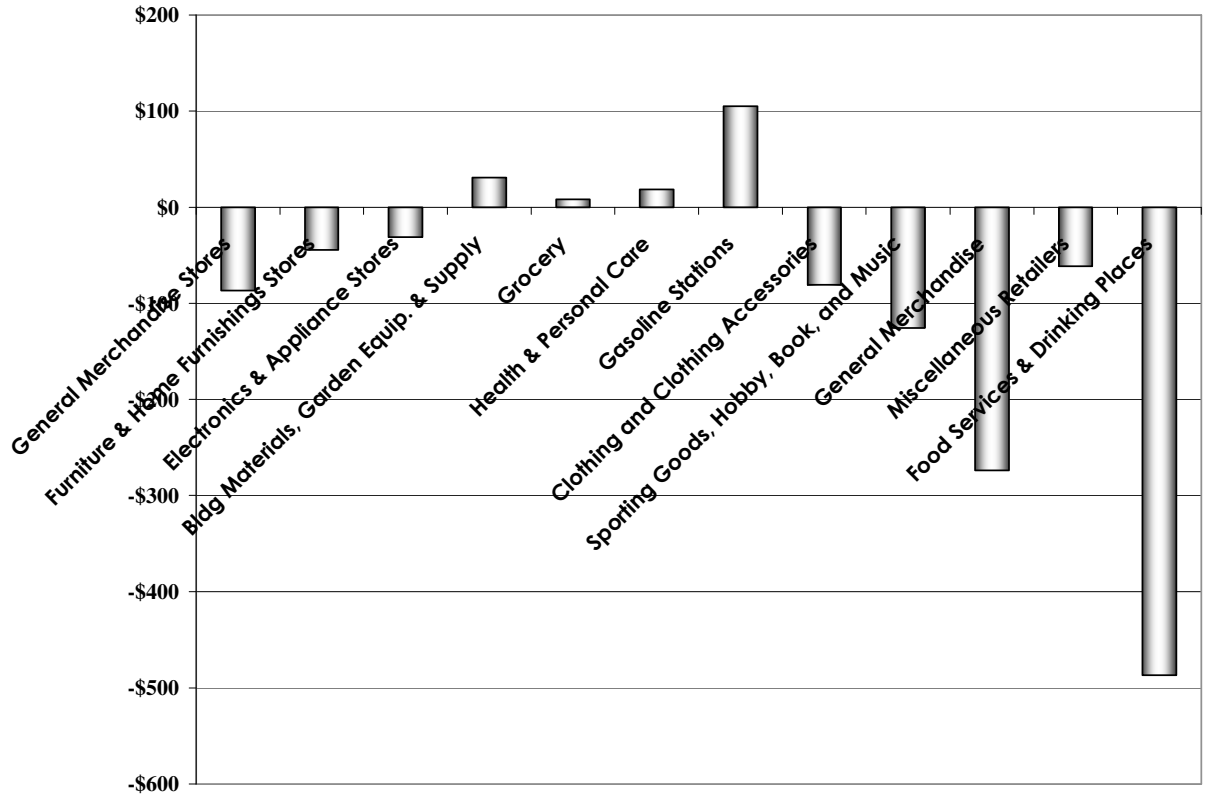
The following graph illustrates citywide retail leakage by store type. Negative numbers indicate store types in which supply exceeds demand: there is no sales leakage, or dollars spent by Portland residents outside of the city (in reality of course, residents shop in a variety of

jurisdictions, but the *net* result indicates that Portland retail supply is adequate to meet the shopping needs of Portland residents).

Retail sales leakage is reported within four retail categories, indicating there may be room for growth to meet residents' needs for building materials and garden supply (an estimated $87 million in sales leakage); grocery ($7.8 million); health and personal care ($18.5 million), and gas stations (over $100 million).

Retail types estimated to have captured the greatest share of non-resident as well as resident spending potential are restaurants and bars, general merchandise (department stores), and sporting good stores.

**Figure 21. City of Portland Leakage by Store Type (2008)**




Source: ESRI, E. D. Hovee & Company, LLC.

These numbers may in also reflect shopping patterns for Portland residents or store classifications that diverge from the national average (for instance, Portland residents may spend less on gas). On the 4-county metro level (including Clark County), retail demand appears to be more in line with supply. In 2008 there was an estimated $24 billion in retail demand and $23 billion in retail sales.

Given that greater retail supply is not needed to meet the needs of residents (of either the city or the 4-county region), retail development over the longer term is dependent primarily on some

combination of population and/or income growth coupled with destination tourism activity. Portland can also increase its capture of the regional retail market available by strengthening its destination districts and out-competing surrounding communities.

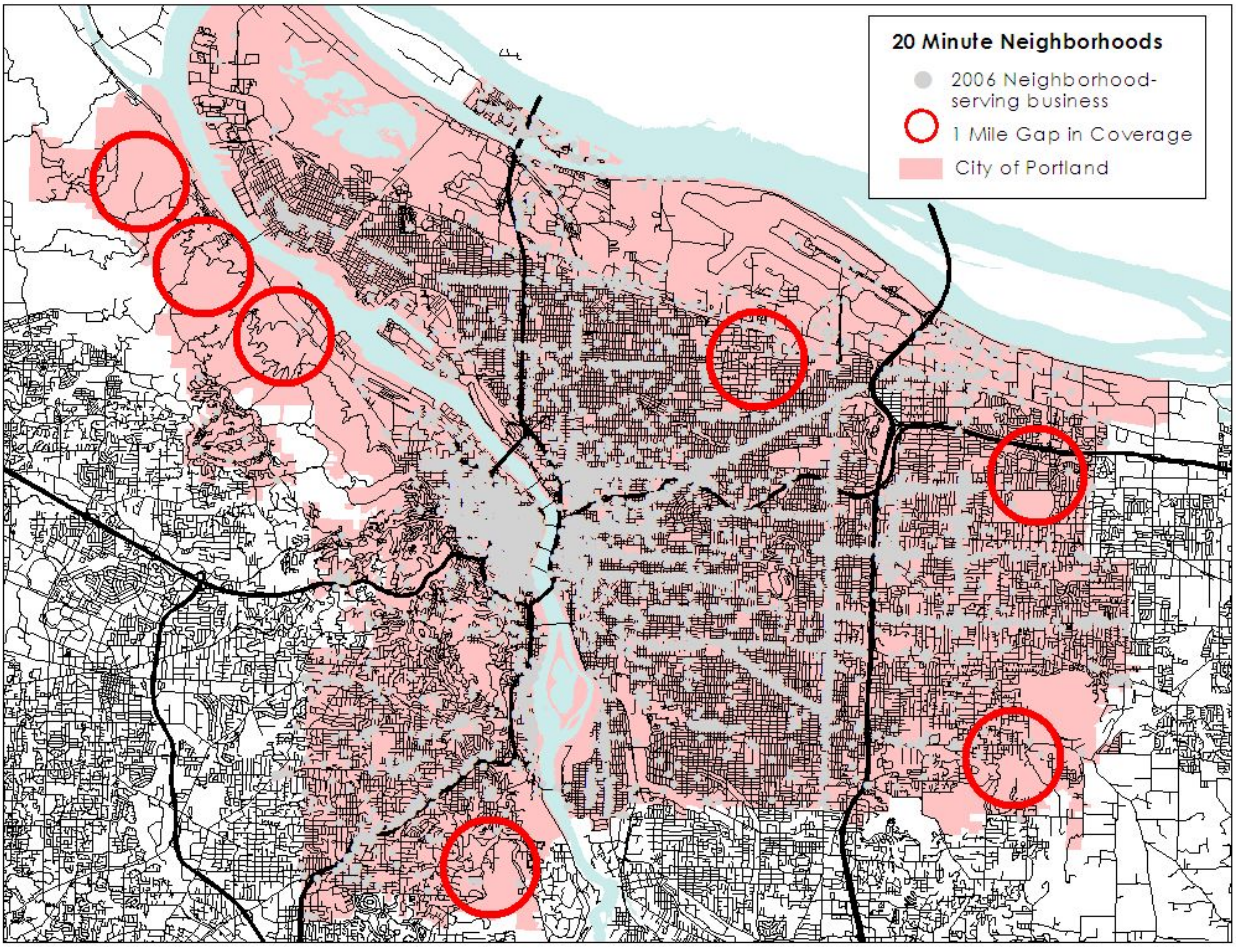
### *Complete Neighborhoods*

Portland's retail districts and corridors are a mix of neighborhood-serving and destination businesses, a distinction deriving as much from a business's product or service mix as from its NAICS classification. Some businesses function as destinations purely because of their status within a business cluster (e.g., as with retailers along NW 23rd or within Lloyd Center Mall); other businesses – such as dry cleaners or convenience markets – are located within a destination business cluster but may primarily serve adjacent households. Many of Portland's commercial corridors function as destination shopping districts, or as a mix of local and destination shopping.

One of the City's planning objectives is to encourage complete or "20 minute" neighborhoods, meaning that daily goods and services are available to households within a walkable distance (equating to roughly one mile). Figure 24 shows these neighborhood serving businesses, which comprise about ¼ of total employment, and identifies areas of gaps in retail coverage.

Based on this visual overview, retail opportunities appear to be reasonably well distributed throughout the city except for a few areas that have more than one mile gap between businesses. Neighborhood-serving businesses blanket the city's commercial corridors and virtually duplicate the arterial street grid. Retail densities decrease east of I-205 (outside of Gateway and SE 122nd), within the Cully neighborhood (west of I-205) and along the narrow but limited residentially populated Northwest corridor between the Willamette River and Forest Park.

## Figure 22. Neighborhood Serving Retail Locations



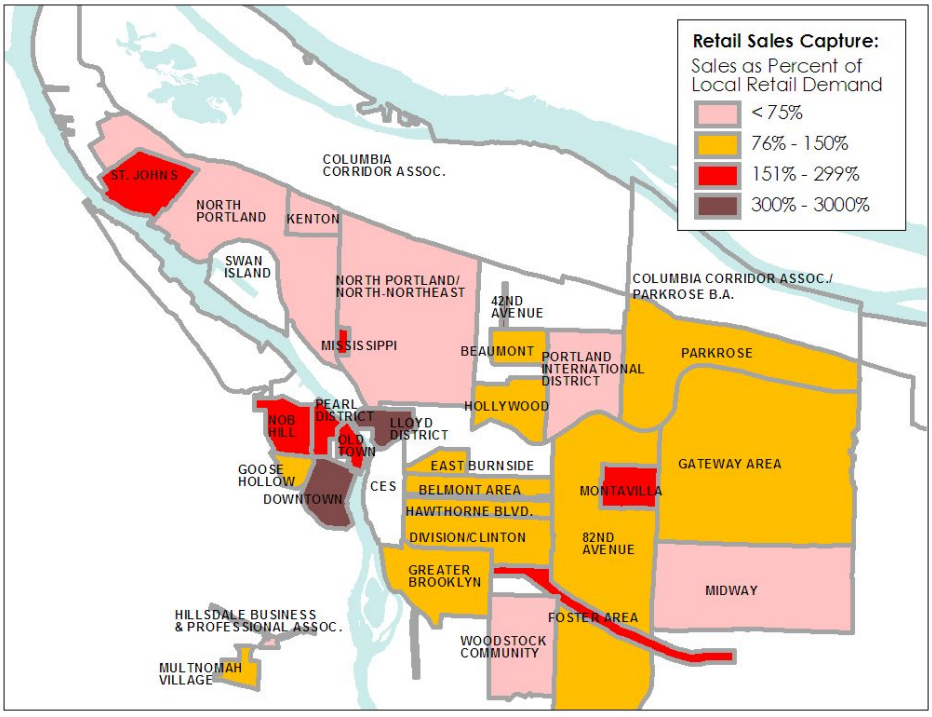

Source: Oregon Employment Department, E. D. Hovee & Company, LLC.

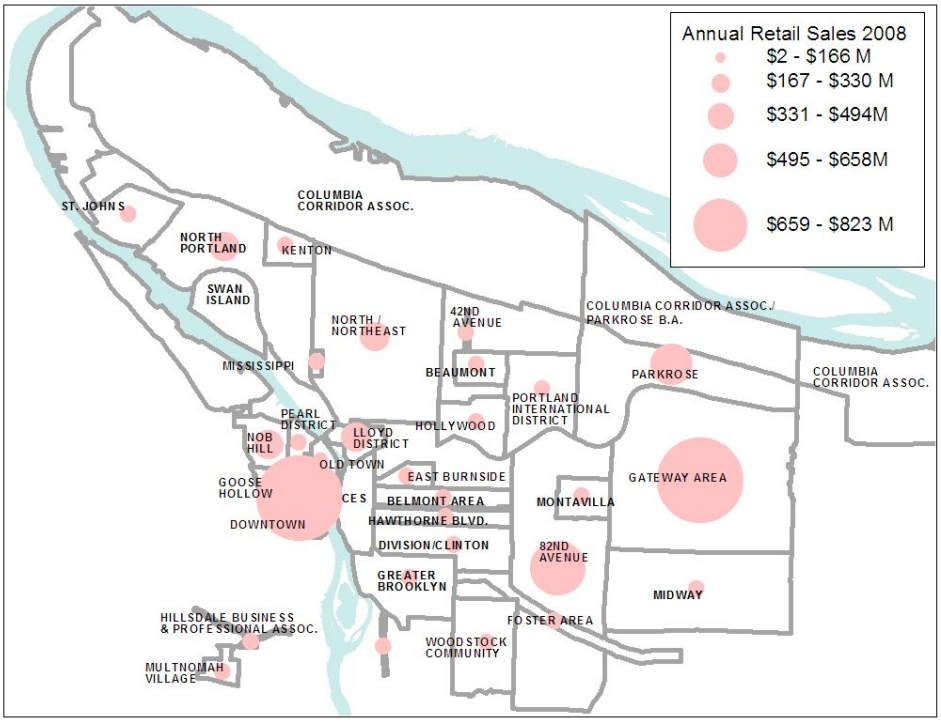
### *Business Associations*

Portland's Business Associations provide another way to analyze retail distribution. Out of the 34 associations, five are predominantly industrial and sales do not represent retail. Of the remaining 29 business associations, 17 reported sales in excess of estimated household demand – these districts function as destinations.

Central City districts top the list for sales capture, given the destination status of downtown retail in general. Neighborhoods with the highest capture rates include Montavilla, Mississippi, St. Johns and Nob Hill. In terms of sales volume, Gateway, 82nd Avenue, North/Northeast and the North Portland Business Association top the list.

## Figure 23. Non-Industrial Business District Capture Rates & Sales Volumes (2008)



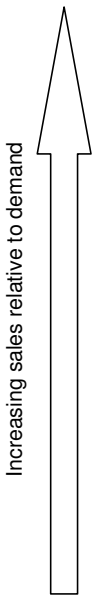




Note: Data is only displayed for non-industrial business associations.

Source: ESRI, Portland Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.

## Figure 24. Business Association Supply & Demand (2008)

| Type | Business Association | (in $ millions) Demand | Supply | Supply Rank | Sales Capture (Supply/Demand) |
|---|---|---|---|---|---|
| Industrial | Swan Island Business Association | $1.5 | $157.6 | 12 | 10630% |
| Central City | Lloyd District Business Association | $11.4 | $264.7 | 8 | 2328% |
| Industrial | Central Eastside Industrial Council | $14.6 | $260.2 | 10 | 1785% |
| Industrial | Columbia Corridor Business Association | $136.7 | $1,212.9 | 1 | 887% |
| Neighborhood | 42nd Avenue Business Association | $2.0 | $16.4 | 31 | 819% |
| Central City | Downtown Retail Council | $131.4 | $822.8 | 2 | 626% |
| Central City | Old Town Chinatown | $32.9 | $85.4 | 24 | 259% |
| Central City | Pearl District Business Association | $60.7 | $151.7 | 13 | 250% |
| Neighborhood | Foster Area Business Association | $49.9 | $120.4 | 18 | 241% |
| Neighborhood | Montevilla Business Association | $45.8 | $101.1 | 20 | 221% |
| Neighborhood | Historic Mississippi | $6.4 | $12.4 | 32 | 192% |
| Town Center | St Johns | $62.8 | $102.5 | 19 | 163% |
| Neighborhood | Nob Hill Business Association | $168.9 | $261.8 | 9 | 155% |
| Regional Center | Gateway Area Business Association | $495.3 | $744.8 | 3 | 150% |
| Industrial | Columbia Corridor Association and Parkrose I | $236.4 | $349.7 | 5 | 148% |
| Central City | Goose Hollow Business Association | $71.1 | $86.1 | 23 | 121% |
| Neighborhood | Hawthorne Business Association | $106.8 | $124.9 | 16 | 117% |
| Town Center | Hollywood Boosters | $106.5 | $121.9 | 17 | 114% |
| Neighborhood | Greater Brooklyn Business Association | $141.0 | $146.9 | 14 | 104% |
| Neighborhood | East Burnside Business Association | $51.6 | $53.7 | 27 | 104% |
| Neighborhood | Multnomah Village Business Association | $25.9 | $26.4 | 29 | 102% |
| Neighborhood | Westmoreland Business Association | $6.4 | $5.8 | 33 | 90% |
| Neighborhood | 82nd Avenue Business Association | $627.9 | $550.2 | 4 | 88% |
| Neighborhood | Belmont Business Association | $114.9 | $99.3 | 21 | 86% |
| Neighborhood | Beaumont Business Association | $42.7 | $36.1 | 28 | 84% |
| Neighborhood | Division-Clinton Business Association | $165.4 | $128.7 | 15 | 78% |
| Neighborhood | Kenton Business Association | $34.2 | $25.6 | 30 | 75% |
| Neighborhood | North Portland Business Association | $399.3 | $273.5 | 7 | 68% |
| Neighborhood | International Business District | $151.5 | $90.6 | 22 | 60% |
| Neighborhood | North-Northeast Business Association | $571.2 | $317.7 | 6 | 56% |
| Neighborhood | Midway Business Association | $296.9 | $165.0 | 11 | 56% |
| Neighborhood | Woodstock Business Association | $135.5 | $74.4 | 25 | 55% |
| Town Center | Hillsdale Business Association | $14.1 | $1.7 | 34 | 12% |
| Industrial | NW Industrial | $0.0 | $72.5 | 26 | NA |




Source: ESRI, Portland Bureau of Planning & Sustainability, E. D. Hovee & Company, LLC.

Neighborhoods with relatively lower retail capture include Hillsdale, Woodstock, Midway, North-Northeast, North and Kenton. North-Northeast and North appear to be large districts with lower capture rates despite relatively larger sales volumes. The caveat is that some business associations have been narrowly defined to include a commercial corridor only and not the surrounding households (such as NE 42nd Avenue and Foster Area); sales capture rates for these business districts are therefore not a good estimate for whether surrounding neighborhoods are adequately served. High capture rates can also describe areas with relatively little housing, such as Old Town or Lloyd District (which has a relatively low residential mix and supports a regional mall).

To encourage added retail in areas where existing stores or related customer services are more limited, identifying *market drivers* to each specific neighborhood district represents a key opportunity and challenge:

- Retail is drawn to areas with high household density or high household income and offering good traffic/pedestrian counts plus street visibility. Existing retail locations reflect these market preferences.
- As referenced by focus group participants, neighborhood commercial growth will require greater household density. Encouraging household density – through zoning and project subsidies – may have a greater impact on retail site selection than either introducing commercial zoning or supporting commercial development in areas in which these are now missing.
- Since most (though not all) of the city currently has 20-minute coverage, a priority opportunity may be more to encourage locating critical urban retail services (e.g. grocery) and supportive infill rather than to create new or expanded retail districts.

### *Neighborhood Commercial Growth Trends: Building Development*

Retail space has dominated the inventory of newly developed commercial space within Portland's neighborhoods, averaging about 300,000 new square feet annually over a five year period (from 2003-08) outside of the Central City. However, retail employment fell by about 4,000 jobs with 2/3 of that loss coming from the neighborhoods despite significant new building development.

The disconnect between these two trends may in part be due to service jobs locating within retail spaces. Also noted is that a significant contributor to neighborhood retail has been dining, which is no longer defined with retail (for employment classification purposes) but with arts, accommodations and food services. This sector is as large within the neighborhood geographies as the retail sector; however, it too declined over the study time frame.

Rather than corresponding necessarily to retail users (as defined by NAICS), retail space is increasingly becoming defined as either a) ground floor space within densely developed districts, with office or residential above, or b) a lower density or smaller footprint product (in comparison with office) within more suburban or main street settings.

Citywide, retail building development over the 2003-08 time period was dominated by Cascade Station, within the Airport Way subarea. That subarea has seen over 620,000 square feet of new large format/power center retail development over this five year period. This is close to twice the square footage added to the CBD (356,000 square feet) over the same time period, about 2/3 of which was ground floor space in residential buildings.

## Figure 25. Recent Retail Development Trends (2003-2008)

| Subarea | Annual Average New Construction | Absorption | Total Rentable Building Area |
|---|---|---|---|
| **Central City** | | | |
| CBD | 71,200 | 39,400 | 9,195,000 |
| Lloyd District | 6,900 | 17,100 | 4,689,000 |
| Johns Landing | 6,000 | 2,400 | 335,000 |
| NW Close In | 8,400 | 15,700 | 1,803,000 |
| **Inner Neighborhoods** | | | |
| SW Close In | 8,600 | 6,600 | 902,000 |
| NE Close In | 24,700 | 26,200 | 2,810,000 |
| SE Close In | 20,500 | 40,000 | 4,085,000 |
| **Industrial Areas** | | | |
| North Portland | 47,700 | 39,600 | 2,506,000 |
| Rivergate | - | (1,300) | 349,000 |
| **East Portland** | | | |
| Airport Way | 124,100 | 139,000 | 2,710,000 |
| Mall 205 | 30,500 | 53,700 | 3,760,000 |
| Gateway | 14,900 | 32,500 | 3,720,000 |
| East Columbia | 39,500 | 55,600 | 3,060,000 |
| Total | 403,000 | 466,500 | 39,924,000 |

Source: E. D. Hovee & Company, LLC.

The other top subareas for attracting new (and inventoried) retail development were neighborhoods, with almost all growth locating along commercial corridors such as Killingsworth, Alberta, Lombard, MLK, Belmont, Division and Hawthorne. In-fill development along commercial corridors may also be classified as commercial retail/service by default due to the typical smaller building size.

- North Portland: 140,000 square feet
- Mall 205: 153,000 square feet (a submarket extending beyond the Mall property only)[8]
- Inner Northeast: 125,000
- Inner Southeast: 100,000

Office development has been both more limited and more concentrated than retail over the study time frame, with only 800,000 square feet developed citywide compared with 1.7 million square feet of new retail space. In contrast with retail trends, about 60% of newly developed office space was located within the CBD + Lloyd District, another 24% in Gateway and the remainder consisted largely of Class B buildings of less than 35,000 square feet each dispersed throughout the city.

[8] Mall 205 is a submarket defined by CoStar and encompasses an area larger than the mall property.

### *Implications for Transit Oriented Development*

Transit Oriented Development (TOD) describes dense development (a relative descriptor), either commercial or residential, with lower than average parking ratios and in close proximity to transit routes, either bus or fixed rail. TOD is also often viewed as occurring within a mixed use setting – as with residential (or in some cases office) above ground floor retail and related active use commercial space.

From a business owner's perspective, TOD offers commercial space that is probably on the leading edge of the density to which the private market is willing to develop. "Denser" development may command a cost premium associated with steel vs. wood frame construction, although buildings up to five stories can be achieved via wood framing, and this quality of development may be acceptable for certain users outside of the Central City.

Businesses will desire space within an area or corridor suitable for TOD if:

- The space is well-located and visible to target customers
- The space is affordable
- The business' customers can and will access the building in the absence of expansive parking options

The answer to these questions is not dictated by a building's status as a TOD, although TODs are likely to be well-located (on commercial corridors) and well-served by transit. Rather than business demand, the extent to which this region sees additional TODs along its commercial corridors will be influenced by:

- Continued density increases within Portland's neighborhoods;
- Continued resident and visitor preference for mixed use neighborhood retail districts (a vision to which participants in focus groups generally adhere, despite the indicated job losses);
- Flexibility with building uses allowed within commercial zones; and
- Over-all economic vitality and growth of the Portland metro region.

Continued growth in commercial rents to support more expensive construction techniques is also a consideration. In recent years Portland has seen significant market-driven in-fill commercial development occurring along relatively low-rent commercial corridors such as NE Alberta. The bulk of this development to date has been single story, indicating that the market will likely bring TOD projects – as opposed to infill – to those corridors now capable of achieving the highest rental rates.

Corridors reporting rents above $20 per square foot as of March 2009 include SE Bybee, NE Broadway/Weidler, N Williams, John's Landing, SE Belmont, N Mississippi and SE Division. While not a threshold that indicates certain development feasibility (which will vary according to construction technique, building configuration and building use mix), these reported rents have been on a par with the range reported for many Central City properties in the Pearl District, the West End and the CBD.

## INSTITUTIONAL DEVELOPMENT

For this analysis, the focus is education and health institutions (but with secondary consideration of other public agency jobs). The key question for this topic is: *How will rapid growth of institutional employment and building needs be both accommodated within and potentially reshape development in Portland?* Related questions around this topic are:

- What job growth has occurred within Portland's major institutional campuses?
- What job growth has occurred for institutional users that may not be located on institutional campuses?
- What are the unique land requirements of institutional users, and how are those changing?

### *Institutional Definitions & Associated Employment*

This section of the report tracks institutional-related employment in two distinct ways:

- Campuses for 10 colleges and 7 hospitals on sites of more than 10 acres, which account for an estimated 35,200 jobs as of 2008, excluding Portland State University (Central City) and Adventist Medical Center(Gateway Regional Center). This *campus institutional* category is a primary frame of reference for the EOA analysis.
- All institutional uses throughout the City, consisting of schools and hospitals in all Comprehensive Plan zones and all businesses in the IR zone – account for 2008 employment estimated at 54,400.

- A third, broader indicator of institutional employment is the combined education and health care sectors, which totaled 84,660 jobs citywide in 2008.

### *Employment Associated with Institutional Uses*

As depicted by the chart on the following page, the discussion in this section begins more broadly on the 54,400 jobs represented by schools and hospitals throughout all zones of the City plus other businesses within the City's IR zone.

- From 2000-08, employment associated with these institutional uses within this zone increased at a rate averaging about 2.5% per year – well above the citywide job growth rate of just 0.1% per year.
- In 2008, 24% of employment situated within the IR zone was outside of hospitals and schools. The bulk of this was health-related (doctors offices, HMOs) and the remainder a mix of supportive uses such as retail and un-related businesses.

Institutional employment growth from 2000-08 has been stronger outside of institutional zoning than within this zone. These sectors averaged 2.5% annual growth citywide, compared with a growth rate of close to 2% within the IR zone. This appears to be primarily due to relatively flat employment with schools, while hospital and related IR zone employment increased more substantially.

## Figure 26. Institutional Employment Trends (2000-2008)

| | General Commercial CG | Central Commercial CX | Central Employment EX | Institution IR | Industrial Sanctuary IS | Mixed Employment ME | Commercial Storefront NC,OC,UC | Open Space OS | SFR R2.5,R5, R7,R10 | MFR R1,R2,R3, RH,RX | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **2008** | | | | | | |
| Institutions (defined by NAICS) | | | | | | | | | | | |
| Schools | 448 | 3,257 | 12,821 | 4,968 | 1,402 | 140 | 358 | 583 | 5,513 | 4,383 | 33,873 |
| *Primary* | *103* | *228* | *114* | *1,110* | *1,380* | *1* | *251* | *583* | *5,214* | *1,760* | *10,744* |
| *College* | *345* | *3,029* | *12,707* | *3,858* | *22* | *139* | *107* | - | *299* | *2,623* | *23,129* |
| Hospitals | - | 3,330 | 3,181 | 5,430 | 1 | - | 99 | - | - | 5,232 | 17,273 |
| Other businesses within IR Zone | | | | | | | | | | | |
| Health related | | | | 2,771 | | | | | | | 2,771 |
| Other | | | | 531 | | | | | | | 531 |
| | 448 | 6,587 | 16,002 | 13,700 | 1,403 | 140 | 457 | 583 | 5,513 | 9,615 | 54,448 |
| *2008 Share* | *1%* | *12%* | *29%* | *25%* | *3%* | *0%* | *1%* | *1%* | *10%* | *18%* | *100%* |
| *AAGR 00-08* | *5%* | *4%* | *4%* | *2%* | *3%* | *-1%* | *22%* | *26%* | *-2%* | *3%* | *2.5%* |
| | | | | | **2000** | | | | | | |
| Institutions (defined by NAICS) | | | | | | | | | | | |
| Schools | 297 | 3,009 | 9,313 | 4,586 | 1,080 | 154 | 92 | 91 | 6,691 | 2,313 | 27,626 |
| Hospitals | - | 1,866 | 2,441 | 4,378 | - | - | - | - | 35 | 5,395 | 14,115 |
| Other businesses within IR Zone | | | | | | | | | | | |
| Health related | - | - | - | 1,666 | - | - | - | - | - | - | 1,666 |
| Other | - | - | - | 1,174 | - | - | - | - | - | - | 1,174 |
| | 297 | 4,875 | 11,754 | 11,804 | 1,080 | 154 | 92 | 91 | 6,726 | 7,708 | 44,581 |
| *2000 Share* | *1%* | *11%* | *26%* | *26%* | *2%* | *0%* | *0%* | *0%* | *15%* | *17%* | *100%* |

Source: Oregon Employment Department, Portland Bureau of Planning, E. D. Hovee & Company, LLC.

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### *Trends within Key Institutions*

Rather than reflect zoning designation, the institutional geography reported in Figure 14 (earlier in the report) reflects land owned by 17 hospitals and colleges on sites of at least 10 acres and 100 employees each. Total employment of 35,200 is more than double the 13,700 jobs located within IR-designated zoning. For these 17 large site institutions, employment grew at about 3.6% per year, above the average of 2.5% for citywide institutional employment.

**Hospitals**

- Oregon Health & Science University
- Shriners Hospital
- Portland Veteran's Hospital
- Providence Portland Medical Center
- Legacy Emanuel Hospital & Health Center
- Legacy Good Samaritan Hospital
- Kaiser Medical Centers

**Colleges**

- Portland Community College (Sylvania)
- Portland Community College (Cascade)
- Portland Community College (Southeast)
- Reed College
- Lewis & Clark College
- University of Portland
- Multnomah Bible College
- Concordia University
- Western States Chiropractic College
- Warner Pacific University

Note: Adventist Medical Center and Portland State University (PSU) are not included in the Institutional employment geography – Adventist is part of the Gateway Regional Center and PSU is included with the Central City University District.

Many of these institutional uses are located on what could be considered as legacy sites that are in or near residential neighborhoods. Site decisions made decades ago for what typically began as relatively modest uses may have been for reasons unrelated to factors that would be considered today if these institutions were to start anew.

### *Implications for Future Development*

Taken together, the city's 54,400 institutional use jobs account for about 14% of its jobs base. The bulk of these are associated with the city's colleges and hospitals. Institutions are key employment drivers and now among the fastest growing economic sectors in Portland.

With its moderate growth (mid-case) scenario, Metro forecasts that education and health care employment will increase by a combined average rate of 2.8% per year. This is well above the average projected growth rate of 1.7% for all regional employment and more than double anticipated public agency job growth.

To the degree that Portland continues to capture a relatively high share of medical and educational employment (particularly for higher education), growth needs for this sector can be

expected to account for an increasing share of the city's total job base and associated building space requirements.

Based on the combination of this quantitative review and qualitative assessment from the institutional focus group, key challenges for the city's institutions (both larger and smaller) will include:

- Opportunities for maintaining a strong in-city presence as a key economic development driver – offset by growing impetus for decentralization to get closer to residential populations.
- Improved transit access or other transportation options to better serve patrons and employees – especially for institutions currently not conveniently located near transit.
- Potential for increased density of development – as an alternative to expanded site area.
- Consistency of land use approach and approval process for institutional users – especially those situated within or near residential neighborhoods.

# VI. LOCAL SECTOR SPECIALIZATIONS

This analysis considers local sector specializations both for the Portland metro area and the City of Portland. A common approach to defining comparative advantage is via location quotient (or LQ), which compares a geography's concentration of employment with the national average.

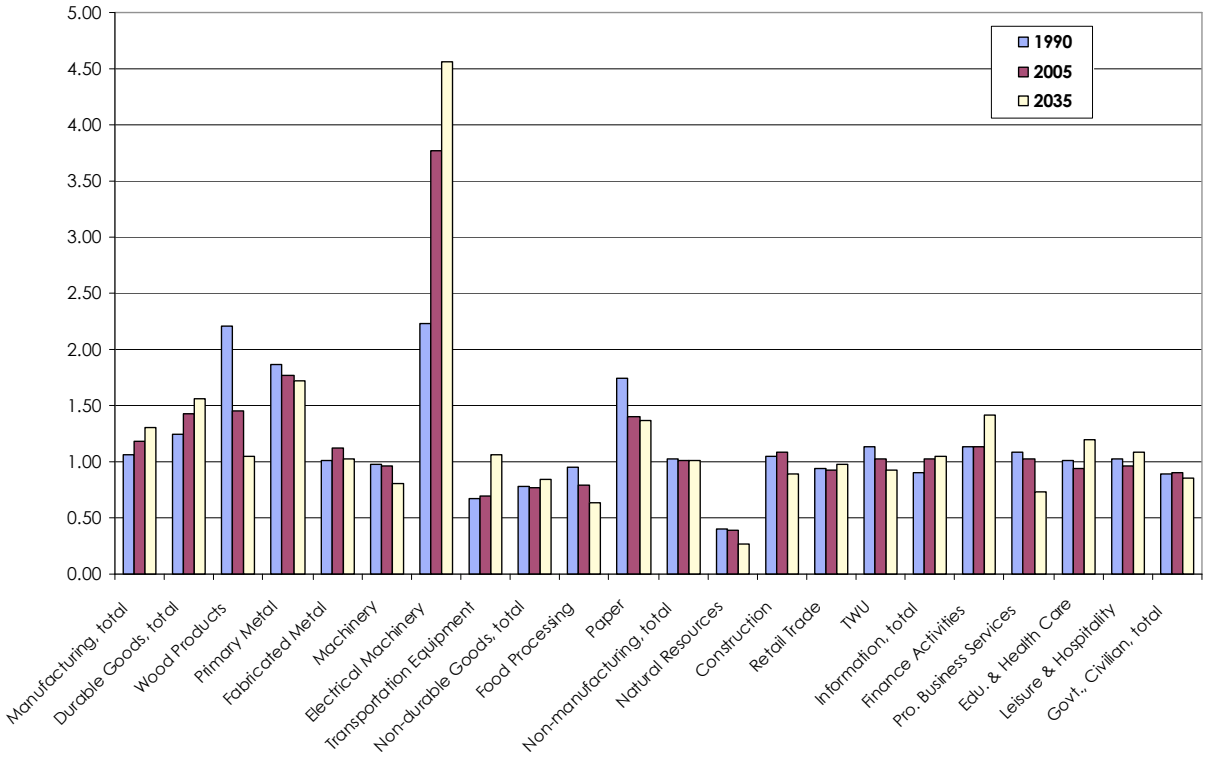
Portland can be defined as having a comparative advantage for sectors in which employment concentration is above the national average: a LQ of one or above.[9] For example, if 20% of the region's employment is in a particular sector versus just 10% of the nation's job base, the location would be 2.0 – meaning that this region has twice the concentration of employment in that sector as the nation.

## PORTLAND METRO SPECIALIZATIONS

The following chart illustrates changes in LQ by major job sector for the historic period 1990-2005 and as projected by Metro to 2035. The greatest detail is provided for manufacturing sub-sectors.

[9] While comparative advantage analysis offers a snapshot of the relative concentration of employment in a region compared to the U.S. at a point in time, that advantage may be a reflection of both historic and current competitive advantage of the region relative to the nation. This changing competitive position can be indicated by the *shift* portion of *shift-share* analysis – with the shift indicated as the change in location quotient (LQ) between two or more different points in time.

**Figure 27. Changing Portland Competitive Advantage – All Industries (1990-2035)**




Source: Global Insight, *2008 QR US Long-Term Outlook* and Metro.

## Manufacturing LQ

The Portland metro area has gone from a slight comparative advantage relative to the nation in *manufacturing* in 1990 (LQ – 1.06) to a more substantial position as of 2005 (LQ – 1.18). This indicates that the region better maintained its manufacturing job count while net job loss was experienced across the nation as a whole. Metro has forecast that this comparative advantage may increase by 2035 to an LQ of as much as 1.30. If realized, this forecast would allow for a net manufacturing job gain of about 7% between 2005 and 2035.

LQs have increased since 1990 for manufacturing sectors of electrical machinery and transportation equipment, while declining for wood products, food processing and paper. Metals and machinery have about held their own relative to the nation. Looking forward to 2035, Metro has forecast continued LQ gains for electrical machinery and transportation equipment; the other manufacturing sectors are projected to hold steady or decline.

## Non-Manufacturing LQ

Overall, non-manufacturing industrial sectors show relatively little comparative advantage relative to the rest of the nation. These sectors have experienced relatively minor changes in LQ since 1990, with slight gains noted for construction and information and losses for natural resources, transportation and warehousing, and utilities. These trends are largely expected to

continue forward except for construction where declining LQ is forecast (albeit after a continued surge that was projected to about 2010). Also noted is that Metro projects a growing LQ potential for publishing (a subsector of the information sector).

For most service sectors, Portland does not show any substantial comparative advantage relative to the rest of the U.S. – with the modest exceptions of finance activities (especially real estate) and professional business services (notably management of companies). Looking forward, Metro is projecting increased comparative advantage for finance activities, education and health care and other services (including personal services), but reduced LQ for professional business services (except management of companies).

## CITYWIDE VALUE ADDED CLUSTERS

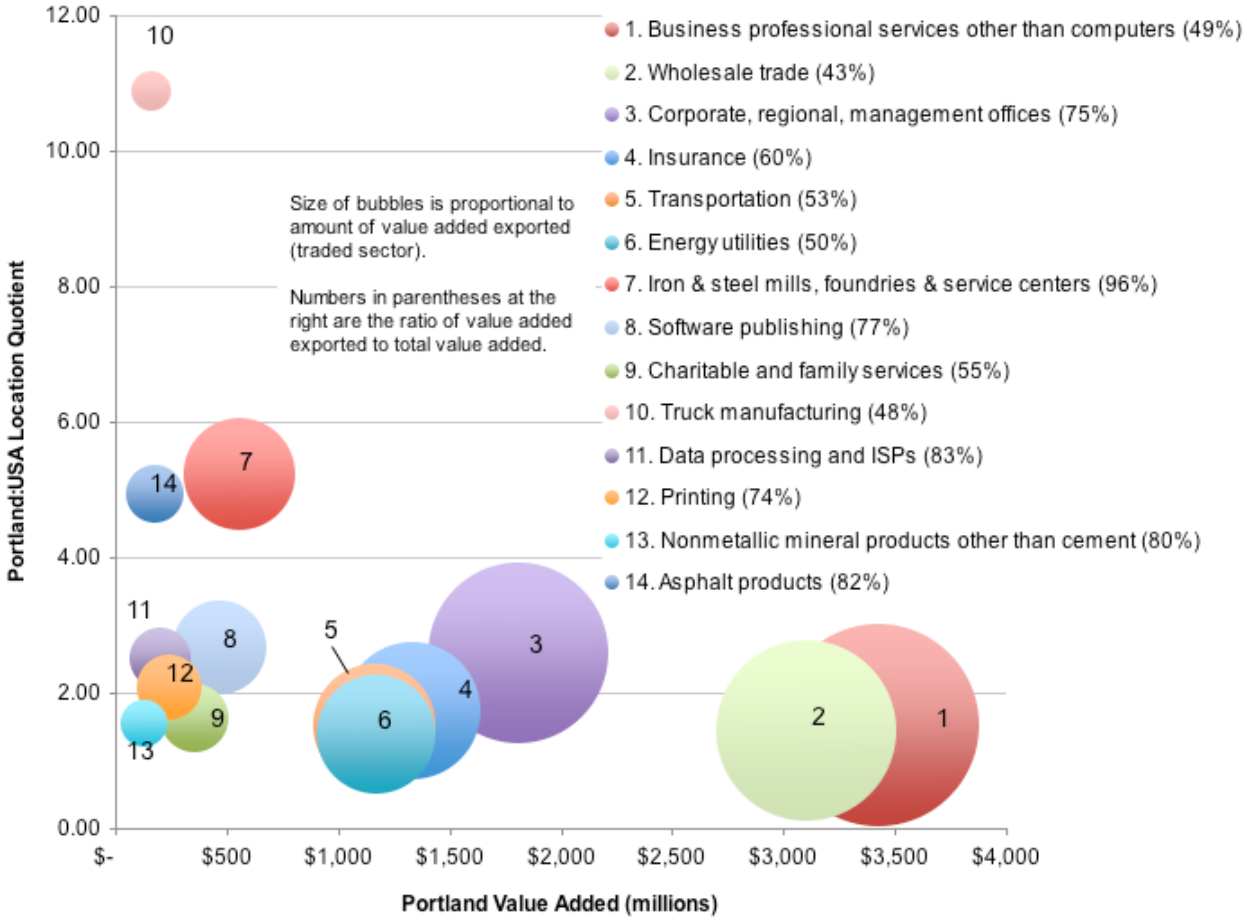
In a 2009 study for the Portland Development Commission, ECONorthwest has investigated LQ on the basis of an industry's valued added (output) rather than employment, identifying city specializations relative to the nation rather than regional specializations. Value added describes the market value of a business' production of goods and services, including payroll and the contributions of capital, land and property. This approach elevates the importance of industry output, in addition to considering employment levels.

ECONorthwest's conclusions are that Portland supports two kinds of clusters:

- Specialized firms with high location quotients – such as truck manufacturing, iron and steel mills, insurance and software publishing – but that are relatively small contributors to the overall Portland economy in terms of value added and export amounts; and
- Firms with above-average but lower location quotients (1.5 – 2.5) that generate much larger amounts of industry output, as well as export output from sales outside the region. These are dominated by professional services and wholesale trade, many of which tend to serve the regional and statewide markets (although professional firms with national scope can also serve as local economic engines). These moderate city specializations also include management of companies, insurance, transportation, and energy utilities.

ECONorthwest's results tend to corroborate the employment-base results released by Metro in 2008: both LQ analyses indicate that Portland's location quotients are higher in the manufacturing sectors. However, these are smaller shares of total economic activity than in the past. Consequently, the ECONorthwest analysis indicates that manufacturing's output may be insufficient as an *exclusive engine* for continued economic growth into the future.

## Figure 28. Value Added Portland Clusters (2007)




Source: ECONorthwest, 2009.

# VII. INDUSTRIAL LAND DEMAND ANALYSIS

The primary method for determining land demand is employment growth. However, in the industrial areas there are indications that employment may not be the best measure of economic performance and the future demand for industrial land. Additional research has been compiled to supplement the industrial land demand forecast based on employment growth to analyze additional land demand drivers.

## *Absorption Trend Comparison*

Reviewing long-term industrial land absorption trends is one method to estimate future industrial land needs, although this approach does not account for possible future shifts between industrial sectors.

Historic absorption is available only for properties along the Willamette and Columbia (west of the rail bridge) between the river and the nearest parallel street or railroad right-of-way. This area represents about one-third of the City's industrial areas, but likely a greater portion of land absorption. The other primary area that has realized industrial development during this time frame (post 1960) is the Columbia Corridor east of 82nd Avenue and north of Sandy Boulevard. A land absorption trend estimate is currently being completed for this second geography so that a citywide industrial absorption trend can be approximated.

### Figure 29. Industrial Land Demand Comparison with Past Trends

| Absorption Trends | Acres per year |
|---|---|
| Portland Harbor 1960-1997 absorption trends, all industrial uses (source: PHILS) | 45 |
| Portland Harbor 1960-1990, marine uses (Portland only. Source: Port of Portland) | 24 |
| Portland Harbor 1960-1990, all uses (including parks and residential. Source: Port of Portland) | 39 |
| Portland Harbor 2002-2008, developed industrial land | 18 |

**Absorption Forecast**

| | All Industrial Areas | | Columbia Harbor | |
|---|---|---|---|---|
| | driven | terminals | driven | terminals |
| Low | (9) | (9) | (5) | (5) |
| Mid | 45 | 45 | 30 | 30 |
| High | 104 | 104 | 69 | 69 |

Source: Portland Harbor Industrial Lands Study Feb 2003, Bureau of Planning; E.D. Hovee & Company, LLC. Portland Harbor Industrial Land Supply Analysis, Feb 2012, ECONorthwest

The historic absorption figures available indicate an increase in annual absorption between 1990 and 1997. The bulk of this absorption occurred within the Port's Rivergate development and on Swan Island.

### *Commodity Flows*

Commodity flows provide another indicator of economic activity and terminal and distribution facility needs. The overall freight volume handled in the Portland region is forecast to roughly double in tonnage and triple in value between 2007 and 2040 (see Draft Portland/Vancouver Commodity Flow Forecast, 2014).

There are two studies that analyze the cargo moving through the Portland Harbor. The 2003 *Portland Harbor Industrial Land Study* (PHILS) reports that cargo volumes increased at an average annual rate of 2.3% between 1960 and 2000. Marine terminal investments of note that accompanied this increase include the 85 acre Portland Bulk Terminal facility at Port of Portland and a 20-acre expansion of the container terminal at T-6. The 2012 *Portland Harbor Industrial Land Supply Analysis* found cargo volume growth continues to be robust in recent years. From 2002-2008, cargo volumes increased by 4.8% per year. This study of marine terminal cargo volumes and land absorption needs plus the 2010 *West Hayden Island Economic Foundation Study* take a cargo-specific approach, factoring in the known size and capacity of existing terminals, existing cargo volumes, cargo forecasts, and the size requirements of modern terminal facilities. With the goal of understanding these factors in more depth, the City also commissioned a study of the operational characteristics of different marine terminal types, which includes case studies of best-in-class facilities with land area and cargo throughput information.[10] More information about marine cargo forecasts, and associated land needs can be found later in this section.

The Port of Portland notes that land needs associated with commodity flows an inherently difficult to forecast. Over the past 10 years, the Port has twice been the fastest growing on the West Coast, and also the fastest declining. This short-term fluctuation results from decisions within the handful of steamship line companies on whether or not to utilize Port of Portland facilities, and is independent of shipping growth associated with business activity. For this reason, longer term trend data is more reliable. There is also some level of opportunistic growth that can be driven by a specific opportunity, driven by the competitive market. For example, other ports in the lower Columbia River have recently announced new projects to ship coal. Local ports are able to respond to these opportunities not because growth of that commodity had been forecast, but because they had an inventory available development-ready land. If the Port of Portland waits for a specific business opportunity to arise before land can made available, as long as other Ports have more readily developable land supply, Portland will probably not be competitive.

### *Gross Domestic Product Output*

Industry output provides a third measure of the health and growth of an industry. Data on industry output is available (via the Bureau of Economic Analysis) on a metro area level.

Between 2001 and 2006 there was a substantial increase in output among many industries, including manufacturing and information and technology. Manufacturing output (across the seven county PMSA, the smallest geography for which data is available) increased at an annual rate of close to 12%, compared to an annual average increase of 6% for the PMSA economy as a whole.

[10] Worley Parsons, Operational Efficiencies of Ports/Terminals World--Wide, February 2012

GDP data portrays manufacturing as a growth industry, rather than the declining industry that employment trends suggest. Industry stakeholders describe several factors that influenced this sector's recent profitability gains, including:

- Substantial increases in commodity and product pricing;
- Substitution of technology for labor, and
- A low valued dollar that fueled export growth.

These factors may continue in future years. However, the challenge remains of predicting land needs based on industry output; as yet no clear quantitative relationship between the two measures has been identified.

### Figure 30. Portland-Vancouver PMSA Gross Domestic Product Trends (01-06)

| | | | Change | |
|---|---|---|---|---|
| **Industry** | **2001** | **2006** | **Net** | **AAGR** |
| All industry total | 77,200 | 103,400 | 26,200 | 6.0% |
| Private industries | 69,600 | 94,000 | 24,400 | 6.2% |
| Manufacturing | 12,000 | 21,000 | 9,000 | 11.8% |
| Transportation and utilities | 3,600 | 4,300 | 700 | 3.6% |
| Retail trade | 4,300 | 4,900 | 600 | 2.6% |
| Professional and business services | 8,700 | 11,000 | 2,300 | 4.8% |
| Education and health services | 5,400 | 7,600 | 2,200 | 7.1% |
| Leisure and hospitality | 2,300 | 3,000 | 700 | 5.5% |
| Information, Communication, and Technol | 8,200 | 15,800 | 7,600 | 14.0% |
| Government | 7,500 | 9,400 | 1,900 | 4.6% |
| *Private goods-producing industries* | *16,600* | *26,700* | *10,100* | *10.0%* |
| *Private services-providing industries* | *53,100* | *67,300* | *14,200* | *4.9%* |

Source: Bureau of Economic Analysis, US Dept. of Commerce, April 2009

## *Other Indicators*

In order to better understand this dynamic, ECONorthwest examined trends in land efficiency from 2002-2008 in the Portland Harbor using several different measures. They calculated the economic activity measured in terms of employment, real market value, value added, and cargo tonnage. The value added and real market value measures appear to grow, however the US Consumer Price Index grew by 3.0%, indicating that these measure grew less than the rate of inflation, while the cargo tonnage grew at a faster pace (Table 30).[11]

[11] ECONorthwest, Portland Harbor Industrial Land Supply Analysis, February 2012 (Appendix C)

## Figure 30. Portland Harbor Measures of Economic Activity (per acre)

| Measure | 2002 | 2008 | AAGR |
|---|---|---|---|
| Value Added | $1,147,614 | $1,217,713 | 1.0% |
| Real Market Value | $776,715 | $838,091 | 1.3% |
| Employment (jobs) | 6.21 | 5.75 | -1.3% |
| Cargo Tonnage | 3,873 | 4,928 | 4.1% |

Source: ECONorthwest, Portland Harbor Industrial Land Supply Analysis, February 2012

# VIII. ECONOMIC MULTIPLIER ANALYSIS

As discussed above, there can be a disconnection between employment growth and the demand for new building space and development sites, especially within the industrial sectors. Another way to look at the situation is economic multipliers, which represents the relationship between direct investment in economic activity at a particular site and the resulting multiplier (or ripple effect) throughout Portland and the metro region. The three most common types of economic multipliers are provided within this EOA report are measures of:

- Employment
- Personal income (to residents of the region)
- Output (or added gross receipts)

For example, an employment multiplier of 2.00 indicates that for every job directly associated with a place-specific investment, another job is created off-site through indirect and induced economic effects elsewhere in the region. Indirect effects occur as the new economic activity makes purchases from other businesses in the region. Induced effects occur as the direct employees of the new economic activity are able to make added purchases from increased disposable income from local retail and services.

Multipliers are based on the nationally recognized IMPLAN input-output model. IMPLAN data is available for every county in the U.S. Multipliers used with this analysis are those for the seven-county metro region (PMSA) as of 2009. Economic multipliers are typically reported by NAICS employment sector. For the Portland EOA, NAICS specific multipliers have been aggregate to six industrial/commercial building types based on the City of Portland's projected 2035 mix of sector employment and anticipated allocation of employment sectors to building types.

This essentially reflects weighted averaging of specific building types. For example, the General Industrial building type is associated with a relatively high 3.15 overall jobs multiplier. The key components of the General Industrial multiplier are manufacturing (with a 3.69 multiplier) and construction (2.04). Other building types involve different employment sectors but with a similar weighting methodology applied.

## Figure 31. Economic Multipliers By Building Type

| | Economic Multiplier | | |
|---|---|---|---|
| **Building Type** | **Jobs** | **Income** | **Output** |
| Office | 1.95 | 1.87 | 1.98 |
| Institution | 1.62 | 1.69 | 2.13 |
| Flex / BP | 2.19 | 2.12 | 1.91 |
| General Industrial | 3.15 | 2.50 | 2.15 |
| Warehouse | 2.36 | 1.95 | 1.95 |
| Retail | 1.64 | 1.76 | 1.97 |

Source: E. D. Hovee & Company, LLC based on IMPLAN

Multipliers are relevant to district-specific land supply decisions because they suggest the importance of looking beyond direct site-specific employment opportunities. For example, although job density is low on industrial land, the General Industrial and Warehouse multipliers are high. That is, industrial acres have the potential to generate a greater number of secondary and tertiary off-site jobs that an acre of retail. All other things being equal, this could be a factor if one must allocate a limited supply of land to different industry types. Or, put another way, some of our retail and office job growth is dependent on having an adequate industrial land supply.

# IX. LAND EFFICIENCY ANALYSIS

The purpose of this analysis is to estimate the portion of future employment-related development that will take place on parcels with a significant amount of existing building square footage – sites that are not included in the Buildable Land Inventory.

## METHODOLOGY

The analysis is based on development activity from 1999-2011 to assign it to the type of site in 1999 – vacant, LoFAR, or HiFAR.[12] The LoFAR category corresponds to the underutilized or redevelopable sites in the BLI and is defined as sites with less than 20% of the building square footage allowed by zoning (based on applicable zoned FARs) based on existing building square footage in 1999. For industrial properties, only vacant parcels are considered buildable.

RLIS assessor data is used to create a side-by-side comparison of tax lots with a "new year built" or for which there was more than 50% building square footage added (as opposed to a minor addition). A review of the assessor data revealed a number of parcels for which there was no building square footage indicated in 1999 but had a 1999 building value of over $25,000, which indicated some kind of improvement. Tax parcels greater than 10,000 square feet in size with missing data have been cross-checked with development permit data to better determine which parcels were: a) previously developed in 1999 with no added building space developed through 2011, or b) previously developed but added some amount of net new building space since 1999. This analysis was limited to parcels for which there was comparable data regarding building square footage, land and improvements valuation with matching tax records in 1999 and 2011. Excluded are parcels for which there is not a matching tax parcel identifier or for which other data is missing in either year. Also excluded are parcels for which building square footage was increased by less than 50%, but with no new built data between 1999-2011 indicated. For these reasons, the analysis should be viewed as representing a conservative representation of development activity on employment lands over this time period.

Using the revised parcel dataset, development activity is assigned to the type of site in 1999 – vacant, LoFAR, or HiFAR (Figure 32). The proportion of development activity that occurs on vacant or LoFAR is development that would occur on sites in the BLI (industrial geographies are limited to vacant sites). Development that takes place on HiFAR parcels is on parcels that are not included in the BLI.

The data analysis shows that the campus institutions present a unique case. These campuses consist of large parcels with existing development that places them in the HiFAR category. So as to not skew the overall results, the campus institutions were eliminated from this analysis because these areas are treated differently in the BLI (development capacity based on master plans, not vacant/underutilized parcels).

[12] The initial method was to analyze employment data (ES202) data to identify job growth that took place on sites with existing development and no new development from 2000-2008. This analysis proved to be too difficult to manage because of employers with multiple tax parcels and dispersed employment that was reported to different tax parcels over the analysis period.

## Figure 32. Land Efficiency Analysis (Net Added Building Space 1999-2011)

| Forecast Geographies | On Sites that Were Previously Vacant | LoFAR | HiFAR | Total | % on Vac/Lo | |
|---|---|---|---|---|---|---|
| Central City Commercial | 4,753,957 | 286,431 | 3,605,539 | 8,645,927 | 58% | |
| Central City Incubator | 589,616 | 230,191 | 41,871 | 861,678 | 95% | |
| Columbia Harbor | 4,259,890 | 2,262,671 | 91,150 | 6,613,711 | 64% | Vacant |
| Columbia East | 3,932,091 | 502,344 | 75,646 | 4,510,081 | 87% | Vacant |
| Dispersed Employment | 543,702 | 241,891 | 491,278 | 1,276,871 | 43% | Vacant |
| Neighborhood Commercial | 3,111,419 | 12,073 | 2,236,145 | 5,359,637 | 58% | |
| Town Centers | 135,913 | 0 | 341,128 | 477,041 | 28% | |
| Regional Center | 694,329 | 0 | 160,986 | 855,315 | 81% | |
| Institutions | 407,270 | 4,800 | 2,164,726 | 2,576,796 | 16% | |
| Total | 18,428,187 | 3,540,401 | 9,208,469 | 31,177,057 | 70% | |
| Total (w/o Institutions) | 18,020,917 | 3,535,601 | 7,043,743 | 28,600,261 | 75% | |
| | | | | | | |
| % of Change | 59% | 11% | 30% | 100% | 70% | |
| % of Change w/o Institutions | 63% | 12% | 25% | 100% | 75% | |
| | | | | | | |
| **Aggregate Geographies** | | | | | | |
| Central City | 5,343,573 | 516,622 | 3,647,410 | 9,507,605 | 62% | |
| Industrial | 8,735,683 | 3,006,906 | 658,074 | 12,400,663 | 70% | Vacant |
| Commercial | 3,941,661 | 12,073 | 2,738,259 | 6,691,993 | 59% | |
| Institutions | 407,270 | 4,800 | 2,164,726 | 2,576,796 | 16% | |
| Total | 18,428,187 | 3,540,401 | 9,208,469 | 31,177,057 | 70% | |
| Total w/o Institutions | 18,020,917 | 3,535,601 | 7,043,743 | 28,600,261 | 75% | |

Source: E.D Hovee & Company

## OBSERVATIONS

This supplemental analysis provides added insight into development patterns for different employment geographies. From a market perspective, the data indicates that newly built sites tend to occur on vacant or low value property. However, considerable acreage has experienced building expansion on properties with existing high value improvements. The overall results show that roughly 60% of Central City and Commercial development took place on vacant or LoFAR land and approximately 70% of industrial development took place on vacant land. A significant portion of new development (30-40%) is occurring on parcels with a significant amount of existing development (HiFAR) that is not included in the BLI.

Both for newly built sites and expansions, the market evidences continued preference for unconstrained sites. The market can shift to support development of environmentally constrained and/or potential brownfield sites where fewer unconstrained property opportunities are available. This analysis is useful as a means to better refine realistic land needs in employment land supply and demand analysis.

# X. MARINE CARGO FORECAST

## PORTLAND HARBOR MARINE TERMINALS

The Harbor Access Lands geography benefits from its superior connectivity: the confluence of two rivers, access to domestic markets via two major rail lines (UP and BNSF), and interstate freeway access to I-5 (north-south) and I-84 (east-west), and access to global markets via the Pacific Ocean. Having all of this connectivity in the heart of the City of Portland, with strong local and regional policies in place to preserve harbor land for industrial use, creates a special place for water-dependent industrial firms. However, the industrial harbor land supply in the Portland region is fixed, and vacant developable land is rare and usually constrained. (See Appendix C. ECONorthwest, *Portland Harbor Industrial Land Supply Analysis*, May 2012)

A primary source of past economic growth in Portland has been marine-related economic activity, including marine industrial and marine cargo uses. These uses are projected to continue to grow over the next 30-years, with particular growth forecasted in the marine cargo and related transportation, warehousing, utility, and wholesale trade sectors. The Portland Harbor serves as a major economic engine for the regional economy. Studies indicate that cargo and manufacturing activities dependent on waterborne transportation contribute significantly to the metro region's economy. These studies indicate that marine-related economic activity generates from 20,000 to 100,000 jobs and from $1.4 to 3.4 billion annually in regional income.[13]

The Port of Portland has four marine terminals located along the Willamette and Columbia Rivers. These terminals accommodated 575 ocean-going vessels in 2010, though over the past two decades it was not uncommon for the Port to accommodate 800 to 1,000 ocean-going vessels in a year. Not counting cargos received or shipped via inland barges, the Port of Portland shipped over 13 million short tons of cargo in 2010.

Harbor industrial development tends to have low floor-to-area ratios (FAR) and a relatively low number of jobs per acre. But despite declining employment in recent years, the Portland Harbor experienced an increase in cargo tonnage at a faster pace than the rate of industrial land development in the area. [14] Therefore, given the disconnected relationship between employment growth and cargo activity in the harbor, there is a need to base the need for additional marine terminals on cargo forecasts as a supplement to any land needed to support future industrial employment growth in the Harbor Access Lands geography.

## MARINE CARGO FORECAST

While employment forecasts traditionally form the basis of employment land supply analysis, as noted earlier, employment is not a very good indicator of the long-term land needs of the freight and distribution sectors of the economy. Despite a general decline in industrial employment between 2002 and 2008 (-1.3% AAGR), cargo tonnage handled in the Portland Harbor went up

[13] Entrix, West Hayden Island Economic Foundation Study, July 2010

[14] ECONorthwest, Portland Harbor Industrial Land Supply Analysis, May 2012.

4.1% per year during that same period. An average of 18 acres of land was developed each year during that period.[15]

There have been several attempts to understand how cargo tonnage trends may impact future land needs in the Portland Harbor. Extrix studied this topic in 2010, based on cargo forecasts completed in 2009. The most recent cargo forecasts are based on a 2010 study by BST, refined to specifically call out cargo demand for Portland and Vancouver and updated with the most recent economic data.[16] Cargo forecasts generally assume an adequate land supply will be made available (that is, they do not attempt to predict how any land supply constraint might impact growth). The most recent BST forecast demand for the region in 2040 (including both Portland and Vancouver) ranges from 39 million to 66 million metric tons. For the Portland Harbor, the forecast range is 28 million to 43 million metric tons. For context, in 2010 the Port of Portland moved 13 million metric tons of cargo, and approximately 27 million tons moved through the region as a whole (including private terminals and both public Ports).

**Figure 33. 2040 Portland Harbor Cargo Volume Forecast Scenarios**

| Cargo Type | Low | Medium | High |
|---|---|---|---|
| Automobiles (units) | 811,000 | 912,500 | 1,014,000 |
| Containers (TEUs) | 379,000 | 452,500 | 526,000 |
| **Metric Tons** | | | |
| Automobiles | 1,076,000 | 1,206,000 | 1,336,000 |
| Containers | 2,162,000 | 2,583,500 | 3,005,000 |
| Breakbulk | 1,132,000 | 1,242,000 | 1,352,000 |
| Grain | 6,686,000 | 9,078,000 | 11,470,000 |
| Dry Bulk | 10,278,000 | 14,093,500 | 17,909,000 |
| Liquid Bulk | 6,912,000 | 7,461,500 | 8,011,000 |
| **Total** | **28,246,000** | **35,664,500** | **43,083,000** |

Source: ECONorthwest and BST Associates
Note: Low and High forecasts were made by BST Associates for the Portland and Vancouver Harbor Forecast Update, 2012. Medium scenario is calculated by ECONorthwest.

Factoring in the capacity of existing marine terminals, ECONorthwest estimated the need by 2040 for additional marine terminal facilities by cargo type, shown in Figure 34.[17] With the low scenario forecast, they estimated that existing terminals could handle all commodity types except automobiles. With the high scenario forecast, additional new terminals would be needed for automobiles, containers, grains, and dry bulk commodity types. With the mid-range scenario forecast, additional terminals would be needed for automobiles, grain, and dry bulk commodities.

Based on the size trends of new terminals being constructed on the West Coast, most of the land need for marine cargo is expected to be for parcels larger than 100 acres to accommodate rail access and ensure competitiveness.[18] The actual acres needed to accommodate the projected

[15] EcoNorthwest, Portland Harbor Industrial Land Supply Analysis, May 2012

[16] BST Associates, Portland and Vancouver Harbor Forecast Update, February 2012

[17] EcoNorthwest, Portland Harbor Industrial Land Supply Analysis, May 2012

[18] Entrix, West Hayden Island Economic Foundation Study, July 2010

marine terminal need varies, depending on the commodity type, and depending on how important it is to have an optimal terminal design. For example, it is possible to operate a grain terminal on less than 10 acres, but a modern rail-served terminal would likely require 100+ acres.

**Figure 34. 2040 Portland Harbor Forecast Cargo Capacity Shortfall**

| Cargo Type | Low | Medium | High |
|---|---|---|---|
| Automobiles (units) | -136,000 | -310,000 | -554,000 |
| Containers (TEUs) | | | -196,000 |
| **Metric Tons** | | | |
| Automobiles | -187,000 | -410,000 | -730,000 |
| Containers | | | -1,120,000 |
| Breakbulk | | | |
| Grain | | -2,390,000 | -4,370,000 |
| Dry Bulk | | -2,960,000 | -10,949,000 |
| Liquid Bulk | | | |
| **Total** | **-187,000** | **-5,760,000** | **-17,169,000** |
| **Acreage Needs** | | | |
| Minimum | 51 | 170 | |
| Practical | **150** | 390 | |
| With Rail Loop | | **470** | **977** |

Source: ECONorthwest (see Appendix C)

At the City's request, Worley Parsons completed a detailed analysis of the operational and land consumption characteristics of modern ports.[19] The report included case studies of innovative international facilities. Provision of efficient rail operations is one of the primary ways that modern terminals maximize cargo throughput for a given terminal. The report also includes discussion of auto terminals with multi-deck parking structures (shown as minimum acreage needs of the low scenario in Figure 34), but concludes that they would be very difficult to make cost-competitive in the context of the current Lower Columbia River market.

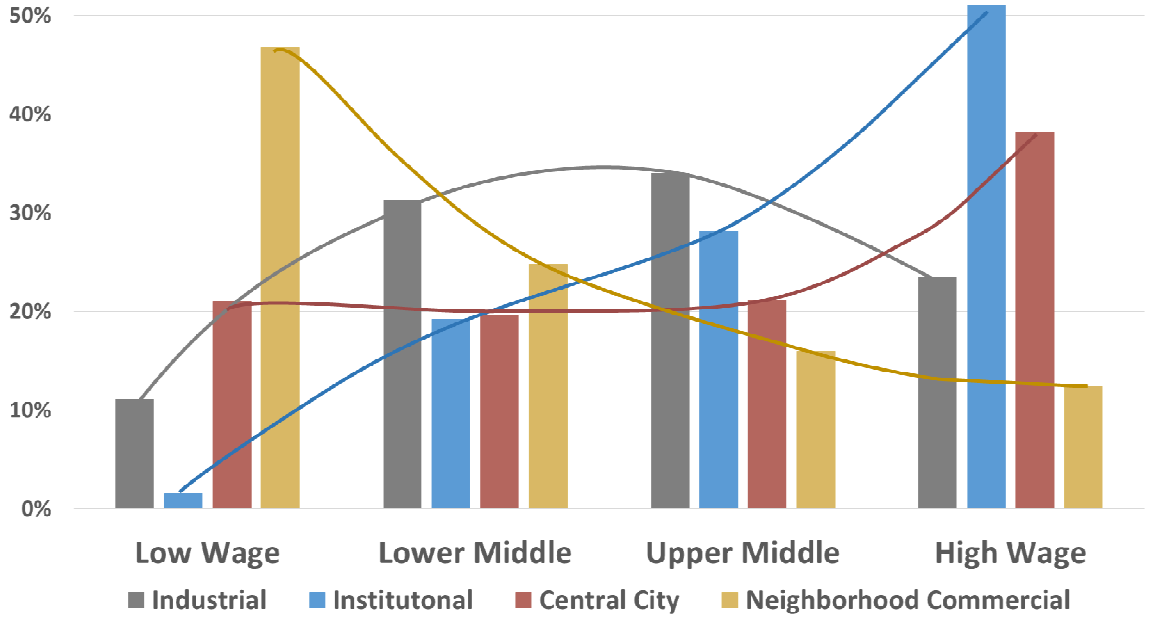
Using information collected from Worley Parsons, and the forecast information described above, ECONorthwest estimated the land need through 2040 for the Port of Portland ranges from 150 acres (practical terminal size) to 977 acres, with a mid-range land need of approximately 470 acres (Figure 34).

[19] Worley Parsons, Operational Efficiencies of Ports/Terminals Worldwide, 2012

# XI. WAGE DISTRIBUTION AND JOB POLARIZATION

The mix of businesses and employment geographies in the local economy shapes the income-distribution and economic equity of the population. As shown in Figure 35, employment in the Central City and institutional geographies is concentrated in high-wage occupations that primarily require college education; industrial geography employment is concentrated in middle-wage occupations; and neighborhood commercial employment is concentrated in low-wage occupations.

**Figure 35. Wage Quartile Comparison of Portland's Employment Geographies, 2012**

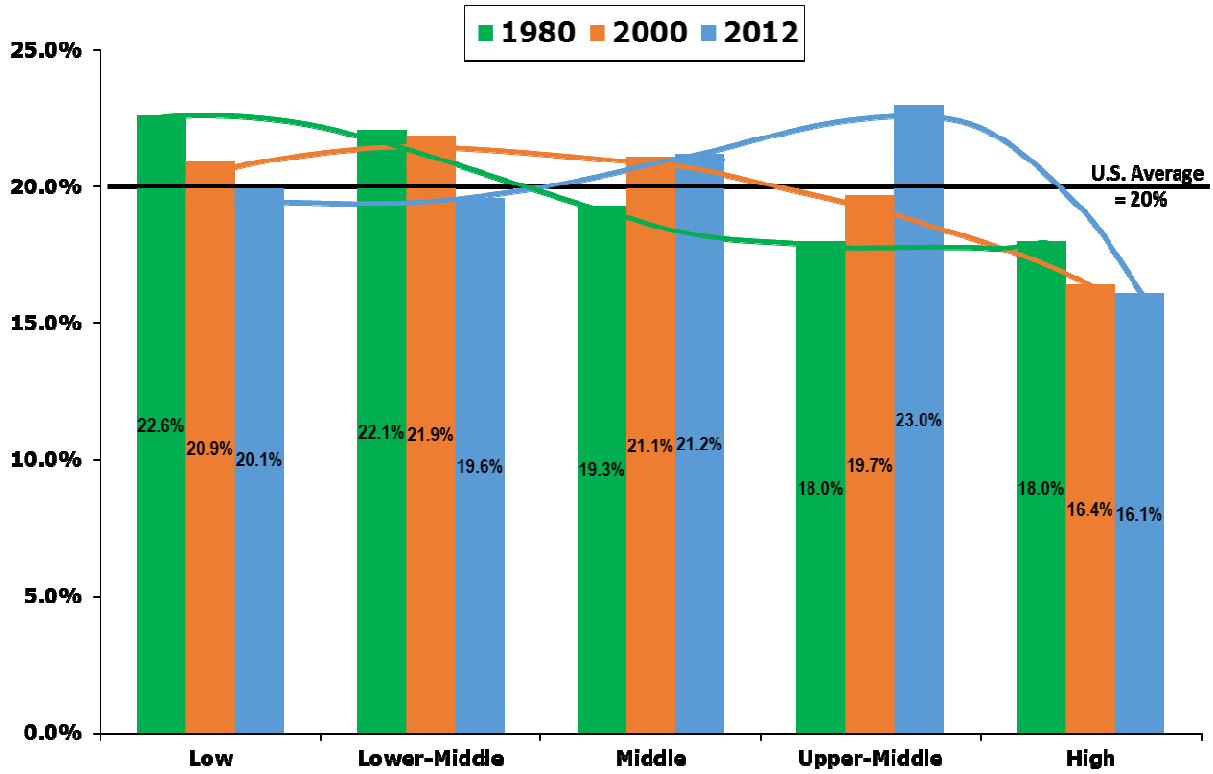



Source: Bureau of Planning and Sustainability. The wage distribution of covered employment in Portland's EOA employment geographies is grouped by citywide wage quartiles. The Low Wage quartile is less than $26,400 annually; Lower Middle is $26,400-46,400; Upper Middle is $46,400-67,600; and High Wage is more than $67,600.

Since 1980, the wage distribution of the economy has been changing, and job growth has become increasingly polarized in low- and high-wage occupations with shrinking middle-wage job opportunities (Josh Lehrer, 2012). This national trend is mirrored in the state and the region. For the majority of the workforce that doesn't have a 4-year college degree, middle-wage job opportunities are primarily in industrial and administrative-support occupations.

Portland has been less affected by this trend, having a relatively balanced economy that supports a predominantly middle-class population (Brookings Institution, Berube and Tiffany, 2004). Nevertheless, Portland's primarily lower-middle income distribution of households in 2000 has shifted to a more upper-middle income distribution by 2012, as shown in Figure 36.

**Figure 36. Proportion of Households in Portland by National Quintile Income Category**

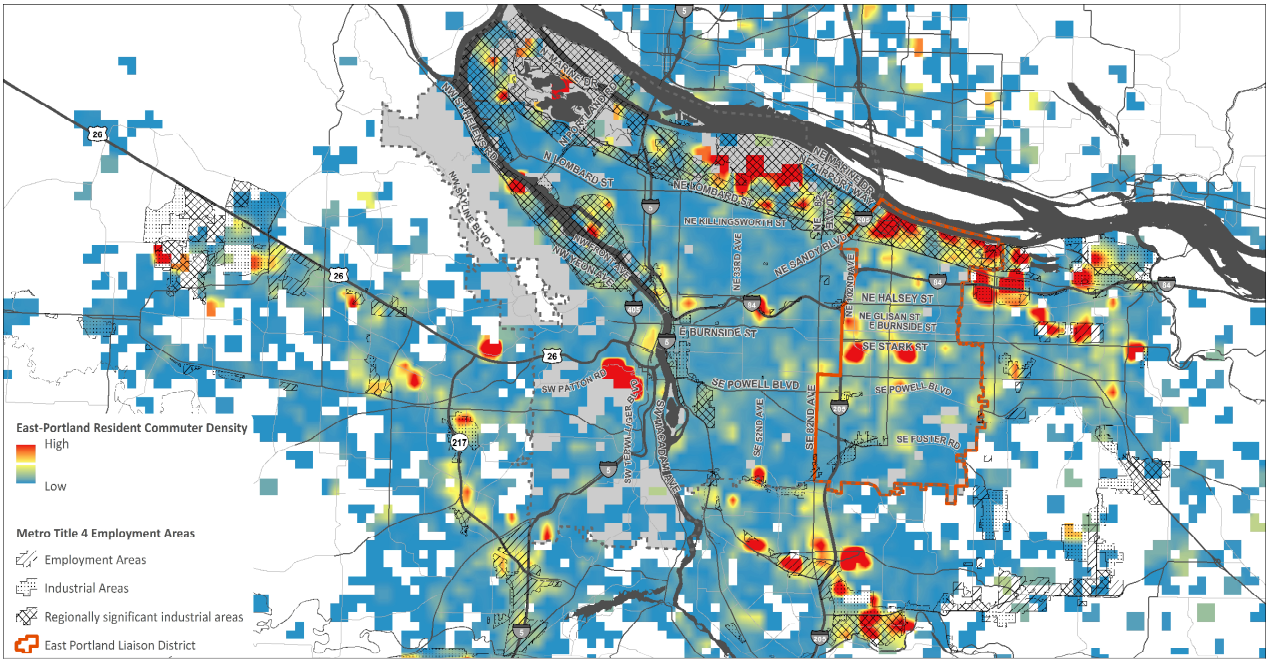



Source: Bureau of Planning and Sustainability and Brookings Institution (Alan Berube and Thatcher Tiffany, The Shape of the Curve, August 2004) from U.S. Census data. The income distribution of Portland households is grouped by national income quintile categories.

Industrial job growth also provides an important equity role in expanding income self-sufficiency for Portland's diverse population and reducing income disparities for people of color and East Portland residents. For example, 27% of the workers of color in Multnomah County are employed in middle-wage industrial occupations, compared to 17% of white workers (Coalition of Communities of Color, 2010). In contrast, only 23% of workers of color are employed in the high-wage professional and management occupations, compared to 44% of white workers. As a result, people of color are disproportionately impacted by job-polarization trends and slower industrial job growth.

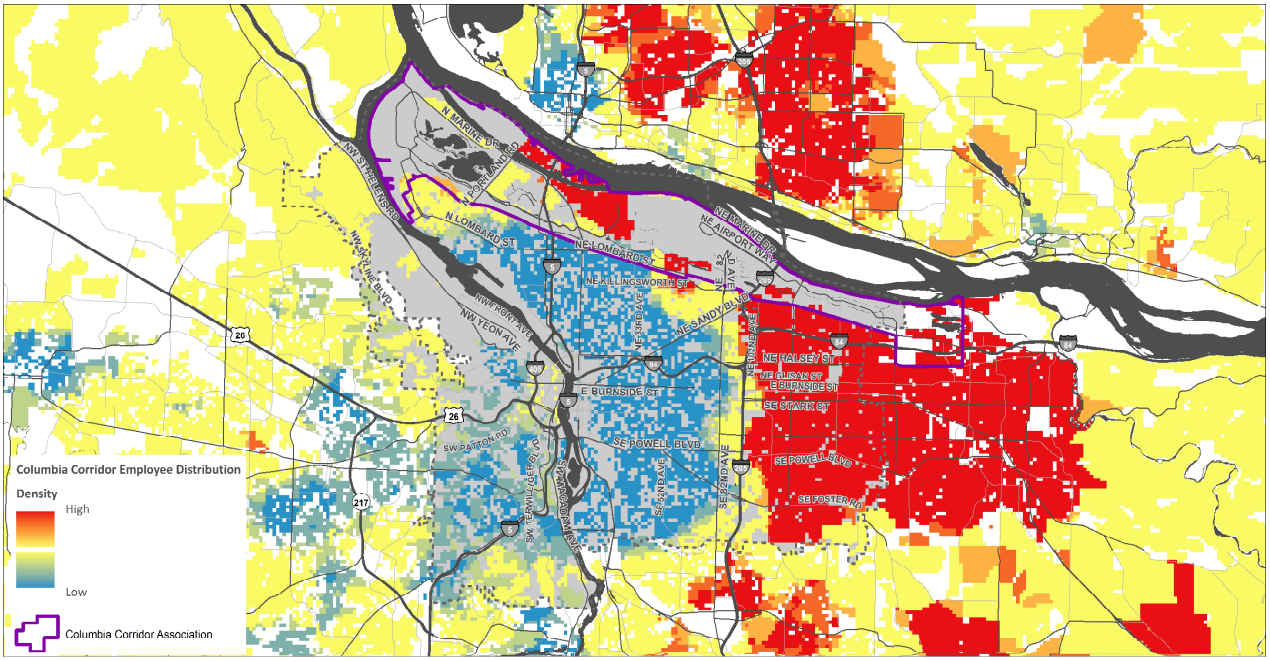
Similarly, residents of the East Portland neighborhoods work disproportionately in industrial districts and especially the Colombia Corridor, as shown in Figure 37. Conversely, workers in the Colombia Corridor industrial districts live primarily east of I-205 and are underrepresented in inner and West Portland neighborhoods, as shown on Figure 38. While labor markets are commonly considered to be regional in scale, there also appears to be substantial interdependence between East Portland's predominantly middle-/moderate-income neighborhoods and Portland's large middle-wage industrial districts.

## Figure 37. Where East Portland Residents Work




Source: Bureau of Planning and Sustainability (August 2014) from Longitudinal Employment and Housing data, U.S. Census.

## Figure 38. Where Columbia Corridor Workers Reside




Source: Bureau of Planning and Sustainability (August 2014) from Longitudinal Employment and Housing data, U.S. Census.

# XII. EOA IMPLICATIONS

This section is intended to *set the stage* for the next steps of this economic opportunities analysis. Key implications of this trends and opportunities analysis for remaining portions of the economic opportunities analysis are summarized as follows:

- Long-term job growth trends have fluctuated and create uncertainty for forecasting growth in the coming decades. The 2000's were a period of relatively slow job growth not only for Portland but for the metro region and nationally. Despite an economic downturn experienced just after 2000, followed by modest growth and a major recession at end of the decade, Metro is projecting that the nation and region should expect to return to a more normalized pattern of job recovery and stronger growth over the long-term horizon of the next 25 years.
- For Portland, another question is whether the city will maintain the 25% capture rate of regional job growth that Multnomah County experienced over the 1980-2008 period. Portland's capture rate fell to 5% in the 2000-2008 business cycle and has since rebounded to 23% in the 2008-2013 period. The answer to this question has significant ramifications not only for Portland's economic vitality but for regional urban growth management.
- Finally, it is apparent that the "hot spot" locations where job growth is occurring within the City have shifted in recent years. The focus of added Central City job gains has shifted from the traditional downtown core toward adjacent areas in the River and Lloyd commercial / mixed use districts and the emerging incubators of the Central Eastside and Lower Albina. Similar shifts are occurring within and between the City's industrial, urban center and neighborhood commercial areas. In numerical terms, by far the strongest growth has been within Portland's institutional geography.

As a final note, this Task 1 report has focused on employment in terms of Goal 9 requirements for an Economic Opportunities Analysis. The resulting employment analysis addresses trends with respect to the number and types of jobs including categorization by land use designation. However, it is important to note that employment is one of many approaches to measuring economic activity.

Because the focus of this report is how business uses land, employment and building development are emphasized. Other factors – such as wage levels, technology and capital intensiveness, monetary output and comparative regional advantage (or location quotients) – are not directly considered. This report also does not evaluate which industries and jobs the region should endeavor to encourage, but rather reports past trends as illustrated via employment data.

# APPENDIX A. FOCUS GROUP PARTICIPANTS

As identified by the following listing, a total of 58 individuals participated in six focus groups conducted in 2009 for this Economic Opportunities Analysis. The interest and time given by all participants is gratefully acknowledged.

### Figure 39. Focus Group Participants

| Participant Name | Firm/Organization |
|---|---|
| **Central City Office:** | |
| Gregory Goodman | City Center Parking |
| Ted Gilbert | Gilbert Brothers |
| David Lake | Liberty NW |
| Scott Andrews | Melvin Mark Companies |
| Jeff Bourlag | NBS Realtors |
| Brian Owendoff | Opus NW |
| Steve Pfeiffer | Perkins Coie |
| Bernie Bottomly | Portland Business Alliance |
| Carly Riter | Portland Business Alliance |
| Josh Schlesinger | Schlesinger Companies |
| Matt Cole | Shorenstein |
| **Close In Incubator:** | |
| Pete Eggspuehler | Beam Development |
| Eva Schweber | Cube Space |
| Debbie Kitchin | Inter Works |
| Mickael Zokoych | Michael's Italian Beef & Sausage |
| Peter F. Fry | Planning Consultant |
| Daniel Yates | Portland Spirit |
| Bob Rogers | Robert R. Rogers Co. |
| David Lorati | School Specialty Co. |
| **Manufacturing & Distribution:** | |
| Corky Collier | Columbia Corridor Alliance |
| D. A. Albrecht | Concordia University |
| Jay Griffith | Evraz Inc NA |
| Wayne Matulich | ITT Technical |
| Linda Craig | Norris & Stevens |
| Gary Hunt | Oregon Transfer |
| Ann Gardner | Schnitzer Steel |
| Mike Williams | Silver Eagle Manufacturing |
| Deon Kampfer | WM |

| Participant Name | Firm/Organization |
|---|---|
| **Neighborhood Commercial:** | |
| Michael Zokoych | Central Eastside Industrial Council |
| Cindy Sturm | Cindy Sturm Real Estate |
| Bob LeFeber | Commercial Realty Advisors |
| Jean Baker | Division Clinton |
| Tony Fuentes | NW Children's Business/Fox Chase Alliance |
| Michelle Marx | SERA Architects |
| Gerry Boeher | St. Johns Boosters |
| **TOD/Mixed Use Corridors:** | |
| Pete Eggspuehler | Beam Development |
| John Carroll | Carroll Investments |
| Kevin Cavenaugh | Cavenaugh Development |
| Jeana Woolley | JM Woolley & Associates |
| Tom Kemper | Kemper Company, LLC |
| Vern Rifer | Rifer Development |
| Kim Knox | Shiels Obletz Johnsen |
| Rick Gustafson | Shiels Obletz Johnsen |
| **Campus Institutional:** | |
| Theresa Paulson | Concordia University |
| Michael Sestric | Institutional Facilities Coalition |
| Scott Davis | Kaiser Permanente |
| Richard Bettega | Lewis & Clark College |
| David Groff | Linfield College |
| Glenn Ford | Linfield College |
| Gary Andeen | Oregon Independent Colleges Association |
| Wing-Kit Chung | Portland Community College |
| Ty Wyman | Providence Medical Center |
| Edwin McFarlane | Reed College |
| Jennifer Baters | Reed College |
| Townsend Angel | Reed College |
| Andrea Cook | Warner Pacific College |
| Steve Stenberg | Warner Pacific College |

# APPENDIX B. SUPPLEMENTAL DATA TABLES

On the following pages are provided supplemental detailed U.S. employment trend and projection data covering:

- U. S. Non-Farm Employment Trend and Projection (by employment sector and covering the 1980 – 2035 time period
- Portland Metro Location Quotients Relative to the U.S. (by employment sector and covering the 1990 – 2035 time period)

## Figure 40. U.S. Non-Farm Employment Trend & Projection (1980-2035)

| | U. S. Employment (in millions) | | | | | | | | | | | | Annual % Change | | % of Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 1990-05 | 2005-35 | 1990 | 2005 | 2035 |
| Total Non-Farm Jobs | 90.53 | 97.51 | 109.49 | 117.31 | 131.79 | 133.69 | 135.62 | 146.5 | 153.33 | 159.9 | 166.49 | 173.54 | 1.3% | 0.9% | 100.0% | 100.0% | 100.0% |
| Private Employment | 74.15 | 80.98 | 91.08 | 97.87 | 111 | 111.89 | 113.24 | 123.29 | 129.36 | 135.4 | 141.28 | 147.88 | 1.4% | 0.9% | 83.2% | 83.7% | 85.2% |
| Manufacturing | 18.73 | 17.82 | 17.70 | 17.24 | 17.27 | 14.23 | 11.99 | 12.78 | 12.63 | 12.00 | 11.52 | 11.14 | -1.4% | -0.8% | 16.2% | 10.6% | 6.4% |
| Durable Goods | 11.68 | 11.03 | 10.74 | 10.37 | 10.88 | 8.96 | 7.46 | 8.20 | 8.04 | 7.57 | 7.28 | 7.10 | -1.2% | -0.8% | 9.8% | 6.7% | 4.1% |
| Lumber | N/A | N/A | 0.54 | 0.57 | 0.61 | 0.56 | 0.43 | 0.55 | 0.53 | 0.49 | 0.46 | 0.47 | 0.2% | -0.6% | 0.5% | 0.4% | 0.3% |
| Primary Metals | N/A | N/A | 0.69 | 0.64 | 0.62 | 0.47 | 0.37 | 0.38 | 0.37 | 0.37 | 0.33 | 0.29 | -2.5% | -1.6% | 0.6% | 0.4% | 0.2% |
| Fabricated Metals | N/A | N/A | 1.61 | 1.62 | 1.75 | 1.52 | 1.29 | 1.47 | 1.50 | 1.45 | 1.39 | 1.30 | -0.4% | -0.5% | 1.5% | 1.1% | 0.7% |
| Machinery | N/A | N/A | 1.41 | 1.44 | 1.46 | 1.17 | 1.05 | 1.20 | 1.18 | 1.11 | 1.05 | 1.00 | -1.2% | -0.5% | 1.3% | 0.9% | 0.6% |
| Electronics | N/A | N/A | 1.90 | 1.69 | 1.82 | 1.32 | 1.15 | 1.01 | 0.94 | 0.90 | 0.94 | 1.01 | -2.4% | -0.9% | 1.7% | 1.0% | 0.6% |
| Transport. Equipment | N/A | N/A | 2.13 | 1.98 | 2.06 | 1.77 | 1.39 | 1.61 | 1.47 | 1.24 | 1.11 | 1.10 | -1.2% | -1.6% | 1.9% | 1.3% | 0.6% |
| Oth. Durables | N/A | N/A | 2.45 | 2.43 | 2.56 | 2.15 | 1.79 | 1.99 | 2.05 | 2.01 | 1.99 | 1.92 | -0.9% | -0.4% | 2.2% | 1.6% | 1.1% |
| Non-Durables | 7.05 | 6.78 | 6.96 | 6.87 | 6.39 | 5.27 | 4.53 | 4.58 | 4.59 | 4.43 | 4.25 | 4.04 | -1.8% | -0.9% | 6.4% | 3.9% | 2.3% |
| Food Proc. | N/A | N/A | 1.51 | 1.56 | 1.55 | 1.48 | 1.45 | 1.55 | 1.62 | 1.62 | 1.62 | 1.61 | -0.1% | 0.3% | 1.4% | 1.1% | 0.9% |
| Paper | N/A | N/A | 0.65 | 0.64 | 0.60 | 0.48 | 0.41 | 0.42 | 0.43 | 0.42 | 0.40 | 0.38 | -2.0% | -0.8% | 0.6% | 0.4% | 0.2% |
| Other Non-Dur. | N/A | N/A | 4.80 | 4.67 | 4.23 | 3.31 | 2.67 | 2.61 | 2.55 | 2.39 | 2.22 | 2.05 | -2.4% | -1.6% | 4.4% | 2.5% | 1.2% |
| Non-Manufacturing | 71.79 | 79.69 | 91.79 | 100.07 | 114.53 | 119.45 | 123.63 | 133.71 | 140.71 | 147.90 | 154.95 | 162.39 | 1.8% | 1.0% | 83.8% | 89.3% | 93.6% |
| Natural Resources | 1.08 | 0.97 | 0.76 | 0.64 | 0.60 | 0.63 | 0.72 | 0.66 | 0.56 | 0.55 | 0.53 | 0.53 | -1.2% | -0.6% | 0.7% | 0.5% | 0.3% |
| Construction | 4.45 | 4.79 | 5.27 | 5.28 | 6.79 | 7.33 | 6.52 | 7.61 | 8.11 | 8.74 | 9.57 | 10.47 | 2.2% | 1.2% | 4.8% | 5.5% | 6.0% |
| Wholesale Trade | 4.56 | 4.91 | 5.27 | 5.43 | 5.93 | 5.76 | 5.76 | 6.35 | 6.98 | 7.66 | 7.87 | 7.69 | 0.6% | 1.0% | 4.8% | 4.3% | 4.4% |
| Retail Trade | 10.24 | 11.73 | 13.18 | 13.90 | 15.28 | 15.28 | 15.40 | 15.59 | 15.38 | 15.38 | 15.32 | 15.44 | 1.0% | 0.0% | 12.0% | 11.4% | 8.9% |
| Auto parts | N/A | N/A | 1.49 | 1.63 | 1.85 | 1.92 | 1.95 | 1.91 | 1.81 | 1.79 | 1.78 | 1.80 | 1.7% | -0.2% | 1.4% | 1.4% | 1.0% |
| Food & Bev. | N/A | N/A | 2.78 | 2.88 | 2.99 | 2.82 | 2.94 | 2.78 | 2.61 | 2.60 | 2.55 | 2.52 | 0.1% | -0.4% | 2.5% | 2.1% | 1.5% |
| Other Retail | N/A | N/A | 8.91 | 9.39 | 10.44 | 10.54 | 10.51 | 10.89 | 10.96 | 11.00 | 10.99 | 11.12 | 1.1% | 0.2% | 8.1% | 7.9% | 6.4% |
| TWU | 3.61 | 3.73 | 4.22 | 4.51 | 5.01 | 4.92 | 4.95 | 5.76 | 6.38 | 6.88 | 7.19 | 7.23 | 1.0% | 1.3% | 3.9% | 3.7% | 4.2% |
| Information | 2.36 | 2.44 | 2.69 | 2.84 | 3.63 | 3.06 | 2.78 | 2.96 | 3.15 | 3.44 | 3.80 | 4.32 | 0.9% | 1.2% | 2.5% | 2.3% | 2.5% |
| Printing | N/A | N/A | 0.87 | 0.91 | 1.03 | 0.90 | 0.80 | 0.82 | 0.84 | 0.86 | 0.89 | 0.95 | 0.2% | 0.2% | 0.8% | 0.7% | 0.5% |
| Internet, etc. | N/A | N/A | 1.82 | 1.93 | 2.59 | 2.16 | 1.98 | 2.14 | 2.32 | 2.58 | 2.91 | 3.37 | 1.1% | 1.5% | 1.7% | 1.6% | 1.9% |
| Financial Activities | 5.02 | 5.81 | 6.61 | 6.83 | 7.69 | 8.15 | 8.24 | 8.57 | 8.42 | 8.44 | 8.44 | 8.61 | 1.4% | 0.2% | 6.0% | 6.1% | 5.0% |
| Finance & Ins. | N/A | N/A | 4.98 | 5.07 | 5.68 | 6.02 | 6.11 | 6.33 | 6.22 | 6.21 | 6.22 | 6.39 | 1.3% | 0.2% | 4.5% | 4.5% | 3.7% |
| Real Estate | N/A | N/A | 1.64 | 1.76 | 2.01 | 2.13 | 2.13 | 2.24 | 2.20 | 2.23 | 2.22 | 2.22 | 1.8% | 0.1% | 1.5% | 1.6% | 1.3% |
| Professional Business | N/A | N/A | 10.85 | 12.85 | 16.67 | 16.94 | 17.73 | 21.96 | 25.16 | 28.42 | 32.30 | 36.37 | 3.0% | 2.6% | 9.9% | 12.7% | 21.0% |
| Pro., Sci., Tech. | N/A | N/A | 4.54 | 5.08 | 6.70 | 7.02 | 7.88 | 8.98 | 10.20 | 12.29 | 14.79 | 17.96 | 2.9% | 3.2% | 4.1% | 5.3% | 10.3% |
| Mgmt. of Companies | N/A | N/A | 1.67 | 1.69 | 1.80 | 1.76 | 1.80 | 1.72 | 1.60 | 1.53 | 1.45 | 1.39 | 0.4% | -0.8% | 1.5% | 1.3% | 0.8% |
| Admin & Waste | N/A | N/A | 4.64 | 6.08 | 8.17 | 8.16 | 8.05 | 11.26 | 13.36 | 14.60 | 16.06 | 17.02 | 3.8% | 2.5% | 4.2% | 6.1% | 9.8% |
| Edu. & Health | 7.07 | 8.66 | 10.98 | 13.29 | 15.11 | 17.37 | 19.90 | 21.61 | 22.87 | 23.64 | 24.09 | 24.81 | 3.1% | 1.2% | 10.0% | 13.0% | 14.3% |
| Education | N/A | N/A | 1.69 | 2.01 | 2.39 | 2.83 | 3.24 | 3.06 | 3.01 | 3.05 | 3.06 | 3.09 | 3.5% | 0.3% | 1.5% | 2.1% | 1.8% |
| Health Care | N/A | N/A | 9.30 | 11.28 | 12.72 | 14.54 | 16.66 | 18.55 | 19.86 | 20.60 | 21.03 | 21.73 | 3.0% | 1.3% | 8.5% | 10.9% | 12.5% |
| Leisure & Hospitality | 6.72 | 7.87 | 9.29 | 10.50 | 11.86 | 12.81 | 13.53 | 14.12 | 14.39 | 14.73 | 14.95 | 15.33 | 2.2% | 0.6% | 8.5% | 9.6% | 8.8% |
| Arts & Entertain. | N/A | N/A | 1.13 | 1.46 | 1.79 | 1.89 | 1.97 | 1.95 | 2.09 | 2.29 | 2.42 | 2.54 | 3.5% | 1.0% | 1.0% | 1.4% | 1.5% |
| Accomm. & Food Ser. | N/A | N/A | 8.15 | 9.04 | 10.07 | 10.92 | 11.56 | 12.17 | 12.30 | 12.44 | 12.53 | 12.79 | 2.0% | 0.5% | 7.4% | 8.2% | 7.4% |
| Other Services | 2.75 | 3.37 | 4.26 | 4.57 | 5.17 | 5.39 | 5.72 | 5.31 | 5.34 | 5.52 | 5.69 | 5.93 | 1.6% | 0.3% | 3.9% | 4.0% | 3.4% |
| Govt., Civilian, total | 16.38 | 16.53 | 18.41 | 19.43 | 20.79 | 21.81 | 22.38 | 23.21 | 23.97 | 24.50 | 25.20 | 25.66 | 1.1% | 0.5% | 16.8% | 16.3% | 14.8% |

Source: Global Insight, *2008 QR US Long-Term Outlook*, as compiled by Metro.

Ord. 187831, Vol. 2.4.C, page 9604

## Figure 41. Portland Metro Location Quotients Relative to U.S. (1990-2035)

| | 1990 | 1995 | 2000 | 2005 | 2008 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Manufacturing, total | 1.06 | 1.09 | 1.12 | 1.18 | 1.22 | 1.27 | 1.23 | 1.22 | 1.26 | 1.28 | 1.30 |
| Durable Goods, total | 1.25 | 1.29 | 1.34 | 1.43 | 1.45 | 1.53 | 1.45 | 1.45 | 1.51 | 1.54 | 1.56 |
| Wood Products | 2.21 | 1.54 | 1.31 | 1.45 | 1.34 | 1.22 | 1.15 | 1.12 | 1.14 | 1.12 | 1.05 |
| Primary Metal | 1.86 | 1.47 | 1.68 | 1.77 | 2.09 | 2.22 | 2.03 | 1.82 | 1.67 | 1.66 | 1.72 |
| Fabricated Metal | 1.01 | 1.13 | 1.06 | 1.12 | 1.11 | 1.16 | 1.07 | 1.01 | 1.00 | 1.00 | 1.02 |
| Machinery | 0.98 | 1.01 | 0.97 | 0.96 | 0.95 | 0.96 | 0.85 | 0.80 | 0.80 | 0.80 | 0.81 |
| Electrical Machinery | 2.23 | 2.70 | 3.07 | 3.77 | 3.75 | 3.63 | 4.38 | 4.79 | 5.01 | 4.86 | 4.56 |
| Transportation Equipment | 0.67 | 0.67 | 0.73 | 0.69 | 0.71 | 0.83 | 0.74 | 0.82 | 0.97 | 1.07 | 1.06 |
| Non-durable Goods, total | 0.78 | 0.79 | 0.76 | 0.77 | 0.80 | 0.85 | 0.84 | 0.82 | 0.82 | 0.83 | 0.84 |
| Food Processing | 0.95 | 0.86 | 0.77 | 0.79 | 0.83 | 0.85 | 0.79 | 0.72 | 0.68 | 0.65 | 0.64 |
| Paper | 1.75 | 1.55 | 1.46 | 1.40 | 1.32 | 1.45 | 1.47 | 1.39 | 1.36 | 1.35 | 1.37 |
| Non-manufacturing, total | 1.03 | 1.03 | 1.01 | 1.01 | 1.00 | 1.00 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 |
| Natural Resources | 0.40 | 0.44 | 0.42 | 0.39 | 0.28 | 0.31 | 0.31 | 0.32 | 0.30 | 0.29 | 0.27 |
| Construction | 1.05 | 1.20 | 1.06 | 1.08 | 1.17 | 1.22 | 1.09 | 1.03 | 0.99 | 0.93 | 0.89 |
| Retail Trade | 0.94 | 0.93 | 0.95 | 0.93 | 0.95 | 0.94 | 0.98 | 0.96 | 0.96 | 0.97 | 0.98 |
| Motor Vehicle & Parts | 1.09 | 1.04 | 1.04 | 1.00 | 0.97 | 0.92 | 1.01 | 1.07 | 1.08 | 1.09 | 1.08 |
| Food & Beverage Stores | 0.82 | 0.80 | 0.85 | 0.89 | 0.93 | 0.89 | 0.97 | 1.01 | 1.01 | 1.03 | 1.05 |
| Other Retail | 0.96 | 0.95 | 0.96 | 0.93 | 0.95 | 0.96 | 0.97 | 0.93 | 0.93 | 0.94 | 0.94 |
| Transp., Warehouse, & Utilities | 1.13 | 1.08 | 1.04 | 1.02 | 0.98 | 1.01 | 1.00 | 0.95 | 0.91 | 0.90 | 0.93 |
| Information, total | 0.90 | 0.93 | 0.97 | 1.02 | 1.09 | 1.08 | 1.11 | 1.14 | 1.14 | 1.12 | 1.05 |
| Publishing | 0.78 | 0.99 | 1.27 | 1.37 | 1.56 | 1.66 | 1.86 | 2.14 | 2.36 | 2.51 | 2.48 |
| Internet & Other | 0.97 | 0.90 | 0.85 | 0.87 | 0.90 | 0.85 | 0.83 | 0.78 | 0.74 | 0.69 | 0.64 |
| Finance Activities | 1.14 | 1.13 | 1.14 | 1.14 | 1.13 | 1.12 | 1.20 | 1.28 | 1.34 | 1.39 | 1.42 |
| Finance & Insurance | 0.91 | 0.91 | 0.99 | 0.99 | 0.95 | 0.96 | 1.04 | 1.11 | 1.17 | 1.21 | 1.24 |
| Real Estate | 1.84 | 1.77 | 1.57 | 1.55 | 1.62 | 1.61 | 1.63 | 1.74 | 1.80 | 1.89 | 1.96 |
| Pro. Business Services | 1.08 | 1.14 | 1.06 | 1.03 | 1.01 | 1.01 | 0.93 | 0.88 | 0.83 | 0.78 | 0.73 |
| Pro., Sci., & Tech. | 1.21 | 1.20 | 0.98 | 0.95 | 0.91 | 0.90 | 0.89 | 0.85 | 0.76 | 0.67 | 0.59 |
| Mgmt. of Companies | 0.92 | 1.23 | 1.52 | 1.56 | 1.62 | 1.61 | 1.95 | 2.32 | 2.66 | 3.10 | 3.56 |
| Admin. Support | 1.01 | 1.05 | 1.02 | 0.99 | 0.96 | 0.99 | 0.81 | 0.73 | 0.70 | 0.67 | 0.65 |
| Edu. & Health Care | 1.01 | 0.92 | 0.92 | 0.94 | 0.92 | 0.90 | 0.95 | 1.01 | 1.07 | 1.14 | 1.19 |
| Educational | 1.04 | 0.98 | 1.02 | 1.00 | 0.96 | 0.96 | 1.09 | 1.21 | 1.29 | 1.38 | 1.45 |
| Health Care | 1.00 | 0.91 | 0.90 | 0.92 | 0.91 | 0.89 | 0.92 | 0.98 | 1.03 | 1.10 | 1.15 |
| Leisure & Hospitality | 1.03 | 1.01 | 0.98 | 0.96 | 0.96 | 0.95 | 0.99 | 1.03 | 1.05 | 1.08 | 1.09 |
| Arts, Entertainment & Rec. | 1.32 | 1.13 | 0.99 | 0.95 | 0.92 | 0.91 | 0.98 | 0.99 | 0.96 | 0.96 | 0.95 |
| Accommodation & Food | 0.99 | 0.99 | 0.98 | 0.96 | 0.97 | 0.96 | 0.99 | 1.03 | 1.07 | 1.10 | 1.12 |
| Other Services | 0.91 | 0.89 | 0.88 | 0.87 | 0.88 | 0.83 | 1.04 | 1.15 | 1.21 | 1.27 | 1.28 |
| Government, Civilian total | 0.89 | 0.85 | 0.90 | 0.90 | 0.91 | 0.91 | 0.86 | 0.85 | 0.85 | 0.83 | 0.85 |
| Federal, Civilian | 0.89 | 0.85 | 0.89 | 0.91 | 0.87 | 0.87 | 0.85 | 0.81 | 0.78 | 0.75 | 0.73 |
| State & Local | 0.81 | 0.79 | 0.84 | 0.85 | 0.86 | 0.86 | 0.82 | 0.81 | 0.82 | 0.81 | 0.83 |

Source: Global Insight, *2008 QR US Long-Term Outlook* and Metro.

# APPENDIX C. PORTLAND HARBOR INDUSTRIAL LAND SUPPLY ANALYSIS

# Portland Harbor: Industrial Land Supply Analysis

Prepared for the City of Portland:
Bureau of Planning and Sustainability

Prepared by ECONorthwest

in association with:

Maul Foster & Alongi, Inc.
and
Bonnie Gee Yosick llc

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May 2012

# Preface

This report addresses four questions about land in the Portland Harbor area. It supports the City of Portland's efforts to update its Economic Opportunities Analysis, plan for the land use in the Harbor area, and address issues related to the development and conservation of West Hayden Island.

ECONorthwest was the lead consultant to the City on this evaluation, assisted by subconsultants Maul Foster & Alongi, and Bonnie Gee Yosick LLC. This consultant team had substantial and appreciated assistance from many sources, but especially: City of Portland Bureau of Planning and Sustainability, Port of Portland, Port of Vancouver, Working Waterfront Coalition, and BST Associates.

Despite the assistance, ECONorthwest and its subcontractors alone are responsible for the report's contents. The report has been reviewed by City staff and an advisory committee, but the views expressed are those of the consultants and may not be shared by others who contributed to or reviewed this report.

Throughout the report ECONorthwest has identified sources of information and assumptions used in the analysis. Within the limitations imposed by uncertainty and the project budget, staff at ECONorthwest and the Bureau of Planning and Sustainability at the City of Portland have made every effort to check the reasonableness of the data, methods, and assumptions and to test the sensitivity of the results to changes in key assumptions. Any forecast of the future is uncertain. The fact that ECONorthwest and its team members evaluate the assumptions in this report as reasonable does not guarantee that those assumptions will prevail.

# Summary

This evaluation starts from the assumption, embedded in the economic development policies of all local governments in the region, that the retention, expansion, and relocation to the region of industrial sectors is something that the region desires. It addresses the capacity of industrial land in the Portland Harbor area to accommodate future development, both for new public marine terminals and private marine-dependent businesses. It addresses *four questions posed by the City*:

1. Are the methods the City used to estimate the location and amount of vacant, partially vacant, and potentially buildable industrial land in the Portland Harbor area likely to yield reasonable estimates?
2. Given the estimated land supply in the Portland Harbor area, how suitable for a public marine terminal are the few sites identified by the City as having the best potential to accommodate such a terminal?
3. If those sites do not develop as marine terminals (for whatever reasons) to what extent can the Port of Vancouver play a role in accommodating forecasted cargo demand in the Portland region?
4. Finally, if existing vacant land in the harbor area and in Vancouver is estimated to be insufficient to accommodate forecasted or desired transshipment or industrial activity, what is the potential for more efficient use of industrial land in the Portland Harbor study area? That question implies answering the question: What does more efficient use of industrial land mean, and how would it be measured?

## SUPPLY OF VACANT OR UNDERUTILIZED INDUSTRIAL LAND

The methods used for the City's evaluation of the supply of vacant land in the Harbor Area are sound, state of the practice, and produce results that have been confirmed by independent methods. When looking for where in the Harbor Area is vacant land that could potentially be assembled into a 100-acre (or, at a minimum, a 50-acre) site with waterfront access? the City correctly identified the two sites with greatest potential: Atofina and Time Oil.

## POTENTIAL FOR MARINE TERMINAL SITES

Public marine terminals have specific land use requirements that are difficult to find. Ideally, sites must be large and flat, inside of an industrial zone, have significant shoreline on a navigable river, be served by both rail and truck, and free of contamination, wetlands, or other environmental constraints. Excluding West Hayden Island, there are no sites in the Portland Harbor that meet these ideal requirements, though there are a few sites that come close. This should not imply that West Hayden Island meets all the ideal site requirements (in fact West Hayden Island lacks sufficient truck access, and is constrained by wetlands), but is simply stating that the West Hayden Island site is outside the boundary of our study area. The questions are: how close do they come, and is there a way to cost-effectively develop these sites as productive public marine terminals?

The City of Portland identified the two sites in the Portland Harbor that are most likely to be suitable for development of a new public marine terminal: the Atofina site, and the Time Oil site. Of these two sites, development is technically possible on either, but there are major hurdles that would add significant costs. Both sites have some level of contamination, both sites would require negotiation and property acquisition from numerous property owners, and both sites are smaller than desirable, which precludes the possibility of an onsite rail loop. Ultimately, issues related to the Superfund cleanup of the Willamette River make all sites in the Portland Harbor very challenging (if not altogether unfeasible) for development in the near future.

## ROLE OF VANCOUVER IN PROVIDING HARBOR-AREA INDUSTRIAL LAND

Recent forecasts suggest that under mid-range assumptions about cargo demand, the Port of Portland's existing marine terminals will reach the limits of their capacity (for at least some cargo types) in the next several decades. Once these facilities meet their capacity, the Port will need to develop new facilities, or else turn away demand. The Port of Vancouver shares many of the same attributes that make the Port of Portland an attractive place for marine shipping. Thus, the Port of Vancouver is a logical place to site new marine terminals, if sites are unavailable in the 4,000-acre Portland Harbor.

Projecting future land needs to accommodate demand for public marine terminals is difficult, and even the best forecasts suggest a wide-range of potential outcomes. Given mid-range (and presumably most likely) scenario for future demand, the Port of Vancouver may, in theory, have

enough developable land to accommodate regional growth in cargo volumes through 2040. The assumptions in variation of the mid-range forecasts show the Portland-Vancouver Region needing an additional 200 to 600 acres for new terminals by 2040: there is vacant industrial land with water-access that is in that range. In practice, however, competing demands for Port of Vancouver lands, policies and competition among affected jurisdictions, and the potential for higher growth in cargo volumes all make it possible, if not likely, that the land controlled by the Port of Vancouver would not be able to accommodate all of the regional demand for marine cargo. The "high" forecast of cargo demand, for example, is three times the mid-range demand.

From a regional perspective, it makes little difference whether terminal development occurs in Portland or Vancouver. Both cities function as part of the same regional economy, and share the same infrastructure and labor pool. At a local level, however, if demand for public marine terminals is shifted from Portland to Vancouver, the City of Portland would lose some industrial jobs and the income they generate to Vancouver.

## POTENTIAL FOR INCREASED EFFICIENCIES IN THE USE OF LAND

Typical measures of efficiency of land use include employment, real market value, and built space. Harbor industrial development tends to have low floor-area ratios (FAR) and a relatively low number of jobs per acre. Thus, typical measures of efficiency would all tend to improve if industrial land were converted to other commercial uses. But industrial lands in general, and harbor lands in the case of this study, are clearly an important piece of the regional economy. Therefore, we suggest two alternative measures of efficiency that are more appropriate for harbor industrial land: value added and tonnage of cargo.

Data from recent years show some measures of economic output have been increasing faster than vacant land is being converted to developed land, and other measures have not. The region should continue to track these measures and adopt policies with the intention of increasing measures of economic output faster than vacant land is converted to developed land. This seems like an objective that could appeal to people with different interests: economic development, environmental amenity, or smart growth.

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# Chapter 1 INTRODUCTION

**Section 1.1** describes events leading to this study and what the City hopes to learn from it. The City wants to evaluate the potential for the Portland Harbor to support economic activity. It has four questions about the capacity of land in the Portland Harbor to support future economic activity: (1) about the supply of vacant and underutilized land in the harbor area for marine terminals or water-dependent industrial uses; (2) about the land needs and potential land available for new port terminals; (3) about the role of Vancouver as a regional port; and (4) about potential changes in the use of industrial land (one aspect of which is referred to as "land efficiency"). **Section 1.2** describes how the rest of the report is organized.

## 1.1 BACKGROUND AND PURPOSE

The City of Portland (City) is the center of a large regional economy: there are about one million jobs in the seven-county metropolitan area, and almost 400,000 jobs within the city limits.

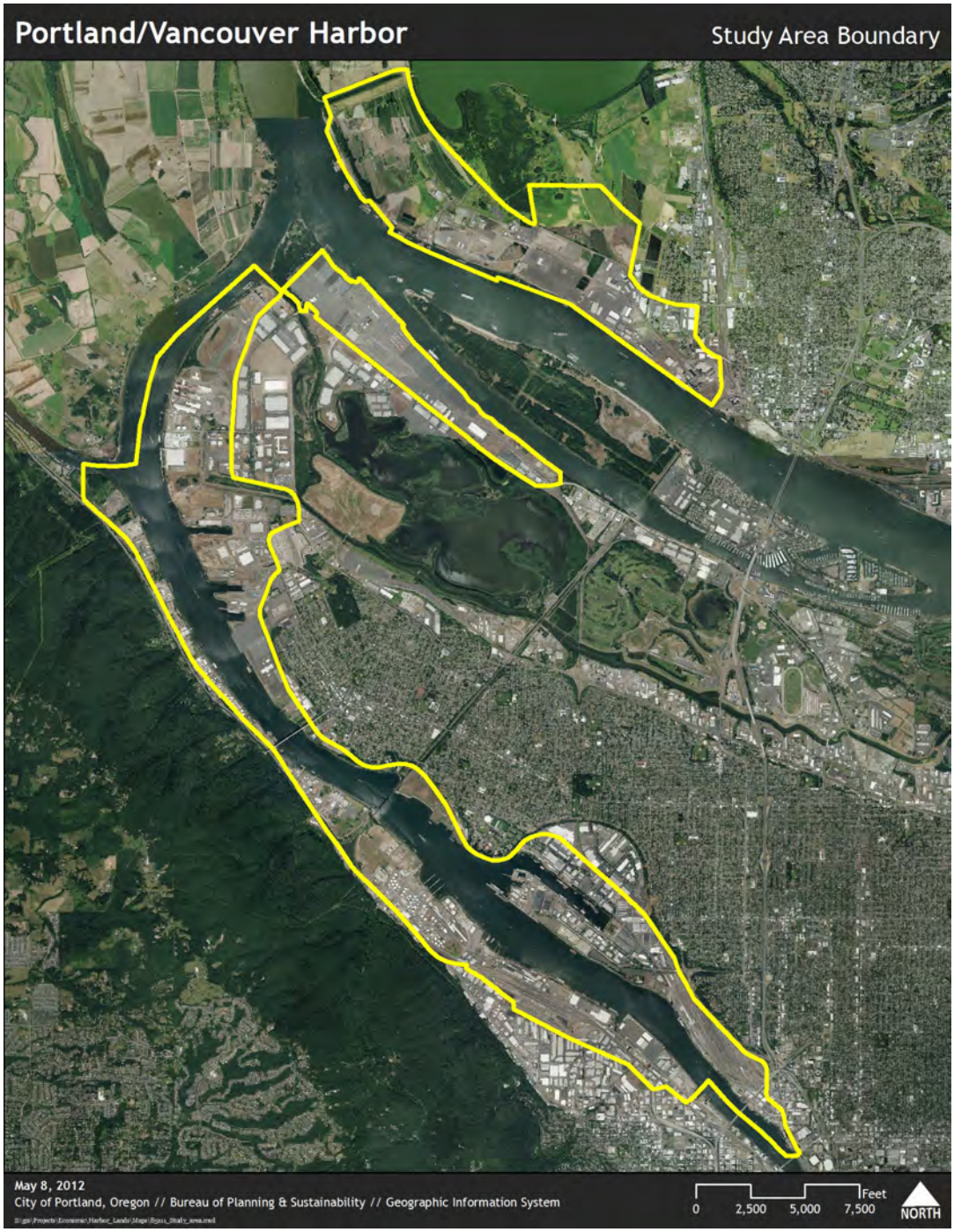
Many factors have contributed to the growth of the Portland economy, but one important factor is its ability to transport goods. Portland benefits from accessibility by highways (at the intersection of Interstates 5 and 84), rail (two Class 1 railroads - Union Pacific and BSNF, and short-line railroads), air (Portland International Airport), and sea (the Columbia and Willamette rivers).

The Portland Harbor is an industrial area located along the Willamette River that relies on the confluence of transportation infrastructure in the City (Exhibit 1.1). It contains about 4,000 acres of land located south of the Columbia River, west of I-5, and on both the east and west shores of the Willamette River. River-related industrial activities operate as a partnership between public marine terminals (owned and operated by the Port of Portland) and private businesses, including many marine-dependent industries. Key industrial sectors in the Portland Harbor include construction, manufacturing, warehousing, and transportation.

Over the past decade several studies of the Portland Harbor have been completed. The 2010 *West Hayden Island Economic Foundation Study* (prepared by Entrix for the City of Portland) summarized the conclusions of these studies:

> *"Portland Harbor serves as an economic engine for the metro regional economy… Past studies indicate that cargo and manufacturing activities dependent on waterborne transportation contribute significantly to the metro region's economy. These studies indicate that marine-related economic activity generates from 20,000 to 100,000 jobs and from $1.4 to 3.4 billion annually in regional income."*

**Exhibit 1-1. Portland Harbor study area**




Source: City of Portland, Bureau of Planning, 2011.

Another recent study, *Portland's Working Rivers: The Heritage and Future of Portland's Industrial Heartland* (2008 report prepared by Carl Abbott for the Working Waterfront Coalition) describes the impact of the harbor on the City. Some of its conclusions:

- The Portland Harbor is the nexus of a multi-modal system. The Willamette and Columbia rivers serve marine terminals, ocean shipping lines, barge lines, and bulk handling facilities. These waterborne facilities connect to railroads, interstates, commercial and general airports, and pipelines.
- Approximately 90% of harbor sites have access to rail routes, improving efficiency of transporting large loads from sea to land.
- Cargo forecasts by the Port of Portland further highlight the importance of the harbor: the volume of trade through Portland is expected to double by 2035.

In 2004, four river-related districts (Northwest Industrial District, Swan Island / Central Eastside, Rivergate, and Columbia Corridor) had employment about equal to the metropolitan area's three other industrial districts: the Sunset Corridor and 217 Corridor (where the electronics and computer industry is concentrated), and the Milwaukie/Clackamas Corridor (with a mix of manufacturing and distribution).

The importance of the harbor to the regional economy would be sufficient reason for the City to evaluate the harbor's needs for continued operation and expansion. But additional issues motivate the current evaluation. First, the City is in the process of concluding an extensive study of the City and regional economy (its *Economic Opportunities Analysis*, or EOA) as required by state land-use law. Second, the City has been engaged in studies of West Hayden Island, where there is a question about which land should be made available for future port development and which should preserved as natural areas.[1] Answering that question depends in part on whether alternative areas in or near the Portland Harbor study area have land that is appropriate and sufficient for the water- and port-related development that is expected or desired.

Thus, though several studies of development issues in the Portland Harbor area have occurred in the last five years, the City wanted an evaluation to (1) synthesize and evaluate the findings of previous studies as they relate to the harbor economy and industrial land uses, and (2) address three specific questions related to the development of industrial land in the Portland Harbor.

To that end, the City asked ECONorthwest (ECO) to re-examine the inventory of existing harbor lands, both in Portland and the broader region (including Vancouver). This report addresses the capacity of industrially-designated land in the harbor area to accommodate future development,

[1] A current proposal for West Hayden Island is to devote 300 acres of land for marine terminal development, while setting aside 500 acres for open space.

both for new public marine terminals and private marine-dependent businesses. It addresses four questions posed by the City, each new question building from the answer of the question preceding it:

1. Are the methods the City used to estimate the location and amount of vacant, partially vacant, and potentially buildable industrial land in the Portland Harbor area likely to yield reasonable estimates?
2. Given the estimated land supply in the Portland Harbor area, how suitable for a public marine terminal are the few sites identified by the City as having the best potential to accommodate such a terminal?
3. If those sites do not develop as marine terminals (for whatever reasons), to what extent can the Port of Vancouver play a role in accommodating forecasted cargo demand in the Portland region?
4. If existing vacant land in the harbor area and in Vancouver is estimated to be insufficient to accommodate forecasted or desired transshipment or industrial activity, what is the potential for more efficient use of industrial land in the Portland Harbor study area? That question implies answering the question: What does more efficient use of industrial land mean, and how would it be measured?

By answering these questions, this report helps the City move forward in its planning processes. It provides information to help with assumptions that the City's *Economic Opportunities Analysis* may be making about industrial land supply and the efficiency (density) at which that land is likely to develop. It helps the City assess the importance of West Hayden Island as a site for future development of new public marine terminals by evaluating the (limited) potential of suitable sites for such development elsewhere in the Portland Harbor.[2]

[2] This report does not, however, include any analysis regarding the applicability of its findings to state, regional or local planning policies: such information will presumably be provided as part of any additional analysis by the City.

## 1.2 ORGANIZATION OF THIS REPORT

This report has three additional chapters and three appendices:

**Chapter 2, Framework and Methods**: Summary of economic concepts underlying the analysis, and specific methods used to answer the four questions that are the focus of this report.

**Chapter 3, Analysis**: Current and likely future conditions for key factors affecting economic activity in the Portland Harbor.

**Chapter 4, Summary of Findings**: Briefly restates the important conclusions of our analysis.

**Appendix A: Research Methods**: Framework for understanding and methods for conducting our analysis (more detail than is provided in Chapter 2 of the main report).

**Appendix B: Port Terminal Site Evaluation Criteria**: Used by Maul Foster & Alongi, Inc. to evaluate the feasibility of potential sites in the Portland Harbor.

**Appendix C: Analysis of Harbor Land Capacity and Demand, Portland and Vancouver:** Provides greater detail (including a wealth of tables) on the data-driven methods used, in part, to determine the potential for the Port of Vancouver to accommodate forecast demand for the Portland Harbor, if there are insufficient sites in Portland to accommodate all of the expected demand.

**Appendix D: Mapping Analysis**: Presents the results of the City's visual survey of aerial maps of the Portland Harbor to classify the lands in one of several categories.

# Chapter 2 FRAMEWORK AND METHODS

**Section 2.1** discusses a *framework* for evaluation: concepts that underlie any evaluation of this type. It discusses (1) the role of industrial activity in the economy, (2) definitions of industrial use and industrial land, (3) factors relating to the supply of and demand for industrial land, and (4) the concept of land efficiency: what is it, why does it matter, and how is it measured. **Section 2.2** is more specific about the *methods* used for the evaluation (review of previous studies, secondary data, case studies, interviews) and how they are used to address this study's four questions. **Appendix A** provides a more detailed description of our framework and methods.

## 2.1 FRAMEWORK

### 2.1.1 WHY CARE ABOUT INDUSTRIAL LAND?

This study starts from the assumption, embedded in the economic development policies of all local governments in the region, that the retention, expansion, and relocation to the region of industrial sectors is something that the region desires. Industrial activity and employment is mainly classified as export oriented ("traded sector") and is likely to have jobs at higher than average wages.

### 2.1.2 DEFINING INDUSTRIAL LAND AND USERS

- **Industrial land:** What is commonly referred to as "industrial" land is land designated by a local government (in its comprehensive plan, and implemented by its zoning ordinances) to allow (but not necessarily require) industrial uses. In the Portland Harbor, the City does strictly limit non-industrial uses, and allows only river-related and river-dependent industry.
- **Harbor land:** A smaller subset of industrial land pertinent in this study is "harbor" land. For this study, we use the City's definition of the "Portland Harbor." A map of the Portland Harbor is shown previously in Exhibit 1-1.
- **Industrial users:** A recent analysis of industrial land published by the American Planning Association[3] used NAICS codes to define "industrial use" in urban areas, including a "strict" definition of construction, manufacturing, wholesale trade, and transportation and warehousing. This list, however, does not necessarily reflect the types of businesses that require industrial land. For example, many jobs in the construction industry are not physically located at a

[3] Howland, Marie. 2011. "Planning for Industry in a Post-Industrial World: Assessing Industrial Lands in a Suburban Economy." Journal of the American Planning Association. Winter, Vol 77, No 1. pp 39-53.

central, industrial location, but instead operate on sites throughout the region. Therefore, one should not focus exclusively on a list of NAICS codes to identify the range of businesses that could have demand for industrial land in Portland.

- **Public marine terminals:** Our analysis treats public marine terminals (i.e., the Port of Portland facilities) differently from other uses of harbor industrial land. These port terminals function as public infrastructure, facilitating economic activity for other industries in the region.

### 2.1.3 SUPPLY OF AND DEMAND FOR INDUSTRIAL LANDS

The total amount of land inside the Portland city limits is essentially fixed. Thus, for the City of Portland, the question of land supply focuses on how much land is vacant, partially vacant, or underutilized, and how much land is constrained (by environmental contamination, environmental overlays, and other issues).

In general, industrial land must accommodate most job growth in "industrial" sectors. It must also accommodate some job growth in "non-industrial" sectors. In other words, not all jobs in "industrial" sectors use industrially-designated land, and not all industrially-designated land is used by "industrial" sectors.

Analysis of land *supply* is about estimation, not forecasting. The use of "data layers" from Geographic Information Systems (GIS) is the standard technique for such estimation. Because it is estimation, the uncertainty is not about the future, but about the data and assumptions that are used to describe what is on the ground now. Our evaluation consists of a review of the data and assumptions.

Factors affecting supply and demand are not independent. Businesses and developers choose the land with the best value. Price makes a difference. In the Portland Harbor land may be more expensive (cost per acre) than at the region's periphery. But land in the Portland Harbor is also close to the downtown, labor markets, port terminals, and interstate highways. If it is only a little more expensive, it may still be a preferred location for growth. If it becomes too expensive, then prospective industrial users may locate elsewhere, on land that provides a better value (for example, because lower land cost and congestion are judged to more than offset the higher costs of being more distant from a preferred location). Businesses that need water access would have an incentive to bid more for land providing that access, and other businesses would find better value in alternative locations.

### 2.1.4 "EFFICIENT" USE OF INDUSTRIAL LAND

Efficiency is a measurement of how much output is produced per unit of input. In this case, the City's concern is about the amount of economic activity (output) generated per acre of land (input).

#### Traditional measures of efficiency

Typical measures of efficiency of land use include employment, real market value, and built space. These measures look at the amount of economic activity occurring on a property, but give relatively low marks to industrial development. Compared to an office tower, an acre of industrial development is likely to have much lower assessed value, employment, and gross square footage of built space. Thus, measures of the efficiency of employment land based on any of these measures in the numerator would all tend to improve if industrial land were converted to commercial uses.

But industrial lands (and harbor lands) are clearly important to the regional economy. If every jurisdiction allowed vacant industrial land to convert to commercial uses on the assumption that some other jurisdiction would provide the industrial land, the regional supply of industrial land would get smaller quickly. Land with port access is a particularly important and relatively rare component of all regional industrial land. Marine terminals provide access to other markets, facilitating commerce, and allowing traded-sector businesses to export their goods to other markets.

#### Alternative measures of the output component of efficiency

To evaluate the efficiency of the use of industrial land in the Portland Harbor, one needs a definition of efficiency that makes sense for industrial land. We suggest two alternative measures of efficiency that are most appropriate for harbor industrial land: value added, and tonnage of cargo.

- **Value added**: Value added is defined as the value of outputs (per unit or in the aggregate) minus the cost of inputs purchased from other firms used to create output.[4] Proponents of the industrial and manufacturing sectors point to its potential for high "value added." One measure of the efficiency of a fixed supply of industrial harbor land would be the amount of value added generated per acre for businesses located in the harbor.
- **Cargo:** There is a reasonable argument that much of the industrial land in the Portland Harbor area serves a regional need for

[4] In that sense, value added is a measure of a firm's contribution to GDP. Another way to think about this is that everything that a firm itself puts into the production of a product (primarily the labor of its employees and capital) "add value" to the raw materials and intermediate goods and services it purchases to make its final product.

transshipment. Therefore, a regional measure of transshipment activity might be appropriate for measuring the efficiency of such land. Some measure of cargo (e.g., tonnage, volume, value, berth utilization) is an obvious choice. Because data are more readily available for tonnage of cargo, that is an alternate measurement of land-use efficiency in the Portland Harbor that we examine in this report. If the City were interested in tracking these alternative efficiency measures in the future, then tracking multiple measures of cargo (i.e., tonnage and value) would provide a more complete picture of cargo trends.

## 2.2 METHODS

### 2.2.1 GENERAL DATA SOURCES AND TECHNIQUES

To conduct our analysis, we used the following data sources:

- **Existing studies**. Extensive analysis has been conducted regarding the Portland Harbor, industrial land, and port terminals. These efforts result in a library of reports and studies addressing different aspects of the regional economy. Appendix A includes a list of recent (or ongoing) studies that were reviewed in our analysis.
- **Secondary data sources**. ECO incorporated many secondary data sources into its analysis.[5] As with "existing studies," the objective is to leverage past research efforts to answer the questions posed in this study. Appendix A includes a list of the secondary data sources used in our analysis.
- **Interviews**: Many people in the Portland area have special knowledge of, and interest in, the Portland Harbor. ECO interviewed individuals from both the public and private sectors, and reviewed notes on past interviews that had been conducted for recent related studies.

### 2.2.2 EVALUATING CITY METHODS USED TO ESTIMATE PORTLAND HARBOR BUILDABLE LAND SUPPLY

ECONorthwest used the following methods to address this question:

[5] Secondary data sources are ones collected and readily available by someone other than the user (in this case ECONorthwest). Typical secondary sources are government agencies (e.g., U.S. Census, ODOT, Metro, Port of Portland).

- Review of studies summarizing industrial and harbor land supply: *Industrial Districts Atlas* (2004) and *Harbor ReDI Industrial Sites Analysis* (2009).
- Review of GIS shape files and cross-referencing to staff aerial analysis of harbor lands and Google Earth aerial photos (August 2011).
- Discussion of methods and BPS staff, and comparison to standard methods for developing land inventories and identifying buildable land.

### 2.2.3 ADDRESSING THE POTENTIAL SITES FOR NEW MARINE TERMINALS

To determine which sites might best accommodate a public marine terminal, we began by identifying the technical site requirements for a marine terminal. ECO interviewed representatives of the Port of Portland to identify their ideal site requirements, as well as which of these requirements could be reduced while still accommodating a working port facility. Members of the ECONorthwest team with experience running west coast ports looked for creative ways to adjust these site requirements to create a working terminal on smaller or otherwise constrained sites.

BPS staff identified sites that could potentially meet these criteria, based upon an aerial analysis of existing development in the Portland and Vancouver harbors.[6] ECO, reviewed the sites identified by the City of Portland, and toured the sites, conducting a visual inspection, documenting conditions affecting the suitability of each site for the proposed development.

### 2.2.4 ADDRESSING THE ROLE OF VANCOUVER IN HARBOR INDUSTRIAL LAND SUPPLY

We began by attempting a data-driven analysis. In principle, if we knew the capacity of existing marine terminals in Portland and Vancouver, and subtracted the forecast future demand for these areas, then we could identify the amount of demand that could not be accommodated by existing facilities. This demand (in tons of cargo) could then be translated into the acres of land necessary for new terminals to accommodate this growth. Comparing the required acres to support new terminals with the available land supply in the Portland Harbor and in Vancouver, we could identify how much of Portland's demand might need to be accommodated

[6] Aerial photos were taken in 2010 and 2011.

in Vancouver, and whether or not Vancouver had sufficient land to accommodate it.

This analysis established a high and low boundary for the potential land need. We also defined a "most-likely" scenario that falls between the two extremes. In order to give these numbers more context, and to help us arrive at the most-likely scenario, we conducted numerous interviews with representatives of the ports of Portland and Vancouver.

### 2.2.5 ADDRESSING THE POTENTIAL FOR INCREASED EFFICIENCIES

The City is interested in knowing if industrial land in the Portland Harbor can be used more efficiently in the future. To answer, we looked at recent economic trends in the Portland Harbor and in the City of Portland as a whole for changes in land-use efficiency for industrial users. For this analysis, we considered several measures of output in an efficiency measure: employment, real market value, value added, and tonnage.

We began by identifying all parcels in the Portland Harbor using GIS. We examined data from two different years: 2002 (one of the earliest years that data are available using North American Industry Classification System codes), and 2008 (the most recent year Quarterly Census of Earnings and Wages data are available). Comparing data from the two years we calculated the change in developed acreage in the Harbor, the corresponding change in real market value, and the net change in employment.[7]

We also collected data from different sources for two alternative measures of output (for the denominator): value added and cargo (volume, tonnage, and value). Unlike employment and real market value, data for value added and cargo tonnage is not tracked at a parcel-specific level. Instead, data is available at the regional, City, zip code or Census tract level. For our analysis, we used Port of Portland data on historical levels of cargo tonnage in the Portland Harbor, and the IMPLAN economic model for the zip codes that most closely align with the boundaries of the Portland Harbor for value added. We used the same years (2002 and 2008) as were used for other measures of efficiency.

[7] The time period used in this analysis, 2002 to 2008, does have limitations. Only having data for two years, doesn't allow for a detailed view of trends during the interim years. Moreover, a six-year period is relatively short, and may not be indicative of long-term trends. Nonetheless, these years allowed us to make the most efficient use of available data for our analysis. Moreover, the analysis focused on comparing how these different measures of efficiency changed relative to each other over the same period of time, and not on establishing long-term trends for each measure.

# Chapter 3 ANALYSIS

**Section 3.1** addresses whether or not the methods used by the City to estimate the location of buildable land in the Portland Harbor area yields reasonable estimates: it concludes that they are. **Section 3.2** addresses the potential for land in Portland Harbor (not including West Hayden Island) to accommodate a new Port terminal. It finds that the two areas that might have enough vacant land to be assembled into a development site of sufficient size are relatively constrained: they could, theoretically, accommodate small terminals of various types, but some of the costs of development would be high relative to alternative sites. **Section 3.3** addresses the potential for the Port of Vancouver to accommodate regional demand for expanded Port facilities. It concludes that under the most-likely scenario, the Port of Vancouver has about the right amount of land to accommodate the bulk of the region's forecast growth in marine cargo through 2040, but that alternative and reasonable assumptions lead to the conclusion that more land than what the Port of Vancouver now controls will be needed. **Section 3.4** addresses the potential for increased efficiency for the use of industrial land in the Portland Harbor. It concludes that value added and tonnage of cargo per acre are more appropriate than traditional measures of efficiency for harbor industrial lands, and that recent historical trends demonstrate the Portland Harbor has become more efficient by most efficiency measures.

## 3.1 EVALUATION OF METHODS USED BY THE CITY TO ESTIMATE BUILDABLE LAND

The question is whether the methods used by BPS to identify vacant and buildable land are likely to be accurate. Will they systematically over or under estimate the land supply? In particular, are they likely to miss areas of vacant, buildable land that are big enough for a marine terminal (sites of at least 50 acres of contiguous vacant of underutilized land that has river access and could be serviced)?

To begin to answer these questions, we looked at recent studies that sought to determine the supply of buildable land in the Portland Harbor. Exhibit 3-1 summarizes the findings of the City of Portland Economic Opportunities Analysis (EOA), including the first draft (Hovee, 2009), and final report (Hovee, 2012), as well as the West Hayden Island Economic Foundation Study (Entrix, 2011), and the City of Portland Bureau of Planning and Sustainability's internal effort to quantify buildable lands, described in Exhibit 3-2 as "BPS Aerial Survey."

**Exhibit 3-1. Summary of previous study estimates of Portland Harbor buildable land supply**

| | | City of Portland Harbor Land Supply | | Parcels of Size: (3) | |
|---|---|---|---|---|---|
| Study | Year | Gross Acres (1) | Effective Acres (2) | 50-250 Acres | 250+ Acres |
| EOA Draft 1, Hovee | 2009 | 266 | 61 | 0 | 0 |
| EOA, Hovee, BPS | 2012 | 326 | 108 | 0 | 0 |
| Entrix, Inc. | 2010 | 299 | <50 | 2 | 0 |
| BPS Aerial Survey | 2011 | 590 | 178 | 3 | 0 |

Compiled by the City of Portland Bureau of Planning and Sustainability, from the following original data sources:
City of Portland Economic Opportunities Analysis, (E.D. Hovee and Company, 2012), and first draft (2009)
West Hayden Island Economic Foundation Study (Entrix, 2011)

Notes:
(1) Total acres of vacant land, without regard to environmental or contamination constraints
(2) Total acres adjusted for environmentally sensitive land, contaminated land, or land with insufficient infrastructure
(3) Number of individual parcels or polygons of the stated acreage

Although these recent studies come to different conclusions on the amount of vacant, buildable land, all of the studies show a relatively small supply of effective acres, ranging from less than 50 acres in the Entrix study, to 178 acres in the BPS Aerial Survey. For the purpose of identifying sites for public marine terminals, we need to consider not only the total acreage, but the size of the individual parcels Scattered small parcels of vacant land cannot accommodate a marine terminal, a single site (typically of 50 acres or more) is needed. These recent studies show that no more than three such sites are present in the Portland Harbor.

The City asked ECONorthwest to confirm that the methods used to identify these sites were reasonable. Some simple ideas and calculations help to answer that question:

- The state of the practice for land inventories is quite advanced. The Oregon statewide planning program's requirements for "buildable land analysis" (from the mid-1970s) spurred the use of Geographic Information Systems (GIS) throughout the state. All large cities and Metropolitan Planning Organizations in Oregon have been developing their GIS tools and datasets for over 25 years. Metro is looked to as a leader in the country on the use of GIS for land-use evaluation. The City of Portland has advanced its data in parallel with Metro. Databases that started as crude approximations have improved substantially. They have been reviewed and updated many times; data from more and more sources have been added (e.g.. tax assessment, public works); computer power and software have improved; digitized mapping of aerial photographs now allows accurate registration of those photographs to underlying layers of thematic maps. In short, the data are current and accurate, and the

ability to manipulate and summarize them is substantial, fast, and technologically reliable.

- The Portland Harbor area is not big by regional standards. The detailed BPS GIS data put it at just over 4,000 acres. As a back-of-the-envelop corroboration using different datasets and tools, ECO used Google-Earth to draw the approximate boundaries of the study area (Exhibit 1-1 above) and calculate areas: the result was 4,100 acres, the equivalent of a square 2.5 miles on a side. Just inspecting aerial photographs would allow one to find large, undeveloped acreages.
- The City has conducted three extensive studies of industrial and harbor land that resulted in detailed mapping: *Industrial Districts Atlas* (2004), *Harbor ReDI Industrial Sites Analysis* (2009), and the GIS-based inventory (2011). The 2011 inventory maps and data table are included as an Appendix to this report.
- ECO has worked on a dozen buildable land evaluations, and has written many reports on the steps for working from "all land" to "vacant, buildable land." ECO's conversations with BPS staff led to the conclusion that staff had used state-of-the-practice techniques. In summary, (1) from "all land" the land not in parcels is removed (e.g., water bodies, street and other rights of way); (2) of the land in parcels, the land that is developed and judged unlikely to redevelop easily (usually based on the value of improvements) is removed; (3) from the undeveloped or under-developed land, the land with physical or policy constraints is removed (e.g., wetlands, in flood ways, steep slopes).

All of the previous points strongly suggest that the information about the supply of developable industrial land in the Portland Harbor area that BPS has generated is very reliable. The buildable land inventory using GIS data that was done for the update of the Economic Opportunity Analysis looks reasonable by the tests we noted.

But despite good intentions and good analysis, there are details in any such analysis that require assumptions, and the assumptions can make a difference to the outcomes. For example:

- Which constraints are absolute, and which are restrictive? Does a slope of more than 10% preclude industrial development? 15%? What if the average slope on a large parcel is 10%, but half of the parcel has slopes less than 5%? What about soil contamination: can the site be remediated, or is the extent of the contamination and legal complexities such that the site is effectively off the market for the foreseeable future?
- When is land "underutilized"? Some vacant areas around buildings may be necessary for vehicle movement, production staging, or

occasional storage. Are large parking lots "vacant" or are they an essential part of the operations in the buildings adjacent to them? A low value for improvements does not necessarily mean that the owner has any interest in redevelopment.

- Ownership patterns. What might look like relatively large areas of vacant land on an aerial photograph may be in many parcels with many different owners. Land assembly and development may be very difficult. This point is illustrated by the findings in Exhibit 3-1, which show up to three sites with at least 50 acres using the BPS methods (ignoring parcel boundaries and looking at aerial photographs), but no sites of that size when using the methods in the Economic Opportunities Analysis (which did look at parcel boundaries).

For the Harbor Area land evaluation, our evaluation is that the buildable land inventory using GIS data that was done by BPS to update of the Economic Opportunity Analysis has generally made inclusionary rather than exclusionary assumptions: we think that is appropriate. BPS did not, for example, eliminate from its search for large, buildable parcels those with arbitrarily defined thresholds for buildability (e.g., proximity to services or the river, steep slopes, contamination), or those that had a particular ownership. All those parcels are still part of the dataset from which large sites were identified. The result, as Section 3.2 shows, is that the large sites identified have several challenges for development: challenges that were not screened out by earlier assumptions about buildability criteria. In other words, on that score, the methods used by BPS were inclusive, and the result is that there would be less chance of screening out land that might eventually prove to be capable of contributing to a large site for a marine facility.

An assumption that BPS did make, and that all buildable land evaluations that we are familiar with also make, is that developed parcels are, in general, not buildable parcels. They can, of course, become buildable parcels if their buildings are removed. Thus, it is theoretically possible that parcels that look developed (from assessment data, aerial photographs, and field surveys) could eventually be part of a land assembly large enough to accommodate a large marine terminal. The kind of detailed, property-level analysis needed to make judgments about land redevelopment and site assembly is not done as part of a regional or city buildable land evaluation.

But there is still the issue of "underutilized" land. A buildable land dataset, like the one BPS has developed, will be quite good (after field testing—and there has been plenty in the Harbor Area over the last 10 years) at distinguishing developed parcels from vacant parcels in most cases. But it is more difficult to determine when a generally vacant parcel is underutilized, and more difficult still to determine whether parcels that are

developed have underutilized remainders that might be considered as vacant and eligible for consolidation into a larger, developable site.

The documentation of the City of Portland's GIS-based Development Capacity Model[8] says that it (1) identifies (and presumably flags as undevelopable) "constrained" properties (i.e., significant environmental or historic resources), and (2) identifies developed parcels "significantly underutilizing their allowed development capacity (using less than 20% of available capacity, not including any development bonuses or incentives)" [that determination can be over-ridden by a judgment by BPS staff that a property is "likely" or "not likely" to redevelop]. The dataset has detailed information on parcel attributes (around 100 attributes per parcel), including building footprint (which allows a calculation of the amount of land not currently developed as a building). It has an algorithm for calculating "site area" by combining the acre of contiguous "underutilized" lots. In short, this is an extensive and well-documented dataset.

The BPS identification of potentially developable sites in the Portland Harbor did not rest entirely on technical analysis using GIS. Additional analysis done as part of the specific to the Harbor Lands Inventory also relied extensively on a review of aerial photographs, with staff performing a visual inspection of all sites along the Willamette River to ensure that any large areas of apparently vacant land had been included in the database of potential terminal sites, and that all of the sites identified by GIS appeared to have the development potential that was suggested by the data. Additionally, BPS staff made reasonable efforts to acquaint themselves with the sites, talking to Port of Portland officials, and visiting the areas, to make sure that the BPS analysis was grounded in a solid understanding of what was actually occurring on key sites in the Portland Harbor. In short, land uses and vacant lands identified in the visual survey were compared with the GIS/BLI data to ensure there were no large information gaps.

As a final check on the site inventory, we relied on our familiarity with the study area, the City documents cited above, and aerial photographs to see whether there were any large areas of vacant or underutilized land besides the two (Atofina and Time Oil sites) that the City identified as the best candidates for a new marine terminal. On the west bank of the Willamette River, we found nothing beyond the Atofina site: the north reach has only a narrow strip of mainly developed land; the south reach has a wider land area but is entirely developed along the waterfront. We found the following candidates on the east bank:

[8]http://www.portlandonline.com/cgis/metadata/viewer/display.cfm?Meta_layer_id=52965&Db_type=sde&City_Only=False

- Swan Island Industrial Park. Land at the south edge on the NE bank of the Willamette River could be classified as underutilized: it is an operation for transshipment of aggregate (10 acres). But even if the parking and storage on both sides of the site is counted, the site would still fall way short of the minimum threshold of 50 acres.
- McCormick and Baxter site, SE of BNSF bridge on east side of the Willamette River. Depending on what land is counted (e.g., backing out land for rail right of way, some existing buildings), this site may be 50 – 70 acres in size. This site was excluded from the City's analysis, primarily because it was recently proposed to be rezoned as EG2 in the River Plan, which (although it allows industrial development) does not allow rail yards, and requires greater setbacks and landscaping than other industrial zones (like IH for heavy industrial). Conversations with BPS staff indicate that the EG2 zone designation is one element of the River Plan that has been challenged, and there is a good chance that a revised River Plan will not propose the EG2 zoning for the site, which would make this site potentially available for marine terminal development.
- "Underutilized" land north of St. John's Bridge on east side of the Willamette. What may seem underutilized from a high-level aerial photograph is actually space for parking new cars from Asia—this is the Port of Portland's Terminal 4 operation (about 260 acres total, handling autos, forest products, steel, and dry and liquid bulks). This site is already part of the Portland area's supply of marine terminals and cannot be counted to add new capacity, unless it were redeveloped. Evaluating that possibility is beyond the scope of our study.
- Sites in the Terminal 5 and Terminal 6 area. There are some sites for infill (e.g., 50 acres off North Lombard in Terminal 6) but there is no water frontage available for a new terminal. Evaluating redevelopment of Port terminals is beyond the scope of our study.
- Kelly Point Park. About 50 acres at the confluence of the Willamette and Columbia Rivers, abutting Port properties of Terminals 5 and 6 is park land that is not available for development.

Of all the sites examined (beyond the Atofina and Time Oil sites already identified by BPS), the only one that met the minimum size requirements (and was not parkland) was the McCormick and Baxter site. The development potential of this site was studied extensively by the City in the past, and the results are described in the *McCormick & Baxter Site Reuse Assessment: Final Report* (June, 2001). The site could have potential for marine terminal development, but (as detailed in the 2001 site assessment) it is heavily constrained in several areas: relatively shallow water at the shoreline, inability to expand to adjacent parcels due to existing uses (Metro

open space and University of Portland campus), isolation from truck routes that require traveling through residential neighborhoods and up a relatively steep bluff, other infrastructure insufficiencies, and significant liens and encumbrances. While the challenges are substantial, they are not necessarily insurmountable, and the other sites identified by BPS face some similar challenges.

Ultimately, the site was excluded from further analysis, because it is less likely that adjacent lands could be assembled into the site, due to the adjoining zoning, and because past brownfield remediation work on the site was carried out in a way that limits future industrial uses, unlike the Atofina and Time Oil sites. Our brief review of the site constraints suggest it is at least as constrained as the Atofina and Time Oil sites, and would not be a better site for marine terminal development, due to the access constraints mentioned above. Thus, our answer to question posed is:

- BPS has used appropriate measures to identify vacant and buildable land.
- The two sites it has identified as meeting the minimum size requirements for a new marine terminal (Atofina and Time Oil) appear to be the two best sites that meet that size requirement with vacant land. Any other location would require assembling and redeveloping properties that now have buildings on them.[9]

## 3.2 POTENTIAL SITES FOR NEW MARINE TERMINALS

This section addresses the question: How suitable for a public marine terminal are the few sites in the Portland Harbor that have been identified by the City as having the best potential to accommodate such a terminal? Through previous planning efforts,[10] the City of Portland Bureau of Planning and Sustainability (BPS) identified the following minimum criteria to meet forecasted demand for new marine terminal sites in the Portland Harbor:

- Industrial zoning
- Deep-water harbor access
- Railroad access

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[9] Whether such redevelopment could be, in some cases, financially feasible is a question beyond the scope of this study.

[10] West Hayden Island Economic Foundation Study, prepared by Entrix and Bonnie Gee Yosick LLC for the City of Portland Bureau of Planning and Sustainability, May 2010. City of Portland Economic Opportunities Analysis: Working Draft, prepared by E.D. Hovee and Company, LLC for the City of Portland Bureau of Planning & Sustainability, June 2011.

- Truck street access
- Vacant (unimproved or unoccupied brownfield) site-assembly area approaching 100 acres.

Using the methods described in Section 3.1 above, BPS staff identified only two sites that could potentially meet all these criteria. These are the two largest vacant sites in the Portland Harbor area: the 59-acre Atofina site, and the 43-acre Time Oil site. Both are brownfields, and both could potentially be assembled with nearby vacant sites.

This analysis looked only at vacant sites. It is always possible that some sites that are non-vacant today could be redeveloped as marine terminals in the future. When considering the opportunity to redevelop non-vacant sites, it is important to look at the net impact in economic activity. In other words, redeveloping existing sites would only be beneficial to the economy if the new use of the site were more efficient and able to accommodate more economic activity (whether measured by employment, output, cargo volumes, etc.) on the same acreage. Evaluating all non-vacant sites in the Portland Harbor to attempt to determine which might be most likely to redevelop in the future was beyond the scope of our analysis.

The ECONorthwest team reviewed the two vacant sites identified by the City of Portland, and evaluated maps of the Portland Harbor, including zoning, infrastructure and aerial photographs. Our preliminary review confirmed the City's findings: most of the Portland Harbor has active development on it, and these two sites have the greatest opportunity to accommodate new public marine terminals.

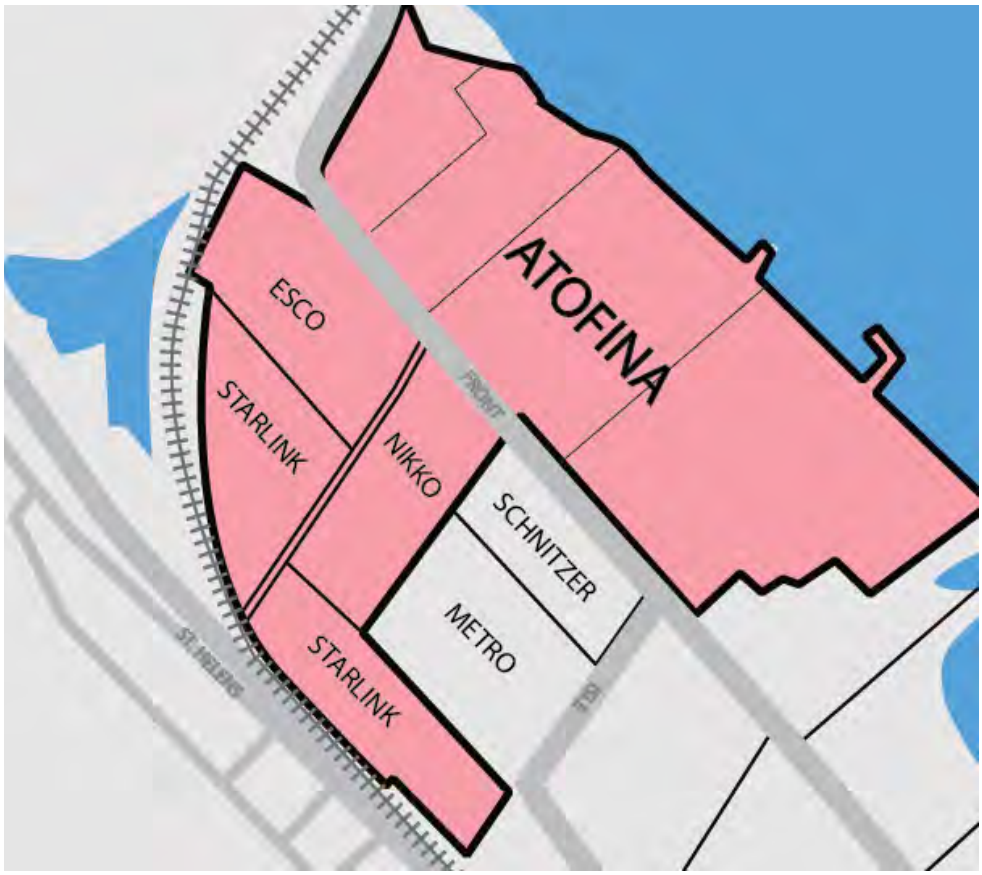
Staff from ECONorthwest and Maul Foster & Alongi toured these sites with BPS staff, documenting conditions affecting the suitability of each site for the proposed development. Key factors considered in the evaluation were: site access, existing uses, natural features, and contamination / remediation. After conducting this site visit, Maul Foster & Alongi developed a set of criteria for evaluating site feasibility for typical port terminals (see Appendix B).

Using these criteria, Maul Foster & Alongi evaluated the potential opportunities and constraints of these sites to accommodate development of a public marine terminal. A cursory site visit is insufficient to make a final determination of site feasibility. Nonetheless, the methods are consistent with the scope and budget, and are sufficient for identifying major opportunities and constraints for these potential sites, and for making a preliminary determination of site feasibility. Further investigation of these sites could be conducted to refine our feasibility findings.

### 3.2.1 ATOFINA

The Atofina site is a collection of parcels under several ownerships, which total approximately 114 acres (59 acres in the four main Atofina parcels, and an additional 55 acres in adjacent parcels across Front Ave.). The parcels are zoned heavy industrial (IH), and are bordered by industrial uses. The site is adjacent to SR 30 and fronts the Willamette River within the Portland Harbor. Exhibit 3-2 shows a map of the Atofina site.

**Exhibit 3-2. Atofina site**




Source: ECONorthwest, 2011.

The parcels that the Atofina site comprises have the following owners:

- Atofina: four vacant parcels totaling 59.14 acres
- Schnitzer: an 8.32-acre parcel, currently occupied by Air Liquide America Corporation
- Metro: a 10.43-acre parcel housing the regional solid waste transfer station
- Nikko (Gould Electronics): a 9.21-acre parcel, which is partially occupied by an operating RCRA C hazardous material landfill
- ESCO: a 10.51-acre parcel, which is a former landfill


Ord. 187831, Vol. 2.4.C, page 9636

- Starlink (Aventis Cropscience USA LP; Rhone Poulenc Ag): two significantly contaminated parcels totaling 16.42 acres, currently under remediation.

## Access

Water depth in the Willamette River near the Atofina site ranges from 30 to 40 feet. The site has historically been used as a bulk-commodity manufacturing and shipping terminal. The waterside parcels (Atofina) provide a total of 2,700 feet of shoreline, and currently accommodate three existing piers on leases from the State of Oregon, Department of State Lands.

The aggregated Atofina site is served by a rail siding from the BNSF mainline. The siding is approximately 2,200 feet in length with three road 'at grade' crossings. While the site has rail access, it appears to be of insufficient size to accommodate a loop track, which would hamper efforts to build an efficient, modern port facility. Highway 30 access has been somewhat hampered by the closure of local streets accessing the highway.

## Existing uses

Current industrial uses on the Schnitzer property as well as the Metro property seemingly eliminate 18.75 acres, while the existing Gould Superfund disposal site on the Nikko property reduces the available footprint by an additional 9.21 acres. The Nikko property contains an operational on-site 4.5-acre containment facility (Subtitle C closed hazardous waste landfill), and is approximately 25 to 30 feet higher in elevation than the surrounding property, with a structured fill containing 77,000 cubic yards of contaminated materials. The former ESCO landfill received non-recyclable wastes (e.g., foundry sand, slag, demolition debris) from ESCO's foundry operations from approximately 1953 to 1983. The landfill was closed with the approval of the Oregon Department of Environmental Quality (DEQ) and the Oregon State Health Division in 1983. The Starlink properties are undergoing extensive investigation and remediation.

## Natural features

The property generally rises in grade from the Front Street ROW in the east to the rail ROW in the west, and has considerable natural gain exclusive of the Subtitle C landfill mass. Along the north and northwest perimeter of the site is a berm with a steep slope leading up to the BNSF main line on its approach to the rail bridge. Across the rail line, North Doane Lake and an environmental conservation land designation wrap the 'site' to the north and west.

The waterside parcel is partially within the FEMA Special Flood Hazard Area or was partially inundated by a 1996 flood event. The area is in a low to moderate earthquake hazard exposure area.

## Contamination and remediation

The Atofina parcels are being remediated by Legacy Site Services (LSS), as the Atofina agent, under a consent order with DEQ, requiring source control and a site-wide feasibility study. The source control measures include both groundwater and stormwater migration controls. The site is included in the area of the Lower Willamette River that was designated a Superfund site in 2000 by the Environmental Protection Agency. Final remediation plans for the Portland Harbor Superfund site have not been determined. The potential liability for remediation of the Superfund adds a high level of risk for all affected properties, making prospective real estate transactions or development unlikely.

## Other constraints

In addition to these property encumbrances the Atofina site is transected by Front Avenue (Service Level B; Priority Truck Route; peak-hour volume average of 106 vehicles and an average daily traffic volume of 640 vehicles, of which 92% are automobiles). Front Avenue separates the Atofina-owned parcels from the remainder of the site. Front Avenue provides primary access to the adjacent Siltronic site and is a public right of way. The Siltronic property does have alternate direct highway access to US 30, but there is an 'at-grade' rail crossing, and it does not readily serve the current land use configuration for the site. In addition to the Front Avenue ROW there is a pipeline easement adjacent to the east side of the street ROW.

While the total aggregated acreage appears to adequate for serving as a barge or bulk facility, current encumbrances, uses, and rights of way limit the useable area to 59 acres: the four parcels owned by Atofina to the East of Front Avenue, fronting the Willamette River.

## Site assessment

Significant changes would need to be overcome to develop this site as a productive public marine terminal. To develop the entire site, NW Front Avenue would need to be closed, requiring additional infrastructure investments to provide alternative access to the Siltronic property. Without closing NW Front Avenue, this site is practically limited to 59 useable acres, with limited road and rail siding access.

While the site has rail access, site size and dimensions are insufficient to accommodate a rail loop track. Providing adequate rail service for the site is

even more challenging if development is limited to the 59 acres east of NW Front Avenue.

If NW Front Avenue were closed to accommodate development of the 114-acre site, the properties owned by Metro and Schnitzer are in active use, and would be unlikely to relocate. Property acquisition for the remaining parcels would be challenging, as it would require negotiations with five different private property owners. While acquiring these properties would provide additional acreage for development, acquisition would also involve additional costs as well as need for environmental remediation on these sites.

Ultimately, the site may be suitable for break bulk commodities, such as project cargoes, but the uncertainty of the planned and ongoing environmental remediation on the Atofina parcels--in addition to the uncertain liability for the Lower Willamette River Superfund remediation--probably make the cost of the land prohibitively high. The site *could* be big enough for a terminal, but the cost of preparing the site to accommodate such a terminal will make the effective land price very high relative to other industrial properties.

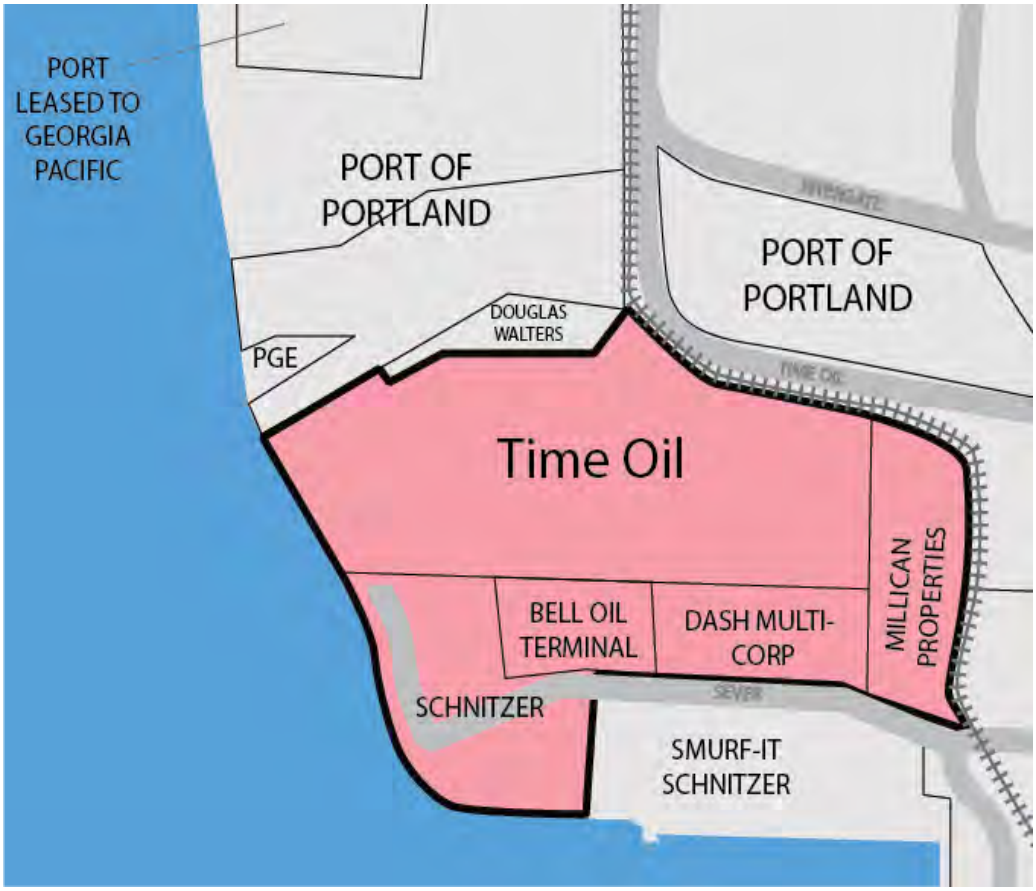
### 3.2.2 TIME OIL

The Time Oil site includes several separately owned parcels totaling approximately 84.2 acres. The subject parcels are adjacent to the Willamette River within the Portland Harbor and are zoned heavy industrial (IH) with a 'River' overlay designation. The site is bordered by industrial uses and also an area governed by a soon-to-expire natural resource management plan. Exhibit 3-3 shows a map of the Time Oil site.

The Time Oil site comprises parcels with the following owners:

- Time Oil: 43.41 acres
- Schnitzer Investment Corporation: 13.79 acres
- Bell Oil: 6.04 acres
- Dash Multi Corporation: 9.82 acres
- Millican Properties: 11.12 acres

**Exhibit 3-3. Time Oil site**




Source: ECONorthwest, 2011.

In addition to the aggregated property initially considered for the Time Oil site, there appears to be additional parcels totaling approximately 57 acres to the east of the Time Oil site, and bounded by Time Oil Street and Burgard Street. Including these parcels (not shown in Exhibit 3-3), the total potential aggregate site would be approximately 139 acres.

## Access

Water depth in the Willamette River ranges from 30 to 40 feet. The aggregated site has approximately 1,400 feet of shoreline (pier head): the Time Oil parcels with 550 lineal feet, and the Schnitzer parcel with 850 lineal feet.

Historically there have been two piers on the parcels. The side channel serving the Schnitzer parcel is navigable, and is likely to be addressed in the Portland Harbor cleanup project.

The Time Oil site is served by a rail siding from the Union Pacific Railroad mainline of approximately 2,500 feet in length with two road 'at-grade' crossings and on-site railroad access. While the site has rail access, it appears to be of insufficient size to accommodate a loop track, which would

hamper efforts to build an efficient, modern port facility. Access to the specific site would require use of a private or Port-owned right of way, connecting to either Rivergate Blvd. or Burgard St., ultimately connecting to N Lombard St, a district collector and priority truck roadway.

## Existing uses

Current industrial uses on the Schnitzer property appear to be temporary in nature. The Bell Oil Terminal is inactive; the Millican parcel is underutilized, and the Dash Multi Corp parcel is an operational tire recycler. There are several existing structures on the Time Oil and Schnitzer site, and evidence of removal of liquid storage tanks. The western half of the site is in a floodplain.

## Contamination and remediation

Like most properties in the Portland Harbor, sediment in the adjacent channel and berthing area have known or suspected contamination. The upland properties have known or suspected contamination and are in various regulatory phases of investigation and remediation. The site is included in the area of the Lower Willamette River that was designated a Superfund site in 2000 by the Environmental Protection Agency. Final remediation plans for the Portland Harbor Superfund site have not been determined. The potential liability for remediation of the Superfund adds a high level of risk for all affected properties, making any real estate transactions or development highly unlikely.

## Other constraints

To the north of the subject site there are high-tension power lines; a small parcel owned by PGE and a series of parcels owned by the Port of Portland with the presence of wetlands (some of these wetlands have environmental conservation zoning). The site is generally flat with mild slope to the river.

## Site assessment

The Time Oil site faces challenges that would need to be overcome to be developed as a productive public marine terminal. While the core of the site (57 acres) has only two different private property owners, the remainder of the site is divided into several different owners. Depending on the desired use and scale of a proposed port terminal, additional property to the east of the site may need to be acquired. The number of private properties and owners makes site assembly a challenge, but not an insurmountable obstacle.

Compared to the Atofina site, the Time Oil site appears to have fewer challenges to redevelopment: it does not require closing a public street, it

appears to have less severe environmental contamination, and the possibility exists to acquire a larger aggregate site. The contamination is mainly along the river, not upland. It may be possible that lower lying contaminated land could be used as fill on other parts of the site and capped under the footprint of a new building.

The site would be a viable candidate for a marine terminal with the appropriate aggregation of key properties. Aggregating 80 to 140 acres would accommodate the transshipment of break bulk and some bulk commodities. Property configuration to make 1,400 feet of pier face accessible is critical to its usability. This site could be explored further for marine terminal use. It will be difficult, however, to negotiate any real estate transactions for this site while the liability for the Lower Willamette River Superfund remediation remains uncertain.

### 3.2.3 IMPLICATIONS

Public marine terminals have specific land use requirements that are difficult to find. Ideally, sites must be large and flat, inside of an industrial zone, have significant shoreline on a navigable river, be served by both rail and truck, and free of contamination, wetlands, or other environmental constraints. There are no sites in the Portland Harbor that meet these ideal requirements, though there are a few sites that come close. The questions are: how close do they come, and is there a way to cost-effectively develop these sites as productive public marine terminals?

The City of Portland identified the two sites in the Portland Harbor that are most likely to be suitable for development of a new public marine terminal: the Atofina site, and the Time Oil site. Of these two sites, development is technically possible on either, but there are major hurdles that would add significant costs. Both sites have some level of contamination, both sites would require negotiation and property acquisition from numerous property owners, and both sites are smaller than desirable, which precludes the possibility of an onsite rail loop.

Of the two sites, the Time Oil site is most suitable for development, as it does not have certain challenges faced by the Atofina site. The development of the Atofina site is further restricted by NW Front Ave. that bisects the site, and provides primary access to the Siltronic property. With this road in place, the site is limited to just 59 acres. Vacating the road would be costly, and would likely require significant infrastructure investments to be made to provide access to the Siltronic property. Even if the road were vacated, property on the other side of the road is contaminated or in active use. And the nature of the contamination on the Atofina site is considered to be more severe than contamination elsewhere in the Portland Harbor.

Ultimately, issues related to the Superfund cleanup of the Willamette River make all sites in the Portland Harbor unfeasible for development in the near future. Until a final agreement is reached, determining the specific liability for all property owners in the Harbor, there is too much cost uncertainty to negotiate a reasonable price for the land acquisition that would be necessary to assemble a site large enough for a new public marine terminal.

## 3.3 ROLE OF VANCOUVER IN HARBOR INDUSTRIAL LAND SUPPLY

The third question we were asked by the City is: What role can the Port of Vancouver play in accommodating forecast demand for cargo volumes in the Portland region? To answer this question, we reviewed estimates from recent studies on the current capacity and forecast demand for cargo in the region, and augmented this data-driven analysis through interviews with port officials. A more detailed description of our analysis is found in Appendix C: Analysis of Harbor Land Capacity and Demand, Portland and Vancouver.

### 3.3.1 EXISTING CAPACITY

The Port of Portland has four marine terminals located along the Willamette and Columbia Rivers. These terminals accommodated 575 ocean-going vessels in 2010, though over the past two decades it was not uncommon for the Port to accommodate 800 to 1,000 ocean-going vessels in a year. Not counting cargos received or shipped via inland barges, the Port of Portland shipped over 13 million short tons of cargo in 2010.

While the Port's existing marine terminals have excess capacity, that capacity is limited. As demand increases over time, the Port will reach a point when existing facilities are unable to accommodate the demand that is forecasted. If the Port is unable to find new ways to improve the efficiency of existing terminals, or find suitable sites to build new terminals, then the Port of Portland may miss potential cargo opportunities. The Port of Vancouver, located across the Columbia River from the Port of Portland, could accommodate some unmet demand.

Exhibit 3-4 summarizes the estimated capacity of public marine terminals in the Port of Portland. Total capacity for all cargo types in the Port of Portland is estimated to be over 21,000,000 metric tons. This capacity is significantly above current cargo volumes for all cargo types, except for grain, which saw a reduction in capacity when the Port closed the terminal

4 grain elevator in recent years, and is unable to accommodate historical levels.

**Exhibit 3-4. Estimated capacity of public marine terminals, and recent peak cargo volumes, Port of Portland**

| Cargo Type | Estimated Capacity | Recent Peak Volume | Peak Year |
|---|---|---|---|
| Automobiles (units) | 675,000 | 460,000 | 2006 |
| Containers (TEUs) | 700,000 | 330,000 | 1995 |
| *Metric Tons* | | | |
| Automobiles | 889,000 | 606,000 | |
| Containers | 3,999,000 | 1,885,000 | |
| Breakbulk | 2,100,000 | 1,130,000 | 2007 |
| Grain | 4,100,000 | 5,400,000 | 1995 |
| Dry Bulk | 10,700,000 | 5,460,000 | 2008 |
| Liquid Bulk | - | - | N/A |
| **Total** | **21,788,000** | **14,481,000** | |

Source: Estimates of capacity are from Port of Portland, reported in West Hayden Island Economic Foundation Study (Entrix, 2010), and confirmed through interviews with Port of Portland officials.
Reported recent peak cargo volumes are from Port of Portland Marine Terminal Statistics, 1980-2010.

## 3.3.2 FORECAST OF FUTURE CARGO VOLUMES

Our analysis did not include forecasting future cargo demand for the region. Instead, we were tasked with obtaining and reviewing the most recent forecasts. These forecasts were contained in the *Portland and Vancouver Harbor Forecast Update* (BST Associates, 2012). These forecasts were based on a 2010 study by BST Associates, but were refined to specifically call out cargo demand for the City's of Portland and Vancouver, and were updated with the most recent economic data.

Exhibit 3-4 shows the *capacity* of *existing public* marine terminals. Exhibit 3-5 shows the forecast *demand* for *existing and future public and private* marine terminals (measured as cargo volume) in the City of Portland in 2040. The forecast demand ranges from 28 million to 43 million metric tons. For context, in 2010 (the most recent year for which data is available) the Port of Portland reports it moved 13 million tons of cargo. Even the low scenario forecasts demand to be more than double 2010 levels by the year 2040, with an average annual growth rate of 1.5% per year.

**Exhibit 3-5. Forecasted cargo volume, public and private, City of Portland, 2040**

| Cargo Type | Low | Medium* | High |
|---|---|---|---|
| Automobiles (units) | 811,000 | 912,500 | 1,014,000 |
| Containers (TEUs) | 379,000 | 452,500 | 526,000 |
| *Metric Tons* | | | |
| Automobiles | 1,076,000 | 1,206,000 | 1,336,000 |
| Containers | 2,162,000 | 2,583,500 | 3,005,000 |
| Breakbulk | 1,132,000 | 1,242,000 | 1,352,000 |
| Grain | 6,686,000 | 9,078,000 | 11,470,000 |
| Dry Bulk | 10,278,000 | 14,093,500 | 17,909,000 |
| Liquid Bulk | 6,912,000 | 7,461,500 | 8,011,000 |
| **Total** | **28,246,000** | **35,664,500** | **43,083,000** |

Source: Low and High forecasts were made by BST Associates for the *Portland and Vancouver Harbor Forecast Update* (2012).
*Medium scenario is calculated by ECONorthwest as the average of the BST low and high scenarios.

Note that 2040 is an arbitrary date. It is not a key milestone. Demand for cargo does not stop growing for some assumed reason in 2040. It is simply the last date for which there is a forecast for cargo demand. Thus, our advice is not to focus on exact tonnage requirements, or exact acres needed to accommodate demand in 2040. It is more important to focus on the big picture. The City of Portland has a limited supply of land suitable for marine terminal development, and this supply will not increase. Demand for cargo has increased steadily for decades, and is forecast to continue to do so in the future. Over a long-enough period, the City will use its capacity to accommodate future growth. As it does, land prices will increase and redevelopment will become more possible than it appears now.

Nonetheless, the inevitable reduction of vacant land available for water-dependent uses in the Portland Harbor area is the motivation for considering ways to use the land efficiently, and whether neighboring jurisdictions might accommodate some additional amount of the forecasted growth. Looking at the 2040 gives good idea of how close the City (and the region) is to reaching its full capacity for public marine terminals.

### 3.3.3 CAPACITY SHORTFALL

Comparing the capacity of existing facilities with the forecast demand provides an estimate of the potential capacity shortfall for the Port of Portland is in 2040. Two factors complicate this analysis: (1) private marine terminals also handle a portion of the City's cargo volume, and there are not accurate estimates of the capacity of private terminals in the City; and (2) if the growth in cargo volumes comes from a different mix of clients and commodities than the terminals are currently handling, then the existing facilities may not be able to accommodate the new opportunities, which

means these facilities may not reach 100% of their capacity before new terminals are needed.

Our analysis needed to make assumptions on how to deal with these two issues. Variations in assumptions, combined with the wide range of the BST forecasts for cargo demand in 2040, result in an even wider range of estimates for capacity shortfall. To bookend our analysis, we created assumptions that would give us the lowest and highest possible shortfall, and then selected assumptions for a "most-likely" scenario.

The lowest shortfall scenario assumes the low demand forecast from BST, and assumes that existing facilities would be able to operate at 100% efficiency to accommodate forecast demand, and that private terminals will be able to continue accommodating cargo at their recent peak levels. The highest shortfall scenario uses the high demand forecast from BST, and assumes that existing facilities would continue operating at their historical peak levels, with all additional demand coming from new market opportunities that require new terminals. The most-likely scenario uses assumptions that fall between the range of these two bookends. Key assumptions for the most-likely scenario are existing facilities operate at 90% of capacity (i.e. to accommodate the forecast growth in cargo, we do not assume that existing facilities are able to use 100% of their capacity, since part of the growth in cargo volumes may be due to new users and new commodities that cannot use existing facilities), and we use the medium demand scenario, calculated as the average of the low and high scenario by BST Associates.

The results of these three scenarios are shown below in Exhibit 3-6. Note that the potential capacity shortfall ranges from less than 200,000 metric tons in the low shortfall scenario to more than 17 million metric tons in the high scenario. Ultimately, our most likely scenario shows a potential shortfall of 5,760,000 metric tons, with all of the shortfall occurring in dry bulk, grain, and automobiles.

**Exhibit 3-6. Potential capacity shortfall, City of Portland, public and private marine terminals, 2040 (metric tons)**

| Cargo Type | Low | High | Most Likely |
|---|---|---|---|
| Automobiles (units) | (136,000) | (554,000) | (310,000) |
| Containers (TEUs) | - | (196,000) | - |
| *Metric Tons* | | | - |
| Automobiles | (187,000) | (730,000) | (410,000) |
| Containers | - | (1,120,000) | - |
| Breakbulk | - | - | - |
| Grain | - | (4,370,000) | (2,390,000) |
| Dry Bulk | - | (10,949,000) | (2,960,000) |
| Liquid Bulk | - | - | - |
| **Total** | **(187,000)** | **(17,169,000)** | **(5,760,000)** |

Source: Calculated by ECONorthwest, with demand forecasts from BST Associates (2012).

### 3.3.4 LAND NEED FOR NEW PORT TERMINALS

Translating cargo volumes into acres for port terminals is challenging, and depends on a host of variables for which we have little or no data for this analysis. Will the terminal need rail access, if so will it need a dedicated rail loop, or will it be able to share rail infrastructure with adjacent terminals? Would another rail configuration like a ladder track work?[11]

The composition of the demand is important as well. For example, if you have demand for 10 million pounds of dry bulk, will that all be the same commodity type? If not, you may not be able to use the same terminal (for example a coal exporter and potash exporter may need to have completely separate terminals even though they are both dry bulk and would have very similar needs. Even the ownership of the cargos makes a difference (e.g., one exporter with a throughput of 10 million tons of potash may require different facilities, than 5 exporters each handling 2 million tons of potash a piece).

Because of the many variables, it is difficult to translate the potential shortfall numbers shown in Exhibit 3-6 into the number of terminals that would be needed to service that demand, and even more difficult to translate the number of terminals into acres. For the purposes of our analysis, we first looked to recent studies to find an industry standard or a rule of thumb for the size of marine terminals for various cargo types. The three sources we looked at were the *West Hayden Island Economic Foundation Study* (Entrix, 2010), the Draft Report on *Operational Efficiencies of Port/Terminal World Wide* (Worley Parsons, 2012), and the Maul Foster and Alongi evaluation criteria included with this report as Attachment B.

Unfortunately, there is little consensus among these sources on the land needed for each terminal. This is because the unique characteristics of each site, the needs of each unique user and commodity, and the market conditions and technologies available at the time existing facilities were built result in a wide-range of variables that are difficult to control for. In short, no conclusive rule of thumb exists, and if it did exist, it would not necessarily be applicable to each of the sites in the Portland and Vancouver harbors. Nonetheless, for the purposes of our analysis, we needed to make some assumptions on the acreage requirements for new terminals for various commodities. We again sought to use different assumptions to present a high and low bound on our analysis, and then to select

[11] Representatives of businesses in the Portland Harbor, as well as Port Officials, and other consultants with expertise in marine terminal development and cargo forecasts have stressed that there is no equal substitute for a loop track, and that other rail configuration such as a ladder track will not work, for attracting new port users in a competitive global economy.

assumptions in the middle of the range that we believe resulted in a most-likely scenario.

The details of these scenarios are shown in Appendix C: Analysis of Harbor Land Capacity and Demand, Portland and Vancouver. The most-likely scenario uses our most-likely capacity shortfall estimates, and assumptions on throughput (tons per acre of terminal land) from the *Operational Efficiencies of Port/Terminal World Wide* (Worley Parsons, 2012), based on tons per acre for case study ports in North America and Europe. It is optimistic, however, to think that all new terminals would achieve the level of efficiency identified in the Worley Parsons draft report, so we have shown another column for the "practical" (i.e., more conservative assumption of land need) land need, based on an average value of the assumptions in the various supporting documents used in our analysis. A final column was added to show the land need if a dedicated rail loop is included with the terminals that would require rail access. Exhibit 3-7 shows the results of our most likely scenario, with at least 170 acres of land needed, and up to 470 acres if rail access is included.

**Exhibit 3-7. Acres of land needed for new public marine terminals in the City of Portland, 2040**

| Cargo Type | Capacity Shortfall (Tons) | New Terminal Space Needed | Acres Needed | | |
|---|---|---|---|---|---|
| | | | Minimum | Practical | w / rail |
| Automobiles | (410,000) | Yes | 120.0 | 270.0 | 270.0 |
| Containers | - | No | - | - | - |
| Breakbulk | - | No | - | - | - |
| Grain | (2,390,000) | Yes | 30.0 | 50.0 | 100.0 |
| Dry Bulk | (2,960,000) | Yes | 20.0 | 70.0 | 100.0 |
| Liquid Bulk | - | No | - | - | - |
| **Total** | **(5,760,000)** | | **170** | **390** | **470** |

Source: Calculated by ECONorthwest
Note: This table estimates acreage needed, not the number of terminals needed. Terminal size can range from 150 to 200 acres for automobiles and containers, to as small as 5 acres for liquid bulk. Depending on terminal size assumptions, the acreage need for automobile cargo could be accommodated by anywhere from one to five terminals in the City of Portland.

Comparing the demand for land for public marine terminals in the City of Portland shown in Exhibit 3-7, with the supply of land in the Portland Harbor shown in Exhibit 3-1, shows an insufficient land supply. As described in Sections 3.1 and 3.2, the Portland Harbor has the potential for two (or perhaps three, if the barriers to development at the McCormick and Baxter site can be overcome) sites to accommodate public marine terminals. These sites (Atofina and Time Oil) have serious development constraints, and even if these constraints can be overcome, they would each only be able to accommodate one terminal of practical size.

The Portland Harbor probably has insufficient land to accommodate the forecast growth for public marine terminals in the City of Portland. An optimistic scenario would show the Portland Harbor with capacity to

accommodate perhaps two terminals of relatively small size (and without a modern rail loop to serve these terminals). A more conservative outlook (and a real possibility) is that the two potential sites in the Portland Harbor may be unable to overcome their significant barriers to redevelopment, which would mean the Harbor may not have any capacity to accommodate future development of marine terminals.

Given the expected growth in demand over the next 30 years, there are few easy solutions to accommodate the City of Portland's anticipated shortfall in land for public marine terminals. The City can take action to address the existing constraints to facilitate redevelopment, or look elsewhere for buildable land for public marine terminals. The following section addresses the latter solution: looking outside of the City of Portland for land for new marine terminals.

### 3.3.5 PORT OF VANCOUVER DEVELOPABLE LAND

This analysis presupposes that from a regional perspective, there is no benefit to having port development occur in Portland vs. Vancouver. Leadership for the ports, and for the cities, counties, and states they are located in, may have different opinions. Indeed many public policies exist that emphasize the importance of retaining and attracting industrial jobs, like those created by marine terminal development. However, the purpose of this analysis was to determine if it was *technically* possible (as opposed to *politically* desirable) to accommodate future marine terminal demand at the Port of Vancouver.

Additionally, our analysis assumed that the type of port users that would be attracted to the Port of Portland if land were available, would find the Port of Vancouver equally as attractive if there were no developable sites in Portland. This assumption may be true for many, but not necessarily all public marine terminal users. Portland and Vancouver are similar in many ways, sharing the same regional infrastructure and labor pool. But differences do exist between the two jurisdictions, and more so for specific sites within each jurisdiction. For the purposes of our analysis, we have assumed land at the Port of Vancouver would be an acceptable substitute for potential marine terminal users unable to find developable land in the Port of Portland.

Ideally, our analysis for the supply and demand for public marine terminals in the Port of Vancouver would have used the same methods as were used for the Port of Portland. Unfortunately, our analysis was constrained by both data limitations, and time/budget. Thus, we were asked to conduct a less rigorous analysis of the Vancouver land supply, making use of the best available data, gathered mostly from conversations and correspondence with officials from the Port of Vancouver.

ECO interviewed officials with the Port of Vancouver to understand their long-term plans for harbor industrial lands, and the challenges and opportunities that would arise from a greater share of regional industrial development locating in Vancouver versus Portland.

The Port of Vancouver is located along the banks of the Columbia River, with access to the same markets and same multi-modal transportation infrastructure as the Port of Portland. The port handles more than 500 ocean-going vessels each year, as well as river barges, with total annual cargo of more than 5 million metric tons.

The Port of Vancouver has room to grow. An analysis of aerial photos of Port land indicate roughly 750 vacant acres. The Port of Vancouver sent a memorandum to the City of Portland that further clarified their intentions for these 750 acres. The land includes approximately 450 acres of undeveloped greenfield land called Columbia Gateway. Approximately 350 acres of this property is planned to be developed as maritime, and the remaining 100 acres planned for heavy industrial. In addition, the port has 110 acres of available undeveloped light industrial land called Centennial Industrial Park. The light industrial properties could be available for development within 12-14 months, while the Columbia Gateway area is not expected to be ready for development for another 8-15 years. The Centennial properties are not waterfront parcels.

Terminal 5, now under development, added 200 acres of heavy industrial and maritime land. All but four acres of this property is river-dependent maritime land. The maritime portion has been, or will be, filled with rail infrastructure, new tenants, and cargos, including wind energy exports and a dry bulk exporter with up to 16 million ton export capacity. The sole industrial tenant is a rail-dependent propane distributor.

The Port of Vancouver is in a period of rapid growth and is currently undertaking a number of public and private development projects, including the West Vancouver Freight Access project. This public rail improvement project will create a unit train facility, more than doubling the miles of track within the port, along with adding a new, grade separate entrance from the BNSF Railway mainline. This project will increase capacity from 45,000 rail cars per year, to more than 160,000 per year, with 40 percent less delay.

Given the Port of Vancouver's holdings of vacant land, the recent dredging of the Columbia River to a depth of 43 feet, and ongoing investment in new rail infrastructure (i.e., the West Vancouver Freight Access project), the Port of Vancouver is well positioned to capture growth in the future. Officials from the Port of Vancouver believe that neither the Port of Portland or the Port of Vancouver have sufficient land and resources to accommodate **all** of the region's future growth on their own.

Instead, ports on both sides of the Columbia River will need to supply land for new public marine terminals.

The Port of Vancouver's undeveloped, unpermitted maritime and industrial land will accommodate some regional growth – from those businesses selecting the Washington business environment and requirements. Using the BST forecasts of cargo demand for the City of Vancouver, we conducted a similar capacity shortfall analysis for Vancouver as we did for Portland (as was described in sections 3.3.1 to 3.3.4).

Combining these analyses allows us to view the regional demand for and supply of land for public marine terminals. The result of this analysis is shown in Exhibit 3-8. Our most likely scenario shows that regional cargo volumes in 2040 could require between 210 and 570 acres of land for new marine terminals.

**Exhibit 3-8. Acres of land needed for new public marine terminals in the Portland Metro Region (including Portland and Vancouver), 2040**

| Cargo Type | Capacity Shortfall (Tons) | New Terminal Space Needed | Acres Needed | | |
|---|---|---|---|---|---|
| | | | Minimum | Practical | w / rail |
| Automobiles | (570,000) | Yes | 160.0 | 370.0 | 370.0 |
| Containers | - | No | - | - | - |
| Breakbulk | (90,000) | No | - | - | - |
| Grain | (2,390,000) | Yes | 30.0 | 50.0 | 100.0 |
| Dry Bulk | (2,960,000) | Yes | 20.0 | 70.0 | 100.0 |
| Liquid Bulk | - | No | - | - | - |
| **Total** | **(6,010,000)** | | **210** | **490** | **570** |

Source: Calculated by ECONorthwest with demand forecasts from BST Associates, and other assumptions based on conversations with officials from the Port of Portland and Port of Vancouver, as well as supporting documents including: *Operational Efficiencies of Port/Terminal World Wide* (Worley Parsons, 2012) and *West Hayden Island Economic Foundation Study* (Entrix, 2010).
Note: This table estimates acreage needed, not the number of terminals needed. Terminal size can range from 150 to 200 acres for automobiles and containers, to as small as 5 acres for liquid bulk. Depending on terminal size assumptions, the acreage need for automobile cargo could be accommodated by anywhere from one to seven terminals in the Portland Region.

If each new port terminal requires a dedicated rail loop, the total acreage needed to accommodate regional cargo volumes in 2040 exceeds the current supply of 350 acres of vacant developable land at the Port of Vancouver planned for marine terminal development.[12] However, the Port of Vancouver has about 200 acres of vacant developable land that could technically accommodate marine terminal development, but is planned for other industrial uses. But about 100 acres of this amount is part of

[12] It is important to note that these projections are based on our "most-likely" scenario. The range of possible assumptions that could be used in this analysis is significant. When using our most conservative assumptions, our analysis showed a regional land need as low as 70 acres, and our most aggressive assumptions resulted in a land need of over 2,250 acres.

Centennial Industrial Park and are not on the waterfront parcels or linked to waterfront parcels, so 100 acres might be a more appropriate estimate. If these acres were included in the total supply, then the Port of Vancouver comes close to having a supply of land to accommodate regional cargo demand through 2040.

While this scenario is technically possible, it may not politically feasible or consistent with adopted policies of the affected jurisdictions: Vancouver's land supply could fall short. The high and low demand forecasts differ by + or – 20% from the most-likely forecast, and assumptions about whether a new terminal has rail loop access or not can easily double the need for land. Portland and Vancouver probably have adequate land now to accommodate a low-demand forecast with few new terminals sized for loop trains. But in our simulations, high demand plus loop-train access at all new terminals led to a overall land shortfall of almost 1,500 acres. If only 350 acres at the Port of Vancouver are available for marine terminal development (its current estimated based on policy) then unmet demand for public marine terminals in the region would be around 1,100 acres.[13]

### 3.3.6 IMPLICATIONS

The most recent forecasts for future cargo demand show the Port of Portland will be unable to accommodate forecast demand by 2040 without adding new capacity. However, the extent of that capacity shortfall depends on the assumptions used. Interviews with officials from the Port of Portland, and the author of the most recent cargo forecasts indicate that although actual tonnage for specific cargo types may differ from the forecasts, long-term trends have shown past forecasts for total cargo volume to be fairly accurate, and the most recent forecasts should be seen as reliable.

Taken at face value, these forecasts suggest that additional port capacity will likely by utilized in the future; however, accurately and reliably forecasting the future is impossible. Although our forecasts (and the BST forecasts which underpin them) include a broad range of assumptions, reflecting the high degree of uncertainty, there is no way to guarantee that the future will fall within our forecast range, let alone our "most-likely" scenario. No one knows exactly how demand for port facilities in the lower

[13] Although this is the "high-scenario," it is not also "highly unlikely." BST Associates, authors of the cargo forecasts used in this analysis, note that the high-scenario calls for 3.1% growth in cargo volumes per year, which is actually lower than the 4.1% average annual growth experienced on the Columbia River between 1962 and 2011.

Columbia will change in the future. Economist HE Haralambides effectively summarizes the difficulty forecasting port demand, stating:[14]

> "As a result of intertwined and extended hinterlands; abundant land infrastructure and short-sea feedering networks; continuously evolving liner shipping networks; and the infamous `mobility' of the container, demand is very volatile and unpredictable. Port market shares are unstable; investments in one region or country have an impact on another … In such a `fluid' environment, how could one forecast port demand with any degree of credibility?"

Competitive and volatile environments do not support reliable forecasting because outcomes depend on many randomly moving variables. Ultimately, whether or not demand for additional port facilities on the lower Columbia materializes will depend on market conditions – demand (what's produced and consumed in the Portland region), supply (what technologies are used to ship goods, what competing port capacity exists), and price. These factors will inevitably change over the next 30 years in ways that no one can predict, which means any attempt to forecast them should be taken with a grain of salt.

In other words, individual cargo types fluctuate year to year and are difficult to predict with accuracy, but long-term historical trends show that demand for total cargo volumes is less volatile, more predictable, and tends to grow at a pace that is linked to the global economy. While the Port's four public marine terminals are not operating at 100% of capacity today, it is very likely that they will reach the limits of their capacity in the next several decades, as demand increases. Once these facilities reach capacity, the Port of Portland will need to develop new facilities, or else turn away demand.

The Port of Vancouver shares many of the same attributes that make the Port of Portland an attractive place for marine shipping. Thus the Port of Vancouver is a logical place to site new marine terminals, if sites are unavailable in Portland.

From a regional perspective, it makes no difference whether terminal development occurs in Portland or Vancouver. Both cities function as part of the same regional economy, and share the same infrastructure and labor pool. However, at a local level, if demand for public marine terminals is shifted from Portland to Vancouver, the City of Portland would lose out on high-paying industrial jobs (and some of the residents that fill those jobs), which would have a detrimental effect on the Portland economy, and a

[14] Haralambides, H.E. (2002), Center for Maritime Economics and Logistics, "Competition, Excess Capacity, and the Pricing of Port Infrastructure".

positive impact on Vancouver's. In other words, some amount of economic activity (measured any number of ways: jobs, wages, output, value added, etc.) would occur in Vancouver, rather than Portland, and Portland would miss out on the resulting direct, indirect, and induced economic benefits.

Given the most recent forecasts of demand, and reasonable assumptions on current capacity and the likely size of new terminals, it would appear that the Port of Vancouver has a surplus of vacant industrial land to accommodate their likely future demand, and should the Port of Portland be unable to accommodate forecast growth, the Port of Vancouver could accommodate some (and perhaps all) of that growth. However, officials from the Port of Vancouver stress that a regional strategy will be necessary to respond to future demand for public marine terminals in the region, and if actual cargo volumes reflect the high-scenario projections from the BST forecasts, then the region is likely to have a significant shortfall of suitable land for new public marine terminals.

## 3.4 POTENTIAL FOR INCREASED EFFICIENCIES

What is the potential for more efficient use of industrial harbor land? The total amount of land inside the Portland city limits is essentially fixed. Unless submerged land is filled to create new dry land, the only way the City can get more land is to expand its boundaries, which is unlikely to occur due to the constraints of surrounding land. Therefore, the City is interested in using its supply of industrial land as efficiently as possible to accommodate the most economic activity.

### 3.4.1 RECENT TRENDS IN EFFICIENCY OF PORTLAND HARBOR LANDS

We examined trends in efficiency in the Portland Harbor using several measures. Because of data limitations (see Chapter 2 and Appendix A) we focused our analysis on the period between 2002 and 2008. We calculated the economic activity in the Portland Harbor for these years, measured in terms of employment, real market value, value added, and cargo tonnage. We then divided each of these measures by the number of developed industrial acres in the Portland Harbor for each year to get a measure of land efficiency: i.e., some amount of some measure of economic activity, per acre. We then looked as the change in that measure of efficiency over this period of time.

Recent trends in the Portland Harbor show different results, depending on the measure of efficiency used. These results are summarized in Exhibit 3-9.

**Exhibit 3-9. Measures of economic activity per acre, Portland Harbor, 2002 and 2008**

| | 2002 | 2008 | AAGR |
|---|---|---|---|
| Value Added | $1,147,614 | $1,217,173 | 1.0% |
| Real Market Value | $776,715 | $838,091 | 1.3% |
| Employment | 6.21 | 5.75 | -1.3% |
| Cargo Tonnage | 3,873 | 4,928 | 4.1% |

Calculated by ECONorthwest with data from:
Value Added: IMPLAN
Real Market Value: Metro RLIS
Employment: Oregon Employment Department, Quarterly Census of Employment and Wages
Cargo Tonnage: Port of Portland
Acreage: Metro RLIS and Multnomah County Office of Assessment and Taxation

From 2002 to 2008, developed industrial land within the Portland Harbor increased from 2,757 acres to 2,863 acres, an average of 18 acres per year. Value added, real market value, and cargo tonnage all grew at a faster pace than developed industrial acres. By those measures, land was used more efficiently. Employment in the Portland Harbor, however, declined over that period (both in absolute terms, and per acre of developed industrial land). The measure of efficiency that is chosen makes a difference when evaluating trends in land use efficiency.

The next section explains each of these measures in more detail.

## Employment

Employment density is a traditional measure of land-use efficiency. In fact, it is typically the basis for forecasting supply of and demand for employment land for all jurisdictions across the State, as they conduct periodic Economic Opportunity Analyses that are required by State law.

For our analysis, we obtained employment data from the Oregon Employment Department for all businesses in the City of Portland for 2002 and 2008. We used GIS software to isolate all employment located within the Portland Harbor for these two years. Total employment in the Portland Harbor declined from 17,134 to 16,466 over this period, a decline of roughly 111 jobs per year (or -0.7% per year).

The Oregon Employment Department QCEW data do have limitations that are worth noting:

- Although the geocoding process OED uses produces accurate results, it is possible that the exact location of some employers could be wrong by one or two hundred feet. This means that some employment in the Portland Harbor may appear outside the harbor boundary when using QCEW data, and conversely, some employment that is actually outside of the Portland Harbor may appear inside the harbor boundary.

- Some firms have multiple locations, but may only report employment at one location (such as at a company headquarters). Depending on how a company reports multi-site employment, all of the company's employment may be incorrectly reported as being inside or outside of the Portland Harbor boundary.

- QCEW data represents the number of *covered workers*. The data excludes members of the armed forces, the self-employed, proprietors, domestic workers, unpaid family workers, and railroad workers covered by the railroad unemployment insurance system. In the case of the Portland Harbor, the most important of these omissions is likely railroad workers. Other studies have shown a significant economic impact from railroad activity in the Portland Harbor, but these workers are excluded from the data.

We do not wish to imply that tracking employment density as a measure of economic activity is wrong or pointless. It is indeed an important measure, and one that the policy-makers, and the general public find useful for understanding the scale of economic activity. Despite the limitations listed above, the QCEW data is widely recognized as one of the most accurate employment data sources updated on an annual basis with site-specific data on all industries. We are just acknowledging that employment isn't the **only** measure of economic activity, and due to its limitations, other alternative measures may prove more useful for evaluating the economic performance of the Portland Harbor.

## Real market value

Real market value is another typical measure of land-use efficiency. The relationship is a fundamental principle of urban economics: higher prices reflect the relative scarcity of some type of land or location, and that relative scarcity causes developers to substitute capital for land (i.e., to build more intensively). Higher-value development typically translates into higher assessed values and property taxes, which is seen as a benefit to local governments.

For our analysis, we obtained real market value for all parcels in the Portland region from Metro RLIS data for 2002 and 2008. Using GIS software, we calculated the sum of the real market value of all parcels within the Portland Harbor. The Harbor saw real market values grow from $2.14 billion in 2006 to $2.40 billion in 2008, an average annual increase of 1.9%. However, the US Consumer Price Index grew by 3.0% per year over this same time period, indicating that real market value in the Portland Harbor grew at less than the pace of inflation.

Data on real market value for this time period should be treated cautiously. The local and national real estate markets were booming during

this period. Multnomah County real estate values grew at above average rates: more than 8% during this period. The region has now had three consecutive years of declining real market values since 2008; a detailed analysis of property values in the Portland Harbor would probably mirror these broader regional trends. Over a long period (long enough to include the ups and downs of several business cycles—say, 20 years) inflation-adjusted changes in real market value in the Portland Harbor might be a useful indicator of land-use efficiency. For shorter periods, it is not a measure that can be used without interpretation.

## Value added

Value added is a measure of economic activity that is not commonly used to measure land use efficiency. Value added, simply defined, is the difference between the sale price and the production cost of a good or service.[15] It is directly comparable to Gross Domestic Product (GDP) at the national level. Value added only considers the final cost of goods and services (the total of four components: wages, business income, other income, and indirect business taxes), and excludes the value of intermediate goods, to avoid double counting.

While value added is a good measure of economic activity at a regional level, the data are not typically collected at smaller geographic levels, and certainly are not available as time-series data at a parcel-specific level. This presents challenges for using value added as a measure of efficiency for the Portland Harbor.

We used the IMPLAN economic modeling software to obtain value added information for the smallest geographic areas possible (zip codes). ECO used the IMPLAN forecast of value added for the four zip codes that overlap the Portland Harbor for 2002 and 2008. Using a geographic boundary that is close to, but not exactly the same as, that of the Portland Harbor means that the measure of value added per gross developed acre should not be viewed as accurate in an absolute sense. But because our geographies and data sources were consistent in both years, the measure is still useful for observing trends over time.

Our analysis showed value added in the zip codes approximating the Portland Harbor increased from $3.16 billion in 2002 to $3.48 billion in 2008, an increase of 1.6% per year. However, the US Consumer Price Index grew by 3.0% per year over this same time period, indicating that value added in the Portland Harbor grew at less than the pace of inflation.

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[15] More accurately, the production costs are the outside purchases of materials and services, but do not count payments to employees for wages, salaries, and benefits. Thus, a lot of value added is a "return to labor;" it also includes returns to land and capital.

### Cargo

The Port of Portland tracks cargo tonnage on a monthly basis and publishes annual data, dating back 30 years. While the data are only available for Port of Portland public marine terminals, and not privately-operated terminals, they are a good proxy for cargo shipped in the Portland Harbor, and the most comprehensive historical data available. The Port data show cargo volumes (measured in short tons[16]) increased from 10.7 million in 2002 to 14.1 million in 2008, an increase of 4.8% per year. Over this period, cargo volumes experienced more robust growth than any of the other efficiency measures used in this analysis. In other words, despite a decline in employment, and modest gains in real market value and value added, the Portland Harbor saw strong growth in cargo volumes per developed acre of industrial land.

Note that is not the same as saying that land in the Portland Harbor is what generated or somehow caused that tonnage to go through the Port.

## 3.4.2 OPPORTUNITIES FOR INCREASED EFFICIENCIES

The available data provide limited answers for understanding the potential for industrial land in the Portland Harbor to be used more efficiently. To supplement them, we interviewed key stakeholders in the Portland Harbor to solicit their input on (1) ways to measure efficiency, (2) challenges to improving efficiency, and (3) strategies to overcome those challenges.

To conduct these interviews as efficiently as possible, ECO staff met with about a dozen members of the Working Waterfront Coalition (WWC), rather than conducting separate interviews with similarly qualified individuals. Established in 2005, the WWC is an organization of businesses concerned about the environmental health and economic vitality of the Portland Harbor. Members of the WWC who were interviewed for this project, included representatives of the following businesses and organizations:

[16] 2,000 pounds per ton, as opposed to metric tons (1,000 kilos, about 2,200 pounds).

- The Greenbrier Companies
- CalPortland
- Northwest Pipe Company
- Schwabe, Williamson & Wyatt
- Kinder Morgan
- Smart Decisions
- Port of Portland
- Perkins Coie
- Schnitzer Steel
- Columbia Pacific Planning
- Evraz Oregon Steel Mills

Group members had different views based on their individual experiences in the Portland Harbor, yet the group as a whole agreed on most key points. Although no votes were taken at the meeting, the following points seemed to achieve consensus:

- **The Portland Harbor has many attributes that provide a competitive advantage for water-dependent industrial activity**. The Harbor benefits from its amazing connectivity: the confluence of two rivers, access to domestic markets via two major rail lines, inland waterways via the Columbia/Snake River system, and I-5 and I-84, and access to global markets via the Pacific Ocean. Having all of this connectivity in the heart of the City of Portland, with strong local policies in place to preserve harbor land for industrial use, creates a special place for water-dependent industrial firms. Members of the WWC recognize the importance of the Portland Harbor, and are committed to maintaining and enhancing its competitive advantages.
- **The constrained land supply is an issue**. Members of the WWC recognize that the industrial harbor land supply in the Portland region is fixed, and vacant developable land is rare and constrained. They believe this limitation is an important issue, and one that will become more important over time.
- **Businesses adjust to these constraints by taking measures that have the effect increasing output on an existing site (i.e., of increasing land efficiency).** Such measures include extra shifts, better machinery, tighter processing procedures, and more.
- **There are bigger public policy issues that are affecting demand for new development in the Portland Harbor**. While members of the WWC were concerned about the constrained land supply, they were more concerned with issues affecting demand: Superfund liability and a burdensome permitting process.
    - **Superfund liability**. The specter of the Superfund is hanging over the heads of all property owners in the Portland Harbor. They know that their liability for the Willamette River cleanup effort will be significant, but they do not know what their individual liability will be, or when a final agreement will be

reached. Members of the WWC expressed concern that it is nearly impossible to sell land in the Portland Harbor for new industrial development until a final agreement has been reached on the Superfund liability.

- **Permitting process**. Members of the group believe the local permitting processes to be time consuming, costly, and uncertain. Such beliefs are typical of most cities. But members of the group who operate facilities across the globe expressed their view that Portland's permitting process is more costly and difficult than most other places they do business. An implication for land efficiency is that permitting, its other intended benefits notwithstanding, makes private sector efforts to improve sites and increase efficiency more difficult. Thus, the City should be sure that the intended benefits are worth the tradeoff, and adjust its permitting process if they do not appear to be.

- **Traditional measures of efficiency do not apply for harbor industrial land, and alternative measures should be used**. Regarding the efficiency of land use, members of the WWC supported the conclusions of this report, that traditional measures (employment, real market value, and FAR) are ill suited for measuring the performance of water-dependent industrial land. The group suggested other measures of economic output, such as value added and cargo tonnage, are more appropriate measures of land-use efficiency in the Portland Harbor.

### 3.4.3 IMPLICATIONS

In our opinion, the main value of this attempt to measure land-use efficiency was to show what a slippery notion it is, and why simple statements about that efficiency are more likely to derive from opinion and a simple causal model than from an even semi-rigorous empirical analysis. In other words, things are complicated.

For example, many would say that land is being used more efficiently if it accommodates more employees. That kind of definition would be consistent with land-use planning practice and law in Oregon. By that measure, land use efficiency in the Portland Harbor decreased from 2002 to 2008.

But an alternative view—and one more likely to be taken by economists—is that labor (employment) and land are both inputs to a production process. They may be substitutes, or at least there is no necessity that they move together. If a business can use less land and even less labor and still increase its production, it is getting more efficient. If a lot

of businesses in an area are increasing their output on the same land they have always been on, then "land efficiency" can be said to be increasing.

In Portland Harbor the data shows mixed results. Despite declining employment, and growth in real market value and value added that is less than the rate of inflation, the Portland Harbor experienced an increase in efficiency as measured by cargo tonnage. If the City is interested in generating the most economic activity on the fixed supply of harbor industrial land, then value added and cargo tonnage may be more appropriate measures than employment. But these measures are inconclusive on whether the harbor increased in land use efficiency from 2002 to 2008.

That last point leads to a suggestion for policy discussion: instead of talking broadly about "land efficiency," talk specifically about changes in certain economic output per acre. Accept that there are different measures of output, and track several of them. That is what we did above. Our conclusion is that some measures of economic output have been increasing faster than vacant land is being converted to developed land, and other measures have not. The region should continue to track these measures, and adopt policies with the intention of increasing measures of economic output faster than vacant land is converted to developed land. This seems like a good objective for people with different passions: economic development, environmental amenity, or smart growth.

Finally, our simple analysis does not answer other questions that could be important for policy, such as (1) What is causing the increase or decrease in economic activity? (2) How does that change compare with other areas in the Portland region, or with other port areas in the U.S.? and (3) What policies would allow for even greater growth?

# Chapter 4 SUMMARY OF FINDINGS

This report focused on issues related to the demand for and supply of land for water-dependent industrial employment in the Portland Harbor (about 4,000 acres of land along the Willamette River, from approximately the I-405 Bridge north of downtown to the confluence of the Willamette and Columbia Rivers). Its main conclusions are:

- The City and its partner agencies have spent years in study and data development for the study area. The City's mapping of vacant parcels is detailed and support its conclusion that outside of land already in Port of Portland Terminals, the best potential sites in the study area of a location and size that a new marine terminal would require are Atofina and Time Oil.
- These two sites meet mandatory criteria for minimum size (more than 50 acres) and location (frontage on the Willamette River) for a new marine terminal. That makes them *possible* sites, but not necessarily *likely* sites. The analysis in this report reconfirms findings of previous studies: small size and a lot of site constraints (especially the need to deal with the legal liabilities of prior soil contamination) make development of these sites for a marine terminal challenging.
- Even using the most detailed and recent data available, it is difficult to predict future land needs for public marine terminals with precision. While the potential land need through 2040 varies greatly depending on key assumptions, the most-likely scenario shows that the Port of Vancouver may, in theory, have enough developable land to accommodate regional growth in cargo volumes through 2040. In practice, however, competing demands for Port of Vancouver lands, competition among and public policies of affected jurisdictions, and the potential for higher growth in cargo volumes all make it possible, if not likely, that the land controlled by the Port of Vancouver would not be able to accommodate all of the regional demand for marine cargo.
- Regarding the efficiency of land use, for the time periods evaluated, we found a decline in employment, modest growth in real market value and value added (though less than the rate of inflation), and stronger growth in cargo volumes per developed acre of industrial land. The mixed results of the various measures of economic activity prevent us from drawing a strong conclusion. The region should continue to track these measures, and adopt policies with the intention of increasing measures of economic output faster than vacant land is converted to developed land. This seems like an objective that could appeal to people with different interests: economic development, environmental amenity, or smart growth.

# Appendix A Research Approach

**Section A.1** describes why getting clear about definitions and assumptions at the beginning of a study is important. **Section A.2** discusses a *framework* for evaluation: concepts that underlie any evaluation of this type. It discusses (1) definitions of industrial use and industrial land, (2) factors relating to the supply of and demand for industrial land, (3) the role of industrial activity in the economy and (3) the concept of land efficiency: what is it, why does it matter, and how is it measured. **Section A.3** is more specific about the *methods* used for the evaluation (review of previous studies, secondary data, case studies, interviews) and how they are used to address four key questions: about land supply for water-dependent uses, a new marine terminal, the role of Vancouver in the regional land supply for marine terminals, and land efficiency.

## A.1 OVERVIEW

The purpose of research on public policy issues to provide information to a public debate about public action. The research *informs* decisions; it does not *make* decisions. Those decisions are usually made by elected and appointed officials on behalf of the citizens they represent.

Some of the issues that require action are controversial. People and groups have different opinions about the extent of the problem, its causes, and best ways it can be mitigated. Ultimately, most solutions that get adopted are a result of debate and compromise. Fundamental to a productive debate about problems and solutions are (1) an agreement on definitions, and (2) clarity about assumptions. Many discussions fail to lead to consensus on action because there was never consensus on definitions. Moreover, it is common for evaluation results to depend more on the assumptions selected than on the data collected in support of those assumptions.

Thus, the analysis in this report starts by trying to describe clearly the context for the questions being asked. That context is a foundation from which to identify data sources and analytical methods. Stated another way, the methods used for evaluation should be consistent with generally accepted ideas about how a regional economy and industrial development work. What do theory and prior empirical work suggest are fundamental contributors to (causes of) economic activity and industrial development, and which of those factors are most closely related to the questions this study is addressing?

Section A.2 provides a *framework* for evaluation: evaluation concepts that underlie any evaluation of this type. Section A.3 then discusses more specific *methods* for data collection and analysis that are consistent with that framework.

## A.2 FRAMEWORK FOR THE EVALUATION

This section discusses a *framework* for evaluation. It discusses (1) definitions of key concepts used in the analysis, (2) the role of industrial activity in the economy, (3) factors relating to the supply of and demand for industrial land, and (4) the concept of land efficiency: what it is, why it matters, and how it is measured.

### A.2.1 WHY CARE ABOUT INDUSTRIAL LAND?

No city or region exists that does not engage in economic activity. A concentration of economic activity is a defining characteristic of all cities.

A substantial but inconclusive literature investigates which economic activities provide the greatest net benefits to cities. Most of that literature assumes, at least implicitly, that (1) specialization allows consumers to get a variety of goods and services at lower prices; (2) if places specialize where they have comparative advantages, they will (a) produce goods more efficiently and be more competitive, but (b) have to trade to get everything they want; and (3) trading requires having something to trade; it means exporting some goods and services so that that money is available to pay for imports. It is that logic that leads economic development specialists to emphasize the importance of growing and retaining local firms that export goods and services: the payment for those exports brings money into the local economy that, among other things, allows purchases of desired goods and services not provided in the local economy.

Whether industrial activity generates larger economic benefits than other economic activities is a matter of debate in the professional literature of development economics.[1] Most economic development practitioners, however, believe that:

- Manufacturing is central to a strong regional economy (for a variety of reasons related to assumptions about greater value added, export

[1] See a recent debate sponsored by *The Economist* on the motion "This house believes that an economy cannot succeed without a big manufacturing base." (http://www.economist.com/debate/days/view/714; accessed 24 August 2011). The opening remarks of the moderator stated "Our topic for the next few days is one that has divided economic practitioners and commentators for as long as anyone can remember: how important is manufacturing?" Hypothetically, if the U.S. were manufacturing more products being sold abroad, its debt would be less. But are global and U.S. economic conditions such that manufacturing is the comparative advantage of the U.S.; maybe it should be exporting services (e.g., financial, accounting, medical, engineering, and so on) instead. Pro and con arguments are posted on-line and readers vote. Readers voted 3 to 1 in favor of the proposition.

orientation, multiplier effects, average wages, and employment social diversity) and their missions.[2]

- By extension, the supply of land to accommodate manufacturing (i.e., industrial land) is important: too little industrial land hinders the growth or utilization of regional economic capacity. It is not uncommon for economic development discussions to include a statement that a region lacks sufficient land for industrial development at what someone has judged to be reasonable prices.

While proponents of manufacturing and industrial development have arguments and data to support their beliefs, so do groups that have different opinions about the importance of manufacturing relative to other sectors. Some of their arguments: too much industrial land could impose opportunity costs on the regional economy and hinder the growth or utilization of regional economic capacity; land markets and resulting land price should be allocating land to highest and best use, and that preserving land for industrial users at the exclusion of non-industrial users would reduce regional economic well-being.

The disagreement between groups stems from different assumptions about the value of industrial uses on particular parcels of land relative to alternative uses. In debates about public policy on land use and development, advocates for any particular use usually argue that:

- Their preferred use of the lands in question generates greater net benefits for a region than the other potential uses.
- Regions should preserve lands for their preferred use even if other users are willing to pay higher prices for these lands. Stated differently, all sides frequently assume that their uses produce positive externalities for a local economy that justify the effective subsidy associated with keeping other users that might pay more for the lands at issue.
- Where the alternative use would pay *less* for land than their preferred use, their arguments go the other way: the preferred uses generate greater net benefits to a region because the alternative uses will not generate sufficient positive externalities to offset the lost consumer and producer surplus that results from requiring the land to be used for purposes that the market prices do not show to be the highest and best use.

[2] One should note, however, the likelihood of self-selection bias here: local economic development has typically been funded with a mission to retain and attract manufacturing jobs, and people attracted to the field of economic development are likely to start with or acquire that point of view.

The arguments for public-sector involvement in urban land markets (e.g., planning, zoning, urban renewal) are based fundamentally on arguments about external effects that are not incorporated into the market price of land transactions. Proponents for policies favoring industrial land (or any type of land use[3]) might make both sides of the argument: because of the important external benefits of industrial use (1) protect industrial land from being converted to uses that will pay more for that land, and (2) do not prohibit industrial uses from converting other land to industrial uses when it is willing to pay more for the land than those other uses.

This study cannot resolve the longstanding debate about the net benefits of industrial uses and land relative to other uses and land. Rather, *this study starts from the assumption, embedded in the economic development policies of all local governments in the region, that the retention and expansion of industrial sectors is something that the region desires*. The City of Portland specifically addresses industrial land uses in its Comprehensive Plan and Zoning Code. The Urban Development goal of the Comprehensive Plan calls for industrial sanctuaries, where industrial land is preserved for manufacturing purposes exclusively. This stance is reiterated in Goal 5: Economic Development, which identifies retention of industrial sanctuary zones, including maximizing linkages with and within these areas, as a primary objective. These policies are implemented via the city's zoning code, which restricts certain commercial uses in industrial zones and only permits changes to Industrial and Employment Comprehensive Plan designations, if stringent criteria are met. These policies demonstrate the City of Portland's commitment to protecting industrial lands for industrial use. With this commitment in mind, this study then investigates land and in the Portland Harbor to see what capacity they have (given different assumptions about user types and changes in technology and operations) to accommodate industrial users.

## A.2.2 DEFINING INDUSTRIAL LAND AND USERS

### A.2.2.1 Industrial land

What is commonly referred to as "industrial" land is land designated by a local government (in its comprehensive plan, implemented by its zoning ordinances) to allow (but not necessarily require) industrial uses.[4] Thus, land may be defined by public policy (e.g., plan or zone designation) or by actual uses. Such definitions may lead to an identification of roughly the

[3] For example, the fundamental argument for the preservation for West Hayden Island is that such preservation has external natural and social benefits that make the land more valuable to the region in its natural state than in development.

[4] Much of the overview in section A.2.2 is drawn from previous work ECO has done on industrial lands, especially work for the City of Tukwila, WA.

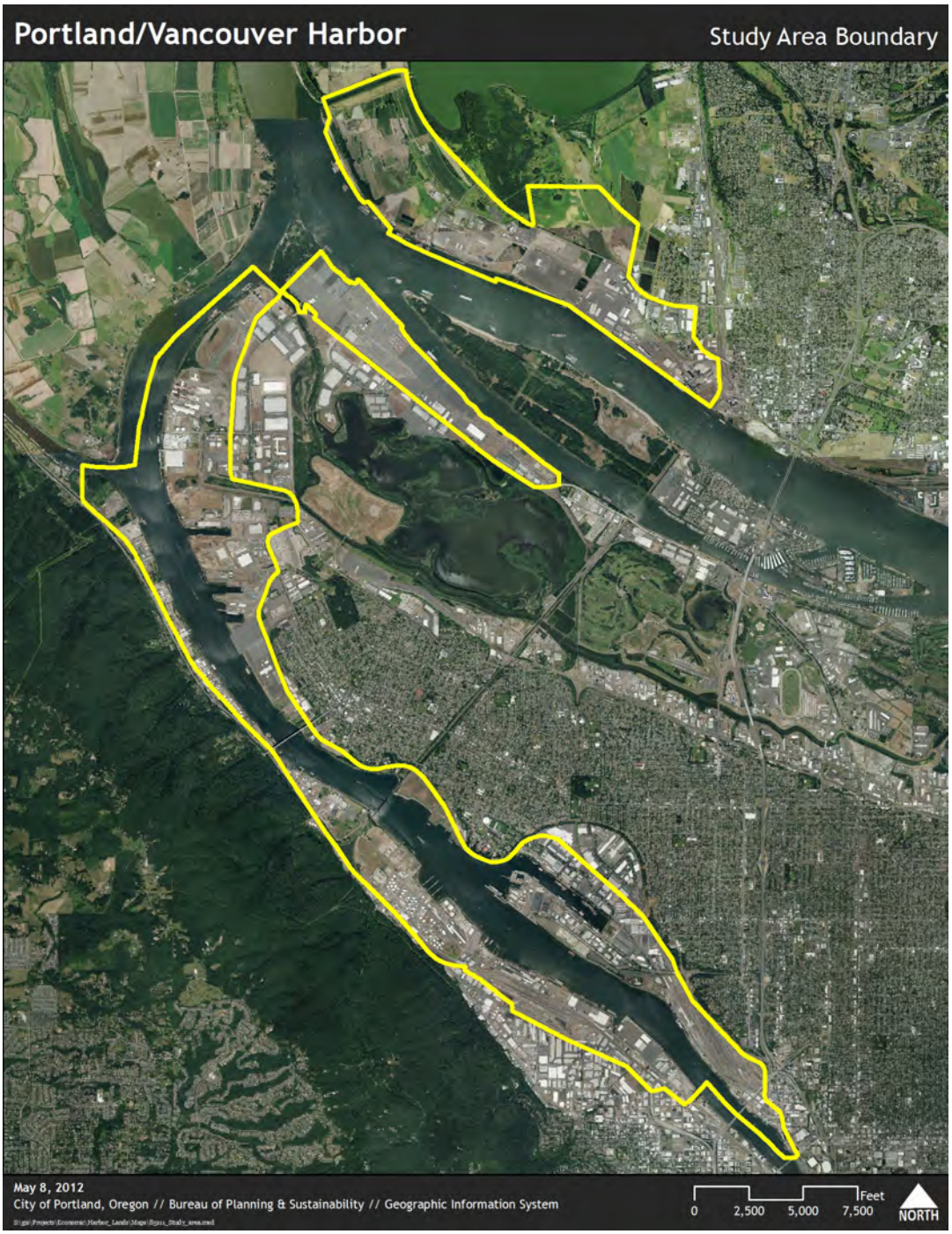
same land, but they are not identical. Industrial uses exist on land not zoned for those uses, and non-industrial uses exist on lands zoned industrial. Either definition, or both, may be appropriate for a particular policy issues.

A smaller subset of industrial land pertinent in this study is "harbor" land. That land could be defined in any of several ways. It could be, for example, land parcels that are within the boundaries defined for this study and also:

- With docking facilities
- Abutting a navigable waterway
- With active water-dependent industries (however "water-dependent" may be defined
- Owned by the Port of Portland
- Any combination of the above.

For this study, we use the City's definition of the "Portland Harbor," based on land designated industrial by the City's Comprehensive Plan in close proximity to the Willamette River. A map of the City's harbor lands is shown below in Exhibit A-1.

**Exhibit A-1. Map of harbor lands in Portland**




Source: City of Portland, 2011.

## A.2.2.2 Industrial users

### All industrial users

Land is designated industrial because it meets, or is intended to meet, the needs of the industrial users. These needs typically include proximity to transportation routes (interstate roadways, rail, water ports, airports),

relatively low-cost land (to accommodate the relatively large land needs of many industries), and a location that reduces conflict with other uses.

Industrial users are usually identified as a collection of sectors from the North American Industrial Classification System (NAICS). A recent analysis of industrial land published by the American Planning Association[5] used NAICS codes to define "industrial use" in urban areas. It described a *strict* definition and *loose* definition. The industries included in both definitions are shown in Exhibit A-2.

**Exhibit A-2. NAICS codes presumed to be highly correlated with industrial land use**

| NAICS | Industry |
|---|---|
| **Strict Definition** | |
| 23 | Construction |
| 31-33 | Manufacturing |
| 42 | Wholesale trade |
| 48-49 | Transportation and warehousing |
| **Loose Definition** | |
| 23 | Construction |
| 31-33 | Manufacturing |
| 42 | Wholesale trade |
| 48-49 | Transportation and warehousing |
| 221 | Utilities |
| 444 | Building material and garden equipment and supplies dealers |
| 511 | Publishing industries (except Internet) |
| 517 | Telecommunications |
| 518 | Internet service providers, web search portals, and data processing services |
| 562 | Waste management and remediation services |
| 811 | Repari and maintenance |
| 812 | Personal and laundry services |

Source: *Planning for Industry in a Post-Industrial World*, Marie Howland. See text for full citation.

These sectors share some basic characteristics. First, they are often referred to as part of the "traded" sectors, presumably because they have a greater propensity to be export-oriented and involved in direct creation of physical goods.[6] Second, they generally have the same building and land needs and site requirements. They cannot typically locate in high-rise office space or in storefront retail space, or in converted homes. This limitation is in part related to possible external effects that can make them unattractive neighbors; they can generate more noise, dust, smells, and visual impacts than other uses. (But many industrial uses can have *fewer* external impacts

[5] Howland, Marie. 2011. "Planning for Industry in a Post-Industrial World: Assessing Industrial Lands in a Suburban Economy." Journal of the American Planning Association. Winter, Vol 77, No 1. pp 39-53.

[6] But note that this distinction has always been fuzzy and is getting blurrier in today's economy. Many businesses in the Services sector are export-oriented: e.g., business services and tourism. Moreover, the notion of "basic" is also fuzzy and increasingly questioned.

of some types than businesses in other sectors have: e.g., on traffic). The limitation also relates to their general need for cheap land and proximity to transportation routes.

The industrial sectors shown in Exhibit A-2 are defined by industrial activities, but the list does not necessarily reflect the types of businesses that require industrial land. For example, many jobs in the construction industry are not physically located at a central, industrial location, but instead operate on sites throughout the region. Similarly, many utility jobs in the region are often in office towers in the Central City, and do not require industrial land. Therefore, the list of NAICS codes that constitute industrial uses (as defined by the American Planning Association) do not necessarily reflect the range of businesses that would have demand for industrial land in Portland.

## Water-dependent industrial users

For this analysis, more important than "all industrial" users is the subset of industrial users that are either "water dependent" or "water related." Every type of job must, by definition, fit into one of 17 broad ("two-digit") NAICS categories. But at the most detailed level (six-digit) there are about 1,175 categories. If one wants information about "water-dependent" employment, one must define it as some combination of NAICS codes, and those codes, even at the finest level of disaggregation, may have firms that one might call water-dependent and others one would not. No standard data source defines business this way; one has to either combine NAICS codes or do primary research (e.g., site evaluations of phone surveys).

Even seemingly obvious NAICS codes like 3366, ship and boat building, may not be completely populated by water-dependent firms: smaller pleasure boats may be built or refurbished for shipping by truck or rail. And codes that may appear to have little to do with water (e.g., 3112, oil seed and grain milling) may have reasons to be close to the water because of the importance of bulk shipment. This report does not conduct analysis that requires a definition of water-dependent industrial users, and because of the difficulties of defining water-dependent industries by NAICS codes, we have not attempted to do so.

The City of Portland defines river-dependent uses as those that can be carried out only on, in, or adjacent to a river because they require access to the river for waterborne transportation or recreation. Included is any development, which by its nature, can be built only on, in, or over a river. The zoning language, however, does not distinguish specific water-dependent industrial uses.

### Public marine terminals

Our analysis treats public marine terminals (i.e., the Port of Portland facilities) differently from other users of harbor industrial land. These port terminals function as public infrastructure, facilitating economic activity for other industries in the region. In this report, we examine certain questions related to broader harbor industrial land efficiencies, and other questions related to land supply specifically for new public marine terminals.

## A.2.3 EVALUATING THE SUPPLY OF AND DEMAND FOR INDUSTRIAL LANDS

This section looks at how cities answer critical questions like: How much developable industrial land is there? How is it likely to be used? Will it be enough for the expected demand in the future?

### A.2.3.1 Supply of industrial land

The total amount of land inside the Portland city limits is essentially fixed. Unless submerged land is filled to create new dry land, the only way the City can get more land is to expand its boundaries. But such expansions are unlikely, because the City is mainly surrounded by rivers, protected areas (Forest Park), and incorporated municipalities.

Thus, for the City of Portland, the question of land supply focuses on how much land is vacant, partially vacant, or underutilized, and how much land is constrained (by environmental contamination, environmental overlays, and other issues).

The Bureau of Planning and Sustainability (BPS) at the City of Portland has done extensive work to characterize the land supply in the Portland Harbor. It uses state-of-the-practice procedures (e.g., GIS data layers) consistent with Oregon planning law (e.g., statutes and administrative rules for statewide Goals 9 and 14).

Exhibit A-4 shows the typical process for categorizing and evaluating land supply. In summary:

- All land is either fully developed or not.
- If not, it is either (1) under development (in the pipeline), (2) buildable, or (3) not buildable (because of prohibitive physical or policy constraints.
- If buildable, a parcel of land may be (1) fully vacant, (2) partially vacant, or (3) potentially redevelopable.

- Buildable land in any of those categories has a *capacity* to accommodate new development. That capacity is defined by public policy and may be partially constrained by public policy.

**Exhibit A-4. Conceptual framework for buildable land inventory and capacity analysis**

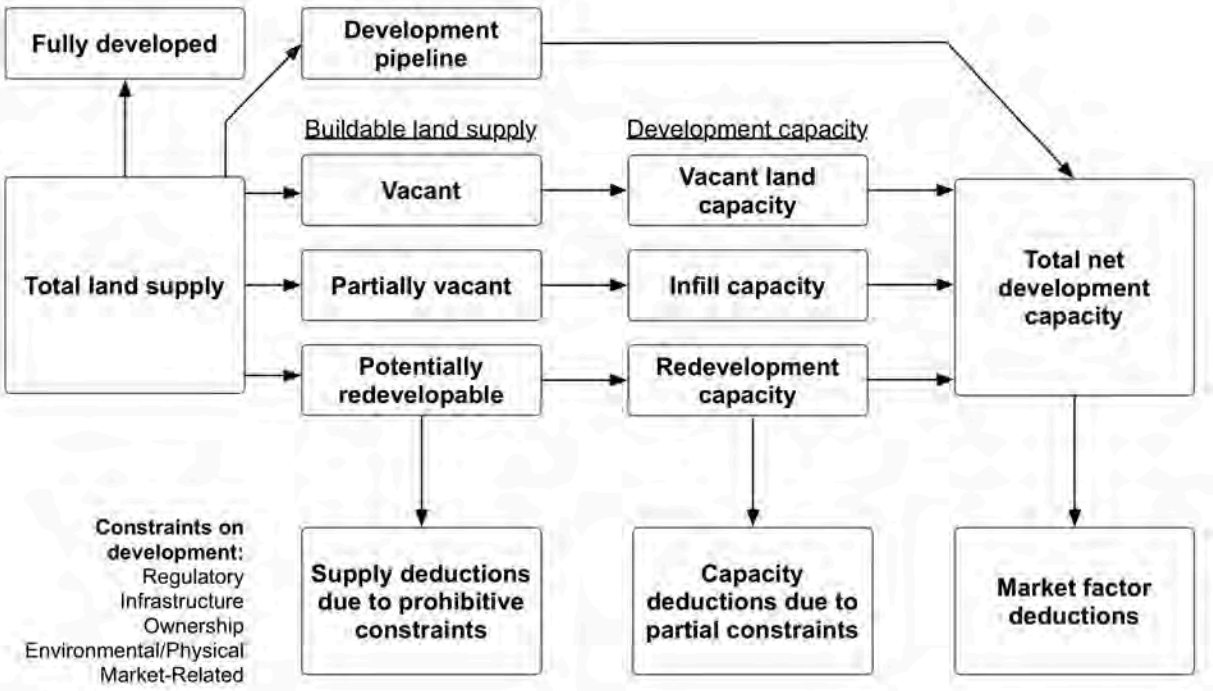



**Fig. 7-4** Land supply and capacity analysis process. *Source: Moudon and Huber 2000. This material is used by permission of John Wiley & Sons, Inc.*

The concepts and definitions illustrated in Exhibit A-4 are relatively well understood in Oregon planning practice. Our investigation suggests that the extensive work by BPS on the land supply in the Portland Harbor generally accepts these concepts, even if its definitions and methods are slightly different.

### A.2.3.2 Demand for industrial land

Forecasting demand for industrial demand begins by identifying what types of users will consider locating on land designated industrial. In general, industrial land must accommodate most job growth in "industrial" sectors. It must also accommodate some job growth in "non-industrial" sectors.

Not all jobs in "industrial" sectors use industrially-designated land. For example, a head office of a manufacturing company may be in a downtown office/commercial zone rather than in an industrial part of a city. Another

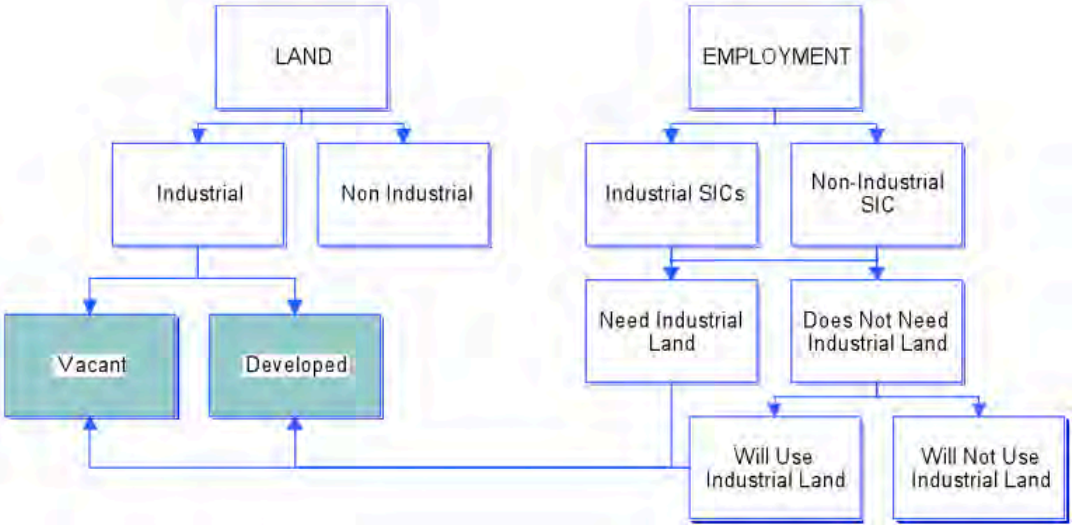
example is that some firms in the industrial sectors are allowed to locate in general commercial or mixed-use zones and may do so.

Not all industrially-designated land is used by "industrial" sectors. Some businesses that are referred to by the NAICS system as "services" need industrial land (for example, auto repair) because they share the same need for a location where land is cheap and where their activity is compatible with the surrounding neighborhood. In addition, non-industrial uses that don't necessarily *require* the characteristics of industrial land (low price, access to transportation, etc.) may nevertheless locate there if (1) they are not prohibited from doing so, and (2) the market conditions allow them to out-bid industrial uses. Big-box retailers with sufficient drawing power may not need surrounding retail: they can stand alone in industrial areas, where they may find cheaper land and better access to customers and suppliers. Services may locate in an industrial area to serve food and other convenience needs of industrial workers. Residential uses may also find an industrial area attractive if the environmental effects of industry are not too deleterious and the location is convenient for residential living. Most significantly, given the focus of this study, professional offices and other commercial uses may locate on industrial land because they can out-bid industrial uses.

This is one of the City of Portland's concerns: that large amounts of industrial land will convert to non-industrial uses. The City has already taken actions to alleviate this concern. Existing policies in the City's Comprehensive Plan and Zoning Ordinance (see Section A.2.1 of this document) aim to prevent the use of industrial land for non-industrial uses. Industrial sanctuary zones, for example, preserve land zoned as industrial for industrial purposes exclusively. The code does, however, allow for conditional use of industrial land for non-industrial purposes in these same areas.

Exhibit A-5 shows this relationship between "industrial" uses (as measured by industrial employment) and "industrial" land, and why studies of industrial land like this one are tricky.

**Exhibit A-5. How industrial and non-industrial businesses use industrial land**




Source: ECONorthwest, 2011.

On the "Land" side, the analysis in this study is concerned with only land designated as industrial, and is concerned with both vacant and developed industrial land. On the "Employment" side, the study cannot limit itself to industrial NAICS codes[7]: non-industrial users use industrial land. It also cannot limit itself to a subset of businesses that in some sense "need" industrial land, because many businesses that fail to meet whatever need criteria we might develop will still be users of industrial land.

In Oregon, state law requires that cities provide adequate land for 20 years of forecasted economic growth (Goals 9 and 14 of the statewide planning goals). As a matter of practice, (1) the common measure of economic growth used in a 20-year forecast is employment, and (2) some estimate of employees per developed acre, by broad industry type (e.g., retail, office commercial, industrial), is used to convert forecasted future employment to needed acres of land.

For several reasons related to market conditions and public policy, it is possible for (1) employment density to increase over time, and (2) an increasing amount of new employment-related development to occur as an intensification of development on an already developed parcel (rather than as new development on a "greenfield" parcel). If a region uses its land more "efficiently" (due to public policies, market forces, or a combination of both), then the ratio of employees per acre should increase, which would reduce the amount of demand for land in the forecast period.

[7] Formerly SIC codes, as shown in Exhibit A-3.

While employment is typically the measurement used to forecast demand for land, it may not be the best measurement for forecasting industrial land demand. Later, this appendix discusses other measurements that could be used to forecast demand, and to measure land efficiency.

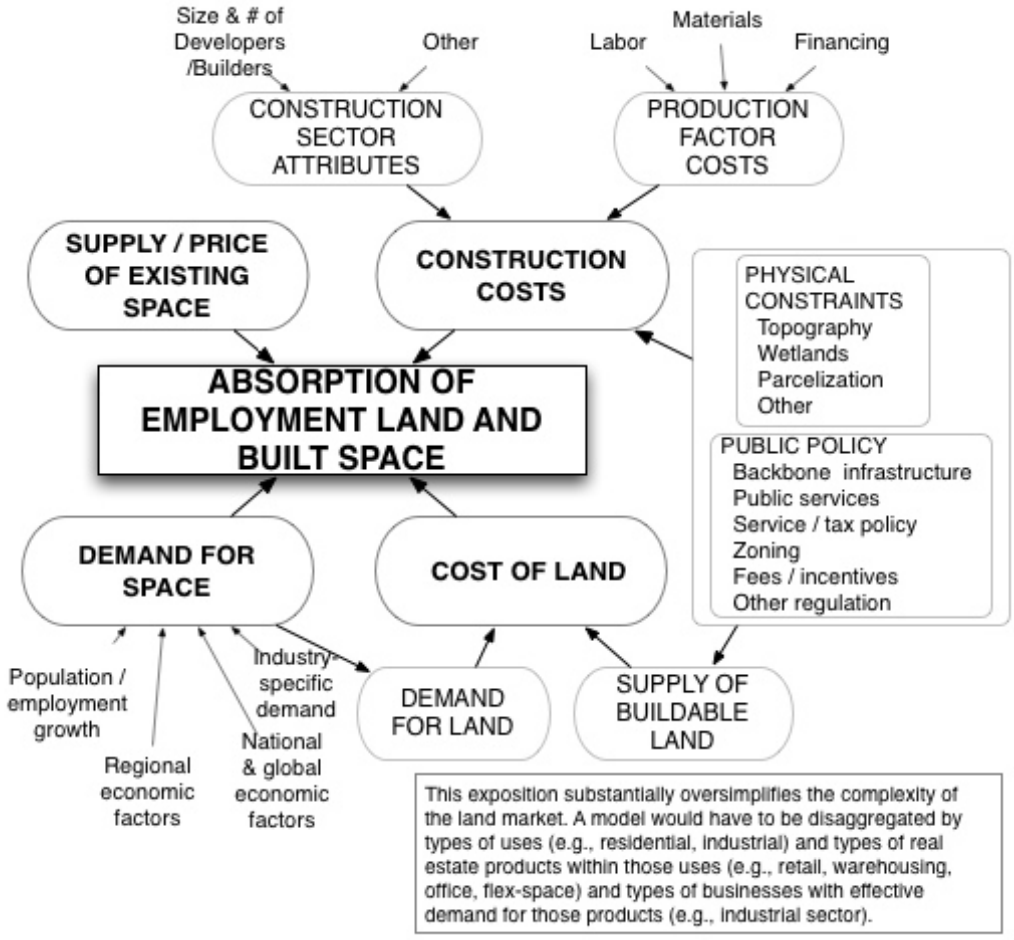
### A.2.3.3 Comparing supply and demand

Factors affecting demand and factors affecting supply are not independent: in theory those factors interact to result in a market clearing price. Businesses and developers do not necessarily choose the cheapest land or the best (most expensive) land: they choose the land with the best value. In other words, price makes a difference. Below are some key points that describe how factors of supply and demand interact to determine where industrial development occurs:

- In any production processes, businesses try to economize on scarce (relatively expensive) resources by finding substitutes or changing the production process. For example, if serviced lands become scarcer, their prices should increase and businesses will substitute other factors (e.g., equipment) for land. In other words, as land gets scarcer, its price should rise and it should get used more intensively.
- With a fixed supply of total land, the supply of vacant, buildable land will decrease as development occurs.
- As the supply decreases (and as the real costs of providing services to that land increase), the price of land for new development will increase.
- As the price increases, users of land (businesses and developers) will try to economize on the use of land. They may do that by (1) using the available land in Portland more intensively, (2) choosing locations in other cities in the region more distant from the center that have more and less expensive buildable land, or, if no land elsewhere in the region has the desirable attributes at an affordable price, then (3) locating somewhere other than the Portland region.

Exhibit A-6 shows some of the many factors that affect the absorption of employment built space and land.

**Exhibit A-6. Factors affecting the price and absorption of vacant land**




Source: ECONorthwest, 2011

In the Portland Harbor, for example, land may be more expensive (cost per acre) than at the region's periphery. But land in the Portland Harbor is also close to the downtown, labor markets, port terminals, and interstate highways. If it is only a little more expensive, it may still be a preferred location for growth. If it becomes too expensive, then prospective industrial users may locate elsewhere, on land that provide a better value. If there is no land within the Portland region that provides this value, then the prospective industrial users may locate in other regions instead of Portland.

In an idealized market, such a value differential would be spotted by developers and businesses. In their efforts to secure the land they would bid up its price until it had little net advantage relative to all other land. In that idealized situation, all industrial land is equally suitable and every sub-area will, over time, get its share of new development.

But more realistically, a particular firm may have particular needs that are best met by land at a certain location. Though businesses on average

may be filling to pay only, say, $5 per square foot for the land, such a firm may be willing to pay, say, $8 per square foot. Thus, the question becomes one of making some assessment of whether the particular package of land attributes for properties in the Portland Harbor is going to be especially desired by some subset of businesses (e.g., water-dependent businesses).

## A.2.4 "EFFICIENT" USE OF INDUSTRIAL LAND

Efficiency is a measurement of how much output is produced per unit of input. Thus, an efficiency measure requires a numerator (output) and a denominator (input). In this case, we care about the amount of economic activity (output) generated per acre of land (input). The denominator—acres—is relatively clear in theory and straightforward to measure. Thus, the bigger challenge is in choosing and measuring the numerator: economic activity. This section describes the various ways to measure efficiency of industrial land, and why some of these measures may be more appropriate than others.

If land use in an area becomes more efficient, then any given amount of economic activity will require less land than it would have otherwise. In an area with a fixed supply of industrial land, like the Portland Harbor, it makes sense to consider ways to use the land more efficiently to accommodate more economic activity. Typical measures of efficiency, however, may not be ideal for evaluating industrial land and marine terminals.

### A.2.4.1 Traditional measures of efficiency

Typical measures in the numerator of an efficiency measure of land use include employment, real market value, and built space. These measurements look at the amount of economic activity occurring on a property. In general, advocates of economic development would prefer larger buildings, with higher value, and more employees to locate on a given parcel of land. But these measures of efficiency tend to give relatively low marks to industrial development.

Harbor industrial development tends to have low floor-to-area ratios (FAR) and a relatively low number of jobs per acre. Compared to an office tower, an acre of industrial development is likely to have much lower assessed value, employment, and gross square footage. Thus, measures of the efficiency of employment land based on any of these measures in the numerator would all tend to improve if industrial land were converted to commercial uses.

But industrial lands in general, and harbor lands in the case of this study, are clearly an important piece of the regional economy. If every

jurisdiction allowed vacant industrial land to convert to commercial uses on the assumption that some other jurisdiction would provide the industrial land, the regional supply of industrial land would get smaller quickly and, at the margin, industrial expansion would be slower than it would have been. Land with port access is a particularly important and relatively rare component of all regional industrial land. Marine terminals provide access to other markets, facilitating commerce, and allowing traded-sector businesses to export their goods to other markets.

In the context of the discussion in A.2.1 above, land with port access is necessary for the development of port and port-related facilities, and such facilities may have large external benefits for the region. Since the benefits are external (and, by definition, cannot be readily captured by owners of the land), they do not influence the price that private developers will pay for land. Thus, land prices that industrial users are willing to pay for land in the Portland Harbor probably do not reflect the full value to the Portland region of having that land in industrial use.[8]

### A.2.4.2 Key issues for measuring efficiency

Regardless of what measure of economic activity is used in the numerator for calculating efficiency, there are fundamental issues that present challenges for defining and measuring efficiency and changes in efficiency for industrial land.

#### Efficient use of land versus efficient production of goods and services

Fundamental to land-use planning regulation in Oregon is the assumption that sprawl is inefficient, and that reducing sprawl saves valuable natural land (for farming, forestry, and the provision of ecosystem services) and promotes more intensive use of urban land (i.e., more density). This system intends to promote more efficient use of land. Denser development, however, does not necessarily mean more efficient production of goods and services for all types of businesses. Put another way, a public-sector mandated increase in certain measures of intensity of industrial land use (e.g., minimum FAR) may or may not increase the efficiency of a particular operation (measured by value added, employment, etc.).

This issue is critical when discussing land-use efficiency in the Portland Harbor. For some (perhaps many) industrial businesses located in the

[8] Proponents of other uses could make the same argument: that their external benefits are substantial and not capitalized in land value. A full technical evaluation of the relative net benefits would require extensive empirical work, is unlikely to be definitive, and is beyond the scope of this study.

Portland Harbor, pressure to develop at greater density is unlikely to increase the efficiency of their operations.

## Site-specific land efficiency versus regional land efficiency

Site-specific efficiency refers to the economic activity on an individual site. If a user of a one-acre industrial parcel were to double some measure of economic activity (e.g., employment, value added, etc.) without developing more land, one could call that an example of increasing the efficiency of industrial land as a factor of production. This is often what is meant by increasing efficiency.

But what if a parcel serves the regional economy: in other words, what if it provides external benefits? For example, a warehouse may allow other businesses in the region to transport their goods. The warehouse could appear unchanged over time by many measures of economic activity (e.g., assessed value, employment, FAR), but it may be accommodating more goods for other businesses in the region, allowing these businesses to grow.

There are at least three implications. First, standard measures of economic activity like employment may be the wrong ones. The warehouse and its employment may not have changed: it may be that both are now more efficient because the warehouse is now processing more goods because of increases in demand, changes in technology, or some other factor. Second, even if the production per acre for that warehouse were to remain the same in terms of tons or cubic feet of cargo processed, the value of that cargo may have increased (so an argument can be made that efficiency should be measured as value, not tonnage). Third, and related, even if the value of cargo did not change much, its transshipment is a necessary component of what may be a different and rapidly growing industrial sector that is contributing to the regional economy.

An example of this regional land efficiency is the Port of Portland itself. A port's economic impacts extend well beyond its land and the land that surrounds it. In Oregon, the economy of eastern Oregon and Washington depend on the port facilities in the Portland area to ship grain and other products. Looking just at measures of production on land around a port can easily miss the point: a port is a regional facility that may benefit many businesses a great distance from the port. Thus, it may be "efficient" for a port to have relatively low-density uses that allow efficient transportation of goods, facilitating economic growth throughout the region.

## Economies of scale and threshold effects

For many enterprises, as they grow for small and start-up to bigger and established, they achieve economies of scale. There are start-up costs that they have to incur, and there are relatively fixed ongoing operating costs

that must be amortized. It is common for costs per unit of output (or, in the case of transshipment) throughput to decline.

Economies of scale (because of declining marginal costs) almost certainly exist for port facilities. There is a large initial capital investment in facilities: once they are there, they can be used more intensively at a low additional (marginal) cost per unit of activity (e.g., tonnage handled). As more facilities, even of different types are available, the per-unit cost of operation and maintenance can decrease, and the attractiveness of and demand for the facilities may increase for users.

Politically, getting to some scale is probably important for users and for higher levels of government (state and federal) that provide financial assistance to ports: in the case of Portland especially, for dredging the Columbia River. In other words, there may be subtle or not-so-subtle threshold effects: if port operations drop below some level, its ability to sustain even those lower levels of activities may be seriously diminished.

#### Markets versus public policies

Many economists would argue that the best judges of the efficiency of a particular industrial use at a particular site are the owners and managers of the use in question. If they believe that they can operate more efficiently by adding employees, buildings, or equipment to their site, they will do so. If they believe they can profitably increase production without adding land, they will do so. If their land and land around their site has locational characteristics that make it particularly valuable for certain types of production, and if there are a number of businesses involved in that type of production, its price will rise, and the price is a measure of the increasing value (efficiency) of the land in production.

That argument, however, does not address a concern of cities like Portland about that market-based process: what if non-industrial and non-water-dependent commercial uses (e.g., offices and retail) outbid industrial uses for the land? Yes, the land value has increased (as have the cities' property-tax revenues), but perhaps at a greater cost to the regional economy.

### A.2.4.3 Alternative measures of the output component of efficiency

In short, to address the question about the efficiency of the use of industrial land in the harbor area, one needs a definition of efficiency that makes sense for industrial land. Such a definition must make sense not only in theory, but also in the context of the data and methods that are available for measuring efficiency. We suggest two alternative measures of efficiency

that are most appropriate for harbor industrial land: value added, and tonnage of cargo.

## Value added

Proponents of the industrial and manufacturing sectors point to its potential for high "value added." Value added means that the value of outputs (per unit or in the aggregate) less the cost of inputs purchased from other firms used to create output.[9] In economic terms, industrial activity is a "goods-producing" activity, and is generally considered to have strong potential for value added. A service industry, in contrast, tends mainly to sell transformed labor services. There is value added, of course, but this value added is often lower than in a goods-producing setting.[10]

Setting aside cross-sector comparisons, value added may be a better measure of output over time *within* sectors than employment or built square footage. A measure of the efficiency of a fixed supply of industrial harbor land would be the amount of value added generated per acre for businesses located in the harbor.

## Cargo

There is a reasonable argument that much of the industrial land in the Portland Harbor area serves a regional need for transshipment. Therefore, a regional measure of transshipment activity might be appropriate for measuring the efficiency of such land. Some measure of cargo (e.g., tonnage, volume, value) is an obvious choice. Because data are more readily available, we suggest tonnage of cargo as an alternate measurement of land-use efficiency in the Portland Harbor.

The economic activity occurring on a parcel is only part of the impact that land has on the regional economy. Many users of harbor industrial land facilitate economic activity throughout the region. While most measures of efficiency fail to measure this broader impact, tonnage of cargo is a measurement that is consistent with the idea that port facilities have broader regional economic benefits.

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[9] In that sense, value added is a measure of a firm's contribution to GDP. Another way to think about this is that everything that a firm itself puts into the production of a product (primarily the labor of its employees and capital) "add value" to the raw materials and intermediate goods and services it purchased to make its final product.

[10] Often lower, but not always lower. Service sectors that use highly-trained human capital may have high productivity and high value added. In addition, as technology increases the productivity of physical capital, less manufacturing and construction activity is required to produce the same output. Communication systems, for example, are much more productive than they were in the past, but require much less "brick and mortar" type activities and, hence, less construction activity.

Methodologically, such an analysis should be done for the Portland Harbor in the aggregate, not for individual businesses or parcels. For this measure, it does not matter how much cargo occurs on a given parcel; it matters how much the amount of tonnage per developed acre of land is increasing.

## A.3 METHODS

Section A.2 is a *framework*: it is about definitions and concepts related to the issues this study is investigating. It is a basis for selecting specific methods (data and analytical approaches) for addressing the four questions posed:

- Are the methods the City used to estimate the location and amount of vacant, partially vacant, and potentially buildable industrial land in the Portland Harbor area likely to yield reasonable estimates?
- How suitable for a public marine terminal are the few sites in the Portland Harbor that have been identified by the City as having the potential to accommodate such a terminal?
- What role can the Port of Vancouver play in accommodating forecast demand for cargo volumes in the Portland region?
- What is the potential for more efficient use of industrial harbor land?

We describe the methods we used to answer those questions in the rest of this section.

### A.3.1 GENERAL DATA SOURCES AND TECHNIQUES

To conduct our analysis, we used the following data sources:

- **Existing studies**. Extensive analysis has been conducted regarding the Portland Harbor, industrial land, and port terminals. Local governments and service districts in the region (e.g., Metro, the City of Portland, the Port of Portland) are constantly evaluating past economic growth patterns, and planning for future economic development opportunities. These efforts result in a library of reports and studies addressing different aspects of the regional economy. These recent (as well as ongoing) efforts contain useful information for the analysis. *The scope for this study emphasized synthesizing and interpreting existing data over collecting new data*. Thus, ECO reviewed these related research efforts, and pulled their key findings into the analysis where appropriate.

  The City of Portland provided ECO with a list of over 30 recent, relevant documents. After an initial review of all of these documents,

ECO selected a subset of documents of particular value to its analysis:

- Portland Economic Opportunities Analysis (2010)
- West Hayden Island Economic Foundation Study (2010)
- West Hayden Island: Marine Cargo Forecasts & Capacity Assessment (2010)
- Portland Vancouver Trade Capacity Analysis (2006)
- West Hayden Island Planning Document
- Oregon Commodity Flow Forecast (2005)
- Portland's Working Rivers: The Heritage and Future of Portland's Industrial Heartland (2008)
- Port of Portland annual reports

ECO focused on data and text related to historical trends and future projections for economic growth: in the region in general and the Portland Harbor in particular.

- **Secondary data sources**. ECO incorporated many secondary data sources into its analysis.[11] As with "existing studies," the objective is to leverage past research efforts to answer the questions posed in this study. Examples of secondary data sources we used are:
  - Buildable Lands Inventory (City of Portland). This source includes multiple data layers in the City's Geographic Information System (GIS)
  - Port of Portland Marine Terminal Statistics
  - Multnomah County Assessment & Taxation
  - RLIS (Metro)
  - Quarterly Census of Employment and Wages
  - IMPLAN
- **Interviews**: Many people in the Portland area have special knowledge of, and interest in, the Portland Harbor. ECO interviewed individuals from both the public and private sectors, and reviewed notes on past interviews that had been conducted for recent related studies. Interviewees included:

[11] Secondary data sources are ones collected and readily available by someone other than the user (in this case ECONorthwest). Typical secondary sources are government agencies (e.g., U.S. Census, ODOT, Metro, Port of Portland).



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- Port of Portland officials
- Port of Vancouver officials
- Authors of relevant studies and reports
- Members of the Working Waterfront Coalition
- Other local economic development professionals

Data from these sources were used to address the three specific questions that are the focus of this study. The next sections explain how.

## A.3.2 EVALUATION OF PRIOR EFFORTS TO IDENTIFY LAND SUPPLY IN THE PORTLAND HARBOR

The City asked ECO to evaluate whether the methods the City used to estimate the location and amount of vacant, partially vacant, and potentially buildable industrial land in the Portland Harbor area likely to yield reasonable estimates? More specifically, the question was whether it is reasonable to assume that the two sites that the City identified (Atofina and Times Oil) are the only two in the Harbor study area (as defined in Exhibit A-1) that are of a size and location that they *might* be suitable for a new Port of Portland marine terminal?

To answer that question we needed an estimate of the minimum feasible size of a marine terminal. Maul, Foster & Alongi provided that estimate (documented in Section 3.2 of the report and Appendix B): 50 acres. We then looked for 50 acres of vacant land with waterfront access in the study area by:

- Reviewing studies summarizing industrial and harbor land supply: *Industrial Districts Atlas* (2004) and *Harbor ReDI Industrial Sites Analysis* (2009).
- Reviewing GIS shape files and cross-referencing to Google Earth aerial photos (August 2011).
- Discussing methods with BPS staff, and comparing those to standard methods for developing land inventories and identifying buildable land.

## A.3.3 ADDRESSING THE POTENTIAL SITES FOR NEW MARINE TERMINALS

Much of the analysis in this report deals with the supply of harbor industrial lands in general: it includes both public and private ownership and uses of the land. This task deals specifically with land supply for new, public, marine terminals.

To determine which sites might best accommodate a public marine terminal, we began by identifying the technical site requirements for a marine terminal. ECO interviewed representatives of the Port of Portland to identify their ideal site requirements, as well as which of these requirements could be reduced while still accommodating a working port facility. ECO compared these site requirements with the findings of the Worley Parsons, a consultant to the City evaluating the potential site design of a new marine terminal on West Hayden Island. Finally, ECO turned to internal team members with experience running west coast ports, and looked for creative ways to adjust these site requirements to create a working terminal on smaller or otherwise constrained sites.

BPS staff identified only two sites that could potentially meet these criteria. ECO, reviewed the sites identified by the City of Portland, and evaluated maps of the Portland Harbor, including zoning, infrastructure and aerial photographs. Our preliminary review confirmed the City's findings, that most of the Portland Harbor has active development on it, and these two sites have the greatest opportunity to accommodate new public marine terminals.

The ECONorthwest Team, including Maul Foster & Alongi, Inc., toured these sites with BPS staff. Maul Foster & Alongi, Inc. conducted a visual inspection of the sites, documenting conditions affecting the suitability of each site for the proposed development. Key factors considered in our analysis were: site access, existing uses, natural features, and contamination/remediation. After conducting this site visit, we developed a set of criteria for evaluating site feasibility for typical port terminals. This set of criteria is included with this document as Appendix C.

Using these criteria, Maul Foster & Alongi evaluated the potential opportunities and constraints of these sites to accommodate development of a public marine terminal. A cursory site visit is insufficient to make a final determination of site feasibility. Nonetheless, our methods are consistent with our scope and budget, and are sufficient for identifying major opportunities and constraints for these potential sites, and making a preliminary determination of site feasibility.

### A.3.4 ADDRESSING THE ROLE OF VANCOUVER IN HARBOR INDUSTRIAL LAND SUPPLY

The third question we were asked by the City is: What role can the Port of Vancouver play in accommodating forecast demand for cargo volumes in the Portland region? To answer this question, we used a combination of interviews with port officials and reviews of past reports.

We began by attempting a data-driven analysis. In principle, if we knew the capacity of existing marine terminals in Portland and Vancouver, and subtracted the forecast future demand for these areas, then we could identify the amount of demand that could not be accommodated by existing facilities. This demand (in tons of cargo) could then be translated into the acres of land necessary for new terminals to accommodate this growth. Comparing the required acres to support new terminals with the available land supply in the Portland Harbor and in Vancouver, we could identify how much of Portland's demand might need to be accommodated in Vancouver, and whether or not Vancouver had sufficient land to accommodate it.

The specific steps in our analysis, and detailed tables showing our results are contained in Appendix C: Analysis of Harbor Land Capacity and Demand, Portland and Vancouver. In short, we relied on the following data sources:

- Capacity of existing facilities: Estimates for the public marine terminals in the Port of Portland were taken from the *West Hayden Island Economic Foundation Study*, prepared by Entrix for the City of Portland in May 2010. These estimates were produced in interviews conducted by Entrix with Port of Portland staff. For estimates of capacity of private terminals in the City of Portland, as well as all terminals in the City of Vancouver, we relied on historical data on cargo volumes reported by BST Associates in their *Portland and Vancouver Harbor Forecast Update*, prepared for the Port of Portland in February 2012. Our estimates were confirmed and refined through interviews with Port of Portland officials.

- Future cargo demand: Estimates of cargo demand for all public and private terminals in the cities of Portland and Vancouver in the year 2040 were taken from the BST Associates *Portland and Vancouver Harbor Forecast Update*. These forecasts included a low and high scenario.

- Acreage necessary for new terminals: Estimates of the acreage required for new marine terminals were taken from a variety of sources, including the *West Hayden Island Economic Foundation Study* (Entrix, 2010), the Draft Report on *Operational Efficiencies of Port/Terminal World Wide* (Worley Parsons, 2012), and the Maul Foster and Alongi evaluation criteria included with this report as Attachment B.

- Available land supply: Finally, estimates of available land in the Portland Harbor are based on our own analysis of developable sights, described in Sections A.3.2 and A.3.3. Estimates of available

land in Vancouver, were based on the *West Hayden Island Economic Foundation Study* (Entrix, 2010), and verified through GIS analysis, and conversations with officials from the Port of Vancouver.

The data-driven method described above has many advantages: it is a logical way to conduct the analysis, it relies on the best and most recent data and forecasts, and with any one-set of assumptions used in the analysis, it results in a definitive answer of the acres of land needed for new terminal development. However, there is one major limitation to this method: it relies on so many assumptions, which can be pulled from such a broad range, with each assumption compounding on all previous assumptions, that using different sets of reasonable assumptions can create largely different results.

Therefore, our analysis uses the data to establish a high and low boundary for the potential land need, and describes a "most-likely" scenario that falls between the two extremes. In order to give these numbers more context, and to help us arrive at the most-likely scenario, we also conducted numerous interviews with representatives of the ports of Portland and Vancouver.

### A.3.5 ADDRESSING THE POTENTIAL FOR INCREASED EFFICIENCIES

Section A.2.4 provides a context for defining and evaluating the efficiency of the use of industrial land. This section builds on that context to describe specific data and analytical techniques that this study uses.

The City is interested in knowing if industrial land in the Portland Harbor can be used more efficiently in the future. To answer we looked at recent economic trends in the Portland Harbor and in the City of Portland as a whole for changes in land-use efficiency for industrial users. For this analysis, we considered several measures of output in an efficiency measure: employment, real market value, value added, and tonnage.

Ideally, we would like to have data with a long time series (20 – 30 years) for each efficiency measure. But changes in the type, definition, and collection of data make it impossible to get consistent time-series data for both the numerators and denominators of efficiency measures. Our method is an approximation based on available data. We create different measures of efficiency for two different time periods: (1) 2002 – 2008, when detailed and consistent data are available on both output and land area, and (2) 1960 - 1997 when the Port of Portland did occasional studies of its land and activity.

For 2002- 2008 we began by identifying all parcels in the Portland Harbor using GIS. We examined data from two different years: 2002 (one of the earliest years that data are available using NAICS codes), and 2008 (the most recent year QCEW data are available). Comparing data from the two years we calculated the change in developed acreage in the Harbor, and the corresponding change in real market value, and employment.

We also collected data from different sources for two alternative measures of output (for the denominator): value added and cargo (volume, tonnage, and value). Unlike employment, and real market value, data for value added and cargo tonnage is not tracked at a parcel specific level. Instead, data is available at the regional, City, zip code or Census tract level. For our analysis, we used Port of Portland data on historical levels of cargo tonnage in the Portland Harbor, and the IMPLAN economic model for the zip codes that most closely align with the boundaries of the Portland Harbor for value added. We used the same years (2002 and 2008) as were used for other measures of efficiency.

In summary, we created various measures of change in land-use efficiency between 2002 and 2008.

This method has limitations. Six years is not a long time to observe economic trends and changes in land-use efficiency if one is hoping to use those trends as a basis for long-run forecasts. Moreover, the period includes the recent recession, which began in 2007. Ideally, our analysis would include years before 2002, as well as years later than 2008. However, data after 2008 are not yet available, and data before 2002 have significant limitations. Prior to 2000, employment was recorded by SIC codes, rather than NAICS. The change in classification makes comparing data across this time period difficult and unreliable for time-series analysis. Additionally, land-use data, including data from the County Assessor is less accurate prior to 2000, as GIS and other technology had not yet been widely adopted.

For a long-run look at trends, we used yet another method based on cargo tonnage as a measure of output. The Port of Portland conducts periodic studies of land use and development in the Portland Harbor. The earliest Port study dates back to 1960, with additional studies in 1990 and 1997. Additionally, various data sources, including the Port of Portland, the US Department of Transportation, and the Corps of Engineers track cargo tonnage that is shipped through the Portland Harbor. Comparing these datasets, we were able to calculate the tons of cargo that were shipped per developed acre in the Portland Harbor from 1960 through 1997, and observe trends over this 37-year period.

# Appendix B Criteria for Evaluating Potential Sites for Marine Terminals

One of the four questions that this study addressed was, "How well do the characteristics of the Atofina and Time Oil sites (the two identified by the City as meeting the minimum requirements for size and waterfront access) match the characteristics that would be needed to create a reasonable probability the sites could be developed as marine terminals?" To answer that question the consultant team had to specify those characteristics. Team member Maul, Foster & Alongi created the evaluation criteria summarized in the table that follows. Those criteria are used in the evaluation reported in Section 3.2 of the main report.

## Marine Terminal Criteria

| Criteria | Considerations | Comments |
|---|---|---|
| Water Access | Depth | Both berth and channel water depth are limiting considerations on vessel size and ultimately cargo type: (1) Barge: 15 to 20'; (2) Bulk: 35 to 52'; (3)Break Bulk: 30 to 40' |
| | Dredge Maintenance | Ability to maintain navigational depth through routine dredging. It is a function of siltation rate, cost, regulatory hurdles and physical restraints such as the presence of contaminated sediments. |
| | Pier Face Capacity | Vessel length and number of number of berths determine cargo type:<br>▪ Barge: 200 to 500'<br>▪ Bulk: 330 to 1200'<br>▪ Break Bulk: 400 to 800 |
| Land side transportation | Mainline Rail | Multiple rail service is desirable for competitive rates. |
| | Rail Siding | On site useable rail siding with sufficient on site car storage. The requirements for train length storage awaiting loading or unloading is a function of the cargo type. Bulk facilities including autos require 9.000 to 12,000 feet of track, whereas specialty project cargos can be managed on much smaller sidings and onsite storage track systems. |
| | Road | Proximity and ease of access to interstate freeway systems is an important criterion for marine terminals. Access should be on designated, all-weather truck routes with high levels of service including the access ramps to the interstate system. |
| Size | Total Acreage | Minimal acreage for cargo handling is required for various cargo types:*<br>▪ Barge: 10 to 75 acres (Mixed, bulk and project cargos)<br>▪ Bulk: 10 to 200 acres (Liquid and dry commodities)<br>▪ Break Bulk: 20 to 100 acres (Project cargos; autos) |

| Criteria | Considerations | Comments |
|---|---|---|
| Size (continued) | Unity of Ownership | Total acreage is a critical consideration and the assembly of property is often hampered by cost and timely assembly. |
| | Configuration | Parcel shape for marine terminals has an impact on terminal operating efficiency, most notably distance to pier face from remotest staging area. Configurations vary with cargo type and loading techniques. Dry conveyor and liquid piping configurations as well as auto handling are somewhat more forgiving. |
| Physical | Slope and elevation | Generally speaking facilities need to have minimal elevation change and slope. Bank heights have practical limitations, but fixed pier systems can be engineered to accommodate water to upland elevation differentials. |
| | Utilities | Power demands are limited to electricity for equipment operation and "at berth" vessel operations for on board systems to avoid ship engine fuel burn consistent with zero discharge environmental goals. Stormwater management is also a prime concern, but can readily be managed on most sites. |
| | Encumbrances | Encumbrances include easements, public rights of way and other deed restrictions that restrict or otherwise limit a site's efficient use. |
| Regulatory | Zoning | Appropriate zoning is required consistent with local land use regulations. In Portland, although several zoning classifications may be appropriate for some aspects of marine terminals, the heavy industrial (IH) zone allows for the widest range of primary and assessor uses necessary for marine terminals; such as rail yards or handling of hazardous materials. |
| | Overlay Regulations | While Oregon does not have shoreline regulations, the City of Portland has overlay zones which may impose additional restrictions and protections. |

| Criteria | Considerations | Comments |
|---|---|---|
| Environmental and Natural Resources | Contamination | Shipping terminals have historically been in industrial sites which quite frequently have been exposed to contamination. Remediation of these sites are typically held to a long time industrial use standard and as a result continuing industrial use for shipping are wholly compatible with industrial level cleanup standards. However it should be noted that previously remediated sites are likely to have deed covenants on future use such as restrictions on potable water wells (not an encumbrance in a serviced urban environment), penetrations into protective caps and disruption of in situ treatment processes. |
| | Flood Plain | Flood plains are a consideration as most shipping terminals are at elevations that are often included in exposure areas. |
| Cultural & Historic | Historical and Cultural Significant Sites | Like critical areas, industrial properties that have been historically used for industrial purposes are unlikely to present any encumbrances for cultural and historical uses. |

*Acreages vary considerable depending on the precise cargo handling and storage requirements. Storage and handling approaches that dramatically affect the required acreage include: on site storage in rail cars, bulk tanks and silos; warehouses and open air facilities, as well as handling mechanisms such as cranes, loading ramps and bulk material (dry and liquid) conveyors. These ranges are generally useable for the cargo category, but need to be further refined for a specific cargo. In selecting a site, one would err to the higher side of the range to afford the maximum market flexibility. The planned use of rail storage sidings has the single greatest impact on size, and materially affects a site's usability.

# Appendix C Analysis of Harbor Land Capacity and Demand, Portland & Vancouver

The City of Portland asked us: to what extent can the Port of Vancouver play a role in accommodating forecast cargo demand in the Portland region? This question is addressed Section 3.3 of the main report. This appendix provides additional tables with more detail than was presented in the main report. Our analysis finds that the Portland Harbor has very limited capacity to accommodate future demand for public marine terminals, but that the Port of Vancouver may technically have sufficient capacity to accommodate all forecast demand for cargo for both the cities of Portland and Vancouver through the year 2040.

## C.1 DISCLAIMER

All of this analysis described in this appendix depends on estimates of current variables that are uncertain, and forecasts that are even more uncertain, and themselves dependent on a wide range of possible assumptions. Like any analysis of future economic conditions, this one is built upon many layers of assumptions: each assumption widens the range of potential outcomes, and each layer of assumptions compounds on the previous layer to provide an even wider range of potential results. That fact does not necessarily make the analysis irrelevant: it can definitely inform public policy about possible and likely futures. Despite the uncertainty inherent in this analysis, it is helpful for bookending the potential land need for public marine terminals. Assumptions in the middle of the range give conclusions that should be useful for planning purposes, even if actual results may vary.

## C.2 DEMAND FOR MARINE CARGO

We were tasked with obtaining and reviewing the most recent forecasts. These forecasts were contained in the *Portland and Vancouver Harbor Forecast Update* (BST Associates, 2012). These forecasts were based on a 2010 study by BST Associates, but were refined to specifically call out cargo demand for the City's of Portland and Vancouver, and were updated with the most recent economic data. Exhibit C-1 shows the forecast demand for public and private marine terminals in the City of Portland in 2040.

**Exhibit C-1. Forecast cargo demand, public and private marine terminals, City of Portland, 2040**

| Cargo Type | Low | Mid-Range | High |
|---|---|---|---|
| Automobiles (units) | 811,000 | 912,500 | 1,014,000 |
| Containers (TEUs) | 379,000 | 452,500 | 526,000 |
| *Metric Tons* | | | |
| Automobiles | 1,076,000 | 1,206,000 | 1,336,000 |
| Containers | 2,162,000 | 2,583,500 | 3,005,000 |
| Breakbulk | 1,132,000 | 1,242,000 | 1,352,000 |
| Grain | 6,686,000 | 9,078,000 | 11,470,000 |
| Dry Bulk | 10,278,000 | 14,093,500 | 17,909,000 |
| Liquid Bulk | 6,912,000 | 7,461,500 | 8,011,000 |
| **Total** | **28,246,000** | **35,664,500** | **43,083,000** |

Calculated by ECONorthwest with source data from BST Associates (2012).

Exhibit C-2 shows the forecast demand for public and private marine terminals in the City of Vancouver in 2040.

**Exhibit C-2. Forecast cargo demand, public and private marine terminals, City of Vancouver, 2040**

| Cargo Type | Low | Mid-Range | High |
|---|---|---|---|
| Automobiles (units) | 159,000 | 197,000 | 235,000 |
| Containers (TEUs) | - | - | - |
| *Metric Tons* | | | |
| Automobiles | 226,000 | 278,500 | 331,000 |
| Containers | - | - | - |
| Breakbulk | 534,000 | 568,500 | 603,000 |
| Grain | 3,808,000 | 4,109,000 | 4,410,000 |
| Dry Bulk | 5,931,000 | 11,663,500 | 17,396,000 |
| Liquid Bulk | 510,000 | 802,500 | 1,095,000 |
| **Total** | **11,009,000** | **17,422,000** | **23,835,000** |

Calculated by ECONorthwest with source data from BST Associates (2012).

BST Associates estimates that the regional demand for cargo at marine terminals will range from 39,255,000 to 66,918,000 metric tons in 2040, with roughly two thirds of the demand coming from Portland, and the remainder from Vancouver. Dry bulk is forecast to be the cargo type with the most demand (as measured by tonnage) in 2040, comprising just over half of total tonnage in the region.

## C.3 EXISTING CAPACITY

Estimates of existing cargo capacity are difficult to obtain, particularly since our analysis looked at multiple geographies (Portland and Vancouver), and multiple ownerships (public and private). We used two methods to bookend our estimates of existing capacity, based on two different assumptions (1) assuming current facilities operate at 100% of maximum capacity before new terminals are needed, and (2) assuming all

growth in demand is from new opportunities that require new facilities, and current facilities continue to operate at current levels.

The Port of Portland provided us with estimates of maximum capacity, as well as annual historical cargo volumes for each cargo type for public marine terminals in the City of Portland. These estimates of capacity are shown in Exhibit C-3.

**Exhibit C-3. Existing cargo capacity, public marine terminals, City of Portland**

| Cargo Type | Estimated | Recent Peak Volume | Peak Year |
|---|---|---|---|
| Automobiles (units) | 675,000 | 460,000 | 2006 |
| Containers (TEUs) | 700,000 | 330,000 | 1995 |
| *Metric Tons* | | | |
| Automobiles | 889,000 | 606,000 | |
| Containers | 3,999,000 | 1,885,000 | |
| Breakbulk | 2,100,000 | 1,130,000 | 2007 |
| Grain | 4,100,000 | 5,400,000 | 1995 |
| Dry Bulk | 10,700,000 | 5,460,000 | 2008 |
| Liquid Bulk | - | - | N/A |
| **Total** | **21,788,000** | **14,481,000** | |

Calculated by ECONorthwest with source data from the Port of Portland, 2012.
Note: Recent peak volume for grain is no longer applicable, as the Terminal 4 grain elevator has closed since 1995 when the peak was measured.

For private marine terminals in the City of Portland, we compared historical data for total cargo volumes for the years 2000 and 2010 from the BST report with anecdotal data and conversations with the Port of Portland to determine the estimated current capacity. Key assumptions are that all historical liquid bulk cargo, and that none of the automobile and container cargo shown in the BST report for the City of Portland is handled by private marine terminals. For private marine terminals we only used one method for estimating existing capacity, under the assumption that existing facilities do not have significant excess capacity, and that recent historical peaks are a reasonable estimate of capacity.

## Exhibit C-4. Existing cargo capacity, private marine terminals, City of Portland

| Cargo Type | Estimated | Notes |
|---|---|---|
| Automobiles (units) | - | No private auto terminals |
| Containers (TEUs) | - | No private container terminals |
| *Metric Tons* | | |
| Automobiles | - | |
| Containers | - | |
| Breakbulk | 250,000 | Conversation with Port of Portland. |
| Grain | 3,000,000 | Existing private terminals are old and nearing obsolesence |
| Dry Bulk | 1,500,000 | Conversation with Port of Portland, recent historical peak. |
| Liquid Bulk | 8,280,000 | BST reports citywide liquid bulk in 2000. |
| **Total** | **13,030,000** | |

Source: ECONorthwest, informed by "Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012) and conversations with officials from the Port of Portland.

For the City of Vancouver, we were unable to obtain estimates of capacity from the Port of Vancouver or from the Port of Portland. Nor were we able to obtain detailed historical data by cargo type isolating public terminals from private terminals. Instead, we relied on the BPS report, which reported cargo volumes for just two years: 2000 and 2010. In our evaluation of Port of Portland public marine terminals (described previously in this section), we found that the recent peak volumes were equal to 66% of the total capacity. We applied that same percentage to the recent peak volumes for the City of Vancouver to estimate the total capacity, shown in Exhibit C-5. One adjustment, however, had to be made. The Port of Vancouver is in the planning process of developing a potash terminal, which will have capacity for up to 16 million tons of dry bulk. We added this capacity to the estimated capacity shown in Exhibit C-5.

## Exhibit C-5. Existing cargo capacity, public and private marine terminals, City of Vancouver

| Cargo Type | Estimated | Recent Peak | Peak Year |
|---|---|---|---|
| Automobiles (units) | 90,000 | 60,000 | 2010 |
| Containers (TEUs) | | - | |
| *Metric Tons* | | | |
| Automobiles | 137,000 | 91,000 | |
| Containers | - | - | |
| Breakbulk | 531,000 | 354,000 | 2000 |
| Grain | 5,544,000 | 3,696,000 | 2010 |
| Dry Bulk | 17,556,000 | 1,037,000 | 2010 |
| Liquid Bulk | 1,110,000 | 740,000 | 2000 |
| **Total** | **24,878,000** | **5,918,000** | |

Source: ECONorthwest, informed by "Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012) and conversations with officials from the Port of Portland.

## C.4 CAPACITY SHORTFALL

Determining the capacity shortfall should be as simple as subtracting the existing capacity from the projected demand. However, we have two different estimates of capacity, and three different estimates of demand. And since we are interested in identifying the shortfall for public marine terminals, we also need to make assumptions for what portion of future demand for what cargo types will be accommodated by private terminals.

We created three scenarios for cargo capacity: low, high, and most likely. These scenarios are based on the following assumptions:

- The low shortfall scenario takes the estimates of facility capacity and subtracts the low BST forecast for 2040 demand. This assumes that all existing facilities are pushed to 100% of capacity to accommodate the forecast future demand.
- The high scenario takes the recent peak volume for facility capacity, and subtracts the high BST forecast for 2040 demand. This assumes that all facilities continue to operate at their current levels and that all additional demand will need to be accommodated in new facilities.[1]
- The most-likely scenario takes the estimates of facility capacity and reduces them by 10% (this reduction reflects the fact that some forecast demand will be from new market opportunities that will not be able to take advantage of existing facilities, and therefore despite forecasting a capacity shortfall in the aggregate, not all existing facilities will be operating at 100% of capacity), then subtracts the mid-range demand forecasts (that we calculated as the average of the high and low BST forecasts). This scenario assumes that demand will fall in the middle of the range that BST forecast, and that existing facilities will be able to accommodate some of the future growth, but will never operate at 100% of capacity.

Exhibits C-6 through C-8 show the forecast of the cargo capacity shortfall for public marine terminals in 2040 for each of these three scenarios. In Exhibit C-6, we see the shortfall for the City of Portland public marine terminals could range from 187,000 metric tons to more than 17 million metric tons, with the medium scenario showing some shortfall for automobiles, grain, and dry bulk cargoes.

[1] Since the recent historical peak for grain for public marine terminals in the City of Portland is not applicable, due to the removal the Terminal 4 grain elevator, we used the estimated capacity for grain in this scenario.

**Exhibit C-6. Forecast cargo capacity shortfall, public marine terminals, City of Portland, 2040**

| Cargo Type | Low | Medium | High |
|---|---|---|---|
| Automobiles (units) | (136,000) | (310,000) | (554,000) |
| Containers (TEUs) | - | - | (196,000) |
| *Metric Tons* | | - | |
| Automobiles | (187,000) | (410,000) | (730,000) |
| Containers | - | - | (1,120,000) |
| Breakbulk | - | - | - |
| Grain | - | (2,390,000) | (4,370,000) |
| Dry Bulk | - | (2,960,000) | (10,949,000) |
| Liquid Bulk | - | - | - |
| **Total** | **(187,000)** | **(5,760,000)** | **(17,169,000)** |

Calculated by ECONorthwest with source data from Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012) and conversations with officials from the Port of Portland.

Exhibit C-7 shows the forecast cargo capacity shortfall for public marine terminals in the City of Vancouver could range from less than 100,000 to 1.9 million metric tons, with the medium scenario showing a shortfall of 250,000.

**Exhibit C-7. Forecast cargo capacity shortfall, public marine terminals, City of Vancouver, 2040**

| Cargo Type | Low | Medium | High |
|---|---|---|---|
| Automobiles (units) | (69,000) | (120,000) | (175,000) |
| Containers (TEUs) | - | - | - |
| *Metric Tons* | | - | |
| Automobiles | (89,000) | (160,000) | (240,000) |
| Containers | - | - | - |
| Breakbulk | (3,000) | (90,000) | (249,000) |
| Grain | - | - | (714,000) |
| Dry Bulk | - | - | (359,000) |
| Liquid Bulk | - | - | (355,000) |
| **Total** | **(92,000)** | **(250,000)** | **(1,917,000)** |

Calculated by ECONorthwest with source data from Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012) and conversations with officials from the Port of Portland.

Exhibit C-8 shows the combined shortfall for public terminals in the City of Portland and City of Vancouver for the year 2040. The total shortfall is estimated to range from 279,000 metric tons to more than 19 million metric tons, with a medium scenario showing a shortfall of 6 million metric tons.

**Exhibit C-8. Forecast cargo capacity shortfall, public marine terminals, Portland / Vancouver region, 2040**

| Cargo Type | Low | Medium | High |
|---|---|---|---|
| Automobiles (units) | (205,000) | (430,000) | (729,000) |
| Containers (TEUs) | - | - | (196,000) |
| *Metric Tons* | | | |
| Automobiles | (276,000) | (570,000) | (970,000) |
| Containers | - | - | (1,120,000) |
| Breakbulk | (3,000) | (90,000) | (249,000) |
| Grain | - | (2,390,000) | (5,084,000) |
| Dry Bulk | - | (2,960,000) | (11,308,000) |
| Liquid Bulk | - | - | (355,000) |
| **Total** | **(279,000)** | **(6,010,000)** | **(19,086,000)** |

Calculated by ECONorthwest with source data from Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012) and conversations with officials from the Port of Portland.

## C.5 TERMINAL SIZE

We were asked to translate the forecast cargo capacity shortfalls (described in Section C.4) into acres of land for public marine terminals. To accomplish this, we need assumptions on the size of public marine terminals.

As stated in Section C.1, all of this analysis suffers from a high degree of uncertainty and a wide range of possible assumptions. This aspect of the analysis (converting tons of cargo into acres of land for new terminals) is probably the most uncertain. There is no accepted rule of thumb for the minimum size of marine terminals, let alone the standard or average size. Some aspects of marine terminal size can scale with cargo volumes (e.g., an automobile terminal moving 100,000 cars may require roughly half the acreage of an automobile terminal moving 200,000 cars.). However, other aspects of terminal size may not scale proportionately to cargo volume.

We attempted to assemble recent studies from the City of Portland to see what we could learn about the likely size of marine terminals that would be needed to accommodate future demand in the City of Portland. The West Hayden Island Economic Foundation Study (Entrix 2011), provided a summary of site characteristics for marine-related land uses, including an acreage approximation for terminals of various cargo types in the Portland Harbor and other west coast harbors. The Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011 – Draft) provides other assumptions for terminal sizes for automobiles, grain, and dry bulk, based on case studies from North American and European terminals. The Worley Parsons analysis also provides a range of potential throughput per acre based on these case study ports.

Ultimately, we looked at both of these sources of data, and the Criteria for Evaluating Potential Sites for Marine Terminal produced by Maul, Foster & Alongi as part of the consultant team for this study (included as Appendix B to this same report) to determine a range of reasonable terminal sizes. These assumptions are shown in Exhibit C-9. We show both a minimum size, and a practical, case study-supported size. Note that the size for these marine terminals does not necessarily reflect land required for rail infrastructure to support these terminals.

**Exhibit C-9. Summary of assumptions on acreage requirements for public marine terminals by cargo type**

| | ENTRIX | | Worley Parsons | | For This Analysis | |
|---|---|---|---|---|---|---|
| Cargo Type | Minimum | Practical | Minimum | Practical | Minimum | Practical |
| Automobiles | 75 | 100 | 47 | 150 | 50 | 150 |
| Containers | 50 | 200 | | | 50 | 200 |
| Breakbulk | 15 | 50 | | | 15 | 50 |
| Grain | 40 | 50 | 15 | 45 | 30 | 50 |
| Dry Bulk | 5 | 100 | 30 | 30 | 20 | 70 |
| Liquid Bulk | 5 | 20 | | | 5 | 20 |

Source: ECONorthwest, with original data and input from:
West Hayden Island Economic Foundation Study (Entrix, 2011)
Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011- Draft)
Appendix B: Criteria for Evaluating Potential Sites for Marine Terminal (Maul, Foster & Alongi, 2012)

Other experts and stakeholders may have different opinions on what is truly a practical size for a new marine terminal. The assumptions used in this analysis, are not asserted as the definitive answer for what size terminal is best for any and all new marine terminals. These assumptions simply reflect the range of terminal sizes that were reported as reasonable and practical in the two source documents that we reviewed. For this reason, in the rest of this document, we refer to the "practical" terminal sizes in Exhibit C-9, as "case study supported" terminal sizes.

## C.6 EVALUATION OF LAND NEED FOR PUBLIC MARINE TERMINALS

Determining the land needed for public marine terminals is as simple as multiplying the demand shortfall (in metric tons) by a ratio of tons per acre for cargo size. However, the estimate of shortfall does not tell us how many terminals will be needed. If for example, we see a shortfall of 10 million tons of dry bulk, it could potentially be accommodated in one terminal, or in many terminals. For each of the terminals, they could be operating at 100% of capacity, or at only a small fraction of capacity (if they were sized to accommodate future growth, beyond the 2040 horizon). Additionally, we have multiple scenarios for the cargo capacity shortfall (low, medium, and high), and multiple measures of cargo size (minimum, and case study-

supported). One final challenge is that some terminals will require rail access, and if a dedicated rail loop is needed, then it will require about 100 acres of land, regardless of our other assumptions on minimum or case study-supported terminal size.

In this section, we present results only in terms of the minimum number of acres needed to absorb the capacity shortfall, and do not estimate the number of terminals the acreage equates to. We ultimately provide assumptions for determining the number of terminals required to accommodate the projected cargo capacity shortfall.

Exhibits C-10 through C-12 show projected capacity shortfall, needed acreage to fulfill the shortfall, and whether new terminal space is needed for the six cargo types under the lowest scenario in the City of Portland, City of Vancouver, and the two combined. This scenario uses the low estimate of cargo capacity shortfall and assumes the minimum acreage requirement for each cargo type.

For the City of Portland automobile shortfall, we used an estimate of throughput per acre from the Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2012), which used case study examples to show that automobile terminals can achieve 2,688 autos per acre. For the City of Vancouver automobile shortfall, we assumed the 89,000 metric tons, could be accommodated by improved efficiencies at their existing facility, and would not be sufficient demand to necessitate development of a new terminal. Exhibits C-10 through C-12 show the results of the lowest scenario for public marine terminals in Portland and Vancouver.

**Exhibit C-10. Lowest Scenario, Forecast land need for new public marine terminals, City of Portland, 2040**

| Cargo Type | Capacity Shortfall (Tons) | New Terminal Space Needed | Minimum Acres Needed |
|---|---|---|---|
| Automobiles | (187,000) | Yes | 51.0 |
| Containers | - | No | - |
| Breakbulk | - | No | - |
| Grain | - | No | - |
| Dry Bulk | - | No | - |
| Liquid Bulk | - | No | - |
| **Total** | **(187,000)** | | **51.0** |

Source: ECONorthwest, with original data and input from:
West Hayden Island Economic Foundation Study (Entrix, 2011)
Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011- Draft)
Appendix B: Criteria for Evaluating Potential Sites for Marine Terminal (Maul, Foster & Alongi, 2012)
Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012)
Conversations with officials from the Port of Portland

## Exhibit C-11. Lowest Scenario, Forecast land need for new public marine terminals, City of Vancouver, 2040

| Cargo Type | Capacity Shortfall (Tons) | New Terminal Space Needed | Minimum Acres Needed |
|---|---|---|---|
| Automobiles | (89,000) | No | - |
| Containers | - | No | - |
| Breakbulk | (3,000) | No | - |
| Grain | - | No | - |
| Dry Bulk | - | No | - |
| Liquid Bulk | - | No | - |
| **Total** | **(92,000)** | | **-** |

Source: ECONorthwest, with original data and input from:
West Hayden Island Economic Foundation Study (Entrix, 2011)
Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011- Draft)
Appendix B: Criteria for Evaluating Potential Sites for Marine Terminal (Maul, Foster & Alongi, 2012)
Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012)
Conversations with officials from the Port of Portland

## Exhibit C-12. Lowest Scenario, Forecast land need for new public marine terminals, cities of Portland and Vancouver, 2040

| Cargo Type | Capacity Shortfall (Tons) | New Terminal Space Needed | Minimum Acres Needed |
|---|---|---|---|
| Automobiles | (276,000) | Yes | 51.0 |
| Containers | - | No | - |
| Breakbulk | (3,000) | No | - |
| Grain | - | No | - |
| Dry Bulk | - | No | - |
| Liquid Bulk | - | No | - |
| **Total** | **(279,000)** | | **51.0** |

Source: ECONorthwest, with original data and input from:
West Hayden Island Economic Foundation Study (Entrix, 2011)
Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011- Draft)
Appendix B: Criteria for Evaluating Potential Sites for Marine Terminal (Maul, Foster & Alongi, 2012)
Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012)
Conversations with officials from the Port of Portland

The previous set of tables show that in the lowest scenario, demand for new public marine terminals in Portland and Vancouver could be as low as 51 acres. Exhibits C-13 through C-15 show the opposite bookend, the highest scenario. This scenario uses the high estimate of cargo capacity shortfall, assumes low estimates of throughput per acre for automobile terminals, and assumes terminals for dry bulk, grain, and containers require a dedicated rail loop.

## Exhibit C-13. Highest Scenario, Forecast land need for new public marine terminals, City of Portland, 2040

| Cargo Type | Capacity Shortfall (Tons) | New Terminal Space Needed | Maximum Acres Needed |
|---|---|---|---|
| Automobiles | (730,000) | Yes | 577.0 |
| Containers | (1,120,000) | Yes | 100.0 |
| Breakbulk | - | No | - |
| Grain | (4,370,000) | Yes | 100.0 |
| Dry Bulk | (10,949,000) | Yes | 200.0 |
| Liquid Bulk | - | No | - |
| **Total** | **(17,169,000)** | | **977.0** |

Source: ECONorthwest, with original data and input from:
West Hayden Island Economic Foundation Study (Entrix, 2011)
Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011- Draft)
Appendix B: Criteria for Evaluating Potential Sites for Marine Terminal (Maul, Foster & Alongi, 2012)
Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012)
Conversations with officials from the Port of Portland

## Exhibit C-14. Highest Scenario, Forecast land need for new public marine terminals, City of Vancouver, 2040

| Cargo Type | Capacity Shortfall (Tons) | New Terminal Space Needed | Maximum Acres Needed |
|---|---|---|---|
| Automobiles | (240,000) | Yes | 180.0 |
| Containers | - | No | - |
| Breakbulk | (249,000) | Yes | 50.0 |
| Grain | (714,000) | Yes | 100.0 |
| Dry Bulk | (359,000) | Yes | 100.0 |
| Liquid Bulk | (355,000) | Yes | 50.0 |
| **Total** | **(1,917,000)** | | **480.0** |

Source: ECONorthwest, with original data and input from:
West Hayden Island Economic Foundation Study (Entrix, 2011)
Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011- Draft)
Appendix B: Criteria for Evaluating Potential Sites for Marine Terminal (Maul, Foster & Alongi, 2012)
Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012)
Conversations with officials from the Port of Portland



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**Exhibit C-15. Highest Scenario, Forecast land need for new public marine terminals, cities of Portland and Vancouver, 2040**

| Cargo Type | Capacity Shortfall (Tons) | New Terminal Space Needed | Maximum Acres Needed |
|---|---|---|---|
| Automobiles | (970,000) | Yes | 757.0 |
| Containers | (1,120,000) | Yes | 100.0 |
| Breakbulk | (249,000) | Yes | 50.0 |
| Grain | (5,084,000) | Yes | 200.0 |
| Dry Bulk | (11,308,000) | Yes | 300.0 |
| Liquid Bulk | (355,000) | Yes | 50.0 |
| **Total** | **(19,086,000)** | | **1,457.0** |

Source: ECONorthwest, with original data and input from:
West Hayden Island Economic Foundation Study (Entrix, 2011)
Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011- Draft)
Appendix B: Criteria for Evaluating Potential Sites for Marine Terminal (Maul, Foster & Alongi, 2012)
Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012)
Conversations with officials from the Port of Portland

The previous set of tables for the highest scenario show that up to 1,457 acres of land could be needed to accommodate the 19 million metric tons of cargo capacity shortfall. Given the assumptions about minimum and case study-supported terminal size shown in Exhibit C-9, a shortfall of this size would probably require on the order of 10 new terminals of average size.

Both the lowest and highest scenarios are possibilities, but unlikely.[2] These scenarios do help to show the extreme ends of the spectrum, but it is better to focus our attention on the medium scenario. For this scenario, we used the medium estimate of cargo capacity shortfall, and assumed all demand for each cargo type in each City could be accommodated by one terminal.

Exhibit C-16 shows our medium forecast of acres needed for public marine terminals in the City of Portland in 2040. It shows a total land need ranging from 170 to 470 acres, depending on the size and efficiency of new terminals, and the need for dedicated rail infrastructure.

[2] This is not to imply the underlying "high-scenario" cargo forecast from BST is unreasonable. In fact, the forecast demand for cargo in the high scenario averages 3.1% growth per year, which is less than the 4.1% per year that has been experienced on the Columbia River between 1962 and 2011. However, the compounding assumptions for capacity (existing facilities only operate at current levels, and accommodate none of the future growth), terminal size (rail loops for every terminal), and number of terminals (e.g., 3 new auto terminals to accommodate total demand of less than 1,000,000 tons per year), all combine to make this scenario unrealistic.

## Exhibit C-16. Medium Scenario, Forecast land need for new public marine terminals, City of Portland, 2040

| Cargo Type | Capacity Shortfall (Tons) | New Terminal Space Needed | Acres Needed | | |
|---|---|---|---|---|---|
| | | | Minimum | Case Study Examples | w / rail |
| Automobiles | (410,000) | Yes | 120.0 | 270.0 | 270.0 |
| Containers | - | No | - | - | - |
| Breakbulk | - | No | - | - | - |
| Grain | (2,390,000) | Yes | 30.0 | 50.0 | 100.0 |
| Dry Bulk | (2,960,000) | Yes | 20.0 | 70.0 | 100.0 |
| Liquid Bulk | - | No | - | - | - |
| **Total** | **(5,760,000)** | | **170.0** | **390.0** | **470.0** |

Source: ECONorthwest, with original data and input from:
West Hayden Island Economic Foundation Study (Entrix, 2011)
Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011- Draft)
Appendix B: Criteria for Evaluating Potential Sites for Marine Terminal (Maul, Foster & Alongi, 2012)
Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012)
Conversations with officials from the Port of Portland

Exhibit C-17 shows our medium forecast of acres needed for public marine terminals in the City of Vancouver in 2040. It shows a total land need ranging from 40 to 100 acres to accommodate 160,000 metric tons of automobiles.

## Exhibit C-17. Medium Scenario, Forecast land need for new public marine terminals, City of Vancouver, 2040

| Cargo Type | Capacity Shortfall (Tons) | New Terminal Space Needed | Acres Needed | | |
|---|---|---|---|---|---|
| | | | Minimum | Case Study Examples | w / rail |
| Automobiles | (160,000) | Yes | 40.0 | 100.0 | 100.0 |
| Containers | - | No | - | - | - |
| Breakbulk | (90,000) | No | - | - | - |
| Grain | - | No | - | - | - |
| Dry Bulk | - | No | - | - | - |
| Liquid Bulk | - | No | - | - | - |
| **Total** | **(250,000)** | | **40.0** | **100.0** | **100.0** |

Source: ECONorthwest, with original data and input from:
West Hayden Island Economic Foundation Study (Entrix, 2011)
Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011- Draft)
Appendix B: Criteria for Evaluating Potential Sites for Marine Terminal (Maul, Foster & Alongi, 2012)
Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012)
Conversations with officials from the Port of Portland

The combination of demand for public marine terminals in the cities of Portland and Vancouver are shown in Exhibit C-18. It forecasts a need for 210 to 570 acres.

**Exhibit C-18. Medium Scenario, Forecast land need for new public marine terminals, cities of Portland and Vancouver, 2040**

| Cargo Type | Capacity Shortfall (Tons) | New Terminal Space Needed | Acres Needed | | |
|---|---|---|---|---|---|
| | | | Minimum | Case Study Examples | w / rail |
| Automobiles | (570,000) | Yes | 160.0 | 370.0 | 370.0 |
| Containers | - | No | - | - | - |
| Breakbulk | (90,000) | No | - | - | - |
| Grain | (2,390,000) | Yes | 30.0 | 50.0 | 100.0 |
| Dry Bulk | (2,960,000) | Yes | 20.0 | 70.0 | 100.0 |
| Liquid Bulk | - | No | - | - | - |
| **Total** | **(6,010,000)** | | **210.0** | **490.0** | **570.0** |

Source: ECONorthwest, with original data and input from:
West Hayden Island Economic Foundation Study (Entrix, 2011)
Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011- Draft)
Appendix B: Criteria for Evaluating Potential Sites for Marine Terminal (Maul, Foster & Alongi, 2012)
Portland and Vancouver Harbor Forecast Update" (BST Associates, 2012)
Conversations with officials from the Port of Portland

In Exhibits C-10 through C-18 we purposely showed estimates of "acres needed" and not "number of terminals needed." Moving from cargo to land adds uncertainty; moving from acres to terminals adds even more. Exhibit C-9 is a basis for the conversion, but it shows a range of possible terminal sizes.[3] Moreover, terminals may not be used to capacity, technologies may change, and so on. That said, a rough application of estimates of terminal size supported by the case studies (in acres, Exhibit C-9) to estimates of needed acres under medium assumptions (Exhibit C-18), yields estimates of number of new terminals needed by 2040 as follows: automobiles, 1 – 4 terminals; grain, 1 – 3 terminals; dry bulk, 1 – 3 terminals.

[3] The ranges in Exhibit C-9 are based on all available data sources: existing terminal sizes at the Port of Portland and Vancouver, conversations with officials at both ports, and case studies included in the report on Operational Efficiencies of Port/Terminal World-Wide (Worley Parsons, 2011 Draft). Ultimately, however, these assumptions were a judgment call on the part of ECONorthwest, and represent our best guesses for a lowest, highest, and medium scenario.

## C.7 IMPLICATIONS

The City of Portland identified the two sites in the Portland Harbor that are most likely to be suitable for development of a new public marine terminal: the Atofina site, and the Time Oil site. Of these two sites, development is technically possible on either, but there are major hurdles that would add significant costs. Both sites have some level of contamination, both sites would require negotiation and property acquisition from numerous property owners, and both sites are smaller than desirable, which precludes the possibility of an onsite rail loop. Depending on the specific parcels that would be acquired and aggregated to make development of these sites possible, each site could range in size from 50 to 100 acres, for total developable acreage of 100 to 200 acres.

When considering the potential cargo capacity shortfall, the two sites in the Portland Harbor could potentially accommodate the one dry bulk and one grain terminal that are anticipated to be needed. These terminals are expected to require between 20 and 200 acres, which matches fairly well with the capacity of the two potential sites. However, if these potential terminals require a dedicated rail loop, or if they are unable to overcome the barriers to redevelopment at each site, then the forecast capacity shortfall will need to be accommodated elsewhere in the region.

Assuming each new port terminal requires a dedicated rail loop, it would appear that the total acreage needed to accommodate regional cargo volumes in 2040 exceeds the current supply of 350 acres of vacant developable land at the Port of Vancouver planned for marine terminal development.[4] However, the Port of Vancouver has about 200 acres of vacant developable land that could technically accommodate marine terminal development, but is planned for other industrial uses. If these acres were included in the total supply, then it would appear that the Port of Vancouver would have about the right supply of land to accommodate regional cargo demand through 2040. While this is technically possible, that does not mean that it is politically feasible or consistent with adopted policies of the affected jurisdictions.

While it is possible that the Port of Vancouver could accommodate the regional demand for cargo through 2040, it is also possible that Vancouver's land supply could fall far short. Using the high-scenario demand forecasts, and assuming rail loop access for all terminals, the region could have a

[4] It is important to note that these projections are based on our medium scenario. The range of possible assumptions that could be used in this analysis is significant. When using our most conservative assumptions, our analysis showed a regional land need as low as 70 acres, and our most aggressive assumptions resulted in a land need of over 2,250 acres.

shortfall of up to 1,457 acres. If only 350 acres at the Port of Vancouver are available for marine terminal development, as is their current stated policy, then that would leave over 1,100 acres of unmet demand for public marine terminals in the region.

Our analysis finds that the Portland Harbor has very limited capacity to accommodate future demand for public marine terminals, but that the Port of Vancouver has capacity to accommodate some (but not necessarily all) forecast demand for cargo for both the cities of Portland and Vancouver through the year 2040 under our medium scenario.

# Appendix D Mapping Analysis

As part of the background research for the Harbor Lands Contract, Bureau of Planning and Sustainability staff conducted a visual survey of aerial maps of the Portland Harbor to classify the lands in one of several categories. The first reason for undertaking this review was to provide the consultant for the Harbor Lands Analysis, ECONorthwest (ECO), with a visual representation of current Portland Harbor development so that they could analyze this and confirm potential sites to consider for assembly into larger parcels. The second reason for this effort was to help validate the initial acreage findings of the draft Economic Opportunities Analysis (EOA).

Lands were split into various development types, including buildings, other structures/tanks, exterior work/storage areas, loading & maneuvering areas, parking areas, rail yards, vacant land and a few residual categories (see chart below). Once these lands were categorized, they were compared with the lands that are considered environmentally constrained or brownfields. The intent was to specifically consider whether vacant lands predominantly had one of these constraints applied to them. While the visual survey and analysis was initially considered to cover the lands that staff wanted ECO to review along the harbor, it was also refined to incorporate the boundary of the EOA for the Portland Harbor sub-geography to determine whether the acreage was significantly different. The findings are provided in a table attached to this summary.

Within the Portland Harbor sub-geography, the visual survey identified a total of 590 acres of lands that were considered vacant. However, of this acreage, approximately 412 acres either contained medium or high level natural resources (174.4 acres), were existing brownfields (145.2 acres), or were brownfield sites with resources as well (92.6 acres). This left approximately 174 acres that were not constrained. This number exceeds the amount of unconstrained vacant land determined by Hovee (108 acres). This is partially due to the fact that the visual survey included vacant portions of otherwise developed parcels, and was not constrained by lot lines. Thus vacant portions of lots were included in the aerial survey that were not included in the EOA. Within the EOA update, Hovee had separated out the Harbor Access Lands from the larger Columbia Harbor subgeography. In either case, the unconstrained land represents a minority of the overall vacant land in the harbor.

For the ECO analysis, the maps helped illustrate the potential vacant sites that could be looked in greater detail in their report. This led to the consideration of the Time Oil and Atofina sites as possible areas for consideration of a marine terminal. The report includes the analysis on these sites.



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| Category # | Category Description | **TOTAL Acres Harbor Lands Study Area** | (1)Acres in med/high NRI resources ONLY | (1) Acres both NRI & Brownfields | (1)Acres in vacant Brownfields ONLY (2009+11) | **TOTAL Acres PDX *Harbor Access Lands (2)** | **Acres in med/high NRI resources* ONLY (2)** | **Acres both NRI AND Brownfields (2)** | **Acres in vacant Brownfields ONLY(2009+11)* (2)** | Acres Port of Vancouver |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | building | **415.1** | 0.6 | 0.1 | 5.2 | **267.2** | 0.4 | 0.1 | 4.8 | 65.7 |
| 2 | other structures, tanks, utilities | **197.1** | 2.6 | 0.0 | 1.5 | **92.1** | 2.2 | 0.0 | 1.5 | 72.6 |
| 3 | exterior storage & work areas | **1,326.0** | 26.9 | 1.1 | 20.7 | **994.0** | 23.9 | 1.0 | 10.3 | 435.7 |
| 4 | loading/maneuvering | **295.0** | 14.0 | 0.2 | 0.2 | **181.9** | 13.4 | 0.2 | 0.2 | 134.9 |
| 5 | rail yards | **457.3** | 38.4 | 0.3 | 3.3 | **138.0** | 5.2 | 0.3 | 0.0 | 72.1 |
| 6 | employee/guest parking | **143.2** | 6.7 | 0.1 | 1.1 | **94.5** | 1.5 | 0.0 | 1.1 | 12.0 |
| 7 | vacant land | **1,739.4** | 328.1 | 127.9 | 214.4 | **586.0** | 174.4 | 92.6 | 145.2 | 1,442.5 |
| 8 | parks | **110.0** | 103.2 | 0.8 | 0.4 | **3.0** | 1.0 | 0.0 | 0.0 | 0.0 |
| 9 | taxloted water | **89.3** | 88.9 | 0.0 | 0.0 | **89.3** | 88.9 | 0.0 | **0.0** | 101.8 |
| 10 | misc right of way | **25.3** | 6.8 | 0.0 | 0.0 | **15.6** | 4.1 | 0.0 | 0.0 | 0.0 |
| | **Total** | **4,798** | **616** | **131** | **247** | **2,462** | **315** | **94** | **163** | **2,337** |

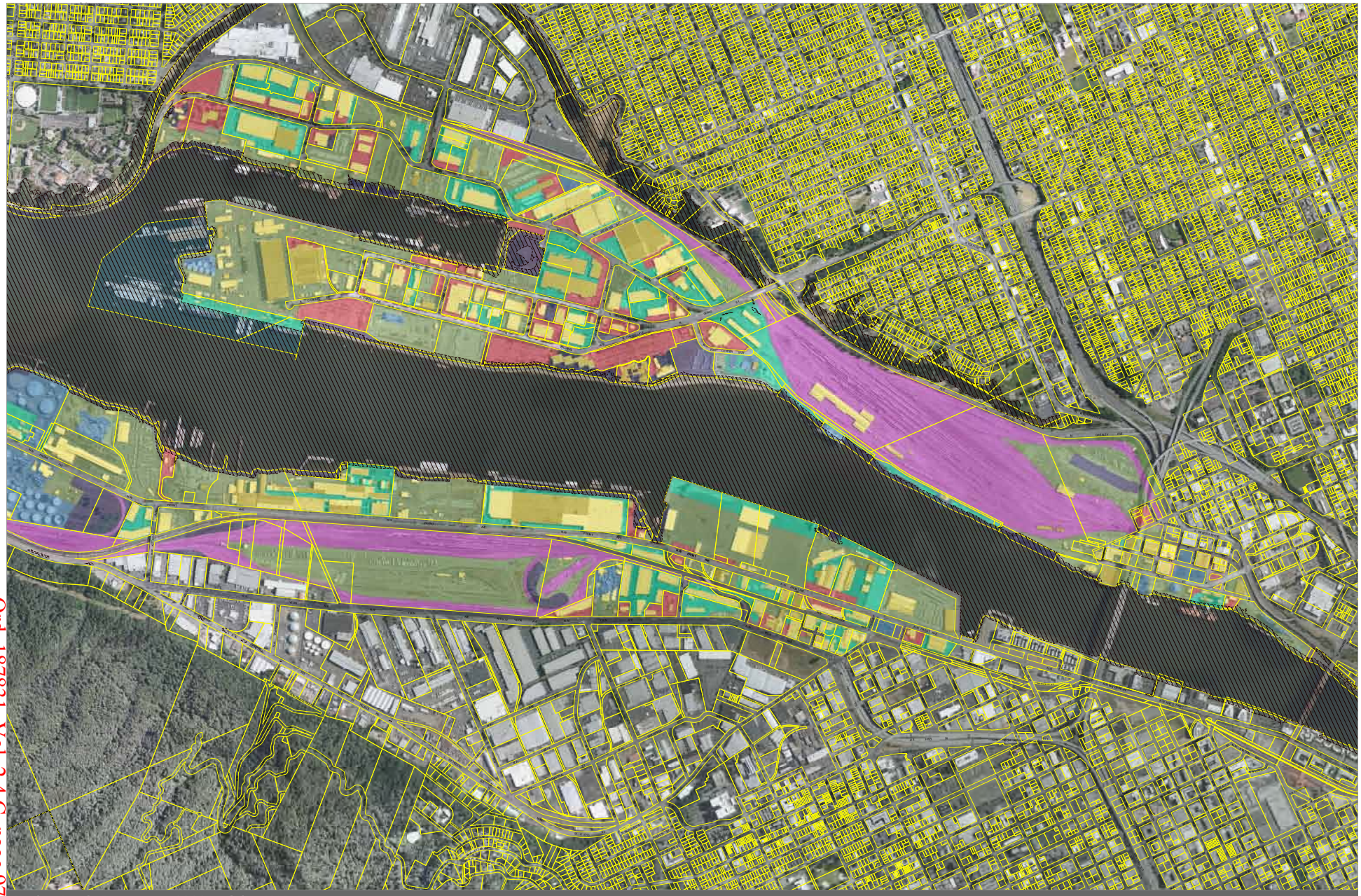
Revised 3/19/2012

*Harbor Access Lands dataset = river overlay zones created by Hovee

(1)Acres within the Harbor Lands Boundary

**(2)Acres within *Harbor Access Lands dataset (hovee's river overlay zone shapefile)**

NOTE: West Hayden Island NRI not included.

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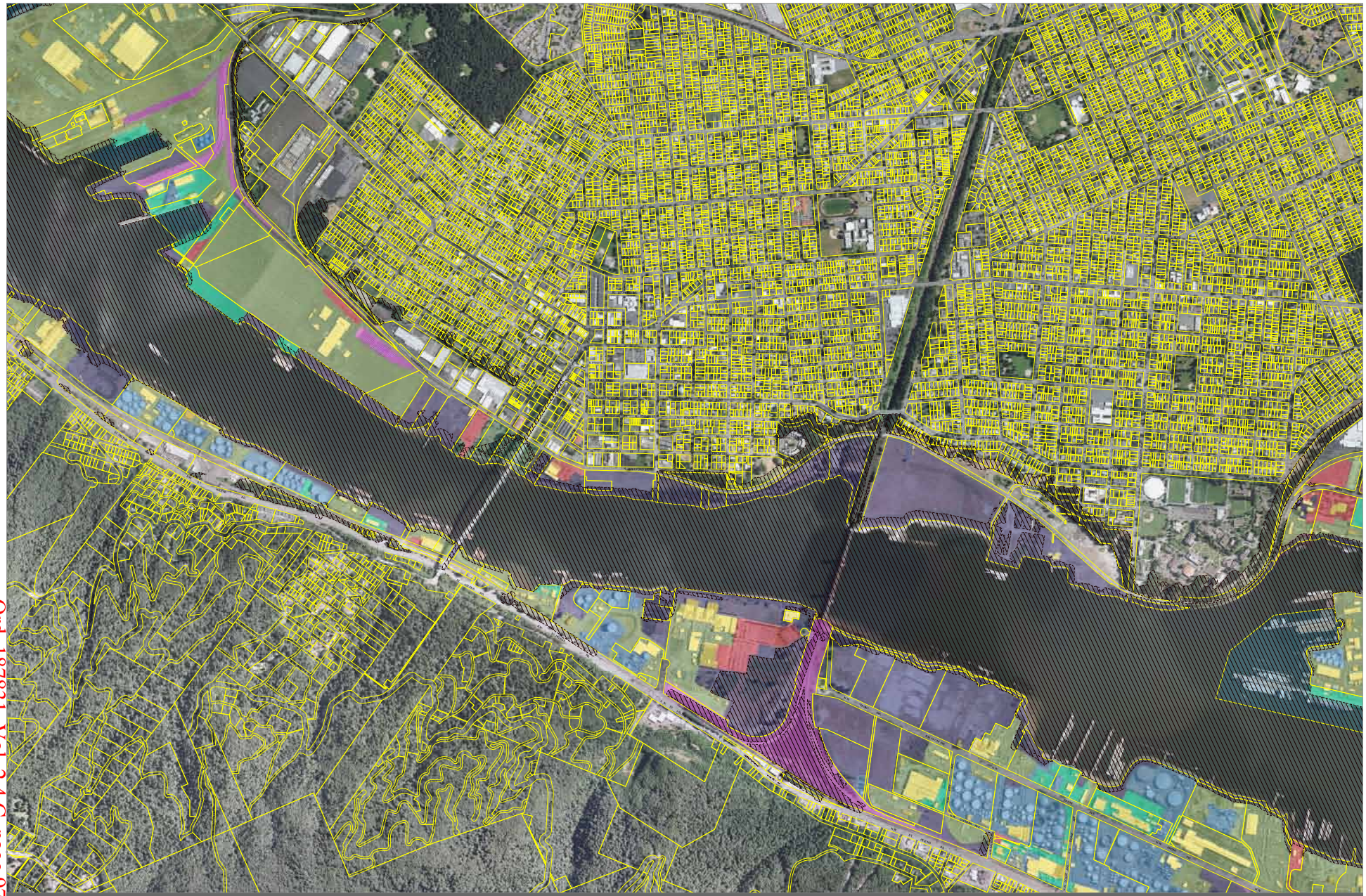


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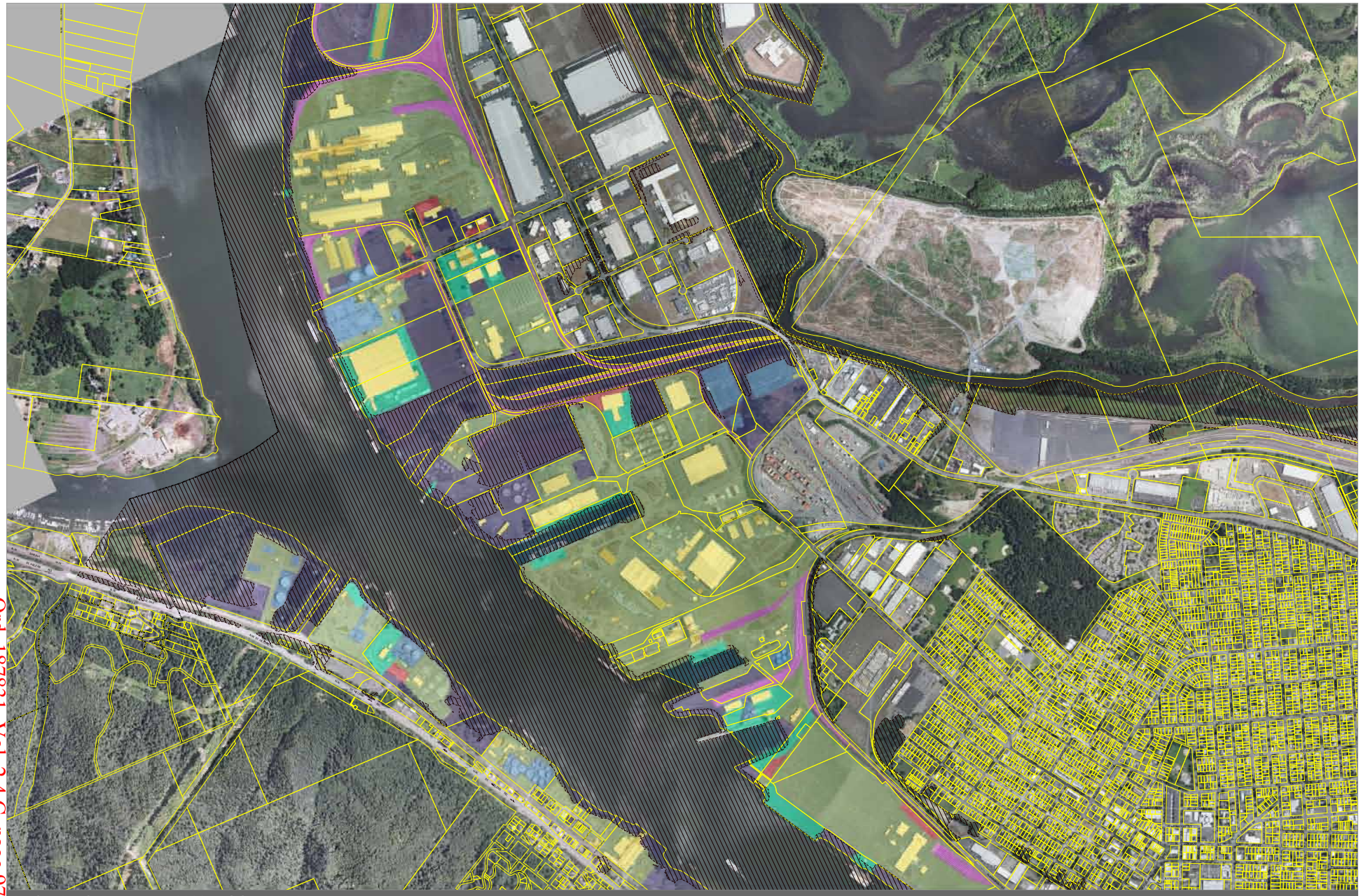


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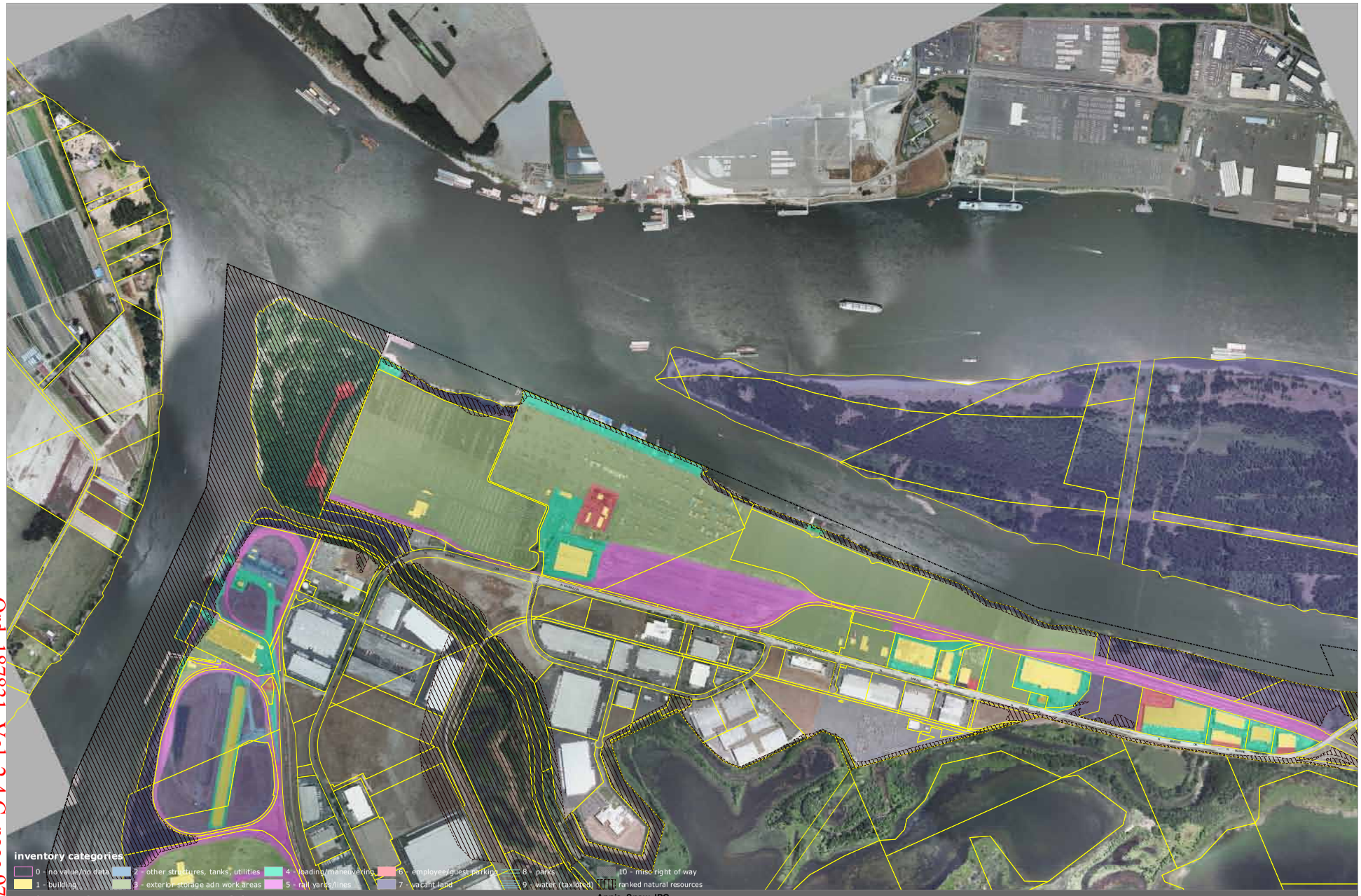


Ord. 187831, Vol. 2.4.C, page 9715




Ord. 187831, Vol. 2.4.C, page 9716




## Harbor Lands Inventory - 2007 aerials - Vancouver

- 1 - building
- 2 - other structures, tanks, utilities, concrete plant
- 3 - exterior storage and work areas
- 4 - loading/maneuvering
- 5 - rail yards/lines
- 6 - employee/guest parking
- 7 - vacant land
- 9 - water (part of lot)
- Not Port owned

NORTH

May 18, 2011 City of Portland | Bureau of Planning & Sustainability | Geographic Information System

The information on the map was derived from digital data-bases on the City of Portland, Bureau of Planning and Sustainability GIS. Care was taken in thecreation of this map but it is provided "as is". The City of Portland cannot accept any responsibility for error, omissions, or positional accuracy, and therefore, there are no warranties which accompany this product. However, notification of any errors will be appreciated.

City of Portland Bureau of Planning & Sustainability

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# CITY OF PORTLAND
# ECONOMIC OPPORTUNITIES ANALYSIS:

## Section 2 and 3 – Employment Land Needs and Supply Analysis





## JANUARY 2015 Proposed Draft

This EOA report has been funded through a grant from the State of Oregon Department of Land Conservation and Development.

**City of Portland Bureau of Planning & Sustainability**

**E. D. Hovee & Company, LLC**

Economic & Development Services

# EXECUTIVE SUMMARY

The EOA is an analysis of the 20-year supply and demand for employment development and land in the city. It is prepared according to State Administrative Rule OAR 660-09-0015 and consists of four sections:

1. Trends, Opportunities & Market Factors
2. Long Range Employment Forecast (Demand)
3. Buildable Land Inventory (Supply)
4. Community Choices (Comprehensive Plan proposals to meet employment land needs)

This report includes the second and third sections and presents the 2010-2035 employment forecast and resulting demand for employment land as well as the inventory of buildable employment land.

## KEY FINDINGS

- The Metro regional employment forecast allocates 511,000 jobs to the City of Portland in 2035, an addition of 141,600 new jobs in the 2010-2035 period.
- This job forecast translates into a demand for 71.5 million square feet of floor area in typical commercial and industrial building types, the equivalent of 2,560 acres of employment land.
- Portland's traded-sector economy needs an additional 350-580 acres of land for marine terminals, rail yards, and airport facilities. The range relates to two scenarios analyzed for marine terminal growth.
- Buildable Land Inventory identifies a supply of 3,200 acres of vacant and underutilized employment land, but it is not always the right type or in the right location.
- The City of Portland will need additional development capacity for industrial land, especially for Harbor Access Lands and in the Harbor and Airport Districts.
- Additional development capacity is also needed on the major institutional campuses, Central City Industrial, and Dispersed Employment geographies.

## EMPLOYMENT FORECAST AND LAND DEMAND

The City of Portland employment forecast is based on the Metro regional forecast of job growth. According to this forecast, Metro has prepared a baseline forecast for the Portland region in which employment is expected to increase from just under 1 million jobs in 2010 to nearly 1.5 million in 2035 - a gain of over 537,000 jobs with an average annual growth rate in the range of 1.8% per year over the 2010-2035 period.

Metro allocates 511,000 of these projected 1.5 million total jobs expected in 2035 to the City of Portland. When compared with actual 2010 employment of 370,000 jobs, the projected Portland job gain is approximately 141,600 jobs over the 2010-35 forecast period – an annual average growth rate of 1.3% and a 26% capture rate of regional employment growth.

The Economic Opportunity Analysis translates this forecast growth into demand for additional employment related development and land supply. After accounting for jobs that locate in residential areas (schools, home occupations, non-conforming uses), there is an estimated demand for 2,560 acres of employment land citywide in six typical commercial and industrial building types (such as office buildings or warehouse/distribution buildings).

Portland is a key freight distribution hub on the West Coast. As such, substantial additional land is needed for air, marine, and rail terminals that support the overall traded-sector economy. These specialized types of freight transportation facilities are treated as separate line items of land demand, because they are estimated primarily by transportation throughput. They also represent specialized, land-intensive building types that do not match the typical building needs of other transportation sector employment growth. An additional 350 to 580 acres of land is needed for these facilities and is added to the demand for industrial land in other building types.

### Figure 1. 2010-2035 Employment Forecast and Land Demand

| | Jobs | | Acres | |
|---|---|---|---|---|
| **Aggregate Geography** | **#** | **%** | **#** | **%** |
| Central City | 44,740 | 32% | 150 | 6% |
| Industrial | 31,630 | 22% | 1,350 | 53% |
| Neighborhood Commercial | 35,140 | 25% | 690 | 27% |
| Institutions | 22,730 | 16% | 370 | 14% |
| Residential | 7,400 | 5% | NA | - |
| **Total** | **141,640** | **100%** | **2,560** | **100%** |

| **Traded Sector Support Facilities** | **Additional Acres** |
|---|---|
| Rail Yards | 200 |
| Marine Terminals* | 110/340 |
| Airport Facilities | 40 |
| **Total** | **350/580** |

* Two marine terminal forecast scenarios are analyzed. See Figure 17.

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability

## BUILDABLE LAND INVENTORY

The Buildable Land Inventory (BLI) is based on a GIS model developed by the Bureau of Planning and Sustainability (BPS) that looks at the difference between existing and allowed development to determine the remaining development capacity under the current comprehensive plan. The capacity is reduced to account for constraints such as infrastructure, brownfields, and natural resources protection. It also reduces capacity if the site is likely to be developed as a mixed-use employment/residential building by discounting the portion of building space that would be residential space based on past development trends. The development capacity is also adjusted for market factors in some areas to reflect zoned capacity that is more than is currently being developed or expected to be developed in the foreseeable future.

The citywide employment development capacity is about 152 million square feet, which is distributed across the different employment geographies. The employment land supply is presented in three stages – the base supply (vacant and underutilized parcels), the constrained supply, and the (final) adjusted market supply (see Figure 2).

### Figure 2. Summary of 2035 Employment Development Capacity

| Aggregate Geography | Acres | Bldg SQFT | % of Base |
|---|---|---|---|
| Central City | 266 | 49,297,000 | 85% |
| Industrial | 1,365 | 59,442,000 | 52% |
| Neighborhood Commercial | 1,303 | 32,506,000 | 24% |
| Institutions | 306 | 10,676,000 | 100% |
| **Total** | **3,240** | **151,921,000** | **48%** |

Source: Bureau of Planning and Sustainability

## LAND NEEDS RECONCILIATION

By subtracting effective land supply from demand, it is possible to determine whether and to what extent Portland's employment land base will be adequate to serve forecast needs over the 2035 planning horizon. In cases where there is adequate inventory, a land surplus is indicated; where the inventory is not adequate, a resulting deficit is calculated.

### Figure 3. 2035 Employment Land Needs

| Employment Geography | Added Jobs | Land Demand | Existing Supply | Surplus/ Deficit | % Capacity |
|---|---|---|---|---|---|
| Central City Commercial | 34,120 | 60 | 201 | 141 | 335% |
| Central City Industrial | 10,620 | 90 | 65 | **-25** | **72%** |
| Harbor & Airport Districts* | 16,210 | 1,020 | 774 | **-246** | **76%** |
| Harbor Access Lands* | 1,910 | 200/430 | 113 | **-87/-317** | **57%/26%** |
| Columbia East | 9,310 | 350 | 356 | 6 | 102% |
| Dispersed Employment | 4,200 | 130 | 121 | **-9** | **93%** |
| Gateway Regional Center | 3,970 | 50 | 137 | 87 | 274% |
| Town Centers | 6,160 | 130 | 304 | 174 | 234% |
| Neighborhood Centers & Corridors | 25,010 | 510 | 863 | 353 | 169% |
| Institutions | 22,730 | 370 | 306 | **-64** | **83%** |
| Residential | 7,400 | - | - | **-** | **-** |
| **Total** | **141,640** | **2,910/3,140** | **3,240** | | |
| **Aggregate Geography** | | | | | |
| Central City | 44,740 | 150 | 266 | 116 | 177% |
| Industrial* | 31,630 | 1,700/1,930 | 1,365 | **-335/-565** | **80%/71%** |
| Neighborhood Commercial | 35,140 | 690 | 1,303 | 613 | 189% |
| Institutions | 22,730 | 370 | 306 | **-64** | **83%** |
| Residential | 7,400 | - | - | - | - |
| **Total** | **141,640** | **2,910/3,140** | **3,240** | | |

* Total land demand shown here includes Traded Sector Support Facilities in marine, rail and air terminals. Harbor Access Lands demand is shown with two marine-terminal forecast scenarios (see Figure 17).

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability

There are specific geographies that have a deficit or shortfall that will need to be addressed to provide an adequate supply of development capacity to meet the forecasted employment growth. Specifically, additional policy changes, zoning capacity, public investments, and development incentives will be needed to address capacity shortfalls in the **Central City Industrial, Harbor & Airport Districts, Harbor Access Lands, Dispersed Employment,** and **Institutions** geographies. The Comprehensive Plan update will need to identify changes to policy or zoning, public investments, development incentives or other means to address these deficits and meet the forecast demand.

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# I. INTRODUCTION

As part of Periodic Review, the City of Portland is required to complete an Economic Opportunities Analysis (EOA) to comply with Oregon Statewide Planning Goal 9. The EOA evaluates the types and amounts of employment land needed to accommodate expected growth to 2035. The EOA is intended to inform the Comprehensive Plan Update, consistent with Statewide Planning Goal 9 and regional capacity analysis.

## ORGANIZATION OF EMPLOYMENT LAND NEEDS ANALYSIS

The Task 2 / 3 supply and demand analysis report is organized to cover the following topics:

- Employment Forecast and Land Demand Analysis
- Buildable Land Inventory
- Land Needs and Supply Reconciliation
- Short-Term Land Needs Analysis
- Lot Size Analysis

## METHODOLOGY

The EOA methodology of evaluating the adequacy of current development capacity has two parallel steps for estimating land demand to 2035 and current supply available to meet it, as summarized in (Figure 4). The first part determines the demand for developable land based on a future employment forecast. The process of estimating demand has many steps to translate Metro's regional employment forecast (jobs) into a demand for land (building square footage/acres) by employment geography types. The second part establishes the amount of the employment land supply available for development and is based on the Buildable Land Inventory (BLI). The BLI estimates the development capacity of vacant and underutilized land that is available for development, while factoring various constraints on development such as lack of infrastructure, natural resources, or brownfields. The final step is a reconciliation or comparison between the demand for employment land and the available supply to identify any unmet land needs – the shortfalls or gaps. Measures to address these gaps to ensure an adequate supply of land to meet forecasted demand will be addressed through the comprehensive plan update process.

This report was updated in 2014. Appendix C of the EOA Section 4 Report includes a detailed description of revisions in the 2014 update. The citywide employment forecast was reduced to be consistent with Metro's adopted employment allocation to the City of Portland in 2012. The short-term land supply demand horizon was extended to 2020 to address 5-year land needs. Harbor Access Lands was identified as a distinct employment geography and two marine terminal demand scenarios were analyzed there. The Employment Geographies map was revised to be consistent with the proposed update of the Comprehensive Plan. And the Buildable Land Inventory was updated, including revisions to the employment geographies, vacant and underutilized land map, and constraints mapping.

## Figure 4. EOA Methodology

**Demand**

Forecast land demand to 2035

**Region/City Forecast**

Metro forecasts 537,000 new jobs in 7-county MSA from 2010 to 2035 and a 26% capture rate for Portland, consistent with post-1980 growth trends. Portland's employment forecast is for 141,600 new jobs by 2035

**Sector Growth**

Allocate employment to different employment sectors (manufacturing, finance, retail, etc.). Growth rates of different sectors are estimated from national and regional trends and adjusted by 2000-2008 city trends.

**Building Space Needs by Type**

Job growth by sector is allocated to six building types (e.g., office, warehouse), based on sector--to-building-type and jobs-per-square-foot assumptions.

**Land Demand by Employment Geography**

Building space needs are allocated to nine employment geographies (e.g., Central City Commercial). Each geography represents areas with a distinct mix of jobs, building types, and sites. Special needs for marine, airport, and rail terminals are based on throughput trends.

**Supply**

Inventory current land capacity

**Buildable Land Inventory**

Underutilized land was inventoried as the sites most likely to accommodate new building space, based on development trends. The inventory consists of vacant land (undeveloped) and redevelopable sites (buildings with less than 20% of allowable zoning density). Industrial land is limited to vacant land.

**Effective Supply of Constrained Land**

The capacity of constrained sites were reduced to reflect the difficulty in developing sites with infrastructure needs, brownfields, environmental resources, historic sites, etc.

**Adjustments**

Mixed- Use - zoning districts can allow for mixed use development, which requires an allocation between employment and residential capacity.

Market Factor - in some areas, land is zoned to allow more development or taller buildings than the real estate market can support by 2035.

**Land Supply by Employment Geography**

Estimate available land supply for each employment geography.

**Demand/Supply Reconciliation**

Forecast demand and effective supply were compared by employment geography. Supply shortfalls were identified in geographies where additional capacity is needed to meet projected demand.

# II. EMPLOYMENT & LAND DEMAND FORECAST

This chapter details the methodology used to forecast employment-related land needs within the City of Portland through 2035.

As stipulated by Statewide Planning Goal 9 (Economy of the State), the intent of the Economic Opportunities Analysis is to "compare the demand for industrial and other employment uses to the existing supply of such land." This section details the employment forecast that drives the demand for employment land. While employment growth serves as a major driver for land demand, the forecast process also recognizes that some needs (such as regional transportation facilities) require industrial land that can be more accurately estimated by the transportation throughput (e.g, marine cargo or airport passengers) handled at these facilities.

## EMPLOYMENT FORECAST METHODOLOGY

Metro prepares a regional forecast of population and employment growth for the 7-county PMSA region and then allocates that forecast to individual jurisdictions.[1] The Portland allocation anticipated job growth is translated into land demand via an excel worksheet model. The key steps in translating job growth into land demand are outlined below. The Portland employment forecast is dependent on two main factors – the total employment forecast for the region and the percent share of forecast growth assigned to Portland. In 2012, Metro adopted a single point regional forecast of 1.49 million total jobs in the region by 2035.[2] Supporting data tables are provided in Appendix C.

1. **Portland Metro Regional Employment Forecast.** The City of Portland employment forecast is based on the Metro regional forecast of job growth. With the baseline forecast, Portland PMSA non-farm employment would increase from recession dampened figure of less than 1 million jobs in 2010 to nearly 1.5 million in 2035, a gain of approximately 537,000 jobs with an average annual growth rate in the range of 1.8% per year over the 2010-2035 time period. Metro uses a forecasted employment figure as the starting point year (2010) of approximately 943,100 non-farm workers. For this EOA, the starting point has been adjusted to actual 2010 covered employment of 949,700 as reported by the Oregon Employment Department (OED) using the Quarterly Census of Employment and Wages (QCEW). Sector specific data is aggregated to cover 18 broad employment classifications consistent with the North American Industry Classification System (NAICS).

2. **Allocation of Metro Employment Forecast to City of Portland.** Metro allocates 517,000 total jobs by 2035 to the City of Portland. When compared with actual 2010 employment of 370,000 jobs, this results in a projected Portland job gain of

[1] The U.S. Census Bureau defines the Portland PMSA as a 7-county region consisting of Multnomah, Washington, Clackamas, Yamhill and Columbia Counties in Oregon together with Clark and Skamania Counties in Washington.

[2] Previously, Metro had used a range forecast. This forecast is based on Metro's "GAMMA" run of the 2035 forecast that was provided to the City of Portland in October 2011. Metro continues to refine the local jurisdiction allocation process, which is expected to be finalized in June 2012. The final allocation may vary, but is not expected to materially change the results of this analysis.

approximately 141,600 over the 2010-35 forecast period – an annual average growth rate of 1.3%.

3. **Allocation of Job Growth by Employment Geography.** The employment forecast is geo-coded to each of 10 employment geographies and a remainder "residential" geography based on actual covered employment records in 2010. An additional geographic-shift factor is also applied to the employment forecast for each geography, calculated by their relative employment trends between 2000 and 2008 (the peak-to-peak period of the last business cycle). Thus, the forecast reflects both sector trends at the national and regional level and local geography trends at the employment district level. Resulting detailed working data tables provide employment by geography and NAICS categories.

4. **Allocation of Job Growth by Building Type.** While Metro forecasts are classified by NAICS-specific employment or industrial sectors, the employment growth is translated to the demand of building square footage and acres of land for commercial and industrial land uses by allocating sector-specific job growth to each of six building types. General industrial, warehouse and flex space/business park categories are building types common to industrial employment uses. Office, retail and institutional building types are for commercial uses.

   The job growth allocations by geography (Step 3) are matched to the distribution of jobs by building type. Shifting geographic shares of employment accounted for by a particular building type are forecast forward to 2035. For example, geographies that have increased their share of the city's office employment are expected to continue to do so over the next 25 years – but at a rate of change slower than that of the last decade.

   This allocation is consistent with the Metro forecast distribution with minor adjustments based on a more detailed analysis of employment sector trends in Portland. For forecast steps 4-6, city-specific forecast modeling includes inputs from Metro (including the Metroscope model) together with results of an *Employment & Economic Trends Analysis* conducted by E. D. Hovee & Company, LLC for Metro in 2009, as further refined with input from the City of Portland Bureau of Planning and Sustainability.

5. **Building Space per Employee.** Industry standard estimates of the building square footage that houses a typical employee are applied to each of the six building types and to Portland's 10 employment geographies. These estimates are consistent with the Metro analysis with City-provided adjustments, especially with respect to analysis conducted for the City of Portland's industrial areas.[3]

[3] City of Portland, 2004 Industrial Districts Atlas

6. **Intensity of Development.** Floor area ratios (FARs) are a measure of building square footage on a site divided by site area (in square feet). FARs in this analysis reflect results of Metro employment study research together with input from the City of Portland Industrial Atlas (providing overall data for employees per acre as a composite control check on results of steps 5 and 6).

   Anticipated intensity of development is intended to increase somewhat over the 25-year forecast period, as available vacant sites are in shorter supply. The rate of FAR increase is greater for commercial than industrial building types and geographies.

7. **Building square feet is translated into land area** via Floor Area Ratios (FAR). A separate FAR is assumed for each building type and each geography. FARs are based on actual FARs that are increased over the 25 year forecast period to reflect increasing densities as the land supply becomes limited over time.

## Figure 5. Forecast Employment Lands Assumptions Summary

| Forecast Variable | Assumptions | Calculations in Appendix A |
|---|---|---|
| ***Employment Growth:*** | | |
| 1. Metro PMSA Job Forecast (2010-35) | 537,000 jobs (1.8% AAGR) | Figure 28 |
| 2. Portland Capture of PMSA Job Growth (% Portland Growth) | 26% Capture (1.3% AAGR) | Figure 29 |
| 1+2 Resulting Portland Job Forecast (25 Year) | 141,600 | Figure 30 |
| ***Building- Land Need:*** | | |
| 3. Job Allocation to Building Types | Does not vary | Figure 31 |
| 4. Typical Building Square Feet per Job | Does not vary | Figure 33 |
| 5. Floor Area Ratios (FARs) | Central City increases by 34%<br>Other non-industrial by 10%<br>Industrial constant. | Figure 34 |

Note: AAGR depicts average annual growth rate, calculated as a compound average.

Source: E. D. Hovee & Company, LLC.

8. **Employment Land Demand Results.** Results of this forecast and allocation process are presented in terms of added employment, building space needs, gross land acreage needs, and associated FARs over the 2010-35 horizon for each of the city's 10 employment geographies.

9. **Traded-Sector Support Facilities.** In addition to typical land absorption corresponding to employment growth in each standard building type, the City of Portland will need land set aside for atypical regional transportation facilities that support the regional economy such as airport aviation support, rail yard, and marine terminal needs. These added industrial land needs are more accurately estimated by the transportation throughput

handled at these significant regional transportation facilities (e.g., marine cargo and airport passengers). To prevent double counting, the typical land needs associated with the job growth of the sectors at these facilities (which are already counted in the forecast) are deducted from the total land forecast estimated by transportation throughput.

10. **Total Land Demand for Employment.** The overall demand for employment land is the combination of the demand for land for employment growth and traded-sector transportation facilities.

## EMPLOYMENT GEOGRAPHIES

The results of the employment forecast and resulting demand for development land are reported by ten summary employment land geographies, allowing development assumptions to vary across the City and provide more detail in describing job growth trends and forecasts together with associated building and anticipated land acreage needs. The employment geographies are subareas of the city that represent types of business districts as examined and defined in Section 1. While each geography has a mix of sectors, some geographies also have clear sector specializations. For example, 62% of the Central City Commercial jobs in 2008 were in the office sectors, 64% of industrial area jobs were in the industrial sectors, and 98% of the institutional campus jobs were in health care and education (see Figure 11 in EOA Section 1).

Each "employment land geography" represents (1) a collection of established business districts by type that reflects business location preferences (agglomeration) and community location preferences (comprehensive plan); (2) a segment of citywide demand for employment land, consisting of a distinct mix of business sectors and building types; and (3) a segment of the city's current developable land supply (see Figures 6, 7 and 8). Methodologically, the geographies represent a way of linking 25-year demand by site type to location advantages and developable land supply.

Figure 8 shows the employment geographies of the proposed Comprehensive Plan. It also depicts map changes from the existing Comprehensive Plan employment geographies that were used in EOA Section 1 to describe current conditions and trends. The proposed Comprehensive Plan geographies were used to estimate adequate existing and proposed capacity to meet the forecasted demand. Figure 9 depicts the configuration of the Harbor & Airport Districts and Harbor Access Lands geographies and the related multimodal freight infrastructure located there.

These employment geographies are summarized into four larger aggregate categories of: Central City, industrial, neighborhood commercial, and institutions. The residential geography is primarily associated with institutional uses occurring in residential areas, home occupations, non-conforming uses and ancillary employment with open space areas (ranging from golf courses to public parks).

.

## Figure 6. Employment Geographies

| Category | Employment Geography |
|---|---|
| **Central City** | Central City Commercial |
| | Central City Industrial |
| **Industrial** | Harbor & Airport Districts |
| | Harbor Access Lands |
| | Columbia East (east of 82nd Ave) |
| | Dispersed Employment |
| **Commercial** | Gateway Regional Center |
| | Town Centers |
| | Neighborhood Centers & Corridors |
| **Institutions** | Institutions |
| **Residential** | Residential areas and open space not included in the other geographies |

**Institutional Campuses**

| **Universities** | **Hospitals** |
|---|---|
| Reed College | Oregon Health & Science University |
| University of Portland | Shriner's Hospital |
| Concordia University | Portland Veteran's Hospital |
| Warner Pacific University | Providence Portland Medical Center |
| Lewis and Clark College | Kaiser Medical Centers |
| Portland Community College – Southeast | Legacy Emanuel Hospital |
| Portland Community College – Cascade | Legacy Good Samaritan Hospital |
| Portland Community College – Sylvania | |
| Multnomah University | |
| Western States Chiropractic College | |

Institutions included in other employment geographies:

*Portland State University (Central City)* *Adventist Medical Center (Gateway)*

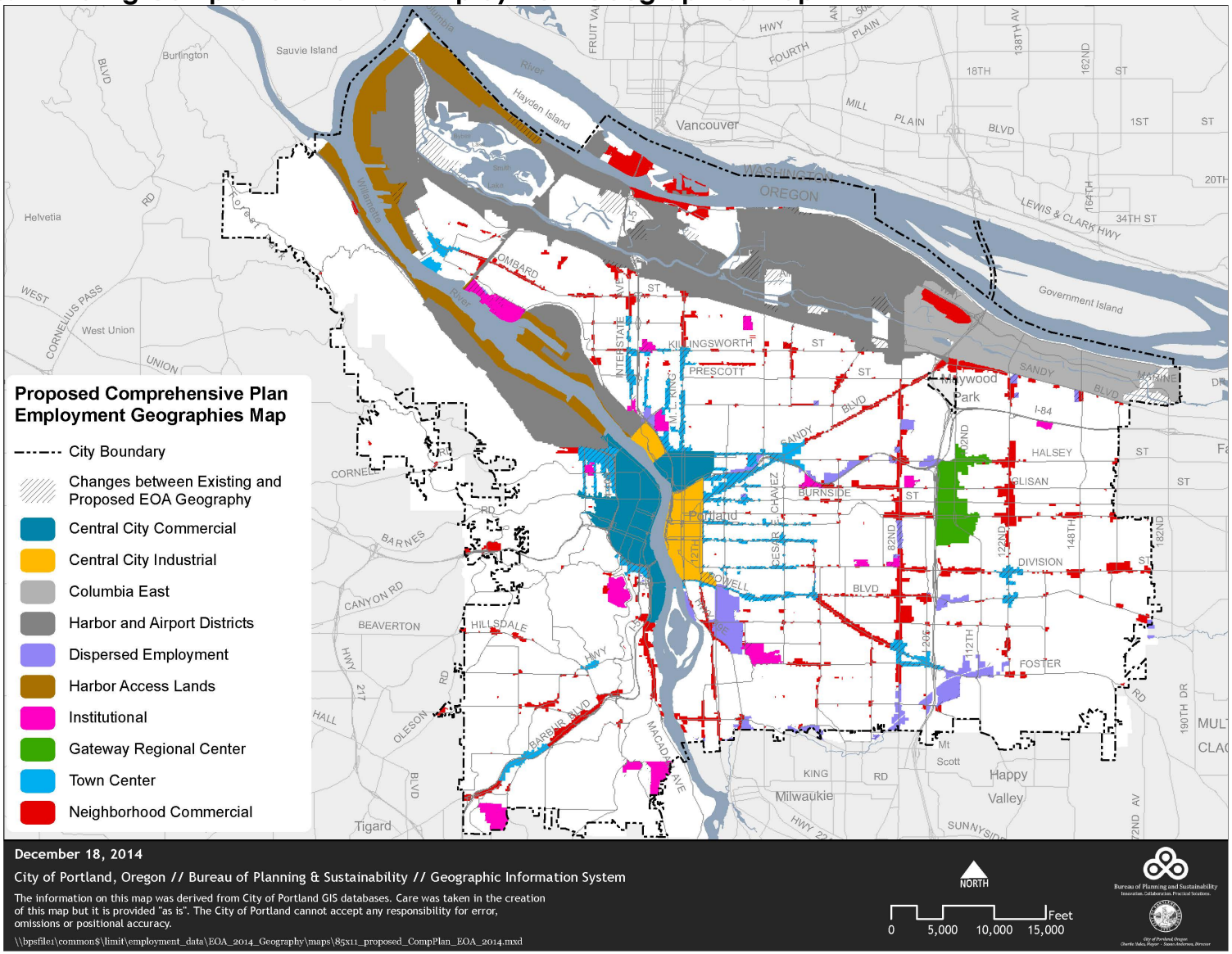
## Figure 7. Predominant Site Conditions of Employment Geographies

| Location | Types of Businesses | Density/site size | Features |
|---|---|---|---|
| **Central City** | | | |
| **Central City Commercial** | | | |
| Central City westside, Lloyd | Office, mixed employment | High, <1 acre | Regional CBD |
| **Central City Industrial** | | | |
| Central Eastside, L. Albina | Industrial, mixed employment | Medium, <3 acres | Incubator/industrial |
| **Industrial** | | | |
| **Harbor & Airport Districts** | | | |
| Harbor upland & Airport* | Distribution, manufacturing | Low, 1-100+ acres | Marine/rail/air hub |
| **Harbor Access Lands** | | | |
| Harbor frontage* | River-dependent/related industry | Low, 5-100+ acres | Deepwater channel |
| **Columbia East** | | | |
| Col. Corridor E of 82nd | Industrial, mixed employment | Low, 1-20 acres | Flex industrial parks |
| **Dispersed Employment** | | | |
| Neighborhoods | Industrial, mixed employment | Low, <1-10 acres | Freeway proximity |
| **Commercial** | | | |
| **Gateway Regional Center** | | | |
| I-84 at I-205 | Mixed employment | Medium, <1-6 acres | Transit/freeway hub |
| **Town Centers** | | | |
| Neighborhoods | Institutional, mixed commercial | Low/med., <1-3 acres | Mixed-use centers |
| **Neighborhood Centers & Corridors** | | | |
| Neighborhoods | Retail, mixed employment | Low, <1-10 acres | Commercial corridors |
| **Institutions** | | | |
| **Institutions** | | | |
| Neighborhoods | Hospitals, colleges | Low/med., >10 acres | 17 large campuses |

* The Harbor & Airport Districts includes the Northwest, Swan Island, Rivergate, and Airport industrial districts, excluding Harbor Access Lands that extends generally one block from the deepwater channel.

Source: Bureau of Planning and Sustainability

## Figure 8. Existing Comprehensive Plan Employment Geographies Map




Source: E.D. Hovee & Company, LLC, City of Portland Bureau of Planning & Sustainability.

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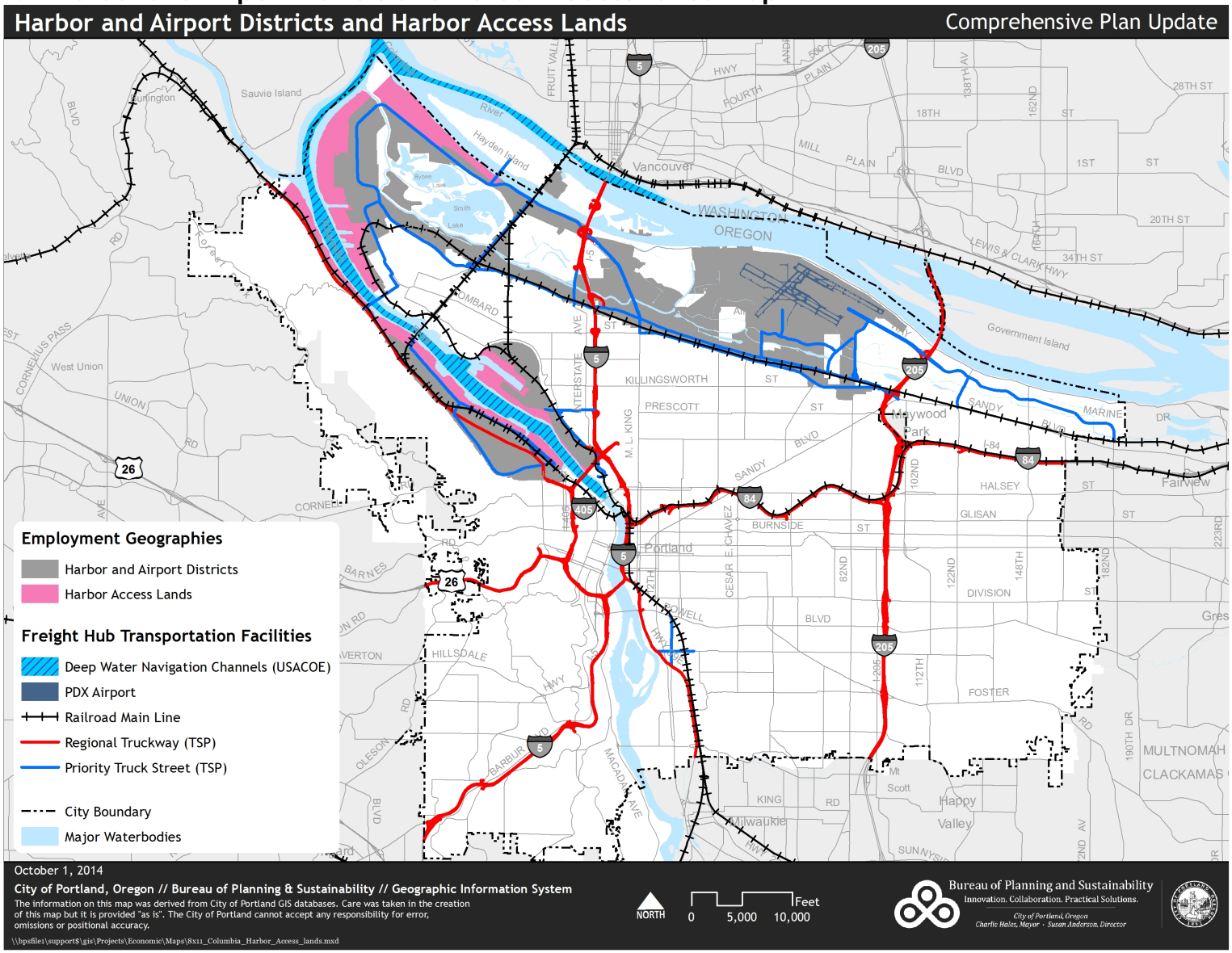
## Figure 9. Harbor and Airport Districts and Harbor Access Lands Map




Source: E.D. Hovee & Company, LLC, City of Portland Bureau of Planning & Sustainability.

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## EMPLOYMENT FORECAST RESULTS

Overall, Portland's employment growth is expected to capture approximately 26% of the region's employment growth. The forecast reflects an expectation of continued, but relatively slower, decline in the City's overall share of regional employment. In 2010 Portland had nearly 39% of the region's job base. This forecast estimates that share will decline to 34% by 2035. While each of Portland's 18 job sectors have varied shares of regional employment, the allocation assumes that each sector's proportion of corresponding regional employment declines at a similar rate over the 25-year forecast period. Figure 10 shows the distribution of the employment forecast by sector. The institutional sectors (health and education) account for nearly 52,000 new jobs or 36% of the growth. While the manufacturing sector declines slightly as consistent with national and regional forecast expectations, the warehousing and distribution sectors are expected to see strong growth with over 16,000 new jobs by 2035.

### Figure 10. City of Portland Employment Forecast by Sector

| Employment Sector | 2010 | 2035 | Job Change 2010-35 | Avg Rate of Growth 2010-35 |
|---|---|---|---|---|
| Agriculture & Mining | 392 | 353 | (39) | -0.4% |
| Construction | 14,224 | 21,539 | 7,315 | 1.7% |
| Manufacturing | 25,035 | 24,076 | (959) | -0.2% |
| Wholesale Trade | 18,009 | 23,009 | 5,000 | 1.0% |
| Retail Trade | 31,060 | 32,963 | 1,903 | 0.2% |
| Transportation, Warehousing & Utilities | 23,676 | 34,978 | 11,302 | 1.6% |
| Information | 9,640 | 13,761 | 4,121 | 1.4% |
| Finance | 17,048 | 24,270 | 7,222 | 1.4% |
| Real Estate | 7,946 | 15,366 | 7,420 | 2.7% |
| Professional Services | 26,943 | 38,861 | 11,918 | 1.5% |
| Management | 14,322 | 21,683 | 7,361 | 1.7% |
| Administrative & Waste Services | 18,449 | 28,110 | 9,661 | 1.7% |
| Educational Services | 37,937 | 61,196 | 23,259 | 1.9% |
| Health & Social Services | 50,616 | 78,876 | 28,260 | 1.8% |
| Arts, Entertainment & Recreation | 6,741 | 8,493 | 1,752 | 0.9% |
| Accomodation & Food Services | 35,102 | 44,222 | 9,120 | 0.9% |
| Other Services | 16,802 | 23,076 | 6,274 | 1.3% |
| Government (Civilian) | 15,498 | 16,251 | 753 | 0.2% |
| **TOTAL EMPLOYMENT** | **369,440** | **511,083** | **141,643** | **1.3%** |
| City Share of Portland Metro Employment | 39% | 34% | 26% | |

Source: E. D. Hovee & Company, LLC based on Metro projection and City/Metro forecast 2035 allocation.

The City of Portland employment forecast allocation of 141,600 additional jobs is distributed to the employment geographies based on actual employment distribution in 2010 and trends from the recent 2000-2008 business cycle (Figure 11).

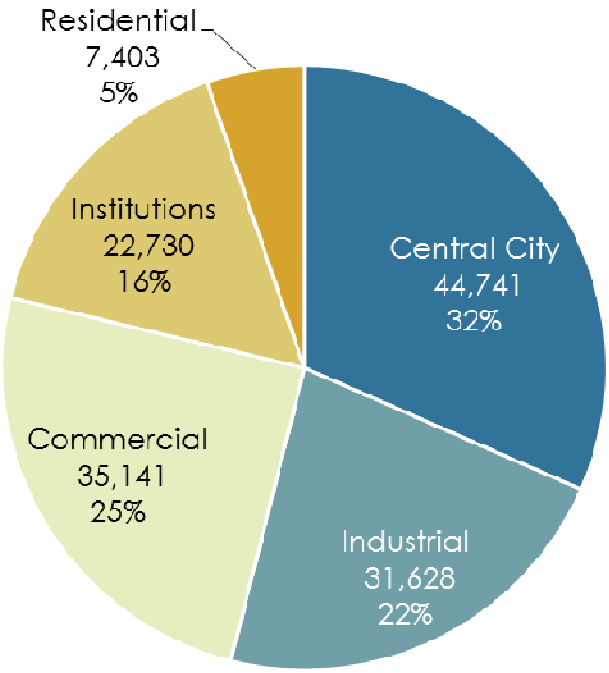
## Figure 11. Employment Forecast by Employment Geography

| Employment Geography | Added Jobs | Square Feet | Total Acres* | FAR* |
|---|---|---|---|---|
| Central City Commercial | 34,124 | 13,598,000 | 60 | 5.20 |
| Central City Industrial | 10,617 | 5,218,000 | 90 | 1.33 |
| Harbor & Airport Districts* | 16,215 | 11,994,000 | 780 | 0.35 |
| Harbor Access Lands* | 1,905 | 1,409,000 | 90 | 0.36 |
| Columbia East | 9,308 | 6,140,000 | 350 | 0.40 |
| Dispersed Employment | 4,200 | 2,060,000 | 130 | 0.36 |
| Gateway Regional Center | 3,970 | 1,996,000 | 50 | 0.92 |
| Town Centers | 6,160 | 3,199,000 | 130 | 0.56 |
| Neighborhood Centers & Corridors | 25,011 | 11,549,000 | 510 | 0.52 |
| Institutions | 22,730 | 12,892,000 | 370 | 0.80 |
| Residential | 7,403 | NA | NA | NA |
| **Total** | **141,643** | **70,055,000** | **2,560** | |
| **Aggregate Geography** | | | | |
| Central City | 44,741 | 18,816,000 | 150 | 2.88 |
| Industrial | 31,628 | 21,603,000 | 1,350 | 0.37 |
| Neighborhood Commercial | 35,141 | 16,744,000 | 690 | 0.56 |
| Institutions | 22,730 | 12,892,000 | 370 | 0.80 |
| Residential | 7,403 | NA | NA | NA |
| **Total** | **141,643** | **70,055,000** | **2,560** | |

* Total land and FAR shown here do not include Traded Sector Support Facilities in marine, rail and air terminals. See Figures 16 and 17.
Source: E.D. Hovee & Company, LLC

The share of employment distributed to different areas is not expected to change very much. About one-third or 45,000 new jobs are expected in the Central City (Figure 12). Industrial area jobs are forecast to account for about 22% of citywide employment growth. Campus institutions are expected to expand with about 23,000 new jobs or 16% of the job growth, which will raise their share of the City's overall employment.

**Figure 12. 2010-2035 Employment Growth Distribution**




Source: E.D. Hovee & Company, LLC

## EMPLOYMENT LAND DEMAND

The employment forecast allocation is translated into a resulting demand for building square footage and land (Figure 13). The employment growth is expected to generate the demand for nearly 77 million square feet of building space, requiring approximately 2,560 acres of buildable land area. The Central City land demand is 150 acres, and an additional 690 acres of land is needed for development in the Neighborhood Commercial geographies elsewhere in Portland. Job growth on institutional campuses will need capacity for about 13 million square feet of buildings or about 370 acres of buildable land. The largest demand for land will be for approximately 1,400 acres of industrial land (excluding freight terminals), which is to be expected given the lower employment densities (jobs per acre) and FARs for industrial buildings.

Also, approximately 7,400 of the new jobs created (or 5% of the total job growth) is allocated to residential and open-space designated areas of the city. This growth is primarily associated with institutional uses occurring in residential areas. It also includes schools, churches, home occupations and non-conforming uses and ancillary employment with open space areas (ranging from golf courses to public parks). For the purposes of forecasting future demand for employment land, it is assumed that the jobs in the residential areas locate on residential land that is not part of the employment buildable land supply and not considered further in the EOA.

## Figure 13. Employment Forecast Land Demand (2010-2035)

| Employment Geography | Added Jobs | Square Feet | Total Acres* | FAR* |
|---|---|---|---|---|
| Central City Commercial | 34,124 | 13,598,000 | 60 | 5.20 |
| Central City Industrial | 10,617 | 5,218,000 | 90 | 1.33 |
| Harbor & Airport Districts* | 16,215 | 11,994,000 | 780 | 0.35 |
| Harbor Access Lands* | 1,905 | 1,409,000 | 90 | 0.36 |
| Columbia East | 9,308 | 6,140,000 | 350 | 0.40 |
| Dispersed Employment | 4,200 | 2,060,000 | 130 | 0.36 |
| Gateway Regional Center | 3,970 | 1,996,000 | 50 | 0.92 |
| Town Centers | 6,160 | 3,199,000 | 130 | 0.56 |
| Neighborhood Centers & Corridors | 25,011 | 11,549,000 | 510 | 0.52 |
| Institutions | 22,730 | 12,892,000 | 370 | 0.80 |
| Residential | 7,403 | NA | NA | NA |
| **Total** | **141,643** | **70,055,000** | **2,560** | |
| **Aggregate Geography** | | | | |
| Central City | 44,741 | 18,816,000 | 150 | 2.88 |
| Industrial | 31,628 | 21,603,000 | 1,350 | 0.37 |
| Neighborhood Commercial | 35,141 | 16,744,000 | 690 | 0.56 |
| Institutions | 22,730 | 12,892,000 | 370 | 0.80 |
| Residential | 7,403 | NA | NA | NA |
| **Total** | **141,643** | **70,055,000** | **2,560** | |

* Total land and FAR shown here do not include Traded Sector Support Facilities in marine, rail and air terminals. See Figures 16 and 17.

Source: E.D. Hovee & Company, LLC

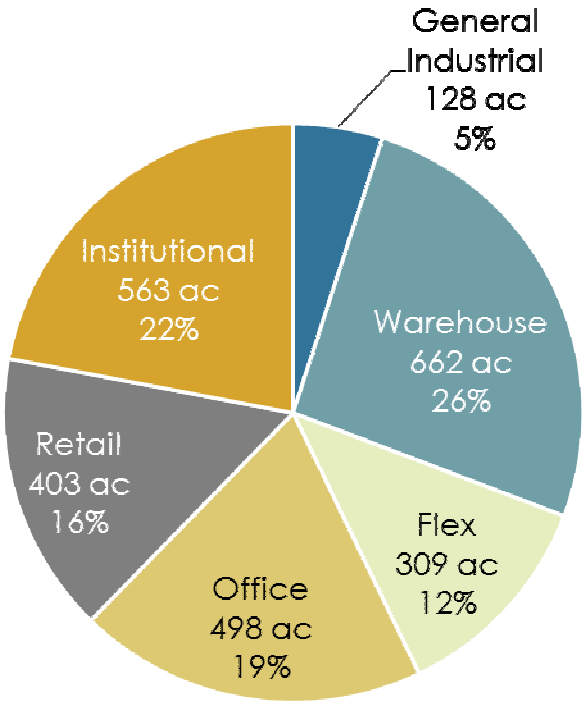
## EMPLOYMENT LAND NEED BY BUILDING TYPE

Figure 14 and 15 disaggregate projected employment land need (in terms of jobs, building square feet and land acres) by building type. Building types roughly correspond to industrial or commercial sectors, however, each geography has a mix of these building types. For example, while much of professional services employment is accommodated by office space, a portion of the demand ends in street-level retail spaces, and another portion in flex (or business park) space.

The table also illustrates that most employment-related demand – even within some industrial areas – derives from the commercial building types (office, retail and institutional). Citywide, 57% of the land demand forecasted is associated with commercial building types – including office, retail and institutional space.

Figure 15 provides the detail for the different types of job growth and land demand within each of Portland's major employment geographies. For industrial buildings, major sources of demand are expected to be associated with warehouse and flex space, with little added net demand projected for general industrial space. With commercial buildings, the primary need is anticipated to be for institutional space (including education and health care) followed by office and retail space.

**Figure 14. Employment Land Demand by Building Type**




Source: E.D. Hovee & Company, LLC.

Commercial building types comprise smaller but still substantial shares of anticipated land need within industrial geographies. For example, in the Central City Incubator geography (the Central Eastside and Lower Albina) commercial building types account for two-thirds of projected land demand; and for the Columbia Harbor geography this proportion accounts for one-quarter of the land demand.

The employment forecast projects that a significant 36% of new employment is expected to be within the health and education sectors. A significant portion of these jobs will be within institutional campuses with about one-half of the institutional building space and land demand allocated for the 17 campuses that make up the institutional employment geography, with the other half spread across the other employment geographies. This distribution and demand is consistent with recent trends in which institutions, especially heath care, appear to be decentralizing and bringing services closer to where people live.

Land demand is also influenced by FARs, as less dense building types (such as retail and warehousing) generate more land demand than building types such as office for an equivalent number of jobs. The FAR assumptions utilized in the forecast are presented in Figure 36 of Appendix A.

## Figure 15. Employment Land Demand by Building Type

| | Industrial Uses | | | Commercial Uses | | |
|---|---|---|---|---|---|---|
| | Jobs | Bldg Sq Ft | Acres | Jobs | Bldg Sq Ft | Acres |
| | **General Industrial** | | | **Office** | | |
| Central City Commercial | (178) | (62,000) | (0) | 22,272 | 7,795,000 | 24 |
| Central City Industrial | 516 | 478,000 | 11 | 5,222 | 1,828,000 | 19 |
| Harbor & Airport Districts | 361 | 335,000 | 22 | 6,104 | 2,136,000 | 135 |
| Harbor Access Lands | 159 | 147,000 | 10 | 673 | 236,000 | 15 |
| Columbia East | 765 | 708,000 | 41 | 3,618 | 1,266,000 | 70 |
| Dispersed Employment | 561 | 519,000 | 34 | 3,129 | 1,095,000 | 69 |
| Gateway Regional Center | 16 | 5,000 | 0 | 1,062 | 372,000 | 5 |
| Town Centers | 54 | 19,000 | 1 | 1,328 | 465,000 | 16 |
| Neighb. Centers & Corridors | 106 | 98,000 | 9 | 10,372 | 3,630,000 | 128 |
| Institutions | (0) | 0 | (0) | 1,927 | 675,000 | 18 |
| **Total** | **2,255** | **2,247,000** | **128** | **57,892** | **19,498,000** | **498** |
| | **Warehouse & Distribution*** | | | **Retail** | | |
| Central City Commercial | 134 | 47,000 | 0 | 6,015 | 2,827,000 | 21 |
| Central City Industrial | 995 | 775,000 | 17 | 1,479 | 695,000 | 31 |
| Harbor & Airport Districts | 5,335 | 6,736,000 | 442 | 1,757 | 826,000 | 54 |
| Harbor Access Lands* | 438 | 552,000 | 36 | 144 | 68,000 | 4 |
| Columbia East | 1,825 | 2,304,000 | 132 | 1,535 | 722,000 | 41 |
| Dispersed Employment | (12) | (15,000) | (1) | (280) | (131,000) | (9) |
| Gateway Regional Center | (29) | (10,000) | (0) | 920 | 432,000 | 27 |
| Town Centers | (4) | (1,000) | (0) | 932 | 438,000 | 32 |
| Neighb. Centers & Corridors | 497 | 388,000 | 35 | 7,591 | 3,568,000 | 158 |
| Institutions | 11 | 4,000 | 0 | 2,013 | 946,000 | 42 |
| **Total** | **9,457** | **10,780,000** | **662** | **22,657** | **10,391,000** | **403** |
| | **Flex*** | | | **Instititutional** | | |
| Central City Commercial | 2,150 | 752,000 | 3 | 3,731 | 2,239,000 | 10 |
| Central City Industrial | 1,026 | 615,000 | 7 | 1,379 | 827,000 | 9 |
| Harbor & Airport Districts | 2,396 | 1,842,000 | 121 | 261 | 156,000 | 10 |
| Harbor Access Lands* | 438 | 337,000 | 22 | 53 | 32,000 | 2 |
| Columbia East | 1,191 | 915,000 | 53 | 373 | 224,000 | 13 |
| Dispersed Employment | 659 | 506,000 | 33 | 143 | 86,000 | 6 |
| Gateway Regional Center | 19 | 7,000 | 0 | 1,983 | 1,190,000 | 17 |
| Town Centers | 124 | 44,000 | 2 | 3,725 | 2,235,000 | 82 |
| Neighb. Centers & Corridors | 1,520 | 910,000 | 68 | 4,924 | 2,954,000 | 107 |
| Institutions | 5 | 3,000 | 0 | 18,775 | 11,265,000 | 308 |
| **Total** | **9,831** | **5,931,000** | **309** | **39,552** | **21,208,000** | **563** |
| | **Total Industrial** | | | **Total Commercial** | | |
| Central City Commercial | 2,106 | 737,000 | 3 | 32,018 | 12,861,000 | 54 |
| Central City Industrial | 2,537 | 1,868,000 | 36 | 8,081 | 3,350,000 | 59 |
| Harbor & Airport Districts | 8,093 | 8,913,000 | 585 | 8,122 | 3,118,000 | 199 |
| Harbor Access Lands | 1,035 | 1,036,000 | 68 | 870 | 336,000 | 21 |
| Columbia East | 3,781 | 3,927,000 | 225 | 5,527 | 2,212,000 | 124 |
| Dispersed Employment | 1,208 | 1,010,000 | 66 | 2,992 | 1,050,000 | 66 |
| Gateway Regional Center | 5 | 2,000 | (0) | 3,965 | 1,994,000 | 50 |
| Town Centers | 175 | 62,000 | 3 | 5,985 | 3,138,000 | 130 |
| Neighb. Centers & Corridors | 2,124 | 1,396,000 | 112 | 22,887 | 10,152,000 | 393 |
| Institutions | 16 | 7,000 | 0 | 22,715 | 12,886,000 | 368 |
| **Total** | **21,542** | **18,958,000** | **1,098** | **120,101** | **51,097,000** | **1,465** |

* Total land demand shown here includes Traded Sector Support Facilities in marine, rail and air terminals.

Source: E.D. Hovee & Company, LLC.

## ADDITIONAL DEMAND FOR INDUSTRIAL LAND

Additional land demand is projected for freight terminals, a prominent land use in Portland, because their building density does not match typical industrial building types and their growth is more accurately estimated by transportation throughput than employment trends.

Portland is a key freight distribution hub and export gateway on the West Coast and is Oregon's largest seaport, rail hub, and airport. As such, air, marine, and rail terminals are prominent land uses in Portland's industrial districts. These freight terminals support the overall traded-sector economy by enhancing access of regional exporters to international and domestic markets, supporting local access and continuing investment in national-system freight infrastructure, and attracting diverse distribution and manufacturing businesses to the region.. In turn, goods production industries (distinct from services) make up 81% of the export income in this region's "trade-dependent" economy, in contrast to the 71% national average (see Brookings Institution export analysis, 2013).

The adopted 2009 Climate Action Plan notes the importance of freight system efficiency, and included the following objective:

> *"Improve the efficiency of freight movement within and through the Portland metropolitan area (Urban Form and Mobility Objective 7)."*

Central to the efficiency of the freight system is the location of industrial areas and the integration with the regional transportation system. Minimizing emissions from freight movement requires protecting and improving intermodal facilities and continuing to connect them to the transportation system. Enhancing strong connections to marine and rail shipment is particularly important because movement of freight with those modes requires a much lower energy cost per ton. In the absence of strong rail and marine connections, more freight will be moved long distance through the Portland region in trucks.

Freight terminal land uses are exceptionally land-intensive. On-site employment is very low at these national/international transportation facilities, but substantial direct and supported job impacts of these facilities is located at other sites in the city, region, and Pacific Northwest.[4] An alternative method is used here to estimate their land needs for two reasons. First, the warehouse and other standard building types used to estimate the land needs of job growth at these freight terminals (see Figure 15) do not match their large site size and low building density. Second, their land needs are more closely related to the volume of transportation throughput handled at these facilities than to related sector employment trends. The overall freight volume handled in the Portland region is forecast to roughly double in tonnage and triple in value between 2007 and 2040 (see EOA Section 1 and the Draft Portland/Vancouver Commodity Flow Forecast, 2014). The resulting additional land demand for these traded-sector support facilities is summarized in Figure 16.

[4] Martin Associates, *Economic Impact of the Port of Portland*, 2011

## Figure 16. Additional Land Demand for Traded Sector Support Facilities

| Traded Sector Support Facilities | Demand (acres) |
|---|---|
| PDX Aviation Support | 40 |
| Rail Yard Expansion | 200 |
| Marine Terminals (Scenarios A/B) | 110/340 |
| **Total** | **350/580** |

Source: Bureau of Planning and Sustainability.

In order to avoid double counting, the estimated land needs of freight terminals are calculated as the difference between their employment-based land need and the land need attributable to transportation throughput, as shown in Figure 17. Marine terminal land needs are expected to be met in the Harbor Access Lands geography, and the rail yard and airport-support facility land needs apply to the Harbor and Airport Districts geography. The overall employment forecast in these geographies reflects existing employers and does not change with this additional land demand.

## Figure 17. Estimation of Land Demand for Traded-Sector Support Facilities

| Traded Sector Support Facilities | Transportation-Trend Forecast (Acres) | Employment-Trend Forecast | | Additional Land Need (Difference) |
|---|---|---|---|---|
| | | New Jobs | Acres | |
| **PDX Aviation Support Facilities*** | | | | |
| Air Transportation and Terminal Services | 72 | 2,450 | 136 | -64 |
| Air Cargo and Car Rental | 135 | 670 | 29 | 106 |
| Other Airport Employers | | 140 | 4 | -4 |
| Total | 207 | 3,260 | 169 | 37 |
| **Rail Yard Expansion** | | | | |
| Rail Yards | 200 | ** | ** | 200 |
| **Marine Terminals** | | | | |
| Scenario A: Low Cargo Forecast*** | 125 | 325 | 19 | 106 |
| Scenario B: Mid-range Cargo Forecast*** | 392 | 850 | 50 | 342 |

* The Airport Futures Plan (2010) used transportation-trend forecasts to estimate these land needs.
** Railroads are not included in Covered Employment data used in employment trends forecast.
*** Marine terminal growth scenarios compare (A) ECONW's "low" capacity need estimate (auto terminals only) and (B) ECONW's mid-range capacity need estimate for new auto, grain, and dry bulk facilities (EOA Task 1 Appendix C).
Source: Bureau of Planning and Sustainability

### *PDX Airport*

The PDX Airport today occupies approximately 2,800 acres, excluding the adjacent Cascade Station and Portland International Center areas. The 2010 Airport Futures Plan and PDX Master Plan were adopted in 2011 by the City of Portland and Port of Portland as a long-range development plan for PDX. These plans included a detailed analysis of airport land needs to 2035 based on an aviation demand forecast (passengers and air cargo) and analysis of specific facility expansion needs. The PDX Master Plan identifies 207 acres of additional land need for new and expanded facilities. However, there is an overlap or double-counting with the

employment-based forecast. The employment located in the airport geography is forecast to generate 175 acres of land demand in standard building types. This employment land demand is deducted from the land need estimated in the Airport Futures Plan, which is derived from air travel demand forecasts rather than employment forecasts.

Figure 17 compares these forecast methods by types of airport facilities. The Airport Futures Plan found that projected passenger travel growth by 2035 can be accommodated by existing runways, so the employment growth associated with air transportation and terminal services can be accommodated. However, land needs for air cargo couriers, general aviation (non-scheduled flights), and rental car lots are more land-intensive than estimated by the employment-based forecast (see Appendix A, Figure 37). Combining the net result of all airport facilities, Airport Futures found an additional 37 acres of 2010-2035 land demand for airport facilities beyond the employment-based forecast. This additional demand for aviation support facilities is rounded to 40 acres and applied as a separate line item in the land demand forecast.

### *Rail Yard Expansion*

Portland is the Pacific Northwest's rail transportation hub, and seven larger rail yards currently occupy approximately 700 acres in Portland's industrial districts. The employment-based forecast allocates no land for railroad or rail yard expansion, because rail transportation employment is not included in Covered Employment data used for the forecast. Rail yard expansion since 2004 has consisted of the Port of Portland's Ramsey Yard and South Rivergate Yard, providing approximately 25 acres of new yard space. While long-term needs and railroad investment plans remain uncertain, likely demand for expansion and modernization of yard facilities is estimated at approximately 200 acres, based on projected rail tonnage growth and the typical size of new rail yards.

Long-term rail transportation forecasts anticipate robust growth. BST Associates projected 2010-2030 freight rail tonnage growth by type for the Oregon Lower Columbia and Oregon Coast areas[5]:

- 4.1% (moderate) to 7.3% (high) average annual growth rate (AAGR) for marine-related rail, such as the trains served by Barnes, Ramsey and South Rivergate Yards in Portland;
- 2% AAGR for merchandise trains, such as those served by Albina Yard in Portland; and
- 3.5% AAGR for domestic intermodal trains, such as those served by Brooklyn and Lake Yards in Portland.

Put in context, growth at 2.9% AAGR would approximately double the local rail tonnage handled in 25 years.

In addition to the recent expansion at Ramsey and South Rivergate Yards, construction of a new domestic intermodal yard at Troutdale was discussed and met community objections. Afterward, Union Pacific moved their domestic intermodal operations from Albina Yard to Brooklyn Yard, to improve efficient use of available yard capacity. Nationally, Union Pacific constructed 5

[5] BST Associates, *Pacific NW Marine Cargo Forecast Update and Rail Capacity Assessment*, October, 2011

intermodal yards between 2000 and 2005, ranging from 130 to 320 acres in size and averaging 224 acres. To accommodate increasing rail operations, rail yard land demand to 2035 is estimated at 200 acres, which conceptually could consist of a new domestic intermodal yard or the combined expansion of existing yards and smaller new yards.

A Union Pacific representative commented that a 200-acre rail demand forecast to 2035 is not unreasonable. The railroad's long-term plans are unclear in the current economic climate. Expansion for energy-related cargo exports is a wildcard that was not factored into local demand forecasts. The organization has a five-year plan that describes track capacity. For the Portland area, short-term plans assume working within their existing land holdings. The railroad generally focuses on consolidation and efficiencies within urban areas, and if necessary, relocation, such as the recent relocation of intermodal facilities to Brooklyn Yard.

### *Marine Terminals*

Portland Harbor serves as a major economic engine for the regional economy. These port terminals function as public infrastructure, facilitating economic activity for other industries in the region. Studies indicate that cargo and manufacturing activities dependent on waterborne transportation contribute significantly to the metro region's economy. Estimates of the economic impacts generated by marine-related activity in Portland range from 20,000 to 100,000 jobs and from $1.4 to 3.4 billion annually in regional income.[6]

Harbor industrial development tends to have low floor-to-area ratios (FAR) and a relatively low number of on-site jobs per acre. But industrial lands in general, and harbor lands in particular, are an important piece of the regional economic base, which supports a much larger number of jobs in other economic sectors. Despite declining employment in the Harbor Access Lands geography during the 2000-2008 business cycle, like the employment losses in Downtown Portland and some other geographies in this period, Portland Harbor experienced an increase in cargo tonnage at a faster pace than the rate of industrial land development in the area.[7] Employment losses during this period are partly associated with the listing of the extensive Portland Harbor Superfund Project in 2000, which has constrained vacant land development that would typically result from business turnover on affected sites.

Given the robust cargo forecasts and projected marine terminal needs described in EOA Section 1 and the disconnected relationship between employment growth and cargo activity in the harbor, an alternative land needs forecast is particularly needed for marine terminal development. ECONorthwest identifies several forecast scenarios for marine cargo tonnage and associated land needs in Portland in EOA Section 1, Appendix C.[8] The commodity forecasts summarized by ECONorthwest are expressed as a range. To inform community choices, two harbor growth scenarios are analyzed here. Scenario A is the low end of the demand forecast. Scenario B is the mid-range demand forecast. The impacts of these choice are described in more detail in Section 4.

6 Entrix, Inc., West Hayden Island (WHI) Economic Foundation Study, July 2010.

7 ECONorthwest, Portland Harbor: Industrial Land Supply Analysis, May 2012.

8 ECONorthwest, Portland Harbor: Industrial Land Supply Analysis, May 2012.

**Harbor Growth Scenario A** is derived from the low end of the demand forecast estimated by ECONorthwest at 187,000 metric tons for automobile cargo only (see Exhibit 3-6 in EOA Section 1, Appendix C). For "practical" site sizes of auto terminals (a conservative land need assumption), this tonnage results in 150 acres of overall land need by 2040, adjusted to 125 acres by 2035. The 125-acre overall land need for marine terminal growth is further adjusted to 106 acres (rounded to 110) to avoid double-counting land needs estimated by the employment-trends forecast (see Figure 17). This scenario could potentially be met in the existing Harbor Access Lands geography by vacant and redevelopable land development at T-6 (approximately 40 vacant acres), T-4 (approximately 30 redevelopable acres at the former Cargill terminal), and/or an assembled brownfield development site around the former Time Oil terminal (an assembled site of up to 84 acres is analyzed by ECONorthwest in EOA Section 1, Appendix C).

**Harbor Growth Scenario B** consists of ECONorthwest's mid-range demand forecast (5,760,000 metric tons) with an expected land need of 470 acres (see Exhibit 3-7 in EOA Section 1, Appendix C), which is adjusted for the year 2035 to 392 acres (rounded to 390). Based on the development trends of new terminals being constructed on the West Coast, land need for marine cargo is typically expected to be for parcels larger than 100 acres to accommodate some form of rail access and ensure facility competitiveness.[9] This scenario anticipates the need for 270 acres of land need for auto terminal development and 100-acre grain and dry bulk terminal sites large enough for conventional unit-train rail loop access. Again, as with Scenario A, these combined land needs are adjusted to approximately 340 acres (see Figure 17) to avoid double-counting land needs estimated by the employment-trends forecast. West Hayden Island is the only site in the Portland Urban Services Area where this combined need could potentially be met, due to the geometric requirements for a modern rail loop. The new on-site marine terminal employment in Scenario B is estimated to be 850 jobs.

## TOTAL EMPLOYMENT LAND DEMAND

The employment growth forecast demand is combined with the traded sector transportation facilities to determine the total land need (Figure 18).

[9] Entrix, Inc., West Hayden Island (WHI) Economic Foundation Study, July 2010.

## Figure 18. 2035 Employment Development Capacity Demand

| Employment Geography | Added Jobs | Building SQFT | Total Acres | Avg FAR |
|---|---|---|---|---|
| Central City Commercial | 34,124 | 13,598,000 | 60 | 5.20 |
| Central City Industrial | 10,617 | 5,218,000 | 90 | 1.33 |
| Harbor & Airport Districts* | 16,215 | 13,403,000 | 780 | 0.39 |
| Harbor Access Lands* | 1,905 | 1,409,000 | 90 | 0.36 |
| Columbia East | 9,308 | 6,140,000 | 350 | 0.40 |
| Dispersed Employment | 4,200 | 2,060,000 | 130 | 0.36 |
| Gateway Regional Center | 3,970 | 1,996,000 | 50 | 0.92 |
| Town Centers | 6,160 | 3,199,000 | 130 | 0.56 |
| Neighborhood Centers & Corridors | 25,011 | 11,549,000 | 510 | 0.52 |
| Institutions | 22,730 | 12,892,000 | 370 | 0.80 |
| Residential | 7,403 | NA | NA | NA |
| **Total** | **141,643** | **71,464,000** | **2,560** | |
| **Aggregate Geography** | | | | |
| Central City | 44,741 | 18,816,000 | 150 | 2.88 |
| Industrial | 31,628 | 23,012,000 | 1,350 | 0.39 |
| Neighborhood Commercial | 35,141 | 16,744,000 | 690 | 0.56 |
| Institutions | 22,730 | 12,892,000 | 370 | 0.80 |
| Residential | 7,403 | NA | NA | NA |
| **Total** | **141,643** | **71,464,000** | **2,560** | |
| **Additional Land Need for Traded Sector Support Facilities** | | | | |
| PDX Aviation Support | 3,220 | | 40 | |
| Rail Yard Expansion | NA | | 200 | |
| Marine Terminals (Scenarios A/B) | 325/850 | | 110/340 | |
| **Total** | | | **350/580** | |
| **Total Land Demand** | | | **2,910/3,140** | |

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability.

## SHORT-TERM EMPLOYMENT FORECAST AND LAND DEMAND

The State of Oregon Administrative Rules also require cities to provide an adequate short-term land supply "to respond to economic development opportunities as they arise." The Metro regional forecast predicts a robust recovery from the national recession. Consequently, the City of Portland is expected to add 95,000 jobs or 67% of the forecasted employment growth in the 2010-2020 period. If this predicted growth occurs, it will generate the demand for about 2,000 acres of employment land. Land demand over the remainder of the planning period is projected to grow at lower rates, following the job-growth trajectory shown in Figure 32. Additional freight terminal demand is expected to occur episodically after 2020 through individual terminal investment decisions, except that a currently proposed marine terminal (Pembina) is included in short-term demand. Short-term land need for this marine terminal is estimated at 36 acres, which assumes an approximate 40-acre development site and excludes 4 acres to prevent double-counting of land need estimated by the employment-trends forecast.

**Figure 19. 2010-2020 Short-Term Employment Forecast and Land Demand**

| Employment Geography | Added Jobs | Building SQFT | Total Acres |
|---|---|---|---|
| Central City Commercial | 22,600 | 8,951,000 | 40 |
| Central City Industrial | 7,560 | 3,885,000 | 75 |
| Harbor & Airport Districts | 12,790 | 10,139,000 | 663 |
| Harbor Access Lands* | 1,500 | 1,191,000 | 114 |
| Columbia East | 6,980 | 4,867,000 | 279 |
| Dispersed Employment | 3,030 | 1,673,000 | 109 |
| Gateway Regional Center | 2,460 | 1,220,000 | 33 |
| Town Centers | 3,860 | 1,985,000 | 86 |
| Neighborhood Centers & Corridors | 16,280 | 7,658,000 | 362 |
| Institutions | 13,440 | 7,562,000 | 224 |
| Residential | 4,110 | NA | NA |
| **Total** | **94,610** | **49,131,000** | **1,985** |

Source: E.D. Hovee & Company, LLC., and Bureau of Planning and Sustainability

## PARCEL SIZE DEMAND ASSESSMENT

This assessment is based on the same parcel distribution by geography as demand experienced 1999-2011 for parcels experiencing new construction (year built as of 2000 or later) but with smoothing (or interpolation) of demand to in-between sizes with no demonstrated demand from 1999-2011.

This parcel size distribution reflects the pattern of activity that occurred during the last decade, a period of slower job growth regionally and in Portland than is forecast over the next 25 years. Future parcel size requirements may well vary from experience of recent years.

A pivotal factor suggesting a need for a greater mix of large parcels is the need to accommodate more job growth than has occurred in the last decade. To the extent that achieving more aggressive job growth targets depends on ability to accommodate larger employers (especially within industrial geographies), more large acreage sites may be required. Otherwise, Portland runs a greater risk of losing these large employers to sites elsewhere in the region or outside the Portland metro area altogether. Also noted is that presence of constrained sites (as with brownfields and environmental constraints) within the remaining inventory may require larger sites in terms of gross acreage to get to the same net yield as may have been experienced previously with less constrained sites. Therefore, this demand assessment includes the additional need for one large (50 acre) site in the Harbor and Airport Districts. This demand assessment also includes the traded sector land needs, which are expected to be located in the area as well.

## Figure 20. Land Demand by Parcel Size (acres)

| EOA Geographies | Gross Acreage Land Need (2010-35) by Parcel Size | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | < 1 | 1 - 3 | 3 - 5 | 6 - 10 | 10-20 | 20-50 | 50-100 | > 100 | Total | Total >1 |
| Central City Commercial | 33 | 9 | 9 | 10 | 0 | 0 | 0 | 0 | 60 | 27 |
| Central City Industrial | 54 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 90 | 36 |
| Harbor & Airport Districts | 71 | 135 | 213 | 166 | 126 | 49 | 50 | 200 | 1,010 | 939 |
| Harbor Access Lands | 1 | 6 | 9 | 11 | 11 | 42 | 50 | 300 | 430 | 428 |
| Columbia East | 9 | 85 | 78 | 67 | 111 | 0 | 0 | 0 | 350 | 341 |
| Dispersed Employment | 38 | 26 | 23 | 23 | 20 | 0 | 0 | 0 | 130 | 92 |
| Gateway Regional Center | 18 | 13 | 11 | 9 | 0 | 0 | 0 | 0 | 50 | 32 |
| Town Centers | 84 | 46 | 0 | 0 | 0 | 0 | 0 | 0 | 130 | 46 |
| Neighb. Centers & Corridors | 276 | 77 | 91 | 65 | 0 | 0 | 0 | 0 | 510 | 234 |
| **Total** | **584** | **432** | **434** | **350** | **269** | **91** | **100** | **500** | **2,760** | **2,176** |
| **Aggregate Geographies** | | | | | | | | | | |
| Central City | 86 | 45 | 9 | 10 | 0 | 0 | 0 | 0 | 150 | 64 |
| Industrial | 119 | 252 | 322 | 266 | 269 | 91 | 100 | 500 | 1,920 | 1,801 |
| Neighborhood Commercial | 379 | 136 | 102 | 74 | 0 | 0 | 0 | 0 | 690 | 311 |
| **Total** | **584** | **432** | **434** | **350** | **269** | **91** | **100** | **500** | **2,760** | **2,176** |

* Harbor Access Lands demand shown here includes marine terminal forecast Scenario B for 340 acres (see Figure 17). Scenario A would exclude the 100+ acre site demand and add 70 acres to the 20-100 acre categories.

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability.

Conversely, there are some factors that would suggest at least some ability for demand to adjust to available supply over time on smaller parcels that previously may have been bypassed. These factors include increasing interest by firms already heavily invested in Portland to make do with existing sites and/or acquire smaller, nearby (and in some cases multiple) sites for incremental expansion. This approach can be facilitated with greater regulatory flexibility and targeted infrastructure investments to make more efficient use of a shrinking supply of remaining vacant as well as redevelopable in-city inventory.

This assessment also suggests the need for monitoring of actual development site sizes over the course of the forecast period – with capacity for plan adjustments if warranted by demonstrated site size demand not being met by the remaining site inventory.

# III. SUPPLY: BUILDABLE LAND INVENTORY

As stipulated by Goal 9 (Economy of the State), the intent of the Economic Opportunities Analysis is to "compare the demand for industrial and other employment uses to the existing supply of such land." This section analyzes the Buildable Land Inventory as Portland's measure of employment land supply.

The Buildable Land Inventory (BLI) is based on a GIS model developed by the Bureau of Planning and Sustainability (BPS) that looks at the difference between existing and allowed development to determine the development capacity of the current comprehensive plan. This report summarizes the methodology and results of the employment land portion of the BLI. A full description of the BLI with supporting maps can be found in the *Buildable Land Inventory* background report.

## METHODOLOGY

The BPS Development Capacity Analysis (DCA) model is a series of steps or filters to identify the acreage of land that is available for development or redevelopment in Portland.

1. Identify vacant land.
2. Identify land likely to redevelop.
3. Discount capacity based on physical constraints
4. Adjust capacity for mixed use development and market factors

### *Base Land Supply – Vacant and Redevelopable Land*

The first step to inventory buildable land is a relatively straightforward process to identify vacant sites or land utilizing tax assessment data, Metro's vacant land inventory, and verification process utilizing aerial photos and field checking. Parcels under 0.5 acres were not considered viable for industrial geographies and parcels less than 1,500 square feet were not considered viable for commercial development.

The development analysis in the Task 1 report shows that only 50-70% of the development activity in Portland is taking place on totally vacant sites. The second step in the inventory is a more complicated process to identify non-vacant parcels that are significantly under-developed or underutilized and are likely to redevelop. The DCA model uses existing building area to calculate the likelihood of redevelopment based on the rationale that parcels with smaller building coverage compared to what is allowed by current zoning regulations are likely to redevelop given the potential for a new larger building to absorb the value of the existing building into the development costs. Within the Central City, a parcel must have less than 20% of the allowed floor area and have an improvement-to-land ratio (I/L ratio) of less than 50%. I/L ratios are used because improvement and land values are more accurately recorded in the Central City. Outside the Central City, parcels within 500 feet of a "frequent service" transit line are mapped as underutilized if they are using less than 20% of their allowed floor area (regardless of the improvement-to-land ratio). Frequent service transit lines are defined as bus and light rail lines that run every 15 minutes or better during weekday peak hours. All other parcels are

mapped as underutilized if they are using less than 10% of their allowed floor area (regardless of the improvement-to-land ratio). For underutilized parcels that will redevelop, the existing building square footage is deducted from the zoned capacity, so only the net new development capacity is counted.

For the Industrial areas, underutilized parcels are treated differently. Industrial Sanctuary designated parcels are limited to vacant parcels. Underutilized parcels are not included in this analysis because there are no FAR limits in the Portland industrial zones and industrial development tends to have lower building coverage with large areas for outdoor storage and vehicle maneuvering areas. However, developed parcels designated Central Employment and Mixed Employment that currently utilize less than 10% of their allowed floor area (regardless of the improvement-to-land ratio) are considered underutilized and included in the land supply because these parcels tend to include a wider mix of uses with more intensive development.

Institutional uses warrant special consideration because their land use patterns are distinct from other employers. Medical and higher education institutions often tend to cluster all or a significant portion of their activity into campuses, requiring larger parcels or aggregations of parcels, developing land more intensively (e.g. with structured parking) and locating in a variety of zones other than commercial and industrial (such as residential). For the BLI, 17 individual campuses are identified and the development capacity is determined through an assessment of current land use approvals and base zoning minus existing buildings.

### *Development Constraints*

Constrained lands include sites that lack needed infrastructure (e.g. sites without sewer service) or have other physical or regulatory constraints on development, such as environmentally sensitive areas, historic landmarks, steep slopes, and flood hazards. Each constraint is defined and mapped and a discount factor is determined to reflect the degree of site utilization expected on land affected by each constraint.

The discount factor is determined in a two-step process. The first step is characterizing the constraint as high, medium, or low based on consultation with the City of Portland's development review staff at the Bureaus of Development Services, Transportation, Water, and Environmental Services.[10] Then this factor is adjusted based on a review of development rates of various constrained sites compared to unconstrained sites for the 1999-2011 period (Appendix B). This analysis included both the rate of development (avoidance) as well as the overall amount of development to determine the level of constraint. The constraint analysis considered the impact of 52 different characteristics that are grouped into six categories and sorted by geographic area.[11] An additional discount factor of -10% is applied to sites with two overlapping constraints or -20% for sites with more than three constraints. Institutional campuses are not included in this adjustment factor because the master planning process to establish the development capacity has already factored most of these constraints.

[10] BPS, 2012 Buildable Land Inventory, Appendix A

[11] Constraint discount factors are not calculated for the Institutional geography because it assumed that these constraints are factored into the campus master plans that are the basis for determining the development capacity of the 17 campuses.

## Figure 21. Development Constraint Factors

| Constraint | Adjusted Capacity Utilization | Constraint | Adjusted Capacity Utilization |
|---|---|---|---|
| **Environmental** | | **Historic Landmarks** | |
| Central City | 75% | Central City | 55% |
| Industrial | 50% | Industrial | 55% |
| Commercial | 35% | Commercial | 55% |
| | | | |
| **Infrastructure** | | **Low** | |
| Central City | 75% | Central City | 85% |
| Industrial | 75% | Industrial | 85% |
| Commercial | 75% | Commercial | 85% |
| | | | |
| **Brownfields** | | **Greenway** | |
| Central City | 90% | Central City | 75% |
| Industrial | 40% | Industrial | 50% |
| Commercial | 50% | Commercial | 55% |

Source: E.D. Hovee & Company, LLC and Bureau of Planning and Sustainability

### *Adjustments*

### Mixed-Use Zoning

In most of the City of Portland's commercial land use zones residential uses are an allowed use, and over the last 15 years Portland has seen a significant amount of mixed use, residential development in these areas, especially in the Central City. Therefore, in this capacity analysis a certain amount of the development capacity is assumed to develop as residential space and therefore not available for employment uses. The residential share is based on a review of building permit activity in commercial areas from 2002-2008.[12]

## Figure 22. Mixed Use Zoning Residential Share Factors

| | Comprehensive Plan Designation | Residential Share | Central City Residential Share |
|---|---|---|---|
| EX | Central Employment | 75% | 63% |
| CX | Central Commercial | 55% | 40% |
| UC | Urban Commercial | 75% | 40% |
| CG | General Commercial | 25% | 40% |
| NC | Neighborhood Commercial | 30% | 40% |
| IR | Institutional Residential | 5% | 78% |
| ME | Mixed Employment | 0% | 63% |

Source: Bureau of Planning and Sustainability

[12] The most robust permit data was in the EX, CX, and UC designations. For the GC, NC, IR, and ME designations there was less mixed use data, so the factors are more conservative and assume less mixed use residential space.

### Market Development Rates

This factor adjusts the land supply to reflect market supportable building capacity for the commercial geographies. In the commercial areas outside the Central City, the commercial development capacity allowed by zoning regulations is greater than what the private market is expected to develop. For example, most town centers and commercial corridors allow for 3:1 FARs. Even after some of the floor area is allocated to residential space (see above), the commercial space is greater than what the private sector typically develops. Parking plays a substantial factor in these determinations because FARs over 0.50 typically require some mix of structured parking and/or high transit mode split. Future market conditions are difficult to predict. These market factors are based on the average FARs estimated by the demand forecast in these geographies (total building area divided by total land area). Therefore, the commercial or employment capacity is capped at a maximum market-supportable FAR.

### Figure 23. Commercial FAR Market Factor

| Employment Geography | Commercial FAR Cap |
|---|---|
| Gateway Regional Center | 0.95 |
| Town Centers | 0.54 |
| Neighborhood Commercial | 0.52 |

Source: E.D. Hovee & Company, LLC

A review of development trends in the Central City shows that most development incorporates floor area bonuses that exceed the base standards in the BLI, therefore no market factor is needed in the Central City.[13] The development capacity of industrial areas is not regulated by FARs so no factor is needed there. The Institutional campus capacity has been determined by the campus master plan process, so the market factor does not apply.

## EMPLOYMENT LAND SUPPLY

The employment development capacity is about 152 million square feet, which is distributed across the different employment geographies. The employment land supply is presented in three stages – the base supply (vacant and underutilized parcels), the constrained supply (capacity after constraint deductions), and the (final) adjusted market supply (Figure 24). Appendix C includes a more detailed analysis of the land supply with vacant and redevelopment capacity distributed by lot size.

[13] 2012 Central City Development Capacity Analysis

## Figure 24. Buildable Land Inventory by Employment Geography

| Employment Geography | Base Supply Bldg Sq Ft | Constrained Supply Bldg Sq Ft | Constrained Supply % of Base | Market Adjusted Supply Bldg Sq Ft | Market Adjusted Supply % of Base | Acres |
|---|---|---|---|---|---|---|
| Central City Commercial | 54,137,000 | 45,517,000 | 84% | 45,517,000 | 84% | 201 |
| Central City Industrial | 4,161,000 | 3,780,000 | 91% | 3,780,000 | 91% | 65 |
| Harbor & Airport Districts | 66,215,000 | 35,664,000 | 54% | 33,704,000 | 51% | 774 |
| Harbor Access Lands | 15,374,000 | 4,932,000 | 32% | 4,932,000 | 32% | 113 |
| Columbia East | 23,330,000 | 15,519,000 | 67% | 15,519,000 | 67% | 356 |
| Dispersed Employment | 8,906,000 | 5,287,000 | 59% | 5,287,000 | 59% | 121 |
| Gateway Regional Center | 12,588,000 | 8,992,000 | 71% | 5,483,000 | 44% | 137 |
| Town Centers | 25,875,000 | 22,644,000 | 88% | 7,485,000 | 29% | 304 |
| Neighborhood Centers & Corridors | 97,316,000 | 72,838,000 | 75% | 19,538,000 | 20% | 863 |
| Institutions | 10,676,000 | 10,676,000 | 100% | 10,676,000 | 100% | 306 |
| **Total** | **318,578,000** | **225,849,000** | **71%** | **151,921,000** | **48%** | **3,240** |
| **Aggregate Geography** | | | | | | |
| Central City | 58,298,000 | 49,297,000 | 85% | 49,297,000 | 85% | 266 |
| Industrial | 113,825,000 | 61,402,000 | 54% | 59,442,000 | 52% | 1,365 |
| Neighborhood Commercial | 135,779,000 | 104,474,000 | 77% | 32,506,000 | 24% | 1,303 |
| Institutions | 10,676,000 | 10,676,000 | 100% | 10,676,000 | 100% | 306 |
| **Total** | **318,578,000** | **225,849,000** | **71%** | **151,921,000** | **48%** | **3,240** |

Source: Bureau of Planning and Sustainability

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The City of Portland has about 3,200 acres of buildable land. Approximately 68% of the development capacity is vacant land and 32% is underutilized, redevelopable land.

The Central City Commercial geography has a significant amount of zoned development capacity for employment uses – 54 million square feet. Various constraints reduce that capacity by 16% to 46 million square feet, the equivalent of 201 acres. The Central City Industrial geography is composed primarily of industrial zoned land, so there is less capacity – about 4.2 million square feet of base supply that constraints reduce by 9% to 3.8 million square feet, or 65 acres of buildable land.

The City of Portland's industrial areas have about 2,346 acres of vacant land and 107 acres of vacant land, but 48% of that capacity is constrained, leaving about 1,365 acres available for future employment growth. Harbor & Airport Districts has the bulk of this industrial capacity – 774 acres, and about 113 acres are located along the waterfront in the Harbor Access Lands. The Columbia East geography has 356 acres of capacity, and another 121 acres is scattered through the Dispersed Employment areas.

The neighborhood commercial areas outside the Central City have a tremendous amount of development capacity, even after accounting for mixed use residential development, totaling about 136 million square feet. Constraints reduce this capacity by 23%, but it is the market adjustment factor (based largely on patterns of development activity experienced in recent years) that reduces the capacity by another 53%. The net result is capacity for 33 million square feet, or 1,303 acres.

Institutional campuses have the potential for about 10.7 million square feet of development, or 306 acres of capacity.

## SHORT-TERM EMPLOYMENT LAND SUPPLY

The State of Oregon Administrative Rules also requires cities to assess the short-term land demand and supply. As defined in these rules, "engineering feasibility is sufficient to qualify land for the short term supply" and funding availability is not required. For the most part, the land within Portland has services available or proximate to the sites such that development is not dependent on major public infrastructure investments. The major short-term constraint will be brownfields, especially within the Portland Harbor Superfund area. Due to overlapping constraints with infrastructure deficiencies and natural resource protections, the overall impact to the land supply is relatively minor – about 360 acres of development capacity.

## Figure 25. Short-Term Land Supply

| | Building Square Feet | | | |
|---|---|---|---|---|
| Employment Geography | Base Supply | Constrained Supply | Adjusted Supply | Acres |
| Central City Commercial | 54,137,000 | 40,309,000 | 40,309,000 | 178 |
| Central City Industrial | 4,161,000 | 3,439,000 | 3,439,000 | 59 |
| Harbor & Airport Districts | 66,215,000 | 29,169,000 | 27,209,000 | 625 |
| Harbor Access Lands | 15,374,000 | 2,578,000 | 2,578,000 | 59 |
| Columbia East | 23,330,000 | 14,832,000 | 14,832,000 | 340 |
| Dispersed Employment | 11,434,000 | 6,907,000 | 6,907,000 | 105 |
| Gateway Regional Center | 12,588,000 | 7,965,000 | 4,456,000 | 111 |
| Town Centers | 25,875,000 | 21,685,000 | 7,095,000 | 288 |
| Neighborhood Centers & Corridors | 97,316,000 | 69,915,000 | 18,368,000 | 811 |
| Institutions | 9,045,000 | 7,048,000 | 7,048,000 | 306 |
| **Total** | **319,475,000** | **203,847,000** | **132,241,000** | **2,883** |
| | | | | |
| **Aggregate Geography** | | | | |
| Central City | 58,298,000 | 43,748,000 | 43,748,000 | 237 |
| Industrial | 116,353,000 | 53,486,000 | 51,526,000 | 1,129 |
| Neighborhood Commercial | 135,779,000 | 99,565,000 | 29,919,000 | 1,210 |
| Institutions | 9,045,000 | 7,048,000 | 7,048,000 | 306 |
| **Total** | **319,475,000** | **203,847,000** | **132,241,000** | **2,883** |

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability

## PARCEL SIZE ASSESSMENT

The parcel size assessment distributes the employment development capacity across the same range as demand assessment. This assessment does not include the Institutional campus geography because that capacity was calculated using master plan methodology. The industrial geographies only include parcels greater than 0.5 acres

As to be expected with a virtually land-locked, developed city, most of the development capacity is in smaller parcels. In fact, no vacant parcels greater than 100 acres are currently identified in the industrial geographies. About 51% of the Central City capacity and 30% of the Neighborhood Commercial capacity is tied up in small parcels that are less than one acre.

## Figure 26. Land Supply by Parcel Size (acres)

| | Existing Buildable Land Inventory by Parcel Size (acres) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **EOA Geographies** | **< 1** | **1 - 3** | **3 - 5** | **6 - 10** | **10-20** | **20-50** | **50-100** | **> 100** | **Total** | **Total >1** |
| Central City Commercial | 90 | 39 | 32 | 6 | 10 | 24 | 0 | 0 | 201 | 111 |
| Central City Industrial | 45 | 13 | 6 | 2 | 0 | 0 | 0 | 0 | 65 | 21 |
| Harbor & Airport Districts | 8 | 76 | 64 | 86 | 111 | 164 | 310 | 0 | 774 | 811 |
| Harbor Access Lands | 0 | 4 | 0 | 3 | 23 | 42 | 41 | 0 | 113 | 113 |
| Columbia East | 6 | 23 | 19 | 27 | 45 | 96 | 140 | 0 | 356 | 350 |
| Dispersed Employment | 7 | 22 | 19 | 2 | 6 | 21 | 45 | 0 | 121 | 114 |
| Gateway Regional Center | 14 | 61 | 33 | 14 | 15 | 0 | 0 | 0 | 137 | 123 |
| Town Centers | 153 | 88 | 35 | 21 | 5 | 2 | 0 | 0 | 304 | 151 |
| Neighb. Centers & Corridors | 227 | 218 | 101 | 59 | 91 | 96 | 71 | 0 | 863 | 636 |
| **Total** | **550** | **543** | **308** | **220** | **305** | **445** | **607** | **0** | **2,934** | **2,429** |
| **Aggregate Geographies** | | | | | | | | | | |
| Central City | 135 | 52 | 38 | 8 | 10 | 24 | 0 | 0 | 266 | 131 |
| Industrial | 21 | 125 | 102 | 118 | 185 | 324 | 536 | 0 | 1,365 | 1,388 |
| Neighborhood Commercial | 394 | 367 | 169 | 94 | 111 | 98 | 71 | 0 | 1,303 | 909 |
| **Total** | **550** | **543** | **308** | **220** | **305** | **445** | **607** | **0** | **2,934** | **2,429** |

* Industrial geography parcels smaller than 1/2 acre are not included in the total supply.

Source: Bureau of Planning and Sustainability



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# IV. DEMAND & SUPPLY RECONCILIATION

As stipulated by Goal 9 (Economy of the State), the intent of the Economic Opportunities Analysis is to "compare the demand for industrial and other employment uses to the existing supply of such land." This section compares the demand for employment land from the employment forecast with the land supply from BLI to identify gaps or land needs to meet future employment growth.

## EMPLOYMENT LAND NEEDS

By subtracting effective land supply from demand, it is possible to determine whether and to what extent Portland's employment land base will be adequate to serve forecast needs over the 2035 planning horizon. In cases where there is adequate inventory, a land surplus is indicated; where the inventory is not adequate, a resulting deficit is calculated.

Because calculations are made by employment geography, there may be an adequate land supply for some inventory categories, with deficits noted for others.

### Figure 27. Employment Land Needs

| Employment Geography | Added Jobs | Land Demand | Existing Supply | Surplus/ Deficit | % Capacity |
|---|---|---|---|---|---|
| Central City Commercial | 34,120 | 60 | 201 | 141 | 335% |
| Central City Industrial | 10,620 | 90 | 65 | **-25** | **72%** |
| Harbor & Airport Districts* | 16,210 | 1,020 | 774 | **-246** | **76%** |
| Harbor Access Lands* | 1,910 | 200/430 | 113 | **-87/-317** | **57%/26%** |
| Columbia East | 9,310 | 350 | 356 | 6 | 102% |
| Dispersed Employment | 4,200 | 130 | 121 | **-9** | **93%** |
| Gateway Regional Center | 3,970 | 50 | 137 | 87 | 274% |
| Town Centers | 6,160 | 130 | 304 | 174 | 234% |
| Neighborhood Centers & Corridors | 25,010 | 510 | 863 | 353 | 169% |
| Institutions | 22,730 | 370 | 306 | **-64** | **83%** |
| Residential | 7,400 | - | - | **-** | **-** |
| **Total** | **141,640** | **2,910/3,140** | **3,240** | | |
| **Aggregate Geography** | | | | | |
| Central City | 44,740 | 150 | 266 | 116 | 177% |
| Industrial* | 31,630 | 1,700/1,930 | 1,365 | **-335/-565** | **80%/71%** |
| Neighborhood Commercial | 35,140 | 690 | 1,303 | 613 | 189% |
| Institutions | 22,730 | 370 | 306 | **-64** | **83%** |
| Residential | 7,400 | - | - | - | - |
| **Total** | **141,640** | **2,910/3,140** | **3,240** | | |

* Total land demand shown here includes Traded Sector Support Facilities in marine, rail and air terminals. Harbor Access Lands demand is shown with two marine-terminal forecast scenarios (see Figure 17).
Source: Bureau of Planning and Sustainability

## Figure 28. 2010-2035 Parcel Size Assessment Reconciliation

| | Gross Acreage Land Need (2010-35) by Parcel Size | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **EOA Geographies** | **< 1** | **1 - 3** | **3 - 5** | **6 - 10** | **10-20** | **20-50** | **50-100** | **> 100** | **Total** | **Total >1** |
| Central City Commercial | 58 | 30 | 23 | -3 | 10 | 24 | 0 | 0 | 141 | 83 |
| Central City Industrial | -9 | -24 | 6 | 2 | 0 | 0 | 0 | 0 | -25 | -16 |
| Harbor & Airport Districts | -63 | -59 | -149 | -80 | -15 | 115 | 260 | -200 | -237 | -128 |
| Harbor Access Lands | -1 | -2 | -9 | -8 | 12 | 0 | -9 | -300 | -316 | -315 |
| Columbia East | -3 | -63 | -59 | -39 | -66 | 96 | 140 | 0 | 6 | 9 |
| Dispersed Employment | -31 | -4 | -4 | -22 | -15 | 21 | 45 | 0 | -9 | 22 |
| Gateway Regional Center | -4 | 48 | 22 | 5 | 15 | 0 | 0 | 0 | 87 | 90 |
| Town Centers | 69 | 42 | 35 | 21 | 5 | 2 | 0 | 0 | 174 | 105 |
| Neighb. Centers & Corridors | -50 | 141 | 10 | -5 | 91 | 96 | 71 | 0 | 353 | 402 |
| **Total** | **-34** | **111** | **-126** | **-129** | **37** | **354** | **507** | **-500** | **174** | **253** |
| **Aggregate Geographies** | | | | | | | | | | |
| Central City | 48 | 7 | 29 | -1 | 10 | 24 | 0 | 0 | 116 | 68 |
| Industrial | -98 | -127 | -221 | -149 | -84 | 232 | 436 | -500 | -555 | -412 |
| Neighborhood Commercial | 16 | 231 | 66 | 21 | 111 | 98 | 71 | 0 | 613 | 598 |
| **Total** | **-34** | **111** | **-126** | **-129** | **37** | **354** | **507** | **-500** | **174** | **253** |

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability

## OBSERVATIONS BY EMPLOYMENT GEOGRAPHY

These observations are based on an assessment of the overall capacity and demand to determine the land needs, as well as the range of parcel sizes. In cases where there is a shortfall, there may be a secondary analysis of the employment demand to determine the type of space/use that will be needed in the future.

**Central City Commercial**: The Central City Commercial areas have a surplus of capacity, even after accounting for mixed-use residential space, primarily due to the high FARs and continued availability of development sites in the Pearl and South Waterfront sub-districts.

**Central City Industrial**: The Central Eastside and Lower Albina districts have a strong demand for building space, especially for emerging small business that are seeking cheaper, Class B and C office space that account for about 49% of the employment growth. The existing buildable land supply only covers 72% of the demand. To effectively overcome the shortfall, additional capacity should be targeted to the specific demand opportunities of this "incubator" geography, particularly for Class B/C office and flex space development attractive to cost-conscious tenants. Additional development capacity could be provided through rezoning, such as to expand allowances for industrial office development, and/or incentives to leverage higher rates of redevelopment. These actions are discussed in the EOA Section 4 report.

**Harbor Access Lands**: This geography is the Portland Harbor industrial area, where sites generally have dock access to the deep-water navigation channel. This distinctive geography is the land area available for continuing growth of marine terminals and other marine industrial facilities at Portland Harbor. Two marine terminal growth scenarios are analyzed in this geography to inform community choices. Under the low forecast scenario, the existing buildable

land supply in the Harbor Access Lands geography meets 57% of forecast demand, leaving an estimated 87-acre shortfall in growth capacity to 2035. Under the mid-range forecast scenario, existing buildable land meets only 26% of forecast demand, resulting in a 317-acre shortfall. Options to meet these shortfalls involve policy tradeoffs addressing public spending priorities, environmental protection, neighborhood compatibility, economic development, transportation infrastructure, and equity, as described in the EOA Section 4 report.

**Harbor and Airport Districts**: The Harbor and Airport Districts contain more gross developable land (1,520 acres) than any other geography, though much of it is constrained by brownfield contamination, infrastructure deficiencies, and environmental protection regulations that reduce the effective supply to 774 acres. The Harbor and Airport Districts are also a distinctive geography with 24% of the land demand associated with traded-sector transportation support facilities for railroad and airport growth. The existing buildable land supply in this geography meets 76% of forecast demand, leaving an estimated 246-acre shortfall in 25-year growth capacity. Like Harbor Access Lands, options to meet these shortfalls involve policy tradeoffs as described in the EOA Section 4 report.

**Columbia East**: This industrial area has a minor surplus of 6 acres. There is a surplus of larger 20-50 acre and 50-100 acres sites, which is balanced by a deficit for some of the small to medium sized sites. Constraints, such as infrastructure deficiencies and brownfields, account for 34% of the base supply. If these constraints are partially remedied through public investment and incentives, additional surplus capacity could be available to meet comparable demand for warehouse and flex space development in the Harbor and Airport Districts.

**Dispersed Employment**: Forecast land demand for this relatively small employment geography results in a shortfall of 9 acres. Existing growth capacity meets approximately 93% of forecast demand. While this "business park" geography typically includes substantial landscaping and building amenities to attract office tenants, neighborhood compatibility concerns can limit options for expansion of this geography. Over two-thirds of forecast job growth and building area in the Dispersed Employment geography is for office sector businesses. .

**Gateway Regional Center**: This geography has a surplus of 87 acres of development capacity, even after discounting the zoned capacity by 56% for constraint and market factors. The Gateway supply consists predominantly (55%) of smaller parcels of less than 3 acres, but this capacity is generally matched to the expected demand.

**Town Centers**: This mixed-use geography consists of the eight town centers. Five existing town centers are designated in Metro's 2040 Plan, and the Comprehensive Plan Update proposes additional town center designations in the Northwest District, Killingsworth/Interstate, and Midway (122nd/Division). Strong employment growth is forecast in this geography, driven particularly by the institutional space needs that account for 60% of forecast Town Centers demand. The forecast land needs for town centers is based on the five existing town centers, and has not been updated to match those currently proposed. However, the capacity needs of the Town Centers and Neighborhood Commercial geographies are interrelated and more than amply met in the 25-year planning horizon. Specifically, the existing buildable land inventory meets an estimated 274% of forecast demand for town center land needs and 234% of neighborhood

commercial land needs. Moreover, demand for town center densities may be more accurately estimated by the existing town centers. Also, the level of existing development and market trends in these town centers varies widely. In the 2000-2008 business cycle, for example, most of the town center job growth was in Hollywood, attributable primarily to medical office expansion from the nearby Providence hospital campus.

**Neighborhood Centers & Corridors**: Nearly 18% of citywide employment growth is allocated to this extensive geography, which drives a demand for over 500 acres of employment land. This geography also has a surplus of almost 350 acres of capacity, even after discounting the zoned capacity for mixed use residential and market factors. As with the Town Centers geography, most of the Neighborhood Commercial capacity is in smaller, underutilized, redevelopable sites. To the extent that capacity shortages are not effectively addressed in other geographies (especially for commercial and institutional uses), some of the unmet demand might be shifted to this employment geography.

**Institutions**: The larger campus institutions have strong demand corresponding to 16% of the city's projected employment growth. The unused portion of development capacity under current master plans and zoning accounts for a significant amount of development capacity, but still leaves a shortfall of about 2.2 million square feet of development or about 64 acres.

## OTHER ISSUES

### *Short-Term Forecast and Land Needs*

The Metro regional forecast predicts a robust recovery from the national recession. Consequently, the City of Portland is expected to add 95,000 jobs or 67% of the forecasted employment growth between 2010 and 2020. If this predicted growth occurs, it will generate the demand for 1,950 acres of employment land. The traded-sector transportation facilities represent a longer term investment in the regional economy, so that land demand is not included in the short-term forecast, except for one currently proposed marine terminal. Fortunately, most of Portland's land supply is available for development in the short-term, with the exception of brownfields. The constraint and market factor analysis of the Buildable Land Inventory also removes 52% of the gross development capacity of vacant and underutilized land. The remaining market-effective supply is expected to be generally available as short-term supply with the exception of brownfields. Relatively diverse surplus capacity in the Columbia East geography can likely meet short-term land needs in the Harbor and Airport Districts, but additional efforts will be needed to meet short-term capacity shortfalls in the Central City Industrial, Dispersed Employment, and Harbor Access Lands geographies.

## Figure 29. 2010-2020 Short-Term Employment Land Needs

| Employment Geography | 2010-2020 Added Jobs | 2010-2020 Land Demand | Land Supply | Surplus/ Deficit |
|---|---|---|---|---|
| Central City Commercial | 22,600 | 40 | 178 | 138 |
| Central City Industrial | 7,560 | 75 | 59 | -15 |
| Harbor & Airport Districts | 12,790 | 663 | 625 | -39 |
| Harbor Access Lands | 1,500 | 114 | 59 | -55 |
| Columbia East | 6,980 | 279 | 340 | 62 |
| Dispersed Employment | 3,030 | 109 | 105 | -4 |
| Gateway Regional Center | 2,460 | 33 | 111 | 78 |
| Town Centers | 3,860 | 86 | 288 | 202 |
| Neighborhood Centers & Corridors | 16,280 | 362 | 811 | 449 |
| Institutions | 13,440 | 224 | 306 | 82 |
| Residential | 4,110 | NA | NA | NA |
| **Total** | **94,610** | **1,985** | **2,883** | **898** |

Source: E.D. Hovee & Company, LLC, and Bureau of Planning and Sustainability
Note: Harbor and Airport Districts demand does not include land for traded-sector support facilities.

### *Lot Size Assessment*

The reconciliation of the lot size assessment varies widely, but overall about 53% of the demand is for parcels of less than 6 acres while 48% of the supply consists of small parcels less than 6 acres. Each of the employment geographies with a capacity shortfall has a different need for lot sizes.

In the Central City Industrial geography, the need is for small parcels of less than 3 acres, which matches the supply, but there is not enough overall capacity. The Harbor and Airport Districts and Harbor Access Lands are unique in that there is a need for smaller parcels of less than 20 acres with a small surplus of medium sized parcels of 20-100 acres, but large (550 acres) demand for 100+ acre sites, primarily for marine terminal and rail yard development. Columbia East and Dispersed Employment have a similar pattern of a need for small parcels with slight surpluses in the medium sized parcels. The town centers have a need for small parcels. Overall, there is a lot of surplus capacity of small parcels in the Neighborhood Commercial geography that could provide some relief for the smaller, incubator businesses and services forecasted for the other geographies.

Portland's land supply of larger sites will tighten over the long term as a land-locked city, and other jurisdictions in the metropolitan area can generally be expected to address that regional demand. Land-assembly and site-assistance efforts also provide opportunities to meet location-specialized demand in Portland, such as freight terminal expansion.

# APPENDIX A. EMPLOYMENT FORECAST DETAILS

The tables in this appendix provide detail on five forecast elements:

- Metro's forecast, the basis of the Portland forecast;
- 2008 City employment share, and the decreasing share trend employed in the low and mid forecasts;
- The allocation of jobs to building types (consistent across scenarios)
- Square foot per employee assumptions (consistent across scenarios)
- Floor Area Ratios (varies across scenarios)

## Figure 30. Metro's Seven County PMSA Forecast: Total Jobs by 2035

| NAICS | Employment Sector | Actual QCEW 2010 | 7-County PMSA Forecast Employment 2015 | 2020 | 2025 | 2030 | 2035 | Job Change 2010-35 | % of Growth 2010-35 |
|---|---|---|---|---|---|---|---|---|---|
| 11 & 21 | Agriculture & Mining | 1,100 | 1,530 | 1,400 | 1,320 | 1,250 | 1,200 | 100 | 0.3% |
| 23 | Construction | 43,620 | 61,550 | 65,010 | 69,010 | 74,060 | 79,930 | 36,310 | 2.5% |
| 31-33 | Manufacturing | ###### | 117,100 | 119,740 | 121,040 | 122,360 | 123,890 | 17,431 | 0.6% |
| 42 | Wholesale Trade | 52,961 | 61,130 | 66,600 | 71,600 | 76,800 | 81,880 | 28,919 | 1.8% |
| 44-45 | Retail Trade | ###### | 113,200 | 114,820 | 118,270 | 123,490 | 129,200 | 28,597 | 1.0% |
| 22, 48-49 | Transportation, Warehousing & Utilities | 32,051 | 43,090 | 47,140 | 50,180 | 53,580 | 57,300 | 25,249 | 2.4% |
| 51 | Information | 22,426 | 24,560 | 27,930 | 31,470 | 35,250 | 38,740 | 16,314 | 2.2% |
| 52 | Finance | 39,322 | 49,170 | 53,710 | 58,110 | 62,370 | 67,740 | 28,418 | 2.2% |
| 53 | Real Estate | 15,940 | 27,160 | 29,800 | 32,210 | 34,700 | 37,300 | 21,360 | 3.5% |
| 54 | Professional Services | 51,937 | 59,540 | 67,390 | 74,590 | 82,340 | 90,650 | 38,713 | 2.3% |
| 55 | Management | 23,067 | 24,960 | 28,700 | 32,590 | 37,140 | 42,260 | 19,193 | 2.5% |
| 56 | Administrative & Waste Services | 51,601 | 68,100 | 75,430 | 82,280 | 88,790 | 95,140 | 43,539 | 2.5% |
| 61 | Educational Services | 19,718 | 24,960 | 28,350 | 31,630 | 34,870 | 38,490 | 18,772 | 2.7% |
| 62 | Health & Social Services | ###### | 127,390 | 150,540 | 170,610 | 192,050 | 214,710 | 100,849 | 2.6% |
| 71 | Arts, Entertainment & Recreation | 13,571 | 14,240 | 16,030 | 17,700 | 19,260 | 20,690 | 7,119 | 1.7% |
| 72 | Accommodation & Food Services | 80,675 | 89,630 | 98,440 | 106,410 | 114,550 | 122,990 | 42,315 | 1.7% |
| 81 | Other Services | 39,254 | 40,920 | 47,660 | 53,740 | 59,760 | 65,240 | 25,986 | 2.1% |
| 92 | Government (Civilian) | ###### | 142,570 | 150,950 | 159,400 | 167,560 | 179,590 | 38,060 | 1.0% |
| Total Employment | | ###### | ######## | ######## | ######## | ######## | ######## | **537,244** | **1.8%** |

Notes: QCEW is the Quarterly Census of Employment and Wages, Oregon Employment Department (OED).
All Metro gamma forecast numbers rounded to nearest ten employees.
2010 are Metro modeled forecast outcomes.
AAGR denotes annual average growth rate (compounded).
Source: Metro 2012 Adopted Forecast.

## Figure 31. City Share of PMSA Employment: 2008 and Projected

| NAICS | Employment Sector | Portland as Share of Metro Area: Actual Jobs 2008 | Actual Jobs 2010 | Forecast City of Portland Employment 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|---|---|
| 11 & 21 | Agriculture & Mining | 1.5% | 35.6% | 35.2% | 34.3% | 33.0% | 31.4% | 29.4% |
| 23 | Construction | 30.9% | 32.6% | 32.2% | 31.4% | 30.2% | 28.7% | 26.9% |
| 31-33 | Manufacturing | 24.7% | 23.5% | 23.2% | 22.6% | 21.8% | 20.7% | 19.4% |
| 42 | Wholesale Trade | 35.4% | 34.0% | 33.6% | 32.7% | 31.5% | 30.0% | 28.1% |
| 44-45 | Retail Trade | 30.6% | 30.9% | 30.5% | 29.7% | 28.6% | 27.2% | 25.5% |
| 22, 48-49 | Transportation, Warehousing & Utilities | 72.7% | 73.9% | 73.0% | 71.1% | 68.5% | 65.1% | 61.0% |
| 51 | Information | 46.4% | 43.0% | 42.5% | 41.4% | 39.9% | 37.9% | 35.5% |
| 52 | Finance | 44.7% | 43.4% | 42.8% | 41.8% | 40.2% | 38.2% | 35.8% |
| 53 | Real Estate | 47.7% | 49.8% | 49.2% | 48.0% | 46.2% | 43.9% | 41.2% |
| 54 | Professional Services | 50.6% | 51.9% | 51.2% | 50.0% | 48.1% | 45.7% | 42.9% |
| 55 | Management | 60.4% | 62.1% | 61.3% | 59.8% | 57.6% | 54.7% | 51.3% |
| 56 | Administrative & Waste Services | 37.9% | 35.8% | 35.3% | 34.4% | 33.1% | 31.5% | 29.5% |
| 61 | Educational Services* | 194.2% | 192.4% | 190.0% | 185.3% | 178.4% | 169.5% | 159.0% |
| 62 | Health & Social Services | 45.2% | 44.5% | 43.9% | 42.8% | 41.2% | 39.2% | 36.7% |
| 71 | Arts, Entertainment & Recreation | 43.6% | 49.7% | 49.1% | 47.8% | 46.1% | 43.8% | 41.0% |
| 72 | Accomodation & Food Services | 42.2% | 43.5% | 43.0% | 41.9% | 40.3% | 38.3% | 36.0% |
| 81 | Other Services | 43.1% | 42.8% | 42.3% | 41.2% | 39.7% | 37.7% | 35.4% |
| 92 | Government (Civilian)* | 12.5% | 11.0% | 10.8% | 10.5% | 10.2% | 9.6% | 9.0% |
| **Total** | | **38.3%** | **38.9%** | **39.4%** | **39.0%** | **37.9%** | **36.4%** | **34.4%** |

Notes: * Metro public education re-allocated to educational services to match OED.
All Metro gamma forecast numbers rounded to nearest ten employees.
2010 are Metro modeled forecast outcomes.
AAGR denotes annual average growth rate (compounded).
Source: Metro, Oregon Employment Department, and E. D. Hovee & Company, LLC.


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## Figure 32. City of Portland Employment Forecast by Sector

| NAICS | Employment Sector | QCEW 2010 | Forecast Employment by Year 2015 | 2020 | 2025 | 2030 | 2035 | Job Change 2010-35 | Avg Rate of Growth 2010-35 |
|---|---|---|---|---|---|---|---|---|---|
| | | Jobs within City of Portland | | | | | | | |
| 11 & 21 | Agriculture & Mining | 392 | 538 | 480 | 436 | 392 | 353 | (39) | -0.4% |
| 23 | Construction | 14,224 | 19,821 | 20,416 | 20,864 | 21,279 | 21,539 | 7,315 | 1.7% |
| 31-33 | Manufacturing | 25,035 | 27,195 | 27,118 | 26,391 | 25,353 | 24,076 | (959) | -0.2% |
| 42 | Wholesale Trade | 18,009 | 20,529 | 21,810 | 22,574 | 23,010 | 23,009 | 5,000 | 1.0% |
| 44-45 | Retail Trade | 31,060 | 34,515 | 34,139 | 33,855 | 33,593 | 32,963 | 1,903 | 0.2% |
| 22, 48-49 | Transportation, Warehousing & Utilities | 23,676 | 31,435 | 33,535 | 34,368 | 34,873 | 34,978 | 11,302 | 1.6% |
| 51 | Information | 9,640 | 10,426 | 11,562 | 12,542 | 13,351 | 13,761 | 4,121 | 1.4% |
| 52 | Finance | 17,048 | 21,053 | 22,425 | 23,358 | 23,825 | 24,270 | 7,222 | 1.4% |
| 53 | Real Estate | 7,946 | 13,371 | 14,306 | 14,887 | 15,241 | 15,366 | 7,420 | 2.7% |
| 54 | Professional Services | 26,943 | 30,504 | 33,668 | 35,876 | 37,636 | 38,861 | 11,918 | 1.5% |
| 55 | Management | 14,322 | 15,305 | 17,161 | 18,761 | 20,318 | 21,683 | 7,361 | 1.7% |
| 56 | Administrative & Waste Services | 18,449 | 24,045 | 25,972 | 27,275 | 27,971 | 28,110 | 9,661 | 1.7% |
| 61 | Educational Services | 37,937 | 47,426 | 52,529 | 56,423 | 59,112 | 61,196 | 23,259 | 1.9% |
| 62 | Health & Social Services | 50,616 | 55,927 | 64,448 | 70,319 | 75,223 | 78,876 | 28,260 | 1.8% |
| 71 | Arts, Entertainment & Recreation | 6,741 | 6,985 | 7,668 | 8,152 | 8,429 | 8,493 | 1,752 | 0.9% |
| 72 | Accomodation & Food Services | 35,102 | 38,514 | 41,249 | 42,927 | 43,915 | 44,222 | 9,120 | 0.9% |
| 81 | Other Services | 16,802 | 17,298 | 19,646 | 21,327 | 22,538 | 23,076 | 6,274 | 1.3% |
| 92 | Government (Civilian) | 15,498 | 15,418 | 15,919 | 16,183 | 16,167 | 16,251 | 753 | 0.2% |
| **Total Employment** | | **369,440** | **430,306** | **464,052** | **486,518** | **502,226** | **511,083** | **141,643** | **1.3%** |
| City Share of Portland Metro Employment | | 38.9% | 39.4% | 39.0% | 37.9% | 36.4% | 34.4% | **26.4%** | |

Source: E. D. Hovee & Company, LLC based on Metro projection and City/Metro forecast 2035 allocation.

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## Figure 33. Employment to Building Types

| NAICS Employment Sector | | General Industrial | Warehouse | Flex/BP | Office | Retail | Institution |
|---|---|---|---|---|---|---|---|
| 11 & 21 | Ag, Mining | 3% | 3% | 3% | 72% | 18% | - |
| 23 | Construction | 41% | - | 14% | 28% | 17% | - |
| 31-33 | Manufacturing | 76% | - | 11% | 5% | 8% | - |
| 42 | Wholesale | - | 65% | 13% | 13% | 9% | - |
| 44-45 | Retail | - | - | - | - | 100% | - |
| 22, 48-49 | Transport, Warehouse & Utilities | - | 55% | 11% | 31% | 3% | - |
| 51 | Information | - | - | 35% | 45% | 20% | - |
| 52 | Finance | - | - | 5% | 88% | 7% | - |
| 53 | Real Estate | - | - | 24% | 67% | 8% | - |
| 54 | Professional Services | - | - | 3% | 91% | 6% | - |
| 55 | Management | - | - | - | 100% | - | - |
| 56 | Admin, Waste | - | - | 31% | 57% | 12% | - |
| 61 | Education | - | - | - | 10% | 5% | 85% |
| 62 | Health & Social Services | - | - | - | 15% | 15% | 70% |
| 71 | Arts, Entertainment, Recreation | - | - | - | 79% | 21% | - |
| 72 | Accommodation & Food Service | - | - | - | 45% | 55% | - |
| 81 | Other Services | - | - | - | 34% | 66% | - |
| 92 | Government | - | - | - | 87% | 13% | - |

Source: Metro, BPS, and E. D. Hovee & Company, LLC.

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## Figure 34. Net Job Growth by Building Type & Employment Geography (2010-35)

| Employment Geography | General Industrial | Warehouse | Flex/BP | Office | Retail | Institution | Total |
|---|---|---|---|---|---|---|---|
| Central City Commercial | (178) | 134 | 2,150 | 22,272 | 6,015 | 3,731 | 34,124 |
| Central City Industrial | 516 | 995 | 1,026 | 5,222 | 1,479 | 1,379 | 10,617 |
| Harbor & Airport Districts | 361 | 5,335 | 2,396 | 6,104 | 1,757 | 261 | 16,215 |
| Harbor Access Lands | 159 | 438 | 438 | 673 | 144 | 53 | 1,905 |
| Columbia East | 765 | 1,825 | 1,191 | 3,618 | 1,535 | 373 | 9,308 |
| Dispersed Employment | 561 | (12) | 659 | 3,129 | (280) | 143 | 4,200 |
| Gateway Regional Center | 16 | (29) | 19 | 1,062 | 920 | 1,983 | 3,970 |
| Town Centers | 54 | (4) | 124 | 1,328 | 932 | 3,725 | 6,160 |
| Neighb. Centers and Corridors | 106 | 497 | 1,520 | 10,372 | 7,591 | 4,924 | 25,011 |
| Residential | (105) | 266 | 303 | 2,184 | 550 | 4,205 | 7,403 |
| Institutions | (0) | 11 | 5 | 1,927 | 2,013 | 18,775 | 22,730 |
| **Total** | **2,255** | **9,457** | **9,831** | **57,892** | **22,657** | **39,552** | **141,643** |
| **Aggregate Geography** | | | | | | | |
| Central City | (178) | 134 | 2,150 | 22,272 | 6,015 | 3,731 | 34,124 |
| Industrial | 1,846 | 7,587 | 4,684 | 13,524 | 3,157 | 830 | 31,628 |
| Incubator | 516 | 995 | 1,026 | 5,222 | 1,479 | 1,379 | 10,617 |
| Neighborhoods | 70 | 731 | 1,966 | 14,947 | 9,993 | 14,837 | 42,544 |
| Institutions | (0) | 11 | 5 | 1,927 | 2,013 | 18,775 | 22,730 |
| **Total** | **2,255** | **9,457** | **9,831** | **57,892** | **22,657** | **39,552** | **141,643** |

Source: Metro, BPS, and E. D. Hovee & Company, LLC.
Note: Figures exclude employment allocated to non-employment geographies including areas designated for residential and open space use.

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## Figure 35. Square Feet per Employee

| Employment Geography | General Industrial | Warehouse | Flex/BP | Office | Retail | Institution |
|---|---|---|---|---|---|---|
| Central City Commercial | 350 | 350 | 350 | 350 | 470 | 600 |
| Central City Industrial | 926 | 780 | 599 | 350 | 470 | 600 |
| Harbor & Airport Districts | 926 | 1,263 | 769 | 350 | 470 | 600 |
| Harbor Access Lands | 926 | 1,263 | 769 | 350 | 470 | 600 |
| Columbia East | 926 | 1,263 | 769 | 350 | 470 | 600 |
| Dispersed Employment | 926 | 1,263 | 769 | 350 | 470 | 600 |
| Gateway Regional Center | 350 | 350 | 350 | 350 | 470 | 600 |
| Town Centers | 350 | 350 | 350 | 350 | 470 | 600 |
| Neighborhood Centers and Corridors | 926 | 780 | 599 | 350 | 470 | 600 |
| Residential | 926 | 780 | 599 | 350 | 470 | 600 |
| Institutions | 350 | 350 | 599 | 350 | 470 | 600 |
| *Notes* | *Atlas + acts like office in urban geogs* | *Atlas + acts like office in urban geogs* | *Atlas + acts like office in urban geogs* | *Industry standard range: 250-350* | *Industry standard assumption* | *Metro assumption* |

Sources: Metro, Portland Bureau of Planning & Sustainability, and E. D. Hovee & Company, LLC.

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## Figure 36. Floor Area Ratios

**2010 Base Floor Area Ratios (FARs)**

| Employment Geography | General Industrial | Warehouse | Flex/BP | Office | Retail | Institution |
|---|---|---|---|---|---|---|
| Central City Commercial | 5.00 | 5.00 | 5.00 | 7.00 | 3.00 | 5.00 |
| Central City Industrial | 1.00 | 1.00 | 2.00 | 2.00 | 0.50 | 2.00 |
| Harbor & Airport Districts | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |
| Harbor Access Lands | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |
| Columbia East | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 |
| Dispersed Employment | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |
| Gateway Regional Center | 0.60 | 0.60 | 1.50 | 1.50 | 0.35 | 1.50 |
| Town Centers | 0.50 | 0.50 | 0.50 | 0.60 | 0.30 | 0.60 |
| Neighb. Centers and Corridors | 0.30 | 0.25 | 0.30 | 0.60 | 0.50 | 0.60 |
| Residential | 0.40 | 0.40 | 0.40 | 0.55 | 0.40 | 0.55 |
| Institutions | 0.50 | 0.50 | 0.50 | 0.80 | 0.50 | 0.80 |

**2035 Floor Area Ratios (FARs)**

| Employment Geography | General Industrial | Warehouse | Flex/BP | Office | Retail | Institution |
|---|---|---|---|---|---|---|
| Central City Commercial | 5.79 | 5.79 | 5.79 | 9.38 | 3.47 | 5.79 |
| Central City Industrial | 1.16 | 1.16 | 2.32 | 2.68 | 0.58 | 2.32 |
| Harbor & Airport Districts | 0.35 | 0.35 | 0.35 | 0.41 | 0.35 | 0.35 |
| Harbor Access Lands | 0.40 | 0.40 | 0.40 | 0.46 | 0.40 | 0.40 |
| Columbia East | 0.40 | 0.40 | 0.40 | 0.46 | 0.40 | 0.40 |
| Dispersed Employment | 0.35 | 0.35 | 0.35 | 0.41 | 0.35 | 0.35 |
| Gateway Regional Center | 0.69 | 0.69 | 1.74 | 2.01 | 0.41 | 1.74 |
| Town Centers | 0.58 | 0.58 | 0.58 | 0.80 | 0.35 | 0.69 |
| Neighb. Centers and Corridors | 0.35 | 0.29 | 0.35 | 0.80 | 0.58 | 0.69 |
| Residential | 0.46 | 0.46 | 0.46 | 0.74 | 0.46 | 0.64 |
| Institutions | 0.58 | 0.58 | 0.58 | 1.07 | 0.58 | 0.93 |

Source: Metro, Portland Bureau of Planning & Sustainability, and E. D. Hovee & Company, LLC.

## Figure 37. Estimated 2010-2035 Land Need for Airport Facilities

| Facility | Airport Futures Need | Acres | Job-Based Demand Acres | Additional Land Demand for Airport Facilities |
|---|---|---|---|---|
| **Air Transportation & Terminal Services** | | **52** | **141** | **(88.81)** |
| Customer Parking | 11,372 spaces | 16.25 | | |
| Employee Parking | 556 spaces | 5.56 | | |
| RON Aircraft Parking | 23 acres | 23 | | |
| Airport Maintenance | 2 acres | 2 | | |
| Airport Fire & Rescue | 3 acres | 3 | | |
| Aircraft Fuel Storage | 2 acres | 2 | | |
| **Rental Car Agencies** | | **21** | **11** | **10.39** |
| Rental Car Ready/Return | 1219 spaces | 12.19 | | |
| Rental Car Service | 9.2 acres | 9.2 | | |
| **General Aviation** | 20 acres | **20** | **0.2** | **19.80** |
| **Air Cargo Couriers** | | **113** | **18** | **95.38** |
| Air Cargo Warehouse | 613,000 s.f. | 14.07 | | |
| Air Cargo Landside | 1,005,000 s.f. | 23.07 | | |
| Air Cargo Ramp | 369,000 s.y. | 76.24 | | |
| **Total** | | **207** | **170** | **37** |

Source: Bureau of Planning and Sustainability

# APPENDIX B. CONSTRAINED LANDS DEVELOPMENT RATES

The constraint analysis considered the impact of different characteristics that are grouped into seven broad categories and mapped according to the BLI.

## Figure 38. BLI Constraints

**Infrastructure**

*Transportation*
2008 Volume to Capacity Ratios
Streets Connectivity Standards
ODOT Highway Interchanges
Improved and Unimproved Streets
Pedestrian System
*Water Service*
Water Deficient Service Areas
*Sewer Service*
Infrastructure Constrained Areas: Sewer
*Stormwater*
Stormwater System
Depth to Seasonal High Water
Soil Infiltration Capability
Wellfield Protection Areas

**Environmental**

Wetlands
Environmental Conservation Overlay Zones
All slopes over 25%
FEMA 100-Year Floodplain Map

**Brownfields**

DEQ Environmental Cleanup Sites I (ECSI)
DEQ Confirmed Release Sites (CRL)
DEQ Underground Storage Tank Cleanup Sites (UST)

**Greenway**

Willamette Greenway Setback

**Low**

Scenic Area View Corridors
Historic and Conservation Districts
Archaeological Areas

**Historic**

Historic and Conservation Landmarks

**Full**

OS Comprehensive Plan Map Designation
Environmental Protection Zones
FEMA Floodway Map
Beds and banks of navigable waterways
Public rights-of-way
Land within the City but outside the Urban Growth Boundary

Source: Bureau of Planning and Sustainability

A discount factor is determined to reflect the degree of impact each constraint has on development. The first step is characterizing the constraint as high, medium, or low based on consultation with the City of Portland's development review staff at the Bureaus of Development Services, Transportation, Water, and Environmental Services. Then the factor is adjusted based on a review of development rates of various constrained sites compared to unconstrained sites for the 1999-2011 period. This analysis included both the rate of development (avoidance) as well as the overall amount of development to determine the level of constraint by type of constraint and by geographic area.

## Figure 39. Development Rate Calculations by Constraint Type and Aggregated Geography

| | 1999-2011 Land Development Rate | Development Rate as % of Unconstrained | 1999-2011 FAR | 1999-2011 FAR % of Unconstrained | 2010-2035 Composite Rate | Jun 2011 BLI Constraint | Adjusted Constraint | Comments |
|---|---|---|---|---|---|---|---|---|
| **Environmental** (Wetlands, C zones, Floodplain, Slopes) | | | | | | | | |
| Central City | 5.1% | 31.1% | 1.02 | 44.1% | 13.7% | 55% | 75% | |
| Industrial | 20.6% | 40.8% | 0.15 | 47.4% | 19.4% | 55% | 50% | |
| Commercial | 18.0% | 38.5% | 0.28 | 71.0% | 27.4% | 55% | 35% | |
| **Infrastructure** | | | | | | | | |
| Central City | 9.2% | 55.4% | 0.36 | 15.7% | 8.7% | 85% | 75% | |
| Industrial | 14.1% | 27.8% | 0.17 | 53.5% | 14.9% | 85% | 75% | |
| Commercial | 20.8% | 44.5% | 0.21 | 52.4% | 23.3% | 85% | 75% | |
| **Brownfields** | | | | | | | | |
| Central City | 39.0% | 100.0% | 2.14 | 92.1% | 92.1% | 85% | 90% | |
| Industrial | 31.3% | 61.8% | 0.20 | 62.9% | 38.9% | 85% | 40% | |
| Commercial | 48.8% | 100.0% | 0.19 | 47.9% | 47.9% | 85% | 50% | |
| **Historic Landmarks** | | | | | | | | |
| Central City | 17.6% | 100.0% | 4.32 | 186.3% | 186.3% | 55% | 55% | Too few cases |
| Industrial | 0.0% | 0.0% | 0.00 | 0.0% | 0.0% | 55% | 55% | |
| Commercial | 100.0% | 100.0% | 0.39 | 100.1% | 100.1% | 55% | 55% | |
| **Low** (Historic Districts, View Corridors) | | | | | | | | |
| Central City | 4.5% | 27.2% | 0.69 | 29.6% | 8.1% | 85% | 85% | Too few cases |
| Industrial | 0.0% | 0.0% | 0.00 | 0.0% | 0.0% | 85% | 85% | |
| Commercial | 32.4% | 69.6% | 0.76 | 192.6% | 134.0% | 85% | 85% | |
| **Greenway** | | | | | | | | |
| Central City | 11.0% | 66.5% | 1.81 | 78.1% | 51.9% | 55% | 75% | |
| Industrial | 30.1% | 59.6% | 0.23 | 72.1% | 42.9% | 55% | 50% | |
| Commercial | 4.7% | 10.1% | 0.82 | 207.9% | 21.0% | 55% | 55% | |
| **Unconstrained** | | | | | | | | |
| Central City | 16.6% | 100.0% | 2.32 | 100.0% | 100.0% | | | |
| Industrial | 50.6% | 100.0% | 0.32 | 100.0% | 100.0% | | | |
| Commercial | 46.6% | 100.0% | 0.39 | 100.0% | 100.0% | | | |

Source: E.D. Hovee & Company, LLC and Bureau of Planning and Sustainability

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# APPENDIX C. BUILDABLE LAND INVENTORY TABLES

Detailed tables of the Buildable Land Inventory, December 2014, are provided in the following pages.

The net building square footage is the total building square footage allowed under current comprehensive plan designations less existing building square footage.

In the industrial geographies, vacant land and underutilized parcels smaller than 0.5 acres are not included. Vacant land supply in the Harbor and Airport Districts excludes 45 acres of land held as long-term aviation reserve that exceeds forecast airport land demand.

Institutional campus capacity is based on approved master plans, although vacant and underutilized parcels are reported.



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## Figure 40. Existing Buildable Land Inventory – Net Building Square Footage (part 1)

| Employment Geography | Less than .5 acres | | | .5 to 1 acre | | | 1 to 3 acres | | | 3 to 5 acres | | | 6 to 10 acres | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment |
| **Central City Commercial** | 7,458,959 | 7,168,400 | 7,168,400 | 15,082,749 | 13,262,718 | 13,262,718 | 10,562,292 | 8,839,118 | 8,839,118 | 8,043,163 | 7,165,394 | 7,165,394 | 1,467,324 | 1,466,445 | 1,466,445 |
| Vacant | 5,024,107 | 4,831,415 | 4,831,415 | 9,613,896 | 8,300,572 | 8,300,572 | 6,777,220 | 5,755,076 | 5,755,076 | 5,729,222 | 5,232,577 | 5,232,577 | 1,467,324 | 1,466,445 | 1,466,445 |
| Redevelopment | 2,434,852 | 2,336,985 | 2,336,985 | 5,468,853 | 4,962,146 | 4,962,146 | 3,785,072 | 3,084,042 | 3,084,042 | 2,313,940 | 1,932,816 | 1,932,816 | 0 | 0 | 0 |
| **Central City Industrial** | 869,945 | 813,330 | 813,330 | 1,935,896 | 1,768,007 | 1,768,007 | 779,761 | 735,157 | 735,157 | 418,253 | 355,991 | 355,991 | 156,711 | 107,381 | 107,381 |
| Vacant | 517,375 | 481,089 | 481,089 | 1,588,023 | 1,443,271 | 1,443,271 | 669,450 | 624,846 | 624,846 | 377,287 | 318,407 | 318,407 | 71,105 | 37,258 | 37,258 |
| Redevelopment | 352,569 | 332,242 | 332,242 | 347,873 | 324,736 | 324,736 | 110,310 | 110,310 | 110,310 | 40,965 | 37,584 | 37,584 | 85,606 | 70,123 | 70,123 |
| **Columbia East** | 68,322 | 48,329 | 48,329 | 433,726 | 273,239 | 273,239 | 1,734,983 | 995,105 | 995,105 | 1,275,839 | 813,366 | 813,366 | 1,688,887 | 1,185,501 | 1,185,501 |
| Vacant | 68,322 | 48,329 | 48,329 | 433,726 | 273,239 | 273,239 | 1,697,601 | 981,697 | 981,697 | 1,222,329 | 759,857 | 759,857 | 1,631,765 | 1,128,378 | 1,128,378 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 37,383 | 13,408 | 13,408 | 53,510 | 53,510 | 53,510 | 57,122 | 57,122 | 57,122 |
| **Dispersed Employment** | 574,417 | 486,760 | 486,760 | 392,721 | 302,229 | 302,229 | 1,058,976 | 964,494 | 964,494 | 1,243,260 | 815,384 | 815,384 | 87,417 | 68,362 | 68,362 |
| Vacant | 411,765 | 341,904 | 341,904 | 278,923 | 199,532 | 199,532 | 673,107 | 619,556 | 619,556 | 891,055 | 557,954 | 557,954 | 77,736 | 58,680 | 58,680 |
| Redevelopment | 162,653 | 144,856 | 144,856 | 113,798 | 102,697 | 102,697 | 385,869 | 344,938 | 344,938 | 352,205 | 257,430 | 257,430 | 9,681 | 9,681 | 9,681 |
| **Harbor Access Lands** | 15,401 | 4,121 | 4,121 | 58,769 | 19,678 | 19,678 | 792,699 | 159,438 | 159,438 | 0 | 0 | 0 | 712,955 | 199,870 | 199,870 |
| Vacant | 15,401 | 4,121 | 4,121 | 58,769 | 19,678 | 19,678 | 792,699 | 159,438 | 159,438 | 0 | 0 | 0 | 712,955 | 199,870 | 199,870 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Harbor & Airport Districts** | 322,018 | 222,380 | 222,380 | 546,829 | 333,422 | 333,422 | 5,305,617 | 3,305,608 | 3,305,608 | 4,200,870 | 2,795,402 | 2,795,402 | 6,116,182 | 3,746,286 | 3,746,286 |
| Vacant | 296,115 | 203,042 | 203,042 | 471,529 | 287,336 | 287,336 | 4,356,784 | 2,491,808 | 2,491,808 | 3,460,302 | 2,137,395 | 2,137,395 | 6,116,182 | 3,746,286 | 3,746,286 |
| Redevelopment | 25,902 | 19,338 | 19,338 | 75,300 | 46,086 | 46,086 | 948,833 | 813,800 | 813,800 | 740,568 | 658,007 | 658,007 | 0 | 0 | 0 |
| **Institutions** | 115,139 | 98,989 | 98,989 | 185,281 | 150,267 | 150,267 | 547,202 | 501,122 | 501,122 | 211,523 | 211,523 | 211,523 | 413,929 | 408,680 | 408,680 |
| Vacant | 27,759 | 24,872 | 24,872 | 70,722 | 50,512 | 50,512 | 82,479 | 79,854 | 79,854 | 0 | 0 | 0 | 73,174 | 67,925 | 67,925 |
| Redevelopment | 87,379 | 74,117 | 74,117 | 114,559 | 99,755 | 99,755 | 464,723 | 421,268 | 421,268 | 211,523 | 211,523 | 211,523 | 340,754 | 340,754 | 340,754 |
| **Neighb. Centers & Corridors** | 8,369,842 | 7,377,621 | 2,529,889 | 10,495,818 | 9,019,990 | 2,610,404 | 23,948,142 | 20,999,887 | 4,940,798 | 11,458,239 | 9,500,089 | 2,289,441 | 6,910,446 | 5,622,594 | 1,345,485 |
| Vacant | 2,207,664 | 1,893,699 | 941,700 | 2,413,747 | 2,059,438 | 875,093 | 4,638,711 | 3,906,244 | 1,345,224 | 2,787,632 | 2,376,608 | 901,446 | 2,257,367 | 1,703,802 | 578,797 |
| Redevelopment | 6,162,178 | 5,483,922 | 1,588,189 | 8,082,071 | 6,960,552 | 1,735,311 | 19,309,431 | 17,093,643 | 3,595,574 | 8,670,608 | 7,123,481 | 1,387,994 | 4,653,079 | 3,918,792 | 766,688 |
| **Gateway Regional Center** | 424,485 | 345,074 | 209,147 | 634,391 | 516,252 | 360,689 | 4,841,116 | 4,064,246 | 2,436,238 | 3,537,351 | 2,476,419 | 1,311,382 | 1,641,898 | 875,837 | 572,277 |
| Vacant | 195,721 | 177,703 | 115,710 | 296,577 | 233,587 | 202,328 | 1,785,034 | 1,319,835 | 888,564 | 1,490,073 | 994,080 | 656,292 | 115,187 | 81,550 | 57,594 |
| Redevelopment | 228,764 | 167,371 | 93,437 | 337,813 | 282,665 | 158,361 | 3,056,082 | 2,744,412 | 1,547,673 | 2,047,279 | 1,482,339 | 655,090 | 1,526,711 | 794,287 | 514,683 |
| **Town Centers** | 4,257,397 | 3,896,924 | 1,784,613 | 5,273,893 | 4,817,100 | 1,975,589 | 7,974,293 | 7,337,382 | 2,186,506 | 3,111,738 | 2,815,239 | 857,304 | 3,213,112 | 2,799,419 | 506,577 |
| Vacant | 1,392,753 | 1,285,288 | 762,437 | 1,389,458 | 1,292,599 | 714,408 | 2,092,275 | 1,859,456 | 886,969 | 914,607 | 770,198 | 339,456 | 385,765 | 217,689 | 94,835 |
| Redevelopment | 2,864,644 | 2,611,635 | 1,022,176 | 3,884,435 | 3,524,501 | 1,261,181 | 5,882,018 | 5,477,926 | 1,299,537 | 2,197,131 | 2,045,042 | 517,848 | 2,827,347 | 2,581,730 | 411,742 |
| **Outside Geographies** | 411,917 | 318,675 | 318,675 | 100,780 | 87,148 | 87,148 | 770,814 | 644,578 | 644,578 | 818,086 | 342,668 | 342,668 | 189,055 | 125,799 | 125,799 |
| Vacant | 133,059 | 94,644 | 94,644 | 60,953 | 47,490 | 47,490 | 408,609 | 352,498 | 352,498 | 699,068 | 246,903 | 246,903 | 93,604 | 48,648 | 48,648 |
| Redevelopment | 278,858 | 224,031 | 224,031 | 39,827 | 39,657 | 39,657 | 362,205 | 292,080 | 292,080 | 119,018 | 95,766 | 95,766 | 95,452 | 77,151 | 77,151 |
| **Grand Total** | **22,771,362** | **20,612,067** | **13,516,097** | **35,744,743** | **31,117,054** | **21,710,395** | **58,554,123** | **48,694,948** | **25,856,974** | **34,368,186** | **27,417,414** | **17,083,793** | **22,603,447** | **16,604,082** | **9,730,571** |
| **Aggregate Geography** | | | | | | | | | | | | | | | |
| Central City | 8,328,904 | 7,981,731 | 7,981,731 | 17,018,644 | 15,030,725 | 15,030,725 | 11,342,053 | 9,574,275 | 9,574,275 | 8,461,415 | 7,521,384 | 7,521,384 | 1,624,035 | 1,573,826 | 1,573,826 |
| Industrial | 980,158 | 761,589 | 761,589 | 1,432,045 | 928,568 | 928,568 | 8,892,276 | 5,424,644 | 5,424,644 | 6,719,968 | 4,424,153 | 4,424,153 | 8,605,441 | 5,200,018 | 5,200,018 |
| Neighborhood Commercial | 13,051,724 | 11,619,618 | 4,523,648 | 16,404,102 | 14,353,342 | 4,946,683 | 36,763,552 | 32,401,516 | 9,563,541 | 18,107,329 | 14,791,748 | 4,458,127 | 11,765,456 | 9,297,850 | 2,424,339 |
| Institutions | 115,139 | 98,989 | 98,989 | 185,281 | 150,267 | 150,267 | 547,202 | 501,122 | 501,122 | 211,523 | 211,523 | 211,523 | 413,929 | 408,680 | 408,680 |
| Outside Geographies | 411,917 | 318,675 | 318,675 | 100,780 | 87,148 | 87,148 | 770,814 | 644,578 | 644,578 | 818,086 | 342,668 | 342,668 | 189,055 | 125,799 | 125,799 |
| **Total** | **22,887,841** | **20,780,603** | **13,684,633** | **35,140,851** | **30,550,050** | **21,143,390** | **58,315,896** | **48,546,134** | **25,708,160** | **34,318,321** | **27,291,475** | **16,957,855** | **22,597,915** | **16,606,173** | **9,732,661** |

Source: Bureau of Planning and Sustainability

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## Figure 41. Existing Buildable Land Inventory – Net Building Square Footage (part 2)

| Employment Geography | 10 to 20 acres Before Constraints | 10 to 20 acres After Constraints | 10 to 20 acres After Market Adjustment | 20 to 50 acres Before Constraints | 20 to 50 acres After Constraints | 20 to 50 acres After Market Adjustment | More than 50 acres Before Constraints | More than 50 acres After Constraints | More than 50 acres After Market Adjustment | Total Before Constraints | Total After Constraints | Total Adjusted Capacity | Employment Geography |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Central City Commercial** | 3,846,801 | 2,211,321 | 2,211,321 | 0 | 0 | 0 | 9,346,822 | 5,429,870 | 5,429,870 | 55,808,110 | 45,543,265 | **45,543,265** | **Central City Commercial** |
| Vacant | 2,577,466 | 1,498,518 | 1,498,518 | 0 | 0 | 0 | 7,875,465 | 4,385,367 | 4,385,367 | 39,064,699 | 31,469,972 | **31,469,972** | Vacant |
| Redevelopment | 1,269,335 | 712,803 | 712,803 | 0 | 0 | 0 | 1,471,358 | 1,044,503 | 1,044,503 | 16,743,411 | 14,073,294 | **14,073,294** | Redevelopment |
| **Central City Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,160,564 | 3,779,866 | **3,779,866** | **Central City Industrial** |
| Vacant | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,223,240 | 2,904,871 | **2,904,871** | Vacant |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 937,323 | 874,995 | **874,995** | Redevelopment |
| **Columbia East** | 4,175,176 | 1,962,414 | 1,962,414 | 5,582,653 | 4,198,004 | 4,198,004 | 8,439,811 | 6,091,741 | 6,091,741 | 23,331,074 | 15,519,370 | **15,519,370** | **Columbia East** |
| Vacant | 4,175,176 | 1,962,414 | 1,962,414 | 5,582,653 | 4,198,004 | 4,198,004 | 8,439,811 | 6,091,741 | 6,091,741 | 23,183,060 | 15,395,331 | **15,395,331** | Vacant |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 148,014 | 124,039 | **124,039** | Redevelopment |
| **Dispersed Employment** | 448,556 | 246,238 | 246,238 | 1,381,040 | 929,710 | 929,710 | 4,294,052 | 1,960,903 | 1,960,903 | 8,906,021 | 5,287,319 | **5,287,319** | **Dispersed Employment** |
| Vacant | 429,890 | 228,733 | 228,733 | 1,297,140 | 862,041 | 862,041 | 3,869,291 | 1,792,295 | 1,792,295 | 7,517,142 | 4,318,790 | **4,318,790** | Vacant |
| Redevelopment | 18,665 | 17,505 | 17,505 | 83,899 | 67,669 | 67,669 | 424,762 | 168,608 | 168,608 | 1,388,880 | 968,528 | **968,528** | Redevelopment |
| **Harbor Access Lands** | 3,934,358 | 1,055,625 | 1,055,625 | 3,136,373 | 1,862,838 | 1,862,838 | 6,753,628 | 2,556,419 | 2,556,419 | 15,388,782 | 5,853,867 | **5,853,867** | **Harbor Access Lands** |
| Vacant | 3,867,467 | 1,024,919 | 1,024,919 | 3,136,373 | 1,862,838 | 1,862,838 | 6,753,628 | 2,556,419 | 2,556,419 | 15,321,892 | 5,823,161 | **5,823,161** | Vacant |
| Redevelopment | 66,891 | 30,706 | 30,706 | 0 | 0 | 0 | 0 | 0 | 0 | 66,891 | 30,706 | **30,706** | Redevelopment |
| **Harbor & Airport Districts** | 8,733,262 | 4,861,467 | 4,861,467 | 13,291,954 | 7,386,287 | 7,386,287 | 28,019,308 | 13,503,041 | 13,503,041 | 66,214,022 | 35,931,513 | **33,971,313** | **Harbor & Airport Districts** |
| Vacant | 7,053,014 | 3,855,566 | 3,855,566 | 12,488,433 | 6,829,590 | 6,829,590 | 27,970,575 | 13,485,981 | 13,485,981 | 61,916,818 | 32,833,961 | **30,873,761** | Vacant |
| Redevelopment | 1,680,248 | 1,005,901 | 1,005,901 | 803,521 | 556,697 | 556,697 | 48,733 | 17,061 | 17,061 | 4,297,204 | 3,097,552 | **3,097,552** | Redevelopment |
| **Institutions** | 1,358,633 | 1,355,695 | 1,355,695 | 2,660,874 | 1,606,056 | 1,606,056 | 3,551,957 | 3,524,122 | 3,524,122 | 9,044,536 | 7,856,453 | **7,856,453** | **Institutions** |
| Vacant | 520,681 | 517,864 | 517,864 | 2,020,558 | 989,912 | 989,912 | 441,122 | 413,287 | 413,287 | 3,236,495 | 2,144,227 | **2,144,227** | Vacant |
| Redevelopment | 837,952 | 837,831 | 837,831 | 640,317 | 616,144 | 616,144 | 3,110,835 | 3,110,835 | 3,110,835 | 5,808,041 | 5,712,227 | **5,712,227** | Redevelopment |
| **Neighb. Centers & Corridors** | 11,862,647 | 9,416,529 | 1,881,664 | 14,379,443 | 6,834,603 | 2,394,607 | 17,334,963 | 3,838,998 | 1,606,234 | 104,759,540 | 72,610,312 | **19,598,522** | **Neighb. Centers & Corridors** |
| Vacant | 1,222,901 | 945,652 | 346,029 | 5,455,839 | 3,209,800 | 1,491,864 | 13,007,181 | 2,776,464 | 1,347,405 | 33,991,041 | 18,871,708 | **7,827,558** | Vacant |
| Redevelopment | 10,639,746 | 8,470,877 | 1,535,635 | 8,923,604 | 3,624,802 | 902,744 | 4,327,782 | 1,062,534 | 258,829 | 70,768,499 | 53,738,604 | **11,770,964** | Redevelopment |
| **Gateway Regional Center** | 1,509,049 | 714,704 | 593,596 | 0 | 0 | 0 | 0 | 0 | 0 | 12,588,290 | 8,992,532 | **5,483,328** | **Gateway Regional Center** |
| Vacant | 54,086 | 40,564 | 29,301 | 0 | 0 | 0 | 0 | 0 | 0 | 3,936,679 | 2,847,319 | **1,949,789** | Vacant |
| Redevelopment | 1,454,963 | 674,140 | 564,295 | 0 | 0 | 0 | 0 | 0 | 0 | 8,651,612 | 6,145,213 | **3,533,539** | Redevelopment |
| **Town Centers** | 1,930,583 | 879,943 | 129,168 | 121,958 | 105,822 | 50,243 | 0 | 0 | 0 | 25,882,973 | 22,651,829 | **7,490,001** | **Town Centers** |
| Vacant | 135,278 | 132,585 | 37,636 | 41,030 | 24,894 | 23,441 | 0 | 0 | 0 | 6,351,166 | 5,582,709 | **2,859,182** | Vacant |
| Redevelopment | 1,795,305 | 747,358 | 91,532 | 80,928 | 80,928 | 26,802 | 0 | 0 | 0 | 19,531,807 | 17,069,119 | **4,630,819** | Redevelopment |
| **Outside Geographies** | 1,613,378 | 1,217,133 | 1,217,133 | 3,857,805 | 1,034,574 | 1,034,574 | 2,596,566 | 329,063 | 329,063 | 10,358,401 | 4,099,638 | **4,099,638** | **Outside Geographies** |
| Vacant | 825,582 | 664,947 | 664,947 | 2,539,482 | 462,307 | 462,307 | 2,565,904 | 298,401 | 298,401 | 7,326,260 | 2,215,838 | **2,215,838** | Vacant |
| Redevelopment | 787,796 | 552,186 | 552,186 | 1,318,323 | 572,266 | 572,266 | 30,662 | 30,662 | 30,662 | 3,032,141 | 1,883,800 | **1,883,800** | Redevelopment |
| **Grand Total** | **40,641,871** | **24,912,256** | **16,505,508** | **44,772,365** | **24,219,266** | **19,723,692** | **80,378,270** | **37,045,462** | **34,812,698** | **338,970,688** | **230,029,495** | **156,386,474** | **Grand Total** |
| **Aggregate Geography** | | | | | | | | | | | | | **Aggregate Geography** |
| Central City | 3,846,801 | 2,211,321 | 2,211,321 | 0 | 0 | 0 | 9,346,822 | 5,429,870 | 5,429,870 | 59,968,674 | 49,323,131 | **49,323,131** | Central City |
| Industrial | 17,291,352 | 8,125,744 | 8,125,744 | 23,392,020 | 14,376,839 | 14,376,839 | 47,506,800 | 24,112,105 | 24,112,105 | 113,839,900 | 62,592,070 | **60,631,870** | Industrial |
| Neighborhood Commercial | 15,302,279 | 11,011,176 | 2,604,428 | 14,501,401 | 6,940,424 | 2,444,850 | 17,334,963 | 3,838,998 | 1,606,234 | 143,230,804 | 104,254,672 | **32,571,851** | Neighborhood Commercial |
| Institutions | 1,358,633 | 1,355,695 | 1,355,695 | 2,660,874 | 1,606,056 | 1,606,056 | 3,551,957 | 3,524,122 | 3,524,122 | 9,044,536 | 7,856,453 | **7,856,453** | Institutions |
| Outside Geographies | 1,613,378 | 1,217,133 | 1,217,133 | 3,857,805 | 1,034,574 | 1,034,574 | 2,596,566 | 329,063 | 329,063 | 10,358,401 | 4,099,638 | **4,099,638** | Outside Geographies |
| **Total** | **39,412,442** | **23,921,068** | **15,514,321** | **44,412,100** | **23,957,892** | **19,462,318** | **80,337,108** | **37,234,158** | **35,001,394** | **336,442,316** | **228,125,964** | **154,482,943** | **Total** |

Source: Bureau of Planning and Sustainability

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## Figure 42. Existing Buildable Land Inventory – Net Land Acres (part 1)

| Employment Geography | Less than .5 acres | | | .5 to 1 acre | | | 1 to 3 acres | | | 3 to 5 acres | | | 6 to 10 acres | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment |
| **Central City Commercial** | 33 | 32 | 32 | 67 | 59 | 59 | 47 | 39 | 39 | 36 | 32 | 32 | 6 | 6 | 6 |
| Vacant | 22 | 21 | 21 | 42 | 37 | 37 | 30 | 25 | 25 | 25 | 23 | 23 | 6 | 6 | 6 |
| Redevelopment | 11 | 10 | 10 | 24 | 22 | 22 | 17 | 14 | 14 | 10 | 9 | 9 | 0 | 0 | 0 |
| **Central City Industrial** | 15 | 14 | 14 | 33 | 31 | 31 | 13 | 13 | 13 | 7 | 6 | 6 | 3 | 2 | 2 |
| Vacant | 9 | 8 | 8 | 27 | 25 | 25 | 12 | 11 | 11 | 7 | 5 | 5 | 1 | 1 | 1 |
| Redevelopment | 6 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Columbia East** | 2 | 1 | 1 | 10 | 6 | 6 | 40 | 23 | 23 | 29 | 19 | 19 | 39 | 27 | 27 |
| Vacant | 2 | 1 | 1 | 10 | 6 | 6 | 39 | 23 | 23 | 28 | 17 | 17 | 37 | 26 | 26 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Dispersed Employment** | 13 | 11 | 11 | 9 | 7 | 7 | 24 | 22 | 22 | 29 | 19 | 19 | 2 | 2 | 2 |
| Vacant | 9 | 8 | 8 | 6 | 5 | 5 | 15 | 14 | 14 | 20 | 13 | 13 | 2 | 1 | 1 |
| Redevelopment | 4 | 3 | 3 | 3 | 2 | 2 | 9 | 8 | 8 | 8 | 6 | 6 | 0 | 0 | 0 |
| **Harbor Access Lands** | 0 | 0 | 0 | 1 | 0 | 0 | 18 | 4 | 4 | 0 | 0 | 0 | 16 | 5 | 5 |
| Vacant | 0 | 0 | 0 | 1 | 0 | 0 | 18 | 4 | 4 | 0 | 0 | 0 | 16 | 5 | 5 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Harbor & Airport Districts** | 7 | 5 | 5 | 13 | 8 | 8 | 122 | 76 | 76 | 96 | 64 | 64 | 140 | 86 | 86 |
| Vacant | 7 | 5 | 5 | 11 | 7 | 7 | 100 | 57 | 57 | 79 | 49 | 49 | 140 | 86 | 86 |
| Redevelopment | 1 | 0 | 0 | 2 | 1 | 1 | 22 | 19 | 19 | 17 | 15 | 15 | 0 | 0 | 0 |
| **Institutions** | 3 | 2 | 2 | 4 | 3 | 3 | 13 | 12 | 12 | 5 | 5 | 5 | 10 | 9 | 9 |
| Vacant | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 2 | 2 | 2 |
| Redevelopment | 2 | 2 | 2 | 3 | 2 | 2 | 11 | 10 | 10 | 5 | 5 | 5 | 8 | 8 | 8 |
| **Neighb. Centers & Corridors** | 370 | 326 | 112 | 463 | 398 | 115 | 1,057 | 927 | 218 | 506 | 419 | 101 | 305 | 248 | 59 |
| Vacant | 97 | 84 | 42 | 107 | 91 | 39 | 205 | 172 | 59 | 123 | 105 | 40 | 100 | 75 | 26 |
| Redevelopment | 272 | 242 | 70 | 357 | 307 | 77 | 852 | 755 | 159 | 383 | 314 | 61 | 205 | 173 | 34 |
| **Gateway Regional Center** | 11 | 9 | 5 | 16 | 13 | 9 | 121 | 101 | 61 | 88 | 62 | 33 | 41 | 22 | 14 |
| Vacant | 5 | 4 | 3 | 7 | 6 | 5 | 45 | 33 | 22 | 37 | 25 | 16 | 3 | 2 | 1 |
| Redevelopment | 6 | 4 | 2 | 8 | 7 | 4 | 76 | 68 | 39 | 51 | 37 | 16 | 38 | 20 | 13 |
| **Town Centers** | 173 | 158 | 73 | 214 | 196 | 80 | 324 | 298 | 89 | 126 | 114 | 35 | 131 | 114 | 21 |
| Vacant | 57 | 52 | 31 | 56 | 53 | 29 | 85 | 76 | 36 | 37 | 31 | 14 | 16 | 9 | 4 |
| Redevelopment | 116 | 106 | 42 | 158 | 143 | 51 | 239 | 223 | 53 | 89 | 83 | 21 | 115 | 105 | 17 |
| **Outside Geographies** | 9 | 7 | 7 | 2 | 2 | 2 | 18 | 15 | 15 | 19 | 8 | 8 | 4 | 3 | 3 |
| Vacant | 3 | 2 | 2 | 1 | 1 | 1 | 9 | 8 | 8 | 16 | 6 | 6 | 2 | 1 | 1 |
| Redevelopment | 6 | 5 | 5 | 1 | 1 | 1 | 8 | 7 | 7 | 3 | 2 | 2 | 2 | 2 | 2 |
| **Grand Total** | **636** | **565** | **262** | **833** | **723** | **320** | **1,797** | **1,529** | **570** | **941** | **748** | **321** | **697** | **524** | **234** |
| **Aggregate Geography** | | | | | | | | | | | | | | | |
| Central City | 48 | 46 | 46 | 100 | 89 | 89 | 60 | 52 | 52 | 43 | 38 | 38 | 9 | 8 | 8 |
| Industrial | 23 | 17 | 17 | 33 | 21 | 21 | 204 | 125 | 125 | 154 | 102 | 102 | 198 | 119 | 119 |
| Neighborhood Commercial | 553 | 493 | 189 | 693 | 607 | 205 | 1,502 | 1,327 | 368 | 721 | 596 | 169 | 477 | 384 | 94 |
| Institutions | 3 | 2 | 2 | 4 | 3 | 3 | 13 | 12 | 12 | 5 | 5 | 5 | 10 | 9 | 9 |
| Outside Geographies | 9 | 7 | 7 | 2 | 2 | 2 | 18 | 15 | 15 | 19 | 8 | 8 | 4 | 3 | 3 |
| **Total** | **636** | **565** | **262** | **833** | **723** | **320** | **1,797** | **1,529** | **570** | **941** | **748** | **321** | **697** | **524** | **234** |

Source: Bureau of Planning and Sustainability

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## Figure 43. Existing Buildable Land Inventory – Net Land Acres (part 2)

| Employment Geography | 10 to 20 acres Before Constraints | 10 to 20 acres After Constraints | 10 to 20 acres After Market Adjustment | 20 to 50 acres Before Constraints | 20 to 50 acres After Constraints | 20 to 50 acres After Market Adjustment | More than 50 acres Before Constraints | More than 50 acres After Constraints | More than 50 acres After Market Adjustment | Total Before Constraints | Total After Constraints | Total Adjusted Capacity | Employment Geography |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Central City Commercial** | 17 | 10 | 10 | 0 | 0 | 0 | 41 | 24 | 24 | 246 | 201 | **201** | **Central City Commercial** |
| Vacant | 11 | 7 | 7 | 0 | 0 | 0 | 35 | 19 | 19 | 172 | 139 | **139** | Vacant |
| Redevelopment | 6 | 3 | 3 | 0 | 0 | 0 | 6 | 5 | 5 | 74 | 62 | **62** | Redevelopment |
| **Central City Industrial** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72 | 65 | **65** | **Central City Industrial** |
| Vacant | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 50 | **50** | Vacant |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 15 | **15** | Redevelopment |
| **Columbia East** | 96 | 45 | 45 | 128 | 96 | 96 | 194 | 140 | 140 | 536 | 356 | **356** | **Columbia East** |
| Vacant | 96 | 45 | 45 | 128 | 96 | 96 | 194 | 140 | 140 | 532 | 353 | **353** | Vacant |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | **3** | Redevelopment |
| **Dispersed Employment** | 10 | 10 | 6 | 6 | 32 | 21 | 21 | 99 | 45 | 45 | 204 | **121** | **Dispersed Employment** |
| Vacant | 10 | 10 | 5 | 5 | 30 | 20 | 20 | 89 | 41 | 41 | 173 | **99** | Vacant |
| Redevelopment | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 10 | 4 | 4 | 32 | **22** | Redevelopment |
| **Harbor Access Lands** | 90 | 24 | 24 | 72 | 43 | 43 | 155 | 59 | 59 | 353 | 134 | **134** | **Harbor Access Lands** |
| Vacant | 89 | 24 | 24 | 72 | 43 | 43 | 155 | 59 | 59 | 352 | 134 | **134** | Vacant |
| Redevelopment | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | **1** | Redevelopment |
| **Harbor & Airport Districts** | 200 | 112 | 112 | 305 | 170 | 170 | 643 | 310 | 310 | 1,520 | 825 | **780** | **Harbor & Airport Districts** |
| Vacant | 162 | 89 | 89 | 287 | 157 | 157 | 642 | 310 | 310 | 1,421 | 754 | **709** | Vacant |
| Redevelopment | 39 | 23 | 23 | 18 | 13 | 13 | 1 | 0 | 0 | 99 | 71 | **71** | Redevelopment |
| **Institutions** | 31 | 31 | 31 | 61 | 37 | 37 | 82 | 81 | 81 | 208 | 180 | **180** | **Institutions** |
| Vacant | 12 | 12 | 12 | 46 | 23 | 23 | 10 | 9 | 9 | 74 | 49 | **49** | Vacant |
| Redevelopment | 19 | 19 | 19 | 15 | 14 | 14 | 71 | 71 | 71 | 133 | 131 | **131** | Redevelopment |
| **Neighb. Centers & Corridors** | 524 | 416 | 83 | 635 | 302 | 106 | 765 | 169 | 71 | 4,625 | 3,206 | **865** | **Neighb. Centers & Corridors** |
| Vacant | 54 | 42 | 15 | 241 | 142 | 66 | 574 | 123 | 59 | 1,501 | 833 | **346** | Vacant |
| Redevelopment | 470 | 374 | 68 | 394 | 160 | 40 | 191 | 47 | 11 | 3,124 | 2,372 | **520** | Redevelopment |
| **Gateway Regional Center** | 38 | 18 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 314 | 224 | **137** | **Gateway Regional Center** |
| Vacant | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 98 | 71 | **49** | Vacant |
| Redevelopment | 36 | 17 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 216 | 153 | **88** | Redevelopment |
| **Town Centers** | 78 | 36 | 5 | 5 | 4 | 2 | 0 | 0 | 0 | 1,052 | 920 | **304** | **Town Centers** |
| Vacant | 5 | 5 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 258 | 227 | **116** | Vacant |
| Redevelopment | 73 | 30 | 4 | 3 | 3 | 1 | 0 | 0 | 0 | 794 | 694 | **188** | Redevelopment |
| **Outside Geographies** | 37 | 28 | 28 | 89 | 24 | 24 | 60 | 8 | 8 | 238 | 94 | **94** | **Outside Geographies** |
| Vacant | 19 | 15 | 15 | 58 | 11 | 11 | 59 | 7 | 7 | 168 | 51 | **51** | Vacant |
| Redevelopment | 18 | 13 | 13 | 30 | 13 | 13 | 1 | 1 | 1 | 70 | 43 | **43** | Redevelopment |
| **Grand Total** | **1,122** | **729** | **358** | **1,300** | **707** | **498** | **1,961** | **889** | **737** | **9,208** | **6,411** | **3,239** | **Grand Total** |
| **Aggregate Geography** | | | | | | | | | | | | | **Aggregate Geography** |
| Central City | 17 | 10 | 10 | 0 | 0 | 0 | 41 | 24 | 24 | 318 | 266 | **266** | Central City |
| Industrial | 397 | 191 | 187 | 511 | 340 | 330 | 1,013 | 607 | 554 | 2,454 | 1,520 | **1,392** | Industrial |
| Neighborhood Commercial | 640 | 469 | 103 | 640 | 306 | 108 | 765 | 169 | 71 | 5,991 | 4,350 | **1,306** | Neighborhood Commercial |
| Institutions | 31 | 31 | 31 | 61 | 37 | 37 | 82 | 81 | 81 | 208 | 180 | **180** | Institutions |
| Outside Geographies | 37 | 28 | 28 | 89 | 24 | 24 | 60 | 8 | 8 | 238 | 94 | **94** | Outside Geographies |
| **Total** | **1,122** | **729** | **358** | **1,300** | **707** | **498** | **1,961** | **889** | **737** | **9,208** | **6,411** | **3,239** | **Total** |

Source: Bureau of Planning and Sustainability

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# APPENDIX D. BUILDABLE LAND INVENTORY MAP

A map of the Buildable Land Inventory, December 2014, by constraint levels is provided below. The underutilized parcels and constraint levels identified are based on the proposed Comprehensive Plan, including proposed land use designations on the plan map and 60% brownfield redevelopment capacity in Industrial and Neighborhood Commercial geographies.



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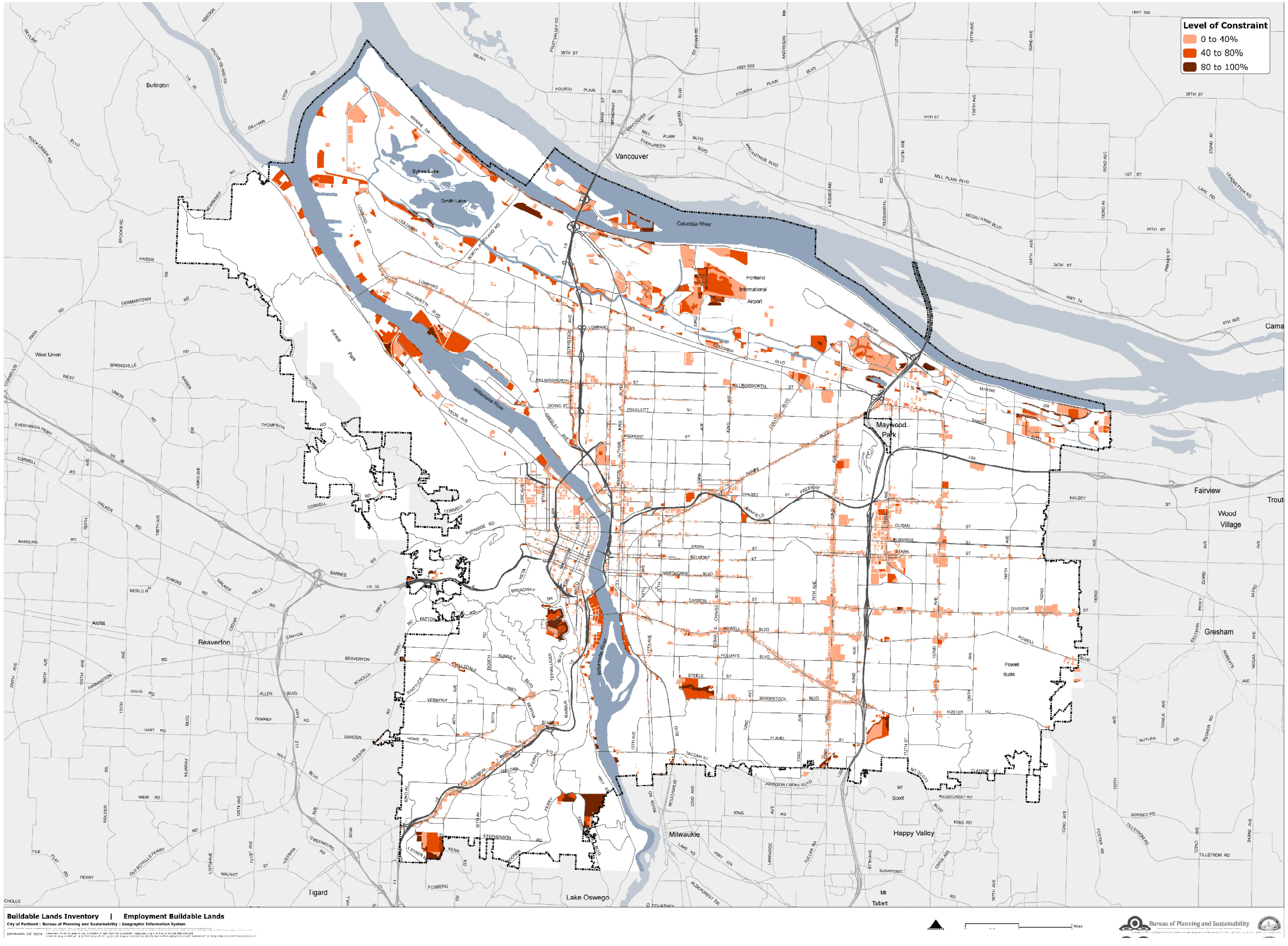
**Figure 44. Buildable Land Inventory Map of Proposed Comprehensive Plan**

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# CITY OF PORTLAND
# ECONOMIC OPPORTUNITIES ANALYSIS:
## Section 4 – Community Choices





## January 2015 Proposed Draft

This Economic Opportunities Analysis has been funded through a grant from the State of Oregon Department of Land Conservation and Development.

**City of Portland Bureau of Planning & Sustainability**

# EXECUTIVE SUMMARY

The EOA is an analysis of the 20-year supply and demand for employment land in the city. It is prepared according to State Administrative Rule OAR 660-09-0015 and consists of four sections:

1. Trends, Opportunities & Market Factors
2. Long Range Employment Land Forecast (Demand)
3. Buildable Land Inventory (Supply)
4. Community Choices

This report is the fourth section of the EOA. It assesses the likely development capacity of the community choices proposed in the updated Comprehensive Plan map, policies, and investments to support and meet the employment land needs identified in Sections 1-3. Section 4 also summarizes additional implementation strategies expected to implement the proposed policies and meet identified employment land needs.

## KEY FINDINGS

- The 2012 Metro regional employment forecast allocates 141,600 new jobs to the City of Portland by 2035.
- This forecast job growth translates to a demand for 2,920 acres of employment land by 2035.
- The proposed Comprehensive Plan provides for adequate development capacity to meet this employment land demand through:
    - 450 acres of additional development capacity on existing industrial land through map changes, public infrastructure investments (for example, transportation access improvements near vacant land), and strategies to improve industrial land retention, brownfield redevelopment, intensified use of developed land, and expansion. Taken together, these actions make it possible to use the existing gross land supply more efficiently by removing existing constraints.
    - 826 acres of additional development capacity for major campus institutions, the Central City industrial areas (Central Eastside and Lower Albina), and the town centers.
    - 360 acres of additional land capacity for marine terminals, rail yards, and airport facilities. This is adjusted from the previous draft EOA to reflect a policy decision to meet the lower end of the marine terminal commodity movement forecast, rather than the middle or higher end of the forecast range.

## KEY OPPORTUNITIES

The proposed Comprehensive Plan includes key opportunities to support forecast job growth and meet employment land needs. The Comprehensive Plan provides a broader framework for economic development to support job growth and prosperity, including business development,


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sector initiatives, innovation, workforce development, poverty reduction, and other interrelated programs.

**Figure 1. Proposed Employment Land Development Capacity**

| Aggregate Geography | Added Jobs | Land (acres) | Existing Plan BLI | Proposed Plan BLI* | Other Gains** | Surplus/ Deficit | Supply/ Demand |
|---|---|---|---|---|---|---|---|
| Central City | 44,740 | 150 | 266 | 266 | 266 | 116 | 177% |
| Industrial | 31,630 | 1,710 | 1,365 | 1,540 | 1,815 | 105 | 106% |
| Neighborhood Commercial | 35,140 | 690 | 1,303 | 1,463 | 1,463 | 773 | 212% |
| Institutions | 22,730 | 370 | 306 | 522 | 522 | 152 | 141% |
| **Total** | 141,640 | 2,920 | 3,240 | 3,791 | 4,066 | | |

* Proposed Plan BLI (Buildable Land Inventory) includes gains from plan map changes and brownfield proposals.

** Other gains result from proposed strategies for industrial land intensification, retention, and site-assistance.

Source: Bureau of Planning and Sustainability

To fill the need for all types of employment land, the following strategies have been identified:

### *Citywide*

- Establish a job capture rate target to help measure Portland's performance over time.
- Create a strong business climate through regulatory improvements, cost-competitiveness, and business development.
- Provide a competitive employment land supply with a wide range of types, sizes and locations.
- Expand exports and grow traded sector businesses as an impetus to overall economic growth and prosperity.

### *Central City*

- Promote and invest in the Central City as the region's and state's office, employment, and cultural center.
- Protect and facilitate the long-term success of the Central City Industrial districts, and facilitate their evolution into a higher density mix of employment uses.
- Expand industrial office overlay zoning and office development incentives to meet development capacity needs of the Central City Industrial districts.
- Support initiatives to advance Portland as a national leader in urban innovation and sustainability, supporting higher density mixed use development in the Central City and entrepreneurship in the expanding creative and green sectors of the economy.



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### *Industrial and Employment Districts*

- Promote industrial retention, growth, and traded sector competiveness as a West Coast freight hub and the state's largest industrial area.
- Protect Prime Industrial Areas for long-term retention and reduce non-industrial use allowances in industrial and employment zones.
- Create and implement a comprehensive toolkit of brownfield redevelopment incentives and tools, and support prompt resolution and cleanup of the Portland Harbor Superfund Site and associated brownfields.
- Implement strategic freight investments and business climate improvements to support industrial land intensification and reinvestment.
- Designate portions of airport area golf courses for a mix of industrial use, natural resource area, and public access to open space, to help meet industrial development capacity needs.
- Designate additional Dispersed Employment areas, particularly in East Portland, to meet development capacity needs.
- Expand natural resource protection, restoration and enhancement, and ecological site design to support concurrent improvement of watershed health and industrial capacity.

### *Neighborhood Business Districts*

- Promote the growth, economic equity and vitality of Neighborhood Business Districts as dynamic areas of small business development and a foundation of neighborhood livability.
- Designate additional Town Centers and Neighborhood Centers to meet capacity needs in Town Centers, provide for concentrated employment and residential density, and foster healthy and connected neighborhoods.
- Designate neighborhood commercial areas between centers to expand local access to goods and services and promote neighborhood-serving business.
- Prioritize commercial revitalization investments in underserved neighborhoods.

### *Campus Institutions*

- Promote the stability and growth of campus institutions as essential service providers and major employers.
- Designate campus institutions as employment land with associated zoning to accommodate capacity needs.
- Create campus development regulations that support projected institutional growth and neighborhood livability through suitable density, adequate infrastructure, context-supportive edges, and attractive amenities.
- Invest in transportation improvements that acknowledge and accommodate forecast institutional growth.


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# I. INTRODUCTION

This report is the fourth and concluding section of the EOA. It assesses the likely development capacity that could result from the community choices proposed in the updated Comprehensive Plan. These include changes to Comprehensive Plan map land use designations, policy changes, and new investments. Section 4 also summarizes additional implementation strategies expected to implement the proposed policies and meet identified employment land needs. This draft is based on the Proposed Draft of the Comprehensive Plan.

Statewide Planning Goal 9 and the associated administrative rules require cities to provide for economic development and job growth in their comprehensive plans. Goal 9 requires cities to show they can meet employment land needs through adopted policies and implementation measures. They must provide for an adequate number of sites of suitable sizes, types and locations needed to accommodate the forecasted employment growth.

The proposed Portland Comprehensive Plan proposes a variety of approaches to meet these requirements:

- Policies to maintain an adequate supply of land with the necessary supporting public facilities.
- Policies and programs to implement brownfield redevelopment strategies.
- Comprehensive plan map and zoning code changes.
- Capital improvement programming and funding.
- Regulatory and fee improvements.
- Tax incentives and other assistance.
- Property acquisition and parcel assembly.
- Public-private partnerships.

The overall objectives for economic development in the proposed Comprehensive Plan mirror those in the Portland Plan. They call for a growing city economy, traded sector competitiveness, and equitable household prosperity. They seek continuing growth of a balanced, diverse economy that supports a socially and economically diverse population. In turn, the Comprehensive Plan proposes land use and development policies to meet the varying land needs across the employment geographies identified in the EOA, including the Central City, Industrial and Employment Districts, Campus Institutions, and Neighborhood Business Districts.

This report starts with a brief section on citywide opportunities and then focuses on proposed policies and strategies addressing each employment geography to support its growth potential. The Comprehensive Plan identifies a broad range of community choices that guide and support employment land development. The summary of those choices described here center on key policies, infrastructure investments and land use map changes that will ensure Portland will provide adequate growth capacity to meet 20-year forecast for employment growth.

# II. CITYWIDE CHOICES

The Comprehensive Plan proposes new policy directions in four areas that support job growth and related development capacity:

1. A clear job growth target
2. A strong business climate
3. A competitive land supply
4. Competitive traded sectors

## EMPLOYMENT GROWTH TARGET

> *Proposed Comprehensive Plan Policy 6.2.* Strive to capture at least 25 percent of the seven-county region's employment growth (Multnomah, Washington, Clackamas, Yamhill, Columbia, Clark, and Skamania Counties).

The City of Portland has had a housing growth policy since the early 1990s to capture 20% of the region's housing growth, which has been successfully met. At one time Portland was thought to be running out of capacity to develop new housing. Setting a housing growth target was used to support finding new ways to reach the goal – expanding multifamily housing capacity, expanding tax incentives and tools to support multi-family housing development, and supporting livability investments that expand demand for housing growth in Portland.

Setting a job-growth target in Policy 6.2 provides a comparable opportunity to respond to emerging economic challenges and measure success in our responses. Additional policies that contribute to meeting this growth target include 6.1 Diverse and Expanding Economy, 6.6 Competitive Advantages, 6.9 Business Innovation, and policies cited in the sections below on improved business climate, traded sector competitiveness, and specific employment geographies.

In contrast to most of Oregon, Portland by 2013 had recovered all of the jobs it lost during the Great Recession. Multnomah County added about 31,000 jobs between 2010 and 2013, leading the region's recovery with an average annual job-growth rate of 2.4% during this upswing period. This recent job growth in Portland is consistent with long-term trends, and signals an upturn from the relatively flat job growth over the 2000-2008 business cycle, when the City captured only 5% of regional employment gains.

Despite Portland's strong historic and continued role as a major job center for the entire regional labor market, the experience of the last two economic downturns (since 2000) indicates that this continued role is not assured. Portland is typical of large cities that support a diverse and growing population attracted by economic opportunity.

With 370,000 jobs as of 2010, Portland accounts for 39% of the jobs in the 7-county metro area (PMSA), much higher than its 26% share of the region's 2.2 million residents. Long-term trends and forecast growth indicate moderate erosion of Portland's role as a regional job center, expected to decline from 39% of regional employment in 2010 to 34% by 2035.

The proposed job-growth target in Policy 6.2 is consistent with the historic capture rate for Multnomah County from 1980-2008 of 25%, with a high of 31% in the 1990s.[1] The trend-line analysis in EOA Section 1 indicates a job growth level that would represent a 28% city capture rate of PMSA job growth to 2035. The Metro regional employment forecast of 141,600 new jobs for the City of Portland by 2035 equates to a 26% capture rate of regional employment growth.

The proposed job growth target is complemented by Policy 6.27, which addresses increasing Income Self Sufficiency. It adds further guidance on job growth, supporting adequate land supply and public facilities to expand access to self-sufficient wages and career ladders for low-income people. This policy implements similar direction set in the Portland Plan. Policy 6.27 responds to the increasing job-polarization trends of recent decades, during which job growth has been in the low- and high-wage occupations with shrinking job opportunities in middle-wage occupations.

Middle-wage jobs are particularly concentrated in the industrial districts. In contrast, employment in the Central City and campus institutions is concentrated in high-wage occupations requiring college education, and neighborhood business districts are concentrated in low-wage occupations. In turn, workers of color and residents in East Portland rely disproportionately on industrial district jobs for self-sufficient wages and upward mobility (see EOA Section 1).

## STRONG BUSINESS CLIMATE

> *Proposed Comprehensive Plan Policy 6.7. Use plans and investments to help create a positive business environment in the city and provide strategic assistance to retain, expand, and attract businesses.*
>
> *Policy 6.17. Improve development review processes and regulations to encourage predictability and support local and equitable employment growth and encourage business retention.* Five sub-policies provide a framework of direction on regulatory improvements.

Improving Portland's regulatory and overall business climate was a primary theme of the Portland Plan Business Survey (2010) results and the Economic Development Policy Expert Group comments and business workshop comments on the Comprehensive Plan Working Draft.

In the business focus group results, described in Section 1 of the EOA, the most frequently mentioned responses to the question about how to position Portland to remain a prosperous city were the following:

[1] The long-term employment trends analysis is based on county data because reliable, comparable city data is not available before 2000.

- Need for greater regulatory flexibility better tailored to unique needs of individual businesses and/or business types.
- More recognition of the contribution of business to Portland's vitality – a change from regulators to partners asking "what can we do to help".
- Greater emphasis on cultivating business opportunity in Portland – with active marketing but without "picking winners."
- Need for better business access to resources, incentives and/or tax structure reform – ranging from reforming the business income tax to loan/incentive programs for small business to a point person/advocate for business in City Hall.

Business owners and real estate investors make decisions about where and how to invest based on the alternatives available. For many commercial businesses, the choice is between Portland and other communities in the metro area. For industrial and other traded sector businesses that compete globally, choices are often with locations well beyond the Portland metro area.

Making Portland's business districts more attractive and competitive to a broader range of businesses will help diversify and expand the economy. Portland's Central City, freight-oriented industrial areas, large hospital and college campuses, and other commercial centers and corridors make up a varied urban economy. In order to overcome constraints and strengthen location advantages to remain Oregon's largest job center, the Comprehensive Plan includes policies and actions that will help Portland's business districts be more attractive and support job growth.

In addition to Policies 6.7 and 6.17 cited above, other proposed policies that support a stronger business climate are 6.8 Small Business Development, 6.18 Short-Term Land Supply, 6.22 Clusters, 6.26 Traded Sector Diversity, and 6.31 Minority-Owned, Woman-Owned and Emerging Small Business (MWESB) Assistance.

## COMPETITIVE LAND SUPPLY

> *Policy 6.12 Land Supply. Provide supplies of employment land that are sufficient to meet the long-term and short-term employment growth forecasts, adequate in terms of amounts and types of sites, available and practical for development.*

The Oregon statewide planning rules require that all cities have an adequate land supply to meet the needs for future job growth. Policy 6.2 is an overall response to meet this state requirement. The Comprehensive Plan recommends changes needed for the employment land supply to be sufficient to meet forecast job growth through 2035. These changes address shortfalls identified in five of the city's ten employment geographies.

This policy is implemented by a variety of measures in the proposed Comprehensive Plan:

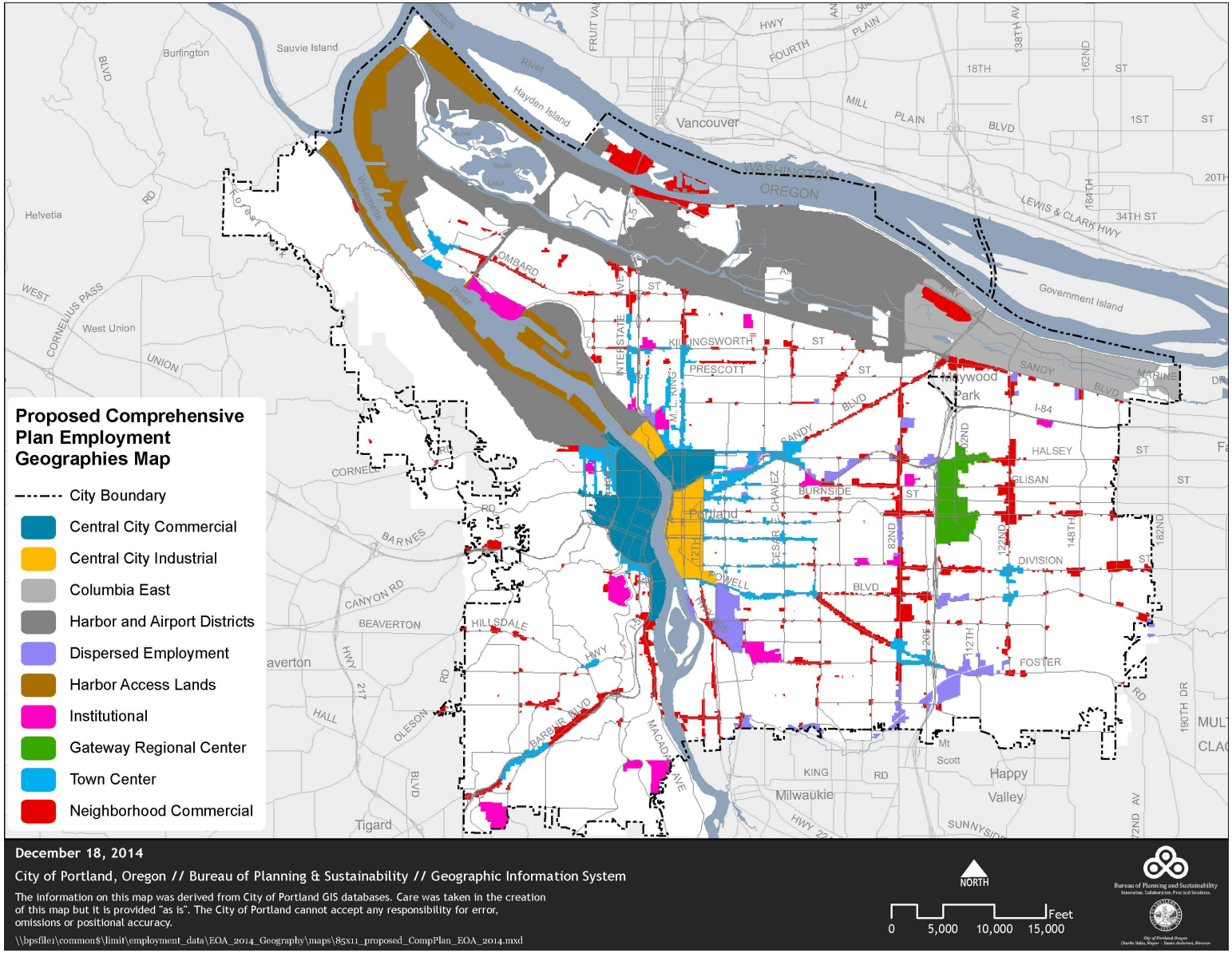
- Designation of additional land area for employment development in each of the EOA employment geographies as shown in Figure 1.

- New policy support for brownfield redevelopment, providing regionally competitive development sites, and land supply for near-term development.

- Policies and strategies that allow additional development capacity to meet identified shortfalls.

Resulting development capacity in each employment geography is shown in Figure 2. The increase in development capacity that could result from investments identified in the Transportation System Plan (TSP) will be estimated in an upcoming 2015 draft of this report, after the PSC reviews the proposed TSP project list.

## Figure 2. Proposed Comprehensive Plan Employment Geographies Map



## Figure 3. Proposed Employment Land Development Capacity

| Employment Geography | Added Jobs | Land (acres) | Existing Plan BLI | Proposed Plan BLI* | Other Gains** | Surplus/ Deficit | Supply/ Demand |
|---|---|---|---|---|---|---|---|
| Central City Commercial | 34,120 | 60 | 201 | 201 | 201 | 141 | 335% |
| Central City Industrial *** | 10,620 | 90 | 65 | 65 | 65 | -25 | 72% |
| Harbor & Airport Districts | 16,210 | 1,020 | 774 | 905 | 1,076 | 56 | 105% |
| Harbor Access Lands | 1,910 | 200 | 113 | 136 | 167 | -33 | 84% |
| Columbia East | 9,310 | 350 | 356 | 365 | 435 | 85 | 124% |
| Dispersed Employment | 4,200 | 130 | 121 | 135 | 135 | 5 | 104% |
| Gateway Regional Center | 3,970 | 50 | 137 | 164 | 164 | 114 | 327% |
| Town Centers | 6,160 | 130 | 304 | 371 | 371 | 241 | 285% |
| Neighb. Centers & Corridors | 25,010 | 510 | 863 | 928 | 928 | 418 | 182% |
| Institutions | 22,730 | 370 | 306 | 522 | 522 | 152 | 141% |
| Residential | 7,400 | | | | | | |
| **Total** | 141,640 | 2,910 | 3,240 | 3,791 | 4,064 | | |
| **Aggregate Geography** | | | | | | | |
| Central City *** | 44,740 | 150 | 266 | 266 | 266 | 116 | 177% |
| Industrial | 31,630 | 1,700 | 1,365 | 1,540 | 1,813 | 113 | 107% |
| Neighborhood Commercial | 35,140 | 690 | 1,303 | 1,463 | 1,463 | 773 | 212% |
| Institutions | 22,730 | 370 | 306 | 522 | 522 | 152 | 141% |
| **Total** | 141,640 | 2,910 | 3,240 | 3,791 | 4,064 | | |

* Proposed Plan BLI (Buildable Land Inventory) includes gains from plan map changes and brownfield proposals.
** Other gains result from proposed strategies for industrial land intensification, retention, and site-assistance.
*** Does not include capacity gains from proposed zoning changes in Central City 2035 Plan
Source: Bureau of Planning and Sustainability

**Policy 6.14 Brownfield Redevelopment** calls for the cleanup and redevelopment of 60% of the city's brownfield acreage by 2035. In contrast, continuation of current approaches and trends would support a brownfield redevelopment rate of 40% by 2035.

This policy target is based on the 2012 Portland Brownfield Assessment, which includes a citywide brownfield inventory, financial feasibility analysis, and recommendations of national best practices. Strategies to develop a comprehensive local brownfield toolkit of incentives and best practices are described below in the industrial districts section of this report.

**Policy 6.16 Regionally Competitive Development Sites** broadly supports use of incentives, investments, and other efforts to improve the regional competitiveness of vacant and underutilized sites in Portland.

These measures aim to moderate the long-term national and regional trend for job sprawl. The city's declining regional share of employment and commercial/industrial space, especially during the 2000-08 business cycle, suggest significant opportunity for improvement in regional markets. Further policy direction on cost-competitiveness is discussed below addressing specific employment geographies and their growth-capacity needs.

**Policy 6.18 Short-Term Land Supply** calls for a competitive and diverse supply of development-ready sites to meet 5-year increments of demand. The proposed Comprehensive Plan proposes two approaches to meet this policy.

First, while short-term land needs between 2010 and 2020 are already met in most geographies, actions are needed to meet identified needs in the others. The most challenging geography for meeting short-term land needs is Harbor Access Lands. Here the City has limited ability to resolve, by 2020, Superfund and brownfield constraints on vacant sites; however, recent and planned transportation investments and site-development assistance have supported redevelopment and infill that appear sufficient to be meet forecast growth. In the Central City Industrial and Dispersed Employment geographies, short-term land supply needs will be met by rezoning for expanded development capacity. Second, **Policy 6.19. Evaluate Land Needs** proposes that the City update its short-term land supply analysis and strategy every 5-7 years to coincide with regional forecast updates. These updates are expected to include specific actions to replenish short-term land supply as needed in each employment geography.

## EXPORT AND TRADED SECTOR COMPETITIVENESS

> *Policy 6.21 Traded Sector Competitiveness. Align plans and investments with efforts to improve the city and regional business environment for traded sector and export growth. Participate in regional and statewide initiatives.*

Traded sector businesses have a central role in driving and expanding the regional economy across the board.[2] To succeed and grow, these businesses must stay competitive in the changing global marketplace. Traded sector companies and related industries tend to collect in regions where they have competitive advantages, a phenomenon called industry clusters. This supports greater access to specialized services and suppliers, a strong industry knowledge base, and skilled, experienced workers.

Global trends have put increasing pressure on regions to strengthen their competitiveness for traded sector growth, which drives regional prosperity. In response, the Oregon Business Plan, regional economic development strategies, and the Portland Economic Development Strategy all focus their attention on traded sector competitiveness and growth. Portland's Economic Development Strategy concentrates the City's business development resources on a targeted set of traded sector clusters in advanced manufacturing, athletic and outdoor, clean tech, and software.

Proposed Comprehensive Plan policies reinforce this state and regional economic development direction in Policy 6.21 (above), 6.22. Clusters, 6.23. Trade and Freight Hub, 6.24. Import Substitution, 6.25. Business Opportunities in Urban Innovation, and 6.26 Traded Sector Diversity.

[2] Traded sector businesses are companies that sell many of their products and services to people and businesses outside the Portland region, nationally and globally. Examples include most manufacturing and many professional and business service companies as well as smaller craft businesses with local and global customers. Traded sector businesses may be locally owned and can be small, medium or large in size.

# III. CENTRAL CITY

***Currently, the Central City accounts for 123,500 jobs – about one-third of the jobs in Portland. By 2035, more than 44,750 additional jobs are projected for the area, requiring an additional 150 acres of development capacity in the city center.***

**What types of businesses locate here?** Central City businesses are concentrated in the "office sectors" – professional and business services, headquarters offices, finance, information, and government. Central City is also a diverse business district with specializations in higher education, small-scale industry, and entertainment/tourism/retail services. The EOA identifies two types of Central City employment geographies, each having a different mix of businesses, facilities, and land needs:

- The "Central City Commercial" geography is the region's high-density core, consisting of Downtown (the Central Business District), Lloyd, South Waterfront, and the University and River Districts. Office sectors make up 72% of Downtown jobs and 58% in the Lloyd District (see EOA Section 1). Entertainment, restaurants, retail, and higher education are also major parts of this employment geography.

- The Central City Industrial geography, consisting of the Central Eastside and Lower Albina, has a mix of small-scale industrial, lower-cost office, and diverse commercial space. These districts meet demand for close-in industrial space and have become a dynamic "incubator" location for new and expanding businesses.

**Why are these employment geographies important?** While nationally other central cities have lost out to suburban competition, Central City Portland is experiencing strong growth as a high-density mixed use neighborhood. It contains over half of the regional office market and has benefited from an emphasis on access, especially transit, and livability for residents, workers and visitors. This is the preferred location for faster-growing office sector businesses that make up 34% of forecast citywide job growth. Land use and infrastructure policies prioritize Central City as the region's core location for concentrated growth and increasing density.

**2010-2035 job growth potential: 45,000 net new jobs**. Central City accounts for 32% of the citywide job forecast. Metro's robust regional job growth forecast in the office sectors suggests substantial opportunity to compete for a larger Central City share of office development that has been occurring primarily in suburban locations, where lower land costs, larger sites, and less-expensive surface parking patterns prevail.

## EMPLOYMENT LAND CAPACITY OF THE PROPOSED COMPREHENSIVE PLAN

While the Central City Commercial geography easily has the development capacity to meet 2035 demand, the EOA forecasts that, without action, Central City Industrial geography would meet only 72% of demand (a 25-acre shortfall).

The Central City 2035 plan, and specifically the Southeast Quadrant Plan, is proposing to increase employment capacity in the Central Eastside through a variety of land use changes.

Similarly, the 15-acre deficit in "short-term" land supply needed by 2020 in the Central City Industrial geography is expected to be met by plan map amendments and expected rezoning by 2017.

### Figure 4. Proposed Central City Development Capacity

[Insert Figure 4 when completed. Specific map amendments and approaches to expand capacity have not yet been recommended in the Central City 2035 plan update but are expected in the coming months. Resulting capacity gains will be estimated in Figure 3 and included in an upcoming 2015 draft of this report.]

## CENTRAL CITY GROWTH AND LAND USE DIRECTION

> *Policy 6.32 Central City. Maintain the Central City's regional share of employment and continue its growth as the unique center of both the city and the region for innovation and exchange through commerce, employment, arts, culture, entertainment, tourism, education, and government.*

The land use and development policies for the Central City are being developed in the Central City 2035 Plan Update, which is underway as a separate process from the Comprehensive Plan Update; however, the proposed Comprehensive Plan does include key policy directions emphasizing accelerated job growth, the innovation and exchange advantages of being a large-scale economic center, diversity as a business and cultural center, and industrial retention.

**Over the last 20 years, the development focus of the Central City Commercial geography has shifted from office to residential and mixed use as new drivers of core area development.** In recent years, this has had the previously unanticipated effect of generating new office demand closer to residential, notably in the Pearl District. The increased role that a mixed residential-commercial neighborhood can play for the downtown core area received particular attention and recommended priority from developers participating in the Central City office focus group.

Downtown Portland has 49% of the multi-tenant office space in the region. On average, the CBDs in eight peer cities (including Denver, Austin, and Charlotte) have a 27% share of the multi-tenant office space in their respective regions. In the 2000-08 business cycle, the Central City's average annual job growth rate of 0.7% exceeded the national average of 0.5%. **Proposed policies reinforce this competitive position of the Central City as the dominant office center in the region.**

## RETENTION AND EVOLUTION OF CENTRAL CITY INDUSTRIAL AREAS

> *Policy 6.33. Central City industrial districts. Protect and facilitate the long-term success of Central City industrial districts, while supporting their evolution into places with a broad mix of businesses with high employment densities.*

The Central City Industrial districts are a preferred, close-in location for many warehouse, manufacturing, and industrial service business. The industrial setting also provides a cost-competitive "incubator" location for new and expanding businesses, creative services, and cost-conscious offices. The combination of these competitive roles has made these districts a dynamic

job growth center. This strong job growth trend has continued through the Great Recession and recent recovery period.

**Proposed land use direction in the Central City Industrial geography supports the retention and continuing evolution as industrial/incubator districts, recognizing the strong market niche and job growth advantages of these land use roles.** Much of the recent job growth within these districts has been fueled by the renovation of multi-story buildings into uses that support higher (largely service sector) job densities while offering competitive rents. In effect, incubator space and incubator districts represent an increasingly important hybrid or crossover product positioned between traditional office and industrial-service segments of employment building space spectrum. Incubator space is intended to:

- Offer greater flexibility to the user including pure office, exclusive industrial-distribution, and also mixed office-industrial functions.
- Be oriented to information and design applications for which Portland is becoming better known both on the West Coast and nationally.
- Offer employment and functional business space at a cost below that of prime office but with better finishes and in a more urbanized setting than would be possible in an exclusively industrial sanctuary setting.

There is a question as to how this adaptive reuse model can also be applied to leverage new construction, once the stock of the most prime existing multi-story older industrial spaces has been renovated. The primary challenge for creating new incubator space is to deliver a product that meets current business needs at rental rates low enough to be competitive for start-up and emerging creative firms. The alternative would be to forego this opportunity for in-city incubator areas, with more potential demand transferred to other parts of Portland, the region or outside the metro area. For example, additional employment land along SE 82nd Avenue and in the Gateway Regional Center could potentially serve this function.

## EXPAND CENTRAL CITY INDUSTRIAL DEVELOPMENT CAPACITY

Existing development capacity in the Central City Industrial geography meets only 44% of forecast demand. In 2002, capacity was expanded in part of the Central Eastside by establishing the EOS Overlay (Employment Opportunity Subarea of the Central City Plan District), which defined and allowed "industrial office" uses there. Industrial office uses are limited primarily to information sector businesses, such as graphics and software. This zoning innovation helped accelerate job growth in the Central Eastside by reuse of underutilized second-floor space. The predominant industrial zoning in this geography has created an affordable environment for robust job growth by cost-conscious office tenants. Continued growth in this market appears to be reliant on hybrid zoning that retains industrial sanctuary cost levels while expanding development capacity of Class C office tenants.

The Central City 2035 Plan update underway will be designating additional capacity in these industrial areas by expanding the area allowing industrial office development and site assistance to overcome development constraints for new construction. Changes will be made to existing Employment Opportunity Subarea (EOS) overlay to preserve building square footage for industrial and industrial office use by limiting retail sales and services to 5,000 square feet per

site and allowing additional industrial office in rehabilitated multi-story structures. EOS will be expanded to the ODOT blocks, North of Burnside, the Southern Triangle, and IG zoned properties along Hawthorne, Madison, Main, Yamhill and Belmont. On EOS sites 20,000 square feet or larger, industrial office uses are limited to a maximum floor area ratio of 3:1. In core areas of the Central Eastside, industrial office capacity will be allowed with a FAR of up to 3:1 only when ground floor use is dedicated to manufacturing and production, warehouse and freight movement, wholesale sales or industrial services. A significant increase in employment capacity is gained through a flexible employment zone (EX no housing) that will be applied to the OMSI station area to promote Employment Transit-Oriented Development. Resulting capacity gains and explanation of assumptions for calculating capacity gains will be included in an upcoming 2015 draft of this report.

## URBAN INNOVATION INITIATIVES

> *Policy 6.25. Business opportunities in urban innovation. Strive to have Portland's built environment, businesses, and infrastructure systems showcase examples of best practices of innovation and sustainability.*

Portland universities and businesses are active in research and development and the commercialization of new technologies. The development of the South Waterfront and University districts are directly linked to efforts to create a world-class educational and research complex anchored by OHSU and PSU with increasing opportunities for research commercialization.

Policies and programs, such as Clean Energy Works Oregon and Solarize Portland have contributed to growing the market for green building technologies and practices and have demonstrated how job creation can be part of reducing energy use and resource consumption.

Portland has a solid record of business growth related to urban innovation including startups and niche product development. Examples are bicycle manufacturing, green building and stormwater products and services, local food businesses, planning and design, and international tourism. Connections to other cities, nationally and internationally, and widening recognition of Portland as a sustainability leader have contributed to making the region and city more innovative and prosperous.

***The proposed Comprehensive Plan will provide a 25-year supply of additional employment land in the Central City by preserving and enhancing the area's industrial districts while increasing their development capacity, and making the city center even more attractive for research and development, new technologies and healthcare.***

# IV. INDUSTRIAL AND EMPLOYMENT DISTRICTS

***Currently, Industrial and Employment Districts account for 87,000 jobs – about 25% of the jobs in Portland. By 2035, more than 31,600 additional jobs are projected for these areas, requiring 1,700 more acres of industrial land.***

**What types of businesses locate here?** Industrial employers, mainly in manufacturing and distribution, concentrate along the Portland Harbor and the Columbia Corridor, which make up Oregon's freight infrastructure hub and largest industrial area. They particularly need one-story buildings, medium to large sites, and locations buffered from housing. Central City Industrial and Dispersed Employment areas also have a range of commercial and industrial businesses. The EOA identifies four types of Industrial and Employment District geographies (counting Central City separately), each representing a different mix of businesses, facilities and land needs:

- The Harbor and Airport Districts geography is a heavy industrial setting occupied primarily by manufacturing and distribution businesses that need multimodal freight access.
- Harbor Access Lands along the deep-water shipping channel are occupied almost entirely by river- or rail-dependent industry, including marine terminals, manufacturing, construction, vessel services, and accessory uses, including headquarters offices associated with nearby industry.
- The Columbia East district, located east of the Portland Airport and 82nd Ave., is a mix of industrial and business flex space.
- The Dispersed Employment geography consists of primarily small business-park and flex-space sites occupied by low-density office and light industrial businesses in residential settings near freeways or truck routes.

**Why are these geographies important?** Portland is the core of the region's distribution and manufacturing economy. It includes the state's (and the Columbia River Basin's) largest seaport, rail hub, and airport.

The region's traded sectors, which bring income into the region and drive regional prosperity, are primarily industrial. The 87,000 jobs in these districts are also Portland's primary middle-wage job base and provide upward-mobility opportunities that expand income self-sufficiency and reduce racial disparities. The higher employment "multiplier" impact of industrial activity (see explanation in EOA Section 1), compared to commercial activity, means that industrial district jobs generate additional employment and prosperity benefits in the region.

**2010-2035 job growth potential: 31,600 net new jobs**. These districts account for 22% of the citywide job forecast. Compared to commercial sectors, industrial sector trends are complicated by slower job growth and faster output growth, driven by global market pressures to raise productivity. Portland's industrial job growth forecast is moderate, faster than national trends and slower than regional trends. Portland remains a preferred location for general industrial and warehouse development in the region, drawing on its advantages of multimodal freight-hub infrastructure, proximity to customers and suppliers in diverse industrial districts, and established industrial sanctuary zoning.

## EMPLOYMENT LAND CAPACITY OF THE PROPOSED COMPREHENSIVE PLAN

The existing Comprehensive Plan does not provide adequate capacity to meet forecast demand in the combined industrial and employment districts to 2035. Forecast land needs exceed the existing supply of buildable land by 345 to 565 acres in these districts (the range relates to marine terminal commodity forecasts), providing only 71% to 80% of the needed growth capacity.

Local options to expand industrial development capacity are limited by various factors: the prevalent demand for one-story buildings on large sites; Portland's inability to annex industrial land beyond West Hayden Island; and the budget tradeoffs of increasing public investment in brownfields and freight transportation infrastructure to facilitate industrial land intensification. Moreover, these geographies are regionally significant locations for both industry and natural resources, and Comprehensive Plan policies support allocating more land to meet the needs of both.

The new Comprehensive Plan proposes a balanced package of policies, map changes, and infrastructure investment strategies to meet forecast land needs in Portland's industrial and employment districts. These strategies are intended to support both industrial growth and improved watershed health in industrial districts while meeting other plan objectives. This package of strategies was shaped with advice from the Industrial Land/Watershed Health Working Group, which included members from a broad mix of affected stakeholders, and which met for over a year.

Transportation System Plan (TSP) projects are not included in this version of the Buildable Land Inventory. The next (March 2015) draft of the EOA will account for these TSP projects, and is expected to show that additional development capacity will result from reducing infrastructure constraints on vacant and underutilized sites.

Overall, the estimated industrial land capacity of the proposed Comprehensive Plan is expected to be adequate to meet forecast demand, based on the following three general assumptions:

1. *The plan accommodates the low end of the marine-terminal commodity movement forecast of 150 acres for marine terminal land demand.*

   Community agreement is lacking at this time to designate 300 acres of Industrial Sanctuary on West Hayden Island to accommodate the mid-range forecast for marine terminal development to 2035. West Hayden Island is proposed to be designated Rural Farm Forest pending future annexation and a Comprehensive Plan amendment to determine the industrial and open space designations.

   Forecast demand under the mid-range marine terminal demand scenario would be expected to occur after in the 20-year planning horizon. The proposed Comprehensive Plan policy direction continues to support future consideration of a marine terminal development proposal as needed at West Hayden Island that mitigates adverse environmental and community impacts, consistent with the industrial designation of the site in Metro's 2040 Plan. If clear demand emerges, there is policy context in the Comprehensive Plan to consider annexation to meet that demand.

2. *The Comprehensive Plan can meet overall 2035 demand for industrial development and job growth across all of the industrial geographies even with the Harbor Access Lands geography meeting only 80% of forecast demand.*

   Not all of the job growth (and land demand) in the Harbor Access Lands geography is river-related. Some elements, such as administrative support, can be located in other geographies. Portland's combined industrial geographies provide a diverse supply of industrial development sites to meet overlapping demand for industrial building types, and the aggregate industrial geographies are expected to maintain adequate capacity to meet forecast demand.

3. *The City must act to retain prime industrial land and to continue to get greater development and productivity from its supply of sites.*

   Future industrial capacity depends on getting more industrial growth on less land by 2035. This requires rules for industrial land retention, new incentives and programs to increase brownfield redevelopment, and public investments and efforts to encourage more intensified use of developed sites.

   Significant land use actions that reduce industrial district capacity below forecast demand are expected to explain how those reductions will be addressed through long-range programs (e.g., brownfield remediation), be offset with equivalent capacity gains, or seek a Goal 9 exception. Five-year updates of the EOA are proposed to monitor effectiveness, adjust strategies, and maintain an adequate short-term land supply.

Figure 5 provides a summary of the capacity impacts of the proposed strategies to provide adequate industrial development capacity and improve watershed health. These capacity impacts are analyzed by geography and strategy. The "Periodic Review" section of the table includes the forecasted demand, the capacity in the proposed Comprehensive Plan from the map changes, brownfields cleanup, intensification and retention, and the resulting surplus or deficit.

The "Integrated 2035 Strategies" section of the table reflects the potential capacity impact of future watershed health improvements. Improvements include the rezoning of approximately 550 acres of land from industrial to open space. The Watershed Health Strategies also identify significant natural resources that should be protected through future updates to the City's environmental and greenway overlay zones. These capacity estimates are intended as placeholders and are not intended to be binding. The estimates are based on natural resource information from the adopted 2012 Natural Resource Inventory (NRI), however the City expects to update the NRI as part of future legislative projects. The capacity estimates also have a placeholder for future acquisition sites to accommodate restoration projects required to Portland Harbor Superfund Natural Resources Damages Assessment (NRDA) mitigation requirement.

Taking into consideration the strategies to both improve employment capacity and to improve watershed health, the analysis indicates there is an expected shortfall of development capacity in the Harbor Access Lands and Harbor & Airport Districts geographies. Future post-acknowledgement plan amendments to protect these natural resources will need to explain how industrial development capacity needs will be met, or take an exception to Goal 9.

## Figure 5. Proposed Industrial and Employment Districts Capacity

| Employment Geography | Land Demand (acres) | Periodic Review: Proposed Plan (1) | Periodic Review: Other Gains (2) | Periodic Review: Surplus/ Deficit | Periodic Review: Supply/ Demand | Integrated 2035 Strategies: Watershed Strategies (3) | Integrated 2035 Strategies: Surplus/ Deficit | Integrated 2035 Strategies: Supply/ Demand |
|---|---|---|---|---|---|---|---|---|
| **Proposed Capacity Summary by Employment Geography** | | | | | | | | |
| Harbor & Airport Districts | 1,020 | 905 | 1,076 | 56 | 105% | 978 | -42 | 96% |
| Harbor Access Lands | 200 | 136 | 167 | -33 | 84% | 130 | -70 | 65% |
| Columbia East | 350 | 365 | 435 | 85 | 124% | 395 | 45 | 113% |
| Dispersed Employment | 130 | 135 | 135 | 5 | 104% | 135 | 5 | 103% |
| Total | 1,700 | 1,540 | 1,812 | 112 | 107% | 1,637 | -63 | 96% |

| Proposed Strategies to Provide Growth Capacity and Improve Watershed Health | Capacity Impacts of Proposed Strategies: Harbor & Airport | Harbor Access | Columbia East | Dispersed Empl. | Total |
|---|---|---|---|---|---|
| Industrial land retention - prime industrial area retention, reduced non-industrial use allowances | 30 | 2 | 21 | | 52 |
| Brownfiield redevelopment - comprehensive program and incentives, Superfund, land bank | 89 | 23 | 8 | 4 | 124 |
| Industrial land intensification - strategic freight projects, Kenton line, regulatory improvements | 113 | 29 | 49 | | 192 |
| Airport golf courses - map designation, rezoning, investments, site assistance, restoration | 123 | | | | 123 |
| New Mixed Employment areas - map designation, rezoning, investments | | | | 9 | 9 |
| Other plan map changes - OS designation on natural areas and parks | -53 | | | | |
| Watershed health improvements - future environmental zoning, NRDA, enhancement, ecological design | -98 | -37 | -40 | | -175 |
| Total | 204 | 17 | 38 | 13 | 272 |

1. Proposed Plan BLI (Buildable Land Inventory) includes gains from plan map changes and brownfield proposals.
2. Other gains result from proposed strategies for industrial land intensification, retention, and site-assistance.
3. Watershed health strategies include estimated capacity impacts of future environmental zoning changes and a 25-acre estimate for NRDA requirements in the Portland Harbor Superfund.

Source: Bureau of Planning and Sustainability

The existing Buildable Land Inventory of 113 acres in the Harbor Access Lands geography meets only 54% of forecast land needs. Development opportunities exist to meet the 150-acre marine terminal demand estimate, including approximately 40 acres at Port of Portland's T-6 (proposed Pembina development site), 30 acres at T-4 (former Cargill site), and 55-89 acres at the former Time Oil terminal and aggregated nearby sites. Proposed public investments (e.g., improvements at Suttle Road and Time Oil Road) and site assistance are expected to help overcome development constraints at these sites. The small 33-acre Harbor Access Land shortfall can be accommodated in other industrial areas. Not all of the existing jobs in the area

are dependent on access to the Portland Harbor. With a tight land supply, over time some of the industrial demand will relocate in industrial areas nearby. For example, expanding harbor businesses like Evraz Steel have grown on nearby sites off of the harbor. A capacity-management approach is proposed to maintain a diverse supply of industrial sites overall to meet the short-term and 2035 land needs of the aggregated industrial geographies citywide.

## INDUSTRIAL GROWTH AND LAND USE DIRECTION

> *Policy 6.34. Industrial land. Provide industrial land that encourages industrial business retention, growth, and traded sector competitiveness as a West Coast trade and freight hub, a regional center of diverse manufacturing, and a widely accessible base of family-wage jobs, particularly for under-served and under-represented people.*
>
> *Policy 6.35. Industrial sanctuaries. Protect industrial land as industrial sanctuaries identified on the Comprehensive Plan Map primarily for manufacturing and distribution uses and to encourage the growth of industrial activities in the city.*

These policies support continuing industrial growth and acknowledge its household and regional prosperity benefits. Proposed industrial land use policies respond to the range of forecast land demand in different types of industrial and employment areas, including Policy 6.35. Industrial Sanctuaries, 6.37. Harbor Access Lands, 6.42 Multimodal Freight Corridors, and 6.43 Dispersed Employment Areas. The proposed Comprehensive Plan retains its 1980 "Industrial Sanctuary" designation and policy as the primary land use direction for industrial districts. The Industrial Sanctuary concept is designed to limit non-industrial uses in order to encourage industrial retention, reinvestment and growth. Other large cities have also adopted similar, more restrictive industrial zoning approaches in recent years, including Seattle, Vancouver B.C., and Los Angeles on the West Coast.

## INDUSTRIAL LAND RETENTION

> *Policy 6.36. Prime industrial land retention. Protect the multimodal freight-hub industrial districts at Portland Harbor, Columbia Corridor, and Brooklyn Yard as prime industrial land that is prioritized for long-term retention.* (This policy goes on to call for limiting conversion of prime industrial land and offsetting capacity reductions with additional capacity.)
>
> *Policy 6.50. Public facilities and land acquisition. Limit the use of prime industrial land for parks or other non-industrial public facilities.*

These policies prioritize Prime Industrial areas (see map in Comprehensive Plan Figure 6.1) for long-term retention, and they support reduction of zoning allowances for non-industrial uses. Since 1990, approximately 400 acres of former industrial or mixed employment land in or adjacent to Prime Industrial areas has been rezoned for non-industrial use. In addition, substantial public acquisition of designated Industrial Sanctuary land has occurred in these areas for natural areas, parks, jails, and other public facilities that do not serve industrial uses.

The following proposed actions will implement the industrial land retention policies with corresponding increases in development capacity due to shifting non-industrial development demand to other geographies, such as Central City Commercial or Neighborhood Commercial, where there is a surplus of capacity to accommodate that demand.

- Amend zoning regulations to prohibit quasi-judicial map amendments from Industrial Sanctuary to another designation on Prime Industrial land. Future legislative projects are expected to analyze and estimate the loss of prime industrial land capacity, including existing industrial development and vacant capacity. Findings will need to explain how forecast demand for Prime Industrial development capacity will be met. An industrial capacity inventory system based on the BLI will be used to track program activities that are or are expected to increase, reduce, or mitigate for loss of industrial land capacity to conversion, regulation, or acquisition for other purposes.

- Amend zoning regulations to reduce allowance for non-industrial uses in industrial zones; reduce land-intensive non-industrial allowances in IH and IG zones, such as parks and open areas, commercial parking, self-service storage, commercial outdoor recreation and major event entertainment; and reduce retail allowances and prohibit residential use in EG zones.

- Develop inter-governmental coordination procedures for proposed public acquisitions to track and mitigate impacts on industrial land supply.

**Proposed land retention policies and these implementation actions are expected to result in development capacity gains of 30 acres in the Harbor and Airport Districts, 2 acres in Harbor Access Lands, and 21 acres in Columbia East.** Calculation of these gains is based on two primary assumptions. First, industrial land conversion trends through rezoning and public acquisition for non-industrial use are not expected to continue without offsetting capacity losses by equivalent gains elsewhere in Portland. Second, a 52-acre capacity gain is expected from shifting an estimated 50% of forecast retail land development in these districts to other employment geographies. To implement this change, zoning code amendments are expected to substantially reduce future retail allowances in General Employment (EG) zones to approximately 20,000 square feet per site.

## BROWNFIELD REDEVELOPMENT

*Policy 6.39. Industrial brownfield redevelopment. Provide incentives, technical assistance and direct support to overcome financial-feasibility gaps to enable remediation and redevelopment of brownfields for industrial growth.*

*Policy 6.40. Portland Harbor Superfund Site. Take a leadership role in prompt resolution and cleanup of the Portland Harbor Superfund Site and redevelopment of associated brownfields. Encourage a science-based and cost-effective cleanup solution that facilitates re-use of land for river- or rail-dependent or related industrial uses.*

Brownfields are vacant or underutilized properties where real or potential contamination complicates redevelopment. Proposed Policies 6.39 and 6.40 provide direction for a broad-

ranging brownfield strategy to substantially increase industrial brownfield redevelopment as outlined below. Further direction is provided in proposed Policies 6.14. Brownfield Redevelopment and 7.29. Brownfield Remediation. Increasing brownfield redevelopment is a broadly supported option to increase industrial land capacity because it meets multiple objectives, including improvement of public health and environmental quality, reduction of urban sprawl, and expansion of industrial development capacity in advantageous locations.

**Portland's industrial districts contain an estimated 560 acres of brownfields,** accounting for over 60% of brownfields on employment lands citywide, as inventoried in the 2012 Portland Brownfield Redevelopment Assessment. The pace of recent development trends in Portland reviewed in EOA Sections 1 and 3 indicate that only 40% of the city's industrial brownfield acreage is likely to redevelop by 2035 under current conditions. Essentially, cleanup costs and financial risks exceed potential redevelopment revenues on most brownfields; however, other states have adopted aggressive tax incentives and a variety of other brownfield tools to overcome this financial gap. The Portland Brownfield Assessment estimated the total financial feasibility gap of the current citywide brownfield inventory at about $210 million, out of a total estimated cleanup cost of $240 million. That study also analyzed the return on investment of applying tax incentives to cover $210 million gap, estimating that future state income and property taxes after redevelopment would typically recover the costs of these incentives within one to four years.

In addition to on-site contamination, liability for future cleanup of river sediment contamination in the Portland Harbor Superfund Site has been a significant deterrent to brownfield redevelopment along the harbor. While progress on this Superfund project has been long delayed, it is anticipated that the U.S. Environmental Protection Agency will issue a Record of Decision, allocate liability among responsible parties, and move forward with cleanup actions well within the 2035 planning horizon. Proposed Comprehensive Plan Policy 6.40. Portland Harbor Superfund Site supports City efforts toward prompt resolution and cleanup.

The following proposed actions are expected responses to implement brownfield policies. Estimates of resulting development-capacity gains in the proposed Comprehensive Plan assume implementation of these actions. While the City can influence brownfield redevelopment, cooperation with state and federal agencies is also necessary, including legislative changes and new funding sources to accelerate brownfield cleanup.

- Create an industrial/commercial brownfield redevelopment program to implement a comprehensive brownfield toolkit of incentives and best practices. Hire staff to develop and implement the program.

- Draft and lobby for enabling legislation and funding to substantially expand brownfield redevelopment, including tax incentives, authorization of land banks with liability protection, and other brownfield best practices.

- Create and fund financial gap incentives for cleanup and redevelopment of underutilized, contaminated sites. Design incentives to substantially increase industrial redevelopment but not be available to entities identified as being responsible for the contamination.

- Obtain Superfund liability relief for brownfield purchasers. Obtain EPA commitment and staff resources to provide prospective purchaser agreements and de minimis settlements on harbor brownfields. Consider a city insurance pool or other incentives to minimize in-water liability cost gaps for innocent purchasers.

- Take a leadership role and promote prompt resolution and cleanup of the Portland Harbor Superfund site.

- Create a local industrial land bank. Facilitate strategic brownfield and other industrial redevelopment unlikely to occur in the private market, such as large industrial sites.

**Proposed brownfield policies and these implementation actions are expected to result in development capacity gains of 89 acres in the Harbor and Airport Districts, 23 acres in Harbor Access Lands, 8 acres in Columbia East, and 4 acres in Dispersed Employment areas.** Calculation of these capacity gains is based on increasing the brownfield redevelopment rate from 40% (estimate used in existing Buildable Land Inventory) to 60% by 2035, consistent with the 60% target set in Policy 6.14 Brownfield Redevelopment. This gain appears to be realistic, based on the estimated capacity impacts of recommended "best practice" incentives and tools in the Portland Brownfield Redevelopment Assessment.

## INDUSTRIAL LAND INTENSIFICATION

> *6.38. Industrial land use intensification. Encourage reinvestment and intensification of industrial land use, as measured by output and throughput per acre.*
>
> *Policy 6.23. Trade and freight hub. Encourage investment in transportation systems and services that will retain and expand Portland's competitive position as a West Coast trade gateway and freight distribution hub.*

Not all job growth will be accommodated on vacant or underutilized land. Strategic freight investments and business climate improvements offer key opportunities to encourage industrial reinvestment and more intensive use of existing buildings and developed land by raising the City's value proposition among competing industrial locations. Proposed Policies 6.38 and 6.23 (above) and Policy 6.17. Regulatory Climate and 8.26. Public-Private Partnerships provide supporting direction to pursue these opportunities. Business community participation in public investment planning and regulatory improvement processes can help to further target public actions to industry priorities and intensification opportunities, as supported by proposed Policy 2.1. Partnerships and Coordination.

**Industrial land "intensification" means more intensive use of existing industrial buildings and businesses on already developed sites.** For example, the heavy industrial, freight-hub location advantages that characterize most of Portland's Prime Industrial areas are unique in the region. However, retention and expansion of capacity in these heavy industrial geographies enables the region to more effectively compete for and efficiently serve these types of employment land demand. Policy 6.38 acknowledges that floor area or employment density are not the only measures of productivity and that intensification through productivity gains in

output-per-acre on manufacturing facilities or throughput-per-acre on distribution facilities is appropriate.

In North America and Europe, significant examples of new and modern, multi-story industrial development have been limited. Building elevators are an efficiency bottleneck for most manufacturing and warehousing. Instead, industry preferences and development trends have shifted toward more large, single-story buildings and more outdoor maneuvering area to accommodate efficient truck movement and bigger trains and ships, driven by increasingly competitive global markets (see business focus group results in EOA Section 1). Within this context, however, various recent development examples in Portland indicate opportunities to increase intensification through business expansion, infill, or redevelopment:

- Site investments that expand output capacity at developed sites are common. The recent expansion of South Rivergate Rail Yard (TSP Project 30047) improved unit-train access and encouraged capacity expansion at nearby Canpotex and Columbia Grain marine terminals. The proposed Rivergate Overcrossing (TSP Project 115610) nearby is similarly expected to facilitate continuing expansion at Evraz Steel.
- Underused or obsolete facilities can be redeveloped. Proposed site improvements (TSP Project 112080) at Port of Portland T-4 will facilitate redevelopment of the former Cargill terminal.
- Office functions are expanding at industrial headquarters sites, such as the proposed redevelopment of Daimler offices on Swan Island.
- The proposed double-tracking improvements and eight proposed overcrossings along Union Pacific's Kenton Line (TSP Projects 40085 and others) will alleviate congestion from forecast rail volume growth on this corridor and improve rail yard capacity.
- An expanding market for micro-business incubator facilities has spurred reuse of underutilized upper floors and redevelopment in the Central Eastside District. Another example that extends beyond the Central City is the recently developed five-story industrial building on NW York St. in the Harbor and Airport Districts geography.

To implement Policies 6.38 and 6.23 (above) and freight transportation policies 9.30 – 9.37, an extensive program of strategic freight investments are proposed in the Transportation System Plan, consistent with the Regional Transportation Plan. These infrastructure projects address identified deficiencies, accommodate forecast growth, improve Portland's competitiveness as a leading export region, and some of them facilitate development or intensification of particular sites. Freight volumes handled in the region are expected to roughly double in tonnage and triple in value between 2007 and 2040 (2014 Commodity Flow Forecast). In addition to the freight projects proposed in the TSP, the following proposed actions are expected responses to implement industrial land intensification and related freight infrastructure and regulatory climate policies. Estimates of resulting development-capacity gains in the proposed Comprehensive Plan assume implementation of these actions.

1. Update the Portland Freight Master Plan project list and incorporate changes into the Transportation System Plan Update. Develop a list of priority freight projects that improve Portland's industrial location value and freight district access.

2. Pursue funding sources to increase freight system improvements. Expand opportunities for public-private funding partnerships.

3. Improve Portland's industrial regulatory climate to support job growth (see further explanation above on new citywide directions). Conduct a study to evaluate cumulative city regulatory and fee costs, and develop implementation strategies. Explore process improvements to reduce uncertainty, timing, complexity, other transactions costs, and emphasize regional competitiveness in new regulations and fees without rolling back regulatory standards.

4. Consider establishing an industrial land bank and incentives to facilitate more intensive industrial redevelopment on underutilized sites.

**Proposed policies and these implementation actions are expected to result in industrial land intensification with estimated development capacity gains of 114 acres in the Harbor and Airport Districts, 31 acres in Harbor Access Lands, and 50 acres in Columbia East.** Calculation of these capacity gains is based on two factors. First, the redevelopment/infill rate is expected to increase to 15% from the current estimates in the Buildable Land Inventory (BLI) of 8% in Harbor and Airport Districts, 1% in Harbor Access Lands, and 7% in Columbia East. Existing BLI estimates are based on the amount of underdeveloped land with General Employment (EG) zoning. The 15% target represents conservative expansion of the 13% redevelopment/infill trend in Columbia East from 1999 to 2011 (see EOA Section 1), taking into account expected tightening transportation budgets for freight investments and proposed environmental zoning on developed land described in the next section. The Columbia East development trend is used here because the associated job growth trends during this period approximate forecast growth much closer than in the other industrial geographies.

Second, the 15% intensification rate is applied to the total land demand forecast of the industrial geographies, including additional acreage needs for marine, air, and rail terminals. For example, approximately 50 acres of the forecast 200-acre land need for railroad yards is expected to be met in the Harbor and Airport Districts by the proposed Kenton Line double-tracking and associated overcrossing improvements (TSP Projects 40085, 30055, 40001, and others). The Port of Portland's 2013 Rail Plan identified the Kenton Line as the only rail segment in Portland where forecast growth is expected to exceed practical capacity by 2030, and the proposed double-tracking improvements are recommended as a major regional project to address this congestion. These improvements are also expected to improve rail yard efficiency and functional capacity in Portland through substantial train storage capacity and improved rail mobility, which is the basis for the 50-acre estimate of railroad land needs to be met by infill and redevelopment.

## INDUSTRIAL DISTRICT EXPANSION

*Policy 6.*48. *Golf course reuse and redevelopment. Facilitate a mix of industrial, natural resource, and public open space uses on privately owned golf course sites in the Columbia Corridor that become available for reuse.*

*Policy 6.41. West Hayden Island. Provide for the future annexation of West Hayden Island for a combination of open space and deep water marine industrial uses with*

*supplemental requirements in a plan district or other implementation agreement that ensures mitigation of impacts and provision of public benefits.* (This policy goes on to call for an annexation ordinance, future zoning, plan districts, and intergovernmental agreements to allow up to 300 acres for marine terminal and infrastructure development and protecting and enhancing at least 500 acres as open space).

New Industrial Sanctuary areas are designated on the proposed Comprehensive Plan Map at three airport area golf courses (Colwood, Riverside, and Broadmoor). These map changes represent 35% of the development capacity gains in the Harbor and Airport District. Proposed Policy 6.48 provides further direction for their land use and development. An employment designation at West Hayden Island is not proposed in the Comprehensive Plan Update, although Policy 6.41 provides direction for future reconsideration of the proposed Farm and Forest designation. These proposed policies advance a multi-objective planning approach to accommodate a mix of new industrial areas, existing and enhanced natural resource areas, and public access to open space at these sites. The plan map also designates various additional sites as Mixed Employment land to meet capacity needs in Dispersed Employment areas.

Capacity impact estimates of map changes are based on assumptions that development of buildable land in new industrial and employment areas is expected to be (1) serviceable by public facilities and (2) financially viable on average to meet forecast demand within the 2035 planning horizon. The serviceability of sites is supported by proposed investments in the Citywide Systems Plan and Transportation System Plan and proposed Policy 8.17. System Capacity. Site assistance to accommodate financial feasibility of development on these sites by 2035 is also supported by Policy 6.16. Regionally Competitive Development Sites. Implementation efforts are expected to address development feasibility constraints as needed.

**Airport Area Golf Courses**

The Trust for Public Land and property owners of the 138-acre Colwood golf course obtained conditional approval of a quasi-judicial plan map and zoning amendment in 2014 to rezone 48 acres for industrial uses with the remainder as public open space and natural area. The proposed Comprehensive Plan includes this map change at the Colwood site and similar land use proposals at two nearby golf courses, designating approximately 90 additional acres at Riverside and 15 acres at Broadmoor as Industrial and retaining the Open Space designation on 215 acres.

These map designations were drawn to avoid encroaching on natural resources protected through existing environmental overlay zones, and to create large, functional industrial sites and open spaces with opportunities for substantial environmental restoration. The buildable land inventory estimates 95 acres of capacity after constraints at these sites. With public infrastructure investment and site assistance, the full 155 acres of industrially designated land at these sites may be available for development, assuming that street access is existing and all of the designated industrial area is available for development.

While these golf courses could potentially remain in operation indefinitely, national market trends indicate an oversupply of golf courses in the coming years relative to population demographics, particularly in inner city locations. Given these trends and continuing intensification of industrial development in the surrounding area, it is reasonable to expect potential reuse of these sites in the 2035 planning horizon and the proposed Comprehensive Plan

proposal would accommodate that change. Proposed public investments (e.g., improvements at 33rd Avenue) and site assistance are expected to help overcome development constraints at these sites. Development requirements are expected to include adequate infrastructure improvements, natural resource protection and enhancement, and expanded public access to open space, consistent with proposed Policy 6.48. Golf Course Reuse and Redevelopment.

**West Hayden Island**
As noted above, an employment map designation is not proposed at West Hayden Island in the Comprehensive Plan update. This reflects a policy choice to accommodate the low end of the marine terminal commodity movement forecast. A demand scenario of 150 acres for marine terminal development is used here to estimate land needs for the Harbor Access Lands geography. West Hayden Island represents the only opportunity to meet the mid-range marine terminal commodity movement forecast as described in EOA Sections 1-2.

West Hayden Island was brought into the Urban Growth Boundary in 1983 for marine industrial development, and Metro designates the site as Regionally Significant Industrial Area in the Urban Growth Management Functional Plan (Title 4), as well as a regionally significant fish and wildlife habitat (Title 13). Proposed Policy 6.41. West Hayden Island provides City direction for future reconsideration of the proposed Farm and Forest designation, consistent with this regional land use designation. Future development of West Hayden Island still could occur beyond the 20-year planning horizon, and marine terminal land needs can potentially be reevaluated at that time. Policy 6.41 anticipates a future marine terminal development proposal of up to 300 acres at West Hayden Island, mitigation of adverse environmental and community impacts from development, and designation of at least 500 acres as open space, based on the 2010 City Council Resolution #36805.

**New Mixed Employment Areas**
A variety of map changes are proposed in the Comprehensive Plan Update to expand capacity and improve the land use efficiency and functions of Dispersed Employment areas:

- New Mixed Employment areas have been designated at development opportunity sites near freeway interchanges or truck routes in East Portland, including existing farm sites (currently designated residential or commercial) and underutilized commercial sites.

- New Mixed Employment areas have been designated as transition areas between industrial districts and residential neighborhoods at NW Vaughn St. and N Columbia Blvd. at Denver St.

- Existed General Commercial areas with redevelopment potential for higher employment density have been changed to Mixed Employment designations, including portions of SE 82nd Ave. and N Hayden Meadows Dr.

- Existing Central Employment sites in employment use have been changed to Mixed Employment designations in Dispersed Employment areas (e.g., Freeway Lands and Montgomery Park sites) and in Central Gateway (see explanation in Neighborhood Business Districts section below), focusing their development potential on employment uses rather than mixed use/residential use.

The Employment Capacity Zoning Project is underway as part of the Periodic Review Task 5 Implementation to propose zoning map and code changes that implement these new Comprehensive Plan designations.

## WATERSHED HEALTH IMPROVEMENTS

> *Policy 6.46. Industrial growth and watershed health. Facilitate concurrent strategies to protect and improve industrial capacity and watershed health in the Portland Harbor and Columbia Corridor areas.*

Development capacity impacts are also expected to result from actions to meet City environmental policies and regulatory obligations. As noted above, Portland's industrial districts along the Willamette and Columbia Rivers serve as regionally significant industrial and natural resource locations. Recognizing the parallel public objectives for limited land in these geographies, Policy 6.46 above describes expectations for concurrent improvements in both industrial capacity and watershed health. Other proposed Comprehensive Plan Policies to protect and improve watershed health include 7.4. Natural Resource Protection, 7.6. and 7.7 pertaining to Environmental Protection Programs, 7.8. Land Acquisition Priorities and Coordination, additional policies specific to the Willamette, Columbia, and Columbia Slough watersheds, and policies calling for designing with nature, resource efficient development, and hazard resilient development.

**To implement watershed health policies on balance with economic development policies, a strategy of additional natural resource protection, enhancement and ecological site design is proposed as summarized below.** This multi-faceted strategy was developed in consultation with the Industrial Land/Watershed Health Working Group described above. Implementation of this strategy is expected to be pursued concurrently with actions to support industrial capacity gains, in accordance with Policy 6.46. Industrial Growth and Watershed Health. **Update Environmental and Greenway Overlay Zones and Regulations**

- Complete multi-objective plans for the River Plan/North Reach and Columbia Corridor, to address some combination of the following:
    - Applying new overlays to unprotected higher functioning or priority resources (e.g. high- and medium-ranked natural resources in the City's Natural Resource Inventory (NRI), potential off-site mitigation and restoration sites).
    - Removing overlays from land with no NRI resources.
    - Adjusting the protection level to better correspond to the level of natural resource function and improve program consistency (e.g. c-zone to p-zone or vice versa).
    - Updating area-specific environmental and greenway regulations that improve natural resource function through industrial development and redevelopment (e.g., streamlined procedures for site enhancements or ecological site design (see

section D below), and allow prospective mitigation credit for proactive restoration activities, etc.).

- Pursue targeted update of Environmental Overlay Zone chapter of the Zoning Code (citywide regulations) including streamlining for resource enhancement, streamlining to encourage industrial intensification, clarification of mitigation requirements (e.g., potential standards, additional flexibility for off-site mitigation or participation in mitigation bank), and provisions needed to respond to new ESA listings.

- Complete future regulatory and/or program updates as needed to comply with the Endangered Species Act in response to litigation against FEMA relating to floodplain development.

**Enhance/Restore Protected Natural Resources**

- Identify priorities, estimated costs, and funding options (revenue sources, partnerships, incentives) in the Columbia Corridor and Portland Harbor. Specifically explore and pursue the following:

    - Restoration investments in public or land trust ownership or conservation easements.

    - Dedicated, long-term revenue sources for acquisition, restoration, and maintenance.

    - Options for public/private partnerships and investments.

    - Incentives for natural resource enhancement, such as tax credits.

    - Innovative institutional and funding structures.

    - Community and political support and commitment for proactive, long-term restoration investments.

- Prioritize target mitigation/restoration sites in the Columbia Corridor and Portland Harbor.

- Work with private mitigation bankers and other partners to explore and develop banks that sell wetland, riparian, in-water and grassland-related mitigation credits for City-required mitigation or NRDA/Superfund mitigation.

**Advance Ecological Site Design**

- Encourage ecological site design through best practices research and seeking partnerships and pilot projects.

- Establish or reinstate financial incentives, such as the eco-roof incentive program

- Provide education and technical assistance.
- Evaluate and pursue, as appropriate, code amendments, including regulatory incentives and performance based approaches.
- Develop resource handbook or design competition to encourage eco-industrial site design.

**Capacity Assumptions for Additional Natural Resource Protection**

The following analysis is intended to estimate the potential development capacity impacts of future legislative projects that will among other items, update the City's existing greenway and environmental overlay zones. The analysis also estimates potential development capacity impacts associated with Portland Harbor Superfund's Natural Resources Damages Assessment required restoration activities. This analysis and associated assumptions do not specifically dictate or bind future City decisions. In the future, when specific regulatory actions are proposed, development capacity impacts and Goal 9 compliance will be addressed along with other goals as part of that project.

It is estimated that future updates to the City's environmental and greenway overlay zones could reduce development capacity by 150 acres on vacant and underutilized sites:

- 98 acres in the Harbor and Airport Districts
- 12 acres in Harbor Access Lands
- 40 acres in Columbia East

These capacity impacts represent the potential incremental impact of updated regulations beyond the capacity reductions attributed to physical features (floodplains, wetlands, etc.) that have already been applied as part of the Buildable Land Inventory methodology.

An additional 25 acres of capacity reduction is assumed in anticipation of the use of some vacant or underutilized sites for restoration to meet Natural Resource Damage Assessment requirements associated with Portland Harbor Superfund.

Future regulatory updates are also expected to expand environmental overlay zoning on developed sites in Columbia East and in the Harbor and Airport Districts. These overlay zone expansions are estimated to apply to approximately 2% of the developed sites in Columbia East, and 3.5% of the developed sites in the Harbor and Airport Districts, respectively.

An additional 1% of the developed sites in Columbia East, and 2% of the developed sites in the Harbor and Airport Districts, are assumed to shift from existing environmental conservation zone to environmental protection zone. These areas are within 50 feet of a stream or wetland. Most of these natural resource areas on developed sites have existing environmental constraints other than or in addition to environmental overlay zones.

In the Harbor Access Lands, greenway and environmental overlay zone updates are expected to apply to approximately 12% of developed sites; however, in each of these geographies, the

regulatory updates would apply to natural resources that are currently constrained and subject to existing regulations (e.g., Willamette greenway overlay zones, balanced cut and fill) or other environmental constraints. As a result, the incremental impact of future regulations on developed sites is expected to be negligible.

More detailed descriptions of these analyses are provided in Appendix A.

Other elements of the strategy to improve watershed health are not assumed to have significant impacts on development capacity. Restoration efforts are assumed to focus primarily on protected natural resource or open space areas. Efforts to encourage ecological site design are assumed to include a mix of non-regulatory and regulatory tools that will support both development and watershed goals for certainty and overall cost-effectiveness.

## SHORT-TERM LAND SUPPLY

EOA Section 3 identifies significant deficits of short-term development capacity in the Harbor and Airport Districts, Harbor Access Lands, and Dispersed Employment areas. These short-term deficits are expected to be met by announced development projects, intensified use of developed sites, and proposed map amendments and rezoning.

In the Harbor and Airport Districts, an estimated 39-acre deficit in existing short-term land supply estimated geography can be amply met by proposed investments and efforts to encourage intensified use of developed land (estimated at 15% of demand, as discussed above) and the proposed 49-acre development project at Colwood Golf Course. Surplus short-term capacity of 62 acres in the Columbia East geography is also available to partially meet demand for comparable building types.

In the Harbor Access Lands geography, most of the vacant land supply consists of brownfields affected by Portland Harbor Superfund liability. These harbor brownfield sites are not included in the short-term land supply, and the City has limited ability to overcome those development constraints by 2020; however, substantial development is underway or proposed in this geography that appears to be generally at pace to meet short-term forecast demand for 114 acres by 2020, leaving an estimated 6-acre shortfall (see Figure 8 in Appendix B). This shortfall can potentially be met by surplus capacity available in other industrial geographies; for example, the large Evraz steel foundry in the Harbor Access Lands geography has accommodated substantial expansion over the last decade at nearby sites away from the river.

- Redevelopment of the Daimler Trucks headquarters offices broke ground in 2014 on a new 269,000 square foot nine-story building that is expected to result in approximately 400 new jobs. This development represents equivalent capacity of approximately 18 acres (measured by floor area, or 21 acres measured by expected jobs).

- The proposed Pembina terminal development by 2017 at an approximately 40-acre vacant portion of Port of Portland T-6 is another example of recent development in the Harbor Access Lands geography.

- The Canpotex potash terminal at Port of Portland T-5 has proposed plans to double their existing storage capacity, consisting of a 320,000 square foot storage building, by 2020. This intensified use of non-vacant land represents an approximate capacity gain of 21 acres, since this site is not included in the Buildable Land Inventory.

The modest 4-acre deficit in short-term land supply estimated in the Dispersed Employment areas is expected to be met rezoning projects underway in Task 5 of the Comprehensive Plan Update, including new areas of General Employment zoning and increases in industrial development allowances in the Neighborhood Commercial geography.

***The proposed Comprehensive Plan will provide a 20-year supply of additional employment land capacity in Portland's industrial districts through brownfield redevelopment, intensification of land uses, and expansion of industrial sanctuaries.***

# V. NEIGHBORHOOD BUSINESS DISTRICTS

***Currently, Neighborhood Business Districts account for 93,000 jobs – about 25% of the jobs in Portland. By 2035, more than 35,000 additional jobs are projected for these areas, requiring 700 acres of business commercial capacity.***

**What types of businesses locate here?** Neighborhood business districts are mainly home to the retail, personal service, and related sectors that serve customers on-site. These businesses generally need ground-floor space along pedestrian- or auto-oriented streets. The EOA identifies three types of Neighborhood Business District geographies:

- Gateway is designated by Metro as a Regional Center and is planned to transition to a high-density, mixed use area. Gateway has concentrations of businesses in health care and retail.
- Town Centers are planned for midrise, mixed-use development and include concentrations of institutional, retail, and office sector businesses. They include Hillsdale, Hollywood, Lents, St. Johns, and West Portland, which are designated in Metro's 2040 Growth Concept, and new town centers are proposed in Northwest District, Killingsworth/Interstate, and Midway (122nd/Division).
- The numerous mixed use commercial corridors across Portland have a diverse business mix and concentrations of small businesses. These districts are designated as Neighborhood Centers, Civic Corridors, Neighborhood Corridors, and interspersed nodes.

**Why are these employment geographies important?** Neighborhood Business Districts are a foundation of neighborhood livability in attracting pedestrian and social activity, defining neighborhood character, providing diverse destinations, and conveniently serving daily shopping needs. The 93,000 jobs in these districts account for 25% of the citywide employment. Neighborhood business districts also provide major economic benefits by keeping local dollars circulating within Portland, particularly through small business vitality. Small businesses are concentrated in this employment geography more than others, supporting Portland's identity as a small business city.

**2010-2035 job growth potential: 35,100 net new jobs**. These districts account for 25% of the citywide job forecast. Many of these districts are experiencing significant growth and change, providing synergistic locations for concentrated housing and commercial growth in "complete neighborhoods" with convenient access to services.

## EMPLOYMENT LAND CAPACITY OF THE PROPOSED COMPREHENSIVE PLAN

**The Neighborhood Business Districts currently have surplus development capacity to accommodate nearly twice their aggregate forecast demand by 2035.** Substantial surplus capacity exists in the Gateway, Town Centers, and Neighborhood Centers and Corridors geographies. Surplus short-term capacity to meet demand by 2020 is also available in these three geographies (see EOA Task 2/3 Report).

## NEIGHBORHOOD BUSINESS GROWTH AND LAND USE DIRECTION

*Policy 6.59. Neighborhood business districts. Provide for the growth, economic equity, and vitality of neighborhood business districts.*

*Policy 6.63. Neighborhood-serving business. Provide for neighborhood business districts and small commercial nodes in areas between centers to expand local access to goods and services. Allow nodes of small-scale neighborhood serving commercial uses in large planned developments and as a ground floor use in high density residential areas.*

The primary land use and development policies for this employment geography are summarized in the section below on centers and corridors. The areas are designated for mixed residential and employment uses and higher densities to support complete neighborhoods and healthy communities. Policies 6.59 and 6.63 provide further land use direction on their primary commercial market function of neighborhood serving businesses. The livability and economic equity of Portland neighborhoods rely on these neighborhood serving businesses.

## PROPOSED COMPREHENSIVE PLAN MAP CHANGES

Numerous map changes are proposed in the Comprehensive Plan to implement the centers and corridors framework. A Mixed Use Zoning Project is underway as part of the Comprehensive Plan Update (in Task 5 in the periodic review work plan) to clarify and implement these new designations. Existing commercial zones already allow multifamily residential use and densities that are generally consistent with these designations. The proposed plan designates:

- Three new Town Centers at Northwest District, Killingsworth/Interstate, and Midway. Town Centers are intended to accommodate low-rise to midrise density of up to 10 stories.

- Twenty-two Neighborhood Centers throughout the city, supporting the objectives of healthy and complete neighborhoods. Neighborhood Centers are intended to accommodate low-rise density of up to 4 stories.

- A network of Civic Corridors and Neighborhood Corridors for midrise and low-rise densities, respectively, which take advantage of their redevelopment potential and transit connections. Civic corridors are the city's busiest, widest and most prominent streets.

- A Mixed Employment area in Central Gateway that supplements the tightening capacity for industrial-office incubator space in the Central City and compete more effectively in the regional office development market.

## SYSTEM OF CENTERS AND CORRIDORS

> *Goal 3.D. A system of centers and corridors. Portland's interconnected system of centers and corridors provides diverse housing options and employment opportunities, robust multimodal transportation connections, access to local services and amenities, and supports low-carbon complete, healthy, and equitable communities.*
>
> *Policy 3.9. Role of centers. Enhance centers as anchors of complete neighborhoods that include concentrations of commercial and public services, housing, employment, gathering places, and green spaces.*
>
> *Policy 3.12. Investments in centers. Encourage public and private investment in infrastructure, economic development, and community services in centers to ensure that all centers will support the populations they serve.*

One of the primary themes of the proposed Comprehensive Plan is the urban form framework of centers and corridors that are well served by pedestrian, bicycle, and transit systems. Centers and mixed use corridors are places with concentrations of businesses and services, housing, gathering places and green spaces that provide residents with options to live a healthy, active lifestyle. When services and other destinations are clustered in compact areas economic viability is strengthened and walking, transit and bicycling become more practical. The proposed of Neighborhood and Town Centers and Civic and Residential Corridors vary in size and character depending on their location, but all of them contribute to increasing economic opportunities and neighborhood vitality.

**Currently, only 64% of Portlanders live in complete neighborhoods with frequent transit service, schools, parks or greenspaces, and businesses and other amenities close enough to safely and easily walk or bike for meeting.** In some areas, services are scattered or missing, or streets may lack sidewalks, bikeways or other safe connections providing local access. The Portland Plan set the objective that 80% of Portlanders live in a complete neighborhood by 2035. The proposed Comprehensive Plan supports this objective by concentrating growth in centers and corridors that are dispersed across Portland neighborhoods.

In the past, Portland has primarily used zoning that promotes a compact mix of commercial uses and housing to cultivate places with a sufficient mix of uses and services; however, zoning alone has not been successful in producing these results evenly across the city. Emerging opportunities to increase development of centers and corridors include expanding demand for multifamily housing in close-in locations, associated retail and service needs as well as continuing expansion of the health care and education sectors in centers and corridors. Policy 3.12 and the Transportation System Plan and Citywide Systems Plan propose concentrated investments in centers and corridors that make them more attractive and affordable locations to develop. Additionally, the Portland Plan's Healthy Connected City strategy introduces a broader range of tools, including community partnerships and investments that will help achieve these objectives.

## SMALL BUSINESS SUPPORT AND NEIGHBORHOOD REVITALIZATION

*Policy 6.8. Small business development. Facilitate the success and growth of small businesses and coordinate plans and investments with programs that provide technical and financial assistance to promote sustainable operating practices.*

*Policy 6.64 Investment priority. Prioritize commercial revitalization investments in neighborhoods that serve communities with limited access to goods and services.*

*Policy 6.61 Small, independent businesses. Facilitate the retention and growth of small and locally-owned businesses.*

Community-driven revitalization efforts underway offer potential to increase small business development, improve economic equity, and reduce retail and service disparities among Portland neighborhoods. **Small businesses are at the core of Portland's neighborhood business districts. Collectively, they offer diverse potential to improve job growth, increase self-employment, and add to the city's economic resiliency.**

Policies 6.64 and 6.61 reinforce new directions for commercial revitalization set in the Portland Neighborhood Economic Development Strategy and Portland Plan. These strategies propose a community-driven neighborhood economic development approach to build local capacity, minimize involuntary displacement and spur commercial activity in underserved neighborhoods. This approach includes support for entrepreneurship and microenterprise development, as well as expanding community partnerships to leverage more public investments to advance neighborhood economic development goals.

While much of the public sector role has focused on one-time capital investments and incentives, a pivotal difference can be in the form of day-to-day technical, marketing, and related business assistance. Portland has a solid base of business districts with supportive community organizing and small business resources. Recent initiatives include the East Portland Action Plan, the Neighborhood Economic Development Strategy, and the Neighborhood Prosperity Initiative. PDC's Neighborhood Economic Development Strategy includes a multi-pronged approach to measuring neighborhood business vitality, including new business licenses, new business growth, positive job growth, resident income, transit access, and retail needs satisfaction.[3]

## GATEWAY AS PORTLAND'S SECOND BUSINESS CENTER

*Policy 3.22. Role of Gateway. Encourage growth and investment in Gateway to enhance its role as East Portland's center of employment, commercial and public services.*

For the Gateway Regional Center, substantial new office development has not yet occurred despite direct proximity to east-west and north-south freeway (I-84/I-205) and light rail transit service coupled with availability of tax increment funding through the urban renewal area. Barriers to successful office development have included lack of a critical mass of professional and financial sector office activity, lower market rents that are inadequate to support mid-to-high

[3] For detailed information on the neighborhood vitality index, please read the Neighborhood Economic Development strategy: http://www.pdc.us/bus_serv/ned.asp

rise construction costs, and relative fragmentation of many of the vacant and lesser valued property holdings.

Policy 3.22 supports a range of demand opportunities in Gateway to expand low/mid-rise institutional and office development:

- Institutional development accounts for 59% of the forecast building area in Gateway to 2035, building on the expansion potential of Adventist hospital and a variety of other health care and education facilities there.

- The Mixed Employment area designated in Central Gateway takes advantage of the area's potential to accommodate spillover demand from the tightening capacity for industrial office incubator space in the Central City.

- Gateway and the nearby Portland International Center at PDX are Portland's largest concentrated area of office development capacity, outside of the Central City, available to establish a critical mass of office activity that could compete more effectively with lower-rise and larger footprint office parks currently focused in the suburban market around Portland. Greater diversity of office products would better enable Portland to recapture its competitive share of the office space market that has been lost over the last couple of decades. Gateway's relative affordability and proximity to PDX is among its location advantages for businesses requiring immediate access to air transport through personnel, customers, or high-value freight.

The majority of the land supply is associated with smaller, underutilized redevelopment sites rather than vacant sites; however, the current development trends indicate that the market is developing at a relatively low 0.5 FAR, which is consistent with a significant existing amount of surface parking lot area. **Achieving higher FARs in Gateway and the town centers will depend on opportunities to reduce the proportion of land in surface parking.** One of the key elements will be to find innovative approaches to reduce the parking footprint while assuring customer and employee accessibility. These strategies include support for prototype developments to show market viability. Innovations could include taking advantage of the reduced parking standards already in place, un-bundling of parking in real-estate transactions (for example, listing the price of a parking space separate from the residential or commercial lease, as an add-on), maintaining on-street parking, and initial structured parking with major development projects outside of the Central City.

## COMMERCIAL CAPACITY IN UNDERSERVED NEIGHBORHOODS

Commercial vitality is widely uneven among neighborhood business districts, and only 60% of Portlanders currently live within a half-mile of a full-service grocery store or market that sells healthy, fresh food. The Portland Plan's Healthy Connected City goal emphasizes creating complete neighborhood centers that provide access to services and destinations, locally and across the city. In response, **the proposed Comprehensive Plan map designates new Neighborhood Commercial areas in underserved areas.** Policy 6.63 Neighborhood-Serving Business also supports adding commercial and mixed use development capacity in underserved neighborhoods. Related policies that further support reducing neighborhood retail and service

disparities include Policy 6.8. Small Business Development, 6.66. Temporary and Informal Markets and Structures, and 4.66 Neighborhood Food Access.

***The proposed Comprehensive Plan will provide a 20-year supply of additional commercial land in neighborhood business districts by enhancing the capacity of existing centers and corridors, investing in new centers and corridors, providing small business support and neighborhood revitalization programs, and addressing the needs of underserved neighborhoods.***

# VI. CAMPUS INSTITUTIONS

***Currently, institutional campuses (hospitals, colleges and universities) account for 35,00 jobs – about 10% of the jobs in Portland. By 2035, more than 22,730 additional jobs are projected for these areas, requiring 370 more acres of development capacity for campus institutions.***

**What types of businesses locate here?** The health care and education sectors are concentrated in large hospital and college campuses and smaller neighborhood facilities. The institutional geography consists of 17 of Portland's 19 large hospital and college campuses (excluding PSU in the Central City Commercial geography and Adventist hospital in Gateway). Their campuses vary from large pastoral expanses (some exceed 100 acres) to concentrated urban complexes of mid-rise buildings.

**Why is this geography important?** Portland has an exceptional collection of higher education and health care institutions that provide access to essential services, such as education and workforce training and health care. They are centers of innovation and learning in the community. These institutions are also major employers, anchoring the health care and education sectors, which accounted for 88,500 jobs, or 24% of the employment in the city in 2010, and have been leading sources of job growth locally, regionally, and nationally. The jobs in this geography are also relatively stable, continuing to grow during the 2008-2010 Great Recession, and are concentrated in high-wage occupations.

**2010-2035 job growth potential: 22,700 net new jobs**. The Institutional geography accounts for 16% of the citywide job forecast. The health care and education sectors concentrated in this geography have been the city's biggest job growth sectors, making up 36% of forecast job growth and 27% of forecast citywide employment in 2035.

## EMPLOYMENT LAND CAPACITY OF THE PROPOSED COMPREHENSIVE PLAN

The current growth capacity in most of the Campus Institutions geography consists of the maximum development allowance set in their conditional use master plans and impact mitigation plans. This existing capacity meets only 83% of forecast demand by 2035, leaving a 64-acre shortfall of needed developable land. The proposed Comprehensive Plan meets this capacity shortfall primarily by designating each campus as employment land with expected development (FAR) allowances that exceed forecast development. The draft floor area allowances being considered in the Institutional Zoning Project now underway meet an estimated 141% of forecast demand overall, as described further below.

## INSTITUTIONAL GROWTH AND LAND USE DIRECTION

> *Policy 6.53 Campus institutions. Provide for the stability and growth of Portland's major campus institutions as essential service providers, centers of innovation, workforce development resources, and major employers.*
>
> *Policy 6.54 Campus land use. Provide for major campus institutions as a type of employment land, allowing uses typically associated with health care and higher education institutions.*

These policies and the Comprehensive Plan Map propose a major shift in land use direction for campus institutions, designating them as employment districts, where uses typically associated with their operations are allowed, rather than conditional uses in residentially designated areas. The average age of the 15 residentially designated institutions at their current locations is nearly 80 years. **The average size of these campuses in total employment is comparable to Town Centers.**

This policy shift also supports the forecast job growth at campus institutions. Implementation of these policies is expected to include zone changes to allow forecast development, as well as transportation and other infrastructure projects to adequately serve these campuses.

## PROPOSED COMPREHENSIVE PLAN MAP CHANGES

The current residential land use designation on most of this geography in the Comprehensive Plan Map is proposed to be changed to Institutional Campus, a new employment land designation. This map designation is generally applied to the current master planned campus boundaries. Proposed Policy 10.5.20 Institutional Campus describes the intended use, intensity and public services provision at these map designations, including the intent to foster the growth of the institution while enhancing the livability of surrounding residential neighborhoods and the viability of nearby business areas. The Portland Plan specifically supports this map change in Action 69, calling for new land use and investment approaches to support the growth and neighborhood compatibility of college and hospital campuses.

Continuing development of Portland's campus institutions is complicated by the historic development of these campuses in unusual locations not consistent with typical commercial siting criteria. As a result, campus institutions commonly have limited transit or arterial street access, proximity to residential neighborhoods that constrain campus expansion, and zoning regulations that appear to increasingly impede effective site planning to respond to rapidly changing educational and health care needs. The current residential map designations contribute to this mismatch.

Meeting forecast institutional land needs is challenging, not only because of the size of the gap (64 acres) but also the physical setting of many institutions, often bounded by residential neighborhoods. Options generally include:

- Increased density of development within the existing footprint through infill and redevelopment.
- Increasing the campus footprint (with land acquisition), often requiring re-zoning and conditional use master plan (CUMP) approval processes.
- Creating satellite campuses taking advantage of opportunities elsewhere in Portland, such as designated mixed use centers and corridors.

The approach proposed in the Comprehensive Plan combines each of these options. Moderate campus-wide densities can accommodate substantial growth, while limiting development at campus edges near single-family neighborhoods. The proposed map designations are based on the current master plans, which can extend outward from the current footprint, such as inclusion of the planned riverfront expansion area at the University of Portland. Policy 6.58. Satellite

Facilities also encourages continuing off-site expansion where practical for some types of uses, such as OHSU outpatient and research facilities in nearby South Waterfront and Providence offices in nearby Hollywood.

## REGULATORY REFORM

> *Policy 6.55 Development impacts. Protect the livability of surrounding neighborhoods through adequate infrastructure and campus development standards that foster suitable density and attractive campus design.*
>
> *Policy 6.56 Community amenities and services. Encourage campus development that provides amenities and services to surrounding neighborhoods, emphasizing the role of campuses as centers of community activity.*
>
> *Policy 6.57 Campus edges. Provide for context-sensitive, transitional uses and development at the edges of campus institutions to enhance their integration into surrounding neighborhoods, including mixed-use and neighborhood-serving commercial uses where appropriate.*

These proposed policies provide balanced direction for new development standards to accommodate institutional growth and neighborhood compatibility and livability. Implementation of these policies is underway in the Campus Institutional Zoning Project as part of the Comprehensive Plan Update (Task 5).

The current zoning regulatory approach of conditional use master plans and impact mitigation plans has been widely criticized. This zoning approach does not designate adequate 20-year growth capacity for campus institutions. Representatives of long-established institutions have objected that their conditional use status treats them as "guests in the neighborhood." Required ten-year and interim updates of master plans entail extensive Type 3 review and tend to hamper flexibility for technological and market changes in the rapidly growing health care and education fields. In response, institutions may overestimate planned development to meet potential future needs, which can contribute to protracted neighborhood disputes from development impacts in these discretionary review processes.

The current conditional-use status of campus institutions, requiring campus master plans and periodic updates, is expected to be replaced by institutional campus base zones that allow typical institutional uses and establish development standards to protect surrounding neighborhood livability, consistent with proposed Policies 6.55 - 6.57.

Draft zoning concepts in the Campus Institutional Zoning Project propose new zones to implement the Institutional Campus map designations. Two to three types of campus zones will encompass the broad range of conditions and suitable development capacity among campuses, such as the following: a medical campus zone allowing 3:1 Floor Area Ratio (FAR), or up to 4:1 in Regional and Town Centers; an urban higher education campus zone allowing 2:1 FAR or up to 3:1 in designated Regional and Town Centers; and a lower density higher education campus zone allowing 0.5:1 FAR. **The resulting development capacity will be adequate to meet forecast land needs for each type of campus** (see Figure 2).

## SATELLITE AND SMALLER URBAN CAMPUSES IN CENTERS AND CORRIDORS

> *Policy 6.58 Satellite facilities. Encourage opportunities for expansion of uses, not integral to campus functions, to locate in centers and corridors to support their economic vitality.*

Policy 6.58 encourages expansion of less integral institutional facilities in satellite locations, which in turn frees up space for core services on the campuses. For example, Providence Hospital has taken this approach by locating some of their administrative office facilities in nearby Hollywood Town Center. Another example is the location of OHSU outpatient and research facilities at satellite facilities in nearby South Waterfront, linked to the OHSU hospital by an aerial tram. These institutional satellite facilities can be a source of both services and employment in mixed-use centers and corridors.

A related trend and capacity-expansion opportunity is the location of smaller standalone campuses in centers and corridors. For example, PCC is making significant investments in its Cascade and Southeast campuses that integrate the campus into the existing commercial corridors. Other related examples include proposed expansion of the University of Oregon and Oregon State University facilities in the Central City.

## ADEQUATE TRANSPORTATION ACCESS AND SERVICE

> *Policy 8.17. System capacity. Establish, improve, and maintain public facilities and services at levels appropriate to support land use patterns, densities, and anticipated residential and employment growth, as physically feasible and as sufficient funds are available.*

Traffic impacts and related transportation system deficiencies are commonly cited as the most challenging compatibility issue of campus institutional growth on neighborhood livability. Additionally, EOA focus groups identified improved transit service as the single greatest public infrastructure need. Because most of Portland's major medical and educational institutions have been in place for many years, the need for continued public investment and service reconfiguration can be easily overlooked.

The proposed designation of campus institutions on the Comprehensive Plan Map has helped to specifically account for institutional growth in transportation modeling for the Transportation System Plan (TSP) update. In turn, proposed projects in the TSP are expected to be implemented as needed to provide adequate system capacity.

As major employers, transportation demand management (TDM) plans offer another significant opportunity to more efficiently serve transportation needs of institutions and reduce traffic impacts on surrounding neighborhoods. Proposed Policy 9.56. Transportation Demand Management supports creation and maintenance of ongoing TDM programs.

***The proposed Comprehensive Plan will provide a 20-year supply of additional land for campuses and institutions through regulatory reform, encouraging satellite facilities, and addressing traffic impacts and transportation deficiencies.***

# APPENDIX A. INDUSTRIAL CAPACITY IMPACTS OF NATURAL RESOURCE PROTECTION REGULATIONS

## ESTIMATING THE DEVELOPMENT CAPACITY IMPACTS OF POTENTIAL FUTURE NATURAL RESOURCE PROTECTION

The impacts of potential future regulations have been estimated to inform City strategies to meet Statewide Planning Goal 9 and relevant Comprehensive Plan policies. The development capacity impact estimates are incremental, accounting for existing environmental constraints and associated capacity reductions applied by the Buildable Land Inventory (BLI).

Specifically, for vacant and underutilized sites, the BLI already deducts 100% of development capacity for floodways and environmental protection overlay zones, and 50% of the capacity for environmental conservation overlay zones, steep slopes, wetlands, and the 100-year floodplain. The BLI also deducts 50% of the site area from development capacity for nearly all vacant and underutilized sites that contain existing greenway overlay zones.

The incremental development capacity impact of potential future regulations is estimated in Figures 6, 7, and 8 below, based on the following assumptions and analysis. This analysis provides a reasonable basis for planning, given City goals, policies, recent planning analyses, and regulatory obligations, but is not intended to bind future City policy and regulatory decisions.

## HARBOR AND AIRPORT DISTRICTS, AND COLUMBIA EAST

In the Harbor and Airport Districts, and in Columbia East, environmental overlay zones are assumed to be applied to land with natural resources that rank high or medium in the Natural Resources Inventory (NRI). For purposes of this analysis it is assumed that:

- The environmental protection overlay zone (p-zone) would be applied to protect natural resources within 50 feet of rivers, streams, drainageways, and wetlands; and the p-zone would be applied to the wetlands and waterways themselves. It is assumed that the p-zone would be applied to these natural resource areas if they are currently unprotected by environmental overlay zones. It is also assumed that the environmental conservation zone (c-zone) would be converted to the p-zone to provide additional protection for natural resources within 50 feet of water bodies.

- The environmental conservation overlay zone would be applied to high- and medium-ranked natural resources located more than 50 feet from rivers, streams, drainageways, and wetlands.

- The BLI constraint methodology would be applied to estimate the incremental impacts of the expanded or modified environmental overlay zones.

- Environmental overlay zones would not be applied to low-ranked natural resources or to natural resources in the Airport Districts that rank high in the NRI, solely because they are Special Habitat Areas (SHAs) that support grassland associated wildlife species. This is because environmental program updates for those SHAs were addressed relatively recently in the Airport Futures project (adopted in 2011).

Applying these assumptions to vacant and under-utilized sites in the Harbor and Airport Districts, the p-zone would be applied to an additional 136 acres of acres of high- and medium-ranked natural resources within 50 feet of water bodies (88 acres of which are currently within the c-zone). The c-zone would be applied to an additional 66 acres of high- and medium-ranked natural resources located more than 50 feet from water bodies. The employment capacity impact of these regulatory updates is estimated to be an additional 97 acres beyond the capacity reductions already applied by the BLI constraints.

Applying these assumptions to vacant and under-utilized sites in Columbia East, the p-zone would apply to an additional 45 acres of high- and medium-ranked natural resources within 50 feet of water bodies (27 acres of which are in the existing c-zone). The c-zone would be applied to an additional 27 acres of high- and medium-ranked natural resources located more than 50 feet from water bodies. The employment capacity impact of these regulatory updates is estimated to be an additional 39 acres beyond the capacity reductions already applied by the BLI constraints.

## HARBOR ACCESS LANDS

In the Harbor Access Lands geography, nearly all the vacant and underutilized sites contain Willamette River Greenway overlay zones. For these sites, it is assumed that:

- Future updates to the greenway overlay zones will retain key elements of existing regulations, including the greenway setback, greenway review for development on vacant and under-utilized sites that must establish river-dependent or river-related uses, and a planting or landscape requirement.

- A new natural resource-focused overlay zone will be applied to the 115 acres of high- and medium-ranked natural resources on vacant or underutilized sites containing existing greenway overlay zones. It is assumed that this new overlay zone would be similar in construct to the environmental conservation zone, but would be specifically designed for areas with river-related and river-dependent uses in the Portland Harbor.

- The updated regulations will include a new, streamlined standards-based review track for new development, as well as clearer mitigation requirements that would allow mitigation to occur on- or off-site. A new clear and objective standards track should significantly reduce the frequency in which a land use review is triggered by new development or redevelopment projects on already developed sites.

Given that the BLI already deducted at least 50% of the development capacity for entire vacant and underutilized sites within the existing Greenway overlay zones, and because it is assumed

future greenway regulations would contain similar elements as the existing Greenway overlay zones, no incremental impact on development capacity is assumed for future regulatory updates on sites within the Willamette Greenway.

The only high- and medium-ranked natural resources that are in the Harbor Access Lands geography but outside the Willamette Greenway are located on Port of Portland-owned Terminal 6 (T-6). To estimate the potential development capacity impact of future environmental regulatory updates on the vacant and underutilized portions of T-6, it is assumed that the environmental conservation overlay zone would be applied to high- and medium-ranked significant natural resources that are not within the existing overlay zone, including Special Habitat Areas. Applying this analysis, the c-zone would be applied to an additional 28 acres, with a capacity impact of an additional12 acres, beyond the environmental constraints already applied by the BLI.

### IMPACTS OF FUTURE CITY ENVIRONMENTAL REGULATIONS ON DEVELOPED PROPERTIES

As noted above, the BLI and EOA assigned potential new employment capacity only to vacant or under-utilized properties in the Columbia East and Columbia Harbor EOA geographies, including the Harbor Access Lands portion of the Columbia Harbor geography. Potential new employment capacity was not assigned to developed properties in these geographies.

Given that the BLI did not allot future development capacity to developed industrial sites it is appropriate to view the impact of future regulations in terms of impacts on intensification of existing uses. Like the analysis of impacts on vacant and underutilized sites, it is appropriate to view the impacts of potential future environmental regulations as incremental relative to existing regulations and other constraints.

It is also assumed that the updated regulations would strike a balance among City policies for economic development and watershed health, for example, while it is expected that existing regulations will be improved and/or expanded to address unprotected natural resources, the updated regulations are also expected to include streamlined provisions, such as new or updated standards, or clearer allowances for off-site mitigation, that improve development and certainty, reduce the number of discretionary land use reviews required, and facilitate intensification of existing uses.

In terms of developed sites potentially affected by future environmental and greenway overlay zone updates, analysis suggests that these updates would have a relatively minimal impact, as summarized in the following bullets:

- There are 7,661 acres of developed sites in the Harbor and Airport Districts. Of the 615 acres of high- and medium-ranked NRI resources on these sites, (315 acres high, 300 acres medium) 340 acres or about 55% are within existing environmental overlay zones. The approximately 275 acres that are not within existing environmental overlay zones represent 3.5% of the developed site area in this portion of the geography. In addition, the vast majority of this area is currently constrained by existing wetlands, floodway, floodplain, or other environmental constraints.

- There are 1,705 acres of developed sites in the Columbia East geography. Of the 258 acres of high- and medium-ranked NRI resources these sites (139 acres high, 119 acres medium), 221 acres or about 86% are within existing environmental overlay zones. The 37 acres of high- and medium ranked NRI resources that are not within existing environmental overlay zones represent about 2% of the developed land in Columbia East. Some of this area is currently constrained by existing wetlands, floodway, floodplain, or other physical environmental constraints.

- There are approximately 1,996 acres of developed sites in the Harbor Access Lands, including sites in the greenway-i and greenway-g, overlay zones, and at Terminal 6. This area includes 237 acres of high and medium-ranked natural resources, or about 12% of the developed site area. Of these acres, 226 acres are on sites with existing greenway overlay zone or are affected by other environmental constraints. The area of currently unconstrained high and medium-ranked natural resources is about 11 acres or less than 1% of the developed sites in the Harbor Access Lands.

## CAPACITY IMPACTS OF NATURAL RESOURCE DAMAGE ASSESSMENT AND RESTORATION

In addition to cleaning up contamination at the Portland Harbor Superfund site, responsible parties will be required to meet the Natural Resource Damage Assessment (NRDA) requirements of Superfund. Under NRDA, responsible parties must sponsor environmental restoration on their property or other designated sites to remedy past damages to fish, wildlife, and users of the Willamette River (e.g., boaters, fishers, etc.). A list of potential NRDA restoration sites has been identified by the Portland Harbor Natural Resource Trustees. A number of these sites have industrial or employment zoning. To account for the potential employment capacity impacts of future NRDA restoration, an additional 25-acre reduction in employment capacity is assumed as a contingency. This number reflects the employment capacity allocated by the BLI to the Linnton Plywood Site (~25 acres) and vacant portions of the site owned by Portland General Electric, including the Harborton Wetlands (~42 acres). NRDA restoration opportunities are currently being planned for both of these sites, or portions of the sites. The 25 acres also reflects an additional increment of capacity reduction based on the vacant portion of the Owens Corning site which is largely in the floodplain (~11 acres). For purposes of this analysis it is assumed that these sites are at least 70% constrained by a combination of greenway regulations and other constraints.

## Figure 6. Harbor and Airport Districts - Capacity Impacts of Potential Environmental Zoning Changes on Vacant and Underutilized Land

**Natural Resources Inventory (NRI) resources and environmental overlay zones within 50 feet of streams and wetlands (acres) (1)**

| NRI Ranking | Environmental Conservation Zone | Environmental Protection Zone | No Environmental Overlay Zone | Total |
|---|---|---|---|---|
| High | 61.56 | 0.00 | 17.88 | 79.44 |
| Medium | 26.10 | 0.00 | 30.85 | 56.95 |
| **Total** | **87.66** | **0.00** | **48.73** | **136.39** |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources within 50 feet of streams (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (2) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (4) | Yes Env. Conservation Zone | Emp. Capacity Impact (5) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 2.82 | -2.82 | 2.99 | -1.50 | 25.83 | -11.62 | -15.94 | 31.64 |
| Medium | 9.82 | -9.82 | 8.90 | -4.45 | 20.83 | -9.37 | -23.64 | 39.55 |
| **Totals** | **12.64** | **-12.64** | **11.89** | **-5.95** | **46.66** | **-21.00** | **-39.58** | 71.19 |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources within wetlands and 50 feet of wetlands (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (2) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (4) | Yes Env. Conservation Zone | Emp. Capacity Impact (5) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 2.34 | -2.34 | 10.25 | -5.13 | 35.73 | -16.08 | -23.54 | 48.32 |
| Medium | 10.73 | -10.73 | 1.40 | -0.70 | 5.25 | -2.36 | -13.79 | 17.38 |
| **Totals** | **13.07** | **-13.07** | **11.65** | **-5.83** | **40.98** | **-18.44** | **-37.34** | **65.70** |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources more than 50 feet from streams and wetlands (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (6) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (7) | Yes Env. Conservation Zone | Emp. Capacity Impact (8) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 1.17 | -0.59 | 2.29 | -0.23 | 19.78 | 0.00 | -0.81 | 23.24 |
| Medium | 33.33 | -16.67 | 29.26 | -2.93 | 52.44 | 0.00 | -19.59 | 115.03 |
| **Totals** | **34.50** | **-17.25** | **31.55** | **-3.16** | **72.22** | **0.00** | **-20.41** | **138.27** |
| **Total Employment Capacity Impacts** | | | | | | | **-97.32** | |

(1) Acreage includes wetlands and land within 50 feet of wetlands and streams, but does not include the area of streams. Land within 50 feet of streams and wetlands receive either a High or Medium NRI rank in this geography.
(2) It is assumed that environmental protection zone (p-zone) would be applied to significant natural resources within 50 feet of streams and wetlands. For resources with no BLI constraints the capacity reduction would be 100% of the resource area, consistent with the BLI and EOA methdology which eliminated 100% of employment capacity for land within the pzone.

(3) Calculated by subtracting the area of natural resources in the environmental conservation overlay from the total area of land with environmental BLI constraints.
(4) It is assumed that the p-zone would be applied to High and Medium ranked natural resources within 50 feet of streams and wetlands. For resources with BLI environmental constraints but no environmental overlay zone, the employment capacity impact would be -50%. The BLI and EOA deducted 50% employment capacity for 1 environmental constraint, and 10% each for up to 2 more constraints. This assumes the resources have 1 BLI environmental constraint, and that applying the p-zone would remove the remaining 50% capacity.

(5) The impact on employment capacity impact of applying the p-zone to significant natural resources that are within 50 feet of streams and wetlands, and within the environmental conservation overlay zone (c-zone) is - 45%. The BLI/EOA deducted 50% capacity to the portion of properties within the environmental conservation overlay zone (c-zone). Deducting an additonal 45% (rather than 50%) accounts for the likelihood that these natural resources in the c-zone have more than one BLI environmental constraint.
(6) The impacts on employment capacity impact of applying or modifying environmental overlay zoning on land that is further than 50 feet from streams and wetlands, and that has no BLI environmental constraints, are: - 50% for High-ranked NRI resources (assumes c-zone is applied); -50% for Medium-ranked resources (assumes c-zone is applied).
(7) The impacts on employment capacity impact of applying the environmental overlay zone to High and Medium ranked resources further than 50 feet from streams and wetlands, and that has BLI environmental constraints but no overlay zone are is -10% (assumes c-zone is applied).

(8) The impact on employment capacity impact of applying the environmental overlay zone to High and Medium ranked resources further than 50 feet from streams and wetlands, and that is within the c-zone is -0% since no change in overlay zone is anticipated.

Source: Bureau of Planning and Sustainability

## Figure 7. Harbor Access Lands (T-6 only) - Capacity Impacts of Potential Environmental Zoning Changes on Vacant and Underutilized Land

**Natural Resources Inventory (NRI) resources and environmental overlay zones (acres)**

| NRI Ranking | Environmental Conservation Zone | Environmental Protection Zone | No Environmental Overlay Zone | Total |
|---|---|---|---|---|
| High | 3.56 | 0 | 4.41 | 7.97 |
| High - SHA 0nly | 0 | 0 | 10.43 | 10.43 |
| Medium | 2.44 | 0 | 12.86 | 15.3 |
| **Total** | **6.0** | **0** | **27.7** | **33.7** |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (1) | Yes BLI Env. Constraints, No Env. Zone (2) | Emp. Capacity Impact (3) | Yes Env. Conservation Zone | Emp. Capacity Impact (4) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 1.76 | -0.88 | 2.65 | -1.33 | 3.52 | 0.00 | -2.21 | 7.93 |
| High - SHA only | 10.43 | -5.22 | 0.00 | 0.00 | 0.00 | 0.00 | -5.22 | |
| Medium | 7.75 | -3.88 | 5.11 | -0.51 | 2.36 | 0.00 | -4.39 | 15.22 |
| **Totals** | **19.94** | **-9.97** | **7.76** | **-1.84** | **5.88** | **0.00** | **-11.81** | 33.58 |

(1) Capacity reduction = -0.5 x area of natural resources with no BLI environmental constraints, consistent with the BLI methodology, assuming that c-zone would be applied here.

(2) Calculated by subtracting the area of natural resources in the environmental conservation overlay from the total area of land with environmental BLI constraints.

(3) Capacity reduction of -0.1 x the area of natural resources with BLI constraints and no overlay zone, reflects the assumption that c-zone would be applied here, and is consistent with the BLI and EOA methodology.

(4) It is assumed that natural resources already within the c-zone would remain so, with no incremental impact on development capacity.

Source: Bureau of Planning and Sustainability



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## Figure 8. Columbia East - Capacity Impacts of Potential Environmental Zoning Changes on Vacant and Underutilized Land

**Natural Resources Inventory (NRI) resources and environmental overlay zones within 50 feet of streams and wetlands (acres) (1)**

| NRI Ranking | Environmental Conservation Zone | Environmental Protection Zone | No Environmental Overlay Zone | Total |
|---|---|---|---|---|
| High | 10.27 | 0 | 6.89 | 17.16 |
| Medium | 17.06 | 0 | 11.68 | 28.74 |
| **Total** | **27.33** | **0** | **18.57** | **45.9** |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources within 50 feet of streams (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (2) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (4) | Yes Env. Conservation Zone | Emp. Capacity Impact (5) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 0.29 | -0.29 | 0.01 | -0.01 | 1.20 | -0.54 | -0.84 | 1.50 |
| Medium | 2.05 | -2.05 | 2.65 | -1.33 | 3.18 | -1.43 | -4.81 | 7.88 |
| **Totals** | **2.34** | **-2.34** | **2.66** | **-1.33** | **4.38** | **-1.97** | **-5.64** | 9.38 |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources within wetlands and 50 feet of wetlands (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (2) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (4) | Yes Env. Conservation Zone | Emp. Capacity Impact (5) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 1.49 | -1.49 | 5.10 | -2.55 | 9.07 | -4.08 | -8.12 | 15.66 |
| Medium | 6.98 | -6.98 | 0.00 | 0.00 | 13.88 | -6.25 | -13.23 | 20.86 |
| **Totals** | **8.47** | **-8.47** | **5.10** | **-2.55** | **22.95** | **-10.33** | **-21.35** | **36.52** |

**Employment Capacity Impact of potential future environmental regulations on significant natural resources more than 50 feet from streams and wetlands (acres)**

| NRI Ranking | No BLI Env. Constraints, No Env. Zone | Emp. Capacity Impact (6) | Yes BLI Env. Constraints, No Env. Zone (3) | Emp. Capacity Impact (7) | Yes Env. Conservation Zone | Emp. Capacity Impact (8) | Total Employment Capacity Impact | Total |
|---|---|---|---|---|---|---|---|---|
| High | 1.01 | -0.51 | 0.18 | -0.02 | 0.11 | 0.00 | -0.52 | 1.30 |
| Medium | 23.30 | -11.65 | 2.01 | -0.20 | 8.52 | 0.00 | -11.85 | 33.83 |
| **Totals** | **24.31** | **-12.16** | **2.19** | **-0.22** | **8.63** | **0.00** | **-12.37** | **35.13** |
| **Total Employment Capacity Impacts** | | | | | | | **-39.36** | |

(1) Acreage includes wetlands and land within 50 feet of wetlands and streams, but does not include the area of streams. Land within 50 feet of streams and wetlands receive either a High or Medium NRI rank in this geography.
(2) It is assumed that environmental protection zone (p-zone) would be applied to significant natural resources within 50 feet of streams and wetlands. For resources with no BLI constraints the capacity reduction would be 100% of the resource area, consistent with the BLI and EOA methdology which eliminated 100% of employment capacity for land within the pzone.
(3) Calculated by subtracting the area of natural resources in the environmental conservation overlay from the total area of land with environmental BLI constraints.
(4) It is assumed that the p-zone would be applied to High and Medium ranked natural resources within 50 feet of streams and wetlands. For resources with BLI environmental constraints but no environmental overlay zone, the employment capacity impact would be -50%. The BLI and EOA deducted 50% employment capacity for 1 environmental constraint, and 10% each for up to 2 more constraints. This assumes the resources have 1 BLI environmental constraint, and that applying the p-zone would remove the remaining 50% capacity.
(5) The impact on employment capacity impact of applying the p-zone to significant natural resources that are within 50 feet of streams and wetlands, and within the environmental conservation overlay zone (c-zone) is - 45%. The BLI/EOA deducted 50% capacity to the portion of properties within the environmental conservation overlay zone (c-zone). Deducting an additonal 45% (rather than 50%) accounts for the likelihood that these natural resources in the c-zone have more than one BLI environmental constraint.
(6) The impacts on employment capacity impact of applying or modifying environmental overlay zoning on land that is further than 50 feet from streams and wetlands, and that has no BLI environmental constraints, are: - 50% for High-ranked NRI resources (assumes c-zone is applied); -50% for Medium-ranked resources (assumes c-zone is applied).
(7) The impacts on employment capacity impact of applying the environmental overlay zone to High and Medium ranked resources further than 50 feet from streams and wetlands, and that has BLI environmental constraints but no overlay zone are is -10% (assumes c-zone is applied).

(8) The impact on employment capacity impact of applying the environmental overlay zone to High and Medium ranked resources further than 50 feet from streams and wetlands, and that is within the c-zone is -0% since no change in overlay zone is anticipated.

Source: Bureau of Planning and Sustainability



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# APPENDIX B. CAPACITY DETAILS OF THE PROPOSED COMPREHENSIVE PLAN


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## Figure 9. Proposed Short-Term Land Development Capacity

| | Building Square Feet | | | | | | |
|---|---|---|---|---|---|---|---|
| Employment Geography | Base Supply | Constrained Supply | Adjusted Supply | BLI Acres | Other Gains* | 2010-20 Demand | Surplus/ Deficit |
| Central City Commercial | 54,137,000 | 40,309,000 | 40,309,000 | 178 | | 40 | 138 |
| Central City Industrial | 4,161,000 | 3,439,000 | 3,439,000 | 59 | | 75 | -15 |
| Harbor & Airport Districts | 66,215,000 | 29,169,000 | 27,209,000 | 625 | 89 | 663 | 50 |
| Harbor Access Lands | 15,374,000 | 2,578,000 | 2,578,000 | 59 | 49 | 114 | -6 |
| Columbia East | 23,330,000 | 14,832,000 | 14,832,000 | 340 | 39 | 279 | 101 |
| Dispersed Employment | 11,434,000 | 6,907,000 | 6,907,000 | 105 | 10 | 109 | 6 |
| Gateway Regional Center | 12,588,000 | 7,965,000 | 4,456,000 | 111 | | 33 | 78 |
| Town Centers | 25,875,000 | 21,685,000 | 7,095,000 | 288 | | 86 | 202 |
| Neighborhood Centers & Corridors | 97,316,000 | 69,915,000 | 18,368,000 | 811 | | 362 | 449 |
| Institutions | 9,045,000 | 7,048,000 | 7,048,000 | 306 | | 224 | 82 |
| **Total** | **319,475,000** | **203,847,000** | **132,241,000** | **2,883** | **188** | **1,985** | **1,086** |
| **Aggregate Geography** | | | | | | | |
| Central City | 58,298,000 | 43,748,000 | 43,748,000 | 237 | | 114 | 123 |
| Industrial | 116,353,000 | 53,486,000 | 51,526,000 | 1,129 | 188 | 1,165 | 152 |
| Neighborhood Commercial | 135,779,000 | 99,565,000 | 29,919,000 | 1,210 | | 482 | 729 |
| Institutions | 9,045,000 | 7,048,000 | 7,048,000 | 306 | | 224 | 82 |
| **Total** | **319,475,000** | **203,847,000** | **132,241,000** | **2,883** | **188** | **1,985** | **1,086** |

* Assume gains from meeting 15% of demand by industrial land intensification, proposed Harbor Access Land projects (Daimler, Canpotex, and Pembina), and expansion of Dispersed Employment development allowances in Neighborhood Commercial corridors.

Source: Bureau of Planning and Sustainability



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## Figure 10. Buildable Land Inventory of Proposed Comprehensive Plan Designations and Constraint Assumptions – Net Building Square Footage

| | Less than .5 acres | | | .5 to 1 acre | | | 1 to 3 acres | | | 3 to 5 acres | | | 6 to 10 acres | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Employment Geography** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** |
| **Central City Commercial** | 7,458,689 | 7,168,128 | 7,168,128 | 15,083,391 | 13,263,246 | 13,263,246 | 10,562,204 | 8,839,132 | 8,839,132 | 8,043,156 | 7,165,392 | 7,165,392 | 1,467,006 | 1,466,146 | 1,466,146 |
| Redevelopment | 2,434,809 | 2,336,941 | 2,336,941 | 5,468,841 | 4,962,149 | 4,962,149 | 3,784,898 | 3,083,891 | 3,083,891 | 2,313,931 | 1,932,810 | 1,932,810 | 0 | 0 | 0 |
| Vacant | 5,023,880 | 4,831,187 | 4,831,187 | 9,614,550 | 8,301,097 | 8,301,097 | 6,777,307 | 5,755,242 | 5,755,242 | 5,729,225 | 5,232,582 | 5,232,582 | 1,467,006 | 1,466,146 | 1,466,146 |
| **Central City Industrial** | 864,684 | 808,065 | 808,065 | 1,935,998 | 1,768,085 | 1,768,085 | 766,906 | 722,307 | 722,307 | 418,315 | 356,030 | 356,030 | 156,741 | 107,401 | 107,401 |
| Redevelopment | 348,680 | 328,352 | 328,352 | 347,980 | 324,816 | 324,816 | 110,314 | 110,314 | 110,314 | 40,969 | 37,587 | 37,587 | 85,606 | 70,123 | 70,123 |
| Vacant | 516,005 | 479,713 | 479,713 | 1,588,018 | 1,443,268 | 1,443,268 | 656,591 | 611,993 | 611,993 | 377,346 | 318,443 | 318,443 | 71,136 | 37,277 | 37,277 |
| **Columbia East** | 68,322 | 50,988 | 50,988 | 433,737 | 273,249 | 273,249 | 1,675,848 | 1,027,845 | 1,027,845 | 1,276,750 | 902,397 | 902,397 | 1,276,977 | 885,539 | 885,539 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 37,383 | 21,399 | 21,399 | 53,536 | 53,536 | 53,536 | 57,099 | 57,099 | 57,099 |
| Vacant | 68,322 | 50,988 | 50,988 | 433,737 | 273,249 | 273,249 | 1,638,465 | 1,006,445 | 1,006,445 | 1,223,214 | 848,861 | 848,861 | 1,219,878 | 828,440 | 828,440 |
| **Dispersed Employment** | 525,647 | 416,127 | 416,127 | 443,459 | 355,033 | 355,033 | 672,099 | 557,053 | 557,053 | 919,217 | 593,120 | 593,120 | 282,189 | 255,512 | 255,512 |
| Redevelopment | 162,372 | 145,552 | 145,552 | 176,043 | 161,535 | 161,535 | 340,583 | 259,613 | 259,613 | 265,292 | 149,944 | 149,944 | 105,462 | 105,462 | 105,462 |
| Vacant | 363,275 | 270,575 | 270,575 | 267,416 | 193,498 | 193,498 | 331,516 | 297,440 | 297,440 | 653,924 | 443,176 | 443,176 | 176,727 | 150,049 | 150,049 |
| **Harbor Access Lands** | 15,401 | 5,314 | 5,314 | 58,775 | 22,322 | 22,322 | 792,699 | 197,721 | 197,721 | 0 | 0 | 0 | 712,955 | 205,006 | 205,006 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vacant | 15,401 | 5,314 | 5,314 | 58,775 | 22,322 | 22,322 | 792,699 | 197,721 | 197,721 | 0 | 0 | 0 | 712,955 | 205,006 | 205,006 |
| **Harbor & Airport Districts** | 376,775 | 266,261 | 266,261 | 582,568 | 388,886 | 388,886 | 4,653,577 | 2,972,408 | 2,972,408 | 3,229,140 | 2,116,370 | 2,116,370 | 5,983,141 | 4,172,733 | 4,172,733 |
| Redevelopment | 41,731 | 27,578 | 27,578 | 45,428 | 28,848 | 28,848 | 307,896 | 183,806 | 183,806 | 148,650 | 118,343 | 118,343 | 0 | 0 | 0 |
| Vacant | 335,044 | 238,683 | 238,683 | 537,140 | 360,039 | 360,039 | 4,345,681 | 2,788,602 | 2,788,602 | 3,080,489 | 1,998,027 | 1,998,027 | 5,983,141 | 4,172,733 | 4,172,733 |
| **Institutions** | 187,969 | 153,362 | 153,362 | 486,078 | 376,565 | 376,565 | 1,784,236 | 1,512,681 | 1,512,681 | 188,806 | 188,806 | 188,806 | 432,724 | 422,779 | 422,779 |
| Redevelopment | 61,655 | 55,583 | 55,583 | 288,897 | 260,719 | 260,719 | 1,652,389 | 1,398,834 | 1,398,834 | 188,806 | 188,806 | 188,806 | 340,764 | 340,764 | 340,764 |
| Vacant | 126,313 | 97,779 | 97,779 | 197,180 | 115,847 | 115,847 | 131,847 | 113,847 | 113,847 | 0 | 0 | 0 | 91,959 | 82,014 | 82,014 |
| **Neighb. Centers & Corridors** | 11,109,308 | 10,006,462 | 2,846,522 | 11,365,356 | 10,082,988 | 2,870,990 | 22,822,342 | 19,749,856 | 5,753,497 | 9,657,915 | 8,212,730 | 2,526,044 | 7,182,672 | 5,727,650 | 1,732,906 |
| Redevelopment | 8,387,810 | 7,591,781 | 1,868,218 | 8,708,758 | 7,791,364 | 1,994,990 | 17,772,563 | 15,752,169 | 4,218,135 | 7,043,464 | 5,952,394 | 1,521,258 | 4,826,919 | 4,030,536 | 1,065,550 |
| Vacant | 2,721,498 | 2,414,681 | 978,304 | 2,656,599 | 2,291,624 | 876,000 | 5,049,779 | 3,997,687 | 1,535,362 | 2,614,451 | 2,260,336 | 1,004,787 | 2,355,752 | 1,697,114 | 667,356 |
| **Gateway Regional Center** | 519,048 | 443,181 | 286,222 | 856,560 | 720,599 | 413,264 | 5,410,323 | 4,676,321 | 2,476,112 | 4,248,014 | 3,019,683 | 1,356,044 | 2,147,191 | 1,291,012 | 647,569 |
| Redevelopment | 256,753 | 199,523 | 127,855 | 497,161 | 424,399 | 205,542 | 3,466,285 | 3,165,948 | 1,478,360 | 2,729,399 | 1,980,013 | 714,992 | 1,928,941 | 1,136,497 | 589,976 |
| Vacant | 262,295 | 243,658 | 158,366 | 359,399 | 296,200 | 207,722 | 1,944,038 | 1,510,373 | 997,752 | 1,518,615 | 1,039,669 | 641,053 | 218,250 | 154,516 | 57,594 |
| **Town Centers** | 4,257,791 | 3,884,949 | 1,745,647 | 5,325,834 | 4,873,760 | 2,280,895 | 7,073,022 | 6,333,660 | 2,772,061 | 2,879,584 | 2,627,155 | 1,091,249 | 1,759,068 | 1,553,269 | 611,679 |
| Redevelopment | 3,010,275 | 2,736,017 | 1,103,868 | 3,811,781 | 3,469,325 | 1,498,929 | 5,025,444 | 4,509,969 | 1,724,079 | 2,095,834 | 1,931,301 | 706,735 | 1,479,973 | 1,346,348 | 481,486 |
| Vacant | 1,247,517 | 1,148,932 | 641,779 | 1,514,053 | 1,404,435 | 781,966 | 2,047,579 | 1,823,692 | 1,047,982 | 783,750 | 695,855 | 384,514 | 279,096 | 206,921 | 130,193 |
| **Outside Geographies** | 507,226 | 441,521 | 441,521 | 379,284 | 293,491 | 293,491 | 1,231,526 | 1,032,137 | 1,032,137 | 0 | 0 | 0 | 5,434,208 | 4,275,251 | 4,275,251 |
| Redevelopment | 422,347 | 357,046 | 357,046 | 303,373 | 235,738 | 235,738 | 165,781 | 122,244 | 122,244 | 0 | 0 | 0 | 2,739,717 | 2,086,975 | 2,086,975 |
| Vacant | 84,879 | 84,475 | 84,475 | 75,911 | 57,753 | 57,753 | 1,065,745 | 909,892 | 909,892 | 0 | 0 | 0 | 2,694,491 | 2,188,276 | 2,188,276 |
| **Grand Total** | **25,890,860** | **23,644,356** | **14,188,155** | **36,951,041** | **32,418,224** | **22,306,026** | **57,444,783** | **47,621,120** | **27,862,953** | **30,860,897** | **25,181,684** | **16,295,452** | **26,834,872** | **20,362,296** | **14,782,519** |
| | | | | | | | | | | | | | | | |
| **Aggregate Geography** | | | | | | | | | | | | | | | |
| Central City | 8,323,374 | 7,976,193 | 7,976,193 | 17,019,389 | 15,031,331 | 15,031,331 | 11,329,110 | 9,561,440 | 9,561,440 | 8,461,471 | 7,521,422 | 7,521,422 | 1,623,747 | 1,573,546 | 1,573,546 |
| Industrial | 986,145 | 738,689 | 738,689 | 1,518,539 | 1,039,491 | 1,039,491 | 7,794,223 | 4,755,026 | 4,755,026 | 5,425,106 | 3,611,888 | 3,611,888 | 8,255,262 | 5,518,789 | 5,518,789 |
| Neighborhood Commercial | 15,886,147 | 14,334,591 | 4,878,391 | 17,547,751 | 15,677,347 | 5,565,149 | 35,305,688 | 30,759,837 | 11,001,670 | 16,785,514 | 13,859,569 | 4,973,337 | 11,088,931 | 8,571,932 | 2,992,155 |
| Institutions | 187,969 | 153,362 | 153,362 | 486,078 | 376,565 | 376,565 | 1,784,236 | 1,512,681 | 1,512,681 | 188,806 | 188,806 | 188,806 | 432,724 | 422,779 | 422,779 |
| Outside Geographies | 507,226 | 441,521 | 441,521 | 379,284 | 293,491 | 293,491 | 1,231,526 | 1,032,137 | 1,032,137 | 0 | 0 | 0 | 5,434,208 | 4,275,251 | 4,275,251 |
| **Total** | **25,890,860** | **23,644,356** | **14,188,155** | **36,951,041** | **32,418,224** | **22,306,026** | **57,444,783** | **47,621,120** | **27,862,953** | **30,860,897** | **25,181,684** | **16,295,452** | **26,834,872** | **20,362,296** | **14,782,519** |



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## Figure 9. Buildable Land Inventory of Proposed Comprehensive Plan Designations and Constraint Assumptions – Net Building Square Footage (Part 2)

| | Less than .5 acres | | | .5 to 1 acre | | | 1 to 3 acres | | | 3 to 5 acres | | | 6 to 10 acres | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Employment Geography | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment | Before Constraints | After Constraints | After Market Adjustment |
| **Central City Commercial** | 7,458,689 | 7,168,128 | 7,168,128 | 15,083,391 | 13,263,246 | 13,263,246 | 10,562,204 | 8,839,132 | 8,839,132 | 8,043,156 | 7,165,392 | 7,165,392 | 1,467,006 | 1,466,146 | 1,466,146 |
| Redevelopment | 2,434,809 | 2,336,941 | 2,336,941 | 5,468,841 | 4,962,149 | 4,962,149 | 3,784,898 | 3,083,891 | 3,083,891 | 2,313,931 | 1,932,810 | 1,932,810 | 0 | 0 | 0 |
| Vacant | 5,023,880 | 4,831,187 | 4,831,187 | 9,614,550 | 8,301,097 | 8,301,097 | 6,777,307 | 5,755,242 | 5,755,242 | 5,729,225 | 5,232,582 | 5,232,582 | 1,467,006 | 1,466,146 | 1,466,146 |
| **Central City Industrial** | 864,684 | 808,065 | 808,065 | 1,935,998 | 1,768,085 | 1,768,085 | 766,906 | 722,307 | 722,307 | 418,315 | 356,030 | 356,030 | 156,741 | 107,401 | 107,401 |
| Redevelopment | 348,680 | 328,352 | 328,352 | 347,980 | 324,816 | 324,816 | 110,314 | 110,314 | 110,314 | 40,969 | 37,587 | 37,587 | 85,606 | 70,123 | 70,123 |
| Vacant | 516,005 | 479,713 | 479,713 | 1,588,018 | 1,443,268 | 1,443,268 | 656,591 | 611,993 | 611,993 | 377,346 | 318,443 | 318,443 | 71,136 | 37,277 | 37,277 |
| **Columbia East** | 68,322 | 50,988 | 50,988 | 433,737 | 273,249 | 273,249 | 1,675,848 | 1,027,845 | 1,027,845 | 1,276,750 | 902,397 | 902,397 | 1,276,977 | 885,539 | 885,539 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 37,383 | 21,399 | 21,399 | 53,536 | 53,536 | 53,536 | 57,099 | 57,099 | 57,099 |
| Vacant | 68,322 | 50,988 | 50,988 | 433,737 | 273,249 | 273,249 | 1,638,465 | 1,006,445 | 1,006,445 | 1,223,214 | 848,861 | 848,861 | 1,219,878 | 828,440 | 828,440 |
| **Dispersed Employment** | 525,647 | 416,127 | 416,127 | 443,459 | 355,033 | 355,033 | 672,099 | 557,053 | 557,053 | 919,217 | 593,120 | 593,120 | 282,189 | 255,512 | 255,512 |
| Redevelopment | 162,372 | 145,552 | 145,552 | 176,043 | 161,535 | 161,535 | 340,583 | 259,613 | 259,613 | 265,292 | 149,944 | 149,944 | 105,462 | 105,462 | 105,462 |
| Vacant | 363,275 | 270,575 | 270,575 | 267,416 | 193,498 | 193,498 | 331,516 | 297,440 | 297,440 | 653,924 | 443,176 | 443,176 | 176,727 | 150,049 | 150,049 |
| **Harbor Access Lands** | 15,401 | 5,314 | 5,314 | 58,775 | 22,322 | 22,322 | 792,699 | 197,721 | 197,721 | 0 | 0 | 0 | 712,955 | 205,006 | 205,006 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vacant | 15,401 | 5,314 | 5,314 | 58,775 | 22,322 | 22,322 | 792,699 | 197,721 | 197,721 | 0 | 0 | 0 | 712,955 | 205,006 | 205,006 |
| **Harbor & Airport Districts** | 376,775 | 266,261 | 266,261 | 582,568 | 388,886 | 388,886 | 4,653,577 | 2,972,408 | 2,972,408 | 3,229,140 | 2,116,370 | 2,116,370 | 5,983,141 | 4,172,733 | 4,172,733 |
| Redevelopment | 41,731 | 27,578 | 27,578 | 45,428 | 28,848 | 28,848 | 307,896 | 183,806 | 183,806 | 148,650 | 118,343 | 118,343 | 0 | 0 | 0 |
| Vacant | 335,044 | 238,683 | 238,683 | 537,140 | 360,039 | 360,039 | 4,345,681 | 2,788,602 | 2,788,602 | 3,080,489 | 1,998,027 | 1,998,027 | 5,983,141 | 4,172,733 | 4,172,733 |
| **Institutions** | 187,969 | 153,362 | 153,362 | 486,078 | 376,565 | 376,565 | 1,784,236 | 1,512,681 | 1,512,681 | 188,806 | 188,806 | 188,806 | 432,724 | 422,779 | 422,779 |
| Redevelopment | 61,655 | 55,583 | 55,583 | 288,897 | 260,719 | 260,719 | 1,652,389 | 1,398,834 | 1,398,834 | 188,806 | 188,806 | 188,806 | 340,764 | 340,764 | 340,764 |
| Vacant | 126,313 | 97,779 | 97,779 | 197,180 | 115,847 | 115,847 | 131,847 | 113,847 | 113,847 | 0 | 0 | 0 | 91,959 | 82,014 | 82,014 |
| **Neighb. Centers & Corridors** | 11,109,308 | 10,006,462 | 2,846,522 | 11,365,356 | 10,082,988 | 2,870,990 | 22,822,342 | 19,749,856 | 5,753,497 | 9,657,915 | 8,212,730 | 2,526,044 | 7,182,672 | 5,727,650 | 1,732,906 |
| Redevelopment | 8,387,810 | 7,591,781 | 1,868,218 | 8,708,758 | 7,791,364 | 1,994,990 | 17,772,563 | 15,752,169 | 4,218,135 | 7,043,464 | 5,952,394 | 1,521,258 | 4,826,919 | 4,030,536 | 1,065,550 |
| Vacant | 2,721,498 | 2,414,681 | 978,304 | 2,656,599 | 2,291,624 | 876,000 | 5,049,779 | 3,997,687 | 1,535,362 | 2,614,451 | 2,260,336 | 1,004,787 | 2,355,752 | 1,697,114 | 667,356 |
| **Gateway Regional Center** | 519,048 | 443,181 | 286,222 | 856,560 | 720,599 | 413,264 | 5,410,323 | 4,676,321 | 2,476,112 | 4,248,014 | 3,019,683 | 1,356,044 | 2,147,191 | 1,291,012 | 647,569 |
| Redevelopment | 256,753 | 199,523 | 127,855 | 497,161 | 424,399 | 205,542 | 3,466,285 | 3,165,948 | 1,478,360 | 2,729,399 | 1,980,013 | 714,992 | 1,928,941 | 1,136,497 | 589,976 |
| Vacant | 262,295 | 243,658 | 158,366 | 359,399 | 296,200 | 207,722 | 1,944,038 | 1,510,373 | 997,752 | 1,518,615 | 1,039,669 | 641,053 | 218,250 | 154,516 | 57,594 |
| **Town Centers** | 4,257,791 | 3,884,949 | 1,745,647 | 5,325,834 | 4,873,760 | 2,280,895 | 7,073,022 | 6,333,660 | 2,772,061 | 2,879,584 | 2,627,155 | 1,091,249 | 1,759,068 | 1,553,269 | 611,679 |
| Redevelopment | 3,010,275 | 2,736,017 | 1,103,868 | 3,811,781 | 3,469,325 | 1,498,929 | 5,025,444 | 4,509,969 | 1,724,079 | 2,095,834 | 1,931,301 | 706,735 | 1,479,973 | 1,346,348 | 481,486 |
| Vacant | 1,247,517 | 1,148,932 | 641,779 | 1,514,053 | 1,404,435 | 781,966 | 2,047,579 | 1,823,692 | 1,047,982 | 783,750 | 695,855 | 384,514 | 279,096 | 206,921 | 130,193 |
| **Outside Geographies** | 507,226 | 441,521 | 441,521 | 379,284 | 293,491 | 293,491 | 1,231,526 | 1,032,137 | 1,032,137 | 0 | 0 | 0 | 5,434,208 | 4,275,251 | 4,275,251 |
| Redevelopment | 422,347 | 357,046 | 357,046 | 303,373 | 235,738 | 235,738 | 165,781 | 122,244 | 122,244 | 0 | 0 | 0 | 2,739,717 | 2,086,975 | 2,086,975 |
| Vacant | 84,879 | 84,475 | 84,475 | 75,911 | 57,753 | 57,753 | 1,065,745 | 909,892 | 909,892 | 0 | 0 | 0 | 2,694,491 | 2,188,276 | 2,188,276 |
| **Grand Total** | **25,890,860** | **23,644,356** | **14,188,155** | **36,951,041** | **32,418,224** | **22,306,026** | **57,444,783** | **47,621,120** | **27,862,953** | **30,860,897** | **25,181,684** | **16,295,452** | **26,834,872** | **20,362,296** | **14,782,519** |
| | | | | | | | | | | | | | | | |
| **Aggregate Geography** | | | | | | | | | | | | | | | |
| Central City | 8,323,374 | 7,976,193 | 7,976,193 | 17,019,389 | 15,031,331 | 15,031,331 | 11,329,110 | 9,561,440 | 9,561,440 | 8,461,471 | 7,521,422 | 7,521,422 | 1,623,747 | 1,573,546 | 1,573,546 |
| Industrial | 986,145 | 738,689 | 738,689 | 1,518,539 | 1,039,491 | 1,039,491 | 7,794,223 | 4,755,026 | 4,755,026 | 5,425,106 | 3,611,888 | 3,611,888 | 8,255,262 | 5,518,789 | 5,518,789 |
| Neighborhood Commercial | 15,886,147 | 14,334,591 | 4,878,391 | 17,547,751 | 15,677,347 | 5,565,149 | 35,305,688 | 30,759,837 | 11,001,670 | 16,785,514 | 13,859,569 | 4,973,337 | 11,088,931 | 8,571,932 | 2,992,155 |
| Institutions | 187,969 | 153,362 | 153,362 | 486,078 | 376,565 | 376,565 | 1,784,236 | 1,512,681 | 1,512,681 | 188,806 | 188,806 | 188,806 | 432,724 | 422,779 | 422,779 |
| Outside Geographies | 507,226 | 441,521 | 441,521 | 379,284 | 293,491 | 293,491 | 1,231,526 | 1,032,137 | 1,032,137 | 0 | 0 | 0 | 5,434,208 | 4,275,251 | 4,275,251 |
| **Total** | **25,890,860** | **23,644,356** | **14,188,155** | **36,951,041** | **32,418,224** | **22,306,026** | **57,444,783** | **47,621,120** | **27,862,953** | **30,860,897** | **25,181,684** | **16,295,452** | **26,834,872** | **20,362,296** | **14,782,519** |

## Figure 11. Buildable Land Inventory of Proposed Comprehensive Plan Designations and Constraint Assumptions – Net Land Area

| | Less than .5 acres | | | .5 to 1 acre | | | 1 to 3 acres | | | 3 to 5 acres | | | 6 to 10 acres | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Employment Geography** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** | **Before Constraints** | **After Constraints** | **After Market Adjustment** |
| **Central City Commercial** | 33 | 32 | 32 | 67 | 59 | 59 | 47 | 39 | 39 | 36 | 32 | 32 | 6 | 6 | 6 |
| Redevelopment | 11 | 10 | 10 | 24 | 22 | 22 | 17 | 14 | 14 | 10 | 9 | 9 | 0 | 0 | 0 |
| Vacant | 22 | 21 | 21 | 42 | 37 | 37 | 30 | 25 | 25 | 25 | 23 | 23 | 6 | 6 | 6 |
| **Central City Industrial** | 15 | 14 | 14 | 33 | 31 | 31 | 13 | 12 | 12 | 7 | 6 | 6 | 3 | 2 | 2 |
| Redevelopment | 6 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| Vacant | 9 | 8 | 8 | 27 | 25 | 25 | 11 | 11 | 11 | 7 | 5 | 5 | 1 | 1 | 1 |
| **Columbia East** | 2 | 1 | 1 | 10 | 6 | 6 | 38 | 24 | 24 | 29 | 21 | 21 | 29 | 20 | 20 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| Vacant | 2 | 1 | 1 | 10 | 6 | 6 | 38 | 23 | 23 | 28 | 19 | 19 | 28 | 19 | 19 |
| **Dispersed Employment** | 12 | 10 | 10 | 10 | 8 | 8 | 15 | 13 | 13 | 21 | 14 | 14 | 6 | 6 | 6 |
| Redevelopment | 4 | 3 | 3 | 4 | 4 | 4 | 8 | 6 | 6 | 6 | 3 | 3 | 2 | 2 | 2 |
| Vacant | 8 | 6 | 6 | 6 | 4 | 4 | 8 | 7 | 7 | 15 | 10 | 10 | 4 | 3 | 3 |
| **Harbor Access Lands** | 0 | 0 | 0 | 1 | 1 | 1 | 18 | 5 | 5 | 0 | 0 | 0 | 16 | 5 | 5 |
| Redevelopment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vacant | 0 | 0 | 0 | 1 | 1 | 1 | 18 | 5 | 5 | 0 | 0 | 0 | 16 | 5 | 5 |
| **Harbor & Airport Districts** | 9 | 6 | 6 | 13 | 9 | 9 | 107 | 68 | 68 | 74 | 49 | 49 | 137 | 96 | 96 |
| Redevelopment | 1 | 1 | 1 | 1 | 1 | 1 | 7 | 4 | 4 | 3 | 3 | 3 | 0 | 0 | 0 |
| Vacant | 8 | 5 | 5 | 12 | 8 | 8 | 100 | 64 | 64 | 71 | 46 | 46 | 137 | 96 | 96 |
| **Institutions** | 4 | 4 | 4 | 11 | 9 | 9 | 41 | 35 | 35 | 4 | 4 | 4 | 10 | 10 | 10 |
| Redevelopment | 1 | 1 | 1 | 7 | 6 | 6 | 38 | 32 | 32 | 4 | 4 | 4 | 8 | 8 | 8 |
| Vacant | 3 | 2 | 2 | 5 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 2 | 2 | 2 |
| **Neighb. Centers & Corridors** | 490 | 442 | 126 | 502 | 445 | 127 | 1,008 | 872 | 254 | 426 | 363 | 112 | 317 | 253 | 77 |
| Redevelopment | 370 | 335 | 82 | 384 | 344 | 88 | 785 | 695 | 186 | 311 | 263 | 67 | 213 | 178 | 47 |
| Vacant | 120 | 107 | 43 | 117 | 101 | 39 | 223 | 176 | 68 | 115 | 100 | 44 | 104 | 75 | 29 |
| **Gateway Regional Center** | 13 | 11 | 7 | 21 | 18 | 10 | 135 | 117 | 62 | 106 | 75 | 34 | 54 | 32 | 16 |
| Redevelopment | 6 | 5 | 3 | 12 | 11 | 5 | 86 | 79 | 37 | 68 | 49 | 18 | 48 | 28 | 15 |
| Vacant | 7 | 6 | 4 | 9 | 7 | 5 | 49 | 38 | 25 | 38 | 26 | 16 | 5 | 4 | 1 |
| **Town Centers** | 173 | 158 | 71 | 216 | 198 | 93 | 287 | 257 | 113 | 117 | 107 | 44 | 71 | 63 | 25 |
| Redevelopment | 122 | 111 | 45 | 155 | 141 | 61 | 204 | 183 | 70 | 85 | 78 | 29 | 60 | 55 | 20 |
| Vacant | 51 | 47 | 26 | 62 | 57 | 32 | 83 | 74 | 43 | 32 | 28 | 16 | 11 | 8 | 5 |
| **Outside Geographies** | 12 | 10 | 10 | 9 | 7 | 7 | 28 | 24 | 24 | 0 | 0 | 0 | 125 | 98 | 98 |
| Redevelopment | 10 | 8 | 8 | 7 | 5 | 5 | 4 | 3 | 3 | 0 | 0 | 0 | 63 | 48 | 48 |
| Vacant | 2 | 2 | 2 | 2 | 1 | 1 | 24 | 21 | 21 | 0 | 0 | 0 | 62 | 50 | 50 |
| **Grand Total** | **763** | **687** | **280** | **894** | **789** | **358** | **1,738** | **1,465** | **647** | **821** | **670** | **315** | **776** | **591** | **360** |
| | | | | | | | | | | | | | | | |
| **Aggregate Geography** | | | | | | | | | | | | | | | |
| Central City | 48 | 46 | 46 | 100 | 89 | 89 | 60 | 51 | 51 | 43 | 38 | 38 | 9 | 8 | 8 |
| Industrial | 23 | 17 | 17 | 35 | 24 | 24 | 179 | 109 | 109 | 125 | 83 | 83 | 190 | 127 | 127 |
| Neighborhood Commercial | 676 | 611 | 204 | 740 | 661 | 230 | 1,430 | 1,246 | 428 | 649 | 545 | 190 | 442 | 348 | 118 |
| Institutions | 4 | 4 | 4 | 11 | 9 | 9 | 41 | 35 | 35 | 4 | 4 | 4 | 10 | 10 | 10 |
| Outside Geographies | 12 | 10 | 10 | 9 | 7 | 7 | 28 | 24 | 24 | 0 | 0 | 0 | 125 | 98 | 98 |
| **Total** | **763** | **687** | **280** | **894** | **789** | **358** | **1,738** | **1,465** | **647** | **821** | **670** | **315** | **776** | **591** | **360** |











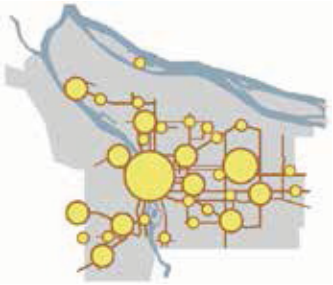
# Mixed Use Zones Project

## Preliminary Zoning Concept – DRAFT

The ***Mixed Use Zones (MUZ) Project*** will revise Portland's Commercial and Central Employment zoning codes applied in Centers and Corridors outside of the Central City. These zones ***(CN1/2, CO1/2, CM, CS, CG, CX, EX)***, in which mixed uses are allowed, were created over 20 years ago when auto-oriented and low intensity commercial uses were more common. The project will address issues that arise with new, more intensive mixed use buildings, such as massing and design, transitions and step-downs, and ground floor uses. An initial concept proposal is being developed this fall. A more detailed Mixed Use Zones Concept Report is due this winter. Proposed zoning codes are expected in spring 2015. Public hearings on any proposed zoning codes are anticipated in June/July 2015.

### Why are we doing it?

Over the next 20 years, the number of people and jobs will grow in Portland. The City's new ***Comprehensive Plan*** proposes to focus this growth in mixed use ***Centers and Corridors***, which will serve as the anchors of convenient, walkable neighborhoods. The MUZ Project is an early implementation project of the Comprehensive Plan Update.



*Centers and Corridors*

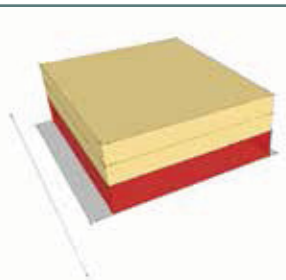
### Project Process

| | |
|---|---|
| **1. Research and Assessment**<br>March to September 2014 | • Evaluate Portland's current mixed use development and design regulations to determine what works well and what needs improvement.<br>• Research best practices and zoning approaches other cities have used to create successful, walkable urban centers. |
| **2. Concept Development**<br>June 2014 to January 2015<br>★<br>**We are here** | • Develop a framework for new mixed use zones that responds to different geographic contexts and the Centers and Corridors called out in the new Comprehensive Plan.<br>• Analyze development feasibility and explore how incentives can be used to achieve key goals. |
| **3. Code Development**<br>November 2014 to April 2015 | • Revise zoning regulations to implement the mixed use zones framework. |
| **4. Public Hearings/Adoption**<br>Mid to Late 2015 | • Planning and Sustainability Commission public hearings.<br>• Portland City Council public hearings. |

# A Conceptual Framework for Commercial Mixed Use Zones

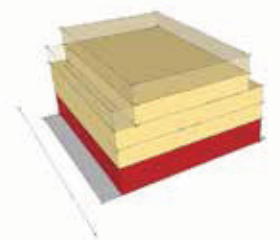
The Bureau of Planning and Sustainability is considering a new framework of zones to replace the city's existing Commercial and Central Employment zones. The working concept would reduce the current array of nine zones to a set of four. The new framework would include zones that allow small, medium and large scale commercial mixed use development, as well as a medium-scale zone that would allow a broader array of employment uses.

## Commercial Mixed-Use 1 (CM1)



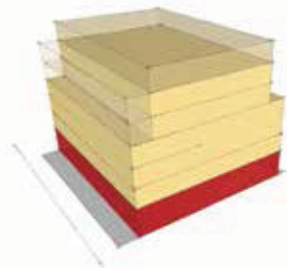
This small-scale commercial mixed use zone is intended for sites in neighborhood Centers and Corridors, at the edges of town centers and regional centers, and in smaller mixed use nodes within lower density residential areas. This zone allows a mix of commercial and residential uses. Buildings in this zone are generally expected to be up to three stories. Development is intended to be pedestrian-oriented and generally compatible with the scale of surrounding residentially zoned areas.

## Commercial Mixed-Use 2 (CM2)



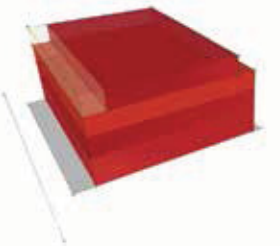
This medium-scale commercial mixed use zone is intended for sites in a variety of centers and corridors, and in smaller mixed use areas that are well served by frequent transit or within a larger area zoned for multi-dwelling development. The zone allows a mix of commercial and residential uses, as well as other employment uses that have limited off-site impacts. Buildings in this zones are generally expected to be three to four stories, unless bonuses are used to provide additional community benefits. Development is intended to be pedestrian-oriented and complement the scale of surrounding residentially zoned areas.

## Commercial Mixed-Use 3 (CM3)



This large-scale commercial mixed use zone is intended for sites in larger centers and Civic Corridors, particularly in locations close to the Central City or in high-capacity transit station areas. The zone allows a mix of commercial and residential uses, as well as other employment uses that have limited off-site impacts. Buildings in this zones are generally expected to be four to six stories, unless bonuses are used to provide community benefits or plan district provisions specify other height limits. Development is intended to be pedestrian-oriented, but buildings may be larger than those allowed in lower intensity mixed use and residential zones. Design review is typically required in this zone.

## Commercial Employment (CE)



This medium-scale commercial employment zone is intended for sites along corridors in areas between centers, especially along Civic Corridors that are also Major Truck Streets or Priority Truck Streets. The zone allows a mix of commercial uses, as well as some light manufacturing and distribution/employment uses that have few off-site impacts. The emphasis is on commercial and employment uses, with limitations on new residential uses. Buildings in this zone are generally expected to be up to four stories. Development is intended to be pedestrian-oriented, as well as auto accommodating, and complement the scale of surrounding areas.

## Centers Overlay Zone



In addition to new base zones, the preliminary concept includes a new overlay zone that would be applied to properties in the commercial core of centers identified on the Urban Design Framework (UDF) map. Such an overlay might include limitations on: drive through developments; quick vehicle servicing uses; self-storage uses; single-dwelling developments and other developments and land uses that are not supportive of creating pedestrian-oriented areas of activity. It could also include requirements for active ground floor uses.

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## Zoning Concept Parameters

The table below shows the range of conceptual new zones. The use allowances, height, FAR, and other code features are conceptual and require additional refinement, testing and development during the concept development phase.

| | Conceptual Zones | | | |
|---|---|---|---|---|
| | **CM1** | **CM2** | **CM3** | **CE** |
| **Scale** | **Small** (relates to CN1/2 and CO1 zones) | **Medium** (relates to CS, CM, CO2 and CG zones) | **Large** (relates to EX and CX zones) | **Medium** (relates to CG zone) |
| **Commercial uses** | Allow limited array of retail, service and office uses; smaller scale | Allow broader array of retail, service and office uses; larger scale | Allow broad array of retail, service and office uses | Allow broad array of retail, service and office uses |
| **Residential uses** | Allow | Allow | Allow | Limit |
| **Industrial uses** | Limit | Allow employment uses with few off-site impacts | Allow employment uses with few off-site impacts | Allow range of light industrial uses with few off-site impacts |
| **Institutional uses** | Allow | Allow | Allow | Allow |
| **Other uses** | Limited | Limited | Limited | Limited |
| **Max height (feet)*** | 35 | 35-45 to 55 | 45-65 to 75 | 45 |
| **Max height (stories)** | 3 | 3/4 to 5 | 4/6 to 7 | 4 |
| **Additional height (feet) for active ground-floor use** | 3 | 3 | 3 | 3 |
| **Height step-back from street; step-down to RF-R2.5 Zone** | TBD | TBD | TBD | N/A |
| **FAR**** | 1:1 to 2.5:1 | 2:1 to 3.5:1 | 3:1 to 4.5:1 | 2:1 to 3:1 |
| **Maximum building coverage (inner/ East/West)** | TBD | TBD | TBD | TBD |
| **Required landscaping (inner/East/West)** | TBD | TBD | TBD | TBD |

* Height for testing and modeling. A range indicates a base allowed height at street edge depending on street right-of-way width (e.g. 60'/80'), and a maximum overall height achievable through bonuses.

** FAR (Floor Area Ratio) for testing and modeling of bonuses and incentives. The range indicates a base-allowed floor area and a maximum floor area achievable through use of bonuses. Floor area ratios include residential and other uses.


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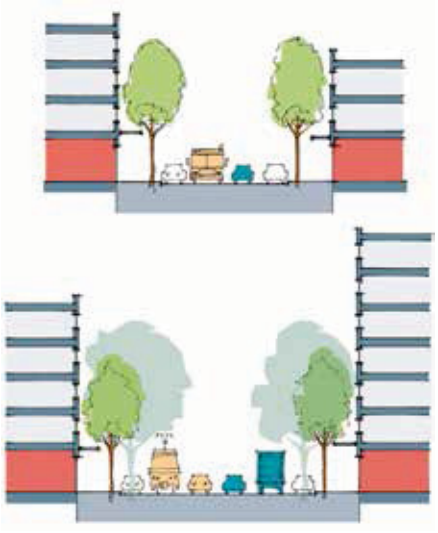
# Elements of the New Codes

Beyond developing a new framework for zones, the city is exploring a range of elements such as new development standards, incentives and other features to be included in new mixed use base zones.

## Building Height and Transitions

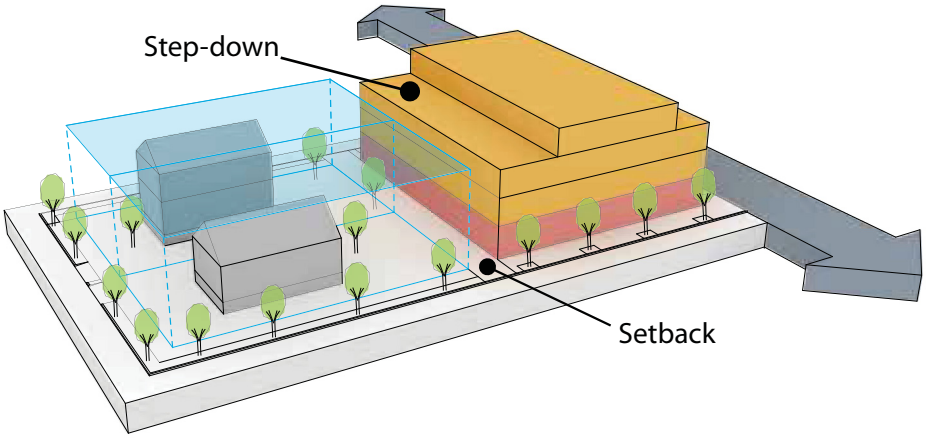


*1. Relate building height to street scale*



*4. Building articulation/massing*

1. **Relate building height to street scale/transit function.** Create zones that can respond to different street scales and contexts. This allows taller or larger buildings on Civic Corridors, in key locations close to the Central City and near high-capacity transit stations.
2. **Accommodate ground-floor active uses and roofline variety.** Allow additional building height to accommodate ground-level commercial spaces with high ceilings and foster roofline variety.
3. **Height transitions and buffering.** Apply setbacks, height transitions and/or buffering for mixed use zones adjacent to lower density residential zones to foster more gradual scale transition.




4. **Building articulation/massing.** Craft development standards that more definitively address building form/massing, including requirements or allowances for façade articulation, upper level step-backs, limits on building length, emphasis at corners, and possibly a maximum floor plate size above four stories to reduce mass and shadows.
5. **Full-block zoning transitions.** Apply special landscaping and building height standards for mixed-use areas that are located off of corridors and have street frontage adjacent to residential zones. Potentially encourage/require residential development as part of this interface.
6. **Large sites/planned developments.** Allow larger scale development on large sites in transit-rich locations, potentially in tandem with transfer of development rights (TDR) provisions, stronger requirements for transitions to lower density areas and design review. Provide options for planned development (PD) or master plan development proposals.

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## Design Standards



*8. Street frontages*



*9. Front/street setbacks.*

7. **Pattern area standards.** Create design-related standards specific to the three major neighborhood pattern areas (Inner, Eastern and Western neighborhoods), such as variations on building setbacks, ground floor and upper-story design features and landscaping.
8. **Street frontages.** Strengthen design-related standards that address the relationship of buildings to public street frontages, including requiring more ground floor window coverage (a transparency standard), minimum floor-to-ceiling heights (for ground floor active uses and commercial), limiting residential driveways, and applying pedestrian-oriented standards to dispersed commercial development/ corner markets.
9. **Front/street setbacks.** Simplify maximum setback regulations, and offer more flexibility for providing outdoor spaces and landscaping. Relax requirements that require 100 percent of street-facing façades to be located within required maximum setbacks.

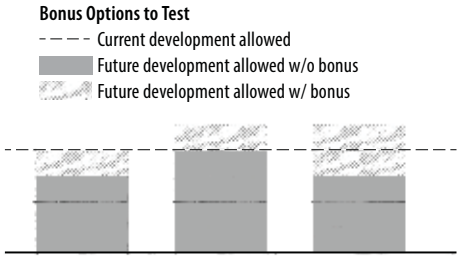
## Residential Standards



*10. Outdoor space*

10. **Outdoor space.** Require private or shared outdoor space for residents to be provided in conjunction with mixed use or residential development.
11. **Side setback requirements.** Create a flexible set of standards for residential windows close to side property lines or require building to the property line without windows.
12. **Detached house development.** Limit or prohibit new detached houses in mixed use zones, especially in the core areas of centers.

## Incentives




*13. Bonus for community benefits*

13. **Bonus for community benefits.** Provide bonus/incentives such as some combination of FAR and/or height allowances for the following features: affordable housing; affordable commercial space; historic preservation; community services, including grocery, daycare, arts/culture; publicly accessible outdoor space; and high-performance green features. Test and model various base and bonus allowances.

## Other Regulations




*16. Exterior display*

14. **Green features.** Craft development standards to help accommodate green features and infrastructure as part of development.
15. **Neighborhood notification requirements.** Expand the required neighborhood notification of new development in mixed use zones; consider posting of sites.
16. **Exterior display.** Allow more flexibility for commercial exterior display arrangements.
17. **Shared parking.** Expand allowances for shared parking.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## How do the zones relate to the Comprehensive Plan and current zones?

The new Comprehensive Plan establishes four mixed use map designations based on a hierarchy of place types, each of which could be implemented by one or more zones. This differs from the current plan-to-zoning relationship, in which one or two very similar zones implement a single Comprehensive Plan designation. The table below shows the relationship between Comprehensive Plan Map designations, current implementing zones, and the conceptual new implementing zones.

| Proposed Comprehensive Plan Designation | Existing Implementing Zones | Conceptual Implementing Zones |
|---|---|---|
| **Mixed-Use Dispersed** | CN1, CN2, CO1, CO2, CM, CS, EX | CM1, CE |
| **Mixed-Use Neighborhood** | CN2, CO2, CM, CS, EX | CM1, CM2, CE |
| **Mixed-Use Civic Corridor** | CN2, CO2, CM, CS, CG, CX, EX | CM1, CM2, CM3, CE |
| **Mixed-Use Urban Center** | CN1, CO1, CM, CS, CG, CX, EX | CM1, CM2, CM3, CE |

## How will the zones be applied?

The Mixed Use Zones Project is part of Comprehensive Plan implementation. It will fit together with Comprehensive Plan adoption and include a public process that includes meetings, workshops and public hearings.

### Develop Zoning Codes

After refining the zoning concepts, new zoning codes will be fully developed, including use allowances, development/design standards and other components. Plan district and overlay zone amendments will also be identified as appropriate to reduce redundancies and conflicting regulations. However, most plan districts and overlays are expected to remain. Code development will also include criteria and a process for evaluation of zone changes in conformance with a Comprehensive Plan designation, when more than one zone may be applied.

### Create Conversion Table

The new zones will initially be applied to properties based on a combination of factors, including the UDF, Comprehensive Plan designation and current zone. The project will propose a conversion system that recommends mapping/application of new zones. As shown in the preliminary concept table below, in most cases the new recommended zone for a particular parcel will be the most similar to the current zone, in terms of scale and general use allowances. In some cases more than one option exists. New zones will have new development and design standards that result from the project.

| Proposed Comprehensive Plan Designation | Current Zones | | | | | | |
|---|---|---|---|---|---|---|---|
| | CN1/2 | CO1/2 | CM | CS | CG | EX | CX |
| **Mixed Use Dispersed** | CM1 | CM1 | CM1 | CM1 | CM1# CE# | CM2 | n/a |
| **Mixed Use Neighborhood** | CM1 | CM1 | CM1* CM2* | CM1* CM2* | CM2# CE# | CM2 | n/a |
| **Mixed Use Civic Corridor** | CM1^ CM2^ | CM1^ CM2^ | CM2 | CM2 | CM2# CE# | CM3 | CM3 |
| **Mixed Use Urban Center** | CM1 | CM1+ CM2+ | CM2 | CM2 | CM2# CE# | CM3 | CM3 |

* CM1 may be proposed for UDF Neighborhood Corridors outside of Centers; CM2 may be proposed for UDF Neighborhood Centers.

^ CM1 may be proposed for isolated locations; CM2 may be proposed for areas contiguous to larger scale mixed use zones.

\+ CM1 may be proposed for CO1 zones; CM2 may be proposed for CO2 zones.

\# TBD: CM zones may be applied to UDF Centers; CE may be applied to UDF Corridors.

### Apply to Zoning Map

The MUZ Project will work closely with the City's District Liaisons to publish a map of proposed zoning. This process will help fine tune the mapping/application of new zones where specific circumstances may warrant application of a different zone than recommended through the conversion table. Examples of these circumstances could include areas: of unique topography or natural resource impacts; with significant historic resources; where transition to a different development pattern may be desired (e.g., less auto oriented or more employment focused).

### Public Review

The Portland Planning and Sustainability Commission (PSC) will hold public hearings on the new zoning codes, proposed conversion approach, and proposed map in mid-2015. Adjustments may be made based on public testimony. The PSC recommendations will be forwarded to Portland City Council for final public hearings and adoption in late 2015.

## Comparison of Current and Conceptual Zones

The table below compares key use and development parameters for exiting zones and for conceptual new mixed use zones.

| | Small-size Zones | | | | Medium-size Zones | | | | | | Large-size Zones | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Existing Zones | | | Concept Zone | Existing Zones | | | | Concept Zone | | Existing Zones | | Concept Zone |
| | CN1 | CN2 | CO1 | CM1 | CO2 | CM | CS | CG | CM2 | CE | EX | CX | CM3 |
| **Commercial** | | | | | | | | | | | | | |
| **Retail sales and service** | L | Y | N | L | L | L | Y | Y | Y | Y | Y | Y | Y |
| **Office** | L | Y | Y | Y | Y | L | Y | Y | Y | Y | Y | Y | Y |
| **Quick vehicle servicing** | N | L | N | V | N | N | N | Y | V | Y | N | L | V |
| **Vehicle repair** | N | N | N | V | N | N | Y | Y | V | Y | Y | L | V |
| **Commercial parking** | N | N | N | TBD | N | N | Y | CU | TBD | TBD | CU | CU | TBD |
| **Self-service storage** | N | N | N | V | N | N | N | L | V | Y | L | L | V |
| **Residential** | Y | Y | Y | Y | Y | Y | Y | Y | Y | L | Y | Y | Y |
| **Industrial** | L | L | L | L | L | L | L | L | L | Y/L | Y | Y | Y |
| **Height** | 30 | 30 | 30 | 35-38 | 45 | 45 | 45 | 45 | 35-58 | 45 | 65 | 75 | 45-78 |
| **FAR*** | .75:1 | .75:1 | .75:1 | 1:1 – 2.5:1 | 2:1 | 1:1 | 3:1 | 3:1 | 2:1 – 3.5:1 | 2:1 – 3:1 | 3:1 | 4:1 | 3:1 – 4.5:1 |

| | |
|---|---|
| Y = Yes, allowed | N = No, not allowed |
| L = Limited | V = Variable based on location |
| * = Currently, except in EX zone, residential is not counted in FAR limits and is allowed to the height limit and zone setbacks. Residential uses are proposed to be counted in FAR in new zones. | |


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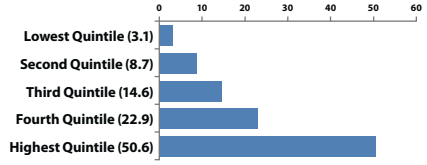
# PORTLAND PLAN MEASURES AT-A-GLANCE

This focused list of measures provides a snapshot of the current state of the city and an overview of the challenges that stand between where Portland is today and where Portland wants to be by 2035. The purpose of these measures is to provide a sense of where the city is headed and of current conditions related to our past performance and future goals. These measures cannot and are not intended to tell us everything about each topic.

*Please see the Measures of Success section for more information.*

## 1 EQUITY AND INCLUSION

INCOME DISTRIBUTION (CITY OF PORTLAND, 2005–09)




DIVERSITY INDEX 55

**While racial and ethnic diversity, overall, is growing, it varies across the city. The diversity index shows that between 2000 and 2010, diversity declined in inner North and Northeast neighborhood and increased in East Portland. The information suggests that non-white residents are being pushed to areas where housing is more affordable, but transit service is less frequent and with unimproved fewer pedestrian-accessible commercial services.**

## 2 RESIDENT SATISFACTION

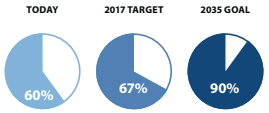
PERCENT SATISFIED LIVING IN THE CITY




**Right direction, steadily increasing**

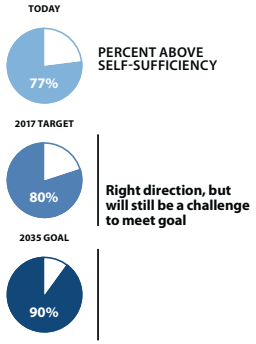
## 3 EDUCATED YOUTH

HIGH SCHOOL ON-TIME GRADUATION RATE




**Right direction, but challenges ahead**

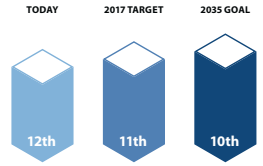
## 4 PROSPEROUS HOUSEHOLDS




**Right direction, but will still be a challenge to meet goal**

## 5 GROWING BUSINESSES

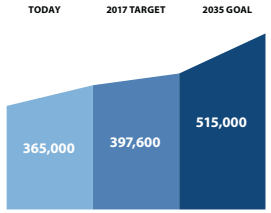
EXPORT VALUE, CITY RANK




**Right direction**

## 6 JOB GROWTH

NUMBER OF JOBS




**Still need more jobs**

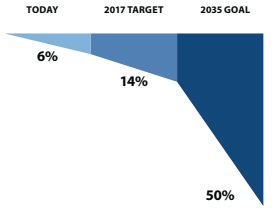
## 7 TRANSIT AND ACTIVE TRANSPORTATION




**Right direction, but will still be a challenge to meet goal**

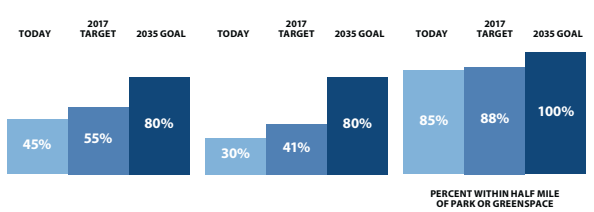
## 8 REDUCED CARBON EMISSIONS

PERCENT BELOW 1990 LEVELS




**Emissions steadily decreasing, but much more work to do**

## 9 COMPLETE NEIGHBORHOODS




**Less than half of city considered "complete"**

**Right direction, slow incremental progress**

**Incremental progress**

## 10 HEALTHIER PEOPLE

ADULTS AT A HEALTHY WEIGHT




**Declining**

EIGHTH GRADERS AT A HEALTHY WEIGHT




**No trend data**

## 11 SAFER CITY

PERCENT WHO FEEL SAFE WALKING ALONE AT NIGHT IN THEIR NEIGHBORHOOD




**Right direction, increasing**

PART 1 CRIMES PER 1000




**Right direction, declining**

## 12 HEALTHY WATERSHEDS

| WATER QUALITY INDEX | TODAY | 2017 TARGET | 2035 GOAL | TREND |
|---|---|---|---|---|
| Willamette River | 67 | TBD | 75 | Right direction, all steadily improving |
| Columbia Slough | 52 | 53 | 60 | |
| Johnson Creek | 53 | 54 | 60 | |
| Fanno Creek | 56 | 57 | 60 | |
| Tryon Creek | 41 | 45 | 60 | |

| | TODAY | 2017 TARGET | 2035 GOAL | TREND |
|---|---|---|---|---|
| TREE CANOPY | 26% | 28% | 33% | Right direction, but challenge to raise percentage |



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··· COMPREHENSIVE PLAN UPDATE ···

# 2035 Comprehensive Plan

# Proposed Draft

## What's Inside?


- Introduction
- About the Plan
- Goals and Policies
- List of Significant Projects
- Comprehensive Plan Map
- Glossary


**July 2014**

**Portland's Comprehensive Plan Update**
**For more information, visit:**
**www.portlandoregon.gov/bps/pdxcompplan**


Bureau of Planning and Sustainability
Innovation. Collaboration. Practical Solutions.

*City of Portland, Oregon*
*Charlie Hales, Mayor • Susan Anderson, Director*



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**Portland's Comprehensive Plan Update proposes changes to create a prosperous, healthy, equitable and resilient city.**
Visit www.portlandoregon.gov/bps/pdxcompplan
or call 503-823-0195.

**Implementing the Portland Plan: The Comprehensive Plan forwards Portland's strategic priorities through land use.**
Adopted in 2012, the City's strategic plan, the Portland Plan, established four integrated strategies to guide Portland over the next 25 years: (1) A Framework for Equity, (2) Thriving Educated Youth, (3) Economic Prosperity and Affordability, and (4) Healthy Connected City. The 2035 Comprehensive is an implementing tool of the Portland Plan.

| |
|---|
| **Para obtener más información, por favor llame al 503-823-0195.** |
| **如需更多資訊，請致電：503-823-0195。** |
| **За дополнительной информацией обращайтесь по номеру 503-823-0195.** |
| **Để biết thêm thông tin, vui lòng gọi 503-823-0195.** |
| **Wixii macluumaad dheeraad ah, fadlan wac 503-823-0195** |
| **Call the helpline at 503-823-0195 for more information.** |

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## A letter from Susan Anderson

Director of the Bureau of Planning and Sustainability

**On behalf of the Bureau of Planning and Sustainability and our many community and business partners, who participated extensively in its development, I am pleased to share the 2035 Comprehensive Plan Proposed Draft.**

The draft 2035 Plan builds on dozens of community strategies and plans since 1980, including: the *Portland Plan*, *Climate Action Plan*, *Portland Economic Development Strategy*, *Parks 2020 Vision*, *Albina Community Plan*, *East Portland Action Plan*, Watershed Management Plan, *Central City Transportation Management Plan*, *1980 Comprehensive Plan*, and many others.

The draft 2035 Plan is Portland's long-range tool to guide growth, change, and improvements over the next 20 years. It will be a guide for the City as we leverage new investment and growth to ensure that Portland becomes more prosperous, healthy and resilient for everyone.

Much more than simply a map or new zoning code, the 2035 Plan provides a framework for the City to create opportunities for more jobs, affordable housing, a low-carbon economy, a clean environment, increased mobility and greater equity among Portlanders.

The draft plan was developed with extensive research, technical analysis and an enormous amount of community participation and knowledge. It includes goals and policies that set specific directions for future decision makers. It includes an Urban Design Framework (a map-based illustration of the vision for 2035) as well as a list of significant projects to direct major investments in public infrastructure — like streets, sidewalks and parks that keep Portlanders safe, mobile and healthy.

The draft 2035 Plan carries forward the best of the many successful approaches that Portland is known for internationally from the 1980 Comprehensive Plan. In addition, it considers new priorities and recommends that Portland find more advanced ways to:

- Create complete, healthy connected neighborhoods throughout the city to meet the needs of 120,000 new households.
- Ensure there is commercial and industrial land available to support 140,000 new jobs.
- Create a low carbon city that is energy and resource efficient and creates local jobs.
- Integrate public health and equity goals into land use policies.
- Improve resiliency and decrease development pressure in areas that lack public services or are susceptible to hazards, like flooding and landslides.
- Recognize that one size does not fit all, so we must plan and design distinctive areas of the city to fit local conditions.
- Promote affordable housing throughout the city in areas with good access to transit, grocery stores and shops, schools and other services.
- Improve natural areas and open space that help integrate nature into the city.
- Promote schools as multi-use facilities and assets that serve the whole community.

Please take this opportunity to review the draft 2035 Plan and provide your feedback to us in writing, on-line through the Map App, or through testimony at hearings that will be held by the Planning and Sustainability Commission throughout the fall. If you have specific questions or concerns about a policy or map designation, please give us a call at 503-823-0195.

The 2035 Plan is a roadmap to the future. Your comments are critical for helping to create a healthier, more resilient and prosperous city for us and future generations.

All the best,

Susan Anderson



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# COMPREHENSIVE PLAN COMPONENTS

## Goals and Policies

**Long-term aspirations for Portland and descriptions of the work that must be done to achieve them.**

## List of Significant Projects

**A plan for public facility investments.**

## Comprehensive Plan Map

**Land use designations for growth, development and conservation.**

## Transportation System Plan

**Transportation policies, street classifications and street plan maps.**



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## The 2035 Comprehensive Plan is a 20-year plan for the growth and development of Portland.

- It forecasts the amount and location of population and job growth.
- It guides where and how land is developed and conserved.
- It identifies what public investments are needed in infrastructure (such as streets, sidewalks, parks and stormwater management systems).
- It sets expectations for how and when community members will be involved in future land use plans and decisions.
- It helps coordinate policies and actions across City bureaus, and state and regional agencies.

## Why plan now?

- It's been 35 years since Portland wrote its first Comprehensive Plan.
- Portland is growing — 120,000 new households and 140,000 new jobs are expected by 2035.
- Portland is becoming a more diverse city and advancing equity is essential.
- Everyone needs access to jobs, services, gathering places and recreational opportunities.
- Preparation helps us be more resilient in a changing world.

## This Comprehensive Plan offers an opportunity to leverage growth to create a more prosperous, healthy, equitable and resilient community for all Portlanders.



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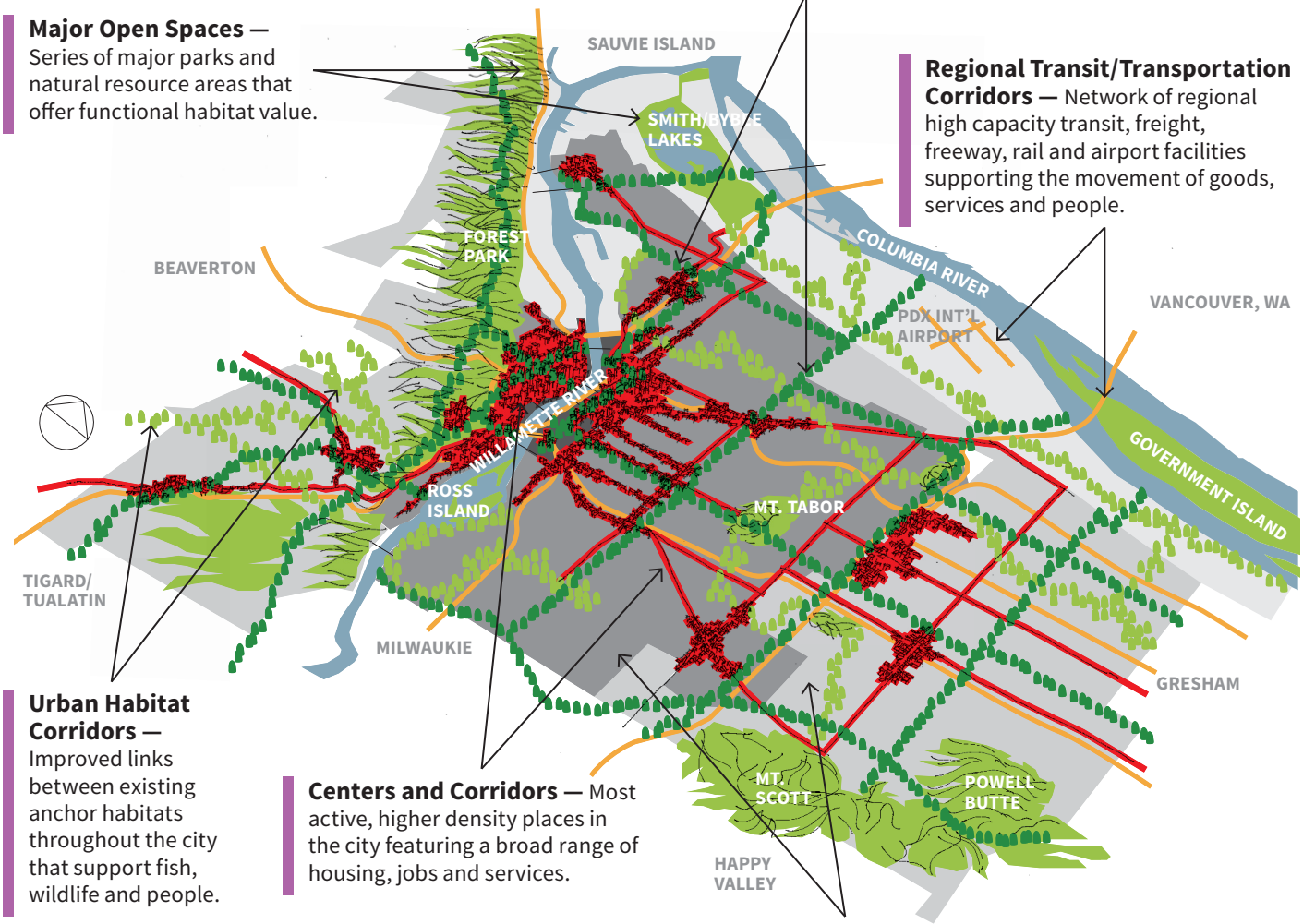
# Urban Design Concept

## A map of the vision for 2035.

**City Greenways —** System of quieter, park-like walking and biking routes linking centers, parks and other destinations.

**Major Open Spaces —** Series of major parks and natural resource areas that offer functional habitat value.

**Regional Transit/Transportation Corridors —** Network of regional high capacity transit, freight, freeway, rail and airport facilities supporting the movement of goods, services and people.




**Urban Habitat Corridors —** Improved links between existing anchor habitats throughout the city that support fish, wildlife and people.

**Centers and Corridors —** Most active, higher density places in the city featuring a broad range of housing, jobs and services.

**Pattern Areas —** Broad geographies of the city defined by distinctive built and natural features.



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# VISION FOR 2035

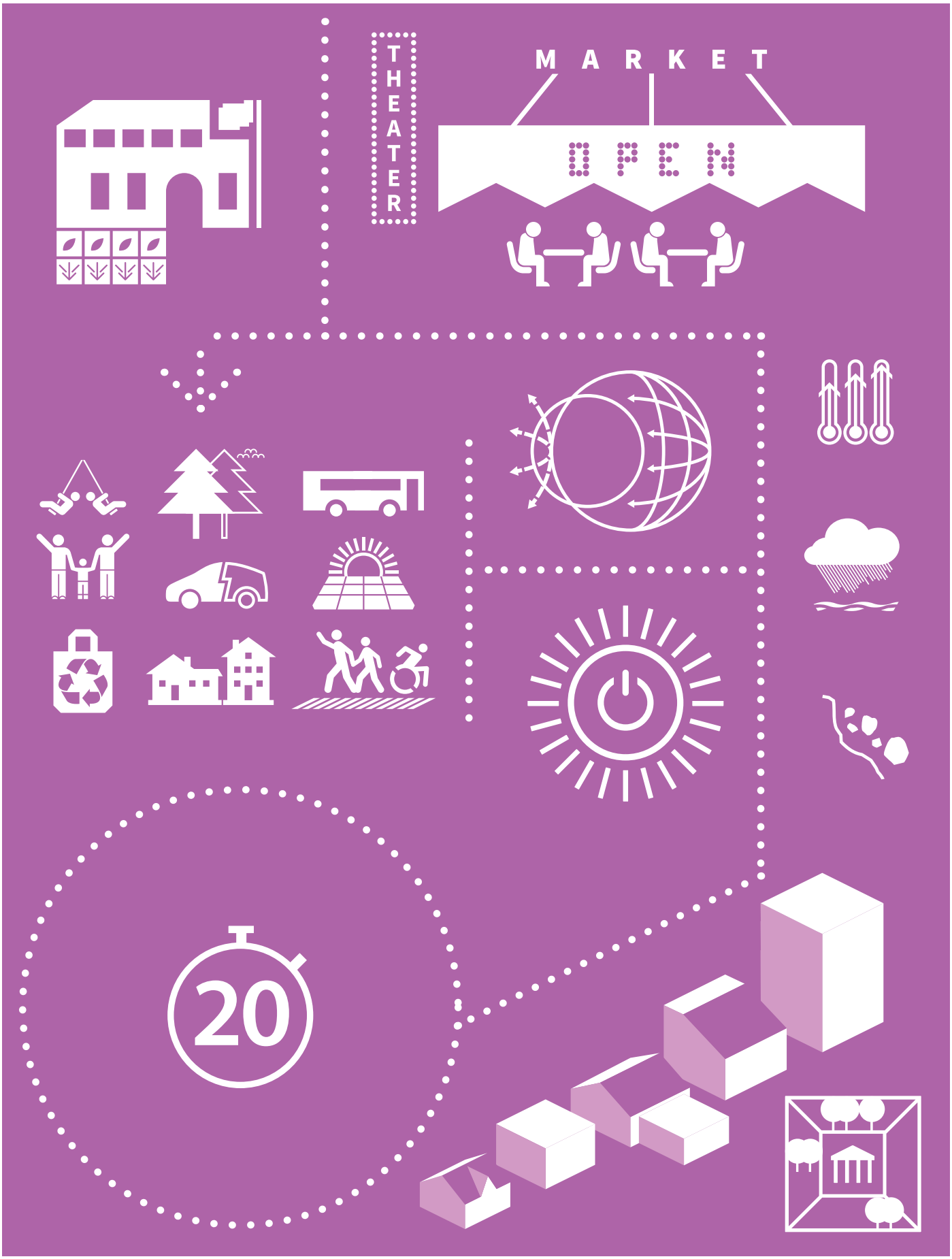
**Portland is a prosperous, healthy, equitable and resilient city where everyone has access to opportunity and is engaged in shaping decisions that affect their lives.**

Our diverse population, innovative businesses and forward-thinking leaders create a vibrant and unique community.

- A thriving low-carbon economy provides jobs and supports the prosperity of a diverse population.
- Portlanders feel more connected to each other, the city, and their communities and they are involved in community decisions.
- Nature is woven into the city, and a healthy environment sustains people, neighborhoods and wildlife.
- Distinctive neighborhoods and the vibrant downtown are safe, energizing civic and cultural spaces.
- Environmental risks are managed and resiliency increases, helping Portlanders prepare for change and recover from disasters.



Ord. 187831, Vol. 2.4.C, page 9851



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## Seven key directions to achieve the vision

### These key directions are reflected throughout the plan in goals, policies and infrastructure investments and on the Urban Design Framework and the Comprehensive Plan Map.

1 **Create complete neighborhoods:** Grow and invest in well-designed centers and corridors that support healthy living. Complete neighborhoods include shops and services, a variety of housing opportunities and have good pedestrian environments with access to bike and transit networks.

2 **Encourage job growth:** Provide and increase the productivity of land, and infrastructure for businesses, institutions and industry to meet the needs of 140,000 new jobs citywide. Invest in industrial districts and the Central City, facilitate the growth of colleges and hospitals and support the success of small businesses in neighborhood business districts.

3 **Create a low-carbon community:** Reduce carbon emissions in residential, commercial, industrial and transportation sectors. A new generation of buildings, infrastructure, technologies and energy systems that use 50 percent less fossil fuels will help mitigate climate change and create tens of thousands of jobs. This will also help reduce reliance on non-renewable energy that must be imported from outside the region.

4 **Improve natural areas and open spaces:** Build city greenways and enhance and protect open spaces and natural areas. Trails, streets and open spaces connect pedestrians and bicyclists throughout the city, create pleasant places for rest and recreation, provide wildlife habitat and improve water and air quality.

5 **Provide reliable infrastructure to equitably serve all parts of the city:** Build, maintain and upgrade public facilities. Public investments in streets and sidewalks, sewer lines and water facilities, parks, and stormwater and flood management improve health and safety. Focused investments in areas that do not have safe and plentiful facilities will increase access to opportunity.

6 **Improve resiliency:** Prepare for climate change and reduce risks posed by natural hazards. Focus growth in lower risk areas, away from creeks and steep hillsides; build housing near transit and services; and provide open space, trees and stormwater to help reduce harmful flooding, cool the city on hot summer days and reduce health, safety and economic risks for households, businesses and the City.

7 **One size does not fit all:** Plan and design to fit local conditions. Each area of Portland has distinctive and valued characteristics — natural features, community histories, patterns of development and types of buildings. Instead of following a one-size-fits-all approach, harness growth and change to enhance positive and valued community characteristics.


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··· COMPREHENSIVE PLAN UPDATE ···

KEY DIRECTION 1

# Create Complete Neighborhoods






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# Grow and invest in well-designed centers and corridors.

## Complete neighborhoods support health and increase access to opportunity.

They are places where people of all ages and abilities have safe and convenient access to more of the goods and services needed in daily life — where they can get to grocery stores, schools, libraries, parks and gathering places on foot or by bike.

They are well connected to jobs and the rest of the city by transit and have a variety of housing types and prices for households of different sizes and incomes.

**Today, only about half of all Portlanders live in places with convenient, safe and walkable access to services.** Often it is lower income Portlanders and people of color who are not able to live in healthy connected neighborhoods. Neighborhoods with amenities are increasingly becoming more expensive than other neighborhoods.

**Growing in centers and corridors will help create an equitable and accessible network of healthy complete neighborhoods.** Growing in centers and corridors, like Hillsdale and Sandy Blvd., allows more people the opportunity to live close to services, while strengthening neighborhood businesses.

A compact development pattern also helps reduce our environmental footprint, mitigate and prepare for the effects of climate change and maximizes the use of existing infrastructure.

**There will be areas of stability and areas of change.** Focusing growth in defined centers and corridors has many social, economic and community benefits. One of the benefits is that much of the future population growth and change will happen along existing mixed-use and commercial streets.

This will help preserve single-family residences throughout the city as the population grows. Portland is expected to grow by more than 120,000 more households by 2035. Today, Portland has more than 260,000 households.

This growth will help create more complete neighborhoods and expand access to services to more Portlanders, if it is focused in centers and corridors.

## Why create healthy connected neighborhoods?

- Local convenience and healthy lifestyles
- Neighborhood business development
- Efficient and equitable public investment
- Lower household costs
- Energy efficiency and carbon emissions reduction
- More stable existing neighborhoods



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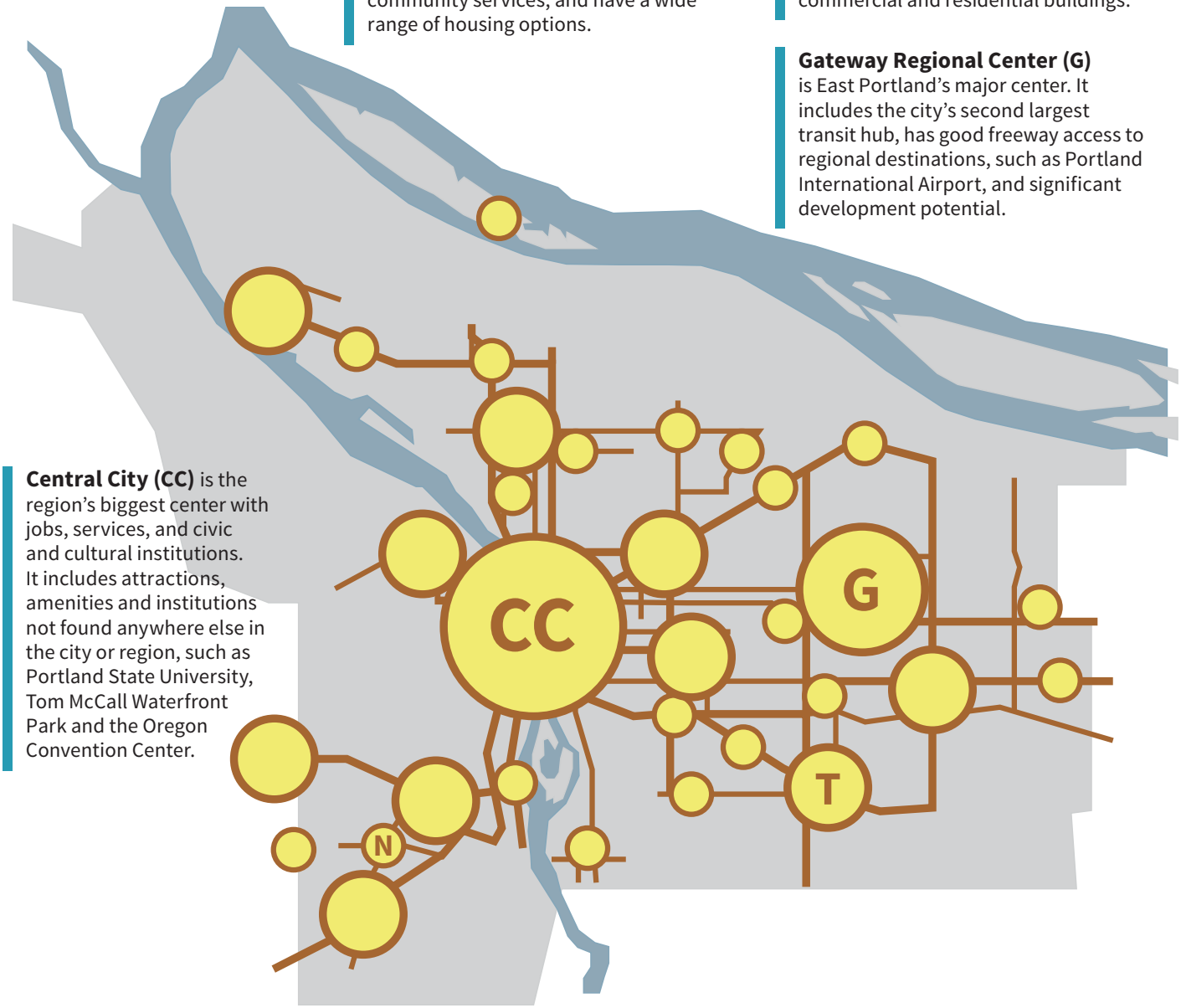
# Types of centers and corridors

**Town Centers (T),** like Hollywood and Hillsdale, are located throughout the city and serve entire districts. They are typically anchored by employment centers or institutions, feature commercial and community services, and have a wide range of housing options.

**Neighborhood Centers (N)** are places like Mississippi Avenue or the inner SE main streets, like Division, Belmont and Hawthorne. They include a mixture of medium to higher density commercial and residential buildings.

**Gateway Regional Center (G)** is East Portland's major center. It includes the city's second largest transit hub, has good freeway access to regional destinations, such as Portland International Airport, and significant development potential.




**Central City (CC)** is the region's biggest center with jobs, services, and civic and cultural institutions. It includes attractions, amenities and institutions not found anywhere else in the city or region, such as Portland State University, Tom McCall Waterfront Park and the Oregon Convention Center.

**Civic Corridors** are the city's busiest, widest and most prominent streets, like Barbur and Powell Boulevards. They connect the city and the region and support the movement of people and goods across the city, with high levels of traffic and, in some cases, pedestrian activity. Civic Corridors can be great places for growth and transit-supportive densities of housing, commercial, or employment uses.

**Neighborhood Corridors** are narrower main streets that connect neighborhoods with each other and to other parts of the city. They support neighborhood business districts and provide housing opportunities close to local services, amenities and transit lines. They are streets that include a mix of commercial and higher-density housing development.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## What could centers and corridors look like?

### Inner neighborhoods




Today




Future

*With a wider street, like the one shown here, there are greater opportunities to provide space for people to walk, roll and gather and to provide street furnishings like pedestrian-scale lights, bike racks and recycling and trash bins.*

Portland's Pattern Areas, including Inner, Eastern and Western Neighborhoods, are defined in Key Direction 7.



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# What could centers and corridors look like?

## Eastern neighborhoods




Today




Future

*This visualization shows one way to transform the intersection of SE 122nd and Division Street, with high capacity transit, landscaping, prominent bike and pedestrian crossings to increase safety, housing and local food. The sidewalks are now buffered from the street and provide opportunities for gathering spaces.*


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## Western neighborhoods




Today




Future

*This visualization shows one way to transform SW Barbur Boulevard, with more housing and retail, high capacity transit, landscaping, and prominent bike and pedestrian crossings to increase safety and access to services.*



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··· COMPREHENSIVE PLAN UPDATE ···

KEY DIRECTION

# 2 Encourage Job Growth





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# Provide and increase the productivity of land and infrastructure for businesses, institutions and industry.

## A robust and resilient regional economy, thriving local businesses, and growth in living wage jobs are all critical to ensuring household prosperity.

It is important to plan for the long term and make policies and investments that improve Portland's ability to weather economic change and improve household prosperity for all Portlanders.

**Plan for a vibrant Central City.** Address development issues that affect businesses and create the next generation of employment sanctuaries in the Central Eastside Industrial District to encourage job growth.

**Improve access to living wage jobs in East Portland.** Create more opportunities for a wide variety of small to medium sized office, creative services, craft manufacturing, distribution, and other neighborhood-compatible light-industrial businesses near freeways and along major streets.

**Invest in brownfield clean-up.** Portland has more than 900 acres of vacant and under-utilized brownfields, with nearly 550 acres in industrial areas. However, brownfields are often costly and difficult to redevelop. New public incentives that support brownfield remediation can leverage private investment to bring these contaminated properties back into productive use and increase the availability of usable industrial land, while reducing environmental risks.

**Protect and use industrial land efficiently.** Portland has limited, but precious employment land. To protect this resource, it is important to encourage businesses to grow on existing sites and stop commercial and residential encroachment on industrial land. Improving the movement of goods/freight within Portland is also essential to making better use of Portland's existing employment land, port terminals, the airport, and rail yards.

**Plan for campus growth.** Portland's colleges and hospitals are essential service providers, centers of innovation, workforce development resources and major employers. Planning for campus growth, while addressing neighborhood impacts, will help these economic engines thrive and promote neighborhood livability.

**Support neighborhood business districts.** Local business districts contribute to neighborhood character. They provide services and destinations within walking and biking distance of residential areas, supporting healthy complete neighborhoods. They also keep more local dollars circulating in Portland, improving prosperity.





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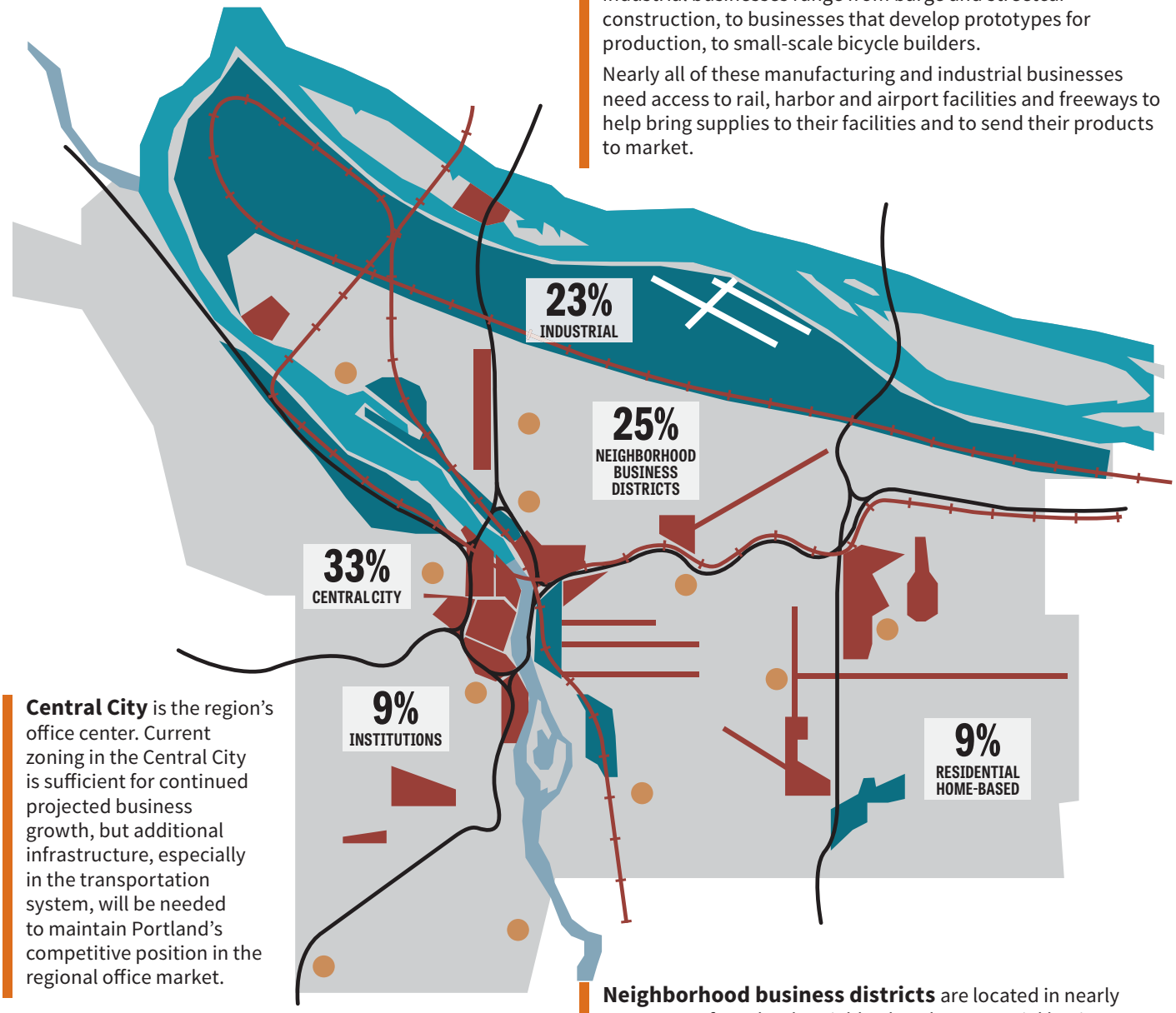
# Portland's employment sectors

**Portland's economy is split across four broad sectors that concentrate in different places in the city.**

**Industrial areas** are primarily located along the Columbia River and the northern portion of the Willamette River, and near the I-84 and I-205 freeways. The Central Eastside Industrial District is also home to more than 17,000 jobs.

Industrial businesses range from barge and streetcar construction, to businesses that develop prototypes for production, to small-scale bicycle builders.

Nearly all of these manufacturing and industrial businesses need access to rail, harbor and airport facilities and freeways to help bring supplies to their facilities and to send their products to market.




**Central City** is the region's office center. Current zoning in the Central City is sufficient for continued projected business growth, but additional infrastructure, especially in the transportation system, will be needed to maintain Portland's competitive position in the regional office market.

**Neighborhood business districts** are located in nearly every part of Portland. Neighborhood commercial business districts and corridors generally have sufficient zoning for growth, but many would benefit from business development support and better transportation connectivity to the surrounding neighborhoods.

**Institutions (hospitals and colleges)** are Portland's fastest growing job sector and they are expected to continue to grow. This plan includes policies that facilitate growth within existing institutional campuses and call for the creation of clear rules to maintain and improve neighborhood compatibility.

Nine percent of jobs are **home-based businesses in residential areas.**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## Business and job growth is influenced by the quality of the city as a place to live, the education system, the availability of capital and the natural and built environments.



Forecasts indicate that Portland will likely be home to 140,000 new commercial, industrial and institutional jobs between now and 2035.

In the Comprehensive Plan, the City of Portland must show how and where it will have the land, space and infrastructure for the business growth needed to meet this forecast. Sustained job growth in Portland depends on many factors.

## The City's economic development strategies focus on:

- Growth in exports of goods and services.
- Growth in the productivity and vitality of key and emerging industries.
- Staying competitive as a major West Coast trade gateway for goods traveling between the Columbia River basin and the Pacific Rim.
- An overall supportive business environment.

**Household prosperity varies greatly by employment type.** In 2012, the average wages for retail and service workers ($26,000) were far below what is needed to sustain a household. The Portland Plan's measure of success for household prosperity uses a self-sufficiency index based on the income needed to meet basic household needs, including the cost of housing, childcare, food, healthcare and transportation.

For example, in Portland, the self-sufficiency household income is approximately $36,000 per year for one adult and an infant. By contrast, the average wage for an industrial worker in Portland is $55,000 per year. Industrial jobs provide better opportunities for many to earn a living wage, but living wage job creation is critical across all employment sectors.



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Ord. 187831, Vol. 2.4.C, page 9864

# Reduce carbon emissions in residential, commercial, industrial and transportation sectors.

## A low-carbon community is safe, healthy and resilient.

It is a place where transportation systems and buildings are highly efficient and affordable, and communities produce much of the electricity that is needed to power their homes and businesses from renewable sources. It is a place where buildings conserve and use scarce resources efficiently.

Next-generation industry designs and sells low-carbon technologies that help improve human and environmental health, while building a sustainable and resilient 21st century economy. Healthy complete neighborhoods help people complete daily errands without getting in a car and community gathering places foster connections. A low-carbon community is a self-reliant, self-sustaining and connected community.

**Cities, as hubs for people and commerce, are a primary cause of carbon emissions, which cause global climate change.** Communities, like Portland, present an essential opportunity to reduce emissions. To avoid potentially catastrophic impacts from climate change — including significantly increased temperatures, extreme weather and rising sea levels — climate scientists estimate that global carbon emissions must decline 50 to 85 percent below 2000 levels by 2050.

**Portland has reduced per-person carbon emissions by more than 30 percent since 1990.** In this timeframe, even as the population grew by 30 percent, total community-wide emissions have dropped by more than 11 percent. Portland has adopted the goal of reducing total local carbon emissions by 80 percent by 2050, with an interim goal of 40 percent by 2030.

**Successful carbon emissions reduction rests on a foundation of sound land use, transportation and infrastructure planning.**

- Connect housing and employment with transit and complete pedestrian and bicycle networks.
- Maintain and repair streets and other transportation infrastructure to enable safe, efficient use by multiple modes of transportation.
- Use green infrastructure to effectively manage stormwater, clean water before it enters streams and rivers and help cool the city.
- Promote the development of resource-efficient buildings.
- Encourage high-efficiency, low-carbon energy sources, including solar, on-site electricity generation and shared district energy systems.

## Why is a low-carbon community good for Portland?

- **Carbon-reduction solutions make businesses more efficient and competitive, and save residents money.** The products and services developed to respond to climate change — from energy efficiency to stormwater management — can be exported to other places. As the world transitions to a low-carbon economy and invests in climate-ready communities, being on the forefront of these solutions is good business.
- **A shift away from coal, oil and natural gas can have substantial indirect economic benefits.** Because Oregon has almost no fossil fuel resources, dollars spent on these energy sources contribute little to the local economy. By redirecting energy dollars to pay for efficiency improvements and non-fossil fuel energy, businesses and residents will spend more money locally, expanding markets for local products and services.
- **It supports healthy, active lifestyles and promotes human health.** Residents who can readily walk, bicycle and take transit are more physically active, resulting in direct health benefits. Low-carbon transportation also tends to reduce air pollution, resulting in additional health benefits for all residents.
- **Reducing energy use results in lower utility bills, relieving pressure on housing costs.** Similarly, it is more affordable to walk, bike or take transit than it is to own, fuel and park a vehicle.



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··· COMPREHENSIVE PLAN UPDATE ···

KEY DIRECTION

# 4 Improve Natural Areas and Open Spaces





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# Build city greenways and enhance and protect open spaces and natural areas.



## Located at the confluence of two major rivers and between mountain ranges, Portland has a wealth of natural resources and a stunning natural setting.

This setting provides a beautiful home for people and provides important habitat for wildlife.

Today, Portland has an extensive public space system — streets, parks, trails, open spaces and natural areas. These public spaces link the city and the region. Some of them are big and busy, connecting people to jobs and businesses to businesses. Others, like the Springwater Corridor, are quieter pathways for walking, jogging or rolling. Places like Columbia Slough and Smith and Bybee Lakes, link natural resource areas for native species of birds, fish, pollinators and other wildlife. All of these connections help strengthen sense of place, support the movement of goods, people and wildlife, encourage active lifestyles and improve ecological health.

But, many of Portland's valuable natural resources are at risk. Urbanization has filled floodplains, causing seasonal flooding. Streams are unable to support healthy fish populations, and trees that reduce heat island effects and provide habitat are vulnerable to development. Without thoughtful intervention human and ecological health will suffer. This plan includes policies and investments to expand the public space system to increase mobility, access to services, and improve human and environmental health.

## How people get around the city, how roads are built and the amount of open space affects human and environmental health.

- Safe, accessible and attractive streets, trails, parks and open spaces encourage active living and community interaction. They also make activities like walking, biking and using public transit the easy choice.
- Driving less helps reduce household costs, improves personal and environmental health, and helps lower emissions.
- Access to open spaces and parks increases opportunities for recreation, relaxation and learning.
- A transportation network that integrates nature into neighborhoods increases access to the outdoors, provides corridors for wildlife movement, and helps manage and clean stormwater.



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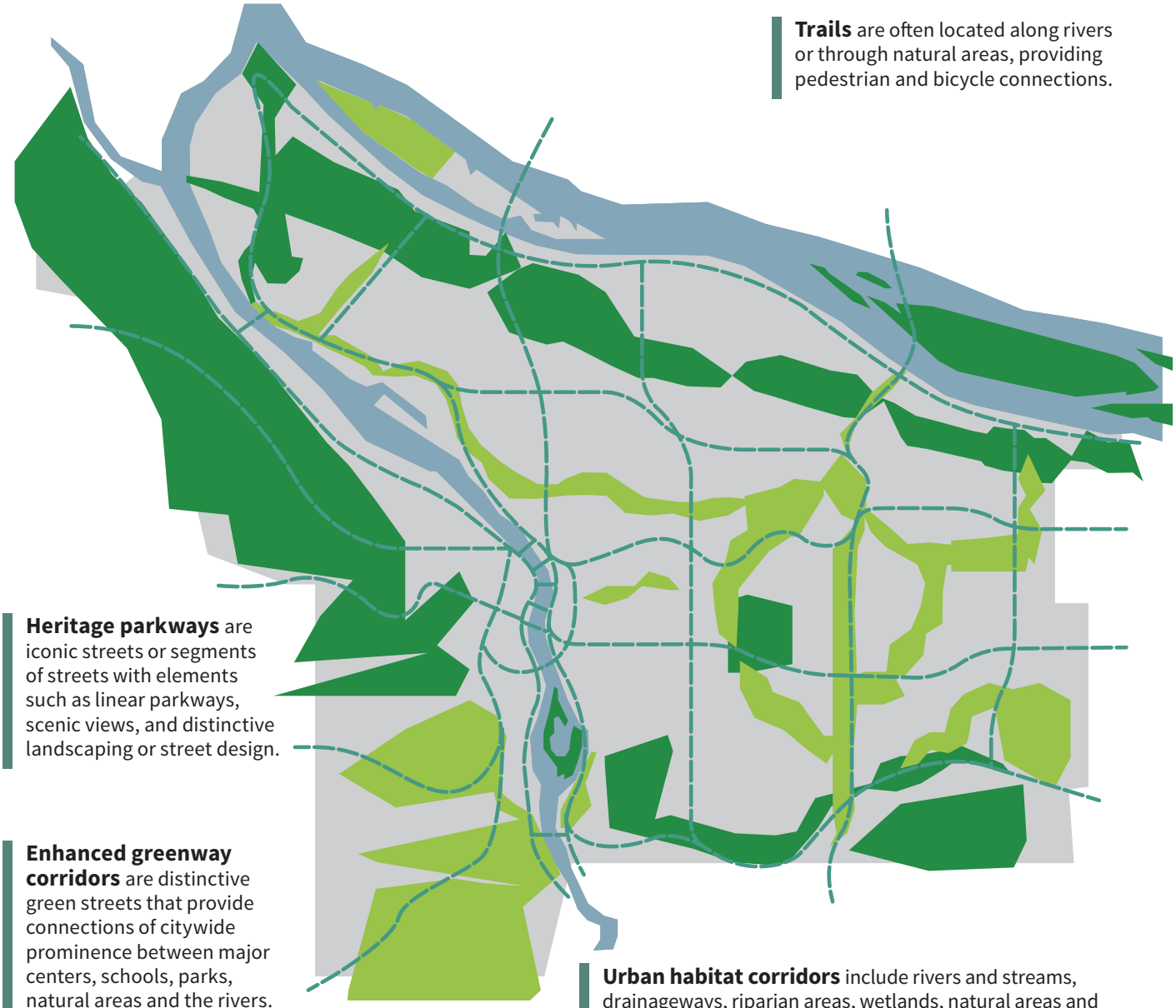
# Portland's greenway and habitat corridors

**City greenways and habitat corridors will expand Portland's system of streets, parks, trails, open spaces and natural areas to better connect people, places, water and wildlife. This network will also improve human and environmental health.**



**Trails** are often located along rivers or through natural areas, providing pedestrian and bicycle connections.

**Heritage parkways** are iconic streets or segments of streets with elements such as linear parkways, scenic views, and distinctive landscaping or street design.

**Enhanced greenway corridors** are distinctive green streets that provide connections of citywide prominence between major centers, schools, parks, natural areas and the rivers.

**Neighborhood greenways** are an extensive network of low motor vehicle traffic streets prioritized for bicycles and pedestrians, working in conjunction with the rest of the City Greenways system to extend the system into all neighborhoods.

**Urban habitat corridors** include rivers and streams, drainageways, riparian areas, wetlands, natural areas and upland habitats. There are two types of habitat corridors, existing and potential.

Existing corridors generally include and build upon areas identified in the City's Natural Resources Inventory. Potential corridors generally include areas outside those identified in the inventory, but are places where it would be beneficial to weave nature into the city and link to other habitat areas in the city and the region.



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**These natural and built areas provide safe, healthy places for resident and migratory fish and wildlife. They also clean and store water, reduce landslide and flooding risks; and provide places for people to learn, play and experience nature.**







*Natural resources can perform important services. They clean Portland's air and water, stabilize hillsides, soak up rainwater and manage flood waters, and they add to the sense of place and community.*

**Salmon, beaver, deer, elk and more than 200 species of birds — including bald eagles and peregrine falcons — live or travel through Portland.**

**Prior to European settlement, the Willamette River was used primarily by Native Americans for travel, trade, fishing and gathering plant materials.** Permanent and seasonal villages existed on both sides of the river to facilitate these uses, and many of these traditional uses are carried on today by local Native Americans.

Vegetation in bottomland and wetland forests was dominated by black cottonwood, Oregon ash and willow, along with shrubs, grasses and herbs. Denser, mixed-conifer forests of Douglas fir, big leaf maple, western red cedar, western hemlock, grand fir and red alder were in the West Hills, and some parts of the east terrace. Foothill savannas of Oregon white oak and other trees were found on the east side of the river.



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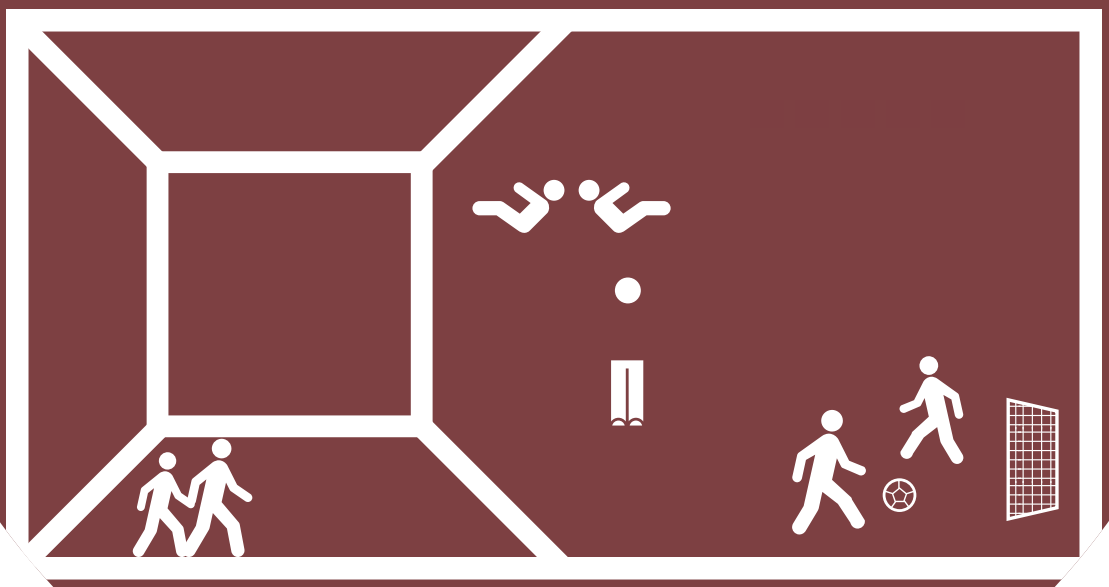
··· COMPREHENSIVE PLAN UPDATE ···

KEY DIRECTION

# 5 Provide Reliable Infrastructure to Equitably Serve All Parts of the City





Ord. 187831, Vol. 2.4.C, page 9870

# Build, maintain and upgrade public facilities.

## High quality basic services are essential to Portland's future success.

Infrastructure , like sidewalks, developed streets, stormwater management systems and parks and open space, ensure that Portlanders can move around the city recreate, drink clean water and have reliable sewer service. They also help protect the environment and support the city's economy. However not all communities in the city have access to basic services. Disproportionately, low-income households and Portlanders of color have inadequate services.

Portland's population is expected to grow over the next 20 years by more than 120,000 households. The City will need to maintain, upgrade and expand existing transportation, parks, water, sewer, stormwater and public safety systems to make sure they meet the needs of current and new residents and businesses.

Filling gaps in service is key to addressing equity. In the 2035 Comprehensive Plan, the City of Portland is declaring an intention to reduce disparities and increase opportunities for more people by investing in infrastructure.

The List of Significant Projects and the Citywide Systems Plan are two documents that directly relate to infrastructure.

- **The List of Significant Projects** includes the City's planned infrastructure projects for the life of the Comprehensive Plan. These investments are necessary to meet the transportation, sewer, stormwater and water needs of Portland's current and future residents and businesses.
- **The Citywide Systems Plan** guides infrastructure investments to address deficiencies, maintenance needs and safety risks. It includes the state mandated public facilities plan to provide public facilities to serve a growing population.



## What is infrastructure investment and why is it important?

The City of Portland owns and maintains numerous facilities, including water pipes and reservoirs; stormwater swales and sewers; parks, streets and trails. These are basic systems needed to protect the health, safety and well-being of Portland households and businesses.

The ability to meet these basic needs is critical. The City's infrastructure assets are valuable and represent generations of investment. They also require maintenance, repair and attention. In some areas, they have eroded due to years of disinvestment.



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# Caring for Portland's infrastructure

**There are three types of core infrastructure concerns that service providers must always consider:**

1. **System maintenance —** Take care of existing infrastructure so it can continue to meet community needs and work efficiently.

2. **System deficiencies —** Determine where systems do not meet basic levels or needs, and analyzing who is and is not being served. It is also about meeting state and federal requirements.

3. **Future needs —** Assess which facilities need to be upgraded or replaced to avoid major problems or to meet growing demand.

**As Portland continues to grow up rather than out, maintaining existing infrastructure becomes increasingly important.**

**Using an equity lens when making infrastructure decisions.** Progress can be made on infrastructure equity by employing a decision-making process including an equity analysis of Portland's past decisions and challenging unconscious assumptions about how the City works.

Equity considerations can be incorporated throughout the infrastructure decision-making process — from long range plans, like the Citywide Systems Plan, through project design and implementation. This approach considers a series of questions related to who benefits from an investment, who is burdened, who pays and who decides.

Several City bureaus are now taking the first step to develop tools to help ask and answer such questions. An equity lens helps identify opportunities to prioritize where and when the City invests in infrastructure to ensure that low-income communities, communities of color and people with disabilities have equitable access, especially to sidewalks, parks and safe streets.

**Addressing gentrification and displacement.** Neighborhood improvements are often accomplished through public and private investments that increase a neighborhood's livability. This can benefit existing residents through better access to shopping and services, improved neighborhood walkability and better transit service. This also will enhance a neighborhood's attractiveness to new residents. Greater demand for housing and commercial space can increase property values and costs for residents and businesses.

For many, neighborhood revitalization is a positive change. For others, it provokes concern that Portland is becoming less affordable. In some circumstances revitalization becomes gentrification where the negative consequences outweigh the benefits. These consequences include involuntary displacement of lower income households and a change in the ethnic and racial make-up of a neighborhood's residents and businesses.

Gentrification and displacement are long-standing issues in Portland and will continue to be issues as the city grows. The relevant policies in the Comprehensive Plan include those that seek to preserve affordable housing and local businesses; increase the supply of affordable housing in gentrifying neighborhoods; and increase household and businesses assets to improve their ability to stay in their neighborhoods.



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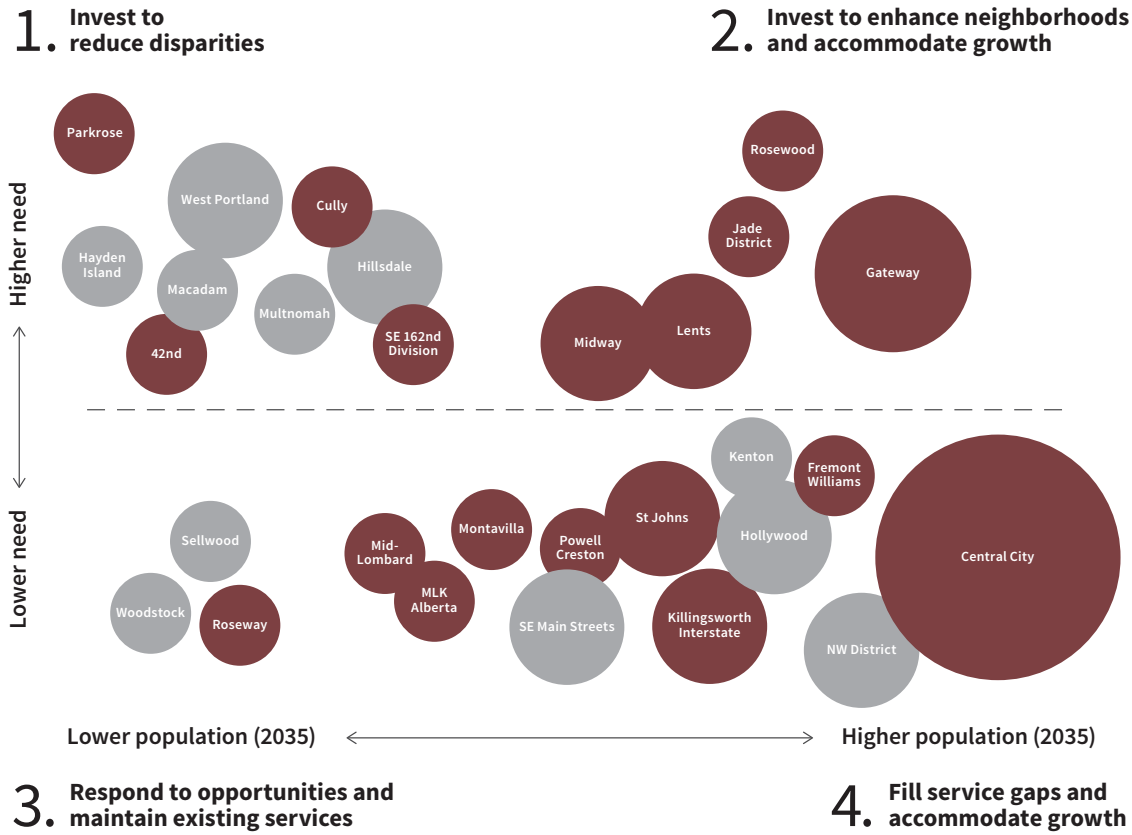
# Investment strategies for complete centers




*Circle sizes correspond to center types: Central City (largest), Gateway Regional Center, Town Center and Neighborhood Center (smallest). Darker circles indicate that the center includes higher than average concentrations of vulnerable residents, such as renters, communities of color, households with low median incomes and/or low education levels.*

## An intentional investment strategy is essential.

Portland's neighborhoods vary in size and local conditions. The Comprehensive Plan supports four investment strategies that tailor the type of investment to local needs and context.

1. **Invest to reduce infrastructure disparities and improve livability.** This strategy is appropriate for places that are not expected to grow significantly, but that have existing infrastructure deficiencies. Investments could fill gaps in streets, bicycle and pedestrian routes, and create local parks. Economic development programs could support existing and new businesses, and improve neighborhood prosperity and vitality.

2. **Invest to enhance neighborhoods, maintain affordability and accommodate growth.** This strategy is aimed at places that lack basic infrastructure or services and that have many residents now, or will in the future. Investments could include improving streets, creating new parks, and addressing other deficiencies. Economic development programs could preserve and increase jobs, businesses and community services in the area.

3. **Invest to respond to opportunities and maintain existing services.** In these areas, investments focus on maintaining livability and existing infrastructure as well as responding to opportunities.

4. **Invest to fill service gaps, maintain affordability and accommodate growth.** Some places have already benefited from public and private investments in things like light rail, complete streets and neighborhood business districts. Future investments should focus on making sure that infrastructure can serve new residents by filling remaining service gaps and providing affordable housing.



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KEY DIRECTION

# 6 Improve Resiliency





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# Prepare for climate change and reduce risks posed by natural hazards.

## Portland currently faces many natural hazards — including floods, landslides, fire and earthquakes — which could have environmental, economic and social impacts.

Certain populations, including low-income households, communities of color, renters and older adults may be less able to prepare for and recover from impacts from natural hazards and climate change. Intentional decisions to reduce risk for all, but particularly vulnerable populations, is critical to increasing equity and safety.

**Encourage growth in lower-risk areas.** Focusing growth in centers and corridors and reducing density in parts of East and West Portland, where there are greater risks for landslides and floods, will help improve safety and resilience.

A significant earthquake could also threaten lives and seriously affect Portlanders for an extended period of time. In cases where risks can't totally be avoided, zoning and building codes often require additional measures to further reduce risk. For example, building codes for new buildings help improve earthquake safety. Similarly, building in an area with a steep slope may require additional engineering studies and construction practices to minimize landslide risks.

**Develop green infrastructure.** Trees, natural areas, stormwater swales and open spaces make up what is referred to as Portland's green infrastructure. Green infrastructure helps 1) minimize risks from flooding and landslides, 2) cool the city — reducing the impacts from urban heat island effects, and 3) create an overall healthier and more pleasant environment for people.

**Invest to reduce risks.** The city's ability to withstand and respond to natural disasters depends heavily on the strength and resilience of the street, bridge and water systems. Improvements are planned to protect Portland's critical infrastructure services such as drinking water, sewage treatment and bridges. These systems are necessary to protect Portlanders' safety and security and support the region's economy.

- **Backup systems:** Many of Portland's infrastructure investments help build resilience through flexibility and redundancy. For example, infrastructure investments planned for Portland's secondary groundwater supply in outer northeast Portland enables water to be provided when the primary Bull Run system needs to be supplemented.
- **Complete neighborhoods:** Investments to create complete neighborhoods, including multi-modal streets, grocery stores and parks, can help improve the community's resilience to natural hazards by providing access to local services, offering multiple ways to get around and fostering community connections. Parks, community centers and other public buildings can also play a role in emergency response — as locations for cooling centers, emergency shelters and communication centers.

## Resilience is important in the face of change. Planning and investing to reduce risk and vulnerability will increase Portland's ability to withstand and bounce back from environmental, economic and social challenges that may result from major hazardous events. And, it will enable Portland to become stronger over time.



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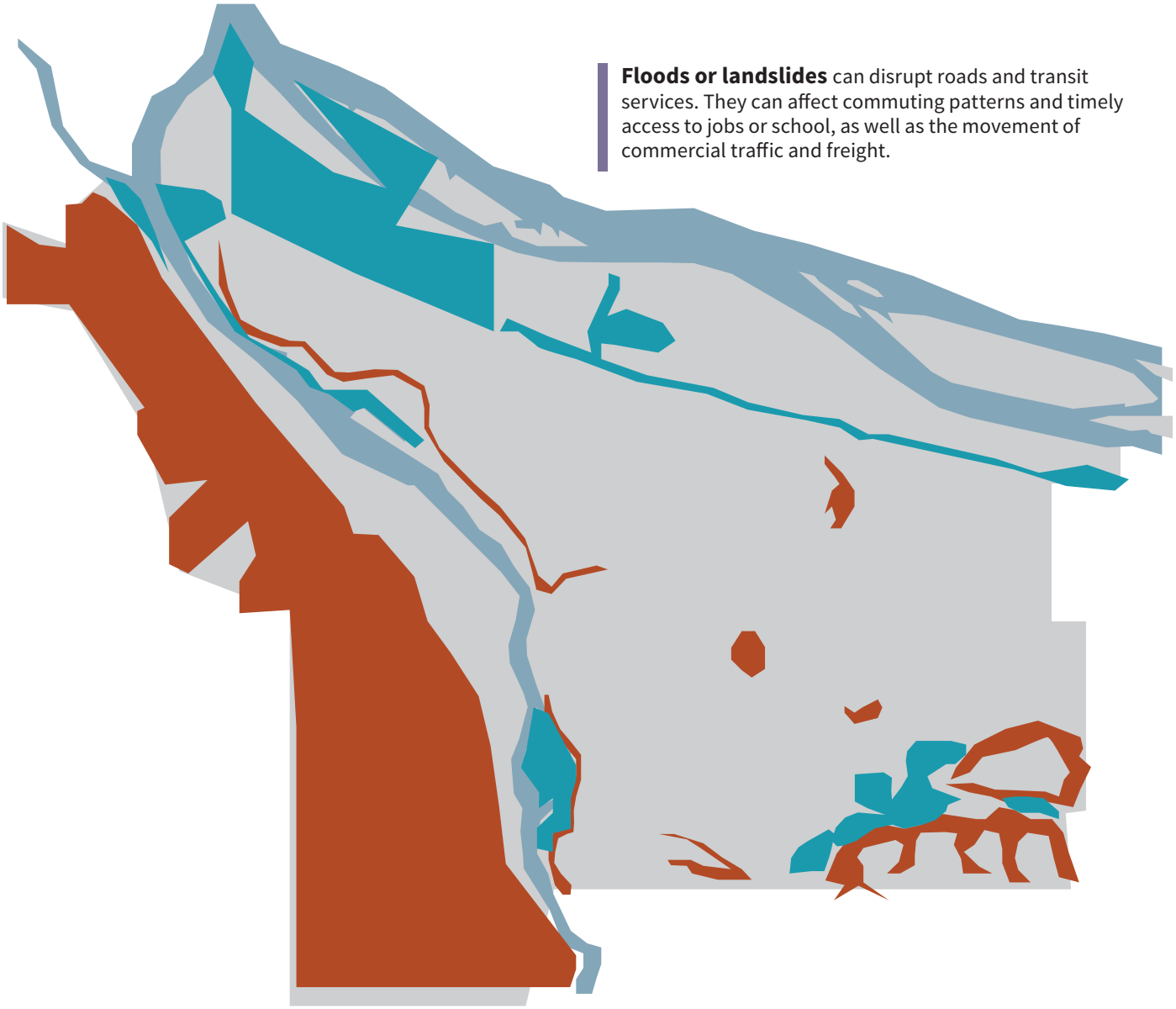
## Managing risk improves resiliency

**Effectively managing risks involves assessing the likelihood that a natural hazard will occur, as well as the potential consequences, such as injury or fatalities, environmental degradation, or economic loss.**



**Floods or landslides** can disrupt roads and transit services. They can affect commuting patterns and timely access to jobs or school, as well as the movement of commercial traffic and freight.



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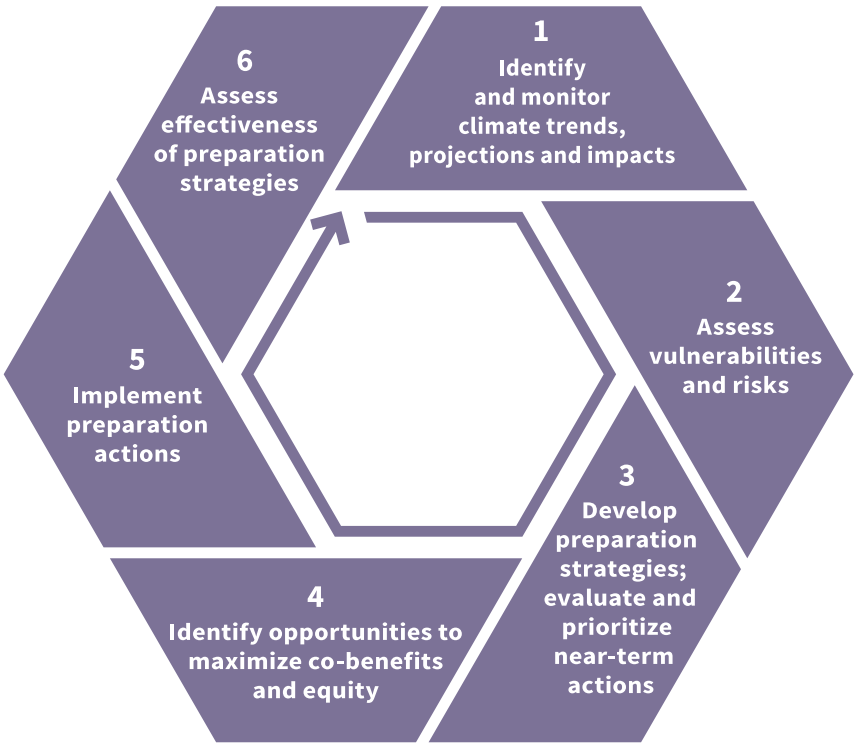
## Climate change presents an unparalleled challenge

**Climate change needs to be routinely considered in virtually all aspects of the City's work, including setting policy, making budget decisions, updating code, investing in infrastructure, delivering health services, and preparing for emergencies.**

The 2035 Comprehensive Plan weaves policies and investments to respond and prepare for climate change throughout each component.

Portland's future climate will likely be characterized by hotter, drier summers with more heat waves (increasing the urban heat island effect and wildfires); and warmer, wetter winters (increasing the incidence of flooding and landslides).




*This diagram summarizes the adaptive management planning process the City of Portland is using to prepare for climate change.*

## Land use policies and infrastructure investments can be used to:

- Reduce carbon emissions from transportation and buildings.
- Ensure effective emergency and disaster response by maintaining and building new, stronger and more resilient infrastructure and public buildings.
- Protect vulnerable populations from hazards.
- Provide room to manage higher volumes of stormwater.
- Add greenspaces to help cool the city during hotter summers.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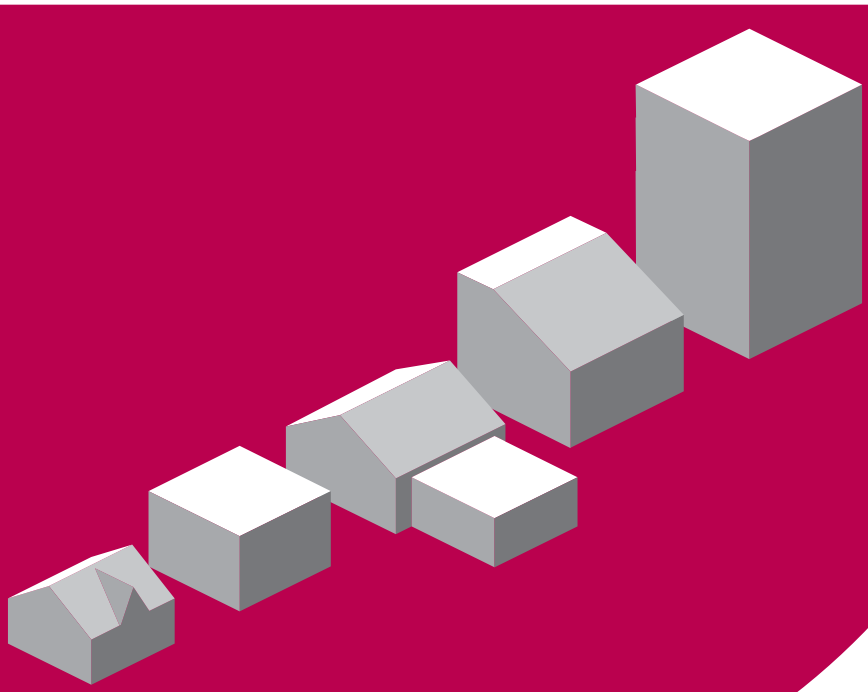
··· COMPREHENSIVE PLAN UPDATE ···

KEY DIRECTION

# 7 One Size Does Not Fit All





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# Plan and design to fit local conditions.

## As Portland grows in population and jobs, it will be essential to implement projects and programs that meet each area's specific needs.


Inner Neighborhoods


Eastern Neighborhoods


Western Neighborhoods


Central City


Rivers

**Portland has five major pattern areas: Inner Neighborhoods, Eastern Neighborhoods, Western Neighborhoods, Central City and Rivers. Each area has unique needs and characteristics.**



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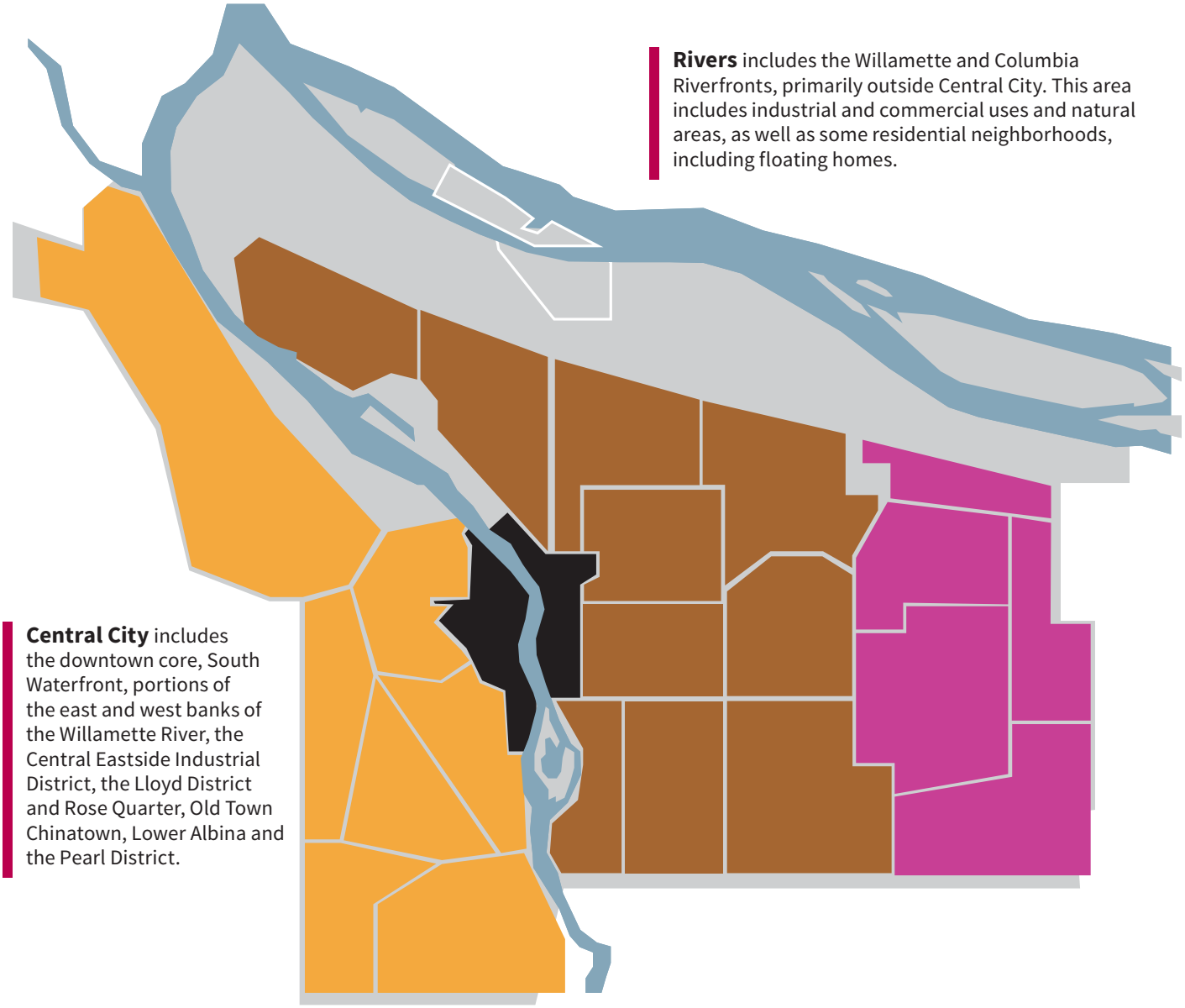
# Respect and enhance local context

**The diversity among Portland's Pattern Areas is part of what makes Portland vibrant and engaging for residents and businesses alike. Maintaining the unique identities of these areas will help keep Portland distinctive and captivating.**



**Rivers** includes the Willamette and Columbia Riverfronts, primarily outside Central City. This area includes industrial and commercial uses and natural areas, as well as some residential neighborhoods, including floating homes.

**Central City** includes the downtown core, South Waterfront, portions of the east and west banks of the Willamette River, the Central Eastside Industrial District, the Lloyd District and Rose Quarter, Old Town Chinatown, Lower Albina and the Pearl District.

**Western Neighborhoods** include all areas west of Central City, including the Portland Hills and extending into the Fanno and Tryon Creek basins.

**Inner Neighborhoods** extend from Lents to St. Johns to Northwest Portland. This area generally includes neighborhoods that were developed in an historical "streetcar era" pattern.

**Eastern Neighborhoods** encompass all of Portland east of Interstate 205 from the Columbia Corridor to Portland's southern and eastern boundaries. It also includes parts of the Cully and Brentwood-Darlington neighborhoods.



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**Central City** is the state's business and commercial center and an employment center for many Portland residents. It is home to major institutions and universities and is a regional cultural hub. Its mixed-use areas and connections to the regional multimodal transportation network, make it easier for downtown workers and the quickly growing number of residents that walk, take transit or bike to work to meet their daily needs.

New development should help the Central City continue to be the major center for job and household growth over the next generation. Its increasing residential population will need more diverse housing options, public school capacity and community facilities, as well as continued investment in business and employment growth.

**Western Neighborhoods** have many parks, streams, ravines, forested hillsides and an extensive trail system that provide a unique green network. Residential densities are relatively low. Sidewalk and street connectivity is relatively poor.

New development in Western Neighborhoods should respond to the area's hilly topography, streams, ravines and forested slopes, and prevalent views. The area could benefit from stronger local-serving walkable commercial hubs, better pedestrian and bike connections, and restored habitat corridors.

**Eastern Neighborhoods** have a mix of urban and suburban development, towering Douglas Firs and buttes. The area has a significant concentration of households with children, but has poor street and sidewalk connections and a lack of developed neighborhood parks and local services.

New development in Eastern Neighborhoods should enhance the area's distinctive mix of building types, improve connectivity, and integrate natural features, like buttes, streams and large native trees. The area could benefit from stronger neighborhood business districts, improved pedestrian and transit access, and improved parks.

**Inner Neighborhoods** have many local business districts, compact development, and street and sidewalk connectivity, giving them great potential to be places where most residents can walk or bike to neighborhood hubs. Improvements should try to minimize residential and commercial displacement and provide additional affordable housing options.

New development should enhance the fine-grain, pedestrian-scaled built environment. In Inner Neighborhoods that are closest to the Central City, new development should take advantage of this proximity with increased densities, while at the same time working to enhance and preserve identified historic and cultural resources. Traffic and parking will need active management throughout the Inner Neighborhoods.

**Rivers** are the primary form giving feature of the region. Human settlement began along and at the confluence of the Willamette and Columbia rivers because the rivers offered plentiful food and natural resources and critically-important trade and transportation functions. After white immigrants began moving to the area, the settlement grew into the city of Portland. As the city's initial form-giving features, the two rivers have continued to shape the city over time.

Today, the Willamette and Columbia rivers continue to serve multiple functions and roles. They:

- Are features of significant historic and cultural significance to Native American tribes and others throughout the region.
- Serve as essential industrial transportation corridors that support the local and regional economy.
- Support recreational, subsistence and commercial fisheries.
- Provide important habitat for resident and migratory fish and wildlife.
- Are important scenic, recreational and transportation amenities for Portlanders and visitors.

New development along the rivers must balance the complex role of the river — from recreation to employment to habitat and transportation.


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# Share your feedback with the Planning and Sustainability Commission

## Provide testimony online via the MapApp, by email, letter or in person.

| | |
|---|---|
| **ONLINE VIA THE MAPAPP** | **www.portlandoregon.gov/bps/mapapp** |
| **EMAIL** | *Send to* **psc@portlandoregon.gov**<br>*with "Comprehensive Plan Testimony" in the subject line.*<br>*Be sure to include your name and mailing address.* |
| **LETTER** | *Send a letter with your comments to:*<br>**Planning and Sustainability Commission**<br>**1900 SW 4th Avenue**<br>**Portland, OR 97201-5380** |
| **IN PERSON** | *Attend a public hearing to offer oral testimony directly to the Planning and Sustainability Commission:*<br>**September 23, 2014 at 5 p.m.**<br>(Focus on Goals and Policies)<br>1900 SW 4th Avenue, Room 2500A<br>**October 14, 2014 at 5 p.m.**<br>(Focus on Maps)<br>Community location TBD<br>**October 28, 2014 at 5 p.m.**<br>(Focus on Maps)<br>Community location TBD<br>**November 4, 2014 at 4 p.m.**<br>(Focus on Citywide Systems Plan and Transportation System Plan)<br>1900 SW 4th Avenue, Room 2500A |

*To be considered formal testimony, you must include your name and address in your letters, emails or online comments. Comments received without your full name and mailing address will not be included in the Planning and Sustainability Commission's record, and the City will not be able to notify you of City Council hearing dates. In addition, if your name does not appear in the record for this proceeding, you may be precluded from appealing the Council's final decision.*

*Check www.portlandoregon.gov/bps/compplan for updated information on these and other events.*

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··· COMPREHENSIVE PLAN UPDATE ···

# About the Comprehensive Plan

**Portland's Comprehensive Plan is a long-range land use and public infrastructure investment plan (2015–2035).**

**It guides land use development and growth-related infrastructure investment decisions so that Portland can become more prosperous, healthy, equitable and resilient between now and 2035.**

The Comprehensive Plan is an essential document that distills the City's land use goals and aspirations. Through maps, visuals and text the plan outlines what Portland will look like in 2035 and provides a framework to get there.

The Comprehensive Plan components are intended to direct land use decisions and public infrastructure investments. The Comprehensive Plan does not prescribe the details of individual programs, regulations or other strategies that are needed to achieve its broad goals. It also does not rank policies or goals. Rather it addresses a wide range of topics, and the individual costs, benefits and burdens of decisions will need to be weighed and evaluated on a case-by-case basis.

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# WHAT IS IN THE COMPREHENSIVE PLAN?

## The Comprehensive Plan includes components that work together to guide the City of Portland's land use and infrastructure investment decisions.

1. **Goals and Policies —** Goals are long-term outcomes the City hopes to achieve by implementing the Comprehensive Plan. They are aspirational, expressing Portlanders' collective desires and values. Policies set preferred direction and describe what must be done to achieve these broad goals. They are specific enough to help determine whether plans would advance the values expressed in the goals. The goals and policies also include principles that guide how decisions are made.

   Together, the goals and policies guide future public decisions about development and investments. The goals and policies are published together in one document that is organized into ten different topics.

2. **List of Significant Projects —** The list includes the City's planned infrastructure projects for the life of the Comprehensive Plan. These investments are necessary to meet the transportation, sewer, stormwater and water needs of Portland's current and future residents and businesses.

3. **Comprehensive Plan Map —** This map establishes land use designations for all land in Portland's Urban Services Boundary. It shows desired development intensity and where various uses (residential, commercial, etc.) will be allowed. It is the basis for the Zoning Map. A copy of the Comprehensive Plan Map is included in this document. Additional explanatory maps are provided under separate cover.



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4. **Transportation System Plan —** The Transportation System Plan (TSP) is the 20-year plan to guide transportation investments in Portland. The TSP meets state and regional planning requirements and addresses local transportation needs. It includes:

- Policies that guide the maintenance, development and implementation of Portland's transportation system.
- A list of projects and a financial plan that will accommodate 20 years of population and employment growth.
- Master Street Plans and modal plans.
- Strategies and regulations for implementation, including street classification maps.

**Elements of the TSP —** The policies, street classification maps and the street plan maps in the TSP are adopted as part of the Comprehensive Plan. The TSP is adopted concurrently with the Comprehensive Plan, but published under a separate cover. For ease of use and transparency, the citywide policies from the TSP are also included in Chapter 9 (Transportation) of the Comprehensive Plan Goals and Policies and are also part of the Comprehensive Plan. The TSP also includes additional sub-policies and area-specific policies.

The TSP is both an implementation tool and a supporting document to the Comprehensive Plan. The TSP contains the transportation element of the City's Public Facilities Plan, and the List of Significant Projects. The TSP also provides more detail than the Comprehensive Plan by including additional supporting information about transportation system conditions. Figure 9-1 illustrates the relationship between the TSP and other policies and plans.

**Citywide Systems (Infrastructure) Plan —** The Citywide Systems Plan (CSP) includes information on current and future transportation, water, sanitary sewer, and stormwater infrastructure needs and projects. A portion of the CSP is the City's public facilities plan, which is a state required plan and a supporting document of the Comprehensive Plan. The Citywide Systems Plan also includes information for parks and natural areas, recreation, and civic facilities, this information is not a part of the public facilities plan. This document is provided under separate cover.



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# WHEN AND HOW IS THE COMPREHENSIVE PLAN USED?

## There are a variety of situations where one or more of the Comprehensive Plan components must be used.

**The Comprehensive Plan applies to plans, and investments that are considered "land use decisions" and that are located within the City of Portland limits or Portland's Urban Service Boundary.**

The information that follows generally describes how the Plan is used and who most often uses it.

### City of Portland

The City of Portland must use the Comprehensive Plan when making certain decisions, but it may be used to inform a wider array of choices and actions. Mandatory uses are described below.

1. **Legislative Planning Project —** Legislative projects establish area plans, zoning, development standards, and/or other land use and physical investment related regulations. These projects typically affect large parts of the city and affect many people. They are adopted by the City Council by ordinance. The Comprehensive Plan must be used to scope, develop, assess alternatives, and make findings of support. This applies to long-range land use planning and policy development projects, such as area-specific plans and Citywide land use policy projects. These include updates to the Zoning Code or area plans, like the Central City 2035 Plan. These types of projects are called legislative projects.

2. **Quasi-Judicial Projects —** Quasi-judicial projects are land use reviews that require detailed review for compliance with specific approval criteria contained in the Zoning Code. These are smaller site-specific projects that affect a small part of the city (often limited to one property or site that is subject to development) and fewer people. Examples include amendments to the Comprehensive Plan Map proposed by a private property owner, proposals to demolish historic landmarks, Greenway Goal Exceptions, Type IV Demolition Reviews, or requests for street vacations, among others.

   The Zoning Code establishes which types of land use reviews must be reviewed for compliance with the Comprehensive Plan. With few exceptions quasi-judicial projects are approved using criteria established in the Zoning Code. In limited cases, the Zoning Code criteria may require direct findings of compliance with the Comprehensive Plan.


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3. **Urban Renewal Areas —** Urban renewal is a state-authorized, redevelopment, and finance program designed to help communities improve and redevelop areas that are physically deteriorated, suffering economic stagnation, unsafe, or poorly planned. Between its establishment in 1958 and the development of this Comprehensive Plan, as the City's urban renewal agency, the Portland Development Commission has managed 25 urban renewal areas and/or programs. If new urban renewal areas are proposed in Portland, the proposal must conform to the Comprehensive Plan.

4. **Infrastructure Project Selection —** The List of Significant Projects identifies major sanitary and stormwater, water, and transportation infrastructure projects and programs needed to support anticipated housing and employment growth through the life of the plan — in this case, 2035. Only projects on the list may be carried out. If the City wants to take on a growth-related project that is not on the list, the list must be amended. The City may carry out other projects to maintain and repair existing infrastructure, or to comply with state and federal regulations. These projects are not subject to the Comprehensive Plan.

5. **Other Agencies —** State agencies may refer to the plan when determining if a State of Oregon project is consistent with the local Comprehensive Plan.

## Community members

The Comprehensive Plan is also a community tool that is often used for advocacy purposes. Community members are also encouraged to use the plan to monitor City projects and decisions. Community members may choose to use the Comprehensive Plan to:

- Advocate for projects and programs to be included in the annual City budget.
- Review, evaluate, and comment on proposed legislative projects.
- Review, evaluate, and comment on Comprehensive Plan-related projects and programs.
- Review, evaluate, and comment on site-specific land use reviews that are subject to Comprehensive Plan review.
- Support or appeal approved land use reviews and legislative projects.
- Apply for a change to the Comprehensive Plan Land Use Map designation for a property they own, apply for a street vacation, or apply for any other land use approval for which a project must be reviewed for compliance with the Comprehensive Plan.
- As background information when applying for grants, funding, or other programs.
- As a reference when a regulation in the Zoning Code requires interpretation.


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# WHY DID PORTLAND DEVELOP A NEW COMPREHENSIVE PLAN?

## There are two key reasons why Portland developed a new Comprehensive Plan:

- It has been nearly 35 years since Portland developed its first Comprehensive Plan in 1980. Conditions and needs in Portland have changed significantly since then.
- Oregon has a Statewide Planning program that requires the creation of local Comprehensive Plans and periodic updates to those plans. In November 2007, the Oregon Department of Land Conservation and Development (DLCD) informed the City that its Comprehensive Plan was due for an update, called Periodic Review. DLCD has the authority to compel a local jurisdiction to enter Periodic Review under Oregon Revised Statutes (ORS) 197.628 to 197.650 and Oregon Administrative Rules (OAR) 660-25.

### Changing Conditions

The City of Portland adopted its first Comprehensive Plan in 1980. Since 1980, Portlanders have worked hard to build strong neighborhoods and approached land use, transportation, economic development, greenspaces, and human welfare holistically. Portlanders cleaned up the Willamette River, built parks and light rail lines instead of freeways, and have taken significant action to dramatically reduce per capita carbon emissions.

Although the City of Portland has incrementally revised, expanded, and improved the plan since 1980, as a whole the policies, development approaches, and investments that served Portlanders in the past may not provide all the direction needed today. It is time for a new plan.

Portland is growing and diversifying.

- Over the past 30 years Portland's population grew by nearly 240,000 residents, increasing from 366,000 to more than 600,000. The city's land area grew, too. By annexing large parts of East and West Portland, the city's area grew by more than 36 square miles, between 1980 and today.
- Portland is becoming a more diverse city. For most of its history, the City of Portland was an overwhelmingly white city, but as population has increased, so has Portland's racial and ethnic diversity. In 1980, communities of color made up 15 percent of the total population. That share grew to 27 percent by 2010. That same year, the national average was 33 percent.
- When looking at the youth population (people 25 years old or younger), Portland's growing diversity is more pronounced. According to the 2010 US census, more than 36 percent of Portland youth are people of color — Black or African-American, Native American, Native Hawaiian, Pacific Islander, Native Alaskan, Asian, or multiracial. In addition, more than 18 percent of all youth identify as Latino or Hispanic.
- The new Comprehensive Plan must respond to and provide opportunities to include and better serve all Portlanders.



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## All Portlanders need to have access to affordable and healthy living options.

- People often describe Portland as an affordable and livable West Coast city. However, declining real income and increased housing costs put this reputation at risk. From 1979 to 2005 the average real adjusted gross income of the top fifth of Oregon households grew by 47 percent, but it stagnated or dropped for all other income groups. African-American and Native American household incomes continue to be less than half of the citywide median.
- During this time, home prices also increased at a greater rate than wages. In recent years, housing prices in Portland's Inner Neighborhoods — those with complete sidewalk networks and better access to transit — have risen sharply. Much of Portland's affordable family housing is now located in areas without sidewalks and without good access to frequent transit service.
- A key challenge for the future is to create a healthy and connected city. A healthy connected city is a place where all Portlanders have access to affordable housing, healthful food, services, and parks and open spaces. It is also a place where people can safely and easily walk, bike, roll, or take transit to work and to complete daily errands.

## Household and business prosperity is essential for a successful city.

- Forecasts indicate that by 2035 Portland may add nearly 140,000 jobs. (For comparison, in 2010 there were approximately 389,000 jobs in Portland.) These new jobs will be distributed across the industrial, institutional, retail, and office sectors.
- Although there is more than enough appropriately zoned land for new retail and office jobs in main street commercial areas, Gateway, and the Central City, there are fewer opportunities for growing institutions and industrial businesses. There is an industrial land shortfall and a slight institutional land shortfall. This Comprehensive Plan identifies ways to aid institutional and industrial job growth.

## Resilience is important in a changing world.

- Portland faces many uncertainties, including the impacts of climate change and natural and human-made hazards.
- Portland has successfully reduced per person carbon emissions by more than 30 percent since 1990. And even though the population has grown by 30 percent since 1990, total community-wide emissions have dropped by more than 11 percent. But more work is needed. Climate scientists estimate that, by 2050, global carbon emissions must decline 50 to 85 percent below 2000 levels to avert significantly increased temperatures, extreme weather, rising sea levels and other potentially catastrophic impacts.
- Portland's bridges, schools, roads, and parks need repair and attention. Some areas of the city do not have complete stormwater management systems. There are also many streets without sidewalks and bridges, and roads and schools that are not built to withstand a major earthquake.
- Portland needs well-designed, flexible, and strong physical, social, and economic infrastructure to adapt and thrive. The Comprehensive Plan is designed to address land use and physical infrastructure investments to increase prosperity, health, equity, and resilience.


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## Oregon's Statewide Planning Program

The Comprehensive Plan is a state-mandated plan. Since 1973, Oregon has maintained a statewide planning program. This program is built on a set of 19 Statewide Planning Goals that cover a wide range of topics. Oregon's planning program is a partnership between state and local governments.

The State of Oregon, through the Land Conservation and Development Commission (LCDC) and the Department of Land Conservation and Development (DLCD), adopts the Statewide Planning Goals that set standards for local planning and monitors local compliance with the Statewide Planning Goals.

Local governments (cities, counties, Metro, and some special districts) do the planning through the creation and implementation of local Comprehensive Plans. Every jurisdiction in the State of Oregon is required to complete a Comprehensive Plan that complies with the Statewide Planning Goals.

The Land Conservation and Development Commission notifies local jurisdictions when it is time to update all or part of a Comprehensive Plan. This notification is called "Periodic Review." According to the State, the fundamental purpose of Periodic Review is to ensure that local comprehensive plans are:

- Updated to respond to changes in local, regional, and state conditions;
- Coordinated with other comprehensive plans and investments; and
- In compliance with the statewide planning goals, statutes and rules.

### Statewide Planning Goals

1. Citizen Involvement
2. Land Use Planning
3. Agricultural Lands
4. Forest Lands
5. Natural Resources, Scenic and Historic Areas, and Open Spaces
6. Air, Water and Land Resources Quality
7. Areas Subject to Natural Hazards
8. Recreational Needs
9. Economic Development
10. Housing
11. Public Facilities and Services
12. Transportation
13. Energy Conservation
14. Urbanization
15. Willamette River Greenway
16. Estuarine Resources
17. Coastal Shorelands
18. Beaches and Dunes
19. Ocean Resources

The City of Portland is subject to all goals, except 3, 4, 16, 17, 18, and 19. The City's Comprehensive Plan must demonstrate compliance with all remaining goals. During this Comprehensive Plan update, the City was specifically required to, at a minimum, address goals 1, 2, 9, 10, 11, and 14 and was directed to address goals 5 and 7 during the research and inventory phase of the plan update process.

### Regional Planning and Coordination

In addition to complying with the applicable Statewide Planning Goals, Portland's Comprehensive Plan must be consistent with two regional plans and implementing regulations established by Metro: the Regional Transportation Plan and the Urban Growth Management Functional Plan. Metro is the Portland metropolitan area's regional government. It is authorized to coordinate and plan investments in the transportation system for the three-county area that includes Multnomah, Clackamas, and Washington counties.


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# HOW IS A COMPREHENSIVE PLAN DEVELOPED AND APPROVED?

**There are multiple steps that must be taken to update a Comprehensive Plan, consistent with the requirements of Periodic Review, and have it approved by the State of Oregon.**

Below is a summary of Portland's process for updating the Comprehensive Plan.

## Assessment

The first step of Periodic Review is assessing the adequacy of the existing plan and background data to determine if conditions have changed enough to require the development of a new Comprehensive Plan or updates to portions of the Comprehensive Plan. The 2008 assessment showed that a significant update to the City's Comprehensive Plan, including new background information, was needed. This direction ultimately resulted in the development of new Comprehensive Plan Goals and Policies, and a substantial update to the Comprehensive Plan Map.

## Periodic Review Work Plan

The next step in Periodic Review is the development of a work plan. As part of periodic review, the City is required to develop and adopt a work plan to guide the update of the Comprehensive Plan. In 2008, after review and recommendations by the Planning and Sustainability Commission, the Portland City Council adopted a work plan (City Council by Resolution No. 36626. This document includes Resolution 36626, the Council-approved Periodic Review Work Program & Public Involvement Plan (August 6, 2008)) for Periodic Review of the Comprehensive Plan.

## Factual Basis

After the work plan is adopted, the next step is the development of a factual basis, as required by ORS 197.625 and OAR 660-0025. The purpose of this work is to provide a thorough and current analysis of existing conditions in Portland on which to base the content of the Comprehensive Plan. The factual basis includes the following documents:

- Economic Opportunities Analysis
- Housing Needs Analysis
- Natural Resource Inventory
- Infrastructure Condition and Capacity
- Buildable Lands Inventory

The factual basis was adopted by the City Council in October 2012, and all but one of the reports was acknowledged by the State in May 2014. The Economic Opportunities Analysis is being revised by the City and will be re-submitted in 2015.



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## Growth Scenarios and Alternatives Analysis

In the Buildable Lands Inventory Report published in 2012, the City analyzed existing development patterns and intensity, land and development values, and existing land use designations and zoning to determine where there is vacant land and land that is likely to be redeveloped. The report identifies constraints, such as inadequate infrastructure services or natural hazards. The Growth Scenarios Report offers a basis for making informed decisions about which investments and growth patterns will bring the greatest benefit to the most Portlanders, and move the city closer to meeting performance goals. Performance goals include things such as reducing carbon emissions, improving access to living-wage jobs, and providing safe and convenient access to goods and services within walking distance of where people live.

The Growth Scenarios Report uses information from the Buildable Lands Inventory and measures the performance of different possible growth alternatives, and how those choices may impact our ability to meet the Measures of Success adopted with the Portland Plan. Based on analysis in the Growth Scenarios Report, a "preferred scenario" was developed. The proposed Comprehensive Plan Map implements that preferred scenario.

## Working Draft (Part 1 and Part 2)

A Working Draft of the Comprehensive Plan was prepared in 2013. The Working Draft was shared with the public at meetings and events and online. The Working Draft Part 1, which included the Urban Design Framework and the Goals and Policies, was released for public review in January 2013. The Working Draft Part 2, which included the Comprehensive Plan Map and the Citywide Systems Plan, was released for public review in October 2013.

## Proposed Draft

This current draft is the Proposed Draft Comprehensive Plan. The Proposed Draft was developed based on feedback received from the Working Draft. It will be reviewed and refined by the community and the Planning and Sustainability Commission at public hearings.

## Recommended Draft

The Recommended Draft is a version of the plan that includes all changes to the Proposed Draft that are approved and recommended by the Planning and Sustainability Commission. It will be forwarded to the City Council at public hearings and adoption. It will be published after the Planning and Sustainability Commission completes its review of the plan, probably in the first half of 2015.

## Adopted Plan

The Adopted Plan is the final version of the plan that includes all changes directed by the City Council and that has been adopted by the City Council by ordinance.



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## Early Implementation

The final step in the state-required Periodic Review process is updating city codes and zoning maps to be consistent with the new Comprehensive Plan. There are currently eight Early Implementation Projects:

| Project | What Will It Do? | Outcomes |
|---|---|---|
| **Zoning Map Updates** | Change official zoning maps to be consistent with the new Comprehensive Plan Map. | Amended Zoning Maps |
| **Mixed Use Zoning** | Develop new mixed-use planning and zoning designations in Portland's commercial and central employment zones. | New Zoning Code chapter |
| **Institutional Zoning** | Develop new campus institution zoning procedures and standards, and identify infrastructure investments that could facilitate institutional employment growth. | New Zoning Code chapter |
| **TSP Implementation** | Adopt implementation measures associated with the Transportation System Plan. | Amendments to Zoning Code and Title 17 regulations as necessary, new street classification policy maps |
| **Community Involvement Program** | Update Community Involvement Manual and Zoning Codes. | Community Involvement Manual and potential Zoning Code amendments |
| **Industrial and Employment Land Supply** | Create a brownfield redevelopment program and update the zoning code to limit conversion of prime industrial land to other land uses. | Zoning Code amendments and brownfield program |
| **Intergovernmental Agreements** | Update agreements to comply with current state statutes and rules with all urban service providers within Portland's urban service boundary. | Intergovernmental Agreements |
| **Housekeeping Amendments** | Address changes that are not being included in larger Early Implementation projects. Examples of potential housekeeping changes include a variety of amendments to land use review approval criteria. | Zoning Code amendments |

## Acknowledgment

After the City Council adopts the Comprehensive Plan, the City of Portland will send the City's Final Draft to the Land Conservation and Development Commission (LCDC). LCDC must review and acknowledge that the Comprehensive Plan completed by the City meets all applicable State of Oregon requirements. Once the plan is approved by LCDC it is considered an acknowledged Comprehensive Plan and the changes in the plan can become effective.



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# WHEN AND HOW IS THE COMPREHENSIVE PLAN UPDATED AND AMENDED?

The Comprehensive Plan is a long-range plan to guide land use decisions for a generation. Given the breadth of the plan, its long-term planning horizon and the amount of work required to update the plan's components, the Comprehensive Plan is only updated periodically.

However, it is often necessary to update portions of the plan or to create more focused area plans. When smaller updates are completed or area plans like Central City 2035 are completed, they must be adopted as "post-acknowledgment plan amendments." Post-acknowledgment plan amendments are not sent to the Land Conservation and Development Commission.

## Implementing the Portland Plan

The Comprehensive Plan forwards Portland's strategic priorities through land use. Concurrently with the development of the Factual Basis, the City of Portland and numerous local, regional, state, and federal partners, developed a strategic plan, The Portland Plan.

Adopted in 2012, the Portland Plan set four shared strategies to guide the City's and other government agency actions in Portland over the next 25 years: (1) A Framework for Equity, (2) Thriving Educated Youth, (3) Economic Prosperity and Affordability, and (4) Healthy Connected City. The 2035 Comprehensive Plan is an implementing tool of the Portland Plan.



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··· COMPREHENSIVE PLAN UPDATE ···

# 2035 Comprehensive Plan Proposed Draft

# Goals and Policies

**July 2014**

**Portland's Comprehensive Plan Update**
**For more information, visit:**
**www.portlandoregon.gov/bps/pdxcompplan**

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**Chapter 1: The Plan and Guiding Principles**
Defines the breadth of content included in the Comprehensive Plan and provides principles that aim to realize the four key values of prosperity, health, equity and resilience

**Chapter 2: Community Involvement**
How and why the City works with the community in land use planning and decision making

**Chapter 3: Urban Form**
Policies that describe the city's overall development pattern and area character to inform and guide future investments and development

**Chapter 4: Design and Development**
Policies that encourage development and site design that respects context, minimizes risk and integrates nature into the urban environment

**Chapter 5: Housing**
Policies that will help Portland meet its need for quality, affordable homes for a growing and socioeconomically-diverse population, and to help ensure equitable access to housing

**Chapter 6: Economic Development**
Land development approaches to improve neighborhood prosperity as well as local competitiveness in regional markets, including more brownfield redevelopment, low-cost office development and institutional zoning

**Chapter 7: Environment and Watershed Health**
How land use and investment plans can help to protect investments in our watersheds, and help the City meet various regulations to protect public health and the environment

**Chapter 8: Public Facilities and Services**
Policies that support the equitable, efficient and adaptive management approaches needed to provide high-quality facilities and services to all Portlanders, including those in future generations

**Chapter 9: Transportation**
A multimodal transportation system that offers safe and affordable choices

**Chapter 10: Administration and Implementation**
Guidance on how to amend the Comprehensive Plan while maintaining consistency with the Plan's vision

# Chapter 1:
# The Plan and Guiding Principles

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Use Guiding Principles to inform all land use and capital improvement decisions.
- Provide direction on how to use the Comprehensive Plan to make land use and capital improvement decisions.
- Describe and codify the purpose and role of the Comprehensive Plan's components, supporting documents, and implementation measures.
- Define how each component of the Comprehensive Plan – the Urban Design Framework, the Goals and Policies, the Comprehensive Plan Map, and the List of Significant Projects – work together.
- Define the relationship between the Comprehensive Plan and regional plans, and between the Comprehensive Plan and implementation tools.
- Establish consistency within the Comprehensive Plan and consistency and coordination among agencies.



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## Why is this important?

The goals and policies within the Comprehensive Plan are designed to help Portland become a prosperous, healthy, equitable, and resilient city. This chapter defines the breadth of content included in the Comprehensive Plan. It describes both the scope and limit of the Plan's components and explains how and when supporting documents and implementing measures are used. This chapter also reminds users of the Guiding Principles, which aim to realize four key values: prosperity, health, equity and resilience.

The Comprehensive Plan is a long-range land use and public infrastructure investment plan to guide future growth, and the physical development of the City. A land use decision is one that has a significant impact on present or future land uses in the area. Land use decisions include, for example, zoning decisions, and adoption of growth-related infrastructure plans. The goals and policies in this Plan cover a wide variety of other topics, but they are all for the purpose of informing and guiding land use decisions.

When applying goals and policies to particular situations, such as specific development proposals or area plans, there may be competing or conflicting policies. Although it would be ideal to always meet each goal and policy, sometimes that is not possible, and it judged whether proposals or situations meet the goals and policies on balance. This approach recognizes that there are trade-offs and compromises, and allows flexibility while still guiding land use and capital decisions. The Guiding Principles provide an anchor or reference point to consider when making trade-offs and compromises.



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GOAL 1.B Regional partnerships
GOAL 1.C A well-functioning plan
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### Guiding Principles

## Policies

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# Goals

**Goal 1.A: Guiding principles**
Portland's Comprehensive Plan provides a framework to guide land use, development, and infrastructure investments. It is based on principles that call for actions and outcomes that meet the multiple objectives to ensure Portland is prosperous, healthy, equitable, and resilient.

**Goal 1.B: Regional partnership**
Portland's Comprehensive Plan acknowledges Portland's role within the region, and is coordinated with the policies of governmental partners.

**Goal 1.C: A well-functioning plan**
Portland's Comprehensive Plan is effective; internally consistent; consistent with city, local, regional, state, and federal regulations; and is updated periodically to be current and address mandates, community needs, and identified problems.

**Goal 1.D: Implementation tools**
Portland's Comprehensive Plan is executed through a variety of implementation tools, both regulatory and non-regulatory. Implementation actions are to be consistent with the Comprehensive Plan and are implemented in a coordinated and efficient manner. They are to protect the public's current and future interests. They are to balance the need for providing certainty for future development with the need for flexibility and the opportunity to promote innovation. Implementation tools are listed in Policy 1.8.



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## Guiding Principles

The Guiding Principles build the Portland Plan's key priorities of prosperity, equity, health, and resiliency into the Comprehensive Plan and its implementation. The Principles guide plans and investments that are subject to the Comprehensive Plan. The Principles encourage balanced, integrated multi-disciplinary approaches among topics such as housing, economic development, and transportation.

They are intended to be relevant to every action that updates or amends an element of the Comprehensive Plan or one of its implementation tools. Implementation tools for the Comprehensive Plan are identified in Policy 1.8.

**Guiding Principles.** When making and adopting legislative land use decisions, consider the impacts of:

- **Economic prosperity.** Encourage land use decisions that support a low-carbon economy and foster employment growth, competitiveness, and equitably-distributed household prosperity.
- **Human health.** Encourage land use decisions that avoid or minimize negative health impacts and improve opportunities for Portlanders to lead healthy, active lives.
- **Environmental health.** Encourage land use decisions that recognize, incorporate, and sustain valuable ecosystem services related to air, water, and land quality, and the intrinsic value of nature.
- **Equity.** Encourage land use decisions that reduce existing disparities, minimize burdens, extend benefits, and improve socio-economic opportunities for under-served and under-represented populations.
- **Resilience.** Encourage land use decisions that improve the ability of individuals, communities, economic systems, and the natural and built environment to recover from natural and human-made disasters, climate change, and economic shifts.

# Policies

## The Comprehensive Plan and supporting documents

This section identifies the core elements of the Comprehensive Plan and calls for the Plan and its supporting documents to be both internally consistent, and consistent with regional, state, and federal requirements. See *Figure 1 – Comprehensive Plan Package* at the end of this chapter.

**Policy 1.1** **Comprehensive Plan.** Maintain a Comprehensive Plan that includes the components listed below. Future work to maintain the Comprehensive Plan will generally respond to mandates, community needs, current information,



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or identified or potential land use problems, and will be based on the best available data, science, or analytical tools. Projects may be focused on a particular geographical area or may address a particular issue or set of issues, and may result in amendments to the Comprehensive Plan, a supporting document, or an implementation tool.

- **Goals and policies.** The goals and policies of the Comprehensive Plan, including the Urban design Framework, provide the long-range planning framework and guide for the development and redevelopment of the city.

- **Comprehensive Plan Map.** The Comprehensive Plan Map is the official long-range planning guide for defining the allowed, and in some cases desired, land uses and development in Portland. The Comprehensive Plan Map is a series of maps, which together show the boundaries of municipal incorporation, the Urban Service Boundary, and the land use designations.

- **List of Significant Projects.** The List of Significant Projects identifies the long-term infrastructure projects needed to serve the city we expect to be in 2035, including expected new housing and jobs. The Transportation System Plan (TSP) includes the transportation-related list of significant projects.

- **Transportation System Plan.** The Transportation System Plan (TSP) is the detailed long-range plan to guide transportation investments. The TSP ensures that new development and allowed land uses are consistent with the identified function and capacity of, and adopted performance measures for, affected transportation facilities. The policies, street classifications, and street plan maps within the Transportation System Plan are part of the Comprehensive Plan. Elements of the TSP function as a supporting document and implementation measure, as described below.



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**Policy 1.2** **Comprehensive Plan supporting documents.** Maintain the following Comprehensive Plan supporting documents. The supporting documents contain the factual information or infrastructure assessments that are used to develop the Comprehensive Plan goals and policies and are not an element of the Comprehensive Plan.

**1. Inventories and analyses**. The following inventories and analyses are supporting documents to the Comprehensive Plan:

- Economic Opportunities Analysis (EOA)
- Buildable Lands Inventory (BLI)
- Natural Resource Inventory (NRI)
- Housing Needs Analysis

**2. Public Facilities Plan**. The Public Facilities Plan (PFP) is a coordinated plan for the provision of urban public facilities and services within Portland's Urban Services Boundary.

**3. Transportation System Plan**. The TSP includes the transportation element of the Public Facilities Plan.

**Policy 1.3** **Internal consistency.** Ensure that the components of the Comprehensive Plan are internally consistent.

**Policy 1.4** **Consistency with Metro Urban Growth Management Functional Plan and Urban Growth Boundary.** Ensure that the Comprehensive Plan is consistent with the Metro Urban Growth Management Functional Plan and supports a tight urban growth boundary for the Portland metropolitan area.

**Policy 1.5** **Consistency with state and federal regulations.** Ensure that the Comprehensive Plan is consistent with all applicable state and federal regulations, and that implementation measures for the Comprehensive Plan are well coordinated with other City activities that respond to state and federal regulations.

**Policy 1.6** **Intergovernmental coordination**. Ensure that the Comprehensive Plan is implemented in a manner that complements the efforts and fiscal health of the City, partner agencies including school districts, transit agencies, and county and regional governments.

## Implementation

These policies identify and describe the Comprehensive Plan implementation tools.

**Policy 1.7** **Implementation of the Comprehensive Plan.** Implement the Comprehensive Plan through coordinated long-range transportation and land use planning.



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**Policy 1.8** **Implementation tools subject to the Comprehensive Plan.** Comprehensive Plan implementation tools must be maintained, derived from, and consistent with the Comprehensive Plan. Implementation tools include:

1. Zoning Map
2. Zoning Code
3. Street policy and design classifications, and street plans in the TSP, described in Chapter 9: Transportation
4. The List of Significant Projects
5. Service coordination agreements
6. Annexations
7. Urban renewal plans
8. Development agreements

**Policy 1.9** **Planning service delivery.** Provide planning, zoning, building, and subdivision control services within the City's boundaries of incorporation.

**Policy 1.10** **Community Involvement Committee.** Establish the Planning and Sustainability Commission (PSC) as the committee to oversee the Community Involvement Program as recognized by Oregon Statewide Planning Goal 1 – Community Involvement and policies 2.14 and 2.15 in the Community Involvement chapter of this Comprehensive Plan.

**Policy 1.11** **Service coordination agreements.** Maintain coordination agreements with local governments of adjoining jurisdictions concerning mutual recognition of urban service boundaries; special service districts concerning public facilities and services within Portland's Urban Services Boundary; and public school districts concerning educational facilities within Portland's Urban Service Boundary. Major amendments to these service agreements must comply with the Comprehensive Plan. "Comply" means that, on the whole, the proposal strikes a reasonable balance among applicable goals and policies.

**Policy 1.12** **List of Significant Projects.** Develop and maintain a List of Significant Projects based on the framework provided by the supporting Public Facilities Plan and capital improvement plans. Amendments to the List of Significant Projects must comply with the Comprehensive Plan. "Comply" means that, on the whole, the proposal strikes a reasonable balance among applicable goals and policies.

**Policy 1.13** **Annexations.** Provide a process for the incorporation of urban and urbanizable land within the City's Urban Services Boundary through annexation.

*See policies 8.9-8.15 for service extension requirements for annexations.*



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**Policy 1.14** **Urban renewal plans.** Coordinate Comprehensive Plan implementation with urban renewal plans and implementation activities. A decision to adopt a new urban renewal district, or amend the boundaries of an existing district, must comply with the Comprehensive Plan. "Comply" means that, on the whole, the proposal strikes a reasonable balance among applicable goals and policies.

**Policy 1.15** **Relationship to community, area, and neighborhood plans adopted before [date].** Community, area, and neighborhood plans that were adopted by ordinance prior to [Comp Plan adoption date] are still in effect, however the goals and policies of this Comprehensive Plan supersede any goals or policies of a community, area, or neighborhood plan that conflict with a goal or policy in this plan.



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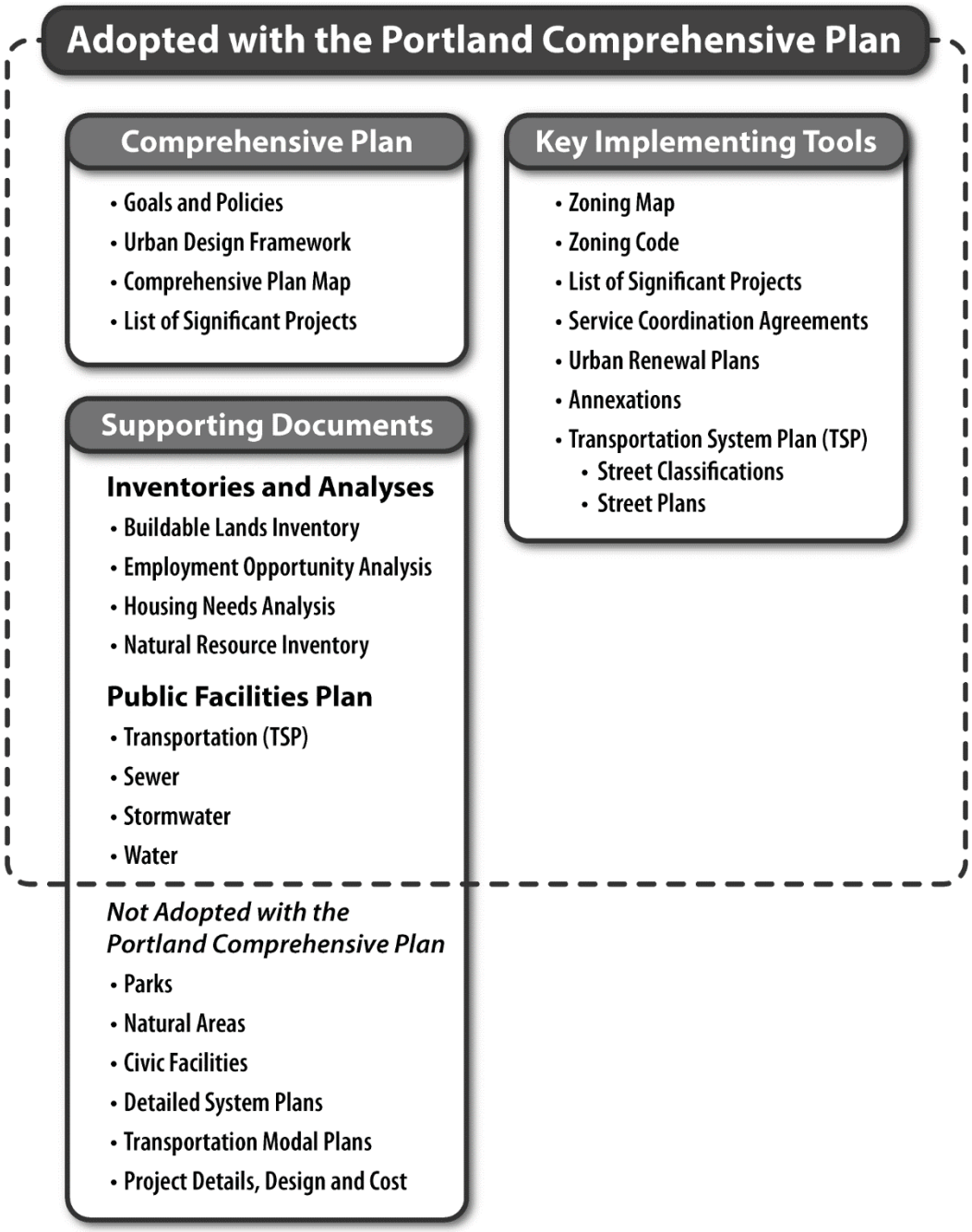
*Figure 1 – Comprehensive Plan Package*



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# Chapter 2: Community Involvement

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Provide a wide range of opportunities for involvement in land use decisions.
- Foster ongoing positive relationships between communities and the City in support of positive land use decision outcomes.
- Recognize that the City has a responsibility to plan for the needs of and engage with under-served and under-represented communities to achieve greater equity.
- Expand opportunities for meaningful community engagement in land use decisions, from issue identification and project scoping through implementation.
- Require transparent, well-designed, thoughtful public processes for land use decisions.
- Increase the community's meaningful participation in land use decisions.
- Promote thoughtful consideration of and responses to public comment on land use decisions

## Why is this important?

The results are better — more durable, equitable and accountable — when a wide and diverse range of Portlanders are involved in the scoping, development and implementation of plans and investment projects. Collaborative partnerships and inclusive community participation in land use decision making are essential to creating and sustaining a prosperous, healthy, equitable and resilient Portland.

As the city grows, diversifies, and works to advance equity, it is essential that all community members' needs and concerns are considered. Particular efforts must be made to improve services for people of color, immigrants and refugee communities, people with disabilities, renters, low-income Portlanders, older adults, youth, and the lesbian, gay, bisexual, transgender and queer (LGBTQ) community.

It is the City's responsibility to promote deep and inclusive community involvement in land use decisions.



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# Goals

**Goal 2.A: Community involvement as a partnership**
The City of Portland government works together as a genuine partner with Portland communities. The City promotes, builds, and maintains relationships and communicates with individuals, communities, businesses, organizations, institutions, and other governments to ensure meaningful community involvement in land use decisions.

**Goal 2.B: Social justice and equity**
The City of Portland seeks social justice by working to expand choice and opportunity for all community members, recognizing a special responsibility to identify, orient, and involve under-served and under-represented communities in land use planning. The City actively works to improve its land use-related decisions to achieve more equitable distribution of burdens and benefits.

**Goal 2.C: Value community wisdom and participation**
Portland values and encourages community and civic participation. The City seeks and considers community wisdom, and integrates it with sound technical analysis, to strengthen land use decisions.

**Goal 2.D: Transparency and accountability**
City planning, policy, investment, and development decision-making processes are clear, open, and documented. Through these processes a diverse range of community interests are heard and balanced. The City makes it clear to the community who is responsible for making decisions, and how community input is taken into account.

**Goal 2.E: Meaningful participation**
Community members have meaningful opportunities to participate in and influence all stages of planning and decision-making. Public processes engage the full diversity of affected community members, including under-served and under-represented individuals and communities.

**Goal 2.F: Accessible and effective participation**
City planning, policy, investment, and development decision-making processes are designed to be accessible and effective. The City draws from acknowledged best practices and uses a wide variety of tools to promote inclusive, collaborative, and robust community involvement.

**Goal 2.G: Strong civic infrastructure**
Civic institutions, organizations, and processes encourage active and meaningful community involvement and strengthen the capacity of individuals and communities to participate in planning processes and civic life.



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# Policies

Ongoing community involvement practices, procedures and programs are a necessary foundation for project-specific community involvement efforts. Many of the policies in this chapter are intended to build on community wisdom, expand community knowledge, and improve City staff capacity to work effectively with an increasingly diverse and growing Portland population.

## Partners in decision making

Portland benefits when community members are meaningfully involved in land use decisions. By building and maintaining partnerships with individuals and a wide range of formal and informal organizations that represent a variety of interests, the City of Portland government will have a better understanding of various communities' diverse needs and concerns. These policies support building and maintaining strong and supportive relationships with an increasingly diverse and growing Portland population.

**Policy 2.1** **Partnerships and coordination.** Maintain partnerships and coordinate land use engagement with:

**2.1.a.** Individual community members.

**2.1.b.** Communities of color and other under-served and under-represented communities.

**2.1.c.** Neighborhood and business associations as local experts and channels for place-based projects.

**2.1.d.** Businesses, unions, employees, and related organizations that reflect Portland's diversity as the center of regional activity.

**2.1.e**. Interest and affinity organizations and groups.

**2.1.f.** Institutions, governments, and tribal sovereign nations.

**Policy 2.2** **Broaden partnerships**. Work with neighborhood and business associations to increase diversity and to help them reflect the diversity of the people and institutions they serve.



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## Invest in education and training

Both the community and City of Portland representatives must have the capacity to work together as effective partners. Ongoing investment in education and training leads to better informed community members who then have increased capacity to participate effectively. Community involvement-focused professional development training helps improve City staff's ability to work with and learn from community members. These policies support both community and agency capacity building.

**Policy 2.3** **Community capacity building**. Enhance the ability of community members, particularly those in under-served and/or under-represented groups, to develop the relationships, knowledge, and skills to effectively participate in land use planning processes.

**Policy 2.4** **Land use literacy.** Provide training and educational opportunities to build the public's understanding of land use, transportation, housing, and related topics and increase capacity for meaningful participation in land use planning processes.

**Policy 2.5** **Agency capacity building.** Increase City staff's capacity, tools, and skills to design and implement processes that engage a broad diversity of affected and interested communities, including under-served and under-represented communities, in meaningful and appropriate ways.

## Community assessment

City staff must build and maintain their understanding of community demographics, trends and needs. Community members should have opportunities to share how conditions and needs affect quality. The following policies support effective two-way communication between City government and communities and encourage community-level data gathering and information sharing in land use planning processes.

**Policy 2.6** **Channels of communication.** Maintain channels of communication among City Council, the Planning and Sustainability Commission, project advisory committees, City staff, and community members.

**Policy 2.7** **Community data collection.** Provide meaningful opportunities for individuals and communities to be involved in inventorying, mapping, data analysis, and the development of alternatives, as appropriate to the land use decision.

**Policy 2.8** **Community analysis.** Evaluate data, including community verified data and information to understand the needs, priorities, and trends and historical context affecting different communities in Portland.



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## Transparency and accountability

The City is committed to improving transparency in community involvement processes tied to land use decisions. When community members have a better understanding of a process, they are better able to participate effectively. Improved transparency and communication allows the City to better understand community opinions and needs.

The following policies articulate how and when land use decisions are made; the community's role in land use decision-making processes; and what the community can expect from the City of Portland.

**Policy 2.9** **Roles and responsibilities.** Establish clear roles, rights, and responsibilities for participants and decision-makers in land use processes. Address roles of City of Portland bureaus, elected officials, and participants, including community leadership, business, organizations, and individuals.

**Policy 2.10** **Project scope.** Establish clear expectations about land use project sponsorship, purpose, design, and how decision-makers will use the process results.

**Policy 2.11** **Community influence.** At each stage of the process, identify which elements of a land use process can be influenced or changed through community involvement. Clarify the extent to which those elements can be influenced or changed.

**Policy 2.12** **Documentation and feedback.** Provide clear documentation for the rationale supporting decisions in land use planning processes. Communicate to participants about the issues raised in the community involvement process, how public input affected outcomes, and the rationale used to make decisions.

## Community involvement program

Much has changed in Portland in the 35 years since the adoption of the 1980 Comprehensive Plan. Much more will likely change between the adoption of this plan and the next one. The following policies challenge City staff to assess current practices and develop new tools through ongoing process evaluation and improvement, and direct the City to develop, maintain and update a manual that details current best practices for community involvement.

**Policy 2.13** **Community Involvement Program Manual.** Create, maintain, and actively implement a community involvement program manual that details how to conduct community involvement for land use projects and decisions.



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**Policy 2.14** **Community Involvement Committee.** The Community Involvement Committee, a subcommittee of the Planning and Sustainability Commission, will evaluate and provide feedback to City staff on community involvement processes for individual land use and infrastructure decisions, before, during, and at the conclusion of these processes.

**Policy 2.15** **Program evaluation.** Periodically evaluate the effectiveness of the community involvement program and recommend and advocate for program and policy improvements. The Community Involvement Committee will advise City staff regarding this evaluation.

**Policy 2.16** **Shared engagement methods.** Coordinate and share methods, tools, and technologies that lead to successful engagement practices with both government and community partners.

## Process design and evaluation

The policies in this section guide the design of project-specific community involvement processes.

These policies will help ensure that community involvement processes for land use projects fit the scope, character and impact of land use projects. The policies also promote full representation in land use planning processes and actively involve under-served and under-represented communities. Representation can help ensure that City decisions do not further reinforce the disadvantaged position of under-served and under-presented groups, and do not narrowly benefit privileged groups.

**Policy 2.17** **Representation.** Facilitate participation of a cross-section of the full diversity of affected Portlanders during land use planning processes. This diversity includes individuals, stakeholders, and communities represented by race, color, national origin, English proficiency, gender, age, disability, religion, sexual orientation, gender identity, and source of income.

**Policy 2.18** **Early involvement.** Improve opportunities for interested and affected community members to participate early in land use processes, including, identifying and prioritizing issues, needs, and opportunities; participating in process design; and recommending and prioritizing projects and/or other types of implementation.

**Policy 2.19** **Verifying data.** Use data, including community verified data, to guide land use planning and priority setting and to shape community involvement and decision-making processes.

**Policy 2.20** **Demographics.** Identify the demographics of potentially affected communities when initiating a land use project.



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**Policy 2.21** **Historical understanding.** To better understand concerns and conditions when initiating a project, research the history, culture, past plans, and other needs of the affected community, particularly under-represented and under-served groups, and persons with limited English proficiency (LEP).

**Policy 2.22** **Project-specific needs.** Customize community involvement processes to meet the needs of those potentially affected by the land use project. Use community involvement techniques that fit the scope, character, and potential impact of the land use decision under consideration.

**Policy 2.23** **Culturally-appropriate processes.** Consult with communities to design culturally appropriate processes to meet the needs of those affected by a land use project. Evaluate, use, and document creative and culturally appropriate methods, tools, and technologies to inform and engage people from under-served and under-represented groups about land use projects.

**Policy 2.24** **Innovative engagement methods**. Develop and document innovative methods, tools, and technologies for community involvement processes for land use projects.

**Policy 2.25** **Inclusive participation beyond Portland residents.** Design public processes for land use projects to engage affected and interested people who may not live in Portland such as, property owners, employees, employers, and students, among others, as appropriate and practicable.

**Policy 2.26** **Accessibility.** Ensure that community involvement processes for land use projects are broadly accessible in terms of location, time, and language, and that they support the engagement of individuals with a variety of abilities and limitations on participation.

**Policy 2.27** **Participation monitoring.** Evaluate and document participant demographics throughout land use processes to assess whether participation reflects the demographics of affected communities, and adapt involvement practices and activities accordingly to increase effectiveness at reaching targeted audiences.

**Policy 2.28** **Adaptability.** Adapt community involvement processes for land use projects as appropriate to flexibly respond to changes in the scope and priority of the issues, needs, and other factors that may affect the process.

**Policy 2.29** **Process evaluation.** Evaluate each community involvement process for land use projects from both the City staff and participants' perspective and consider feedback and lessons learned to enhance future involvement efforts.



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## Information design and notification

These policies will help improve notification procedures for land use projects and the community's access to process and technical information related to land use projects. The City of Portland's Civil Rights Title VI Plan requires that information shall be available to the public, with assistance provided as requested to interpret and effectively use technical information. Additionally, the City of Portland must ensure that limited English proficient (LEP) individuals have meaningful access to City land use-related activities.

**Policy 2.30** **Accommodation.** Ensure accommodations to let individuals with disabilities participate in land use decisions, consistent with federal regulations.

**Policy 2.31** **Notification.** Notify affected and interested community members and groups about land use and infrastructure projects with enough lead time to enable effective participation. As practicable and appropriate, consider notification to both property owners and renters.

**Policy 2.32** **Information for effective participation.** Provide community members with clear and easy to access information about land use and infrastructure projects in multiple formats.

**Policy 2.33** **Limited English Proficiency (LEP).** Ensure that limited English proficient (LEP) individuals are provided meaningful access to information about land use projects, consistent with federal regulations.



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# Chapter 3: Urban Form

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Foster an equitable system of compact mixed-use and commercial centers across the city to increase access to community services and businesses and create more low-carbon complete healthy connected neighborhoods.
- Improve Portland's major corridors so that they become vibrant urban places and key transportation connections.
- Enhance Portland's public realm, integrate nature into the city and link people, places and wildlife through active transportation facilities, green infrastructure investments and habitat connections.
- Describe the city's overall development pattern and area character to inform and guide future investments and development.

## Why is this important?

Portland's identity now and in the future is significantly shaped by the design and physical structure of the city and its neighborhoods. How people live and get around is partly determined by the location of services and other destinations and the arrangement and design of buildings, streets and other public spaces. Together these design characteristics help determine whether: (1) a community is walkable, (2) children have safe places to play, (3) people have places to gather and (4) businesses are easy to access.

Where housing and services are built, where street networks are connected and how all of this is designed provides a key opportunity to: (1) enable people to meet more of their daily needs locally, (2) strengthen neighborhoods, (3) improve equitable access to services and (4) support healthy, active living.

This chapter includes policies that support enhancing centers across the city as anchors to complete neighborhoods, providing Portlanders with convenient access to local services. Clustering destinations in centers makes access by transit, walking, wheelchair, and bicycle more practical and reduces the amount of driving needed to access services. Focusing growth and investments in centers and along corridors can also make good use of existing infrastructure capacity and encourage efficiency in new infrastructure investments.

This network of well-functioning centers and corridors will be critical to achieve the Portland Plan goals to make it possible for most Portlanders (80%) to live in complete neighborhoods by 2035, and to meet goals for travel by transit, walking and bicycling.



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**GOAL 3.A: A city designed for people**
Portland's built environment is designed to serve the needs and aspirations of all Portlanders, promoting prosperity, health, equity, and resiliency. New development, redevelopment, and public investments reduce disparities, and encourage social interaction to create a healthy connected city.

**GOAL 3.B: A climate and hazard resilient urban form**
Portland's compact urban form, sustainable building development practices, green infrastructure, and active transportation system reduce carbon emissions and improve resilience to the effects of climate change.

**GOAL 3.C: Focused growth**
Household and employment growth is focused in the Central City and other centers, corridors, and transit station areas creating compact urban development in areas with a high level of service and amenities, while allowing the relative stability of lower-density single-family residential areas.

**GOAL 3.D: A system of centers and corridors**
Portland's interconnected system of centers and corridors provides diverse housing options and employment opportunities, robust multimodal transportation connections, access to local services and amenities, and supports low-carbon complete, healthy, and equitable communities.

**GOAL 3.E: Connected public realm and open spaces**
A network of parks, streets, City Greenways, and other public spaces supports community interaction; connects neighborhoods, districts, and destinations; and improves air, water, and land quality and environmental health.

**GOAL 3.F: Employment districts**
Portland supports job growth in a variety of employment districts to maintain a diverse economy.

**GOAL 3.G: Nature in the city**
A system of habitat corridors weaves nature into the city, enhances habitat connectivity, and preserves natural resources and the ecosystem services they provide.



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# Policies

## Citywide Design and Development

**Policy 3.1** **Urban Design Framework.** Use the Urban Design Framework as a guide to create inclusive and enduring places, while providing flexibility for implementation at the local scale to meet the needs of local communities. *See Figure 3.1: Urban Design Framework*

**Policy 3.2** **Growth and stability.** Direct the majority of growth and change to centers, corridors, and transit station areas, allowing the continuation of the residential scale and characteristics of Portland's residential neighborhoods.

**Policy 3.3** **Equitable development.** Guide development, growth, and infrastructure investment to support positive outcomes for all Portlanders.

**3.3.a.** Avoid or reduce negative development impacts, especially where those impacts inequitably burden communities of color, under-served and under-represented communities, and other vulnerable populations.

**3.3.b.** Make needed investments in areas that are deficient in infrastructure and services to reduce disparities and increase equity..

**Policy 3.4** **All ages and abilities.** Strive for a built environment designed to provide a safe, healthful, and attractive environment for people of all ages and abilities.

**Policy 3.5** **Energy and resource efficiency.** Support energy-efficient, resource-efficient, and sustainable development and transportation patterns through land use and transportation planning.

**Policy 3.6** **Integrate nature.** Integrate nature and use appropriate green infrastructure throughout Portland.

**Policy 3.7** **Leadership and innovation in design.** Encourage high-quality design and development that demonstrates Portland's leadership in the design of the built environment, commitment to a more equitable city, and ability to experiment and generate innovative design solutions.

**Policy 3.8** **Growth and development.** Evaluate the impacts of land use decisions on the physical characteristics of neighborhoods and current residents, particularly under-served and under-represented communities.



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## Centers

Centers are compact, walkable and pedestrian-oriented urban places. They are connected to public transit and active transportation networks. They anchor complete neighborhoods with retail stores and businesses (grocery stores, restaurants, markets, shops, etc.) civic amenities (libraries, schools, community centers, places of worship, etc.), housing options, health clinics, daycare centers, employment centers, plazas and parks or other public gathering places.

Centers will be the primary areas for growth and change in Portland over the next 20 years. Focusing new growth in centers helps achieve goals of having more Portlanders live in complete neighborhoods, use public transit and active transportation—walking, biking and rolling—to commute to work and complete errands, and it will help mitigate and prepare for the effects of climate change. Clustering destinations and housing within compact, walkable centers makes access by transit, walking, wheelchair, and bicycle more practical and reduces the amount of driving needed to access services, reducing the impact on roadways, reducing congestion, and facilitating freight movement.

Centers range in scale from the Central City's downtown to small neighborhood centers, providing local access to services and allowing Portlanders across the city to live a healthy, active lifestyle. Neighborhood business districts and the commercial services they provide are the foundation of many centers, but centers, particularly larger centers, will also become a focus for public services, gathering places, and housing growth. In and around all centers, there will be change as areas urbanize and new services, shops and housing are developed.

The UDF identifies four types of centers that vary in size, scale, service area, local versus regional role, and density of residents and businesses. The four types are:

1. Central City
2. Regional Center (Gateway)
3. Town Center
4. Neighborhood Center

*See Figure 3-2: Centers*

Policies in this section identify essential elements and functions of centers that will be enhanced over time. Additional policies provide more detailed direction for specific types of centers based on their scale.

**Policy 3.9** **Role of centers.** Enhance centers as anchors of complete neighborhoods that include concentrations of commercial and public services, housing, employment, gathering places, and green spaces.



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**Policy 3.10** **Variety of centers.** Plan for a range of centers across the city to enhance local, equitable access to services, and expand housing opportunities.

**Policy 3.11** **Housing in centers.** Provide housing capacity for enough population to support a broad range of commercial services, focusing higher-density housing within a half-mile of the Town Center core.

**Policy 3.12** **Investments in centers investments.** Encourage public and private investment in infrastructure, economic development, and community services in centers to ensure that all centers will support the populations they serve.

**Policy 3.13** **Government services.** Encourage the placement of services in centers, including schools and colleges, health services, community centers, daycare, parks and plazas, library services, and justice services.

**Policy 3.14** **Arts and culture.** Ensure that land use plans and infrastructure investments allow for and incorporate arts and culture as central components of centers.

**Policy 3.15** **Accessibility.** Design centers to be compact, safe, attractive, and accessible places, where the street environment makes access by transit, walking, biking, and mobility devices, such as wheelchairs, safe and attractive for people of all ages and abilities.

**Policy 3.16** **Center connections.** Connect centers to each other and to other key destinations, such as schools and parks, by frequent and convenient transit, bicycle sharing, bicycle routes, pedestrian trails and sidewalks, and electric and vehicle charging stations.

**Policy 3.17** **Green infrastructure in centers.** Integrate nature and green infrastructure into centers and enhance public views and connections to the surrounding natural features.



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## Central City

The Central City serves as the region's premier center with jobs, services, and civic and cultural institutions that support the entire city and region. It includes attractions, amenities and institutions not found anywhere else in the city or region, such as Portland State University, the Oregon Convention Center, the Vera Katz Eastbank Esplanade, Rose Quarter Facilities, Providence Park, the Portland 5 Center for the Arts, Portland Art Museum and the region's Transit Mall.

**Policy 3.18** **Central City employment.** Encourage the growth of the Central City's regional share of employment and continue its growth as the region's unique center for innovation and exchange through commerce, employment, arts, culture, entertainment, tourism, education, and government.

**Policy 3.19** **Central City housing.** Encourage the growth of the Central City as Portland's and the region's largest center with the highest concentrations of housing and with a diversity of housing options and services.

**Policy 3.20** **Transportation hub.** Enhance the Central City as the region's transportation hub and optimize regional access to the Central City's key destinations.

**Policy 3.21** **Public places.** Enhance public places and the Willamette River waterfront in the Central City as places of business and social activity and gathering for the people of its districts and the broader region.

## Regional Center — Gateway

Gateway Regional Center is East Portland's major center, providing the area and region with civic, employment and community services. It includes the city's second largest transit hub outside of downtown and good freeway access to regional destinations, such as Portland International Airport.

**Policy 3.22** **Role of Gateway.** Encourage growth and investment in Gateway to enhance its role as East Portland's center of employment, commercial and public services.

**Policy 3.23** **Housing.** Encourage East Portland's largest concentration of high-density housing in Gateway

**Policy 3.24** **Transportation.** Enhance Gateway's role as a regional high-capacity transit hub that serves as an anchor for East Portland's multimodal transportation system.

**Policy 3.25** **Public places.** Enhance the public realm and public places in Gateway to provide a better setting for business and social activity that serves East Portland residents and the region.



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## Town Centers

Town Centers are located throughout Portland to serve broad parts of the city. They are typically anchored by employment centers or institutions, feature a wide range of commercial and community services, and have a wide range of housing options. Development in Town Centers is intended to be mid-rise in scale. Mid-rise development includes buildings from five to 10 stories in height, but most frequently ranging from five to six stories.

**Policy 3.26** **Role of Town Centers.** Enhance Town Centers as successful places that serve the needs of surrounding neighborhoods and a wider area and contain higher concentrations of employment, institutions, commercial and community services, and a wide range of housing options.

**Policy 3.27** **Housing.** Provide for a wide range of housing types in Town Centers, which are intended to generally be larger in scale than the surrounding residential areas. There should be sufficient zoning within a half-mile walking distance of a Town Center to accommodate 7,000 households.

**Policy 3.28** **Transportation.** Improve Town Centers as multimodal transportation hubs that optimize access from the broad area of the city they serve and are linked to the region's high-capacity transit system.

**Policy 3.29** **Public places.** Provide parks or public squares within or near Town Centers to support their roles as places of focused business and social activity.

## Neighborhood Centers

Neighborhood Centers are smaller centers that include a mixture of higher density commercial and residential buildings. Because these centers are smaller than Town Centers, there are many more of these citywide. Development in Neighborhood Centers is intended to be low-rise in scale. Low-rise development typically includes buildings up to four stories in height.

**Policy 3.30** **Role of Neighborhood Centers.** Enhance Neighborhood Centers as successful places that serve the needs of surrounding neighborhoods. In Neighborhood Centers, provide for higher concentrations of development, employment, commercial and community services, and a wider range of housing options than the surrounding neighborhoods.

**Policy 3.31** **Housing.** Provide for a wide range of housing types in Neighborhood Centers, which are intended to generally be larger in scale than the surrounding residential areas, but smaller than Town Centers. There should be sufficient zoning within a half-mile walking distance of a Town Center to accommodate 3,500 households.



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**Policy 3.32** **Transportation.** Design Neighborhood Centers as multimodal transportation hubs that optimize pedestrian and bicycle access from adjacent neighborhoods and are served by frequent-service transit.

**Policy 3.33** **Public places.** Provide small parks or plazas within or near Neighborhood Centers to support their roles as places of local activity and gathering.

## Corridors

Corridors, like centers, are areas where Portland will grow and change over the next 25 years. They are busy, active streets with redevelopment potential. They are close to neighborhoods and are places with transit, stores, housing and employers. They need to be planned, designed and improved to be places that benefit and become successful additions to surrounding neighborhoods. The largest places of focused activity and density along these corridors are designated as centers.

There are three types of street corridors:

1. Civic Corridors
2. Neighborhood Corridors
3. Freight Corridors

*See Figure 3-3: Corridors*

**Policy 3.34** **Growth and mobility.** Coordinate transportation and land use strategies along corridors to accommodate growth and mobility needs for people of all ages and abilities.

**Policy 3.35** **Connections.** Improve corridors as multimodal connections providing transit, pedestrian, bicycle, and motor vehicle access and that serve the freight needs of centers and neighborhood business districts.

**Policy 3.36** **Design.** Encourage street design that balances the important transportation functions of corridors with their roles as the setting for commercial activity and residential living.

**Policy 3.37** **Green infrastructure in corridors.** Enhance corridors with distinctive green infrastructure, including landscaped stormwater facilities, extensive tree plantings, and other landscaping that both provide environmental function and contribute to a quality pedestrian environment.



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## Civic Corridors

Civic Corridors are the city's busiest, widest and most prominent streets. They provide major connections among centers, the rest of the City and the region. They support the movement of people and goods across the city, with high levels of traffic and, in some cases, pedestrian activity. Civic Corridors provide opportunities for growth and transit-supportive densities of housing, commerce, and employment. Development in Civic Corridors is intended to be mid-rise in scale. Mid-rise development includes buildings from five to 10 stories in height, but most frequently ranging from five to six stories.

Abundant trees and high-quality landscaping beautify Civic Corridors and offset the impacts of their large paved areas. These corridors exemplify the benefits of green infrastructure by cleaning and soaking up stormwater runoff and minimizing urban heat island effects, while also being enjoyable places to live, work and gather. Civic corridors are safe for all types of transportation. Civic Corridors policies apply to the roadway, the public realm of the street and the buildings that line the street.

**Policy 3.38** **Integrated land use and mobility.** Enhance Civic Corridors as distinctive places with transit-supportive densities of housing and employment, and high-quality transit service and pedestrian and bicycle facilities that are models of ecologically-sensitive urban design.

**Policy 3.39** **Design to be great places.** Encourage public street and sidewalk improvements along Civic Corridors to support the vitality of business districts, create distinctive places, provide a safe and attractive pedestrian environment, and contribute to creating quality living environments for residents.

**Policy 3.40** **Mobility corridors.** Improve Civic Corridors as key mobility corridors of citywide importance that accommodate all modes of transportation within their right-of-way or on nearby parallel routes.

**Policy 3.41** **Freight.** Maintain freight mobility, freight access, and freight capacity on Civic Corridors that are also Major or Priority Truck Streets.



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## Neighborhood Corridors

Neighborhood Corridors are narrower main streets that connect neighborhoods with each other and to other parts of the city. They have transportation, land use and design functions that are important at a neighborhood or district level. They support neighborhood business districts and provide housing opportunities close to local services, amenities and transit lines. They are streets that include a mix of commercial and higher-density housing development. This policy is intended to balance the important transportation functions of Neighborhood Corridors with their roles in supporting the viability of business districts and residential livability.

**Policy 3.42** **Multiple roles.** Enhance Neighborhood Corridors as important places that support vibrant neighborhood business districts with quality multi-family housing while providing transportation connections that link neighborhoods.

## Freight Corridors

Freight Corridors are the primary routes into and through the city that supports Portland as an important West Coast hub and a gateway for international and domestic trade. While the forms of these streets are not expected to change significantly, they are integral to the growth of traded sector businesses such as manufacturing, warehousing and distribution industries.

*Policies related to freight are provided in Chapter 9: Transportation and Chapter 6: Economic Development.*

## Transit station areas

Transit stations provide access to high-capacity transit, which currently consists of the region's light rail and streetcar systems and the TRAM, but in the future may also include bus rapid transit. These policies encourage housing and employment growth in transit station areas to maximize the ability of people to benefit from the regional connections they provide and to increase transit access to employment. The policies support a range of transit station area types, with differing priorities for growth, depending on the station type and context.

Priority is given to growth in station areas located in centers since they provide more people with opportunities to be close to both transit and to commercial and public services. These stations have the highest potential for mixed use development. Center stations benefit from the concentration of local services and businesses as well as connections to other transit routes typically found on corridors. Mixed use development with housing is not the priority for all transit station areas. Some are locations for employment, or serve major regional destinations such as the Oregon Zoo.

*See Figure 3-4: Transit Station Areas*



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**Policy 3.43** **Transit-oriented development.** Encourage transit-oriented development and transit-supportive concentrations of housing and jobs, and multimodal connections at and adjacent to high-capacity transit stations.

**Policy 3.44** **Community connections.** Integrate transit stations into surrounding communities and enhance pedestrian and bicycle connections (including bike sharing) to provide safe access to key destinations beyond the station area.

**Policy 3.45** **Transit station area safety.** Design transit areas to improve pedestrian, bicycle, and personal safety.

**Policy 3.46** **Center stations.** Encourage transit stations in centers to provide high density concentrations of housing and commercial uses that maximize the ability of residents to live close to both high-quality transit and commercial services.

**Policy 3.47** **Employment stations.** Encourage concentrations of jobs and employment-focused land uses in and around stations in employment-zoned areas.

**Policy 3.48** **Transit neighborhood stations.** Encourage concentrations of mixed-income residential development and supportive commercial services close to transit neighborhood stations. Transit neighborhood stations are high-capacity transit station that are not in a center.

**Policy 3.49** **Destination stations.** Enhance connections between major destinations and transit facilities and strengthen the role of these station areas as places of focused activity.

## City Greenways

City Greenways are a system of distinctive pedestrian- and bicycle-friendly green streets and trails, enhanced by lush tree canopy and landscaped stormwater facilities that support active living by expanding recreational opportunities and making it easier and more attractive to reach destinations across the city. As Portland continues to grow, the City Greenways system will strengthen connections to nature, weave green elements into neighborhoods, and enhance mobility and recreation.

City Greenways are a network that includes the following types of infrastructure:

1. Enhanced greenway corridors are distinctive green streets with extensive tree canopy and landscaped stormwater facilities that provide connections between major centers, schools, parks, natural areas, and the rivers.

2. Trails are often located along rivers or through natural areas, providing pedestrian and bicycle connections.



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3. Heritage parkways are iconic streets or segments of streets with elements such as linear parkways, scenic views, and distinctive landscaping or street design.

4. Neighborhood greenways are an extensive network of streets with low volumes of motor vehicle traffic that are prioritized for bicycles and pedestrians, working in conjunction with the rest of the City Greenways system to extend the system into all neighborhoods.

*See Figure 3-5: City Greenways*

**Policy 3.50** **Connections.** Create a network of distinctive and attractive City Greenways that link centers, parks, schools, rivers, natural areas, and other key community destinations.

**Policy 3.51** **Integrated system.** Create an integrated City Greenways system that includes regional trails through natural areas and along Portland's rivers, connected to neighborhood greenways and heritage parkways.

**Policy 3.52** **Multiple benefits.** Design City Greenways that provide multiple benefits that contribute to Portland's pedestrian, bicycle, green infrastructure, and parks and open space systems.

**Policy 3.53** **Design.** Use design options such as distinctive street design, landscaping, tree plantings and scenic views, and other appropriate design options, to create City Greenways that extend the experience of open spaces and nature into neighborhoods, while improving stormwater management and calming traffic.

*Additional policies related to City Greenways are provided in Chapter 9: Transportation.*

## Urban habitat corridors

Urban habitats are natural and built areas that provide safe, healthy places for resident and migratory fish and wildlife species that live in and move through the city. Maintaining diverse, connected habitat corridors will help fish and wildlife adapt to continued human population growth, development, and climate change. Urban habitat corridors also benefit Portlanders by keeping air and water clean and cool, reducing the risks from landslides and flooding, and providing places for people to play, learn and experience nature.

Urban habitats encompass the city's most valuable and distinctive natural features – the Willamette and Columbia Rivers, streams and sloughs, wetlands, and large forested areas, such as Tryon Creek State Park, the West Hills, Willamette Bluff, and the East Buttes. Other urban habitats are woven throughout the built environment and include things like street and yard trees, backyard plantings, parks, and bridges that provide opportunities for bird nesting. Enhancing or establishing new urban habitat corridors will involve preserving and restoring existing natural features, creating vegetated connections between tree canopy



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and greenspaces, and incorporating nature into the design of buildings and landscaping, streetscapes, parking lots, and infrastructure.

These policies support plans, regulations, and investments to restore and reconnect habitat in diverse areas within the city.

*See Figure 3-6, Urban Habitat Corridors*

**Policy 3.54** **Urban habitat corridors.** Establish a system of connected, well-functioning and diverse habitat corridors that link habitats in Portland and the region, facilitate safe fish and wildlife access and movement through and between habitat areas, enhance the quality and connectivity of existing habitat corridors, and establish new habitat corridors in developed areas.

**Policy 3.55** **Habitat connection tools.** Improve habitat corridors using a mix of tools including natural resource protection, property acquisition, natural resource restoration, tree planting and landscaping with native plants, and ecological design integrated with new development.

**Policy 3.56** **Connect habitat corridors.** Ensure that planned connections between habitat corridors, greenways, and trails are located and designed to support the functions of each element, and create positive interrelationships between the elements, while also protecting habitat functions, fish, and wildlife.

*Additional policies related to habitat corridors are provided in Chapter 7: Watershed Health and the Environment.*

## Employment areas

Portland is a major employment center in the region and the state. The diversity of the economy is spread evenly among four types of business sectors that thrive in different parts of the city: industrial, office, institutional and retail/service. The city's employment geographies are:

**Central City** – Central City is the region's high-density employment center. It is primarily an office district for professional and business services, finance, information, and government. It is also a key location for the entertainment, small industry, and education sectors.

**Industrial Districts** – Industrial districts are in the low, flat areas along Portland Harbor and the Columbia Corridor, Oregon's freight infrastructure hub. The manufacturing and distribution sectors concentrate here. They typically need one-story buildings, medium to large sites, and locations buffered from housing. There is also an industrial district in the Central Eastside and smaller industrial areas scattered around the city, mostly adjacent to major transportation hubs.



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**Neighborhood Commercial** – Neighborhood Commercial areas are mainly home to the retail, personal service, and related sectors that serve customers on-site. These businesses locate amid their market areas, lining corridors across the city. They generally need ground-floor space along pedestrian or auto-oriented streets.

**Campus Institutions** – Institutions in the health care and education sectors are concentrated in large hospital and college campuses and dispersed smaller facilities. Major institutions are large employers with campuses that vary from pastoral expanses to more concentrated urban grounds. They are located throughout the city, often in or adjacent to residential areas.

Each of these sectors is growing. Each has different land use needs and offers different prosperity benefits. Traded sector (export) businesses bring income and jobs into the region and are mainly in the industrial and office sectors. Middle-wage jobs that require less college education and improve equity are concentrated in the industrial sectors. Office jobs are mainly concentrated in the Central City, but are also distributed in neighborhood business districts. They offer jobs with a wide variety of wages.

Retail and service sector jobs are concentrated in the Central City and neighborhood business districts. They provide needed services to residents and include many locally-owned businesses; they do not typically offer higher-paying employment opportunities. The health care and education sectors are the leading job growth opportunities, most of which are located on major campuses. Healthcare is one of the city's fastest growing employment sectors.

*See Figure 3-7: Employment Areas*

**Policy 3.57** **Employment area geographies.** Consider the land development and transportation needs of Portland's employment geographies when creating and amending land use plans and making infrastructure investments.

*Policies for each of the employment areas are provided in the Economic Development chapter. Policies related to the design of the Central City are provided in the Centers section of this chapter. Policies related to the design of industrial areas are provided in the Pattern Areas section of this chapter. Policies related to the design of neighborhood commercial areas are provided in the Centers and Corridors sections of this chapter and in the Pattern Areas section of this chapter.*



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## Pattern Areas

Portland has five distinct Pattern Areas. The development patterns and characteristics of these areas are influenced by the natural landscape and how and when these parts of the city were developed.

1. Rivers
2. Central City
3. Inner Neighborhoods
4. Western Neighborhoods
5. Eastern Neighborhoods

Each Pattern Area has unique physical, social, cultural and environmental qualities that differentiate them and create their sense of place. In order to maintain and enhance the positive qualities and sense of place in each pattern area, it is desirable to have policies and regulations that respond to each area's unique natural and built assets.

The following policies identify key positive characteristics of each of Portland's Pattern Areas that are relevant to decisions related to future development in these areas. Area and neighborhood plans should be consulted for more detailed guidance on design priorities in different parts of the city.

## Rivers Pattern Area

Human settlement began along and at the confluence of the Willamette and Columbia rivers because they offered Native Americans plentiful food, natural resources and critically-important trade and transportation functions. After white immigrants began moving to the area, the settlement grew into the city of Portland. As the city's initial form-giving features, the two rivers have continued to shape the city.

Today, the Willamette and Columbia rivers continue to serve multiple functions and roles. They:

- Are features of significant historic and cultural significance to Native American tribes and others throughout the region.
- Serve as essential industrial transportation corridors that support the local and regional economy.
- Support recreational, subsistence and commercial fisheries.
- Provide important habitat for resident and migratory fish and wildlife.
- Are important scenic, recreational and transportation amenities for Portlanders and visitors.

*See Figure 3-8: Pattern Areas*



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These policies foster development and land stewardship approaches that recognize, support and balance the varied systems, uses and activities along the Columbia and Willamette Rivers, including: the Portland Harbor, Columbia Corridor and other prime industrial lands, habitat areas and corridors; distinctive riverfront neighborhoods along the banks, and access to, along, and within the rivers.

**Policy 3.58** **Historic and multi-cultural significance.** Recognize, restore, and protect the historic and multi-cultural significance of the Willamette and Columbia Rivers, including current activities such as subsistence fishing of legally-permitted fish species.

**Policy 3.59** **Transportation.** Recognize and enhance the roles of the Willamette and Columbia rivers as part of Portland's historic, current, and future transportation infrastructure, including for freight, commerce, commuting, and other public and private transportation functions.

**Policy 3.60** **Recreation.** Improve conditions along and within the Willamette and Columbia rivers for a diverse mix of recreational users and activities. Designate and invest in strategically-located sites for passive or active recreation activities that are compatible with nearby land uses, historically and culturally important sites, and significant habitat, fish, and wildlife.

**Policy 3.61** **Industry and port facilities.** Enhance the regionally significant economic infrastructure that includes Oregon's largest seaport and largest airport, unique multimodal freight, rail, and harbor access; and proximity to anchor manufacturing and distribution facilities.

**Policy 3.62** **Habitat.** Enhance the roles of the Willamette and Columbia rivers and their confluence as an ecological hub that provides regionally significant habitat for fish and wildlife.

**Policy 3.63** **Commercial activities.** Enhance the roles of the Willamette and Columbia rivers in supporting local and regional business and commerce, including commercial fishing, tourism, recreation, and leisure.

**Policy 3.64** **River neighborhoods.** Enhance the strong river orientation of residential areas that are located along the Willamette and Columbia Rivers.

**Policy 3.65** **River access.** Enhance and complete Portland's system of riverside trails and river access points, and strengthen active transportation connections between neighborhoods and the rivers.

**Policy 3.66** **River management and coordination.** Coordinate with federal, state, regional, and other agencies to address issues of mutual interest and concern, including economic development, flood control, regulatory



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compliance, permitting, emergency management, endangered species recovery, climate change preparation, and habitat restoration.

**Policy 3.67** **Columbia River.** Enhance the role of the Columbia River for river dependent industry, fish and wildlife habitat, subsistence and commercial fisheries, floating and land based neighborhoods, recreational uses, and water transportation.

**Policy 3.68** **Willamette River North Reach.** Enhance the role of the Willamette River North Reach for river dependent industry, fish and wildlife habitat and as an amenity for riverfront neighborhoods and recreational users.

**Policy 3.69** **Willamette River Central Reach.** Enhance the role of the Willamette River Central Reach as a key amenity for the Central City and riverfront districts, recreational users, emergency response, water transportation, and as habitat for fish and wildlife.

**Policy 3.70** **Willamette River South Reach.** Enhance the role of the Willamette River South Reach as fish and wildlife habitat, a place to recreate, and as an amenity for riverfront neighborhoods and others.

*Additional policies related to these topics can be found in Chapter 6: Economic Development, Chapter 7: Watershed Health and the Environment, and Chapter 4: Design and Development.*

## Central City Pattern Area

The Central City is the location of Portland's greatest concentrations of employment, and civic, cultural and higher education institutions. Primary natural features include the Willamette River, large street trees, green streets and landscaping, and corridors of park blocks that further weave nature into the Central City. The area's high-density mixed-use neighborhoods contribute to the distinct identities of different areas within the Central City. These policies highlight some key design priorities for the Central City related to its distinctive urban form. These policies encourage design in the Central City that enhances its role as the region's center of innovation and exchange, in recognition that a healthy city must have a healthy core.

*Additional policies related to the design of the Central City are provided in the Centers section of this chapter.*

**Policy 3.71** **Central City districts.** Enhance the distinct identities of the Central City's districts.

**Policy 3.72** **Central City industrial districts.** Support the long-term success of Central City industrial districts and their evolution in terms of the mix of businesses and higher employment densities.



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**Policy 3.73** **Central City river orientation.** Enhance and strengthen access and orientation to the Willamette River in the Central City and increase river-focused activities.

**Policy 3.74** **Central City pedestrian system.** Maintain and expand the Central City's highly interconnected pedestrian system.

**Policy 3.75** **Central City bicycle system.** Expand and improve the Central City's bicycle system.

## Inner Neighborhoods Pattern Area

The Inner Neighborhoods were developed and shaped during the Streetcar Era of the late 19th and early 20th centuries. The Inner Neighborhoods are characterized by a regular pattern of neighborhood business districts located along former streetcar streets interspersed with residential areas. This Pattern Area has a small block pattern with an interconnected street grid that make transit, walking, and bicycling attractive options. Within this Pattern Area is an inner ring of neighborhoods that provide important opportunities for additional housing close to the Central City, but where future growth should be integrated into the existing and historic context. These policies express the overall design approach in Inner Neighborhoods.

**Policy 3.76** **Inner Neighborhoods main streets.** Maintain and enhance the streetcar era pattern of street-oriented buildings along Civic and Neighborhood Corridors.

**Policy 3.77** **Inner Neighborhoods street patterns.** Preserve the area's urban fabric of compact blocks and its highly interconnected grid of streets.

**Policy 3.78** **Inner ring districts.** Expand the range of housing and employment opportunities in inner ring districts, which are part of the Inner Neighborhoods and are within walking distance of the Central City.

**Policy 3.79** **Inner Neighborhoods infill.** Fill gaps in the urban fabric through infill development on vacant and underutilized sites, and re-use of historic buildings on adopted inventories. Integrate new development into these districts' historic development patterns.

**Policy 3.80** **Inner Neighborhoods active transportation.** Use the extensive street, sidewalk, bikeway, and trail system and multiple connections to the Central City as a key part of Portland's active transportation system

**Policy 3.81** **Inner Neighborhoods residential areas.** Continue the pattern of small, connected blocks and the regular lot patterns in Inner Neighborhood residential areas.



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## Eastern Neighborhoods Pattern Area

The Eastern Neighborhoods feature a diverse range of urban and natural landscapes. Many structures in the Eastern Neighborhoods, which also include parts of Brentwood-Darlington and Cully, were developed after World War II. In addition, most of this this area was annexed into the City of Portland after the 1980 Comprehensive Plan was completed. The policies for the Eastern Neighborhoods promote design that responds to and enhances the area's distinctive mix of urban patterns and natural features, such as groves of Douglas firs, the East Buttes, and streams. Some policies address the opportunities and challenges presented by the area's large blocks and deep lots.

The Eastern Neighborhoods provide opportunities for new and distinctive approaches to the design of development and infrastructure that can enhance the area's positive characteristics and improve quality of life. It is important to continue the area's verdant character and provide a more livable environment, while reducing disparities and increasing access to services.

**Policy 3.82** **Eastern Neighborhoods street, block, and lot pattern.** Guide the evolving street and block system in the Eastern Neighborhoods in ways that build on positive aspects of the area's large blocks, such as opportunities to continue mid-block open space patterns and create new connections through blocks that make it easier to access community destinations.

**Policy 3.83** **Eastern Neighborhoods trees and natural features.** Encourage development and right-of-way design that preserves and incorporates Douglas fir trees and groves, and that protects the area's streams, forests, wetlands, steep slopes, and buttes.

**Policy 3.84** **Eastern Neighborhoods buttes.** Enhance public views of the area's skyline of buttes.

**Policy 3.85** **Eastern Neighborhoods corridor landscaping.** Encourage landscaped building setbacks along residential corridors on major streets.

**Policy 3.86** **Eastern Neighborhoods active transportation.** Enhance access to centers and other community destinations in Eastern Neighborhoods by ensuring that corridors have safe and accessible pedestrian facilities and creating additional secondary connections that provide low-stress pedestrian and bicycle access.



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## Western Neighborhoods Pattern Area

The Western Neighborhoods have been shaped by their location within the terrain of Portland's west hills. Much of this area was developed after World War II. These policies encourage design that responds to area's prominent characteristics, such as its hilly topography, streams, ravines, and forested slopes, while cultivating a built environment that expands mobility and accessibility for all people. These design approaches are intended to apply to a range of development types and locations.

**Policy 3.87** **Western Neighborhoods village character.** Enhance the village character of the Western Neighborhoods' small commercial districts and increase opportunities for more people to live within walking distance of these neighborhood anchors.

**Policy 3.88** **Western Neighborhoods connections.** Provide safe and accessible pedestrian and bicycle connections along corridors as well as off-street trail connections to and from residential neighborhoods.

**Policy 3.89** **Western Neighborhoods Habitat Corridors.** Preserve, enhance, and connect the area's network of habitat areas and corridors, streams, parks, and tree canopy.

**Policy 3.90** **Western Neighborhoods trails.** Enhance the Western Neighborhoods' distinctive system of trails to expand mobility, access to nature, and active living opportunities in the area.



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*Figure 3-1. Urban Design Framework. The locations shown on the diagram are not exact boundaries. Detailed boundaries for centers, corridors and habitat areas and all other items shown on the map will be defined in supporting plans or through future planning projects.*






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*Figure 3-2. Centers*

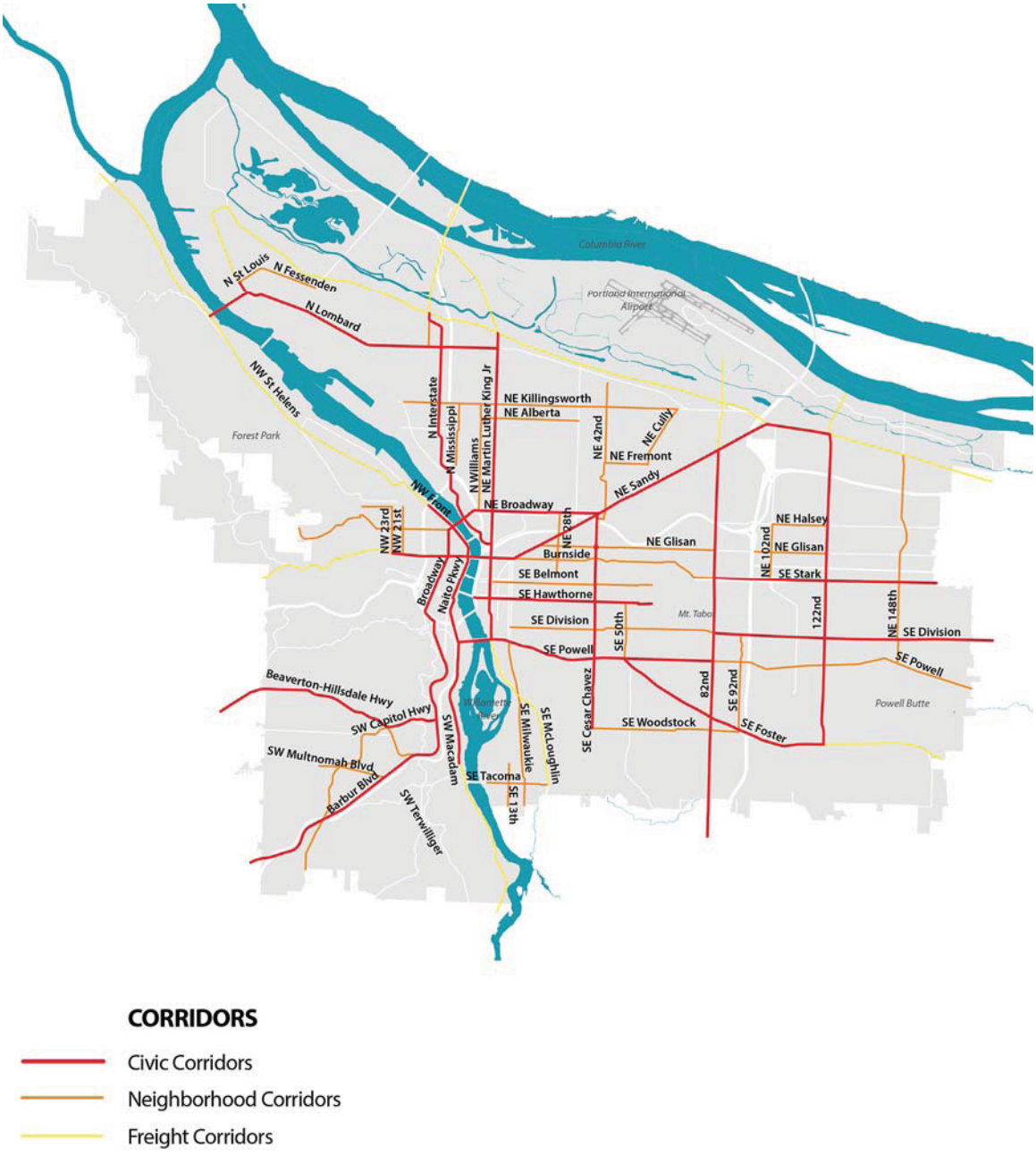




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*Figure 3-3. Corridors*

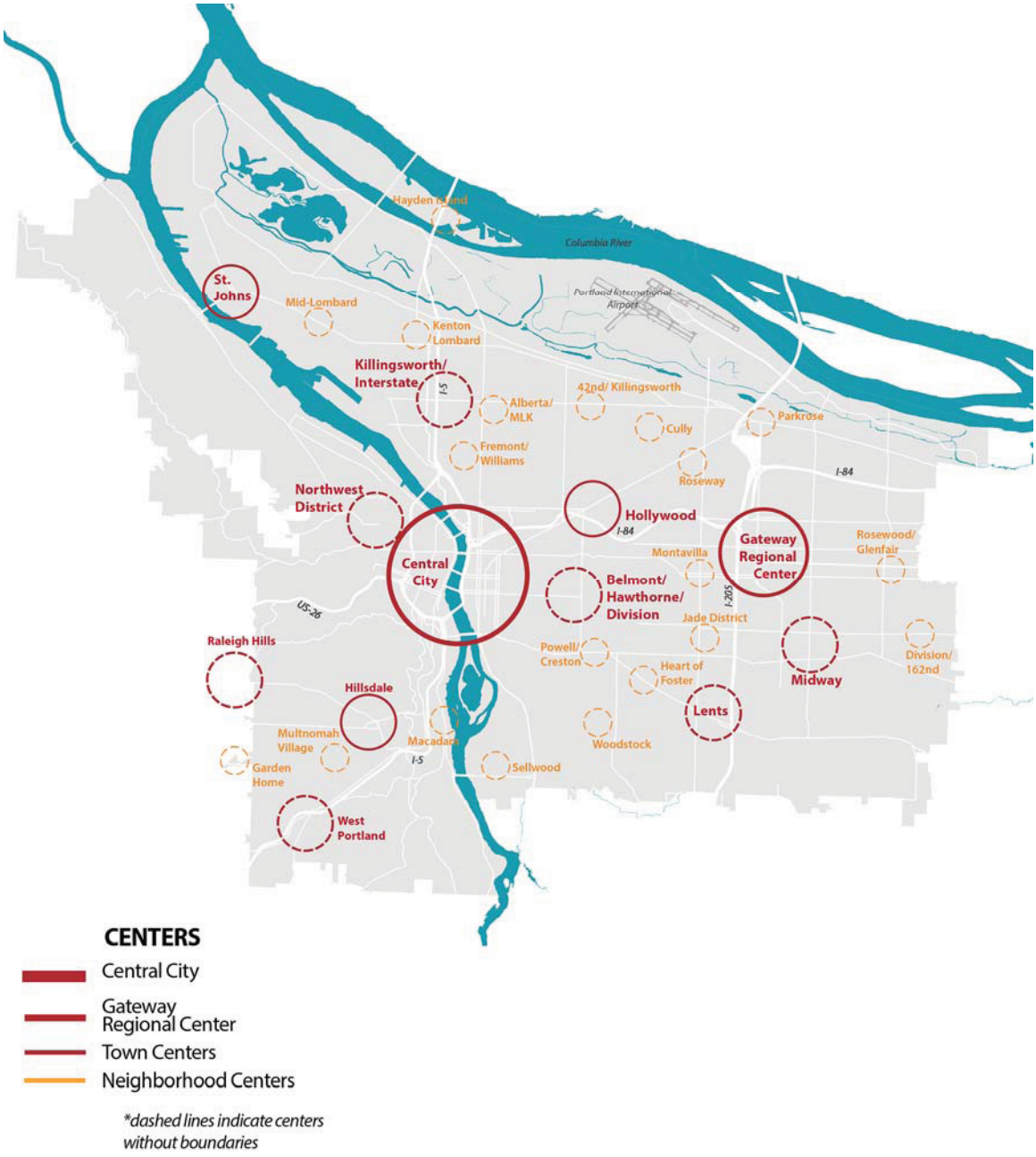




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*Figure 3-4. Transit Station Areas*

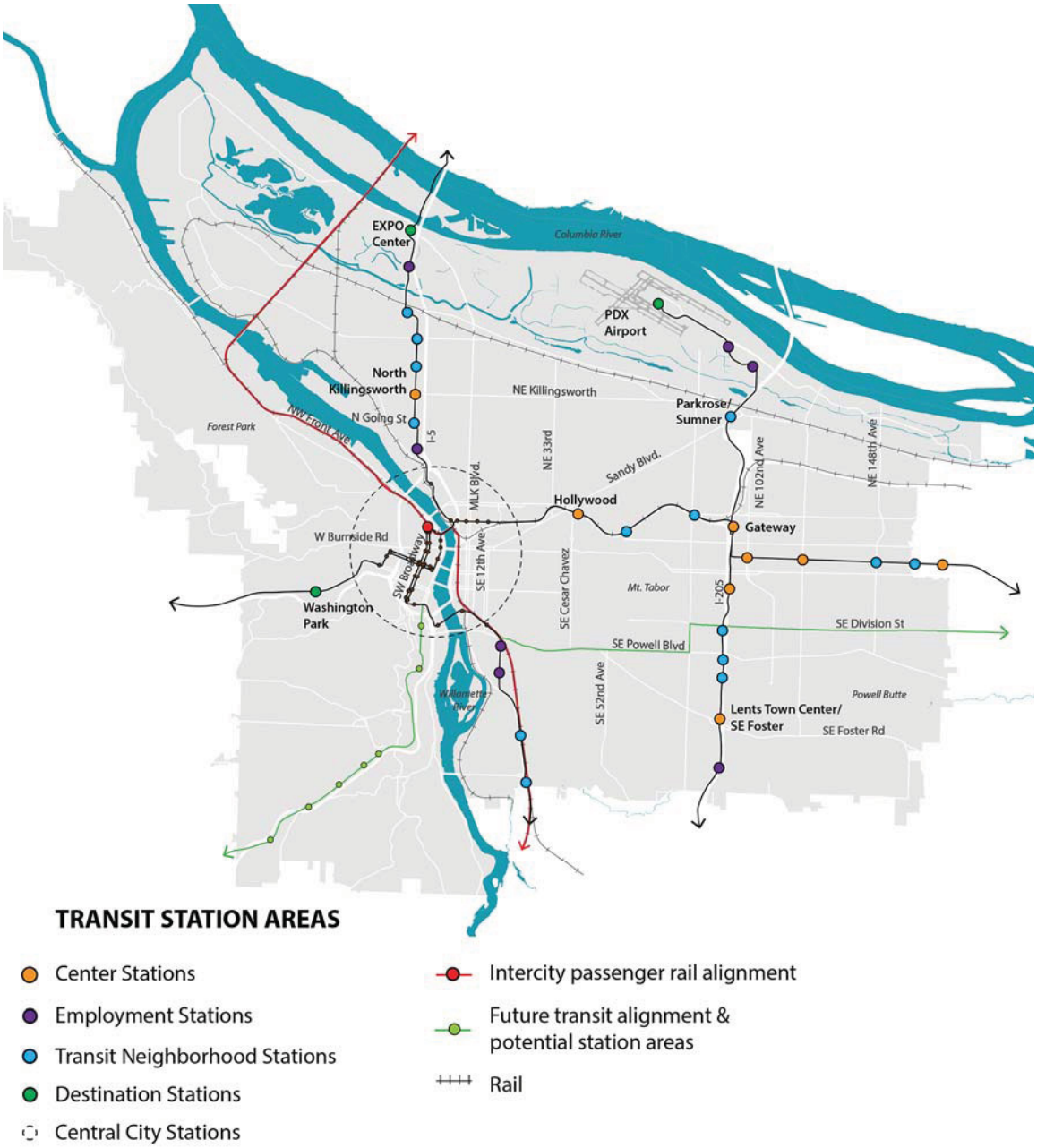




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*Figure 3-5. Greenways*






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*Figure 3-6. Urban Habitat Corridors*

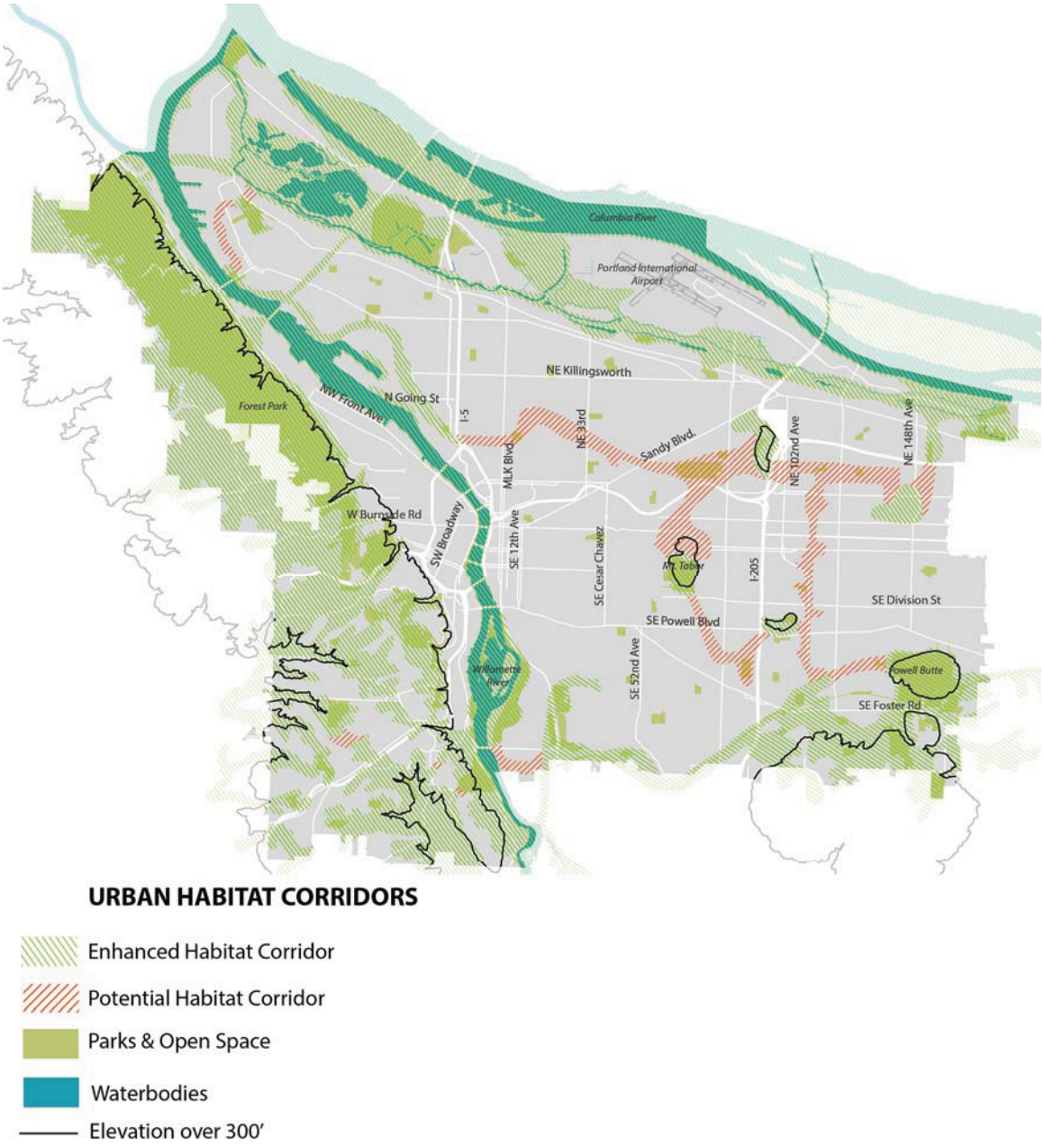




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*Figure 3-7. Employment Areas*

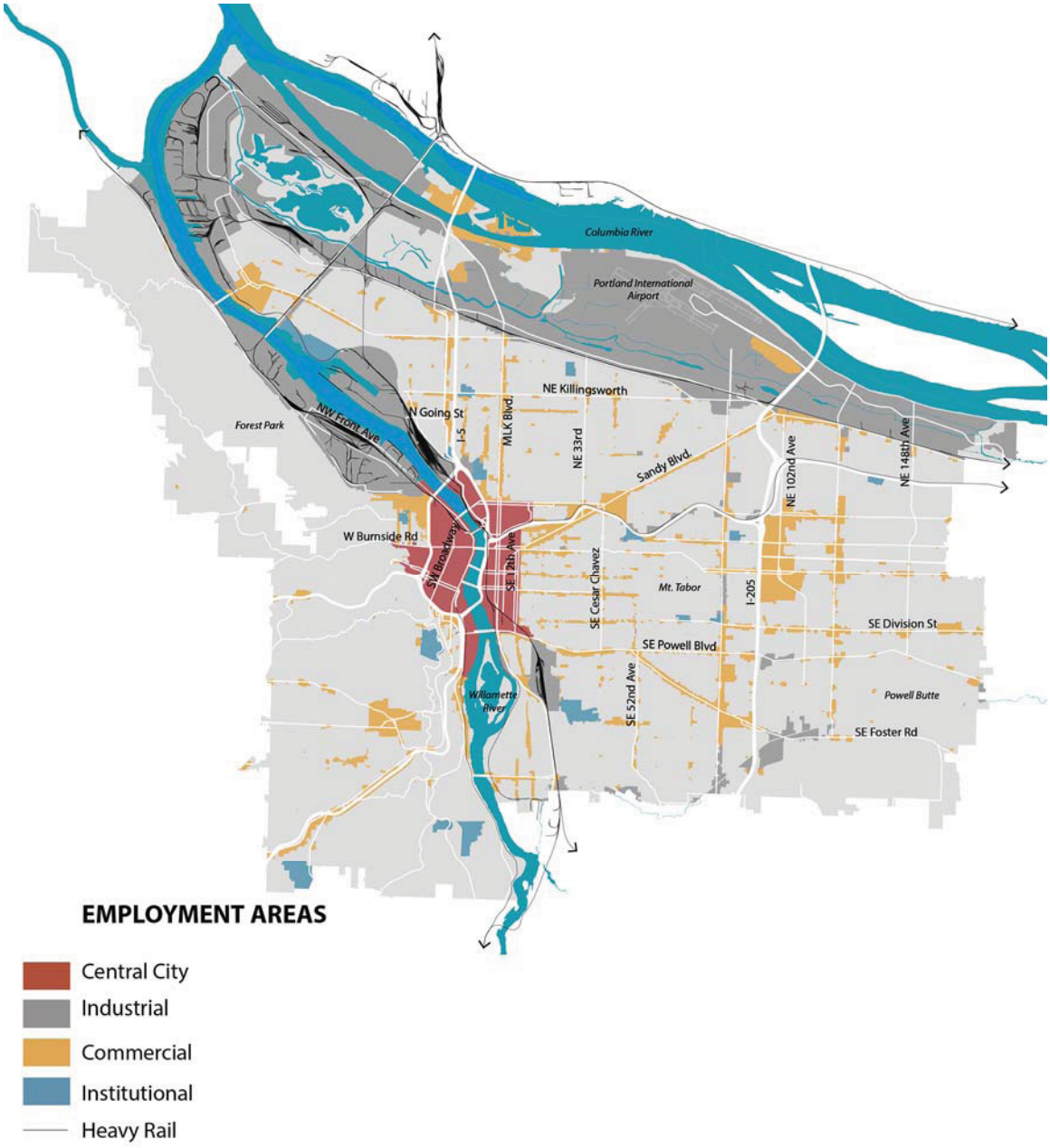




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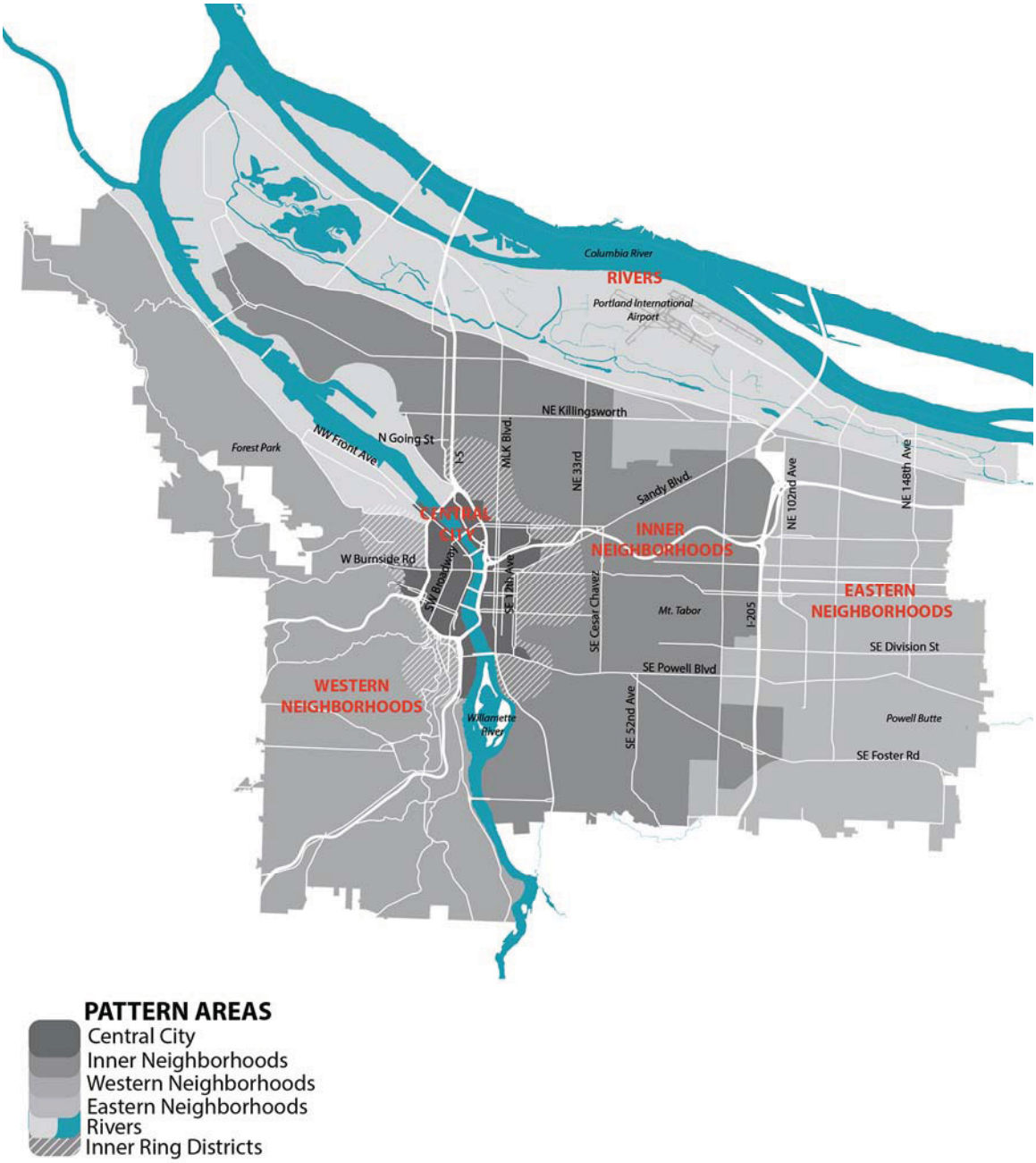
*Figure 3-8. Pattern Areas*



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# Chapter 4: Design and Development

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Encourage building and site design that promotes human and environmental health and safety and responds to local context.
- Promote strong links between building and site design, streets and the public realm.
- Guide historic and cultural resource and scenic view preservation.
- Encourage the integration of nature into the built environment.
- Reduce carbon emissions and promote energy and resource efficient neighborhoods and buildings.

## Why is this important?

Development and design shapes how Portland looks and functions. Past development, in combination with the natural landscape, has shaped how the city is experienced. Future development, and the treatment of built and natural heritage, has the potential to create a better, healthier, more efficient and more pleasant Portland. New development and redevelopment can promote vibrant, accessible urban places for people of all ages, abilities and backgrounds, while also enhancing natural resources, protecting health and safety and promoting resilience.

As a growing city, Portland faces design and development challenges, as well as opportunities. The policies in this chapter encourage development that respects context, preserves historic and cultural resources, reduces carbon emissions, improves resource efficiency, minimizes risk from natural hazards, limits impacts to wildlife and natural systems, and integrates nature into the urban environment.



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# Goals

**Goal 4.A: Context-sensitive design and development**
New development is designed to respond to and enhance the distinctive physical, historic, and cultural qualities of its location, while accommodating growth and change.

**Goal 4.B: Historic and cultural resources**
Historic and cultural resources are integral parts of an urban environment that continues to evolve and are preserved when possible.

**Goal 4.C: Human and environmental health**
Neighborhoods and development are designed and built to enhance human and environmental health. They are designed and built to protect safety and livability, support local access to healthy food, limit negative impacts on water and air quality, reduce carbon emissions, encourage active and sustainable design, and integrate nature and the built environment.

**Goal 4.D: Urban resilience**
Buildings, streets, and open spaces are designed to ensure long-term resilience. They are designed to adjust to changing demographics, climate, and economy, and withstand and recover from natural disasters.

# Policies

## General development principles

The design of buildings and other development can affect the safety, health, and quality of life of building users, neighbors and the environment. The following policies guide building and site design to promote accessible and attractive public environments. They also encourage site and building designs that contribute to a welcoming and attractive public realm and respond to current and historical contexts.

**Policy 4.1** **Pattern areas.** Encourage building and site designs that respect the unique built natural, historic, and cultural characteristics of Portland's five pattern areas, described in the Urban Form chapter.

**Policy 4.2** **Community identity.** Encourage the development of character-giving design features that are responsive to place and the cultures of communities.

**Policy 4.3** **Site and context.** Encourage development that responds to and enhances the positive qualities of site and context—the block, the public realm, and natural features.


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**Policy 4.4** **Pedestrian-oriented design.** Enhance the pedestrian experience throughout Portland, through public and private development that creates accessible and attractive places for all those who walk and/or use wheelchairs or other mobility devices.

**Policy 4.5** **Transitional urbanism.** Encourage temporary activities and structures in areas that are transitioning to being more urban, to promote job creation, entrepreneurship, active streets, and human interaction.

**Policy 4.6** **Design for active living.** Encourage development and building and site design that promotes active living.

**Policy 4.7** **Access to light and air.** Provide for public access to light and air by managing and shaping the height, and mass of buildings, while accommodating urban scale development.

**Policy 4.8** **Privacy and solar access.** Encourage building and site designs that limit reductions in privacy and solar access for residents and neighbors, while accommodating urban scale development.

**Policy 4.9** **Crime-preventive design.** Encourage building and site design approaches that help prevent crime.

**Policy 4.10** **Fire prevention and life safety.** Encourage building and site design that improves fire prevention and life safety.

**Policy 4.11** **Alleys.** Encourage the continued use of alleys for parking access and expand their use as the location of accessory dwelling units and as multi-purpose community space.

## Residential areas

There will be development and change, even in relatively stable lower density residential areas. These policies encourage designs and development that continue the existing development pattern. They also address design and development in lower density residential areas (see Glossary) outside of centers and corridors.

**Policy 4.12** **Adaptable neighborhoods.** Encourage more housing choices to accommodate a wider diversity of family sizes, incomes, and ages. Allow adaptive reuse of existing buildings and the creation of accessory dwelling units to serve the changing needs of a household over time.



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**Policy 4.13** **Scale and patterns.** Encourage design and development that complements the general scale, character, and natural landscape features of neighborhoods. Consider building forms, scale, street frontage relationships, setbacks, open space patterns, and landscaping. Allow a range of architectural styles and expression, and respect existing entitlements.

**Policy 4.14** **Resource efficient and healthy residential design and development.** Support resource efficient and healthy residential design and development (see those polices below).

## Design and development of centers and corridors

Centers and corridors are places where large numbers of people live, work, and visit. Careful attention to the design of centers and corridors is necessary to ensure that they become places where people want to live and gather, and where getting around by walking, biking, or wheelchair is an attractive choice. These policies also encourage the development of centers as places that reflect the character and cultures of the surrounding neighborhoods.

**Policy 4.15** **Walkable scale.** Focus services and higher-density housing in the core of centers to support a critical mass of demand for commercial services and more walkable access for customers.

**Policy 4.16** **Street environment.** Encourage development in centers and corridors to include amenities that create a pedestrian-oriented environment and provide places for people to sit, spend time, and gather.

**Policy 4.17** **Street orientation.** Promote building and site designs that enhance the pedestrian experience in centers and corridors, with windows, entrances, pathways, and other features that provide connections to the street environment.

**Policy 4.18** **Relationship between building height and street size.** Encourage development in centers and corridors that is responsive to street space width, allowing taller buildings on wider streets.

**Policy 4.19** **Design for pedestrian and bicycle access.** Provide accessible sidewalks, high-quality bicycle access, and frequent street connections and crossings in centers and corridors.

**Policy 4.20** **Residential uses on busy streets.** Improve the livability of places and streets with high motor vehicle volumes. Encourage landscaped front setbacks, street trees, and other design approaches to buffer residents from street traffic.



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**Policy 4.21** **Natural features and green infrastructure in centers and corridors.** Integrate natural and green infrastructure, such as street trees, green spaces, ecoroofs, gardens, and vegetated stormwater management systems, into centers and corridors.

**Policy 4.22** **Active gathering places.** Locate public squares, plazas, and other gathering places in centers and corridors to provide places for community activity and social connections. Encourage location of businesses and services adjacent to these spaces that relate to and promote the use of the space.

**Policy 4.23** **Protect defining features.** Protect and enhance defining places and features of centers and corridors, including landmarks, natural features, and historic and cultural resources.

**Policy 4.24** **Historic buildings in centers and corridors.** Protect, restore, and improve historic buildings in centers and corridors on adopted inventories.

**Policy 4.25** **Public art.** Encourage new development and public places to include design elements and public art that contribute to the distinct identities of centers and corridors, and that highlight the history and diverse cultures of neighborhoods.

## Transitions and offsite impacts

These policies address transitions between areas of differing types of activity and scale of development, such as where centers and corridors interface with adjacent lower-intensity residential zones. These policies also address the consideration and mitigation of offsite impacts from development.

**Policy 4.26** **Scale transitions.** Create transitions in building scale in locations where higher-density and intensity development is adjacent to smaller scale single-dwelling zoning. Ensure that new high-density and large-scale infill development adjacent to single dwelling zones incorporates design elements that soften transitions in scale and strive to protect light and privacy for adjacent residents.

**Policy 4.27** **Land use transitions.** Improve the interface between non-residential activities and residential areas, in areas where commercial or employment areas are adjacent to residential zoned land.

**Policy 4.28** **Offsite impacts.** Use land use and other regulations to limit and mitigate impacts, such as odor, noise, glare, air pollutants, and vibration that the use or development of a site may have on adjacent residential or institutional uses, and on significant fish and wildlife habitat areas. Pay particular attention to limiting and mitigating impacts to under-served and under-represented communities.



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**4.28.a. Auto-oriented uses and exterior displays.** Minimize the impacts of auto-oriented uses, vehicle areas, drive-through areas, signage, and exterior display and storage areas on adjacent residential areas.

**4.28.b. Minimizing industrial impacts.** Protect non-industrial zoned parcels from the adverse impacts of activities on industrial zoned parcels.

**4.28.c. Industrial edge.** Buffer between industrial sanctuaries and adjacent residential or mixed use areas to protect both the viability of long-term industrial operations and the livability of adjacent areas.

**4.28.d. Air quality impacts.** Encourage building and landscape design and land use patterns that limit and/or mitigate negative air quality and noise impacts to building users and residents, particularly in areas near freeways, high traffic streets, and other sources of air pollution.

**4.28.e. Light pollution.** Encourage lighting design and practices that reduce the negative impacts of light pollution, including sky glow, glare, energy waste, impacts to public safety, disruption of ecosystems, and hazards to wildlife.

**4.28.f. Airport noise.** Require compatible land use designations and development within the noise-affected area of Portland International Airport, while providing public notice of the level of aircraft noise and mitigating the potential impact of noise within the area.

**4.28.g. Telecommunication facility impacts.** Mitigate the visual impact of telecommunications and broadcast facilities near residential areas through physical design solutions.



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## Scenic resources

Portland's signature views of Mount Hood and other mountain peaks, bridges, and rivers are important to the city's identity. They strengthen connections to the regional landscape. These policies encourage the recognition, enhancement and protection of public views and significant scenic resources, as designated in the Scenic Resources Inventory.

**Policy 4.29** **Significant places.** Enhance and celebrate significant places throughout Portland with symbolic features or iconic structures that reinforce local identity, histories, and cultures and contribute to way-finding throughout the city. Consider these especially at:

- High-visibility intersections
- Attractions
- Bridges
- Rivers
- Viewpoints and view corridor locations
- Historically or culturally significant places
- Neighborhood boundaries and transitions

**Policy 4.30** **Scenic resource protection.** Protect designated significant scenic resources, including public views and scenic sites and corridors; and update or reconfirm the inventory of significant views, sites, and corridors in the future.

**Policy 4.31** **Vegetation management.** Provide allowances for the pruning and cutting of trees and shrubs to maintain or enhance designated public views.

**Policy 4.32** **Utility lines.** Maintain designated scenic views, sites, and corridors by encouraging the placement of utility lines underground.

**Policy 4.33** **Regulatory guidance.** Avoid adverse impacts to scenic resources as part of land use reviews, where practicable.

**Policy 4.34** **New public views.** Encourage new public and private development to contribute to creating new public views of Portland's rivers, bridges, the surrounding mountains, hills and buttes, the Central City skyline, and other landmark features.

**Policy 4.35** **Street views.** Maintain public views of prominent landmarks and buildings that serve as visual focal points within streets or that terminate views at the end of streets.



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## Historic and cultural resources

Portland has several hundred designated historic landmarks and historic and conservation districts. These special places help create a sense of place, contribute to neighborhood character, and recognize past history and events. More than half of Portland's buildings are over 50 years old, creating a vast pool of potentially significant properties. These policies support the protection of all resources of statewide significance and encourage preservation of historic and culturally significant resources.

**Policy 4.36** **Historic and cultural resource protection.** Encourage the protection and restoration of high-quality historic buildings and places that contribute to the distinctive character and history of Portland's evolving urban environment, where feasible.

**Policy 4.37** **Continuity with established patterns.** Encourage development that fills in vacant and underutilized gaps within the established urban fabric, while preserving and complementing historic resources.

**Policy 4.38** **Demolition.** Protect significant historic structures from demolition until opportunities can be provided for public comment, pursuit of alternatives to demolition, or actions that mitigate for the loss.

**Policy 4.39** **City-owned historic resources.** Keep City-owned historic resources in a state of good repair.

**Policy 4.40** **Historic Resources Inventory.** Survey and inventory historic resources as part of future planning projects, with a focus on areas of anticipated growth and change.

**Policy 4.41** **Preservation equity.** Expand historic preservation inventories, regulations, and programs to encourage historic preservation in areas that are under-represented by current historic preservation efforts.

**Policy 4.42** **Cultural diversity.** Work with Portland's diverse communities to identify and preserve places of historic and cultural significance.

**Policy 4.43** **Cultural heritage.** Encourage the protection and enhancement of cultural heritage structures and sites as valuable and important public assets.

**Policy 4.44** **Community structures.** Encourage the adaptive reuse of historic community structures, such as meeting halls and places of worship, for arts, cultural, and community uses that continue their role as anchors for community and culture.

**Policy 4.45** **Archaeological resources.** Protect and preserve archaeological resources in place, especially those sites and objects associated with American Indian cultures.



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## Public art

Public art and cultural amenities enrich people's lives. They offer educational experiences, enliven public spaces, and foster creativity. This helps build a sense of community and identity for an area. These policies support including public art in development.

**Policy 4.46** **Public art and development.** Create incentives for public art as part of public and private development projects.

## Resource-efficient design and development

These policies support resource efficient design and development, from the location of development to the types of building materials. They apply to new development as well as the continued and adaptive reuse of existing buildings.

**Policy 4.47** **Rehabilitation and adaptive reuse.** Encourage rehabilitation and adaptive reuse of buildings, especially those of historic or cultural significance, to conserve natural resources, reduce waste, and demonstrate stewardship of the built environment.

**Policy 4.48** **Prioritize reuse.** Encourage maintenance, rehabilitation, and/or relocation of viable buildings over demolition and new construction.

**Policy 4.49** **Seismic and energy retrofits.** Promote seismic and energy efficiency retrofits of historic buildings and other existing structures to reduce carbon emissions, save money, and improve public safety.

**Policy 4.50** **Life cycle efficiency.** Encourage use of technologies, techniques, and materials in building design, construction, and removal that result in the least environmental impact over the life cycle of the structure.

**Policy 4.51** **Materials and practices.** Encourage use of natural, resource-efficient, recycled, recycled content, and non-toxic building materials and energy-efficient building practices.

**Policy 4.52** **Water use efficiency.** Encourage site and building designs that make efficient use of water and manage stormwater as a resource.

**Policy 4.53** **Optimizing benefits.** Provide mechanisms to evaluate and optimize the range of benefits from solar and renewable resources, tree canopy, ecoroofs, and building design.

**Policy 4.54** **Energy efficiency.** Encourage and promote energy efficiency significantly beyond the Statewide Building Code and the use of solar and other renewable resources in individual buildings and at a district scale.



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**Policy 4.55** **District energy systems.** Encourage and remove barriers to the development and expansion of low-carbon heating and cooling systems that serve multiple buildings or a broader district.

**Policy 4.56** **Ecodistricts.** Encourage the creation of ecodistricts where multiple partners work together to achieve sustainability and resource efficiency goals at a district scale.

**Policy 4.57** **Energy-producing development.** Encourage and promote development that uses renewable resources, such as solar, wind, and water to generate power on-site and to contribute to the energy grid.

*Goals and policies related to energy infrastructure can be found in Chapter 8: Public Facilities and Services.*

## Designing with nature

Incorporating natural features and functions into development yields tangible social, environmental and economic benefits. It improves human and watershed health. How this integration looks and functions depends on local conditions and characteristics. Regardless, designing with nature provides or enhances ecosystem services, such as stormwater management, cooling of air and water, reduction of landslide and flooding risks, protection or improvement of fish and wildlife habitat, and the ability of Portlanders to enjoy nature in their daily lives. These policies encourage development and design that enhances the identity and beauty of Portland's neighborhoods, while improving environmental health and preparing for the effects of climate change. Additional goals and policies about the integration of nature into the built environment are found in Chapter 7.

**Policy 4.58** **Design with nature.** Encourage design and site development practices that enhance and avoid the degradation of watershed health and ecosystem services.

**Policy 4.59** **Flexible development options.** Encourage flexibility in the division of land, the siting and design of buildings, and other improvements to reduce the impact of development on environmentally sensitive areas.

## Hazard-resilient design

Portland has varied topography, with hills, buttes, abundant trees, and vegetation. It is also located at the confluence of two major river systems. As a result, there are periodic floods, wildfires, and landslides. The city is also in a seismically active region, at risk of earthquakes from local faults and the Cascadia Subduction Zone in the Pacific Ocean. These policies direct development away from hazard-prone areas, seek to reduce hazard risks and impacts, and improve resilience to disasters and climate change.

**Policy 4.60** **Evaluating hazards.** Evaluate slope and soil characteristics, including liquefaction potential, landslide hazards, and other geologic hazards.



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**Policy 4.61** **Reducing natural hazards and climate change risks and impacts.** Limit development in or near areas prone to natural hazards where practicable, using the most current hazard and climate change-related information and maps.

**Policy 4.62** **Disaster recovery.** Encourage development approaches that will enhance the ability of people, wildlife, natural systems, and property to withstand and recover from a natural disaster or other major disturbance.

**Policy 4.63** **Urban heat islands.** Encourage development, building, and infrastructure design that reduces urban heat island effects.

**Policy 4.64** **Planning and disaster recovery.** Facilitate effective disaster recovery by providing recommended updates to land use designations and development codes, as warranted, in preparation for natural disasters.

## Healthy Food

Access to healthy food is important for many reasons. A nourishing diet is critical to maintaining good health and avoiding chronic disease later in life. This leads to better long term public health outcomes and lower healthcare costs. Food behaviors are shaped at an early age. Children who are exposed to healthy foods are more likely to develop healthful food behaviors than those who are not.

In spite of these benefits, many Portlanders do not have good access to healthy food. These policies promote a range of approaches for improving access to healthy food through buying and growing. The policies help meet the Portland Plan goal for 90 percent of Portlanders to live within a half-mile of a store or market that sells healthy food.

**Policy 4.65** **Grocery stores in centers.** Facilitate the development of grocery stores and neighborhood-based markets offering fresh produce in centers.

**Policy 4.66** **Neighborhood food access.** Encourage small, neighborhood-based retail food opportunities, such as corner markets, food co-ops, food buying clubs, and community-supported agriculture pickup/drop off sites, to fill in service gaps in food access across the city.

**Policy 4.67** **Growing food.** Increase opportunities to grow food for personal consumption, donation, sales, and educational purposes.

**Policy 4.68** **Access to community gardens.** Ensure that community gardens are allowed in areas close to or accessible via transit to people living centers and other high-density areas where residents have few opportunities to grow food in yards.



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# Chapter 5: Housing

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Ensure adequate access to housing for a socially- and economically-diverse population.
- Support fair, equitable, healthy, resource efficient and physically-accessible housing.
- Establish ways to mitigate gentrification and displacement.
- Concentrate new housing in and around centers and corridors near transit and services to reduce the housing/transportation cost burden.
- Maintain and promote a supply of permanently-affordable housing for Portland's most vulnerable residents.

## Why is this important?

While a place to live is a basic human need, not all Portlanders have safe and healthy housing. Ensuring a fair and equitable housing market is essential to providing the opportunities and security people need to live healthy and successful lives. Economic, social and physical barriers limit many Portlanders' access to adequate housing. People of color experience housing discrimination at much higher rates than do white Portlanders, and often have fewer housing choices. Income, immigration status, limited English proficiency, sexual orientation and disability can also limit choices.

In recent years, rising costs and declining incomes have strained household budgets for all but the most well-off. Greater housing and transportation costs mean that the cost burden is being felt not just by low-income households, but also by moderate- and middle-income households. In 2010, nearly one quarter of Portland's renter households were cost burdened, meaning that they spent more than 50 percent of household income on housing and transportation. There were many cost-burdened homeowners as well. Metro's long-range forecasts predict a steep increase in the number of cost-burdened households, particularly amongst low-income households.



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# HOUSING

The purpose of this chapter is to provide policies that will help Portland meet its need for quality, affordable homes for a growing and socioeconomically-diverse population, and to help ensure equitable access to housing. The Comprehensive Plan Map allows for a more-than-adequate supply of housing to meet the future needs. The challenge is to provide housing with a diverse range of unit types and prices in locations that help meet the needs of all, including low-income populations, communities of color, and people of all ages and abilities.

These goals and policies provide guidance for the regulations, programs, incentives, and partnerships that will help achieve Portland's housing goals.



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# Goals

**Goal 5.A: Housing diversity**
Portlanders have access to high-quality affordable housing that accommodates their needs, preferences, and financial capabilities in terms of different types, tenures, density, sizes, costs, and locations.

**Goal 5.B: Equitable access to housing**
Portland ensures equitable access to housing, making a special effort to remove disparities in housing access for people of color, low-income households, diverse household types, older adults, and households that include people with disabilities.

**Goal 5.C: Healthy connected city**
Portlanders live in safe, healthy housing that provides convenient access to jobs and to goods and services that meet daily needs. This housing is connected to the rest of the city and region by safe convenient affordable multimodal transportation.

**GOAL 5.D: Affordable housing**
Portland has an adequate supply of affordable housing units to meet the needs of residents vulnerable to increasing housing costs.

**GOAL 5.E: High-performance housing**
Portland residents have access to resource efficient and high performance housing for people of all abilities and income levels.


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# Policies

## Diverse and expanding housing supply

About 122,000 new households are expected in Portland between 2010 and 2035.

Oregon's Statewide Planning Goal 10 and the Metropolitan Housing Rule require that cities provide adequate land and plan for a range of housing types that can meet the diverse housing needs of various types of households. The Portland Plan provides additional policy guidance on the benefits of locating high-quality housing in amenity rich centers and corridors.

The policies below set expectations for housing supply and growth. They identify specific types of housing needed to serve a variety of households, including multi-generational families, small and large households with children, older adults and households that include people with disabilities who may need independent living services, assisted living and skilled nursing care facilities.

**Policy 5.1** **Housing supply.** Maintain sufficient residential development capacity to accommodate Portland's projected share of regional household growth.

**Policy 5.2** **Housing growth.** Strive to capture at least 25 percent of the seven-county region's residential growth.

**Policy 5.3** **Housing potential.** Evaluate plans and investments for their impact on housing capacity, particularly the impact on the supply of housing units that can serve low- and moderate-income households.

**Policy 5.4** **Housing types.** Encourage new and innovative housing types that meet the evolving needs of Portland households and expand housing choices in all neighborhoods. These housing types include single dwelling units; multi-dwelling units; accessory dwelling units; small units; pre-fabricated homes such as manufactured, modular, and mobile homes; co-housing and clustered housing/clustered services.

**Policy 5.5** **Housing in centers.** Apply zoning in and around centers that allows for and supports a diversity of housing that can accommodate a broad range of households.

**Policy 5.6** **Adaptable housing**. Encourage adaption of existing housing and the development of new housing that can be adapted in the future to accommodate the changing variety of household types.



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**Policy 5.7** **Physically-accessible housing.** Allow and support a robust and diverse supply of affordable, accessible housing to meet the needs of older adults and people with disabilities, especially in centers and other places which are in close proximity to services and transit.

**Policy 5.8** **Accessible design for all.** Encourage new construction and retrofitting to create physically accessible housing, extending from the unit to the community, through the use of Universal Design Principles.

## Housing access

Housing supply and household income are not the only factors determining access to housing. Discrimination in the housing market, gentrification, and the changing nature of households over time also influence access to desired housing.

The following policies address discriminatory barriers to fair and equitable access to housing and the impact of gentrification and displacement, particularly for under-served and under-represented populations.

**Policy 5.9** **Coordination with fair housing programs.** Foster inclusive communities, overcome disparities in access to community assets, and enhance housing choice for people in protected classes throughout the city by coordinating plans and investments with fair housing policies.

**Policy 5.10** **Remove barriers**. Remove potential regulatory barriers to housing choice for people in protected classes in order to ensure freedom of choice in housing type, tenure, and location.

**Policy 5.11** **Impact analysis.** Evaluate plans and investments, and other legislative land use decisions to identify potential disparate impacts on housing choice and access for protected classes.

**Policy 5.12** **Housing stability.** Coordinate plans and investments with programs that prevent avoidable, involuntary evictions and foreclosures.

**Policy 5.13** **Preserving communities.** Encourage plans and investments to protect and restore the socioeconomic diversity and cultural stability of established communities.

**Policy 5.14** **Gentrification/displacement risk.** Evaluate plans and investments for the potential to cause gentrification/displacement in areas with concentrations of communities of color, low- and moderate-income households, and renters.



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**Policy 5.15** **Involuntary displacement.** When plans and investments are expected to create neighborhood change, limit the involuntary displacement of under-served and under-represented people. Use public investments and programs, and coordinate with nonprofit housing organizations (such as land trusts and housing providers) to mitigate the impacts of market pressures that cause involuntary displacement.

**Policy 5.16** **Rebuild communities**. Coordinate plans and investments with programs that enable communities impacted by involuntary displacement to maintain social and cultural connections, and re-establish a stable presence and participation in the impacted neighborhoods.

**Policy 5.17** **Aging in place.** Encourage a range of housing options and supportive environments to enable older adults to remain in their communities as their needs change.

## Housing location

The Portland Plan's Healthy Connected City strategy provides policy guidance to expand opportunities for Portlanders to live in complete communities offering a mix of desirable services and opportunities. Housing that is located in a walkable neighborhood near active transportation, employment centers, open spaces, high-quality schools and various services and amenities enhances the general quality of life for its residents. Neighborhoods in Portland offer varying levels of opportunity (See Figure 5-1), with housing in high opportunity neighborhoods tending to be expensive compared to more affordable housing in areas that offer fewer opportunities. However, there are also small parts of Portland that are lacking in both opportunities as well as quality affordable housing units.

The following policies support efforts to provide equitable access to locational opportunities for under-served and under-represented populations in Portland.

**Policy 5.18** **Coordinate housing needs in high poverty areas.** Meet the housing needs of under-served and under-represented populations living in high poverty areas by coordinating plans and investments with housing programs.

**Policy 5.19** **Access to opportunities.** Improve equitable access to active transportation, jobs, open spaces, high-quality schools, and supportive services and amenities in areas with high concentrations of under-served and under-represented populations and an existing supply of affordable housing.

**Policy 5.20** **New development in high opportunity areas.** Locate new affordable housing in areas that are opportunity rich in terms of access to active transportation, jobs, open spaces, high-quality schools, and supportive services and amenities (see Figure 5-1: Housing Opportunity Map).



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**Policy 5.21** **Higher density housing**. Locate higher density housing, including units that are affordable and accessible, in and around centers to take advantage of the access to active transportation, jobs, open spaces, schools, and various services and amenities.

**Policy 5.22** **Impact of housing on schools.** Evaluate plans and investments for the effect of housing development on school enrollment, financial stability, and student mobility.

## Housing affordability

Housing affordability is a growing concern for Portland. Many households in the city have to spend significantly more than the recommended 30 percent of their income on housing. Households are considered cost-burdened if they spend more than 50 percent of their income on housing and transportation. More and more households are falling into this category because of steep increases in home prices, a tight rental market, increases in gasoline prices and transportation costs, and falling household incomes. Population projections for 2030 indicate that 25 to 30 percent of households in several parts of Portland will be housing cost-burdened.

The following policies respond to the challenges of housing affordability through regional cooperation, housing preservation and production efforts that lower housing costs, and provide homeownership opportunities for under-served and under-represented populations.

**Policy 5.23** **Housing preservation**. Preserve and produce affordable housing to meet the needs that are not met by the private market by coordinating plans and investments with housing providers and organizations.

**Policy 5.24** **Permanently affordable housing.** Evaluate plans and investments for their impact on the supply of permanently affordable housing. Increase the supply where practicable.

**Policy 5.25** **Housing cost burden.** Evaluate plans and investments for their impact on household cost, and consider ways to reduce the combined cost of housing, utilities, and/or transportation.

**Policy 5.26** **Household prosperity.** Facilitate expanding the variety of types and sizes of affordable housing units, and do so in locations that provide low-income households with greater access to convenient transit and transportation, education and training opportunities, the Central City, industrial districts, and other employment areas.

**Policy 5.27** **Affordable housing in centers.** Encourage income diversity in and around centers by allowing a mix of housing types and tenures.



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**Policy 5.28** **Affordable housing resources**. Pursue a variety of funding sources and mechanisms to preserve and develop housing units and various assistance programs for households whose needs are not met by the private market.

**Policy 5.29** **Impact of regulations on affordability**. Evaluate how existing and new regulations affect private development of affordable housing and minimize negative impacts where possible. Avoid regulations that facilitate economically exclusive neighborhoods.

**Policy 5.30** **Mobile home parks.** Evaluate plans and investments for potential redevelopment pressures on existing mobile home parks and impacts on park residents.

**Policy 5.31** **Workforce housing**. Encourage private development of a robust supply of housing that is affordable to moderate-income households located near convenient multimodal transportation that provides access to education and training opportunities, the Central City, industrial districts, and other employment areas.

**Policy 5.32** **Employer-assisted housing**. Encourage employer-assisted affordable housing in conjunction with major employment development.

**Policy 5.33** **Compact single-family options**. Encourage development and preservation of small resource-efficient and affordable single family homes in all areas of the city.

**Policy 5.34** **Affordable homeownership**. Align plans and investments to support improving homeownership rates and locational choice for people of color and other groups who have been historically under-served and under-represented.

**Policy 5.35** **Homeownership retention**. Support opportunities for homeownership retention for people of color and other groups who have been historically under-served and under-represented.

**Policy 5.36** **Variety in homeownership opportunities**. Encourage a variety of ownership opportunities and choices by allowing and supporting the creation of condominiums, cooperatives, mutual housing associations, limited equity cooperatives, land trusts, and sweat equity.

**Policy 5.37** **Regional cooperation**. Facilitate opportunities for greater regional cooperation in addressing housing needs in the Portland metropolitan area, especially for the homeless, low- and moderate-income households, and historically under-served and under-represented communities.



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**Policy 5.38** **Regional balance**. Encourage development of a "regional balance" strategy to secure greater regional participation to address the housing needs of homeless people and communities of color, low- and moderate-income households, and historically under-served and under-represented communities throughout the region.

## Homelessness

Understandably, the homeless population is most vulnerable to decreasing affordability and declining household prosperity. Unified guidance by the City of Portland, Multnomah County and Home Forward is provided through their jointly authored plan, *A Home for Everyone: A United Community Plan to End Homelessness in Multnomah County (2013)*. This plan focuses resources to support priority populations, particularly families with children, unaccompanied youth, adults with disabilities, women, and veterans. It focuses investments in six program areas to prevent and end homelessness, including housing, income and benefits, health, survival and emergency services, access to services and systems coordination. The purpose of the plan is to prevent homelessness, and reduce the time people spend being homeless. The following policy provides land use support for the priorities identified by this plan.

**Policy 5.39** **Housing continuum**. Prevent homelessness and reduce the time spent being homeless by ensuring that a continuum of safe and affordable housing opportunities and related supportive services are allowed, including but not limited to transitional housing, self-built micro housing communities, emergency shelters, temporary shelters such as warming centers and transitional campgrounds.

## Health and safety

Having a place to live does not guarantee health and safety. A critical connection exists between the quality of the housing unit and the health of its occupants.

A safe housing unit is largely free of hazardous materials, such as lead and radon. It is also free of mold, is not in a state of disrepair, and offers emergency safety features, such as carbon monoxide monitors, smoke alarms, and emergency exits. Access to open spaces, opportunities for social interactions, green features, and adaptability also influence the health of a community. The following policies focus on building and maintaining Portland's housing stock in ways that foster community health.

**Policy 5.40** **Healthy housing**. Encourage development and maintenance of housing, especially multi-dwelling housing, that protects the health and safety of residents and encourages healthy lifestyles and active living.



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**Policy 5.41** **Housing quality.** Encourage housing that provides high indoor air quality, access to sunlight and outdoor spaces, and is protected from noise, pests, hazardous environmental conditions, and materials.

**Policy 5.42** **High-performance housing.** Encourage energy efficiency, green building practices, materials, and design to produce healthy, efficient, durable, and adaptable homes that are affordable or reasonably priced.

**Policy 5.43** **Healthy and active living.** Encourage housing that provides features supportive of healthy eating and active living, such as useable open areas, recreation areas, community gardens, crime-preventive design, and community kitchens in multifamily housing.

**Policy 5.44** **Walkable surroundings.** Encourage active transportation in residential areas through the development of pathways, sidewalks, and high-quality onsite amenities, such as secure bicycle parking.

**Policy 5.45** **Responding to social isolation.** Encourage site designs and relationship to adjacent developments that reduce social isolation for groups that often experience it, such as older adults, people with disabilities, communities of color, and immigrant communities.



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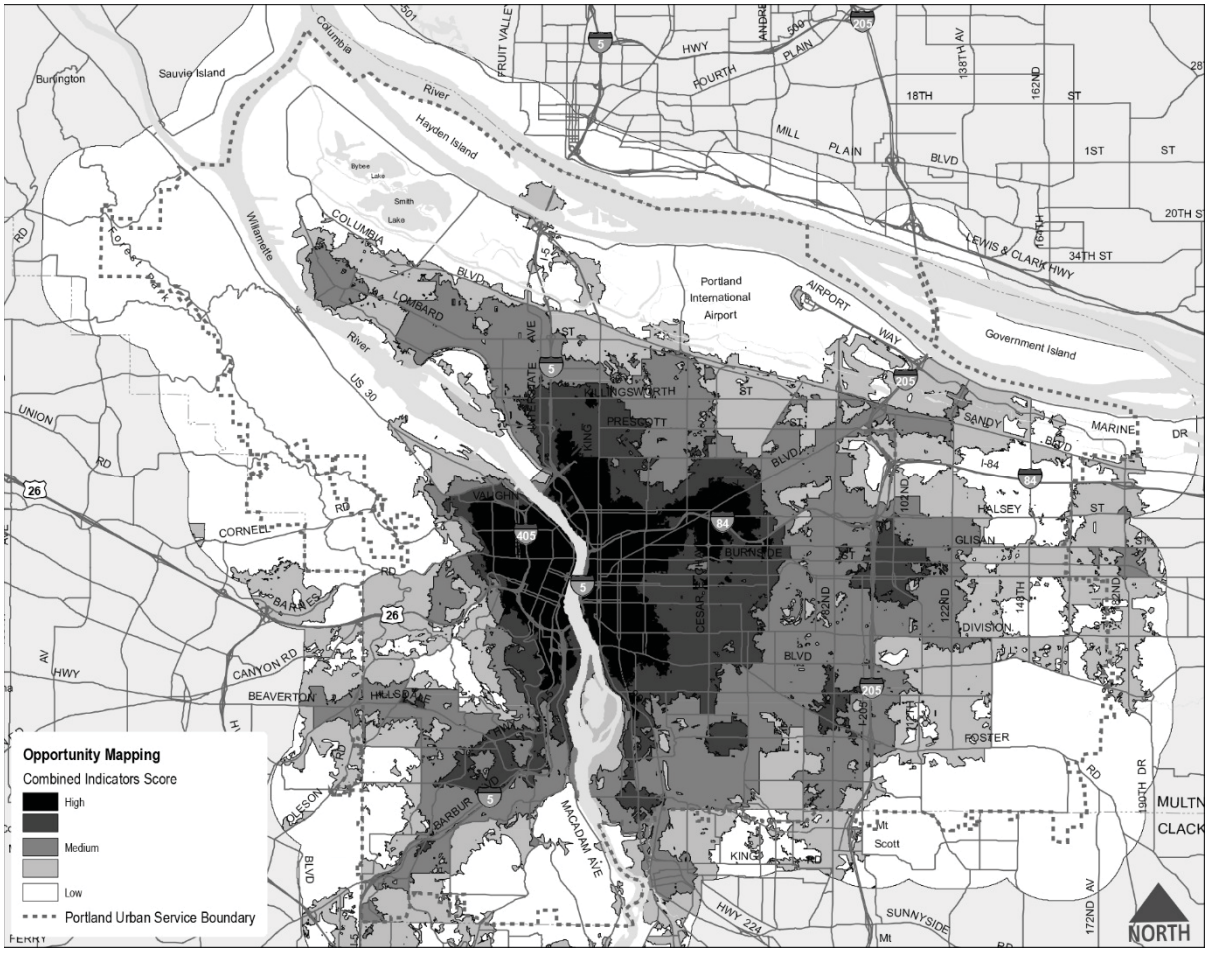
*Figure 5-1. Housing Opportunity Map*



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# Chapter 6: Economic Development

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Provide land supply to support job growth, and to expand the use of tools, such as brownfield redevelopment, to increase efficient use of land.
- Expand economic opportunity and improve economic equity for Portland's growing population through sustained business growth.
- Support traded sector growth, expand exports and retain Portland's position as an innovative industrial and commercial center and a West Coast trade gateway.
- Provide land use policies to support the growth and vitality of business districts.
- Create an environment that encourages innovation and entrepreneurship, builds on local strengths for business success and growth, and offers businesses a functional and attractive place to locate.

## Why is this important?

A healthy economy provides opportunities for people to achieve their full potential and it is the foundation of a livable city. A healthy economy supports the creation of living wage jobs for our growing and increasingly diverse population. It supports a growing tax base for public services. It also improves health and educational outcomes. People with stable jobs and reliable incomes have resources to meet their basic needs, which contributes to their physical and mental health, and to the educational and economic success of youth.

Portland is an innovative employment center in a region with strong economic and export growth. Economic strengths also include a successful Central City and industrial base, a primarily middle-class distribution of jobs that support a diverse community, and livability advantages that attract population growth and talent. However, these strengths mask trends toward declining prosperity for many Portlanders and highlight that economic development must be a higher priority in the coming decades than it has been.

Since 2000, job growth in the city has fallen far short of housing growth. Rising costs of living have outpaced average wages. The share of middle-wage jobs and resulting upward-mobility opportunities for low-income people has declined. Income growth has been concentrated among the top-earning 20 percent of the workforce. In addition, deep income disparities persist for under-represented and under-served populations, such as people of



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color. Research suggests that cities with more equitable economies have stronger economies.

As businesses face an increasingly competitive regional and global marketplace, new directions are needed to sustain job growth and improve economic equity. The region's primarily industrial traded sectors that drive regional prosperity will need more investment in workforce education, land supply, freight infrastructure and innovation. Improving economic equity and affordability will depend on making equity a more central part of City policy and investments.

New land development approaches are needed to improve local competitiveness in regional markets, including more brownfield redevelopment, low-cost office development and institutional zoning. Land use programs must address the increasingly blurred lines between commercial, industrial and create services sectors. Citywide neighborhood prosperity will depend on new approaches to concentrated commercial growth in centers, neighborhood revitalization, flexibility, affordability and small business growth. And business climate improvements are needed to keep regulatory burdens and fees competitive in the regional marketplace.

The world economy is a dynamic system.  Portland's economy will continue to change in response to technology, social change and global trends. Zoning and land use must respond to these changes. This kind of local economic innovation will be key to Portland being a player in development of the future economy.



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# Goals

**Goal 6.A: Prosperity**
Portland has vigorous economic growth and a healthy, diverse economy that supports prosperity and equitable access to employment opportunities for an increasingly diverse population. A strong economy that is keeping up with population growth and attracting resources and talent can:

- Create opportunity for people to achieve their full potential.
- Improve public health.
- Support a healthy environment.
- Support the fiscal well-being of the city.

**Goal 6.B: Development**
Portland supports an attractive environment for industrial, commercial, and institutional job growth and development by 1) maintaining an adequate land supply; 2) a local development review system that is nimble, predictable, and fair; and 3) high-quality public facilities and services.

**Goal 6.C: Business district vitality**
Portland implements land use policy and investments to:

- Ensure that commercial, institutional, and industrial districts support business retention and expansion.
- Encourage the growth of districts that support productive and creative synergies among local businesses.
- Provide convenient access to goods, services, and markets.
- Take advantage of our location and quality of life advantages as a gateway to Oregon and the Columbia River basin.



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# Policies

## Diverse, expanding city economy

Diverse economic growth is central to Portland's long-term prosperity. It provides jobs for a growing population, improved equity, fiscal stability, neighborhood prosperity, and economic resilience. Moreover, Portland is a statewide economic engine with opportunities and benefits that extend beyond city boundaries.

About 140,000 new jobs are expected in the city between 2010 and 2035, which is consistent with local and national 25-year trends. The policies below set explicit economic growth targets, highlight coordination opportunities, and specify benefits that should be sought through economic growth, and call out important local strengths that support economic growth.

**Policy 6.1** **Diverse and expanding economy**. Align plans and investments to maintain the diversity of Portland's economy and status as Oregon's largest job center with growth across all sectors (commercial, industrial, and institutional) and across all parts of the city.

**Policy 6.2** **Employment growth.** Strive to capture at least 25 percent of the seven-county region's employment growth (Multnomah, Washington, Clackamas, Yamhill, Columbia, Clark, and Skamania Counties).

**Policy 6.3** **Fiscally-stable city.** Maintain a high citywide jobs-to-households ratio that supports tax revenue growth at pace with residential demand for municipal services.

**Policy 6.4** **Economic resilience.** Improve Portland's economic resilience to impacts from climate change and natural disasters through a strong local economy and equitable opportunities for prosperity.

**Policy 6.5** **Low-carbon economy.** Align plans and investments with efforts to improve energy efficiency and reduce lifecycle carbon emissions from business operations. Promote employment opportunities associated with energy efficiency projects, waste reduction, production of more durable goods, and recycling.

**Policy 6.6** **Competitive advantages**. Maintain and strengthen the city's comparative economic advantages including access to a high-quality workforce, business diversity, competitive business climate, and multimodal transportation infrastructure.

**Policy 6.7** **Business environment.** Use plans and investments to help create a positive business environment in the city and provide strategic assistance to retain, expand, and attract businesses.



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**Policy 6.8** **Small business development.** Facilitate the success and growth of small businesses and coordinate plans and investments with programs that provide technical and financial assistance to promote sustainable operating practices.

**Policy 6.9** **Business innovation.** Encourage innovation, research, development, and commercialization of new technologies, products, and services through responsive regulations and public sector approaches.

**Policy 6.10** **Sharing economy.** Encourage mechanisms that enables individuals, corporations, non-profits and government to market, distribute, share and reuse excess capacity in goods and services. This includes peer to peer transactions, crowd funding platforms, and a variety of business models to facilitate borrowing and renting unused resources.

**Policy 6.11** **Economic role of livability and ecosystem services.** Conserve and enhance Portland's cultural, historic, recreational, educational, food-related, and ecosystem assets and services for their contribution to the local economy and their importance for retention and attraction of skilled workers and businesses.

## Land development

According to forecasts, Portland will continue to have relatively strong demand for employment land development. However, most of Portland's land supply for employment growth is on land that has constraints or is already developed.

Statewide Planning Goal 9 – Economic Development requires Portland to provide adequate long-term and short-term land supply for economic development and job growth, consistent with an Economic Opportunities Analysis. Forecasted demand for buildable land by 2035 includes 150 acres in the Central City, 1,350 acres in industrial districts, 690 acres in neighborhood business districts, and 370 acres for campus institutions.

New directions to support Portland's land supply for job growth include policies for adequate long-term and short-term development capacity, a targeted increase in brownfield redevelopment, incentives to maintain competitiveness in regional markets, and guidance for streamlining the City's regulatory climate.

**Policy 6.12** **Land supply.** Provide supplies of employment land that are sufficient to meet the long-term and short-term employment growth forecasts, adequate in terms of amounts and types of sites, available and practical for development.

**Policy 6.13** **Land efficiency**. Provide strategic investments and incentives to leverage infill, redevelopment, and promote intensification of scarce urban land.



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**Policy 6.14** **Brownfield redevelopment**. Cleanup and redevelop 60 percent of brownfield acreage by 2035. Additional related policies are found in the Industrial and Employment Districts section of this chapter.

**Policy 6.15** **Annexation.** Facilitate a predictable, equitable process for annexation of employment lands within the urban services area as needed to meet the City's forecasted land needs. See the West Hayden Island policy in the Industrial and Employment Districts section below.

**Policy 6.16** **Regionally-competitive development sites.** Improve the competitiveness of the vacant and underutilized sites located in Portland's employment areas through the use of incentives and regional and state assistance for needed infrastructure and site readiness improvements.

**Policy 6.17** **Regulatory climate.** Improve development review processes and regulations to encourage predictability and support local and equitable employment growth and encourage business retention, including:

**6.17.a.** Assess and monitor cumulative regulatory costs to ensure that Portland is financially competitive with other comparable cities.

**6.17.b.** Promote certainty for new development through appropriate allowed uses and "clear and objective" standards to permit typical development types without a discretionary review.

**6.17.c.** Allow discretionary-review as a way to facilitate flexible and innovative approaches to meet requirements.

**6.17.d.** Design and monitor development review processes to avoid unnecessary delays.

**6.17.e.** Promote cost effective compliance with federal and state mandates, productive intergovernmental coordination, and avoid duplicative procedures when City policies can be achieved through other means.

**Policy 6.18** **Short-term land supply**. Provide for a competitive supply of development-ready sites, with different site sizes and types, to meet five-year demand for employment growth in the Central City, industrial areas, campus institutions, and neighborhood business districts.

**Policy 6.19** **Evaluate land needs.** Update the Economic Opportunities Analysis and short-term land supply strategies every 5 to 7 years.

**Policy 6.20** **Corporate headquarters.** Provide land opportunities in suitable locations for development of corporate headquarters campuses.



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## Traded sector competitiveness

Global trends have put increasing pressure on regions to strengthen their competitiveness for traded-sector growth, which drives regional prosperity. Traded sectors are local businesses of all sizes that export goods and services and compete in markets outside of the region, bringing income and jobs into the region. These sectors have become more vulnerable and dynamic in the shifting global marketplace, as they reinvent their supply and distribution lines and concentrate activity in lower cost or higher productivity locations.

The following policies call for focusing limited resources on strategic traded sector specializations with growth prospects. This region's growing export activity is concentrated in high tech and advanced manufacturing, where job growth has been modest but output growth continues to outpace the service sectors. Other growing export specializations include software, apparel, clean-tech, freight-hub distribution, and creative services. While these growing specializations are expected to shift over time with market changes, connecting existing and emerging local business with global markets helps bring new resources into the region.

**Policy 6.21** **Traded sector competitiveness.** Align plans and investments with efforts to improve the city and regional business environment for traded sector and export growth. Participate in regional and statewide initiatives.

**Policy 6.22** **Clusters.** Align plans and investments with efforts that direct strategic business development resources to enhance the competitiveness of businesses in traded sector clusters.

**Policy 6.23** **Trade and freight hub.** Encourage investment in transportation systems and services that will retain and expand Portland's competitive position as a West Coast trade gateway and freight distribution hub.

**Policy 6.24** **Import substitution**. Encourage local goods production and service delivery that substitute for imports and help keep the money Portlanders earn in the local economy.

**Policy 6.25** **Business opportunities in urban innovation**. Strive to have Portland's built environment, businesses, and infrastructure systems showcase examples of best practices of innovation and sustainability.

**Policy 6.26** **Traded sector diversity**. Encourage partnerships to foster the growth, small business vitality, and diversity of traded sectors.



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## Equitable household prosperity

National and local trends reveal growing inequities in economic opportunity. Income growth has been concentrated among the top-earning 20 percent of the workforce as disproportionate barriers to upward mobility persist for people of color and people with disabilities. Since 2000, slower job growth and the decline of middle-wage jobs have further widened economic insecurity, increased unemployment, and reduced upward-mobility opportunities for the working poor. Rising inequality threatens the long-term stability of our economy.

In response, the Portland Plan set a high bar for improving economic equity, targeting increased levels of income self-sufficiency from 77 percent of county households to 90 percent by 2035. The new policy directions below support expanded employment, and housing opportunities to increase middle-class prosperity, improve job growth in East Portland, and coordinate efforts to overcome poverty and disparities.

**Policy 6.27** **Income self-sufficiency.** Improve access to self-sufficient wage levels and career ladders for low-income people by maintaining an adequate and viable supply of employment land and public facilities to support and expand opportunities in Portland for middle and high wage jobs that do not require a 4-year college degree. Evaluate plans and investments for their impact on middle and high wage job creation and retention.

**Policy 6.28** **East Portland job growth.** Improve opportunities for East Portland to grow as a business destination and source of living wage jobs.

**Policy 6.29** **Poverty reduction**. Encourage investment in and alignment of poverty-reduction efforts that address economic development, land use, transportation, housing, social services, public health, community development, and workforce development.

**Policy 6.30** **Disparity reduction**. Encourage investment in and alignment of public efforts to reduce racial, ethnic, and disability-related disparities in income and employment opportunity.

**Policy 6.31** **Minority-owned, woman-owned and emerging small business (MWESB) assistance.** Ensure that plans and investments improve access to contracting opportunities for minority-owned, woman-owned, and emerging small businesses.



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## Transportation, public facilities, and economic development

Transportation and other public facilities and services play critical roles in ensuring an adequate land supply for job growth, strengthening competitive location advantages, and providing better access to employment opportunities. See the Public Facilities and Transportation chapters for related policies on prosperity objectives, leveraging private investment, and freight mobility.

## Central City

Central City is the region's and the state's high density employment center. While it is primarily an office district for professional and business services, finance, information, and government, it's also a key location for the entertainment, tourism, small industry, and education sectors. See the Central City 2035 plan for the land use and development policies for this part of the city's economy. The following policies provide overall direction for the Central City's continued employment growth, competitive roles in the region, and land use in the Central City industrial districts.

**Policy 6.32** **Central City.** Maintain the Central City's regional share of employment and continue its growth as the unique center of both the city and the region for innovation and exchange through commerce, employment, arts, culture, entertainment, tourism, education, and government.

**Policy 6.33** **Central City industrial districts**. Protect and facilitate the long-term success of Central City industrial districts, while supporting their evolution into places with a broad mix of businesses with high employment densities.

## Industrial and Employment Districts

Portland is the core of the region's distribution and diverse manufacturing economy, including the state's (and the Columbia River Basin's) largest seaport, rail hub, and airport. Established "industrial sanctuaries" meet the needs of manufacturing and distribution firms for medium to large sites, and are buffered from housing. Other types of employment areas include flex space developments, incubator districts for emerging local businesses, industrial headquarters offices, and dispersed neighborhood employment areas. The businesses in these districts are a primary source of Portland's middle-wage jobs, upward mobility opportunities, and traded sector activity (See Figure 6-1).

Looking forward to 2035, new strategies are needed to expand capacity for employment growth while also meeting environmental and other objectives. The policies below call for new tools to accelerate brownfield redevelopment, make freight investments that expand market access and industrial land intensification, more effectively protect prime industrial land, and strategically expand industrial and flexible neighborhood employment areas.



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**Policy 6.34** **Industrial land**. Provide industrial land that encourages industrial business retention, growth, and traded sector competitiveness as a West Coast trade and freight hub, a regional center of diverse manufacturing, and a widely accessible base of family-wage jobs, particularly for under-served and under-represented people.

**Policy 6.35** **Industrial sanctuaries**. Protect industrial land as industrial sanctuaries identified on the Comprehensive Plan Map primarily for manufacturing and distribution uses and to encourage the growth of industrial activities in the city.

**Policy 6.36** **Prime industrial land retention**. Protect the multimodal freight-hub industrial districts at Portland Harbor, Columbia Corridor, and Brooklyn Yard as prime industrial land (see Figure 6-1) that is prioritized for long-term retention:

**6.36.a.** Strictly limit quasi-judicial Comprehensive Plan Map amendments that convert prime industrial land and consider the potential for amendments to otherwise diminish the economic competitiveness or viability of prime industrial land.

**6.36.b.** Limit conversion of prime industrial land through land use plans, regulations, or public land acquisition for non-industrial uses, especially land that can be used by river-dependent and river-related industrial uses.

**6.36.c.** Identify how regulations affect the capacity, affordability, and viability of industrial uses, and minimize those impacts.

**6.36.d.** Strive to offset the reduction of development capacity as needed, with additional prime industrial capacity that includes consideration of comparable site characteristics.

**Policy 6.37** **Harbor access lands**. Limit use of harbor access lands to river- or rail-dependent or related industrial land uses due to the unique and necessary infrastructure and site characteristics of harbor access lands for river-dependent industrial uses.

**Policy 6.38** **Industrial land use intensification**. Encourage reinvestment and intensification of industrial land use, as measured by output and throughput per acre.

**Policy 6.39** **Industrial brownfield redevelopment**. Provide incentives, technical assistance and direct support to overcome financial-feasibility gaps to enable remediation and redevelopment of brownfields for industrial growth.



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**Policy 6.40** **Portland Harbor Superfund Site**. Take a leadership role in prompt resolution and cleanup of the Portland Harbor Superfund Site and redevelopment of associated brownfields. Encourage a science-based and cost-effective cleanup solution that facilitates re-use of land for river- or rail-dependent or related industrial uses.

**Policy 6.41** **West Hayden Island**. Provide for the future annexation of West Hayden Island for a combination of open space and deep water marine industrial uses with supplemental requirements in a plan district or other implementation agreement that ensures mitigation of impacts and provision of public benefits. The annexation ordinance, future zoning, plan districts, and intergovernmental agreements will be used to:

- Allow no more than 300 acres for future deep water marine terminal and infrastructure development.
- Permanently protect and enhance at least 500 acres as open space, to be managed primarily for the benefit of the regional ecosystem.

**Policy 6.42** **Multimodal freight corridors**. Encourage freight-oriented industrial development to locate where it can maximize the use of and support reinvestment in multimodal freight corridors.

**Policy 6.43** **Dispersed employment areas**. Provide small, dispersed employment areas for a flexible and affordable mix of office, creative services, small scale manufacturing, traded sector and distribution, and other small-format light industrial and commercial uses with access to nearby freeways or truck streets.

**Policy 6.44** **Impact analysis.** Evaluate and monitor the impacts on industrial land capacity that may result from land use plans, regulations, public land acquisition, public facility development, and other public actions.

**Policy 6.45** **Clean, safe, and green**. Encourage improvements to the cleanliness, safety, and ecological performance of industrial development and freight corridors by facilitating adoption of market feasible new technology and design.

**Policy 6.46** **Industrial growth and watershed health.** Facilitate concurrent strategies to protect and improve industrial capacity and watershed health in the Portland Harbor and Columbia Corridor areas.

**Policy 6.47** **District expansion**. Provide opportunities for expansion of industrial areas based on evaluation of forecasted need and the ability to meet environmental, social, economic, and other goals.



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**Policy 6.48** **Golf course reuse and redevelopment.** Facilitate a mix of industrial, natural resource, and public open space uses on privately owned golf course sites in the Columbia Corridor that become available for reuse.

**Policy 6.49** **Residential and commercial reuse.** Facilitate compatible industrial or employment redevelopment on residential or commercial sites that become available for reuse if the site is in or near prime industrial areas, and near a freeway or on a freight street.

**Policy 6.50** **Public facilities and land acquisition.** Limit the use of prime industrial land for parks or other non-industrial public facilities.

**Policy 5.51** **Mitigation banks.** Facilitate industrial site development by promoting and allowing environmental mitigation banks that serve industrial land uses on prime industrial land.

**Policy 6.52** **Neighborhood buffers**. Maintain and enhance major natural areas, open spaces, and constructed features as boundaries and buffers for the Portland Harbor and Columbia Corridor industrial areas.

## Campus institutions

Health care and education sectors are concentrated in large hospital, college, higher education and high school campuses (see Figure 6-2) as well as dispersed smaller facilities. Major institutions are large employers with campuses that vary from pastoral expanses to more concentrated urban grounds. Health care and education are projected to be the city's leading job growth sectors, adding more than 50,000 new jobs by 2035 at campus institutions and in other commercial areas. Rapid growth of campus institutions is a national trend, and best practices offer opportunities to plan effectively for this campus growth, and reduce neighborhood impacts. Examples of new directions in the policies below include designation of major campuses as employment land, regulatory improvements, and transportation-related improvements.

**Policy 6.53** **Campus institutions**. Provide for the stability and growth of Portland's major campus institutions (see Figure 6-2: Campus Institutions) as essential service providers, centers of innovation, workforce development resources, and major employers.

**Policy 6.54** **Campus land use**. Provide for major campus institutions as a type of employment land, allowing uses typically associated with health care and higher education institutions.

**Policy 6.55** **Development impacts.** Protect the livability of surrounding neighborhoods through adequate infrastructure and campus development standards that foster suitable density and attractive campus design.



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**Policy 6.56** **Community amenities and services.** Encourage campus development that provides amenities and services to surrounding neighborhoods, emphasizing the role of campuses as centers of community activity.

**Policy 6.57** **Campus edges**. Provide for context-sensitive, transitional uses and development at the edges of campus institutions to enhance their integration into surrounding neighborhoods, including mixed-use and neighborhood-serving commercial uses where appropriate.

**Policy 6.58** **Satellite facilities**. Encourage opportunities for expansion of uses, not integral to campus functions, to locate in centers and corridors to support their economic vitality.

## Neighborhood business districts

Neighborhood business districts are mixed-use corridors and centers outside of the Central City (see Figure 6-3: Neighborhood Business Districts). Home to retail and related businesses that typically serve customers on-site, they are commonly interspersed with multi-family housing. Many of these districts are experiencing significant growth and change, providing synergistic locations for concentrated housing and commercial growth in "complete neighborhoods" with convenient access to services.

Neighborhood business districts also provide major economic benefits by keeping local dollars circulating within Portland, providing goods and services to nearby residents, defining neighborhood character, supporting small business vitality, and accounting for about one-fourth of all jobs in the city. Neighborhood business districts are especially important to Portland because we are a city mainly made up of small business.

New directions to support these multi-functional places include:

- A framework of new centers and civic corridors well served by pedestrian, bicycle, and transit systems.
- Focused public investments that attract concentrated growth and improve equity, and community-based economic development initiatives that broaden access to jobs and prosperity.
- Opportunities for affordable commercial space and affordable housing.



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**Policy 6.59** **Neighborhood business districts**. Provide for the growth, economic equity, and vitality of neighborhood business districts (Figure 6-3).

**Policy 6.60** **District function.** Enhance the function of neighborhood business districts as a foundation of neighborhood livability.

**Policy 6.61** **Small, independent businesses.** Facilitate the retention and growth of small and locally-owned businesses.

**Policy 6.62** **Home based business.** Encourage low-impact home based businesses in residential areas.

**Policy 6.63** **Neighborhood-serving business.** Provide for neighborhood business districts and small commercial nodes in areas between centers to expand local access to goods and services. Allow nodes of small-scale neighborhood serving commercial uses in large planned developments and as a ground floor use in high density residential areas.

**Policy 6.64** **Investment priority.** Prioritize commercial revitalization investments in neighborhoods that serve communities with limited access to goods and services.

**Policy 6.65** **Involuntary commercial displacement.** Evaluate plans and investments for their impact on existing businesses.

**6.66.a**. Limit involuntary commercial displacement in areas at risk of gentrification and incorporate tools to reduce the cost burden of rapid neighborhood change on vulnerable small business owners.

**6.66.b.** Encourage the preservation and creation of affordable neighborhood commercial space to support a broad range of small business owners.

**Policy 6.66** **Temporary and informal markets and structures.** Acknowledge and support the role that temporary markets (farmers markets, craft markets, flea markets, etc.) and other temporary or mobile vending structures play in enabling startup business activity. Also acknowledge that temporary uses are assumed to be replaced ultimately by more permanent development and uses.



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**Policy 6.67** **Community economic development.** Encourage collaborative approaches to align land use and neighborhood economic development for residents and business owners to better connect and compete in the regional economy.

**6.68.a.** Encourage broad-based community coalitions to implement land use and economic development objectives and programs.

**6.68.b.** Enhance opportunities for cooperation and partnerships between public and private entities that promote economic vitality in communities most disconnected from the regional economy.

**6.68.c.** Encourage cooperative efforts by area businesses, business associations, and neighborhood associations to work together on commercial revitalization efforts, sustainability initiatives, and transportation demand management.

**Policy 6.68** **Centers**. Encourage concentrations of commercial services and employment opportunities in centers.

**6.68.a.** Encourage a broad range of neighborhood commercial services in centers to help residents and others in the area meet daily needs and/or serve as neighborhood gathering places.

**6.68.b.** Encourage the development and retention of grocery stores and local markets as essential elements of centers.

**6.68.c.** Enhance opportunities for services and activities in centers that are responsive to the needs of the populations and cultural groups of the surrounding area.

**6.68.d.** Require that ground-level building spaces in core areas of centers accommodate commercial or other street-activating uses and services.

**6.68.e.** Encourage employment opportunities as a key function of centers, including connections between centers, institutions, and other major employers to reinforce their roles as vibrant centers of activity.



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*Figure 6-1. Industrial and Employment Districts*

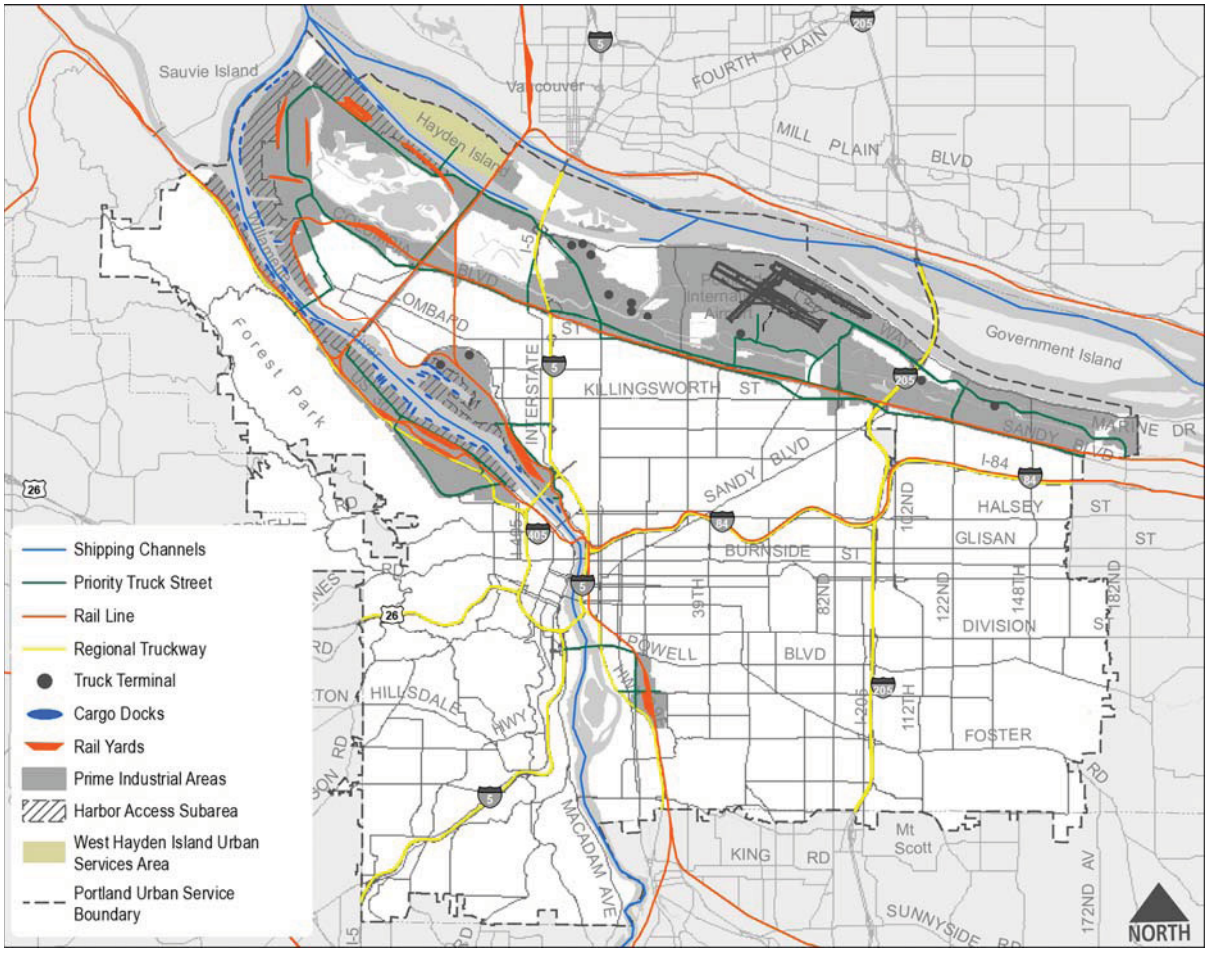




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*Figure 6-2. Campus Institutions*

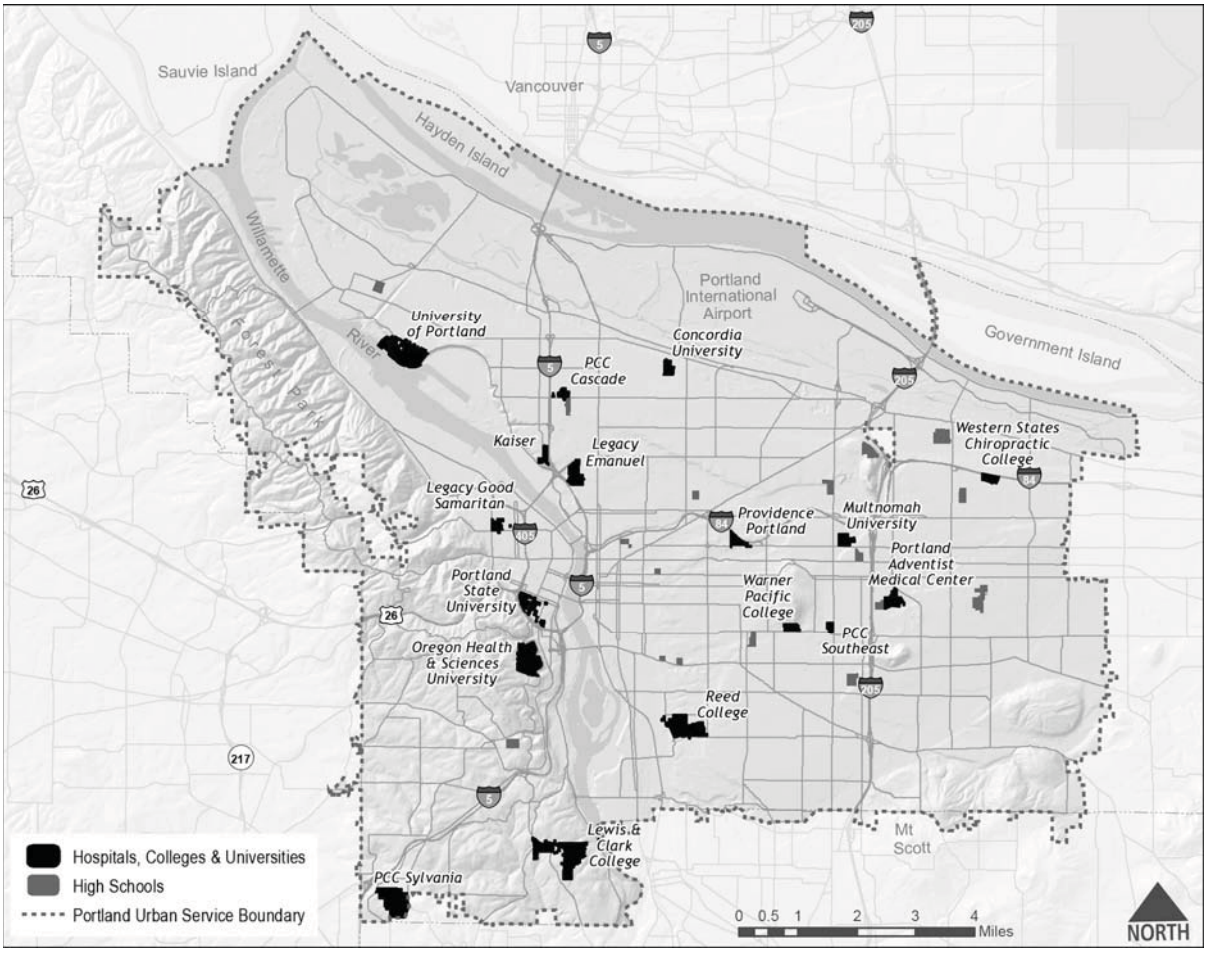




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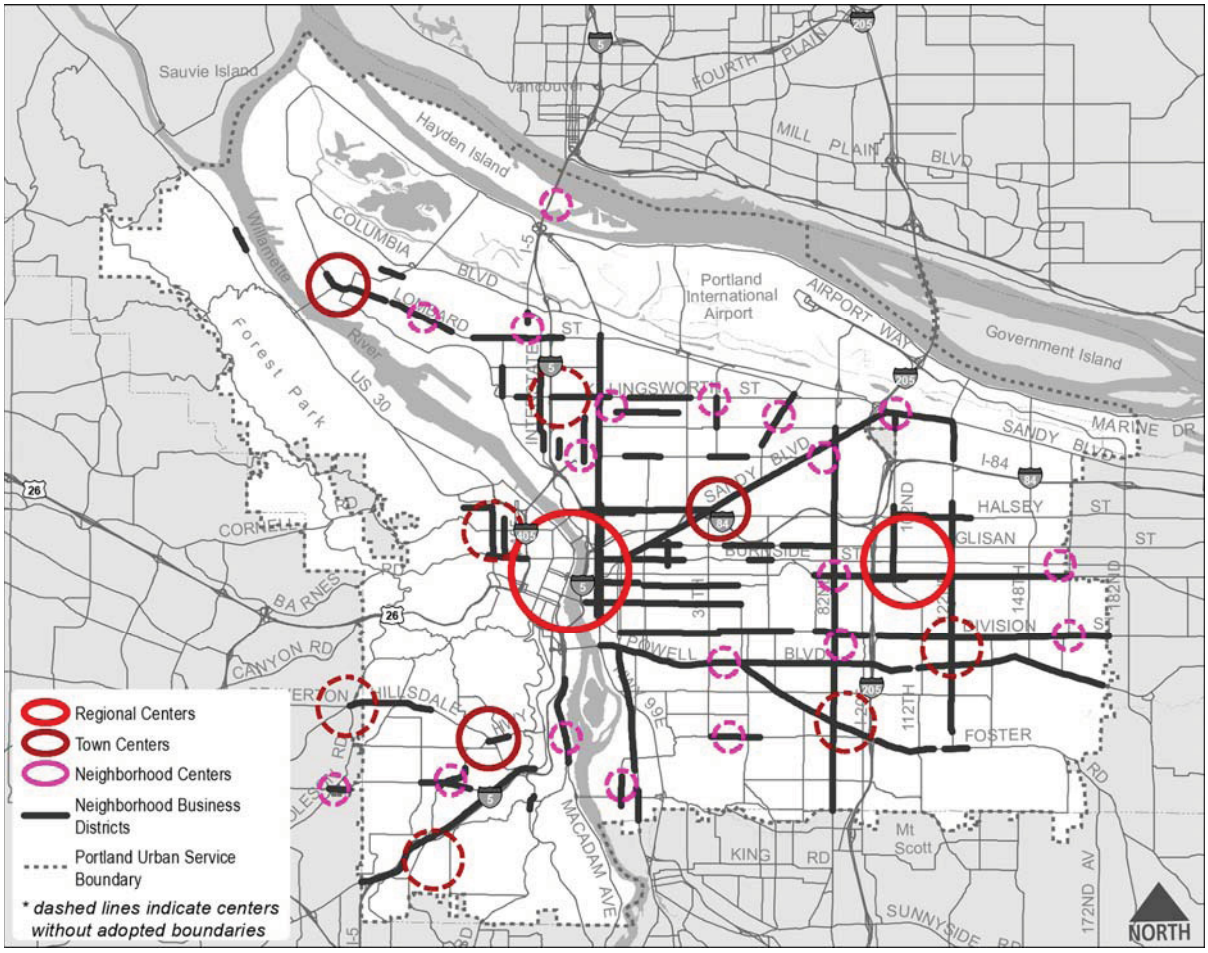
*Figure 6-3. Neighborhood Business Districts*



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# Chapter 7:
# Environment and Watershed Health

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Recognize the economic, health, and intrinsic values of nature, and the importance of community stewardship.
- Preserve natural resources and the beneficial functions and services they provide.
- Improve air quality and watershed health, including hydrology, water quality, fish and wildlife habitat, and biodiversity.
- Recognize the city's impact on global climate change, and opportunities to reduce carbon emissions.
- Recognize the importance of a healthy urban forest and natural systems in reducing the impacts of natural hazards, such as landslides and flooding, and in adapting to climate change.
- Prevent incremental environmental degradation including the spread of invasive species, loss of habitat, and adverse impacts of additional impervious surfaces.
- Ensure that environmental protection programs and regulations reflect current data, science, and evaluation of impacts to under-served and under-represented communities.
- Advance good decisions and adaptive management through better data collection.
- Provide guidance that addresses the distinct ecological issues of specific watersheds.
- Ensure that plans and investments are coordinated with relevant policies from other City plans such as the Portland Watershed Management Plan, Urban Forest Management Plan, Climate Action Plan, and Natural Hazard Mitigation Plan.



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## Why is this important?

Located at the confluence of two major rivers, between two mountain ranges, and adjacent to some of the most fertile agricultural land in the world, Portland's wealth of natural resources provides an array of ecologically, economically and aesthetically valuable ecosystem services. Our rivers, streams and floodplains convey and store water and provide critical habitat for native fish and aquatic species. Our wetlands, trees, and vegetation clean and cool Portland's air and water, stabilize hillsides, soak up rainwater and provide habitat for an abundance of birds and other wildlife. These resources also trap carbon and reduce urban heat island effects, which are increasingly important given the potential impacts of climate change. These natural resources are key contributors to Portland's identity, reputation and sense of place.

The City has a long-standing commitment to maintaining a high-quality environment; however many of Portland's natural resources have been lost over time or are currently at risk. Urbanization has filled floodplains, contributing to seasonal flooding damage. Stormwater runoff from paved areas and rooftops has eroded our stream channels and polluted our streams, many of which are unable to support healthy fish populations. There is concern that anticipated growth and development will result in substantial tree removal, continued habitat loss, and negative impacts on at-risk plant and animal species.

The City's land use plans and investments have been, and will continue to be, instrumental in helping contribute to improvements in air and water quality over time, and in preserving natural resources. In addition, the City and community have made substantial investments of time and money to restore our watersheds. The goals and policies in this chapter protect these investments and help the City meet various regulations to protect public health and the environment. With thoughtful guidance, we can achieve and sustain healthy watersheds and a healthful environment as the city grows.



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# Goals

**Goal 7.A: Climate**
Carbon emissions are reduced by 50% below 1990 levels.

**Goal 7.B: Healthy watersheds and environment**
Ecological and ecosystem functions are maintained and watershed conditions have improved over time.

**Goal 7.C: Resilience**
Portland's built and natural environments function in complementary ways and are resilient in the face of climate change, and natural hazards.

**Goal 7.D: Environmental equity**
All Portlanders have access to clean air and water, can experience nature in their daily lives, and benefit from development designed to lessen the impacts of natural hazards and environmental contamination.

**Goal 7.E: Community stewardship**
Portlanders actively participate in efforts to maintain and improve the environment, including watershed health.



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# Policies

## Planning for natural resource protection

Portland's quality of life depends on maintaining clean air, water, soil, and a healthy environment overall. The policies in this section will preserve and maintain environmental quality by emphasizing protection of natural resources and their functions, consistent with widely accepted ecological principles and scientific literature. These policies call for an up-to-date natural resource inventory and actions to protect air, water, soil, climate, biodiversity, and existing significant natural resources. They also call for consideration of tradeoffs in developing environmental protection programs.

**Policy 7.1** **Environmental quality.** Protect air, water, and soil quality and associated benefits to public and ecological health and safety.

**Policy 7.2** **Climate action.** Update and implement the Climate Action Plan to reduce carbon emissions and resilience through policy, regulations, investment, and behavior change.

**Policy 7.3** **Biodiversity.** Maintain self-sustaining populations of native plants, native resident and migratory fish, and wildlife species, including at-risk species and beneficial insects such as pollinators.

**Policy 7.4** **Natural resource protection.** Protect the quantity, quality, and function of significant natural resources identified in the City's natural resource inventory, including:

- Rivers, streams, sloughs, and drainageways.
- Floodplains.
- Riparian corridors.
- Wetlands.
- Groundwater.
- Native and other beneficial vegetation species and communities.
- Aquatic and terrestrial habitats, including special habitats or habitats of concern, including large anchor habitats, habitat complexes and corridors, rare and declining habitats such as wetlands, native oak, bottomland hardwood forest, grassland habitat, shallow water habitat, and habitats that support special-status or at-risk plant and wildlife species.
- Other resources identified in natural resource inventories.

**Policy 7.5** **Natural resource inventory.** Maintain an up-to-date inventory by identifying the location and evaluating the relative quantity and quality of natural resources.



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**Policy 7.6** **Environmental protection programs.** Adopt environmental protection plans and regulations that specify the significant natural resources to be protected and the types of protections to be applied, based on the best data and science available, and on an evaluation of the potential consequences of allowing conflicting uses.

**Policy 7.7** **Environmental protection program updates.** Improve the effectiveness of environmental protection plans and regulations. Updates will reflect current data and science, consider impacts on under-served and under-represented communities, and meet multiple city goals.

**Policy 7.8** **Land acquisition priorities and coordination.** Maintain a prioritized list of natural resource types, target areas, or properties desirable for public acquisition to support long-term natural resource protection, and establish a process for coordinating acquisition with other programs including strategies to maintain employment land capacity, programs to protect water quality, and programs to reduce exposure to flooding hazards.

## Protecting natural resources in development situations

The following policies provide guidance for land use regulations that address significant natural resources where new development is proposed. They will help ensure that the potential adverse impacts of development are well understood, and avoided where practicable. These policies also call for an evaluation of design alternatives to minimize impacts, and mitigation approaches that fully mitigate unavoidable impacts.

**Policy 7.9** **Impact evaluation.** Evaluate the potential adverse impacts of proposed development on significant natural resources, their functions, and the ecosystem services they provide.

**Policy 7.10** **Regulatory hierarchy: avoid, minimize, mitigate.** Require that the potential adverse impacts of new development on significant natural resources and their functions first be avoided where practicable, then minimized, then lastly mitigated.

**Policy 7.11** **Mitigation effectiveness.** Encourage mitigation approaches that maximize the intended natural resource-related benefits. Require on-site mitigation unless off-site mitigation within the same watershed will improve mitigation effectiveness.

**Policy 7.12** **State and federal coordination.** Coordinate implementation of these policies to ensure consistency with state and federal permitting authorities.

**Policy 7.13** **Ecosystem services.** Consider the benefits provided by healthy ecosystems that contribute to the livability and economic health of the city.



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## Improving environmental quality and preventing degradation

The following policies are intended to support improving environmental quality over time as the city grows. They provide direction to enhance the condition, capacity, and resilience of Portland's air and water. They support Portland's watershed plan goals to restore hydrology, water quality, habitat and biological communities. These policies call for more effectively preventing incremental environmental degradation, including the spread of invasive species, soil loss, habitat fragmentation, and introduction of hazards to wildlife. They support a healthy urban forest and recognize that healthy natural systems reduce natural hazard risks. They also help the City mitigate and adapt to climate change.

Like preventive medicine, preventing additional environmental degradation will be more successful and cost-effective than addressing problems as they increase in severity. These policies will help the City avoid exacerbating adverse and disproportionate impacts on under-served and under-represented communities. While some of the impact areas listed below are regulated by other agencies, the City's land use plans and investments can help avoid or reduce impacts, while also improving conditions over time.

**Policy 7.14** **Air quality.** Ensure that plans and investments are consistent with and advance efforts to improve air quality and reduce exposure to air toxics, criteria pollutants, and urban heat island effects. Consider air quality related health impacts on all Portlanders, with an emphasis on under-served and under-represented communities.

**Policy 7.15** **Hydrology.** Ensure that plans and investments are consistent with and advance efforts to improve watershed hydrology by achieving more natural flow and enhancing conveyance and storage capacity in rivers, streams, floodplains, wetlands, and groundwater aquifers. Minimize impacts from development and associated impervious surfaces, especially in areas with poorly infiltrating soils and limited public stormwater discharge points, and encourage restoration of degraded hydrologic functions, where practicable.

**Policy 7.16** **Water quality.** Ensure that plans and investments are consistent with and advance efforts to improve water quality in rivers, streams, floodplains, groundwater, and wetlands, including reducing toxics, bacteria, temperature, metals, and sediment pollution. Consider water quality related health impacts on all Portlanders, especially under-served and under-represented communities.



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**Policy 7.17** **Habitat and biological communities.** Ensure that plans and investments are consistent with and advance efforts to improve the diversity, quantity, and quality, of fish and wildlife habitat and habitat corridors, especially rare and declining habitat types and habitats that support at-risk plant and animal species and communities.

**Policy 7.18** **Habitat connectivity.** Ensure that plans and investments are consistent with and advance efforts to improve terrestrial and aquatic habitat connectivity for fish and wildlife by:

- Preventing habitat fragmentation.
- Improving habitat quality.
- Weaving habitat into sites as new development occurs.
- Enhancing or creating habitat corridors that allow fish and wildlife to safely access and move through and between habitat areas.

**Policy 7.19** **Urban forest.** Ensure that plans and investments are consistent with and advance efforts to improve the quantity, quality, and equitable distribution of Portland's urban forest:

**7.19.a.** Require or encourage preservation of large healthy trees, native trees and vegetation, tree groves, and forested areas as an element of discretionary land use reviews.

**7.19.b.** Coordinate plans and investments with efforts to improve tree species diversity and age diversity.

**7.19.c.** Support progress toward meeting City tree canopy targets.

**7.19.d.** Invest in tree planting and maintenance, especially in low canopy areas, neighborhoods with under-served or under-represented communities, and within and near urban habitat corridors.

**7.19.e.** Require native trees and vegetation in significant natural resource areas.

**7.19.f.** Encourage planting of native trees and vegetation generally, and especially in urban habitat corridors.

**7.19.g.** Identify priority areas for tree preservation and planting in land use plans.

**Policy 7.20** **Soils.** Coordinate plans and investments with programs that address human-induced soil loss, erosion, contamination, or other impairments to soil quality and function.



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**Policy 7.21** **Invasive species.** Ensure that plans and investments are consistent with and advance efforts to prevent the spread of invasive plants, and support efforts to reduce the impacts of invasive animals and insects.

**Policy 7.22** **Natural hazards.** Prevent development-related degradation of natural systems and associated increases in landslide, wildfire, flooding, and earthquake risks, especially as they affect under-served and under-represented communities.

**Policy 7.23** **Low-impact development and best practices.** Encourage use of low-impact development, habitat-friendly development, bird-friendly design, and green infrastructure, especially for City-owned, managed, or funded facilities.

**Policy 7.24** **Impervious surfaces.** Limit impervious surfaces to reduce impacts on hydrologic function, air and water quality, habitat connectivity, and tree canopy.

**Policy 7.25** **Hazards to wildlife.** Encourage building, site, and infrastructure design and practices that provide safe fish and wildlife passage, and reduce or mitigate hazards to birds, bats, and other wildlife.

**Policy 7.26** **Access to nature.** Promote equitable, safe, and well-designed physical and visual access to nature while also protecting significant natural resources, fish, and wildlife. Provide access to major natural features, including:

- Water bodies, such as the Willamette and Columbia rivers, Smith and Bybee Lakes, creeks, streams, and sloughs.
- Major topographic features, such as the West Hills, Mt. Tabor, and the East Buttes.
- Natural areas, such as Forest Park and Oaks Bottom.

**Policy 7.27** **Carbon sequestration.** Enhance the capacity of Portland's urban forest, soils, and water bodies to serve as carbon reserves.

**Policy 7.28** **Climate adaptation and resilience.** Enhance the ability of rivers, streams, wetlands, floodplains, urban forest, habitats, and wildlife to temper and adapt to climate-exacerbated flooding, landslides, wildfire, and urban heat island effects.

**Policy 7.29** **Brownfield remediation.** Improve environmental quality and watershed health by promoting and facilitating brownfield remediation and redevelopment that incorporates ecological site design and resource enhancement.



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**Policy 7.30** **Adaptive management.** Evaluate trends in watershed and environmental health using current monitoring data and information to guide improvements in the effectiveness of City plans, regulations, and infrastructure investments.

**Policy 7.31** **Restoration partnerships.** Coordinate plans and investments with other jurisdictions, air and water quality regulators, watershed councils, soil conservation organizations, and community organizations and groups to maximize the benefits and cost-effectiveness of watershed environmental efforts and investments.

**Policy 7.32** **Coordinated stormwater management.** Coordinate transportation and stormwater system planning in areas with unimproved or substandard rights of way to improve water quality, pedestrian safety, and enhance neighborhood livability.

**Policy 7.33** **Community stewardship.** Encourage voluntary cooperation between property owners, community organizations, and public agencies to restore or re-create habitat on their property, including removing invasive plants and planting native species.

Other policies in Chapters 3 and 4 are essential counterparts to the policies in the section above.

## Aggregate resources

**Policy 7.34** **Aggregate resource protection.** Protect aggregate resource sites for current and future use, where there are no major conflicts with urban needs, or where these conflicts may be resolved**.**

**Policy 7.35** **Aggregate resource development**. Ensure that development of aggregate resources minimizes adverse environmental impacts and impacts on adjacent land uses.

**Policy 7.36** **Mining site reclamation.** Ensure that reclamation of mining sites protect public health and safety, restore the site to adequate watershed conditions and functions, and is compatible with the surrounding land uses and conditions of nearby land.



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# Watershed specific policies

The policies above guide planning, actions, and investments citywide. The following policies are intended to augment the citywide Watershed Health and Environment policies, by providing additional guidance relating and responding to the characteristics within each of Portland's distinctive watersheds. They address watershed-specific habitat types, hydrology, water quality issues, and stormwater management challenges. Together, the citywide and watershed-specific policies support the close coordination of watershed health and land use programs, guiding land use planning-related activities and future infrastructure investments. While these watersheds are not entirely within Portland's urban services boundary, Portland's actions can have significant benefits for the watershed as a whole.

## Columbia River Watershed

**Policy 7.37** **In-water habitat.** Enhance in-water habitat for native fish and wildlife, particularly in the Oregon Slough and near-shore environments along the Columbia River.

**Policy 7.38** **Sensitive habitats.** Enhance grassland, beach, riverbanks, wetlands and other key habitats for wildlife traveling along the Columbia River migratory corridor, while continuing to manage the levees and floodplain for flood control.

**Policy 7.39** **Flood protection coordination.** Coordinate plans and investments with special districts and agencies responsible for managing and maintaining certification of levees along the Columbia River.

**Policy 7.40** **Floodplain protection and restoration.** Promote restoration and protection of floodplain habitats as a flood protection strategy.

## Willamette River Watershed

**Policy 7.41** **Fish habitat.** Provide adequate intervals of ecologically-functional shallow-water habitat for native fish along the entire length of the Willamette River within the city, and at the confluences of its tributaries.

**Policy 7.42** **Stream connectivity.** Improve stream connectivity between the Willamette River and its tributaries.

**Policy 7.43** **River bank conditions.** Preserve existing river bank habitat and encourage the rehabilitation of river bank sections that have been significantly altered due to development with more fish and wildlife friendly riverbank conditions.



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**Policy 7.44** **South Reach ecological complex.** Enhance habitat quality and connections between Ross Island, Oaks Bottom, and riverfront parks and natural areas south of the Central City, to enhance the area as a functioning ecological complex.

**Policy 7.45** **Contaminated sites.** Ensure that plans and investments are consistent with and advance programs that facilitate the cleanup, reuse, and restoration of the Portland Harbor Superfund site and other contaminated upland sites.

**Policy 7.46** **Sensitive habitats.** Protect and enhance grasslands, beaches, floodplains, wetlands, remnant native oak, bottomland hardwood forest, and other key habitats for native wildlife including shorebirds, waterfowl, and species that migrate along the Pacific flyway and the Willamette River corridor.

**Policy 7.47** **Riparian corridors.** Increase the width and quality of vegetated riparian buffers along the Willamette River where practicable.

**Policy 7.48** **Connected upland and river habitats.** Enhance habitat quality and connectivity between the Willamette riverfront and upland natural resource areas.

**Policy 7.49** **Forest Park.** Enhance Forest Park as an anchor habitat and recreational resource.

## Columbia Slough Watershed

**Policy 7.50** **Fish passage.** Restore in-stream habitat and improve fish passage within the Columbia Slough, including for salmonids in the lower slough.

**Policy 7.51** **Flow constriction removal.** Reduce constriction, such as culverts, in the slough channels, to improve the flow of water and water quality.

**Policy 7.52** **Riparian corridors.** Increase the width and quality of vegetated riparian buffers along Columbia Slough channels where practicable, while also managing the slough for flood control.

**Policy 7.53** **Sensitive habitats.** Enhance grasslands and wetland habitats in the Columbia Slough, such as those found in the Smith and Bybee Lakes and at the St. Johns Landfill site, to provide habitat for sensitive species, and for wildlife traveling along the Columbia and Willamette river migratory corridors.

**Policy 7.54** **Connected rivers habitats.** Enhance upland habitat connections to the Willamette and Columbia rivers.



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**Policy 7.55** **Contaminated sites.** Ensure that plans and investments are consistent with and advance programs that facilitate the cleanup, reuse and restoration of contaminated sites that are adjacent, or that discharge stormwater to the Columbia Slough.

## Fanno and Tryon Creek Watersheds

**Policy 7.56** **Stream connectivity.** Encourage the daylighting of piped portions of Tryon and Fanno creeks and their tributaries.

**Policy 7.57** **Riparian and habitat corridors.** Protect and enhance riparian habitat quality and connectivity along Tryon and Fanno creeks and their tributaries. Enhance connections between riparian areas, parks, anchor habitats, and areas with significant tree canopy. Enhance in-stream and upland habitat connections between Tryon Creek State Natural Area and the Willamette River.

**Policy 7.58** **Reduced hazard risks.** Reduce the risks of landslides and streambank erosion by protecting trees and vegetation that absorb stormwater, especially in areas with steep slopes or limited access to stormwater infrastructure.

## Johnson Creek Watershed

**Policy 7.59** **In-stream and riparian habitat.** Enhance in-stream and riparian habitat and improve fish passage for salmonids along Johnson Creek and its tributaries.

**Policy 7.60** **Floodplain restoration.** Enhance Johnson Creek floodplain functions to increase flood-storage capacity, improve water quality, and enhance fish and wildlife habitat.

**Policy 7.61** **Connected floodplains, springs, and wetlands.** Enhance hydrologic and habitat connectivity between the Johnson Creek floodplain and its springs and wetlands.

**Policy 7.62** **Reduced natural hazards.** Reduce the risks of landslides, streambank erosion and downstream flooding by protecting seeps, springs, trees, vegetation, and soils that absorb stormwater in the East Buttes.

**Policy 7.63** **Greenspace network.** Enhance the network of parks, trails, and natural areas near the Springwater Corridor Trail and the East Buttes to enhance habitat connectivity and nature-based recreation in East Portland.

*For additional policy guidance regarding geographically-specific issues and opportunities, see Chapter 4 —Design and Development.*



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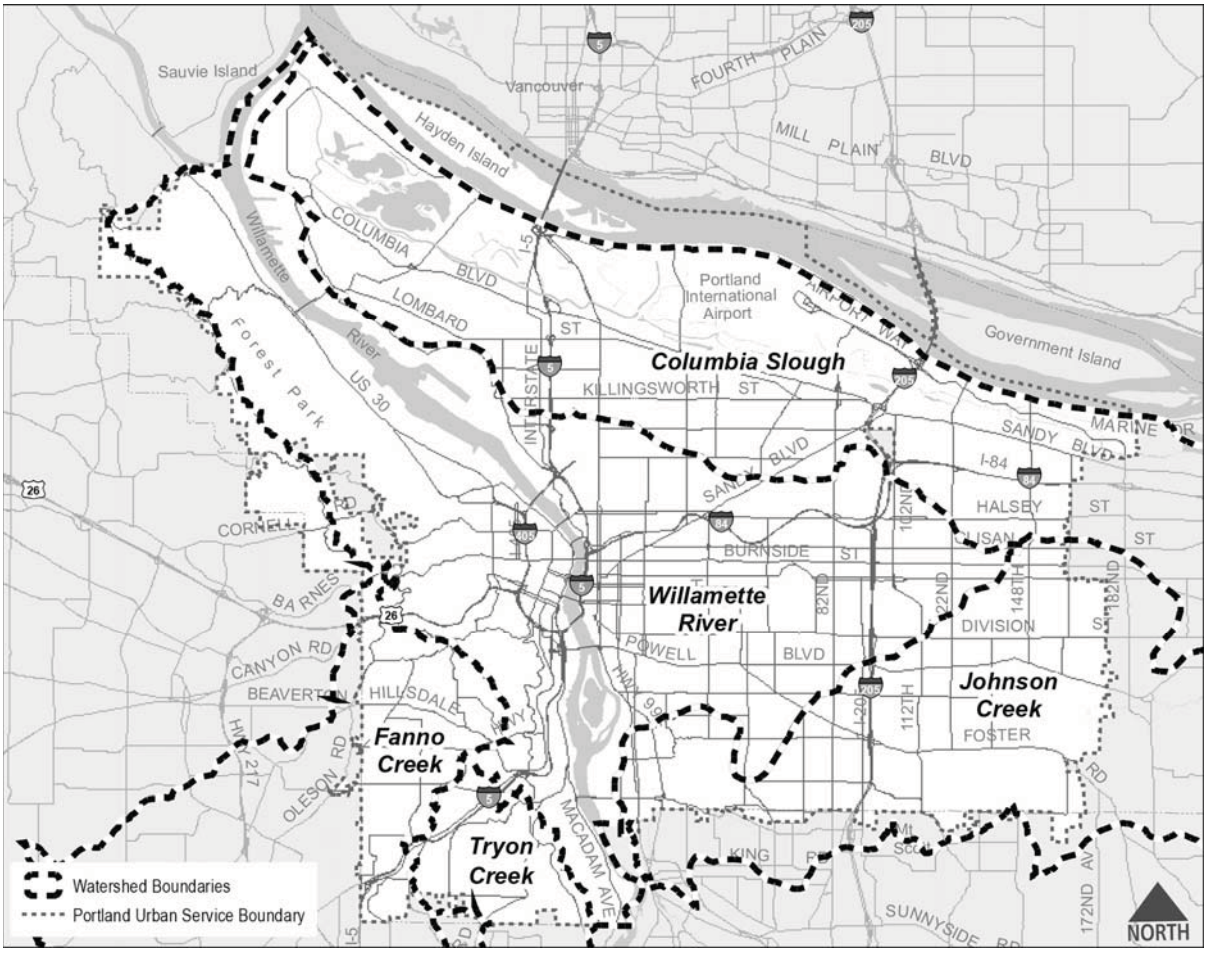
*Figure 7-1. Portland's Watersheds*



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# Chapter 8: Public Facilities and Services

## What is this chapter about?

The goals and policies in this chapter convey the City's intent to:

- Set clear standards for service delivery and system expansion for public rights-of-way, sanitary and stormwater systems, water, parks and recreation, public safety and emergency response, solid waste management, school facilities, technology access, and energy infrastructure.
- Emphasize the development of facilities that serve multiple goals.
- Affirm methods for interagency and intergovernmental coordination.
- Advance an adaptive management approach to improve reliability and resilience.
- Provide more equitable service delivery.
- Reduce risks to human and environmental health and safety.

## Why is this important?

High-quality and dependable basic public services, like clean water and reliable sewer and stormwater management services, are essential to Portland's future success. Cost-effective and dependable services improve quality of life, affordability, and make Portland a more attractive place to do business. Well-built and well-maintained facilities also help the city recover from damaging natural events and emergencies. The City's public facilities and services can also help create a vibrant public realm.

The City's public facility systems provide water, sewer, transportation, parks and civic services. Public facilities include the varied and extensive networks of streets and pipes, as well as parks and natural areas, that not only manage stormwater and flooding, but also help provide places for recreation. Public services include things like public transportation and police, fire, and emergency response. In addition, services such as access to broadband technology, electricity and natural gas, and comprehensive waste, recycling, and composting services are essential for households and businesses. It takes the collective and coordinated effort of multiple agencies and regulated utilities to maintain and operate the complex systems used to manage and provide these necessities to Portlanders.

Public agencies aim to provide basic services to all Portlanders. However, for a variety of reasons, not all services are distributed equitably across the city. The agencies charged with managing public facility systems must balance the need to maintain existing services and infrastructure with the need to bring new or improved services to more recently annexed



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areas of the city, to under-served communities, and to new residents and businesses. In addition, these improvements must be made in ways that meet federal, state, and regional regulations.

Given the likelihood of environmental, economic, and technological change in the next twenty years, the agencies that deliver, build, and manage services and facilities must reinvent systems and facilities to satisfy multiple uses, withstand environmental stress, and adapt to changing circumstances. The goals and policies in this chapter support the equitable, efficient, and adaptive management approaches that are needed to provide high-quality facilities and services to all Portlanders, including those in future generations.



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# Goals

**GOAL 8.A: Quality public facilities and services**
High-quality public facilities and services provide Portlanders with optimal levels of service throughout the city, based on system needs and community goals, and in compliance with regulatory mandates.

**GOAL 8.B: Multiple benefits**
Public facility and service investments improve equitable service provision, support economic prosperity, and enhance human and environmental health.

**GOAL 8.C: Reliability and resiliency**
Public facilities and services are reliable, able to withstand or recover from catastrophic natural and manmade events, and are adaptable and resilient in the face of long-term changes in the climate, economy and technology.

**GOAL 8.D: Public rights-of-way**
Public rights-of-way enhance the public realm and provide a multi-purpose, connected physical space for safe movement and travel, public, and private utilities, and other appropriate public purposes.

**GOAL 8.E: Sanitary and stormwater systems**
Wastewater and stormwater are managed, conveyed, and/or treated to protect public health, safety, and the environment, and to meet the needs of the community on an equitable, efficient, and sustainable basis.

**GOAL 8.F: Flood management**
Flood management systems and facilities support watershed health and manage flooding to reduce adverse impacts on Portlanders' health, safety, and property.

**GOAL 8.G: Water**
Reliable and adequate water supply and delivery systems provide sufficient quantities of high-quality water at adequate pressures to meet the needs of the community on an equitable, efficient and sustainable basis.

**GOAL 8.H: Parks, natural areas, and recreation**
All Portlanders have safe, convenient, and equitable access to high-quality parks, natural areas, trails, and recreational opportunities in their daily lives, which contribute to their health and well-being. The City manages its natural areas and urban forest to protect unique urban habitats and offer Portlanders an opportunity to connect with nature.

**GOAL 8.I: Public safety and emergency response**
Portland is a safe, resilient, and peaceful community where public safety, emergency response, and emergency management facilities and services are coordinated and able to effectively and efficiently meet community needs.


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**GOAL 8.J: Solid waste management**
Residents and businesses have access to waste management services and are encouraged to be thoughtful consumers to minimize upstream impacts and avoid generating waste destined for the landfill. Solid waste — including food, yard debris, recyclables, electronics, and construction and demolition debris — is managed, recycled and composted to ensure the highest and best use of materials.

**GOAL 8.K: School facilities**
Public schools are honored places of learning as well as multifunctional neighborhood anchors serving Portlanders of all ages, abilities, and cultures.

**GOAL 8.L: Technology and communications**
All Portlanders have access to universal, affordable, and reliable state-of-the-art communication and technology services.

**GOAL 8.M: Energy infrastructure and services**
Residents, businesses and institutions are served by reliable energy infrastructure that provides efficient, low-carbon, affordable energy through decision-making based on integrated resource planning.



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# Policies

## Service provision

The policies in this section support the maintenance of an urban services boundary to coordinate planning and provision of public facilities. These policies also identify which urban facilities and services are and will be provided by the City of Portland within this boundary. This section supports Statewide Planning Goal 11 — Public Facilities.

**Policy 8.1** **Urban services boundary.** Maintain an urban services boundary for the City of Portland that is consistent with the regional urban growth policy, in cooperation with neighboring jurisdictions. The Urban Services Boundary is shown on the Comprehensive Plan Map.

**Policy 8.2** **Service delivery.** Provide the following public facilities and services within the City's boundaries of incorporation:

- Comprehensive planning.
- Public rights-of-way, including streets and public trails.
- Sanitary sewers and wastewater treatment.
- Stormwater management and conveyance.
- Flood management.
- Protection of the waterways of the state.
- Water supply.
- Police, fire, and emergency response.
- Parks, natural areas, and recreation.
- Solid waste regulation.

**Policy 8.3** **Supporting facilities and systems.** Maintain supporting facilities and systems, including public buildings, technology, fleet, and internal service infrastructure, to enable the provision of public facilities and services.



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## Service coordination

While the City of Portland is the primary provider of many urban facilities and services within city limits, other public and private agencies also provide public facilities and services. The City has a responsibility for, and an interest in, the planning, coordination, provision, and, in some cases, regulation of these facilities and services. The following policies identify other public facility providers and encourage planning and service coordination — both within the city boundaries and between the City and partner agencies — to meet the needs of people and businesses.

**Policy 8.4** **Interagency coordination**. Maintain interagency coordination agreements with neighboring jurisdictions and partner agencies that provide urban public facilities and services within the city of Portland to ensure effective and efficient service delivery. See Policy 8.2 for the list of services included. Such jurisdictions and agencies include, but may not be limited to:

- Multnomah County for transportation facilities, and public safety.
- State of Oregon for transportation and parks facilities and services.
- TriMet for public transit facilities and services.
- Port of Portland for air and marine facilities and services.
- Metro for regional parks and natural areas, and for solid waste, composting, and recycling facilities and transfer stations.
- Gresham, Milwaukie, Clackamas County Service District #1, and Clean Water Services for sanitary sewer conveyance and treatment.
- Multnomah County Drainage District No. 1, Peninsula Drainage District No 1, and Peninsula Drainage District No. 2 for stormwater management and conveyance, and for flood mitigation and control.
- Rockwood People's Utility District; Sunrise Water Authority; and the Burlington, Tualatin Valley, Valley View, West Slope, Palatine Hill, Alto Park, and Clackamas River Water Districts for water distribution.
- Portland Public Schools and the David Douglas, Parkrose, Reynolds, Centennial, and Riverdale school districts for public education and recreational facilities.
- Private utilities for energy, technology, and communications facilities and services.

**Policy 8.5** **Outside contracts**. Coordinate with jurisdictions and agencies outside of Portland where the City provides services under agreement.

**Policy 8.6** **Public service coordination**. Coordinate with the planning efforts of agencies providing public education, public health services, community centers, library services, justice services, flood protection, energy, and technology and communications services, as appropriate.



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**Policy 8.7** **Internal coordination**. Coordinate planning and provision of public facilities and services among City agencies, including internal service bureaus, as appropriate.

**Policy 8.8** **Co-location**. Encourage co-location of public facilities and services across providers where co-location improves service delivery efficiency and equity.

## Service extension

The policies in this section outline the City's approach towards annexation and service extension to newly-incorporated areas.

**Policy 8.9** **Annexation**. Require annexation of unincorporated areas within the City's urban service boundary as a prerequisite to receive urban services.

**Policy 8.10** **Feasibility of service**. Evaluate the physical feasibility and cost-effectiveness of extending urban public services to candidate annexation areas.

**Policy 8.11** **Orderly service extension**. Establish or improve urban public services in newly-annexed areas to serve designated land uses at established levels of service, as funds are available and as responsible engineering practice allows.

**Policy 8.12** **Coordination of service extension.** Coordinate provision of urban public services to newly-annexed areas so that provision of any given service does not stimulate development that significantly hinders the City's ability to provide other urban services at uniform levels.

**Policy 8.13** **Services to unincorporated urban pockets**. Plan for future delivery of urban services to areas that are within the urban services boundary but outside city limits.

**Policy 8.14** **Services outside the city limits**. Prohibit City provision of new urban services, or expansion of the capacity of existing services, in areas outside the city's municipal limits, except in cases where the City has agreements or contracts in place.

**Policy 8.15** **Service district expansion**. Prohibit service district expansion or creation within the City's urban services boundary without the City's expressed consent.



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## Public investment

The following policies support investments in Portland's public facility systems to maintain and improve system capacity, resolve service deficiencies and properly manage assets. They also reduce risks to the economy, environment and community. Such investments enable the City to provide levels-of-service to meet the needs of residents and businesses.

**Policy 8.16** **Regulatory compliance.** Ensure public facilities and services remain in compliance with state and federal regulations. Work toward cost-effective compliance with federal and state mandates through intergovernmental coordination and problem solving.

**Policy 8.17** **System capacity**. Establish, improve, and maintain public facilities and services at levels appropriate to support land use patterns, densities, and anticipated residential and employment growth, as physically feasible and as sufficient funds are available.

**Policy 8.18** **Equitable service**. Provide public facilities and services to alleviate service deficiencies and meet level-of-service standards for all Portlanders, including individuals, businesses, and property owners.

**Policy 8.19** **Asset management.** Improve and maintain public facility systems using asset management principles to optimize preventative maintenance, reduce unplanned reactive maintenance, achieve scheduled service delivery, and protect the quality, reliability, and adequacy of City services.

**Policy 8.20** **Risk management**. Maintain and improve Portland's public facilities to minimize or eliminate economic, social, public health and safety, and environmental risks.

**Policy 8.21** **Critical infrastructure**. Increase the resilience of high-risk and critical infrastructure through monitoring, planning, investment, adaptive technology, and continuity planning.

**Policy 8.22** **Capital programming.** Maintain long-term capital improvement programs that balance acquisition and construction of new public facilities with maintenance and operations of existing facilities.



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## Funding

Portland's investments in the public facility systems necessary to serve designated land uses are funded through a variety of mechanisms, including taxes, user rates and fees, system development charges, and partnerships. The policies in this section acknowledge and support cost-effective service provision, maintenance of diverse funding streams to support the public's investments, and equitable sharing of the costs of investing in and maintaining the City's public facilities.

**Policy 8.23** **Cost-effectiveness**. Establish, improve, and maintain the public facilities necessary to serve designated land uses in ways that cost-effectively provide desired levels of service, consider facilities' lifecycle costs, and maintain the City's long-term financial sustainability.

**Policy 8.24** **Shared costs**. Ensure the costs of constructing and providing public facilities and services are equitably shared by those who benefit from the provision of those facilities and services.

**Policy 8.25** **System development charges**. Require private or public entities whose prospective development or redevelopment actions contribute to the need for public facility improvements, extensions, or construction to bear a proportional share of the costs.

**Policy 8.26** **Partnerships.** Maintain or establish public and private partnerships for the development, management, or stewardship of infrastructure facilities necessary to serve designated land uses, as appropriate.

## Community benefits

The following policies support infrastructure investments to improve equity, economic prosperity, human and watershed health, and resiliency while minimizing negative impacts. They also recognize that the public facility and service needs, and the appropriate approaches to meeting those needs, vary throughout the city.

**Policy 8.27** **Community involvement**. Encourage effective community engagement in public facilities and services planning and budgeting decisions, as appropriate.

**Policy 8.28** **Application of Guiding Principles**. Establish, improve, and maintain public facilities in ways that promote and balance the Guiding Principles established in Chapter 1 of this Comprehensive Plan.

**Policy 8.29** **Resource efficiency**. Reduce the energy and resource use, waste, and carbon emissions from facilities necessary to serve designated land uses.

**Policy 8.30** **Natural systems**. Protect, enhance, and restore natural systems and features for their infrastructure service and other values.



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**Policy 8.31** **Context-sensitive infrastructure**. Design, improve, and maintain public rights-of-way and facilities in ways that are compatible with, and that minimize negative impacts on, their physical, environmental, and community context.

**Policy 8.32** **Site- and area-specific needs.** Allow for site-specific and area-specific public facility standards, requirements, tools, and policies as needed to address distinct topographical, geologic, environmental, and other conditions.

## Public rights-of-way

The policies in this section support the role of public rights-of-way in providing multiple public services, including multimodal transportation access and movement, stormwater management, water distribution, private utilities, and community use, among others. Current practices and the Portland Plan regard public rights-of-way as a coordinated and interconnected network that provides a place for these multiple public facilities and functions.

**Policy 8.33** **Interconnected network**. Establish a connected rights-of-way system that equitably provides infrastructure services throughout the city.

**Policy 8.34** **Transportation function**. Improve and maintain the right-of-way to support multimodal transportation mobility and access to goods and services as is consistent with the designated street classification.

**Policy 8.35** **Utility function**. Improve and maintain the right-of-way to support equitable distribution of utilities, including water, sanitary sewer, stormwater management, energy, and communications, as appropriate.

**Policy 8.36** **Community uses**. Allow community use of rights-of-way for purposes such as public gathering space, events, or temporary festivals, as long as the community uses are integrated in ways that balance and minimize conflict with the designated through movement and access roles of rights-of-ways.

**Policy 8.37** **Commercial uses**. Allow commercial uses of the rights-of-way for the purpose of enhancing commercial vitality, if the commercial uses can be integrated in ways that balance and minimize conflict with the other functions of the right-of-way.

**Policy 8.38** **Flexible design**. Allow flexibility in right-of-way design and development standards to appropriately accommodate relevant physical, community, and environmental contexts and local needs.

**Policy 8.39** **Stormwater management**. Improve rights-of-way to integrate green infrastructure and other stormwater management facilities to meet desired infrastructure levels-of-service and economic, social, and environmental



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objectives.

**Policy 8.40** **Corridors and City Greenways**. Ensure public facilities located along Civic Corridors, Neighborhood Corridors, and City Greenways support the multiple objectives established for these corridors.

*Corridor and City Greenway goals and policies are listed in Chapter 3: Urban Form.*

**Policy 8.41** **Coordination**. Coordinate the design, improvement, and maintenance of public rights-of-way and associated facilities among public agencies, private providers, and adjacent landowners, as appropriate.

**Policy 8.42** **Undergrounding**. Encourage undergrounding of electrical and telecommunications facilities within public rights-of-way, especially in Centers and along corridors where multi-story development is allowed.

**Policy 8.43** **Right-of-way vacations**. Adopt and maintain City code that identifies when street vacations are appropriate. That code should:

- Maintain existing rights-of-way unless there is no existing or future need for them.
- Require pedestrian or bicycle facilities, if needed.
- Preserve existing and abandoned rail rights-of-way for future rail or recreational trail uses.
- Consider appropriateness of other public uses.
- Require preservation and/or maintenance of existing view corridors, easements, and viewpoints.

## Transportation system

Additional goals and policies specifically related to transportation can be found in the Transportation chapter of this Comprehensive Plan.

## Sanitary and stormwater systems

The City's sewer and drainage system accommodates Portland's current and future needs. It also protects public health, water quality, and the environment. Using asset management and watershed health as goals and guides, the City considers the whole watershed as an interconnected hydrologic system.

The City manages sanitary sewage through an extensive piped collection and treatment system, including two wastewater treatment plants that discharge to the Columbia and Willamette rivers. Stormwater is managed and conveyed through a variety of infrastructure, including pipes, sumps, surface facilities, and natural drainageways. Green infrastructure,



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including landscaped stormwater facilities and natural resources such as trees and natural areas, is an important part of the stormwater system. Private property investments and public-private partnerships also play key roles in the management of stormwater.

The policies below ensure effective sanitary and stormwater systems.

## Sanitary system

**Policy 8.44** **Sewer connections**. Require all developments within the city limits to be connected to sanitary sewers unless the public sanitary system is not physically or legally available per City Code and state requirements; or the existing onsite septic system is functioning properly without failure or complaints per City Code and state requirements; and the system has all necessary state and county permits.

**Policy 8.45** **Combined sewer overflows**. Provide adequate public facilities to limit combined sewer overflows to frequencies established by regulatory permits.

**Policy 8.46** **Sanitary sewer overflows**. Provide adequate public facilities to prevent sewage releases to surface waters as consistent with regulatory permits.

**Policy 8.47** **Private sewage treatment systems.** Adopt land use regulations that require any proposed private sewage treatment system to demonstrate that all necessary state and county permits are obtained.

**Policy 8.48** **Sewer extensions**. Prioritize sewer system extensions to areas that are already developed at urban densities and where health hazards exist.

**Policy 8.49** **Pollution prevention**. Reduce the need for wastewater treatment capacity through land use programs and public facility investments that manage pollution as close to its source as practical and that reduce the amount of pollution entering the sanitary system.

**Policy 8.50** **Treatment**. Provide adequate wastewater treatment facilities to ensure compliance with effluent standards established in regulatory permits.

## Stormwater system

**Policy 8.51** **Stormwater facilities**. Provide adequate stormwater facilities for conveyance, flow control, and pollution reduction.

**Policy 8.52** **Stormwater as a resource**. Manage stormwater as a resource for watershed health and public use in ways that protect and restore the natural hydrology, water quality, and habitat of Portland's watersheds.

**Policy 8.53** **Natural systems.** Protect and enhance the stormwater management capacity



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of natural resources such as streams, rivers, wetlands, and floodplains.

**Policy 8.54** **Stormwater discharge.** Avoid or minimize the impact of stormwater discharges on the water and habitat quality of rivers and streams.

**Policy 8.55** **Green infrastructure**. Promote the use of green infrastructure, such as natural areas, the urban forest, and landscaped stormwater facilities, to manage stormwater.

**Policy 8.56** **Onsite stormwater management**. Encourage on-site stormwater management, or management as close to the source as practical, through land use decisions and public facility investments.

**Policy 8.57** **Pollution prevention.** Coordinate policies, programs and investments with partners to prevent pollutants from entering the stormwater system by managing point and non-point pollution sources through public and private facilities, local regulations, and education.

**Policy 8.58** **Stormwater partnerships**. Provide stormwater management through coordinated public and private infrastructure, public-private partnerships, and community stewardship.

## Flood management

Portland's floodplain areas are primarily along the Columbia River, Willamette River, Columbia Slough, Johnson Creek, and low elevation areas along smaller tributary streams. In accordance with state and federal regulations, the City of Portland, Multnomah County Drainage District, and Peninsula Drainage Districts No. 1 and No. 2 manage floodplains to reduce public safety risks, prevent property damage, support economic activity, and protect watershed health. These policies ensure proper floodplain management and compliance.

**Policy 8.59** **Flood management**. Improve and maintain the functions of natural and managed drainageways, wetlands, floodplains, and flood management facilities, to protect health, safety, and property, provide water conveyance and storage, improve water quality, and maintain and enhance fish and wildlife habitat.

**Policy 8.60** **Floodplain compliance.** Maintain compliance with federal and state floodplain-related requirements.



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## Water systems

The City works to provide reliable water service that meets or exceeds both customer and regulatory standards through sound business, management, and operational practices; appropriate application of innovation and technology; responsible stewardship of water infrastructure and fiscal and natural resources; and by supporting community objectives and overall vision for the City of Portland.

The policies below are intended to protect the quality of the water supply while delivering clean drinking water and meeting user needs.

**Policy 8.61** **Primary supply source**. Protect the Bull Run watershed as the primary water supply source for Portland.

**Policy 8.62** **Bull Run protection.** Maintain a source protection program and practices to safeguard the Bull Run watershed as a drinking water supply.

**Policy 8.63** **Secondary supply sources**. Protect, improve, and maintain the Columbia South Shore wellfield groundwater system, the Powell Valley wellfield groundwater system, and any other alternative water sources designated as secondary water supplies.

**Policy 8.64** **Groundwater wellfield protection**. Maintain a groundwater protection program and practices to safeguard the Columbia South Shore wellfield and the Powell Valley wellfield as drinking water supplies.

**Policy 8.65** **Water quality**. Maintain compliance with state and federal drinking water quality regulations.

**Policy 8.66** **Storage**. Provide sufficient in-city water storage capacity to serve designated land uses, meet demand fluctuations, maintain system pressure, and ensure supply reliability.

**Policy 8.67** **Fire protection.** Provide adequate water facilities to serve the fire protection needs of all Portlanders and businesses.

**Policy 8.68** **Water pressure**. Provide adequate water facilities to maintain water pressure in order to protect water quality and provide for the needs of customers.

**Policy 8.69** **Water efficiency**. Reduce the need for additional water facility capacity and maintain compliance with state water resource regulations by encouraging efficient use of water by customers within the city.

**Policy 8.70** **Service interruptions**. Maintain and improve water facilities to limit interruptions in water service to customers.



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**Policy 8.71** **Outside user contracts**. Coordinate long-term water supply planning and delivery with outside-city water purveyors through long-term wholesale contracts.

## Parks and recreation

The City of Portland manages more than 11,000 acres of developed parks and natural areas, as well as local and regional trails, the urban tree canopy, and the City of Portland's community gardens. It offers thousands of programs for all ages at its community centers, swimming pools, and other recreational facilities. Parks and natural areas give life and beauty to the city and are essential assets that connect people to place, self and others. The following policies ensure this legacy is preserved for all Portlanders and future generations.

**Policy 8.72** **Acquisition, development, and maintenance**. Provide and maintain an adequate supply and variety of parkland and recreational facilities to serve the city's current and future population based on identified level-of-service standards and community needs.

**Policy 8.73** **Service equity.** Invest in acquisition and development of parks and recreation facilities in areas where service-level deficiencies exist.

**Policy 8.74** **Acquisition of surplus properties**. Evaluate opportunities to acquire and/or develop lands declared surplus by other public agencies, or offered as donation by private owners, if consistent with policies 8.72 and 8.73.

**Policy 8.75** **Capital programming**. Maintain a long-range park capital improvement program that balances acquisition, development, and operations; provides a process and criteria for capital improvement project selection; and emphasizes creative and flexible financing strategies.

**Policy 8.76** **Park planning.** Improve parks, recreational facilities, and natural areas in accordance with current master plans, management plans, or adopted strategies that reflect user group needs, development priorities, development and maintenance costs, program opportunities, financing strategies, and community input.

**Policy 8.77** **Public Trails.** Establish, improve, and maintain a citywide system of public trails that are a component of a larger network of bicycle and pedestrian facilities. This citywide trail system should connect Portland's neighborhoods, employment centers, schools, parks, natural areas, recreational facilities, commercial areas, regional trail system, and other key places that Portlanders access in their daily lives. See *Figure 8-1: Citywide Trails Map*.

**Policy 8.78** **Trail and City Greenway coordination.** Coordinate the planning and improvement of trail and City Greenway systems.



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**Policy 8.79** **Natural resources**. Preserve, enhance, and manage City-owned natural areas and resources to protect and improve their ecological health, in accordance with both the natural area acquisition and restoration strategies, and to provide compatible public access.

**Policy 8.80** **Recreational facilities**. Provide a variety of recreational facilities and services that contribute to the health and well-being of Portlanders of all ages and abilities.

**Policy 8.81** **Special recreational facilities**. Establish and manage specialized recreational facilities within the park system to respond to identified public needs, take advantage of land assets, and meet cost recovery goals.

**Policy 8.82** **Enterprise facilities**. Maintain special recreational facilities (such as for golf and motorsports) as enterprises to meet public needs and ensure maximum use and financial self-sufficiency.

**Policy 8.83** **Public-private partnerships.** Encourage public-private partnerships to develop and operate publicly-accessible recreational facilities that meet identified public needs.

## Public safety and emergency response

Coordinated, effective and efficient public safety and emergency response services are essential for a safe and resilient city. They help the community prepare for and respond to medical and fire emergencies, hazards, and natural- and human-made disasters. The policies in this section reflect the variety of public safety and emergency response services provided by the City that must be maintained and enhanced as the city grows, including police, fire and rescue, emergency communications, and emergency management.

**Policy 8.84** **Emergency preparedness, response, and recovery coordination.** Coordinate land use plans, programs and public facility investments between City bureaus, other public and jurisdictional agencies, community partners, and other emergency response providers, to ensure coordinated and comprehensive emergency and disaster preparedness, response, and recovery.

**Policy 8.85** **Emergency management facilities**. Provide adequate public facilities – such as emergency coordination centers, communications infrastructure, and dispatch systems – to support emergency management, response and recovery.

**Policy 8.86** **Police facilities**. Improve and maintain police facilities to allow police personnel to efficiently and effectively respond to public safety needs and serve designated land uses.



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**Policy 8.87** **Community safety centers**. Establish, coordinate, and co-locate public safety and other community services in Centers.

**Policy 8.88** **Fire facilities**. Improve and maintain fire facilities to serve designated land uses, ensure equitable and reliable response, and provide fire and life safety protection that exceeds minimum established service levels.

**Policy 8.89** **Mutual aid.** Maintain mutual aid coordination with regional emergency response providers as appropriate to protect life and ensure safety.

**Policy 8.90** **Community preparedness**. Enhance community preparedness and capacity to prevent, withstand, and recover from emergencies and natural disasters through land use decisions and public facility investments.

**Policy 8.91** **Continuity of operations**. Maintain and enhance the City's ability to withstand and recover from natural disasters and human-made disruptions in order to minimize disruptions to public services.

## Solid waste management

Solid waste, composting and recycling facilities and services are regulated and provided through a partnership between the City of Portland, Metro, franchised haulers and private companies. The following policy supports sustainable waste reduction, recovery, and management, and the use and reuse of materials prior to disposal. This policy relates to the aspects of Oregon's Statewide Planning Goal 13 – Energy Conservation, which focuses on systems and incentives for collection, reuse and recycling of waste.

**Policy 8.92** **Waste management**. Ensure land use programs, rights-of-way regulations, and public facility investments allow the City to manage waste effectively and prioritize waste management in the following order: waste reduction, recycling, anaerobic digestion, composting, energy recovery, then landfill.



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## School facilities

Public education is provided by Portland Public Schools and the David Douglas, Parkrose, Reynolds, Centennial, and Riverdale school districts, as well as public colleges and universities. The City partners with school districts on school facility planning and siting. By encouraging school facilities to be multi-functional neighborhood anchors, designed and programmed to serve community members of all generations and abilities, these policies also help implement the concept of Portland as an age-friendly city.

**Policy 8.93** **Co-location.** Encourage public school districts, Multnomah County, the City of Portland, and other providers to co-locate facilities and programs in ways that optimize service provision and intergenerational and intercultural use.

**Policy 8.94** **Community use.** Encourage public use of public school grounds for community purposes while meeting educational and student safety needs and balancing impacts on surrounding neighborhoods.

**Policy 8.95** **Recreational use**. Encourage publicly-available recreational amenities (e.g. athletic fields, green spaces, community gardens, and playgrounds) on public school grounds for public recreational use, particularly in neighborhoods with limited access to parks.

**Policy 8.96** **Schools as emergency aid centers**. Encourage the use of school facilities as gathering and aid-distribution locations during natural disasters and other emergencies.

**Policy 8.97** **Facility adaptability.** Ensure that public schools may be upgraded to flexibly accommodate multiple community-serving uses and adapt to changes in educational approaches, technology, and student needs over time.

**Policy 8.98** **Leverage public investment.** Encourage City infrastructure investments that complement and leverage local public school districts' major capital investments.

**Policy 8.99** **School access.** Encourage public school districts to consider the ability of students to safely walk and bike to school when making decisions about the site locations and attendance boundaries of schools.

**Policy 8.100** **Private institutions.** Encourage collaboration with private schools and educational institutions to support community and recreational use of their facilities.

## Technology and communications

Private utilities and companies provide technology and communication facilities and services to the general public. The City also provides specific technology and



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communications services to support City and partner agency service delivery. The City promotes access to affordable and reliable technology and communications for all Portlanders.

The policies in this section embrace innovation to ensure all Portlanders are able to access and benefit from emerging technologies and systems that have the potential to make Portland a cleaner, safer, and more efficient, resilient and affordable city. This section acknowledges that information and technology services have become essential infrastructure, and supports investments and partnerships to keep Portland competitive and build on the City's tradition of open-source collaboration and innovation.

**Policy 8.101** **Technology and communication systems.** Maintain and enhance the City's technology and communication facilities to ensure public safety, facilitate access to information, and maintain City operations.

**Policy 8.102** **Capacity and reliability**. Encourage investments in technology and communication infrastructure to reduce disparities in capacity, access, and affordability and provide high-performance, reliable service for Portland's residents and businesses.

## Energy infrastructure

Energy facilities and services in Portland are primarily provided by private utilities and companies. While the City of Portland does not directly provide energy facilities and services, it does promote efficient, sustainable, and resilient energy resources, production, distribution, and consumption. The following policies relate to energy infrastructure and support Oregon's Statewide Planning Goal 13 – Energy Conservation, which includes planning guidelines for renewable energy sources. They ensure that as the City makes land use decisions it removes barriers to promoting efficient and sustainable energy practices.

**Policy 8.103** **Energy efficiency**. Encourage efficient and sustainable production and use of energy resources by residents and businesses, including low-carbon renewable energy sources and distributed generation, through land use plans, zoning, and other legislative land use decisions.

**Policy 8.104** **Coordination**. Coordinate with energy providers to encourage investments that ensure reliable, equitable, efficient, and affordable energy for Portland's residents and businesses.



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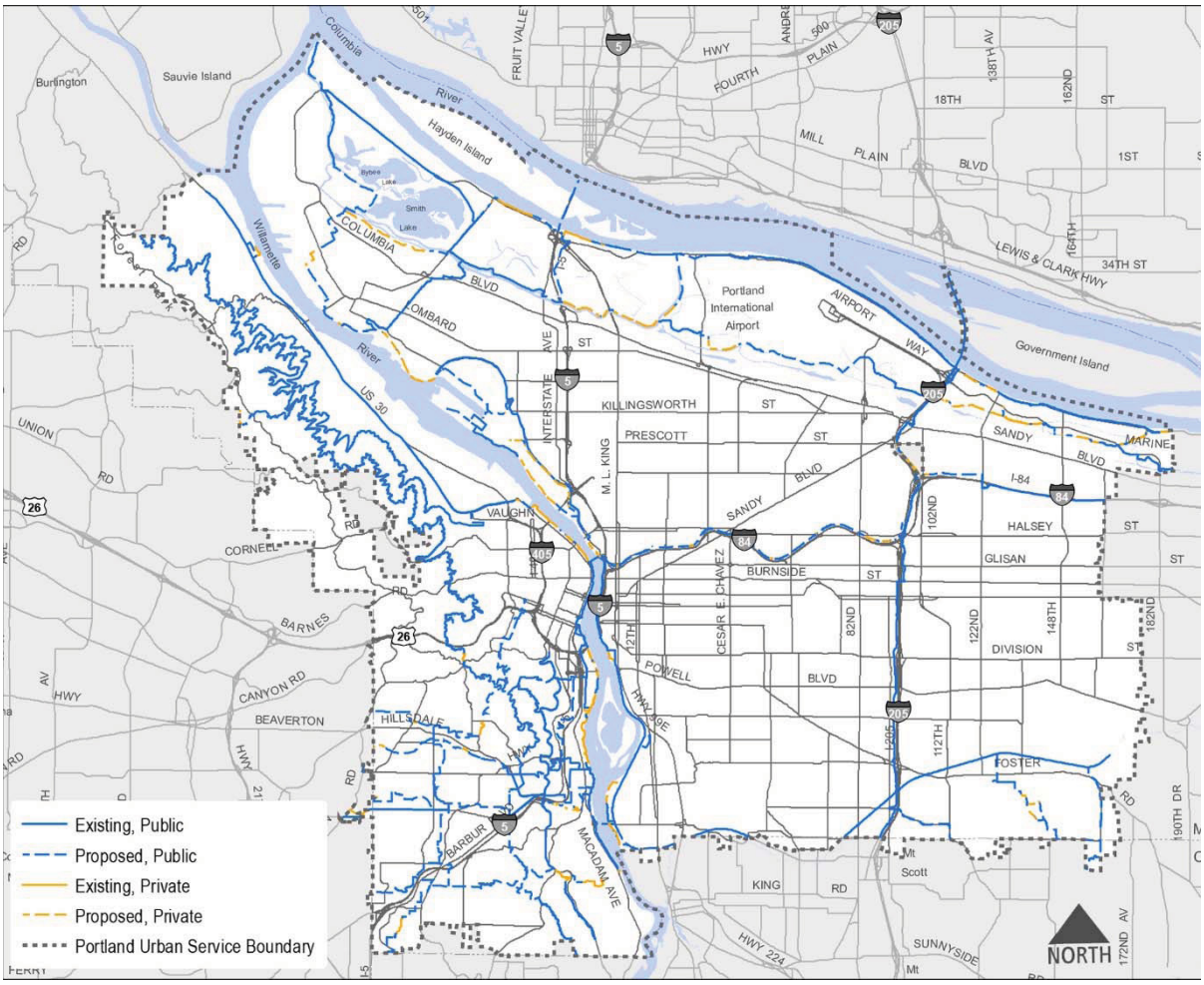
*Figure 8-1. Citywide Trails Map*



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# Chapter 9: Transportation

## What is this chapter about?

The goals and policies in this chapter show the City's intent to:

- Create a coordinated, efficient, and more affordable multimodal transportation system.
- Make cost effective investments and system management decisions that encourage people to choose healthy, active, and low-carbon transportation modes and systems, and enhance the economic competitiveness of the region.
- Reduce service disparities and achieve equitable access to all types of facilities and transportation modes.
- Ensure safety for users of all transportation modes, with attention to the most vulnerable road users.
- Guide the location and design of new street infrastructure.
- Direct how and when transportation infrastructure is managed and maintained.
- Provide policy guidance for developing and implementing the Transportation System Plan.

## Why is this important?

The transportation system is essential to the functioning of the city and the well-being and prosperity of the community. It connects people and businesses to goods and services, and links them to the region, state, nation and world. Although transportation is often measured in terms of mobility, it also creates access to opportunity. These goals and policies also reflect the role of transportation planning in reducing carbon emissions, and improving public health. Finally, this chapter acknowledges the role that streets can play in providing great civic and recreational spaces. The way we build our city has an impact on our mobility and, by extension, our access to opportunity.

With its 1980 Comprehensive Plan, the City of Portland became a national leader in the integration of land use and transportation. The 2035 Comprehensive Plan carries that tradition forward and adds new innovations. The goals and policies in this chapter increase the focus on complete multimodal transportation systems. The historical emphasis on automobile mobility is increasingly creating a cost burden on households and the community as a whole. For the city to successfully meet its transportation system goals for the future, other more affordable choices must be widely available and safe.



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# What is the Transportation System Plan?

The Transportation System Plan (TSP) is the 20-year plan to guide transportation investments in Portland. The TSP meets state and regional planning requirements and addresses local transportation needs. It includes:

- Policies that guide the maintenance, development, and implementation of Portland's transportation system.
- A list of projects necessary to accommodate 20 years of growth in population and employment, with a financial plan.
- Master street plans and modal plans.
- Strategies and regulations for implementation, including street classification maps.

Elements of the TSP — the policies, street classification maps and the street plan maps —-are adopted as part of the Comprehensive Plan. The TSP is adopted concurrently with the Comprehensive Plan, but published under a separate cover. For ease of use and transparency, the citywide policies from the TSP are also included in Chapter 9 (Transportation) of the Comprehensive Plan document and are also part of the Comprehensive Plan. The TSP also includes additional sub-policies and area-specific policies.

The TSP is both an implementation tool and a supporting document to the Comprehensive Plan. The TSP contains the transportation element of the City's Public Facilities Plan, and the List of Significant Projects. The TSP also provides more detail than the Comprehensive Plan by including additional supporting information about transportation system conditions. Figure 9-1 illustrates the relationship between the TSP and other policies and plans.



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# Goals

**Goal 9.A: Achieve multiple goals**
Portland's transportation system is funded and maintained to achieve multiple goals and measureable outcomes for people and the environment. The transportation system is complete, interconnected, multimodal, and fulfills daily needs for people and businesses.

**GOAL 9.B: Support great places**
Portland's transportation system reinforces neighborhoods, placemaking, and quality of life for all Portlanders.

**GOAL 9.C: Environmentally sustainable**
The transportation system increasingly uses renewable energy, or electricity from renewable sources, achieves adopted carbon reduction targets, and reduces air pollution, water pollution, noise, and Portlanders' reliance on private vehicles.

**GOAL 9.D: Equitable transportation**
The transportation system provides all Portlanders options to move about the city and meet their daily needs by using a variety of efficient, convenient, and affordable modes of transportation. Transportation investments are responsive to the distinct needs of each community.

**GOAL 9.E: Positive health outcomes**
The transportation system promotes positive health outcomes and minimizes negative impacts for all Portlanders by supporting active transportation, physical activity, and community and individual health.

**GOAL 9.F: Opportunities for prosperity**
The transportation system supports a strong and diverse economy, enhances the competitiveness of the city and region, and maintains Portland's role as a West Coast trade gateway and freight hub, by providing efficient and reliable goods movement, multimodal access to employment areas and educational institutions, as well as enhanced freight access to industrial areas and intermodal freight facilities. The transportation system helps people and businesses reduce spending and keep money in the local economy by providing affordable alternatives to driving.

**GOAL 9.G: Safety**
Transportation safety contributes to a livable city and ensures that people of all ages and abilities feel comfortable and secure using City streets. Human impact and economic costs are reduced by comprehensive efforts to improve traffic safety, including engineering, education, enforcement, and evaluation, all of which will move Portland toward zero traffic-related fatalities and no serious injuries.


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**GOAL 9.H: Cost effective**
The City analyzes and prioritizes capital and operating investments to cost effectively achieve the above goals while responsibly managing and protecting our past investments in existing assets.

# Policies

## Design and planning policies

The City of Portland's transportation system is a key public facility. The following policies describe what the transportation system is, what it does, and what factors to consider for how the overall system is used. Policies 8.1-8.51 in the Public Facilities chapter also apply to the need for quality facilities and services, multiple benefits, reliability, and creating a multi-purpose and safe right-of-way.

**Policy 9.1** **Street design classifications**. Maintain and implement street design classifications consistent with land use plans, environmental context, urban design pattern areas, and Urban Design Framework designations.

**Policy 9.2** **Street policy classifications.** Maintain and implement street policy classifications for pedestrian, bicycle, transit, freight, emergency vehicle, and automotive movement, while considering access for all modes, connectivity, adjacent planned land uses, and state and regional requirements.

**Policy 9.3** **Transportation System Plan.** Maintain and implement the Transportation System Plan (TSP) as the decision-making tool for transportation-related projects, policies, programs, and street design.

**Policy 9.4** **Use of classifications.** Plan, develop, implement, and manage the transportation system in accordance with street design and policy classifications outlined in the Transportation System Plan.

**Policy 9.5** **Mode share goals and Vehicle Miles Travelled (VMT) reduction.** Increase the share of trips made using active and low-carbon transportation modes and reduce VMT to achieve targets set in the most current Climate Action Plan and Transportation System Plan. Meet or exceed Metro's mode share and VMT targets in Neighborhood Centers and 2040 Growth Concept areas.



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**Policy 9.6** **Transportation hierarchy for people movement.** Implement a hierarchy of modes for people movement by making transportation system decisions according to the following prioritization:

1. Walking
2. Cycling
3. Transit
4. Taxi / commercial transit / shared vehicles
5. Zero emission vehicles
6. Other private vehicles

When implementing the hierarchy, ensure that:

- The needs and safety of each group of road users are considered, and changes do not make existing conditions worse for the most vulnerable users higher on the hierarchy.
- All users' needs are balanced, and when necessary to ensure safety, accommodate some users on parallel streets as part of multi-street corridors.
- Land use and system plans, network functionality for all modes, other street functions, and complete street policies, are maintained.
- Rationale is provided if modes lower in the hierarchy are prioritized.

*Specific modal policies are found below in policies 9.18 to 9.41.*

**Policy 9.7** **Moving goods and delivering services.** Maintain efficient and reliable movement of goods and services as a critical transportation system function. Prioritize freight system reliability improvements over general motor vehicle mobility where there are solutions that distinctly address those different needs. Multimodal freight policies are found below in policies 9.31 to 9.39.

**Policy 9.8** **Affordability.** Improve and maintain the transportation system to increase access to convenient and affordable transportation options for all Portlanders, especially those who have traditionally been under-served or have historically borne unequal burdens.

**Policy 9.9** **Geographic policies.** Adopt geographically-specific policies in the Transportation System Plan, to ensure that transportation infrastructure reflects the differing topography, historic character, natural features, economic needs, demographics, and land uses of each area. Use the Pattern Areas identified in Chapter 3 Urban Design as the basis for area policies.



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## Land use, development, and placemaking

Land use patterns and connections among different land uses are key elements defining the form and character of places. In tandem with the Urban Form and Design and the Design and Development chapters, the policies in this section give direction for designing and building a transportation system that supports, complements, and meets the needs of different places. These policies acknowledge development adjacent to transportation as a critical component in shaping the future of Portland's public spaces and places.

**Policy 9.10** **Land use and transportation coordination.** Implement the Comprehensive Plan Map and the Urban Design Framework though coordinated long-range transportation and land use planning. Ensure that street policy and design classifications and land uses complement one another.

**Policy 9.11** **Growth strategy.** Implement street design and policy classifications to support a Centers and Corridors growth strategy.

**Policy 9.12** **Centers, Corridors, and Transit Station Areas** Enhance design and transportation function of Town Centers, Neighborhood Centers, Neighborhood Corridors, Civic Corridors, Transit Station Areas, and Greenways as highlighted in Chapter 3, Urban Form and Design.

**Policy 9.13** **Development and street design.** Evaluate adjacent land use to help inform street classifications in framing, shaping, and activating the public space of streets. Guide development and land use to create the kinds of places and street environments intended for different types of streets.

## Streets as public spaces

Streets, including sidewalks and planting strips, provide critical transportation and utility functions. In Portland, streets are the most abundant type of public space, occupying nearly 20 percent of land area in the city. The following policies support community desire to expand the use of streets beyond their transportation functions. See the Public Facilities and Design and Development chapters for further use and streetscape policies.

**Policy 9.14** **Streets for transportation and public spaces.** Integrate both the placemaking and transportation functions when designing and managing streets by encouraging design, development, and operation of streets to enhance opportunities for them to serve as places for community interaction, environmental function, open space, recreation, and other community purposes.

**Policy 9.15** **Repurposing street space.** Encourage repurposing street segments that are not critical for transportation connectivity to other community purposes.



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**Policy 9.16** **Design with nature.** Promote street alignments and designs that respond to topography and natural features, when feasible, and protect streams, habitat, and native trees.

**Policy 9.17** **Street views.** Maintain public views of prominent landmarks and buildings that serve as visual focal points within streets or that terminate views at the end of streets.

## Modal policies

Portland is committed to providing a multimodal transportation system that provides affordable and convenient travel options within the city, region, and outside the Metro area. Because trips are made for different reasons, they vary in length and type of vehicle (mode) needed to make them. Different modes create different kinds of impacts — on neighborhood livability and carbon emissions, for example. These policies recognize that some modes are more appropriate than others for different types of trips.

**Policy 9.18** **Pedestrian transportation**. Encourage walking as the most attractive mode of transportation for most short trips, within and to centers, corridors, and major destinations, and as a means for accessing transit.

**Policy 9.19** **Pedestrian networks.** Create more complete networks of pedestrian facilities and improve the quality of the pedestrian environment.

**Policy 9.20** **Pedestrian safety and accessibility.** Improve pedestrian safety, accessibility, and convenience for people of all ages and abilities.

**Policy 9.21** **Bicycle transportation**. Create conditions that make bicycling more attractive than driving for most trips of approximately three miles or less.

**Policy 9.22** **Accessible bicycle system.** Create a bicycle transportation system that is safe, comfortable, and accessible to people of all ages and abilities.

**Policy 9.23** **Bicycle classifications.** Develop and implement classifications that emphasize the movement of bicycles on a citywide network of designated streets that safely and efficiently provides access to the Central City, Gateway, Town Centers, and Neighborhood Centers.

**Policy 9.24** **Public transportation**. Coordinate with public transit agencies to create conditions that make transit the preferred mode of travel for trips that are not made by walking or bicycling.

**Policy 9.25** **Transportation to job centers.** Encourage transit as the preferred transportation mode for people travelling to and from the Central City and Gateway. Enhance regional access to the Central City and access from Portland other regional job centers.



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**Policy 9.26** **Transit service.** In partnership with Trimet, develop a public transportation system that conveniently, safely, comfortably, and equitably serves residents and workers 24 hours a day, 7 days a week.

**Policy 9.27** **Transit equity.** In partnership with Trimet, maintain and expand high-quality frequent transit service to all Town Centers, Civic Corridors, Neighborhood Centers, Neighborhood Corridors, and other major concentrations of employment, and improve service to areas with high concentrations of poverty and historically under-served and under-represented communities.

**Policy 9.28** **Prosperity and growth.** In partnership with Trimet**,** maintain, expand, and enhance Portland Streetcar, frequent service bus, and bus rapid transit to better serve Civic Corridors with the highest intensity of potential employment and household growth. Use transit investments as a means to shape the city's growth.

**Policy 9.29** **Intercity passenger service**. Coordinate planning and project development to expand intercity passenger transportation services in the Willamette Valley, and from Portland to Seattle and Vancouver, BC.

**Policy 9.30** **Regional trafficways and transitways**. Enhance capacity of regional transitways and existing regional trafficways to accommodate future increases in regional through-traffic.

**Policy 9.31** **Multimodal goods movement.** Develop, maintain, and enhance a multimodal freight transportation system for the safe, reliable, sustainable, and efficient movement of goods within and through the city. Ensure that the transportation system supports traded sector economic development plans and full utilization of prime industrial land.

**Policy 9.32** **Multimodal system and hub.** Maintain Portland's role as a multimodal hub for global and regional movement of goods. Enhance Portland's network of multimodal freight corridors.

**Policy 9.33** **Freight network.** Develop, manage, and maintain a safe, efficient, and reliable freight street network to provide freight access to and from intermodal freight facilities, industrial and commercial districts, and the regional transportation system. Invest to accommodate forecasted growth of interregional freight volumes and provide access to truck, marine, rail, and air transportation systems.

**Policy 9.34** **Sustainable freight system.** Support the efficient delivery of goods and services to businesses and neighborhoods, while also reducing environmental and neighborhood impacts. Encourage the use of energy efficient and clean delivery vehicles, and manage on- and off-street loading



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spaces to ensure adequate access for deliveries to businesses, while maintaining access to homes and businesses.

**Policy 9.35** **Freight rail network.** Coordinate with stakeholders and regional partners to support continued reinvestment in, and modernization of, the freight rail network.

**Policy 9.36** **Portland Harbor.** Coordinate with the Port of Portland, private stakeholders, and regional partners to improve and maintain access to marine terminals and related river-dependent uses in Portland Harbor.

**9.36.a.** Support continued reinvestment in, and modernization of, marine terminals in Portland Harbor.

**9.36.b.** Facilitate continued maintenance of the shipping channels in Portland Harbor and the Columbia River.

**9.36.c.** Support shifting more long-distance, high-volume movement of goods to river and oceangoing ships and rail.

**Policy 9.37** **Portland International Airport.** Maintain the Portland International Airport as an important regional, national, and international transportation hub serving the bi-state economy.

**Policy 9.38** **Portland Heliport.** Maintain Portland's Heliport functionality in the Central City.

**Policy 9.39** **Automobile transportation.** Maintain acceptable levels of mobility and access for private automobiles while reducing overall vehicle miles traveled (VMT) and negative impacts of private automobiles on the environment and human health.

**Policy 9.40** **Automobile efficiency.** Coordinate land use and transportation plans and programs with other public and private stakeholders to encourage vehicle technology innovation, shifts toward electric and other cleaner more energy efficient vehicles and fuels, integration of smart vehicle technology with intelligent transportation systems, and greater use of options such as car-share, carpool, and taxi.

**Policy 9.41** **Emergency response**. Maintain a network of accessible emergency response streets to facilitate safe and expedient emergency response and evacuation. Ensure that police, fire, ambulance, and other emergency providers can reach their destinations in a timely fashion, without negatively impacting traffic calming and other measures intended to reduce crashes and improve safety.



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## System management

Portland's transportation system is an integrated network of roads, rails, sidewalks, bicycle paths, and other facilities within and through the city. These modal networks intersect and are often located within the same right-of-way. These policies provide direction to manage the system in ways that:

- Allow different modes to interact safely.
- Maximize the capacity of the existing network.
- Identify where additional capacity might be needed.

*Also see Policies 8.33 through 8.43 in Chapter 8: Public Facilities and Services.*

**Policy 9.42** **System management**. Give preference to transportation improvements that use existing roadway capacity efficiently and that improve the safety of the system for all users.

**Policy 9.43** **Traffic management**. Evaluate and encourage traffic speed and volume to be consistent with street classifications and desired land uses to improve safety, preserve and enhance neighborhood livability, and meet system goals of calming vehicle traffic through a combination of enforcement, engineering, and education efforts.

**Policy 9.44** **Connectivity**. Establish an interconnected, multimodal transportation system to serve centers and other significant locations. Promote a logical, direct, and connected street system through street spacing guidelines and district-specific street plans found in the Transportation System Plan and prioritize access to specific places by certain modes in accordance with the transportation hierarchy.

**Policy 9.45** **Technology.** Encourage the use of emerging technology, vehicle technology, and parking technology to improve real-time management of the transportation network and to manage and allocate parking supply and demand.

**Policy 9.46** **Performance measures.** Establish multimodal performance measures to evaluate and monitor the adequacy of transportation services. Use these measures to evaluate overall system performance, inform corridor and area-specific plans and investments, and regulate development, institutional campus growth, zone changes, Comprehensive Plan Map amendments, and conditional uses.

**Policy 9.47** **Regional congestion management**. Coordinate with Metro to create a regional congestion management approach, including a market-based system, to price or charge for auto trips and parking, better account for the cost of auto trips, and to more efficiently manage the regional system.



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## Parking management

Vibrant urban places link people and activities. As Portland grows, we must manage both the demand and supply of parking. Providing too much parking can lead to inefficient land use patterns and sprawl. Insufficient parking can negatively affect neighborhood livability and economic vitality. These policies provide guidance to manage parking demand and supply to meet a variety of public objectives, including achieving compact walkable communities, reducing overall vehicle use, enhancing livability, reducing pollution, and expanding economic opportunity.

**Policy 9.48** **Parking management.** Manage parking supply to achieve transportation policy objectives for neighborhood livability, safety, business district vitality, vehicle miles traveled (VMT) reduction, and improved air quality.

**Policy 9.49** **Central City, and centers parking.** Limit the growth of off-street parking spaces and manage supply and demand for parking, loading, and unloading in the public right-of-way in the Central City, Gateway, Town Centers, and Station Areas.

**Policy 9.50** **On-street parking.** Manage parking and loading demand, supply, and operations in the public right of way to encourage safety, economic vitality, and livability. Recognize that the curb zone is a public space, and as such, a physical and spatial asset that has value and cost. Allocate and manage on-street parking and loading within the curb zone in a manner that achieves the highest and best use of this public space in support of broad City policy goals and local land use context.

**Policy 9.51** **Off-street parking.** Limit the development of new parking spaces to achieve land use, transportation, and environmental goals. Regulate off-street parking to achieve mode share objectives, promote compact and walkable urban form, encourage lower rates of car ownership, and promote the vitality of commercial and employment areas. Utilize transportation demand management and pricing of parking in areas with high parking demand.

**Policy 9.52** **Share space and resources.** Encourage the shared use of parking and vehicles to maximize the efficient use of limited urban space.

**Policy 9.53** **Bicycle parking.** Promote the development of new bicycle parking facilities, including dedicated bike parking in the public right-of-way. Provide sufficient bicycle parking at High-Capacity Transit stations to enhance bicycle connection opportunities.



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## Finance, programs, and coordination

Programs and funding are required to build and maintain the transportation system, and they are necessary to help decide what projects to build. They also provide public information about what facilities are available and how they can be used. Agencies outside of the City also own and operate facilities in the city and provide funding for new facilities. These policies address essential funding and coordination opportunities with other agencies, as well outreach and education programming.

**Policy 9.54** **Coordination**. Coordinate with state and federal agencies, local and regional governments, special districts, and providers of transportation services when planning for, developing, and funding transportation facilities and services.

**Policy 9.55** **Education and encouragement.** Create, maintain, and coordinate educational and encouragement programs that support multimodal transportation and that emphasize safety for all modes of transportation. Ensure that these programs are accessible to under-served and under-represented populations.

**Policy 9.56** **Transportation Demand Management (TDM).** Create and maintain Transportation Demand Management (TDM), programs that increase the modal share of walking, bicycle, and transit trips. Integrate TDM with other programs, including parking management.

**Policy 9.57.** **Telecommuting.** Promote telecommuting and the use of communications technology to reduce travel demand.

**Policy 9.58** **Project selection criteria.** Establish transportation project selection criteria consistent with goals 9A through 9H, to cost effectively achieve access, place making, sustainability, equity, health, prosperity and safety goals. Coordinate transportation project selection with other capital planning programs impacted by work in the public right of way, including sewer and water utilities.

**Policy 9.59** **Funding.** Encourage the development of a range of stable transportation funding sources that provide adequate resources to build an equitable and sustainable transportation system.



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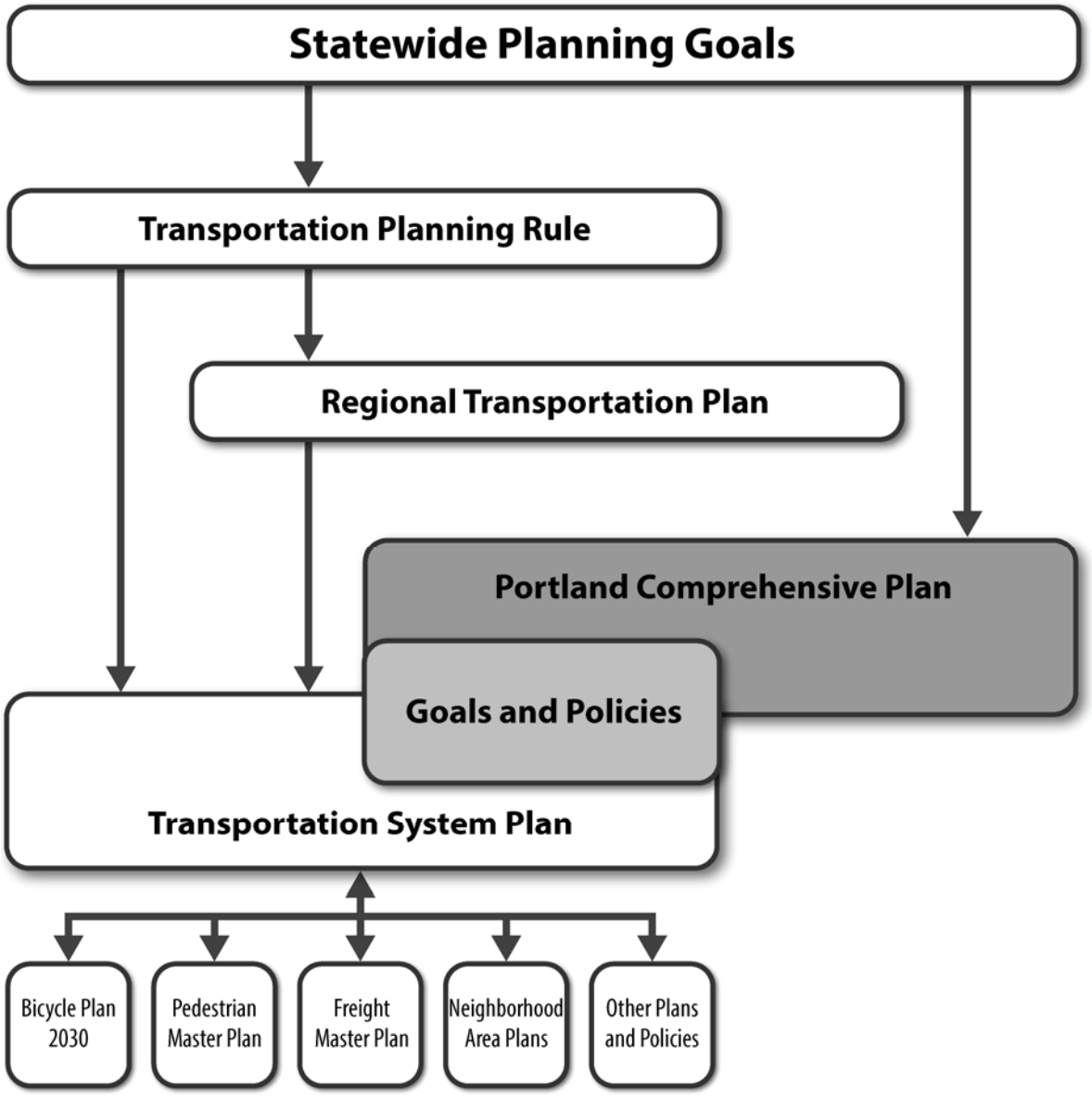
*Figure 9-1. Transportation System Plan: Relationship to Other Policies and Plans*



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# Chapter 10: Administration and Implementation

## What is this chapter about?

The goals and policies in this chapter serve to:

- Provide guidance for how to update the Comprehensive Plan and develop implementation measures.
- Provide a clear definition of each Comprehensive Plan Map Designation.

## Why is this important?

Although the Comprehensive Plan anticipates land use and significant capital project investment needs for the next 20 years, no plan that is as broad in scope or as comprehensive in its application as this Comprehensive Plan can be wholly relevant for 20 years. Changing needs, new technologies and innovations, and shifting perceptions may make it necessary and reasonable to update parts of the Comprehensive Plan over the next 20 years.

This chapter provides guidance on how to amend the Plan while maintaining consistency with the Plan's vision.



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# Goals

**Goal 10.A: Administration**
Portland's Comprehensive Plan is administered efficiently and effectively. It is implemented in accordance with State law and the goals, policies, and Comprehensive Plan Map contained in the adopted Comprehensive Plan.

# Policies

## Administration

To effectively administer the Comprehensive Plan, amendments to an element of the Plan or an implementation tool must be internally consistent and support the Guiding Principles listed in Chapter 1. The policies in this section direct both legislative and quasi-judicial amendments to the Plan or an implementation tool.

**Policy 10.1 Amending the Comprehensive Plan Goals and Policies, Urban Design Framework, List of Significant Projects, or a supporting document.**

**10.1.a.** The Planning and Sustainability Commission (PSC) must review and make recommendations to the City Council on all proposed amendments to Comprehensive Plan goals and policies, the Urban Design Framework, List of Significant Projects, or a Comprehensive Plan supporting document.

**10.1.b.** Amendments to Comprehensive Plan goals and policies, the Urban Design Framework, List of Significant Projects, or a supporting document must:

- Comply with statewide planning goals.
- Comply with the Comprehensive Plan goals and policies. "Comply" means that, on the whole, the proposal conforms with the purposes of the goals and strikes a reasonable balance among applicable goals and policies.
- Demonstrate that reasonable consideration was given to the Guiding Principles outlined in Chapter 1.
- Promote environmental justice by:
    - Extending benefits associated with environmental assets, land uses, and public investments to communities of color, low-income populations, and other under-served or under-represented groups impacted by the decision.



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- Eliminating, where practicable, disproportionate burdens (e.g. adverse environmental, economic or community impacts) associated with land use and public investment decisions for communities of color, low-income populations, and other under-served or under-represented groups impacted by the decision. In cases where disproportionate burdens cannot be eliminated, they should be minimized or mitigated.
- Leveraging land use and investment decisions to address disproportionate burdens of previous decisions.
- Effectively including impacted communities in the decision-making process (see the Community Involvement chapter of this Comprehensive Plan).

- Be consistent with the identified function and capacity of, and adopted performance measures for, affected transportation facilities.

**Policy 10.2 Amending the Comprehensive Plan Map**

**10.2.a.** The Planning and Sustainability Commission (PSC) must review and make recommendations to the City Council on all legislative amendments to the Comprehensive Plan Map, including amendments to the Urban Services Boundary. The Hearings Officer must review and make recommendations to the City Council on all quasi-judicial amendments to the Comprehensive Plan Map using procedures outlined in the Zoning Code.

When a Comprehensive Plan Map Land Use designation is amended legislatively and the underlying base zone is more intensive than the zone or zones that correspond to the designation, the underlying zone will be automatically changed to a corresponding zone. When a Comprehensive Plan Map Land Use designation is changed quasi-judicially and the underlying base zone is more intensive than the zone or zones that correspond to the designation, the quasi-judicial review must include an amendment to the corresponding zone.

In either situation, when the underlying base zone is less intensive than the zone that corresponds to the designation, the underlying zone may remain. Table 10-1 shows base zones that correspond to a land use designation and the base zones that are more intense and less intense than the zone or zones that correspond to the designation.



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**10.2.b.** Legislative amendments to the Comprehensive Plan Map must:

- Comply with statewide planning goals.
- Comply with the Comprehensive Plan goals and policies. "Comply" means that, on the whole, the proposal strikes a reasonable balance among applicable goals and policies.
- Demonstrate that reasonable consideration was given to the Guiding Principles outlined in Chapter 1.
- Promote environmental justice by:
  - Extending benefits associated with environmental assets, land uses, and public investments to communities of color, low-income populations, and other under-served or under-represented groups impacted by the decision.
  - Eliminating, where practicable, disproportionate burdens (e.g. adverse environmental, economic or community impacts) associated with land use and public investment decisions for communities of color, low-income populations, and other under-served or under-represented groups impacted by the decision. In cases where disproportionate burdens cannot be eliminated, they should be minimized or mitigated.
  - Using, where relevant and practicable, land use and investment decisions to address disproportionate burdens of previous decisions.
  - Effectively including impacted communities in the decision-making process (see the Community Involvement chapter of this Comprehensive Plan).
- Be consistent with the identified function and capacity of, and adopted performance measures for, affected transportation facilities.
- Be consistent with the Metro Urban Growth Management Functional Plan.
- Recognize infrastructure and resource limitations and the investments required to support the desired change.

**10.2.c.** For quasi-judicial amendments to the Comprehensive Plan Map, the burden of proof for the amendment is on the applicant. The applicant must show that the requested change:

- Complies with Comprehensive Plan goals and policies. "Complies with" means that, on the whole, the proposal strikes a reasonable balance among applicable goals and policies.
- Is compatible with the land use pattern established by the Comprehensive Plan Map.
- Is based on reasonable consideration of the Guiding Principles outlined in Chapter 1.
- Promotes environmental justice by effectively including impacted communities in the decision-making process as outlined in the Community Involvement chapter of this Comprehensive Plan.
- Is consistent with the Statewide Land Use Planning Goals.



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- Is consistent with the identified function of, and adopted performance measures for, affected transportation facilities.
- Is consistent with the Metro Urban Growth Management Functional Plan.
- Is consistent with any adopted applicable area plans.

**Policy 10.3** **Amending** the **Zoning Map.**

**10.3.a.** Amending a base zone may be done legislatively or quasi-judicially. Amendments to a base zone in compliance with the Comprehensive Plan land use designation must be to the corresponding zone stated in the designation. When a designation has more than one corresponding zone, the most appropriate zone, based on the purpose of the zone and the zoning and general land uses of surrounding lands, will be applied.

**10.3.b.** An amendment to a base zone in compliance with the land use designation must be approved when it is found that current public services are capable of supporting the uses allowed by the zone, or that public services can be made capable by the time the development is complete. The adequacy of services is based on the proposed use and development. If a specific use and development proposal is not submitted, services must be able to support the range of uses and development allowed by the zone. For the purposes of this requirement, services include water supply, sanitary sewage disposal, stormwater management, transportation, school district capacity (where a school facility plan exists), and police and fire protection.

**10.3.c.** An amendment to apply or remove an overlay zone or plan district may be done legislatively or quasi-judicially, and must be based on a study or plan document that identifies a specific characteristic, situation, or problem that is not adequately addressed by the base zone or other regulations.

**Policy 10.4** **Amending the Zoning Code.** Amendments to the zoning regulations must be done legislatively, and should be clear, concise, and applicable to a broad range of development situations faced by a growing city. Amendments should:

- Promote good planning:
  - Comply with the Comprehensive Plan goals and policies. “Comply” means that, on the whole, the proposal strikes a reasonable balance among applicable goals and policies.
- Demonstrate that reasonable consideration was given to the Guiding Principles outlined in Chapter 1.
- Promote equity:
  - Extend benefits associated with environmental assets, land uses, and public investments to communities of color, low-income populations, and other under-served or under-represented groups impacted by the decision.



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    - Eliminate, where practicable, disproportionate burdens (e.g. adverse environmental, economic or community impacts) associated with land use and public investment decisions for communities of color, low-income populations, and other under-served or under-represented groups impacted by the decision. In cases where disproportionate burdens cannot be eliminated, they should be minimized or mitigated.
    - Use, where relevant and practicable, land use and investment decisions to address disproportionate burdens of previous decisions.
    - Effectively include impacted communities in the decision-making process (see the Community Involvement chapter of this Comprehensive Plan).
- Effectively and efficiently implement the Comprehensive Plan.
- Address existing and potential land use problems.
- Balance the benefits of regulations against the costs of implementation and compliance.
- Ensure that Portland remains competitive with other jurisdictions as a location in which to live, invest, and do business.
- Ensure good administration of land use regulations:
    - Keep regulations as simple as possible.
    - Use clear and objective standards wherever possible.
    - Maintain consistent procedures and limit their number.
    - Establish specific approval criteria for land use reviews.
    - Establish application requirements that are as reasonable as possible, and ensure they are directly tied to approval criteria.
    - Emphasize administrative procedures for land use reviews.
    - Avoid overlapping reviews.
- Strive to improve the code document:
    - Use clear language.
    - Maintain a clear and logical organization.
    - Use a format and layout that enables use of the document by lay people as well as professionals.
    - Use tables and drawings to clarify and shorten the document.
    - Identify and act on regulatory improvement suggestions.



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## Land use designations

The Comprehensive Plan Map is one of the Comprehensive Plan's implementation tools. The Map includes land use designations, which are used to carry out the Comprehensive Plan. The land use designation that best implements the plan is applied to each area of the city. This section contains descriptions of the land use designations. Each description generally includes:

- Type of place or Pattern Area for which the designation is intended.
- General use and intensity expected within the area. In some cases, the alternative development options allowed in single-dwelling residential zones (e.g. duplexes and attached houses on corner lots; accessory dwelling units) may allow additional residential units beyond the general density described below.
- Level of public services provided or planned.
- Level of constraint.

**Policy 10.5** **Land use designations.** The land use designation that best advances the Comprehensive Plan, including the Urban Design Framework, is applied to each parcel of land. The land use designations are shown on the official Zoning Maps. The Zoning Code contains the use and development regulations.

*Note: The pending Central City 2035 Plan will revise the Central City-specific land use descriptions, or will create new corresponding zones.*

**Open Space**

**1. Open Space**
This designation is intended for lands that serve a recreational, public open space, or ecological function, or provide visual relief. Lands in this designation are primarily publicly owned but can be in private ownership. Lands intended for the Open Space designation include parks, public plazas, natural areas, scenic lands, golf courses, cemeteries, and large water bodies. The corresponding zone is OS.

**Single-Dwelling Residential**

**2. Farm and Forest**
This designation is intended for agricultural and forested areas far from centers and corridors, where urban public services are extremely limited or absent, and future investment in public services are not planned. Areas within this designation generally have multiple significant development constraints that pose health and safety risks. The designation can be used where larger lot sizes are necessary to enable on-site sanitary or stormwater disposal. Agriculture, forestry and very low-density single-dwelling residential will be the primary uses. The maximum density is generally 1 unit per 2 acres. The corresponding zone is RF.



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**3. Single-Dwelling — 20,000**
This designation is intended for areas far from centers and corridors where urban public services are extremely limited or absent, and future investments in public services are not planned. Areas within the designation generally have multiple significant development constraints that pose health and safety risks. Agriculture, forestry, and very low-density single-dwelling residential will be the primary uses. The maximum density will range from 1 unit per 2 acres to 2.2 units per acre. The corresponding zones are RF and R20. RF is often used where larger lot sizes are necessary to enable on-site sanitary or stormwater disposal.

**4. Single-Dwelling — 10,000**
This designation is intended for areas far from centers and corridors where urban public services are available or planned but complete local street networks or transit service is limited. This designation is also intended for areas where ecological resources or public health and safety considerations warrant lower densities. Areas within this designation generally have development constraints, but the constraints can be managed through appropriate design during the subdivision process. Single-dwelling residential will be the primary use. The maximum density is generally 4.4 units per acre. The corresponding zone is R10.

**5. Single-Dwelling — 7,000**
This designation is intended for areas near, but not adjacent to, centers and corridors where urban public services are available or planned but complete local street networks or transit service is limited. This designation is also intended for areas where urban public services, generally including complete local street networks and access to frequent transit, are available or planned, but the development pattern is predominantly built-out at 7,000 square feet or more per dwelling unit. Areas within this designation generally have only minor development constraints. Single-dwelling residential will be the primary use. The maximum density is generally 6.2 units per acre. The corresponding zone is R7.

**6. Single-Dwelling — 5,000**
This designation is Portland's most common pattern of single-dwelling development, particularly in the city's inner neighborhoods. It is intended for areas near, in, and along centers and corridors where urban public services, generally including complete local street networks and access to frequent transit, are available or planned. Areas within this designation generally have few or very limited development constraints. Single-dwelling residential will be the primary use. The maximum density is generally 8.7 units per acre. The corresponding zone is R5.

**7. Single-Dwelling — 2,500**
This designation allows a mix of housing types that are single-dwelling in character. This designation is intended for areas near, in, and along centers and corridors where urban public services, generally including complete local street networks and access to frequent transit, are available or planned. Areas within this designation generally do not have development constraints. The maximum density is generally 17.4 units per acre. The corresponding zone is R2.5.



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### Multi-Dwelling Residential

**8. Multi-Dwelling — 3,000**
This designation allows a mix of housing types, including multi-dwelling structures, in a manner similar to the scale of development anticipated within the Attached Single-Dwelling designation. This designation is intended for areas near, in, and along centers and corridors where urban public services, generally including complete local street networks and access to frequent transit, are available or planned. Areas within this designation generally do not have development constraints, and may include larger development sites. The maximum density is generally 14.5 units per acre, but may go up to 21 units per acre in some situations. The corresponding zone is R3.

**9. Multi-Dwelling — 2,000**
This designation allows multi-dwelling development mixed with single-dwelling housing types but at a scale greater than for single-dwelling residential. This designation is intended for areas near, in, and along centers and corridors where urban public services, generally including complete local street networks and access to frequent transit, are available or planned. Areas within this designation generally do not have development constraints. The maximum density is generally 21.8 units per acre, but may be as much as 32 units per acre in some situations. The corresponding zone is R2.

**10. Multi-Dwelling — 1,000**
The designation continues a common development pattern for medium density apartments. The scale of development is intended to reflect the allowed densities while being compatible with nearby single-dwelling residential. This designation is intended for areas near, in, and along centers and corridors where urban public services, generally including complete local street networks and access to frequent transit, are available or planned. Areas within this designation generally do not have development constraints. The maximum density is generally 43 units per acre, but may be as much as 65 units per acre in some situations. The corresponding zone is R1.

**11. High-Density Multi-Dwelling**
This designation is intended for the Central City, Gateway Regional Center, town centers, and station areas where a residential focus is desired and urban public services including access to high-capacity transit, very frequent bus service or streetcar service are available or planned. This designation is intended to allow high-density multi-dwelling structures at an urban scale. Maximum density is based on a floor-area-ratio, not on a unit-per-square-foot basis. Densities will range from 80 to 125 units per acre. The corresponding zone is RH.



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**12. Central Residential**
This designation allows the highest density and most intensely developed multi-dwelling structures. Limited commercial uses are also allowed as part of new development. The designation is intended for the Central City and Gateway Regional Center where urban public services are available or planned including access to high-capacity transit, very frequent bus service, or streetcar service. Development will generally be oriented to pedestrians. Maximum density is based on a floor area ratio, not on a units-per-square-foot basis. Densities allowed exceed 100 units per acre. The corresponding zone is RX.

**Mixed-Use and Commercial**
*Note: The Mixed Use Zoning Project may revise the mixed-use designations, and will result in new corresponding zones.*

**13. Mixed-Use — Dispersed**
This designation allows mixed use, multi-dwelling, or commercial development that are small in scale, have little impact, and provide services for the nearby residential areas. Development will be similar in scale to nearby residential development to promote compatibility with the surrounding area. This designation is intended for areas where urban public services are available or planned. Areas within this designation are generally small nodes, rather than large areas or corridors. The corresponding zones are Neighborhood Commercial 1 (CN1), Neighborhood Commercial 2 (CN2), Office Commercial 1 (CO1), Office Commercial 2 (CO2), Mixed Commercial/Residential (CM), and Storefront Commercial (CS).

**14. Mixed-Use — Neighborhood**
This designation promotes mixed-use development in neighborhood centers and along neighborhood corridors to preserve or cultivate locally serving commercial areas with a storefront character. This designation is intended for areas where urban public services, generally including complete local street networks and access to frequent transit, are available or planned, and development constraints do not exist. Areas within this designation are generally pedestrian-oriented, predominantly built-up at low- to mid-rise scale, often with buildings close to and oriented towards the sidewalk. The corresponding zones are Neighborhood Commercial 1 (CN1), Neighborhood Commercial 2 (CN2), Office Commercial 1 (CO1), Office Commercial 2 (CO2), Mixed Commercial/Residential (CM), Storefront Commercial (CS), and General Commercial (CG).

**15. Mixed Use — Civic Corridor**
This designation allows for transit-supportive densities of commercial, residential, and employment uses, including a full range of housing, retail, and service businesses with a local or regional market. This designation is intended for areas along key civic corridors where urban public services are available or planned including access to high-capacity transit, frequent bus service, or streetcar service. The Civic Corridor designation is applied along some of the City's busiest, widest, and most prominent streets. As the city grows, these corridors also need to become places that can succeed as attractive locations for more intense, mixed-use


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development. They need to become places that are attractive and safe for pedestrians while continuing to play a major role in the City's transportation system. Civic Corridors, as redevelopment occurs, are also expected to achieve a high level of environmental performance and design. The corresponding zones are Neighborhood Commercial 1 (CN1), Neighborhood Commercial 2 (CN2), Office Commercial 1 (CO1), Office Commercial 2 (CO2), Mixed Commercial/Residential (CM), Storefront Commercial (CS), General Commercial (CG), and Central Employment (EX).

**16. Mixed Use — Urban Center**

This designation is intended for areas that are close to the Central City and within Town Centers where urban public services are available or planned including access to high-capacity transit, very frequent bus service, or streetcar service. The designation allows a broad range of commercial and employment uses, public services, and a wide range of housing options. Areas within this designation are generally mixed-use and very urban in character. Development will be pedestrian-oriented with a strong emphasis on design and street level activity, and will range from low- to mid-rise in scale. The range of zones and development scale associated with this designation are intended to allow for more intense development in core areas of centers and corridors and near transit stations, while providing transitions to adjacent residential areas. The corresponding zones are Neighborhood Commercial 1 (CN1), Neighborhood Commercial 2 (CN2), Office Commercial 1 (CO1), Office Commercial 2 (CO2); Mixed Commercial/Residential (CM), Storefront Commercial (CS), General Commercial (CG), Central Employment (EX), and Central Commercial (CX).

**17. Central Commercial**

This designation is intended to provide for commercial development within Portland's Central City and Gateway Regional Center. A broad range of uses is allowed to reflect Portland's role as a commercial, cultural, and governmental center. Development is intended to be very intense with high building coverage, large buildings, and buildings placed close together along a pedestrian-oriented, safe, and attractive streetscape. The corresponding zone is Central Commercial (CX).

**18. Central Employment**

The designation allows for a full range of residential, commercial, and light-industrial uses. This designation is intended to provide for mixed-use areas within the Central City and Gateway Regional Center where urban public services are available or planned including access to high-capacity transit or streetcar service. The intensity of development will be higher than in other mixed-use land designations. The corresponding zone is Central Employment (EX).



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### Employment

**19. Mixed Employment**
This designation encourages a wide variety of office, creative services, manufacturing, distribution, traded sector, and other light-industrial employment opportunities, typically in a low-rise, flex-space development pattern. Most employment uses are allowed but limited in impact by the small lot size and adjacency to residential neighborhoods. Retail uses are allowed but are limited in intensity so as to maintain adequate employment development opportunities. Residential uses are not allowed to reserve land for employment uses, to prevent conflicts with the other uses, and to limit the proximity of residents to truck traffic and other impacts. The corresponding zones are General Employment 1 (EG1), General Employment 2 (EG2), and Neighborhood Employment (EN).

**20. Institutional Campus**
This designation is intended for large institutional campuses that are centers of employment and serve a population from a larger area than the neighborhood or neighborhoods in which the campus is located. This designation is intended for areas where urban public services are available or planned. This designation includes medical centers, colleges, schools, and universities. A variety of other uses are allowed, including residential, to support the mission of the campus. Neighborhood-serving commercial uses and other services are also encouraged. The designation is intended to foster the growth of the institution while enhancing the livability of surrounding residential neighborhoods and the viability of nearby business areas. Corresponding zones are Institutional Residential (IR), Central Employment (EX), Campus Institution 1 (CI1), and Campus Institution 2 (CI2).

### Industrial

**21. Industrial Sanctuary**
This designation is intended to reserve areas that are attractive for manufacturing and distribution operations and encourage the growth of industrial activities in the parts of the city where important freight and distribution infrastructure exists, including navigable rivers, airports, railways, and pipelines. A full range of industrial uses are permitted and encouraged. Nonindustrial uses are significantly restricted to facilitate freight mobility, retain market feasibility for industrial development, prevent land use conflicts, reduce human exposure to freight traffic and potential air quality, noise, and pedestrian safety impacts, and to preserve land for sustained industrial use. The corresponding zones are General Industrial 1 (IG1), General Industrial 2 (IG2), and Heavy Industrial (IH).



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**22. West Hayden Island Urban Services Area**
This designation is intended to provide for a combination of open space and deep water marine industrial uses in anticipation of future annexation, infrastructure extension, and rezoning. This designation implements Metro's Urban Growth Management Functional Plan. The interim zoning before annexation will be Multnomah County Multiple Use Forest (MUF). The implementing zoning after annexation will be Open Space (OS) and Heavy Industrial (IH).

**Policy 10.6** **Relationship of land use designations to base zones.** Base zones must either be the zone that corresponds to the land use designation or be a zone that is less intense. In some situations there are long-term or short-term obstacles to achieving the level of development intended by the land use designation (e.g., an infrastructure improvement to serve the higher level of development is planned but not yet funded). In these situations, a less intense zone may be applied. Base zones that are corresponding, less intense, and more intense for each land use designation are shown in Figure 10-1. When a land use designation is amended, the zone may have to be changed to correspond or be less intense than the new designation.



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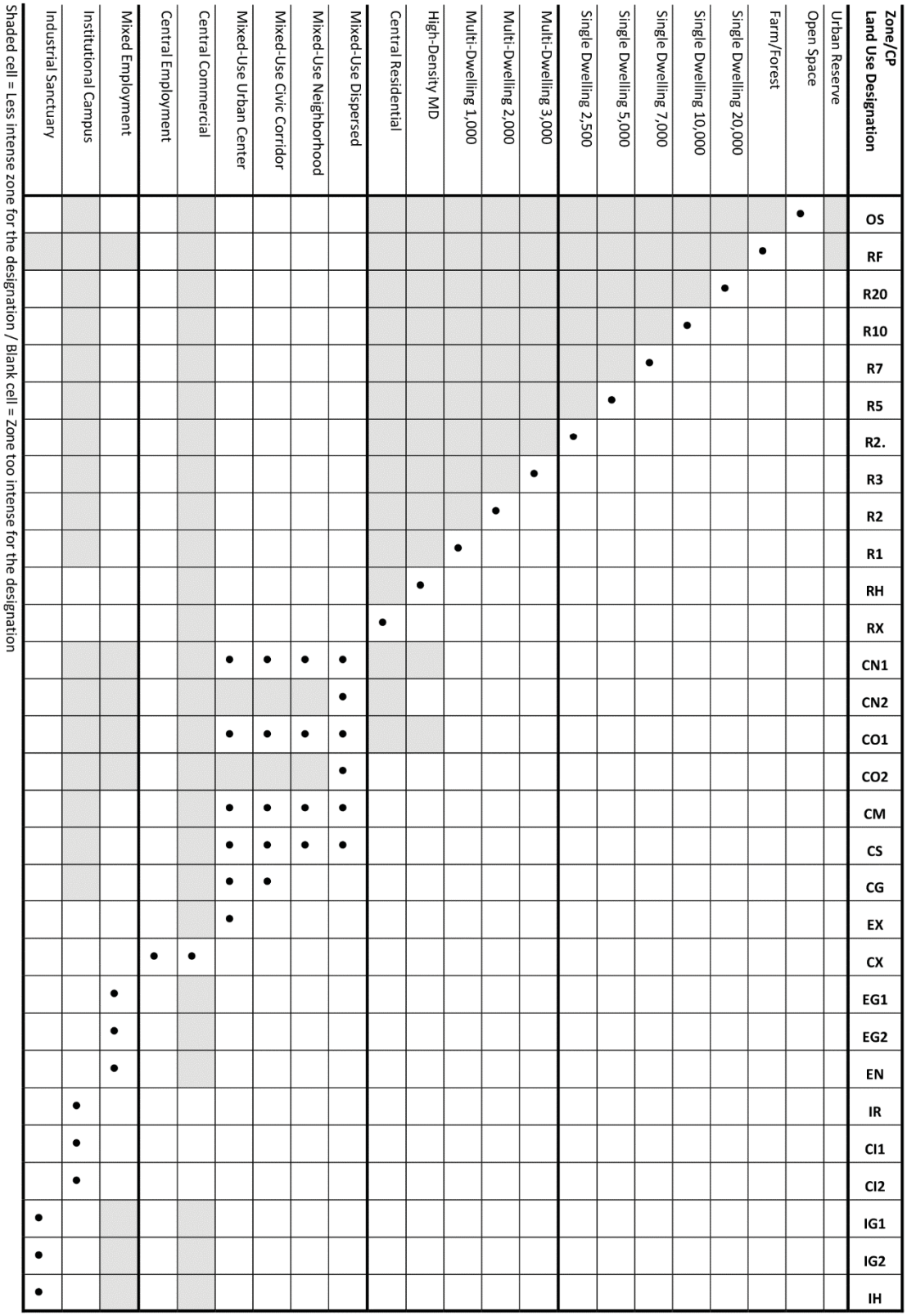
*Figure 10-1. Corresponding and Less-Intense Zones for Each Plan Map Designation*



| Zone/CP Land Use Designation | Urban Reserve | Open Space | Farm/Forest | Single Dwelling 20,000 | Single Dwelling 10,000 | Single Dwelling 7,000 | Single Dwelling 5,000 | Single Dwelling 2,500 | Multi-Dwelling 3,000 | Multi-Dwelling 2,000 | Multi-Dwelling 1,000 | High-Density MD | Central Residential | Mixed-Use Dispersed | Mixed-Use Neighborhood | Mixed-Use Civic Corridor | Mixed-Use Urban Center | Central Commercial | Central Employment | Mixed Employment | Institutional Campus | Industrial Sanctuary |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OS | | • | | | | | | | | | | | | | | | | | | | | |
| RF | | | • | | | | | | | | | | | | | | | | | | | |
| R20 | | | | • | | | | | | | | | | | | | | | | | | |
| R10 | | | | | • | | | | | | | | | | | | | | | | | |
| R7 | | | | | | • | | | | | | | | | | | | | | | | |
| R5 | | | | | | | • | | | | | | | | | | | | | | | |
| R2. | | | | | | | | • | | | | | | | | | | | | | | |
| R3 | | | | | | | | | • | | | | | | | | | | | | | |
| R2 | | | | | | | | | | • | | | | | | | | | | | | |
| R1 | | | | | | | | | | | • | | | | | | | | | | | |
| RH | | | | | | | | | | | | • | | | | | | | | | | |
| RX | | | | | | | | | | | | | • | | | | | | | | | |
| CN1 | | | | | | | | | | | | | | • | • | • | • | | | | | |
| CN2 | | | | | | | | | | | | | | • | | | | | | | | |
| CO1 | | | | | | | | | | | | | | • | • | • | • | | | | | |
| CO2 | | | | | | | | | | | | | | • | | | | | | | | |
| CM | | | | | | | | | | | | | | • | • | • | • | | | | | |
| CS | | | | | | | | | | | | | | • | • | • | • | | | | | |
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Shaded cell = Less intense zone for the designation / Blank cell = Zone too intense for the designation



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··· COMPREHENSIVE PLAN UPDATE ···

# 2035 Comprehensive Plan Proposed Draft

# List of Significant Projects

**July 2014**

**Portland's Comprehensive Plan Update**
**For more information, visit:**
**www.portlandoregon.gov/bps/pdxcompplan**

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# List of Significant Projects

The List of Significant Projects includes significant projects necessary to support the land uses designated in the Comprehensive Plan. This list is subset of projects included in the Citywide System Plan's Investment Strategy.

## Sanitary Sewer and Stormwater Management

The list of significant projects for sanitary sewer and stormwater management is based on existing system plans and includes treatment plant upgrades for capacity and regulatory compliance; pipe capacity projects by sanitary and combined sewer basins; a sanitary sewer extension program; watershed programs to improve stormwater management; and a stormwater program area to address system connectivity and water quality.

## Water

The list of significant projects for water is based on system plans and includes projects and programs to address supply, storage, transmission and distribution needs to ensure short and long-term provision of clean water and compliance with drinking water regulations.

## Transportation

The transportation list of significant projects includes multi-modal projects to address the needs of pedestrians, bicyclists, transit users, freight, and motorists. Investments in the City's transportation system are needed to maintain existing facilities and to ensure the system meets the needs of Portlanders for decades to come.



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## Sanitary and Combined Sewer

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| SS-1 | CBWTP Improvements | Program includes mid-size improvements at the Columbia Boulevard Wastewater Treatment Plant such as: seismic improvements, outfall diffuser extension, access / egress improvements, bio-solids dryer, dewatered sludge hopper, TWAS piping upgrade, centrifuge. Includes expansion to secondary treatment, if required. All are consistent with the Facilities Plan and the Conditional Use Master Plan. | Columbia Blvd Wastewater Treatment Plant | $171,808,000 |
| SS-2 | TCWTP Improvements | Improvements identified in the facilities plan. Anticipated projects include property acquisition, new headworks/screenhouse, upgrades to the primary clarifier, and construction of an additional secondary clarifier. | Tryon Creek Wastewater Treatment Plant, Lake Oswego | $55,926,000 |
| SS-3 | Pump Station Improvement Program | Program to refurbish or upgrade pump stations not in compliance with current codes, not operating reliably, need improvement due to growth in the receiving basin, and/or over 20 years old with out-of-date equipment. The Pump Station Improvement Plan guides project selection. Program will also address the 57 miles of force mains. | Citywide | $132,901,000 |
| SS-4 | Holladay/Stark/ Sullivan - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Spans NE Broadway, narrowly to 24th; N to Fremont; S to Stark. S of I-84, extends to I-205 | $34,700,000 |
| SS-5 | Beech/Essex - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Willamette River east to Grand between Knott and Alberta | $18,500,000 |
| SS-6 | Oak - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Willamette River to NE 24th, between Irving and Stark | $22,600,000 |
| SS-7 | Taggart/Insley - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Willamette River to NE 60th between Stark and the south city limit. | $60,800,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|
| SS-8 | Wheeler - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Willamette River, Grand, Prescott, 24th, Hancock. | $10,300,000 |
| SS-9 | Lloyd District - capacity upgrades | Based on Systems Plan and redevelopment activity, adds capacity by creating a separated stormwater system and/or upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Includes high priority pipe rehabilitation if located in project area. | Lloyd District | $18,500,000 |
| SS-10 | Alder - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Includes high priority pipe rehabilitation if located in project area. | Willamette River to SE 42nd bw Stark & Hawthorne; inc. Ladds Addition. | $41,000,000 |
| SS-11 | NE 13th Ave Basin - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | Vancouver, Columbia Blvd, NE 42nd, Prescott | $17,400,000 |
| SS-12 | Northwest Neighborhoods - capacity upgrades | Based on Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | NW including hills to ridgeline, excluding downtown | $41,000,000 |
| SS-13 | North Portland - capacity upgrades | Based on Systems Plan, adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work includes high priority pipe rehabilitation if located in project area. | West of Peninsular Ave. | $5,000,000 |
| SS-14 | Sanitary Sewer Collection System Capacity (Infiltration & Inflow) | Series of projects to address infiltration and inflow in the sanitary sewer system in SW Portland. Projects typically involve rehabilitation of main lines and laterals and disconnecting storm inlets from the sanitary sewer. | SW | $56,340,000 |
| n/a | Sewer Capacity Upgrades | Based on Systems Plan, adds capacity in small combined sewer system areas not addressed by specific basin projects, by upsizing pipes and/or adding surface infiltration facilities. Projects prioritized based on risk and benefit/cost. Work may include high priority pipe rehabilitation. | Various | $50,000,000 |
| n/a | Sewer Extensions | Sewer extensions to relieve septic systems at risk of failure, correct party sewer situations, and provide service where development will be occurring soon and service is not available. | Various | 83,462,000 |



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## Stormwater Management

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|
| SM-1 | Johnson Creek Willing Seller Ph. 2 | Based on the Johnson Creek Restoration Plan, acquisition of land in four target areas for floodplain restoration. Properties are purchased at fair market value and used to implement restoration projects detailed in other capital projects on list. | Johnson Creek Target Areas | 10,000,000 |
| SM-2 | West Lents Flood Mitigation | Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the West Lents target area for flood storage and water quality, stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations. | West Lents target area | 6,417,000 |
| SM-3 | East Lents Area Flood projects | Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the East Lents target area for flood storage and water quality, stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations. | East Lents target area | 8,240,000 |
| SM-4 | Other Johnson Creek Target Area Floodplain Projects | Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the Tideman Johnson and Powell Butte target areas, and smaller floodplain restoration in partnership with creek-side property owners in other targeted areas, for flood storage and water quality, stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations. | Tideman and Powell Butte Target areas plus CRP | 5,045,000 |
| SM-5 | Johnson Creek Restoration Program Projects | Priority projects along the main stem and tributaries of Johnson Creek to mitigate flooding, improve water quality and wildlife habitat, address stormwater outfalls and culverts, and sanitary sewer protection. Includes restoration of floodplain and wetlands, construction of stream enhancements, and partnership projects with other agencies to meet the objectives of the 2001 Johnson Creek Restoration Plan. Projects address TMDL requirements, ESA plans and other regulations. | Johnson Creek Watershed, various | 9,025,000 |



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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|
| SM-6 | Columbia Slough Outfalls | Design and construction of pollution control facilities for separated stormwater areas flowing through 220-city owned outfalls to the Columbia Slough to address DEQ Sediment Order. Program prioritizes outfalls draining Columbia Boulevard and other high traffic City roadways. | Columbia Boulevard area | 14,250,000 |
| SM-7 | Columbia Slough Restoration Projects | Culvert replacement, water quality facilities and wetland and habitat restoration and enhancement to improve water quality, habitat and hydrology. Projects address TMDL requirements, infrastructure deficiencies, ESA plans and other regulations and may include partnership with other agencies. Includes in-stream restoration as well as stormwater system improvements. | Columbia Slough Watershed, various | 11,121,000 |
| SM-8 | Fanno Creek Stormwater System Improvements | Projects to address TMDLs, recommended by the Fanno/Tryon TMDL predesign. 1-5 year projects include stormwater retrofits along the Beaverton-Hillsdale Highway, addressing deficient stormwater outfalls, and other stormwater system improvements. | Fanno Watershed: Beaverton-Hillsdale corridor and various | 2,700,000 |
| SM-9 | Tryon Creek Stormwater System Improvements | Projects to address TMDLs, recommended by the Fanno/Tryon TMDL predesign. 1-5 year projects include stormwater retrofits along the I-5 and Barbur Blvd. corridors, addressing deficient stormwater outfalls, and other stormwater system improvements. | Tryon Watershed: I-5/Barbur area, and various | 2,675,000 |
| SM-10 | Fanno/Tryon Drainage Shoulder Improvements | Drainage improvements for high priority City maintained roadside ditches along arterial streets in the Fanno and Tryon watersheds. Projects address water quality, as recommended by the Fanno/Tryon TMDL predesign. Includes SW Hamilton and SW Stephenson and future projects. | Fanno and Tryon Creeks watersheds (various) | 5,401,000 |
| SM-11 | Fanno/Tryon Restoration Projects | In-stream restoration and improvements to address water quality, hydrology and habitat, including TMDL requirements, ESA plans and other regulations. Includes culvert replacement, stream daylighting, sanitary sewer protection and other restoration in both the Fanno and Tryon creek watersheds. Projects recommended by the Fanno/Tryon TMDL predesign and watershed plans. | Fanno and Tryon Creeks watersheds, various | 7,557,000 |
| SM-12 | Willamette River Restoration Projects | Projects to improve water quality, habitat and hydrology along the main stem river and tributaries (subwatersheds) to address TMDL requirements, ESA plans and other regulations. Includes in-stream and floodplain restoration and enhancement. | Willamette River Watershed | 17,600,000 |



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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|
| SM-13 | Stephens Creek Stormwater System Improvements | Address stormwater issues in the Stephens Creek subwatershed, including unmanaged stormwater discharge, pollution reduction and detention facilities, restoration of riparian and wetland functions, erosion and sediment loading at outfalls. | Stephens Creek Subwatershed | 14,323,000 |
| n/a | Stormwater Management Program Implementation | Improvements to the stormwater management system beginning with the Stephens Creek subwatershed. Other areas of particular concern include elsewhere in SW, outer east, and the Columbia Slough. Specific improvements have not been identified. | Various | 56,300,000 |
| n/a | Culvert Replacement Program | Replace or improve stream culverts citywide to improve fish passage and water quality, and address flooding and maintenance needs. Includes completion of culvert replacements on Crystal Springs Creek and other priority projects to address ESA plans and other system needs. | Various/ Citywide | 14,302,000 |
| n/a | Watershed Land Acquisition Ph. 1 & 2 | Program targets acquisition of medium to high functioning natural resource lands in support of watershed health and stormwater management. | Various/ Citywide | 16,000,000 |



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## Water

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| n/a | Dodge Park | Improvements will continue to address security and visitor amenities at the site, trespass/hazard warning signs, alternative park management arrangements, and visitor management. The bureau is committed to improving the maintenance of the park including preservation of existing infrastructure, repairs, replacements and upgrades. New uses for the park include an amphitheater, camping, training area, facility upgrade to the existing building, and special needs assistance for using the park amenities. | Dodge Park | 1,200,000 |
| W-1 | Emergency Coordination Center | This project designs and constructs the City's Emergency Coordination Center. The bureau will locate its emergency response and security staff at the location. The project location is adjacent to the City's 911 Call Center at SE 99th Ave and Powell Blvd. The total project cost is $19.85M and PWB is a contributing bureau. | Emergency Coordination Center (SE 99th and Powell) | 1,807,000 |
| W-2 | Bertha Service Area Improvements | This project will connect the Bertha 962 pressure zone with the 937 pressure zone with new 8-inch and 4-inch main and a new regulator. This work will allow for the abandonment of the existing main that passes through steep, unimproved right-of-way while maintaining an adequate level of service to the Bertha Service Area. | Bertha Service Area | 856,000 |
| W-3 | Burnside Pump Station Replacement | This project will decommission the old undersized pump station and modify the nearby Verde Vista pump station to serve the Burnside pumping needs for the next 50 years. The project will also acquire property for the future Burnside pump station to be built 50 years from now. | Burnside Pump Station | 2,000,000 |
| W-4 | Carolina Pump Main Extension, Phase II | This project will connect the existing Carolina Pump Main (Westwood Tanks) and the Fulton Pump Main (Burlingame Tanks) together. This will be a pump main from the intersection of SW Capitol Hwy and SW Terwilliger Blvd to the Burlingame Tank site. | SW Capitol Hwy – SW Terwilliger | 3,184,000 |



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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| n/a | Distribution Mains | This program includes rehabilitation and replacement of substandard mains, expansion due to applications from private developers, increasing supply for fire protection, improving water quality and water system upgrades due to local improvement districts (LIDs), and street improvements. Main replacements also include appurtenances (e.g. fire hydrants, valves, pressure regulators, service branches, and other facilities). | Various/Citywide | 300,738,000 |
| W-5 | Division Street Piping | This project will design and construct improvements located in the ROW for the Tabor Reservoir Adjustments project. Improvements will be made to the distribution and transmission systems as well as to Conduits 2 and 3 in SE Division St. | SE Division St | 1,680,000 |
| W-6 | Forest Park Low Tank | This project will plan, design and construct a single 1.3 million gallon AWWA D110 type 1 tank. This storage is to augment regular system capacity and increase fire flow. | Forest Park Low Tank | 2,210,000 |
| n/a | Fountains | The bureau has responsibility for 27 decorative fountains, including repairs, replacements and upgrades. Funding includes provisions for repair of drain lines and valves, replacement of liners, repair and replacement of electrical equipment and lighting systems, repair and replacement of pumps, addition of telemetry, and various improvements to exterior surfaces. | Various/Citywide | 3,000,000 |
| W-7 | Fulton Pump Station | This project will replace the Fulton Pump Station with a new pump station located in Willamette Park. | Fulton Pump Station | 9,060,000 |
| W-8 | Greenleaf Pump Station | This project will plan, design and construct a replacement Greenleaf pump station at the existing site. Flow upgrades will remove the Penridge tank from the system. The new pump station will pump directly to the distribution system. | Greenleaf Pump Station | 3,500,000 |
| n/a | Hydrants | This project provides for the replacement of fire hydrants that are no longer repairable. Replacements may also occur as part of the bureau's ongoing efforts to standardize hydrant types for more efficient and effective management of maintenance and repair activities. | Various/Citywide | 23,900,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| W-9 | Interstate Facility Renovation | This project consists of comprehensive reconstruction and improvements to the bureau's System Control Center and Operations and Maintenance Facility, located on North Interstate Avenue, to address seismic and other site vulnerabilities and bring the facility up to current safety and building codes. | Interstate Facility (NE Interstate) | 35,323,812 |
| W-10 | Portland-Milwaukie Light Rail Project | This project consists of planning, design and construction for relocation of over 5,000 feet of main required for the Portland-Milwaukie Light Rail project. PWB Construction crews and Construction Management Team will assist during the construction phase of the project. | PMLR alignment, SW/SE | 1,100,000 |
| n/a | Meters | This project funds the purchase and installation of water meters. The Bureau objective is to maintain meter accuracy to within 3% of actual values. | Various/Citywide | 35,690,000 |
| n/a | Pump Stations and Tanks | This program maintains a large variety of infrastructure consisting of water storage tanks, pumps, and pump and control facilities. The bureau uses a reliability centered maintenance (RCM) analysis to prioritize projects in these areas. A key focus of the next five years will be to replace the remote telemetry units at over 140 remote sites. The existing units are over 15 years old, and are becoming obsolete. The servers are at the end of their service cycle, and must also be replaced. | Various/Citywide | 20,003,000 |
| W-11 | Rose City Sewer Rehabilitation | The project will install new 1207 feet of 8 inch DI, 2 hydrants and 39 services 2 inches or smaller. | Rose City area | 2,000 |
| W-12 | Raymond Tank Supply Improvements | This project will design and construct improvements at Raymond Tank Site and at an intersection of SE Holgate Boulevard and SE 136th. | Raymond Tank, vicinity | 535,000 |
| W-13 | Sam Jackson Pump Station | This project will add multiple capital improvements including seismic improvements, replacement of RTU and motor controllers, installation of pump control and check valves, extension of the crane rail, a concrete pad, and installation of a security fence and gate. | Sam Jackson Pump Station | 1,400,000 |
| n/a | Services | This project constructs replacement and customer requested water services. A water service is the connection between the water main and any given customer's service meter. Service connections are always performed by Water Bureau crews directed by a certified Water Service Mechanic. An ongoing budget of approximately $4 million per fiscal year provides for installation of about 1,000 water service connections annually and other upgrades to existing water services. | Various/Citywide | 80,000,000 |



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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| W-14 | Willamette River Pipe Crossings | The project replaces major pipelines to strengthen the transmission link between Powell Butte and the service areas west of the Willamette River, including downtown and the storage reservoirs at Washington Park. It includes construction of a new seismically strengthened river crossing to replace the first one of potentially two Willamette River crossings, and new transmission piping on both sides of the river. | Various, Powell Butte – Washington Park | 111,600,000 |
| n/a | Water Quality and Regulatory Compliance | The bureau recognizes the Bull Run watershed as a diverse ecosystem. The bureau is committed to preserving this habitat and complying with federal regulations using practical, locally driven solutions. Many of the projects in this subprogram respond to the Endangered Species Act (ESA), including the implementation of the Bull Run Habitat Conservation Plan (HCP) as adopted by City Council and approved by the National Marine Fisheries Service. Consistent with HCP commitments, this program funds easements, purchases land, and also supports projects jointly conducted with other watershed partners. | Bull Run | 48,596,000 |
| n/a | Bull Run Watershed | The bureau is committed to updating the Bull Run watershed protection and maintenance procedures and agreements based on the 2007 Bull Run Agreement with the Mt. Hood National Forest. The function of this program is to allocate funds for the capital projects necessary to maintain, improve, and protect the watershed facilities that are not directly related to the water supply system facilities. This includes Bull Run Watershed road reconstruction to ensure continuous, reliable, and safe access to all facilities, as well as maintenance of other city-owned infrastructure within the watershed. | Bull Run | 38,410,000 |



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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| n/a | Dams and Headworks Repair and Rehabilitation | This program provides for assessment of the condition and rehabilitation of dams and other facilities at Headworks. As many of these facilities are between 50 and 70 years old, their safe and reliable operation requires ongoing investment. The program includes preliminary engineering and design of needed repairs, rehabilitation of these facilities, and actual repair work. | Bull Run | 3,000,000 |
| W-15 | Groundwater Improvements | The Columbia South Shore Wellfield (CSSW) is Portland's alternative supply of water should the Bull Run watershed supply be interrupted for any reason. Projects improve the maintenance of this aging infrastructure, including repairs, selective replacements and upgrades. | CSSW | 9,700,000 |
| W-16 | Groundwater Collection Main Hardening | Much of the piping connecting the wells to the Groundwater Pump Station is located in liquefiable soils which are vulnerable during a seismic event. This project would design and install measures to "harden" the piping and reduce this vulnerability. | CSSW | 20,000,000 |
| W-17 | Groundwater Electrical Supply Improvements | This project designs and constructs a new 115kV/4160V transformer and other components to complete a double-ended electrical substation at the Groundwater Pump Station. It will also design and construct a 5kV main breaker replacement and purchase selected spare components. | CSSW | 2,071,000 |
| W-18 | Groundwater Pump Station Expansion | As water demand increases, the bureau will need to increase the available flows from the groundwater system. The system expansion will include upgrade of the Groundwater Pump Station to provide additional capacity. | CSSW | 10,000,000 |
| W-19 | Groundwater Wellfield Expansion | As water demand increases, the bureau will need to increase the available flows from the groundwater system. The system expansion will include additional well development and collection mains in the Columbia South Shore area. | CSSW | 12,000,000 |
| W-20 | Groundwater Wellfield Reliability Enhancements | The bureau is attempting to increase flexibility and preparedness to meet the challenge of an interruption of Bull Run water. It is evaluating electrical vulnerability for the pumping system, reviewing flood inundation vulnerability, and development of a Groundwater Intertie to reduce transmission system vulnerability. Inundation review may be partially completed in partnership with Multnomah County Drainage District. | CSSW | 3,000,000 |



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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| W-21 | Powell Valley Well Improvements | The project includes upgrade of the facilities in the previous Powell Valley Road Water District area and connection and integration of these facilities to the PWB water system. | Powell Valley wellfield | 3,000,000 |
| n/a | Road 1008 | This project will design and construct an overlay for the Bull Run 1008 road. | Bull Run | 710,000 |
| n/a | Road 10 MP 0.6-1.8 | Design and construct walls, widening, culverts and repave this portion of the Bull Run 10 road. | Bull Run | 900,000 |
| n/a | Building Maintenance | The bureau maintains hundreds of structures from the Bull Run watershed to Downtown Portland. These structures range in size from small pump houses to the maintenance hub on Interstate Avenue. The necessary work involves structural repairs and maintenance. | Various/Citywide | 3,000,000 |
| n/a | Sandy River Station Upgrade | This project consists of upgrades to the Sandy River Station facilities including an evaluation of a potential move to a different site. | Sandy River station | 5,000,000 |
| n/a | West Side Maintenance Facility | A hub is needed on the west side of the Willamette River for maintenance and construction crews, vehicles, equipment and materials, and emergency operations. This project includes construction of the facility within the next 20 years. | West of Willamette River, tbd | 5,000,000 |
| n/a | Conduit 5 | This project would include installation of sections of a new Conduit 5 as growth occurs and the condition of the existing conduits worsens. | Conduit 5, east of city limits | 75,000,000 |
| n/a | Conduits and Transmission Mains | The conduits that bring water to Portland from the Bull Run watershed are pipes 56 to 72 inches in diameter. This program funds repairs, replacements and upgrades to these key pipelines. Reliable service to the City and the City's wholesale customers is the key reason for the bureau's commitment to improve maintenance of this aging infrastructure. | Various/Citywide | 63,525,000 |
| W-22 | Kelly Butte Reservoir | The purpose of this project is to increase storage capacity from 10MG to 25MG by replacing the existing tank with a buried reservoir. This includes site access, construction access and easements, staging areas, and on-site storage areas. This project establishes Kelly Butte as the key facility that will be used for system pressure equalization and in-town terminal storage in lieu of the Mt. Tabor open reservoirs. | Kelly Butte | 66,970,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| n/a | New Conduit Intertie | This project would address concerns about the capability of the conduit system to withstand hazards and deliver an uninterruptible supply to the City. The project will improve reliability of flow during emergency conditions and for maintenance by providing additional isolation and interconnectivity. | Conduit, east of city limits | 10,000,000 |
| W-23 | Powell Butte Reservoir 2 | This LT2 project is being constructed in 2 phases – Phase 1 is complete. The project is currently in Phase 2, the construction of a 50 million gallon buried reservoir at Powell Butte. It includes a short section of Conduit 5, construction of a maintenance and storage facility, replacing the caretaker's house, construction of an interpretive center and restrooms, reservoir overflow, park improvements and mitigation requirements as part of the conditions for approval in the 2003 LUR Type III CUMP. | Powell Butte | 35,220,000 |
| W-24 | Powell Butte Reservoir 3 | This project constructs a third reservoir at Powell Butte and possible bypass piping around the Butte. | Powell Butte | 100,000,000 |
| n/a | Sandy River Conduit Relocation, Phase II | The bureau is committed to increasing the flexibility and preparedness to meet the future challenge of a natural disaster. This project will relocate the Sandy River crossings of Conduit 3. The crossings of Conduit 2 and 4 have already been completed. These conduits were identified in the system vulnerability study as vulnerable to seismic, volcanic, flooding, and other natural and manmade hazards. | Sandy River crossing | 5,000,000 |
| W-25 | Tabor Reservoir Adjustments | This project includes adjustments to piping, structures and other features at Mt. Tabor in order to move storage elsewhere and physically disconnect the open reservoirs from the public water system for compliance with LT2. Project does not include disposition of the reservoirs after they have been disconnected from the public water system. | Mt. Tabor | 3,355,000 |
| W-26 | Washington Park Reservoir 3 | The project will plan, design and construct a new buried reservoir to replace open reservoir No. 3. This project is one solution toward compliance with LT2 replacement of the open reservoirs. It is assumed that Reservoir # 4 will be used as the overflow detention structure. We envision that the buried reservoir would be topped with a reflecting pond and historical features would be protected to retain its visual appeal. | Washington Park | 52,100,000 |



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| Map ID | Project Title | Project Description | Location | Rough Cost Estimate (2014-2032) |
|---|---|---|---|---|
| W-27 | West Side Transmission Main Improvements | These mains include the Sam Jackson to Downtown Pipeline and the Jefferson Street Supply mains. These large transmission mains are needed to strengthen the supply to terminal storage located on the west side of the Willamette River. | Various, SW Portland | 20,000,000 |
| n/a | Treatment Facilities Improvements | Treatment of Portland's drinking water is the most complex activity the bureau engages in while operating the water system. This project would include several related projects for the Bull Run water supply, at Bull Run Headworks and the Lusted Hill Facility. Projects would likely be driven by State and Federal regulations | Bull Run | 150,000,000 |



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## Transportation

| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 10001 | Portland | Banfield LRT Stations, NE/SE: Pedestrian Improvements | Retrofit existing streets along eastside MAX and at intersecting streets to include better sidewalks and crossings, curb extensions, bus shelters, and benches at 82nd, 148th, and 162nd stations. | Banfield LRT Stations, NE/SE | $3,156,750 |
| 20002 | Portland | 14th/16th, NW/SW & 13th/14th, SE, (Glisan - Clay): ITS | Six signals between Clay and Glisan including communications infrastructure; closed circuit TV cameras, variable message signs for remote monitoring and control of traffic flow. | 14th/16th, NW/SW & 13th/14th, SE, (Glisan - Clay) | $505,080 |
| 20005 | Portland | 10th, NW (Overton - Naito Parkway): Pedestrian Bridge | Construct pedestrian bridge along 10th alignment to connect over railroad tracks. | 10th, NW (Overton - Naito Parkway) | $2,500,000 |
| 20006 | Portland | Bancroft St., SW (River Parkway - Macadam): Street Improvements | Widen SW Bancroft in conformance with district street standards. | Bancroft St., SW (River Parkway - Macadam) | $1,403,000 |
| 20007 | Portland | South Portal Phase I & II, SW: Intersection Improvements | Improve the intersection of Bancroft, Hood, and Macadam to address safety and capacity issues. | South Portal, SW | $41,478,000 |
| 20009 | Portland | Bond Ave, SW (River Parkway - Bancroft): Street Improvements | Extend SW Bond one-way northbound from Gibbs to River Parkway and convert Moody to one-way southbound operation to form a couplet. | Bond Ave, SW (River Parkway - Bancroft) | $ 18,834,515 |
| 20010 | Mult. Co | Broadway NE/NW: Bridge Improvements | Broadway Bridge improvements include painting, phase 1 seismic retrofit, sidewalk replacements, and resurface of bridge deck/approaches. | Broadway NE/NW | $ 42,668,000 |
| 20011 | Mult. Co | Burnside Bridge, W/E: Bridge Improvements | Improvements include deck rehabilitation, mechanical improvements, painting, and phase 1 seismic retrofit. | Burnside Bridge, W/E | $ 42,668,000 |
| 20012 | Mult. Co | Burnside Bridge, SE/SW: Pedestrian and Bike Access | Improve bicycle and pedestrian access from the Burnside Bridge to Waterfront Park and Eastbank Esplanade. | Burnside Bridge, SE/SW | $ 2,140,000 |
| 20014 | Portland | Burnside, W (NW 15th to NW 23rd): Boulevard Improvements | Boulevard design improvements including pavement reconstruction, wider sidewalks, curb extensions, safer crossings, traffic signals at 20th Pl and 22nd, and traffic management to limit motorist delays. | Burnside, W (NW 15th to NW 23rd) | $ 18,000,000 |
| 20017 | Portland | Clay/2nd, SW: Pedestrian/Vehicle Signal | New signal installation. | Clay/2nd, SW | $ 250,000 |
| 20018 | Portland ODOT | Clay/MLK Jr, SE: Intersection Improvements | Geometric, signalization and channelization improvements to allow transit and general traffic access to westbound Clay street from southbound MLK. | Clay/MLK Jr, SE | $1,296,372 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 20020 | Portland | 9th & Park, SW (Burnside - Salmon): Midtown Blocks Streetscape Improvements | Completion of design guidelines and preliminary capital improvements for Midtown Park Blocks. | 9th & Park, SW (Burnside - Salmon) | $141,543 |
| 20022 | Portland | DivisionSt/9th, SE (7th - Center): Bikeway | Design and implement a neighborhood greenway. | DivisionSt/9th, SE (7th - Center) | $27,548 |
| 20027 | Portland | I-405/US 26/Ross Island Bridge, SW: Access Improvements | Construct new freeway access from Ross Island Bridge to I-405 and US 26 to improve connections between regional facilities and separate traffic from neighborhood streets. | I-405/US 26/Ross Island Bridge, SW | $50,000,000 |
| 20030 | Portland | 18th/Jefferson St, SW: ITS | Communications infrastructure including closed circuit TV cameras, variable message signs for remote monitoring and control of traffic flow at SW 18th/Jefferson intersection. | 18th/Jefferson St, SW | $112,240 |
| 20035 | Portland | Grand/MLK Jr, SE/NE: CEID/Lloyd District Streetscape Improvements | Complete boulevard design improvements including street trees, tree grates, ornamental lighting, and curb extensions. | Grand/MLK Jr, SE/NE | $4,861,395 |
| 20039 | Portland ODOT | South Waterfront District, SW: Bicycle and Pedestrian Improvements | Implement pedestrian and bicycle district access improvements identified in the North Macadam Transportation Development Strategy. | South Waterfront District, SW | $3,250,050 |
| 20040 | Portland | Arthur, Gibbs & Lowell, SW (River Parkway - Moody): Street Improvements | Arthur, Gibbs, and Lowell are the primary connectors between Moody-Bond and River Parkway and will be constructed in phases as development occurs in North Macadam District. | Arthur, Gibbs & Lowell, SW (River Parkway - Moody) | $5,261,250 |
| 20042 | Portland | South Waterfront Transit Improvements, SW | Implement transit improvements identified in the North Macadam Transportation Development Strategy, including central city transit hub and local bus service improvements. | South Waterfront, SW | $2,806,000 |
| 20043 | Portland | Old Town/China Town District, NW: Streetscape Improvements | Design and construction public improvements in Old Town/Chinatown to enhance cultural identity, following Chinatown Development Plan. Includes sidewalks, street trees, and redevelopment assistance to private properties. | Old Town/China Town District, NW | $6,247,646 |
| 20049 | Portland | Corbett/Hood/Sheridan, SW: Pedestrian and Bike Improvements | Construct bike and pedestrian improvements under I-5 to the Corbett-Terwilliger-Lair Hill neighborhood at SW Sheridan St. | Corbett/Hood/ Sheridan, SW | $210,450 |
| 20050 | Portland | Southern Triangle Circulation Improvements, SE | Improve local street network and regional access routes in the area between the Powell/12th, Willamette River, railroad mainline and Hawthorne Bridge. Improve freeway access route from CEID to I-5 SB via the Ross Island Bridge. | Southern Triangle, SE | $4,051,163 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 20057 | Portland | Willamette Greenway, SW: Trail Extension | Provide two paths in order to separate bicyclists from pedestrians in remaining gaps (Marquam Bridge to SW Gibbs, SW Lowell to SW Lane, Benz Springs) of South Waterfront's Willamette Greenway trail. | Willamette Greenway, SW | $2,650,000 |
| 20064 | Portland | 14/16th Connections, NW | Improve or create connections to W. Burnside, Yeon, and Vaughn and provide directional signage to route non-local traffic to 14th/16th couplet. | 14/16th Connections, NW | $280,600 |
| 20065 | Portland | Interstate, N, Bridge at Larrabee: Seismic Retrofit | Replacement of the existing N. Interstate to Larrabee flyover ramp with a new structure. | Interstate, N, Bridge at Larrabee | $20,592,147 |
| 20068 | Portland | 12th, NE (Bridge at Lloyd Blvd): Seismic Retrofit | Seismic retrofit. | 12th, NE (Bridge at Lloyd Blvd) | $1,540,000 |
| 20069 | Portland | Marshall, NW (9th - Naito Parkway): Pedestrian Bridge | Construct pedestrian bridge along Marshall alignment to connect over railroad tracks. | Marshall, NW (9th - Naito Parkway) | $3,000,000 |
| 20070 | Portland | Naito Parkway (Broadway Br - north of Terminal One): Street and Pedestrian Improvements | Construct streetscape improvements include pedestrian amenities. | Naito Parkway (Broadway Br - north of Terminal One) | $4,559,750 |
| 20075 | Portland | Water Ave, SE (Stark - Clay): Reconstruction | Reconstruct street, improve streetscape design, and provide pedestrian and bicycle enhancements. | Water Ave, SE (Stark - Clay) | $900,000 |
| 20077 | Portland | 7th/I-84 & 9th/I-84, NE: Pedestrian and Bike Bridges | Construct a pedestrian/bicycle bridge across Interstate 84 connecting NE 7th Ave in the Lloyd District to NE 7th or 8th Ave in the Central Eastside Industrial District. | 7th/I-84 & 9th/I-84, NE | $8,300,000 |
| 20078 | Portland | 7th & 9th, NE (Broadway - Lloyd Blvd): Pedestrian Improvements | Construct an enhanced pedestrian street. | 7th & 9th, NE (Broadway - Lloyd Blvd) | $5,500,000 |
| 20079 | Portland | Lloyd Blvd, NE (Grand - 12th): Pedestrian Improvements | Widen and enhance the pedestrian walk along the south edge of Lloyd Blvd. | Lloyd Blvd, NE (Grand - 12th) | $800,000 |
| 20081 | Portland | 6th Ave, SW (Sheridan - Broadway): Roadway Improvements | Widen or reconfigure street to improve traffic operations and safety. | 6th Ave, SW (Sheridan - Broadway) | $679,000 |
| 20089 | Portland | Burnside/Couch, W/NW (Burnside Bridge - NW 15th): Couplet and Street Improvements, Phase I | Implements a one-couplet design including new traffic signals, widened sidewalks, curb extensions, bike lanes, on-street parking and street trees. This project will be coordinated with ODOT to address potential impacts to the I-405 interchanges, overcrossings and ramps. | Burnside/Couch, W/NW (Burnside Bridge - NW 15th) | $75,895,353 |
| 20092 | UPRR | Steel Bridge, N/NE: Rehabilitation | Major bridge maintenance | Steel Bridge, N/NE | $30,000,000 |
| 20095 | UPRR | Graham Line Siding, N: Graham rail line | Add controlled siding on the UP Graham line | Graham Line, N | $12,000,000 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 20097 | Portland | Flanders, NW (Steel Bridge to Westover): Bicycle Facility | Design and implement a neighborhood greenway from NW 24th Ave to the Steel Bridge, including a new bicycle/pedestrian bridge over I-405 on Flanders and connections to bikeways on Vista, 18th, 14th, 13th, Broadway, 3rd, 2nd, Glisan and Everett. This project will be coordinated with ODOT to address potential impacts to the I-405 interchanges, overcrossings and ramps. | Flanders, NW (Steel Bridge to Westover) | $ 5,392,337 |
| 30001 | Portland | Ainsworth Bridge, N (at I-5):Bridge Improvements | Improvements to bridge to create a safe and pleasant crossing for pedestrians and bicyclists over I-5. | Ainsworth Bridge, N (at I-5) | $1,500,000 |
| 30004 | Portland | Columbia Blvd, N (Swift - Portland Rd & Argyle Way - Albina): Pedestrian Improvements, Phase I & II | Construct sidewalk and crossing improvements. | Columbia Blvd, N (Swift - Portland Rd & Argyle Way - Albina) | $4,213,209 |
| 30005 | Portland | Columbia Blvd, N (Bridge at Taft): Seismic Retrofit | Seismic retrofit of bridge. | Columbia Blvd, N (Bridge at Taft) | $583,367 |
| 30008 | Portland | Columbia Blvd, N/NE(I-205 - Burgard): ITS | Communications infrastructure including closed circuit TV cameras, truck priority detection, variable message signs for remote monitoring and control of traffic flow for six signals. | Columbia Blvd, N/NE(I-205 - Burgard) | $589,260 |
| 30010 | ODOT | Denver Viaduct and Connections (Argyle-Victoria), N: Roadway Improvements | Construct shared-use path; rehabilitate, resurface and restripe Denver Ave for buffered bike lanes; connect shared-use path to Columbia Slough levee trail. | Denver Viaduct and Connections (Argyle-Victoria), N | $10,000,000 |
| 30011 | Portland | Force/Broadacre/Victory, N: Bikeway | Signed bikeway connection to I-5 river crossing. | Force/Broadacre/Victory, N | $28,060 |
| 30012 | Portland | Going St, N (Interstate - Basin): Bikeway | Design and implement a multi-use path. | Going St, N (Interstate - Basin) | $768,000 |
| 30014 | Portland | Failing St & Ped Bridge, N (Interstate - Mississippi): Street Improvements | Street improvements to provide a safe and pleasant connection between the MAX station and the Mississippi Target Area. | Failing St & Ped Bridge, N (Interstate - Mississippi) | $800,000 |
| 30015 | Portland | Going, N (Interstate - Greeley): ITS | Install needed ITS infrastructure (communication network, new traffic controllers, CCTV cameras, and vehicle /pedestrian detectors). These ITS devices allow us to provide more efficient and safe operation of our traffic signal system. | Going, N (Interstate - Greeley) | $550,000 |
| 30016 | Portland | Going/Greeley, N: Climbing Lane and Interchange Improvements | Redesign Going/Greeley interchange including climbing lane on Going to improve truck movement between Swan Island, Lower Albina, and I-5. | Going/Greeley, N | $16,750,000 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 30018 | Portland | West Hayden Island, N: Street Network Improvements | Implement street plan for Hayden Island to improve circulation and access for all modes. | West Hayden Island, N | $4,000,000 |
| 30019 | Port | Hayden Island/Rivergate, N: Rail Access | Rail access bridge from Rivergate to West Hayden Island development. | Hayden Island/ Rivergate, N | $3,000,000 |
| 30026 | Metro | Kelly Point Park Access Trail/40-Mile Loop Trail, N | Construct multi-use trail for bicycle and pedestrian along the north bank of the Columbia Slough. | Kelly Point Park/40-Mile Loop, N | $115,000 |
| 30028 | Portland | Killingsworth, N (Interstate - MLK Jr Blvd): Street Improvements | Construct street improvements to improve pedestrian connections to Interstate MAX LRT and to establish a main street character promoting pedestrian-oriented activities | Killingsworth, N (Interstate - MLK Jr Blvd) | $4,900,000 |
| 30030 | Portland | Killingsworth, N ( Denver to Greeley): Pedestrian Improvements | Design and implement streetscape and transportation improvements. | Killingsworth, N ( Denver to Greeley) | $1,851,960 |
| 30034 | Portland | Lombard, N/NE (St Johns Bridge - MLK Jr): Bikeway | Design and implement bicycle facilities. | Lombard, N/NE (St Johns Bridge - MLK) | $100,000 |
| 30035 | Portland | Lombard, N/NE (MLK Jr - Philadelphia): ITS | Communications infrastructure including closed circuit TV camera, Bluetooth detection, improved bus priority variable message signs for remote monitoring and control of traffic flow at the intersections with MLK Jr, Interstate, Greeley, Portsmouth, Philadelphia/Ivanhoe. | Lombard, N/NE (MLK Jr - Philadelphia) | $673,440 |
| 30037 | Portland | Lombard, N (I-5 - Denver): Street Improvements | Establish a landscaped boulevard to promote pedestrian-oriented uses and to create a safe, pleasant pedestrian link over I-5, including a signal or other intersection improvement at Montana & Lombard and an improved pedestrian crossing of the Interstate 5 on-ramp.The project will be coordinated with ODOT to address potential impacts to Lombard and the I-5 interchange. | Lombard, N (I-5 - Denver) | $1,703,242 |
| 30038 | Portland | Marine Dr, N/NE (Portland Rd to 185th): ITS | CCTV at N Portland Rd. Changeable message signs at Portland Rd, Vancouver and 185th | Marine Dr, N/NE (Portland Rd to 185th) | $238,510 |
| 30039 | Port | Marine Dr, N (at Rivergate West): Rail Crossing, Phase II | Reroute rail tracks and construct an above-grade rail crossing at Rivergate West entrance to improve safety and reduce vehicle and rail traffic conflicts. | Marine Dr, N (at Rivergate West) | $13,644,200 |
| 30043 | Portland | Prescott Station Area Street Improvements, N | Construct improvements to Prescott & Skidmore (Interstate-Maryland) & Maryland (Interstate-Prescott) to provide neighborhood focal point at LRT | Prescott Station Area, N | $4,770,200 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 30050 | Portland | St. Johns Pedestrian District, N | Enhance pedestrian access to transit, improve safety, and enhance the streetscape such as better lighting and crossings. Improvements including realigning the "ivy" island, curb extensions, a new traffic signal at Richmond/Lombard, and pedestrian connections between St. Johns and the riverfront based on the St Johns/Lombard Plan. | St. Johns, N | $5,000,000 |
| 30054 | Port | Barnes Rail Yard - Bonneville Rail Yard, N: Track Expansion | Construct additional unit train trackage between Bonneville and Barnes Yards to support unit train movement between South Rivergate and the Columbia Corridor. | Barnes Rail Yard - Bonneville Rail Yard, N | $11,900,000 |
| 30055 | Port | Penn Junction, N, UP/BNSF Main Line: Track Realignment | Realign track configuration, double track, and upgrade signaling to improve mainline capacity and allow greater train turnout speed. | Penn Junction, N, UP/BNSF Main Line | $3,500,000 |
| 30056 | Portland | Columbia Bl, N/NE (MLK Jr BL - Lombard): Bikeway | Design and implement bicycle facilities. | Columbia Bl, N/NE (MLK Jr BL - Lombard) | $ 153,944 |
| 30058 | Portland Port | Lombard, N (at Terminal 4): Driveway Consolidation | Consolidate driveways at Terminal 4 and Schnitzer Steel. | Lombard, N (at Terminal 4) | $ 10,000,000 |
| 30059 | Portland | Lombard, N (N Tyler - N Woolsey) | Implement main street improvements along N Lombard consistent with the St. Johns/Lombard Plan, including curb extensions, street lighting and bicycle improvements. | Lombard, N (N Tyler - N Woolsey) | $ 1,002,000 |
| 30062 | Port Railroad | West Hayden Island Rail Yard Expansion, West Hayden Island | Extend rail from BNSF mainline to West Hayden Island and construct rail loop to serve future marine terminal development. | West Hayden Island | $9,500,000 |
| 30063 | Region | BNSF Line at Columbia Bridge, N: Track Improvements | Improve rail track conditions on approaches to movable spans. | BNSF Line at Columbia Bridge, N | $8,000,000 |
| 30065 | Region | N Portland Junction, N: Rail Improvements | Upgrade rail track with revised crossovers, centralized traffic control tie-in and increased turning radius to accommodate higher rail speeds and capacity. | N Portland Junction, N | $23,600,000 |
| 30066 | Region | N Portland Rail Grade Separation, N | Grade separate rail/highway traffic on N Columbia Blvd at Penn Junction at BNSF Rail Bridge and Columbia Slough and N Portland Junction | N Portland Rail, N | $75,000,000 |
| 30069 | Region | Slough Rail Bridge, N | Future rail bridge across Columbia Slough to provide rail connection to south Rivergate from Terminal 6. | Slough Rail Bridge, N | $4,500,000 |
| 30070 | Portland | Columbia Bl/Portland Rd, N: Intersection Improvements | Redesign intersection. | Columbia Bl/Portland Rd, N | $3,000,000 |
| 30072 | Port | Rivergate ITS, N | Connect real-time information to ODOT's Highway ITC systems. | Rivergate, N | $480,000 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 30075 | Portland | Lombard, N/NE (MLK Jr - Philadelphia): ITS | CCTV at various intersections; changeable message signs. | Lombard, N/NE (MLK Jr - Philadelphia) | $210,000 |
| 30077 | Port | Barnes to Terminal 4, N: Track Expansion | Add dedicated track for Terminal 4 through Barnes Yard and add new track from Barnes Yard to Terminal 4. | Barnes to Terminal 4, N | $3,000,000 |
| 30080 | Portland | Burgard-Lombard, N: Street Improvements | Widen street to include two 12-foot travel lanes, continuous left turn lane, bike lanes and sidewalk. | Burgard-Lombard, N | $17,000,000 |
| 30081 | ODOT Portland | Argyle, N (Columbia - Denver): Roadway Improvements | New N Argyle street connection, west of I-5. Construct a new arterial roadway north of existing street alignment and reconstruct existing street as a local street in a Pedestrian District as recommended by the I-5 Delta Park project in the Argyle on the Hill Alternative. | Argyle, N (Columbia - Denver) | $11,773,032 |
| 40003 | Portland | 26th/Regents, NE: Intersection Improvements | Reconstruct intersection including pedestrian refuge to improve traffic flow and safety. | 26th/Regents, NE | $115,000 |
| 40006 | Portland | 33rd/Marine Drive, NE: Intersection Improvements | Signalize intersection for freight movement. | 33rd/Marine Drive, NE | $350,750 |
| 40007 | Portland ODOT | 42nd Bridge, NE (at Lombard): Bridge Replacement | Replace 42nd bridge over Lombard to remove weight restriction. | 42nd Bridge, NE (at Lombard) | $4,900,000 |
| 40008 | Portland | 47th/42nd, NE (Cornfoot - Siskiyou): Bike Lanes | Design and implement bicycle facilities. Project involves shoulder paving and drainage work. | 47th/42nd, NE (Cornfoot - Siskiyou) | $160,000 |
| 40009 | Portland | 47th, NE (Columbia - Cornfoot):Roadway & Intersection Improvements | Widen and reconfigure intersections to better facilitate truck turning movements to the cargo area located within the airport area. Project includes pedestrian and bicycle improvements. | 47th, NE (Columbia - Cornfoot) | $5,541,678 |
| 40010 | Portland | 60th Ave, NE( Killingsworth - Going/Cully): Pedestrian Improvements | Construct sidewalks, curbs, and storm drainage improvements. | 60th Ave, NE( Killingsworth - Going/Cully) | $400,000 |
| 40012 | Portland | 72nd, NE (Killingsworth - Prescott): Pedestrian Improvements | Construct sidewalks, curbs, and storm drainage improvements along 72nd and improve pedestrian crossings at Prescott and Killingsworth. | 72nd, NE (Killingsworth - Prescott) | $750,000 |
| 40016 | Port | 82nd, NE (Airport Way - Columbia Bl): Bike & Pedestrian Improvements | Construct bicycle and pedestrian facilities. | 82nd, NE (Airport Way - Columbia Bl) | $510,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 40020 | Portland | 92nd Ave, NE (Fremont - Halsey): Bicycle & Pedestrian Improvements | Design and implement bicycle facilities. Construct sidewalks to provide access to transit and schools. | 92nd Ave, NE (Fremont - Halsey) | $360,000 |
| 40023 | Port | Airport Way, NE: Return and Exit Roads | Relocate Airport Way exit roadway and construct new return roadway (Terminal Access Study, projects R4 and R5; to be scoped by PDX Master Plan). | Airport Way, NE | $ 6,400,900 |
| 40025 | Port | 82nd/Airport Way, NE: Overcrossing | Construct grade-separated overcrossing. | 82nd/Airport Way, NE | $ 86,000,000 |
| 40027 | Portland Port | Alderwood St, NE, (Alderwood Trail - Columbia Bl): Bikeway | Design and implement bicycle facilities. Project includes some shoulder widening. | Alderwood, NE (Alderwood Trail - Columbia Bl) | $561,200 |
| 40028 | Portland | Argyle, NE (14th - MLK): Street Extension | Extend NE Argyle to provide better street grid. Will serve as a collector/distributor for industrial businesses & reduce traffic congestion at MLK/Columbia intersection. | Argyle, NE (14th - MLK) | $480,000 |
| 40030 | Portland | Broadway/Weidler, NE (15th - 28th): Multi-modal Improvements, Phases II & III | Boulevard retrofit of street including street trees, traffic signals, curb extensions, wider sidewalks, and bicycle facilities. | Broadway/ Weidler, NE (15th - 28th) | $9,058,399 |
| 40032 | Portland | Alderwood/Columbia Blvd/Cully, NE: Intersection Improvements | Reconstruct intersection to provide left turn pockets, enhancing turning radii and improving circulation for trucks serving expanding air cargo facilities south of Portland. | Alderwood/ Columbia Blvd/Cully, NE | $1,460,000 |
| 40036 | Portland | Cornfoot, NE (47th - Alderwood): Road Widening & Intersection Improvements | Construct a multi-use path on the north side of Cornfoot Rd and install missing guardrail segments on the south side. | Cornfoot, NE (47th - Alderwood) | $3,626,000 |
| 40037 | Portland | Cully, NE (Columbia Bl - Fremont): Multi-modal Improvements | Design and implement bicycle facilities. | Cully, NE (Columbia Bl - Fremont) | $500,000 |
| 40039 | Portland | Fremont St, NE (42nd-52nd): Pedestrian and Safety Improvements | Construct streetscape and transportation improvements to improve the pedestrian environment. | Fremont St, NE (42nd-52nd) | $405,116 |
| 40042 | Portland ODOT | Halsey, NE (Bridge at I-84): Seismic Retrofit | Seismic bridge retrofit. | Halsey, NE (Bridge at I-84) | $387,000 |
| 40045 | Portland ODOT | Hollywood Pedestrian District, NE: Multi-modal Improvements | Multi-modal street improvements including traffic signals, restriping, improved pedestrian crossings and connections to transit center. | Hollywood, NE | $10,776,092 |
| 40052 | Portland | Killingsworth, NE (42nd-72nd): Pedestrian Improvements | Construct sidewalks and crossing improvements for pedestrian travel and access to transit. | Killingsworth, NE (42nd-72nd) | $420,000 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 40053 | Portland | Killingsworth, NE (33rd - Williams): Pedestrian Improvements | Design and implement streetscape and transportation improvements to increase opportunities to walk and enhance the main street character of this corridor. | Killingsworth, NE (33rd - Williams) | $900,000 |
| 40058 | Portland ODOT | MLK Jr, N (Columbia Bl - CEID): ITS | CCTV at various locations & traffic monitoring stations at Clay and Burnside. | MLK Jr, N (Columbia Bl - CEID) | $989,115 |
| 40061 | Portland | Columbia Blvd/MLK Jr & Lombard/MLK Jr, NE: Intersection Improvements | Intersection and signalization improvements with right turn lane. | Columbia Blvd/MLK Jr & Lombard/MLK Jr, NE | $2,228,909 |
| 40065 | Portland | Prescott, NE (47th - I-205): Pedestrian and Bicycle Improvements | Construct bicycle facilities, sidewalks, and crossing improvements for pedestrian and bike safety and to improve access to transit. | Prescott, NE (47th - I-205) | $1,403,000 |
| 40068 | Portland | Sandy Blvd, NE (47th - 101st): Multi-modal Improvements, Phase II | Retrofit existing street with multi-modal street improvements including bicycle facilities, redesign of selected intersections to improve pedestrian crossings, streetscape, and safety improvements. | Sandy Blvd, NE (47th - 101st) | $6,481,860 |
| 40069 | Portland | Sandy Blvd, NE (82nd - Burnside): ITS | Install ITS infrastructure (communication network, enhanced bus detection, Bluetooth detection, CCTV cameras, and vehicle /pedestrian detectors). These ITS devices allow us to provide more efficient and safe operation of our traffic signal system consistent with our policies of moving people more effectively | Sandy Blvd, NE (82nd - Burnside) | $519,110 |
| 40070 | Portland | Sandy Bl, NE (12th - 47th): Multi-modal Improvements | Design and implement bicycle facilities. | Sandy Bl, NE (12th - 47th) | $500,000 |
| 40071 | Portland | Skidmore, N/NE, (Interstate - Cully): Bikeway | Design and implement a neighborhood greenway. | Skidmore, N/NE, (Interstate - Cully) | $105,330 |
| 40073 | Port | Southwest Quad, NE (at 33rd): Access to PDX Properties | Provide street access from 33rd into the SW Quad property. | Southwest Quad, NE (at 33rd) | $5,917,500 |
| 40074 | Portland | Twenties Bikeway, NE/SE (Lombard - Clinton) | Design and implement a bikeway from Lombard to Crystal Springs & 45th using neighborhood greenways and bike lanes with a varying alignment along NE/SE 26th to 30th Avenues. | Between 26th and 30th Ave, NE/SE (Lombard - Clinton) | $2,300,000 |
| 40079 | Portland | Marine Dr, NE: Intersection Improvements | Intersection improvements at NE Bridgeton Rd and NE Faloma/6th. | Marine Dr, NE | $2,035,000 |
| 40081 | Port | Airport MAX, NE: Light Rail Track Realignment | Realign light rail track into airport terminal building to accommodate terminal expansion plans. | Airport MAX, NE | $16,330,700 |
| 40082 | Portland | Seventies Neighborhood Greenway, NE (Killingsworth - I-84) | Design and implement a neighborhood greenway from Thomas Cully Park to I-84 with a varying alignment along the "70s" Avenues. | 70s Avenues, NE (Killingsworth - I-84) | $1,409,019 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 40084 | Portland ODOT | I-405/Kerby, N: Interchange Improvement | Improve I-405/Kerby interchange to calm traffic at off-ramp. | I-405/Kerby, N | $515,000 |
| 40085 | Port | Kenton Rail Line, NE: Additional RR Tracks | Upgrade single track to double track; new sidings; staging tracks | Kenton Rail Line, NE | $25,400,000 |
| 40086 | Portland | Halsey, NE (39th - I-205): Bikeway | Design and implement a bikeway along the NE Halsey Street corridor. | Halsey, NE (39th - I-205) | $500,000 |
| 40091 | Port | PDX PIC Pedestrian & Bicycle Improvements | Bicycle & pedestrian connection between Alderwood and Mt Hood LRT station. | Alderwood to Mt Hood LRT stations | $1,163,835 |
| 40097 | ODOT | Airport Way, NE: Braided Ramps | Braided ramps between I-205 interchange and Cascade interchange. | Airport Way, NE | $59,000,000 |
| 40100 | Portland | 33rd Ramps, NE (at Columbia Bl/Lombard: New Ramps | New ramp system connecting Columbia & Lombard at 33rd. | 33rd Ramps, NE (at Columbia Bl/Lombard | $7,014,016 |
| 40102 | Portland | Columbia BL, NE (60th - 82nd): Road Widening | Widen Columbia Blvd to five lanes in this segment to address a system bottleneck and improve property access. | Columbia BL, NE (60th - 82nd) | $14,859,000 |
| 50001 | Portland | Parkrose Connectivity Improvements, NE | Supplement access route for commercial properties in Parkrose by creating a loop road connection (102nd and 109th, NE, Killingsworth - Sandy; Killingsworth, NE, 109nd - 102nd) serving truck access functions, pedestrian, and bike connections. | Parkrose, NE | $1,403,000 |
| 50003 | Portland | 102nd Blvd & Cherry Blossom, NE/SE (Glisan - Market): Gateway Plan District Multi-modal Improvements, Phase II | Implement Gateway regional center plan with boulevard design retrofit, new traffic signals, improved pedestrian facilities and crossings, street lighting and new bicycle facilities. | 102nd Blvd & Cherry Blossom, NE/SE (Glisan - Market) | $2,200,000 |
| 50004 | Portland | 102nd, N (Sandy - Brazee): Pedestrian Improvements | Construct sidewalks and improved crossings, install bicycle facilities, and make traffic safety improvements. | 102nd, N (Sandy - Brazee) | $720,000 |
| 50005 | Portland | 122nd, NE/SE (Airport Way - Powell): ITS | CCTV at various locations; changeable message signs; traffic monitoring stations. | 122nd, NE/SE (Airport Way - Powell) | $515,703 |
| 50006 | Portland | 122nd, NE (Sandy Dr - Prescott): Pedestrian Improvements | Construct sidewalks along existing street. | 122nd, NE (Sandy Dr - Prescott) | $120,000 |
| 50008 | Portland | 138th, NE (Marine Dr - Sandy): Street Improvements | Widen street and add vehicle lanes, sidewalks, and bicycle facilities. | 138th, NE (Marine Dr - Sandy) | $2,000,000 |
| 50009 | Portland | 148th, NE (Marine Dr - Glisan): Bicycle & Pedestrian Improvements | Retrofit bike facilities to existing street (Airport Way - I-84) and construct sidewalk and safety improvements including signal/intersection improvements at 148th/Sandy (Airport Way-Glisan). | 148th, NE (Marine Dr - Glisan) | $2,568,893 |
| 50012 | Portland | 162nd Ave, NE (Sandy - Halsey): Bikeway | Design and implement separated in-roadway bicycle facilities. | 162nd Ave, NE (Sandy - Halsey) | $20,000 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 50014 | Portland | 99th Ave & Pacific Ave, NE: Gateway Plan District Street Improvements, Ph I | Reconstruct primary local main street network in Gateway Regional Center on NE 99th from Weidler to 300' south of Glisan and NE Pacific from 97th to 102nd. | 99th Ave & Pacific Ave, NE | $4,042,500 |
| 50015 | Portland | 99th & 96th, NE/SE (Glisan-Market: Gateway Plan District Street Improvements, Phase II & III | Reconstruct primary local main street in Gateway Regional Center. Phase II - 99th (Glisan - Washington). Phase III - 96th (Washington to Market). | 99th & 96th, NE/SE (Glisan-Market | $4,910,500 |
| 50016 | Port Portland | Airport Way, NE (I-205 - 158th): ITS | Install needed ITS infrastructure (communication network, new traffic controllers, CCTV cameras, and vehicle /pedestrian detectors). These ITS devices allow us to provide more efficient and safe operation of our traffic signal system. | Airport Way, NE (I-205 - 158th) | $278,251 |
| 50018 | Portland | Gateway Regional Center, NE/SE: Local Street Improvements, Phase I | High priority local street and pedestrian improvements in regional center | Gateway Regional Center, NE/SE | $3,000,000 |
| 50019 | Portland | Gateway Regional Center, NE/SE: Local Street Improvements, Phase II | High priority local street and pedestrian improvements in regional center. | Gateway Regional Center, NE/SE | $8,418,000 |
| 50020 | Portland | Gateway Regional Center, NE/SE: Local Street Improvements, Phase III | High priority local street and pedestrian improvements in regional center. | Gateway Regional Center, NE/SE | $8,418,000 |
| 50023 | Portland | Glisan St, NE (106th - 122nd): Bikeway | Design and implement bicycle facilities. | Glisan St, NE (106th - 122nd) | $81,023 |
| 50024 | Portland | Glisan St, NE (I-205 - 106th): Gateway Plan District Multi-modal Improvements | Implement Gateway regional center plan with boulevard design retrofit, new traffic signals, bike facilities, improved pedestrian facilities and crossings, and street lighting. | Glisan St, NE (I-205 - 106th) | $3,240,930 |
| 50027 | Portland | Halsey to San Rafael & 118th to 132nd, NE: Pedestrian Improvements | Improve pedestrian access to San Rafael Shopping Center including street trees. | Halsey to San Rafael & 118th to 132nd, NE | $250,000 |
| 50028 | Portland | Halsey St, NE (122nd-162nd): Pedestrian Improvements | Construct sidewalks, crossing improvements for ped travel and access to transit. | Halsey St, NE (122nd-162nd) | $1,000,000 |
| 50030 | Portland | Marine Drive/122nd, NE: Intersection Improvements | Signalize and widen dike to install left turn lane on Marine Drive. | Marine Drive/122nd, NE | $2,361,249 |
| 50032 | Portland | 105th & Prescott, NE: Parkrose Pedestrian Enhancements | Construct sidewalk and crossing improvements to provide access to transit and schools. | 105th & Prescott, NE | $500,000 |
| 50033 | Portland | Prescott St, NE (122nd - I-205): Bikeway | Design and implement a bikeway along the NE Prescott corridor. | Prescott St, NE (122nd - I-205) | $1,000,000 |
| 50036 | Portland | Shaver St, NE (116th to 122nd): Pedestrian Improvements | Construct sidewalks and crossing improvements for pedestrian travel and access to transit and schools. | Shaver St, NE (116th to 122nd) | $210,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 50037 | Portland | San Rafael/Tillamook, NE (102nd - 148th): Bikeway | Design and implement a neighborhood greenway. | San Rafael/Tillamook, NE (102nd - 148th) | $1,300,000 |
| 50038 | Portland | Woodland Park, NE: Pedestrian Improvements | Construct sidewalks and crossing improvements on San Rafael (111th-122nd), Sacramento (111th-117th), & 111th (San Rafael-Sacramento) to provide access to transit & schools. | Woodland Park, NE | $500,000 |
| 50039 | Portland | Halsey/Weidler, NE (I-205 - 114th): Multi-modal Improvements | Implement Gateway Regional Center Plan boulevard design including new traffic signals, improved pedestrian facilities and crossings and street lighting. | Halsey/Weidler, NE (I-205 - 114th) | $17,014,883 |
| 50041 | | Marine Dr, NE:(I-205 - 122nd) Multi-Use Path | Add multi-use path along Marine Dr. | Marine Dr, NE | $1,100,000 |
| 60004 | ODOT | Bridge Ave, NW (St Helens Rd - St Helens Rd): Pedestrian/ Bicycle trail at St. Johns Bridge | Construct a multi-use path along Bridge Avenue between both St Helens Rd intersections. | Bridge Ave, NW (St Helens Rd - St Helens Rd) | $346,500 |
| 60005 | Portland | Barnes/Burnside, NW: Intersection/Access Improvements | Install signal or 4-way stop near Wildwood Trail and entrance to Pittock. | Barnes/Burnside, NW | $500,000 |
| 60006 | Portland | Burnside, W (23rd - Skyline): Multi-modal Improvements | Design and implement separated in-roadway bicycle facilities. Construct and improve sidewalks, lighting, and crossings. The project will include intersection improvements at Burnside/Skyline to improve pedestrian/bicycle crossings and traffic safety. | Burnside, W (23rd - Skyline) | $2,000,000 |
| 60007 | Portland | Cornell, NW (30th - City Limits): Bikeway | Design and implement bicycle facilities. | Cornell, NW (30th - City Limits) | $1,000,000 |
| 60008 | Portland | Everett St, NW, (Broadway - 23rd): Corridor Safety Improvements | Install improved pedestrian crossing at NW Park Ave, remodel traffic signal and improve overhead signage at NW 16th Ave, and provide additional minor improvements along corridor to improve safety at high crash locations. | Everett St, NW, (Broadway - 23rd) | $2,000,000 |
| 60009 | Portland | Everett/Glisan, NW (Front - 14th & 18th - 24th): Bikeway | Design and implement bicycle facilities. | Everett/Glisan, NW (Front - 14th & 18th - 24th) | $200,000 |
| 60012 | Portland | Kittridge, NW (Bridge at Yeon): Seismic Retrofit | Seismic retrofit. | Kittridge, NW (Bridge at Yeon) | $2,100,000 |
| 60015 | Portland | Skyline, NW (Hwy 26 - City Limits): Bikeway | Widen street in order to add bicycle facilities and gravel shoulders. | Skyline, NW (Hwy 26 - City Limits) | $8,088,812 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 60023 | Portland ODOT | Yeon/St. Helens, NW: ITS | CCTV at various locations; changeable signs; monitoring stations at Nicolai and Kittridge. | Yeon/St. Helens, NW | $885,499 |
| 60024 | Portland | Wildwood Trail Bridge, NW/SW | Construct pedestrian overcrossing where Burnside intersects the Wildwood Trail to eliminate at-grade crossing. | Wildwood Trail Bridge, NW/SW | $2,126,948 |
| 60025 | Portland | Fairview, SW (Kingston - City Limits): Bikeway | Design and implement bicycle facilities. | Fairview, SW (Kingston - City Limits) | $2,000,000 |
| 60026 | Portland | Champlain, SW: Viaduct Replacement10292 | Replace existing viaduct with retaining wall and geofoam fill. | Champlain, SW | $282,269 |
| 60027 | Portland ODOT | 23rd/Vaughn, NW: Intersection Improvements | Improve the intersection of NW 23rd & Vaughn and extend NW 20th Ave from Upshur to Thurman in accordance with the Northwest Master Plan for Con-way Site. | 23rd/Vaughn, NW | $1,540,000 |
| 60029 | Mult Co Portland | Miller, NW (Stark - Cornell): Multimodal Improvements | Add bicycle and pedestrian facilities. | Miller, NW (Stark - Cornell) | $261,000 |
| 70001 | Portland | 13th Ave, SE(Malden - Tacoma): Streetscape Improvements | Plan and implement streetscape and transportation improvements to increase opportunities to walk and enhance the main street character. | 13th Ave, SE(Malden - Tacoma) | $2,000,000 |
| 70005 | Portland | Ceasar E, Chavez., NE/SE (Sandy - Woodstock): Safety & Pedestrian Improvements | Reconstruct street and upgrade sidewalks as necessary to meet current standards and add pedestrian/bicycle crossing improvements (Stark - Schiller). Upgrade signals and make striping changes to improve traffic safety and transit operations. | Ceasar E, Chavez., NE/SE (Sandy - Woodstock) | $3,086,600 |
| 70006 | Portland | 60th Ave, NE/SE (Glisan - Belmont): Corridor Safety Improvements | Signal improvements, modifications, and realignment to improve safety at high accident locations. Includes the intersections with Belmont, Glisan, and Stark. | 60th Ave, NE/SE (Glisan - Belmont) | $380,000 |
| 70008 | Portland | 92nd Ave, SE (Powell - City Limits): Bicycle & Pedestrian Improvements | Construct sidewalks, crossing improvements and bicycle facilities. | 92nd Ave, SE (Powell - City Limits) | $4,910,500 |
| 70009 | Portland | Belmont St, SE (25th - 43rd): Street and Pedestrian Improvements | Design and implement streetscape improvements to enhance sidewalks, lighting, crossings, transit stops, and signals. Evaluate the feasibility of bicycle facilities along the Belmont corridor. | Belmont St, SE (25th - 43rd) | $3,240,930 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 70010 | Portland | Burnside, E (28th - 82nd): Bicycle & Pedestrian Improvements | Install separated in-roadway bicycle facilities (32nd - 68th), construct traffic safety and pedestrian improvements (16th - Cesar Chavez), and improve pedestrian crossings to provide access to schools and transit (60th - 82nd). | Burnside, E (28th - 82nd) | $500,000 |
| 70013 | Portland | Division St, SE (Grand - 60th): Multi-modal Improvements, Phase I | Design and implement streetscape improvements to enhance sidewalks, lighting, crossings, access to transit, transit stops, and signals. Add separated in-roadway bicycle facilities (52nd - 60th). | Division St, SE (Grand - 60th) | $5,848,135 |
| 70014 | Portland | Division St, SE (60th - I-205): Multimodal Improvements, Phase II | Design and implement streetscape improvements to enhance sidewalks, lighting, crossings, access to transit, transit stops, and signals. | Division St, SE (60th - I-205) | $2,806,000 |
| 70017 | Portland | Ellis St, SE (92nd - Foster): Bikeway | Design and implement bicycle facilities. | Ellis St, SE (92nd - Foster) | $648,186 |
| 70019 | Portland | Flavel Dr, SE (45th - Clatsop): Multimodal Improvements | Fully improve street from SE 45th to Clatsop Street with travel lanes, curbs, swales, sidewalks, and separated in-roadway bicycle facilities from 52nd to Clatsop. | Flavel Dr, SE (45th - Clatsop) | $7,294,088 |
| 70020 | Portland | Flavel St, SE (82nd - 92nd): Pedestrian Improvements | Construct sidewalks and crossing improvements. | Flavel St, SE (82nd - 92nd) | $340,000 |
| 70021 | Portland | Foster Rd, SE (Powell - 90th): Pedestrian/Bicycle/Safety Improvements | Improve sidewalks, lighting, crossings, bus shelters, and benches on Foster and improve pedestrian crossings to benefit access to transit. Install separated in-roadway bicycle facilities. | Foster Rd, SE (Powell - 90th) | $5,250,000 |
| 70024 | Portland | Foster & Woodstock, SE (94th - 101th): Street Improvements, Phase II | Implement Lents Town Center Business District Plan with new traffic signals, pedestrian amenities, wider sidewalks, pedestrian crossings, and street lighting. | Foster & Woodstock, SE (94th - 101th) | $11,510,000 |
| 70027 | Portland | Harney Dr, SE (52nd - Flavel): Bikeway | Design and implement bicycle facilities. | Harney Dr, SE (52nd - Flavel) | $1,252,000 |
| 70028 | Portland | Harold St, SE (52nd - Foster): Bikeway | Design and implement bicycle facilities. | Harold St, SE (52nd - Foster) | $200,000 |
| 70030 | ODOT | McLoughlin (99E), SE (Ross Island Bridge - Clatsop): Street Improvements | Provide access management and operational improvements from Ross Island Bridge to Harold and widen to six lanes from Harold to Tacoma. | McLoughlin (99E), SE (Ross Island Bridge - Clatsop) | $50,000,000 |
| 70031 | Portland | Holgate Bl, SE (52nd - I-205): Bikeway, Ph I | Design and implement bicycle facilities. | Holgate Bl, SE (52nd - I-205) | $100,000 |
| 70032 | Portland | Holgate Bl, SE (39th - 52nd): Street Improvements | Reconstruct pavement structure and stormwater drainage facilities, improve corner curb ramps to ADA standards, improve pedestrian crossings, and add separated in-roadway bicycle facilities. | Holgate Bl, SE (39th - 52nd) | $10,000,000 |
| 70033 | Portland | Holgate Bl, SE (McLoughlin - 39th): Bikeway, Phase II | Design and implement bicycle facilities. | Holgate Bl, SE (McLoughlin - 39th) | $2,000,000 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 70040 | Portland | McLoughlin Blvd, SE (at Ross Island Sand and Gravel signalized entrance): Brooklyn Neighborhood Access Improvements | Upgrade intersection at Ross Island Sand and Gravel entrance to accommodate safe pedestrian crossing of McLoughlin Blvd. Alternative crossing opportunities will be considered if location is found to be infeasible or unsafe. | McLoughlin Blvd, SE (at Ross Island Sand and Gravel signalized entrance) | $330,000 |
| 70041 | Portland | Milwaukie, SE (Gideon - Mall): Bicycle & Pedestrian Improvements | Design and implement streetscape and pedestrian/bike improvements. | Milwaukie, SE (Gideon - Mall) | $350,000 |
| 70042 | Portland | Milwaukie, SE (Yukon - Tacoma): Bicycle & Pedestrian Improvements | Design and implement streetscape and pedestrian/bike improvements. | Milwaukie, SE (Yukon - Tacoma) | $1,403,000 |
| 70044 | Portland | Mt. Scott Bl, SE (92nd - 112th): Pedestrian Improvements | Build a continuous walkway for pedestrian travel and access to transit with crossing improvements at transit stop locations. | Mt. Scott Bl, SE (92nd - 112th) | $1,900,000 |
| 70045 | ODOT Portland | Powell, SE (Ross Island Bridge - 50th): Multi-modal Improvements | Retrofit existing street with multimodal safety improvements including enhanced pedestrian and bicycle crossings, pedestrian and bike activated signals, median islands with trees, redesign of selected intersections and stormwater management facilities. | Powell, SE (Ross Island Bridge - 50th) | $7,997,100 |
| 70047 | Tri Met | Powell - Foster Rapid Bus, SE | Construct improvements that enhance frequent bus service along the Foster corridor. | Powell - Foster, SE | $745,368 |
| 70049 | Portland | Reedway St, SE (McLoughlin - 29th): Multi-Use Path | Construct a multi-use path from 23rd to 26th crossing McLoughlin Blvd and connecting to the McLoughlin multi-use path. | Reedway St, SE (McLoughlin - 29th) | $1,000,000 |
| 70052 | Portland | Seventies Greenstreet and Bikeway, SE (I-84 - Clatsop) | Design and implement a neighborhood greenway from I-84 to Clatsop with a varying alignment along the "70s" Avenues. | 70s Avenues, SE (I-84 - Clatsop) | $2,818,037 |
| 70053 | Portland | Springwater Corridor Trail, SE (Umatilla - 19th): Trail | Construct trail-with-rail multi-use path between Umatilla and 19th to fill in the "Springwater Gap." | Springwater Corridor Trail, SE (Umatilla - 19th) | $3,032,411 |
| 70055 | Portland | Tacoma St, SE (Sellwood Bridge - McLoughlin): Multi-modal Improvements | Implement boulevard design based on Tacoma Main Street study recommendations and incorporate McLoughlin Neighborhoods Project recommendations. | Tacoma St, SE (Sellwood Bridge - McLoughlin) | $1,400,000 |
| 70057 | Portland | Tacoma, SE (Sellwood Bridge - 45th/Johnson Creek): ITS | Communications infrastructure; closed circuit TV cameras, variable message signs for remote monitoring and control of traffic flow for four signals. | Tacoma, SE (Sellwood Bridge - 45th/Johnson Creek) | $231,495 |
| 70059 | Portland | Glisan St, NE (47th - I-205): Bikeway | Design and implement bicycle facilities. | Glisan St, NE (47th - I-205) | $81,023 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 70060 | Portland | 92nd, SE (Stark - Lincoln): Bikeway | Design and implement bicycle facilities. | 92nd, SE (Stark - Lincoln) | $50,000 |
| 70064 | Portland | Foster Rd, SE/FSE: ITS | CCTV at various locations; changeable signs; monitoring stations | Foster Rd, SE/FSE | $145,000 |
| 70065 | ODOT | McLoughlin/SE: ITS | CCTV at various locations; variable sign; monitoring stations. | McLoughlin/SE | $250,000 |
| 80001 | Portland | 111th/112th Ave, SE (Market - Mt. Scott Bl): Bicycle & Pedestrian Improvements | Design and implement bicycle facilities on existing street (Market - Mt. Scott Bl) and construct sidewalks (Holgate - Mt. Scott Bl). | 111th/112th Ave, SE (Market - Mt. Scott Bl) | $2,070,127 |
| 80004 | Portland | 136th Ave, SE (Division - Foster): Bikeway | Improve streetscape to provide curbs, sidewalks, swales, and bicycle facilities from Division to Foster. | 136th Ave, SE (Division - Foster) | $5,000,000 |
| 80005 | Portland | 148th Ave, SE (Burnside - Powell): Pedestrian Improvements | Construct sidewalks, curbs, ADA ramps. | 148th Ave, SE (Burnside - Powell) | $980,000 |
| 80007 | Portland | 174th & Jenne Rd , SE (Foster - Powell): Multi-modal Improvements | Roadway improvements to increase safety and capacity to accommodate increased residential development. Widen roadway to 3 lanes and provide bicycle facilities and sidewalks. | 174th & Jenne Rd , SE (Foster - Powell) | $7,155,300 |
| 80008 | Portland | Barbara Welch Rd, SE (Foster - City Limits):Multimodal Improvements | Widen travel lanes, improve sidewalks, and improve intersection at Foster. Design and implement bicycle facilities on existing roadway. | Barbara Welch Rd, SE (Foster - City Limits) | $20,191,557 |
| 80009 | Portland | Division St, SE (I-205 - 174th): Multimodal Improvements, Phase III | Improve sidewalks, lighting, crossings, bus shelters and benches, and bicycle facilties. | Division St, SE (I-205 - 174th) | $5,710,912 |
| 80010 | Portland | Foster Rd, SE (102nd - Foster Pl): Pedestrian Improvements | | Foster Rd, SE (102nd - Foster Pl) | $1,403,000 |
| 80011 | Portland | Foster Rd, SE (136th - Jenne): Multi-modal Improvements | Widen street to three lanes to provide two travel lanes, continuous turn lane, bike lanes, sidewalks, crossing improvements, and drainage. Reconstruct Foster/162nd intersection. | Foster Rd, SE (136th - Jenne) | $16,963,756 |
| 80012 | Portland | Holgate Bl, SE (92nd - 142nd): Pedestrian Improvements | Construct sidewalks and crossing improvements to facilitate pedestrian travel and access to transit. Provide bicycle facilities (122nd - 136th). | Holgate Bl, SE (92nd - 142nd) | $1,260,000 |
| 80014 | Portland | Mill Park Pedestrian Improvements, SE | Construct sidewalks & crossing improvements to improve pedestrian travel and access to transit and schools on Market (96th - 112nd), 101st (Market - Division), 117th (Stark - Division). | Mill Park, SE | $1,185,000 |
| 80015 | ODOT | Powell, SE (99th - 174th): Multi-modal Improvements | Widen street to three to four lanes (inclusive of a center turn lane) with sidewalks and buffered bike lanes or other enhanced bike facility. Add enhanced pedestrian and bike crossings. | Powell, SE (99th - 174th) | $66,551,572 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 80016 | Portland | Powellhurst/Gilbert Pedestrian Improvements, SE | Construct sidewalks & crossing improvements to enhance pedestrian travel and access to transit and schools on Harold (102nd-128th), 122nd (Bush-Harold), 110th (Harold-Foster); 103rd/104th (Powell-Foster). | Powellhurst/Gilbert, SE | $1,473,288 |
| 80017 | Portland | Stark, SE (111th - City Limits): Bicycle and Pedestrian Improvements | Construct sidewalks and crossing improvements and provide separated in-roadway bicycle facilities. | Stark, SE (111th - City Limits) | $243,070 |
| 80018 | Portland | Stark & Washington, SE (92nd - 111th): Gateway Plan District Street Improvements | Implement Gateway regional center plan with boulevard design retrofit including new traffic signals, improved pedestrian facilities and crossings, and street lighting. | Stark & Washington, SE (92nd - 111th) | $6,157,767 |
| 80020 | Portland | Market/Mill/Main, SE (72nd - 175th): Bikeway | Design and implement a neighborhood greenway. | Market/Mill/Main, SE (72nd - 175th) | $600,000 |
| 80021 | Portland Clackamas Co | Clatsop, SE (Deardorf/132nd - 162nd): Multimodal Improvements | Multimodal improvements based on PV Implementation Plan. | Clatsop, SE (Deardorf/132nd - 162nd) | $2,000,000 |
| 80022 | ODOT | I-205, SE (Division - Powell Blvd): Interchange Improvements | Add full access ramps to I-205 at Powell. | I-205, SE (Division - Powell Blvd) | $12,000,000 |
| 80023 | Portland | 162nd/Clatsop, SE: Intersection Improvements | Install signal at intersection. | 162nd/Clatsop, SE | $250,000 |
| 80024 | Portland Gresham | Clatsop, SE (162nd - City Limits): Street Extension | Extend street east into PV based on PV Implementation Plan. | Clatsop, SE (162nd - City Limits) | $4,202,582 |
| 80025 | Portland Gresham | Foster Rd, SE (162nd - Giese Rd): Multi-modal Street Improvements | Multimodal improvements based on PV Implementation Plan. | Foster Rd, SE (162nd - Giese Rd) | $2,525,400 |
| 80026 | Portland | 162nd, SE (Foster Rd - Clatsop): Street Improvements | Multimodal improvements based on PV Implementation Plan. | 162nd, SE (Foster Rd - Clatsop) | $7,000,000 |
| 90001 | Portland | 12th, Broadway, Cardinell & Davenport, SW (Montgomery - Vista): Bikeway | Design and implement bicycle facilities. | 12th, Broadway, Cardinell & Davenport, SW (Montgomery - Vista) | $4,508,000 |
| 90002 | Portland | 19th, SW (Barbur - Spring Garden): Bicycle and Pedestrian Improvements | Design and implement bicycle and pedestrian facilities. | 19th, SW (Barbur - Spring Garden) | $200,000 |
| 90003 | Portland | 25th Ave & Kanan, SW (23rd - B-H Hwy): Pedestrian Improvements | Construct a walkway for pedestrian travel and access to transit. | 25th Ave & Kanan, SW (23rd - B-H Hwy) | $450,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 90004 | Portland | 26th Ave, SW (Spring Garden - Taylors Ferry): Pedestrian Improvements | Construct a walkway for ped travel and access to transit and install street lighting. | 26th Ave, SW (Spring Garden - Taylors Ferry) | $350,000 |
| 90005 | Portland | 30th Ave, SW (Vermont to B-H Hwy): Bicycle & Pedestrian Improvements | Design and implement bicycle facilities, construct sidewalks, and improve the pedestrian crossing at Beaverton-Hillsdale Hwy & 30th. | 30th Ave, SW (Vermont to B-H Hwy) | $1,839,333 |
| 90006 | Portland | 35th Ave, SW (Vermont - Barbur): Bicycle & Pedestrian Improvements | Add bike facilities (Vermont - Barbur), sidewalks, and crossing improvements (Multnomah - Barbur). | 35th Ave, SW (Vermont - Barbur) | $690,000 |
| 90007 | Portland | 35th Ave, SW (Taylors Ferry - Stephenson): Bicycle & Pedestrian Improvements | Add bicycle facilities (Taylors Ferry - Stephenson), sidewalks, crossing improvements, and median islands (Taylors Ferry - Dickinson) to improve safety. | 35th Ave, SW (Taylors Ferry - Stephenson) | $1,570,000 |
| 90009 | Portland | 48th/Alfred, SW (Taylors Ferry - 55th): Bikeway | Design and implement bicycle facilities. | 48th/Alfred, SW (Taylors Ferry - 55th) | $500,000 |
| 90011 | Portland | 55th/Pasadena/ Pomona, SW (Taylors Ferry - Barbur): Bikeway | Design and implement bicycle facilities. | 55th/Pasadena / Pomona, SW (Taylors Ferry - Barbur) | $2,000,000 |
| 90012 | Portland | 61st/62nd, SW (Taylors Ferry - Pomona): Bikeway | Design and implement bicycle facilities. | 61st/62nd, SW (Taylors Ferry - Pomona) | $1,000,000 |
| 90013 | Portland | Arnold, SW (Boones Ferry - 35th): Bicycle & Pedestrian Improvements | Design and implement bicycle and pedestrian facilities. | Arnold, SW (Boones Ferry - 35th) | $3,479,000 |
| 90014 | Portland ODOT | Barbur Blvd, SW: ITS | Install intelligent transportation system infrastructure to improve safety and enhance traffic flow. | Barbur Blvd, SW | $550,000 |
| 90016 | Portland | Barbur Blvd, SW (3rd - Terwilliger): Multi-modal Improvements | Construct Improvements for transit, bikes and pedestrians. Transit improvements include preferential signals, pullouts, shelters, left turn lanes and sidewalks. | Barbur Blvd, SW (3rd - Terwilliger) | $4,000,000 |
| 90017 | Portland ODOT | Barbur Blvd, SW (Terwilliger - City Limits): Multi-modal Improvements | Complete boulevard design improvements including sidewalks and street trees, safe pedestrian crossings, enhanced transit access and stop locations, traffic signal at Barbur/30th, and bicycle facilities (Bertha - City Limits). | Barbur Blvd, SW (Terwilliger - City Limits) | $24,833,100 |
| 90019 | Portland | Beaverton-Hillsdale Hwy, SW: ITS | CCTV at Terwilliger, Berth, shattuck; changeable signs. | Beaverton-Hillsdale Hwy, SW | $315,675 |
| 90020 | Portland | Beaverton-Hillsdale Hwy, SW (Capitol Hwy - 65th): Multi-modal Improvements | Improve streetscape to include better sidewalks, crossings, and other improvements to enhance access to transit. | Beaverton-Hillsdale Hwy, SW (Capitol Hwy - 65th) | $3,565,023 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 90022 | Portland | Bertha, SW (B-H Hwy - Barbur): Multi-modal Improvements | Design and implement bicycle facilities on Bertha Blvd (Vermont-B-H Hwy), construct walkway for pedestrian travel and access to schools (Barbur-B-H Hwy); and improve street to City standards (Vermont-Capitol). | Bertha, SW (B-H Hwy - Barbur) | $2,104,500 |
| 90023 | Portland | Boones Ferry Rd, SW (Terwilliger - City Limits): Bikeway | Design and implement bicycle facilities. | Boones Ferry Rd, SW (Terwilliger - City Limits) | $7,015,000 |
| 90024 | Portland | Broadway Dr, SW (Sherwood - Grant): Pedestrian Improvements | Construct a sidewalk and crossing improvements. | Broadway Dr, SW (Sherwood - Grant) | $ 1,100,000 |
| 90025 | Portland | Cameron Rd, SW (45th - Shattuck): Multi-modal Improvements | Design and implement bicycle facilities, construct sidewalks, and provide safety improvements at the Cameron/Shattuck intersection. | Cameron Rd, SW (45th - Shattuck) | $3,068,000 |
| 90026 | Portland | Capitol Hwy, SW (Multnomah Bl - Taylors Ferry): Bicycle & Pedestrian Improvements | Replace existing roadway and add sidewalks, improved crossings, bike lanes, and green stormwater features. | Capitol Hwy, SW (Multnomah Bl - Taylors Ferry) | $19,100,000 |
| 90027 | Portland | Capitol Hwy, SW (West Portland Town Center - 49th): Pedestrian Improvements | Complete curb extensions and medians recommended in the Capitol Hwy Plan. | Capitol Hwy, SW (West Portland Town Center - 49th) | $1,403,000 |
| 90028 | Portland | Beaverton-Hillsdale /Bertha/Capitol Hwy, SW: Intersection Improvements | Redesign intersection to improve safety. | Beaverton-Hillsdale /Bertha/Capitol Hwy, SW | $1,403,000 |
| 90029 | Portland | Capitol Hwy, SW (Terwilliger - Sunset): Multi-modal Improvements | Construct sidewalks, crossing improvements for access to transit and bike improvements, and install left turn lane at the Capitol/Burlingame intersection. | Capitol Hwy, SW (Terwilliger - Sunset) | $1,403,000 |
| 90031 | Portland | Dosch Rd, SW (Patton - B-H Hwy): Bicycle & Pedestrian Improvements | Design and implement bicycle and pedestrian facilities. | Dosch Rd, SW (Patton - B-H Hwy) | $5,745,000 |
| 90033 | Portland | Garden Home Rd, SW (Capitol Hwy - Multnomah): Multi-modal Improvements | Reconstruct road to three lanes with signal improvements at Multnomah intersection, drainage, bike lanes, sidewalks and curbs. | Garden Home Rd, SW (Capitol Hwy - Multnomah) | $1,931,033 |
| 90034 | Portland | Hamilton St, SW (Dosch - Scholls Ferry): Bicycle & Pedestrian Improvements | Design and implement bicycle facilities and construct sidewalks to provide access to transit and schools. | Hamilton St, SW (Dosch - Scholls Ferry) | $12,420,360 |
| 90038 | Portland | Humphrey Bl, SW (Patton - Scholls Ferry): Bicycle & Pedestrian Improvements | Construct bicycle facilities and sidewalks. | Humphrey Bl, SW (Patton - Scholls Ferry) | $4,000,000 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 90043 | Portland | Lancaster Rd, SW (Taylors Ferry - Stephenson): Pedestrian Improvements | Construct pedestrian facilities. | Lancaster Rd, SW (Taylors Ferry - Stephenson) | $1,000,000 |
| 90044 | Portland | 43rd & Lee, SW: Pedestrian Bridge & Path | Construct a bridge and path to connect SW Lee to SW 43rd within the existing ROW. | 43rd & Lee, SW | $90,000 |
| 90046 | Portland | Macadam, SW (Bancroft - Sellwood Br): ITS | CCTV at various locations; variable sign; monitoring station. | Macadam, SW (Bancroft - Sellwood Br) | $401,794 |
| 90047 | Portland | Macadam, SW (Bancroft - County line): Multi-modal Improvements | Improve pedestrian and bicycle crossings of Macadam and connections to the Willamette Greenway Trail. | Macadam, SW (Bancroft - County line) | $1,000,000 |
| 90048 | Portland ODOT | Pedestrian Overpass near Markham School, SW | Construct pedestrian path and bridge over Barbur Bl and I-5 to connect SW Alfred and SW 52nd to the rear of Markham School. | Between Alfred and 52nd, SW | $4,861,395 |
| 90049 | Portland | Marquam Hill, SW (13th/Gibbs - 11th/Curry): Pedestrian Improvements | Construct a walkway and crossing improvements. | Marquam Hill, SW (13th/Gibbs - 11th/Curry) | $1,000,000 |
| 90050 | Portland | Multnomah Bl, SW (Barbur - 45th): Street Improvements | Reconstruct street to urban standards including curb, sidewalks, storm sewers and upgraded street lights. | Multnomah Bl, SW (Barbur - 45th) | $4,225,000 |
| 90051 | Portland | Nevada St/Ct, SW: Path & Stair/Bridge | Construct a path and bridge over Stevens Creek to connect Nevada Ct to Capitol Hill Road & Bertha Blvd at Chestnut. | Nevada St/Ct, SW | $400,000 |
| 90052 | Portland Mult Co | Palatine Hill Rd, SW (Boones Ferry - City Limits): Bikeway | Design and implement bicycle facilities. | Palatine Hill Rd, SW (Boones Ferry - City Limits) | $10,000,000 |
| 90053 | Portland | Palatine St, SW (27th-Lancaster): Street Extension | Complete neighborhood collector to provide multi-modal access to Lancaster Rd. | Palatine St, SW (27th-Lancaster) | $672,228 |
| 90054 | Portland | Patton Rd, SW (Vista - Scholls Ferry): Bicycle & Pedestrian Improvements | Construct bikeway (Vista - Scholls Ferry) and walkway (Homar to Shattuck). | Patton Rd, SW (Vista - Scholls Ferry) | $1,220,000 |
| 90055 | Portland | Pomona St, SW (35th - Barbur): Bicycle & Pedestrian Improvements | Provide bicycle facilities (35th - Capitol) and sidewalks (35th - Barbur). | Pomona St, SW (35th - Barbur) | $2,700,000 |
| 90059 | Portland | Shattuck Rd, SW (Patton - Vermont): Bicycle & Pedestrian Improvements | Provide bicycle facilities and sidewalks. | Shattuck Rd, SW (Patton - Vermont) | $6,405,000 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 90060 | Portland | South Portland Improvements | Reconstruct Naito Pkwy as two-lane road w/bike lanes, sidewalks, left turn pockets, & on-street parking. Includes realignment/regrading at intersecting streets; removal of Barbur tunnel, Ross Is Br ramps, Arthur/Kelly viaduct & Grover ped bridge. This project will be coordinated with ODOT and with the Southwest Corridor Plan, and will consider impacts to ODOT facilities including Naito Parkway and the Ross Island Bridge. | Natio Pkwy, SW | $39,695,079 |
| 90061 | Portland | Spring Garden, SW (Taylors Ferry - Capitol Hwy): Bicycle and Pedestrian Improvements | Provide bicycle facilities on existing street and construct pedestrian facilities. | Spring Garden, SW (Taylors Ferry - Capitol Hwy) | $4,165,000 |
| 90062 | Portland | Stephenson, SW (Boones Ferry - 35th): Multi-modal Improvements | Design and implement bicycle and pedestrian facilities. Improve safety at the Stephenson & Boones Ferry intersection. | Stephenson, SW (Boones Ferry - 35th) | $2,374,408 |
| 90063 | Portland | Sunset Bl, SW (Dosch - Capitol): Bicycle & Pedestrian Improvements | Construct bicycle facilities, sidewalks, and crossing improvements. | Sunset Bl, SW (Dosch - Capitol) | $ 1,683,600 |
| 90064 | Portland | Taylors Ferry, SW (Capitol Hwy - City Limits): Bicycle & Pedestrian Improvements | Provide bicycle facilities, including shoulder widening and drainage, and construct sidewalk for access to transit (40th - 60th). | Taylors Ferry, SW (Capitol Hwy - City Limits) | $4,400,000 |
| 90065 | Portland | Taylors Ferry, SW (Macadam - 35th): Bicycle & Pedestrian Improvements | Widen shoulder in uphill direction on SW Taylors Ferry Rd from Macadam to Terwilliger to provide bicycle climbing lane and stripe bike lanes from Terwilliger to 35th. Construct sidewalks for pedestrian travel and access to transit. | Taylors Ferry, SW (Macadam - 35th) | $1,800,000 |
| 90066 | Portland Mult Co | Terwilliger, SW, (Troy - County line): Pedestrian Improvements | Provide pedestrian improvements including missing sidewalks and improved pedestrian crossings at Lewis & Clark and Maplecrest. | Terwilliger, SW, (Troy - County line) | $1,280,000 |
| 90067 | Portland | Vermont St, SW, (30th - Oleson): Bicycle and Pedestrian Improvements | Add bicycle facilities to existing street (30th - Oleson), construct sidewalk (37th - Shattuck), and redesign intersection at 25th. | Vermont St, SW, (30th - Oleson) | $7,909,800 |
| 90068 | Portland | West Portland Town Center, SW: Pedestrian Improvements | Improve sidewalks, lighting, crossings, bus shelters, and benches on Barbur, Capitol Hwy, and surrounding neighborhood streets. | West Portland Town Center, SW | $7,015,000 |
| 90069 | Portland | Barbur/Capitol/Huber /Taylors Ferry, SW: Intersection Improvements | Construct safety improvements for all modes at the intersection of Capitol Hwy, Taylors Ferry, Huber, and Barbur, including possible modifications to the I-5 ramps. This project will be coordinated with ODOT because it is within the interchange influence area. | Barbur/Capitol /Huber/Taylors Ferry, SW | $40,000,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 90070 | Portland | Capitol Hwy, SW (Vermont - Florida): Intersection Improvements | Realign the Capitol/Vermont/30th intersection and provide sidewalks, bike lanes, and drainage improvements. | Capitol Hwy, SW (Vermont - Florida) | $1,898,314 |
| 90071 | Portland Mult Co | Willamette Greenway, SW: Trail Extension | Extend Greenway Trail from Sellwood Bridge to the County line. | Willamette Greenway, SW | $500,000 |
| 90072 | Portland | Capitol Hwy & Lesser, SW (49th - Kruse Ridge): Bicycle & Pedestrian Improvements | Add bicycle facilities to existing roadway and construct sidewalks. | Capitol Hwy & Lesser, SW (49th - Kruse Ridge) | $1,400,000 |
| 90073 | Portland | Dolph Ct, SW (26th - Capitol Hwy): Pedestrian Improvements | Construct a walkway. | Dolph Ct, SW (26th - Capitol Hwy) | $640,000 |
| 90075 | Portland | 35th and Stephenson, SW: Pedestrian Improvements | Construct a walkway for pedestrian travel and access to schools on 35th (Stephenson- Dickenson) and on Stephenson (27th - 35th). | 35th and Stephenson, SW | $850,000 |
| 90077 | ODOT | Capitol Hwy, SW (Barbur): Ramp Seismic Retrofit | Seismic retrofit. | Capitol Hwy, SW (Barbur) | $1,039,000 |
| 90078 | Mult Co/ Portland | Scholls Ferry, SW (Humphrey - County line): Multimodal Improvements | Add bicycle and pedestrian facilities; intersection improvements at Patton. | Scholls Ferry, SW (Humphrey - County line) | $2,300,000 |
| 90079 | Mult Co/ Portland | 55th Dr, SW (South of Patton Road): Pedestrian Improvements | Add sidewalks to both sides of street. | 55th Dr, SW (South of Patton Road) | $211,000 |
| 102040 | Portland | Gateway Regional Center, Local and Collector Streets, Phase 2 | High priority local and collector streets and pedestrian improvements in the Gateway Regional Center. | Gateway Regional Center, E | $32,648,540 |
| 102050 | Portland | Gateway Regional Center, Local and Collector Streets, Phase 1 | High priority local and collector streets and pedestrian improvements in the Gateway Regional Center. | Gateway Regional Center, E | $4,209,000 |
| 102290 | Portland | Saint Johns Truck Strategy Implementation phase II | Implement traffic calming pedestrian and bicycle improvements along the Fessenden/St. Louis corridor. Implement freight and other multimodal improvements on N. Lombard street from N. Bruce to St. Louis Ave. | Saint Johns, N | $3,345,990 |
| 102340 | Portland | Columbia Slough Trail Gaps | Close gaps in Columbia Slough Trail: North Slough to North Portland Rd; Landfill to Pier Park; I-5 to NE Elrod; NE Elrod to NE 82nd Ave; NE 82nd Ave to 92nd Ave; I-205 to approx. NE 128th; NE 145th to 158th, Peninsula Canal, Cross-Levee, Delta Park Trail. | Columbia Slough Trail, N/NE | $8,460,000 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 103540 | Portland | Fanno Creek Greenway (Red Electric) Trail | Provide east-west route for pedestrians and cyclists in SW Portland that connects the existing Fanno Creek Greenway Trail to Willamette Park. | Fanno Creek Greenway (Red Electric) Trail | $17,653,000 |
| 105420 | Portland | Foster Rd. Improvements (162 - Jenne) | Improve Foster Rd. to Minor Arterial (Parkway) standards, 2 lanes, with turn pockets where appropriate. | Foster Rd. Improvements (162 - Jenne) | $3,014,698 |
| 108570 | Portland | Jenne/Foster | Modify the intersection to improve traffic safety and operations. Evaluate adding a second EB left turn lane from Foster to Jenne. | Jenne/Foster | $540,780 |
| 108580 | Portland | 174th/Powell | Modify the intersection to improve traffic safety and operations. | 174th/Powell | $1,860,824 |
| 110910 | Portland /Port | Columbia Blvd./I-205 Interchange: SB On-Ramp Improvement | Widen the southbound on-ramp to three lanes, including for one for Freight and HOV use. | Columbia Blvd./I-205 Interchange | $750,000 |
| 111020 | Portland | Streetcar Extension to Hollywood via Sandy Blvd or Broadway/ Weidler | Corridor Alternatives Analysis, public outreach, planning, design, engineering, and construction for future streetcar extension from Lloyd District/Central Eastside to Hollywood Town Center. The new extension intended to provide streetcar service from Northwest Portland to Hollywood. | Sandy Blvd or Broadway/ Weidler, NE | $70,000,000 |
| 111330 | Portland | St. Johns Truck Strategy Implementation Phase III | Addresses pedestrian safety, bicycle safely and neighborhood livability impacts associated with cut-through truck traffic on N. Fessenden St. The project will construct pedestrian crossing safety and traffic calming improvements, such as curb extensions and median islands. | St. Johns, N | $1,000,000 |
| 111970 | Portland | Swan Island Active Transportation Access and Mobility Improvements | Improve access and mobility on Swan Island by constructing the recommended bikeway and trail network. | Swan Island, N | $9,000,000 |
| 111980 | Portland | Portland-Milwaukie Light Rail Active Transportation Enhancements Project | Construct a shared-use path along SE McLoughlin Blvd from 17th Ave to the Springwater Corridor Trail and build a bicycle parking center at the Tacoma/Springwater light rail station. This project will be coordinated with ODOT to determine the alignment along McLoughlin Blvd. | Portland-Milwaukie Light Rail, SE | $8,000,000 |
| 113160 | Portland | Lents Town Center Active Transportation Demonstration Project | Expand from existing 26 miles of developed bikeway to 53 miles, including improvements of existing facilities. Construct 4 miles of new sidewalks and undertake encouragement programs in support of new infrastructure. | Lents Town Center, SE | $57,000,000 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 113180 | Portland | MLK (Broadway Killingworth) Streetcar Corridor | Corridor Alternatives Analysis, public outreach, planning, design, engineering, and construction for future streetcar extension from Lloyd District to NE Portland. The new extension intended to provide streetcar service from South Waterfront District to Northeast Portland neighborhoods. | MLK (Broadway-Killingworth) | $65,000,000 |
| 113190 | Portland | NW 18th/19th (Saiver/Thurman Streetcar Corridor) | Corridor Alternatives Analysis, public outreach, planning, design, engineering, and construction for future streetcar extension to Con-Way and NW Portland. | NW 18th/19th (Saiver/Thurman) | $35,000,000 |
| 113200 | Portland | NE 60th & Glisan LRT Station Area | Implement pedestrian and bicycle improvements in the 60th Ave MAX Station Area. | NE 60th & Glisan LRT Station Area | $7,570,723 |
| 113230 | Portland | Sullivan's Gulch Trail, Phase 1 | Construct a multi-use trail for pedestrians and bicycles within the Banfield (I-84) Corridor from the Eastbank Esplanade to NE 21st Ave. | Sullivan's Gulch Trail, NE | $7,700,000 |
| 113240 | Portland | Barbur Bridges | Reconstruct existing viaducts. Include bicycle and pedestrian facilities on or parallel to the structures. | Barbur Blvd, SW | $32,000,000 |
| 113610 | Portland | Portland Bike Share | Design and implement a bike share system. | Citywide | $4,690,000 |
| 115590 | Portland | NE Halsey Safety Improvements (40th - 92nd) | Make safety improvements including pedestrian/bicycle crossings, left turn pockets, and improved signal timing. | NE Halsey Safety Improvements (40th - 92nd) | $150,000 |
| 115600 | Portland | Central City Multimodal Safety Improvements | Identify, prioritize, and implement multi-modal safety improvements in the Portland Central City. Includes preliminary development of a new greenway trail south of the Marquam Bridge, providing access to the Tilikum Bridge and the South Waterfront neighborhood. | Central City | $6,616,200 |
| 115610 | Portland | South Rivergate Freight | Make roadway improvements and evaluate alternatives to resolve rail blockages, and reconstruct the N Lombard/Rivergate intersection to accommodate truck turning movements. Install ITS communication infrastructure including advance notification systems for rail blockage and CCTV cameras to monitor truck and rail traffic in the South Rivergate Industrial District | Rivergate, N | $3,552,899 |
| 115620 | Portland | Swan Island ITS | Improve signal timing to improve access to and from Swan Island Industrial area. | Swan Island, N | $551,350 |
| 115640 | Portland | Barbur Demonstration Project 19th Ave. to 26th Ave. | The project will make minor improvements to existing signalized intersections and provide two new enhanced crossings for pedestrians and cyclists along SW Barbur Boulevard. | Barbur (19th Ave. - 26th Ave) | $2,100,000 |



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| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 115670 | Portland | Downtown I-405 Pedestrian Safety and Operational Improvements | Improve pedestrian and bike access from NW Portland to Central City across I-405. Improves traffic operations for I-405 off-ramp. | Central City | $2,240,000 |
| 115690 | Portland | Willamette Greenway Trail/Chimney Park | Construct a pedestrian/bicycle bridge over Columbia Blvd and adjacent connections. Connects North Portland Greenway Trail segments 1 and 2. | Willamette Greenway Trail/Chimney Park, N | $2,612,381 |
| 115700 | Portland | Columbia/Alderwood | Improve traffic operations and freight mobility on Columbia Blvd. between Cully and Alderwood. | Columbia/Alderwood, N | $5,527,534 |
| 115710 | Portland | Barbur/99W Corridor Safety and Access to Transit | This project makes improvements for safety, access to transit, and transit operations in the Barbur-99W corridor. | Barbur/99W, SW | $3,605,001 |
| 115720 | Portland | Powell-Division Safety and Access to Transit | This project makes improvements for safety, access to transit and transit operations in the Powell and Division corridors. | Powell-Division, SE | $2,800,000 |
| 116320 | Portland /Port | North Hayden Island Drive | Reconstruct North Hayden Island Drive from the Burlington Northern Rail Bridge to the I-5 Hayden island Interchange. | North Hayden Island Drive, N | $12,350,000 |
| 116330 | Portland Gresham | Gresham Fairview Trail Phase V | Multi-use path on 185th from Sandy to Marine drive | Gresham Fairview Trail, NE | $1,000,000 |
| 116340 | Portland | 9th Ave Neighborhood Greenway NE | Design and implement a neighborhood greenway along 7th Ave and/or 9th Ave through NE Portland and the Lloyd District. | 9th Ave, NE | $700,000 |
| 116350 | Portland | 9th Ave Neighborhood Greenway SE | Design and implement a neighborhood greenway along 9th Ave through the Central Eastside Industrial District. | 9th Ave, SE | $700,000 |
| 116360 | Portland | NE Multnomah multi-modal improvements | Construct permanent improvements to the NE Multnomah protected bikeway. | Multnomah, NE | $1,000,000 |
| 116380 | Portland | Capitol Highway Safety Improvements | Make safety improvements including pedestrian/bicycle crossings, left turn pockets, and improved signal timing. | Capitol Highway, SW | $150,000 |
| 116390 | Portland | Johns Landing Streetcar | Corridor Alternatives Analysis, public outreach, planning, design, engineering, and construction for future streetcar extension from Portland to Johns Landing. | Johns Landing, SW | $80,000,000 |
| 116400 | Portland | North Portland Greenway Segment 1 | Build a multi-use trail connecting Kelley Point Park to N Columbia Blvd at Chimney Park. | North Portland Greenway, N | $9,559,102 |
| 116410 | Portland | North Portland Greenway Segment 2 | Build a multi-use trail connecting Chimney Park, Pier Park, Baltimore Woods, Cathedral Park, and St Johns. | North Portland Greenway, N | $2,083,874 |
| 116420 | Portland | North Portland Greenway Segment 3 | Build a multi-use trail connecting the Cathedral Park with Swan Island via University of Portland and Willamette Cove. | North Portland Greenway, N | $14,787,630 |



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## LIST OF SIGNIFICANT PROJECTS

| Map ID | Lead Agency | Project Title | Project Description | Location | Rough Cost Estimate (2013-2033) |
|---|---|---|---|---|---|
| 116430 | Portland | North Portland Greenway Segment 4 | Build a multi-use trail connecting Waud Bluff Trail to N Going Street through Swan Island. | North Portland Greenway, N | $5,256,420 |
| 116440 | Portland | North Portland Greenway Segment 5 | Build a multi-use trail along the Albina Yard connecting Swan Island to the Rose Quarter. | North Portland Greenway, N | $7,306,910 |
| 116460 | Portland | NE Broadway Multi-modal improvements (Broadway Bridge - 42nd) | Construct a protected bikeway and enhanced pedestrian/bicycle crossings. | Broadway (Broadway Bridge - 42nd), NE | $3,500,000 |



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··· COMPREHENSIVE PLAN UPDATE ···

# 2035 Comprehensive Plan Proposed Draft

# Comprehensive Plan Map

**July 2014**

**Portland's Comprehensive Plan Update**
**For more information, visit:**
**www.portlandoregon.gov/bps/pdxcompplan**

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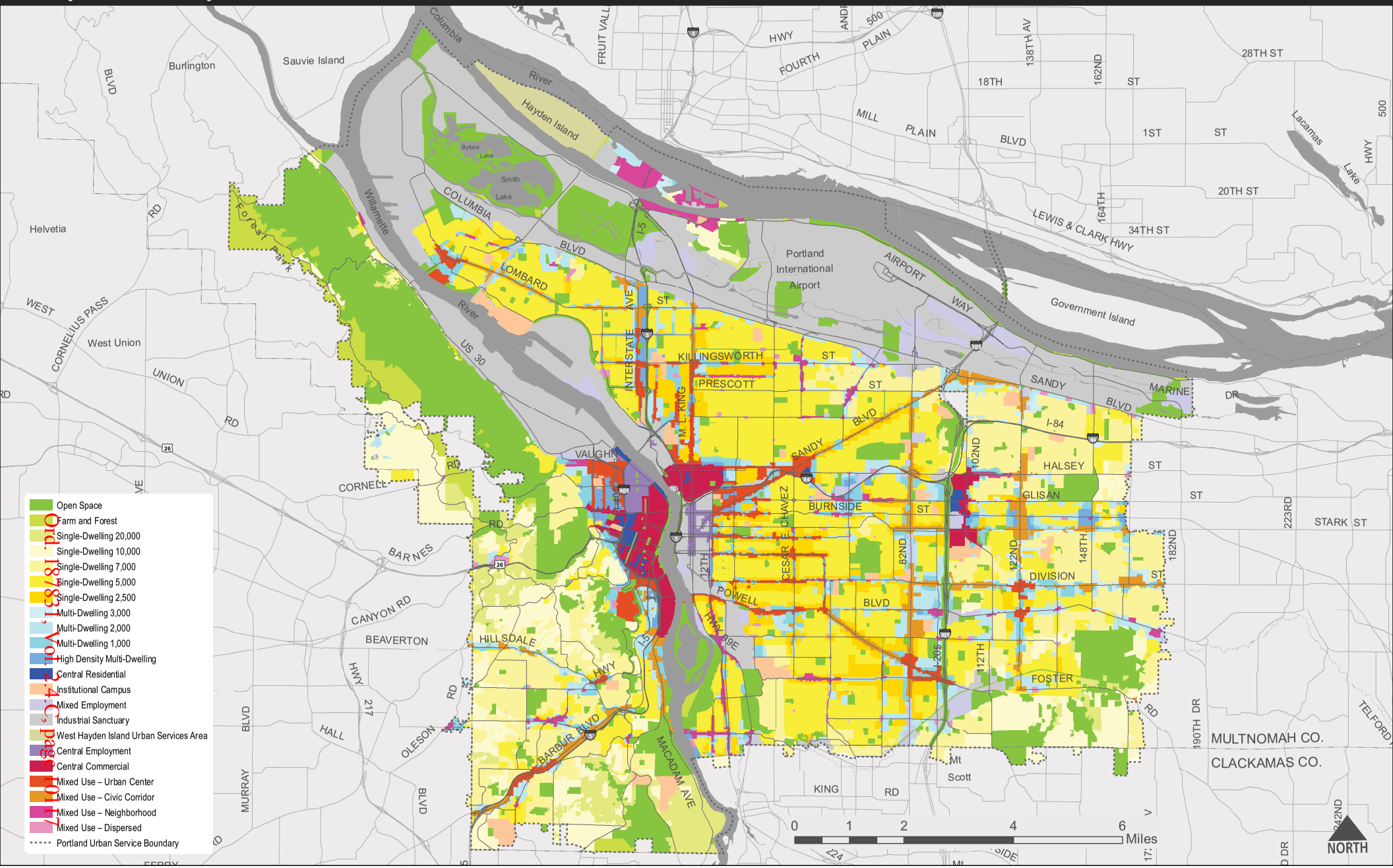
# Proposed Comprehensive Plan

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··· COMPREHENSIVE PLAN UPDATE ···

# 2035 Comprehensive Plan Proposed Draft

# Glossary

**July 2014**

**Portland's Comprehensive Plan Update**
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# Glossary

The Comprehensive Plan uses clear, everyday language as much as possible. Words and terms in the glossary have the specific meaning stated below when used in the Comprehensive Plan, unless the context clearly indicates another meaning. Words not included in this Glossary are defined by their dictionary meaning, or in some cases, by their meaning in state or federal law.

**Accountability:** The ability to identify and hold public officials responsible for their actions.

**Access**: 1) The ability to approach or make use of transportation facilities, parks and open space, public infrastructure, or businesses and services that are open to the public. Good access means within close proximity (up to ½ mile) that is free from physical barriers for those with limited mobility. 2) Providing a wide variety of information and involvement opportunities, activities, and settings as part of meaningful community engagement in public decision-making.

**Accessory dwelling unit:** A second dwelling unit on a lot with a house, attached house, or manufactured home. The second unit is created auxiliary to, and is always smaller than, the house, attached house, or manufactured home. The unit includes its own independent facilities including provisions for sleeping, cooking, and sanitation, and is designed for occupancy by one or more people independent of the primary dwelling unit.

**Active transportation:** Transportation that involves physical activity, including walking, biking, and using transit.

**Adaptive management:** A dynamic planning and implementation process that applies scientific principles, methods, and tools to incrementally improve management activities. Management strategies change as decision makers learn from experience and better information, and as new analytical tools become available. Adaptive management can involve frequent modification of planning and management strategies, goals, objectives, and benchmarks.

**Adopt:** This directs the City to adopt a specific plan or regulation.

**Affordable housing:** Housing that serves extremely low, very low, and low-income households. In determining affordability, the cost of housing, utilities, and transportation are considered. The U.S. Department of Housing and Urban Development (HUD) defines “affordable” as housing that costs no more than 30 percent of a household’s monthly income.

**Aggregate resources:** Naturally occurring concentrations of stone, rock, sand and gravel, decomposed granite, lime, pumice, cinders and other naturally occurring solid materials used in road building.

**Archaeological resource:** Part of the physical record of an indigenous or other culture. Archaeological resources are material remains of past human life or activity, including, but not limited to, monuments, symbols, tools, facilities, technological by-products, and dietary by-products. As defined under state law, archaeological objects are more than 75 years old.



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**Asset management:** The continuous cycle of asset inventory, condition, and performance assessment that aims to provide cost-effective provision of a desired level of service for physical assets. Asset management includes planning, design, construction, maintenance, operation, rehabilitation, and replacing assets on a sustainable basis, while considering social, economic, and environmental impacts.

**Best practice:** An activity that has proven its effectiveness in multiple situations and may have applicability in other situations.

**Bird-friendly building design:** Structural design approaches that reduce the risk of mortality or harm to resident and migratory birds. Approaches may include window and building façade treatments that deter bird strikes (such as patterned glass or reduced exterior glass), exterior and interior lighting designs that direct light downward or otherwise avoid light spill, and turning lights off at night during specified periods.

**Brownfield:** Real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

**Carbon emissions:** Carbon dioxide and other greenhouse gas equivalents from the mining and use of fossil fuels in homes, industry, business, transportation, and electricity generators.

**Centers:** Places with concentrations of commercial and community services, housing, gathering places, and transit connections. Centers provide services to surrounding neighborhoods and are intended to be enhanced as places because they are a focus of housing and job growth. There are four types of centers with varying functions, levels of activity, and scales and intensities of development:

- **Central City:** Corresponds to the Central City plan district, which serves as the region's premier center, anchoring an interconnected system of centers.
- **Gateway Regional Center:** Corresponds to the Gateway plan district, East Portland's largest center, which is intended to be enhanced as an employment and community service hub within the area and region.
- **Town Centers:** Large centers that serve a broad area of the city and have an important role in accommodating growth. They provide a full range of commercial and community services, high-density housing, mid-rise commercial and mid-rise mixed-use buildings (typically up to five to seven stories in height), are served by high-capacity transit connections, and have a substantial employment component. Town Centers provide housing opportunities for enough population to support a full-service business district.
- **Neighborhood Centers:** Centers that primarily serve adjacent neighborhoods and provide opportunities for additional housing and low- to mid-rise commercial and mixed-use buildings (typically up to three to five stories in height). They provide a range of local commercial and community services and transit connections. Neighborhood



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Centers provide housing opportunities for about half the population needed to support a neighborhood business district.

**Centers and corridors:** When used together, "centers and corridors" refers generally to places where development is concentrated, including the Central City and the Gateway Regional Center, Town Centers, and Neighborhood Centers, and along Civic Corridors and Neighborhood Corridors, and at Transit Station Areas.

**City:** City is capitalized when it refers specifically to City of Portland government. When it is used to designate a geographic area it is not capitalized.

**City Greenways:** A system of distinctive pedestrian- and bicycle-friendly green streets and trails, enhanced by lush tree canopy and landscaped stormwater facilities that support active living by expanding recreational opportunities and making it easier and more attractive to reach destinations across the city. City Greenways are a network that includes the following types of infrastructure:

1. Enhanced greenway corridors are distinctive green streets with extensive tree canopy and landscaped stormwater facilities that provide connections between major centers, schools, parks, natural areas, and the rivers.

2. Trails are often located along rivers or through natural areas, providing pedestrian and bicycle connections.

3. Heritage parkways are iconic streets or segments of streets with elements such as linear parkways, scenic views, and distinctive landscaping or street design.

4. Neighborhood greenways are an extensive network of streets with low volumes of motor vehicle traffic that are prioritized for bicycles and pedestrians, working in conjunction with the rest of the City Greenways system to extend the system into all neighborhoods.

**Clustered housing/clustered services:** This is a non-traditional housing model that refers to housing that is built, planned, or organized to offer long-term living services. Housing options range from cottages to multi-unit high rises and can be on single lots or campus settings. In most cases the service provider, rather than the housing provider, is responsible for delivery of services**.**

**Cohousing:** This is a non-traditional housing model that is designed to foster an intentional community and cooperation, while preserving independence. Cohousing combines the autonomy of private dwellings with the advantages of community living by clustering private residences near shared facilities. The members typically design and manage all aspects of their community.



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**Community:** A group of people with a shared sense of identity or belonging.

**Complete neighborhood**: A neighborhood where people have safe and convenient access to the goods and services needed in daily life, which include a variety of housing options, grocery stores and other commercial services, high-quality public schools, and parks. Complete neighborhoods are also easily accessible by foot, wheelchair, bike, and transit for people of all ages and abilities.

**Complete streets:** Complete streets provide accessibility to all users of the right-of-way regardless of age, ability, or mode of transportation. They are designed and operated to make better places and to enable safe access for all modes, including people walking and bicycling, those using a mobility device, motorists, and transit riders.

**Conflict with:** Incompatible or irreconcilable with.

**Consider:** Take into account when planning or making decisions.

**Continue:** Persist in an activity or process.

**Coordinate:** Work together with others toward a common goal; collaborate.

**Corridor:** An area that may be a single major street, or a broad mobility corridor that provides connections for a range of transportation modes (transit, pedestrians, cyclists, freight, motor vehicles, and so forth), not necessarily on the same street. There are three types of corridor:

- **Civic Corridor:** These are a prioritized subset of the city's most prominent transit and transportation streets. They connect centers, provide regional connections, and include segments where commercial development and housing are focused. Civic Corridors are intended to continue their important transportation functions while providing livable environments for people, and evolving into distinctive places that are models of ecological design.

- **Neighborhood Corridor:** Main streets that connect neighborhoods with each other and to other parts of the city. They support neighborhood business districts and provide housing opportunities close to local services, amenities, and transit lines. They are streets that include a mix of commercial and higher-density housing development. They have less intense development and transportation function than Civic Corridors.

- **Freight Corridor:** Primary routes into and through the city that support Portland as an important West Coast hub and a gateway for international and domestic trade. These facilities are integral to the growth of traded sector businesses such as manufacturing, warehousing, and distribution industries.



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**Cost burdened households:** According to the U.S. Department of Housing and Urban Development (HUD), any household that spends more than 30% of its income on housing is categorized as a "cost burdened household." Because they are burdened by housing costs, such households may have difficulty affording other necessities such as food, clothing, transportation, and medical care.

**Critical infrastructure:** Systems that are essential for the functioning of society and the economy, including energy generation, transmission and distribution; telecommunications; water supply and wastewater; transportation systems; public health; and security and emergency response services.

**Cultural resource:** Aspects of cultural systems that contain significant information about a culture. These resources include, but are not limited to, districts, sites, buildings, structures, and objects that are associated with people, cultures, and human activities and events, either in the present or in the past.

**Design:** Determine the shape or configuration of something. This verb is used for physical outcomes for which the City will establish parameters for plans and through implementation.

**Discourage:** To try to deter or prevent from happening.

**Displacement:** Households or businesses involuntarily forced to move from a neighborhood because of increasing market values, rents, or changes in the neighborhood's ability to meet basic needs in the case of households or erosion of traditional client base in the case of businesses.

**Ecodistricts:** Areas, typically located in centers, where energy, water, and resource efficiency approaches are undertaken at a district scale, sometimes including district energy systems and other shared systems.

**Ecological function:** The physical, chemical, and biological functions of a watershed such as flow conveyance and storage, channel dynamics, nutrient cycling, microclimate, filtration, control of pollution and sedimentation, water quality, terrestrial and aquatic habitat, and biodiversity.

**Ecosystem services:** The contribution of ecosystem conditions and processes to human well-being, including the production of goods and processes that control variability, support life, enrich cultural life, and preserve options. Examples include pollination of trees and plants, climate regulation, flood mitigation, stormwater management, clean air and water, recreational opportunities, and satisfaction of aesthetic and spiritual needs.

**Enable:** To supply with the means, knowledge, or opportunity; make able.

**Encourage:** Promote or foster something that people or other organizations are already doing or could do.

**Ensure:** To make something certain; to make sure that something will happen or be available.



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**Environmental justice:** The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

**Equity:** Equity is when everyone has access to the opportunities necessary to satisfy their essential needs, advance their well-being, and achieve their full potential.

**Establish:** Create something, such as a program or project, that does not yet exist.

**Expand:** Make something that already exists more extensive.

**Evaluate:** Assess the range of outcomes, and identify costs and benefits.

**Facilitate:** To make something easier; to help bring about or make run more smoothly.

**Family wage:** The minimum income necessary, depending on family size, for a person working forty hours a week to meet their basic needs, such as housing, food, health care, childcare, and transportation.

**Foster:** This directs the City to encourage or guide the incremental development of something over a long period of time.

**Gentrification**: An under-valued neighborhood that becomes desirable, resulting in rising property values and changes to demographic and economic conditions of the neighborhood. These changes include a shift from lower-income to higher-income households, and often there is a change in racial and ethnic make-up of the neighborhood's residents and businesses.

**Green infrastructure:** Public or private assets — either natural resources or engineered green facilities — that protect, support, or mimic natural systems to provide stormwater management, water quality, public health and safety, open space, and other complementary ecosystem services. Examples include trees, ecoroofs, green street facilities, wetlands, and natural waterways.

**Green street:** A green street is a landscaped street side planter or bioswale that captures stormwater runoff from the street and allows it to soak into the ground as soil and vegetation filters out pollutants.

**Guide:** Shape or direct actions over time to achieve certain outcomes. This verb is used when the City has a role in shaping outcomes, but implementation involves multiple other implementers and actions taking place over a long period of time.

**Habitat Corridor:** Natural and built areas that provide safe, healthy places for resident and migratory fish and wildlife species that live in and move through the city. As a system they link habitats in Portland and the region, facilitating safe fish and wildlife access and movement through and between habitat areas. Enhanced habitat corridors are places where there is existing significant fish or wildlife habitat, as identified in the Natural Resource Inventory, and where habitat connectivity will be improved over time. Potential habitat corridors will be established over time. They are places where habitat features and functions (e.g., trees,



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vegetation, nesting and perching sites and food, etc.) will be integrated into generally more developed areas of the city.

**Habitat-friendly development:** Strategies to provide habitat for and prevent harm to native resident and migratory wildlife. Examples include habitat-oriented ecoroofs, bridges, buildings, and sites, including features such as nest platforms and bat boxes. Strategies also involve development design and practices that: limit the amount of light, noise, vibration, and other disturbance that negatively affect wildlife and wildlife habitat, especially during vulnerable wildlife life cycles (such as mating/nesting season and migration); improve wildlife access and passage, by limiting fencing, roads, culverts and other barriers between important habitats (desirable feeding and watering sites, for example); and minimize the impact of construction on and in rivers.

**High-capacity transit:** High capacity transit is public transit that has an exclusive right of way, a non-exclusive right of way, or a combination of both. Vehicles make fewer stops, travel at higher speeds, have more frequent service, and carry more people than local service transit such as typical bus lines. High-capacity transit can be provided by a variety of vehicle types including light rail, commuter rail, streetcar, and bus.

**High-density housing:** Refers generally to higher-density housing that is mid- to high-rise in building scale.

**High performance and green homes:** High performance and green homes conserve energy and water, are healthier for the occupants and the environment, have lower utility bills, manage stormwater, and are more durable and adapt to the long-term needs of their residents through design that accommodates people of all ages and abilities. To ensure performance, high performance and green homes must be assessed and rated by a third-party green building certification program.

**High-rise:** Buildings more than 10 stories in height.

**High-risk infrastructure:** Infrastructure assets that have a high risk of failure, based on the likelihood and consequence of that failure.

**Historic resource:** A structure, place, or object that has a relationship to events or conditions of the human past. Historic resources may be significant for architectural, historical, and cultural reasons. Examples include historic landmarks, conservation landmarks, historic districts, conservation districts, and structures or objects that are identified as contributing to the historic significance of a district, including resources that are listed in the National Register of Historic Places. Structures, places, and objects that are included in historic inventories are potential historic resources.

**Housing + transportation (H+T) cost burden:** A household's ability to afford a house or apartment is most often measured by calculating the percentage of household income devoted to housing costs, the single biggest expense for most households. However, transportation costs are typically the second-biggest draw on household income. Current thinking suggests



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that to get a true measure of household cost burden, you need to combine housing (H) and transportation (T) cost. The measure for the Portland Metro area is that households spending more than 50 percent of their income on housing and transportation are considered cost burdened.

**Hydrologic:** Of or pertaining to water.

**Hydrologic cycles:** The movement of water on, in, and above the earth.

**Implement:** To put something into effect.

**Improve:** Make the current situation better; increase; enhance; expand services or facilities; to become better in terms of quality or condition.

**Income self-sufficiency:** Households with adequate income, based on family type, to cover local costs of basic needs, such as housing, food, health care, childcare, and transportation.

**Include:** Incorporate as part of a whole.

**Infrastructure:** Consists of assets in two general networks that serve whole communities—transportation modalities (roads, rail, etc.) and utilities. These are necessary municipal or public services, provided by the government or by private companies and defined as long-lived capital assets that normally are stationary and can be preserved for a significant number of years. Examples are streets, bridges, tunnels, drainage systems, water and sewer lines, pump stations and treatment plants, dams, and lighting systems. Beyond transportation and utility networks, Portland includes buildings, green infrastructure, communications, and information technology as necessary infrastructure investments that serve the community.

**Inner Ring districts:** Parts of the Inner Neighborhoods that are within walking distance of the Central City, as shown on the Pattern Areas map in the Chapter 3, Urban Form.

**Invest:** Spend money and/or other resources.

**Lessons learned:** Insights drawn from past actions, projects, and operations that are applied to or inform current and future projects. Lessons can be positive or negative, in that they may recommend that an approach be replicated or avoided in the future.

**Level of service:** A defined standard against which the quality and quantity of service can be measured. A level of service can take into account reliability, responsiveness, environmental acceptability, customer values, and cost.

**Limit:** Minimize something or the effects of something.

**Living wage:** The minimum income necessary for a person working forty hours a week to meet their basic needs, such as housing, food, health care, childcare, and transportation.

**Low-density areas:** Refers generally to residential areas outside centers and corridors that are predominantly zoned for single-dwelling housing and lower-density multi-dwelling housing.



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**Low-impact development:** Strategies to reduce the environmental impact of development on natural systems, including hydrology and vegetation. These strategies include using paving and roofing materials that reduce impervious area; clustered or small lot development that reduces disturbance area; vegetated stormwater management that mimics pre-development site hydrology; alternative road layout and narrower streets; natural area protection; and landscaping with native plants.

**Low and moderate income:** Typically based on annual Median Family Income (MFI) limits published by HUD. Households earning: 0-30% MFI are "extremely low-income"; 31-50% MFI are "very low- income"; 51-80% MFI are "low-income"; 81-120% MFI are "moderate-income".

**Low-rise:** Buildings up to four stories in height.

**Maintain:** Keep what you have; conserve; preserve; continue.

**Mid-rise:** Buildings from five to 10 stories in height.

**Needed housing units:** Statewide Planning Goal 10 defines needed housing units as housing types determined to meet the need shown for housing within an urban growth boundary at particular price ranges and rent levels. The term also includes government-assisted housing. For cities having populations larger than 2,500 people and counties having populations larger than 15,000 people, "needed housing units" include (but are not limited to) attached and detached single-family housing, multiple-family housing, and manufactured homes, whether occupied by owners or renters**.**

**Neighborhoods:** Broad areas of the city that typically include residential, commercial, and mixed-use areas. Neighborhoods are physical communities located outside of the Central City and large industrial areas. In general, the word "neighborhoods" is not intended to refer to specific neighborhood association geographies.

**Neighborhood business districts:** Commercial areas outside the Central City, usually adjacent to neighborhood residential areas. A subset of neighborhood business districts are designated as centers, which, in addition to their commercial functions, are prioritized as a focus for residential growth and community amenities and services. Other neighborhood business districts allow residential development, providing additional housing options close to services, but are not a prioritized focus for this growth.

**Non-traditional housing types:** Housing types and models that do not conform to existing practices or standards of housing development and household living. A unit can be non-traditional based on its construction materials or the living arrangements of its occupants. Cohousing is one non-traditional housing type.

**Older adults:** Population over 65 (as defined by the Age-Friendly City Action Plan).

**Pattern Areas:** Five primary geographies in Portland that have differing physical characteristics, needs, and assets. Each of these areas has unique topographies and natural features, patterns



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and types of development, street and other infrastructure characteristics, and histories that have shaped their urban form. The five primary Pattern Areas are:

- **Central City:** This area corresponds to the Central City plan district and is also a major center.
- **Inner Neighborhoods:** This area includes inner portions of the city that originally developed during the streetcar era, prior to World War II. It includes a large part of the city east of the Willamette River, extending roughly to 82nd Avenue, and also the inner westside "flats," located between the river and the West Hills.
- **Western Neighborhoods:** This area includes the West Hills (Tualatin Mountains) and areas to the west.
- **Eastern Neighborhoods:** This area includes eastern portions of the city, mostly located east of 82nd Avenue and largely annexed to Portland in the 1980s and 1990s.
- **Industrial and River:** This area includes land along the Columbia River and Columbia Slough, and areas along the Willamette River north of the Central City.

**Permanently affordable housing:** This refers to a housing status which means that a certain unit, whether rented or owned, continues to remain affordable to lower income households. A variety of programs and strategies are used to keep the unit mostly below market price. For example, properties with homes that are rented are owned and operated by nonprofit charitable corporations that agree to hold this real estate to provide affordable shelter in perpetuity. Similarly, for homeownership units, the land remains public while the unit is sold below market price with restrictions on resale.

**Placemaking:** The collaborative act of identifying current or creating new, distinctive public environments or places to be experienced by people. These places build on existing assets that include physical, social, or natural characteristics.

**Plans and investments:** Legislatively adopted land use plans, zoning maps, zoning regulations, comprehensive plan map designations, and changes to the List of Significant Projects.

**Portlanders:** People who live, work, do business, own property, or visit Portland, including people of any race, ethnicity, sex, gender or gender identity, sexual orientation, belief system, political ideology, ability, socioeconomic status, educational status, veteran status, place of origin, language spoken, age, or geography.

**Prevent:** Don't allow at all; stop from happening; prohibit.

**Prime industrial land:** According to Statewide Land Use Planning Goal 9, land that is suited for traded sector industries and possesses site characteristics that are difficult or impossible to replace elsewhere in the region.



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**Prioritize:** To treat something as more important than something else. Policies that use this verb must identify the thing that will be treated as more important, and the thing that will be treated as less important.

**Priority populations:** For housing, a program implementation approach designed to improve access and outcomes and eliminate disparities based on race and ethnicity for those who currently and have historically been under-served.

**Prosperity:** When the term prosperity is used, it includes prosperity for households not just for businesses.

**Protect:** To defend or guard against loss, injury, or destruction.

**Provide:** To supply, offer, or make available. The City must be able to supply the item or service in question.

**Public realm:** The system of publicly accessible spaces that is made up of parks and other open spaces, streets, trails, public or civic buildings, and publicly-accessible spaces in private buildings (such as lobbies or courtyards). This system works with, and is framed by, adjacent development and building edges that help energize and define the public spaces of streets, sidewalks and parks.

**Reduce:** Have less of something than in the current situation.

**Remove:** To do away with; eliminate.

**Require:** Compel; demand something.

**Residential areas:** Predominantly residential areas located outside centers, civic corridors, and transit station areas.

**Resilience/resiliency:** The capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment.

**Restore:** Recreate elements that are missing; move something back to its original condition; rehabilitate.

**Shared governance:** Shared decision making between the community and the City of Portland. Shared governance is based on partnerships, equity, accountability, and community ownership. This model empowers all Portlanders to have a voice in decision making, thus encouraging diverse and creative input that will help advance the vision and goals of the City of Portland.

**Short-term supply of employment land:** According to Statewide Land Use Planning Goal 9, suitable land that is ready for construction within one year of an application for a building permit or request for service extension. Engineering feasibility is sufficient to qualify land for short-term supply, and funding availability is not required.



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**Strive:** Devote serious effort or energy to; work to achieve over time.

**Support:** To keep from weakening.

**Traded sector:** A business sector consisting of companies that compete in markets extending beyond the metropolitan region. These companies include exporters to markets outside the region, suppliers to regional exporters, and businesses whose products substitute for regional imports.

**Transit Station Areas:** Areas within ½ mile of light rail and other high-capacity transit stations. Some transit station communities are located within centers or civic corridors and are subject to policies for those types of places.

**Transparency:** Reliable, relevant, and timely publicly available information about government activities and decision making.

**Under-served:** People and places that historically and currently do not have equitable resources, access to infrastructure, healthy environments, housing choice, etc. Disparities may exist both in services and outcomes.

**Under-represented:** People and communities that historically and currently do not have an equal voice in institutions and policy-making, and have not been served equitably by programs and services.

**Universal Design principles:** Underlying Universal Design is the principle that buildings and their sites should be built or renovated in ways that can work for all — for a "universal" population. People have varying abilities, temporary or permanent, throughout life. Rather than doing special or separate design to accommodate differences in age and ability, Universal Design principles foster design that works for all. The seven principles of Universal Design are equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use.

**Urban heat island:** The urban heat island effect is a measurable increase in ambient urban air temperatures resulting primarily from the replacement of vegetation with buildings, roads, and other heat-absorbing infrastructure. The heat island effect can result in significant temperature differences between rural and urban areas.

**Utilize:** To put to use; to make practical or worthwhile use of. Conveys intention to apply a resource toward a purpose.

**Watershed:** A watershed is the area that catches rain and snow and drains into a corresponding river, stream, or other waterbody. It is a geographic area that begins at ridge tops (highest elevations) and ends at a river, lake, or wetland (lowest elevation). Within a watershed, there can also be sub-watersheds. These drainage areas are smaller and are defined by their tributaries.



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# Acknowledgements


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Watershed Health and Environment

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··· COMPREHENSIVE PLAN UPDATE ···

# Citywide Systems Plan

## Proposed Draft

**July 2014**

**Portland's Comprehensive Plan Update**
**For more information, visit:**
**www.portlandoregon.gov/bps/pdxcompplan**

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## Provide testimony online via the MapApp, by email, letter or in person.

| | |
|---|---|
| **ONLINE VIA THE MAPAPP** | **www.portlandoregon.gov/bps/mapapp** |
| **EMAIL** | *Send to* **psc@portlandoregon.gov**<br>*with "Comprehensive Plan Testimony" in the subject line.*<br>*Be sure to include your name and mailing address.* |
| **LETTER** | *Send a letter with your comments to:*<br>**Planning and Sustainability Commission**<br>**1900 SW 4th Avenue**<br>**Portland, OR 97201-5380** |
| **IN PERSON** | *Attend a public hearing to offer oral testimony directly to the Planning and Sustainability Commission:*<br>**September 23, 2014 at 5 p.m.**<br>(Focus on Goals and Policies)<br>1900 SW 4th Avenue, Room 2500A<br>**October 14, 2014 at 5 p.m.**<br>(Focus on Maps)<br>Community location TBD<br>**October 28, 2014 at 5 p.m.**<br>(Focus on Maps)<br>Community location TBD<br>**November 4, 2014 at 4 p.m.**<br>(Focus on Citywide Systems Plan and Transportation System Plan)<br>1900 SW 4th Avenue, Room 2500A |

*To be considered formal testimony, you must include your name and address in your letters, emails or online comments. Comments received without your full name and mailing address will not be included in the Planning and Sustainability Commission's record, and the City will not be able to notify you of City Council hearing dates. In addition, if your name does not appear in the record for this proceeding, you may be precluded from appealing the Council's final decision.*

*Check www.portlandoregon.gov/bps/compplan for updated information on these and other events.*

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# Reader's Guide

The Comprehensive Plan guides the location of population and job growth as well as public investments in infrastructure, such as streets, sidewalks, parks and stormwater systems, over the next 20 years. It is one of multiple tools that implement the Portland Plan, the City of Portland's strategic roadmap. The Comprehensive Plan sets guidelines for community involvement and influences private development and public facilities — all to ensure Portland is on a path to becoming a more prosperous, healthy, educated, equitable and resilient city.

The Citywide Systems Plan (CSP), a support document to the Comprehensive Plan, guides infrastructure investments to meet the needs of current and future Portlanders.

## Purpose of the Citywide Systems Plan

The Citywide Systems Plan is a 20-year (2013-2033), coordinated municipal infrastructure plan for areas within the City of Portland's urban service boundary. Portland's municipal infrastructure assets are physical systems that provide services and are maintained by the City. These include transportation networks; water storage and distribution; sewer and stormwater collection and treatment facilities; parks and recreation facilities; other facilities such as City Hall, office buildings, and fire and police stations; and technology assets.

The State of Oregon's Growth Management Act requires cities and counties to develop and implement public facilities plans. At a minimum, the public facilities plan (PFP) must describe transportation, water, and sewer facilities needed to support the land uses designated in the acknowledged Comprehensive Plan. Portions of the Citywide Systems Plan will serve as the City's State-mandated public facilities plan.

The Citywide Systems Plan includes inventory, condition, and future project information for City transportation, water, sanitary sewer, and stormwater systems, as required by Oregon Planning Goal 11: Public Facilities and Oregon Revised Statute 197. To provide a more complete picture of the City's infrastructure, the Plan also includes similar information for parks, recreation, and other facilities and systems provided by the City of Portland. Reporting on these facilities and systems is not required by State statutes.

## Plan Overview

The Citywide Systems Plan includes the following chapters:

- **Chapter 1. Infrastructure Planning and Coordination** provides an overview of the regional and local planning context for the Citywide Systems Plan and the process for developing the Plan.
- **Chapter 2. Asset Management** describes the City's asset management approach and details key trends and needs.
- **Chapter 3. Guiding Principles** discusses of how the Plan relates to and supports the Comprehensive Plan's integrated Guiding Principles.


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- **Chapter 4. Summary of Infrastructure and Service Delivery** provides an overview of the City's infrastructure systems and the investment strategy outlined in the Plan.
- **Chapter 5. Goals and Policies** includes goals and policies form the Public Facilities and Services and Transportation chapters of the Comprehensive Plan Goals and Policies.
- **Chapters 6** through **Chapter 10** include more detailed inventories of existing systems, discussions of infrastructure needs, and investment strategies for the City's major infrastructure systems – sewer and stormwater, water, transportation, parks and recreation, and other essential facilities and services (e.g. public safety and technology).

# Process

The Citywide Systems Plan (CSP) was developed by the Citywide Systems Team, a cross-bureau group with representatives from the Bureau of Planning and Sustainability, Bureau of Transportation, Bureau of Environmental Services, Portland Water Bureau, Portland Parks & Recreation, and Office of Management and Finance. The document draws from other plans and projects, including the Portland Plan, other components of the Comprehensive Plan Update, community and agency input, and a wide variety of bureau and agency plans.

The Citywide Systems Plan reflects community conversations that occurred as part of the Comprehensive Plan Update, including Policy Expert Group discussions, public workshops and comments from individuals, associations, businesses, and agencies. A Working Draft of the CSP was available for public review and comment from October through December 2013 – prior to the formal legislative review process.


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# Chapter 1
# Infrastructure Planning and Coordination

## Public Facility Provision in Portland

The City of Portland is the primary urban public facility and service provider for water, sewer, stormwater, transportation, civic, parks and recreation within its municipal boundaries. The City of Portland provides these facilities and services to protect the health and safety of Portlanders, safeguard the natural environment, and support economic prosperity. To meet these goals, the City of Portland's infrastructure bureaus steward public investments in these public facilities systems.

A variety of other public agencies work in partnership with the City to provide complementary infrastructure necessary to provide these systems to all Portlanders. The role of these agencies is discussed in greater detail in the relevant system-specific chapters of this plan. For example, drainage districts provide flood management (see Chapter 6); the Rockwood PUD provides water service to portions of east Portland (see Chapter 7); TriMet provides much of the City's public transportation system; the Port of Portland provides air and marine transportation; and Metro provides regional parks (see Chapter 9).

In addition, non-City agencies and companies provide the entirety of public facilities for public education; energy; waste; telecommunications; library; public health; and justice services:

- Public education is provided by Portland Public Schools and the David Douglas, Parkrose, Reynolds, Centennial, and Riverdale School Districts, as well as public colleges and universities. The City partners with school districts on related school facility planning and siting.
- Solid waste, composting, and recycling are provided by Metro, the City and private companies. Metro is the regional solid waste authority, charged with ensuring that the region's solid waste is managed in a manner that protects public health and safety and safeguards the environment. The City partners with Metro and supports Metro's work to ensure sound landfill management. The City regulates collection and hauling; Metro regulates facilities and operates transfer stations; and private companies collect, transfer, process, and dispose of solid waste, compost, and recycling.
- Energy and communications are provided by private utilities and companies. Telephone and communications service is provided by Qwest, Comcast, Verizon, and various wireless providers. Gas and electricity are provided by Northwest Natural, Pacific Power, Portland General Electric, and various small fuel oil companies.
- Libraries are provided by Multnomah County.
- Public health, human services, and justice services are primarily provided by Multnomah County and the State of Oregon.

The City has an interest in coordinating with these agencies and companies to ensure adequate service provision to current and future Portlanders. Additionally, the City plays a role in regulating the siting of, licensing, and/or franchising of some of these facilities.


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# The Citywide Systems Plan

The Citywide Systems Plan (CSP) is a coordinated 20-year plan for the City of Portland's municipal infrastructure systems, including transportation, water, stormwater, sewer, parks and natural areas, and other publicly owned facilities and systems. Many of these systems are supplemented by public facilities that are owned and managed by other public agencies, nonprofit organizations, and private entities. The CSP acknowledges these critical relationships but only describes and plans for City systems.

The Citywide Systems Plan represents a significant update to the 1989 Public Facilities Plan to reflect updated regional and local planning and practices. It serves as a long-range, coordinated plan to guide future public infrastructure investments. Portions of the plan – including Citywide, Bureau of Environmental Services, Portland Water Bureau, and Portland Bureau of Transportation chapters - serve as the City's state-mandated public facilities plan, as required by Oregon Planning Goal 11: Public Facilities and Oregon Revised Statute 197.

However, the CSP goes beyond the State planning requirements and includes a more coordinated and comprehensive look at the City's infrastructure based on community values and best practices. To this end, the CSP includes chapters related to parks and recreation and other essential facilities, such as technology and civic assets. The CSP recognizes the critical roles these systems play in meeting the needs of Portlanders and supporting the overall mission of the City of Portland.

The 1989 Public Facilities Plan and the list of significant projects intended to implement the plan are outdated. City infrastructure bureaus have completed a number of facilities plans that have not been included in a citywide public facilities plan. The CSP incorporates these updated plans, improves coordination between infrastructure planning efforts, and considers the community's infrastructure priorities in a consistently manner.

The CSP reflects a number of significant changes since the 1989 Public Facilities Plan in the internal and external conditions surrounding local capital planning, including:

- The City of Portland has grown significantly, adding over 155,000 residents between 1990 and 2011. By 2035, the city is expected to grow by approximately 260,000 people (123,000 households) and 142,000 new jobs.
- The Portland metropolitan region – of which the City of Portland is the employment, housing, and transportation center – has grown by over 1 million people.
- The planning area for the City of Portland changed significantly with the annexation of the Pleasant Valley area. A public facilities plan for Pleasant Valley was completed, but was not integrated into a citywide public facilities plan.
- Metro completed the Region 2040 Growth Concept and the Urban Growth Management Functional Plan, which provide long-term guidance for future growth and development.
- City priorities have shifted and now include the need to:
    - Address aging infrastructure;
    - Improve equity and address service deficiencies;


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  - Focus growth in centers and corridors;
  - Support economic development and household prosperity;
  - Incorporate sustainable development; green infrastructure; and the protection, restoration, and management of natural systems;
  - Build resilience to natural hazards, manmade disasters, and a changing climate through carbon emission reductions, natural hazard mitigation, and preparation;
  - Meet new and expanded State and federal regulations; and
  - Foster inter-bureau collaboration.

- The Portland Plan, adopted in 2012, provides a strategic framework for both the City's short-term actions and long-range goals and policies, focused around priorities of equity, prosperity, health and education.
- The City has advanced its asset management practices, providing more comprehensive and detailed information about the investments needed to provide and maintain infrastructure services.
- The City recognizes the value of green infrastructure and natural system approaches that can improve infrastructure performance and reduce costs while also improving neighborhood livability and watershed health.
- Analytical tools and technology are vastly different: Metro now provides a centralized data resource; the City has a demographer on staff; and GIS, computer modeling, and other technologies allow for fundamentally new analysis and exploration of data.

## Purpose and Objectives

The Citywide Systems Plan has been developed to meet a number of objectives. It is intended to:

- Guide and coordinate future public infrastructure investments to maintain existing systems, resolve existing deficiencies, serve new residential and employment growth, and meet long-term infrastructure needs.
- Reflect current practices and policies, as expressed in the Comprehensive Plan and system-specific plans.
- Meet State planning requirements under the growth management act.
- Incorporate and respond to the community vision and goals highlighted in visionPDX and the Portland Plan.
- Provide policy recommendations and a list of significant projects for the Comprehensive Plan.

# Meeting Growth Management Planning Requirements

The Citywide Systems Plan responds to State, regional, and local growth management and infrastructure planning requirements as well as community objectives. An update of the 1989 Public Facilities Plan is necessary to meet these planning requirements and accurately reflect community values and goals.


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# State Planning Requirements

## Comprehensive Planning

In 1973, Oregon adopted Senate Bill 100 establishing a statewide land use planning program to "provide for the protection of farm and forest lands, conservation of natural resources, orderly and efficient development, coordination among local governments, and citizen involvement". "The program affords all Oregonians predictability and sustainability to the development process by allocating land for industrial, commercial, and housing development, as well as transportation and agriculture." Oregon's land use program is administered at the State level by the Department of Land Conservation and Development (DLCD) and is guided by the Land Conservation and Development Commission (LCDC), a volunteer citizen board.

Under the program, all cities and counties in Oregon are required to create, adopt, and implement local comprehensive plans to guide growth and development, and to protect resources within their jurisdictions. These plans must meet mandatory State standards included in the 19 Statewide Planning Goals, which address land use, development, housing, transportation, and conservation of natural resources.

### *History of Portland's Comprehensive Plan*

The City of Portland adopted its first Comprehensive Plan in October 1980, after significant public input and planning. The Plan has been amended many times since. Portland's Comprehensive Plan includes three primary elements: a set of goals and policies that apply to the entire city; a list of significant public facility projects; and a set of mapped features. These features include land use designations, street classifications, the city limits, and the urban service boundary.

Since the Comprehensive Plan's adoption in October 1980, all of City Goal 6 (Transportation) and parts of City Goal 11 (Public Facilities) have been amended. The Transportation Goal received major revisions in 1992, 1996 and 2002. In October 2004, the Transportation System Plan received a technical update. The Public Facilities Goal was amended with an urban services study (1983) and transportation policy updates (1996 and 2002).

The City's List of Significant Projects was adopted with the completion of the City's first Citywide Systems Plan in 1989. It has been amended by subsequent updates of the Transportation System Plan and by updates to the sanitary sewer element in 2011.

In 2009, the City began the first major update to the Comprehensive Plan since it was adopted in 1980. The Working Draft Part 1 of the update, released for public review in January 2013, included draft goals and policies for public facilities and transportation. The Working Draft Part 2, released for public review in October 2013, included an initial draft of the Citywide Systems Plan as well as the Map App, an interactive online mapping tool that illustrated existing conditions and potential planning and investment options. A Proposed Draft of the full Comprehensive Plan update was published for legislative review in July 2014.


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## Public Facilities Planning

The State of Oregon's Growth Management Act requires cities and counties to develop and implement public facilities plans. At a minimum, the public facilities plan (PFP) must describe transportation, water, sewer, and stormwater facilities needed to support the land uses designated in the acknowledged Comprehensive Plan. Public facilities plans typically have a 20-year time horizon and help to identify capital improvement projects (5-year horizon) and capital budgets (1-year horizon).

State requirements for public facilities plans are found in Statewide Goal 11: Public Facilities, Oregon Statute 197 and Oregon Administrative Rule 660. To meet these State requirements, the Citywide Systems Plan, which will serve as the City of Portland's public facilities plan, includes:

- An inventory and general assessment of the conditions of all of the significant public facility systems which support the land uses in the acknowledged comprehensive plan;
- A list of significant public facilities to support the land uses designated in the acknowledged comprehensive plan;
- Rough cost estimates of each public facility project;
- A map or written description of each public facility project's general location or service area;
- Policy statements or urban growth management agreements identifying the provider of each public facility system;
- An estimate of when each facility will be needed; and
- An assessment of the financial capacity of the City to complete needed infrastructure improvements and a discussion of existing and potential funding mechanisms. '

DLCD evaluates public facilities plans for inclusion of required elements; whether the plan contains all agreements (urban growth management, any special districts, or State agency coordination); and whether the public facilities plan is consistent with the acknowledged Comprehensive Plan, the Metro Functional Plan, and statewide planning goals.

The Public Facilities Plan (PFP) is a support document to a comprehensive plan. Some elements of a PFP must be adopted as part of the City's Comprehensive Plan. These elements are:

- A list of significant projects;
- A map or written description of the project locations or service areas; and
- Policies or urban growth management agreement(s) designating the provider of each public facility system.

## The Citywide Systems Plan as Portland's Public Facilities Plan

For this update, the City of Portland has chosen to develop this Citywide Systems Plan, which serves the same long-range purpose as a public facilities plan. The term "public facilities plan" is found in State administrative rules, Portland's previous plans, and planning literature generally. This Citywide Systems Plan represents a more comprehensive and holistic view of the City's infrastructure service delivery.


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While it has been developed to meet the State requirements for public facility plans as described in the previous section, it also includes system planning that extends beyond that mandate.

For example, the Citywide Systems Plan includes facility plans for parks, recreation, and other essential facilities; addresses maintenance needs; and includes programmatic investments that are key to meeting service demands. Where applicable, the Citywide Systems Plan identifies these non-required components. The City has included these additional components in the interest of comprehensive infrastructure planning and in support of City and applicable State goals. The City does not intend for these components to be reviewed for compliance with Oregon Statute 197 or Oregon Administrative Rule 660.

## Regional Plans and Requirements

In addition to complying with State planning requirements, many infrastructure systems also look to Metro, the area's regional government, for planning guidance. The following plans have major impacts on planning for the City's infrastructure:

### 2040 Growth Concept and the Urban Growth Management Functional Plan

The 2040 Growth Concept, adopted by the Metro Council, provides a long-range plan for the future growth and development of the Portland metropolitan region. It is based on a set of shared regional values, including thriving neighborhoods and communities; abundant economic opportunity; clean air and water; protecting streams and rivers; preserving farms and forestland; access to nature; and a sense of place. The Growth Management Functional Plan provides tools that help meet goals in the 2040 Growth Concept.

### Regional Transportation Plan

Metro's adopted Regional Transportation Plan (RTP) shapes future planning to protect the livability of the region's communities and sustain the region's well-being and economic prosperity. The Plan is intended to advance regional policies, public priorities, and local efforts to implement the 2040 Growth Concept to keep the region a great place to live and work for everyone.[1] The City of Portland's Transportation System Plan, which serves as the transportation component of this plan, will be updated as part of the Comprehensive Plan Update process to be consistent with the RTP.

### Community Investment Strategy

Metro's Community Investment Strategy (2010) recommends both public and private investments necessary to maintain prosperity, sustainability and equity in the Portland metropolitan region. It is based on an assessment of the region's urban growth boundary. The Community Investment Strategy supports investments within existing communities to promote economic development, protect natural areas, and

[1] Metro. "2035 Regional Transportation System Plan Update". http://www.metro-region.org/index.cfm/go/by.web/id=25038


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improve livability. More specifically, it recommends continued investments in the region's centers and corridors and regional collaboration to identify and address critical infrastructure gaps.

### The Intertwine

The City of Portland is one of over 100 regional public, private, and non-profit partners in the Intertwine Alliance. The Intertwine provides a vision, objectives, and a plan for an "exceptional, multi-jurisdictional, interconnected system of neighborhood, community and regional parks, natural areas, trails, open spaces, and recreation opportunities" in the Portland metropolitan region. Chapter 9: Parks and Recreation includes information and investments related to the City of Portland's park, natural area, and trail components of this regional network.

## Local Plans

### The Portland Plan

The Portland Plan, adopted in 2012, set four shared priorities – prosperity, education, health, and equity – to guide the actions of the City and other government agencies in Portland over the next 25 years. The Comprehensive Plan is one of a set of important tools for implementing the Portland Plan priorities and guiding policies.

According to The Portland Plan, "For Portland to be prosperous, educated, healthy and equitable, quality, reliable basic services must be provided for all." The Citywide System Plan supports this goal and continues the integration of the Portland Plan's strategic priorities and guiding policies. The four shared priorities, and their implications for infrastructure planning and future investment, are discussed in Chapter 3: Guiding Principles. The legacy of these priorities and policies can also be seen in the goals and policies included in Chapter 5.

### City of Portland and Multnomah County Climate Action Plan and Climate Change Preparation Strategy

Portland's Climate Action Plan is a strategy to put Portland and Multnomah County on a path to achieve a 40 percent reduction in carbon emissions by 2030 and an 80 percent reduction by 2050 (compared to 1990 levels). The plan builds upon a legacy of forward-thinking climate protection initiatives that have resulted in significant total and per person reductions in local carbon emissions. The Climate Action Plan identifies several 2030 objectives and near-term carbon reducing actions in a variety of areas that are relevant to the Citywide Systems Plan, including energy, land use, transportation, and natural systems. The Climate Change Preparation Strategy focuses on understanding how climate affects the community today and how those impacts are expected to change in the coming century. In addition to identifying vulnerabilities and risks, the strategy outlines key objectives and actions to build resiliency to heat, drought, wildfire, floods, and landslides into the City's everyday operations, services, and built and natural infrastructure.


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### Transportation System Plan

The Transportation System Plan (TSP) is Portland's long-range plan to guide transportation investments. The TSP meets State and regional planning requirements and addresses local transportation needs for cost-effective street, transit, freight, bicycle, and pedestrian improvements. The Plan provides transportation choices for residents, employees, visitors, and firms doing business in Portland, making it more convenient to walk, bicycle, take transit, and drive less to meet their daily needs. The TSP provides a balanced transportation system to support neighborhood livability and economic development.

The Transportation System Plan is being updated to reflect the Comprehensive Plan Update and the update of the Regional Transportation Plan. The TSP serves as the transportation component of the Citywide Systems Plan, as authorized in State public facility planning statutes (OAR 660-011 and ORS Chapter 197).

### Portland Watershed Management Plan

In 2006, Portland City Council adopted the Portland Watershed Management Plan (PWMP) in order to focus efforts to protect and restore Portland's natural systems while also addressing relevant environmental regulations. The PWMP is a citywide plan that lays out an integrated, system-wide approach to improving watershed health. Although the Bureau of Environmental Services is the lead implementation bureau, the PWMP relies on and informs projects and programs of other bureaus and relates to many infrastructure investments.

### Other City and Agency Plans

The Citywide Systems Plan (CSP) draws from other plans and policies created and adopted by the City's planning and infrastructure bureaus and by agency partners. Individual bureau or asset plans form the foundation of the CSP. In many cases, these plans provide more detailed information regarding infrastructure needs and investment strategies. Area and neighborhood plans, developed through partnerships between the City and local neighborhood associations, organizations, and community members, identify community needs and desired improvements for consideration in long-term infrastructure plans.

With the exception of the Transportation System Plan, discussed above, referenced bureau and agency plans are not adopted as part of the CSP or the Comprehensive Plan. A list of supporting plans and reports can be found in Appendix C.

# Process and Public Involvement

## Periodic Review Work Program

Portland is updating its Comprehensive Plan, as required by the State of Oregon, through a process called "periodic review." According to the state, the fundamental purpose of periodic review is to ensure local comprehensive plans are:

- Updated to respond to changes in local, regional, and State conditions;


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- Coordinated with other comprehensive plans and investments; and
- In compliance with the statewide planning goals, statutes, and rules.

The Bureau of Planning and Sustainability developed a work plan for this update that has been approved by City Council and the Oregon Department of Land Conservation and Development (DLCD). The work plan includes the following tasks:

- Task 1: Community Engagement: Providing open and meaningful opportunities for individuals and organizations to effectively influence the Comprehensive Plan update.
- Task 2: Inventory and Analysis: Conducting research and analysis necessary to provide a solid factual base for the Comprehensive Plan update.
- Task 3: Consideration of Alternatives: Exploring the social, economic, environmental, and energy implications of alternative patterns of development.
- Task 4: Policy Choices: Considering and making a variety of policy choices.
- Task 5: Implementation: Identifying and developing implementation measures necessary to carry out the policy choices.

The Citywide Systems Plan is a component of Task 4 and builds on the work completed in Tasks 1 through 3.

## Interbureau Coordination

The Citywide Systems Plan was developed by the Citywide Systems Team. The Citywide Systems Team is an interbureau working group comprised of representatives from the Bureau of Environmental Services, Bureau of Transportation, Portland Water Bureau, Portland Parks & Recreation, Office of Management and Finance, and Bureau of Planning and Sustainability. The group is overseen by these bureaus' directors and convened by the Bureau of Planning and Sustainability.

## Community Involvement

Development of the Citywide Systems Plan draws on multiple other planning processes that were completed in coordination with the community including:

- The work of Comprehensive Plan Update **Policy Expert Groups**, composed of community and government representatives, who developed, reviewed and provided comments to City staff on policy directions for the Comprehensive Plan Update.
- The **Working Draft Part 1** of the Comprehensive Plan Update, which focused extensively on the draft goals and policies that shape this Plan. These draft goals and policies are included in Chapter 5.
- The **Working Draft Part 2** of the Comprehensive Plan Update, which provided an opportunity for public review of the Citywide Systems Plan and the infrastructure investment strategy.
- The **Portland Plan**, which set strategic priorities and guiding policies that provide a framework for the investments included in this Plan. The Portland Plan was developed in partnership with Portland agencies and institutions, community members, and businesses.


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- Various **bureau and agency plans** including Parks 2020, the Portland Watershed Management Plan, and the Transportation System Plan. Many of these plans were developed in consultation with the community.
- The City's **annual budget process** and Budget Advisory Committees, which involve community members in shaping the City's Capital Improvement Plan, which is reflected in the CSP's investment strategy.

In addition, development of the Citywide Systems Plan has offered various opportunities for direct public review and input. These opportunities included:

- **Online and mail comment options**: Both email and mail comment options were available so residents, businesses, agency partners and organizations could submit comments on the draft Comprehensive Plan Update.
- **An online Map App**: The investment strategies outlined in this plan were included as map layers in the Comprehensive Plan Update's online Map App. The Map App was an interactive online tool that allowed community members, business owners, agency representatives, and other interested people to compare infrastructure needs and investments with potential areas of growth, demographic information, and other policy choices to identify and prioritize investment needs. Visitors to the Map App were able to view the maps, combine map layers, see areas of concern or change, make comments, and view comments from others.
- **Community events**: Staff attended 98 workshops, meetings, and other community events during the three-month comment period, with approximately 1,950 people attending the sessions. These events included:
    - Fifty-one community meetings, where organizations invited staff to introduce and engage members with tools and products like the Citywide Systems Plan, Map App, and the Companion Guide. Many of these meetings were tailored to specific group interests or geographies.
    - Thirty-three training events, where staff primarily focused going through the Map App and the Companion Guide.
    - Three information sessions hosted by the Bureau of Planning and Sustainability, held in downtown and in East Portland.
    - Three District Mapping Conversations, held in West, East, and North Portland, involving interactive discussions focused on specific issues and questions facing those districts.
    - Three community events where staff set up tables and talked to the public in North Portland, East Portland, and Downtown.

During review of the Working Draft (fall 2013), the Bureau of Planning and Sustainability received over 1100 comments through the outreach methods described above. Over 725 of these comments related specifically to infrastructure or to the Citywide Systems Plan. The Citywide Systems Plan has been updated to reflect community conversations that occurred as part of the Comprehensive Plan Update, including Policy Expert Group discussions, public workshops and comments from individuals, associations, businesses, and agencies.


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# Chapter 2
# Asset Management

## Effectively Managing the City's Infrastructure Systems

In 2013, the replacement value of the City of Portland's built infrastructure was estimated at $31.3 billion.[2] Providing, operating, and maintaining the City's infrastructure has become increasingly important as current systems age and Portland's population grows.

Asset management is a tool to identify the most cost-effective way to protect assets, provide community services, and safeguard public health, environmental quality, and economic security. Asset management is commonly defined as meeting agreed upon customer service levels, while minimizing life cycle costs at an acceptable level of risk. It focuses on delivering value to the customer – both in terms of the services provided and the rates charged – in an efficient and transparent manner.

The goal of asset management is to make better decisions about infrastructure acquisition, planning, design, construction, operation and maintenance, and renewal or replacement. Five core questions of asset management help achieve this goal:

- What is the current state of the assets?
- What is the required sustained level of service?
- Given the system, which assets are critical (based on risk) to sustained performance?
- What are the best "minimum life-cycle cost," Capital Improvement Program (CIP), and Operation and Maintenance (O&M) strategies?
- Given the above, what is the best financing strategy?

Asset management involves continuous improvement. City bureaus are committed to improving asset management practices to accurately inform strategic decision making and effective infrastructure management. For example, the City continues to develop more sophisticated methods for assessing and tracking the condition of its infrastructure.

### Maintaining Existing Assets

Because Portland's city limits cannot expand significantly, the majority of new growth will be accommodated within the City of Portland's current boundaries. This means existing transportation, water, sewer, stormwater, and parks and recreation systems will serve the majority of current and new residents' and businesses' needs over the coming decades, resulting in additional demands on existing infrastructure. These systems also will be used more heavily as new residents of Portland's suburbs come into the city to work, shop, or play.

[2] City of Portland, "Citywide Assets Report", 2013, Available at: http://www.portlandoregon.gov/bps/article/49854 .


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The City has a large infrastructure maintenance deficit, due largely to the age of many systems, chronic underinvestment in preventative maintenance and capital repair, increasing maintenance costs, and the lack of revenue to allow more sustainable investment. At current funding levels, some of Portland's infrastructure will continue to deteriorate. This will increase the risk of asset failures, reduce levels of service, and perpetuate long-standing inequities.

### Managing risk

Asset management involves comprehensively examining the risks of infrastructure failure. Infrastructure can fail due to poor condition or impacts from a natural or man-made event. They can also fail to provide the intended service, fail to meet regulatory goals, or fail to be cost effective. The City's infrastructure bureaus are undertaking risk management analyses to help identify strategic investments that will cost-effectively reduce the likelihood of asset failure. For example, the Bureau of Environmental Services and Portland Water Bureau both evaluate the age and condition of pipes. They combine this data with information about what could cause a pipe to fail, how likely these events are to occur, and the potential consequences of a failure. This analysis enables the Bureaus to identify the most critical and cost-effective repair or replacement projects. Actions to manage risk should increase the City's ability to meet community needs while protecting human and environmental health. However, new funding strategies or sources will also be needed to fully address deficiencies.

### Complying with regulatory mandates

In addition to meeting maintenance and repair needs, the City also must maintain compliance with a variety of federal and State regulations, primarily related to protecting public health and environmental quality. At the federal level, many of these mandates are related to the Clean Water Act, Clean Air Act, Safe Drinking Water Act, Endangered Species Act, and Americans with Disabilities Act. Complying with these mandates is a City priority and represents a large component of infrastructure spending. Because of this priority, meeting regulatory mandates can mean that other maintenance, repair, and improvement projects must be put on hold, or additional funding must be allocated. As regulations are created or revised in the future, the City will need to continue to examine investment approaches and priorities to ensure infrastructure systems adequately serve the community. More detailed information on regulatory mandates can be found in the system-specific chapters of this plan.

### Accommodating growth

The majority of the City's residential and employment growth over the next 20 years will occur on vacant sites or as redevelopment within the city's existing boundaries. As such, the ability of the City's infrastructure to accommodate growth depends primarily on the City's ability to resolve current deficiencies — to serve under-served areas and to improve or maintain the condition of existing infrastructure.

Major redevelopment efforts can have significant implications on existing assets and the type and extent of new infrastructure needed to serve an area. Without careful planning, such projects can overstretch the ability of existing built and natural infrastructure to meet community needs, particularly in under-served areas. As redevelopment is planned, it will be important to consider the full implications of such efforts on


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infrastructure needs and financial resources, and to coordinate planning with bureaus whose infrastructure might be impacted.

To better accommodate growth and reduce system loads, bureaus are actively researching and using a variety of demand management strategies. The ability of bureaus to innovate, reduce demand, or increase efficiency through new technologies and practices will be instrumental in their ability to serve the city in the future.

### Infrastructure funding gaps

Conservatively, the City's infrastructure bureaus estimate that the City needs to invest approximately $287 million more than current funding levels per year for each of the next 10 years to replace existing aging assets, maintain existing facilities, address regulatory requirements, and/or meet service levels, see Figure 2.1. This gap will likely grow for each of the next 10 years. That level of reinvestment would require spending at least 25 to 40 percent more than the City currently spends on major maintenance and capital projects. New assets often add to ongoing operations and maintenance needs, potentially adding to the funding gap. Some new assets may also replace existing asset functions and add new functionality. The City's estimated annual funding gap includes:

- **Transportation**: Significant maintenance needs for the City's street system – one of City's most valuable assets – make up the largest portion of the City's annual $153.4 million transportation funding gap. The funding gap for collector and arterial streets is estimated at $47.6 million with another $44 million for local streets, based on pavement condition. There are also significant funding gaps for the sidewalk system ($15.7 million annually to repair, restore or replace curbs and $7.1 million annually to build and maintain ADA accessible corners); bridges ($12.9 million); signal hardware ($17.5 million); street lights ($5.8 million); and other assets ($2.8 million).
- **Environmental Services:** The City's $12.4 million annual funding gap for environmental services reflects unmet replacement and maintenance needs for sewer and stormwater systems. The estimated funding gap makes broad assumptions about the rehabilitation and capacity needs in the City's separated stormwater areas, for which more detailed assessment and planning is currently underway.
- **Water**: The City's annual $15.5 million funding gap for water assets includes unmet replacement and maintenance needs in the distribution system (including pipes, services, valves, and hydrants); needs to replace or upgrade sections of transmission conduits; and maintenance needs for the Bull Run watershed road system.
- **Parks & Recreation**: The City's parks and recreation system has an expected total capital annual funding need of $84.4 million for parks and recreation facilities for each of the next 10 years. This includes $47.8 million for expanding the system to provide standard levels of service for all residents in addition to $36.6 million in funding needed to maintain existing assets.
- **Other civic facilities:** The City's $21.4 million annual funding gap for civic facilities includes funding necessary to meet industry standards for major maintenance of City facilities, such as office buildings, police and fire facilities, spectator facilities, and maintenance facilities, as well as annual funding to ensure replacement and upgrades of technology on accepted schedules.


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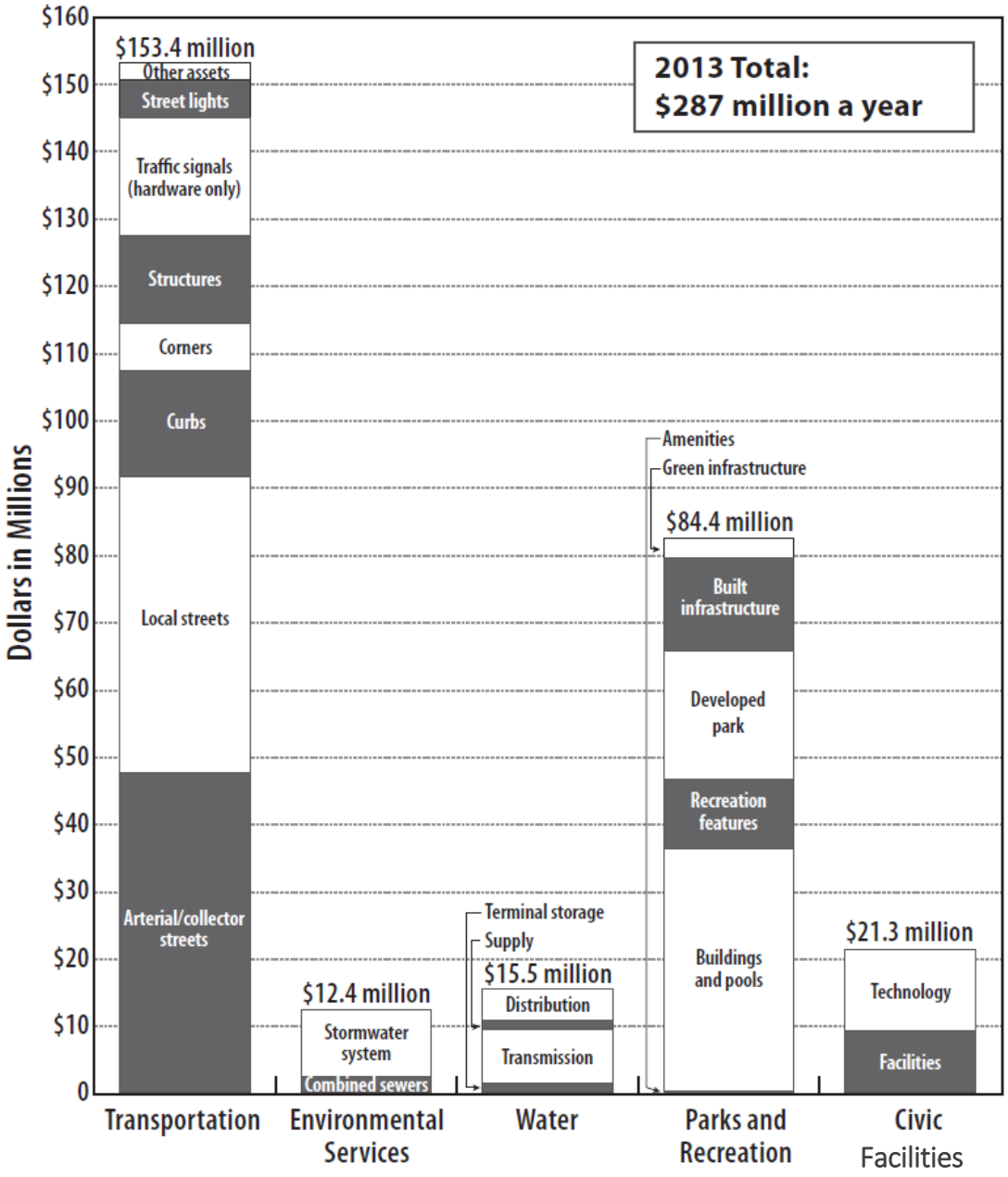
To maintain a high level of infrastructure services, the City will need to reassess service level standards, identify strategic investments, consider the full long-term costs of improvements, pursue innovative funding sources and partnerships, and work with the community to make tough choices about funding priorities. Chapters 6 through 10 of this document provide more detailed system-specific information on the asset management needs and approaches of the various City infrastructure bureaus.

Figure 2.1 Annual Funding Gap, by Asset Group (in millions per year, December 2013)





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### Managing the city's green infrastructure

The city's green infrastructure -- including natural areas, tree canopy, streams and rivers, and engineered features like green streets and ecoroofs -- provides many infrastructure and ecosystem services. For example, green infrastructure can manage stormwater, improve water quality, reduce flooding risk, provide wildlife habitat, provide areas for recreation, and improve resilience to natural hazards and climate change. A single green infrastructure asset may provide many different infrastructure services. For instance, a greenstreet facility might help retain and infiltrate stormwater, provide habitat and access to nature, and calm traffic.

Protecting and enhancing this green infrastructure is critical to the City's ability to provide public services in a cost-effective and sustainable way. However, green infrastructure presents unique asset management challenges:

- Some green infrastructure assets are owned and/or managed by the City (e.g. green streets, City-owned parks and natural areas), while many others are not (e.g. streams and rivers; private vegetated stormwater facilities; and natural areas and trees on land not owned by the City). However, the City relies on the infrastructure functions and ecosystem services provided by both public and private green infrastructure.
- From a financial planning perspective, green infrastructure assets cannot be accounted for in the same ways as grey infrastructure assets, like pipes. For example, the infrastructure service value of green infrastructure assets (e.g. trees) cannot be determined by its replacement cost and the value may appreciate over time.
- The nature and frequency of maintenance, replacement and/or restoration of green infrastructure assets is different than traditional infrastructure assets, such as pipes and streets, and has a bearing on operations and maintenance (O&M) budgets. Some green infrastructure projects have lower up-front capital costs than traditional infrastructure, but may require more regular maintenance. In other cases, capital funding (e.g., to purchase a new park or natural area) is available, but O&M funding is not.

The City is actively working to develop and improve asset management practices for green infrastructure that address these challenges. However, green infrastructure assets are not fully incorporated into the asset management information and tables (e.g. inventory, condition, replacement value) in the Citywide Systems Plan.

## Growth forecasts and locations

Today, more than 605,000 people live in Portland. Over the last 30 years, Portland's population has increased by more than 200,000 residents, primarily due to annexations in east and west Portland during the 1980s and 1990s. According to the Metro 2040 regional forecast, by 2035, Portland is expected to grow by nearly 280,000 people (132,000 households) and 147,000 new jobs within its current boundaries.


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In addition, the four-county Portland metropolitan area is anticipated to grow from approximately 1.6 million residents in 2010 to over 2.8 million residents in 2035.[3]

Portland's existing zoning has more than enough development capacity to accommodate anticipated future residential growth and most projected employment growth, except for industrial and institutional uses. This surplus capacity creates an opportunity to make choices about where to focus or prioritize growth.

## Buildable lands inventory

The Buildable Lands Inventory (BLI) is an assessment of the city's capacity to accommodate projected changes in housing and employment. A series of maps documents potential physical and market constraints to achieving forecasted increases in households and jobs. These maps were used to determine whether land in the city has full, diminished, or no capacity to accommodate additional housing units or additional jobs forecasted for the next 20 years.

A number of infrastructure related constraints were considered to pose physical or market constraints on new development and were accounted for in the inventory. These constraints included:

- Transportation Vehicular Level of Service
- Transportation Street Improvements
- Water Service
- Sewage Conveyance
- Stormwater Constraints
- Airport Flight Limitations

More information on the Buildable Lands Inventory is available at http://www.portlandoregon.gov/bps/59296.

## Growth scenarios and preferred development pattern

The Growth Scenarios report is a background report of the Comprehensive Plan and is a required element of Portland's Periodic Review work program (Task 3). The purpose of this report is to describe how and where Portland is expected to grow over the next 25 years, and to measure the performance of different alternate growth patterns and their ability to help meet Portland's goals and objectives. This analysis is rooted in the Measures of Success adopted in the Portland Plan.

The Growth Scenarios report offers a basis for making informed decisions about which investments and growth patterns will bring the greatest benefit to the most Portlanders, reduce disparities, increase opportunities, and move the city closer to meeting performance goals, such as improving access to living-wage jobs, providing safe and convenient access to goods and services within walking distance of where

[3] Metro, "Population and Housing Forecasts for 2035, by City and County." dated January 15, 2013; Online: http://www.oregonmetro.gov/index.cfm/go/by.web/id=42397.


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people live, reducing risks due to natural hazards, enhancing watershed health, and reducing carbon emissions.

The initial Growth Scenarios analysis included four growth scenarios:

- Default – The Default Scenario is based on existing development patterns and development trends. This scenario distributes future growth in the same places Portland has seen growth over the past 15 years.
- Centers – The Centers Scenario focuses more growth in established centers like Lents, Hillsdale, and Gateway and less growth along the length of commercial and mixed use streets.
- Corridors – The Corridors Scenario focuses more development along streets like SE Powell, SE Foster, SW Barbur and N Lombard and less growth in centers.
- Central City Focused – The Central City Focused Scenario concentrates nearly all growth in the Central City and the inner neighborhoods near the Central City, both east and west of the Willamette River.

More information on the Growth Scenarios is available at http://www.portlandoregon.gov/bps/62384.

The Growth Scenarios analysis and public input were used to develop a preferred development scenario, in which growth is primarily accommodated in centers and corridors distributed throughout the city. This preferred development scenario guided refinement of the Comprehensive Plan Urban Design Direction and Comprehensive Plan Map. The Citywide Systems Plan is intended to provide a general plan for serving the land use designations and densities designated in the Comprehensive Plan Map.

## Centers and Corridors as focus areas for growth

Metro 2040, the Portland Plan, the Growth Scenarios Report, and the Comprehensive Plan Update all support and/or examine continued residential and mixed use growth in centers and along key corridors. This focus is intended to improve access to services and opportunities for active transportation, enhance household and economic prosperity, help the city achieve its climate preparation and carbon emission reduction goals, and promote community and watershed health. Community conversations about the location, type, extent, and level of development in each center and corridor were part of the Comprehensive Plan Update.

These same plans, as well as the Economic Opportunities Analysis (EOA), expect high levels of employment growth and intensification in industrial sanctuaries, campus institutions, and dispersed industrial and employment areas throughout the city to accommodate future job growth.

Many centers, corridors, and employment areas will require additional public infrastructure investment over the next twenty years to resolve existing deficiencies, accommodate additional growth, encourage and support private investment and job creation, and develop complete communities. As more detailed area-specific planning is completed for these areas, future refinements to the Citywide Systems Plan may be necessary to fully reflect recommended infrastructure investments.


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## Investment strategies for centers and corridors

The Comprehensive Plan supports strategic public and private investments in housing, jobs, and infrastructure in centers and corridors. These investments will improve equity and help ensure Portlanders live in healthy, complete, and prosperous neighborhoods.

Centers and corridors vary in terms of their current and expected future size, character, and demographic makeup. They also vary in terms of how prepared they are, in terms of physical infrastructure and facilities, to be able to succeed as anchors to healthy connected neighborhoods.

The Comprehensive Plan supports four investment strategies that tailor the type of investment to the expected population of the area, infrastructure needs, and presence of people who might be vulnerable to displacement. Figure 2.2 shows how designated centers vary according to these factors. The combination of these factors plays out in four different investment strategies described below.

1. **Invest to reduce disparities and improve livability**
   This strategy is appropriate for centers and corridors that are not expected to grow significantly, but that have existing infrastructure deficiencies. Addressing these deficiencies will improve health and livability for area residents. For example, investments could fill gaps in streets, bicycle and pedestrian routes, and local parks. Economic development programs could support existing and new businesses and improve neighborhood prosperity and vitality.

2. **Invest to enhance neighborhoods, maintain affordability and accommodate growth**

   This strategy is aimed at centers and corridors that lack basic infrastructure or shops and services and that either have a lot of residents now, or will in the future. These areas also have many people who may be vulnerable to displacement as property values rise.

   In these areas, infrastructure investment could include improving streets, creating new parks, and addressing other deficiencies. Economic development programs could preserve and increase jobs, businesses, and community services in these areas. Housing security programs, like homeownership and rental assistance, could help keep the neighborhood affordable for a range of households.

3. **Respond to opportunities and maintain existing services**
   Some centers and corridors have limited infrastructure needs and are not expected to grow significantly. In these areas, investments focus on maintaining livability and existing infrastructure as well as responding to opportunities.

4. **Invest to fill service gaps, maintain affordability and accommodate growth**
   Some centers and corridors have already benefited from public and private investments in things like light rail, complete streets and neighborhood business districts. In these areas, future investments should focus on making sure infrastructure can serve new residents, filling remaining service gaps, and providing affordable housing.


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Figure 2.2 Investment Strategies for Centers

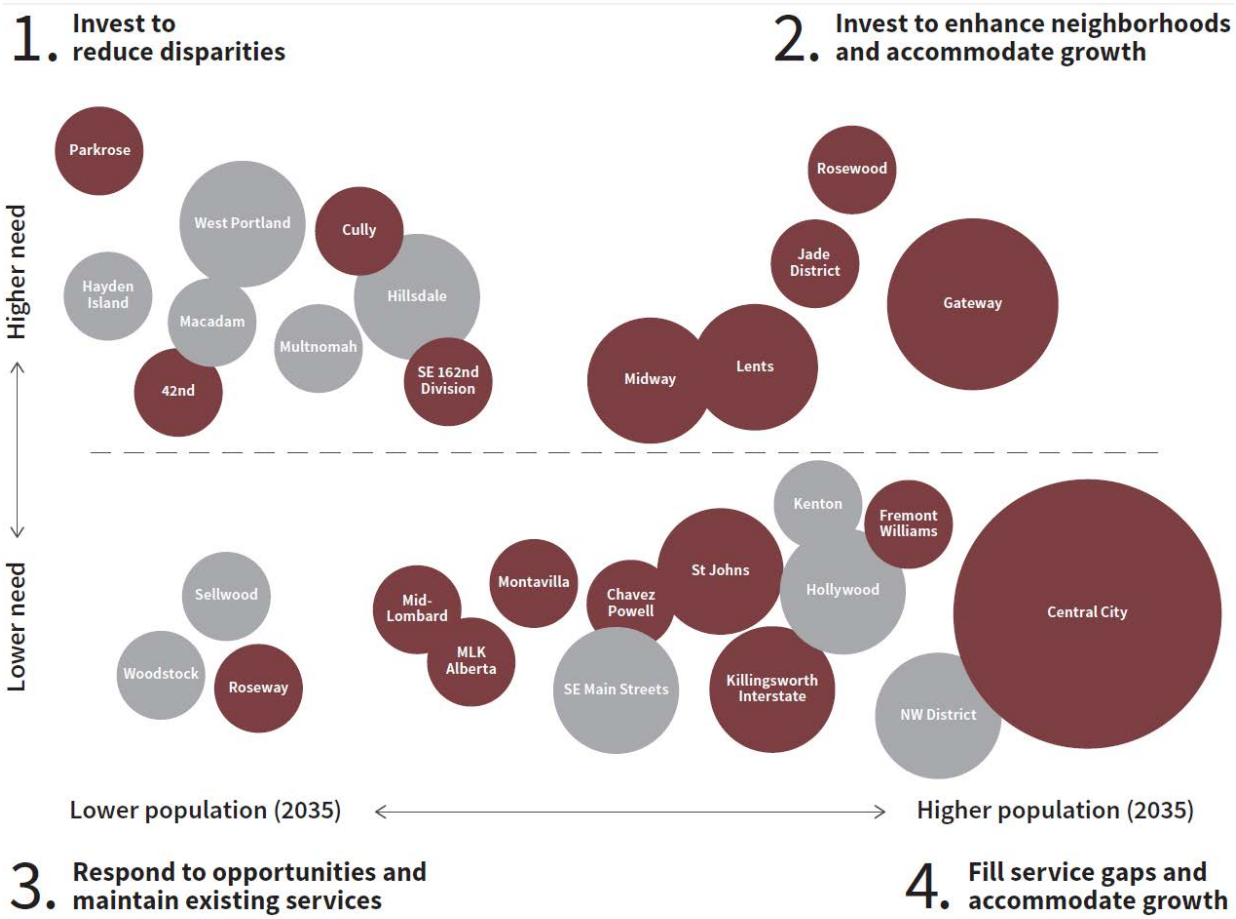


Figure 2.2 shows how Portland's Centers vary in future population, infrastructure needs, and presence of people who might be vulnerable to displacement. The four investment strategies are described in more detail above.

### Vulnerability to displacement

In some centers and corridors, many households have the resources and financial security to benefit from and adapt to neighborhood growth and development. However, other centers and corridors – those shown in dark red on Figure 2.2 - are home to more people (renters, households with low income and education levels, and communities of color) that may not be poised to take advantage of growth or may be at risk of involuntary displacement as development occurs.


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## Summary of system capacity to accommodate growth

### Environmental Services

The Bureau of Environmental Services (BES) plans for its facilities based on the maximum densities allowed within existing Comprehensive Plan land use designations. Additional investments in the sewer system will be necessary to address high risk assets, to provide stated levels of service, and to meet regulatory requirements. BES expects to be able to maintain and improve the sewer systems to handle growth needs as long as sewer rates are sufficient to finance system maintenance and capacity upgrades. However, site-specific issues, such as topography and the proximity of existing sewer or stormwater systems, mean that it may not be technically or economically feasible to serve all properties.

The City's stormwater system is composed of combined sewers (sanitary and storm) and separated storm sewers and drainage systems. Stormwater management also relies on the natural rivers and streams that convey stormwater and on stormwater management systems that are owned by other public agencies and private property owners. In areas of the city where the City's stormwater system is constrained, existing and possible future development may exceed the natural and built systems' ability to manage stormwater. This could contribute to flooding, erosion, and damage to homes, business, roads, natural areas, and streams.

Choices about how the city grows will have a substantial effect on the stormwater system. Adequately serving future growth will require investments in traditional piped systems and green infrastructure by the City, other public agencies, special districts, and private property owners to ensure effective stormwater management.

### Water

The Portland Water Bureau's primary distribution system can reliably deliver water through 2035, mostly using existing facilities. The Water Bureau is planning water infrastructure improvements to address increasing retail demands within the city limits; demand is expected to increase from 61.5 million gallons per day in 2005 to 79 million gallons per day in 2030. Serving Portland's future population also relies on the continued adequacy and reliability of water systems owned by special districts that serve areas within Portland's urban services boundary.

The Water Bureau also supplies water to regional wholesale customers. Population in areas served through these wholesale contracts is expected to increase significantly, resulting in potentially large increases in water demand. The Water Bureau, in collaboration with the Regional Water Providers Consortium, will also continue investing in water conservation programs that help manage demand and extend the life of the water supply system.

### Transportation

The success of Portland's transportation system in meeting future local and regional mobility needs will depend on the City's — and its partners' — ability to maintain existing assets and make strategic investments. The City faces significant funding challenges, maintenance backlogs for existing assets, and


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deficiencies in service provision. Future transportation investments will be needed to provide complete, safe, and accessible pedestrian, bicycle, and transit systems and to support freight mobility and access.

Providing a well-functioning, multimodal transportation system for Portland's residents, businesses, and visitors also depends significantly on the ability of the City's partners, including Multnomah County, the Oregon Department of Transportation, TriMet to provide and maintain their facilities, which are critical components of the overall transportation system.

### Parks & Recreation

To maintain Portland's quality of life while accommodating growth, it will be necessary to preserve and enhance access to a variety of high-quality park and recreation experiences by acquiring and protecting a range of parks and natural areas, maintaining existing facilities, and providing additional recreation facilities and services. The actual number and type of parks and recreational facilities needed will vary based on where and how growth occurs, the ability of existing facilities to serve additional users and meet diverse needs, and what opportunities arise to locate and build additional parks and facilities. Planning for Portland's future park and recreation system will require providing park experiences that are tailored to both a growing and diverse population and also to the unique characteristics of Portland's parks and natural areas.

Adequately serving current and future Portlanders will also require ensuring that the City's diverse park system provides a variety of active and passive recreational experiences that respond to the unique community and environmental context of different areas of the city. In addition, growth may also place additional pressure on heavily used facilities, such as swimming pools, and it may exacerbate service deficiencies in currently under-served areas. These pressures may be particularly acute in centers that currently lack sufficient park amenities, where both existing facilities and acquisition opportunities are scarce.

### Other City Facilities and Systems

Meeting the needs of current and future Portlanders also relies on the City's ability to maintain and enhance other essential facilities and systems – including office buildings, technology, vehicles and apparatus – that are vital to the efficiency and effectiveness of all City agencies, and play an instrumental role in the City's capacity for emergency response.

### Non-City Infrastructure Systems

The City does not directly provide public facilities for public education, energy, waste, telecommunications, library, public health, and justice services. However, the current and future capacity of these systems to meet the desired level of service is critical to the city's overall ability to serve current residents and businesses, meet the demands of growth, and be healthy, prosperous, and resilient. Because of this, the City of Portland has an interest in coordinating with these agencies and companies. For example:

- **Public Education:** The City partners with school districts on school facility planning and siting and has begun to consider school district capacity when planning for growth. In addition, the City


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encourages school facilities to be multi-functional neighborhood anchors, designed and programmed to serve community members of all generations and abilities, helping Portland become a more age-friendly city.

- **Energy:** Private utilities and companies provide energy facilities and services in Portland. While the City of Portland does not directly provide energy facilities and services, it does regulate placement of these facilities within the right-of-way and on public property. In addition, the City promotes efficient, reliable, and sustainable energy resources, investments, and consumption practices. In particular, the City encourages the use of smart grid technologies; low-carbon and renewable energy sources; and onsite and district-scale renewable energy production to improve the efficiency, reliability, affordability, and sustainability of the energy supply and distribution system.
- **Solid waste, composting, and recycling:** Solid waste, composting, and recycling facilities and services are regulated and provided through a partnership between the City of Portland, Metro, and private companies. The City supports sustainable waste reduction, recovery, and management and acknowledges the important upstream impacts of consumption and disposal of goods and materials. The City also supports efforts to ensure materials are used and reused to the fullest extent possible prior to disposal.
- **Technology and communications:** Private utilities and companies provide technology and communication facilities and services to the general public. The City provides certain technology and communications services to support service delivery by the City and other governmental partners, and it promotes access to affordable and reliable technology and communications for all Portlanders. The City acknowledges that information and technology services have become essential infrastructure, and supports investments and partnerships to ensure all Portlanders are able to access and benefit from emerging technologies, keep Portland competitive, and build on the city's tradition of open-source collaboration and innovation.


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# Chapter 3
# Guiding Principles

The Comprehensive Plan includes a set of integrated Guiding Principles – equity, prosperity, human health, watershed health, and resilience – that bridge policy approaches throughout the Comprehensive Plan. These Guiding Principles have direct implications for the City of Portland's infrastructure investment and management over the coming decades. The following sections address each of these principles and highlight supportive infrastructure investments and approaches intended to meet them.

## Guiding Principles

The Guiding Principles encapsulate the Portland Plan's key priorities of equity, prosperity, health, and resiliency into the Comprehensive Plan and implementation tools. The Principles guide projects, programs, and land use decisions that are subject to the Comprehensive Plan. They are intended to be relevant to every project, program, or land use decision that updates or amends an element of the Comprehensive Plan or one of its implementation tools, including amendments to the Citywide Systems Plan. The Principles encourage balanced, integrated multi-disciplinary approaches among topics such as housing, economic development, and transportation.

**Guiding Principles.** When making and adopting legislative land use decisions, consider the impacts of:

- **Equity and environmental justice.** Encourage land use decisions that reduce existing disparities, minimize burdens, extend benefits, and improve socio-economic opportunities for under-served and under-represented populations.
- **Economic prosperity.** Encourage land use decisions that support the city's economy and foster employment growth, competitiveness, and equitably-distributed household prosperity.
- **Human health.** Encourage land use decisions that avoid or minimize negative health impacts and improve opportunities for Portlanders to lead healthy, active lives.
- **Environmental health.** Encourage land use decisions that recognize, incorporate, and sustain valuable ecosystem services related to air, water, and land quality, and the intrinsic value of nature.
- **Resilience.** Encourage land use decisions that improve the ability of individuals, communities, economic systems, and the natural and built environment to recover from natural and human-made disasters, climate change, and economic shifts.

## Equity

Portland is becoming an increasingly diverse city, home to people of many races, ethnicities, ages, abilities, and incomes. To serve the needs of a diverse city, the Portland Plan identifies equity as a key strategic priority and a frame for decision-making, investment, community engagement, and measurement of success.


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In keeping with the federal Civil Rights Act of 1964, "It is the policy of the City of Portland, that no person shall be denied the benefits of or be subjected to discrimination in any City program, service, or activity on the grounds of race, religion, color, national origin, English proficiency, sex, age, disability, religion, sexual orientation, gender identity, or source of income."

The Portland Plan defines equity as "when everyone has access to the opportunities necessary to satisfy their essential needs, advance their well-being and achieve their full potential." As part of adopting the Portland Plan in 2012, City Council directed the implementation of the City's Civic Rights Title VI Plan to remove barriers and conditions that disadvantaged groups from receiving access to, participation in, and benefits of City programs, services, and activities.

The Comprehensive Plan Update's Vision for 2035 highlights the importance of equity, including ensuring "everyone has access to opportunity and is engaged in shaping the decisions that affect their lives." Equity is further integrated into the plan as a guiding principle and through a variety of goals and policies that support decisions that reduce existing disparities, minimize burdens, extend benefits, and improve socio-economic opportunities for under-served and under-represented populations.

## Portland's Demographics

Growing diversity and shifts in Portland's population and household makeup have, and will continue to, bring corresponding changes in the values and needs of the community. These shifts result in changes in the types of transportation, water, park, and civic facilities needed to adequately serve the community.

Changing demographics may require the City to modify existing infrastructure practices or design systems that can anticipate and adapt to changing needs. For example, the City will need to continue to improve transportation infrastructure so all Portlanders, including older residents, families with children, people with disabilities, and residents with limited disposable income can walk, bike, or take transit in their neighborhoods and to destinations throughout the city. The City may also need to plan for improved or different parks and recreation facilities to accommodate diverse recreational needs and shifts in use patterns.

### Race and Ethnicity

According to the U.S. census, communities of color made up approximately 15% of Portland's population in 1980. In 2010, these communities represented 24% of the population, lower than the national average of 33%. In 2010, the City's population was approximately 7% Asian, 6% Black or African American, 1% American Indian and Alaskan Native, 1% Native Hawaiian and Pacific Islander, 5% two or more races, 76% white, and 4% some other race. Additionally, approximately 9% of Portlanders identify as Latino or Hispanic, an increase of over 50% from 2000.

Portland's youth, those 25 years old and younger, are more diverse than the city as a whole. In 2010, more than 36% of Portland youth are people of color — Black or African American, Native American, Native Hawaiian, Pacific Islander, Native Alaskan, Asian, or multiracial. In addition, more than 18% of all youth identify as Latino or Hispanic.


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### Age

The age of Portland's population has remained relatively constant over the past decade. In 2010, approximately 29% of Portlanders were 24 or younger, 36% were between 25 and 44 years of age, 25% were between 45 and 64, and 11% were 65 or older. In general, areas farther from the city's core, such as East Portland and St. Johns, tend to have higher youth populations.

### Disability

In 2000, approximately 19% of Portlanders over age 5 had a disability that impacted their daily activities. These disabilities included sensory, physical, and mental disabilities. Rates of disability are highest for those over 65, at 42.5%, and lowest for people between 5 and 20 years of age, at 8.9%. The Americans with Disabilities Act (ADA), enacted on July 26, 1990, provides protections to individuals with disabilities in the areas of employment, State and local government services, public accommodations, and telecommunications.

The Title II of the ADA prohibits State and local governments from discriminating on the basis of disability, but moreover, its goal is to promote equal access and full participation for all. The City of Portland works to ensure every program, service, benefit, activity, and facility operated or funded by the City of Portland is accessible to people of all abilities. The City strives to eliminate barriers that may prevent persons with disabilities from accessing facilities or participating in City programs, services, and activities. The City is currently developing a citywide transition plan to determine what physical barriers might prevent persons with disabilities from accessing facilities owned or operated by the City.[4]

### Income

In 2011, the median household income in Portland was $48,831. This was $7,023 less than the median household income in the Portland-Vancouver metropolitan region. The region's lowest median incomes can be found in North/Northeast Portland, Southeast Portland, and outer east Portland. Median household income has increased by approximately 21.6% since 2000, less than the rate of inflation. Approximately 28% of Portland households earn less than $25,000 annually, while 31% earn more than $100,000 annually.

Fourteen percent of Portland's families were living below the poverty level[5] in 2011. Poverty affects over a quarter of youth under 18 (27%) and 10% of people 65 and older. Similarly, 14% of local families access food stamp or SNAP benefits.

[4] City of Portland, Americans with Disabilities Title II Program. Online, available at http://www.portlandoregon.gov/bibs/62112

[5] In 2011, the poverty threshold was $22,350 for a family of four.



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## Investing to reduce disparities

To equitably serve Portlanders, the City must work to reduce existing disparities in infrastructure service. In order to meet the Comprehensive Plan's equity principle, the City's infrastructure must be provided in equitable ways to ensure all Portlanders have access to opportunity.

Providing basic infrastructure services in currently under-served areas is a challenge – particularly for transportation, parks and recreation, and stormwater services. Resolving these deficiencies and filling gaps in existing networks will aid the City in serving existing residents and accommodating new growth. The Citywide Systems Plan presents an opportunity to reduce these disparities through policies and investments.

The Bureau of Transportation faces some significant deficiencies, based on existing levels of service and design standards. Issues include street connectivity, pedestrian and bike access and facilities, safety improvements, and substandard streets. Resolving these deficiencies would provide Portlanders with greater transportation access to employment, housing, schools, parks, commercial and community services, and other destinations throughout the city and region. The transportation investment strategy, described in Appendix A and in the Transportation System Plan, includes investments to improve multi-modal connectivity by expanding the active transportation network, maintaining transportation infrastructure, and improving safety.

Portland Parks & Recreation bases its service on sufficiency and access to park and recreation facilities. Unfortunately, many areas of Portland – especially outer east, southwest and central northeast – lack sufficient facilities such as developed parks, community centers, and trails and natural areas. In addition, many areas lack the supporting pedestrian infrastructure to allow safe pedestrian access to parks and recreation facilities. In park-deficient areas, local residents may lack opportunities to recreate, experience nature, and take advantage of the physical, mental, and community health benefits parks provide. Portland Parks & Recreation has identified a need to acquire and develop parks and recreation facilities in currently deficient areas.

Environmental Services' investments in sewer and stormwater systems and wastewater treatment are prioritized by risk due to age, condition, capacity, and regulatory mandates. Typically, high-risk areas are located in Portland's inner neighborhoods, where infrastructure is the oldest. Sewer failures or stormwater issues can result in flooding in basements and streets, sewer backups, landslides, and erosion, posing hazards to residents, businesses, and the environment. In these areas, the Bureau's Investment Strategy, described in Chapter 6 and Appendix A, includes projects to reduce risks and improve sewer capacity. In East Portland, the sewer system is relatively new. There, and in other areas of the city, the Citywide System Plan identifies investments in programs to address stormwater and natural system deficiencies and ensure the benefits of green infrastructure are equitably distributed. Examples include the Johnson Creek flood mitigation program, as well as increased tree planting in canopy-deficient areas, and community watershed stewardship grants and education programs.


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## Responding to local context

Each area of Portland has its own distinctive characteristics that are valued by community members. Different places are distinguished by their communities and their unique topographies, natural features, histories, assets, patterns of development, and building types.

Instead of following a one-size-fits-all approach, growth, investment, and change can be used to enhance the strengths and assets of each area. The use of infrastructure service and design standards that reflect the unique physical and service needs of different areas of the city will ensure infrastructure is context-sensitive and provides appropriate levels of service. The public facility policies and investments in the Citywide System Plan reflect a move towards context-sensitive approaches. For example, transportation policies support a flexible approach to street design and development standards to respond to local context while ensuring multi-modal movement and access. Similarly, stormwater investments account for unique watershed conditions, including hydrology, natural resources, and level of development.

## Promoting inclusive public process

The City supports appropriate and inclusive public involvement in infrastructure investment decision-making – from project identification and prioritization to design and construction. The Community Involvement chapter of the Comprehensive Plan's Goals and Policies, as well as guidance provided by the Community Involvement Program, support inclusive, meaningful, and transparent public involvement. Community involvement in infrastructure decision-making should be tailored to respond to the unique needs of the project and the impacted community.

## Using an equity lens

Putting equity into practice requires considering relevant data and questions and setting priorities to advance equity in decision-making. City infrastructure bureaus have been working both internally and with community members and partners to improve common understanding of infrastructure equity. Meeting the needs of a diverse and changing population requires addressing existing disparities while remaining mindful of, and adapting to, changes in community needs over time. There is, and will continue to be, a need for capacity-building, data refinement, risk assessment, community involvement, and the evolution of policies and practices to fully understand and address the equity impacts of infrastructure decisions.

The following questions can serve as an initial step to implementing an equity lens to ensure equitable outcomes in infrastructure investment decision-making. These questions can be asked at different phases of an infrastructure project, policy, or program to begin to assess potential equity impacts:

- What is the existing level-of-service in the project area? How does it compare to the existing levels-of-service across the City?
    - If the level-of-service in the area is less than other areas in the city, what are the economic, social, and environmental impacts of that reduced level of service? Does the project remedy those impacts?
    - If the level-of-service in the area is equal to or greater than other areas of the city, what are the drivers, desired results, or outcomes of the infrastructure project or program?


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- What are the demographics of the area?
- Are there current or historical disparities related to infrastructure service? How does the service provided by the proposed asset maintenance, rehabilitation or renewal relate to those disparities? Could the project be improved to further reduce existing disparities?
- Who benefits most from the infrastructure project? Does the infrastructure project positively benefit racial, ethnic, or low-income communities, or people with disabilities?
- Are there potential negative consequences, impacts or burdens of the infrastructure project on racial, ethnic, or low-income communities, or people with disabilities? If so, what are the strategies to mitigate these negative impacts?
- How does the infrastructure project support inclusive, meaningful, and transparent public involvement, particularly for those most impacted?
- Does the infrastructure project support local job creation and economic development opportunities for impacted communities? Will local residents and businesses have preference for construction contracts or employment?
- Based on the information gathered and the answers to these questions, does the project or program support increased equity in the City?

## Investment, Gentrification and Displacement

Public and private investments in Portland's neighborhoods have resulted in gentrification and displacement of communities of color, low-income people, and minority-owned businesses. The Portland Plan sets an expectation that an equitable city should be proactive about the inequitable impacts that neighborhood change and gentrification can have on vulnerable households. Specifically, it called for approaches to help evaluate and better manage potential gentrification impacts of new policies, programs, and investments.

Investment in public infrastructure can cause direct displacement, through the use of eminent domain and other tools to "make way" for a new public facility. Investment can also be an indirect factor – inducing gentrification by increasing property values and housing prices, resulting in displacement due to diminished neighborhood affordability.

As part of efforts to evaluate potential gentrification impacts on local communities, the Bureau of Planning and Sustainability (BPS) commissioned a Gentrification and Displacement Study, authored by Dr. Lisa Bates. The study provides a methodology for assessing the risk of displacement, based on vulnerable population criteria (People of Color, low-income, renters, low-education attainment), changing demographics, and real estate market activity. The resulting map of neighborhood typologies, see Figure 3.1, shows where neighborhoods fall on a spectrum of gentrification risk. The study also includes a review of national best practices, including policy tools and programs that Portland could use to mitigate gentrification such as community benefit agreements. This analysis forms the foundation for the assessment of "vulnerability to displacement" used in the investment strategy for centers and corridors, described on pages 21 and 22.


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When planning public investments, the City should use this map and analysis to identify critical opportunities to use the equity lens described above, involve local communities in decision-making, and link planned public investments in at-risk areas with strategic housing, economic development and other tools to address displacement risk for impacted communities.


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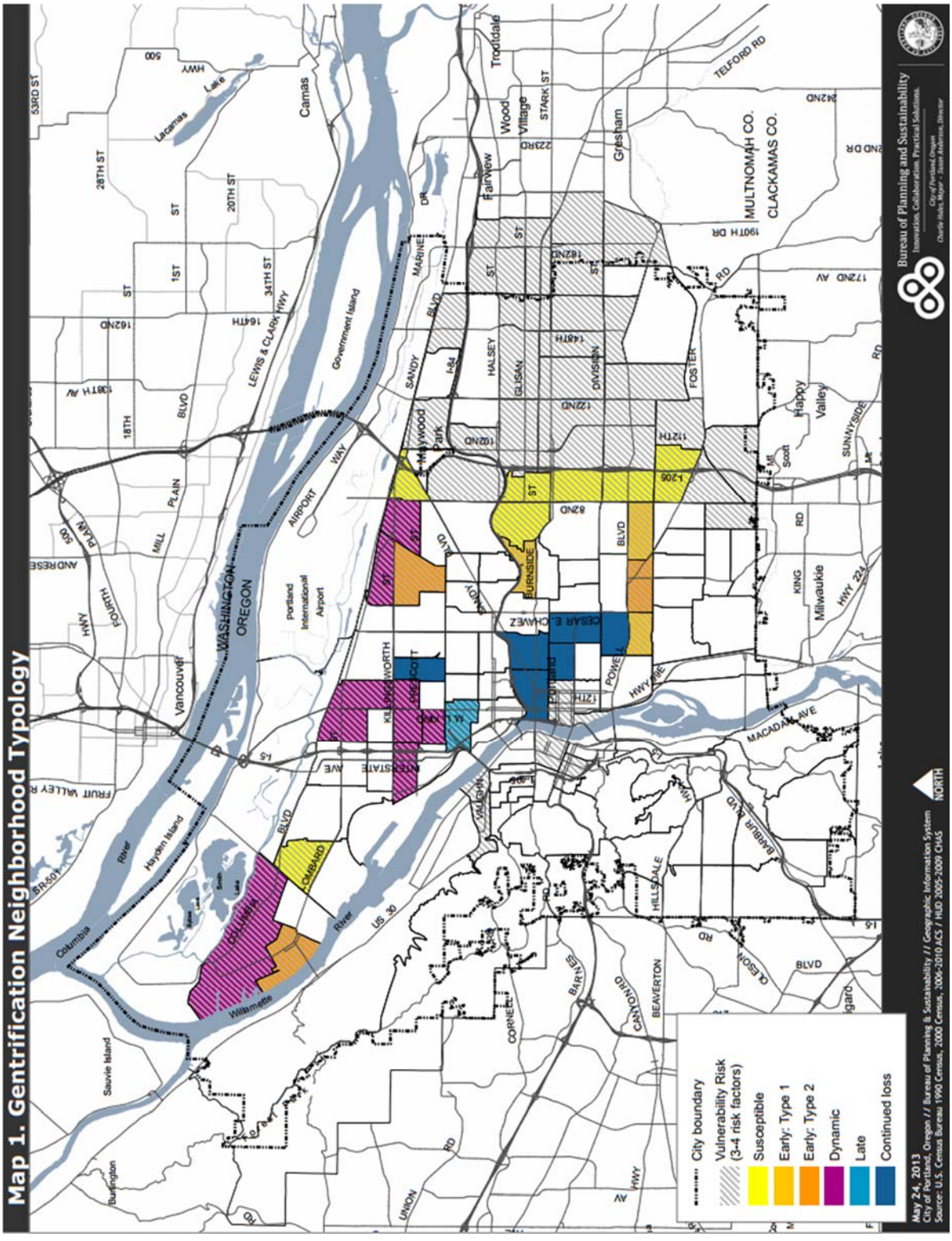
Figure 3.1. Gentrification Neighborhood Typology[6]




[6] Bates, Lisa. "Gentrification and Displacement Study: implementing an equitable inclusive development strategy in the context of gentrification." Commissioned by City of Portland Bureau of Planning and Sustainability, 2013. Available at: http://www.portlandoregon.gov/bps/62635.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# Prosperity

Infrastructure can be an important component of a successful economic development strategy, or it can be a key barrier to competitiveness and sustainability. Planning efforts for economic development should consider the opportunities of existing infrastructure capacity, challenges or deficiencies, and strategies to finance priority improvements. Economic development also offers potential opportunities to fund infrastructure improvements through public/private partnerships and other financing mechanisms.

## Economic Shifts and Employment Forecasts

Portland is the metropolitan area's regional job center and is home to 39% of the region's jobs, even though it is home to only 26% of the population. While Portland's job growth has been nearly flat (5%) since 2010, Metro expects the city will see higher rates of job growth over the next 20 years. It expects 147,000 new jobs in Portland, representing about 27% of the region's expected job growth. This level of growth is comparable to the city's historic "capture rate" of 25% of regional growth.

Manufacturing remains a key employment sector in the city. Jobs in the manufacturing sector offer opportunities for living-wage careers for residents, potentially without requiring higher education. They also have a high "employment multiplier" effect – one manufacturing job supports 3.69 total jobs in the region. Manufacturing output has been growing faster than output from service sectors. Beyond manufacturing, institutional and office are also leading employment sectors.

Over the next 20 years, Portland will see growth in all five employment geographies – in the Central City, industrial areas, commercial areas, institutions like hospitals and universities, and in residential areas. Supporting employment growth and the success of existing businesses in each of these areas may result in different infrastructure needs and investment priorities.

## Building a resilient economy

### Competitiveness

The growth of global markets and the tightening of employment land markets in the inner portions of the Portland region mean Portland must continue to provide sufficient, high-quality employment land and necessary infrastructure to remain competitive and attract and retain businesses. To accomplish this, the City strives to provide adequate industrial and employment lands, served by associated infrastructure services, and to keep utility and infrastructure costs competitive. The Portland region's growing export activity is concentrated in manufacturing (e.g. high tech, metals, and transportation equipment), where job growth has been modest but output growth continues to outpace service sectors. The region also has growing export specializations in software, apparel, and clean-tech.

The Citywide Systems Plan includes investments in basic infrastructure services, such as transportation, water, and sewer, necessary to support economic activity. It also includes investments in parks, recreation, natural areas, trails, and other quality of life improvements, which are key to attracting and keeping a quality workforce.


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### Capacity and Viability

To maintain its economic competitiveness, the City must provide adequate employment capacity and protect the viability of its industrial areas and harbor, which may require infrastructure improvements geared toward the types of industries in these areas. Infrastructure improvements will also be needed to allow economic development of new areas or more intense development of existing commercial and industrial zones.

Portland's Economic Opportunities Analysis (EOA) (2012), recommends infrastructure investment as a strategy to help meet Portland's future industrial and institutional capacity needs. It recommends prioritizing infrastructure investments that will result in greater utilization of existing industrial properties to meet capacity needs. Such infrastructure investments could include improvements to transportation and transit systems, sewer and water facilities, as well as telecommunications infrastructure. For institutional campuses, public transit infrastructure is the highest investment need.[7]

The Citywide Systems Plan identifies transportation, sewer, and water facilities that will be necessary to support employment designations identified in the Comprehensive Plan.

### Transportation and Freight Movement

Many local industries and businesses depend on reliable and efficient transportation systems, particularly for freight. Portland's transportation system is critical to the regional economy, as it provides connections to major markets within the city, access to major rail, marine and air cargo routes, and is a key link in the interstate highway system.

Congestion can impede freight movement, cause delays to businesses and commuters, and increase the cost of doing business in Portland. In general, as roadways reach capacity, small increases in the number of vehicles result in large increases in delays.[8] Conversely, small decreases can also reduce congestion significantly. Successful travel reduction strategies, such as providing affordable, reliable, and connected alternative transportation systems, and investments in critical infrastructure can improve freight movement, reduce commute times, and help attract and keep a quality workforce in Portland.

Portland's Economic Opportunities Analysis (EOA) recommends "strategic investments in the freight transportation systems and infrastructure needed to grow Portland's competitive position in the rapidly growing and changing international marketplace."[9] The EOA highlights the importance of continued investments in Portland's transportation infrastructure as outlined in the City's adopted Freight Master Plan (2006), which details policies, strategies, and desired improvements to freight management and movement in the City. Priority is given to the Freight Master Plan's program of strategic investments to encourage reinvestment and industrial expansion in Columbia Harbor as Oregon's international trade

[7] City of Portland (2012). *Economic Opportunities Analysis – Section 4 Alternative Choices*. p. 26. Retrieved from http://www.portlandonline.com/portlandplan/index.cfm?c=51427&a=392786
[8] Dill, 2007.
[9] City of Portland (2012). *Economic Opportunities Analysis – Section 4 Alternative Choices*. p. 19. Retrieved from http://www.portlandonline.com/portlandplan/index.cfm?c=51427&a=392786


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gateway, freight distribution hub, and international airport. The Transportation chapter of this Plan integrates recommendations and projects identified by the Freight Master Plan.

The Economic Opportunities Analysis also recommends prioritizing and better linking freight transportation improvements with other infrastructure investments in employment districts. To begin, it recommends working with regional partners to develop a regional freight rail strategy focused on enhancing rail access, travel time, and the efficiency of rail operations for competitive access to markets.

### Funding investments

Portland, like many cities across the nation, faces infrastructure funding challenges. Although the City is implementing best management practices and working with public and private partners to improve the efficiency and effectiveness of its infrastructure systems, new ways to fund infrastructure will be needed in the future, either to replace currently outdated funding systems or supplement inadequate funding levels. Portland's Economic Opportunities Analysis (2012) recommends that the City, and the region, pursue alternative infrastructure investment and funding strategies to maintain a competitive and innovative business environment. In particular, the EOA lists maintenance and upgrades to the transportation system, particularly for freight mobility, and broadband investments to support high tech industry as key infrastructure investment areas in need of alternative funding strategies.[10]

## Maintaining Affordability

In order to support community prosperity and affordability for households and businesses, the City aims to cost-effectively provide high-quality, reliable infrastructure services to the community. To accomplish this goal, the City is working to prioritize preventative maintenance to minimize future costs, compare the costs and benefits of proposed actions, employ risk management principles to direct public resources at the most urgent needs, and utilize diverse funding streams.

# Education

Creating an educated Portland requires that all youth have the necessary support and opportunities to thrive – both as individuals and as contributors to a healthy community and a prosperous, sustainable economy.[11]

## Supporting youth success

The City's infrastructure, particularly its transportation systems, parks and recreation facilities, natural areas, and police and emergency services are critical to creating neighborhoods that support youth success. The Portland Plan sets a 2035 goal that all youth live in safe and supportive neighborhoods with safe and affordable transportation options, multiple opportunities for daily physical activity and healthy eating, public safety services, and quality schools that offer multiple community-serving functions.

[10] City of Portland (2012). *Economic Opportunities Analysis – Section 4 Alternative Choices*. p. 11. Retrieved from http://www.portlandonline.com/portlandplan/index.cfm?c=51427&a=392786
[11] City of Portland (2012). The Portland Plan. p. 33.


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The Citywide Systems Plan includes a variety of investments that help to create complete neighborhoods that support youth success. The Plan includes active transportation investments to create safe walking and biking routes throughout the city to key destinations like schools, centers, employment areas, transit, parks and natural areas. It also includes programs and investments to maintain and improve parks, recreation facilities and school grounds to increase access to recreation. The Plan supports investments, programs, and partnerships to bring nature into the city through enhanced habitat corridors, tree planting, and the use of vegetated stormwater facilities, like green streets and stormwater swales. Finally, the Citywide System Plan also supports continued collaboration between the City and local school districts around safe routes to schools, recreational programs, and neighborhood and police services.

# Human and watershed health

A healthy city requires quality basic services to protect and promote human health and safety and watershed health. The City's transportation, water, sewer, stormwater, trails, green infrastructure, parks natural areas and recreation, and police and fire facilities and services are all critical to protecting and maintaining health and quality of life. The Citywide Systems Plan includes investments in projects and programs to manage and maintain these public infrastructure systems to provide these essential services.

## Creating healthy, complete neighborhoods

In complete neighborhoods, people have safe and convenient access to the places, goods, and services needed in daily life. These neighborhoods include housing options, employment options, grocery stores and other commercial services, quality public schools, parks, trails, natural areas and recreational facilities, affordable active transportation options, and civic amenities. A complete neighborhood must also meet the needs of people of all ages and abilities.

Complete neighborhoods can improve human and watershed health by protecting air and water quality through more trees and other green infrastructure; creating safe and convenient options to walk, bike, or take transit; and providing access to nearby parks and natural areas. These elements further promote human and environmental health by reducing auto emissions and other pollutants, and by supporting community resiliency and preparedness in an emergency or disaster. Maintaining existing built and natural infrastructure, as well as providing new infrastructure, is critical to creating complete neighborhoods.

The Citywide Systems Plan includes a variety of investments aimed at creating healthy, complete neighborhoods – including investments in active transportation networks, parks and natural areas, green infrastructure, and emergency response.

## Connecting people and places

Connecting Portlanders through active and low-carbon transportation options to their neighborhoods and to key destinations across the city and the region is integral to improving personal, public, and environmental health. These key destinations include places like work, school, shops, and parks and recreational opportunities. Such transportation choices reduce the need to drive, which can promote health by increasing physical activity, reducing household costs, increasing access to the outdoors, and


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reducing carbon and other air and water pollutants. Making active transportation a safe and convenient option requires creating a network of safe, accessible and attractive streets, trails, and greenways that encourage active living and community interaction and that integrate nature into neighborhoods. In addition to human and environmental health benefits, shifting travel to active transportation can increase capacity on roadways for freight and automobile movement. Preserving this capacity supports economic prosperity and reduces the need for additional roadway capacity as the city and region grow. The Citywide Systems Plan includes projects and programs to improve active transportation and greenway networks and to improve the safety of the city's roadways.

## Protecting and improving watershed health

Healthy watersheds provide a broad array of ecosystem services. Trees, natural areas and other green infrastructure help keep the air and water cool and clean, support stream flow and stormwater management, protect and enhance biodiversity, and reduce the risks and impacts of natural hazards and climate change. These "ecosystem services" are critical for protecting public health and safety and ensuring the effectiveness of Portland's infrastructure systems. They also help the City meet environmental regulations.

The Natural Resource Inventory, adopted as part of the factual basis for the Comprehensive Plan, will inform programs to protect and restore the rivers, streams, wetlands, and vegetation that provide these ecosystem services, and that are vital components of City's stormwater infrastructure system in many Portland neighborhoods. In addition, the Portland Plan establishes objectives and actions for protecting and improving watershed health and associated benefits by 2035.

Multiple bureaus, including Portland Parks & Recreation and the Bureau of Environmental Services, play a role in protecting, restoring, and enhancing watershed health in the city. The Citywide Systems Plan identifies priority projects and program investments needed to sustain and improve key watershed functions relating to hydrology (how water interacts with the natural and built landscapes), water quality, habitat and wildlife, and to meet existing and emerging regulatory obligations.

## Designing with nature

The Citywide Systems Plan and the Comprehensive Plan Update's draft goals and policies encourage infrastructure design that protects and enhances watershed health and ecosystem services and avoids the costs associated with degraded natural resources. The updated goals and policies call for treating stormwater as a resource, protecting existing green infrastructure and adding tree canopy and landscaped stormwater facilities into development and street design in order to mimic the natural functions of a healthy watershed. The Citywide Systems Plan includes policies and investments intended to further integrate green infrastructure into infrastructure planning, design, and implementation, while complementing Comprehensive Plan policies that encourage environmentally-friendly development and building design.


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# Resilience

## Preparing for climate change

Portland's climate is changing. Temperatures have increased by an average 1.3° F over the past century in the Pacific Northwest. Precipitation in the Pacific Northwest has generally increased, especially in the spring. The future impacts Portland experiences from climate change will depend largely on whether global carbon emissions decline quickly, plateau, or continue to rise.

In the Pacific Northwest, climate change projections indicate an increase in average annual temperature of 3.3° F to 9.7° F by the end of this century, with greater warming happening in the summers. These projections forecast decreases in summer precipitation (by as much as 30 percent) and increases in winter precipitation over the coming century. In the future, Portland will likely experience hotter, drier summers, and warmer, wetter winters, with more heat waves occurring during the summers.

Portland's infrastructure is vulnerable to several climate change risks including increased flooding and landslides in the winter, and high temperatures, drought, and wildfires in the summer. Portland's built infrastructure has been designed to withstand the historic climatic record. Events outside of that past experience, or an increased number of damaging events, can significantly impact important infrastructure services such as water, sewer, stormwater, flood management, and transportation. Climate change impacts can result in some infrastructure systems becoming more frequently stressed, overloaded, damaged, or at times, partially or totally unavailable. The Citywide Systems Plan includes investments to help ensure the reliability of the City's infrastructure, including improvements to water supply sources and stormwater management facilities.

Portland's green infrastructure, including trees, ecoroofs, green street facilities, natural areas, wetlands, natural waterways, and floodplains, could also be affected by climate change. For example, hotter summers can stress vegetation and make it more susceptible to diseases, pests, and invasive species. Increased flooding onto developed lands threatens homes, businesses, and roadways, and is likely to result in increased pollution and sediment entering streams, reducing water quality. However, investment in green infrastructure could mitigate stress on other assets and on Portland's residents and businesses. For example, increased tree canopy can reduce the severity of heat waves, and green streets can reduce urban flooding. The Citywide Systems Plan includes a variety of investments to protect, enhance, and restore the city's natural areas, urban canopy, and other green infrastructure.

Considering the impacts of climate change and identifying the vulnerabilities and risks of those impacts, enables the City to make more informed infrastructure investment decisions to better prepare and adapt for climate change and improve the resiliency of critical infrastructure. Climate change vulnerabilities must be incorporated into the risks of failure of the City's built and green infrastructure so assets can be appropriately maintained, designed, and replaced to improve the resiliency of systems to hotter drier summers, wetter winters, and storms of increased intensity.


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## Preparing for and responding to natural hazards[12]

The City of Portland faces potential impacts from a wide variety of natural hazards including earthquakes, severe weather, floods, landslides, urban wildland fires, and volcanic activity. The City's infrastructure facilities and services are vulnerable to natural hazards and are also key to recovering from such events. The City's Natural Hazard Mitigation Plan identifies natural hazards, assesses the related threat and vulnerability to the city's facilities, and recommends mitigation strategies to address high risk assets. The following types of infrastructure are important to hazard preparedness, response, and recovery:

- **Essential facilities** are necessary for continuation of operations and include police and fire stations, City Hall, the 1900 Building, the City's Emergency Coordination Center, the 911 Call Center, and the Justice Center.
- **Critical facilities and infrastructure** include "systems and assets necessary to ensure continuity of security, safety, health and sanitation services, support the area's economy and/or maintain public confidence. Incapacitation or destruction of any of these systems or assets would have a debilitating impact on the area either directly, through interdependencies and/or through cascading effects."[13] Critical infrastructure includes public services that have a direct impact on quality of life such as communication technology (phone lines or Internet access); vital services such as public water supply, sewage treatment; and transportation facilities, such as airports, heliports, highways, bridges, tunnels, roadbeds, overpasses, railways, bridges, rail yards, depots and waterways, harbors, and dry docks.
- **Lifelines** include utility systems (potable water, wastewater, oil, natural gas, electric power facilities, and communication systems) and transportation systems (airways, bridges, roads, tunnels, and waterways). Communications facilities are also important lifelines.
- **High Potential Loss Facilities** include facilities that would have a high loss (environmental, economic, or human life and safety) associated with their failure, such as nuclear power plants, levees, dams, and military installations. In Portland, City-owned high potential loss facilities include Portland Water Bureau reservoirs, such as those at Mount Tabor and Washington Park.

The Citywide Systems Plan includes investments to improve the resiliency of the City's infrastructure to natural and other hazards. These include projects to reduce risks to essential and critical infrastructure; improve and restore the city's green infrastructure; enhance the seismic resilience of facilities; and provide redundant (i.e. backup) infrastructure for assets like water and sewage pump stations.

## Adapting to social and economic changes

Resilient infrastructure must be adaptable to social and economic shifts as well as natural and climactic changes. Many types of infrastructure built today – including roads, pipes, and parks – are expected to last for many decades. Planning, managing, and investing in the City's infrastructure in ways that reflect changing demographics and economic needs will be integral to meeting the needs of the community over coming decades.

[12] Adapted from City of Portland, Natural Hazard Mitigation Plan, 2010.
[13] Portland/Vancouver Urban Area Critical Infrastructure Protection Plan, 2009.


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# Chapter 4
# Infrastructure and Service Delivery

## Urban Service Provision

The City of Portland is the primary provider of infrastructure facilities and services, including transportation, water, sanitary sewer, stormwater, civic facilities, and parks and recreation, within the Portland urban services boundary (USB). The urban service area largely corresponds to areas within the city limits of Portland, but also includes additional unincorporated areas (see Figure 4.1 and the City's Comprehensive Plan Map).

The City of Portland partners with a variety of agencies and organizations to provide infrastructure services within the Portland urban service boundary, see below. While not explicitly discussed in this report, the capacity of these partner agencies to provide necessary services affects the City of Portland's service capabilities and demands. As part of the Comprehensive Plan Update, the City of Portland has or should establish intergovernmental service agreements with agency partners that provide urban services within the Portland Urban Service Boundary, in accordance with Oregon Revised Statute 195 and 197. These service partners are noted with an asterisk (*) below.

In some cases, the City of Portland provides infrastructure services to areas outside of the City of Portland urban services boundary, through service contracts with neighboring jurisdictions.

### Service Responsibilities

The City of Portland provides the following public facilities and services within Portland:

#### Transportation

The City of Portland manages and/or regulates public rights-of-way and manages and maintains a variety of transportation facilities. Transportation facilities and services are also provided by a variety of other public agencies:

- Multnomah County* manages and maintains six Willamette River bridges.
- The Oregon State Department of Transportation* manages the State highway system, including the Marquam, Fremont, Interstate and Glenn Jackson bridges.
- TriMet* provides and operates the regional transit system, including the Tilikum Crossing bridge, with the exception of the Portland Streetcar which is owned by the City of Portland, operated with assistance from Portland Streetcar Inc, and funded in partnership with TriMet; and the Portland Aerial Tram, which is owned by the City and operated in partnership with the Oregon Health Sciences University (OHSU).
- The Port of Portland*, a regional agency, operates several marine terminals and the Portland International Airport.


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- The BNSF Railway, Union Pacific Railroad, Portland and Western Railroad, Portland Terminal Railroad, Peninsula Terminal Railroad, and Amtrak move goods and people by rail.

### Sanitary sewer, stormwater, and flood management

The City of Portland is the primary provider of sanitary sewers, wastewater treatment, stormwater management and conveyance, and flood management except as follows:

- Washington County's Clean Water Services*, the Port of Portland, and the Oregon Department of Transportation provide stormwater management and conveyance to some areas of Portland.
- Gresham, Milwaukie, Clackamas County Service District #1, and Clean Water Services provide conveyance and treatment of sewage in some areas of Portland.
- The Multnomah County Drainage District No 1*, Peninsula Drainage District No 1*, and Peninsula Drainage District No 2* provide stormwater management and conveyance services and flood mitigation and control in much of the Columbia Corridor. New agreements are in negotiations.
- Management of stormwater on private property has an impact on the amount and quality of stormwater entering public stormwater systems.
- The East and West Multnomah Soil and Water Conservation Districts, governmental agencies, provide technical, financial and educational assistance to support efforts to conserve and restore natural resources within their districts.
- Non-governmental associations, such as Watershed Councils and Friends groups, steward and support the protection, restoration and enhancement of the city's watersheds.

### Water supply and distribution

The City of Portland is the primary provider of water supply and distribution, except in areas where service is provided under agreement with water districts, see below. Except as noted below, these water districts are wholesale customers of the Portland Water Bureau and therefore rely, to some degree, on the water supply, transmission, and storage infrastructure of the City of Portland.

- The Rockwood People's Utility District* provides water infrastructure and services to some areas of east Portland.
- The Burlington*, Tualatin Valley*, Valley View*, West Slope*, Palatine Hill*, and Alto Park* Water Districts and the Lorna Water Company provide water service to primarily unincorporated areas within the Portland urban service boundary to the west, southwest, and northwest of Portland.
- The Clackamas River Water District* and Sunrise Water Authority* provide water services to unincorporated areas within Portland's urban service boundary to the south of Portland. These water districts operate in partnership with each other through a cooperative agreement and use the Clackamas River as their main water supply source.

### Parks and recreation

The City of Portland is the primary provider of public parks, recreational facilities, and natural areas. The City also manages Portland's urban forest, including regulation of street trees, public trees, and some


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private trees, and development and implementation of strategies, education programs, and best management practices. Partners include:

- Oregon State Parks owns and operates Tryon Creek State Natural Area.
- Metro, the regional government, manages regional parks and natural areas, a number of spectator facilities, and the Oregon Zoo.
- Other non-governmental providers, such as the Audubon Society, own and maintain natural areas and public open spaces in Portland.
- Non-profit associations, "friends" groups, councils, and volunteer organizations help steward and support the City's parks, natural areas, trails, facilities, and arts and recreation programs.

### Green infrastructure

The City of Portland protects, restores, constructs and manages a variety of green infrastructure assets, such as tress, natural areas, ecoroofs, green street facilities, wetlands, and natural waterways. Other governmental agencies, nonprofit organizations and private entities also play a large role in the protection and stewardship of these resources.

Within the City government, responsibility for green infrastructure assets is divided among various City bureaus, including the Bureau of Environmental Services, Portland Parks & Recreation, the Bureau of Transportation, Portland Water Bureau, and Office of Management and Finance. Bureaus make capital and programmatic investments, and maintain diverse partnerships, to support management of the city's green infrastructure. In addition, because green infrastructure provides multiple infrastructure services and functions, planning, acquisition, development, restoration, and long-term management of green infrastructure assets may be provided by individual bureaus or through cross-bureau partnerships.

### Public safety

Public safety and emergency services, including police, fire, and emergency management, are provided primarily by the City of Portland. Portland Fire & Rescue and the Portland Police Bureau participate in mutual aid agreements with all fire agencies bordering the City of Portland. The goal of mutual aid is to lend or receive fire protection and emergency medical services assistance across jurisdictional boundaries. The City also operates the regional 9-1-1 center and related systems. In addition, the Port of Portland provides police, fire, and rescue services for the Portland International Airport.

### Solid waste, composting and recycling

The City of Portland regulates the collection and hauling of solid waste, compost, and recycling. Metro is the regional solid waste authority, charged with ensuring that the region's solid waste is managed in a manner that protects public health and safety and safeguards the environment. Metro regulates facilities and operates transfer stations; private companies collect, transfer, process, and dispose of solid waste, compost, and recycling. The City partners with Metro and supports Metro's work to ensure sound landfill management.


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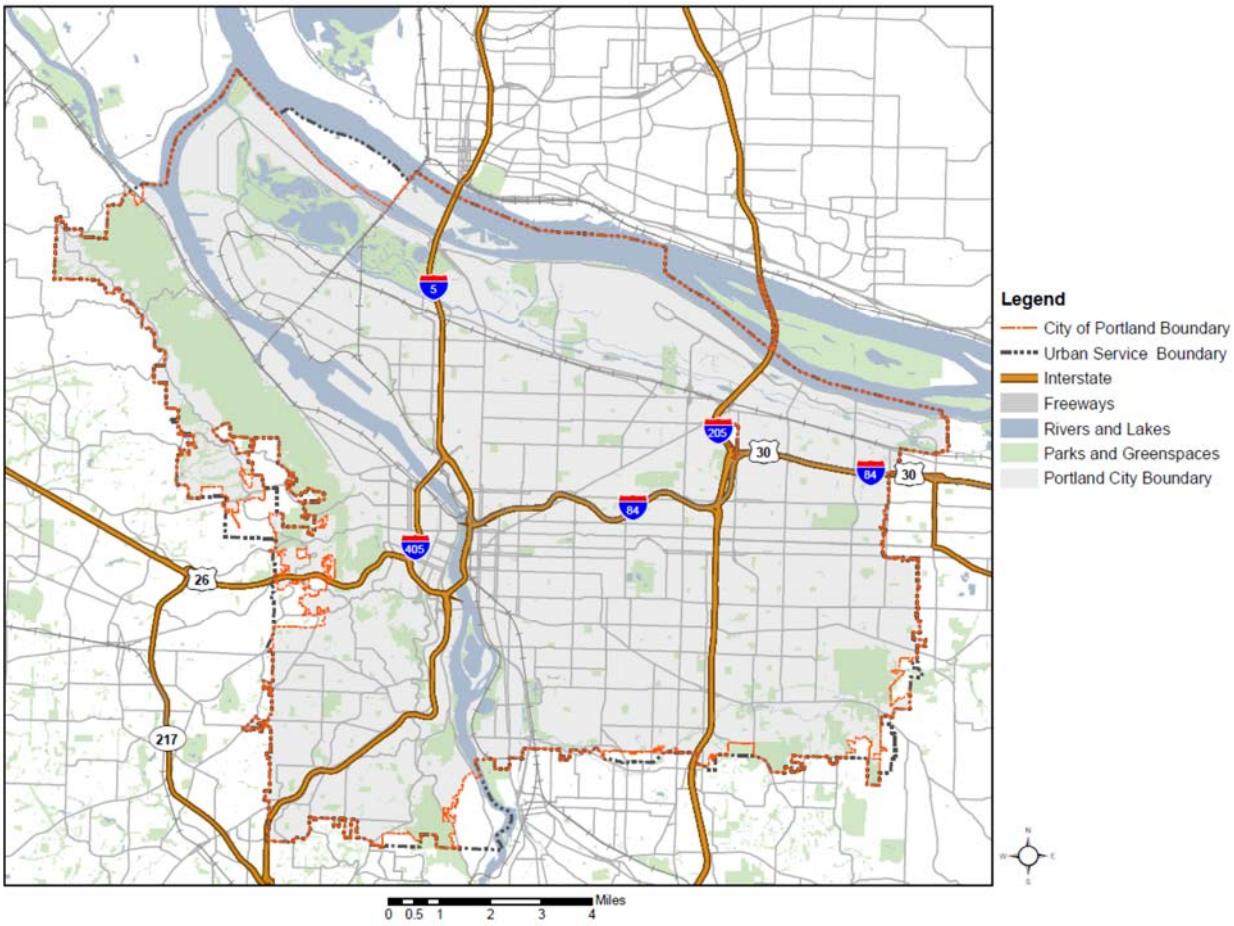
Figure 4.1. Portland's Urban Service Boundary and City Limits





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## Citywide inventory

The City of Portland provides and maintains infrastructure systems that supply water, sewer, transportation, parks and civic services. These infrastructure systems represent a significant investment and have a current replacement value of more than $31 billion.[14] Tables 4.1 and 4.2 summarize of the City's infrastructure inventory, including the status, value, and condition of assets. These tables only include assets owned and/or managed by the City of Portland and do not reflect assets owned by partner agencies or by private property owners (e.g. private trees). Assets owned by partner agencies and private entities contribute to the overall provision of public services in the City of Portland but are not a component of this Plan.

Table 4.1 Summary of the City of Portland's Infrastructure Systems (2013)

| | | |
|---|---|---|
| **Transportation**<br>  | 4,842 lane miles of roads<br>160 bridges<br>1,072 traffic signals<br>8.8 million square yards of sidewalks<br>37,813 improved corners<br>55,389 street lights | |
| **Environmental Services**<br>  | 1,454 miles of separated storm and sanitary sewer pipes<br>885 miles of combined sewer pipes<br>97 pumping stations<br>2 wastewater treatment plants<br>47,779 storm and sanitary sewer access structures<br>1,900 green stormwater facilities (green streets, ponds, and swales)<br>885,312 feet of culverts and ditches<br>8,587 underground injection control facilities (UICs) and sedimentation manholes | |
| **Water**<br>  | Bull Run watershed<br>Columbia South Shore wellfield<br>238 million gallons finished storage<br>75 miles of conduits<br>49 miles of transmission mains<br>2,200 miles of pipes<br>1,600 culverts<br>2 dams | 33 wells<br>184,000 service lines<br>44,000 valves<br>184,800 meters<br>14,200 hydrants<br>38 pump stations<br>70 storage tanks |
| **Parks & recreation**<br>  | 11,546 acres of parkland and natural areas<br>5 golf courses<br>8 botanical / public gardens<br>1 motorsports raceway<br>4 stadiums<br>13 pools<br>14 community and arts centers | 155 miles of regional trails<br>129 playgrounds<br>232 sports fields<br>48 community gardens<br>124 tennis courts<br>5 skate parks<br>33 dog off leash areas |
| **Other facilities & systems**<br>  | Facilities:<br>8 Police precincts and facilities<br>8 office, PDC facilities, and other buildings<br>5 spectator and performing arts facilities<br>32 fire stations and facilities | Technology:<br>Communications networks<br>Production Services<br>Strategic technology<br>Electronic equipment and software |

[14] City of Portland, "2013 City Assets Report".



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Table 4.2 City of Portland's Infrastructure: Inventory, Value, and Condition (2013)

| Capital Asset Class | Description | Replacement Value $ million | Replacement Value Confidence | Current Condition (in %) Very Good | Good | Fair | Poor | Very Poor | TBD | Confidence |
|---|---|---|---|---|---|---|---|---|---|---|
| **Transportation** | | **$8,066.8** | | | | | | | | |
| Arterial & collector streets | 1,871 lane miles | $2,451.0 | Moderate | 18 | 21 | 21 | 32 | 8 | 0 | High |
| Local streets | 2,971 lane miles | $2,304.8 | Moderate | 12 | 19 | 22 | 36 | 11 | 0 | High |
| Sidewalk system | | | | | | | | | | |
| sidewalks | 8,833,812 sq. yds | $1,113.1 | High | 10 | 25 | 30 | 25 | 10 | 0 | Moderate |
| curbs | 3,260 centerline miles | $533.6 | Moderate | 12 | 50 | 16 | 12 | 10 | 0 | Moderate |
| corners | 37,813 corners | $158.5 | High | 10 | 18 | 17 | 28 | 27 | 0 | High |
| Structures (bridges only) | 160 bridges | $378.5 | Optimal | 6 | 42 | 33 | 18 | 1 | 0 | Optimal |
| Traffic signals (hardware only) | 1,072 traffic signals | $275.3 | Moderate | 15 | 16 | 23 | 23 | 23 | 0 | Moderate |
| Street lights | 55,389 street lights | $194.3 | Low | 4 | 12 | 39 | 30 | 15 | 0 | Low |
| Support facilities | various buildings | $6.9 | None to Low | condition ranges from poor to very good | | | | | | None to Moderate |
| Other transportation assets | Streetcar, aerial tram, signal controllers, traffic calming devices, street signs, pavement markings, meters, retaining walls, stairways, guardrails, harbor wall. | $650.8 | Low to Optimal | condition range from poor to very good or tbd | | | | | | Low to Optimal |
| **Environmental Services** | | **$12,517.1** | | | | | | | | |
| Combined sewers | 885 mi. of pipe & access | $5,018.8 | High | 52 | 18 | 12 | 12 | 6 | 0 | High |
| Sanitary sewers | 1000 mi. of pipe & access | $4,104.4 | High | 72 | 20 | 6 | 2 | 0 | 0 | High |
| Stormwater system | 454 mi. of pipe; 1900 green stormwater facilities | $1,946.7 | Moderate | 27 | 29 | 15 | 22 | 7 | 0 | High |
| Wastewater treatment | 2 treatment plants & 97 pump stations | $2,168.0 | Moderate | 20 | 20 | 30 | 20 | 10 | 0 | Low |


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| Capital Asset Class | Description | Replacement Value | | Current Condition (in %) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $ million | Confidence | Very Good | Good | Fair | Poor | Very Poor | TBD | Confidence |
| **Water** | | **$5,472.0** | | | | | | | | |
| Supply | 126 miles of roads, 1609 culverts, 12 bridges, 1 200-ft high concrete dam, 1 110-ft high earth dam, ASR wells, 33 well sites with drilled wells, pumps and motors, monitoring wells, 1 groundwater pump station, treatment facility, tank, and collection mains to bring water from wells to pump station | $826.1 | Moderate | 4 | 54 | 39 | 3 | 0 | 0 | Moderate |
| Transmission | 75 miles of large diameter conduits, with various supports, 9 conduit trestles 7 river crossings, 49 miles of large diameter transmission mains | $1,202.4 | Moderate | 6 | 43 | 44 | 8 | 0 | 0 | Moderate |
| Terminal storage | 238 million gallons finished water storage, interconnecting piping, post-storage treatment facilities, and microhydro facility. | $786.9 | Moderate | 0 | 2 | 24 | 74 | 0 | 0 | High |
| Distribution | 2200 miles of distribution pipes, 184,000 service lines, 44,000 system valves, 6800 large meters, 178,000 small meters, 14,200 hydrants, 24,000 backflow devices, 38 pump stations, 70 storage tanks | $4,176.3 | High | 14 | 47 | 31 | 6 | 2 | 0 | High |
| Support facilities | 13 support buildings, SCADA, vehicles, construction equipment, lab equipment, computers, and infrastructure components in inventory | $105.0 | High | 24 | 17 | 10 | 16 | 32 | 0 | Moderate |



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| | | Replacement Value | | Current Condition (in %) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Capital Asset Class** | **Description** | **$ million** | **Confidence** | **Very Good** | **Good** | **Fair** | **Poor** | **Very Poor** | **TBD** | **Confidence** |
| **Parks and Recreation** | | **$984.3** | | | | | | | | |
| **amenities** | | | | -- | -- | -- | -- | -- | -- | -- |
| furnishings in developed parks | decorative elements and furnishings: memorials, plaques, display fountains, benches, tables, drinking fountains in developed parks and natural areas | $17.60 | Low | 10 | 38 | 37 | 9 | 2 | 4 | Moderate |
| furnishings in natural areas | | | | 0 | 0 | 0 | 0 | 0 | 100 | TBD |
| decorative elements | | | | 0 | 0 | 0 | 0 | 0 | 100 | TBD |
| buildings and pools | community and arts centers, pools indoors and outdoors, restrooms, maintenance and utility buildings | $268.50 | High | -- | -- | -- | -- | -- | -- | -- |
| major buildings | | | | 61 | 9 | 26 | 0 | 4 | 0 | High |
| minor buildings | | | | 42 | 19 | 29 | 6 | 3 | 0 | High |
| recreation features | gathering places, play areas, sports fields and courts, water play areas, docks and boat ramps | $228.60 | Low | -- | -- | -- | -- | -- | -- | -- |
| gathering places | | | | 0 | 0 | 0 | 0 | 0 | 100 | TBD |
| marine | | | | 71 | 0 | 6 | 23 | 0 | 0 | High |
| off-leash areas | | | | 0 | 0 | 0 | 0 | 0 | 100 | TBD |
| play areas | | | | 3 | 38 | 52 | 5 | 2 | 0 | High |
| sports courts and fields | | | | 39 | 24 | 15 | 19 | 3 | 0 | Low |
| water play | | | | 0 | 0 | 0 | 0 | 0 | 100 | TBD |
| built infrastructure | circulation systems such as trails, walks, roads and parking lots; utilities | $63.80 | Low | -- | -- | -- | -- | -- | -- | -- |
| circulation | | | | 0 | 41 | 40 | 18 | 0 | 0 | Moderate |
| utilities | | | | 0 | 0 | 0 | 0 | 0 | 100 | TBD |
| green infrastructure | natural areas, gardens, turf, flower and shrub beds, trees | $405.8 | Low | -- | -- | -- | -- | -- | -- | -- |
| natural areas | | | | 50 | 31 | 6 | 12 | 1 | 0 | Moderate |
| developed areas | | | | 10 | 34 | 45 | 7 | 4 | 0 | Low |


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| | | Replacement Value | | Current Condition (in %) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Capital Asset Class** | **Description** | **$ million** | **Confidence** | **Very Good** | **Good** | **Fair** | **Poor** | **Very Poor** | **TBD** | **Confidence** |
| **Civic** | | **$1,318.5** | | | | | | | | |
| **Facilities (buildings, structures)** | | | | | | | | | | |
| Office buildings | Portland Building, 1900 Building, City Hall | $172.3 | High | 0 | 38 | 62 | 0 | 0 | 0 | High |
| Other buildings | Archives and Records Center, Kerby Garage, and Portland Communications Center | $69.3 | High | 0 | 68 | 32 | 0 | 0 | 0 | High |
| PDC facilities | Train station and related buildings and Centennial Mills | $48.7 | Moderate | 0 | 0 | 80 | 20 | 0 | 0 | High |
| Spectator facilities | Memorial Coliseum, Rose Quarter parking garages, and Providence Park | $529.6 | Moderate | 0 | 37 | | 63 | 0 | 0 | High |
| Performing Arts facilities * | Five stages in three buildings (Arlene Schnitzer Concert Hall, Keller Auditorium, and Antoinette Hatfield Hall) | $111.2 | Moderate | tbd | tbd | tbd | tbd | tbd | 0 | TBD |
| Fire facilities | 30 stations, administration building and support facility | $96.8 | High | 0 | 98 | 0 | 2 | 0 | 0 | High |
| Police facilities | Four precincts, Justice Center, property warehouse, equestrian division, and vehicle storage lot | $108.8 | High | 0 | 100 | 0 | 0 | 0 | 0 | High |
| **Technology Services** | | | | | | | | | | |
| BTS Communications | Data networks, WiFi network, 800 MHz radio system | $70.8 | Moderate | 0 | 97 | 3 | 0 | 0 | 0 | High |
| BTS Production Services | Storage area network, core servers, email system | $2.8 | Moderate | 0 | 77 | 23 | 0 | 0 | 0 | High |
| BTS Strategic technology | Large corporate applications owned and managed by BTS such as GIS | $6.2 | Moderate | 0 | 84 | 16 | 0 | 0 | 0 | High |
| Electronic equipment and software-other bureaus | Video systems, electronic equipment, Office Suite software, bureaus' PC's and laptops | $8.2 | Moderate | 0 | 100 | 0 | 0 | 0 | 0 | High |
| Strategic technology-other bureaus | Large corporate applications such as TRACS, CAD, PPDS, CIS, and EBS | $93.8 | Moderate | 0 | 88 | 12 | 0 | 0 | 0 | High |

* OMF is beginning to work with Metro/MERC on the status of performing arts facilities.



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# Infrastructure Coordination

Providing effective and efficient public facilities and services requires coordination across various City bureaus and offices. This coordination ranges from planning and asset management to long-range financing, annual budgeting, construction, and development review.

## Coordinated Facilities and Services

In support of the City's overall mission, individual bureaus maintain distinct, but often complementary, missions and partner in multi-purpose facilities. A few examples include:

- The Bureau of Environmental Services and Portland Parks & Recreation share an interest in the protection, restoration, and enhancement of the city's green infrastructure, including the urban forest – as it provides stormwater, recreation, and natural resource value and services.
- Portland Parks & Recreation and the Bureau of Transportation cooperatively plan for and manage the City's trail systems and play a role in the provision of an interconnected, multi-modal transportation and recreation system.
- The Bureau of Environmental Services and Bureau of Transportation partner on right-of-way and street improvements to manage stormwater, including green streets.
- The Portland Water Bureau and Portland Parks & Recreation operate co-located facilities at places like Powell Butte Park, home to the City's largest water reservoir, and at the City's hydroparks.
- The Portland Police Bureau, Portland Fire & Rescue (PF&R), and the Office of Management and Finance, including the Bureau of Internal Business Services (BIBS) and the Bureau of Technology Services (BTS), provide buildings, facilities, technology, vehicles and apparatus that directly support the work of the Bureau of Environmental Services, Portland Water Bureau, Portland Bureau of Transportation and Portland Parks & Recreation.

## Asset management

The City of Portland has asset management programs in the five major infrastructure bureaus – the Bureau of Transportation, Bureau of Environmental Services, Portland Water Bureau, Portland Parks & Recreation, and the Office of Management and Finance. While each bureau's asset management activities differ based on the needs of their unique systems, they coordinate with each other on a one-on-one basis and through the City Asset Managers Group (CAMG). The CAMG is a cross-bureau effort to establish best practices and continually improve performance-based information available to the public, bureaus, and city leaders. This information guides choices in the types and levels of service desired. The CAMG produces an annual City Assets Report that provides information on the value, condition, and funding needs for the City's assets. The information contained in this report helps decision-makers make more informed decisions in the annual budget process. More information on asset management can be found in Chapter 2.


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## Annual City Budget[15]

Every year, City bureaus participate in the annual budget process, which sets appropriation levels for operations and capital projects for the following fiscal year. The budget process is governed by Oregon's Local Budget Law, Chapter 294 of the Oregon Revised Statutes, which provides standard procedures for preparing, presenting, and administering local budgets, and ensures citizen involvement in budget preparation.

Budgeting in Oregon is an effort shared by citizens and elected and appointed officials. Citizens involved in the budget process work to ensure the services they require and want are adequately funded. City officials are responsible for building a budget that reflects the public interest and is structurally correct.

### Budget Process

There are four primary steps in the creation of each year's budget – preparation of a proposed budget, approval, adoption, and amendment.

- **Preparing the Proposed Budget**: Acting as the Budget Officer, the Budget Director is responsible for overseeing the preparation of the Mayor's Proposed Budget for presentation to the City Council, sitting as the Budget Committee. The Proposed Budget is the culmination of an extensive process of budget development, analysis, and revision. Bureaus prepare Requested Budgets in accordance with direction given by the Mayor. These are submitted to the City Budget Office, which then analyzes the requests.
- **Approving the Budget**: In accordance with Local Budget Law, the City Council convenes to consider the Proposed Budget. The public is encouraged to attend and provide testimony on the Proposed Budget. The City Budget Office then summarizes the changes from the Mayor's Proposed Budget to the Approved Budget. This information and copies of the Proposed Budget are sent to the Tax Supervising & Conservation Commission for review, analysis, and certification.
- **Adopting the Budget:** City Council votes to officially adopt the budget before the start of the new fiscal year. Changes between the time the budget is approved and final adoption are limited to technical adjustments and other amendments defined by Local Budget Law.
- **Amending the Budget:** Changes after budget adoption are completed through the budget monitoring process (BMP), which also includes a supplemental budget. During the BMP, bureaus can request to transfer appropriation. In supplemental budgets, bureaus may ask to increase appropriation. The BMP and supplemental budgets provide Council the opportunity to change the budget three times a year.

[15] This section was adapted from the 2013-2014 City of Portland Annual Budget. The full description of the budget process can be found in Volume 1: Citywide Summaries and Bureau Budgets, pages 34-37.



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### Public Involvement Process

The City engages in a proactive public outreach effort as part of the budget process through:

**Bureau Budget Advisory Committees:** Bureau-specific Budget Advisory Committees, made up of City staff, community members, and technical experts, review the specific bureau's draft budget request, weigh in on the program and service rankings, and provide input on proposed reductions.

**Community Hearings:** In advance of the Adopted Budget, the City holds community hearings where Portlanders provide input. The feedback Portlanders provide helps Council prioritize services.

**Portland Utility Review Board** (PURB): The PURB is an appointed body of nine community members who provide independent and representative review of water, sewer, stormwater, and solid waste financial plans, budgets, and rates. PURB operates in an advisory capacity to the City Council. Council expects the PURB to provide common ground between the rate makers and the ratepayers through analysis of financial plans and budgets. PURB meets monthly to ensure a comprehensive understanding and assessment of the workings of the City's utilities.

**Direct Public Testimony:** Community members may directly contact the Mayor and Commissioners with input for the budget. In addition to participating in the budget advisory committees, PURB, and community budget forums described above, community members can also personally testify on bureau budget requests at annual budget hearings, at the Tax Supervising and Conservation Commission hearing, and at the adopted budget hearing.

## Development review

Building permits are reviewed by multiple City bureaus, including the infrastructure bureaus discussed in this report. The bureaus consider potential impacts of proposed development on infrastructure levels of service, and may require improvements to infrastructure before a land use permit is issued. Bureaus also review requests for most land use adjustments, such as conditional uses and land divisions. In these instances, they may require improvements – such as building streets, sidewalks, sewer and water lines or planting trees – as a condition of approval. In some instances, system development charges (SDCs) are assessed instead of or in addition to requiring improvements to infrastructure. The SDCs are assessed based on the potential impact of the proposed development.

## Annexation[16]

The City of Portland is the primary infrastructure provider within the City of Portland's limits of incorporation. Annexation is the process of changing municipal boundaries to bring in adjacent unincorporated areas into an existing city, typically to provide urban services not presently available. Either a city or property owner may initiate annexation.

[16] Adapted from City of Portland, "Annexation", accessed on July 15, 2013 at http://www.portlandoregon.gov/bps/article/363163.


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The City of Portland has adopted an urban service boundary (USB) that establishes the area for which it intends to provide urban services at some point in the future. Portland's urban service boundary was adopted in cooperation with surrounding jurisdictions. Property owners within Portland's urban services boundary may apply to the City of Portland to annex in order to receive urban level services, such as connection to City sewer and water systems. In these areas, the City plans for eventual service provision to urban service standards upon annexation of these properties into the City of Portland.

The cities of Portland and Gresham annexed virtually all adjacent unincorporated areas of Multnomah County in the late 1980s and early 1990s to provide sewers and other urban services to this developing area. The City is not currently pursuing any large-scale annexations of nearby unincorporated areas; property owners initiate most small-scale annexations.

### Utility Coordination

When utilities need to access pipes and other facilities below roadways for maintenance or replacement work, they must cut through and then patch the pavement. This can cause travel delays and community impacts during construction and can affect the quality, integrity and appearance of the pavement surface. The City of Portland aims to manage the pavement degradation and travel and community impacts of pavement cuts for utility work by coordinating capital projects and through a 5-year moratorium on new pavement surfaces. The moratorium limits new cuts on new pavement surfaces, including overlays, inlays, reconstruction, and new construction of at least a half street or greater.

## Citywide Investment Strategy Summary

The Citywide Systems Plan contains a capital Investment Strategy, including nearly $5.5 billion in projects, for the Bureau of Environmental Services, Portland Water Bureau, and Bureau of Transportation. For full information, see Chapters 6 through 8 and Appendix A. The projects and programs included in the Investment Strategy are intended to maintain existing assets, comply with regulatory mandates, and provide key levels of service to existing and future residents and businesses. The Investment Strategy is the basis for the Comprehensive Plan's List of Significant Projects, which identifies new facilities necessary to accommodate the residential and employment uses anticipated in the Comprehensive Plan.

Investment in the City's capital assets may utilize existing financial resources or may include issuance of long-term debt. A decision to issue debt as part of a capital investment strategy will include analysis of available resources to support full repayment of the debt, including whether repayment revenues are program-specific or City general funds. Recommendations regarding use of debt are centralized via the City's Debt Management program in the Office of Management and Finance, Public Finance & Treasury Division. Debt issuance must be authorized by City Council, and is conducted in conformance with the City's Debt Policy (FIN-2.12) and nationally recognized best practices.


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Table 4.3 Investment Strategy Summary

| Bureau | Estimated Investment Strategy Total (2013-2033) |
|---|---|
| Environmental Services | $1,731,749,000 |
| Water | $1,567,070,000 |
| Transportation | $2,154,888,804 |
| **TOTAL** | $5,453,717,804 |

Though not required by State public facility planning statutes and rules, the Citywide Systems Plan also includes discussions of long-term investment and financial considerations for parks and recreation facilities (see Chapter 9) and other essential facilities and systems (see Chapter 10). The Plan does not provide detailed investment strategies for these systems.

## System Summaries

### Bureau of Environmental Services

The Bureau of Environmental Services focuses efforts on comprehensive, multi-purpose solutions across four program areas of the Investment Strategy – wastewater treatment, collection system maintenance and reliability, system development, and surface water (stormwater and watershed) management. These investments are driven by regulatory mandates, system risk (condition and capacity), and system plans including watershed planning and monitoring. The bureau anticipates nearly $2 billion in investment in these programs over the next 20 years – see Table 4.4, Chapter 6 and Appendix A for more information on anticipated investments. Additional investment in ongoing operations and maintenance, green infrastructure programs, and other non-capital investments to meet stormwater, sewer, and watershed health system needs are not included here.

Table 4.4 Environmental Services Investment Strategy Summary

| Program | FY 2013-2018 | FY 2018-33 |
|---|---|---|
| Wastewater Treatment | $109,671,000 | $305,964,000 |
| Collection System | $328,896,000 | $702,800,000 |
| System Development | $23,462,000 | $60,000,000 |
| Surface Water Management | $73,441,000 | $127,515,000 |
| **TOTAL** | **$535,470,000** | **$1,196,279,000** |

### Portland Water Bureau

The Portland Water Bureau's Investment Strategy for the Citywide System Plan is divided into seven (7) primary programs: supply, transmission and terminal storage, distribution, treatment, regulatory compliance, customer service, and support. The Water Bureau anticipates over $1.5 billion in new investment in these programs over the next 20 years – see Table 4.5, Chapter 7 and Appendix A. The Bureau's Investment Strategy provides greater detail on anticipated water projects and investments.


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Table 4.5 Portland Water Bureau Investment Strategy Summary

| Program | FY 2013-2018 | FY 2018-33 |
|---|---|---|
| Supply | $14,291,000 | $88,500,000 |
| Transmission and Terminal Storage | $191,170,000 | $242,000,000 |
| Distribution | $244,197,288 | $461,650,000 |
| Treatment | $2,500,000 | $150,000,000 |
| Regulatory Compliance | $25,504,000 | $30,000,000 |
| Customer Service | $3,057,000 | $53,700,000 |
| Support | $10,000,000 | $50,500,000 |
| **TOTAL** | **$490,719,288** | **$1,076,350,000** |

### Bureau of Transportation

The Transportation System Plan (TSP) identifies projects and programs necessary to meet the mobility and access needs of Portland over the next twenty years. The Transportation System Plan is being updated to reflect the Comprehensive Plan Update and the update of the Regional Transportation Plan. The TSP serves as the transportation component of the Citywide Systems Plan. For reference, the TSP's project list is included in Appendix A.

### Portland Parks & Recreation

Portland Parks & Recreation has identified many infrastructure needs over the next 20 years to meet the level of service goals outlined in the Parks 2020 Vision, including:

- Acquisition for developed parks, natural areas, trails, recreation, and maintenance facilities.
- Maintenance of existing parks, natural areas, trails, and facilities
- Development of new community centers
- Development of new parks
- Improvements at existing developed parks
- New trails/improvements to existing trails
- Natural area parks

Portland Parks & Recreation maintains a 20-year capital improvement plan (CIP) list, which includes known growth and maintenance related projects that have been identified at this time. The CIP list does not yet include projects for locations where Portland Parks & Recreation has not yet acquired property or developed a master plan for a site, or projects for tree maintenance and canopy expansion investments. Further information about the Portland Parks & Recreation CIP list, including currently identified projects, can be found on the City of Portland's website at: https://www.portlandoregon.gov/parks/63265.

The Citywide Systems Plan does not include a detailed 20-year project list for Portland Parks & Recreation. A comprehensive system plan that reflects asset management needs and community priorities and includes a list of needed investments, costs, and funding sources, will be developed over the next few years. In addition, this information is not required as part of this Plan under Statewide Planning Goal 11: Public Facilities and related statutes and administrative rules.


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### Other Essential Facilities and Systems

The Citywide Systems Plan does not include a detailed 20-year project list for public safety, technology, and other essential facilities and services because comprehensive system plans, including lists of needed investments, costs and funding sources, are not available at this time. In addition, this information is not required as part of this Plan under Statewide Planning Goal 11: Public Facilities and related statutes and administrative rules.


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# Chapter 5
# Goals and Policies

All chapters of the Comprehensive Plan Goals & Policies contain goals and policies that may be relevant to the provision of public facilities and services. Chapter 8: Public Facilities and Services and Chapter 9: Transportation contain goals and policies for service delivery and system management for public rights of way, sanitary and stormwater systems, water, parks and recreation, transportation, and other City facilities and services. These chapters are included here for reference, but may be updated by future Comprehensive Plan post-acknowledgement amendments. The Comprehensive Plan Goals & Policies document contains the official versions of these policies.

## Chapter 8: Public Facilities and Services

Excerpted from the Comprehensive Plan Goals & Policies.

### Goals

**Goal 8.A: Quality public facilities and services.** High-quality public facilities and services provide Portlanders with optimal levels of service throughout the city, based on system needs and community goals and in compliance with regulatory mandates.

**Goal 8.B: Multiple benefits.** Public facility and service investments improve equitable service provision, support economic prosperity, and enhance human and environmental health.

**Goal 8.C: Reliability and resiliency.** Public facilities and services are reliable, able to withstand or recover from catastrophic natural and manmade events, and are adaptable and resilient in the face of long-term changes in the climate, economy and technology.

**Goal 8.D: Public rights-of-way.** Public rights-of-way enhance the public realm and provide a multi-purpose, connected physical space for safe movement and travel, public and private utilities, and other appropriate public purposes.

**Goal 8.E: Sanitary and stormwater systems.** Wastewater and stormwater are managed, conveyed, and/or treated to protect public health, safety, and the environment, and to meet the needs of the community on an equitable, efficient, and sustainable basis.

**Goal 8.F: Flood management.** Flood management systems and facilities support watershed health and manage flooding to reduce adverse impacts on Portlanders' health, safety and property.

**Goal 8.G: Water.** Reliable and adequate water supply and delivery systems provide sufficient quantities of high-quality water at adequate pressures to meet the needs of the community on an equitable, efficient and sustainable basis.


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**Goal 8.H: Parks, natural areas, and recreation.** All Portlanders have safe, convenient, and equitable access to high-quality parks, natural areas, trails, and recreational opportunities in their daily lives, which contribute to their health and well-being. The City manages its natural areas and urban forest to protect unique urban habitats and offer Portlanders an opportunity to connect with nature.

**Goal 8.I: Public safety and emergency response.** Portland is a safe, resilient, and peaceful community where public safety, emergency response and emergency management facilities and services are coordinated and able to effectively and efficiently meet community needs.

**Goal 8.J: Solid waste management.** Residents and businesses have access to waste management services and are encouraged to be thoughtful consumers to minimize upstream impacts and avoid generating waste destined for the landfill. Solid waste — including food, yard debris, recyclables, electronics, and construction and demolition debris — is managed, recycled and composted to ensure the highest and best use of materials.

**Goal 8.K: School facilities.** Public schools are honored places of learning as well as multifunctional neighborhood anchors serving Portlanders of all ages, abilities, and cultures.

**Goal 8.L: Technology and communications.** All Portlanders have access to universal, affordable, and reliable state-of-the-art communication and technology services.

**Goal 8.M: Energy infrastructure and services.** Residents, businesses and institutions are served by reliable energy infrastructure that provides efficient, low-carbon, affordable energy through decision-making based on integrated resource planning.

## Policies

### Service provision

The policies in this section support the maintenance of an urban services boundary to coordinate planning and provision of public facilities. These policies also identify which urban facilities and services are and will be provided by the City of Portland within this boundary. This section supports Statewide Planning Goal 11 — Public Facilities.

**Policy 8.1** **Urban services boundary**. Maintain an urban services boundary for the City of Portland that is consistent with the regional urban growth policy, in cooperation with neighboring jurisdictions. The Urban Services Boundary is shown on the Comprehensive Plan Map.

**Policy 8.2** **Service delivery**. Provide the following public facilities and services within the City's boundaries of incorporation:

- Comprehensive planning.
- Public rights-of-way, including streets and public trails.
- Sanitary sewers and wastewater treatment.
- Stormwater management and conveyance.
- Flood management.


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- Protection of the waterways of the state.
- Water supply.
- Police, fire, and emergency response.
- Parks, natural areas, and recreation.
- Solid waste regulation.

**Policy 8.3** **Supporting facilities and systems**. Maintain supporting facilities and systems, including public buildings, technology, fleet, and internal service infrastructure, to enable the provision of public facilities and services.

### Service coordination

While the City of Portland is the primary provider of many urban facilities and services within city limits, other public and private agencies also provide public facilities and services. The City has a responsibility for, and an interest in, the planning, coordination, provision, and, in some cases, regulation of these facilities and services. The following policies identify other public facility providers and encourage planning and service coordination — both within the city boundaries and between the City and partner agencies — to meet the needs of people and businesses.

**Policy 8.4** **Interagency coordination**. Maintain interagency coordination agreements with neighboring jurisdictions and partner agencies that provide urban public facilities and services within the city of Portland to ensure effective and efficient service delivery. See Policy 8.2 for the list of services included. Such jurisdictions and agencies include, but may not be limited to:

- Multnomah County for transportation facilities, and public safety.
- State of Oregon for transportation and parks facilities and services.
- TriMet for public transit facilities and services.
- Port of Portland for air and marine facilities and services.
- Metro for regional parks and natural areas, and for solid waste, composting, and recycling facilities and transfer stations.
- Gresham, Milwaukie, Clackamas County Service District #1, and Clean Water Services for sanitary sewer conveyance and treatment.
- Multnomah County Drainage District No. 1, Peninsula Drainage District No 1, and Peninsula Drainage District No. 2 for stormwater management and conveyance, and for flood mitigation and control.
- Rockwood People's Utility District; Sunrise Water Authority; and the Burlington, Tualatin Valley, Valley View, West Slope, Palatine Hill, Alto Park, and Clackamas River Water Districts for water distribution.
- Portland Public Schools and the David Douglas, Parkrose, Reynolds, Centennial, and Riverdale school districts for public education and recreational facilities.
- Private utilities for energy, technology, and communications facilities and services.

**Policy 8.5** **Outside contracts**. Coordinate with jurisdictions and agencies outside of Portland where the City provides services under agreement.


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**Policy 8.6** **Public service coordination**. Coordinate with the planning efforts of agencies providing public education, public health services, community centers, library services, justice services, flood protection, energy, and technology and communications services, as appropriate.

**Policy 8.7** **Internal coordination**. Coordinate planning and provision of public facilities and services among City agencies, including internal service bureaus, as appropriate.

**Policy 8.8** **Co-location**. Encourage co-location of public facilities and services across providers where co-location improves service delivery efficiency and equity.

### Service extension

The policies in this section outline the City's approach towards annexation and service extension to newly-incorporated areas.

**Policy 8.9** **Annexation**. Require annexation of unincorporated areas within the City's urban service boundary as a prerequisite to receive urban services.

**Policy 8.10** **Feasibility of service**. Evaluate the physical feasibility and cost-effectiveness of extending urban public services to candidate annexation areas.

**Policy 8.11** **Orderly service extension**. Establish or improve urban public services in newly-annexed areas to serve designated land uses at established levels of service, as funds are available and as responsible engineering practice allows.

**Policy 8.12** **Coordination of service extension**. Coordinate provision of urban public services to newly-annexed areas so that provision of any given service does not stimulate development that significantly hinders the City's ability to provide other urban services at uniform levels.

**Policy 8.13** **Services to unincorporated urban pockets**. Plan for future delivery of urban services to areas that are within the urban services boundary but outside city limits.

**Policy 8.14** **Services outside the city limits**. Prohibit City provision of new urban services, or expansion of the capacity of existing services, in areas outside the city's municipal limits, except in cases where the City has agreements or contracts in place.

**Policy 8.15** **Service district expansion**. Prohibit service district expansion or creation within the City's urban services boundary without the City's expressed consent.

### Public investment

The following policies support investments in Portland's public facility systems to maintain and improve system capacity, resolve service deficiencies and properly manage assets. They also reduce risks to the economy, environment and community. Such investments enable the City to provide levels-of-service to meet the needs of residents and businesses.


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**Policy 8.16** **Regulatory compliance**. Ensure public facilities and services remain in compliance with state and federal regulations. Work toward cost-effective compliance with federal and state mandates through intergovernmental coordination and problem solving.

**Policy 8.17** **System capacity**. Establish, improve, and maintain public facilities and services at levels appropriate to support land use patterns, densities, and anticipated residential and employment growth, as physically feasible and as sufficient funds are available.

**Policy 8.18** **Equitable service**. Provide public facilities and services to alleviate service deficiencies and meet level-of-service standards for all Portlanders, including individuals, businesses, and property owners.

**Policy 8.19** **Asset management**. Improve and maintain public facility systems using asset management principles to optimize preventative maintenance, reduce unplanned reactive maintenance, achieve scheduled service delivery, and protect the quality, reliability, and adequacy of City services.

**Policy 8.20** **Risk management**. Maintain and improve Portland's public facilities to minimize or eliminate economic, social, public health and safety, and environmental risks.

**Policy 8.21** **Critical infrastructure**. Increase the resilience of high-risk and critical infrastructure through monitoring, planning, investment, adaptive technology, and continuity planning.

**Policy 8.22** **Capital programming**. Maintain long-term capital improvement programs that balance acquisition and construction of new public facilities with maintenance and operations of existing facilities.

### Funding

Portland's investments in the public facility systems necessary to serve designated land uses are funded through a variety of mechanisms, including taxes, user rates and fees, system development charges, and partnerships. The policies in this section acknowledge and support cost-effective service provision, maintenance of diverse funding streams to support the public's investments, and equitable sharing of the costs of investing in and maintaining the City's public facilities.

**Policy 8.23** **Cost-effectiveness**. Establish, improve, and maintain the public facilities necessary to serve designated land uses in ways that cost-effectively provide desired levels of service, consider facilities' lifecycle costs, and maintain the City's long-term financial sustainability.

**Policy 8.24** **Shared costs**. Ensure the costs of constructing and providing public facilities and services are equitably shared by those who benefit from the provision of those facilities and services.

**Policy 8.25** **System development charges**. Require private or public entities whose prospective development or redevelopment actions contribute to the need for public facility


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improvements, extensions, or construction to bear a proportional share of the costs.

**Policy 8.26** **Partnerships.** Maintain or establish public and private partnerships for the development, management, or stewardship of infrastructure facilities necessary to serve designated land uses, as appropriate.

### Community benefits

The following policies support infrastructure investments to improve equity, economic prosperity, human and watershed health, and resilience while minimizing negative impacts. They also recognize that the public facility and service needs, and the appropriate approaches to meeting those needs, vary throughout the city.

**Policy 8.27** **Community involvement**. Encourage effective community engagement in public facilities and services planning and budgeting decisions, as appropriate.

**Policy 8.28** **Application of Guiding Principles**. Establish, improve, and maintain public facilities in ways that promote and balance the Guiding Principles established in Chapter 1 of this Comprehensive Plan.

**Policy 8.29** **Resource efficiency**. Reduce the energy and resource use, waste, and carbon emissions from facilities necessary to serve designated land uses.

**Policy 8.30** **Natural systems**. Protect, enhance, and restore natural systems and features for their infrastructure service and other values.

**Policy 8.31** **Context-sensitive infrastructure**. Design, improve, and maintain public rights-of-way and facilities in ways that are compatible with, and that minimize negative impacts on, their physical, environmental, and community context.

**Policy 8.32** **Site- and area-specific needs**. Allow for site-specific and area-specific public facility standards, requirements, tools, and policies as needed to address distinct topographical, geologic, environmental, and other conditions.

## Public rights-of-way

The policies in this section support the role of public rights-of-way in providing multiple public services, including multimodal transportation access and movement, stormwater management, water distribution, private utilities, and community use, among others. Current practices and the Portland Plan regard public rights-of-way as a coordinated and interconnected network that provides a place for these multiple public facilities and functions.

**Policy 8.33** **Interconnected network.** Establish a connected rights-of-way system that equitably provides infrastructure services throughout the city.

**Policy 8.34** **Transportation function.** Improve and maintain the right-of-way to support multimodal transportation mobility and access to goods and services as is consistent with the


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designated street classification.

**Policy 8.35** **Utility function.** Improve and maintain the right-of-way to support equitable distribution of utilities, including water, sanitary sewer, stormwater management, energy, and communications, as appropriate.

**Policy 8.36** **Community uses**. Allow community use of rights-of-way for purposes such as public gathering space, events, or temporary festivals, as long as the community uses are integrated in ways that balance and minimize conflict with the designated through movement and access roles of rights-of-ways.

**Policy 8.37** **Commercial uses**. Allow commercial uses of the rights-of-way for the purpose of enhancing commercial vitality, if the commercial uses can be integrated in ways that balance and minimize conflict with the other functions of the right-of-way.

**Policy 8.38** **Flexible design**. Allow flexibility in right-of-way design and development standards to appropriately accommodate relevant physical, community, and environmental contexts and local needs.

**Policy 8.39** **Stormwater management**. Improve rights-of-way to integrate green infrastructure and other stormwater management facilities to meet desired infrastructure levels-of-service and economic, social, and environmental objectives.

**Policy 8.40** **Corridors and City Greenways**. Ensure public facilities located along Civic Corridors, Neighborhood Corridors, and City Greenways support the multiple objectives established for these corridors.

Corridor and City Greenway goals and policies are listed in Chapter 3. Urban Form.

**Policy 8.41** **Coordination**. Coordinate the design, improvement, and maintenance of public rights-of-way and associated facilities among public agencies, private providers, and adjacent landowners, as appropriate.

**Policy 8.42** **Undergrounding**. Encourage undergrounding of electrical and telecommunications facilities within public rights-of-way, especially in Centers and along corridors where multi-story development is allowed.

**Policy 8.43** **Right-of-way vacations**. Adopt and maintain City code that identifies when street vacations are appropriate. That code should:

- Maintain existing rights-of-way unless there is no existing or future need for them.
- Require pedestrian or bicycle facilities, if needed.
- Preserve existing and abandoned rail rights-of-way for future rail or recreational trail uses.
- Consider appropriateness of other public uses.
- Require preservation and/or maintenance of existing view corridors, easements, and


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viewpoints.

### Transportation system

Additional goals and policies specifically related to transportation can be found in the Transportation chapter of this Comprehensive Plan.

### Sanitary and stormwater systems

The City's sewer and drainage system accommodates Portland's current and future needs. It also protects public health, water quality, and the environment. Using asset management and watershed health as goals and guides, the City considers the whole watershed as an interconnected hydrologic system.

The City manages sanitary sewage through an extensive piped collection and treatment system, including two wastewater treatment plants that discharge to the Columbia and Willamette rivers. Stormwater is managed and conveyed through a variety of infrastructure, including pipes, sumps, surface facilities, and natural drainageways. Green infrastructure, including landscaped stormwater facilities and natural resources such as trees and natural areas, is an important part of the stormwater system. Private property investments and public-private partnerships also play key roles in the management of stormwater.

The policies below ensure effective sanitary and stormwater systems.

### Sanitary system

**Policy 8.44** **Sewer connections**. Require all developments within the city limits to be connected to sanitary sewers unless the public sanitary system is not physically or legally available per City Code and state requirements; or the existing onsite septic system is functioning properly without failure or complaints per City Code and state requirements; and the system has all necessary state and county permits.

**Policy 8.45** **Combined sewer overflows**. Provide adequate public facilities to limit combined sewer overflows to frequencies established by regulatory permits.

**Policy 8.46** **Sanitary sewer overflows**. Provide adequate public facilities to prevent sewage releases to surface waters as consistent with regulatory permits.

**Policy 8.47** **Private sewage treatment systems**. Adopt land use regulations that require any proposed private sewage treatment system to demonstrate that all necessary state and county permits are obtained.

**Policy 8.48** **Sewer extensions**. Prioritize sewer system extensions to areas that are already developed at urban densities and where health hazards exist.

**Policy 8.49** **Pollution prevention**. Reduce the need for wastewater treatment capacity through land use programs and public facility investments that manage pollution as close to its source


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as practical and that reduce the amount of pollution entering the sanitary system.

**Policy 8.50** **Treatment**. Provide adequate wastewater treatment facilities to ensure compliance with effluent standards established in regulatory permits.

### Stormwater system

**Policy 8.51** **Stormwater facilities**. Provide adequate stormwater facilities for conveyance, flow control, and pollution reduction.

**Policy 8.52** **Stormwater as a resource**. Manage stormwater as a resource for watershed health and public use in ways that protect and restore the natural hydrology, water quality, and habitat of Portland's watersheds.

**Policy 8.53** **Natural systems**. Protect and enhance the stormwater management capacity of natural resources such as streams, rivers, wetlands, and floodplains.

**Policy 8.54** **Stormwater discharge**. Avoid or minimize the impact of stormwater discharges on the water and habitat quality of rivers and streams.

**Policy 8.55** **Green infrastructure**. Promote the use of green infrastructure, such as natural areas, the urban forest, and landscaped stormwater facilities, to manage stormwater.

**Policy 8.56** **Onsite stormwater management**. Encourage on-site stormwater management, or management as close to the source as practical, through land use decisions and public facility investments.

**Policy 8.57** **Pollution prevention**. Coordinate policies, programs and investments with partners to prevent pollutants from entering the stormwater system by managing point and non-point pollution sources through public and private facilities, local regulations, and education.

**Policy 8.58** **Stormwater partnerships**. Provide stormwater management through coordinated public and private infrastructure, public-private partnerships, and community stewardship.

### Flood management

Portland's floodplain areas are primarily along the Columbia River, Willamette River, Columbia Slough, Johnson Creek, and low elevation areas along smaller tributary streams. In accordance with state and federal regulations, the City of Portland, Multnomah County Drainage District, and Peninsula Drainage Districts No. 1 and No. 2 manage floodplains to reduce public safety risks, prevent property damage, support economic activity, and protect watershed health. These policies ensure proper floodplain management and compliance.

**Policy 8.59** **Flood management**. Improve and maintain the functions of natural and managed drainageways, wetlands, floodplains, and flood management facilities, to protect health, safety, and property, provide water conveyance and storage, improve water quality, and maintain and enhance fish and wildlife habitat.



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**Policy 8.60** **Floodplain compliance**. Maintain compliance with federal and state floodplain-related requirements.

### Water systems

The City works to provide reliable water service that meets or exceeds both customer and regulatory standards through sound business, management, and operational practices; appropriate application of innovation and technology; responsible stewardship of water infrastructure and fiscal and natural resources; and by supporting community objectives and overall vision for the City of Portland.

The policies below are intended to protect the quality of the water supply while delivering clean drinking water and meeting user needs.

**Policy 8.61** **Primary supply source**. Protect the Bull Run watershed as the primary water supply source for Portland.

**Policy 8.62** **Bull Run protection**. Maintain a source protection program and practices to safeguard the Bull Run watershed as a drinking water supply.

**Policy 8.63** **Secondary supply sources**. Protect, improve, and maintain the Columbia South Shore wellfield groundwater system, the Powell Valley wellfield groundwater system, and any other alternative water sources designated as secondary water supplies.

**Policy 8.64** **Groundwater wellfield protection**. Maintain a groundwater protection program and practices to safeguard the Columbia South Shore wellfield and the Powell Valley wellfield as drinking water supplies.

**Policy 8.65** **Water quality**. Maintain compliance with state and federal drinking water quality regulations.

**Policy 8.66** **Storage**. Provide sufficient in-city water storage capacity to serve designated land uses, meet demand fluctuations, maintain system pressure, and ensure supply reliability.

**Policy 8.67** **Fire protection**. Provide adequate water facilities to serve the fire protection needs of all Portlanders and businesses.

**Policy 8.68** **Water pressure**. Provide adequate water facilities to maintain water pressure in order to protect water quality and provide for the needs of customers.

**Policy 8.69** **Water efficiency**. Reduce the need for additional water facility capacity and maintain compliance with state water resource regulations by encouraging efficient use of water by customers within the city.

**Policy 8.70** **Service interruptions**. Maintain and improve water facilities to limit interruptions in water service to customers.

**Policy 8.71** **Outside user contracts**. Coordinate long-term water supply planning and delivery with

outside-city water purveyors through long-term wholesale contracts.

### Parks and recreation

The City of Portland manages more than 11,000 acres of developed parks and natural areas, as well as local and regional trails, the urban tree canopy, and the City of Portland's community gardens. It offers thousands of programs for all ages at its community centers, swimming pools, and other recreational facilities. Parks and natural areas give life and beauty to the city and are essential assets that connect people to place, self, and others. The following policies ensure this legacy is preserved for all Portlanders and future generations.

**Policy 8.72** **Acquisition, development, and maintenance**. Provide and maintain an adequate supply and variety of parkland and recreational facilities to serve the city's current and future population based on identified level-of-service standards and community needs.

**Policy 8.73** **Service equity**. Invest in acquisition and development of parks and recreational facilities in areas where service-level deficiencies exist.

**Policy 8.74** **Acquisition of surplus properties**. Evaluate opportunities to acquire and/or develop lands declared surplus by other public agencies, or offered as donation by private owners, if consistent with policies 8.72 and 8.73.

**Policy 8.75** **Capital programming**. Maintain a long-range park capital improvement program that balances acquisition, development, and operations; provides a process and criteria for capital improvement project selection; and emphasizes creative and flexible financing strategies.

**Policy 8.76** **Park planning**. Improve parks, recreational facilities and natural areas in accordance with current master plans, management plans, or adopted strategies that reflect user group needs, development priorities, development and maintenance costs, program opportunities, financing strategies, and community input.

**Policy 8.77** **Public Trails**. Establish, improve, and maintain a citywide system of public trails that are a component of a larger network of bicycle and pedestrian facilities. This citywide trail system should connect Portland's neighborhoods, employment centers, schools, parks, natural areas, recreational facilities, commercial areas, regional trail system, and other key places that Portlanders access in their daily lives. See Figure 8-1. Citywide Trails Map.

**Policy 8.78** **Trail and City Greenway coordination**. Coordinate the planning and improvement of trail and City Greenway systems.

**Policy 8.79** **Natural resources**. Preserve, enhance, and manage City-owned natural areas and resources to protect and improve their ecological health, in accordance with both the natural area acquisition and restoration strategies, and to provide compatible public access.



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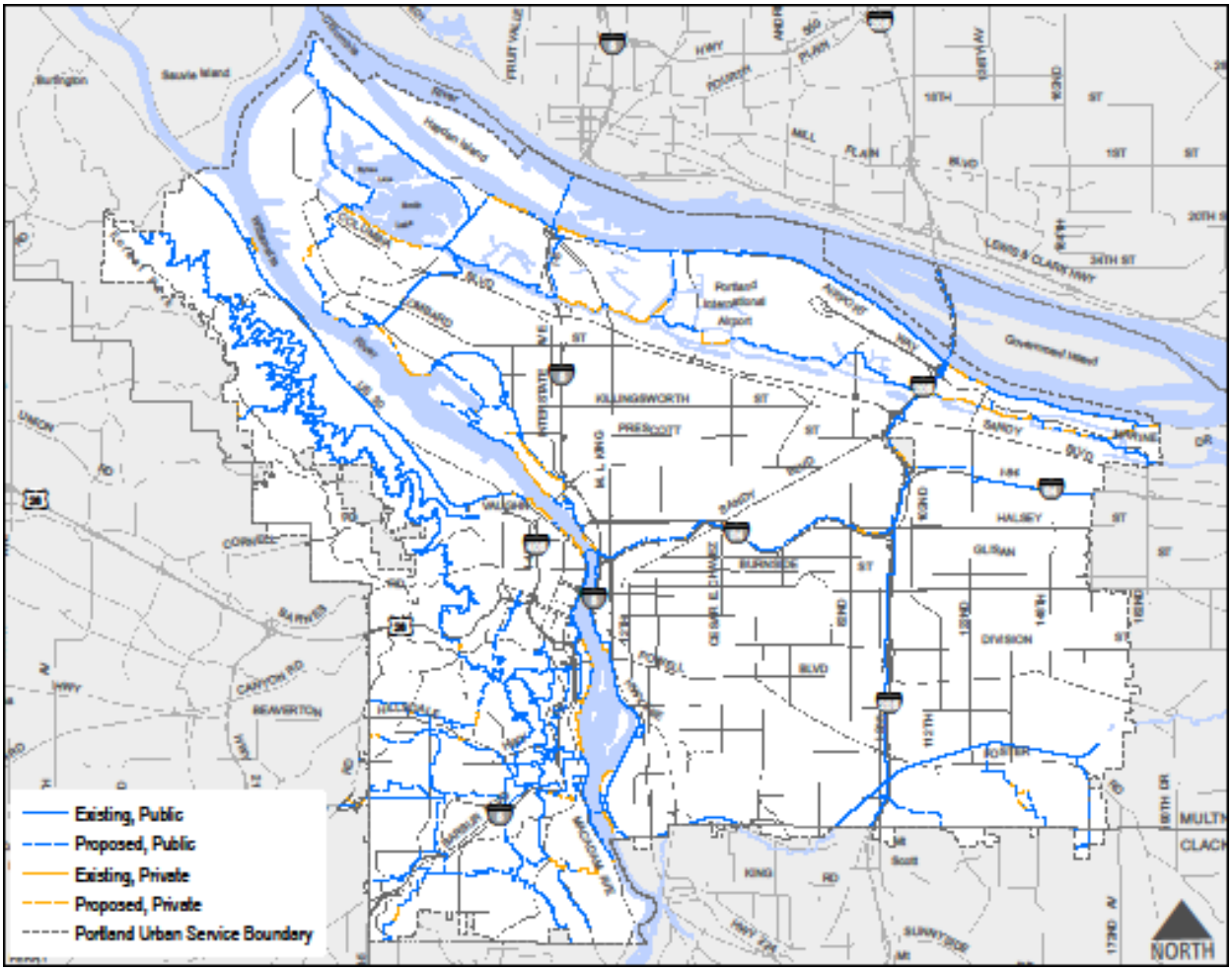
**Policy 8.80** **Recreational facilities**. Provide a variety of recreational facilities and services that contribute to the health and well-being of Portlanders of all ages and abilities.

**Policy 8.81** **Special recreational facilities.** Establish and manage specialized recreational facilities within the park system to respond to identified public needs, take advantage of land assets, and meet cost recovery goals.

**Policy 8.82** **Enterprise facilities**. Maintain special recreational facilities (such as for golf and motorsports) as enterprises to meet public needs and ensure maximum use and financial self-sufficiency.

**Policy 8.83** **Public-private partnerships**. Encourage public-private partnerships to develop and operate publicly-accessible recreational facilities that meet identified public needs.

Figure 8-1. Citywide Trails Map



### Public safety and emergency response

Coordinated, effective, and efficient public safety and emergency response services are essential for a safe and resilient city. They help the community prepare for and respond to medical and fire emergencies, hazards, and natural- and human-made disasters. The policies in this section reflect the variety of public safety and emergency response services provided by the City that must be maintained and enhanced as the city grows, including police, fire and rescue, emergency communications, and emergency management.

**Policy 8.84** **Emergency preparedness, response, and recovery coordination**. Coordinate land use plans, programs and public facility investments between City bureaus, other public and jurisdictional agencies, community partners, and other emergency response providers, to ensure coordinated and comprehensive emergency and disaster preparedness, response, and recovery.

**Policy 8.85** **Emergency management facilities**. Provide adequate public facilities – such as emergency coordination centers, communications infrastructure, and dispatch systems – to support emergency management, response and recovery.

**Policy 8.86** **Police facilities**. Improve and maintain police facilities to allow police personnel to efficiently and effectively respond to public safety needs and serve designated land uses.

**Policy 8.87** **Community safety centers**. Establish, coordinate, and co-locate public safety and other community services in Centers.

**Policy 8.88** **Fire facilities**. Improve and maintain fire facilities to serve designated land uses, ensure equitable and reliable response, and provide fire and life safety protection that exceeds minimum established service levels.

**Policy 8.89** **Mutual aid**. Maintain mutual aid coordination with regional emergency response providers as appropriate to protect life and ensure safety.

**Policy 8.90** **Community preparedness**. Enhance community preparedness and capacity to prevent, withstand, and recover from emergencies and natural disasters through land use decisions and public facility investments.

**Policy 8.91** **Continuity of operations**. Maintain and enhance the City's ability to withstand and recover from natural disasters and human-made disruptions in order to minimize disruptions to public services.

### Solid waste management

Solid waste, composting, and recycling facilities and services are regulated and provided through a partnership between the City of Portland, Metro, franchised haulers and private companies. The following policy supports sustainable waste reduction, recovery, and management, and the use and reuse of materials prior to disposal. This policy relates to the aspects of Oregon’s Statewide Planning Goal 13 –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Energy Conservation, which focuses on systems and incentives for collection, reuse and recycling of waste.

**Policy 8.92** **Waste management**. Ensure land use programs, rights-of-way regulations, and public facility investments allow the City to manage waste effectively and prioritize waste management in the following order: waste reduction, recycling, anaerobic digestion, composting, energy recovery, then landfill.

### School facilities

Public education is provided by Portland Public Schools and the David Douglas, Parkrose, Reynolds, Centennial, and Riverdale school districts, as well as public colleges and universities. The City partners with school districts on school facility planning and siting. By encouraging school facilities to be multi-functional neighborhood anchors, designed and programmed to serve community members of all generations and abilities, these policies also help implement the concept of Portland as an age-friendly city.

**Policy 8.93** **Co-location**. Encourage public school districts, Multnomah County, the City of Portland, and other providers to co-locate facilities and programs in ways that optimize service provision and intergenerational and intercultural use.

**Policy 8.94** **Community use**. Encourage public use of public school grounds for community purposes while meeting educational and student safety needs and balancing impacts on surrounding neighborhoods.

**Policy 8.95** **Recreational use**. Encourage publicly-available recreational amenities (e.g. athletic fields, green spaces, community gardens, and playgrounds) on public school grounds for public recreational use, particularly in neighborhoods with limited access to parks.

**Policy 8.96** **Schools as emergency aid centers**. Encourage the use of school facilities as gathering and aid-distribution locations during natural disasters and other emergencies.

**Policy 8.97** **Facility adaptability**. Ensure that public schools may be upgraded to flexibly accommodate multiple community-serving uses and adapt to changes in educational approaches, technology, and student needs over time.

**Policy 8.98** **Leverage public investment**. Encourage City infrastructure investments that complement and leverage local public school districts' major capital investments.

**Policy 8.99** **School access**. Encourage public school districts to consider the ability of students to safely walk and bike to school when making decisions about the site locations and attendance boundaries of schools.

**Policy 8.100** **Private institutions.** Encourage collaboration with private schools and educational institutions to support community and recreational use of their facilities.


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### Technology and communications

Private utilities and companies provide technology and communication facilities and services to the general public. The City also provides specific technology and communications services to support City and partner agency service delivery. The City promotes access to affordable and reliable technology and communications for all Portlanders.

The policies in this section embrace innovation to ensure all Portlanders are able to access and benefit from emerging technologies and systems that have the potential to make Portland a cleaner, safer, and more efficient, resilient, and affordable city. This section acknowledges that information and technology services have become essential infrastructure, and supports investments and partnerships to keep Portland competitive and build on the City's tradition of open-source collaboration and innovation.

**Policy 8.101** **Technology and communication systems**. Maintain and enhance the City's technology and communication facilities to ensure public safety, facilitate access to information, and maintain City operations.

**Policy 8.102** **Capacity and reliability**. Encourage investments in technology and communication infrastructure to reduce disparities in capacity, access, and affordability and provide high-performance, reliable service for Portland's residents and businesses.

### Energy infrastructure

Energy facilities and services in Portland are primarily provided by private utilities and companies. While the City of Portland does not directly provide energy facilities and services, it does promote efficient, sustainable, and resilient energy resources, production, distribution, and consumption. The following policies relate to energy infrastructure and support Oregon's Statewide Planning Goal 13 – Energy Conservation, which includes planning guidelines for renewable energy sources. They ensure that as the City makes land use decisions it removes barriers to promoting efficient and sustainable energy practices.

**Policy 8.103** **Energy efficiency**. Encourage efficient and sustainable production and use of energy resources by residents and businesses, including low-carbon renewable energy sources and distributed generation, through land use plans, zoning, and other legislative land use decisions.

**Policy 8.104** **Coordination**. Coordinate with energy providers to encourage investments that ensure reliable, equitable, efficient, and affordable energy for Portland's residents and businesses.


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# Chapter 9: Transportation

Excerpted from the Comprehensive Plan Goals & Policies.

## Goals

**Goal 9.A: Achieve multiple goals.** Portland's transportation system is funded and maintained to achieve multiple goals and measureable outcomes for people and the environment. The transportation system is complete, interconnected, multimodal, and fulfills daily needs for people and business.

**GOAL 9.B: Support great places**. Portland's transportation system reinforces neighborhoods, placemaking, and quality of life for all Portlanders.

**GOAL 9.C: Environmentally sustainable**. The transportation system increasingly uses renewable energy, or electricity from renewable sources, achieves adopted carbon reduction targets, and contributes to the reduction of other air pollution, water pollution, noise, and Portlanders' reliance on private vehicles.

**GOAL 9.D: Equitable transportation**. The transportation system provides all Portlanders options to move about the city and meet their daily needs by using a variety of efficient, convenient, and affordable modes of transportation. Transportation investments are responsive to the distinct needs of each community.

**GOAL 9.E: Positive health outcomes**. The transportation system promotes positive health outcomes and minimizes negative impacts for all Portlanders by supporting active transportation, physical activity, and community and individual health.

**GOAL 9.F: Opportunities for prosperity**. The transportation system supports a strong and diverse economy, enhances the competitiveness of the city and region, and maintains Portland's role as a West Coast trade gateway and freight hub, by providing efficient and reliable goods movement, multimodal access to employment areas and educational institutions, as well as enhanced freight access to industrial areas and intermodal freight facilities. The transportation system helps people and business reduce spending and keep money in the local economy by providing affordable options to driving.

**GOAL 9.G: Safety**. Transportation safety contributes to a livable city that ensures that people of all ages and abilities feel comfortable and secure when they are using City streets. Human impact and economic costs are reduced by comprehensive efforts to improve traffic safety, including engineering, education, enforcement, and evaluation; moving toward zero traffic-related fatalities and serious injuries.

**GOAL 9.H: Cost effective**. The City analyzes and prioritizes capital and operating investments to cost effectively achieve the above goals while responsibly managing and protecting our past investment in existing assets.


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# Policies

## Design and planning policies

The City of Portland's transportation system is a key public facility. The following policies describe what the transportation system is, what it does, and what factors to consider for how the overall system is used. Policies 8.1-8.51 in the Public Facilities chapter also apply to the need for quality facilities and services, multiple benefits, reliability, and creating a multi-purpose and safe right-of-way.

**Policy 9.1** **Street design classifications**. Maintain and implement street design classifications consistent with land uses plans, environmental context, urban design pattern areas, and Urban Design Framework designations.

**Policy 9.2** **Street policy classifications.** Maintain and implement street policy classifications for pedestrian, bicycle, transit, freight, emergency vehicle, and automotive movement, while considering access for all modes, connectivity, adjacent planned land uses, and state and regional requirements.

**Policy 9.3** **Transportation System Plan.** Maintain and implement the Transportation System Plan (TSP) as the decision-making tool for transportation-related projects, policies, programs, and street design.

**Policy 9.4** **Use of classifications.** Plan, develop, implement, and manage the transportation system in accordance with street design and policy classifications outlined in the Transportation System Plan.

**Policy 9.5** **Mode share goals and VMT reduction.** Increase the share of trips made using active and low-carbon transportation modes and reduce vehicle miles traveled (VMT) to achieve targets set in the most current Climate Action Plan and Transportation System Plan. Meet or exceed Metro's mode share and VMT targets in Neighborhood Centers and 2040 Growth Concept areas.

Policy 9.6 Transportation hierarchy for people movement. Implement a hierarchy of modes for people movement by making transportation system decisions according to the following prioritization:

1. Walking
2. Cycling
3. Transit
4. Taxi / commercial transit / shared vehicles
5. Zero emission vehicles
6. Other private vehicles

When implementing the hierarchy, ensure:

- The needs and safety of each group of road users are considered, and changes do not make existing conditions worse for the most vulnerable users



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higher on the hierarchy.

- All users' needs are balanced, and when necessary to ensure safety, accommodate some users on parallel streets as part of a multi-street corridors.
- Land use and system plans, network functionality for all modes, other street functions, and complete street policies, is maintained.
- Rationale is provided if modes lower in the hierarchy are prioritized.

*Specific modal policies are found below in policies 9.18 to 9.41.*

**Policy 9.7** **Moving goods and delivering services.** Maintain efficient and reliable movement of goods and services as a critical transportation system function. Prioritize freight system reliability improvements over general motor vehicle mobility where there are solutions that distinctly address those different needs. Multimodal freight policies are found below in policies 9.31 to 9.39.

**Policy 9.8** **Affordability.** Improve and maintain the transportation system to increase access to convenient and affordable transportation options for all Portlanders, especially those who have traditionally been under-served or have historically borne unequal burdens.

**Policy 9.9** **Geographic policies.** Adopt geographically-specific policies in the Transportation System Plan, to ensure transportation infrastructure reflects the differing topography, historic character, natural features, economic needs, demographics, and land uses of each area. Use the Pattern Areas identified in Chapter 3 Urban Design as the basis for area policies.

### Land Use, development, and placemaking

Land use patterns and connections among different land uses are key elements defining the form and character of places. In tandem with the Urban Form and Design and the Design and Development chapters, the policies in this section give direction for designing and building a transportation system that supports, complements, and meets the needs of different places. These policies acknowledge development adjacent to transportation as a critical component in shaping the future of Portland's public spaces and places.

**Policy 9.10** **Land use and transportation coordination.** Implement the Comprehensive Plan Map and the Urban Design Framework though coordinated long-range transportation and land use planning. Ensure street policy and design classifications and land uses complement one another.

**Policy 9.11** **Growth strategy.** Implement street design and policy classifications to support a Centers and Corridors growth strategy.

**Policy 9.12** **Centers, Corridors and Transit Station Areas** Enhance design and transportation function of Town Centers, Neighborhood Centers, Neighborhood Corridors, Civic Corridors, Transit Station Areas, and Greenways as highlighted in Chapter 3, Urban


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Form and Design.

**Policy 9.13** **Development and street design.** Evaluate adjacent land use to help inform street classifications in framing, shaping, and activating the public space of streets. Guide development and land use to create the kinds of places and street environments intended for different types of streets.

### Streets as public spaces

Streets, including sidewalks and planting strips, provide critical transportation and utility functions. In Portland, streets are the most abundant type of public space, occupying nearly 20 percent of land area in the city. The following policies support community desire to expand the use of streets beyond their transportation functions. See the Public Facilities and Design and Development chapters for further use and streetscape policies.

**Policy 9.14** **Streets for transportation and public spaces.** Integrate both the placemaking and transportation functions when designing and managing streets by encouraging design, development, and operation of streets to enhance opportunities for them to serve as places for community interaction, environmental function, open space, recreation, and other community purposes.

**Policy 9.15** **Repurposing street space.** Encourage repurposing street segments that are not critical for transportation connectivity to other community purposes.

**Policy 9.16** **Design with nature.** Promote street alignments and designs that respond to topography and natural features, when feasible, and protect streams, habitat, and native trees.

**Policy 9.17** **Street views.** Maintain public views of prominent landmarks and buildings that serve as visual focal points within streets or that terminate views at the end of streets.

### Modal policies

Portland is committed to providing a multimodal transportation system that provides affordable and convenient travel options within the city, region, and outside the Metro area. Because trips are made for different reasons, they vary in length and type of vehicle (mode) needed to make them. Different modes create different kinds of impacts — on neighborhood livability and carbon emissions, for example. These policies recognize that some modes are more appropriate than others for different types of trips.

**Policy 9.18** **Pedestrian transportation**. Encourage walking as the most attractive mode of transportation for most short trips, within and to centers, corridors, and major destinations, and as a means for accessing transit.

**Policy 9.19** **Pedestrian networks.** Create more complete networks of pedestrian facilities and improve the quality of the pedestrian environment.

**Policy 9.20** **Pedestrian safety and accessibility.** Improve pedestrian safety, accessibility, and convenience for people of all ages and abilities.


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**Policy 9.21** **Bicycle transportation**. Create conditions that make bicycling more attractive than driving for most trips of approximately three miles or less.

**Policy 9.22** **Accessible bicycle system.** Create a bicycle transportation system that is safe, comfortable and accessible to people of all ages and abilities.

**Policy 9.23** **Bicycle classifications.** Develop and implement classifications that emphasize the movement of bicycles on a citywide network of designated streets that safely and efficiently provides access to the Central City, Gateway, Town Centers, and Neighborhood Centers.

**Policy 9.24** **Public transportation**. Coordinate with public transit agencies to create conditions that make transit the preferred mode of travel for trips that are not made by walking or bicycling.

**Policy 9.25** **Transportation to job centers.** Encourage transit as the preferred transportation mode for people travelling to and from the Central City and Gateway. Enhance regional access to the Central City and access from Portland other regional job centers.

**Policy 9.26** **Transit service.** In partnership with Trimet, develop a public transportation system that conveniently, safely, comfortably, and equitably serves residents and workers 24 hours a day, 7 days a week.

**Policy 9.27** **Transit equity.** In partnership with Trimet, maintain and expand high-quality frequent transit service to all Town Centers, Civic Corridors, Neighborhood Centers, Neighborhood Corridors, and other major concentrations of employment, and improve service to areas with high concentrations of poverty and historically under-served and under-represented communities.

**Policy 9.28** **Prosperity and growth.** In partnership with Trimet**,** maintain and expand Portland Streetcar, enhanced frequent service bus, and bus rapid transit to better serve Civic Corridors with the highest intensity of potential employment and household growth. Use transit investments as a means to shape the city's growth.

**Policy 9.29** **Intercity passenger service**. Coordinate planning and project development to expand intercity passenger transportation services in the Willamette Valley, and from Portland to Seattle and Vancouver BC.

**Policy 9.30** **Regional trafficways and transitways**. Enhance capacity of regional transitways and existing regional trafficways to accommodate future increases in regional through-traffic in Portland.

**Policy 9.31** **Multimodal goods movement.** Develop, maintain and enhance a multimodal freight transportation system for the safe, reliable, sustainable and efficient movement of goods within and through the city. Ensure the transportation system supports traded sector economic development plans and full utilization of prime industrial land use.


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**Policy 9.32** **Multimodal system and hub.** Maintain Portland's role as a multimodal hub for global and regional goods movement. Enhance Portland's network of multimodal freight corridors to

**Policy 9.33** **Freight network.** Develop, manage, and maintain a safe, efficient, and reliable freight street network to provide freight access to and from intermodal freight facilities, industrial and commercial districts, and the regional transportation system. Invest to accommodate forecast growth of interregional freight volumes and access in truck, marine, rail, and air transportation systems.

**Policy 9.34** **Sustainable freight system.** Support the efficient delivery of goods and services to businesses and neighborhoods while also reducing environmental and neighborhood impacts. Encourage the use of energy efficient and clean delivery vehicles, and manage on- and off-street loading spaces to ensure adequate access for deliveries to businesses while maintaining access to homes and businesses.

**Policy 9.35** **Freight rail network.** Coordinate with stakeholders and regional partners to support continued reinvestment in, and modernization of, the freight rail network.

**Policy 9.36** **Portland Harbor.** Coordinate with the Port of Portland, private stakeholders, and regional partners to improve and maintain access to marine terminals and related river-dependent uses in Portland Harbor.
**9.36.a** Support continued reinvestment in, and modernization of, marine terminals in Portland Harbor.
**9.36.b** Facilitate continued maintenance of the shipping channels in Portland Harbor and the Columbia River.
**9.36.c** Support shifting more long-distance, high-volume goods movement to river and oceangoing ships and rail.

**Policy 9.37** **Portland International Airport.** Maintain the Portland International Airport as an important regional, national, and international transportation hub serving the bi-state economy.

**Policy 9.38** **Portland Heliport.** Maintain Portland's heliport functionality in the Central City.

**Policy 9.39** **Automobile transportation.** Maintain acceptable levels of mobility and access for private automobiles while reducing overall vehicle miles traveled (VMT) and reducing negative impacts of the private automobile on the environment and human health.

**Policy 9.40** **Automobile efficiency.** Coordinate land use and transportation plans and programs with other public and private stakeholders to encourage vehicle technology innovation, shifts toward electric and other cleaner more energy efficient vehicles and fuels, integration of smart vehicle technology with intelligent transportation systems, and greater use of options such as car-share, carpool, and taxi.

**Policy 9.41** **Emergency response**. Maintain a network of accessible emergency response streets to


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facilitate safe and expedient emergency response and evacuation. Ensure that police, fire, ambulance, and other emergency providers can reach their destinations in a timely fashion, without negatively impacting traffic calming and other measures intended to reduce crashes and improve safety.

### System management

Portland's transportation system is an integrated network of roads, rails, sidewalks, bicycle paths, and other facilities within and through the city. These modal networks intersect and are often located within the same right-of-way. These policies provide direction to manage the system in ways that:

- Allow different modes to interact safely.
- Maximize the capacity of the existing network.
- Identify where additional capacity might be needed.

Also see Policy 8.42 in the Public Facilities chapter.

**Policy 9.42** **System management**. Give preference to transportation improvements that use existing roadway capacity efficiently and that improve the safety of the system for all users.

**Policy 9.43** **Traffic management**. Evaluate and encourage traffic speed and volume to be consistent with street classifications and desired land uses to improve safety, preserve and enhance neighborhood livability, and meet system goals through a combination of enforcement, engineering, and education efforts to calm vehicle traffic.

**Policy 9.44** **Connectivity**. Establish an interconnected, multimodal transportation system to serve centers and other significant locations. Promote a logical, direct, and connected street system through street spacing guidelines and district-specific street plans found in the Transportation System Plan and prioritize access to specific places by certain modes in accord with the transportation hierarchy.

**Policy 9.45** **Technology.** Encourage the use of emerging technology, vehicle technology, and parking technology to improve real-time management of the transportation network and to manage and allocate parking supply and demand.

**Policy 9.46** **Performance measures.** Establish multimodal performance measures to evaluate and monitor the adequacy of transportation services. Use these measures to evaluate overall system performance, inform corridor and area-specific plans and investments, and regulate development, institutional campus growth, zone changes, Comprehensive Plan Map amendments, and conditional uses.

**Policy 9.47** **Regional congestion management**. Coordinate with Metro to create a regional congestion management approach, including a market-based system, to price or charge for auto trips and parking, better account for the cost of auto trips, and to more efficiently manage the regional system.


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### Parking management

Vibrant urban places link people and activity. As Portland grows, we must manage both the demand and supply of parking. Providing too much parking can lead to inefficient land use patterns and sprawl. Insufficient parking can affect neighborhood livability and economic vitality. These policies provide guidance to manage parking demand and supply to meet a variety of public objectives, including achieving compact walkable communities, reducing overall vehicle use, enhancing livability, reducing pollution, and expanding economic opportunity.

**Policy 9.48** **Parking management.** Manage parking supply to achieve transportation policy objectives for neighborhood livability, safety, business district vitality, vehicle miles traveled (VMT) reduction, and improved air quality.

**Policy 9.49** **Central City, centers and corridors parking.** Limit the growth of off-street parking spaces and manage supply and demand for, parking, loading, and unloading in the public right-of-way in the Central City, Gateway, Town Centers, and Station Areas.

**Policy 9.50** **On-street parking.** Manage parking and loading demand, supply, and operations in the public right of way to encourage safety, economic vitality, and livability. Recognize the curb zone is a public space, and as such, a physical and spatial asset that has value and cost. Allocate and manage on-street parking and loading within the curb zone in a manner that achieves the highest and best use of this public space in support of broad City policy goals and local land use context.

**Policy 9.51** **Off-street parking.** Limit the development of new parking spaces to achieve land use, transportation and environmental goals. Regulate off-street parking to achieve mode share objectives, promote compact and walkable urban form, encourage lower rates of car ownership, and promote the vitality of commercial and employment areas. Utilize the shared use of parking, transportation demand management and pricing in areas with high parking demand.

**Policy 9.52** **Share space and resources.** Encourage the shared use of parking and vehicles to maximize the efficient use of limited urban space.

**Policy 9.53** **Bicycle parking.** Promote the development of new bicycle parking facilities including dedicated bike parking in the public right-of-way. Provide sufficient bicycle parking at High-Capacity Transit stations to enhance bicycle connection opportunities.

### Finance, programs, and coordination

Programs and funding are required to build and maintain the transportation system, and they are necessary to help decide what projects to build. They also provide public information about what facilities are available and how they can be used. Agencies outside of the City also own and operate facilities in the city and provide funding for new facilities. These policies address essential funding and coordination opportunities with other agencies as well outreach and education programming.

**Policy 9.54** **Coordination**. Coordinate with state and federal agencies, local and regional governments, special districts, and providers of transportation services when planning for, developing, and funding transportation facilities and services.

**Policy 9.55** **Education and encouragement.** Create, maintain, and coordinate educational and encouragement programs that support multimodal transportation and that emphasize safety for all modes of transportation. Ensure these programs are accessible to underserved and under-represented populations.

**Policy 9.56** **Transportation Demand Management (TDM).** Create and maintain Transportation Demand Management (TDM), programs that increase the modal share of walking, bicycle, and transit trips. Integrate TDM with other programs, including parking management.

**Policy 9.57.** **Telecommuting.** Promote telecommuting and the use of communications technology to reduce travel demand.

**Policy 9.58** **Project selection criteria.** Establish transportation project selection criteria consistent with goals 9A through 9H, to cost effectively achieve access, place making, sustainability, equity, health, prosperity and safety goals. Coordinate transportation project selection with other capital planning programs impacted by work in the public right of way, including sewer and water utilities.

**Policy 9.59** **Funding.** Encourage the development of a range of stable transportation funding sources that provide adequate resources to build an equitable and sustainable transportation system.


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# Chapter 6
# Bureau of Environmental Services

## Overview

Portland's sewer and stormwater systems serve nearly all of the city's 588,000 residents, numerous commercial and industrial properties, as well as some customers from neighboring jurisdictions. The network of pipes, pump stations, stormwater facilities, and two wastewater treatment plants, with an estimated replacement value of $13.2 billion, is designed to protect public health, water quality, and the environment. In 2011, the city completed the largest public works investment in its history, the 20-year program to control combined sewer overflows (CSOs) to the Willamette River and Columbia Slough, adding significant new infrastructure (including the "Big Pipes") to the sewer system. Previously, as little as one-tenth inch of rain caused a CSO event. Now, the system can handle more than an inch without overflowing to the river. As a result, instead of sewage discharging in the Willamette 50 times a year, now it is unlikely to happen more than a few times in the winter and every few summers. Repayment of the "mortgage" on this $1.4 billion investment will continue to impact sewer utility rates for years to come. Rates will also be affected by the need for maintenance and improvement of systems, especially aging collection system infrastructure.

Managing Portland's 37 inches of average annual rainfall, much of it falling on pavement, rooftops, or other impervious surfaces, is an ongoing challenge that involves built and natural infrastructure to be managed in partnership with businesses, residents, and community organizations. Portland has become an international leader in innovative stormwater management and other sustainable practices. These sustainable practices support a high quality of life for residents and strengthen the local economy by attracting visitors and businesses.



## Mission and Values

BES's mission is to serve the Portland community by protecting public health, water quality and the environment. The Bureau provides sewage and stormwater collection and treatment services to accommodate Portland's current and future needs. The Bureau protects the quality of surface and ground waters and conducts activities that promote healthy ecosystems in our watersheds.


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The Bureau's motto is "*Working for Clean Rivers*" and the organizational vision is to be recognized as a trusted service provider and innovative environmental leader through a demonstrated commitment to clean rivers, healthy watersheds and our community.

In the 2011 Strategic Plan, the Bureau identified five priorities for the next five years:

- Responsibly manage ratepayer funds to provide services that address community needs now and in the future.
- Invest in natural and built systems to protect public health and improve watershed health.
- Protect, rehabilitate, and maintain our existing infrastructure for long-term reliability.
- Build and expand partnerships to better meet our Mission and Vision.
- Cultivate leadership and excellence in our workforce.

## Purpose of this Chapter

This chapter describes the public facilities and services provided by the Portland Bureau of Environmental Services that are necessary to carry out its mission. It identifies desired levels of service, inventory and condition information for existing public facilities, and future facilities that will be necessary to support the land uses designated in the Comprehensive Plan, as required by Oregon Planning Goal 11: Public Facilities and Oregon Revised Statute 197. Carrying out the Bureau's mission and other City and community goals may also require programs, investments and practices that are not related to public facilities. This chapter may acknowledge--but does not comprehensively address--these measures.

## System Services

BES provides sewage and stormwater management services in its service area through a complex set of infrastructure systems that are closely intertwined with the natural systems of Portland's watersheds and the historical development of the city. BES is the responsible bureau for compliance with several state and federal regulatory requirements for groundwater and surface water resources (streams and rivers), as well as the Endangered Species Act. (More information about these requirements is provided later in this chapter.) BES is the lead bureau for planning, implementing, monitoring, and reporting on watershed health improvement projects and programs. BES also administers the City's brownfield remediation program which provides financial and technical assistance to facilitate brownfield clean-up as a redevelopment tool for human and environmental health, environmental justice, water quality, job creation, and neighborhood revitalization.

The Bureau provides wastewater collection and treatment services within the city limits and to areas outside the city limits within the City's established urban services boundary (USB). BES provides sewer service to specific areas outside the USB via contract agreements with neighboring jurisdictions where sanitary sewers from outside the USB flow to a BES sewer or treatment facility (Clean Water Services and Lake Oswego in the southwest, Water Environment Services of Clackamas County in the southeast, and city of Gresham in the east). Similarly, some neighboring jurisdictions treat sewage from the BES system.

The Bureau operates and maintains the stormwater collection system and has an oversight and regulatory role for stormwater management within the City's USB. The City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit covers stormwater from approximately 15,500 acres within Portland's USB that drain to the City's MS4 system, which discharges to local streams, the Willamette River, and the Columbia Slough. The City also manages stormwater with sumps or drywells primarily on the east side of the city, under the Water Pollution Control Facilities (WPCF) for Class V Stormwater Underground Injection Controls (UICs) permit.

Due to the close connection between built infrastructure that manages stormwater (pipes, ditches, pump stations, etc.) and the natural system of streams, wetlands, floodplains and forests that convey, filter, infiltrate and reduce stormwater runoff, the city has adopted a watershed approach to managing stormwater and addressing related regulations, guided by the 2005 *Portland Watershed Management Plan*. The Bureau is the city's lead agency for watershed protection and restoration for Portland's five watersheds (Johnson Creek, Fanno Creek, Tryon Creek, Columbia Slough, and the Willamette River) within the USB. All of the watersheds extend beyond the city limits, requiring extensive collaboration with other local, regional, state, and federal agencies, and non-governmental organizations. Improving watershed health is critical to providing stormwater service, meeting regulations, and supporting the resiliency of Portland's built and natural systems.

## Service Agreements

The City of Portland has service agreements with other jurisdictions that allow for treatment of each other's wastewater flows:

- Lake Oswego, for cost sharing of the Tryon Creek Wastewater Treatment Plant.
- Gresham, Milwaukie, Clackamas County Service District #1, and Clean Water Services, for treatment of sewer flows.
- Dunthorpe-Riverdale Service District, for which Portland provides operations and maintenance, engineering, permitting, and treatment services.
- The City also maintains agreements with the Port of Portland and other private entities for maintenance of private pump stations.

The City is negotiating and expects to have in place for Fiscal Year 2013-14 an agreement with Multnomah County Drainage District #1 covering District provision of stormwater management services.

## Inventory Summary

The Bureau of Environmental Services is responsible for facilities associated with sanitary sewage and stormwater service. The sanitary and combined sewage systems include both collection and treatment facilities. Two municipal wastewater treatment plants serve the city: the Columbia Boulevard Wastewater Treatment Plant (CBWTP) and the Tryon Creek Wastewater Treatment Plant (TCWTP). Separated stormwater system assets include collection, conveyance, and management facilities. While the bureau


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owns and maintains an extensive stormwater system, BES also relies on stormwater management infrastructure (particularly green infrastructure[1]) that it does not own or control as formal assets.

In 2013, the city's wastewater and stormwater systems combined had an estimated replacement value of $13.2 billion. In addition, the Bureau invests in and relies upon the city's green infrastructure and natural systems (such as natural areas, tree canopy, wetlands, and streams) for managing rainfall and stormwater runoff. The value of these natural systems is not included in the $13.2 billion.

Table 6.1 Estimated Replacement Value

| System | Inventory | Estimated Replacement Value |
|---|---|---|
| Combined Sewers | 885 miles of pipe & access structures | $5.0 billion |
| Sanitary Sewers | 1,000 miles of pipe & access structures | $4.1 billion |
| Stormwater system* | 1,900 water quality facilities & 454 miles of pipe | $1.9 billion |
| Wastewater Treatment | 2 plants & 97 pump stations | $2.2 billion |
| Total | | $13.2 billion |

* Estimated replacement value does not include the value of the nearly 9,000 Underground Injection Controls (UICs).

The city's combined sewer system provides sanitary and stormwater service to approximately one-third of the city's area, and the majority of its population, through over 885 miles of pipes. Separate sanitary and storm sewer and drainage systems serve the remaining two-thirds (by area) of the city, primarily in the western and outer eastern areas. The separated sanitary sewer system includes a network of 1,000 miles of sanitary lines and associated access structures.

In addition to gravity sewer pipes and service connections, the wastewater system includes more than ninety pump stations and 57 miles of force main which move wastewater uphill as needed to two wastewater treatment plants, where a series of processes clean wastewater through removal of solids and organic materials and disinfects the effluent before discharging to the Columbia or the Willamette River.

The separated stormwater sewer and drainage system collects and conveys stormwater for discharge to local receiving waters (streams and rivers) and includes pipes, culverts, ponds, sumps, detention facilities, ditches, and drainageways, some of which are neither owned nor maintained by the city.

### Condition and Capacity Summary

The Bureau has recent condition inspections for all but a small percentage of the sanitary sewer collection system. Comprehensive condition data is not available for the stormwater system.

Based on recent inspections or condition assessment, over 80% of the combined and sanitary only pipes are in good or very good condition. Although the completion of the CSO program allows capital resources to shift to rehabilitation and system improvements, projected investments are not keeping pace with the rapidly aging collection system. While age is a good predictor of pipe failure, materials must also be

[1] Green infrastructure: Public or private assets—either natural resources or engineered green facilities—that protect, support, or mimic natural systems to provide stormwater management, water quality, public health and safety, open space, and other complementary ecosystem services. Examples include tress, natural areas, ecoroofs, green street facilities, wetlands, and natural waterways.


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considered. Unfortunately, a significant percentage of the pipe system is concrete pipe that was installed in the early 1940s. Because much of the concrete in that era was poor quality, these pipes are failing more rapidly than might be expected from age alone.

Based on recent inspection data, most (69%) combined sewer system pipes are in good to very good condition, but approximately 10% of pipes are at high risk of failure and in need of repair or upgrading. The sanitary sewer pipes are generally much newer than the combined system pipes and over 90% are in good to very good condition. An estimated $225 million is needed to address the highest risk pipe segments. Projects to address this backlog are included in the proposed Investment Strategy, see Appendix A.

BES has established levels of service consistent with our regulatory permits for both the combined and separated sanitary sewer systems. In the combined system, one benchmark is to convey the 25-year storm at full land use build-out (i.e., consistent with the zoning and the Comprehensive Plan) without risk of system overload, as evidenced by basement sewer backups or surcharging of trunk sewers. In the separated sanitary system, the benchmark is to convey the 5-year storm.

Some areas in the combined system are affected by localized hydraulic capacity limitations that increase the risk of basement sewer backups and/or street flooding. These areas are concentrated close in on the east side with scattered areas in other parts of the system. A number of projects to address this hydraulic deficiency are included in the proposed Investment Strategy.

In the separated sanitary system, hydraulic capacity is impacted by stormwater and groundwater entering the sanitary system. Because the source of stormwater inflow and infiltration can be difficult to identify, engineering solutions are challenging to design. Funds are included in the Investment Strategy to address this issue in the basins most impacted. These basins are concentrated in southwest Portland.

The pumping and treatment systems require regular and more frequent capital investment. While pipes have an estimated 100-year useful life, mechanical and electrical components have a useful life that ranges from 20 to 50 years. In general, all of the pump stations and Columbia Boulevard Wastewater Treatment Plant have sufficient capacity. However, Tryon Creek Wastewater Treatment Plant requires capacity upgrades to serve future growth projections and meet expected regulatory requirements. Projects to address both condition and capacity are included in the proposed Investment Strategy, see Appendix A.

Capacity issues for stormwater outside the combined sewer system vary by watershed. Unique challenges exist in the west hills, in the outer east buttes, and along the Columbia Slough. All of these locations have underserved areas, due to deficiencies in the built stormwater system (e.g., undeveloped right-of-way), or natural conditions that limit infiltration and on-site stormwater management, or make building new piped systems very costly or technically infeasible. All of Portland's major waterways, which are part of the stormwater conveyance network, are water quality limited due to temperature and/or contaminants and the habitat, hydrology and native fish and wildlife species are impacted by stormwater runoff. A number of projects to address stormwater conveyance and/or water quality are included in the proposed Investment Strategy.


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## Key Issues and Concerns

### Serving Existing Residents: Wastewater

Both Portland's combined sewer system and its sanitary sewer system have hydraulic and condition deficiencies that impact the ability of these systems to serve existing properties at designated service levels. These deficiencies can result in higher risks for sewer backups, surcharging, and/or overflows. The greatest concentration of combined sewer pipe segments with capacity problems is located in the older central neighborhoods. The majority of the sanitary sewer system pipes have adequate capacity, however There are deficiencies, concentrated in the southwest (Fanno and Burlingame basins) where the system is impacted by stormwater entering the sanitary sewers.

Pipe segments that are in poor structural condition are widely distributed throughout the service area with the exception of outer east Portland where the collection system is relatively new.

Small geographic areas within the urban services boundary continue to treat sanitary sewage using some type of onsite system such as a cesspool or septic tank and drainfield. Development of new onsite systems is discouraged by the state and the county (the permitting authority) because of the high risk of bacterial contamination to surface and ground water. A program to extend sewers to some of the un-sewered areas is included in the proposed Investment Strategy. However, it is important to note that it may not be technically or financially feasible to provide sewer service to all properties within the USB.

### Serving Existing Residents: Stormwater

In areas not served by the combined sewer system, most stormwater is conveyed through pipes, ditches, or drainageways to streams and rivers. In parts of both the combined and separated sewer basins stormwater from the right–of-way or city property is filtered into the ground through sumps (UICs). See Figure 6.1. In some cases, stormwater is managed in detention facilities, other vegetated facilities, or allowed to infiltrate in natural areas. Safe conveyance of stormwater is an issue in some areas, particularly in the hilly areas of west Portland and some parts of outer southeast which lack comprehensive conveyance systems and where infiltration is limited by geology or high groundwater. In some cases, solutions may not be technically or financially feasible.

Flooding continues to be an issue, particularly in the Johnson Creek area. The City is working with partners to restore more natural stream and floodplain conditions to manage 10-year storm events along Johnson Creek.

### Maintenance of Existing Infrastructure

For 2013, sanitary and stormwater systems have an estimated annual capital maintenance funding gap of $12.4 million, including $2.4 million in combined sewers and $10 million for stormwater. The long-term financial forecast anticipates significant increases in the capital maintenance budget as the system continues to age. BES is applying new technologies and collecting improved data on its assets allowing for enhanced analysis, planning, and targeted implementation of corrective action.


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The bureau's operating resources for operational maintenance needs are strained across all asset types. As of July 2012, the city's stormwater system included more than 1,900 water quality facilities including green streets, vegetated swales, constructed wetlands, and ponds. In addition, the City owns nearly 9,000 UICs and thousands of storm inlets, trash racks and sedimentation manholes. Although green infrastructure such as green streets and swales can have lower overall life cycle costs (capital and operating combined) than a piped solution, these facilities require more regular maintenance to be effective. As the Bureau's portfolio of stormwater infrastructure assets increases, additional operating resources are needed for maintenance. Increases to the operating budget have not been supported in recent years.

### Meeting Regulatory Requirements

Bureau projects and programs address a wide range of regulations that focus on protecting human and environmental health. Major mandates stem from five federal acts: the Federal Clean Water Act, Safe Drinking Water Act, Water Resources Development Act, the Endangered Species Act, and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Whenever possible, the Bureau's approach to addressing regulatory requirements is to take a comprehensive "watershed approach" to achieve broader environmental health and other city goals. Projects to address known regulatory requirements are included in the proposed Investment Strategy. Looking ahead, potential changes in regulatory mandates or permit conditions could present additional financial challenges for the Bureau. More information on regulatory requirements and the watershed approach can be found later in this chapter.

In December 2000, Portland Harbor was listed as a Superfund site by the federal government because there is contaminated sediment in the river. The City is one of more than 100 parties that have begun a voluntary settlement process for allocating costs of investigating and cleaning up Portland Harbor. The Portland City Council designated the Bureau of Environmental Services as the lead agency for the City regarding City concerns in the Portland Harbor cleanup. If it is determined that the City's activities contributed contamination to the sediments, the city may need to participate in and pay for some of the cleanup work in the harbor. Because cleanup actions have not yet been determined, cleanup costs are not known at this stage. Therefore, no projects are included in the proposed Investment Strategy.

### Accommodating Growth

The Bureau of Environmental Services plans for its facilities based on build-out densities allowed within the comprehensive plan land use densities. The Bureau expects to be able to maintain and improve the sewer systems to accommodate growth as long as sewer and stormwater rates are sufficient to meet capital investment needs.

The geographic distribution of new growth is potentially a concern for all BES services – sanitary sewer, stormwater management, and protection and improvement of watershed health. In parts of the city, it is difficult to provide traditional constructed sanitary and/or stormwater systems, both from a cost and engineering perspective. Coordinating growth and density in centers and corridors in areas with good infiltration or where constructed stormwater management is technically and economically feasible will help


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address these concerns. Development of some currently underdeveloped areas may be limited by options for sanitary sewer service and/or stormwater management.

### Climate Change

Climate change is expected to influence local hydrology, habitat, and water quality. Preliminary analysis regarding anticipated local impacts suggests that changing weather patterns and temperatures may affect local stormwater management, wastewater treatment, and watershed health. It is not possible to accurately predict the degree of change in climate variables; therefore an adaptive management approach is necessary. The climate variable with the most potential to cause problems for the stormwater system is changes to winter rainfall patterns.

Most of the stormwater pipes and sumps (UICs) in Portland have been in place for decades and were sized with assumptions about climate and land use that were appropriate at the time they were built. Some of these systems are already experiencing problems with the increased runoff caused by increased impervious area. Changing rainfall patterns during the winter months could exacerbate this problem. It could also cause increased erosion and sediment in stormwater runoff. Sediment can clog pipes, make greenstreet facilities less effective, and deteriorate water quality of receiving streams.

The combined sewers could also be impacted by changing rainfall patterns with the added concern of the potential for more frequent combined sewer overflows (CSOs). During very heavy rain storms, runoff from buildings, streets, and other impervious surfaces impacts combined sewer capacity potentially causing overflows.

Climate change predictions include higher summer air temperatures and resultant increases in water temperatures. When wastewater temperatures increase, the dissolved oxygen content decreases and the biological activity of wastewater treatment processes tend to increase. Higher temperatures could result in increased odor production in the collection system and increased oxygen requirements for some biological treatment processes.

Increased temperatures and shifts in the timing and amounts of precipitation could also affect the region's natural systems. These changes are likely to stress and change vegetation, including vegetated facilities (such as green streets, ecoroofs, and rain gardens), and natural areas, particularly wetlands and streams, that we depend on to manage stormwater naturally. Risk of wildfires, floods, and invasive plants and animals are expected to increase. These changes may make it more difficult to meet water quality standards, lead to increasing or more restrictive regulations especially as more fish and wildlife species are listed as threatened or endangered due to changes in habitat, and may lead to higher operations and maintenance costs for infrastructure.

### Sanitary Sewer and Stormwater Rates

Construction of the recently completed $1.4 billion combined sewer overflow control (CSO) facilities has increased sewer and stormwater rates significantly over the past two decade. The CSO program and other capital projects are financed through bond sales. Bond repayment terms vary from 20 to 30 years. Approximately one-third of the bureau's annual budget is allocated to debt payments. Portland's rates are


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high by regional and national standards; however, this is expected to change as other cities begin to undertake combined sewer overflow control capital projects. Planned operations and maintenance of, and capital improvements to, the sewer and stormwater systems will depend on continued predictable increases in sewer and stormwater rates. Continued public acceptance of rate increases is essential to meeting level of service standards and will require open and clear dialog with the public and decision makers.

## Investment Strategy Summary

The work of the Bureau is focused on strategic and comprehensive project and program delivery to protect public health and restore the environment. The Bureau anticipates an annual average capital improvement program of $100 million or approximately $2 billion in capital investment over the next twenty years. Using a risk-based asset management approach, the Bureau budgets to maintain infrastructure and protect or enhance natural systems to meet regulatory requirements and enhance the health of watersheds. Asset management is a tool that addresses life-cycle costs, trade-offs between capital and operating expenditures, and prioritization of projects based on consequence and likelihood of failure, to achieve long-term system sustainability and acceptable levels of service. This approach is reflected in the Bureau's operating budget as well.


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# Regulatory Compliance

Environmental Services' projects and programs are largely guided by, or in response to, several federal regulatory mandates related to wastewater, stormwater, and natural resources. These regulations are focused on protecting human health and the environment, in line with the bureau's mission. Integrated planning efforts, including a comprehensive view of watershed health, guide the Bureau's response to many of these regulatory mandates. The watershed approach outlined in the 2005 *Portland Watershed Management Plan* provides a framework to coordinate and integrate regulatory response to achieve efficiencies and address the larger goals of clean and healthy rivers, while addressing issues and regulatory drivers such as flooding, contaminated sediments, or water quality in streams. Key regulatory mandates are described below. Except where otherwise indicated, projects and programs to address known mandates are included in the proposed Investment Strategy. While not recognized in the Investment Strategy in this document, the bureau also invests in programs such as outreach and education which have been determined to be cost-effective elements for effective service delivery.

## Clean Water Act

The Clean Water Act (CWA), first adopted in 1978, establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating the water quality of surface waters. Several aspects of the CWA apply to the work of the bureau.

### National Pollutant Discharge Elimination System Permits

The National Pollutant Discharge Elimination System (NPDES) permitting program was developed to control the discharge of point and certain non-point sources of pollution to the nation's waters. The NPDES program is administered in Oregon by the Department of Environmental Quality (DEQ). Several different types of NPDES permits apply to BES:

- **Wastewater Program**
  Portland has NPDES Waste Discharge permits for treated municipal wastewater discharges from the Columbia Boulevard Wastewater Treatment Plant (CBWTP) and the Tryon Creek Wastewater Treatment Plant (TCWTP). The permits include water quality-based effluent limits and requirements for programs for pre-treatment, 'Fats, Oils, and Grease,' and illicit discharge response. In addition to the treatment plants, both sanitary sewer overflows (SSOs) and combined sewer overflows (CSOs) are regulated under this permit.
- **Stormwater Program**
  Portland has a Phase I NPDES permit for stormwater discharges from the municipal separate storm sewer system (MS4). The regulations do not prescribe specific pollutant discharge limits, rather they allow for the implementation of Best Management Practices to improve water quality to the "maximum extent practicable" based on location conditions, resources, and priorities. The City's compliance approach is outlined in the Stormwater Management Plan (2011) which includes the following elements: development standards; industrial and commercial controls; illicit discharge detection and elimination; structural controls; operations and maintenance; preservation and restoration of natural areas; and public involvement.


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- **Industrial Stormwater Program**
  Portland is the agent for DEQ for administration of 1200-Z and 1200-COLS industrial stormwater permits within its jurisdiction. Some types of construction stormwater permits, such as 1200-C permits for large construction sites, are administered directly by DEQ.

### Capacity, Management, Operations, and Maintenance (CMOM) Regulations

CMOM is a requirement of the CBWTP permit. It requires the bureau to improve the performance and reliability of the sanitary and combined sewer systems. Consistent with the 2011 NPDES Permit for CBWTP, BES submitted a Draft CMOM Program Report to DEQ in June 2013. The CMOM program is intended to reduce the likelihood of sewer releases by improving the overall reliability of the sanitary and combined sewer collection system. The strategies and activities defined align with the asset management approach to managing, operating, and maintaining the wastewater collection system. The approach uses risk-based strategies for the development, reinvestment, operations, and maintenance of the system.

### Water Quality Standards and Total Maximum Daily Load Programs

Section 303 of the Clean Water Act established programs to develop and implement water quality standards and limits for pollutants received by water bodies. DEQ is responsible for developing water quality standards and total maximum daily loads (TMDLs) in Oregon. TMDLs specify the maximum amounts of certain pollutants (including heat) that a particular body of water is allowed to receive without exceeding water quality standards. The goal is to protect beneficial uses such as recreation, cold water fisheries (such as salmon), and municipal and industrial water supplies.

The City is responsible for addressing Environmental Protection Agency (EPA)-approved TMDLs in the Lower Willamette mainstem and its tributaries, as well as in Tryon, Fanno, and Johnson Creeks; and the Columbia Slough.

### Amended Stipulated Final Order (CSO Program)

In 1991, BES entered into a legal agreement with DEQ concerning the city of Portland's CSO-abatement program, because overflows from the combined sewer system violated water quality standards for the Willamette River and the Columbia Slough. Completion of the CSO controls program in 2011 was a major milestone. Of relevance to this CSP, the agreement requires Portland to continue to further reduce CSO discharges using cost-effective methods that achieve other mission-based objectives such as watershed health, stormwater management, and wastewater operations and treatment. The Post-2011 CSO Facilities Plan was submitted on September 2010 and approved by DEQ in February 2011.

## Safe Drinking Water Act

The Safe Drinking Water Act mandates a variety of programs to protect drinking water supplies. While the Portland Water Bureau is the primary entity regulated by this Act, Environmental Services does have to comply with a sub-set of the regulations through its UIC Program.


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### Underground Injection Control (UIC) Program

The National UIC Program was enacted in 1974 under the Safe Drinking Water Act. In Oregon, the program is administered by DEQ. In 2005, DEQ issued the City a Water Pollution Control Facility (WPCF) permit for stormwater discharges to approximately 9,000 city-owned UICs. The ten-year WPCF permit regulates the construction, operation, and maintenance of all City-owned UICs. The permit required the development and implementation of a UIC Management Plan, describing the measures the City will implement to control pollutants prior to discharge to a UIC to protect groundwater as a drinking water resource. The UIC Management Plan (2008, revised 2012) includes the following elements:

- Systemwide inventory, assessment and evaluation to determine compliance, prioritization and response actions.
- System management to prevent, minimize and control stormwater prior to discharge, including operations and maintenance, spill prevention and pollution control.
- Stormwater Discharge Monitoring Plan (2006, revised 2012) for data collection and evaluation to demonstrate public UICs are operated in a manner that protects groundwater as a drinking water resource.
- Corrective Action Plan (2006) to evaluate, select, and implement actions to address UICs that do not meet permit conditions.

The City has completed a significant amount of work to ensure compliance with the permit.

## Endangered Species Act (ESA)

The Endangered Species Act (ESA) regulates the conservation of threatened and endangered plants and animals and the habitats in which they are found. All eight species of salmon and five species of steelhead that spawn, rear and migrate through waterways in the Portland area are listed as threatened or endangered under the ESA. In addition, ESA-protected Pacific Eulachon (smelt), Bull Trout and Green Sturgeon are present in the Columbia and Willamette Rivers and some local tributaries. Streaked Horned Lark (a bird found primarily in the Columbia Slough) was formally listed as a threatened species in 2013. Pacific lamprey is an ESA candidate species as well.

The basic requirements of the ESA are to avoid harming or harassing the listed species or adversely modifying their critical habitat, and to work to recover these species through the development and implementation of recovery plans. Critical habitat is federally identified and mapped. Portland's waterways are designated as protected critical habitat, which triggers specific requirements for any projects including City infrastructure projects, that involves federal actions such as funding or permitting.

The National Oceanic and Atmospheric Administration Fisheries, the federal agency with jurisdiction over salmon and steelhead, adopted a federal recovery plan for salmon and steelhead in the Lower Columbia River, including Portland, in 2013. BES recently signed a conservation agreement with the USFWS and 15 other state and federal partners regarding lamprey.

The City has a multi-pronged approach to comply with the ESA and advance the recovery plan. BES leads the City's ESA program and a streamlining team for city projects requiring ESA permits. Plans and

projects that help achieve other City objectives, such as culvert replacement, stream bank restoration and riparian protections, erosion control and revegetation, watershed monitoring, zoning, and climate change planning are part of the City's ESA response and critical to species recovery. Several city bureaus have programs and projects related to species recovery; BES implements those projects that are related to its sewer and stormwater mission.

### Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA – Superfund) and Portland Harbor Cleanup

The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA, also known as Superfund) was enacted in the wake of the discovery of toxic waste dumps in the US, such as Love Canal and Times Beach in the 1970s. It allows the U.S. Environmental Protection Agency (EPA) to clean up such sites and to compel responsible parties to perform cleanups or reimburse the government for EPA-led cleanups.

In December 2000, the EPA listed a portion of the Lower Willamette River, known as Portland Harbor, as a Superfund site under the federal National Priorities Listing process. The Portland Harbor Superfund investigation is currently focused on a stretch of the Willamette River from River Mile 2 to River Mile 11.8, roughly the area from the Broadway Bridge to just short of the confluence with the Columbia River. The City operates stormwater and combined sewer overflow outfalls within the Portland Harbor area. The outfalls drain City-owned rights-of-way, industrial, commercial, residential, and vacant lands.

Under an intergovernmental agreement, the City and Oregon DEQ are working to identify sources that discharge significant contamination to the municipal conveyance system and to control these sources to reduce contaminant loads. The City is working closely with DEQ and EPA to develop a comprehensive plan to address future stormwater discharges under state and municipal programs to prevent recontamination of the harbor after clean up. If it is determined that the City's activities contributed contamination to the sediments in Portland Harbor, the city may need to participate in and pay for some of the cleanup work in the harbor. Because cleanup actions have not yet been determined, cleanup costs are not known at this stage. Therefore, no projects are included in the proposed Investment Strategy.

## Goals & Policies

Draft Goals and Policies related to Sanitary and Stormwater Facilities and services can be found in Chapter 5. Key Infrastructure Policies.



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# Wastewater and Stormwater Systems

## Systems Overview

Environmental Services provides sanitary sewage and stormwater collection through a complex set of infrastructure systems that are closely intertwined with the natural systems of Portland's watersheds and the historical development of the city. Wastewater and stormwater are conveyed through either combined pipes (wastewater and stormwater in a single pipe) or separated pipes (sanitary only or stormwater only). The combined and sanitary sewage pipes convey flow to one of the city's two wastewater treatment plants. In the separated area, stormwater is conveyed via pipes, ditches, swales, and natural drainageways, or simply flows overland to surface water (streams or rivers) or underground sumps (UICs). In portions of the combined sewer area, stormwater is also collected from the right–of-way or city property and discharged to UICs. See Figure 6.1, System Overview.

BES uses both "gray" (primarily pipes and pumps) and "green" infrastructure. Green infrastructure is a part of stormwater management in both the combined and separated stormwater areas. Green infrastructure solutions (such as trees, ecoroofs, natural areas, and green streets) capture and filter precipitation and urban runoff that may otherwise drain into the sewer system or directly into rivers and streams without benefit of pollution or velocity reduction. Green infrastructure can sometimes be the most cost-effective solution to protecting the piped infrastructure system. It can also contribute to other goals, such as climate change adaptation and mitigation. While the bureau owns and maintains an extensive stormwater management system, BES also relies on stormwater management infrastructure (particularly green infrastructure) that it does not own or control as formal assets. Portland's stormwater system depends on management and expansion of the city's tree canopy and natural areas that intercept rainfall, keeping it out of pipes and filtering it naturally. Natural streams and drainageways, although not owned by the bureau, are a critical part of the water conveyance network, Green infrastructure components of the stormwater system may be owned or managed by private property owners, other bureaus (most often, Portland Parks & Recreation), and other institutions and agencies (such as schools, the Oregon Department of Transportation (ODOT), and others).

BES conducts system planning to identify, characterize, and analyze (model) its systems. System plans recommend projects and programs to address condition, capacity, meet regulatory requirements, and growth goals. System planning is driven by an asset management approach (described below) and increasingly integrated with watershed planning. BES has current system plans for the combined and sanitary sewer system, the two wastewater treatment plants, but not for its pump stations or pressurized force mains. Stormwater system planning is underway.


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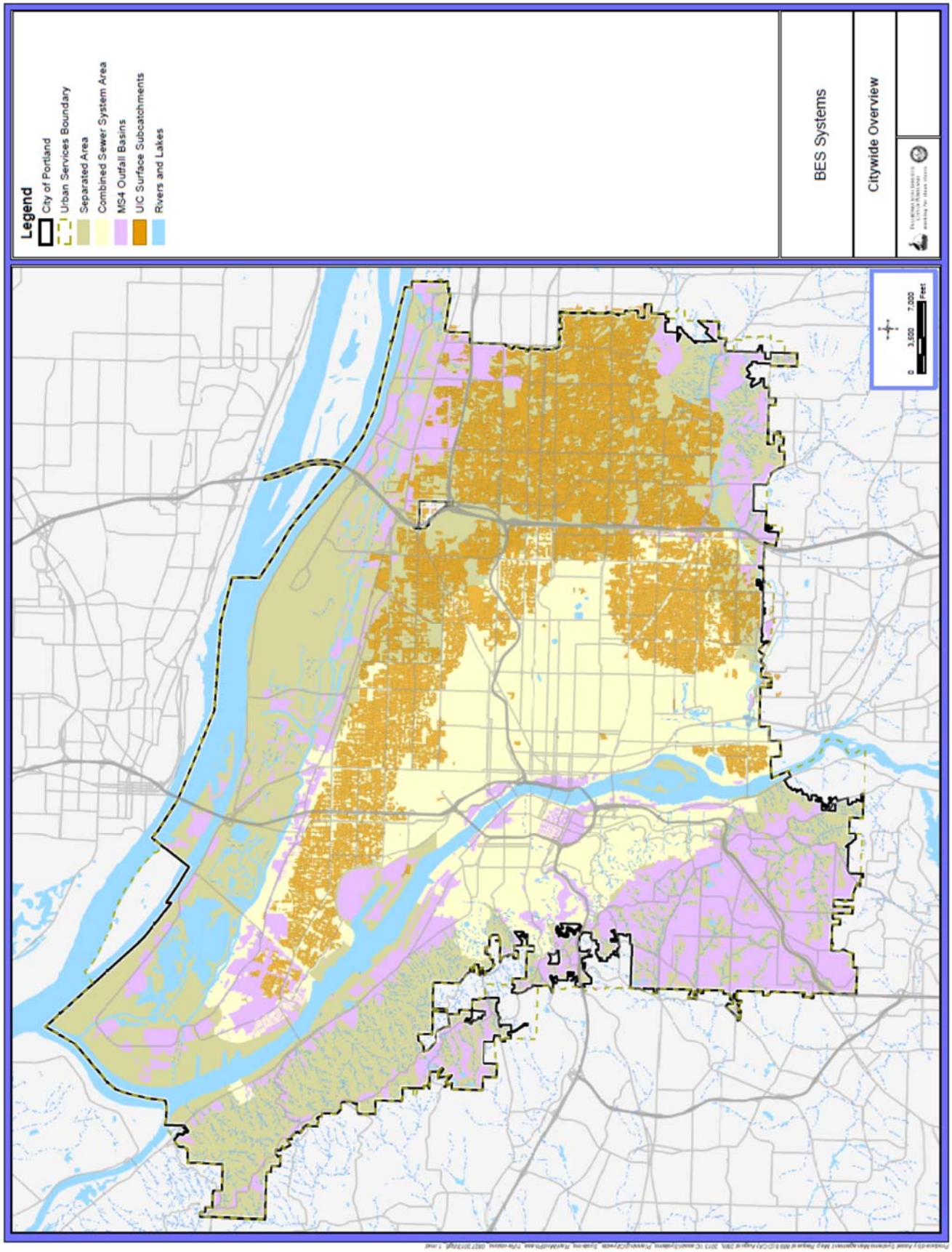
Figure 6.1 Systems Overview



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## Portland's Watersheds

BES's sewer and stormwater systems are managed to protect or enhance human and environmental health and Portland's watersheds, see Figure 6.2. Each watershed has distinct characteristics and conditions, described below, which are relevant to existing and future infrastructure system planning and investments. All of Portland's watersheds include waterways that are TMDL-listed for water quality and have critical habitat for ESA-listed salmonids.

In 2006, Portland City Council adopted the *Portland Watershed Management Plan* (PWMP) in order to focus the City's efforts to protect and restore Portland's natural systems. The PWMP lays out an integrated set of strategies to improve watershed health, and provides a framework to coordinate and integrate responses to some of the City's regulatory requirements. A healthy urban watershed has the hydrologic, habitat, and water quality conditions suitable to protect human health and viable ecological functions and processes, including self-sustaining populations of native fish and wildlife species whose natural ranges include the Portland area." The City's and BES's goals under the PWMP are to achieve improvements in hydrology, water and sediment quality, habitat, and biological communities. Both the *Portland Plan* and the updated *PWMP Implementation Plan* (2012) reinforce the importance of improving watershed health through repair and maintenance of existing infrastructure, investment in built and natural stormwater infrastructure, environmentally-friendly development and the protection, enhancement and restoration of natural resources. While BES is the lead bureau for watershed health, implementation of the PWMP depends on the efforts of several city bureaus and coordination with other agencies and non-governmental entities. Watershed projects related to BES's mission are included in the Investment Strategy.

To inform future investments, the Bureau conducts comprehensive watershed monitoring to track changes in watershed health over time—including water quality trends. Now in the fourth year of monitoring, the Portland Area Watershed Monitoring and Assessment Program (PAWMAP) is establishing consistent citywide data through an efficient sampling approach modeled after EPA protocols. Every year BES samples a subset of the 298 inventoried miles of streams in Portland. Of the stream reaches sampled and analyzed so far, none meet the city's water quality benchmarks, in large part because of mercury and total suspended solids. Targets for in-water large wood, an indicator of in-stream habitat function and complexity, have been achieved in only 13% of the sampled reaches, and only 2.5% of sampled stream reaches meet the standard for a healthy macro-invertebrate population. (Macro-invertebrates include all species with exterior skeletons, including insects, which are a critical part of the food chain and an indicator of overall environmental health.) In sum, Portland's streams generally are not considered functional for water quality, habitat, and biological communities. Impervious area (roads, parking lots, and rooftops) covers between 22% and 40% of Portland's watersheds, generating large





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quantities of stormwater runoff and disrupting the natural water cycle. Due to implementation of public and private stormwater management approaches, including surface water quality facilities like green streets and rain gardens, some of this impervious area is managed. However, effective impervious area—the runoff that remains unmanaged--ranges from 12% in the Johnson Creek watershed to 28% for the mainstem Willamette watershed.

Portland's six primary watersheds are described in more detail below. Specific stormwater system descriptions and challenges for each watershed are in the Stormwater System section.

### Portland Willamette River Watershed

The Willamette River Watershed in Portland is only 0.5 percent of the Willamette River's total drainage basin, which covers more than 11,000 square miles in western Oregon. Within the City of Portland, the watershed encompasses 69 square miles of land. Other city watersheds—Johnson Creek, Fanno Creek and Tryon Creek— drain to the Willamette River. The river flows north through the downtown core to the Columbia River and serves industrial, residential, commercial, and recreational uses. The highly altered stretch of the river through Portland is the gateway to the entire Willamette Basin for salmon, steelhead, lamprey, and other native fish and wildlife. Despite heavy urbanization, valuable habitat for feeding refuge, rearing, and mating still exists in this portion of the watershed. The river is also a significant place for people to encounter nature through active or passive recreation, and the working harbor is a major economic driver for the region.

The watershed includes the central city and much of inner southeast and northeast Portland, which is highly developed and covered by impervious surface, although relatively flat and with generally good infiltration. The watershed also contains Forest Park and several other large parks and open space areas, and includes smaller tributary streams on the west side of the river that are not part of the Fanno or Tryon Creek basins.

The Willamette River has water quality limitations, including established TMDLs for temperature, bacteria, and mercury. Completion of the Combined Sewer Overflow (CSO) Program in 2011 significantly reduced CSO discharge events to the Willamette River, which improved one aspect of river health, but more work remains to address water quality and habitat in the main stem river. Nine miles of the main stem Willamette River in Portland are designated as a federal Superfund site. In the west side tributaries, water quality challenges and stormwater-related high flows in natural channels lead to degradation of the physical and biological characteristics of these tributary systems. Protection and restoration of remaining natural areas on the Willamette escarpment and in the west hills are important to connecting existing high-quality habitat, preserving the natural hydrologic function of steeply sloped areas, and preventing further water quality impacts in the main stem river.


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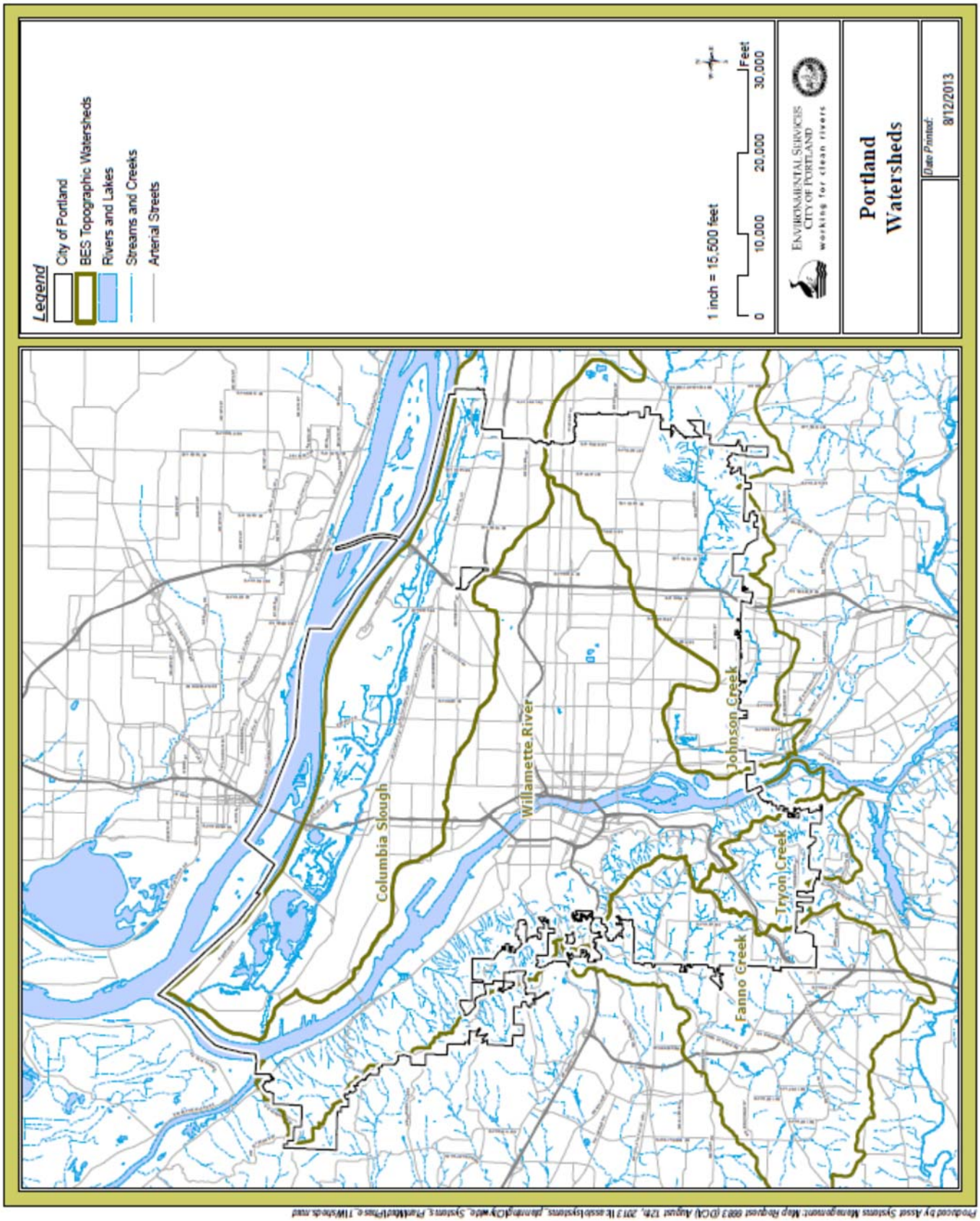
Figure 6.2 Portland Watersheds



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### Columbia Slough and Columbia River Watersheds

The Columbia Slough Watershed extends along the Columbia River shoreline and through north and northeast Portland to Alameda Ridge. The watershed drains approximately 51 square miles of land and is defined by the 19-mile long main channel (the slough) as well as approximately 30 miles of secondary waterways. The Upper Columbia Slough is a highly managed system, with piped stormwater, dikes and levees, and a system of pumps that provide area drainage and flood control. The lower nine miles of the slough—from NE 18th Avenue to Kelley Point Park—are tidal and directly connected to the Willamette River. The lower slough provides valuable habitat for migrating juvenile Columbia River and Willamette Basin salmon. The slough provides recreation and access to nature for the metro region, particularly underserved neighborhoods in north and northeast Portland. The Columbia South Shore Well Field, part of Portland's drinking water supply, is located in this watershed.

The watershed is an important economic and transportation hub, the location of thousands of jobs as well as 170,000 residents. Much of the northern section of the watershed has industrial land uses on large parcels. More information on the slough's unique stormwater management considerations is in the stormwater system section. Completion of the CSO program greatly reduced sewage overflows to the Columbia Slough, which has improved water quality.

However, the slough remains water quality limited, with established TMDLs for temperature, bacteria, nutrients, and toxics. Low levels of contamination in the sediment are also widespread. In 1994, the City of Portland established a Consent Order with DEQ related to sediment. The City entered the Voluntary Clean Up Program in 2006. The City and DEQ have adopted an approach that includes reducing pollutant sources, cleaning up specific sites, and long-term monitoring to track how the slough is responding to watershed management actions. BES has completed a predesign that identifies priority city-owned stormwater outfalls that need pollutant reduction facilities.

Protection of valuable natural resources like Smith and Bybee Wetlands and Big Four Corners Natural Area, ongoing work to revegetate the banks of the slough, construction of green street facilities, and stormwater pollution controls by businesses along the slough are improving conditions in the Columbia Slough watershed, but significant challenges remain.

The Columbia River watershed in Portland is a fraction of the river's overall drainage basin in North America and covers just over one square mile of the City of Portland along the river's south shoreline and Hayden Island. The City provides stormwater and sewer services to the residents and businesses in this area, and the Columbia Boulevard Wastewater Treatment Plant discharges Portland's wastewater effluent to the Columbia River. While development on Hayden Island is concentrated on the eastern side, the western portion is outside the City's service area and remains undeveloped. The island provides rare shallow water habitat and riverine woodlands. The Columbia River south shoreline is leveed for approximately 11 miles and the drainage districts are responsible for flood control in this area.

### Johnson Creek Watershed

The Johnson Creek Watershed encompasses approximately 54 square miles of land, over half of which lies outside the City of Portland. Johnson Creek originates in Clackamas County east of Boring, Oregon,


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and flows west approximately 25 miles to its confluence with the Willamette River. The watershed has a mix of land uses: agricultural, commercial, light industrial, and residential. Salmon, steelhead, and other native fish are found in significant portions of the watershed. Johnson Creek provides some of the city's best opportunities for native species recovery.

Fifteen miles of the creek channel is lined with concrete and rock from Works Progress Administration (WPA) attempts to control flooding in the 1930s, which has exacerbated storm-related flooding, particularly in the Lents neighborhood. In addition, development in the East Buttes area has disturbed natural drainageways, seeps, and springs that are an important part of the hydrologic cycle, and the entire creek has low flows during the summer.

Agricultural runoff, particularly in the headwaters (outside City limits), and legacy pollutants such as DDT are a significant challenge to stream health. Remediation efforts require collaboration among multiple jurisdictions. The creek has established TMDLs for bacteria, temperature, and toxics.

Through the implementation of the Johnson Creek Restoration Plan (JCRP), the City and partners have purchased more than 260 acres of frequently flooded property and are removing WPA alterations and restoring the natural stream channel. The goal of the JCRP is to curb impacts from nuisance flooding while improving water quality and habitat, reversing the damage from earlier attempts to control flooding that altered the natural channel of the creek. Several floodplain restoration projects completed in the past ten years are making cumulative improvements in the natural resource functions of the watershed, and additional priority projects are planned.

### Fanno Creek and Tryon Creek Watersheds

The Fanno Creek Watershed covers approximately seven square miles of land in southwest Portland. The balance of the watershed's 32 square miles is mainly in Washington County. Several of the tributaries to Fanno Creek provide cool water and habitat for native fish, and Fanno Creek itself is a tributary to the Tualatin River.

Stormwater flows into stream channels and into Fanno Creek or is managed by the storm sewer system and surface water facilities. Impervious area from development, combined with local geology and steep slopes, results in highly variable flows that impact streams. Fanno Creek has water quality challenges, including established TMDLs for temperature, bacteria, and nutrients.

The Tryon Creek Watershed covers approximately six square miles of southwest Portland. About 21 percent of the watershed is outside the City of Portland's boundary in the jurisdictions of Multnomah County, Clackamas County, and the City of Lake Oswego. Most of the development is concentrated in the upper part of the watershed where impervious surfaces cover significant area. Tryon Creek State Natural Area and other parks and natural areas provide valuable, but fragmented, habitat. Native resident fish are found in the creek, but salmon and other migratory fish are largely excluded by the culvert under Highway 43 near the mouth of the creek.

Stormwater in this watershed flows quickly across soils that are slow to infiltrate and down steep slopes into stream channels that flow into Tryon Creek. Runoff from major transportation corridors including I-5


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and Barbur Boulevard discharges to Tryon Creek or its tributaries. The creek has water quality challenges, including established TMDLs for temperature and bacteria. Stream bank erosion, channel incision and simplification, and fine sediment deposition are issues in both the Tryon and Fanno Creek watersheds. The Fanno/Tryon Watershed Management Plan calls for a dual approach in Tryon Creek of managing stormwater runoff, to reduce impacts to streams, especially in the upper watershed, while restoring and protecting existing natural areas to preserve the natural functions of the water cycle. In Fanno Creek Watershed, the primary focus is on managing stormwater runoff from commercial corridors and high-traffic streets.

## Asset Management Approach

Although BES began incorporating asset management into its business practices more than 20 years ago, in 2010 the Bureau launched an Asset Management Improvement Program to better define asset management principles and practices as they should be applied to BES assets, identify opportunities for improvement, and establish a framework for implementing improvements. This helps the bureau prioritize investments within and across the different systems (sewage conveyance, treatment, and stormwater management). Asset management is a dynamic process, and the bureau's implementation of asset management varies by system and asset types.

The focus of the asset management approach is assessment and mitigation of business risk. Business risk is calculated as the product of consequences of failure to meet levels of service and likelihood of failure. In determining the consequences of failure to meet levels of service, the following triple bottom line risk factors were used:

- economic, including impacts on operations, maintenance, and/or replacement and emergency costs,
- environmental, including impacts on physical habitat, biological communities, and/or compliance with regulations, and
- social, including impacts on public inconvenience and perception and/or public health and safety.

Starting with these triple-bottom-line asset management factors, staff identified specific risks and associated dollar values for individual consequences of capacity and structural failures. The potential consequences of pipe failure include sewage backing up into private property, sewage overflows to the surface, and/or sinkholes opening to the surface.

Likelihood of failure is the probability an asset will fail. For structural deficiency risk, likelihood of failure was determined from condition assessment data and literature curves that relate pipe condition grades to remaining useful life for different pipe materials. For capacity deficiency risk, likelihood of failure was estimated by computer model simulation of flows for storms with different frequencies and under existing and future development conditions.

Sewer pipe segments were evaluated using a geographical information system (GIS) database tool to prioritize and map potential spot repairs and whole pipe rehabilitation/replacement. The database includes information from pipe inspection regarding condition, grade, and defects of the pipe as well as data concerning consequence of failure, likelihood of failure, estimated cost, and prioritization. This pipe


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rehabilitation tool was utilized to identify rehabilitation/ replacement needs for the sanitary and combined sewer collection systems.

Pipe assets were evaluated to determine the current and potential future capacity risk. Alternatives were developed to address capacity and structural risks and were evaluated for cost-effectiveness in addressing level of service goals including reducing sewage backups into basements in the combined system. In the sanitary system, rainfall derived infiltration and inflow (RDII) is the biggest cause of capacity deficiencies. The effects of RDII were evaluated for the pipelines and pump stations using flow monitoring data and/or modeling assumptions based on pipes of similar age and location.


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# Wastewater Collection System

Wastewater is collected and conveyed via either combined sewers or separated sanitary sewers. Sewage is collected and transported through a combination of gravity pipes, pump stations, and pressurized force mains to major interceptors that convey the sewage to one of two wastewater treatment plants.

## Wastewater Collection System Inventory

The collection system consists of a network of approximately 1,900 miles of collection system piping (1,000 miles of sanitary sewer, 885 miles of combined sewer, and 13 miles of sewers Portland maintains by agreements with other agencies), ranging from six inches to 22 feet in diameter. The system includes 39,760 access structures, 57 miles of force mains, and 25 outfalls. The City is responsible for operation and maintenance of 97 pump stations (80 that are owned by the City; six owned by other public agencies and 11 privately-owned septic tank effluent pumping (STEP) systems). The total wastewater service area is approximately 92,500 acres.

The combined sewer system collects and transports sewage and stormwater flow in a single pipe network to the CBWTP for treatment. It is divided into 41 basins[2], which are grouped into four major CSO service areas: West Side Willamette, East Side Willamette, North Willamette, and the Columbia Slough, see Figure 6.3. This area is approximately 31,700 acres in size and is bounded on the north by the Columbia Slough, on the south by Johnson Creek, on the west by the Portland West Hills, and on the east by 82nd Avenue (approximately). It includes most of downtown Portland and many older residential areas.

In the combined system, raw sewage is collected from local properties and stormwater runoff is collected from the public right-of-way, rooftops, parking areas, and other impervious surfaces. The system includes publicly-owned stormwater control facilities (such as green streets and sumps) that divert stormwater from the pipe system and 14 pumps stations. The city also relies on privately-owned vegetated stormwater facilities such as rain gardens, to reduce stormwater volume entering the combined system. Combined sewage is conveyed through a series of collector sewers and trunk sewers to diversion structures located at the downstream ends of the basins. The diversion structures route the combined sewage from the basins into the interceptor system that conveys the flow to the CBWTP. When capacity is not available in the interceptors, the diversion structures overflow to the CSO control facilities (storage tunnels and pumping systems) to deliver captured CSOs to the CBWTP for treatment. During large, infrequent storms when the tunnels fill, the excess combined sewage spills over the control dams in the tunnel shafts and discharges to the Willamette River or the Columbia Slough.

The sanitary sewer system includes the network of pipelines and pump stations that collect and convey wastewater only. The area served by sanitary sewers is divided into 29 basins, totaling 60,800 acres, and covering most of outer east and southwest Portland, see Figure 6.3. The basins are defined by the network of sanitary sewers that collect wastewater and convey it to either a major sanitary trunk sewer or a combined interceptor sewer. Seventy-four of the City's pump stations pump separated sanitary flow of

[2] BES has defined multiple basins for the combined sewer, sanitary sewer, and stormwater systems. Basin boundaries are based on the routing of flows to downstream discharge locations. The basins are delineated separately for each type of sewer – combined, sanitary, and stormwater. Within one watershed, there may be combined sewer basins, sanitary sewer basins, stormwater basins, or a combination of each.


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which 55 are located in the Columbia Slough Service Area. The sanitary flow from the Tryon Creek Service Area (Tryon Creek and Dunthorpe-Riverdale basins) is treated at the Tryon Creek Wastewater Treatment Plant.

Flow from the Durham Service Area (Skyline and Clean Water Service South basins) flows to the Durham Advanced Wastewater Treatment Facility, owned and operated by Clean Water Services of Washington County. Aside from the few customers served by Gresham, the remaining flow is treated at CBWTP.

## Wastewater Collection System Levels of Service

Levels of service for the wastewater sewer system establish a framework for characterizing system deficiencies, developing and evaluating alternative solutions, and selecting recommended improvements. The following levels of service are specific to the collection system:

- Provide sewage service to support development consistent with the Comprehensive Plan where feasible.
- Customers properly connect and maintain sewer connections per City standards.
- In the combined sewer area, convey combined sewage to prevent releases to buildings or streets up to a 25-year storm frequency (a storm with a 4% chance of happening in any year).
- Prevent combined sewer overflows to frequencies established by the NPDES permit.
- Public sanitary/combined conveyance facilities are maintained in accordance with standards.
- In the separated sewer area, sewage releases to surface waters (SSOs) are prevented for storm events up to a 5-year frequency (a storm with a 20% chance of happening in any year).

The Bureau has evaluated the sanitary and combined sewer pipe systems for structural integrity and the capacity to convey design flows. Pump station capacities have been evaluated to determine whether they could adequately pump the collection system design flows. Characterization of these systems is presented in terms of the risk of not meeting the technical levels of service. The estimated total sewer system capacity and structural deficiency risk is shown in Figure 6.4. In this figure, risk is expressed in dollars per acre and summarized in 25-acre grid cells color coded to signify a risk range. This figure illustrates the areas of the system where total sewer risk is currently highest. The Bureau has included a number of projects in its Investment Strategy to reduce this risk.


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Figure 6.3 Sanitary and Combined Sewer Basins and Service Areas

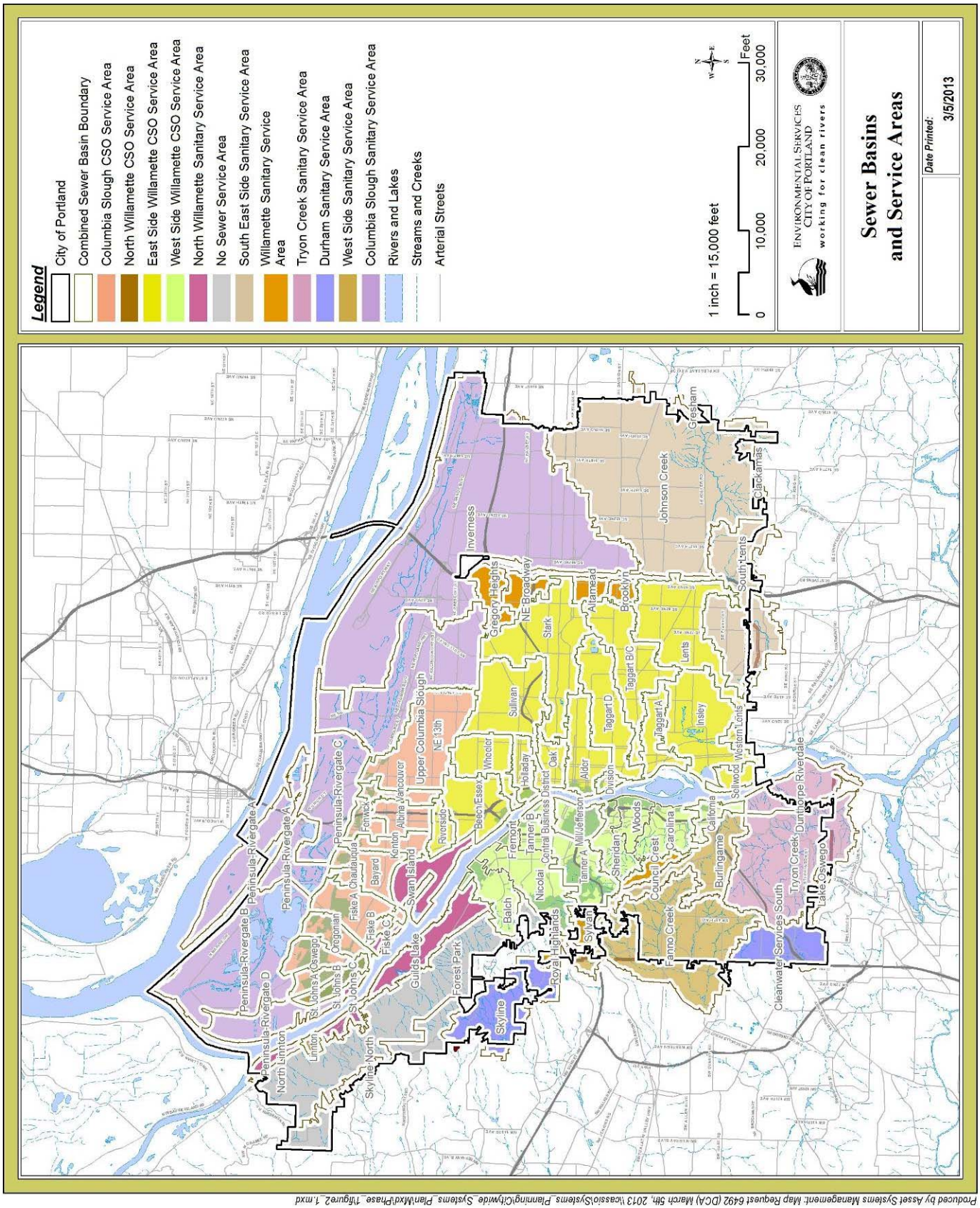


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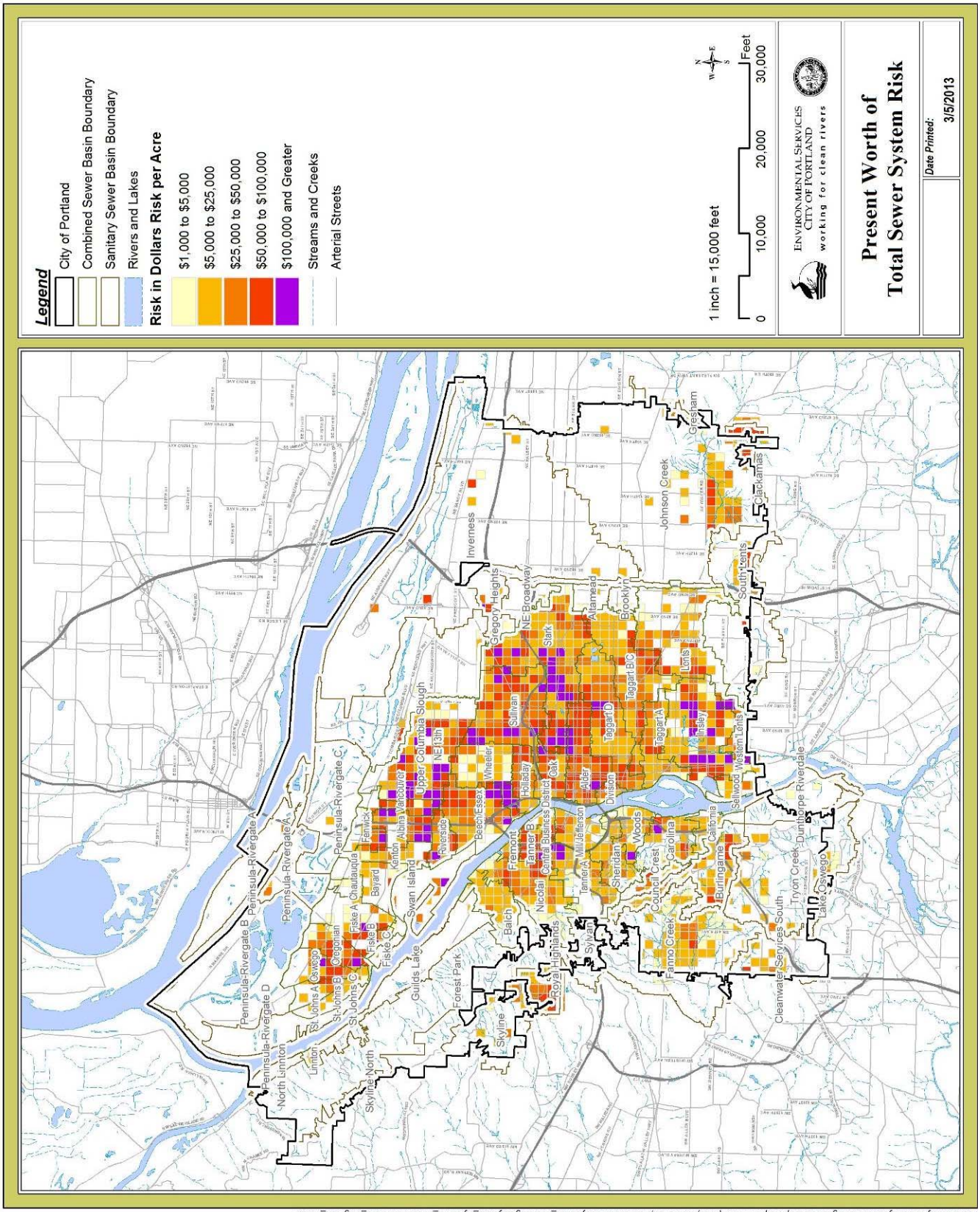
Figure 6.4 Sanitary and Combined Sewer System Risk

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## Wastewater Collection System Current and Projected Condition

Sewer pipes are inspected to determine both structural and operational condition. Over the past 40 years, most of the collection system has been inspected. Approximately three-quarters of the pipe segments have been inspected over the last ten years. Of the remainder, approximately 65% were constructed within the past 20 years and are therefore assumed to be in excellent condition.

Table 6.2 Pipe Condition

| Combined Sewer System | Miles | Very Good | Good | Fair | Poor | Very Poor | TBD |
|---|---|---|---|---|---|---|---|
| Pipes Total | 878 | 51% | 18% | 11% | 12% | 6% | 0.57% |
| Pipes 8” or less | 321 | 45% | 22% | 8% | 16% | 8% | 0.93% |
| > 8 and < 24" | 401 | 54% | 18% | 14% | 10% | 4% | 0.25% |
| >= 24 and < 36" | 68 | 66% | 13% | 7% | 9% | 4% | 0.03% |
| 36" and larger | 88 | 65% | 8% | 8% | 15% | 3% | 1.14% |
| **Sanitary Sewer System** | **Miles** | **Very Good** | **Good** | **Fair** | **Poor** | **Very Poor** | **TBD** |
| Pipes Total | 1,012 | 71% | 20% | 5% | 2% | 0% | 0.40% |
| Pipes 8” or less | 770 | 78% | 18% | 2% | 2% | 1% | 0.13% |
| > 8 and < 24" | 142 | 54% | 31% | 12% | 2% | 0% | 1.41% |
| >= 24 and < 36" | 50 | 46% | 32% | 16% | 4% | 0% | 2.00% |
| 36" and larger | 50 | 52% | 16% | 26% | 6% | 0% | 0.00% |

As inspections are conducted, structural defects are noted and scored. The condition scoring method for sewer mains uses five grade ranges as shown below:

Table 6.3 Structural Condition Rating System

| Grade | Condition | Description | Structural Score Range |
|---|---|---|---|
| 1 | Excellent | No defects or few minor defects | 0 - 9 |
| 2 | Good | Minor defects or few moderate defects | 10 - 99 |
| 3 | Fair | Moderate defects that will continue to deteriorate | 100 - 999 |
| 4 | Poor | Moderately severe defects that will become Grade 5 defects in the foreseeable future | 1,000 - 9,999 |
| 5 | Very poor/ immediate attention required | Defects requiring immediate attention. (Failed or failure imminent.) | 10,000+ |






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All pipes are at risk of structural failure at some point in time. Pipes in poor condition are at risk to fail sooner than pipes in good condition. In accordance with the asset management approach, the business risk of a structural failure for any given pipe is estimated by calculating the potential cost of consequence of failure, estimating the likelihood of failure, and developing a risk distribution as a function of time. To assess structural deficiency risk for the entire sewer system, this process was applied to every pipe in the city's inventory for the service area. Figure 6.5 shows the 100-year present worth value of structural deficiency risk for all condition Grade 4 and 5 pipes summed by 25-acre grid cells. Only Grade 4 and 5 pipes are shown in this figure because they represent pipe rehabilitation needs within the 20-year planning horizon. The Bureau is in the fourth year of a multi-year $123 million rehabilitation program to address the highest risk pipes. Assuming adequate funding, the Bureau anticipates reducing its highest risk. Unfortunately, the collection system is degrading more rapidly than investment projections.

A significant percentage of the pipe system is concrete pipe installed in the early 1940s. Much of that era's concrete was of poor quality, so pipes are failing more rapidly than expected from age alone.

Pump stations, components and force mains require more frequent renewal than the gravity pipe system. The Pump Station Improvement Program was established to keep pump stations in good working order to maintain reliability and efficiency within the conveyance system. The program addresses capacity, mortality, reliability, and code compliance. Funding for this program is proposed to increase in future years to allow for timely capital renewal at each of the 97 pump stations. In general, pump stations are assumed to have a 50-year useful life; however, major components require renewal after about 25 years.

Vegetated stormwater facilities (green streets, etc.) in the combined sewer system are not included in this condition assessment, as most of them are relatively new. However, it is important to recognize the fact that these facilities, which reduce stormwater pollutants in the separated system and reduce the capacity demand in the combined sewer system, require regular maintenance to be effective. Budget requests for increased funding to maintain these facilities have not been supported. Lack of maintenance could lead to system failure.

## Wastewater Collection System Current and Projected Capacity

To support the capacity and performance analyses of the sewer system, BES developed a highly detailed simulation technique called explicit modeling. The technique is explicit in that it models public and private facilities (manholes, pipes, green streets, onsite vegetated facilities, etc.) and impervious surfaces at the property level. Explicit modeling enables BES to more clearly define the sources of basement sewer backup risk and capacity problems throughout the basins, to efficiently calibrate flow monitoring data with more certainly than traditional models, and to evaluate the cumulative benefits of green infrastructure stormwater controls for streets, parking areas, and roofs.

The models are specific to each sewer basin and three of the interceptors. The basin model calibrations were performed by comparing basin model results against flows measured by temporary flow monitors installed within the basins. For the interceptors, flow data is available from more permanent monitors. The good correlation between the model predictions and the physical measurements at the monitors gives BES confidence in the model's ability to predict hydrologic and hydraulic response from rainfall events.


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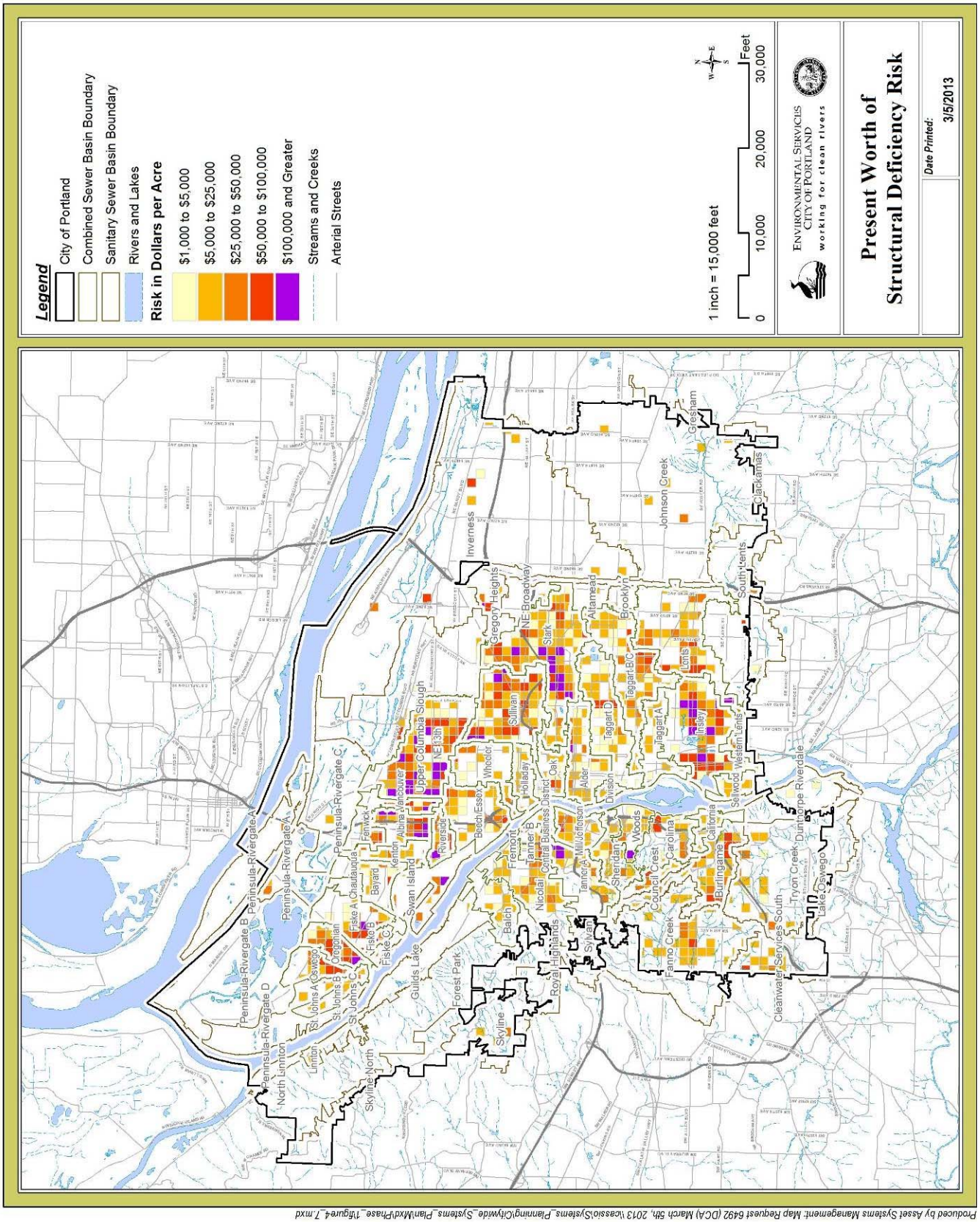
Figure 6.5 Structural Deficiency Risk (Sanitary and Combined Sewer Pipes)



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The hydraulic capacity characteristics of the combined sewer system are evaluated for five different design storm scenarios: three storms (2-year, 5-year, and 25-year) for existing conditions, one storm (25-year) for future conditions (build out of the Comprehensive Plan), and the 3-year summer storm (Regulatory criteria). Each of the existing-condition design storms represents a different level of risk. The combined sewer system performance measures focus on providing sufficient capacity to eliminate or significantly reduce street flooding risk and basement sewer backup risk for the 25-year design storm under future (2050) conditions. An additional regulatory requirement is to eliminate untreated CSO discharges to the Willamette River from May 1 to October 31 of each year except during storms greater than or equal to a summer storm with a 3-year return frequency under future conditions. Typically, this requirement impacts only the stormwater control facilities and the CSO tunnels and not the balance of the collection system capacity.

The greatest concentration of pipe segments with capacity problems is located in the older central neighborhoods. These capacity problems lead to the risk of the combined sewer backing up into basements during intense storm events. The highest risk of basement sewer backups on the east side of the Willamette River are in an area roughly bounded by NE Prescott Street to the north, SE Holgate Blvd to the south and SE 45th Avenue to the east. On the west side of the river, the highest predicted risk of basement sewer backups is in NW Portland in an area roughly bounded by NW Yeon Avenue to the north, West Burnside Street to the south and NW 23rd Avenue to the west.

The performance measure for identifying locations of potential capacity deficiency is basement sewer backup. Individual tax lots are determined to be at risk for basement sewer backups when the maximum water surface elevation in the sewer pipe is within eight feet of the estimated main floor elevation of the property. The estimated main floor elevation is three feet above the estimated ground elevation. The accuracy of the basement sewer backup risk is limited by the estimated main floor and ground level elevations which were determined with a digital terrain model. In the absence of reliable and systematic data, it was assumed that each tax lot has a basement. In additional to basement sewer backup risk, there is the risk of SSOs, CSOs, and the risk of surcharging of trunk sewers to degradation of pipe material.

The capacity-related sanitary sewer system technical levels of service are for storm events up to a 5-year frequency to convey sewage to prevent releases to buildings or streets and to prevent releases to surface waters. The performance measures for these are the same as for the combined system for basement backups, street flooding, surcharging in pipe constructed of brick, and pipe surcharge for a duration greater than 30 minutes. There is an additional performance measure related to pump stations: Separated sanitary pump stations should have adequate firm capacity to pump the peak hourly and peak instantaneous flows associated with the 5-year, 24-hour storm intensity of its tributary area, without overflows. Firm capacity is defined as the capacity of the pump station with the largest pump out of service.

Most of the sanitary sewer basins meet the service levels for conveyance. Exceptions are the Fanno Creek and Burlingame basins where street flooding and basement sewer backups may occur during storms smaller than the service level design storms. During rain events, stormwater enters the sanitary pipes either through inappropriate connections or through cracks in the pipe material. This Rainfall


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Derived Inflow and Infiltration (RDII) is impacting the capacity of the sanitary pipe system. During intense storms, the Fanno Basin Pump Station is unable to keep up with the additional flow. A capital improvement project is underway to address this issue. The capacity of the Tryon Creek Wastewater Treatment Plant is also impacted by RDII. Capacity upgrades to the plant are discussed below. Note that in this same geographic area, there are other stormwater management issues such as incomplete conveyance systems. These are discussed below as part of the stormwater system.

Figure 6.6 illustrates the present worth of pipe capacity deficiency risk associated with the piped system.

The capacity assessments of city pump stations were performed using basin-wide hydrologic and hydraulic models that estimate the base and peak design storm flows coming to the pump stations from the sanitary and combined sewer systems. The models are based on EPA-SWMM, which simulates the upstream hydrologic inputs including direct storm runoff and hydraulic routing of both the sanitary and wet weather flow components. For the separated sewer areas, the modeling system relies on a site-specific set of regression equations to create generate the RDII flows. The regression equations were developed using the city's HYDRA rain gauge system data and actual flow monitoring data to define the hydrologic response of the collection system to the rainfall inputs. A calibration assessment was performed to evaluate the quality of the monitoring flow data and the "goodness of fit" for models

Using this integrated method of EPA-SWMM and regression equations, the full wet weather flow rates from the collection system to each pump station were developed for the appropriate design storm. The estimated flows were then routed in the model through each pump station to determine whether or not the installed station capacity was able to fully convey the design storm. This capacity assessment was performed for both the existing collection system conditions as well as the future (2040-2050) system conditions.

- **No Capacity Deficiencies:** Pump station "Firm Capacity" is able to safely convey the peak design storm flows, which means the station is able to keep one pump in reserve for emergency conditions
- **Insufficient Firm Capacity:** Pump station must use "Full Capacity" (all available pumps) in order to safely convey the peak design storm flows.
- **Insufficient Full Capacity:** Pump station is not able to fully convey the peak design storms even using all available pumps.

The 14 pump stations in the combined area have sufficient capacity to convey flows. Three pump stations in the separate area have insufficient firm capacity and two have insufficient full capacity. Projects to address these capacity issues are included in the proposed Investment Strategy.


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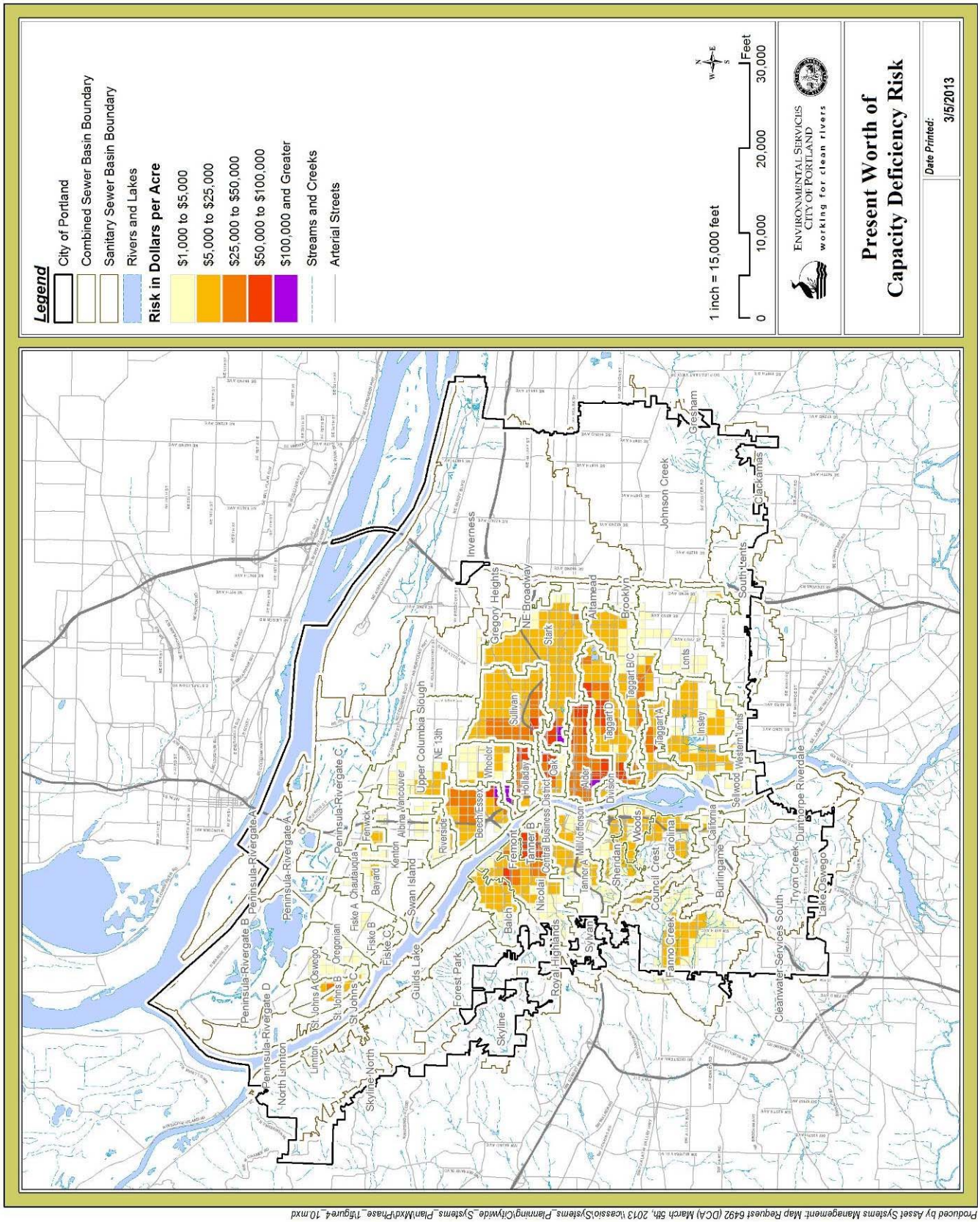
Figure 6.6 Capacity Deficiency Risk (Sanitary and Combined Sewer Pipes)




Produced by Asset Systems Management. Map Request 6492 (DCA) March 5th, 2013 \\corassio\Systems_Planning\City-wide_Systems_Plan\Mxd\Phase_1\Figure4_10.mxd



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### Providing Sanitary Sewer Service to Unserved Areas

The City's level of service for wastewater collection is to provide sewage service to support development consistent with the Comprehensive Plan where feasible. In order to identify system needs and serve unconnected areas, properties that are currently not connected to the sanitary sewer system were reviewed to determine whether tax lots met the conditions required for sewer service connection:

- No gravity sewer exists close enough to allow for a lateral to connect to the sewer.
- It must be feasible to provide service to the lot. Pump stations are not considered feasible for fewer than five properties.

There are significant areas currently unserved by sanitary sewers within the USB, primarily in the Johnson Creek and Skyline basins. It is estimated that 1,500 developed properties have some type of on-site sewage system and are not connected to the piped sewer system. Some of these properties are zoned for development; others are already developed with on-site systems such as cesspools and/or drainfields. In some cases, with current technology, it may not be technically or financially feasible to connect these properties to the sewer system. Estimates to serve individual properties range as high as over $1 million. Lack of sanitary sewer service may cause existing developed properties to become uninhabitable and may deem some vacant lots to be undevelopable.

## Recommended Wastewater Collection System Improvements

BES developed and evaluated alternatives to address the structural and capacity pipe deficiencies identified during the characterization of the system and to meet the levels of service summarized above.

For pipes with structural deficiencies, the alternatives include whole pipe replacement (which may include lining) or a spot repair. Ongoing monitoring is recommended when the defects do not warrant rehabilitation at this time. The preferred alternative is illustrated in Figure 6.7. Given the age of the collection system, pipe rehabilitation is expected to be an ongoing need.

There are two primary alternatives for providing capacity in the combined system – conveyance or stormwater control. The conveyance alternative is a traditional pipe upsizing approach (replacing existing pipes with larger pipes). The stormwater control alternative uses green infrastructure to detain and/or infiltrate stormwater through vegetated facilities. In the sanitary system, the capacity alternatives include pipe upsizing, pump station expansion, RDII (rainfall derived infiltration and inflow) removal (usually pipe repair or replacement, and wastewater treatment plant expansion. In areas currently unserved by any sanitary sewer system, alternatives have been developed and evaluated to provide new sanitary sewer service where technically and financially feasible. The preferred alternative is illustrated in Figure 6.8.





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The recommended plan for the combined sewer system includes projects that reduce basement sewer backup risk, replace structurally deficient pipes, reduce surcharging in major trunk lines, and contribute to CSO reduction through the incorporation of stormwater control facilities. The primary focus of these projects is to provide adequate capacity in the combined sewer system to convey the design flow and resolve basement sewer backup risk. For the most part, this is completed by either increasing pipe capacity through upsizing of pipe diameter or by routing stormwater runoff to stormwater control facilities to reduce the runoff that enters the system. In a few basins the resolution of basement sewer backup risk is achieved through stormwater separation, redirection of flow, or underground pipe storage facilities.

Based on asset management principles, only cost-beneficial projects – projects for which the cost of doing them now is less than the amount of risk from failure as expressed in dollars - (either as stand-alone projects or when combined with hydraulically dependent projects) are recommended as they will cost-beneficially reduce the risk within the combined sewer system. Of the estimated $930 million in capacity-related risk in the combined sewer system, only $200 million in projects were recommended to move forward in the March 2012 plan. One key assumption in the recommendation is development of some private stormwater management facilities to address the some of the capacity issues.

In the long-term, capacity improvement projects will be drawn from the list of projects that are currently not considered cost-beneficial. It is expected that some will become cost-beneficial in the future due to one or more of the following factors:

- The sewer system is aging so pipe segments proposed for upsizing will have a higher risk of having a structural failure. Because the risk is greater, the project will resolve more risk.
- The dollar value of basement sewer backup risk might increase to be more than the current estimate of $5,000 per basement sewer backup.
- Other risk reduction (such as operations and maintenance efficiencies) may be quantified and included in the risk calculation.
- More stormwater control facilities might be implemented on private property through a stormwater retrofit program and reduce the maintenance costs assumed in the system plan because maintaining the facilities will be the responsibility of the property owners.
- Changes to the zoning might alter the future base assumptions changing the number of properties predicted to be at risk of basement sewer backups.

In the sanitary sewer system, the most critical capacity issues are the deficiencies in the Fanno Creek and Burlingame Basins. Significant wet weather flow and capacity problems in this area require a system-based solution that combines capacity upgrades with RDII reduction. Major elements of the recommended plan include increasing the capacity of Fanno Basin Pump Station, constructing a surge tank facility to protect recently completed force mains, near-term RDII reduction and pipe upsizing to resolve local capacity issues, long-term RDII reduction to reduce the risk of flows exceeding the capacity of the Fanno Creek Interceptor and the Fanno Basin Pump Station, and increasing the capacity of a short section of the Southwest Parallel Interceptor.

The recommended plan for the sanitary sewer system includes projects to extend sewer service to unserved areas that are both technically and financial feasible.


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Figure 6.7 Recommended Sanitary and Combined Pipe Rehabilitation Projects

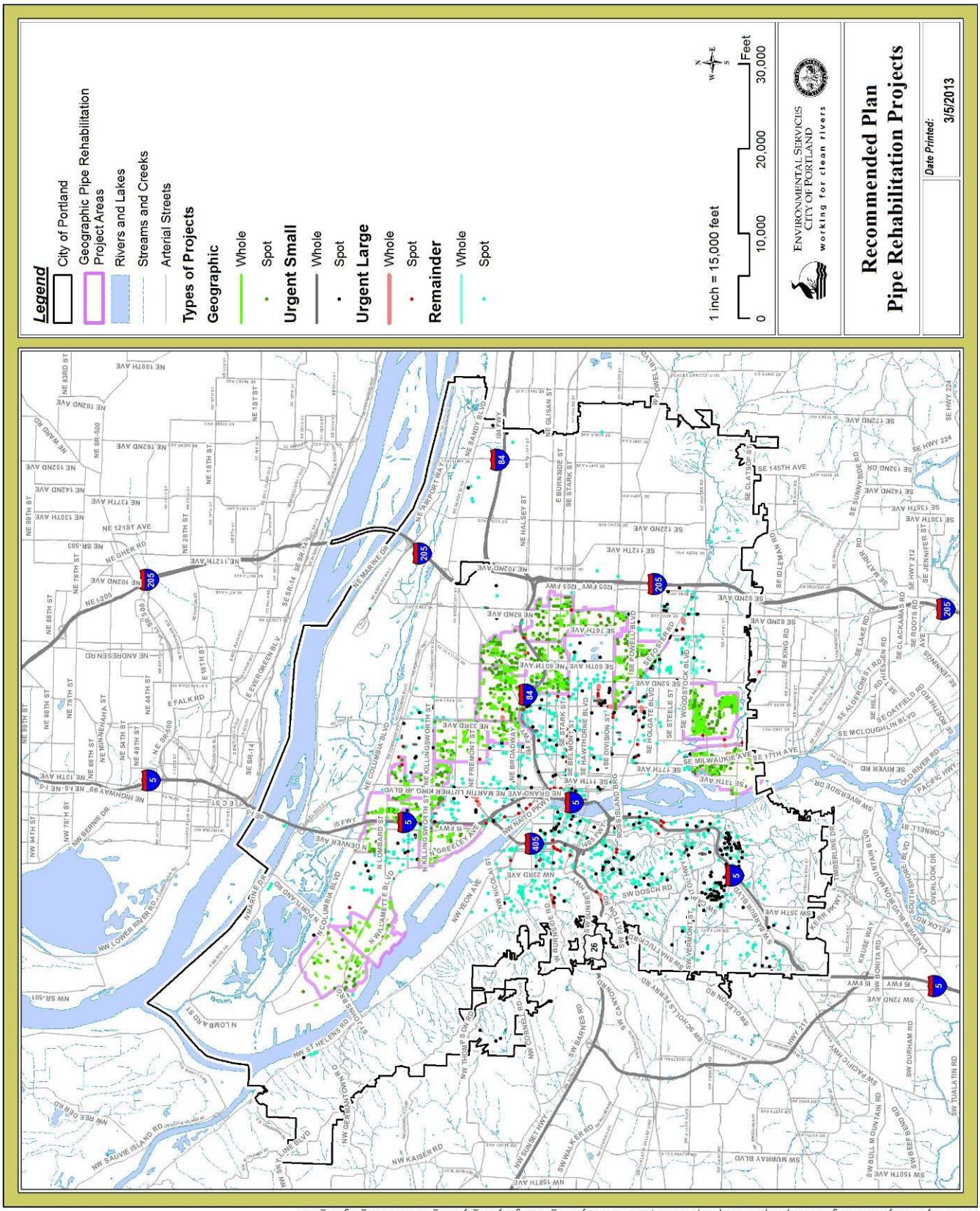




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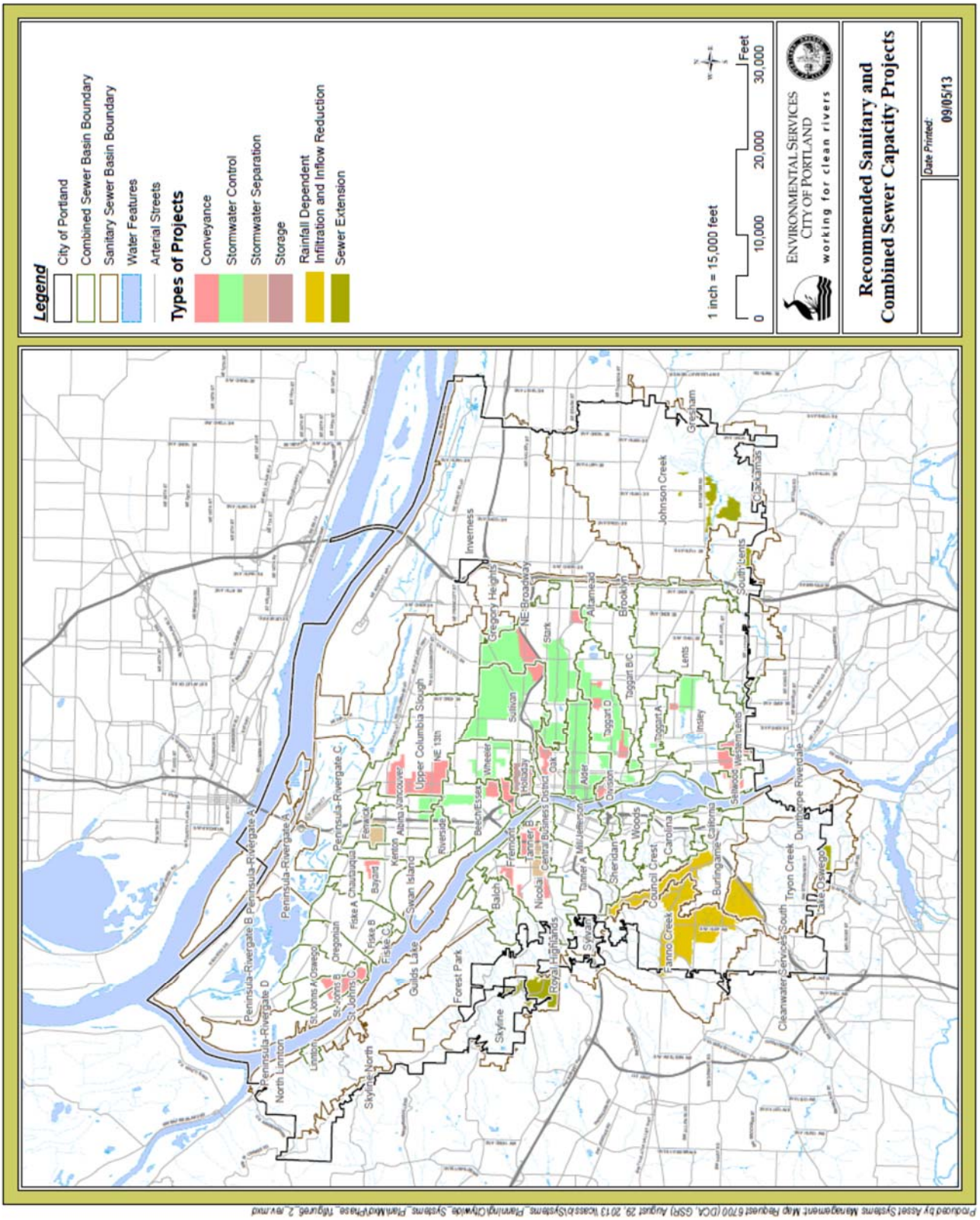
Figure 6.8 Recommended Sanitary and Combined Sewer Capacity Projects



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### Collection System Investment Strategy

The Investment Strategy (Appendix A) includes the following projects and programs for the collection system:

- **Pump Station Improvement Program**: Program to refurbish or upgrade pump stations not in compliance with current codes, not operating reliably, need improvements because of growth in the receiving sewage basin, and/or are over 20 years old with out-of-date equipment. The Pump Station Improvement Plan guides the selection of projects. This program was developed to ensure the 97 pump stations are maintained in accordance with a scheduled plan to increase pump station reliability.
- **Sewage Pipe Rehabilitation Program**: Based on regular inspection, this program rehabilitates the highest risk pipes.
- **Capacity Upgrades**: Based on the Systems Plan, these programs add capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized based on risk and benefit/cost. Work also includes cost-effective pipe rehabilitation, if located within the project area. Capacity upgrade projects are anticipated in the following basins: Holladay/Stark/ Sullivan, Beech/Essex, Oak, Taggart/Insley, Wheeler, Alder, NE 13th Ave, Northwest Neighborhoods, and North Portland.
- **Sanitary Sewer Collection System Capacity**: A series of projects is proposed to address infiltration and inflow (RDII) in the sanitary sewer system in SW Portland. Projects typically involve rehabilitation of main lines and laterals and disconnecting storm inlets from the sanitary sewer.
- **Sewer Extension Program**: Where technically and financially feasible, sewer extensions are proposed to relieve septic systems at risk of failure, to correct party sewer situations, and to provide service where development will be occurring soon and service is currently not available.


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# Wastewater Treatment System

## Wastewater Treatment System Inventory

The City of Portland owns and operates two municipal wastewater treatments plants, where wastewater is processed through removal of solids and organic materials and the addition of disinfection. The Columbia Boulevard Wastewater Treatment Plant (CBWTP), located in north Portland, serves as the city's main sewage treatment facility, cleaning and discharging most of Portland's wastewater. The plant provides service to nearly all of Portland's 583,000 residents. The service area for the wastewater collection and treatment system totals 94,000 acres, including 9,000 acres outside the city limits. The Tryon Creek Wastewater Treatment Plant (TCWTP), located south of Portland in the city of Lake Oswego, serves Lake Oswego and a small portion of southwest Portland, see Figure 6.9.

The CBWTP campus is generally bound by N. Columbia Boulevard on the south, N. Portland Road on the west, the Columbia Slough on the north, and Union Pacific rail lines on the east and southeast. Two other parcels are part of the 147-acre campus: a 36-acre site known as Triangle Lake is located just north of the slough and a 24-acre future expansion site is located west of N. Portland Road on the south bank of the slough. Site zoning is Heavy Industrial (IH) and General Industrial (IG). A narrow strip along the Columbia Slough has environmental overlays for conservation (c) and protection (p). The northern tip of the site has an aircraft landing overlay (h). The entire campus is designated as a conditional use.

As currently configured, the CBWTP includes nearly 350,000 square feet of buildings and over 700,000 square feet of tanks, pumps, and other structures. In October 2011, an updated Master Plan was approved for the campus, see Figure 6.10. The Master Plan allows for development of an additional 122,000 square feet within the campus boundaries without conditional use review, as long as Master Plan standards are met. As part of the land use approval, mitigation activities are proposed to protect the community in the areas of transportation, facilities design, landscaping and screening, open space, neighborhood livability, safety, physical services such as waste disposal and water supply, protection of designated resources, and enhancement of environmental and recreational resources. Odor monitoring and control systems include retrofits to existing facilities and installation of odor controls in all new facilities. The odor monitoring and control systems were developed in collaboration with the CBWTP Citizen Advisory Committee and treatment plant neighbors and are intended to assure compliance with City Council Resolution 35453.


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Columbia Boulevard Wastewater Treatment Plant

In addition to process facilities, maintenance facilities, storage, and office areas, the campus also provides space for Multnomah County Vector and Nuisance Control (four buildings totaling 10,500 square feet) and is one of five fueling stations for publicly-owned vehicles. The site is also designated as one of the City's incident command centers to handle emergencies such as floods or earthquakes.

The TCWTP is a 13.5-acre plant located in the City of Lake Oswego with a rated treatment capacity of 8.3 million gallons per day. It is bounded by the Willamette River to the east, Tryon Creek to the north, and privately owned Industrial zoned properties to the west and south. Development on the plant site includes 80,000 square feet of tanks and 13,000 square feet of building structures. The plant's service area includes part of southwest Portland, unincorporated Multnomah County, and the City of Lake Oswego.

## Wastewater Treatment System Levels of Service

The following bureau levels of service are specific to the wastewater treatment plants:

- Treatment plants are in compliance with NPDES effluent limits.
- 100% of biosolids are beneficially re-used.
- 90% of methane is beneficially re-used.



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# Wastewater Treatment System Current and Projected Condition and Capacity

## Columbia Boulevard Wastewater Treatment Plant

The Columbia Boulevard Wastewater Treatment Plant is an activated-sludge, secondary treatment plant with a designed capacity (average dry weather flow (ADWF)) of 100 million gallons per day (mgd) for secondary treatment. The headworks and the primary treatment process have a design capacity of 450 mgd. The plant receives an ADWF of approximately 63 mgd. The major processes at the plant are liquids handling (pretreatment, primary treatment, secondary treatment, disinfection, and discharge), solids handling, methane utilization, and water re-use.

Liquid processes include:

- Influent pumping;
- Preliminary treatment: bar screens with screen presses, grit basins with grit washer-separators and grit disposal facilities, septage receiving and testing station, and an emergency bypass to the primary clarifiers;
- Flow monitoring and controls;
- Dry weather primary treatment: standard physical clarification for 120 MGD minimum;
- Wet weather primary treatment: fine screening, chemically enhanced primary treatment (CEPT), standard clarifiers and bypass to route excess flows to disinfection and outfalls;
- Secondary treatment: aeration basins, secondary clarifiers, and sludge collectors;
- Chlorine disinfection with dechlorination;
- Effluent pumping: to a 72-inch line that carries flows to the dechlorination facility at Hayden Island, then to an alternative dry weather outfall/diffuser in the Columbia River, and to a 102-inch diameter pipeline that carries treated effluent to the dechlorination facility, then to an alternative wet weather discharge outfall and diffuser in the Columbia River.

Solids handling includes:

- Degritting;
- Transport, storage, handling, processing grit and sewer cleanings;
- Gravity thickening of primary sludge;
- Gravity belt thickening of the waste activated sludge;
- Two-stage anaerobic digestion of primary and secondary sludge;
- Gas collection, storage, and energy generation;
- Seasonal lagoon storage for secondary sludge; and
- Belt press dewatering of anaerobically digested biosolids.

The plant generates approximately 13,000 dry tons of biosolids annually. The solids, in the form of dewatered cake, are transported in trucks to farms in central and eastern Oregon for direct land application, providing for beneficial reuse.


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Figure 6.9 Columbia Boulevard and Tryon Creek Wastewater Treatment Plants Service Areas

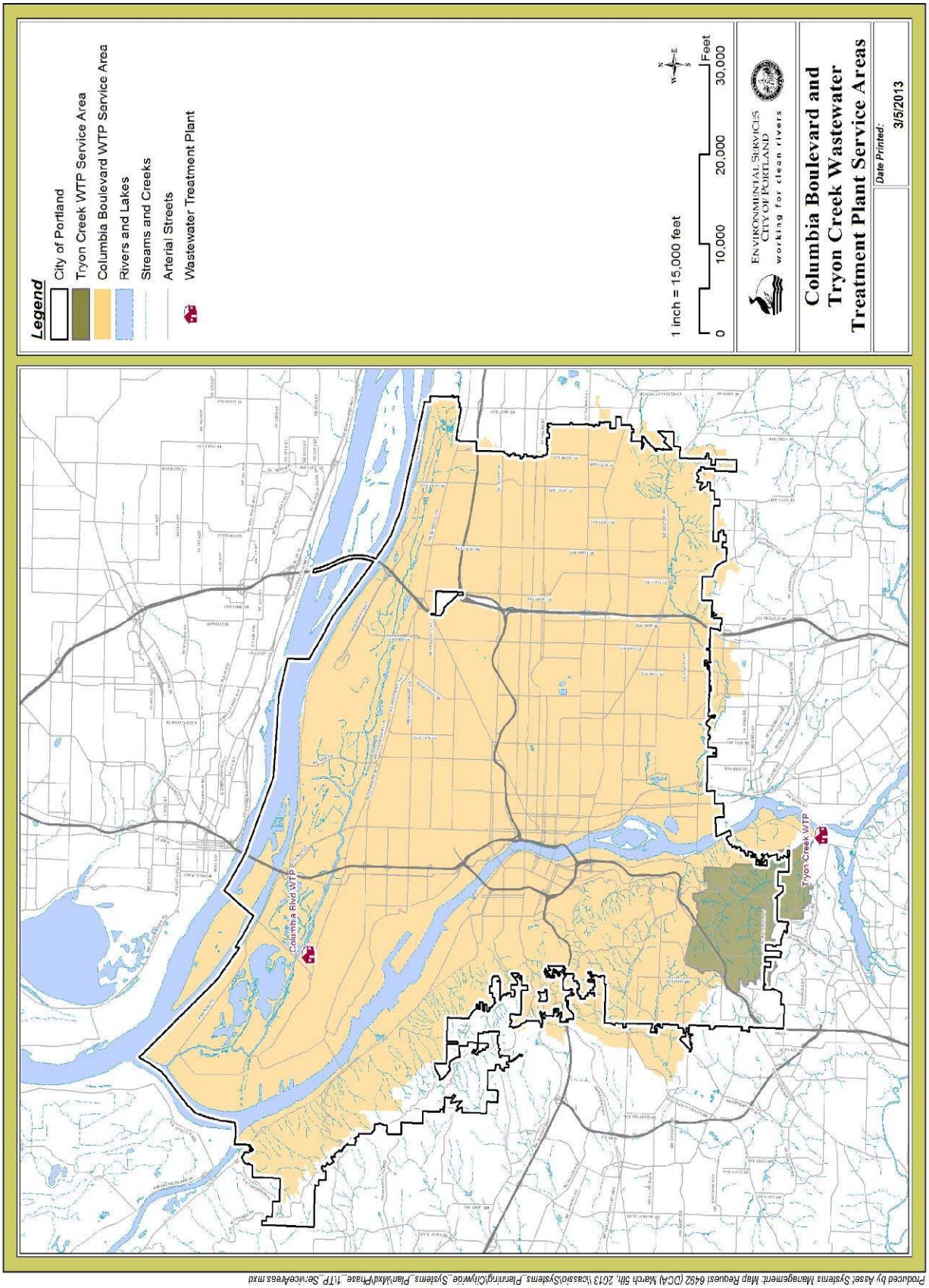




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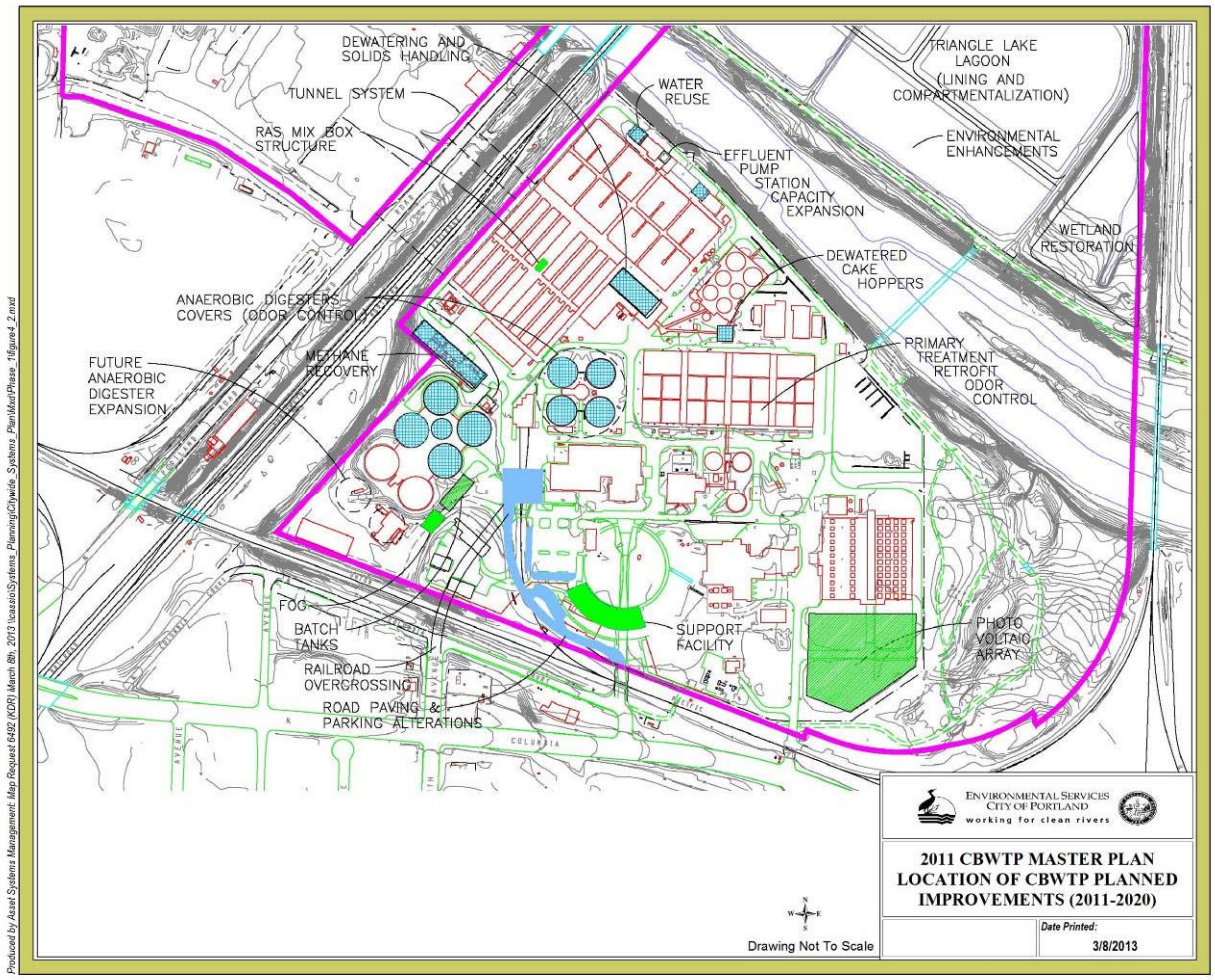
Figure 6.10 Columbia Boulevard Wastewater Treatment Plant Master Plan




As the anaerobic digesters at CBWTP stabilize wastewater solids, they produce a gas that contains methane. Methane is a primary constituent of natural gas. The CBWTP currently collects and uses a portion of its digester gas to fuel boilers, for heating the digesters, and for space heating. The plant also produces electricity by using digester gas to fuel two 850 KW generators. The on-site generated electricity offsets demand for 40 – 50% of previously purchased power. Some gas is sold to a nearby industrial customer. Excess gas is burned in flares on site. A study is looking at alternative uses for the excess gas including expanded electrical generation or conversion to vehicle fuel.

The current hydraulic capacity of the Columbia Boulevard Wastewater Treatment Plant is sufficient to accommodate future twenty-year growth. However, many of the existing process facilities are aging and in need of rehabilitation to ensure maximum efficiency. Projects to address capital maintenance are proposed in the 20-year planning horizon. In addition, changing regulatory requirements impact operations. A number of projects are proposed to maintain the plant and to continue to address regulatory requirements. This is likely to require new process facilities to be located on the west side of Portland Road.

### Tryon Creek Wastewater Treatment Plant

The Tryon Creek Wastewater Treatment Plan is located in north Lake Oswego and receives sanitary flow from sanitary basins in southwest Portland and the city of Lake Oswego. It has an ADWF design capacity of 8.3 mgd and a peak wet weather flow capacity of 37.5 mgd. The plant currently has an ADWF of 4-6 mgd, with Lake Oswego contributing 65% of the flow volume. Treated wastewater is discharged to the Willamette River via an outfall system. Solids are trucked to CBWTP for processing.

The draft update to the Tryon Creek Wastewater Treatment Plant Facilities Plan recommends significant improvements to address projected increases in peak flows to 50 mgd, anticipated new permit requirements, and functional obsolescence of existing facilities. The Plan recommends acquisition of additional property to increase peak flow hydraulic capacity and allow for gravity flow through the treatment process. Solids will continue to be trucked to CBWTP. Figure 6.11 illustrates the recommended 30-year site plan for the Tryon Creek Wastewater Treatment Plant.

Required improvements can be divided by process needs. Improvements to the liquid treatment processes include:

- improvements to the influent collection systems – both the Lake Oswego Foothills Interceptor and the BES Tryon Creek Interceptor, and the Tryon Creek Pump Station;
- demolition of the existing headworks and construction of a new headworks and dry weather clarifiers to be located on property to be acquired which is currently occupied by a self-storage facility;
- construction of an influent pump station to flow from Portland's Tryon Creek Interceptor;
- enhancements to the existing aeration basins an secondary clarifiers;
- enhancements to the disinfection processes including conversion of former primary clarifiers to chlorine contact basins; and
- construction of an additional outfall for effluent disposal when plant flow and Willamette River levels are both high.

Improvements to the solids treatment processes include:

- Construction of a new solids thickening facility and
- Conversion of the existing digesters to blended storage facilities.
- Thickened, blended raw solids will be hauled to CBWTP for processing. A new enclosed loading facility will be constructed for odor control.

Other site improvements will address the non-potable water system; odor control; site design, security, and circulation; architecture, landscape architecture, and site aesthetics; support buildings; and electrical and instrumentation and controls.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## Recommended Wastewater Treatment System Improvements and Investment Strategy

Significant improvements have been made at CBWTP to accommodate the increased wet weather flows resulting from the completion of the CSO controls. A limited number of future improvements to accommodate growth and anticipated regulatory requirements are recommended in the March 2010 Facilities Plan Update:

- Completion of the phased reconstruction of the lagoon
- Secondary Process Improvements (anticipated to meet changing permit requirements) – requires expansion to the west side of Portland Road
- On-site disinfection
- Solids dewatering
- 2 additional digesters
- Thermophillic equipment, blend and batch tanks (for Class A biosolids)
- 2 potential waste re-use projects: expansion of co-generation or alternative uses for methane gas such as conversion to vehicle fuel and improvements to the solids handling processes to create Class A biosolids which have a higher commercial value for fertilizer and could also result in savings in transportation costs.

In addition to the above projects from the Facilities Plan, a series of capital maintenance projects are planned in the 20-year planning horizon. The Investment Strategy includes three investment categories related to wastewater treatment:

- **Columbia Boulevard Wastewater Treatment Plant (CBWTP) Improvements:** This program includes a number of mid-size improvements at the Columbia Boulevard Wastewater Treatment Plant including Seismic Improvements, Outfall Diffuser Extension, Access / Egress Improvements, Bio-Solids Dryer, Dewatered Sludge Hopper, TWAS Piping Upgrade, Centrifuge. Also included is an expansion to Secondary Treatment, if required, to be located on the west side of Portland Road. All are consistent with the Facilities Plan and the Conditional Use Master Plan.
- **Tryon Creek Wastewater Treatment Plant (TCWTP) Improvements**: This program includes improvements identified in TCWTP draft Facilities Plan. Projects include construction of new headworks and dry weather clarifiers, a new influent pump station, odor control facilities, electrical upgrades, and site enhancements. The acquisition of an adjacent parcel will facilitate gravity flow (resulting in potential operational savings from reduced pumping) through the updated processing facilities.
- **Rehabilitation, Repair, and Modification Program**: This program provides for annual reinvestment in the treatment facilities to protect capital investment and enhance system reliability. It provides best management practice to prevent probable violations of the NPDES permit. The aging Columbia Boulevard and Tryon Creek plants require regular investment. Projects include equipment replacement, minor capacity upgrades, restoration of a facility to its original condition and renewal of useful life for more than 10 years, and regulatory mandates.


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Figure 6.11. Tryon Creek Wastewater Treatment Plant Recommended Site Plan






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# Stormwater System

Sanitary sewage and stormwater are managed very differently. In the sanitary system, sewage is collected and conveyed to wastewater treatment plants and finally discharged to the Columbia or Willamette River. Conversely, the City's goal for stormwater is first on-site management for pollution reduction and flow control, as regulated by the *Stormwater Management Manual (discussed in more detail* . Any flow not managed on site is then routed to the nearest conveyance system, which includes pipes and natural drainages. BES distinguishes two primary stormwater management systems in the USB: the combined sewer system and the "separated" stormwater area.

In the combined sewer area, stormwater is managed to reduce peak flows to avoid combined sewer overflows to the Willamette River and Columbia Slough and/or releases to streets or private properties (including basement sewer backups). Surface stormwater facilities – including green street facilities, rain gardens, ecoroofs, trees and other vegetation – detain stormwater, reducing peak flow to the combined sewer and allowing the system time to accommodate the increased flow from rain events. UICs are also used in parts of the combined sewer areas to collect stormwater from the right-of-way and city-owned property and allow that water to infiltrate into the ground. Once stormwater enters the combined sewer, it becomes part of the wastewater flow and is treated at the treatment plant. The pipes and other facilities managing this stormwater are discussed above in Wastewater Collection System.

Within the separated sewer areas of the city, stormwater is not conveyed to the wastewater treatment plants. Instead, stormwater management and conveyance depends on a combination of built and natural infrastructure systems. Approximately two-thirds of the city's land area drains to the city's MS4 system and UICs, both of which are managed under regulatory permits. Flow enters the system from overland runoff and impervious surfaces, including roadways, parking lots, and rooftops. Stormwater in these areas is conveyed through swales, drainage ditches, pipes, and stormwater inlets/catchbasins and discharged to receiving waters (streams and rivers) or to UICs for subsurface infiltration. In some areas, the stormwater system includes facilities that detain peak stormwater runoff and control flow release, and treatment facilities that remove or reduce pollutants.

As development occurs, impervious surfaces reduce the ability of stormwater to soak into the ground and increase the amount of stormwater runoff, disrupting the natural water cycle. Without appropriate stormwater management, these conditions erode stream channels, increase the risk of landslides, contribute to street and stream flooding, and prevent groundwater recharge. Parking lots, roadways, rooftops, and other impervious surfaces increase the pollution levels and temperature in streams, rivers, and groundwater resources.

The city's stormwater management requirements for all areas are defined in the Stormwater Management Manual (SWMM). The SWMM applies to all development and redevelopment projects within the City of Portland on both private and public property.

The City of Portland's approach to stormwater management emphasizes the use of vegetated surface facilities to manage and infiltrate stormwater on the property where the stormwater runoff is created. Infiltrating stormwater onsite with vegetated surface facilities provides a number of benefits, including but not limited to pollution reduction, volume and peak flow reduction, and groundwater recharge. These


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benefits play a critical role in protecting stormwater infrastructure and protecting Portland's water bodies, including about 300 miles of streams and rivers that ultimately receive and convey stormwater. This in turn benefits human health, fish and wildlife habitat, recreational resources, and drinking water. The SWMM complements and supports the Portland Watershed Management Plan and other City standards and practices. Protecting and restoring existing natural resources, open spaces and tree canopy is also a component of the City's stormwater management strategy. BES relies on, and collaborates with, other bureaus (particularly Portland Parks & Recreation and the Bureau of Planning and Sustainability) in the protection, management and restoration of resources that reduce impacts on the built stormwater system and help address clean water regulations.

Not all stormwater is managed by the City's systems. Some of it simply flows over land via private property and/or public right-of-way directly to a receiving water body. Some stormwater management in Portland is the responsibility of other agencies and jurisdictions, including the drainage districts and entities like Oregon Department of Transportation. Stormwater management is further complicated by ownership. In the sanitary system, once sewage enters the system, it is the responsibility of BES. The stormwater system is not a closed system. Stormwater from public property may flow across private property and the reverse, which blurs lines of responsibility. Management and conveyance relies on public-private partnership and innovative solutions that recognize site-specific conditions.

In parts of Portland that lack constructed storm sewers or public drainage facilities, surface water flows over land through private properties. Often this water collects in some kind of open conveyance, or drainageway, which carries it across private property. These drainageways may be naturally formed (such as streams or creeks) or constructed (such as ditches or man-made channels). Drainageways often receive stormwater runoff from multiple sources, accumulating impacts from upstream development on downstream properties. Preserving the natural functions of drainageways protects properties by reducing the impacts of ponding, flooding, erosion, and other effects of excess flows. Especially in areas not specifically protected by zoning, drainageway protections help limit site and off-site impacts of stormwater discharges and flows, mitigate runoff, prevent erosion, and protect the privately owned elements of the watershed drainage network. The City administers drainageway protections, or drainage reserves, during review of private property development proposals. The Stormwater Management Manual allows stormwater to be conveyed from private property to stormwater systems, including drainageways, if onsite stormwater disposal is not feasible.

## Stormwater System Inventory

The City's separated storm sewer and drainage system consists of a 458 miles of stormwater pipe and approximately 144 miles of drainage channels that discharge to streams and rivers. In addition, approximately 9,000 stormwater infiltration sumps (UICs) discharge stormwater underground. The storm sewer and drainage system service area is shown in Figure 6.11. Citywide (in both the combined and separated sewer basins), the Bureau owns and/or maintains approximately 1,900 surface water quality facilities, including detention ponds, swales, constructed wetlands and green street facilities, and approximately 8,000 sedimentation manholes (located upstream of a UIC) that provide some level of detention and pollution reduction.


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The City's MS4 area includes stormwater conveyance infrastructure such as pipes, ditches, roads, catch basins, curbs, gutters, and manmade channels that discharge to waters of the State. Portland's MS4 area is approximately 15,500 acres. The City's MS4 permit does not cover:

- Stormwater that flows to UICs (WPCF permit applies)
- Stormwater that flows to the combined sewer system
- Natural drainageways and stream systems
- Direct stormwater discharges from private property to natural stream systems (without entering the MS4)
- Areas with no public stormwater infrastructure
- Areas with individual, general, or industrial stormwater permits

The NPDES stormwater regulations do not prescribe specific pollutant discharge limits. Instead, they allow for the implementation of Best Management Practices (BMPs) to improve water quality to the "maximum extent practicable" based on local conditions, resources, and priorities. The City developed, updates and implements a Stormwater Management Plan (SWMP) that describes measures the City will implement throughout the five-year (2011-2016) permit term to reduce pollutant discharges in the MS4 storm sewer system. Best Management Practices include both programs and capital projects in the following categories: development standards; industrial and commercial controls; illicit discharge detection and elimination; structural controls; operations and maintenance; preservation and restoration of natural areas; and public involvement. These BMPs are reflected in the bureau's Investment Strategy.

The City's stormwater system includes approximately 9,000 UICs that collect stormwater from the public right-of-way and City-owned properties and discharge it to the subsurface. Approximately 90 percent of the UICs include a sedimentation manhole prior to the sump. UICs are most prevalent east of the Willamette River where soils better support infiltration. The City's WPCF permit regulates the construction, operation, and maintenance of all City-owned and operated UICs. Unlike the MS4 permit, the WPCF permit includes numerical standards, based on national drinking water standards, for stormwater discharges to a UIC. The permit also establishes the requirements the City must implement throughout the ten-year (2005-2015) permit term to control pollutants prior to discharge to a UIC to protect groundwater as a drinking water resource. These requirements are included in the bureau's Investment Strategy.

As discussed earlier in this plan, the city's stormwater management approach also relies on assets not owned or controlled as part of the BES system. This includes nearly 300 miles of surface streams and rivers, numerous acres of natural area and open space that convey, absorb, and filter rainfall and stormwater, and the tree canopy that intercepts rain and reduces stormwater volumes citywide. To help protect water quality and reduce stormwater runoff, BES and other bureaus invest in protecting and restoring natural areas and expanding the urban tree canopy on public and private property. For more information about Portland's natural and green infrastructure see the City's Natural Resource Inventory, urban canopy studies, and the Portland Parks & Recreation chapter in this document.


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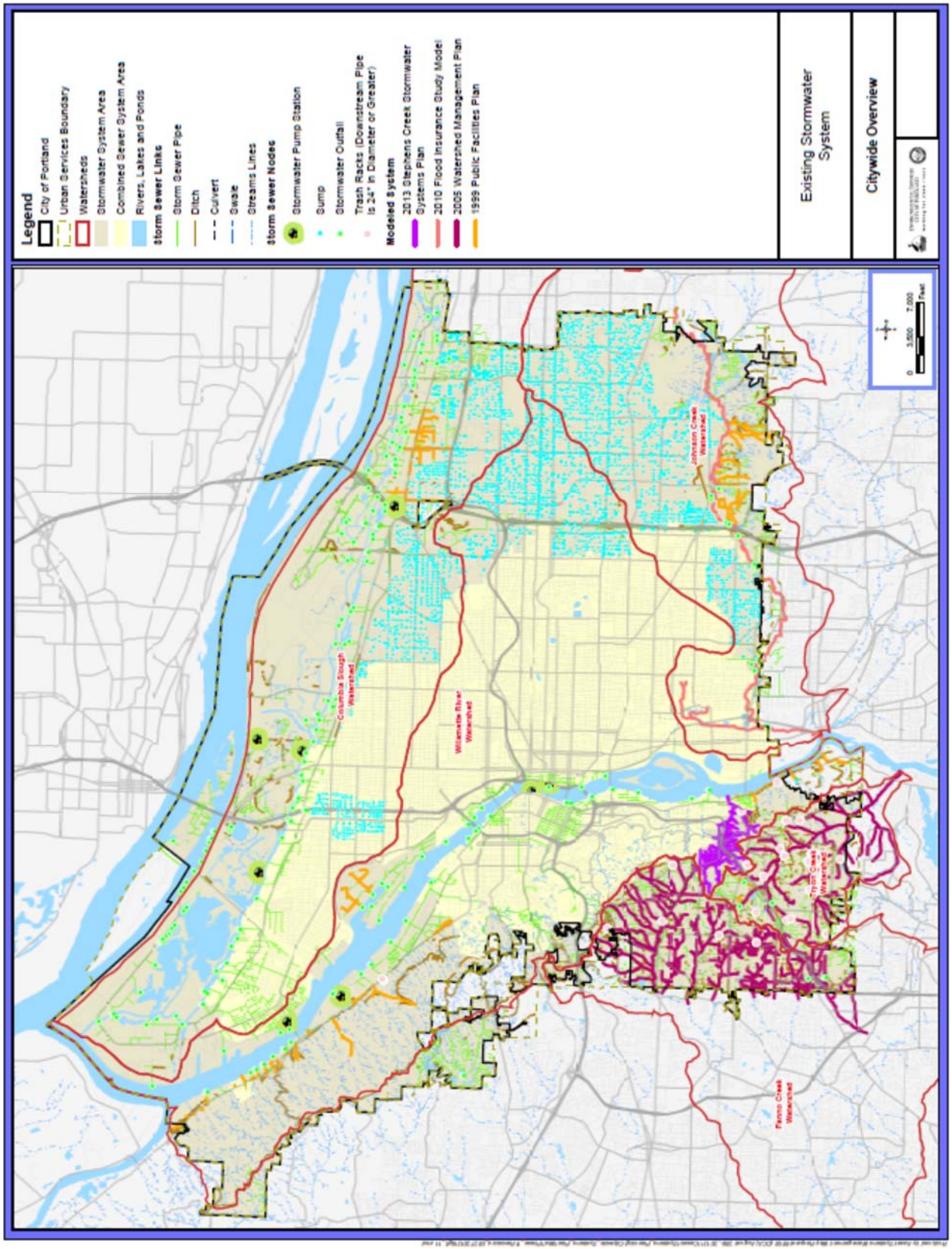
Figure 6.11 Existing Stormwater System



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### Stormwater System Levels of Service

Recently, the Bureau has intensified its stormwater planning activities, especially outside of the combined sewer system. Efforts are underway to update the *Stormwater Management Manual* (SWMM) and develop a comprehensive system plan for stormwater. The proposed stormwater system plan will focus first on identifying risk associated with failing to meet defined levels of service and then performing a targeted alternatives analysis with the goal of identifying and addressing the greatest sources of stormwater-related risk. The Bureau established service categories and related performance indicators to help frame the characterization of system deficiencies, development and evaluation of alternatives, and selection of recommended improvements. These categories include:

- Protect public health and safety and property:
    - Sanitary sewage releases: In the separated area, sewage releases to surface water are prevented for storm events up to a 5-year frequency. In the combined sewer area, prevent releases to buildings or streets up to a 25-year storm frequency.
    - Erosion and landslide hazards: Limit risk claims due to City stormwater.
    - Localized/nuisance flooding: Design and manage infrastructure to limit nuisance flood events.
    - Groundwater contamination: In the UIC area, facilities are managed to effectively reduce pollution to the groundwater.
- Protect biological communities and improve ecological function:
    - Loss of habitat: Address water quality and quantity consistent with requirements of the Endangered Species Act.
    - Mitigate contamination of surface water and sediments through use of pollution reduction facilities.
    - Minimize disruption to the hydrologic cycle by managing impervious area and through flow attenuation.
- Support community needs:
    - Address deficiencies that impede community improvements. Increased impervious surface area – whether public of private – requires an approvable discharge point for stormwater conveyance.

Since 1999, the Stormwater Management Manual (SWMM) has provided policy and design requirements for stormwater management throughout the City of Portland. The requirements apply to all development, redevelopment, and improvement projects within the City of Portland on private and public property and in the public right-of-way. Portland's approach to stormwater management emphasizes the use of vegetated surface facilities to treat and infiltrate stormwater on the property where the stormwater runoff is created. Infiltrating stormwater onsite with vegetated surface facilities is a multi-objective strategy that provides a number of benefits, including but not limited to pollution reduction, volume and peak flow reduction, and groundwater recharge. These benefits play a critical role in protecting stormwater infrastructure and improving watershed health. Revisions to the SWMM will incorporate a systems-based approach, which will focus on the needs of the system to which stormwater is being conveyed. For example, the risks and


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requirements for protection of groundwater when stormwater is infiltrating into the ground are different than the risks and requirements for protecting the capacity and treatment needs of the combined sewer system. The SWMM will continue to emphasize a management hierarchy, requiring onsite stormwater management prior to conveyance offsite. As stormwater system and facility planning evolves, the SWMM will focus regulatory and design approaches by local stormwater systems, including storm-only sewers, drainageways and waterbodies, and combined sewer systems.

## Stormwater System Current and Projected Condition and Capacity

Comprehensive condition data is not available for the stormwater system in the separated stormwater areas. Of particular concern for stormwater management are the many miles of public right-of-way that are undeveloped or otherwise lack adequate stormwater infrastructure, see Figure 6.12

While comprehensive stormwater system planning is underway, existing plans and modeling information reveal some of the condition and capacity issues related to the stormwater system in each watershed. These are summarized below.

### Portland Willamette River Watershed

The Willamette Watershed's developed areas are largely served by the combined sewer system, but portions of the area are also served by UICs and the City, Port of Portland, and ODOT MS4 systems and private systems. The areas within the watershed that have been analyzed with modeling are shown in Figure 6.11.

Studies such as the Westside Streams Water Quality and Trend Analysis Status Report (2010) and the Tanner Creek Water Quality Characterization (2011) identify sources of water quality deficiencies in the watershed and guide the development of pollution reduction projects.

Primary deficiencies in the Willamette watershed are water quality and high flows in the natural channels of the west hills that lead to degradation of the streams. Similar to the Fanno Creek and Tryon Creek watersheds, steep slopes and low infiltration capacity of soils presents challenges for on-site stormwater management in some areas, and makes innovative solutions and protection of the existing natural resources that manage water important.

The Stephens Creek subwatershed of the Willamette has had the most complete and recent stormwater evaluation (2013). It was the first watershed analysis that evaluated not only conveyance system capacity and water quality, but also the hydrologic indicators of stream health. In this area, approximately 22% of taxlots do not have an approvable stormwater discharge point and approximately 25% of the city-managed rights-of-way in the subwatershed do not have an approved stormwater conveyance system.


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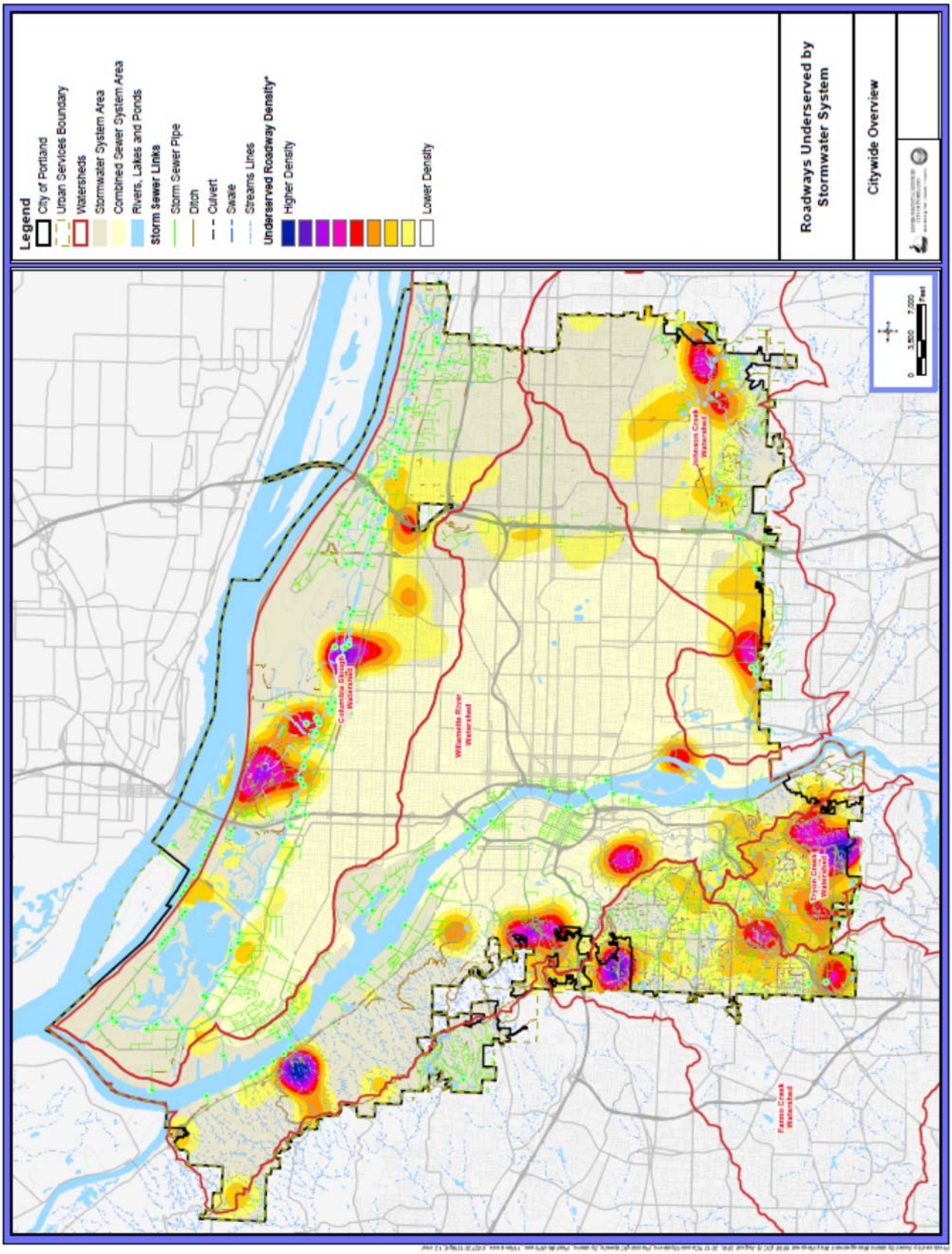
Figure 6.12 Roads Underserved by Stormwater System



### Columbia Slough and Columbia River Watersheds

The existing stormwater systems in the Columbia Slough watershed and on Hayden Island are shown in Figure 6.11. The Columbia Slough watershed is flat, primarily sandy alluvium with good infiltration, but a high water table, which limits the use of sumps and surface infiltration facilities in some areas.

Several entities are responsible for conveying and treating stormwater runoff in the Columbia Slough watershed, which creates unique management challenges. The City of Portland is only responsible for systems that convey stormwater from public right-of-way to the slough. The City manages stormwater in the southeast portions of the watershed using approximately 3,500 UICs. In the Columbia South Shore Well Field, wellhead protection area regulations limit infiltration of stormwater. Private and public UICs in this area are required to protect the groundwater through measures to control and treat spills that could pollute runoff.

Three public drainage districts, operating separately from the City of Portland, are responsible for flood control within their respective district boundaries. Flood control responsibilities include preventing Columbia River water and local stormwater from flooding property by operating pump stations to convey flow into the Columbia Slough and Columbia River. There are over 600 privately-owned stormwater conveyance systems that discharge runoff from private properties into the slough. The Portland International Airport and the Oregon Department of Transportation (ODOT) own and operate stormwater systems that discharge to the slough at 15 different outfall locations. The Port of Portland operates several more private stormwater systems that discharge stormwater from their properties into the slough.

The City is currently using hydrologic and hydraulic modeling to assess stormwater system capacity deficiencies for much of the service area through a cooperative project with Multnomah County Drainage District #1 (MCDD) to recertify the district's levee system with the Corps of Engineers. In addition, stormwater system deficiencies related to sediment quality in the slough are being evaluated as part of a DEQ Consent Order. BES has identified 52 priority city-owned stormwater outfalls that need pollution control. The investment strategy includes an estimate for these projects.

### Johnson Creek Watershed

The existing stormwater systems in the Johnson Creek watershed are shown in Figure 6.11. Stormwater sumps, or UICs, are the primary stormwater management system within the watershed. Currently, the watershed has about 2,400 active sumps.

Flooding along Johnson Creek is a significant stormwater-related issue. Under the Johnson Creek Restoration Plan (2001), the City is working to reduce "nuisance floods" (floods that have about a 10% chance of occurrence in any given year, or an average of once every 10 years), while also improving water quality and habitat. Until recently, Johnson Creek flooded Foster Road in the Lents area about every other year. With the completion of the Foster Floodplain Natural Area restoration project in 2012, flooding is expected to be reduced to a six to eight year recurrence, and further implementation of projects from the restoration plan will continue to improve conditions. In addition, a multi-bureau team is studying the feasibility of managing larger floods (those that have about a 1% change of occurrence in any given year, or occur on average once every 100 years).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Resources have recently shifted to study and understand the stormwater flows from East Buttes, Johnson Creek tributaries and other upland areas into Johnson Creek. Stormwater system planning is expected to comprehensively identify system deficiencies. Based on hydraulic modeling and field observations, stormwater system capacity deficiencies are expected to be identified in the steep, natural channels south of Johnson Creek and east of Interstate 205. Soils in this area have limited capacity to infiltrate stormwater. Natural drainage and local seeps and springs make on-site stormwater management difficult. Disruption of these resources has caused problems for development. Steep slopes present potential landslide risks and many streets lack stormwater management infrastructure. The relatively recent development in some neighborhoods east of I-205 and south of Powell Boulevard has increased the amount of impervious area and decreased vegetation, contributing to the flashiness (rapid rise and fall) of Johnson Creek and its tributaries and exacerbating stormwater problems downstream.

### Fanno and Tryon Creeks Watersheds

The existing stormwater systems that contribute flow to Fanno Creek, other Tualatin River tributaries, and Tryon Creek are shown in Figure 6.11. This figure also shows the portions of the stormwater system that have been assessed using hydrologic and hydraulic models.

Water quality is a primary challenge related to stormwater in these watersheds. As a part of the Fanno and Tryon Creeks Watershed Management Plan (2005), pollutant loading from different land uses was modeled. These results were used to estimate the source of water quality deficiencies in these watersheds and serve as a guide for the development of pollution reduction projects. High traffic commercial corridors are a significant source of pollutants. Some existing stormwater detention ponds contribute to temperature problem.

The 2005 Fanno/Tryon Watershed Management Plan also identified numerous stormwater capacity deficiencies at culvert crossings and within piped systems. In addition, most of Portland's properties and streets that lack adequate stormwater systems are located in the Fanno and Tryon watersheds. These areas tend to have soils with low infiltration capacity that do not allow for on-site stormwater discharge; steep slopes that have potential landslide hazards; and streets that lacking drainage infrastructure for off-site stormwater discharge.

## Recommended Stormwater System Improvements

Recommended improvements can be divided into two categories: retrofits to address stormwater issues that impact existing development and proactive options that can reduce the need to expand the stormwater management system. These vary somewhat by watershed and by stormwater basin.

In the combined sewer basins, priority will continue to be on managing stormwater as close to the source as the possible (i.e., keep water out of the sewer), as called for in the City's NPDES permit. This strategy will be implemented through projects such as private property retrofits (eco-roofs, rain gardens, parking lot retrofits) and public stormwater infiltration facilities in the rights-of-way. The investment strategy includes these multi-objective green infrastructure projects, which also address basement sewer backups. Within in the combined sewer basins, there also may be opportunities to separate stormwater from the sanitary sewer system. This approach is currently under review in the Lloyd District area.


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In the separated stormwater areas, the Bureau has identified a variety of projects and programs to address stormwater system needs. In addition to the types of projects identified for the combined area, there are also projects to address flood management, pollution reduction, and overall watershed health. However, it is important to note that the Bureau anticipates that there will be areas where it is neither technically nor financially feasible to provide stormwater management services. It may be desirable to encourage increased density in areas that are already highly impervious. Allowing for higher density may make neighborhood stormwater management system improvements more cost effective by increasing the number of properties served in proportion to the public investment.

Citywide, the bureau continues to invest in programmatic approaches that protect the existing stormwater system and natural resources, and help avoid the need for future costly capital projects to treat stormwater. These programmatic approaches include capital programs included in the investment strategy, such as land acquisition for protecting high-quality natural resources that are part of the water cycle, and green street projects. Non-capital programs, such as community education and outreach, tree planting, revegetation and control of invasive species are also critical parts of the bureau's strategy to protect water quality and address other regulatory drivers.

While citywide stormwater system planning is not yet complete for all areas, existing watershed and stormwater plans recommend the following investments. Additional stormwater system improvements to address system risk will be recommended in the coming years.

In the **Columbia Slough** Watershed, projects will focus on water quality with a primary goal of improving the quality of the sediments in the Slough. Specific water quality projects are being identified as part of the Columbia Slough Sediment Order. Flood control is also an issue in the slough, both keeping Columbia River water from flooding property within the drainage districts' boundaries and keeping stormwater generated from within the drainage districts from flooding properties. A study will determine whether or not a new stormwater pump station is required. The bureau continues to invest in protection, restoration, and enhancement of natural resources as well as built infrastructure improvements.

In the **Johnson Creek** Watershed, projects will continue to focus on floodplain restoration and management through restoration in target areas along the main stem of the creek. These projects are multi-objective: providing flood mitigation, improving water quality, and enhancing fish and wildlife habitat. The CIP identifies larger flood mitigation projects in West Lents and in East Lents. Restoration is underway on Crystal Spring Creek, a tributary stream that is a source of clean, cold, and constant flows. Projects are also underway to protect and restore natural resources in the uplands and tributaries. Future work will begin to address upland stormwater system conveyance and capacity.


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In the **Fanno/Tryon** Watershed, projects will focus on stormwater system improvements including flow control and treatment to improve water quality, protect streams, and ensure storm system reliability. Stormwater retrofits will focus on managing stormwater from existing impervious area in major transportation corridors such as Beaverton-Hillsdale Highway and SW Barbur Boulevard. Projects to increase culvert capacity and improve fish passage in the streams and their tributaries are underway or planned. Additional projects include stream daylighting, sewer infrastructure protection, stream enhancement, and roadside drainage and shoulder improvements. The bureau and partners continue to focus on protecting, restoring, and enhancing natural resources that support water quality, hydrology, and habitat.

In the **Willamette River** Watershed, the Bureau will continue to implement stormwater projects to address capacity in the combined sewer system to limit sewer overflows and improve watershed health. In the separated sewer system projects will address other stormwater-related impacts to the river, tributaries and their watersheds. Projects will focus primarily on controlling the flow of stormwater and improving water quality through projects to retrofit existing impervious area with stormwater facilities along public right-of-way and on private property. Construction of new neighborhood-scale water-quality facilities could be a cost-effective solution in some areas. As in the Fanno/Tryon Watershed, projects often require partnering with other public agencies (such as ODOT) or private property owners. Restoration and enhancement of remnant habitat areas along the main stem Willamette River to create habitat "stepping stones" through the industrial harbor and downtown core is important for ESA-listed species migrating to upstream habitats.

# Investment Strategy

## Process

Each year, the Bureau prepares capital and operating budgets for the upcoming fiscal year and for the five-year planning horizon. The work of the Bureau is focused on strategic and comprehensive program delivery protecting public health and restoring the environment within a prescribed, but negotiated, regulatory framework. Using asset management principles including reducing risk and the likelihood of failure, the Bureau develops budgets to maintain infrastructure and natural systems to meet regulatory requirements and enhance the health of watersheds. Asset management addresses life-cycle costs, trade-offs between capital and operating expenditures, and prioritization of projects based on risk and consequence of failure, to achieve long-term system sustainability and acceptable levels of service. The Bureau uses an integrated approach, rather than one that addresses only single subject regulatory requirements, whenever possible. Taking an integrated approach is often more cost-effective and results in better watershed health outcomes – hydrology, water quality, habitat, and biological communities – while also addressing other urban environmental problems.

In order to be best stewards of ratepayer dollars, the bureau delivers its services through a wide array of operating programs that complement the capital investments. Public education has proven to be a particularly cost-effective approach to reducing the volume and pollutant load entering the sewers. Investing in public engagement and community stewardship has yielded a number of stormwater management benefits such as extensive tree planting, clearing of invasive species in parks and other


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natural areas, and construction and maintenance of stormwater facilities by private entities (such as eco-roofs and rain gardens). The bureau works closely with a number of non-governmental organizations including watershed councils, environmental groups, and neighborhood groups, which often leverages volunteer contributions and other sources of funding to meet multiple community benefits.

The Bureau has been implementing an asset management approach to guide investment for several years. To date, extensive work has focused on the Combined and Sanitary Collection System where an updated Systems Plan has evaluated projects using a risk-based asset management framework. This approach will be expanded to the Bureau's other systems and asset types as resources are available to do the required analysis. Watershed monitoring data, regulatory requirements and watershed planning (such as the Johnson Creek Restoration Plan) guide prioritization of stormwater and watershed investments. Applying asset management approaches to the natural systems and green infrastructure is an emerging effort for the Bureau.

The Capital Improvement Plan (CIP) is developed utilizing a multi-step process to identify, develop, review, score, and rank projects to determine funding and scheduling priorities and ensure that the core sanitary sewer and stormwater systems are met to serve the community. A bureau-wide stakeholder review team investigates, scores, and ranks all CIP projects in accordance with identified CIP criteria. CIP weighted criteria, scoring, instructions, scheduling guidelines, estimating procedures, and project request forms are used to ensure each project is developed, reviewed, and scored based on detailed and consistent information. A CIP development strategy guides project selection and scheduling. Projects are reviewed by managers in finance, program areas, operations, and engineering to ensure financial resources are expended effectively and appropriately. The bureau director reviews the final CIP plan and submits it to City Council during the annual City budget process.

The public is involved in the budget development process through the Bureau's Budget Advisory Committee and the Public Utilities Review Board. All CIP projects that affect the public include public involvement and outreach plans.

## Projects and Programs

The major components of the sewer system define the program categories within the capital budgeting process: Sewage Treatment, Maintenance and Reliability, Surface Water Management (i.e., stormwater and watershed health), and Systems Development.

The Bureau focuses efforts on comprehensive, multi-purpose solutions in the highest priority areas for work in all four program areas of the CIP, guided by both regulatory requirements and the Bureau's mission and Strategic Plan. The Bureau anticipates nearly $2 billion in capital investment in these programs over the next twenty years. Capital projects and programs are drawn from the recommended system improvements discussed in earlier sections. It is important to note that the proposed Investment Strategy represents a conservative financial approach to addressing system needs. The Bureau's 20-year Investment Strategy (included in Appendix A) is summarized in Table 6.4.


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Table 6.4 Investment Strategy Summary

| Program | FY 2013-2018 | FY 2018-33 |
|---|---|---|
| Wastewater Treatment and | $109,671,000 | $305,964,000 |
| Maintenance & Reliability | $328,896,000 | $702,800,000 |
| System Development | $23,462,000 | $60,000,000 |
| Surface Water Management | $73,441,000 | $127,515,000 |
| **TOTAL** | **$535,470,000** | **$1,196,279,000** |

Specific objectives for the program areas are described below.

### Sewage Pumping and Treatment Systems

Regulations, primarily through the NPDES Waste Discharge permits, require investment in the ten year planning horizon with a focus on process improvements at Columbia Boulevard Wastewater Treatment Plant (CBWTP), including secondary process improvements and upgrades to the mixing systems in the digesters. Other investments in this program area will focus on ongoing maintenance at the CBWTP and the Tryon Creek Wastewater Treatment Plant through the Repair, Rehabilitation and Modification program and the Pump Station Improvement program. An updated Facilities Plan for CBWTP was completed in March 2010; no new projects were identified for the near term. The draft TCWTP Facilities Plan identifies extensive investments to be made at this site including acquisition of property for a new headworks facility which will allow for gravity flow through the plant and upgrades to nearly all the existing facilities on site.

### Collection System Maintenance and Reliability

This program area is focused on improving and maintaining the existing sanitary and combined sewer collection system to provide accepted levels of service. The March 2012 Systems Plan (for sanitary and combined sewers) recommends grey and green infrastructure projects that have a favorable benefit/cost ratio and reduce system risk. The plan identified approximately $175 million in pipe rehabilitation for near-term investment. Additional projects are planned to address the highest risk of basement sewer backup. In response to system failure in the Fanno Basin, an extensive improvement program is underway through fiscal year 2016, including a new pump station to augment the existing pump station. A small amount of work remains to meet ongoing requirements for the Combined Sewer Overflow Program to provide increased efficiency of system operations.

### Surface Water Management

This program area focuses on systematically protecting and restoring surface water assets (such as drainageways, streams and wetlands) and improving overall watershed health to protect public health and safety and comply with state and federal regulations. Projects often involve collaboration with other public agencies, nonprofits and community partners. The Bureau prioritizes projects that protect the most critical existing watershed functions and/or preserve those locations at the greatest risk of damage. This is accomplished by implementing the Watershed Management Plan recommendations for restoring important natural functions and/or using green infrastructure to reduce or avoid stormwater impacts. A stormwater system plan for the Stephens Creek subwatershed was completed in 2012 which identified


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investment needs for that area. A citywide stormwater system planning process is now underway to identify projects to improve stormwater conveyance, capacity and water quality. Other near-term priorities for this program area include continuing restoration of Johnson Creek and its floodplains; stormwater retrofit projects in Fanno/Tryon and the Columbia Slough; and restoration and enhancement projects along the main stem Willamette River and its tributaries, and the Columbia Slough.

### Systems Development

In support of Metro's 2040 Growth Concept, this program area funds projects that cost effectively and incrementally expand the sewer collection system to serve planned development. Work is underway to identify clusters of properties that are currently served by on-site sewage systems, such as septic or cesspools, and to plan for alternatives prior to failure of on-site systems. This program also funds sewer improvements in association with public works projects by others, primarily transportation projects – both road and transit. In response to City Council action, the Bureau has developed a program to address non-conforming sewer connections. Most of the work to date has been in response to either a service failure or a property sale. Some work has been accomplished in conjunction with planned pipe rehabilitation projects.

## Financial Strategy

The Bureau annually prepares a five-year financial plan. Periodically, the Bureau forecasts on 10-year and 20-year horizons to gain additional understanding and insight into long-term financing needs and rate implications. The five-year financial plan has three key elements. Initially, operating and capital expenditure requirements for the Bureau are developed through separate operating and capital planning processes and then they are brought together. Overall revenue requirements and a corresponding five-year funding program are developed taking into account the impact of capital construction on future operations and maintenance requirements.

The financial planning process lays the groundwork for setting utility rates, which are formally adopted each year by the City Council. Rates are set on a cost of service basis, meaning that rates are designed to charge customers for their proportional cost of collecting, transporting, and treating discharges. Debt obligations ("mortgage payments") have a significant impact on the bureau's financial plan and its rates. In fiscal year 2013-14, approximately one-third of the budget was allocated to debt payments.

### Existing Financial Strategies

Environmental Services receives revenue for capital investment from sewer fees, charges and permits; line and branch and system development charges; cash transfers from the Sewer System Operating Fund; and Bond proceeds, the latter are the primary funding source of the Bureau's capital expenditures.

### System Funds

The Bureau's financial reporting system is organized into five separate funds:

- The Sewer System Operating Fund provides for the day-to-day operation, maintenance and management of Bureau programs.


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- The Sewer System Construction Fund holds equity contributions and net bond proceeds for transfer to the Sewer System Operating Fund to reimburse capital-related expenditures.
- The Sewer System Debt Redemption Fund provides for payment of debt incurred for capital construction.
- The Sewer System Rate Stabilization Fund functions as a reserve that enables the Bureau to level its projected annual revenue requirements to reduce significant changes in sewer and stormwater rates from year to year.
- The Environmental Remediation Fund was created to provide funding to remediate former solid waste disposal sites. The Environmental Remediation fund now also provides funding of the City's share of the Portland Harbor Superfund program remedial investigation and feasibility study costs and the City's source investigation program

### Debt Service Coverage

The Bureau's current financial planning standard is to set rates adequate to provide Net Revenues (gross revenues less operating expenses) including transfers from the Rate Stabilization Fund equal to or greater than 1.50 times the annual debt service requirement on first lien debt, and 1.30 times the annual debt service requirement on all (first and second lien) debt. These targets exceed the requirements specified in the existing debt covenants. This approach helps the bureau maintain a high bond rating, which reduces the cost of borrowing money to pay for capital projects.

### Ending Fund Balances

The Bureau's current policy is to maintain combined ending fund balances within the Operating Fund and the Rate Stabilization Funds equal to or greater than 10 percent of each year's operating expenses.

The Construction Fund ending fund balance is targeted at 35 percent of the next year's CIP, or $500,000, whichever is greater, for planning purposes. Actual ending fund balance will differ depending on the rate of expenditures and the timing of CIP borrowings.

### Projected revenues and expenditures

Table 6.5 depicts forecast resources and requirements for the Operating Fund. While the Bureau annually prepares a five-year financial plan, Table 6.5 includes an FY2019 – FY2033 summary column to provide a 20-year extended outlook.


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Table 6.5 Sewer system operating fund forecast sources and use of funds ($1,000)

| Item | 2014 | 2015 | 2016 | 2017 | 2018 | FY2019 – FY2033 |
|---|---|---|---|---|---|---|
| **Resources** | | | | | | |
| Service Charges & Fees | $275,404 | $294,507 | $315,179 | $335,524 | $353,283 | $6,733,906 |
| Connection Fees | 9,910 | 9,364 | 9,909 | 10,494 | 10,773 | 266,070 |
| Wholesale Contracts | 3,445 | 3,555 | 3,669 | 3,787 | 3,909 | 77,778 |
| Other Service Charges & Misc. | 7,907 | 6,335 | 6,475 | 6,681 | 6,872 | 140,826 |
| Cash Transfers In - | | | | | | |
| Rate Stabilization Fund | 10,400 | - | - | - | - | 32,250 |
| Sewer Construction Fund | 86,400 | 112,100 | 110,345 | 108,732 | 112,424 | 2,080,868 |
| Capitalized Overhead | 8,255 | 8,413 | 8,574 | 8,738 | 8,905 | 155,960 |
| Other Funds | 697 | 181 | 186 | 192 | 199 | 3,951 |
| Interest Income | 81 | 36 | 54 | 53 | 48 | 652 |
| Beginning Fund Balance | 52,999 | 58,176 | 62,214 | 66,539 | 70,786 | 74,404 |
| **Total Resources** | **$469,226** | **$491,052** | **$515,200** | **$544,623** | **$567,356** | **$9,566,665** |
| **Requirements** | | | | | | |
| Personal Services | 45,637 | 47,014 | 50,498 | 51,878 | 54,149 | 1,072,772 |
| Materials & Services | 36,893 | 38,470 | 40,657 | 43,172 | 44,897 | 820,078 |
| Internal Services | 33,153 | 34,689 | 36,233 | 37,722 | 38,986 | 759,166 |
| Capital Outlay (1) | 113,121 | 111,623 | 111,548 | 117,357 | 112,837 | 2,156,169 |
| Int. Accruals/Lease Purchase | 71 | 46 | 67 | 79 | 73 | 277 |
| Cash Transfers - | | | | | | |
| General Fund Overhead | 6,965 | 7,348 | 7,753 | 7,966 | 8,186 | 156,865 |
| Construction Fund | 18,759 | 20,096 | 20,916 | 22,963 | 29,153 | 1,660,573 |
| Rate Stabilization Fund | 1,550 | 5,550 | 5,825 | 4,750 | - | 28,875 |
| Debt Redemption Fund | 151,949 | 160,579 | 171,426 | 183,984 | 200,474 | 2,741,297 |
| Other Cash Transfers | 2,977 | 3,401 | 3,727 | 3,972 | 4,205 | 59,763 |
| Ending Fund Balance | 58,176 | 62,214 | 66,539 | 70,786 | 74,404 | 110,830 |
| **Total Requirements** | **$469,226** | **$491,052** | **$515,200** | **$544,623** | **$567,356** | **$9,566,665** |

(1) Includes capitalized personal services, materials & services, internal services, land, equipment and capital improvements

Revenues from service charges and fees, and transfers from the Sewer Construction Fund are the largest resources for the Operating Fund. Projections for expected new customers, average water use per account, increases in impervious area, and planned rate increases are used to forecast revenues over the forecast period.

Operating expenses include personal services, materials and services, internal services, transfers for general fund overhead, and transfers to the Rate Stabilization, Construction, Environmental Remediation, and Debt Redemption Funds. The operating expense forecast reflects the Bureau's existing operating budget, assumed cost escalation factors and service additions associated with CIP and other programs.


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## Factors Influencing the Forecast

The following are considered risks to the forecast as their potential effects were not explicitly included in the investment strategy or financial forecast. Potential costs are not known in all cases.

- **Portland Harbor**
  The Portland Harbor Superfund Site investigation is currently focused on a stretch of the Willamette River from River Mile 2 to River Mile 12. The City is one of the potentially responsible parties actively engaged in assessment and evaluation of cleanup alternatives in this section of the river. The total cost associated with the cleanup and restoration activities and the City's ultimate share of those costs are unknown at this time.
- **Willamette Basin TMDLs**
  The DEQ intends to finalize a mercury TMDL within the next few years and an update of the temperature TMDL is also pending. Changes may affect operations at the Tryon Creek Wastewater Treatment Plant and some projects and programs, but specific implications and the ultimate costs are unknown at this time.
- **MS4 Permit**
  The City's MS4 permit includes requirements to evaluate program effectiveness at reducing applicable TMDL parameters. As new TMDLs are developed and approved, technical work and associated budgets will likely increase.
- **Sanitary Sewer Overflows (SSOs)**
  State and federal regulators continue to study the operations and maintenance of municipal sewer systems and potential guidelines regarding SSOs. Should SSO rules similar to those proposed in 2001 eventually become effective, the Bureau's sewer system would be affected. Such rules could have significant financial impacts to both capital (via upsizing of facilities) and operating (increased system oversight) budgets.
- **Sanitary and Stormwater Service to Residents**
  As discussed in earlier sections, there are challenges to providing sanitary sewer service to all properties within the USB. These include properties with onsite disposal, undeveloped properties, and properties serviced by under capacity sewer lines. While some of the solutions are included in the financial forecast, the full extent of the need is not fully known. Similarly, the Bureau recognizes the need to make improvements to the stormwater system, however, the extent of these improvements is not fully known at this time.
- **Sanitary Sewer and Stormwater Rates**
  The bureau's capital and operating budget forecasts are influenced by annual sewer and stormwater rates approved by the City Council. Planned operations and maintenance of, and capital improvements to, the sewer and stormwater systems will depend on continued predictable increases in rates. Annual rate increases determine the bureau's ability to address the key issues and concerns listed in the Overview section. Lower rate increases than planned would require either reduced operation and maintenance expenditures or delays in maintenance of existing infrastructure and new capital system improvements, which may increase future costs.


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In addition, the financial forecast makes assumptions about factors internal to the Bureau and the City, such as program levels, and external factors, such as inflation and borrowing costs. Changes to these factors may change the financial forecast. This is particularly true of an extended forecast such as the 20-year forecast shown in Table 6.5. The following describes some of the factors and risks involved in unanticipated changes:

- The financial forecast is based on a 1.5% decrease in average use per single-family residential customer (based on winter water consumption), and a 0.75% decrease in average use per multi-family, commercial and industrial customer, roughly consistent with recent history. The forecast also assumes an account growth rate of 0.5% per year. Should consumption or account growth be lower than anticipated, revenues would be adversely affected.
- Changes in interest rates will affect the cost of new debt. Any significant increase in interest rates over the forecast interval will increase revenue requirements for interest on new debt. Conversely, lower-than-anticipated interest rates would reduce borrowing costs and therefore revenue requirements.
- The forecast rate increases are based on best estimates of inflation over the forecast interval. An increase in the actual rate of inflation above the forecast inflation rate will lead to correspondingly higher revenue requirements.
- The current economic recession has resulted in a drastic drop in all construction related fees and permits, most notably System Development Charges, which are a material revenue source. The financial plan assumes construction activities will rebound. If construction activity does not rebound as assumed, revenues would be adversely affected.


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# Chapter 7
# Portland Water Bureau

## Overview

The Portland Water Bureau has supplied domestic water to residents of the Portland area for more than 100 years and is the largest supplier of domestic water in Oregon. The Portland water system serves drinking water to about 940,000 Oregonians, almost one-quarter of the state's population. In 2012-13, the Portland Water Bureau directly served a retail population of over 570,600 people in 163,000 residential households (both single and multi-family residences) and about 20,000 commercial and industrial customers. Portland's wholesale customers served an estimated population of approximately 450,000 in 2012-13.

### Vision, Mission & Values

The mission of the Portland Water Bureau is to provide reliable water service to customers in the quantities they desire and at a quality level that meets or exceeds both customer and regulatory standards; to provide the highest value to customers through excellent business, management, and operational practices, and appropriate application of innovation and technology; to be responsible stewards of the public's water infrastructure, fiscal and natural resources; and to provide the citizens and City Council with a water system that supports their community objectives and overall vision for the City of Portland.

### Purpose of this Chapter

This chapter describes the public facilities and services provided by the Portland Water Bureau that are necessary to carry out its mission. It identifies desired levels of service, inventory and condition information for existing public facilities, and future facilities that will be necessary to support the land uses designated in the Comprehensive Plan, as required by Oregon Planning Goal 11: Public Facilities and Oregon Revised Statute 197. Carrying out the Bureau's mission and other City and community goals may also require programs, investments and practices that are not related to public facilities. This chapter may acknowledge – but does not comprehensively address – these measures.

### System Services

#### Service Area

Approximately 940,000 people living within a 225-square-mile service area around Portland are served by the Water Bureau's retail and wholesale water sales, see Figures 7.1 and 7.2. The Water Bureau delivered 33 billion gallons (BG) to customers during fiscal year (FY) 2012-13. The 20 wholesale water customers are located in Multnomah, Clackamas and Washington counties.


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### Services Provided

The Water Bureau provides reliable water service to customers in the quantities they desire. Water from two sources, the Bull Run watershed and the Columbia South Shore Well Field, is of consistently high quality and meets all regulatory standards.

### Service Agreements & Partnerships

The Portland Water Bureau currently has wholesale water sales agreements with 20 water providers in Portland's metropolitan area -- including cities, water districts, and private water companies. Eight of these water providers have service areas within the Urban Services Boundary of the City of Portland. These include: Burlington Water District, Lorna Water Company, Palatine Hills Water District, Raleigh Water District, Rockwood PUD, Tualatin Valley Water District, Valley View Water District, and West Slope Water District. Some wholesale providers also provide service to small groups of Portland citizens through “wheeling” agreements. These agreements are used where it is difficult or overly expensive to provide water directly from Water Bureau facilities.

The Clackamas River Water District and Sunrise Water Authority provide water services to unincorporated areas within Portland’s urban service boundary to the south of Portland. These water districts operate in partnership with each other through a cooperative agreement and use the Clackamas River as their main water supply source.

The Portland Water Bureau is a member of the Regional Water Providers Consortium. Members include more than 20 municipalities (including the City of Portland), water districts and Metro. (Metro is the regional growth management agency serving Clackamas, Multnomah, and Washington counties.) The Consortium serves as a collaborative and coordinating organization to improve the planning and management of regional municipal water supplies, including regional water conservation implementation and emergency preparedness coordination. The Consortium and its members endorse the Regional Water Supply Plan as the region's water supply strategy for the future. Water providers belonging to the Consortium retain full authority to operate and upgrade their systems and infrastructure.

The Portland Water Bureau maintains partnerships and agreements with other city bureaus and regional and state transportation agencies, providing services such as relocating water mains as directed by City Council. The bureau also has agreements with the U.S. Forest Service for activities within the Bull Run watershed, which is located in the Mt. Hood National Forest.

The City of Portland also maintains partnerships with the cities of Gresham and Fairview regarding participation in the Columbia South Shore Well Field Wellhead Protection Program.


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Figure 7.1 Drinking Water Supply System Retail and Wholesale Service Areas

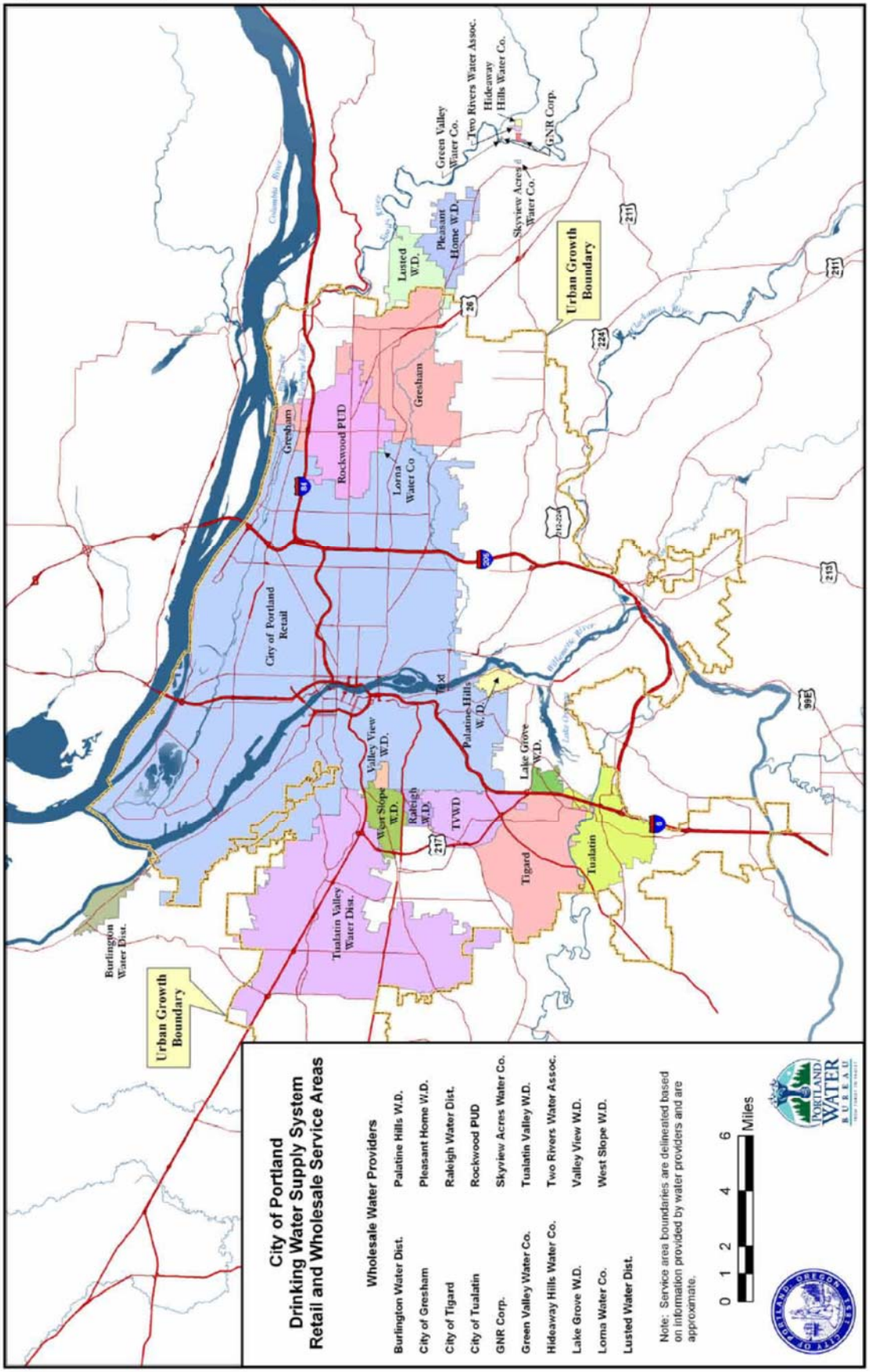




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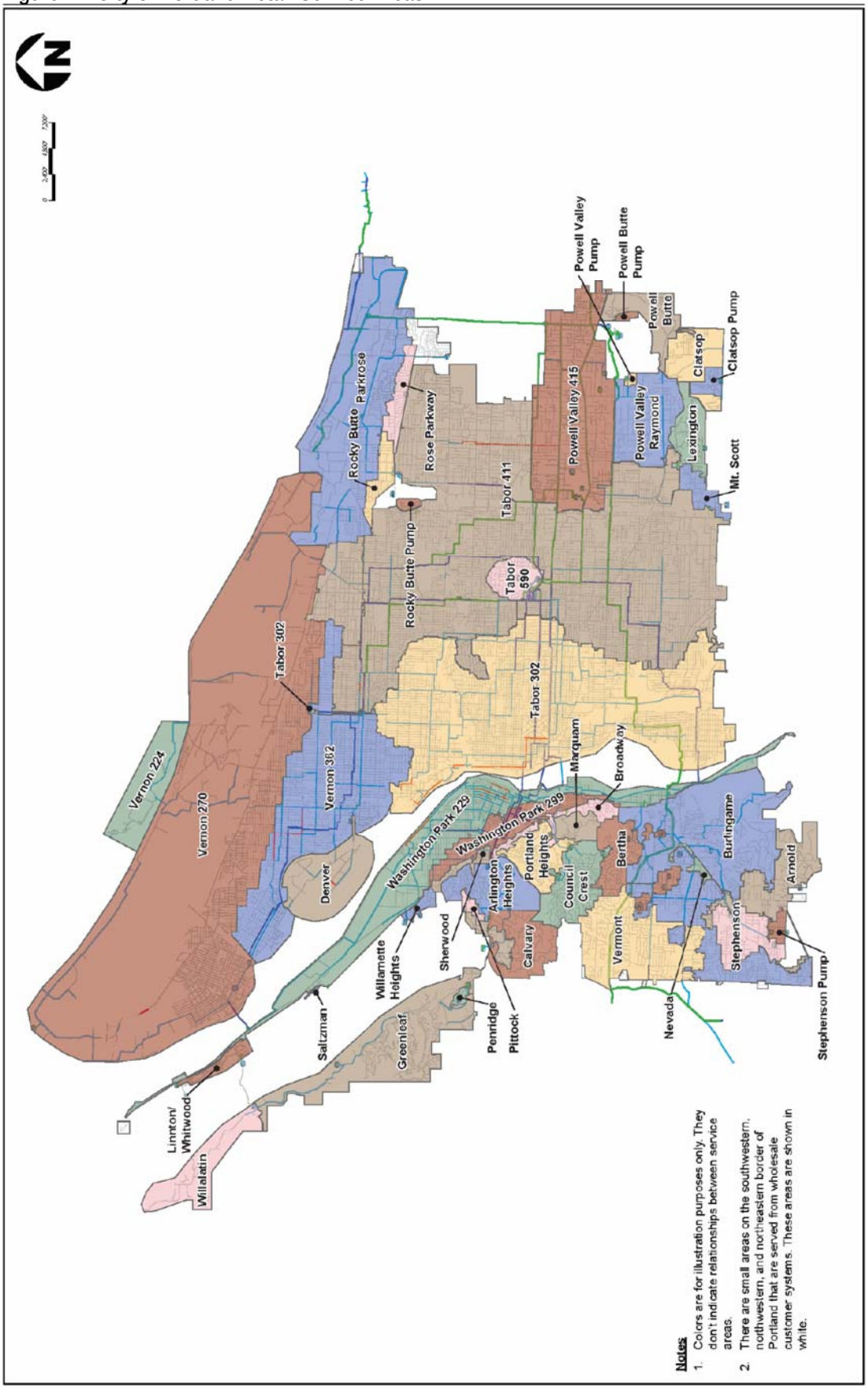
Figure 7.2 City of Portland Retail Service Areas





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## Inventory Summary

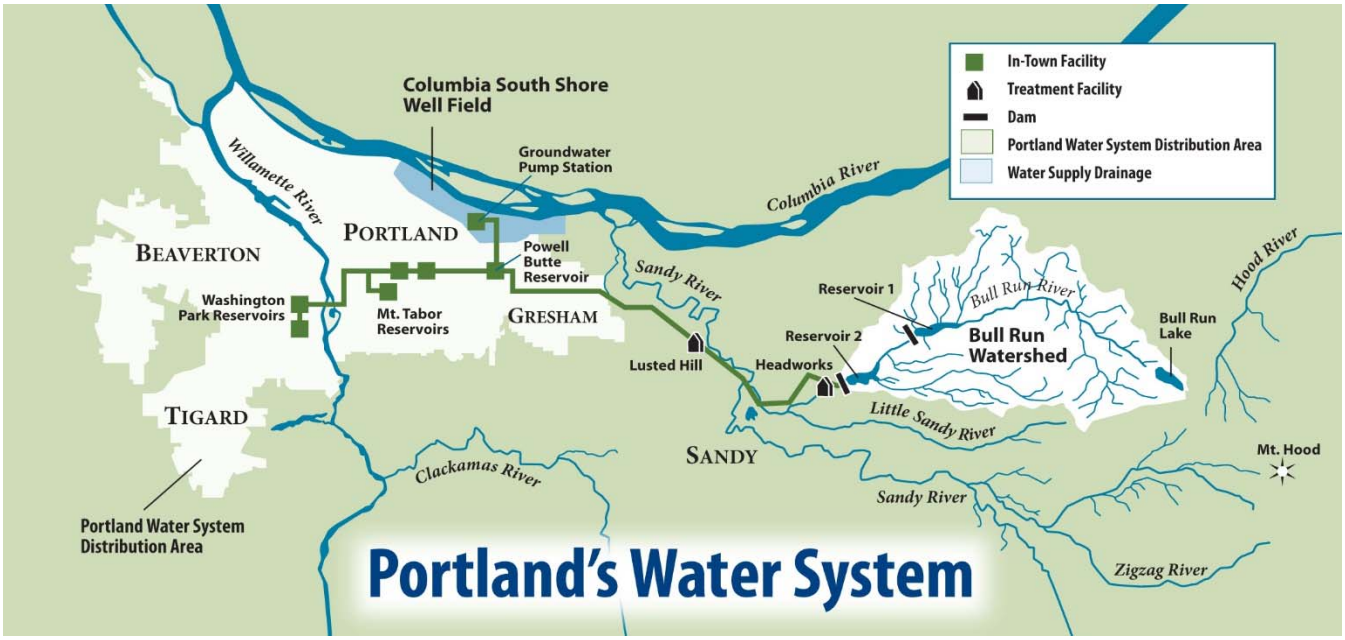
Water is supplied from the Bull Run watershed, located between the city and Mt. Hood, and the Columbia South Shore Well Field, located along the Columbia River, through approximately 2,250 miles of pipes within the City's boundaries. In 2013, the water system was valued at about $7.6 billion.

The City's water system includes five integrated sub-systems:

- a supply system, which collects water from the Bull Run watershed and Columbia South Shore Well Field;
- a transmission system of conduits, which moves water to a number of reservoirs;
- a terminal storage system of reservoirs;
- a distribution system of mains, service lines, pumps and tanks, which distribute water to residences and businesses; and
- support facilities to assist in the operation and maintenance of the water system.

Figure 7.3 illustrates the main components of Portland's water system. The components are described in more detail in Tables 7.1 and 7.2.

Figure 7.3 Portland's Water System




## Condition Summary

The most recent Inventory and Condition Report prepared by the Water Bureau is summarized in Tables 7.1 and 7.2. The replacement value of the water system is estimated at $7.6 billion in 2013 dollars. About 63% of the value of the water system is in the distribution system. The supply system constitutes about 13% of the value of the water system, transmission accounts for 16%, terminal storage is 6%, and support facilities account for 2% of the Bureau's asset value.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Roughly 47% of the water system is estimated to be in good condition with 22% being considered very good. Approximately 23% of the water system is considered to be in fair condition, 6% is poor and 2% is considered to be very poor. Table 7.2 provides additional detail on asset value and condition.

Table 7.1 Portland Water Bureau Summary of Value and Condition of Assets, 2013

| | Value ($ million) | | | | | |
|---|---|---|---|---|---|---|
| **Asset Group** | **Very Good** | **Good** | **Fair** | **Poor** | **Very Poor** | **Total Value** |
| Supply | $131.8 | $457.2 | $276.0 | $82.3 | $18.2 | $967.0 |
| Transmission | $64.9 | $513.2 | $518.7 | $109.7 | $0.2 | $1,207.0 |
| Terminal Storage | $218,9 | $133.8 | $18.1 | $84.7 | $0.0 | $455.7 |
| Distribution | $1,182.1 | $2,434.1 | $912.0 | $190.1 | $65.7 | $4,785.4 |
| Support Facilities | $40.8 | $29.2 | $18.0 | $16.7 | $59.3 | $163.7 |
| **Total** | **$1,638.5** | **$3,567.6** | **$1,742.7** | **$483.6** | **$143.4** | **$7,578.8** |

Table 7.2 Portland Water System Inventory and Condition, 2013

| | Value ($ million) | | | | | |
|---|---|---|---|---|---|---|
| **Asset Group** | **Very Good** | **Good** | **Fair** | **Poor** | **Very Poor** | **Total Value** |
| **Supply** | **$131.8** | **$457.2** | **$276.0** | **$82.3** | **$18.2** | **$967.0** |
| Bull Run Roads | 16.6 | 60.8 | 95.4 | 57.4 | 18.2 | 249.9 |
| Bull Run Lake Facilities | 0 | 17.2 | .1.4 | 1.8 | 0 | 20.4 |
| Dam 1 Facilities | 0 | 119.9 | 102.1 | 0 | 0 | 222.0 |
| Dam 2 Facilities | 30.0 | 1161.3 | 34.9 | 13.8 | 0 | 240.0 |
| Headworks & Lusted Hill Facilities | 0 | 33.3 | 11.4 | 4.8 | 0 | 49.5 |
| Groundwater Well Sites | 0 | 36.5 | 26.6 | 2.9 | 0 | 66.0 |
| Groundwater Pump Station and Treatment | 27.7 | 27.1 | 4.2 | 1.6 | 0 | 60.6 |
| Groundwater Collection System | 57.5 | 1.1 | 0 | 0 | 0 | 58.7 |
| **Transmission** | **$64.9** | **$513.2** | **$518.7** | **$109.7** | **$0.2** | **$1,207.0** |
| Bull Run Transmission | 46.2 | 204.6 | 305.1 | 76.1 | 0.2 | **619.8** |
| Transmission Mains | 18.8 | 308.6 | 213.6 | 33.7 | 0 | **574.8** |
| **Terminal Storage** | **$218.9** | **$133.8** | **$18.1** | **$84.7** | **$0.0** | **$455.7** |
| **Distribution** | **$1,182.1** | **$2,434.1** | **$912.0** | **$190.1** | **$65.7** | **$4,785.4** |
| Distribution & Transport Mains | 721.3 | 1,549.3 | 254.0 | 47.7 | 9.0 | **2,582.5** |
| Services | 112.6 | 323.2 | 381.1 | 65.3 | 17.1 | **899.4** |
| Valves | 211.9 | 287.7 | 72.2 | 19.9 | 12.1 | **603.8** |
| Meters | 23.9 | 24.0 | 19.4 | 15.0 | 5.3 | **87.9** |
| Hydrants | 5.1 | 81.6 | 59.2 | 17.5 | 20.6 | **183.7** |
| Regulators | 0.0 | 7.9 | 7.9 | 8.1 | 0 | **24.0** |
| Fountains | 1.9 | 7.0 | 7.0 | 2.8 | 0.9 | **19.4** |
| Pump Stations | 40.6 | 54.3 | 19.9 | 2.9 | 0.8 | **118.5** |
| Tanks | 64.8 | 99.0 | 91.4 | 10.9 | 0.0 | **118.5** |
| **Support Facilities** | **$40.8** | **$29.2** | **$18.0** | **$16.7** | **$59.3** | **$163.7** |
| Interstate Facility | 16.0 | 5.7 | 0.8 | 1.5 | 49.6 | 73.5 |
| Other Facilities | 24.8 | 23.5 | 17.1 | 15.2 | 9.7 | 90.2 |
| **TOTAL** | **$1,638.5** | **$3,567.6** | **$1,742.7** | **$483.6** | **$143.4** | **$7,578.8** |


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## Capacity Summary

### Population Growth and Water Use

The population in the Portland metropolitan area is expected to continue to increase. Although the physical boundaries of the retail service area are not expected to be redefined beyond the limits of the urban growth boundary (UGB), vacant land and redevelopment lots within the retail service area are increasingly being developed with higher-density housing and more mixed-use development than in the past. In addition, several of the bureau's 20 wholesale customers have identified growth in existing service areas as well as some small additions to the UGB in 2004.

Historical water use, both retail-only and combined retail and wholesale demand, has not kept pace with the increase in the service area population. Since 1992, the number of gallons per capita per day for the entire retail and wholesale area has declined while the population has grown.

### Demand Forecast

Although the growth in demand does not increase at the same rate as the growth in population, analysis of future demand and population shows that demand will increase over time. Using a single-equation econometric model, the Water Bureau estimated the mathematical relationship between the overall demand for water and a series of explanatory variables including population change, weather factors such as precipitation and temperature, the average price of water, weekend use, climate change, and others. The result is a weather-normalized demand forecast for annual demand. The forecast also estimates demand under weather conditions that generated the highest average daily demand during the peak season (1967) and the highest single peak-day water demand (1981). Forecasts for Portland's retail and wholesale annual average daily demand (ADD) have been developed to 2030 for both weather-normalized and 1967 weather conditions for the entire year and for the peak season, respectively.

Population estimates generated as a part of the population and allocation forecasts prepared for the Regional Transportation Plan were provided by METRO. Estimates were made based on approximate service territories of Portland and each wholesale customer. No estimate for future growth outside the existing service territories was included, although some growth outside the existing service territory is likely for some providers as the UGB is expanded to accommodate the required 20-year land supply.

According to the Water Management and Conservation Plan (2010), the average annual daily retail demand for 2030 is predicted to be around 70 million gallons a day (MGD). The average annual daily retail plus wholesale demand for 2030 is predicted to be around 135 million gallons a day (MGD). Both numbers would be a substantial increase from current demands. An update of the Water Management and Conservation Plan is scheduled for 2020.

## Key Issues & Concerns

### Regulatory Compliance

Many large system projects are moving forward to achieve compliance with the Long Term 2 Enhanced Surface Water Treatment Rule (LT2 rule) of 2006. The rule requires that water systems with uncovered


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finished water reservoirs, like those at Mount Tabor and Washington Park, either cover the reservoirs or provide treatment at the outlets of the reservoirs to remove or inactivate *Cryptosporidium*, *Giardia* and viruses. All of the compliance projects are in the Terminal Storage Program. These projects include design and construction for an additional enclosed water storage reservoir at Powell Butte, a replacement storage reservoir at Kelly Butte as well as design work for adjustments necessary to disconnect the uncovered reservoirs at Mt. Tabor and Washington Park from the drinking water system Additional work to replace storage at Washington Park is also necessary. It is expected to cost between $330 million and $400 million to fulfill these requirements.

In addition, the bureau has capital projects in and around the Bull Run watershed to achieve compliance with regulations of the Clean Water Act and the Endangered Species Act. These projects are described in the bureau's Bull Run Water Supply Habitat Conservation Plan.

### Declining Water Demand

As discussed previously, total water demand for the Portland system has fallen over the last few years, as retail and wholesale customers use less water. Per capita water use for retail single-family residential customers has gone down significantly since 1992. The average consumption for retail single-family customers between 1987 and 1992 was 87 gallons per capita per day (GPC), is now down to about 66 GPC, and has been as low as 62 GPC. Variables such as the water shortage of 1992, updated state and national plumbing codes, the change from flat rates to consumption-based rates for wastewater (in 1994), and behavioral changes resulting from conservation education have helped to reduce each household's overall consumption. Figure 7.4 shows the average annual GPC from 1988–2007.

Water demand forecasts developed by the Water Bureau anticipate that while per capita water demands will continue to decline somewhat over time, the overall demands on the Portland water system will increase due to population growth. The status of continued wholesale water sales is not known at this time, but the bureau anticipates continuing to sell water to wholesale customers.


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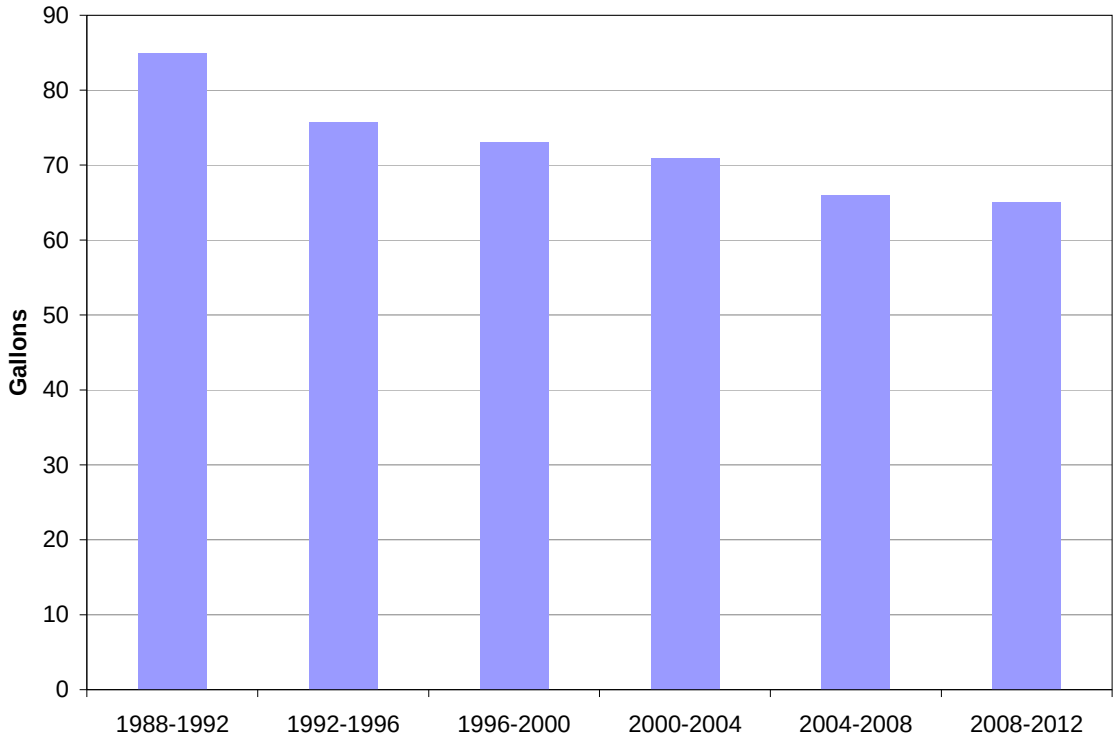
Figure 7.4 Average Residential Per Capita Daily Water Use[1]




### Accommodating Growth

The City of Portland provides water to retail customers within the city limits, as well as a significant number of large wholesale customers. Average daily demand for retail customers in 2012 was 62 million gallons per day (MGD). This is expected to grow to approximately 70 MGD by 2030. While this is not a huge growth rate within the City, it is something that needs to be addressed in the planning of infrastructure.

A larger issue is the impact of regional growth, as the total population in areas served through wholesale water sales agreements is expected to increase significantly. However, as wholesale customers make decisions on future supply sources which may or may not include supply from the City of Portland, it is unknown how this growth will impact the Water Bureau.

### Maintaining Existing Infrastructure

The replacement value of water system assets was estimated at $7.6 billion in 2013. Many water system facilities are nearing the end of their useful lives. Half of distribution mains are older than 50 years. The uncovered reservoirs are all over 100 years old. Transmission conduits are 60 to 100 years old. Dams and reservoirs are 50 to 80 years old. The Water Bureau faces new costs to maintain and replace aging

[1] Each bar is an average of the gallons-per capita for the four-year period.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infrastructure, respond to security and vulnerability issues, and comply with regulatory requirements. In the meantime, there is pressure to hold down rate increases.

For 2013, the Water Bureau estimates a $15.5 million annual funding gap, primarily in the replacement of assets in poor condition, including distribution system components, transmission conduits, and the seismic upgrades of tanks and other facilities. Over the next 5 years, the Water Bureau expects to invest over $490 million on water-related capital improvements, primarily on the Distribution Program, which will help reduce the funding gap.

### Vulnerability and Security

The City of Portland Water Bureau is dedicated to protecting public health and safety by ensuring that key components of the water system will withstand most human-caused or natural disasters. The Water Bureau has completed a number of studies on vulnerabilities within the system. Significant funding will be required to increase protection of more than 80 critical facilities, including dams, reservoirs, water supply pipelines, pump stations, and operations facilities.

### Climate Change

The Water Bureau studies the issue of climate change and is establishing both preparation and mitigation strategies. The ability of Portland's two water systems to meet future demands, as well as the need for conservation and efficiency programs, will be important considerations as climate change impacts become more evident..

The City of Portland has kept detailed climate records for the past 70 years and continues to research and model climate patterns and their effects in the Bull Run watershed. The City also monitors current global and regional climate change information. Information available to date indicates that average winter season precipitation could increase. The average length of summer season, when the water system is drawing more water out of reservoir storage than is being refilled, could also increase. This period is referred to as "reservoir drawdown". In simpler terms, it is approximately the period from when spring rains stop and when fall rains begin. Storage in the Bull Run system is still expected to refill each year, because total flows in the watershed over the winter season are much greater than the amount needed to refill the storage reservoirs.

The City is preparing for climate change through research and monitoring, revising long-term planning models, working with other large drinking water utilities on preparation and mitigation strategies, developing its rights in the Columbia South Shore Well Field to provide summer supply and emergency backup capacity, and supporting efficient water use practices.

# Regulatory Compliance

## Federal Mandates

The City of Portland must comply with a variety of federal mandates, including the Clean Water Act, the Safe Drinking Water Act, the Lead and Copper Rule, and several mandates related to the protection and


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management of the Bull Run watershed. Programs and projects to maintain compliance are included in the Bureau's investment strategy.

### Safe Drinking Water Act (SDWA)[2]

Under the Safe Drinking Water Act, which is implemented through Oregon Revised Statutes and Administrative Rules, the Portland Water Bureau is required to conduct water quality sampling and submit results to Oregon Health Authority, in order to demonstrate compliance with maximum contaminant levels. The bureau also participates in on-site inspections (sanitary surveys) of treatment and distribution facilities by State Drinking Water Program personnel every three years, and participate in annual inspections. The Portland Water Bureau is also required to submit a Water System Master Plan every 20 years, submit a list of completed projects annually, produce and distribute annual Consumer Confidence Reports, meet operator certification requirements, and submit annual cross-connection reports.

### Unregulated Contaminant Monitoring Rule (UCMR)[5]

The UCMR is administered under direct authority of the U.S. EPA and requires monitoring for 25 unregulated contaminants using five analytical methods during 2008-2010. The U.S. EPA uses the data generated by the UCMR to evaluate and prioritize contaminants on the Drinking Water Contaminants Candidate List, a list of contaminants EPA is considering for possible new drinking water standards.

### Stage 2 Disinfection Byproducts Rule[3]

The Stage 2 Disinfection Rule is administered under direct authority of the U.S. EPA and requires the Portland Water Bureau to submit a sample plan and conduct sampling for disinfection byproducts.

### Long Term 2 Enhanced Surface Water Treatment Rule, LT2[4]

The Long Term 2 Enhanced Surface Water Treatment Rule (LT2) was promulgated in January 2006. This federal rule applies to surface water or groundwater under direct influence of surface water (GWUDI) systems, and increases regulations regarding *Cryptosporidium* in the water supply. LT2 also addresses the regulation of *Cryptosporidium, Giardia* and viruses in uncovered finished drinking water reservoirs.

Compliance with LT2 has impacts on two separate parts of Portland's water system. First, the rule requires the city to provide additional treatment to its Bull Run supply to either remove or inactivate *Cryptosporidium*. Portland developed a comprehensive treatment variance request based on the results of a one-year water-quality sampling program and study of Bull Run water. A variance to this part of the rule was granted to the Water Bureau by the Oregon Health Authority on March 14, 2012.

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[2] of 1974, 1986, 1996 as administered under the U.S. EPA Primacy Agreement by the Oregon Department of Human Services (ODHS) under Oregon Revised Statutes (ORS) 448 and Oregon Administrative Rules (OAR) 333-061

[3] U.S. EPA Safe Drinking Water Act of 1974, 1986, 1996 - 40 CFR Parts 9, 141, and 142 - Federal Register: January 4, 2006 (Volume 71, Number 2), Rules and Regulations Page 387-493.

[4] U.S. EPA Safe Drinking Water Act of 1974, 1986, 1996 - 40 CFR Parts 9, 141, and 142 - Federal Register: January 5, 2006 (Volume 71, Number 3) - Rules and Regulations Page 703-752


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In 2002, new treatment facilities were estimated to cost between $55 and $204 million to construct and millions more to operate on an annual basis. If OHA's variance is revoked, the Water Bureau would likely be required to construct these new treatment facilities. [5]

Second, the rule requires changes to how uncovered finished drinking water reservoirs are managed and operated. The rule requires that water systems with uncovered finished water reservoirs, like those at Mount Tabor and Washington Parks, either cover the reservoirs or provide treatment at the outlets of the reservoirs to inactivate *Cryptosporidium* and viruses. A regulatory schedule for this work has been approved by to the Oregon Health Authority. The bureau is required to eliminate the use of uncovered reservoirs at Mt. Tabor by December 31, 2015 and those in Washington Park by December 31, 2020.

In its 2009 LT2 Storage Recommendation, the Water Bureau estimated that it will cost approximately $400 million to come into compliance with the uncovered reservoir requirements of the rule.

### Lead and Copper Rule

Lead and copper enter drinking water primarily through plumbing materials. Exposure to lead and copper may cause health problems ranging from stomach distress to brain damage. On June 7, 1991, EPA published a regulation to control lead and copper in drinking water. This regulation is known as the Lead and Copper Rule (also referred to as the LCR or 1991 Rule).

In January 1997, the Portland Water Bureau began corrosion treatment, raising the pH of the water to make it less acidic and less likely to leach metals. Corrosion treatment has reduced lead levels at the tap by more than 50% since the City began this treatment in 1997.

### Americans with Disabilities Act[6]

The Americans with Disabilities Act of 1990 (ADA) prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation. ADA requires some new Portland Water Bureau facilities, and in some instances existing facilities, to be brought up to specified accessibility standards.

## Bull Run-Related Legislative and Administrative Protections

A variety of federal legislation, regulatory requirements, administrative actions and agreements affects protection, management, and use of the Bull Run watershed that in turn enables the Water Bureau to provide a reliable water supply to the City of Portland. These include federal statutes specific to Bull Run, federal requirements applicable to national forest land, requirements of other federal agencies applicable to Bull Run, and agreements between the City and the Mt. Hood National Forest. Primary examples include the following:

[5] The Water Bureau has plans for an ultraviolet light (UV) treatment facility (completed in early 2012) to address treatment requirements, should the variance be revoked. The UV treatment option was selected by the Portland City Council as the preferred treatment option in 2009 (Resolution 36720).

[6] 1990, administered through Oregon Structural Specialty Code Oregon Administrative Rules 918-460


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### Federal Statutes and Regulations Specific to Bull Run

- Bull Run Watershed Management Act, P.L. 95-200, (1977) directs the Forest Service to consult and coordinate with the City of Portland to ensure management programs, practices, and standards on watershed lands are protective of drinking water quality
- 2012 Mt. Hood National Forest Closure Order for the Bull Run Watershed Management Unit—Closure Order MH-2012-05 closes forest service lands within the BRWMU to the public
- Oregon Resource Conservation Act (ORCA), P.L. 104-208 (1996), prohibits timber cutting within the hydrographic boundary of the Bull Run River drainage, except as necessary to protect or enhance water quality or for the construction, expansion, protection, or maintenance of water supply, energy transmission, or approved hydroelectric facilities
- Little Sandy Protection Act, P.L. 107-30 (2001), extends the boundaries of the Bull Run Management Unit and applies the land management protections of the 1996 ORCA to the entire management unit

### Federal Requirements Implementing Policy Applicable to National Forest Land

- 1990 Mt. Hood National Forest Land and Resource Management Plan provides guidance for natural resource management.
- 1994 Northwest Forest Plan set management direction for the lands within the range of the northern spotted owl.

### Requirements of Other Federal Agencies

- 1995 Bureau of Land Management (BLM), Salem District, Record of Decision and Resource Management Plan provides guidance for the management of non-native species
- BLM Permanent Closure Order for the Bull Run Watershed Management Unit (2011) closes BLM lands within the BRWMU to public access
- Bull Run Water Supply Habitat Conservation Plan (2009) defines the actions the City will take to address impacts of the Bull Run water supply system on native fish species in the Bull Run River, as regulated by the federal Endangered Species and Clean Water Acts and administered by the National Marine Fisheries Service and the Oregon Department of Environmental Quality

### Agreement with the Mt. Hood National Forest

- The Bull Run Watershed Management Unit Agreement was established in 2007. Under this agreement, the city participates in collaborative efforts to maintain and manage various aspects of the watershed.

## State Mandates

In addition to federal mandates, the City of Portland must also comply with state and regional mandates set through Oregon Revised Statutes and Administrative Rules. Projects to maintain compliance are included in the Bureau's investment strategy.

### Statewide Planning Goals and Guidelines[7]

Statewide Planning Goals and guidelines require the City to maintain policies, service agreements, public facilities plans, and project lists for water service, through the City's Comprehensive Plan and public facilities plan. These plans must be submitted to the Oregon Department of Land Conservation and Development (DLCD) for acknowledgment as consistent with statewide goals.

### Water Rights[8]

To maintain water rights granted by the state, the Portland Water Bureau developed a Water Management and Conservation Plan. This plan was approved by the state in 2010, and reports annual water use. Portland has state statutory right to full flow of the Bull Run and Little Sandy Rivers. The state also granted full extensions for the four primary CSSWF groundwater rights in 2009. The bureau is required to provide plan updates every five years.

### Oregon Structural (OSSC), Mechanical (OMSC) and Electrical (OESC) Specialty Codes[9]

Requires new facilities and in some instances existing facilities to be brought up to new building code standards.

### House Bill 3543 (2007)

The Oregon Legislative Assembly declared that it is the policy of the state of Oregon for state and local governments, businesses, nonprofit organizations, and individual residents to prepare for the effects of global warming and, by doing so, prevent and reduce the social, economic and environmental effects of global warming. House Bill (HB) 3543 (2007) sets greenhouse gas emissions targets for the state of Oregon with goals for progressively lower greenhouse gas emissions every decade until 2050.[10] The City of Portland and Multnomah County have adopted a Climate Action Plan (2009) with a goal of reducing carbon emissions by 80 percent by the year 2050.[11] The City also adopted Resolution No. 36749 directing its bureaus to implement policies and programs related to the Climate Action Plan.[12]

## Regional Plans

### Regional Water Supply Plan

The Regional Water Supply Plan (RWSP) (2004) was adopted by most of the region's individual water providers and is coordinated by the Regional Water Providers Consortium. The RWSP provides a

[7] SB 100, Statewide Planning Goals and Guidelines (OAR 660-011), Compliance procedures (ORS 197, and) Goal 11-Public Facilities and Services

[8] ORS 436 and 437 and OAR 690-086, 690-410, and 690-315 Water Rights - Oregon Water Resources Department (OWRD) Oregon Revised Statutes 436, 537 Oregon Administrative Rules 690-086, 690-410, 690-315

[9] 2007 OSSC – OAR 918-460, 2007 OMSC – OAR 918-440, 2005 OESC – OAR 918-305

[10] Oregon Legislative Assembly. 2007. House Bill 3543. An Act relating to climate change; appropriating money; and declaring an emergency. Salem, Oregon.

[11] City of Portland and Multnomah County. 2009. Climate Action Plan. Portland, Oregon. Available at http://www.portlandoregon.gov/bps/index.cfm?c=49989&a=268612. Accessed November 11, 2009.

[12] City of Portland. 2009. Portland City Council Resolution No. 36749. Adopt the joint City of Portland and Multnomah County Climate Action Plan to reduce local greenhouse gas emissions by 80 percent from 1990 levels by 2050.


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comprehensive, integrated framework of technical information, resource strategies and implementing actions to meet the water supply needs of the Portland Metropolitan Area to the year 2050.

### Metro Regional Framework Plan (2005) - METRO

In 1992, the region's voters adopted a Metro charter for Metro which gave Metro jurisdiction over matters of metropolitan concern and required the adoption of a Regional Framework Plan. The Regional Framework Plan unites all of Metro's adopted land use planning policies and requirements. The charter directs Metro to address the water sources and storage in the plan. The Regional Framework Plan, originally adopted in 1997, was amended in 2005, 2010 and 2011 and contains regional policies contained in the Regional Urban Growth Goals and Objectives (RUGGO), 2040 Growth Concept, Metropolitan Greenspaces Master Plan and Regional Transportation Plan to create a coordinated, integrated Regional Framework Plan.

The Metro 2040 Growth Concept provides a structure for the preferred form of regional growth and development in the Portland metropolitan region. The Water Bureau will need to provide the water infrastructure to meet demands associated with projected population densities.

Section 4.1 of the Regional Framework Plan acknowledges the Regional Water Supply Plan developed and adopted by the Regional Water Providers Consortium. It is the policy of Metro to:

- Promote and achieve regional water conservation and demand management goals as defined in the Regional Water Supply Plan;
- Promote the coordination between regional growth management programs and water supply planning;
- Promote the coordination between land use planning and achieving goals of the Regional Water Supply Plan and;
- Set benchmarks and evaluate achievement of the targets and goals established in the Regional Water Supply Plan in coordination with the region’s water providers.

### Urban Growth Management Functional Plan - Title 6 (Metro Code Sections 3.07.610 - 3.07.650) - Centers, Corridors, Station Communities and Main Streets - METRO

The Urban Growth Management Functional Plan was adopted by the Metro Council and codified in Section 3.07 of the Metro Code. The purpose of this functional plan is to implement regional goals and objectives contained in the Regional Framework Plan.

The Regional Framework Plan identifies Centers, Corridors, Main Streets and Station Communities throughout the region and recognizes them as the principal centers of urban life in the region. Title 6 calls for actions and investments by cities and counties, complemented by regional investments, to enhance this role. The Portland Water Bureau is expected to complete infrastructure improvements as needed in order to support activities related to development of these urban environments.


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### Portland Watershed Management Plan

The Portland Watershed Management Plan (PWMP) is intended to guide City decisions and projects by providing a comprehensive approach to restoring watershed health. The Water Bureau collaborates with other City bureaus on projects like green streets, land acquisition, floodplain restoration and fish and wildlife habitat protection.

## Goals & Policies

Draft Goals and Policies related to Water Facilities and services can be found in Chapter 5. Key Infrastructure Policies.

## Investment Strategy

The Portland Water Bureau's Investment Strategy for the Citywide System Plan is divided into seven (7) primary programs: Supply, Transmission and Terminal Storage, Distribution, Treatment, Regulatory Compliance, Customer Service, and Administration & Support. The Water Bureau anticipates over $1.5 billion in new investment in these programs over the next twenty years, see Table 7.3. This chapter and Appendix A. Investment Strategy provides greater detail on anticipated water projects and investments.

Table 7.3 Investment Strategy Summary

| Program | FY 2013-2018 | FY 2018-33 |
|---|---|---|
| Supply | $14,291,000 | $88,500,000 |
| Transmission and Terminal Storage | $191,170,000 | $242,000,000 |
| Distribution | $244,197,288 | $461,650,000 |
| Treatment | $2,500,000 | $150,000,000 |
| Regulatory Compliance | $25,504,000 | $30,000,000 |
| Customer Service | $3,057,000 | $53,700,000 |
| Support | $10,000,000 | $50,500,000 |
| **TOTAL** | **$490,719,288** | **$1,076,350,000** |


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# Supply System[13]

The primary drinking water source for Portland is the Bull Run watershed, supplemented by a groundwater supply from the Columbia South Shore Well Field (CSSWF) and the wells in the former Powell Valley Road Water District. The Bull Run watershed is located east of Portland and just north of the western foothills of Mt. Hood; the CSSWF is south of the Columbia River and east of the Portland International Airport, see Figure 7.5. The former Powell Valley Road Water District is located in southeast Portland, near Powell Butte.

Since 1895, Portland has relied on the Bull Run watershed as its principal source of supply. Rainfall runoff and snowmelt from within the watershed are captured in the Bull Run storage system, which includes Bull Run Lake, and Reservoirs 1 and 2, all located on the Bull Run River. At Reservoir 2, water enters the Headworks, the origination point of the three conduits that convey water from the Bull Run system to Powell Butte Reservoir. Until 2015 and 2020 respectively, water from Powell Butte will be supplied to Mt. Tabor and Washington Park reservoirs. These reservoirs have served as terminal storage for the water supply transmission system, and as central points for distributing water into the retail water system. As these facilities are decommissioned, water from Powell Butte will follow one of three paths: to Kelly Butte, an enclosed underground storage facility; to other terminal storage-system reservoirs; or through large transmission mains to the distribution system and/or wholesale customers.

The federal Safe Drinking Water Act, which regulates public drinking water supplies, typically requires surface water supplies to be filtered to meet federal drinking water standards. Because the Bull Run source water quality is very high and Portland implements source water protection measures, Portland is currently exempt from filtration requirements. Portland's water supply is disinfected using chloramines. Water is chlorinated at the Headworks at Reservoir 2. Ammonia and caustic soda are added at a second treatment facility, Lusted Hill.

Since 1985, Portland has used groundwater from the Columbia River South Shore Well Field as an emergency seasonal supply and as a backup supply when winter storms cause high turbidity in the Bull Run watershed. The groundwater supply comes from three aquifers along the south shore of the Columbia River. The system includes 27 wells, one storage tank, a groundwater booster pump station, and a treatment facility. Portland also has access to wells previously owned by the Powell Valley Road Water District.

## Wholesale Customers

The Water Bureau supplies water to its wholesale customers; the City of Portland does not typically receive water from any sources owned or operated by its wholesale customers. The City's water supply system is interconnected with other water suppliers including the City of Lake Oswego, the City of Milwaukie, and Clackamas River Water. Portland is able to receive water from these other sources on a limited basis in an emergency.

[13] Portland Water Bureau, Distribution System Master Plan and Portland Water Bureau, Water Management and Conservation Plan


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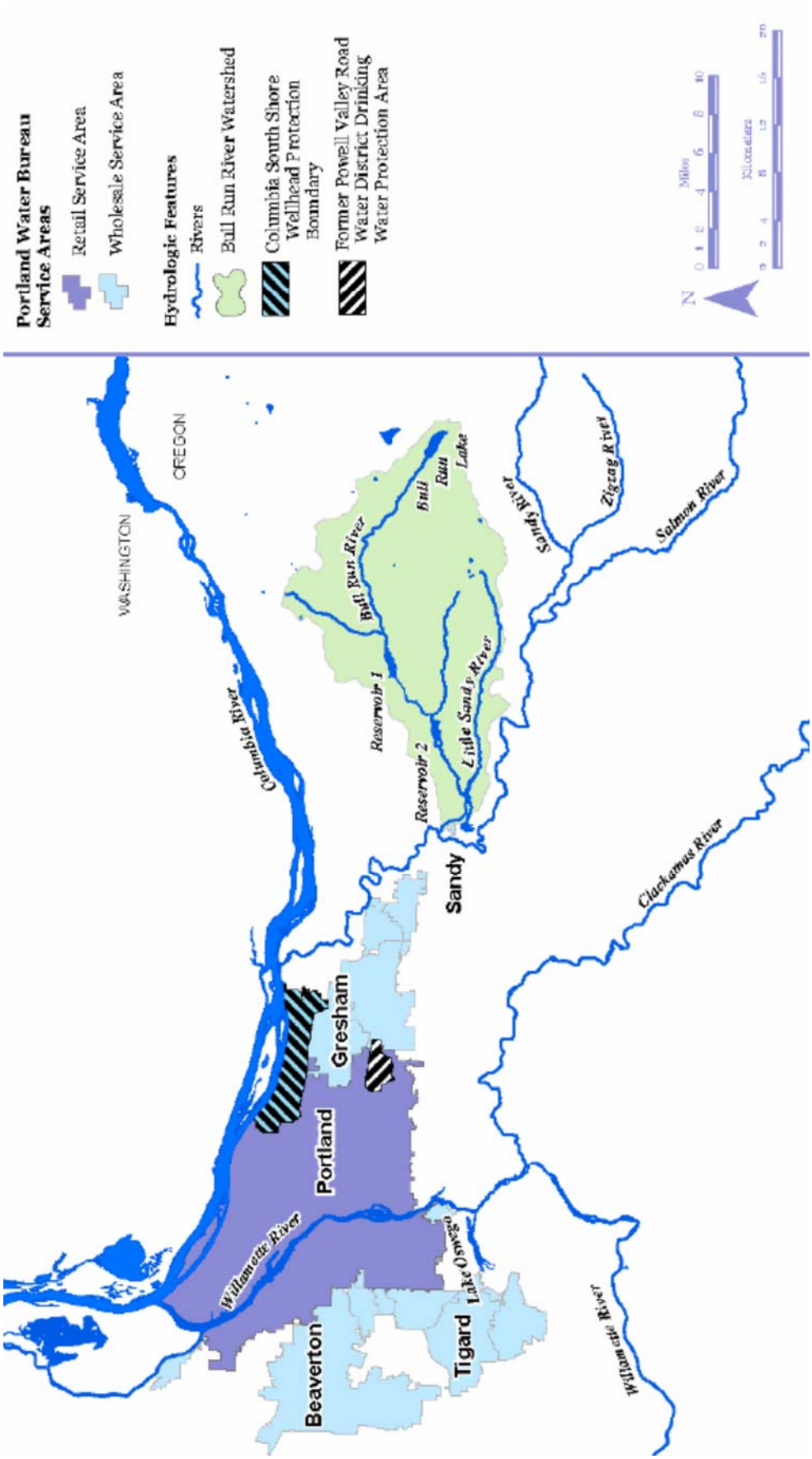
Figure 7.5 Drinking Water Supply System Water Sources





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# Bull Run Watershed

## Inventory

The water of the Bull Run River is primarily impounded in two reservoirs: Reservoir 1, completed in 1929, and Reservoir 2, completed in 1962. Periodically, the Water Bureau relies on storage capacity in Bull Run Lake, a natural lake that is upstream of the headwaters of the Bull Run River, to enhance the supply of the two reservoirs.

At the Headworks facility below Dam 2, the raw water is disinfected. The water then flows to the Lusted Hill facility for further treatment, and is fed by gravity to the terminal storage, transmission, and distribution systems. The Bull Run water system includes facilities for generating hydropower. The Portland Hydroelectric Project's hydropower facilities at Dams 1 and 2 generate electricity that the city sells to Portland General Electric (PGE).

The Water Bureau's facilities in the Bull Run Supply system are served by a network of 123 miles of roads and 11 bridges. In total, infrastructure assets in the Bull Run supply system have a 2013 replacement value of $782 million.

## Current Condition

The vast majority of assets in the Bull Run watershed are in fair to good condition, see Table 7.2. Eight percent of assets are in poor condition; two percent are in very poor condition.

## Adequacy and Reliability of Supply

The Bull Run watershed is the city's primary water source. The approximate median annual water yield from the Bull Run watershed (measured at Headworks) is 180 billion gallons. The median annual diversion for water supply is approximately 20 percent of the total median yield. The reservoirs in the Bull Run are recharged during the fall, winter, and spring when rainfall is abundant. During the dry summer months (starting in June or July), the reservoirs are drawn down. This drawdown period typically lasts until early October but can sometimes last until November or December. During this period, the water flowing out of the reservoirs exceeds the water flowing into the reservoirs from rainfall and tributary flow.

Water demand varies annually, driven primarily by weather. In warm, dry summers when demand is high, the yield from the Bull Run watershed is at its lowest. In cool wet summers, water demand is often lower and yield from the Bull Run tends to be higher.

The duration of the dry season is also important because it determines the time period during which the city will rely on the limited storage in the watershed's reservoirs. Long dry seasons increase the proportion of groundwater that the city uses to meet demand before fall rains return.

The two Bull Run reservoirs are relatively small in comparison to the amount of precipitation and stream discharge in the basin. The reservoirs are not large enough to provide a multi-year water supply. Refill each winter is necessary to ensure supply for the following summer.


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Over the last 20 years, the city has examined a number of options for increasing water storage in the Bull Run system. In the future if necessary, the city will continue to explore these and other options, such as water efficiency and conservation, to meet long-term water supply needs.

## Columbia South Shore Well Field

The Columbia South Shore Well Field (CSSWF) is the second-largest developed water source in the state (after the Bull Run Supply), and the largest developed groundwater source in the state. Located on the floodplain of the Columbia River northeast of downtown Portland, this 11-square-mile area spans the boundaries of three cities: Portland, Fairview, and Gresham. The wells in the well field provide water when the Bull Run supply is shut down due to emergency conditions such as turbidity events, landslides, fires, or other natural or human-caused disruptions. The groundwater system is also a supplemental supply to meet demands during the summer peak season as needed.

### Inventory

As of 2013, there are 27 wells in the CSSWF.[14] These wells draw on three aquifers: the Sand and Gravel Aquifer (SGA); the Troutdale Sandstone Aquifer (TSA), and the Blue Lake Aquifer (BLA). The sum of the nominal instantaneous pumping capacity for all of these wells is approximately 103 to 118 million gallons a day (MGD), based on the maximum pumping rates of the individual wells. In use, the well field has an empirically determined initial 30-day operating capacity of approximately 90 MGD. A large pump station moves water to the city's Powell Butte Reservoir, where it is mixed with Bull Run water (unless the Bull Run supply is off-line).

### Current Condition

The wells in the CSSWF are primarily in good or fair condition (53% and 41%, respectively). Collection mains are primarily in good to very good condition (85% and 13%, respectively). The treatment facility is in good condition and the pump station is in fair to good condition. Additional condition information can be found in Table 7.2.

### Supplemental and Emergency Use of the CSSWF

According to the Seasonal Water Supply Augmentation and Contingency Plan—also referred to as the Summer Supply Plan (SSP), the CSSWF is used for supplemental and emergency supply under the following conditions:

- Supply Augmentation: Groundwater may be used to augment the Bull Run supply to meet demand during seasonal warm dry periods when the Bull Run water supply is not sufficient to meet the needs of the bureau's retail and wholesale customers; to maintain in-stream flows for fish habitat; or if water demand exceeds the conduit capacity long enough to deplete in-town storage below safe levels.[15]

[14] A map of the Columbia South Shore Well Field can be found in Figure 2-3 of the *Water Management and Conservation Plan*, 2010.
[15] Conduit capacity may be exceeded if demand is exceptionally high or if one or more of the conduits is out of service.


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- Turbidity Event Augmentation: Groundwater may be needed to augment or replace the Bull Run surface supply to avoid violating state and federal drinking water standards for turbidity. Turbidity in the surface water supply is typically caused by storm events in the Bull Run watershed.
- Emergency Use: Groundwater may be needed during catastrophic events (in addition to turbidity events) that would cause a loss of part or all of the Bull Run surface water supply. Catastrophic events include, but are not limited to, severe or extended drought, fire in the watershed, flood, landslides, volcanic activity, earthquakes, and acts of vandalism or terrorism. Any of these events could cause significant water quality problems or result in damage to, or shutdown of, the conduits or other critical infrastructure used to transfer Bull Run water to the Bureau's in-town reservoirs. An example of a catastrophic event in the watershed was a landslide in 1995 that damaged two conduits. Groundwater was used for 27 days and provided an average of 25.4 MGD to the distribution system.[16]

### Contamination and Remediation

The City of Portland has an extensive network of monitoring wells. The bureau tracks groundwater quality and changes in groundwater levels over time in multiple aquifers within the CSSWF. Data from city groundwater quality monitoring indicate that the deep confined aquifers Portland uses for drinking water are free of contamination within the capture zones of active wells.

Anthropogenic, or human-related, contamination was first discovered in shallow groundwater aquifers near the well field in the 1980s. Since the early 1990s, the city has worked closely with the Oregon Department of Environmental Quality (ODEQ) to expedite the discovery, assessment, and remediation of contaminant sources and plumes, and to keep the well field operational. Remediation technologies used to remove contaminants from soil and groundwater include pump-and-treat, soil vapor extraction, electro-resistive heating, air sparging, and chemical and biological treatment. Remediation in the CSSWF is nearly complete.

High concentrations of naturally-occurring manganese in two wells have limited the ability of the Water Bureau to utilize these wells. Manganese can cause water discoloration which can affect laundry businesses served by the Water Bureau. The Water Bureau avoids using the high-manganese wells unless no Bull Run supplies are available and the full capacity of the well field is needed.

### Groundwater Protection Program

The Groundwater Protection Program, adopted in 2003 and updated in 2010, replaced existing programs in Portland and Fairview and initiated a program in Gresham. The Groundwater Protection Program requires businesses that use, store, or transport hazardous material above a certain threshold amount to implement best management practices to prevent chemical spills.

Regulated businesses in Portland are inspected every two years as part of their regular fire inspection to ensure the business is in compliance with the program requirements. In Gresham and Fairview,

[16] Although the average is 25.4 MGD, the actual amounts per day varied widely.


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inspections are conducted by Gresham watershed management staff. The Water Bureau and its partners provide free technical assistance to businesses on compliance issues.

The Columbia South Shore Well Head Protection Area delineation was certified by the Oregon Health Authority Drinking Water Program in 2003. A certified wellhead protection area is considered a significant groundwater resource under Statewide Planning Goal 5 if the public water system served by the wellhead area has a service population greater than 10,000 and relies on groundwater as the primary or secondary source of drinking water. Local governments are required to develop a program to reduce the risk of groundwater contamination in such areas. In June 2008, the Department of Environmental Quality certified the Columbia South Shore Well Field Protection Program, which addresses Goal 5 requirements for protecting these groundwater resources.

### Adequacy and Reliability of Supply

The Portland Water Bureau has not experienced any major supply deficiencies in the last 10 years. Supply capacity and reliability were both enhanced in the mid-1980s by the development of a high-quality secondary source of drinking water in the Columbia South Shore Well Field (CSSWF). The CSSWF can be used in the event of a supply shortage in the Bull Run watershed. In the past ten years, water from the CSSWF has been used to augment Bull Run supply due to turbidity, for summer supply augmentation, and for maintenance runs. As of December 31, 2012, the CSSWF has been used a total of 29 times—10 times for turbidity events in Bull Run, once for a landslide that took two of the three conduits out of service, 13 times for summer supply augmentation, and five times for maintenance reasons.

Current well field capacity is sufficient to meet short-term (less than 30-day) emergency needs during the non-peak-season. The current capacity of the well field system is not sufficient to meet demand during a full shutdown of the Bull Run system due to emergencies or catastrophic events for periods longer than 30 days. Groundwater availability may also be limited in the future due to increased withdrawal from the aquifer by full-time and growing municipal users in Oregon and Clark County, Washington.

The city has evaluated several options for maintaining and improving the adequacy and reliability of supplies from the Bull Run watershed and the CSSWF... The results of these studies indicate that developing supplies in the CSSWF is the most cost-effective option.

The Water Conservation and Management Plan (2010) anticipates the potential development of 53 MGD in the CSSWF by 2028 to meet the annual average water demand of the current retail and wholesale service areas.


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## Former Powell Valley Road Water District Wells

On July 1, 2005, the City of Portland annexed areas served by the Powell Valley Road Water District (PVRWD) in southeast Portland, northwest of Powell Butte. Residents of this former water district are now served by the Portland Water Bureau's retail system. Under an intergovernmental agreement, Portland assumed control of all of the district's assets, including six active wells.[17] The PVRWD assets included water rights and water infrastructure. The installed capacity of the Powell Valley wells can be as much as 8.6 MGD, however less than half of this capacity is currently available.[18] Several capital improvement projects are planned to repair various facilities and fully integrate the wells into the Water Bureau system. These projects may be completed in three to ten years.

The former Powell Valley Road Water District wells are in good condition, are productive, and do not have significant water quality issues. In the future, the Water Bureau intends to upgrade these facilities to allow connection of these wells to the main system through Powell Butte. This integration would allow the bureau to increase capacity if needed and to blend well water with water from the Bull Run watershed and/or CSSWF before it enters the distribution system. The Powell Valley Road Water District's wells had a state certified delineation and approved wellhead protection plan (July 1998) at the time of annexation. This protection plan is non-regulatory and relies on best management practices. The Portland Water Bureau reassessed the delineation with an updated methodology and received certification from OHA in October 2010. The protection plan needs to be updated and submitted for re-approval.

The state-approved WMCP includes the potential use of 7.36 MGD of the developed supply to meet future demands.

## Current & Projected Demands

Table 7.4 summarizes existing and 2030 retail demands for the distribution system by service area. The 2005 average daily demand was 61.5 mgd.[19] The Distribution System Master Plan, finalized in 2007, estimated that the average daily retail distribution-system demand for 2030 is projected to increase to 70 mgd. Historically, per capita demand in the retail area has shown a steady downward trend since 1993. However, current demand forecasts project relatively steady total demand through 2015, with an upward trend thereafter based on population increase.

Regional population forecasts from Metro, the state-approved Water Management and Conservation Plan, finalized in 2010, estimate the average system-wide demand to be between 132 and 138 million gallons a day. According to the Water Management and Conservation Plan (2010) the average and peak demand for the total service area is anticipated to increase 21% between 2007 and 2030.

[17] A map of the former Powell Valley Road Water District can be found in Figure 2-4 of the *Water Management and Conservation Plan*, 2010.
[18] Additional information on these wells, including size, depth, and capacity can be found in Table 2-2 of the Portland Water Bureau's Water Management and Conservation Plan.
[19] A 2005 demand of 64 mgd was used in capacity evaluations, projected from 2002 demand data at the outset of the study.


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Table 7.4 Existing and Projected Retail Water Demands[20]

| Service Area | 2005 - Daily Demand Avg (mgd) | 2005 - Daily Demand Peak (mgd) | 2030 – Daily Demand Avg (mgd) | 2030 – Daily Demand Peak (mgd) | Service Area | 2005 - Daily Demand Avg (mgd) | 2005 - Daily Demand Peak (mgd) | 2030 – Daily Demand Avg (mgd) | 2030 – Daily Demand Peak (mgd) |
|---|---|---|---|---|---|---|---|---|---|
| Arlington Heights | 0.7 | 1 | 0.9 | 1.3 | Powell Butte Pump | 0.02 | 0.03 | 0.03 | 0.05 |
| Arnold | 0.5 | 1 | 0.6 | 1.2 | Powell Butte | 0.2 | 0.4 | 0.4 | 0.7 |
| Bertha | 0.5 | 1.1 | 0.6 | 1.3 | PV Pump | 0.03 | 0.05 | 0.03 | 0.1 |
| Broadway | 0.2 | 0.4 | 0.3 | 0.5 | PV Raymond | 1 | 1.8 | 1.3 | 2.3 |
| Burlingame | 1.9 | 3.3 | 2.1 | 3.7 | PV 415 | 2.9 | 5.1 | 3.6 | 6.5 |
| Calvary | 0.6 | 1 | 0.8 | 1.3 | Rocky Butte Pump | 0.02 | 0.03 | 0.02 | 0.04 |
| Council Crest | 0.3 | 0.8 | 0.4 | 1.1 | Rocky Butte | 0.2 | 0.3 | 0.2 | 0.4 |
| Clatsop Pump | 0.1 | 0.2 | 0.1 | 0.2 | Rose Parkway | 0.3 | 0.6 | 0.3 | 0.7 |
| Clatsop | 0.2 | 0.3 | 0.2 | 0.4 | Saltzman | 0.001 | 0.003 | 0.002 | 0.004 |
| Denver | 0.9 | 1.6 | 1 | 1.7 | Sherwood Field | 0.5 | 0.9 | 0.6 | 1.2 |
| Greenleaf | 1 | 1.6 | 2.1 | 3.5 | Stephenson | 0.4 | 0.7 | 0.4 | 0.7 |
| Lexington | 0.2 | 0.4 | 0.3 | 0.5 | Stephenson Pump | 0.1 | 0.1 | 0.1 | 2 |
| Linnton/Whitwood | 0.1 | 0.2 | 0.2 | 0.3 | Tabor 302 | 10.6 | 15.6 | 12.7 | 18.7 |
| Marquam | 0.7 | 1.2 | 0.9 | 1.6 | Tabor 4112 | 15.1 | 22.7 | 16.9 | 25.4 |
| Mt Scott | 0.2 | 0.4 | 0.3 | 0.5 | Tabor 590 | 0.3 | 0.5 | 0.3 | 0.5 |
| Nevada | 0.1 | 0.2 | 0.1 | 0.2 | Vermont | 1.6 | 2.5 | 1.8 | 2.7 |
| Parkrose | 1.9 | 3.6 | 2 | 3.9 | Vernon3 | 10 | 15.2 | 12.1 | 18.2 |
| Penridge | 0.04 | 0.1 | 0.1 | 0.2 | Willalatin | 0.1 | 0.3 | 0.3 | 0.8 |
| Pittock | 0.04 | 0.1 | 0.1 | 0.1 | Washington Park 229 | 6.2 | 9.8 | 8.9 | 14 |
| Portland Heights | 0.6 | 1 | 0.8 | 1.3 | Washington Park 299 | 3.7 | 5.8 | 5.2 | 8.2 |
| **Totals[4]** | **64.2** | **102.6** | **79.2** | **126.6** | | | | | |

1 Willamette Heights service area demands are included in Sherwood service area total.
2 The demands for Tabor 411 include Tabor 338.
3 The demands for Vernon include Vernon 224, Vernon 270 and Vernon 362.
4 The area served via Rockwood WD is not included in the total. The average daily demand for this area is estimated to be 0.3 mgd with a peak demand of 0.5 mgd. In the future the average daily demand will remain the same and the peak demand will rise to 0.6 mgd.

## Wholesale Water Agreements

The Portland Water Bureau has wholesale water sales agreements with 20 water purveyors in the Portland, Oregon metropolitan area, including cities, water districts, and private water companies.

Portland can potentially sell water to a wholesale population of 450,000 and routinely provides wholesale service to over 375,000 people. Annual wholesale water sales account for 12 percent of annual water sales and about 40 percent of annual water demand. These agreements require the Portland Water Bureau to meet specific levels of service.

[20] Portland Water Bureau, Distribution System Master Plan, June 2007 (Table 2-4)


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Table 7.5 Portland Water Bureau Wholesale Agreements[21]

| 5-Year Agreement | 10-Year Agreement | 20-Year Agreement |
|---|---|---|
| GNR Water Company | Pleasant Home Water District | Burlington Water District |
| Green Valley Water Company | Lake Grove Water District | City of Gresham |
| Hideaway Hills Water Company | City of Tigard | City of Sandy |
| Lorna Water Company | City of Tualatin | Lusted Water District |
| Skyview Acres Water Company | Tualatin Valley Water District | Palatine Hill Water District |
| Two Rivers Water Association | | Raleigh Water District |
| | | Rockwood Water PUD |
| | | Valley View |
| | | West Slope Water District |

## Needs & Approach

### Bull Run Supply

Although the demand needs are not critical at this juncture, the City will, if it becomes necessary, explore options for increasing water storage in the Bull Run system in order to meet long-term water supply needs.

### Groundwater Supply

Current well field capacity is sufficient to meet short-term (less than 30 days) emergency needs during the non-peak-season. The current capacity of the well field system is not sufficient to meet demand during a full shutdown of the Bull Run system due to emergencies or catastrophic events for periods longer than 30 days. Groundwater availability may also be limited in the future due to increased withdrawal from the aquifer by full-time and growing municipal users in Oregon and Clark County, Washington.

## Asset Management Plans

Asset management plans are being developed for the Bull Run Supply and Groundwater Supply. These plans will help identify maintenance, repair and replacement strategies necessary to maintain and improve the water system.

## Recommended Supply System Improvements

### Bull Run Watershed

The function of this program is to allocate funds for the capital projects necessary to maintain, improve, and protect the watershed facilities that are not directly related to the water supply system facilities. This includes Bull Run watershed road reconstruction to ensure continuous, reliable, and safe access to all facilities, as well as maintenance of other city-owned infrastructure within the watershed.

The Dam 2 Tower Improvements Project provides for modification of the north tower inlet to allow selective-depth withdrawal from Bull Run Reservoir 2. The intent is to help regulate temperatures for flows

[21] Portland Water Bureau, 2014.


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released to the lower Bull Run River to comply with Clean Water Act requirements and to improve water quality by providing flexibility during turbidity events. The anticipated completion date is 2014.

### Dams and Headworks Repair and Rehabilitation

This program provides for assessment of the condition and rehabilitation of dams and facilities at Headworks. As many of these facilities are between 50 and 70 years old, their safe and reliable operation requires ongoing investment. The program includes preliminary engineering and design of needed repairs, rehabilitation of these facilities, and actual repair work.

### Columbia South Shore Well Field

The Columbia South Shore Well Field (CSSWF) is Portland's alternative supply of water should the Bull Run watershed supply be interrupted for any reason. Projects funded in this program improve the maintenance of this aging infrastructure, including repairs, selective replacements and upgrades.

### Groundwater Collection Main Hardening

Much of the piping connecting the wells to the Groundwater Pump Station is located in liquefiable soils which are vulnerable during a seismic event. This project would design and install measures to "harden" the piping and reduce this vulnerability.

### Groundwater Electrical Improvements

This project designs and constructs a new 115kV/4160V transformer and other components to complete a double-ended electrical substation at the Groundwater Pump Station. It will also design and construct a 5kV main breaker replacement and purchase selected spare components.

### Groundwater Pump Station (GWPS) Expansion

As water demand increases, the bureau will need to increase the available flows from the groundwater system. The system expansion will include upgrade of the Groundwater Pump Station to provide additional capacity.

### Groundwater Well Field Expansion

As water demand increases, the bureau will need to increase the available flows from the groundwater system. The system expansion will include additional well development and collection mains in the Columbia South Shore area.

### Groundwater Well Field Reliability Enhancements

The bureau is attempting to increase its flexibility and preparedness to meet the future challenge of an interruption of Bull Run water. The bureau is improving its emergency preparedness by evaluating electrical vulnerability for the pumping system, reviewing the flood inundation vulnerability of the site, and developing a groundwater intertie that would reduce transmission system vulnerability. The inundation review may be partially completed through a partnership with Multnomah County Drainage District.


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### Powell Valley Well Improvements

The project includes upgrade of the facilities in the previous Powell Valley Road Water District area and connection and integration of these facilities to the Portland Water Bureau's water system.

# Transmission and Terminal Storage System

## Inventory

Three large-diameter conduits carry the water from the Bull Run watershed to the Water Bureau's in-town storage and distribution system. The conduits have interconnections in three places to ensure reliability, should one or two conduits fail. The water flows downhill from an elevation of 735 feet above mean sea level (MSL) then through the Lusted Treatment facility to Portland's easternmost storage reservoir on Powell Butte, at 530 feet above MSL. Alternatively, groundwater can be pumped to Powell Butte from the Columbia South Shore Well Field through the Groundwater Pump Main when the Bull Run Supply is not available or limited. When water is supplied from both Bull Run and the Columbia South Shore Well Field, the water is blended at Powell Butte. See Figure 7.6 for a schematic diagram of the City's water system.

The Water Bureau maintains water storage, or reservoirs, to provide for daily fluctuation of water use, to fight fires, and to provide time to connect to emergency sources of supply when primary sources are unavailable. In 2012, the terminal storage in Portland's water system consists primarily of Powell Butte Reservoir 1, Mount Tabor Reservoirs 1, 5 and 6, and Washington Park Reservoirs 3 and 4. It also includes storage at Kelly Butte, Sam Jackson and Mayfair. After 2012, the terminal storage system will undergo changes in response to regulations. The system will be reconfigured so that water from Powell Butte will be directed along multiple paths: to Kelly Butte, an enclosed underground storage facility; to the terminal storage-system reservoirs, or through large transmission mains to the distribution system and/or wholesale customers.

## Current Condition

The transmission system's 75 miles of conduits is primarily in fair to good condition, although an estimated 12% is in poor or very poor condition. More detailed condition assessments of the conduits are needed. The Washington County Supply Line and Groundwater Pump Main are primarily in good condition (91%), while the Mt. Tabor to Washington Park transmission mains are in fair to good condition.

Terminal storage located at Mount Tabor and Washington Park are classified as uncovered reservoirs, and therefore must be decommissioned or covered as part of the federal LT2 regulations. The Mount Tabor and Washington Park reservoirs are ranked in the condition assessment as poor. As a result of the LT2 regulations, plans are currently underway to build additional terminal storage at Powell Butte (Reservoir #2) and replacement storage at Kelly Butte to replace the function of the Mount Tabor Reservoirs. Design work to replace the uncovered reservoirs at Washington Park is under way.

Terminal storage at Sam Jackson and Mayfair is considered to be in fair condition.


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## Current Capacity

The conduits have a combined maximum capacity of approximately 212 MGD. The current average annual demand (retail plus wholesale) is approximately 100 MGD. Peak-day demand is approximately 170 MGD. At this time, transmission capacity is available to meet demands when all facilities are in operation. However, transmission system outages and vulnerability remains a concern.

Total storage capacity of the terminal storage reservoirs is currently approximately 195 million gallons (MG). This will be reduced to 148 MG through the elimination of the uncovered reservoirs and construction of new covered storage.

## Projected Capacity

At the point in time that peak-day demands are projected to exceed the capacity of the three conduits, Conduit 5 will likely be required. Peak-day demands are not expected to exceed the capacity until near the end of the time period covered by this plan, or later.

Terminal storage capacity will be 148 MG for the time period covered in this plan.

## Needs & Approach

The conduits are a critical part of the supply system and represent a significant financial investment for the Water Bureau. Gaining better information on the condition of the conduits and providing the necessary maintenance is therefore of great importance to the Bureau. This work has begun with the completion of a Conduits Asset Management Plan. Over the next few years, the City will need to invest to help improve knowledge of the condition of the conduits. The recently constructed Sandy River crossing reduced vulnerability and replaced conduit sections that were considered in poor condition. A new seismically hardened Willamette River crossing is also planned and included in the capital improvement plan.

Replacement of terminal storage reservoirs is expensive—significant funding is needed to complete the new storage within the time frames required by EPA.[22] Additional transmission main improvements will also be required as part of the reservoir replacement work. An asset management plan for terminal storage is currently being developed. This plan will help identify projects and replacement strategies necessary to maintain and improve the system.

An overall seismic evaluation of the Transmission and Terminal Storage system is recommended.

## Recommended Transmission and Terminal Storage System Improvements

### Conduits and Transmission Mains

The conduits that bring water to Portland from the Bull Run watershed are large pipes - 56 to 72 inches in diameter. This program funds repairs, replacements and upgrades to the conduits. In future years, the

[22] See the bureau's website on Uncovered Reservoirs, http://www.portlandoregon.gov/water/article/330807, for the most up-to-date information.


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Portland Water Bureau plans to upgrade 4-5 miles of conduits each year at an estimated cost of $4-$5 million per mile.

### Conduit 5

This project would include installation of sections of a new Conduit 5 as growth occurs and the condition of the existing conduits worsens.

### Kelly Butte Reservoir

This project would increase storage capacity from 10MG to 25MG by replacing the existing tank with a buried reservoir. The project includes site access, construction access and easements, staging areas, and on-site storage areas. This project establishes Kelly Butte as a key facility that will be used for system pressure equalization and in-town terminal storage in lieu of the Mt. Tabor uncovered reservoirs.

### New Conduit Intertie

This project would address concerns about the capability of the conduit system to withstand hazards and deliver an uninterruptible supply to the City. The project will connect the conduits through additional piping and valving to improve reliability of flow during emergency conditions and for maintenance by providing additional isolation and interconnectivity.

### Powell Butte Reservoir 2

This LT2-related project is being constructed in two phases – Phase 1 is complete. The project is currently in Phase 2, the construction of a 50-million-gallon buried reservoir at Powell Butte. It includes a short section of Conduit 5, construction of a maintenance and storage facility, replacing the caretaker's house, construction of an interpretive center and restrooms, reservoir overflow facilities, park improvements and mitigation requirements (required in the 2003 Land Use Review Type III Conditional Use Master Plan).

### Powell Butte Reservoir 3

This project constructs a third reservoir at Powell Butte and possible bypass piping around the Butte for additional system reliability.

### Sandy River Conduit Relocation, Phase II

The bureau is committed to increasing the flexibility and preparedness to meet the future challenge of a natural disaster. Conduits 2, 3, and 4 were identified in the system vulnerability study as vulnerable to seismic, volcanic, flood, and other natural and human-caused hazards. This project will relocate the Sandy River crossings of Conduit 3. The replacement of crossings of Conduit 2 and 4 have already been completed.


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### Sandy Wholesale Connection

The project consists of the design and construction of a wholesale meter connection for the City of Sandy to the Portland Water Bureau's supply and is anticipated to be completed early 2014.

### Tabor Reservoir Adjustments

This project includes adjustments to piping, structures and other features at Mt. Tabor in order to move storage elsewhere and physically disconnect the uncovered reservoirs from the public water system for compliance with LT2. The project does not include disposition of the reservoirs after they have been disconnected from the public water system.

### Washington Park Reservoir 3

The project will plan, design and construct a new buried reservoir to replace uncovered Reservoir 3. This project is one solution toward compliance with LT2 replacement of the uncovered reservoirs. It is assumed that Reservoir 4 will be used as the overflow detention structure. The covered Reservoir 3 will likely retain its visual characteristics and historical features.

### West Side Transmission Main Improvements

These mains include the Sam Jackson to Downtown Pipeline and the Jefferson Street Supply mains. These new large transmission mains will strengthen the supply to terminal storage located on the west side of the Willamette River.

### Wholesale Connections

This project provides for facilities serving wholesale customers including repairs, replacements, and upgrades of pump stations and meters.

## Distribution System

The retail distribution system within the City of Portland comprises approximately 2,200 miles of mains connected to 67 active storage tanks and reservoirs and 39 pump stations, located in 42 service areas. The distribution system configuration has evolved over the past 100+ years in response to changing requirements and regulation. Many parts of the system originated as small, independent water districts that have been incorporated into the Portland Water Bureau's system over the years. Table 7.6 lists the retail distribution service areas and the number of service connections (according to Water Bureau maps as of August 2006). The distribution systems for wholesale water customers are owned and managed by other water service providers and are not included in this report.


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Table 7.6 Service Connections by Service Area

| Service Area | # of Connections | Service Area | # of Connections |
|---|---|---|---|
| Arlington Heights | 825 | Powell Butte Pump | 50 |
| Arnold | 1,548 | Powell Valley Road 415 | 3,782 |
| Bertha | 1,730 | Powell Valley Road Pump | 15 |
| Broadway | 604 | Powell Valley Road Raymond | 2,000 |
| Burlingame | 7,816 | Rocky Butte | 892 |
| Calvary | 643 | Rocky Butte Pump | 46 |
| Clatsop | 438 | Rose Parkway | 766 |
| Clatsop Pump | 277 | Saltzman | 8 |
| Council Crest | 1,334 | Sherwood | 679 |
| Denver | 225 | Stephenson | 1,383 |
| Greenleaf | 2,414 | Stephenson Pump | 379 |
| Lexington | 526 | Tabor 302 | 32,362 |
| Linnton/Whitwood | 192 | Tabor 411 | 59,070 |
| Marquam | 170 | Tabor 590 | 888 |
| Mt Scott | 699 | Vermont | 3,650 |
| Nevada | 144 | Vernon 224 & 270 | 15,932 |
| Parkrose | 4,167 | Vernon 362 | 18,545 |
| Penridge | 37 | Washington Park 229 | 5,223 |
| Pittock | 78 | Washington Park 299 | 4,297 |
| Portland Heights | 1,323 | Willalatin | 213 |
| Powell Butte | 431 | Willamette Heights | 292 |
| **Total Service Connections** | **176,093** | | |

Figure 7.2 presents a map showing the locations of service areas. Figure 7.6 is a schematic of the City's system, showing key Bull Run and CSSWF supply and transmission facilities, and key distribution system pipelines, pump stations and storage tanks.

Service areas east of the Willamette River are shown on the right side of Figure 7.6. Most of the areas east of the Willamette are supplied by gravity (without pumping) from Powell Butte and the Mount Tabor Reservoirs, which are fed from the supply and transmission system. Exceptions are small areas in southeast Portland, in and around Powell Butte, the Tabor 590 Service Area, which is located on Mount Tabor, and some areas of northeast Portland, shown on the far right-hand side of the schematic.

Service areas west of the Willamette River are shown schematically on the left side of Figure 7.6. Higher elevation service areas west of the Willamette are served from several key pump stations (Carolina, Fulton, Sam Jackson, and Washington Park) that draw from major transmission lines that currently run from the Mt. Tabor Reservoir complex to the Washington Park Reservoirs.

## Inventory

Portland's retail water distribution system is composed of vast networks of distribution mains, service lines, pump stations, and tanks, as well as hydrants, meters, valves, and fountains.


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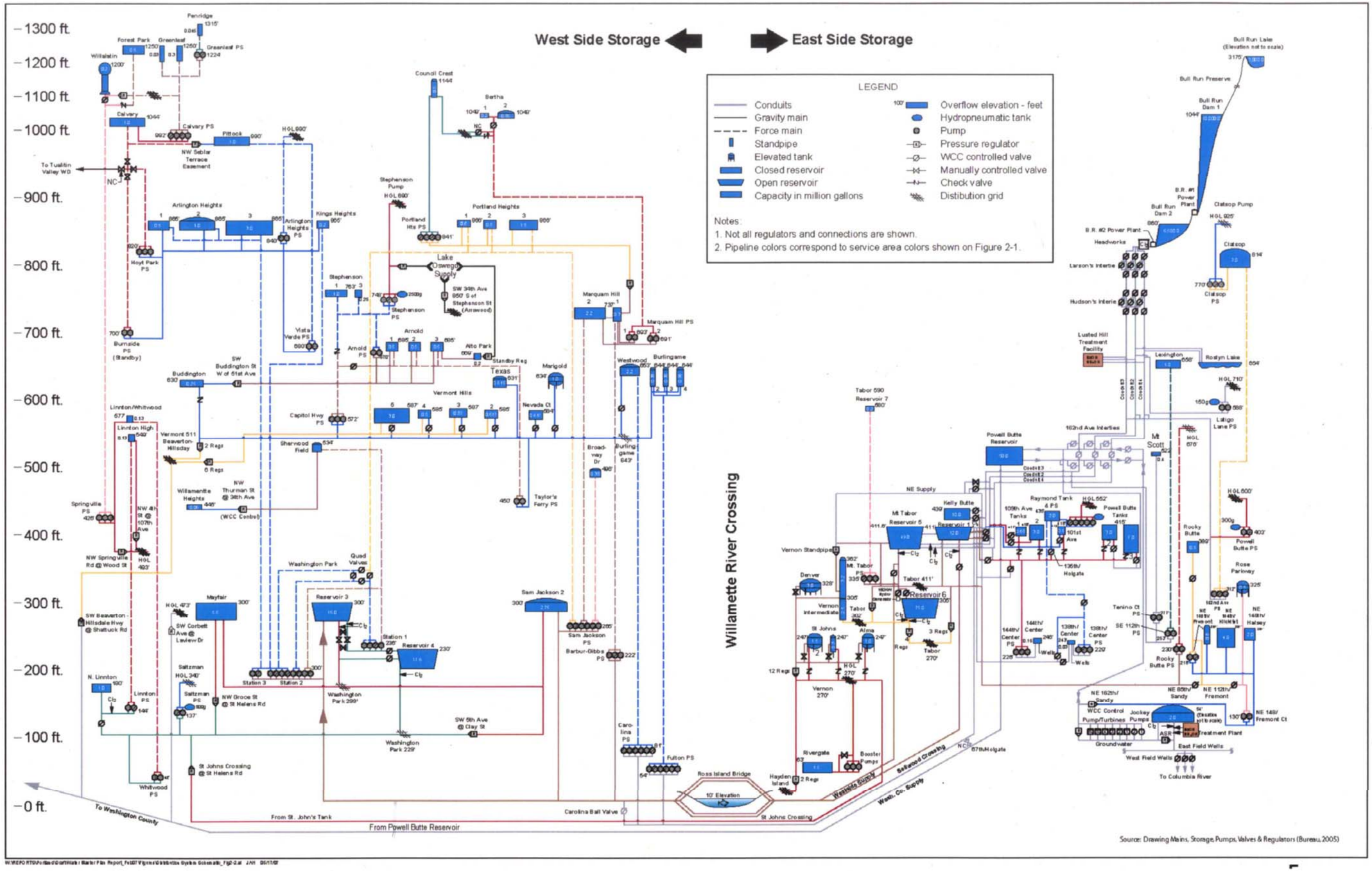
Figure 7.6 City of Portland Water Supply Schematic[23]



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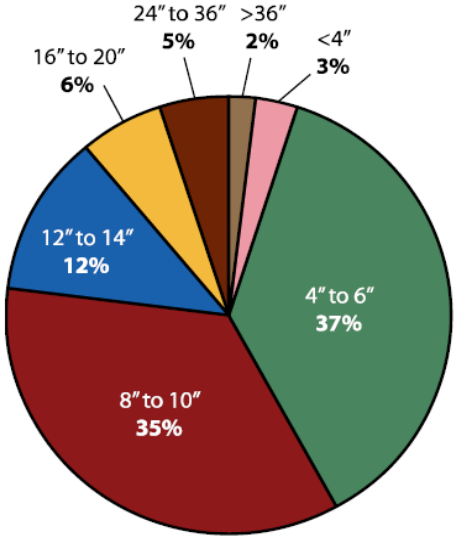
### Mains

Portland's retail distribution system comprises approximately 2,100 miles of pipeline. Figure 7.7 summarizes pipeline diameters in the distribution system. Distribution piping includes a number of materials, including unlined and lined cast iron (65%), ductile iron (29%), steel (2%), and a small percentage of other materials. The City's distribution mains have a combined replacement value of over $2.2 billion.

Figure 7.7 Pipeline Diameters in the Distribution System[24]




### Service Lines

The retail distribution system also includes over 183,000 service lines. The vast majority of these lines (94%) are smaller than 2" in diameter, although larger lines do exist in some areas. The network of service lines has a replacement value of $899 million.

### Tanks

The retail water system is served by 67 active storage tanks with a total storage capacity of approximately 270 million gallons. Table 7.7 lists the tank, its service area, capacity information, and whether the condition of the tank was assessed in 2006 as a part of the Distribution System Master Plan. Portland's storage tanks have a replacement value of $266 million.

### Pump Stations

The distribution system includes 35 pump stations, valued at $118 million. Table 7.7 lists the capacity of each pump station, and whether a condition assessment was performed in 2006 as a part of the Distribution System Master Plan.

[24] Portland Water Bureau, Distribution System Master Plan, 2007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### Meters

The Portland Water Bureau has nearly 180,000 meters worth approximately $88 million. Small meters are replaced every 30 years while large meters are tested and replaced based on condition and criticality.

### Valves

The water distribution system contains approximately 43,800 system valves, with a replacement value of $604 million.

### Hydrants

The distribution system includes about 14,400 hydrants, with a combined replacement value of $184 million.


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Table 7.7 Distribution System Service Areas, Storage Reservoirs and Pump Stations[25]

| Service Area and # of Connections | | Reservoirs/ Tanks | Capacity (mg) | Pump Stations | Capacity (mg) |
|---|---|---|---|---|---|
| Arlington Heights | 825 | Arlington 1 | 0.5 | Arlington Heights | NA |
| | | Arlington 2 | 1 | Sam Jackson | 1700 |
| | | Arlington 3 | 3 | Wash. Park 1 | 3200 |
| | | Kings Heights | 0.2 | Wash. Park 2 | 7500 |
| | | | | Wash. Park 3 | 1300 |
| Arnold | 1,548 | Alto Park | 0.2 | Capitol Hwy | 2500 |
| | | Arnold 1 | 0.5 | Taylors Ferry | 2000 |
| | | Arnold 2 | 0.5 | | |
| | | Arnold 3 | 0.6 | | |
| Bertha | 1,730 | Bertha 1 | 0.2 | Marquam Hill 1 & 2 | 2410 |
| | | Bertha 2 | 0.9 | | |
| Broadway | 604 | Broadway Drive | 0.4 | Sam Jackson | 800 |
| Burlingame | 7,816 | Buddington | 0.3 | Carolina | 10800 |
| | | Burlingame 2 | 1.6 | Fulton | 6400 |
| | | Burlingame 3 | 0.4 | | |
| | | Burlingame 4 | 0.9 | | |
| | | Marigold | 1 | | |
| | | Texas | 0.7 | | |
| | | Westwood | 1 | | |
| Calvary | 643 | Calvary | 1 | Burnside | 470 |
| | | | | Hoyt Park | 2800 |
| Clatsop | 438 | Clatsop | 3 | 162nd Avenue | 880 |
| Clatsop Pump | 277 | | | Clatsop | 775 |
| Council Crest | 1,334 | Council Crest | 0.5 | Portland Heights | 4300 |
| Denver | 225 | Denver | 3 | | |
| Greenleaf | 2,414 | Forest Park | 0.5 | | |
| | | Greenleaf 1 | 0.03 | Calvary | 1900 |
| | | Greenleaf 2 | 0.3 | | |
| Lexington | 526 | Lexington | 1 | 112th Avenue | 1100 |
| Linwit | 192 | Whitwood | 0.1 | Linnton | 130 |
| | | | | Whitwood | 640 |
| Marquam | 170 | Marquam Hill 1 | 0.3 | Barbur Gibbs | 1300 |
| | | Marquam Hill 2 | 2.3 | Sam Jackson | 2100 |
| Mt. Scott | 699 | Mt. Scott | 0.4 | Tenino Ct. | 320 |
| Nevada | 144 | Nevada Ct | 0.6 | | |
| Parkrose | 4,167 | 104th/Klickitat | 4 | | |
| | | 148th/Halsey | 2 | | |
| Penridge | 37 | Penridge | 0.1 | Greenleaf | 130 |
| Pittock | 78 | Pittock | 1 | Verde Vista | 1000 |
| Portland Heights | 1,323 | Portland Heights 1 | 0.6 | | |
| | | Portland Heights 2 | 0.5 | | |
| | | Portland Heights 3 | 1.9 | | |
| Powell Butte | 431 | Powell Butte N/S | 50 | 1st & Kane | N.A. |

[25] *Portland Water Bureau, Water Management and Conservation Plan, 2010 (Tables 2-21 and 2-22)*



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| | | | | | |
|---|---|---|---|---|---|
| PB Pump | 50 | | | PB Heights | 1480 |
| Powell Valley Road 415 | 3,782 | 101st Ave | 0.5 | | |
| | | 109th Ave 1 | 3 | | |
| | | 109th Ave 2 | 0.7 | | |
| | | 160th Ave 1 | 7 | | |
| | | 160th Ave 2 | 3 | | |
| | | PV 144th/Center | 0.2 | | |
| PV Rd Pump | 15 | | | PV Raymond St | 440 |
| PV Road Raymond | 2,000 | PV 138th/Center | 0 | PV 138th / Center | 1100 |
| | | Raymond | 2 | | |
| Rocky Butte | 892 | Rocky Butte | 0.5 | | |
| RB Pump | 46 | | | Rocky Butte | 200 |
| Rose Pkwy | 766 | Rose Parkway | 0.5 | | |
| Saltzman | 8 | | | Saltzman | 75 |
| Sherwood | 679 | Sherwood | 0.4 | Washington Park 2 | 1400 |
| Stephenson | 1,383 | Stephenson 1 | 1.3 | Arnold | 1000 |
| | | Stephenson 3 | 0.3 | | |
| Steph. Pump | 379 | | | Stephenson | 500 |
| Tabor 302 | 32,362 | Mt. Tabor 6 | 37.8 | | |
| | | Vernon 2 | 2.5 | | |
| Tabor 4113 | 59,070 | Kelly Butte | 10 | | |
| | | Mt. Tabor 1 | 12 | | |
| | | Mt. Tabor 5 | 49 | | |
| Tabor 590 | 888 | Mt. Tabor 7 | 0.2 | Mt. Tabor | 1200 |
| Vermont | 3,650 | Vermont Hills 2 | 0.6 | | |
| | | Vermont Hills 3 | 0.9 | | |
| | | Vermont Hills 4 | 0.5 | | |
| | | Vermont Hills 5 | 2.8 | | |
| Vernon 224 & 270 | 15,932 | Alma | 1 | | |
| | | St Johns 2 | 1.5 | | |
| Vernon 362 | 18,545 | Vernon 3 | 3.2 | | |
| Washington Park 229 | 5,223 | North Linnton | 1 | | |
| | | Washington Park 3 | 16 | | |
| | | Washington Park 4 | 17.6 | | |
| Washington Park 299 | 4,297 | Sam Jackson 2 | 2.8 | | |
| | | Mayfair | 5.6 | | |
| Willalatin | 213 | Willalatin | 0.2 | Springville | 630 |
| Willamette Heights | 292 | Willamette Heights | 0.1 | | |

## Current Condition

In general, the majority of the Water Bureau's distribution system asset groups are in fair to very good condition. However, almost half of the bureau's galvanized steel distribution mains (45%) are in poor to very poor condition, as are over one-fifth of the meters (23%), and hydrants (20%), by value. Half of the 2,200 miles of distribution mains are older than 50 years. More information on the condition of major asset groups can be found in Table 7.2. The Water Bureau evaluates asset condition as one factor in asset management decisions.


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### Service Area Assessment

In 2007, the Portland Water Bureau completed a series of hydraulic evaluations of the "backbone" distribution system, or the essential distribution-system components. The purpose of the evaluation was to assess the ability of the system to meet demands under both existing (i.e., 2005) peak-day conditions and 2030 peak-day conditions.[26] The evaluation found that the system that will reliably deliver water through 2030. Of the 42 service areas evaluated representing the retail system, 20 service areas, accounting for 86 percent of the 2030 peak-day demand, have no deficiencies.

Table 7.8 summarizes the results of the preliminary screening. Of the remaining 22 service areas, accounting for 14% of 2030 peak day demand:

- Six service areas (Clatsop Pump, Powell Butte Pump, PV Raymond Pump, Rocky Butte Pump, Saltzman Pump, Stephenson Pump) are direct-pump service areas with no storage. Deficiencies are based on providing sufficient capacity to meet fire flows. In some instances, pump stations were designed for lower fire-flow requirements, in place at the time of pump station design. In other instances, the Bureau has designed pumps to meet fire-flow requirements with all units in service. If all units are used in the screening, three (3) service areas show no deficiencies (Powell Butte Pump, PV Raymond Pump, Stephenson Pump).
- Eight service areas have recognized deficiencies and are being evaluated by the Bureau in other studies. These are: Calvary, Council Crest, Greenleaf, Linnton/Whitwood, Penridge, PV Raymond, Willalatin, and Willamette Heights.
- Five service areas were flagged for further assessment in the hydraulic evaluation. These are: Broadway; Mt Scott; Sherwood; Stephenson; and, Tabor 590. Although the preliminary screening did not identify deficiencies in the Burlingame service area for the planning scenarios evaluated, the Bureau has recently completed a Master Plan for the service area that includes several capital projects to remedy previously identified deficiencies.
- The remaining three service areas have mitigating circumstances that relieve some of their identified deficiencies. The Lexington service area was deemed deficient in the outage screening, but the Bureau has purchased a generator to supply the service area in a power outage situation. However, the generator would not address a service outage of the pump main, so the service area was still deemed deficient. The second, Bertha, was deficient for both storage and outage. However, the service area has additional regulated supply from other service areas. The third, the Vernon 362 service area, has a large number of regulators that supply the zone, which addresses the storage deficiencies.

[26] More information can be found in the Portland Water Bureau's Distribution System Master Plan, 2007. Options to integrate the former Powell Valley Road 415 service area with the Tabor 411 service area, and supply capacity through Washington Park were also assessed in this plan.


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Table 7.8 Results of 2007 Preliminary Screening of Service Areas[27]

**Service Areas that Passed Preliminary Screening for Pumping, Fire, Storage and Outage Service Goals; or Are Being Addressed in Other Studies***

| | | |
|---|---|---|
| Arlington/Portland Heights ** | Arnold | Burlingame |
| Clatsop | Denver | Marquam Hill |
| Nevada | Parkrose | Pittock |
| Powell Butte | PVRWD 415 | Rocky Butte Tank |
| Rose Parkway | Tabor 302 | Tabor 411 |
| Vermont | Vernon 270 | Washington Park 229 |
| Washington Park 299 | | |

**Service Areas that were Deficient for One of More Screening Service Goals**

| Service Area | Pumping | Fire | Storage | Outage | Notes |
|---|---|---|---|---|---|
| Bertha | ✓ | ✓ | X | X | Additional regulated supply available |
| Broadway | X | X | X | X | Additional regulated supply available |
| Calvary | X | X | X | N/A | Being evaluated in NW Hills study |
| Clatsop Pump | X | X | N/A | X | |
| Council Crest | ✓ | ✓ | X | X | Being evaluated by Bureau |
| Greenleaf | ✓ | ✓ | X | X | Being evaluated in NW Hills study |
| Lexington | ✓ | ✓ | ✓ | X | The Bureau has purchased a generator with an automatic transfer switch for 112th St Pump Station. The generator would not address outages due to a pump main break |
| Linnton / Whitwood | X | X | X | X | In Upper Linnton Tank Analysis |
| Mt. Scott | X | X | X | X | Additional regulated supply available |
| Penridge | X | X | X | ✓ | Being evaluated in NW Hills study |
| Powell Butte Pump | X | X | N/A | ✓ | Not deficient if all pumps used |
| PV Raymond Pump | X | X | N/A | ✓ | Not deficient if all pumps used |
| PV Raymond | X | X | X | X | Being evaluated by Bureau |
| Rocky Butte Pump | X | X | N/A | ✓ | |
| Saltzman | X | X | N/A | ✓ | |
| Sherwood | X | X | X | X | Additional regulated supply available |
| Stephenson | X | X | X | ✓ | |
| Stephenson Pump | X | X | N/A | ✓ | Not deficient if all pumps used |
| Tabor 590 | ✓ | X | X | X | |
| Vernon 362 | N/A | X | X | N/A | Large regulated supplies available |
| Willalatin | X | X | X | X | Being evaluated in NW Hills study |
| Willamette Heights | N/A | X | X | X | Being evaluated in Willamette Heights Tank study |

* Passed all screening criteria (Arnold, Clatsop, Denver, Marquam Hill, Nevada, Rocky Butte Tank, Vermont), were only deficient in storage screening (Parkrose, Rose Parkway), or passed pumping, storage, and fire screening goals, but were not screened for outages, since these are being addressed by other studies, or are large service areas with adequate redundancy (Arlington/Portland Heights, Burlingame, Powell Butte, PVRWD 415, Tabor 302, Tabor 411, Washington Park 229, Washington Park 299).

** Arlington Heights and Portland Heights service areas are hydraulically interconnected and were evaluated together.

N/A = Not applicable, or not evaluated in DSMP ✓ = Passed screening X = Failed screening

[27] Portland Water Bureau, *Distribution System Master Plan*, 2007



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### Backbone Hydraulic Evaluation

The backbone evaluation assessed system operation, taking into account system hydraulics, to find further deficiencies not evident in the preliminary screening. The model simulated a 24-hour period on the peak-demand day for 2005 and 2030 demand conditions. Results of the hydraulic evaluation were consistent with the preliminary screening. No additional deficiencies were identified.

Three service areas, however, that had deficiencies in the screening evaluation showed no deficiencies in the hydraulic evaluation. All three (Broadway, Sherwood Field, and Stephenson) have adequate pumping capacity to meet normal demand, but insufficient capacity to meet peak-day demand plus re-fill of storage following a fire within the service area.

### Assessment of Pump Stations and Tanks[28]

Condition assessments have been conducted for 35 pump stations and 66 tanks in the distribution system. The pump station assessment found that, in general, the pump stations originally constructed by the Bureau were in good condition. With the exception of the recently acquired Powell Valley system pump stations, pump stations acquired from other formerly independent water systems had more deficiencies.

- 15 pump stations are in good condition with only minor corrective maintenance needed;
- 20 pump stations are operationally and functionally sound, but exhibiting some signs of wear, with some need for corrective action;
- Deficiencies were identified in the Fulton, Linnton, Portland Heights, Sam Jackson, and Taylors Ferry service areas.
- Of the 66 tanks assessed, 4 tanks are in conditions that substantially diminish performance; 55 tanks are operationally and functionally sound, but exhibiting some signs of wear, with some need for corrective action; and 7 tanks are in good condition with only minor corrective maintenance needed.

The tank assessments found that coating and painting for tanks has not been performed routinely in recent years. A strategic coating and painting program was recommended. The analysis also found seven tanks that require further evaluation to address extensive cracks observed during inspections. Fifty-two tanks also had minor repair or maintenance recommendations, and several tanks require anchoring and/or flexible piping connections to reinforce tanks to withstand an earthquake. All work will be performed as part of ongoing capital and maintenance programs.

### Seismic Assessment

As part of the Distribution System Master Plan (2007) a qualitative seismic assessment was provided for 32 tanks to identify conceptual-level seismic improvements. The analysis used condition information collected in the tank inspections, along with probabilistic ground-motion data from U.S. Geological Survey, to assess which tanks would be most vulnerable in a large-scale earthquake in the Portland area

[28] Portland Water Bureau, *Distribution System Master Plan*, 2007


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(100- year to 500-year frequency). For tanks identified to be the highest risk, conceptual-level improvements were identified to reinforce the tanks.

## Needs & Approach

### Backbone Hydraulic Evaluation

In selecting improvements, service areas were reviewed to identify water supply issues including service pressures, fire flow requirements, water quality goals and sizing for new facilities.

For direct-pumped service areas, the improvements were developed based on a criterion of meeting peak-hour demands plus fire flow with one pumping unit out of service, rather than peak-day plus fire flow, since direct-pumped areas have no storage and pumps and must be able to meet both normal and fire demands. In some instances, the bureau has designed pump stations to meet fire flows with all units in service. In the Powell Butte Pump, Powell Valley Road Water District Pump and Stephenson Pump service areas, pump stations can provide adequate fire flow if all units are used. The bureau will need to determine whether these pump stations - built to then-current standards - should be upgraded based on the Distribution System Master Plan criteria of meeting peak-hour demands plus fire flows with one unit out of service.

### Condition Assessment of Pump Stations and Tanks[29]

All of the pump station projects generated from the pump station condition assessment will be constructed as part of ongoing capital and maintenance programs, or as part of larger planned pump station rehabilitation projects.

### Asset Management Plans

Asset management plans are being developed for all assets within the distribution system. These plans will help identify additional projects and replacement strategies necessary to maintain and improve the system. These plans may identify additional projects to be included in the 20-year Project List.

## Recommended Distribution System Improvements

### Burnside Pump Station Replacement

This project will decommission the old undersized pump station and modify the nearby Verde Vista pump station to serve the Burnside pumping needs for the next 50 years. The project will also acquire property for the future Burnside pump station to be built 50 years from now.

### Carolina Pump Main Extension

This project will connect the existing Carolina Pump Main (Westwood Tanks) and the Fulton Pump Main (Burlingame Tanks) together. This will be a pump main from the intersection of SW Capital Hwy and SW Terwilliger Blvd to the Burlingame Tank site. Phase 1 is replacing the existing 16" Fulton pump main with

[29] Portland Water Bureau, *Distribution System Master Plan*, 2007


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a 24" pump main from Burlingame Tank site to SW Chestnut and SW Burlingame as well as improvements at the Burlingame Tank site. Phase 2 is the new construction of a 24" pump main from SW Chestnut and SW Burlingame Ave to tie into the existing Carolina Pump main at Capitol Hwy and Terwilliger Boulevard.

### Control Center SCADA Server Replacement

This project replaces the aging supervisory control and data acquisition (SCADA) system at the Water Control Center with a secure, Windows based system. The bureau will add, as part of the upgrade, a disaster recovery SCADA system to our Lusted Treatment site. The new system will have better system functionality, improved integration tools, management tools and security and will provide the Water Bureau with critical water supply monitoring and control for 10 years plus. The system includes hot standby real-time and historical servers, client workstations at various facilities, a decision-support server, and a terminal server for remote access.

### Distribution Mains

This program includes rehabilitation and replacement of mains with high leakage or break rates, substandard mains (2-inch galvanized steel), expansion due to applications from private developers, increasing supply for fire protection, improving water quality and water system upgrades due to local improvement districts (LIDs), and street improvements. Water main replacements also include appurtenances such as fire hydrants, valves, pressure regulators, service branches, and other facilities.

### Field Support

This project funds vehicles and major equipment purchases, including heavy construction equipment such as dump trucks and backhoes, and Bureau-owned computer software with a unit cost greater than $5000.

### Forest Park Low Tank

This project will plan, design and construct a single 1.3 million gallon tank at NW Cornell and NW Skyline Drive for the Greenleaf 1034 pressure zone. This storage is to augment regular system capacity and increase fire flow to a large area of Northwest Portland.

### Fulton Pump Station Improvements

This project will replace the Fulton Pump Station with a new pump station located in Willamette Park.

### Greenleaf Pump Station

This project will plan, design and construct a replacement Greenleaf pump station at the existing site. Flow upgrades will remove the Penridge tank from the system. The new pump station will pump directly to the distribution system.


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### Hydrants

The bureau maintains about 16,000 fire hydrants. These hydrants allow Portland the flexibility and preparedness to respond to a fire emergency through coordination with the Fire Bureau. This project provides for the replacement of fire hydrants that are no longer repairable. Replacements may also occur as part of the bureau's ongoing efforts to standardize hydrant types for more efficient and effective management of maintenance and repair activities.

### Meters

This project funds the purchase and installation of water meters. The Bureau's objective is increase accuracy based on replacing high usage meters. High usage meters typically wear out faster than others.

### Portland Heights Pump Main

This project will replace the portion of the 12" pump main in SW Montgomery Drive between the southern end of the 16" pump main from Washington Park and the Portland Heights Tank site with approximately 3,500 feet of 16" main in Montgomery Drive and Greenway Avenue. The new main will replace a poor condition main and provide additional supply capacity to the area.

### Portland Heights Pump Station Electrical Improvements

The project will design and construct a new prefabricated building at the Portland Heights Pump Station to house electrical and control equipment, and also install in the existing pump vault a new 100hp pump and vault improvements.

### Portland to Milwaukie Light Rail

This project consists of relocation of over 5,000 feet of main impacted by TriMet's SE Corridor Light Rail project.

### Pump Stations and Tanks

This project includes a large variety of infrastructure consisting of water storage tanks, pumps, and pump and control facilities. The bureau uses a reliability centered maintenance (RCM) approach to manage its assets. A key focus of the next twenty years will be to replace the remote telemetry units at over 140 remote sites. The existing units are over 15 years old, and are becoming obsolete. The servers are at the end of their service cycle, and must also be replaced.

### Sam Jackson Pump Station and Mains

This project will make multiple capital improvements to the Sam Jackson Pump Station, including seismic improvements, replacement of RTU and motor controllers, installation of pump control and check valves, extension of the crane rail, a concrete pad, and installation of a security fence and gate.


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### Services

This project constructs replacement and customer requested water services. A water service is the connection between the water main and any given customer's service meter. Service connections are always performed by Water Bureau crews directed by a certified Water Service Mechanic. An ongoing budget of approximately $5 million per fiscal year provides for installation of about 1,000 water service connections annually and other upgrades to existing water services.

### Willamette River Crossings

The project replaces major pipelines to strengthen the transmission link between Powell Butte and the service areas west of the Willamette River, including downtown and the storage reservoirs at Washington Park. It includes construction of a new seismically strengthened river crossing to replace the first one of potentially two Willamette River crossings, and new transmission piping on both sides of the Willamette.

# Treatment System

## Inventory

The Federal Safe Drinking Water Act, which regulates public drinking water supplies, typically requires surface water supplies to be filtered to meet federal drinking water standards. Because the Bull Run source water quality is very high and Portland implements source water protection measures, Portland is currently exempted from filtration requirements. Portland's water supply is disinfected using chloramines. Water is chlorinated at the Headworks at Reservoir 2. Ammonia and sodium hydroxide are added at a second treatment facility, Lusted Hill.

Ammonia ensures that disinfection remains adequate throughout the distribution system. Sodium hydroxide increases the pH of the water helping to control lead and copper levels at customers' taps should these metals be present in the customers' home plumbing.

Future federal regulations may require additional treatment processes in the future.

Treatment is also required for the groundwater supply.

Facilities used to provide water treatment include a chlorination building and equipment, and flow metering at Headworks; treatment facilities and equipment at Lusted Hill; and treatment facilities and equipment at the Groundwater Pump Station.

## Current and Projected Condition

Headworks treatment facilities are rated as good to fair. The flow meters are rated as poor.

The Lusted Treatment Facility was constructed in 1992. Condition is assessed at good to fair. However, buildings at this site were built as temporary structures and do not reflect the full cost of replacing the facility with permanent buildings. Future facility upgrades will include permanent structure replacements.


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The treatment facilities at the Groundwater Pump Station were recently upgraded and are rated in very good to good condition.

## Current and Projected Capacity

Due to changing regulations, the suitability of a treatment facility is a moving target. As federal and state rules are modified and as technology changes, treatment facilities must change as well.

With the State granting the Bureau a variance on the treatment provisions of the LT2 rule, many related facility improvements planned at Headworks were postponed as well. Among these improvements were replacement of the chlorination system and the operators' station. Both of these will need significant upgrades within the next 20 years.

## Needs & Approach

Asset management plans are being developed for the Bull Run Supply and Groundwater. These plans should help identify needed improvements.

## Recommended Treatment System Improvements

### Headworks Flow Meters

This project would install new flow meters on the Primary Intake conduits; install new flow meters and flow control valves on Screen house #3 conduits; and address the sump pump drainage system in Bailey pressure-reducing valve vault.

### Treatment Facilities Improvements

This project includes several related projects for treatment facilities for the Bull Run water supply, at both the Bull Run Headworks and the Lusted Hill Facility. Specific treatment improvements have not been determined at this time. Projects would likely be driven by state and federal regulations.

# Support System

## Inventory

The Support system includes miscellaneous facilities and equipment necessary to support the Water Bureau's mission. Support system assets are shown in Table 7.2. Chief among these assets are the Interstate Facility, and Sandy River Station.

Funding for Support system projects often resides in budget programs other than "Support". The Interstate Rehabilitation Project is currently funded through the Distribution program in the CIP.

## Current and Projected Condition

The Interstate Maintenance Building is more than 85 years old. Studies have indicated that this building is highly vulnerable to collapse during an earthquake. This building fails to meet building codes in many


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areas including structural, mechanical and electrical requirements. Renovations required to bring the building up to code are extensive. A major rehabilitation plan has been developed that will result in the demolition and reconstruction of this building, anticipated to be completed in 2016.

Other buildings include Sandy River Station which is primarily in good to fair condition.

## Current and Projected Capacity

## Needs & Approach

Buildings classified as part of the Support system will require maintenance and rehabilitation over the next 20 years. An asset management plan for facilities/buildings is being developed that should help identify work that is needed.

## Recommended Support System Improvements

### Building Maintenance

The bureau maintains hundreds of structures from the Bull Run watershed to downtown Portland. These structures range in size from small pump houses to the maintenance hub on Interstate Avenue. The necessary work involves structural repairs and maintenance.

### Interstate Facility Rehabilitation

The project rebuilds the Portland Water Bureau's main maintenance facility. A four-year master planning effort from 2002 – 2006 developed the baseline requirements for both current and long-term needs. Recent updates to the master plan along with additional program summary work has created the basis for the design of the facility now underway. Two new buildings will replace the eighty-five year old Maintenance Building that currently serves as the main office and warehouse. Site improvements to the 11 acre campus improves vehicle and employee circulation. It also brings the property up to current code requirements for storm water management and landscaping.

### Planning

This program consists of general planning studies for projects needed to improve the operation of the water system. These include pressure zone adjustments, facility modifications, and system element studies.

### Sandy River Station Upgrades

This project consists of upgrades to the Sandy River Station facilities including an evaluation of a potential move to a different site.

### West Side Maintenance Facility

A hub is needed on the west side of the Willamette River for maintenance and construction crews, vehicles, equipment and materials, and emergency operations. Property previously owned by the Federal


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government (the Jerome Sears site) has been acquired by the City for this purpose. This project includes improvements to the facility over the next 20 years.

# Regulatory Compliance

## Inventory

The Regulatory Compliance program ensures that water throughout the system meets Federal and State of Oregon drinking water quality standards and environmental protection standards. Included in this program is implementation of the federally approved Habitat Conservation Plan (HCP) and the multiple easements and improvements required by this plan. Chief among these is the Bull Run Dam 2 tower intake structure which will allow the bureau to better control the release of water to enhance downstream conditions for anadromous fish species in compliance with the Endangered Species and Clean Water acts.

Regulatory Compliance system assets are included in Table 7.2.

## Needs & Approach

The focus of this program is implementation of the federally approved Habitat Conservation Plan and the multiple easements and improvements required by this plan.

## Recommended Regulatory Compliance System Improvements

### Bull Run Dam 2 Tower

The Water Bureau is installing steel multi-level intake structures onto the North Dam 2 Tower located in the Bull Run watershed. Modifications are designed to allow selective water withdrawal, proper operation during flood conditions, and enable the tower to better withstand seismic events.

### HCP Alder Creek Fish Passage

This project will design and install two fish passage facilities as planned in the Habitat Conservation Plan (HCP). The project is in Alder Creek, a tributary to the Sandy River. There will be a fish ladder at the waterfall and a fish ladder at a water diversion.

### Regulatory Compliance

This project responds to requirements of the Endangered Species Act (ESA), including the implementation of the Habitat Conservation Plan (HCP) Consistent with HCP commitments, this project funds easements, purchases land, and also supports projects jointly conducted with other watershed partners.

# Customer Service

## Inventory

The Customer Services Program includes facilities that provide services for customers other than the direct supply of water. It includes customer billing, collection, and call center facilities and equipment, which is the largest part of the program. It also includes conservation, security, emergency management and grounds maintenance for Bureau-owned properties. Specific assets included in the Customer Services program are Dodge Park and the Security and Emergency Management facilities, including the new City Emergency Coordination Center.

Customer Service system assets are included in the Distribution section and the Support Facilities section in Table 7.2.

## Current and Projected Condition

Dodge Park is considered to be in good condition. Upon completion of the new Emergency Coordination Center in 2014, the Security and Emergency Management facilities (including the Ranger Station and security gates) should be in very good condition.

## Current and Projected Capacity

## Needs & Approach

Automated meter reading would reduce operational costs and provide better customer service (i.e. access to more current consumption data).

Maintenance and upgrades of Water Bureau facilities including Dodge Park and Security and Maintenance facilities will be a continual need. An asset management plan for facilities/buildings has been developed that should help identify work that is needed.

## Recommended Customer Service System Improvements

### Automated Meter Reading (AMR) Implementation

This project provides for the replacement of customer meters throughout the City with automatic water meter reading equipment.

### Emergency Coordination Center

This project designs and constructs the City's Emergency Coordination Center. The bureau will locate its emergency response and security staff at this location. The project location is adjacent to the City's 911 Call Center at SE 99th Ave and Powell Blvd. The total project cost is $19.85 million and Portland Water Bureau is a contributing bureau.


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### Security and Emergency Management

The bureau is committed to increasing flexibility and preparedness to meet future security challenges, to enhance security throughout the water system and to modernize security practices and infrastructure. This program includes physical security improvements to major and minor facilities as well as improved security in the overall water distribution system and control/communications system.

# Investment Strategy

## Process

Annually, the Portland Water Bureau prepares capital budgets for the upcoming fiscal year and for the five-year planning horizon. The major components of the water system define the program categories within the capital budgeting process. These capital programs are: Supply, Transmission and Terminal Storage, Distribution, Treatment, Regulatory Compliance, and Customer Service. The Capital Improvement Plan (CIP) is an annual planning process which allows a review of capital projects and programs. The Portland Water Bureau engages the public in developing its budget and the CIP. All Water Bureau CIP projects that affect neighborhoods or that require city, state, and/or federal permit review processes include public involvement elements.

The Engineering Services Group (ESG) receives requests and ideas for CIP projects from a number of sources. Internal bureau stakeholders groups including Asset Management, Development Services, Design or Construction, Operations, Maintenance and Construction, and Resource Protection all may identify the need for a capital project. Other sources include projects generated from ESG CIP Planning Section listed in Master Plans or Public Facility plans, and recommendations from the Asset Management group that include business case studies. In addition, the Portland Water Bureau receives notifications from other agencies or bureaus planning or producing work that may impact the water system. External requests may also come from citizens, wholesale customers, the City Council, and developer requests for projects administered through ESG's Development Services Branch.

The Water Bureau performs economic analyses and/or business cases for new projects, and ensures that investment decisions are economically justified.

## Contributing Plans

### Asset Management

The Bureau's Asset Management Program is intended to guide the strategic management of physical assets to best support the delivery of identified services. It helps the Bureau to better manage existing assets, and plan for future needs. This process is guiding decisions as to the effective mix of maintenance, repair, renewal or replacement of the water system components, and has led the Bureau to focus on critical assets. A risk analysis methodology has been applied to assess the relative risks of asset failure; those assets with the highest risks are then identified for follow-up actions.


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Asset condition assessments have been completed or are underway for many asset classes. Business case methodology is helping ensure that investment decisions deliver good value by comparing the cost of an investment to the benefits it provides. Benchmarking with best practices helps the Bureau better understand process improvement opportunities. Asset Management Plans have been prepared for almost all asset classes, capturing current information on service levels, inventory, condition, failure modes, risks of asset failure, and asset strategies.

### System Plans

A number of plans are consulted in preparation of the CIP. These include the Infrastructure Master Plan (2000), the Distribution System Master Plan (2007), the Bull Run Water Supply Habitat Conservation Plan (2008), the Water Management & Conservation Plan (2010), and various master plans and project specific planning documents developed by the Portland Water Bureau.

## Alternatives Analysis and Prioritization Process

The Portland Water Bureau's methodology and criteria for the selection and ranking of capital projects depends on the magnitude of the project and duration of the project's lifecycle. For major projects, an initial concept report is developed evaluating possible project alternatives and recommending potential capital projects. Senior management approves projects to continue with a larger planning effort to create a Basis of Design Report. To develop this report, the Water Bureau's Planning section uses industry practices in cost-benefit analysis and risk assessment to identify and weigh alternative solutions, and compare them with service standards. The Portland Water Bureau selects projects based on these quantitative analyses but also considers the logistics of rate impacts, sharing cost with interagency partners, creating revenue opportunities, and achieving compliance with regulatory requirements.

The criteria used to select projects for inclusion in the budget include fulfilling service levels (such as maintaining pressure and limiting customer outages), mitigating high risks of asset failure, operating assets at the most efficient and cost-effective levels, contributing to local and regional sustainability and energy-conservation goals, providing appropriate redundancy within the supply system, complying with all state and federal water-quality regulations, ensuring access to key water-supply facilities, and coordinating with other agency infrastructure projects.

## Projects & Programs

The FY 2013-18 CIP provides balance between longer-term infrastructure replacement and maintenance needs and short-term water system infrastructure needs to ensure compliance with drinking water regulations. The CIP priorities for the bureau's budget and capital program include:

- Implement improvements necessary to assure compliance with current safe drinking water regulations, including the LT2 rule.
- Continue to expand the utilization of an asset management system plan and the computerized maintenance management system to support planning and implementation of system maintenance activities.
- Implement the Bull Run HCP, a comprehensive multi-decade Clean Water and Endangered


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Species Act compliance agreement for the Bull Run watershed.

- Support other governmental agency capital improvement projects (e.g., light rail, Sellwood Bridge, Columbia River crossing) as directed by City Council.

The 5-year CIP is summarized within the following seven Bureau programs with key projects identified:

### Customer Service

The Bureau's participation in the City Emergency Coordination Center is the primary project included within this program over the first five years. Bureau security staff will operate from this location with the Portland Bureau of Emergency Management. In the event of a major emergency, all City coordination staff will operate from this center.

### Distribution

Over the first five years, approximately $244 million of the CIP is for improvements to the distribution system. Of the total, about $83 million is to be used for direct water line replacement projects, including work initiated by other bureaus and agencies, as well as replacement of the oldest or most deteriorated portions of the distribution system. About $35 million is to continue rehabilitation of the Interstate maintenance building. There is $57 million for the Willamette River Pipe Crossing Project. Almost $16 million is for pump stations and tanks. Other improvements include services, meters, hydrants, fountains, and vehicle and equipment replacement.

### Regulatory Compliance

Over the first five years, more than $25 million has been planned for improvements to the water supply from the watershed, principally the Dam 2 Tower Improvements. Construction continues on the HCP Alder Creek project to enhance fish habitat.

### Support

The Support Program includes funding for master system planning, focusing on identifying the need for, and timing of, improvements to or acquisitions for the water system. Master planning uses asset management methods to determine the most cost-effective investments. Individual asset studies help guide the selection of major capital projects for the short and long term. The Portland Water Bureau has included funds for some of the planned studies on vulnerable and aging infrastructure in upcoming fiscal years.

### Supply

This program includes projects to improve existing facilities and roads in the Watershed and to improve the groundwater system. An example is the Groundwater Electrical Supply Improvements project that will reduce the risk of an extended electrical supply outage to the groundwater pump station.


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### Transmission and Terminal Storage

Over the first five years, the major projects in this program include $35 million to continue construction of an additional 50-million-gallon water storage tank at Powell Butte and $119 million for other enclosed storage including Kelly Butte reservoir and Washington Park reservoir. Also included is $33 million for other conduit and transmission main projects.

### Treatment

Headworks Flow Meters project, to accurately record treated water flow and regulate chemical additions to the system in compliance with drinking water regulations, is the only project in the first five years.

## Financially Constrained Investment Strategy

The Bureau focuses its efforts on regulatory compliance elements, improving the condition of its aging infrastructure, and addressing operations and maintenance needs. The CIP addresses longer term infrastructure replacement and maintenance needs, while addressing short-term water system infrastructure needs to ensure compliance with drinking water regulations.

Recently, the primary focus of the bureau's capital Investment Strategy has been responses to EPA's LT2 rule (reservoir replacement projects), the HCP (Dam 2 towers project), and the Interstate Facility Improvement project. Upon completion of these projects, the focus will return to improving the maintenance and reliability of existing facilities. As facilities within the water system begin showing their age, major reconstruction and maintenance projects will need to be undertaken.

Planned CIP outlays (excluding capitalized overhead) total $491 million over the five-year forecast period.

Table 7.9 Investment Strategy Summary

| Program | FY 2013-2018 | FY 2018-33 |
|---|---|---|
| Customer Service | $3,057,000 | $53,700,000 |
| Distribution | $244,197,288 | $461,650,000 |
| Regulatory Compliance | $25,504,000 | $30,000,000 |
| Supply | $14,291,000 | $88,500,000 |
| Support | $10,000,000 | $50,500,000 |
| Transmission and Terminal Storage | $191,170,000 | $242,000,000 |
| Treatment | $2,500,000 | $150,000,000 |
| **TOTAL** | **$490,719,288** | **$1,076,350,000** |

# Financial Strategy

## Existing Financing Strategies

As part of the Bureau's overall mission and values, its financial objective is to "maintain fiscal integrity, undertake sound financing practices and ensure auditable results" which:

- Provides for sufficient annual funding of operating, maintenance, and capital programs approved


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by City Council.

- Provides for rates and charges to customers that are equitable and based on generally accepted cost of service principles unless otherwise directed by City Council.
- Strives for a natural optimal balance between financial health, operational effectiveness, infrastructure condition, effective management, rate affordability, and a skilled and experienced workforce.
- Strives to optimize capital financing strategies, today and into the future.
- Ensures the maintenance of appropriate and adequate cash balances (operating fund, construction fund, sinking fund, and rate stabilization account) consistent with City policies, bond covenants, and industry standards

Rates and charges for water services are established annually based, in part, upon cost-of-service principles and methodologies recommended by the American Water Works Association (AWWA). The process used by the Bureau follows the Commodity Demand method set by the AWWA. Under this approach, developed for the Bureau by Raftelis Financial Consultants, Inc in 2006, water system costs are allocated to customers based on their average and peak water demand characteristics and use of the system. Retail rates are then established based on the residual financial requirements of the system.

The Bureau assesses both a volumetric usage charge and a fixed monthly base charge. A monthly base charge is imposed on water services connected directly to the water system. The base charge is in addition to the rates charged for water usage.

### Financial Plan and Rate Setting Process

The Bureau annually prepares a requested budget and five-year financial plan. The Bureau's budget process includes a Budget Advisory Committee (BAC). The BAC meets between October and January to review and provide input on the requested budget including the five-year capital improvement plan and proposed retail rates. The financial plan includes operating and capital expenditure and expected rates for each year of the five-year forecast period. The requested budget and financial plan reflects the financial implications of the bureau's priorities, strategies, and service levels.

The financial planning process lays the groundwork for setting rates. Section 11-105 of the City Charter authorizes the City Council to fix fees and charges for connection to and use of the Water System. Water user fees and connection charges are formally reviewed every year by the Bureau. Rates required to support proposed activities for the next year are submitted by the Bureau Administrator to the City Council for review and approval.

### Water Funds

The Bureau's financial system is organized into three separate funds:

- The Water Operating Fund serves as the operating fund of the Bureau and, with the exception of debt service; all expenditures made from this fund are for operation and maintenance of capital assets. Receipts from the sale of water are the primary source of revenue for the Water Operating Fund. The cash flow in this fund determines the need for rate increases. The Rate

Stabilization Account is within the Operating Fund.

- The Water Construction Fund is the recipient of proceeds from bond sales to provide for the funding of water system capital improvements. Other sources of revenue include reimbursements for capital expenditures, such as main extensions and service installations, system development charges and sale of assets. Also, a portion of the water sales revenues is transferred to this fund to finance routine system repair and replacement. The Water Construction Fund reimburses the Water Operating Fund for capital asset requirements including capitalized overhead, capitalized interest, and the cost of issuing bonds.
- The Water Bond Sinking Fund provides for the repayment of bonded debt and interest incurred in conjunction with construction of water system facilities. The revenue bond reserve accounts are also maintained in the Sinking Fund. The source of revenue for this fund is a transfer from the Water Operating Fund, reduced by interest earnings on fund balances and a transfer from the Water Construction Fund of interest earnings on bond proceeds.

These three funds enable the Bureau to segregate resources for specific uses and ensure that reserves are not used to supplement daily operating needs. Maintenance of the fiscal integrity of each fund is a key objective of the Bureau's financial planning and analysis efforts.

## Anticipated Revenues

The bulk of the Bureau's CIP is financed by Water revenue bonds. Though not required by bond covenants, the Bureau's planning standard is to set rates such that Net Revenues provide at least 1.90 times debt service coverage on First Lien Bonds. Additionally, the Bureau maintains a planning standard that results in Stabilized Net Revenues providing at least 1.75 times coverage on the Combined Annual Debt Service (as defined in the Master Second Lien Water Revenue Bond Declaration) for both First and Second Lien Bonds. These standards exceed the debt service coverage required by bond covenants.

Additional revenues to support the capital plan include cash financed capital funding from rate revenues, system development charges, new services and main reimbursements, City interagency reimbursements on capital projects, and sales of assets.

### Revenue and expenditure comparison

The Bureau plans for a minimum fiscal year-end operating cash reserve of $15.0 million in the Operating Fund. This represents about 45 to 60 days of operating costs. This standard conforms to the generally accepted industry standard for such reserves, and has been approved by the Office of Management & Finance as a reasonable amount for this reserve.

The Bureau also has a Rate Stabilization Account (RSA) within the Water Operating Fund that is used to smooth rate increases over the financial planning period and beyond. This smoothing is one of the Bureau's key financial planning objectives and is aimed at maintaining financial stability and predictability.

### Financial challenges, unmet needs and risks

The Bureau's financial projections include key assumptions underlying the revenue and expenditure forecast. Key assumptions in the revenue forecast include:



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- Retail water demand
- Wholesale water sales
- User charges
- Issuance of additional First Lien Bonds or Second Lien Bonds to fund capital program requirements

Key assumptions in the expenditure forecast include:

- Annual inflation
- The bureau's cost related to the City's outstanding pension obligation bonds
- Pension system contribution rates
- All costs related to compliance with the LT2 rule including regular monitoring and capital projects
- Continuing to operate under the Bull Run Treatment Variance[30]

[30] On March 14, 2012, OHA issued a Final Order granting the City a variance to the treatment requirements of the LT2 Rule. The variance went into effect on April 1, 2012, and will be in effect for ten years as long as the City is able to meet a set of important conditions designed to protect the health of Portland drinking water customers. These conditions require the Bureau to continue to monitor Bull Run source water for *Cryptosporidium*, maintain all legal protections in the Bull Run, and monitor and manage any potential sources for *Cryptosporidium* contamination in the watershed. In the event of a first detection of *Cryptosporidium,* the Bureau is required to increase its monitoring efforts, coordinate with health officials to determine what, if any, impacts the detection may have, and communicate this information to its customers. The communications requirement in the variance conditions requires, at minimum, a press release to Portland-metro media outlets and posting of the information on the Bureau website if *Cryptosporidium* is detected at the intake. If one or more detections occur during this one-year period of increased monitoring, it is likely that OHA will revoke the variance.


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# Chapter 8
# Portland Bureau of Transportation

## Portland's Transportation System

Portland's transportation system served nearly 584,000 residents in 2010, and tens of thousands of individuals who live, work, or spend time in the Portland Metro area. Transportation assets include facilities for pedestrians, bicyclists, transit users, all motorists, and emergency vehicles. Portland's transportation system, provided by the City and a variety of other jurisdictions and agencies, includes not only the networks of roads and highways but also right-of-way, sidewalks and paths, bikeways, bridges and other structures, transit (light rail, bus, streetcar, and tram), and thousands of supporting assets (lights, signals, signs, etc.).

The $8.1 billion the public has invested in the City's transportation system enables individuals to get to work, school, recreation, and activities to sustain daily household needs. The transportation system is a fundamental component of regional access and mobility, serving residents, businesses, and travelers and providing connections to local, regional, interstate, national and international destinations. The City's transportation system also creates the foundation for a variety of activities essential to our lives: livable and safe neighborhoods, land uses and managing growth, commerce and job creation, environmental protection, freight mobility, and revitalization.

## Transportation System Plan

The City of Portland's Transportation System Plan (TSP) serves as the transportation component of the Citywide Systems Plan.

The TSP is the long-range plan to guide transportation investments in Portland. It meets state and regional planning requirements and addresses local transportation needs for cost-effective street, transit, freight, bicycle, and pedestrian improvements. The TSP plans for transportation options for residents, employees, visitors, and firms doing business in Portland, making it more convenient to walk, bike, take transit -- and drive less -- while meeting their daily needs. The TSP provides a balanced transportation system to support neighborhood livability and economic development.

The Bureau of Transportation is updating the TSP to align with the Comprehensive Plan update. More information on the TSP update project is available at:
http://www.portlandoregon.gov/transportation/63710

The currently adopted Transportation System Plan can be found at:
http://www.portlandoregon.gov/transportation/52495


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# Chapter 9
# Portland Parks & Recreation

Note: Parks and recreation facilities are not a required urban service under the Oregon public facility planning goals and statutes. The City of Portland considers parks, natural areas, trails and recreation facilities to be essential infrastructure systems and has included this chapter in the interest of comprehensive infrastructure planning. However, the City does not intend for this chapter to be reviewed for compliance with public facility planning rules, including Oregon Statewide Planning Goal 11: Public Facilities, Oregon Statute 197 or Oregon Administrative Rule 660.

## Overview

Portland Parks & Recreation (PP&R) cares for over 11,000 acres of parks and natural areas, manages the urban canopy and the city's community gardens and offers thousands of programs for all ages at its community centers, swim pools, and other recreation facilities. In 2013, 86% of Portland residents rated the overall quality of parks as good or very good, making Parks the highest rated city service. Public investment in these important recreation facilities, natural areas, and gathering spaces supports a high level of use by Portland residents and visitors. In 2013, there were 4 million visits by Portlanders to community centers, pools, and recreation programs and 88% of Portlanders visited a city park at least once during the year. People from around the world and Portland's neighborhoods visit the Washington Park International Rose Test and Classical Chinese gardens. There are 155 miles of regional trails used for recreation and active transportation that keep Portlander's moving and healthy. Annually Portland community members volunteer over 475,324 hours to help maintain parks and assist others at our community centers.

Portland's treasured parks, trees, gardens, natural areas, and trails are infrastructure that beautify the city, provide important habitat, water quality, and environmental benefits, and add to the quality of life for both residents and visitors. Events and programs stimulate understanding and appreciation of the arts, celebrate diversity, encourage healthy lifestyles, benefit the local and state economy, and contribute to the public safety and stability of Portland neighborhoods. The continued investment in these important public spaces makes Portland a great place to live, work, and play.

Portland Parks & Recreation has adopted the following vision, mission, organizational values, equity statement and Parks 2020 goals to guide the Bureau's work.

### Vision

"Portland's parks, public places, natural areas, urban forest, community gardens, and recreational opportunities give life and beauty to our city. These essential assets connect people to place, self, and others. Portland's residents treasure and care for this legacy, building on the past to provide for future generations."


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### Mission

"The mission of Portland Parks & Recreation is to help Portlanders play – providing the safe places, facilities, facilities, programs, and nature experiences which promote physical, mental, and social activity. We get people, especially kids, outside, active, and connected to the community. As we do this, there will be an increase in the wellness of our residents and the livability of our city. We accomplish this through:

- Establishing, safeguarding and restoring the parks, natural areas, public places, community gardens and urban forest of the city, ensuring that these are accessible to all;
- Developing and maintaining excellent facilities and places for public recreation and community building;
- Providing dynamic recreation programs and services that promote health and wellbeing for all;
- Partnering with the community we serve.

### Organizational Values

Portland Parks & Recreation has the following organizational values:

- Quality, responsive service to our diverse customers and partners.
- Community participation in program and project planning.
- Innovation, creativity, and excellence in all we do.
- Openness, honesty, and respect in all relationships.
- A diverse and culturally competent workforce.
- Transparent, ethical, and accountable decision making.

### Equity Statement

"We recognize, understand and encourage celebration of the differences that surround us. Diversity and equity are vital to Portland Parks & Recreation's ideals and values."

### Parks 2020 Vision Goals

The Parks 2020 Vision outlines the following five goals for the park system:

- Ensure Portland's park and recreation legacy for future generations;
- Provide a wide variety of high quality recreation services and opportunities for all residents;
- Preserve, protect, and restore Portland's natural resources to provide 'Nature in the City';
- Create an interconnected regional and local system of paths and walks to make Portland 'The Walking City of the West'; and
- Develop parks and recreation facilities and programs that promote 'Community in the City'.


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## Purpose of this Chapter

This chapter describes the public facilities and services provided by Portland Parks & Recreation that are necessary to carry out its mission. It identifies desired levels of service, inventory and condition information for existing public facilities, and desired future facilities. Carrying out the Bureau's mission and other City and community goals may also require programs, investments and practices that are not related to public facilities. This chapter may acknowledge – but does not comprehensively address – these measures.

## System Services

### Service Area

Portland Parks & Recreation manages a system of developed parks, natural areas, the urban forest, community gardens, trails, community centers, and special recreation features that serve residents and visitors. See Figure 9.1 for a map of park facilities.

### Core Services Provided

Portland Parks & Recreation's built and green infrastructure forms the base by which Portland Parks & Recreation provides a wide variety of programs and services for the public. The focus of this chapter is built infrastructure, but Portland Parks & Recreation has five service areas:

- Community Services (includes Community Engagement, Leadership & Advocacy, Marketing & Business Development, and Visitor Services)
- Infrastructure Services (includes Capital Development, Maintenance, and Property)
- Support Services (includes Business Services and Planning), and;
- Recreation Services (includes Aquatics, Arts, Community & Socialization, and Sports & Games).
- Natural Resources Services (includes Natural Areas, Community Gardens, and the Urban Forest).


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### Service Agreements & Partnerships

Partnerships are an important strategy for Portland Parks & Recreation. Healthy, robust partnerships increase the visibility of our programs and work, they can help inform our communities about our strengths and our challenges, they extend our services and bring different skills to help manage resources and they provide us with important information about our communities. Working with community partners is a skill and work ethic that permeates all levels of Portland Parks & Recreation.

Portland Parks & Recreation regularly partners with a variety of agencies and organizations that provide park and recreation services to Portland residents. Governmental agencies include Metro, Multnomah County, School Districts (there are five in Portland that PP&R works with), the State of Oregon and many other regulatory bodies that govern land use and environmental work. Additionally, PP&R has more than 100 formally recognized “Friends and Partner” groups that range in capacity from half a dozen episodic volunteers, to fully developed non-profit organizations that completely manage specific assets. Altogether, Friends, Partners and volunteers contribute more than 470,000 hours annually, comparable to more than 220 full-time staff.

To facilitate efficient and effective provision of services, Portland Parks & Recreation has a number of identified service and partnership agreements. For example, Portland Parks & Recreation has a joint facilities agreement with Portland Public Schools, and agreements for the Schools Uniting Neighborhoods (SUN) program, Hoyt Arboretum, Pittock Mansion, Leach Botanical Gardens, Japanese Gardens, and many other Friends groups who help manage and maintain the park system.

The Portland Parks Foundation, an independent, nonprofit organization, formed in 2001 to assist in bringing long-term stewardship to Portland’s parks and programs. The foundation works closely with Portland Parks & Recreation to raise awareness of the funding and stewardship needs of the park system. They cultivate donors to deliver private dollars in three aspects of urban parks: the land, the amenities and the people.

## Inventory Summary

In 2013, the Portland Parks & Recreation system consisted of 11,546 total acres, and includes five main facility types:

- Developed Parks: 209 Parks on 3,455 Acres


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- Natural Areas: 77 parks on 7,887 acres
- Undeveloped Properties: 214 acres
- Trails: 155 Miles of Regional Trails
- Community and Arts Centers:14 Facilities

In addition to the capital infrastructure, Portland Parks & Recreation oversees the City's urban forestry program, which is responsible for managing the urban forest on City-owned or managed land, and certain private properties, and which coordinates implementation of the City's Urban Forest Management Plan. In 2010, the urban canopy covered 29.9% of the City.

## Condition Summary

Portland Parks & Recreation has inspected most of its assets, and strives to re-inspect 20% of its assets each year so that condition information is never more than five years old for any given asset. In 2013, 37% of Portland Parks & Recreation inspected assets were in good or very good condition, 19% were in fair condition, and 13% were in poor condition. Another 32% of the assets have not yet been inspected and given a condition rating. Percentages are based on counts of individual assets, which range in value and complexity, e.g. from pools to playgrounds.

## Capacity Summary

Portland Parks & Recreation strives to serve all Portlanders, and the park system needs to respond to population growth and recreational trends. In 2013, 4 million visits were recorded to a Portland Parks & Recreation recreational programs. Thirty-two percent of Portlanders participated in a city recreation activity, and 88% of Portlanders visited a city park at least once in 2013. While the park system needs to have the capacity to continue serving the large number of Portlanders using parks and recreation programs, Portland Parks &Recreation is also working to deliver equitable access to parks and recreation facilities geographically across the city. These level of service goals are outlined in the Portland Parks & Recreation Vision 2020, and include the goals to have:

- 100% of households within ½ mile walk of a park or natural area,
- 100% of households within 3 miles of a full service community center.

In 2013, 80% of households were within a ½ mile walk of a park or natural area, and 70% were within 3 miles of a full service community center. For service area maps, see Figure 9.3 and 9.4.

## Key Issues & Concerns

### Providing Services in Underserved Areas

Unfortunately, not everyone in Portland has equitable access to the benefits of parks and recreation. Virtually every district of the city has at least one parkland deficiency. In East, Northeast, and Southwest Portland, where there are fewer developed parks and often fewer trees and canopy cover, residents receive fewer benefits from the social and recreational opportunities parks provide. Since there are few remaining sites appropriate for larger developed parks available in the city, remedying park deficiencies


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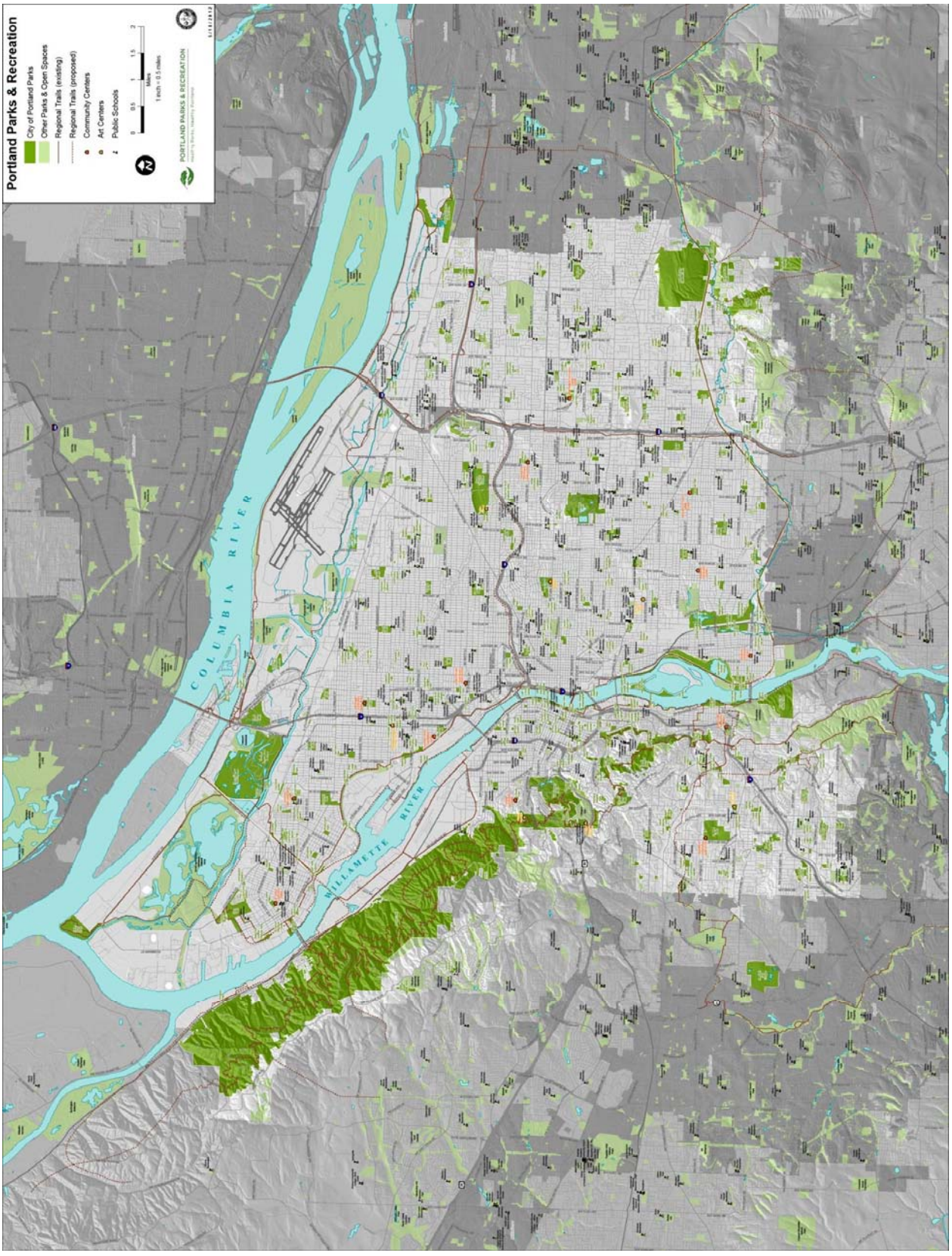
Figure 9.1 Portland Parks & Recreation Parks, Trails, Community Centers, and Natural Areas (2012)



presents a formidable challenge. See Figure 9.3, which shows the areas currently being served and unserved using the ½ mile from a park or natural area level of service.

Although community centers provide the recreational programs and community gathering places that give appeal to urban living, those benefits are unavailable to some residents. Certain areas of the city have no community centers, and others have centers that are housed in old, ill-adapted buildings that lack fundamental elements. Sellwood Community Center (SCC), for example, was built in 1909 as a rooming house. It does not have adequate security surveillance, ADA accessibility, or storage, and many rooms lack basic equipment for classes and programs. Yet, the neighborhood depends on SCC to fulfill its recreation needs. Since recreation programs and facilities are inextricably intertwined, the shortage of quality community centers limits the availability, breadth, and quality of recreation programs. See Figure 9.4, which shows the areas currently being served and unserved using the 3 miles from a full service community center level of service.

Portland's park system also lacks sufficient quantities of certain types of recreation facilities, like aquatic facilities and sports fields. Both are heavily used, highly programmed, and in short supply. Waiting lists also indicate that the Portland Parks & Recreation community garden program needs to keep expanding. While Portland Parks & Recreation currently has 48 community garden sites, only 7 gardens had plots available and there were almost 1400 individuals on the waiting list for garden plots in 2013.

As more people crowd into existing parks and facilities, user conflicts are increasing and the quality of park resources are declining. Portland Parks & Recreation works to balance the need for expansion of the existing system to address level of service gaps and address equity issues, with the need to adequately reinvest in existing infrastructure.





### Improving Access to Parks and Facilities

Lack of access to parks and few connections between parks limits the benefits of the system. Highways, heavy traffic, large taxlots, and industrial properties prevent many Portland residents from accessing park and recreation opportunities. In some situations, if better access to parks were available, including completed sidewalk systems or public access easements acquired, some households not currently considered within ½ mile of an existing park or natural area due to existing street conditions would now be served. Fragmentation reduces optimal conditions and forfeits the immense benefits of a holistic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system, because it is more difficult for people to safely and conveniently access a variety of park and recreation facilities.

Within parks and natural areas, there are also numerous ADA barriers that impact users from fully accessing the park system. Through development of the citywide ADA Transition Plan, PP&R has determined that there are over 20,000 individual barriers to accessibility that need to be addressed. Missing handrails, inaccessible paths, outdated wheelchair lifts, and steep slopes are examples of barriers that prevent people with disabilities or mobility challenges from fully enjoying parks and natural areas. The Transition Plan, with public input, will prioritize the needs and devise a schedule for addressing and funding the improvements given available resources.

### Maintaining Existing Infrastructure

In 2013, Portland's extensive park and recreation system had a current replacement value of over $1.02 billion, not including the underlying land which also adds additional value to the system. The condition of the system directly influences its ability to provide users with quality recreation experiences.

Preserving and improving the condition of a park, facility or natural area requires regular maintenance, which in turn requires sufficient funding. However, Portland Parks & Recreation is currently only able to reinvest 1-2% of facilities current replacement value annually, half of the industry standard of 2-4% for built facilities such as pools and community centers. Reinvestment standards for parks and natural areas are in development.

While the Bureau has identified specific maintenance needs and is currently addressing the most serious needs, Portland Parks & Recreation continues to lack sufficient funds to maintain its assets properly. Improving the level of maintenance and repair of the existing system to sustainable levels would require nearly $36.6 million more in resources each year (based on 2013 calculations, see Table 9.6).

Portland Parks & Recreation has instituted an asset management program to ensure the provision of high-quality facilities, provide for long-range capital planning, and develop best management practices.

However, the asset management program does not account for trees and other green infrastructure found in the Bureau's parks and natural areas. PP&R, BES, and the Water Bureau are investigating the possibility of modifying asset management and capitalization practices to include important green infrastructure assets, including trees.

Asset Management takes a full life-cycle approach, informing decisions from design through operations and maintenance to renewal and eventual replacement. The goal is to deliver expected levels of service with adequate funding at acceptable levels of risk. Asset Management shifts the operations and maintenance perspective from reactive maintenance and repair to a proactive approach of predictive maintenance and renewal, reducing costs and avoiding unplanned loss of service. Ideally, design and capital construction decisions are made in light of ongoing operations and maintenance costs to achieve the lowest total lifecycle costs. For the Bureau to have a full understanding of its assets, the asset management program will need to be expanded to incorporate green infrastructure, including trees.

### Accommodating Growth

Parks and recreation facilities are an important contributor to quality of life in the City of Portland and essential public infrastructure. They provide places to recreate and find respite, and improve the environmental, social, and physical health of the community. Maintaining Portland's quality of life will require preserving access to high quality park and recreation experiences by acquiring and protecting park lands, maintaining and upgrading existing facilities, and providing additional recreation facilities and services. The actual number of parks and facilities necessary will vary based on where and how growth occurs, the ability of existing facilities to serve additional users, and opportunities to locate and build additional parks and facilities.

Growth and increasing density will provide other challenges as well, including:

- Making acquiring new parks more difficult, as development reduces the number of parcels available for parks and natural areas. It may also increase competition for a fixed amount of land, thereby driving up land prices.
- Heightening the need to retain tree canopy, while causing tree removal.
- Increasing the number of users of already heavily utilized facilities, such as pools, Greater use of trail systems could increase user conflicts on multi-modal pathways.
- Exacerbating needs in currently underserved areas. These pressures may be particularly acute in dense urban centers that currently lack sufficient park amenities, where both existing facilities and acquisition opportunities are scarce.

In planning for growth, PP&R will look for opportunities to acquire sufficient parkland to meet needs and will improve and maintain parks, trails, and other facilities to accommodate more users while preserving a quality user experience. The Bureau will also explore options to create separated bike and pedestrian pathways on anticipated heavily used regional trails. Finally, PP&R will continue to work to preserve and enhance the City's natural areas and urban tree canopy for its critical environmental and community functions.

Currently, the City assesses a Park Systems Development Charge (SDC) on new residential and commercial construction to partially offset the costs associated with providing park services to new development. SDC funds are restricted to land acquisition and capital improvements in areas of population growth and new development. SDC funds cannot be used to correct existing parkland deficiencies, nor can they be used to meet the equally vital operations or maintenance needs. At a rate that is 75% of the targeted recovery rate, the SDC assessment does not fully offset the true costs of park development in Portland.

### Meeting Increasingly Diverse Community Needs

Portland's system of parks and recreational activities includes a wide variety of facilities and programs. Over time, the recreational needs of Portland have and will continue to grow and evolve. Pickle ball has been replaced with Footsal, the waitlist for community gardens is growing and wading pools are being replaced with splash pads. Senior recreation programs may have different amenity needs than youth programs.


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Meeting the needs of a growing and diversifying population is a fundamental challenge for Portland Parks & Recreation. Open space is generally viewed as our most flexible and valuable asset. We are, however, asked to accommodate an increasing number of single use and specialized activities that require dedicated land. These facilities, including off-leash dog areas, community gardens, spray parks, skate parks, and disc golf courses provide valuable recreation opportunities to a wide variety of users but limit the acreage available for more general uses. As Portland's demographics continue to change, recreational facilities and programs need to be able to accommodate the needs of growing cultural and ethnic communities. PP&R needs to continue to reduce barriers that may be experienced due to race, socio-economic status, or geographic location to ensure that park service is being provided equitably. Currently, to address the needs of diverse communities, PP&R incorporates community feedback into the planning of new park facilities, and to the programming of facilities. Parks will need to further increase its investment in the diverse populations of the city by deepening its inclusion efforts in decision making to advance equity goals.

Different perspectives will provide a richer analysis to factors including current distribution, service areas, and capacity; current and projected demand; available locations; demographics; and resources when planning for and siting new facilities.

### Protecting Portland's Natural Resources

Portland's natural areas and urban forest provide innumerable environmental, economic, and health related benefits to the city. Natural area settings in Portland include forests, meadows, wetlands, streams, and riverbanks. Portland Parks & Recreation currently protects more than 7,885 acres of natural areas. These natural areas are primarily forest and represent the range of forest types naturally occurring in the region including Douglas fir stands, ash and cottonwood riparian forests, and mixed deciduous and confier forest. The system includes some open woodlands, often dominated by Oregon white oak, and less frequently shrublands and grasslands, including wetland marshes, which offer unique habitat features. Hybrid Parks are managed both as natural areas, and have portions that are developed.

Protecting natural resources is very important to residents who value access to nature, improving the quality of life and environment. As existing open space is developed, more people will seek and use park system resources — crowding into existing parks and facilities, escalating user conflicts, and degrading resource quality. Natural areas are also important for providing wildlife habitat, cleaning the air and water, and enhancing resiliency to the impacts of climate change.

Portland Parks & Recreation's approach to natural area acquisition, restoration, and management is described in The Natural Area Acquisition Strategy (2006) and Natural Areas Restoration Plan (2010). The plan integrates the goals and objectives established in the Salmon Safe Certification (2004), the Portland Watershed Management Plan (2005), and the Oregon Conservation Strategy (2006). When appropriate, PP&R and the Bureau of Environmental Services (BES) collaborate on the acquisition and/or restoration of natural areas, when the property meets the objectives of both Bureaus.

Portland Parks & Recreation used an Ecosystem Management framework to develop specific, science-based restoration actions for each natural area. The framework is based on six steps:

1. Vegetation Inventory
2. Desired Future Condition (25-year timeframe)
3. Assessment: gap analysis between the inventory and the desired future condition
4. Prescription: specific, localized actions necessary to reach the desired future condition
5. Intervention: on-the-ground work
6. Monitoring: observations and data collection to measure the success of the intervention and to modify the prescriptions.

This frameworks sets the trajectory for enhancing ecological health and building resiliency for natural area sites. Portland Parks & Recreation is the only park system certified Salmon Safe (2004, recertified in 2012). Certification standards constitute a set of best management practices that are applied across a variety of landscapes from natural areas to golf courses to sports fields. These best management practices – integrated pest management program, reduction in irrigation and runoff, riparian restoration, removal of invasive species, assist the City in meeting its obligations for the Clean Water and Endangered Species acts.

Portland Parks & Recreation faces ongoing funding challenges in its efforts to implement the Natural Areas Acquisition Strategy (2006) and Natural Areas Restoration Plan (2010). PP&R has not had available funding to acquire all the targeted natural areas identified in the Acquisition Strategy, and has not had sufficient levels of funding to fully implement the restoration and management actions called for in the Restoration Plan. Operation and maintenance funding for natural areas is scare. For example when Forest Park was acquired in 1947, no operation and maintenance funds were allocated for its protection and enhancement, and to date there are still no dedicated funds. The current cost estimate for controlling invasive species in Forest Park – which represents only a portion of the park's operation and maintenance needs – is $10 million.


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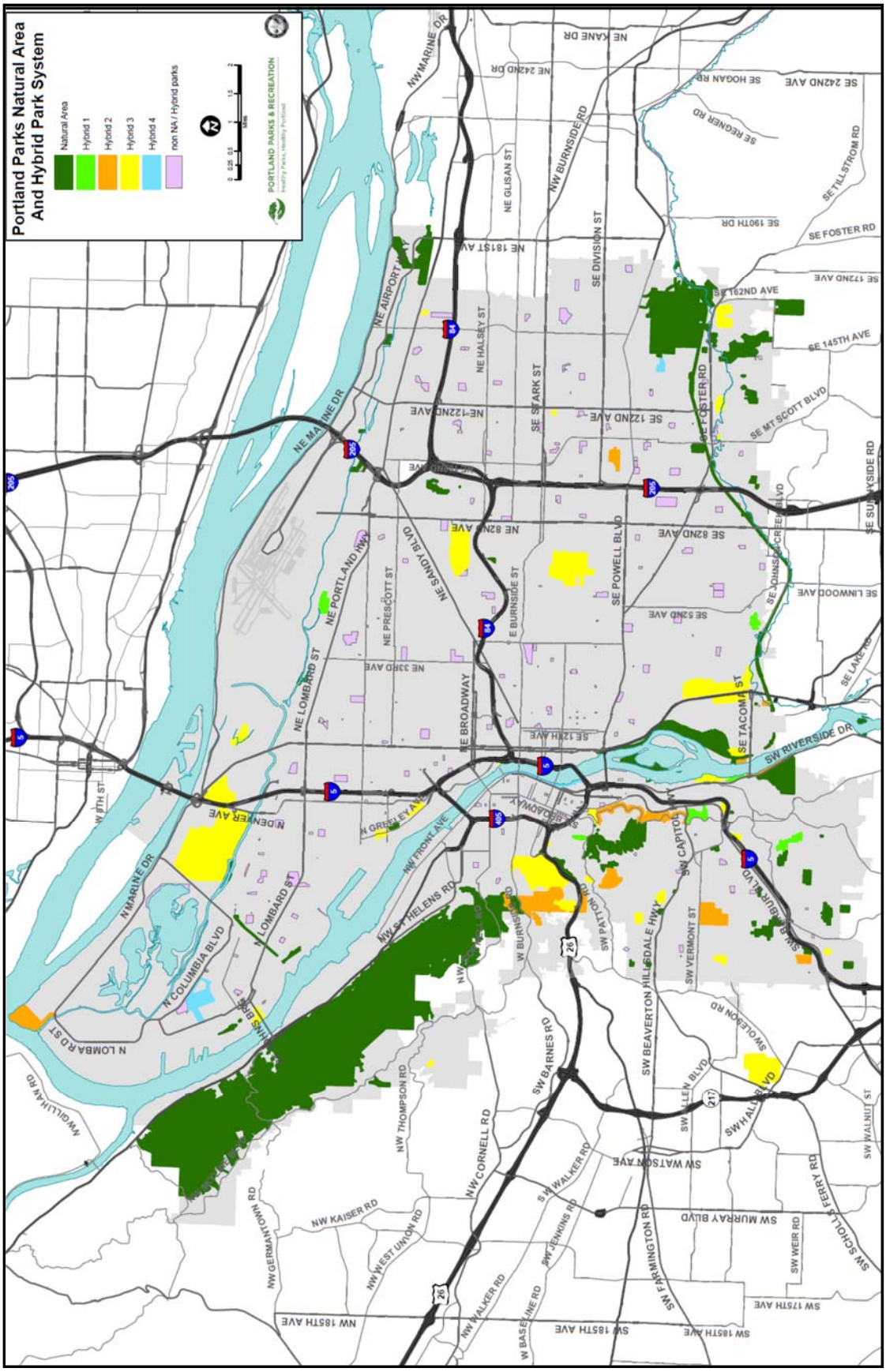
Figure 9.2 Natural Area System



### Stewarding the City's Urban Forest

The urban forest, which includes all the trees and shrubs in the city, provides environmental, social and economic benefits to Portland's residents in the form of increased biodiversity, improved air quality, stormwater mitigation, improved neighborhoods and increased property values.. Regulation of this important resource is led by Portland Parks and Recreation although management is shared among many city bureaus that have an interest in its improvement and well-being, as well as private property owners. These bureaus have developed an action plan to realize the goals of the 2004 Urban Forest Management Plan. The action plan calls for diverse activities to meet Urban Forest Management Plan goals and outcomes; activities such as education and stewardship, research and monitoring, planting and maintenance, and policy and regulatory improvements. The 2009 estimated operation and maintenance needs for operation and maintenance needs of the City's street trees is $13 million.

The city's urban forest faces a number of challenges that have implications for multiple City bureaus and goals. First, canopy cover is being lost to development, particularly in areas of southwest and outer east Portland. Traditional development patterns often involve significant losses of tree canopy cover and increases in impervious surfaces which limits areas for replanting, particularly large tree species. These changes can result in increased stormwater volumes and air temperatures, and heighten pressures placed on hillsides and streams. The urban forest is also threatened by invasive plants and insects. These invasive species can stress the ability of natural species to survive. Invasive pests and diseases can have sudden and devastating effects on the urban forest especially in areas that lack age and species diversity. Climate change will also impact the urban canopy and the tree species survival. The City will need to update the street tree list and plant drought resistance species to increase the resiliency of the urban forest.

Portland's street and park trees form a sustainable resource vital to the city's environmental, social, and economic health. Portland's street and park trees cost the city and private property owners just over $6.5 million annually to maintain, yet provide nearly $27 million worth of environmental and aesthetic benefits[1]. For every dollar invested, $3.80 worth of benefits is returned. Portland Parks & Recreation's approach to managing the urban forest is described in The Urban Forest Management Plan (2004) and The Urban Forest Action Plan (2007). Portland Parks & Recreation, Bureau of Environmental Services, Bureau of





[1] Portland's Urban Forest Canopy – Assessment and Public Tree Evaluation (2007)

Planning and Sustainability and Bureau of Development Services also recently partnered in an effort to update the tree code, which covers privately owned land and was adopted by City Council in April 2011 but has not been fully funded for implementation.

### Managing Park, Recreation, and Natural Resources

Portland Parks & Recreation is developing a System Plan that will provide a holistic and comprehensive approach to park acquisition, management, programming, and resource protection. Portland Parks & Recreation is also developing master and management plans to guide development, management and funding decisions to optimize resources and meet needs.

Portland Parks & Recreation is developing accurate inventory and assessment information for all assets, both capital and non-capital. Without valid, reliable information on which to base management decisions, it is difficult to effectively anticipate and prepare for new park uses, or manage green infrastructure resources like the urban forest and natural areas. For example, the City does not have a complete inventory of private trees, but recognizes that more than half of the tree canopy of the urban forest is located on privately owned land. Basic information such as canopy cover, species diversity and distribution is needed for proactive management.

### Preparing for Climate Change

Hotter, drier summers and warmer, wetter winters due to climate change will likely have impacts on park habitat areas, tree species, natural areas, waterways, and built infrastructure. For example, warmer, drier summers may result in increased demand for water-related recreation and air-conditioned indoor recreation spaces, or may require adjustments to management practices for the urban forest to ensure resilient tree canopy. Changes in rainfall could impact asset lifespan, increasing maintenance requirements for structures, trails, docks, trees and landscaping, and other facilities. Trails and other assets may be impacted by increased landslides.

To help prepare the city for the impacts of climate change, Portland Parks & Recreation will need to take into account trends in river levels, temperatures, and rainfall when locating and designing future park facilities. In addition, the bureau may need to design and maintain bridges, docks, or park features in flood areas differently, to adjust to changing flooding patterns and water levels. Adding tree and shrub cover where appropriate and selecting planting species that are resilient and water-efficient will help mitigate heat and air quality impacts. Portland Parks & Recreation will also need to continue to increase energy efficiency, water conservation, maintenance efficiency, and the use of resilient materials to help prepare for climate change related impacts.

### Funding the City's Park, Recreation, and Natural Area System

In the fiscal year 2013/14 adopted budget, Portland Parks & Recreation will spend just under $100 million to operate, maintain, and expand Portland's park system. Over 40% of Portland Parks & Recreation's financial support comes from the city's General Fund (i.e., discretionary resources that the Council allocates). In addition to the discretionary General Fund revenue, Portland Parks & Recreation receives revenue from system development charges, user fees, interagency agreements, and a variety of other

sources. A small (and unpredictable) fraction of Portland Parks & Recreation's budget comes from grants and donations. Portland Parks & Recreation also periodically raises fees to provide the variety and scope of programs that the public needs and wants. Scholarships are available to mitigate the effect this may have on those on fixed incomes or with lower incomes.

Portland Parks & Recreation operating expenses have risen steadily in recent years due to increasing use, utility costs and an aging park infrastructure, as well as construction of new facilities to accommodate a growing population and demand for different recreation activities. Unfortunately, over many decades, park system funding has not kept up with needs. Numerous parks need major renovation and many recreation facilities are in poor condition. Funding is not available for routine maintenance of park trees, and Portland Parks & Recreation's Urban Forestry program does not have a sustainable source of funding for tree replacement or canopy expansion.

Insufficient funding for public schools also has budget impacts on parks and recreation. As public schools cut youth programs, Portland Parks & Recreation's role as the state's second-largest provider of youth programs becomes even more vital. Portland Parks & Recreation now provides many of the arts, athletics and recreation programs that schools cannot.

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# Regulatory Compliance

Portland Parks & Recreation works to meet all regulatory requirements in the development and maintenance of its assets. Federal, State, Regional, and City legislation and mandates affect how Portland Parks & Recreation operates and manages its park system. Examples of legislation at all levels that affect Portland Parks & Recreation include:

### Federal

- The **Federal Emergency Management Agency (FEMA)** requires communities to take into account floodplain hazards in all official actions related to land management and use. Relevant projects must be reviewed and permitted by the Bureau of Development Services to ensure no net rise in stream or river elevations that would harm downstream properties.
- The **Endangered Species Act** is intended to protect and recover endangered or threatened species, and the habitat and ecosystems upon which they depend. PP&R has been working towards recovery of salmon in the region to help the city meet Endangered Species Act compliance. This includes watershed and fish habitat restoration, removal of invasive plants, redesign of parks and their features, and careful review of management practices. Waterways in parks receive special consideration with specific actions such as invasive species removal, planting native species and working with BES to restore and protect their functions. The IPM Program contributes to the success of the endangered/threatened salmon and steelhead program. PP&R is committed to maintaining Salmon Safe Certification, which requires the use of best management practices throughout the park system to improve aquatic ecosystem and to ensure that any harmful impacts on water quality and fish habitat are minimized.
- The **Americans with Disabilities Act** (ADA) requires that public spaces and programs be accessible, or, where full accessibility cannot be provided in an integrated setting, jurisdictions are required to provide equivalent facilitation opportunities. All new development is required to meet ADA standards, and the City of Portland's ADA Transition Plan, currently under development, will provide an approach for addressing accessibility barriers in existing public spaces to ensure compliance.
- The **National Historic Preservation Act** is intended to preserve significant historical and archaeological sites. Portland Parks & Recreation's portfolio includes several facilities and sites that are listed on the National Historic Register.
- The **Clean Water Act** regulates discharges of pollutants into waters of the United States, and quality standards for surface waters. PP&R's Water Quality Testing Program helps the City achieve compliance by providing specific feedback on the effectiveness of the PP&R Integrated Pest Management (IPM) program at protecting water quality, and providing direct accountability for practices most likely to influence water quality such as fertilizer applications and pesticide use.
- The **Migratory Bird Treaty Act** protects migratory birds, and their habitat and ecosystems. PP&R sponsors the Festival of the Birds to educate the public about migratory birds. Additionally, work PP&R does to remove of invasive species and plant native species enhances native bird habitats throughout the city.

### State

- The **Department of Environmental Quality** (DEQ) is a regulatory agency whose job is to protect the quality of Oregon's environment Projects are required to comply with DEQ regulations impacting air quality, water quality, and general environmental health (including pollutants, hazardous materials, etc.)
- The **Statewide Comprehensive Outdoor Recreation Plan (SCORP)** looks at recreational trends and needs in the state of Oregon, and provides guidance for delivering quality outdoor recreational opportunities for Oregonians and visitors. The SCORP is also used to provide guidance for state administered grant programs.
- Many of **Oregon's Statewide Planning Goals** have impacts on Portland Parks & Recreation projects, including Goals 2, 4, 5, 7, 8, 9, 10, 11, and 15. Goals that most directly impact Portland Parks & Recreation work include:
    - Goal 5 (Open Space, Scenic and Historic Areas and Natural Resources), which requires inventory of these important resources, and policies that guide treatment of these resources;
    - Goal 8 (Recreation Needs), which requires jurisdictions to evaluate its recreation facilities and develop plans to ensure that recreation opportunities will meet projected recreation demand. The Parks Vision 2020 outlines the broad system goals to ensure that Portland Parks & Recreation will be able to address anticipated recreation demands; and
    - Goal 15 (Willamette Greenway), which sets forth procedures for administering the 300 miles of greenway that protects the Willamette River. PP&R's management of public spaces, trails, and access points along the Willamette River Greenway helps the city to be in compliance with Statewide Planning Goal 15.
- The **Oregon Recreation Trails System Act** designates a system of recreation trails statewide to provide outdoor recreation opportunities and access to scenic areas.

### Regional

- The **Metropolitan Greenspaces Master Plan** details the vision, goals, and framework for a regional system of natural areas, trails, and greenways in the Metro region.
- The **Metro 2040 Growth Concept** a long-range plan guiding growth and development in the Portland Metro area, including open space, park, and regional trail goals.
- The **Regional Framework Plan** includes Metro's adopted land use planning policies and requirements, including requirements for parks, open spaces, and recreational facilities, and protection of lands for natural resources.

### Local

- Portland Parks & Recreation projects must also comply with **City of Portland Zoning and Building Permit Code Requirements**, often including environmental review. All projects must also comply with the Portland Stormwater Management Manual.

# Goals & Policies

Draft Goals and Policies related to Parks & Recreation facilities and services can be found in Chapter 5. Key Infrastructure Policies.

## Desired Levels of Service

Portland Parks & Recreation has two defined level of service goals, from its adopted Parks Vision 2020:

- Provide a developed park or natural area within ½ mile from every household
- Provide a full-service community center within 3 miles of every household

Per Vision 2020, PP&R also seeks to build out the recreational trail system. More asset-specific service goals are outlined in Technical Papers, and as Bureau Performance Measures, identified in the Portland Parks & Recreation Strategic Plan. As Portland Parks & Recreation continues development of its new System Plan, it will continue refinement of recreational feature levels of service.

# Capital Improvement Program (CIP) Strategy

Portland Parks & Recreation's Capital Planning Process is outlined in the Portland Parks & Recreation Capital Planning Manual (2009). The goals of the Capital Planning Process are to:

- Protect and maintain those existing assets that provide desired levels of service through maintenance, rehabilitation and renewal that extend the life of the asset.
- Provide new service and expand capacity that accommodates growth and provides equitable levels of service through the expansion of existing facilities and the construction of new parks and facilities. Improve efficiency, environmental quality and energy conservation wherever possible.

Portland Parks & Recreation updates its Capital Project List annually. The list identifies projects on a 1-5 year CIP timeframe, a 5-10 year CIP timeframe, and a 10-20 year timeframe. See the Investment Strategy section later in this chapter for more detail on the Portland Parks & Recreation Capital Planning process and project criteria.

# Inventory

## Built Infrastructure

Portland Parks & Recreation's built infrastructure system is currently valued at over $1.02 billion, see Table 9.1. This is based on 5 main types of assets, with green infrastructure being the largest percentage of the overall replacement value, at $419 million. PP&R defines its green infrastructure asset group as the urban forest, turf, shrub beds, and botanic gardens located on its properties. Buildings and pools are the next largest category, at $280 million. This multitude of parklands, recreation facilities, support facilities, trees, and natural areas contribute to access to nature, recreational opportunity, environmental quality, and livability within the city.

Besides Portland Parks & Recreation, Metro is the largest park and natural area provider in the city. Metro's inventory includes significant natural habitat areas, including the over 2,000 acre Smith & Bybee Wetlands, as well as Glendoveer Golf Course, the M. James Gleason Memorial Boat Ramp on the Columbia River, and fourteen pioneer cemeteries. Metro also owns and operates the Oregon Zoo, Oregon Convention Center, Portland Center for the Performing Arts, and Portland Metropolitan Exposition Center. State parks, public schools, cemeteries, and other open spaces also provide park and natural area opportunities.

Table 9.1 Parks & Recreation Asset Groups and Replacement Values, 2013

| **Capital Asset Class** | **Value** (in millions) |
|---|---|
| Amenities | $21.4 |
| Buildings and pools | $280.6 |
| Recreation features | $236.6 |
| Built infrastructure | $68.0 |
| Green infrastructure | $419.2 |
| **Total Parks** | **$1,025.8** |

Table 9.2 Inventory of Portland Parks & Recreation Facilities by Type, 2013

| **Inventory by Facility Type** | |
|---|---|
| Developed Parks | 3,445 acres |
| Natural Areas | 7,887 acres |
| Regional Trails | 155 miles |
| Community and Arts Centers | 14 facilities |
| Aquatic Facilities | 13 pools |
| Tennis Facilities | 124 courts |
| Athletic Fields | 232 fields |
| Golf Courses | 5 courses |
| Restroom Buildings | 97 facilities |
| Basketball Hoops | 229 hoops |
| Spray Features and Interactive Fountains | 24 facilities |
| Skate parks | 5 facilities |
| Community Gardens | 48 gardens |
| Playgrounds | 129 areas |
| Stadiums and Sports Complexes | 4 facilities |
| Botanical/Public Gardens | 8 gardens |
| Administrative Facilities | 12 facilities |
| Maintenance Facilities | 44 facilities |
| Off-Leash Dog Areas | 33 areas |
| River Beaches | 5 areas |
| Motorsports raceway | 1 area |
| Reservable Picnic Areas | 86 areas |

## Urban Forest

Portland's public streets, parks, and natural areas host a diverse array of tree types. Nearly 1.5 million trees grow in these public spaces. The street tree population includes 171 different types, and over 41


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tree types are found in developed parks and natural areas. Replacement of the city's urban forest is estimated at $6 billion.



Table 9.3 Inventory of Portland's Trees, 2007

| Tree type | Number |
|---|---|
| street trees | 236,000 |
| developed park trees | 39,000 |
| natural area trees | 1,200,000 |

Broadleaf deciduous trees dominate the landscape, accounting for 85% of street trees and 77% of park trees. Tree size designations (small, medium, and large) are determined by both the functional type and mature tree size of the tree. Parks contain more large-at-maturity trees (64%) and more conifers (23%) than do street rights-of-way. Streets host four times the diversity of tree types than parks, one-third of which are small when mature.

# Current Condition

Portland Parks & Recreation is in the process of developing a more formal Asset Management program. Portland Parks & Recreation is working to develop an Asset Register to maintain collected inventory and condition information about its assets. The Bureau has developed an inspection program work plan, and has begun the process of adding routine inspection and condition assessment information into annual operations practices. In general, 20% of all Portland Parks & Recreation assets would be inspected each year, so that condition information on an asset would never be more than five years old.

Table 9.4 illustrates the condition of PP&R's capital assets, as reported in 2013. Some assets have yet to be assessed, but of those that have been, the majority of assets were in fair or better condition. However, 43% of park furnishings were in poor or very poor condition, 4% of major buildings were in poor or very poor condition, 12% of minor buildings were in poor or very poor condition, 23% of marine facilities were in poor condition, 23% of play areas were in poor or very poor condition, 13% of sports courts and fields were in poor or very poor condition, 19% of community gardens were in poor or very poor condition, 19%

of circulation systems (roads and trails) were in poor or very poor condition, 13% of natural areas were in poor or very poor condition, and 11% of developed park landscapes were in poor or very poor condition.

Table 9.4 Current Condition: Parks and Recreation System, 2013

| Capital asset type | Current Condition (in %) | | | | | |
|---|---|---|---|---|---|---|
| | Very Good | Good | Fair | Poor | Very Poor | To Be Determined |
| **amenities** | | | | | | |
| furnishings in developed parks | 12 | 14 | 31 | 41 | 2 | 0 |
| furnishings in natural areas | 0 | 0 | 0 | 0 | 0 | 100 |
| decorative elements | 28 | 31 | 19 | 21 | 1 | 0 |
| **buildings and pools** | | | | | | |
| Major buildings | 61 | 9 | 26 | 0 | 4 | 0 |
| Minor buildings | 40 | 16 | 32 | 8 | 3 | 0 |
| **recreation features** | | | | | | |
| gathering places | 0 | 0 | 0 | 0 | 0 | 100 |
| marine | 71 | 0 | 6 | 23 | 0 | 0 |
| off-leash areas | 0 | 0 | 0 | 0 | 0 | 100 |
| play areas | 17 | 35 | 25 | 18 | 5 | 0 |
| sports courts and fields | 33 | 22 | 21 | 9 | 4 | 11 |
| water play | 0 | 0 | 0 | 0 | 0 | 100 |
| community gardens | 19 | 17 | 45 | 15 | 4 | 0 |
| **built infrastructure** | | | | | | |
| circulation | 0 | 41 | 40 | 19 | 0 | 0 |
| utilities | 0 | 0 | 0 | 0 | 0 | 100 |
| **green infrastructure** | | | | | | |
| natural areas | 50 | 31 | 6 | 12 | 1 | 0 |
| developed areas | 10 | 34 | 45 | 7 | 4 | 0 |

## Condition of Urban Forest

Tree condition is the health of the tree as manifest in the condition of its bark and leaves. The condition of urban trees reflects species hardiness, site conditions, and maintenance history. Trees that are well suited to Portland's climate, that can adapt to the challenges of growing in an urban environment, and that have been maintained using proper arboricultural techniques are generally the most successful. Urban forest condition also includes the distribution of trees and make-up of the forest in terms of tree species; more even distribution of trees and a wide array of tree species comprise a healthier forest which is more resilient to pests, pathogens and catastrophic events such as storms or climate change


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Table 9.5 Current Condition: Street and Park Trees, 2007[2]

| Tree type | Current Condition (in %) | | | |
|---|---|---|---|---|
| | Good | Fair | Poor | Dead/Dying |
| Street trees | 64 | 28 | 7 | 1 |
| Park trees | 88 | 7 | 5 | 1 |

Portland's park trees are in generally better health than its street trees. While roughly the same proportion of park (94%) and street (91%) trees are in fair to good condition, 24% more park trees are classified in good condition. Compared with parks and natural spaces, the street environment – where growing space is limited, soils are generally poor, and automobile exhaust reduces local air quality – is far less hospitable to trees.

# Projected Condition

Portland Parks & Recreation is in the process of developing a full Asset Management program, which will provide projected condition information for assets. At this time, Portland Parks & Recreation does not have projected condition information.

# Current Capacity

Portland Parks & Recreation has not yet met its level of service goals to have every household within ½ mile of a park or natural area, and within 3 miles of a full service community center. In 2013, 80% of households were within ½ mile of a park or natural area, and 70% of households were within 3 miles of a full service community center.





**Park Experience**

PP&R's 2020 Vision includes a goal to "Provide a wide variety of high quality recreation services and opportunities for all residents." An objective of this goal, and a measure of our level of service, is to provide a park experience within a half mile (approximately 10 to 15 minute walk) of every Portland

[2] Portland Parks & Recreation, *Portland's Urban Forest Canopy Assessment and Public Tree Evaluation*, October 2007

resident. The park experience includes developed parks (parks with, at a minimum, grass, trees, circulation, open play areas and seating), and accessible natural areas over 1/6 of an acre in size.

Figure 9.3 shows the areas of the city (in blue) that are within 1/2 mile walk of a park or natural area. The 1/2 mile distance is calculated using the walkable street and trail system, so parks in areas with poor transportation circulation systems have smaller service areas and serve fewer people. The calculation also takes into account walkability to actual park entry points.

Typically, the districts with lower levels of service are the more recently annexed parts of the city, where former county parks with fewer amenities were added to the system. PP&R is actively working to improve that level of service. For example, in 2015 PP&R will be constructing Beech Park and Gateway Park in East Portland using SDC funds. These parks represent a $12.4 million investment in East Portland and will serve more than 1,790 new households. PP&R is presently working with Verde, a nonprofit group, and Let Us Build Cully Park! Coalition to build Cully Park in northeast. The funding for Cully Park is from grants and $1.25 million in from SDC.

As PP&R works to meet the ½ mile goal, it faces the following challenges:

- Properties with the capacity and characteristics to provide a reasonable park experience are not always available in the areas of greatest need.
- Funds for acquisition of new park land often come with restrictions on how or where they can be used. For example, Service Development Charges (SDC) funds can only be used to address needs created by population growth, not to remedy deficiencies in levels of service. Funds that come from Urban Renewal Areas (URA) are restricted to parks within those geographic areas. These restrictions slow progress in meeting the goal.

The percentage of households within a ½ mile walk of a developed park or natural area does not include undeveloped properties or properties not owned or managed by PP&R.

### Community Centers

PP&R's 2020 Vision includes a goal to "Provide a wide variety of high quality recreation services and opportunities for all residents." An objective of this goal, and a measure of the level of service, is to provide a full-service community center within 3 miles of every Portland resident. A full service community center includes a gymnasium, fitness and classrooms, and a pool.

The 3 mile distance is calculated using the walkable street and trail system, so community centers in areas with poor transportation circulation systems have smaller service areas and serve fewer people. The calculation also takes into account walkability to actual community center entry points.

PP&R is actively working to improve that level of service. In 2002, the percentage of households within 3 miles of a full-service community center was 36%; in 2013, it was 70%.

As PP&R works to meet the 3 mile goal, it faces the following challenges:

- Development of a new full-service community center is a major undertaking. Properties with the capacity and characteristics to support a full-service community center are not always available in


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the areas of greatest need. Furthermore, experience shows that co-locating any community center with a park expands recreation programming options and enriches the participant experience.

- Funds for acquisition of new land and facilities often come with restrictions on how or where they can be used. For example, Parks Service Development Charges (SDC) funds can only be used to address needs created by population growth, not to remedy deficiencies in levels of service. Funds that come from Urban Renewal Areas (URA) are restricted to facilities within those geographic areas. These restrictions slow progress in meeting the goal.

The percentage of households within a 3 miles of a full-service community center does include smaller community centers or other facilities owned by PP&R and managed by partners. Figure 9.3 shows the areas of the city currently meeting the 3 mile to a full service community center level of service goal.





## Trails

The Parks 2020 Vision also includes a goal to create an interconnected system of trails to serve both recreational and transportation needs. PP&R has been working to build out its trail system, as outlined in the Parks Recreational Trail Strategy (2006). The Recreational Trail Strategy calls for 220 miles of a connected trail system; however, only 155 miles are built, leaving 65 miles of future trails that need to be constructed. As PP&R works to build out the trail system, it faces the following challenges:

- Trail easements on private property are acquired when a property develops or redevelops, or through a willing seller program. Waiting for one of these conditions to occur before an easement can be acquired has resulted in a slow process for filling in trail gaps.
- As use, both recreational and transportation, continues to increase on trail systems, PP&R needs to continue to coordinate with other partner groups and agencies to ensure that the existing trail systems are able to handle growing capacity and respond to increased maintenance needs.

Figure 9.5 shows the PP&R trail system, existing and future, as shown in the Recreational Trail Strategy.

Figure 9.3. Portland Parks & Recreation ½ Mile to Park or Natural Area Service Area

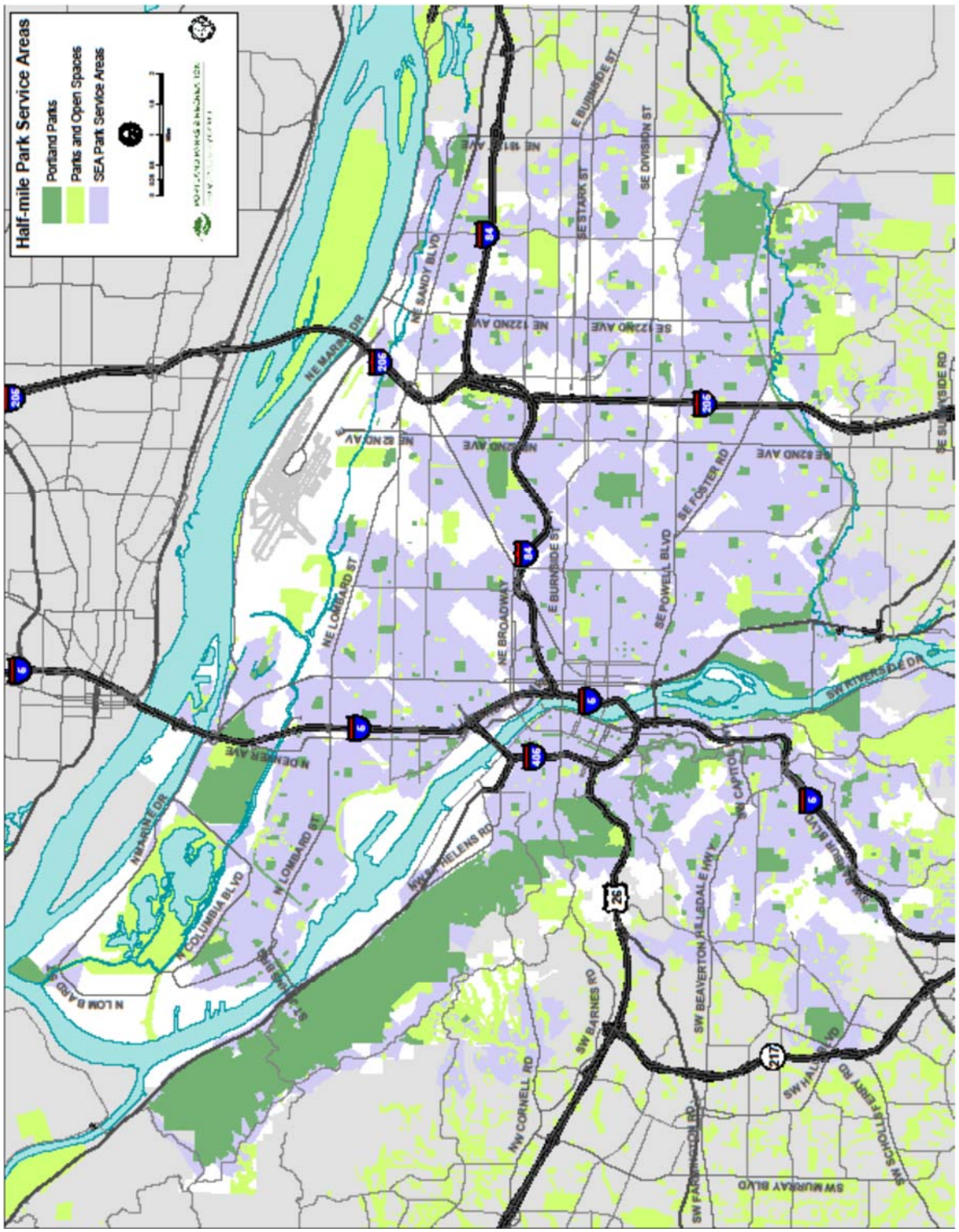




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Figure 9.4. Portland Parks & Recreation 3 Mile Full Service Community Center Service Area

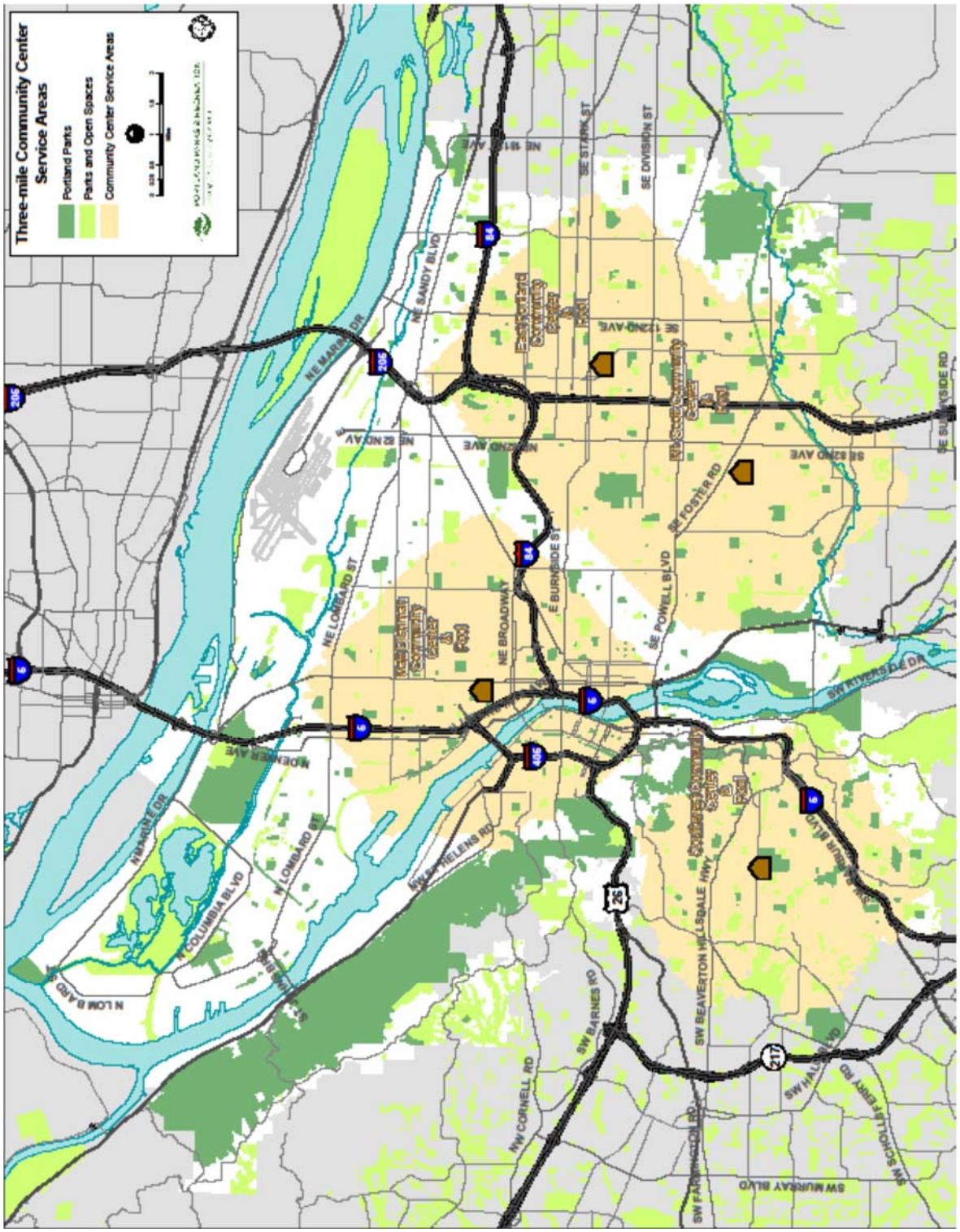
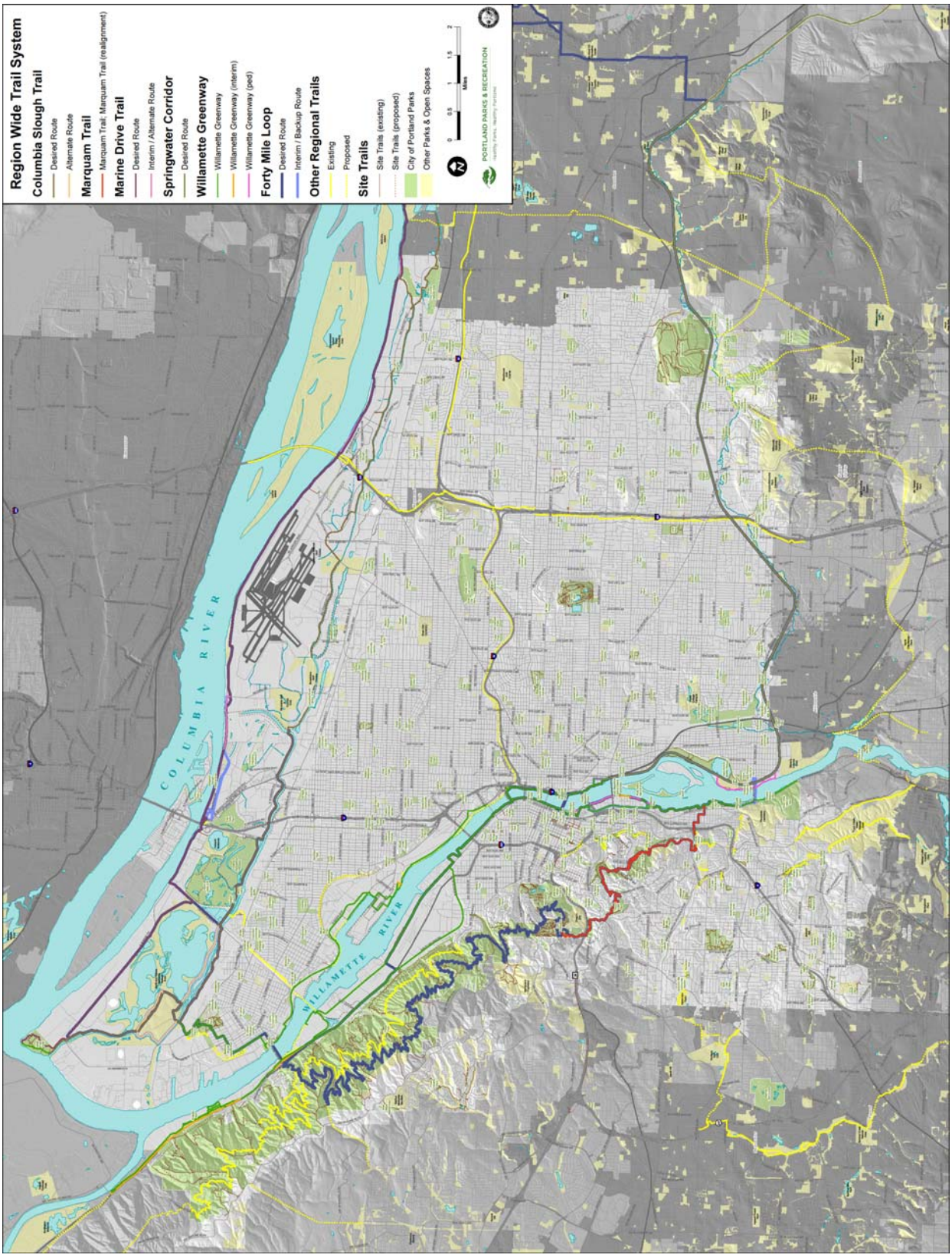


Figure 9.5 Portland Parks & Recreation Recreational Trail Strategy System Map



# Needs & Approach

## Built Infrastructure

Portland Parks & Recreation uses community outreach processes to inform design of new park and facility master plans. It occurs in the form of surveys, trend analysis, project committees, open houses, and other specific targeted outreach. Public involvement during initial project planning helps to inform creation of capital projects that are added to the 20-year project list.

Portland Parks & Recreation has strategically mapped the areas of the city that are currently not meeting the ½ mile desired service level for proximity to a park or natural area (see Figure 9.3) and areas not meeting the 3-mile desired service level for proximity to a full-service community center (see Figure 9.4). The Bureau is actively working to fill in those gaps. At the same time, Portland Parks & Recreation needs to invest in and maintain existing infrastructure. Portland Parks & Recreation balances the needs for system expansions and maintenance in decision-making.

The PP&R 20-year Capital Project List includes projects to maintain the existing system, and projects to expand or grow the system to meet service level goals. Typically, the 20-year Capital Project List includes development of those new parks where PP&R has acquired property and created a master plan. If all the parks and park facilities on the 20-year Capital Project List were implemented, there would still be some level of service gaps. Additional acquisition is necessary to continue to address those level of service needs, and that acquisition is represented on the 20-year Capital Project List, though until development plans are in place for those future properties, development expenditures are not represented.

## Natural Resources

The City's Natural Area Acquisition Strategy (2006), focuses future acquisitions on protecting large, sustainable tracts of land and examples of exceptional value for habitat and watershed health. Of primary importance is protecting a large forested site on Portland's east side, including additional land at Kelly, Powell, and Clatsop Buttes. These, and other "last, best places" in Portland must be protected, as once developed they can never be returned to their natural state.

Portland Parks & Recreation Natural Areas Restoration Plan (2010) is a system-wide, watershed based strategic plan that guides habitat enhancement in natural areas. The plan includes a prioritized list of projects with their objectives and desired ecological outcomes. It guides PP&R in reaching the desired outcome of protecting and enhancing the biodiversity and ecological health of our natural areas, provides direction for near and long-term actions, and establishes management priorities.

## Urban Forest

The Urban Forest Management Plan (2004) calls for expanding the urban forest canopy to cover 33 percent of the city and increasing street tree stocking levels, especially in underserved neighborhoods. The Urban Forest Action Plan (2007) contains the major goals and desired outcomes of the management plan, along with sixty-three actions items. Although these public trees provide a large return for the investment, opportunities exist to further improve the structure and management of the urban forest on

public and privately owned property. To maximize benefits, Portland Parks & Recreation and its partners are focusing efforts on retaining and expanding existing canopy, planting the right tree in the right place, planting large-growing species where appropriate, and keeping trees healthy.

# Recommended System Improvements

Portland Parks & Recreation's park system has existing areas that do not meet service level goals. To resolve these deficiencies and to meet goals established in Parks 2020 Vision, Portland Parks & Recreation has identified a need for:

- Approximately 150 acres of new parkland throughout the City, and the development existing park properties, to meet the goal of providing a park within ½ mile of all city residents;
- 75 miles of multi-use trails within the City to connect people and places and address both recreational and transportation needs;
- Civic spaces in dense urban centers;
- Community centers to serve recreation needs in inner southeast, central and outer northeast and distant southeast.
- Additional pools, particularly in outer northeast Portland.
- Play areas, particularly in central northeast and outer east;
- Additional facilities, including skate parks, courts, fields, and community gardens in areas throughout the city.
- 33% tree canopy cover city-wide, canopy increase in low canopy and low-income areas, and tree species composition of no more than 10% of any one species, 20% of any one genus, and 30% of any one family.
- Continuing to treat and remove invasive species from 1000 acres of natural area sites per year to improve forest health and enhance wildlife habitat.
- Working with our partners to control invasive species in Forest Park.

Portland Parks & Recreation also continually looks to expand the system to respond to new and emerging recreational trends, and meet changing community needs.

# Investment Strategy

## Process

Portland Parks & Recreation gathers requests for capital projects from various sources including staff-identified needs, policy documents such as Parks 2020 Vision, park master plans, technical papers, asset register reports as well as from residents and other public agencies. Potential projects are screened and reviewed against community priorities and system-wide needs annually by a review committee, per the criteria outlined on the next page. Each project is given a Capital Project score.

The review committee recommends projects for either the 1 to 5 year Capital Forecast track for implementation, or for the long-range 20 Year Forecast for future consideration. Projects needed to fulfill

the bureau's strategic direction or take advantage of project-specific funding opportunities go to the 1-5 Year Capital Project list. Projects with lower priorities and uncertain funding are put on the 20-Year Long-Range Planning Master List. The 20-Year list is reviewed annually and projects are advanced to the 1 to 5-Year list if they are deemed necessary, have funding, and there is sufficient staff to manage and implement the projects. Both lists are adjusted annually based on changing needs, funding, resource availability and priorities. The final list of recommended projects is considered by the Parks Budget Committee (in 2012-2013 this was the Portland Parks Board), the public and the mayor during the annual budget process.

Once projects are completed, they will be entered into the Bureau Asset Register (under development). Once assets are built, the Bureau tracks asset condition, value, and maintenance of replacement needs. These needs are then submitted as capital requests in ensuing years.

## Contributing Plans

Projects added to the Portland Parks & Recreation Capital Project List come from many different sources. Plans referenced include Parks 2020 Vision, Master Plans, Technical Papers, System Plans, and Asset Management Plans. Other sources include field staff requests, community-initiated requests through the Park Proposal Process, or projects that originate through specific funding opportunities like grants, gifts, or sponsorships.

## Alternatives Analysis/Prioritization Process

Portland Parks & Recreation has developed prioritization criteria for its capital projects. The criteria are included in the Portland Parks & Recreation Capital Planning Manual (2008). Each project is rated and given a score, based on the following considerations:

- **Legal Compliance**: Project is necessary to meet a legal mandate, directive by Council, condition of Land Use Review, contractual obligation, etc. Excludes ADA.
- **ADA Compliance**: Project is necessary to meet ADA compliance.
- **Public Support**: Project has documented or anticipated public support.
- **Conforms to City or Portland Parks & Recreation Plans**: Project is vital to Portland Parks & Recreation mission and Vision 2020 goals, is part of a Portland Parks & Recreation master plan, City plan, Urban Renewal Area plan, or continues a prior project.
- **Improves Level of Service**: Provides new service or improves existing service for identified need to a significant population.
- **Equity:** Households in project service area are above city average for populations of color, students in free and reduced lunch, or low income.
- **Human Health & Safety**: Project alleviates significant, minor or potential existing health or safety hazard; improves general health and safety.
- **Protects Capital Assets or Facilities**: Project is critical to save structural integrity of existing facility or repair significant structural deterioration, or repairs important systems/deters major future expenditure, or increases life expectancy of the asset.

- **Environmental Quality**: Improves environmental quality of a large area, facility, or neighborhood, or improves local environmental quality or prevents environmental damage.
- **Financing/Business Opportunity**: Project has outside financing, donation, or business opportunity that covers 50% or more of the cost.
- **Maintenance Financing**: Project has outside funding to cover 50% of ongoing maintenance costs.
- **Effect on Operating Budget**: Project will reduce operations and maintenance costs, or increase revenues.

## Investment Strategy

Portland Parks & Recreation has identified many infrastructure needs over the next 20 years to meet the level of service goals outlined in the Parks 2020 Vision, including necessary expansions to the system, and maintenance of existing assets. Portland Parks & Recreation maintains a 20-year capital improvement plan (CIP) list, which includes known growth and maintenance related projects that have been identified at this time. Where Portland Parks & Recreation has not yet acquired property or developed a master plan for a site, those projects are not reflected on the Portland Parks & Recreation CIP list. Tree maintenance and canopy expansion investment amounts have yet to be identified.

Further information about the Portland Parks & Recreation CIP list, including currently identified projects, can be found on the City of Portland's website at: https://www.portlandoregon.gov/parks/63265.

The Citywide Systems Plan does not include a detailed 20-year project list for Portland Parks & Recreation because a comprehensive system plan, that reflects asset management needs and community priorities and includes a list of needed investments, costs, and funding sources, will be developed over the next few years. In addition, this information is not required as part of this Plan under Statewide Planning Goal 11: Public Facilities and related statutes and administrative rules.

Examples of projects and programs PP&R will be working to implement are summarized below.

### Acquisition Program

- Acquisition for developed parks, natural areas, trails, recreation and maintenance facilities. Priorities would include acquisition of land to:
    - Accommodate growth by maintaining a relatively equivalent city wide level of service in areas where growth is occurring
    - Correct deficiencies by providing parks in park-deficient areas
    - Connect to and complete trail systems
    - Protect and enhance natural resource systems
    - Eliminate park in-holdings or expand existing park land, and
    - Effectively operate and maintain Portland's park system.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### Maintenance of Existing Parks, Natural Areas, Trails, and Facilities

- Maintenance or replacement of assets that have reached the end of their useful life

### Development of New Community Centers

- Washington-Monroe
- Additional Community Centers in areas not currently within 3 miles of an existing full service community center

### Development of New Parks

- Beech Park – funded for construction in 2015
- Cherry Park
- Chimney Park
- Clatsop Butte Park
- Errol Heights Park
- Floyd Light Property
- Gates Property
- Gateway Green
- Gateway (urban plaza)
- Gilbert Primary Park
- Hazeltine Property
- Lynchwood Park
- Mill Park
- Mock's Crest
- North Powellhurst Park
- Parklane Park
- SW Thomas & 53rd Property
- Thomas Cully Park – under construction
- Thompson park
- Werbin Property – funded for construction in 2014
- Wilkes Headwaters Property
- Development of additional new parks or natural areas in areas not currently within ½ mile of an existing park or natural area

### Improvements at Existing Developed Parks

- Cathedral Park
- Columbia Children's Arboretum

- Couch Park
- Crystal Springs Rhododendron Garden
- East Holladay Park
- Hillsdale Park
- Leach Botanical Garden – funded for partial improvements in 2015
- Lents Park
- Mt. Tabor Park and Yard
- Spring Garden Park – funded for improvements in 2015
- Washington Park
- Waterfront Park
- Westmoreland Park
- Willamette Park – funded for improvements in 2015

### New Trails / Improvements to Existing Trails

- Columbia Slough/ Columbia South Shore Slough Trail
- Marine Drive / Bridgeton Trail
- Mt Scott / Scouters Mountain Trail
- North Portland Greenway
- Red Electric Trail
- Sullivan's Gulch
- Springwater Trail – construction to complete the 'gap' funded in 2016

### Natural Area Parks

- April Hill Natural Area – funded for construction in 2015
- Beggars Tick Natural Area
- Buttes Natural Area Complex (Clatsop Butte, Buttes NA, Mitchell Creek Natural Area, Kingsley D. Bundy)
- Elk Rock Island Natural Area
- Errol Heights
- Forest Park
- Deardoff Creek and Wahoo Creek Natural Areas
- Lower Powell Butte Floodplain
- Marshall Park (including Jensen and Foley Balmer properties) – funded for improvements in 2014
- Oaks Bottom/ Ross Island/ Oaks Crossing
- River View Natural Area
- Stephens Creek Nature Park

- Southwest Waterfront Parks (Powers Marine, Willamette Moorage, Butterfly and Cottonwood Bay)
- West Portland Park Natural Area
- Whitaker Ponds – funded for improvements in 2016
- Woods Park Natural Area

The Citywide Systems Plan does not include a detailed 20-year project list for Portland Parks & Recreation because a comprehensive system plan, including a list of needed investments, costs and funding sources, is not available at this time. The project list will be developed over the next few years. In addition, this information is not required as part of this Plan under Statewide Planning Goal 11: Public Facilities and related statutes and administrative rules.

# Financial Strategy

## Existing Financing Strategies

### Definition and Use

The primary sources of revenue to the Parks Capital Improvement Program Fund include service charges and fees from the System Development Charges (SDC) program, Metro Bond local match, General Fund discretionary, local, state & federal grants, and the Portland Development Commission. The Portland Parks & Recreation system has also grown and replaced assets when necessary due to the passage of a bond or levy approximately every decade.

As Portland Parks & Recreation creatively seeks alternative funding sources to respond to priority needs, some types of projects are more readily funded than others. The System Development Charge (SDC) and tax increment financing in urban renewal areas are sources of funding for land acquisition and project development. This is especially true where population growth and capacity-driven needs are the underlying premise to development, since SDC funds are specifically intended to be used to build new parks and facilities to respond to increased park demand that results from new development and growth, and urban renewal area funds are required to be used in those specific geographic urban renewal areas. However, for most existing infrastructure these types of resources are not available. Finding alternative solutions to fund major capital improvements for existing infrastructure as well as improved ongoing operations and maintenance are major challenges. However, options are being explored to meet these challenges.

### Anticipated Revenues

On average, Portland Parks & Recreation has been receiving approximately $1 million annually from General Fund discretionary to address major maintenance, and approximately $8 million from System Development Charges (SDC), Portland Development Commission (PDC), and grants/donations. These figures fluctuate and will change over time. As more development occurs, Portland Parks & Recreation will receive more SDC funds. PDC funding has been reduced as Urban Renewal Areas expire and PDC shifts its investment focus from community infrastructure development to economic development.

## Financial Challenges, Unmet Needs and Risks

Portland Parks & Recreation does not receive adequate capital revenues annually to address identified capital needs. Portland Parks & Recreation reported an estimated $844 million annual capital funding gap in 2013, including both maintenance to existing assets and expansions of the system to address deficiencies in service. This funding gap represents the total of projects on Portland Parks & Recreation's 1-10 year Capital Improvement Project list, minus anticipated annual revenues for capital projects, amortized over 10 years.

PP&R has an expected total capital annual funding need of $93.4 million for each of the next 10 years. PP&R receives an average of $8 million annually in System Development Charge funds, plus grants and donations. Additionally, City Council has been able to provide about $1 million annually to address some of the most urgent needs for repair, rehab and replacement and mandated work. This totals an average of $9 million annually available for capital, leaving a funding gap of $84.4 million. This includes $47.8 million for expanding the system to provide standard levels of service for all residents, in addition to $36.6 million in funding needed to maintain existing assets. Where Portland Parks & Recreation has not yet acquired properties to fill service level gaps, there will be additional need to acquire and develop those properties, which are not currently represented on the Capital Improvement Project list. This would further increase the funding gap.

Table 9.6 Portland Parks & Recreation Annual Funding Gap, 2013

| Capital asset type | Value* (in millions) | | | |
|---|---|---|---|---|
| | R/R/R | Mandate | Capacity | Total |
| amenities | $0.2 | $0.1 | $0.0 | $0.3 |
| buildings and pools | $11.0 | $3.0 | $23.0 | $37 |
| recreation features | $4.8 | $2.2 | $3.5 | $10.5 |
| developed park | $4.1 | $1.7 | $13.9 | $19.7 |
| built infrastructure | $5.5 | $1.5 | $7.0 | $14.0 |
| green infrastructure | $2.5 | $0.0 | $0.4 | $2.9 |
| **Total** | $28.1 | $8.5 | $47.8 | **$84.4** |

R/R/R: (Repair, Rehabilitation, Replacement): Additional funding necessary to repair, rehabilitate and replace existing assets to bring them up to established service levels. Also includes replacement of assets considered functionally obsolete (not meeting established service levels).
Mandate: Additional funding necessary to improve existing assets to meet regulatory requirements, exclusive of improvements that fall under R/R/R or Capacity
Capacity: Additional funding necessary to meet the demands of existing customers, based on established levels of service.

## Alternative Strategies

Portland Parks & Recreation will need to examine options to increase available funding for expansion and maintenance of its park system. Some options could include:

### Park Bonds

Continue working with City Council and Portland taxpayers to periodically pass park general obligation "G.O." bond measures to address capital projects and system expansion. Historically, Portland Parks &

Recreation's park system has developed with the assistance of a park G.O. bond measure approximately every decade.

### Dedicated Funding for the Natural Resources and the Urban Forest

Portland Parks & Recreation will need to continue to seek dedicated sources of funding for ongoing natural area restoration and maintenance, including activities such as continued removal of invasive species, planting native species, and safely managing public access to natural areas. The Urban Forest Management Plan calls for the establishment of sustainable funding for the urban forest. Funding sources considered in a 2009 study by Davey Resources Group includes a property frontage fee, among other options.

### Increasing Partnerships

Portland Parks & Recreation continues to look for opportunities to develop public-private partnerships to help expand the park system.

### Maximizing public use of sports fields

Portland Parks & Recreation has developed a joint-use agreement with Portland Public Schools regarding use of some sports fields, and continues to work with surrounding school districts and organized sports groups to look for mutually beneficial joint use opportunities. A recent partnership in the enhancement of Buckman Field is a good example.

## Summary

Portland Parks & Recreation will need to continue to be aware of and implementing best practices and innovative funding techniques used in other jurisdictions may yield other alternative strategies.

If Portland Parks & Recreation is not able to increase funding to address its funding gap, the condition of its assets will worsen, and Portland Parks & Recreation will need to either:

- Reduce levels of service (remove some assets from the system) or;
- Manage a system of assets that is operated with higher levels of risk to the user and organization.

# Chapter 10
# Other Essential Facilities & Systems

*Note: Other essential facilities and systems are not a required urban service under the Oregon public facility planning goals and statutes. The City of Portland recognizes that facilities, technology systems, and vehicles are essential infrastructure and has included this chapter in the interest of comprehensive infrastructure planning. However, the City does not intend for this chapter to be reviewed for compliance with public facility planning rules, including Oregon Statewide Planning Goal 11: Public Facilities, Oregon Statute 197 or Oregon Administrative Rule 660.*

## OVERVIEW

This chapter describes facilities, technology systems, and vehicles that are vital to the efficiency and effectiveness of all City agencies. This chapter recognizes the critical role this infrastructure plays in meeting the needs of Portlanders and supporting the overall mission of the City of Portland, including emergency response and preparedness. The assets covered in this chapter are used to one degree or another by nearly every City agency that utilizes office space, vehicles, or technology. In total, the combined replacement value for technology and facility assets is over $1.25 billion dollars.

The decision to include other essential facilities[1] and systems in citywide infrastructure planning represents a different way of thinking about these public assets, one that recognizes the extensive investments in facilities and systems that enable bureaus to provide the urban services within their purview. This consideration goes above and beyond the set of State-mandated public facilities and services addressed elsewhere in the Citywide Systems Plan.

The infrastructure described as other essential facilities and systems is necessary for the provision of some direct public services, including emergency communications, emergency response, and life safety. Other infrastructure provides internal support to every City Bureau that occupies a City building or uses City technology. The assets covered in this chapter contribute to service provision in both direct and indirect ways. For instance, some computer equipment makes it possible for Portlanders to directly access City websites and internet databases. Other equipment facilitates communications through phones and email systems.

This chapter includes three sections – Civic Facilities & Assets, Technology Systems, and Emergency Response. These sections were created using asset groupings from Portland's annual Citywide Assets Report. For administrative efficiency, these asset groupings do not always correspond with a particular system or set of infrastructure. For instance, Portland's emergency response infrastructure is included in the "fire facilities", "police facilities", and "other buildings" asset groups. See Table 10.1 for more

[1] This definition of essential facilities is different than the "essential facilities" designation utilized in the City's Natural Hazard Mitigation Plan (p. 38) to identify facilities that are necessary for the continuation of City operations.


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information about asset groups covered in different sections of the Other Essential Facilities & Systems chapter.

Table 10.1 Other Essential Facilities & Systems Sections and Asset Groups

| Chapter Section | | Asset Groups* Covered |
|---|---|---|
| Civic Facilities & Assets | | Office buildings<br>Other buildings<br>PDC facilities<br>Spectator facilities<br>Performing arts facilities |
| Technology Systems | BTS: | Communications |
| | | Production services |
| | | Strategic technology |
| | Other bureaus: | Equipment and software |
| | | Strategic technology |
| Emergency Response | | Fire facilities<br>Police facilities |

* Asset groups are based on Citywide Asset Management Group categories. The Emergency Coordination Center and 9-1-1 Center are included in the "other buildings" asset group.

## Description of Other Essential Facilities & Systems

For the purposes of this chapter, other essential facilities and systems includes a wide range of assets, such as offices and special purpose buildings, sports and entertainment venues, emergency response facilities, and transmission towers. It covers technology systems such as computer hardware and software, voicemail systems, video systems, microwave radio systems, and other radio equipment, as well as motorcycles, passenger vehicles, vans, SUVs, pickups, dump trucks, loaders, trailers, and other specialized vehicles. It also addresses emergency response infrastructure like police and fire stations, specialized mobile response units, fire trucks, fireboats, and police cars.[2]

The chapter focuses on planning for these City-owned assets, but not on planning for the services provided through the use of these assets. For instance, it can inform decisions to align the number and location of fire stations with growth assumptions in the Comprehensive Plan, but does not directly plan for the manner in which Portland Fire & Rescue will provide services over the next 20 years.

The assets covered in this chapter are owned, managed, or used by several different bureaus and non-City agencies. These bureaus include the Bureau of Emergency Communications (BOEC), the Bureau of Internal Business Services (BIBS), the Bureau of Technology Services (BTS), the Portland Bureau of Emergency Management (PBEM), Portland Fire & Rescue (PF&R), the Portland Police Bureau (PPB), and the Portland Development Commission (PDC). This makes it difficult to compare the Other Essential Facilities & Systems chapter to other chapters oriented around the operational scope of one bureau or agency. Though assets covered in this chapter differ in many important ways from other public facilities

[2] Vehicles are not typically considered "public facility assets" in this plan or in the Asset Report, with the exception of certain, significant, long-lived fire apparatus. Vehicles are included in this chapter to acknowledge the City's substantial investment in these assets and the essential role they play in the provision of most City services.


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and systems, the sections in this chapter have been structured similarly to other chapters in the Citywide Systems Plan to maintain consistency within the document.

## Role of Other Essential Facilities & Systems

The behind-the-scenes support provided by other essential facilities and systems is critical for maintaining a healthy, prosperous city and ensuring the delivery of services that contribute to Portland's high quality of life. Other essential facilities and systems include the buildings where city employees work on a daily basis, the software they use to display and communicate ideas, the vehicles necessary to provide public services, and the data needed to make informed decisions. This contributes to a high quality of life in an indirect yet integral way, incorporating several city functions often left out of long-term planning discussions. Certain assets in this chapter play an essential role in the City's emergency response and continuation of operations strategies designed to protect the health and safety of Portlanders in the event of an emergency or natural disaster.

This chapter is the result of the city's decision to go beyond the minimum statewide planning requirements, to make sure that the full set of services and facilities necessary to support a prosperous, thriving and sustainable city are included in long-term planning conversations. This chapter is intended to inform future investments in these facilities to maintain existing systems, resolve identified deficiencies, serve new population growth, and address other long-term infrastructure needs.






## Major Needs and Trends for Other Essential Facilities & Systems

The facilities, technology systems, and vehicles included in this chapter experience similar trends and share a few common needs.

### Financial Environment

These facilities and systems exist within a complex financial environment where revenue streams are limited and investments are often the result of opportunistic partnerships between agencies. In addition, disparate funding sources, shared responsibilities between multiple City bureaus, a lack of centralized


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management, and limited long-term planning create challenges that limit the City's ability to holistically manage these assets. In general terms, a more integrated approach is needed in order to perform analysis and make investment decisions that result in cost savings, capitalize upon operational efficiencies, and maximize shared benefits across City agencies. City agencies and elected officials could also benefit from improving asset management processes to assess and prioritize facility needs across bureaus using consistent evaluation metrics.

### Planning for Resiliency

Many assets in this chapter help the City meet goals and policies related to resiliency and climate change, issues that are being increasingly recognized by a wide range of disciplines and institutions. Projects such as the recently completed Emergency Coordination Center and the ongoing Public Safety Systems Revitalization Project (PSSRP) support the City's goals to enhance disaster preparedness and emergency response capacity. Technology featured in this chapter, such as Next-Generation 9-1-1 and renewable microgrid energy systems, has the potential to open up new possibilities to achieve resiliency in the field of emergency preparedness and response. These facilities and systems help Portland prepare for emergencies of different types and magnitudes, allowing for successful long- and short-term recoveries following significant climate-related events or natural or man-made disasters.

### Technological Landscape

Other technological advancements could have a significant impact on the management, maintenance, and construction of other essential facilities and systems. These developments have the potential to present new opportunities to manage City assets more effectively, improve communication, and increase safety and health for all Portlanders. While it is difficult to predict exactly how or when these opportunities will arise, the current pace of technological change could warrant more frequent assessments throughout the next twenty years.

## Purpose of this Chapter

This chapter describes other essential facilities and systems, highlighting the significant role these assets play in supporting fundamental parts of the City's mission. It outlines desired improvements and levels of service related to these assets, discusses the financial challenges and realities that affect them, identifies a few pressing needs, and makes some recommendations to address those needs.

Though this chapter attempts to provide a comprehensive look at these facilities and systems, a holistic long-term plan is not within the scope of this effort. Instead, the chapter identifies some first steps that can be taken to streamline management processes and more successfully incorporate other essential facilities and systems into public decision-making processes. While there is no State requirement to perform planning for this set of assets and systems, the City has recognized their importance and is engaging in conversations about how to better integrate them into long-range planning discussions.


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## Bureau Names and Acronyms

The following list includes names and acronyms for bureaus that own, manage, or are the primary users of the other essential facilities and systems included in this chapter:

- OMF – Office of Management and Finance
- BIBS – Bureau of Internal Business Services, a Bureau within OMF
- BIBS Facilities – the Facilities division within BIBS
- CityFleet – the CityFleet division within BIBS
- Office of the CAO – OMF Office of the Chief Administrative Officer (CAO)
- BTS – Bureau of Technology Services, a Bureau within OMF
- PPB – Portland Police Bureau
- PF&R – Portland Fire & Rescue
- PBEM – Portland Bureau of Emergency Management
- BOEC – Bureau of Emergency Communications
- PDC – Portland Development Commission

In addition, all City bureaus occupy and/or use other essential facilities and systems. Specific bureaus mentioned in the various sections include:

- PP&R – Portland Parks and Recreation
- PWB – Portland Water Bureau
- BES – Bureau of Environmental Services
- PBOT – Portland Bureau of Transportation


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## CIVIC FACILITIES & ASSETS

### Introduction

This section includes a broad array of City-owned buildings, facilities, vehicles, and equipment, the majority of which are managed by Facilities and CityFleet divisions in the Bureau of Internal Business Services (BIBS). These assets include offices and special purpose buildings, sports and entertainment venues, emergency response facilities, and wide variety of City-owned vehicles. This collection can be difficult to discuss as a coherent whole, because many different bureaus utilize the assets covered in this section to provide a number of different public services. Civic facilities and assets are nonetheless vital to all City operations, with considerable effects on service provision for each of the other infrastructure systems in the Citywide Systems Plan. Without well planned and managed civic facilities and assets, many City employees would not have a place to work, emergency communications systems could be compromised, and the ability of Portland residents to depend upon basic public services could be eroded.

Similar to other sections within the chapter, civic facilities and assets are being incorporated into long-range planning for infrastructure systems for the first time. As such, work will need to be done to bring civic facilities and assets to a similar level of knowledge and understanding as other infrastructure systems like those for water and environmental services.

This section outlines the City's vision for civic facilities and assets and provides an assessment of the current status of planning efforts and other related management techniques. It includes a description of these assets, the services they affect, and relevant trends and issues. The section also assesses a few major needs and recommendations, and summarizes the financial landscape that will impact these assets over the next twenty years.


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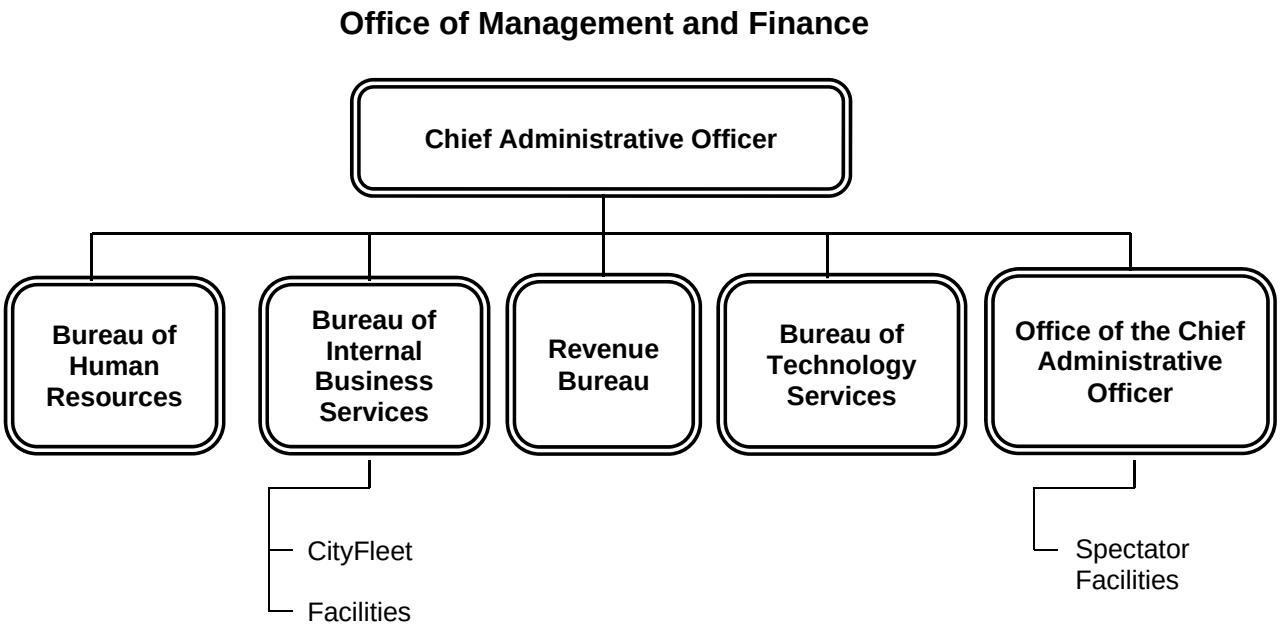
## Agency Organizational Structure

Unlike other chapters within the Citywide Systems Plan, civic facilities and assets are owned and managed by multiple City agencies. Much of this responsibility falls within the purview of the Office of Management and Finance (OMF), a large agency that brings together several bureaus – including the Bureau of Internal Business Services (BIBS) and the Office of the Chief Administrative Officer (CAO). Two divisions of BIBS (Facilities and CityFleet) manage a majority of the facilities and assets covered in this section. The Office of the CAO has responsibility for City-owned spectator facilities, such as Providence Park, and serves as liaison for City-owned performing arts facilities, such as Keller Auditorium. Refer to Figure 10.1 for more information about the structure of OMF as an agency.

Figure 10.1 Office of Management and Finance Organizational Chart




Other assets covered in this section are subject to more complex ownership and management arrangements. For instance, although BIBS Facilities owns and handles maintenance responsibilities for most of the Portland Building, the Portland Water Bureau and the Bureau of Environmental Services own most of the floors that they occupy within the building. For more detail regarding these types of shared arrangements, see Service Agreements later in this section.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## Vision

There is no consolidated vision for civic facilities and assets at this point in time, though BIBS Facilities and CityFleet have developed their own bureau-specific vision statements. Based on these statements and other City language surrounding these particular assets, the following vision statement has been developed for civic facilities and assets for the purposes of this document:

*City-owned buildings, facilities, vehicles, and apparatus allow City agencies to deliver essential services to the public.*

The Office of Management and Finance's and BIBS Facilities' vision statements include aspirations to "demonstrate a commitment to the city's past, present, and future" through enduring form, resilient design, and the use of sustainable operational practices. Other vision language states that these structures "enhance a sense of comfort and beauty in Portland's built environment" and increase the usefulness of City programs by providing quality workplaces for City employees. CityFleet's vision, as stated in their Strategic Plan, is to serve as an "international model for equity and sustainability" and to offer services that illustrate the "power of forward-thinking leaders working together" through the management of City-owned vehicles and apparatus.

## Mission and Levels of Service

Civic facilities and assets also lack a consolidated mission statement relevant to this document. Similar to the vision statements, there are a few bureau-specific mission statements that apply to the assets in this section. The following mission statement was developed for the purposes of this document, and is intended to incorporate bureau-specific language through the lens of civic facilities and assets:

*Civic facilities and assets provide the infrastructure necessary for efficient and accountable delivery of public facilities and services. This infrastructure includes the buildings, facilities, vehicles, and apparatus that City employees utilize on a daily basis, as well as critical facilities that can be depended upon in the event of an emergency.*


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The City of Portland is committed to developing and maintaining high performance buildings that limit their environmental impact, contribute to Portland's civic character and make Portland a better place to live and work. This interconnected system of buildings, facilities, vehicles, and apparatus is provided in a cost-effective manner to City and other municipal agencies. BIBS Facilities provides a wide range of preventative, regular, and demand maintenance services designed to ensure that City buildings stay functional throughout their maximum useful life cycle. CityFleet provides a similarly comprehensive range of services for the City's rolling stock of vehicles, offering acquisition and outfitting, fuel management, both preventative and regular maintenance, repair, and other fleet management services.

## Services Provided

Most of the services related to civic facilities and assets are not provided directly to the general public. Nevertheless, these services support the everyday operations of nearly every City agency, and have a direct impact on the City's capacity to provide public services. These services include:

- The provision, management, and maintenance of office and special use space for City bureaus and employees;
- Life safety and emergency communications, coordination, prevention, and response services; and
- The procurement, storage, and maintenance of City-owned vehicles and apparatus.

Some of the services related to civic facilities and assets are provided more directly to the public. These include:

- Publicly-accessible facilities to facilitate payments, review development plans, and respond to other inquiries;
- Publicly-accessible spaces to facilitate participation in the government process;
- Publicly-accessible archival services for important historical records and documents; and
- The provision of spectator and performing arts facilities for sports, entertainment, the arts, and community events.

## Service Area

For the most part, services related to civic facilities and assets are provided within the Urban Service Boundary (USB) of the City of Portland (see Figure 4.1 on p. 32). However, there are a few exceptions:

- CityFleet has entered into a variety of intergovernmental agreements, several of which involve service provision to organizations or agencies outside of the Portland USB.
- Spectator and performing arts facilities and Union Station are accessible to anyone and provide benefits to residents throughout the region.


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## Service Agreements

The majority of BIBS Facilities services are financed through interagency agreements (IAs) with City bureaus. There are also a number of intergovernmental agreements (IGAs) that allow City agencies to provide their services to other entities. For instance, CityFleet uses IGAs to offer maintenance and repair services to Portland Public Schools, Multnomah County, and other public agencies.

Private contractors and other public entities (e.g. Metro) handle management and operations oversight for certain civic facilities and assets. These agreements can take the form of contracted service agreements, condominium lease agreements or partnerships, or more general arrangements to deliver services on an as-needed basis.

Other partnerships can arise as the City identifies the need for particular improvements or investments. This occurred when the City issued an RFI (Request for Information) for space to store historical records and documents. The identification of shared needs between the City and Portland State University (PSU) led to the eventual creation of the City of Portland Archives and Record Center on the PSU campus.

## Inventory Summary

The Civic Facilities & Assets section includes a range of civic buildings, public facilities, vehicles, and equipment.

This collection includes the office buildings that house City bureaus and employees, such as the Portland Building, the 1900 Building, and City Hall. It includes other buildings for special uses like the Archives and Records Center, where important historical documents are kept, the 9-1-1 Center, where critical emergency communications systems are operated and maintained, the Kerby Garage, where City-owned vehicles are housed and serviced, and Union Station, Portland's passenger rail depot. It also includes spectator facilities for sports and entertainment like the Veterans Memorial Coliseum and Providence Park, as well as performing arts facilities such as the Arlene Schnitzer Concert Hall and other Portland'5 Centers for the Arts venues. Two City-owned parking facilities at the Rose Quarter are also included in the civic facilities and assets grouping. Please refer to Table 10.2 for more information about principal City-owned office buildings, Table 10.3 for asset groupings and replacement values, and Table 10.4 for the current condition of these assets.






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Table 10.2 Principal City-owned Office Buildings

| Building name | Address | Square Footage | Replacement value |
|---|---|---|---|
| Portland Building | 1120 SW 5th Avenue | 406,075 | $106,392,000 |
| 1900 Building | 1900 SW 4th Avenue | 161,185 | $41,747,000 |
| City Hall | 1221 SW 4th Avenue | 87,500 | $24,150,000 |

Table 10.3 Civic Facilities & Assets Groups and Replacement Values, 2013

| Capital Asset class | Value (in millions) |
|---|---|
| Office buildings | $172.3 |
| Other buildings | $69.3 |
| PDC facilities | $48.7 |
| Spectator facilities | $529.6 |
| Performing arts facilities | $111.2 |
| **Total Civic Facilities & Assets** | **$882.4** |

Table 10.4 Current Condition: Civic Facilities & Assets System, 2013

| | Current Condition (in %) | | | | | | |
|---|---|---|---|---|---|---|---|
| Capital asset type | Very Good | Good | Fair | Poor | Very Poor | TBD | Confidence Level |
| Office buildings | 0 | 38.2 | 61.8 | 0 | 0 | 0 | 4 - High |
| Other buildings | 0 | 67.7 | 32.3 | 0 | 0 | 0 | 4 - High |
| PDC facilities | 0 | 0 | 80 | 20 | 0 | 0 | 4 – High |
| Spectator facilities | 0 | 36.7 | 0 | 63.3 | 0 | 0 | 3 - Moderate |
| Performing arts facilities | TBD | TBD | TBD | TBD | TBD | 0 | TBD* |

* OMF is beginning to work with Metro/MERC on the status of performing arts facilities.

There are over 2,950 vehicles and pieces of equipment that also fall within to the category of civic facilities and assets through CityFleet, including motorcycles, passenger vehicles, vans, SUVs, pickups in various weights, police cars, dump trucks, loaders, trailers, vactors, and many other pieces of specialized equipment. Because vehicles are not considered “public facility assets” for the purposes of this plan, they are not included in the any of the asset groups described in the tables above.

## Key Issues, Trends, Opportunities

### De-centralized Property Management

At the current time, the City does not have a centralized property management function. This means that the maintenance and repair needs of City-owned buildings are sometimes assessed using different criteria and decision-making processes. Different bureaus have different levels of success in financing repairs or capital improvements, and the current process can force bureaus to compete with one another for the funding necessary to keep buildings well maintained and operating properly. This lack of integration also makes it more challenging to perform the citywide facilities assessments necessary for emergency response and disaster planning. A more integrated approach is needed in order to perform


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analysis and make investment decisions that result in cost savings, capitalize upon operational efficiencies, and maximize shared benefits across City agencies.

### Investing in a Building's Life Cycle

Investments in public buildings need to account for maintenance and repair needs that accrue as time goes on. Investing in the full life cycle of a building maximizes the utility and cost-effectiveness of the public expenditure, while at the same time ensuring that City-owned buildings are safe and reliable.

Upfront investments in resilient, high-quality materials and systems can minimize repair costs and significantly extend a building's lifespan. Regularly allocating sufficient amounts of money for major maintenance and replacement reserves can fund repairs as needed, which also minimizes costs over time. These practices help to avoid unexpected expenses to replace major structural components – like roofs and support beams - and other building systems that impact the safety of Portland residents and City employees. Additionally, utilizing funds for ongoing preventative maintenance can help keep a wide range of building components in good condition for longer periods of time.

### Diverse Funding Sources

While the majority of BIBS Facilities services are financed through IAs with City bureaus, other funding allocated for civic facilities and assets comes from different sources within Portland's public finance system. These different sources complicate the management and maintenance of civic facilities and assets because each source comes with different provisions about how funds can be spent. Revenue received for the use of one facility or asset category cannot be used for another facility or asset category. Similarly, debt financing for projects in one facility or asset category cannot be used for projects in another facility or asset category.

### Changing Codes, Regulations, and Policies

City-owned facilities are constructed and maintained to meet a wide range of codes, policies, standards, and regulations. While codes and regulations stemming from the federal or state level take the form of mandates with specified consequences, other standards and policies serve as more general guidelines that demonstrate the City's commitment to issues like public art, sustainability, and equity. When any of these standards are changed or updated, it can require unanticipated expenditures to bring facilities up-to-date.

The changing regulatory and policy environment can make it difficult to plan for investments in civic facilities and assets, particularly at a time when innovations in building materials and technology continue to develop at a rapid pace. While new codes, regulations, and policies generally produce effective results and operational improvements, the financing necessary for these changes is often placed in direct competition with the funds available for other basic programmatic needs.

### Innovations in Sustainability

Municipal services in Portland have become increasingly sophisticated, regularly changing to accommodate new technologies and evolving policy priorities.

For example, several innovative Green Fleet initiatives have been implemented in recent years to help the City meet current sustainability goals. These initiatives analyze City vehicles and pieces of equipment to determine the optimal balance between functionality, fuel type, fuel consumption, and cost. CityFleet utilizes various strategies to realize this balance, offering a broad array of clean fuel technologies and low-emission vehicles to their customers.

Similar technological innovations for buildings, facilities, vehicles, and equipment will no doubt continue to develop in the coming years. The City will likely have several opportunities to capitalize upon these innovations to strengthen energy independence, decrease operating costs, and increase Portland's resilience to changes in the environment.





## Regulatory Compliance

Though public facilities planning for civic facilities and assets is not mandated by the State of Oregon, other regulations, standards, and guidelines apply to the City's development, management, and maintenance of these assets. The following list highlights the most relevant of these regulations, standards, and guidelines, but is not intended to be a complete list:

- City of Portland's planning and zoning policies, plans, and regulations, including the **Comprehensive Plan, Zoning Code, and Zoning Map**, provide both guidelines and regulations related to wide array of topic such as land use, building mass and placement, parking and loading, and where applicable, required land use reviews. Portland's plans, policies, and regulations incorporate and are consistent with **regional, state, and federal planning requirements** such as Metro's Regional Framework Plan, Oregon's Statewide Planning Goals, and where applicable, the National Historic Preservation Act.
- A wide range of **building and development codes and regulations** are applied through the City of Portland's building permit and inspection processes, including requirements related to structural components, fire and life safety, accessibility, plumbing, electricity, heating and ventilation, and other issues related to development.
- The **Environmental Protection Agency (EPA)** implements several national regulations related to environmental health and greenhouse gas emissions that impact CityFleet.
- The **Americans with Disabilities Act (ADA)** addresses accessibility of public facilities and programs.
- The **Elevators division** of the Department of Administrative Services (DAS) is responsible for


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statewide elevator code development, interpretation, and enforcement.

- The **2007 Portland Fire Code**, which is based on the **2007 Oregon Fire Code** and the **International Fire Code (IFC)**, is implemented by the City of Portland Fire Marshall and provides development and design guidelines to reduce loss of life and property due to fire.
- The **Oregon Department of Environmental Quality (DEQ)** is the State agency tasked with protecting the health and quality of Oregon's natural environment. Oregon DEQ implements a variety of regulations, including the discharge of pollutants and other hazardous materials, which impact vehicles, apparatus, and facilities used for fueling or de-icing.
- The **Oregon Occupational Health and Safety Division (OR-OSHA)** requires that buildings and facilities comply with statewide environmental controls related to safety, sanitation, and public health.
- The **Oregon Department of Public Safety Standards and Training** is responsible for security-related regulations when required for a project.
- **Leadership in Energy & Environmental Design (LEED)** certification standards are related to existing buildings and new construction.
- The **Department of Justice (DOJ) Community Policing Standards** and **Commission on Accreditation for Law Enforcement Agencies (CALEA)** provide standards for police facilities.

## Investment Strategy

Unlike other City-owned infrastructure assets, civic facilities and assets are not related to the provision of a State-mandated public service – like water or sewer. Investment strategies in the Citywide Systems Plan are generally intended to eliminate service gaps and ensure service provision inside of city boundaries. However, an investment strategy for civic facilities and assets is not a required public facilities plan component.

At the current time, the City lacks a systematic method to quantify these needs for civic facilities and assets. As a result, the needs and improvements identified in this section were not informed by a detailed assessment of how to bring the system's current capacity to a level that can support future development patterns. Instead, this strategy is primarily oriented around improving the current investment process, highlighting some planned and recently completed projects.

### Process

Investments in capital improvements for civic facilities and assets seldom result from a linear decision-making process. While there are annual inspections and reviews that provide a foundation for these investment decisions, they are usually made in a less predictable, more opportunistic manner based on funding availability or shared interests among bureaus and other agencies.

The need for a capital investment can be determined based on a comparison between the current operational needs of the primary user and the capacity of the facility or asset. For example, the Kerby Garage facility, originally built as a stable for the City's equestrian division, does not have sufficient capacity to accommodate CityFleet's current facility needs.

Once an individual agency need is recognized, common needs can be identified between City agencies. For example, if one bureau is looking to expand, and another bureau is holding surplus property nearby, partnerships can be formed to move forward with the expansion in a way that maximizes benefits for each party.

In other instances, City agencies find opportunities to meet their needs by joining with other agencies on previously planned projects. These resourceful partnerships have become an important tool for City agencies seeking funding when available resources are limited. Not only can partnerships allow more parties to benefit from a public expenditure, but they can also help avoid situations where one bureau is competing with another for funding. This approach also allows bureaus to work together to identify applicable goals and policies, consider current City Council priorities, and ultimately present an actionable proposal for Council approval.

## Planned Projects and Improvements

BIBS Facilities and OMF are continually pursuing new projects and improvements to increase their capacity to address facility needs and facilitate the delivery of public services. Notable amongst these planned projects is a scheduled renovation of the 9-1-1 Center – sometimes referred to as the Portland Communications Center.

### *9-1-1 Center*

BIBS Facilities is currently working with BOEC to upgrade the existing 9-1-1 Center. While renovation planning is still underway, the project is intended to address current facility needs that include leaks in the roof structure and an ineffective HVAC system.

This renovation will likely face significant logistical challenges due to the fact that the City's emergency response operations and equipment will need to remain functional on a 24-7 basis throughout the duration of construction. It could be costly, time-intensive, and inefficient to temporarily relocate these operations and equipment while the facility is being upgraded. However, it will be critical to retain emergency communications services at all times to ensure public safety and citywide emergency preparedness. The Emergency Response section includes more information about planned projects and recommended improvements related to other emergency response infrastructure.

## Recent Projects

BIBS Facilities seeks to maintain and improve civic facilities and assets through their property management and facility planning services. These efforts vary in complexity from the construction of entirely new, state-of-the-art facilities to everyday maintenance and repair for existing facilities. A notable recent project is the construction of the Emergency Coordination Center (ECC), which was completed in January 2014.

### *Emergency Coordination Center (ECC)*

The ECC project arose in order to address needs within the City's provision of emergency response services. The facility was designed to equip tenants with more space to provide emergency coordination


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services, a larger parking lot to accommodate standby emergency vehicles, and a 150-foot telecommunications tower. The $19.8 million facility was financed through a multi-agency partnership, and is now occupied by the Portland Bureau of Emergency Management and the Portland Water Bureau's Emergency Management and Security offices.

The facility, located on SE Bush Street and SE 99th Avenue, is connected to the existing building for the 9-1-1 Center to facilitate co-location with BOEC. The ECC acts as a nexus for citywide coordination in the event of an emergency, with several design features and building systems included to ensure continuity of operations with or without access to primary sources of energy or communications technology. The Emergency Response section includes additional information about the Portland Bureau of Emergency Management, the Bureau of Emergency Communications, and the City's emergency response infrastructure.

## Major Needs & Recommended Improvements

The following sections highlight a few significant projects and procedural changes that will impact the investment strategy for civic facilities and assets. The Buildings and Assets section describes buildings that have received a great deal of public attention due to pressing maintenance and repair needs, and explains the current status of efforts to improve these facilities. The Process and Management section describes other important needs that are not necessarily tied to an individual building or project, and identifies ways to improve decision-making processes for investments in this set of assets.

### Buildings & Assets

Many of Portland's most prominent buildings and facilities are showing the impact of deferred maintenance. The following buildings and assets are in need of significant attention to maintain their viability for the coming twenty-year planning horizon.



*The Portland Building*

The Portland Building is a fifteen-story office building that houses several municipal agencies and departments, including the Bureau of Environmental Services, the Portland Bureau of Transportation, Portland Parks and Recreation, the Portland Water Bureau, and OMF.

The building, opened in 1982, is renowned for its status as the world's first major postmodern work of architecture, and was placed on the National Register of Historic Places in 2011. Many structural components and operating systems are in need of repair. A recent assessment by BIBS Facilities included an initial estimate of $95 million for one potential renovation option for the Portland Building. Though demolition and redevelopment scenarios are being considered, the future of the building remains uncertain.



*Veterans Memorial Coliseum*

The Veterans Memorial Coliseum (VMC) has a capacity of almost 10,000 seats and currently hosts over 100 events per year. The facility opened in 1960 and many building components are now in need of repair due to years of underfunded major maintenance and inadequate replacement reserves. Needs include the repair or replacement of structural components of the building's rectangular shell and roof, inefficient heating systems, and a lack of ventilation to accommodate cooking at concession stands.

The VMC has a celebrated history; it was dedicated to veterans of all wars when it opened, and was placed on the National Register of Historic Places in September 2009. Several alternate uses and renovation ideas have been proposed for the facility in recent years. An extensive community engagement process and years of planning for a catalytic investment project were placed on hiatus in 2012 when plans did not move forward. The City is currently planning for the future of the facility.


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*Performing Arts Facilities*

The Portland'5 Centers for the Arts offers five venues in three City-owned facilities[3], providing arts and entertainment to the entire region. The collection of facilities comprises the 5th largest performing arts center in the country. These facilities bring over 1,000 music, theater, dance, and lecture performances to Portland every year, generating an annual average of $60 million dollars[4] in regional spending.

These buildings are owned by the City, with Metro handling operational oversight and management responsibilities. At the current time, many unknowns remain regarding the facilities' needs and funding sources for major systems replacements and building upgrades.

*Westside Emergency Response Center*

The former SFC. Jerome F. Sears U.S. Army Reserve Center was acquired by the City through the Federal Base Realignment and Closure process. The location and size of the property make it suitable as an emergency response staging facility on the west side of the Willamette River, particularly because most of the City's emergency response equipment and offices are currently located on the east side. A facility at this site could serve the operational needs of Portland Fire and Rescue and the Portland Police Bureau, and play an integral role in any coordinated citywide emergency response strategy.

The building, originally built in the 1950s, would need to be brought up to current building standards in order to properly function as a backup staging center, de-icing facility and fueling station. The future use of the facility is uncertain. Efforts to complete necessary zoning changes are moving forward, as is the identification of funding for the full range of improvements required for City occupation. In total this work is estimated to cost approximately $11 to $12 million.

## Process and Management

There are other pressing needs that extend beyond an individual building or facility. The following topics reflect needs regarding the process of planning, managing, maintaining, and repairing civic facilities and assets.

*Major Maintenance and Replacements*

BIBS Facilities collects a major maintenance and replacements reserve fund through its rental rates on all managed properties. The acknowledged industry standard is to build 3% of a building's replacement value into the rental rates to fund these reserves on an annual basis. Currently, the City has built in approximately 1.2% of replacement value into rental rates for facilities owned by OMF.

Collecting less than the industry standard for reserve funding has led to a significant cumulative funding gap for major maintenance and replacements. Similar challenges are shared by other property-owning bureaus, many of which lack funding strategies. A system-wide review could better assess current

[3] The Portland'5 Centers for the Arts includes the Arlene Schnitzer Concert Hall, the Keller Auditorium, and the Antoinette Hatfield Hall which is home to the Brunish, Newmark, and Winningstad Theaters.
[4] Portland Center for the Performing Arts (now called Portland'5 Centers for the Arts), 2011-2012 Annual Report.

funding strategies and prioritize investments to provide more reliable sources of funding for major maintenance reserves.

*Holistic Facilities Planning*

There is no existing, coordinated plan to prioritize and evaluate investments in civic facilities and assets. Major facility projects and capital improvements are typically implemented on an ad-hoc basis, with annual investment decisions often tied to a bureau's budget proposal. The result is a segregated approach that does not maximize the efficiencies of making investments that provide mutual benefits to multiple City agencies. This approach also does not capitalize on the capacity for coordination that already exists between bureaus to develop opportunistic partnerships for underfunded projects.

A more comprehensive, integrated facilities planning approach for all City-owned or City-managed facilities could be beneficial. While individual agencies currently do their own internal strategic planning, these approaches could be analyzed across bureaus in order to assess facilities needs more thoroughly on a City-wide scale. With participation from agency representatives, facilities needs could be more effectively and efficiently addressed across the board.

*Improving Asset Management*

The City's existing asset management process provides a methodology for assessing the condition of assets in relatively broad terms – "very good", "good", "fair", "poor", and "very poor". While it is helpful to understand the condition of assets using these categories, a greater level of detail is needed to more substantially inform decision making.

In collaboration with the City Asset Managers Group, BIBS Facilities has been working to update and improve the Facilities Condition Assessment used for civic assets and facilities. This more detailed approach to facility assessment will be available to all City infrastructure bureaus. This effort may strengthen the asset management foundation, better facilitate inter-bureau coordination for projects and improvements, and enhance the information available about facility needs throughout the city.

## Financial Strategy

Financial strategies in the Citywide Systems Plan are normally intended to address the needs and recommendations identified in the investment strategy. For instance, if the investment strategy points out the need for a new road, the financial strategy is supposed to define ways to finance it. There is no State requirement to provide a financial strategy for civic facilities and assets. In addition, because needs and recommendations for civic facilities and assets aren't currently able to be analyzed at this level of detail, it is difficult to present a corresponding financial strategy. Without the capacity to evaluate required levels of service and develop a project list that will help accommodate those levels of service, financial planning for civic facilities and assets is primarily responsive and opportunistic.

The Sources of Revenue section describes significant sources of funding for each type of asset. The Financial Challenges section identifies funding gaps and other financial issues that affect these assets.


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Future efforts to develop a financial strategy could use this information as a starting point, as these challenges will need to be addressed in order for any strategy to be successfully implemented.

### Sources of Revenue

The operations of BIBS Facilities depend largely upon revenue collected through rental rates. Historically, the City has tried to limit rental rate increases to prevent potential cuts to services.

Major maintenance money for most City-owned office buildings, maintenance facilities, the 9-1-1 Center, and the Archives and Records Center comes out of rental rate revenue. Rental rates account for the full spectrum of services offered by BIBS Facilities, including overhead costs and other non-billable time. Major maintenance money is also gathered through net income from Union Station, a Portland Development Commission facility managed by the City, a portion of which is used to fund improvements at that facility. Most of these agreements are negotiated through either IAs between City agencies or IGAs between a City agency and another public agency.

CityFleet operates similarly to a private business, billing their customers for services rendered using burdened labor rates, parts, and fuel charges – all charges that include overhead costs.

Major projects and capital improvements for civic facilities and assets are sometimes financed through long-term financing. Bonds, loans or lines of credit can be used to provide funds for a project that cannot otherwise be paid for through the existing resources of the City's General Fund or rates paid to bureaus for services. General obligation bond measures can be placed on voter ballots, and if approved create a new property tax that supports a reliable, low-interest form of financing for public projects. Taxpayers then fund the resulting annual debt service. Capital improvements and major projects can also be funded through other forms of debt financing supported by resources other than voter-approved property taxes.

### Financial Challenges

The City uses an asset management approach to document the condition of its property and make informed investment decisions. The financial condition of these assets is primarily indicated by their annual funding gaps; where noted, a one-time funding gap is used (see Table 10.5).

Table 10.5 Civic Facilities & Assets annual funding gaps, 2013

| | Value (in millions) | | | | |
|---|---|---|---|---|---|
| **Capital asset type** | **R/R/R** | **Mandate** | **Capacity** | **Total** | **Confidence level** |
| Office buildings | $2.2 | $0.0 | $0.0 | $2.2 | 4 – High |
| Other buildings | $1.3 | $0.0 | $0.0 | $1.3 | 4 – High |
| PDC facilities | NA | NA | NA | NA | 4 – High |
| Spectator facilities * | NA | NA | NA | NA | 4 – High |
| Performing arts facilities ** | TBD | TBD | TBD | TBD | TBD |
| **Total for Civic Facilities & Assets** | $3.5 | $0.0 | $0.0 | **$3.5** | |

R/R/R (Repair, Rehabilitation, Replacement): Additional funding necessary to repair, rehabilitate and replace existing assets to bring them up to established service levels, or replace assets considered functionally obsolete (not meeting those service levels).

Mandate: Additional funding necessary to improve existing assets to meet regulatory requirements, exclusive of improvements that fall under R/R/R or capacity.

Capacity: Additional funding necessary to address existing inequities and deficiencies in levels of service for current customers and citizens.

* Spectator facilities fund gaps are of a one-time nature: $35M for reserves funding.

** OMF is beginning to work with Metro/MERC on the status of performing arts facilities.

For assets in the "office buildings" and "other buildings" groups, this funding gap is calculated by determining the annual difference between what is collected in rental rates[5] or set aside from net income for major maintenance and the industry standard of 3 percent of replacement value. The Office of Management and Finance is currently only able to reinvest about 1.2 percent of the replacement value of these civic facilities and assets on an annual basis. The level of reinvestment in major maintenance has declined in recent years, due to rapidly escalating costs to replace buildings (above regular inflation), the increase in the number of new facilities, and rate reductions to meet the declining resources of users of civic facilities and assets.

The funding gap created by this 1.2 percent of replacement value reinvestment will not allow OMF to cover major maintenance and replacement needs for civic facilities and assets for the next five years, with many projects being pushed back beyond this timeframe. Regardless, this is not a severe enough funding gap to force a decrease in the overall condition of individual assets from their current broad designations as either "good", "fair" or "poor" within a 10-year planning horizon. Since the likelihood of rental rate increases is low, funding for major maintenance should be increased. One way to reduce the funding gap is to direct savings from efficiency improvements to major maintenance reserves.

For spectator facilities and Union Station, the funding gap is noted as the one-time difference between actual fund reserves for capital maintenance and estimated costs to address the deferred maintenance at Veterans Memorial Coliseum and Union Station. For Union Station, the best resource for addressing maintenance needs are grant funds. Recently grant funds have been used mainly for the roof structure, which is the facility's most pressing need.

[5] Rental rate increases for City facilities are limited to CPI, though there may be cost element factors that are in excess of CPI.



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# TECHNOLOGY SYSTEMS

## Introduction

Technology systems come in a multitude of forms, with a range encompassing computer hardware and software, voicemail systems, video systems, microwave radio systems and other radio equipment, and transmission towers.

These systems have a direct impact upon nearly every City agency's ability to provide services ranging from routine correspondence to emergency response. They enable City agencies to operate more efficiently, with many bureaus relying on sophisticated modeling software, monitoring systems, and databases for construction permitting, land use planning, spatial analysis, and a variety of administrative processes. Reliable, innovative technology systems play a critical role in Portland's status as a resilient, prosperous, modern city, with many predicting that the importance of these systems will only continue to increase throughout the Comprehensive Plan's twenty-year planning horizon.

It can be challenging to analyze these systems using language and concepts associated with more traditional infrastructure systems. The operational capacity of technology and its potential to impact services is constantly in flux, which makes it difficult to measure performance and conduct meaningful long-range planning. When the original Comprehensive Plan was drafted in the late 1980s it would have been impossible to predict the form and magnitude of change that the internet and other corporate software applications would affect. Because the pace of technological innovation is continuing to accelerate, the future is likely to bring several opportunities for the City to consider new and potentially groundbreaking technologies.

Many City bureaus are capitalizing on opportunities to invest in and utilize innovative technology systems, including cloud computing, interactive mapping applications, and mobile payment systems to streamline operations. Though these technologies may become outdated in the coming years, there will be emerging opportunities for the City to benefit from the evolving technological landscape within the twenty-year planning horizon.

Technology systems within the City of Portland are primarily handled by the Bureau of Technology Services (BTS). The Bureau of Technology Services is tasked with providing management, policy setting, strategic planning, and leadership in the use of computer, radio, and telecommunications technologies for the City. Other City bureaus own or manage specialized technology based assets, particularly computer software. While not the focus of this section, these non-BTS technologies are critical to the City's ability to deliver services. For example, SAP, the City's centralized financial and administrative business software, is integral many City functions.

This section begins with mission and vision statements from BTS, then discusses how technology systems impact an array of City services and programs. The section identifies some trends, issues, opportunities, major needs and associated recommendations for technology systems. It concludes with a brief discussion of the investment process and financial strategy currently utilized by BTS and the Office of Management and Finance (OMF) for City-owned technology assets.


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## Vision

There is no consolidated vision for technology systems at this point in time, though BTS has developed their own bureau-specific vision statements. Based on these statements, the following vision statement has been developed for technology systems for the purposes of this document:

The City of Portland's technology systems provide forward-thinking solutions for local government. They enable members of the public to engage with City agencies and programs, and help to facilitate a two-way dialogue between residents and government officials. The Bureau of Technology Services aims to be a recognized leader in municipal technology systems, and a valued strategic partner to public- and private-sector efforts that support innovative and resilient technology investments across the city.

In addition, the Corporate Geographic Information Systems program at BTS has a stated vision to "enable superior decision making by providing the highest quality geospatial information to all, anytime, anyplace, and on any platform, in order to provide the highest level of City services".

## Mission

Technology systems also lack a consolidated mission statement relevant to this document. Similar to the vision statements, there are a few bureau-specific mission statements that apply to the assets in this section. The following mission statement was developed for the purposes of this document, and is intended to incorporate bureau-specific language through the lens of technology systems:

The Bureau of Technology Services provides innovative, reliable, and secure technology services and strategic leadership in alignment with the needs of the City of Portland, the public, and regional partners. Individual services provided by BTS support the City's goal to deliver efficient, effective, and accountable municipal services, as well as OMF's goal to maximize the cost effective use of technology. These services maintain a world class production technology environment, support mission critical voice and


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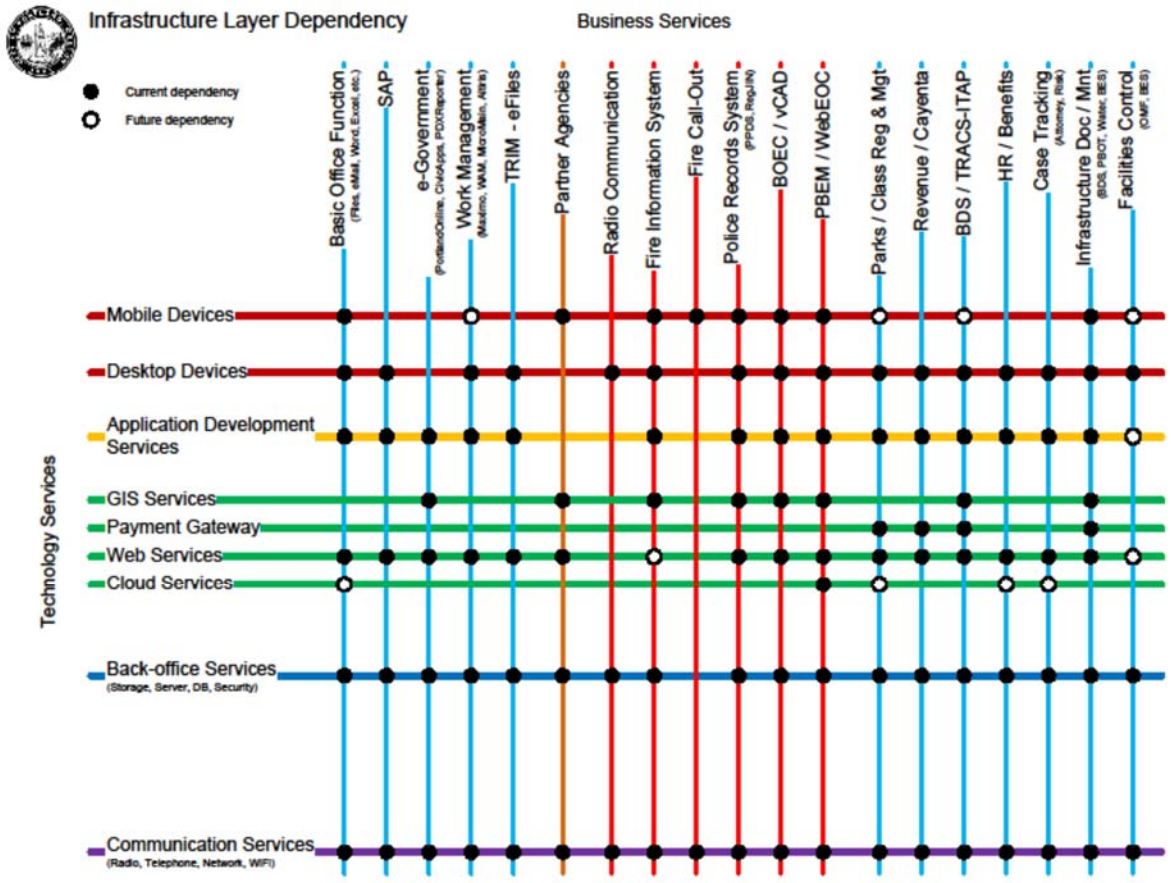
data communications needs, and employ appropriate safeguards required in order to protect the City's information assets.

The Corporate Geographic Information Systems program at BTS also has a mission to "improve the delivery of City services to the public by providing strategic geospatial technology and services that promote informed decision making, foster collaborative partnerships, and enable access to data wherever it is needed".

## Services Provided

The City's major technology systems are all integrated to a significant extent (see Figure 10.2). This means that operations for most BTS technology systems are dependent upon access to other BTS systems, and all systems within this matrix are important for everyday service provision. This matrix of systems has a very broad influence on public service provision, and this influence will continue to expand during the next twenty years.

Figure 10.2 Technology Systems Service Dependency Grid





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Technology systems allow City bureaus to perform the wide array of services that rely upon the use of technology. Services provided and impacted by technology systems include:

- Communications services, including telephony;
- Life safety and emergency communications, coordination, prevention, and response services;
- Water provision, transportation services, and nearly every other public service described elsewhere in the Citywide Systems Plan;
- Public access to City websites and internet databases;
- Internal business services;
- Digital archives and data storage services; and
- The ability to take payment for services using credit or debit cards.

## Levels of Service

The Bureau of Technology Services uses a long list of performance metrics to assess service provision. The Bureau of Technology Services is not subject to State comprehensive planning requirements to meet any specific service levels. A few key metrics related to public services include.

- The percentage of time Radio Systems operated without failure;
- The average number of unique visitors per day to PortlandOnline;
- The average number of maps per day viewed through PortlandMaps;
- Customer service satisfaction ratings;
- Payment gateway availability; and
- Mission critical communications and production systems availability.

In addition, BTS has several performance metrics for services provided internally to other City bureaus or employees. These include metrics related to support call response times, information security, time spent deploying new software or hardware, and the percentage of time that internet service is available to City staff members.

## Service Area

Physical boundaries are less relevant to technology systems than other citywide systems, because much of this technology is either mobile or accessible from remote locations. Most of the technology systems supported by BTS are primarily for the use of the City of Portland and are primarily used within the municipal boundaries as defined by the City's urban growth boundary. However, some of them, including some public safety systems such as Computer-Aided Dispatch and the radio system, are also used by agencies outside of City boundaries.

Other technology systems are used by City agencies outside of city boundaries to support City needs. For instance, the Portland Water Bureau utilizes BTS hardware and software at the Bull Run Reservoir site to support watershed operations. Future years may also bring about other reasons to maintain facilities


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outside of city boundaries to serve needs in Portland – including redundant data centers located remotely to ensure access to important private data servers in the event of an emergency.

## Service Agreements

The Bureau of Technology Services has interagency agreements (IAs) with nearly every City bureau. Funds received through IAs are deposited into the Technology Services Fund, an internal service fund that can only be funded through this source. Interagency charges are designed to approximate the cost of the services consumed by the service receivers. These IAs comprise the bulk of the funding for the services BTS provides, and as such most BTS services are provided internally to other City bureaus.

The Bureau of Technology Services also provides services to other agencies and jurisdictions through intergovernmental agreements (IGAs). Intergovernmental services range from 800 MHz simulcast and trucking radio services, to use of the City's Integrated Regional Networking Enterprise system, to site usage at communications tower locations. The Bureau of Technology Services has negotiated IGAs with organizations including Metro, Tri-Met, Oregon Health and Sciences University, David Douglas School District, and the City of Lake Oswego – among others.



## Inventory Summary

Components of technology systems include many different types of assets, ranging from obsolete to newer and more cutting edge equipment. This technology comes in a multitude of forms, with a range encompassing computer hardware and software, voicemail systems, video systems, microwave radio systems and other radio equipment, and transmission towers. See Table 10.6 for more information about technology system groups and replacement values.

Table 10.6 Technology Systems Groups and Replacement Values, 2013

| Capital Asset class | | Value (in millions) |
|---|---|---|
| BTS: | Communications | $70.8 |
| | Production services | $2.8 |
| | Strategic technology | $6.2 |
| Other bureaus: | Equipment and software | $8.2 |
| | Strategic technology | $93.8 |
| **Total Technology Systems** | | **$181.8** |

Table 10.7 provides information about the current condition of technology systems. The condition ratings for these asset groups are based on current age and expected useful life cycle. Condition here is expressed as a percentage of assets, with systems that are considered to be obsolete included in the "poor" condition rating.

Table 10.7 Current Condition of Technology Systems

| | | Current Condition (in %) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Technology systems by capital asset type | | Very Good | Good | Fair | Poor | Very Poor | TBD | Confidence Level |
| BTS: | Communications | 0 | 97 | 3 | 0 | 0 | 0 | 4 - High |
| | Production services | 0 | 77 | 23 | 0 | 0 | 0 | 4 - High |
| | Strategic technology | 0 | 84 | 16 | 0 | 0 | 0 | 4 - High |
| Other bureaus: | Equipment and software | 0 | 100 | 0 | 0 | 0 | 0 | 4 - High |
| | Strategic technology | 0 | 88 | 12 | 0 | 0 | 0 | 4 - High |

The following paragraphs describe and provide examples to clarify each major grouping of technology systems assets.

Communications assets owned by BTS include data networks, the Integrated Regional Networking Enterprise telecommunications system, certain transmission towers, and the City's 800 MHz radio system. These assets facilitate effective and reliable communication between City employees and agencies. For example, the City's 800 MHz Radio System is used by a number of public safety agencies to coordinate emergency response and other critical communications.

**Production services technology** owned by BTS includes both virtual and physical servers, the City's email system and storage area networks, application servers, and backup system hardware and software. These assets store data and facilitate internal communications within the City of Portland. For example, the City's collection of servers houses software that provides database services to a large number of computers and other computer programs. These servers help display requested data for users within the City network, and perform data analysis and storage tasks necessary for managing large amounts of digital information.

**Strategic technology** owned by BTS includes both hardware and software for corporate applications such as E-Gov, E-Commerce, and Geographic Information Systems. This asset group also includes information security technology in the form of both hardware and software. Information security


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technology is used to ensure continued functionality of the City's technology systems and to keep sensitive information or private data safe from viruses and other internet security threats. A good example of this would be the virus scan software installed on City-owned computers, which ensures that data or programs downloaded from the internet are safe and free of viruses.

**Equipment and software** owned by other bureaus, such as video systems, certain radio equipment, bureau PCs, and bureau laptops, facilitates access to technology services within individual City agencies, connecting City employees with the array of technology systems listed above. For example, email systems and strategic corporate applications can only be used by City agencies if they have PCs and laptops equipped to handle those functions.



**Strategic technology** owned by other bureaus includes corporate applications such as Computer-Aided Dispatch; the Portland Police Data System; the Customer Information System; and the Tracking, Review, Application and Construction System (TRACS). These applications help City agencies provide services by making information more accessible and streamlining administrative processes. For instance, TRACS helps the Bureau of Development Services assess permit requests and review construction plans for proposed projects. This also benefits builders and developers by tracking information on projects, reducing the amount of time spent on permitting processes, and reducing the number of trips to the Permit Center.

## Key Issues, Trends, Opportunities

### Constantly Evolving Technologies with Limited Lifespans

Technology of all types has a limited life span. At present, the increasing availability of high speed internet connections, open source code, "app stores", cloud computing resources, and the increasing availability of good quality mobile devices with internet access are major influencers of technology. These drivers and influencers of technology will continue to evolve rapidly and can be expected to change significantly in short periods of time.

When technology exceeds its lifespan a variety of problems can occur, including failures, inability to maintain, inability to upgrade, and other problems. The City currently has a material investment in older technology that must continue to be maintained while other technology is evolving rapidly. It will continue to be a challenge to maintain important legacy systems while at the same time researching, adopting and implementing new technologies needed by the City in order to keep pace with the needs of Portlanders over the next twenty years.

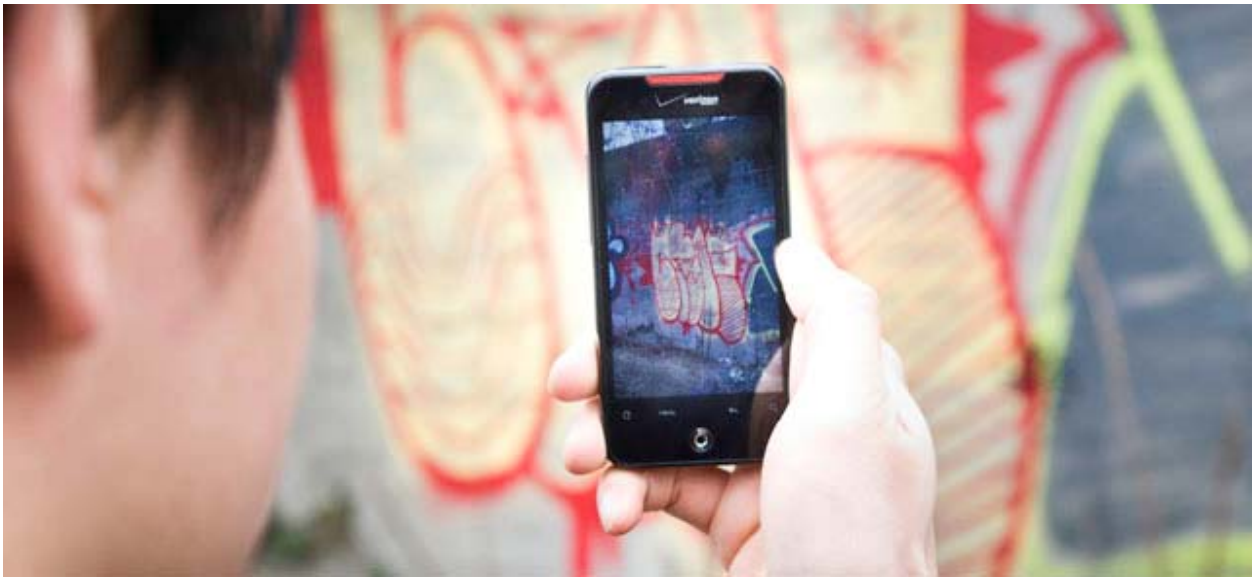
### Cloud Computing

Recent years have seen a rise in the popularity of services such as servers, storage, and applications being delivered through the Internet. Commonly referred to as cloud computing, this development presents an opportunity to use resources more efficiently and reduce costs for City bureaus. The City has already started utilizing cloud technologies to a limited extent, with a future deployment of the cloud-based Office 365 software planned for all City bureaus.

If implemented properly, cloud computing has the potential to improve and streamline City operations. However, there are potential pitfalls that come along with storing private or sensitive government information on the internet. As with many technologies, the City has to balance the potential for operational efficiency with a need for the highest level of information security for private data.

### Mobile Computing and a Mobile Workforce

Mobile computing has allowed citizens and employees to use technology tools virtually anytime and anywhere without the need to be in a certain location – such as an office. This technology is already making it possible for City employees who work in the field to use mobile tools to allow them to work more efficiently. It also presents opportunities to explore different office space arrangements that would allow City employees to work remotely on a more regular basis, as appropriate.

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### Consumerization of Technology

Employees and citizens own a variety of technology tools, such as smartphones and tablets, and many people expect to be able to use them when interacting with the City to obtain information or pay for services. This consumerization of technology presents an opportunity to allow the use of personal technology where it supports the City's mission, while making certain that City systems are protected from viruses and malware.

### "The Internet of Things"

Another emerging technology trend is "the internet of things" where devices and machines communicate via the internet without the intervention of humans. These devices can sense aspects of the real world, like temperature, location, pressure, fluid levels, and other key indicators, assess that data, and act according to program needs. One example is the driverless car technology being developed by Google and other companies. This technology could be used by a pump programed to assess water levels and turn on when reach a certain height was reached to activate drainage at that location

These capabilities are an emerging driver in the technology field, and it is likely that vendors will start to provide the City with solutions informed by this concept in the near future. Though this technology might seem outdated by the end of the twenty-year planning horizon for the Citywide Systems Plan, it could have a large influence on future technology decisions within the City.

## Regulatory Compliance

Though technology systems do not have to comply with quite as many regulations and restrictions as other infrastructure systems, there are still a few relevant standards and guidelines that impact BTS services:

- The use of payment cards (debit and credit cards) is overseen by the Payment Card Industry (PCI) group. This results in periodic audits to evaluate the safeguards applied to the handling of this data in order to prevent identity theft and other misuse. The City processes over 130 million payment card transactions annually.
- The City adheres to the guidelines of the Health Insurance Portability and Accountability Act (HIPAA) which outlines privacy rules for information about an individual's health.
- Certain data, such as law enforcement data, medical data and personally identifiable information (e.g. Social Security numbers) requires a high level of confidentiality. Steps are taken to ensure the proper access to these data.

## Investment Strategy

Technology systems require strategic investments in order to stay current with a constantly progressing technological landscape. The City's asset management practices, as well as other internal working groups, have developed a few guidelines and recommendations to inform these investments. These longer-term strategies are often supplemented by flexibility in the short-term, with other more incremental

decisions being made along the way to capitalize on strategic opportunities or recent technological advancements.

## Process

Five-year maintenance and replacement plans for technology systems are prepared through OMF's Asset Management program. These plans are produced by BTS staff responsible for asset management, and are refined by a management review group. Priority is given to items that support public safety, improve reliability and availability of critical data systems, and improve efficiency and reduce costs through the consolidation of infrastructure. The Bureau of Technology Services also recently embarked upon a Citywide Technology Assessment, which has resulted in additional recommendations to strengthen the City's technology investment and decision-making processes.

The Bureau of Technology Services currently employs a formal intake process when new work is identified. This practice is supplemented by the use of portfolio management software, which provides a comprehensive picture of the entire BTS work queue as well as the demands the project is anticipated to have on City resources. Major influencers for short-term decisions include the urgency of the need, the availability of funding, the presence of executive support, and the capacity for revenue generation. Certain large technology projects are overseen by the Technology Oversight Committee (TOC), where citizen members review the projects, ask questions, and provide suggestions. TOC reports are also shared periodically by the Chief Administrative Officer with City Council.

## Recent and Ongoing Projects

The Bureau of Technology Services is continually implementing any number of projects that aim to provide solutions through technology systems for both City staff and the general public. Recently completed projects include the deployment of Windows 7. Current projects include the deployment of Office 365 and the implementation of the Public Safety Systems Revitalization Project.

### Windows 7 & Office 365

The Bureau of Technology Services is currently finishing the deployment of the Windows 7 operating system for all City bureaus. In addition, Office 365, the online version of Microsoft's office suite, is in the process of being deployed citywide.


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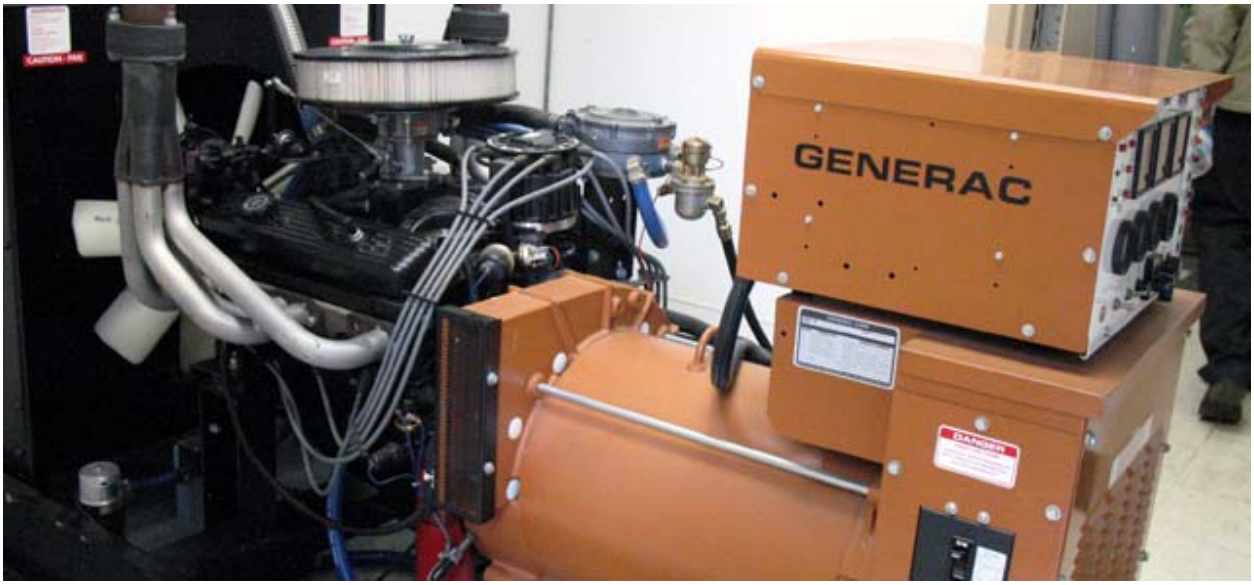
### Public Safety Systems Revitalization Project (PSSRP)

The Office of Management and Finance has established a multi-bureau committee to address the replacement of major public safety technology systems including the 800 MHz radio system, Computer-Aided Dispatch for the Bureau of Emergency Communications, and Portland Police Data System. This work, called the Public Safety Systems Revitalization Project (PSSRP), is addressing funding, governance, coordination, timing, and other issues related to the replacement of these major technology systems.




## Planned Projects and Improvements

There are several other projects that are expected to be completed in the next five to ten years. Some of these anticipated projects include replacements of portions of the City's Integrated Regional Networking Enterprise system, production services assets such as storage area networks and servers, and various strategic corporate applications. For instance, the Portland Police Data System is planned to be replaced by a new system called RegJIN by Spring 2015. Additionally, if the 311 Call Center (see p. 347) moves forward it is likely to include a significant technology component.

## Major Needs & Recommended Improvements

The following section highlights some projects and procedural changes that would be in alignment with the investment strategy for technology systems. These include expanded system performance metrics; the adoption of an integrated, inclusive decision-making process; and improved disaster recovery planning for technology.

### Expanded System Performance Metrics

The Bureau of Technology Services measures both the performance of selected systems and customer experience. There is a need to measure additional characteristics of system performance, such as energy

use, in order to find opportunities for additional efficiencies, Measuring system performance can also help to inform strategic planning and decisions about the purchase of new or replacement technology.

In addition, metrics can provide guidance about system and network load and sizing, thus helping to determine whether the components are the right fit for the work load. This information is useful when expanding or replacing the system. Data centers are notoriously heavy consumers of electricity, which is needed to run technology equipment and to manage temperature and humidity. Expanded system monitoring and performance metrics could provide more precise information about energy consumption and energy savings as changes are made to improve efficiency.

### Integrated, Inclusive Decision-Making Process

The City could benefit from a more robust methodology to evaluate the costs and benefits of proposed technology investments before they are approved. This could lead to better assessments of each requested technology systems project by considering factors such as life-cycle cost, which identifies not only purchase and implementation costs but also the cost of maintenance and upgrades. This would allow the City as a whole to make more informed investment decisions and reject projects that do not demonstrate adequate value.

The recent Citywide Technology Assessment conducted by BTS has brought forth some recommendations about best practices and governance. Among these is the recommendation to create Communities of Interest, a collaborative venue for bureaus with similar technology needs to consider solutions that span multiple bureaus. This would increase efficiency and cost savings, and could provide a more complete view of technology needs across the City.

### Disaster Recovery Planning for Technology

The City needs a robust disaster recovery plan that includes technology systems in order to prepare for City services to continue during and after a disaster. The implementation of such a plan is critical to Portland's emergency response capacity, and could contribute to the resiliency of many essential City services and programs. The Bureau of Technology Services is working on a plan for technology systems disaster recovery.

## Financial Strategy

As mentioned elsewhere in this chapter, financial strategies in the Citywide Systems Plan usually address the needs and recommendations identified in the investment strategy. There is no state requirement to develop a financial strategy for technology systems, and needs and recommendations for technology systems are not able to be analyzed at this level of detail. Without the capacity to develop a project list or detailed investment strategy, financial planning for technology systems will necessarily remain responsive and opportunistic.

The following is a description of the significant sources of funding for capital asset groups included in the Technology Systems section, and a discussion of funding gaps and other financial issues that affect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these assets. Future efforts to develop a financial strategy should use this information as a starting point, as these challenges will need to be addressed in order for any strategy to be successfully implemented.

### Sources of Revenue

At this time, the sole sources of revenue for BTS are IGAs and IAs related to service provision. Revenue received from these agreements flows through the Technology Services Fund, an internal services fund requiring that revenue received be used to fund BTS operations. Bureau of Technology Services IA charges are designed to cover the cost of the services consumed by the service receivers.

Other critical projects are usually funded using one-time fund balances or other one-time allocations included in annual bureau-specific budget proposals. Additionally, replacements are sometimes funded through reserve funds.

Due to the fact that technology systems projects benefit different bureaus in different ways, their associated funding sources can vary depending upon the project and its intended scope. For instance, the PSSRP was financed partially through General Obligation bonds approved by voters. This funding source was used to complement a mix of debt and cash financing for the project that was approved by Council as part of prior budget processes.

### Financial Challenges

Establishing replacement values, current conditions, and funding gaps for technology systems requires a different approach than for other City assets. This is primarily due to the short lives and quick obsolescence of technology assets. Another important factor is the critical need to stay current with technologies that may not be supported by vendors in the future, which can render the technology unusable. For example, Microsoft recently stopped providing customer support for the Windows XP operating system, which prompted most users to upgrade to the newer Windows 7.

Bureau of Technology Services rates currently only include partial funding for major maintenance and replacement systems. This significant long-term financial challenge is compounded by the fact that replacement values for technology assets are difficult to assess with any certainty, even on a short-term basis. Currently BTS estimates the replacement value of technology assets based on recently completed projects and a rough assessment of the experiences of other governments. The Bureau of Technology Services includes the indirect costs for engineering and other professional services in these replacement values

Another pertinent issue is the value of the revenue lost when technology systems malfunction or become inaccessible. Glitches or other technology failures can result in electronic payments being dropped, valuable data disappearing, and a variety of other negative consequences. Though lost revenue is not incorporated into calculations of the value of technology assets, it has a direct impact on the value of these systems to both City staff and the members of the public that utilize technology systems.

Annual funding gaps and other relevant financial information has been compiled in Table 10.8. Annual funding gap calculations include annual funding necessary to meet industry standards for major


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maintenance, and annual needs to ensure replacement and upgrades of technology on accepted schedules.

Table 10.8 Technology Systems Annual Funding Gaps, 2013

| | | Value* (in millions) | | | | |
|---|---|---|---|---|---|---|
| **Capital asset type** | | **R/R/R** | **Mandate** | **Capacity** | **Total** | **Confidence level** |
| BTS: | Communications | $5.4 | $0.0 | $0.0 | $5.4 | 4 – High |
| | Production services | $0.4 | $0.0 | $0.0 | $0.4 | 4 – High |
| | Strategic technology | $0.7 | $0.0 | $0.0 | $0.7 | 4 – High |
| Other bureaus: | Electronic equipment and software | $0.7 | $0.0 | $0.0 | $0.7 | 4 – High |
| | Strategic technology | $4.9 | $0.0 | $0.0 | $4.9 | 4 – High |
| **Total for Technology Systems** | | $12.1 | $0.0 | $0.0 | **$12.1** | |

R/R/R (Repair, Rehabilitation, Replacement): Additional funding necessary to repair, rehabilitate and replace existing assets to bring them up to established service levels, or replace assets considered functionally obsolete (not meeting those service levels).

Mandate: Additional funding necessary to improve existing assets to meet regulatory requirements, exclusive of improvements that fall under R/R/R or capacity.

Capacity: Additional funding necessary to address existing inequities and deficiencies in levels of service for current customers and citizens.



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## EMERGENCY RESPONSE

### Introduction

Emergency response infrastructure includes City-owned buildings, facilities, apparatus, vehicles, and equipment primarily owned or managed by the Office of Management and Finance (OMF) or Portland Fire and Rescue (PF&R). Emergency response infrastructure plays a central role in the City's full emergency response system, which delivers life safety and emergency response services for occurrences ranging from vandalism to inclement weather to a major natural disaster.

Under day-to-day circumstances, emergency response infrastructure is utilized by bureaus in the City's four-legged stool of emergency response – the Portland Police Bureau (PPB), Portland Fire and Rescue (PF&R), the Bureau of Emergency Communications (BOEC), and the Portland Bureau of Emergency Management (PBEM) – to respond to calls when Portlanders are in need. This emergency response system places BOEC as the first point of contact for emergency calls, with dispatchers then directing incidents to PPB or PF&R depending on the situation. When incidents or events require the involvement of additional City bureaus, PBEM steps in to coordinate emergency response on a broader scale

The City's emergency response system is vital to Portland's emergency preparedness and continuation of operations strategies, with many components of this section listed as "essential facilities" in the City's Natural Hazard Mitigation Plan (see p. 38). In the event of a large-scale climate event or disaster, the City's emergency response system expands to include the Disaster Policy Council and other City bureaus like the Portland Bureau of Transportation, the Portland Water Bureau, or the Bureau of Environmental Services for additional services as needed. Regardless of the scale or intensity of the emergency, Portland's emergency response system plays a foundational role in increasing citywide resiliency and facilitating an appropriate recovery.

Infrastructure covered in this section includes fire stations, specialized mobile response units, fire trucks, fireboats, police stations, and other buildings occupied by BOEC, PBEM, PF&R, and PPB. Due to existing

accounting and asset management practices, this collection does not comprise the entirety of the City's emergency response system. Many assets equally critical to emergency response are covered in other sections of this chapter, including the computer-aided dispatch system, the Emergency Coordination Center, the 9-1-1 Center, police vehicles, and emergency communications technology[6].

Emergency response infrastructure is often utilized by multiple bureaus simultaneously, with many intergovernmental and mutual-aid agreements that extend related services into every jurisdiction that borders the City of Portland. These assets are also subject to different ownership and management structures, and are dispersed throughout different capital asset groups used in City asset management practices. This complexity makes it difficult to perform comprehensive assessments, prioritize investments, and conduct financial planning for emergency response infrastructure. Because the Citywide Systems Plan represents the first effort to plan at this level of detail for emergency response assets, there is more work that needs to be done before long-term strategies can be implemented for the system as a whole.

This section describes how, where, and to what degree emergency response assets impact the provision of life safety services. It also includes a summary inventory for emergency response infrastructure, a discussion of their current condition and capacity, and a compilation of relevant issues, trends, and opportunities likely to arise over a twenty-year timeframe. This section then assesses some needs and recommendations for these assets, and concludes with a consideration of investment priorities and financial strategies to address those needs and recommendations in coming years.

## Agency Organizational Structure

The Office of Management and Finance and PF&R manage the buildings, facilities and apparatus included in the Emergency Response section. The Office of Management and Finance is responsible for all police facilities, which are managed through BIBS Facilities much like other City-owned or occupied office buildings. The Portland Police Bureau is the primary user of police facilities, with police vehicles provided through an interagency agreement with CityFleet. Portland Fire and Rescue is the primary user and manager for all fire facilities, as well as a collection of specialized firefighting vehicles, apparatus, and equipment. Portland Fire and Rescue handles ownership and management of these assets in part because their services are heavily integrated with the use of these assets. For instance, extinguishing a fire is nearly impossible without the use of specialized fire-fighting equipment such as hoses, ladders, and the fire apparatus itself. Though PPB depends upon precincts and vehicles to fulfill their bureau's mission, police facilities are less specialized and more flexible in nature.

Other bureaus are directly involved in the provision of emergency response services, particularly BOEC and PBEM. Depending on the circumstance, many other agencies can play support roles in Portland's emergency response system, including the Portland Bureau of Transportation, the Portland Water

[6] The value of the Emergency Coordination Center and the 9-1-1 Center is included in the "other buildings" asset group in the Civic Facilities & Assets section. The value of police vehicles has not been included in any asset groups within the Citywide Systems Plan. The value of communications technology has been included in the "communications" asset group in the Technology Systems section.


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Bureau, and the Bureau of Environmental Services. The Bureau of Technology Services is also involved in emergency communications services and systems.

## Vision

Similar to civic facilities and assets, there is no consolidated vision for Portland's emergency response assets. All four emergency response bureaus (BOEC, PBEM, PF&R, and PPB) have their own bureau-specific vision statements, but this language is only partly applicable to the assets covered in this chapter. Based on existing language, the following vision statement has been created for the purposes of this document:

Emergency response buildings, facilities apparatus, vehicles and equipment allow City agencies to provide coordinated, efficient and effective emergency response and life safety services to Portland residents and visitors.

## Mission

Emergency response infrastructure also lacks a consolidated mission statement. Based on the mission statements from BOEC, PBEM, PF&R, and PPB, the following mission statement has been developed for Portland's emergency response infrastructure:

*Emergency response buildings, facilities and apparatus provide the infrastructure necessary to effectively support services that protect life, property, and the environment, reduce crime and the fear of crime, maintain human rights, contribute to disaster risk reduction, and support the connection between the community and emergency responders.*

## Services Provided

Emergency response facilities and apparatus are utilized by PPB and PF&R, in coordination with PBEM, BOEC, and other City bureaus as necessary. Emergency response infrastructure enables these bureaus to provide life safety and emergency response services, which include:

- Fire and rescue services;
- Police services;
- Fire prevention services, such as plan review, code enforcement, and Harbor Master services;
- Emergency communications services;
- Emergency coordination and incident management; and
- Emergency prevention education and outreach.

Additionally, emergency response facilities often include conference rooms and gathering spaces used by neighborhood groups and various City bureaus. For instance, the North and East Precinct facilities each have community rooms available to the public, and all three major Precincts (Central, East, and North) also serve Portland citizens by providing a physical point of contact for police-related issues and concerns.


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## Service Area

Emergency response services are provided within the boundaries shown in Figure 10.3 and Figure 10.4. These services are provided to Portland residents within the City's urban growth boundary.

Additionally, emergency response services are available in areas outside of these boundaries based on a number of intergovernmental agreements entered into by the bureaus responsible for emergency response and life safety service provision. This results in an effective service area that is larger than the urban services area, extending into the areas under the jurisdiction of the Port of Portland as well as those governed by Multnomah County, the City of Gresham, and other municipalities in the region.

Figure 10.3 Portland Fire Stations, 2014

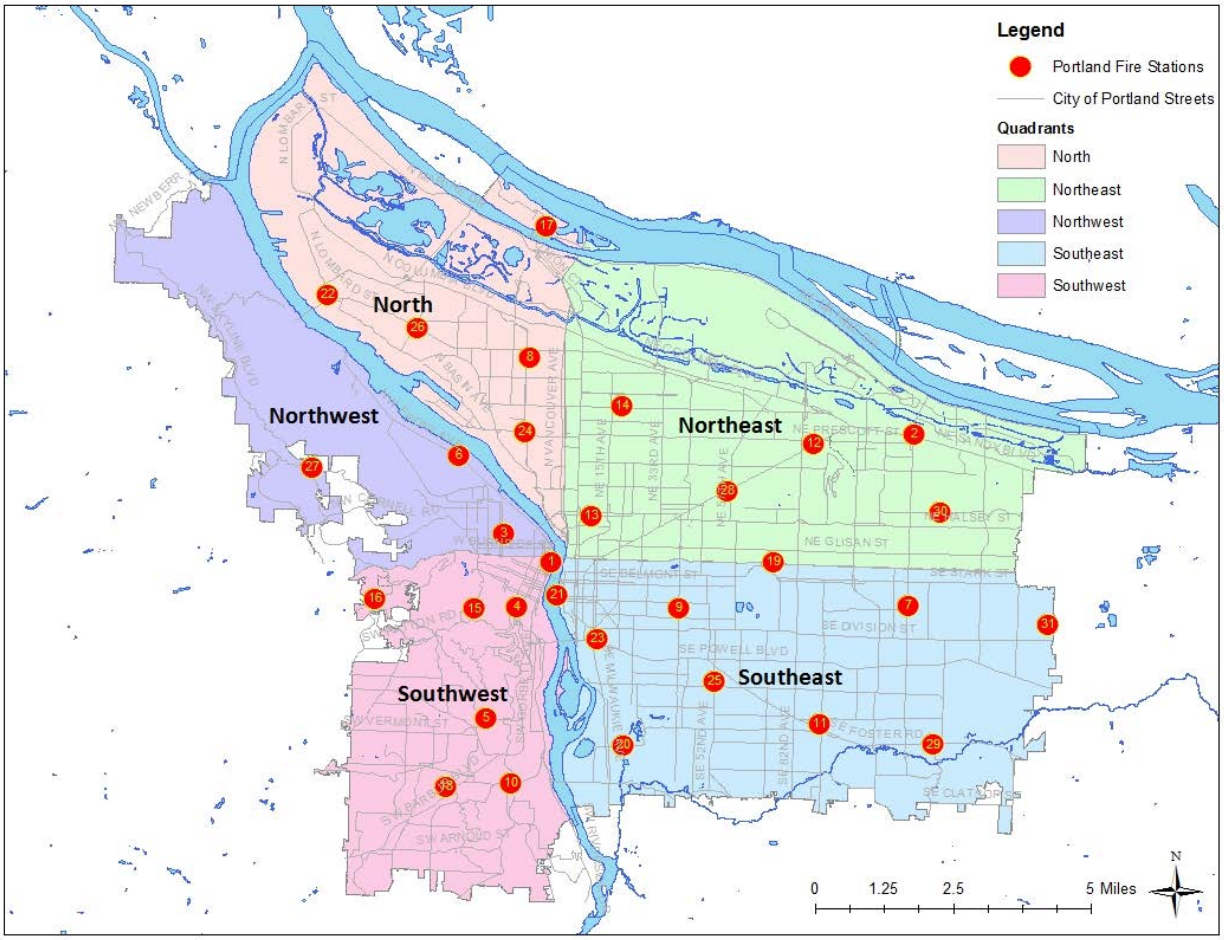




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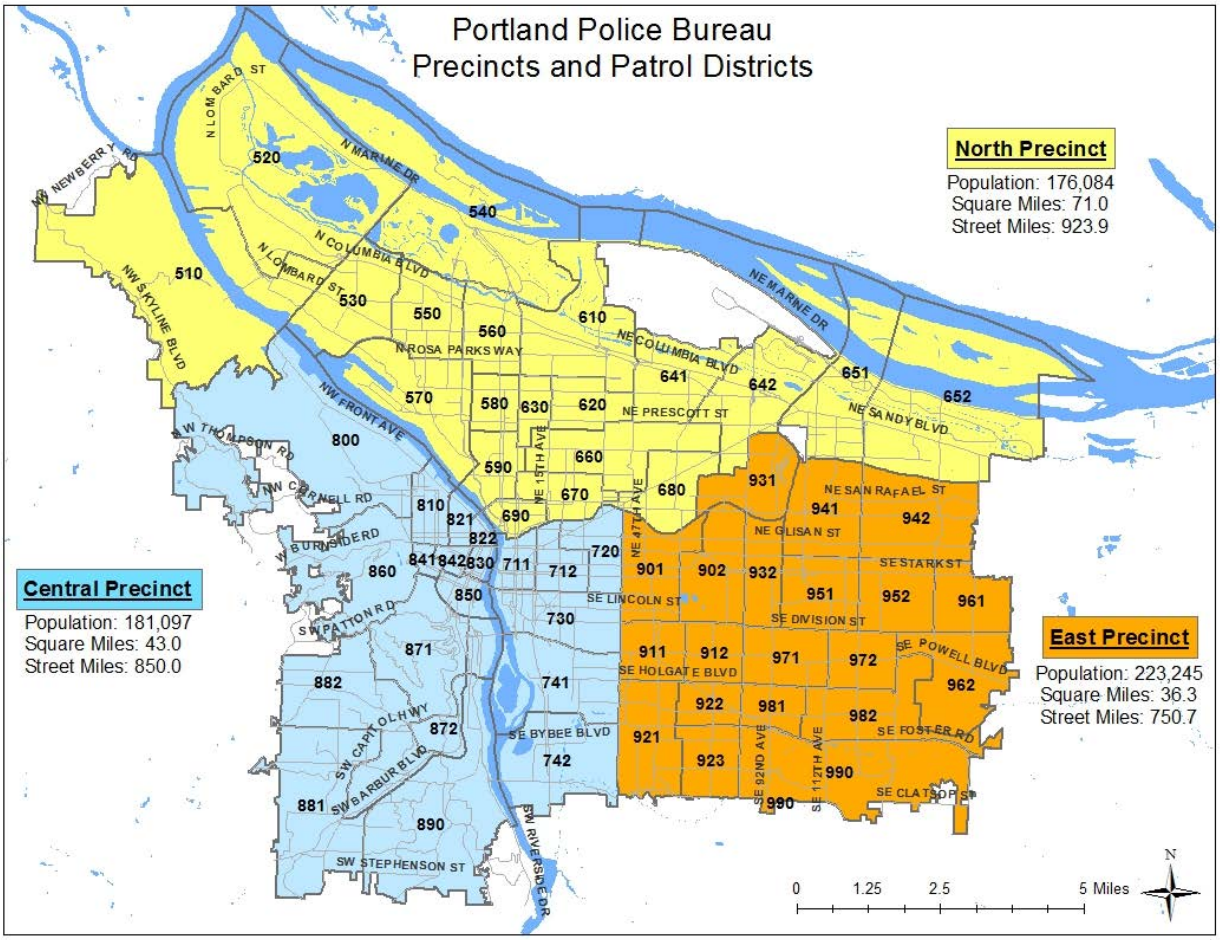
Figure 10.4 Portland Police Precincts and Patrol Districts, 2014




## Service Agreements

Service agreements for emergency response infrastructure take similar forms to the agreements for civic facilities and assets discussed earlier in the chapter. These agreements range from interagency agreements (IAs) amongst City bureaus, intergovernmental agreements (IGAs) between city bureaus and outside agencies, and condominium lease agreements, or other partnerships oriented around City-owned assets.

Portland Fire and Rescue has mutual-aid agreements with all jurisdictions surrounding City of Portland boundaries, including waterways and forest areas. For instance, PF&R is a member of the Marine Fire Safety Association (MFSA) serving the Lower Columbia and Lower Willamette River areas along with other emergency response agencies from Vancouver to Clackamas County (for more information on mutual-aid agreements see p.41).

The Portland Police Bureau is involved in over 200 agreements with over 50 different agencies, including the State of Oregon, the State of Washington, and several federal agencies. Many of these are IGAs related to mutual aid in the event of a major emergency, including agreements with Sherriff's offices in

Multnomah and Clackamas County. Other agreements include IAs related to police vehicles leased through CityFleet and technology services provided by the Bureau of Technology Services.

The Bureau of Emergency Communications provides 9-1-1 and responder dispatch services through IGAs with partner jurisdictions ranging from the City of Troutdale to Fire District 30 on Sauvie Island. The Bureau of Emergency Communications provides computer-aided dispatch connectivity services to the Port of Portland through an IGA, in addition to sharing live dispatch data with regional communications partners in Clackamas, Washington, Columbia, and Clark counties, as well as Lake Oswego.

The Portland Bureau of Emergency Management also has interstate mutual aid agreements for services through the nationally-adopted Emergency Management Assistance Compact (EMAC) and the Pacific Northwest Emergency Management Arrangement (PNEMA), which includes the states of Oregon, Washington, Idaho, and Alaska, along with the Canadian provinces of British Columbia and the Yukon Territory.

All primary emergency response bureaus (BOEC, PBEM, PPB, and PF&R) are involved in agreements or other partnerships related to the buildings, facilities, technology, vehicles, and apparatus covered in this chapter. For instance, the portion of the newly constructed Emergency Coordination Center occupied by PBEM is leased through BIBS Facilities, who was able to construct the facility through a joint-partnership with the Portland Water Bureau. Other examples include the Justice Center, which is occupied by PPB through a condominium lease agreement with Multnomah County.

## Levels of Service

Emergency response facilities and vehicles are not required to meet any specific or quantifiable levels of service by the State or any other regulatory body. These facilities and vehicles are expected to perform in a cost-effective and efficient manner to support City bureaus in the direct provision of public services, which are listed in the Services Provided section.

Emergency response bureaus utilize a variety of performance measures to assess their provision of emergency response and life safety services to the public. The Portland Police Bureau has a performance measure to respond to 9-1-1 emergency calls in less than five minutes, an industry standard that PPB has been surpassing in recent years. The Portland Police Bureau also measures their success by the percentage of citizens who rate their services as ‘good’ or better, the percentage of residents who feel safe walking alone in their neighborhood at night, and the percentage of crimes cleared. Police services are also assessed through a measure of “part 1” or major crimes per 1,000 residents, and other similar metrics.

Portland Fire and Rescue uses similar measures to quantify the speed and overall impact of their services. The bureau’s performance measure related to response times seeks to respond to medical and fire emergency calls in five minutes or less 90% of the time, from the time of the call to time of arrival on-site. There are many other performance measures being utilized by PF&R to increase proactive health and wellness practices for their employees and enhance existing code enforcement inspection practices.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## Inventory Summary

The emergency response asset inventory includes buildings, facilities, apparatus, vehicles, and equipment. These assets fall into the groupings of "police facilities" and "fire facilities", though it should be noted that "fire facilities" as a grouping includes several mobile fire apparatus units, specialized vehicles, and fire equipment that are not included in the data for either asset group. See Table 10.9 for information about the replacement values of emergency response asset groups, and Table 10.10 for an assessment of their current condition.

**Table 10.9 Emergency Response Groups and Replacement Values, 2013**

| Capital Asset class | Value (in millions) |
|---|---|
| Police facilities | $108.8 |
| Fire facilities | $96.8 |
| **Total Emergency Response** | **$205.6** |

Table 10.10 Current Condition: Emergency Response System, 2013

| | Current Condition (in %) | | | | | | |
|---|---|---|---|---|---|---|---|
| **Capital asset type** | **Very Good** | **Good** | **Fair** | **Poor** | **Very Poor** | **TBD** | **Confidence Level** |
| Police facilities | 0 | 100 | 0 | 0 | 0 | 0 | 4 - High |
| Fire facilities | 0 | 98 | 0 | 2 | 0 | 0 | 4 - High |

The "police facilities" grouping includes PPB precinct facilities for each of the City's three patrol divisions, East, North, and Central. The Central Precinct is located in the Justice Center downtown, a facility that is shared with Multnomah County and also utilized as PPB Headquarters. The City also operates the Southeast Precinct as a sub-station of the East Precinct, at a facility that also houses the Property Crimes unit and the Portland Office of Neighborhood Involvement. Other facilities included in the inventory and utilized by PPB include the Rivergate Vehicle Storage facility, the Property Evidence Division warehouse, the Traffic Division in St. Johns, and a training facility on NE Airport Way that is scheduled to open in August 2014.






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The “fire facilities” grouping includes all 30 stations for PF&R, as well as dozens of large mobile fire apparatus not provided through CityFleet. Other facilities included in the inventory and utilized by PF&R include a facility on NE 122nd Avenue that houses a Training Center and Emergency Medical Services (EMS) facility, the Public Education Office and Belmont Learning Center, the Fire Code Enforcement and Permit Office in the Gideon Building, the Main Administrative Office on SW Ash Street, and the Logistics Building on SE Powell and 12th Avenue.

Other facilities relevant to emergency response are included in the Civic Facilities & Assets section, such as the newly completed Emergency Coordination Center, the 9-1-1 Center, and police vehicles – which are utilized by PPB through operating agreements with CityFleet. Additionally, communications technology such as Computer-Aided Dispatch (CAD) and 800 MHz radio systems are covered in the Technology Systems section.

## Key Issues, Trends, Opportunities

*Budgeting For Maintenance*

Similar to civic facilities and assets, annual City budgeting processes do not set aside an adequate amount of money for major maintenance of emergency response facilities. Each year, bureaus must evaluate maintenance needs for their facilities in order to prioritize projects that must be dealt with immediately, and defer projects that address less pressing needs. This generally leads to a backlog of projects that tend to become more immediate priorities as budget constraints become tighter. Over time, these delays in repairs and maintenance can cause all projects to become priorities that need addressing.

Currently, PF&R is identifying long-term, ongoing maintenance needs for their existing facilities. For example, a comprehensive roof evaluation for all fire facilities has been completed recently. This will aid in planning for long-term repair or replacement of roofs to last for the next ten to twenty years, and will help to avoid the unnecessary costs of replacing roofs due to deferred maintenance. BIBS Facilities and the OMF perform similar assessments as part of citywide asset management practices, including the Facilities Condition Assessment updates mentioned earlier in the chapter.

Future budgeting processes could benefit from more comprehensive evaluations of emergency response facilities, so that bureaus can better plan for costly repairs and replacements of components such as emergency generators, HVAC systems, and other key building components.

*Intensification of Development along Major Corridors*

As Portland’s population continues to grow, new development is being concentrated in a number of Centers and Corridors. This intensification of infill development in neighborhoods and business districts may have both positive and negative impacts on emergency response services. A larger population is expected to increase the total number of incidents requiring emergency response. Increased traffic congestion associated with more intense development along emergency response routes may result in an incremental increase in emergency response times. At the same time, complete neighborhoods promote non-auto modes of transportation for many trips, which may reduce congestion. Reducing the number of


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trips made by automobile may also lead to a reduction in automobile collisions, thus avoiding the emergency response generated by those incidents.

To address some the effects of growth, the City has designated a number of emergency response routes that avoid streets with traffic-calming devices or other pedestrian-oriented street improvements. Additionally, future siting of fire or police facilities could mitigate this effect by locating closer to intensified development or otherwise expanding the coverage of mobile response units.

### Climate Change

Climate change may cause an increase in weather-related emergency events, like extreme heat, wildfires, flooding and landslides. All of these events have the potential to cause medical emergencies, including illness and injury, or require emergency response to protect the public, environment or infrastructure assets. For example, these events may increase demand for law enforcement to respond to increased emergency-related calls, establish roadblocks, reroute traffic, respond to accidents, or facilitate evacuations.[7]

As climate change occurs, the City's public safety and emergency response bureaus, including PF&R, PPB, PBEM and BOEC, will need sufficient emergency management capacity to prepare for, respond to, and recover from weather-related emergencies. The City's Climate Change Preparation Strategy includes number of emergency management objectives to improve this capacity, such as:

- Developing, testing, training and updating emergency response plans that address weather-related hazards that are likely to become more frequent or intense as the climate changes.
- Ensuring service providers have the education, training and tools to succeed in disaster planning, preparedness, response and recovery efforts.
- Planning and staffing for potential increases in weather-related displacement – people may be in need of emergency housing, food or other supplies – and the resulting potential increases in violence, mental illness, chemical dependency and addiction.[8]

Certain populations – including people who are homeless, lack transportation options, live in poverty, or have physical or mental illnesses or disabilities - may be at greater risk during weather-related emergencies, as they may not have the physical, mental or economic ability to prepare for or respond to hazards. Public safety and emergency response bureaus will need to be prepared for potential shifts in the service needs of these populations.

*Emergency response activities occur through multi-agency partnerships. Preparing for and responding to climate change will require continued partnerships between City emergency response bureaus; other City bureaus, like the Portland Housing Bureau and Portland Bureau of Transportation; as well as Multnomah*

[7] City of Portland and Multnomah County, "Climate Change Preparation Strategy: Risk and Vulnerabilities Assessment," 2014.
[8] City of Portland and Multnomah County, "Climate Change Preparation Strategy: Public Comment Draft," 2014.

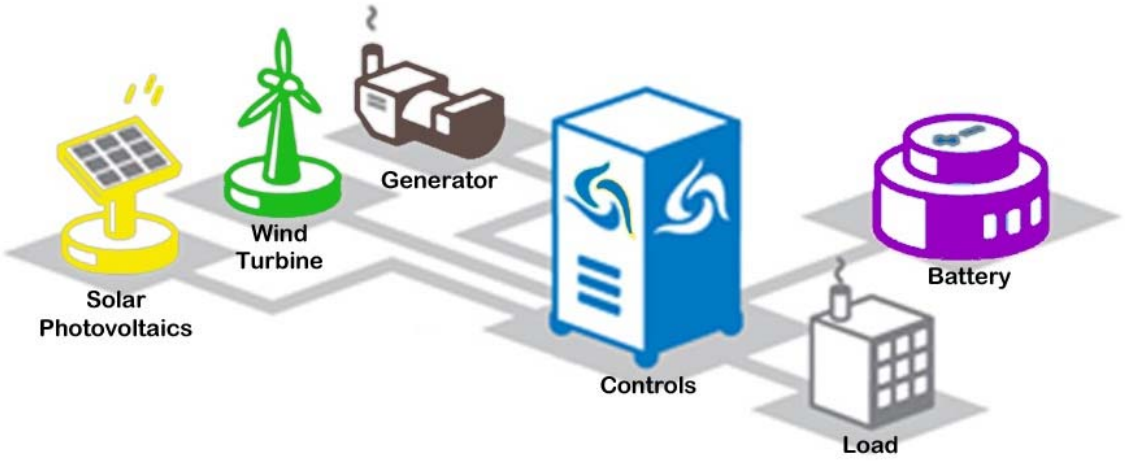
*County agencies, including the Departments of Human Services, Emergency Management, Health, Community Services, Community Justice, and the Sheriff's Office. Increasing Role of Social Media*

The role of social media continues to evolve during emergencies. The Great Tōhoku Earthquake, Hurricane Sandy and the Boston Marathon bombing tragedies are recent examples where disaster-affected communities and their first responders immediately relied on social media to share and access up-to-date news and information. When an emergency results in degraded telecommunications capabilities and limited bandwidth on cellular networks, texts, tweets, and posts to Facebook are replacing traditional forms of communication. Social media provides a real-time interactive platform for information sharing and first-person accounts of the impacts of the emergency.

However, there are also challenges to the use of social media. Crowd-sourced information is not always accurate, and misinformation spreads as virally as verified information. Additionally, the volume of posts on Twitter, Facebook, Instagram, and other social media platforms can easily overwhelm response agencies trying to monitor and respond to this information. Emerging technology such as Next-Generation 9-1-1 has been designed to better incorporate social media with emergency response systems, allowing people to tweet their 9-1-1 or emergency calls through a system designed to handle this activity. This technology presents opportunities to connect residents with City programs and services, but has yet to be adopted locally due to the large number of regional agencies affected

*Microgrids*

Redundant technology and equipment is a major part of any emergency response or continuity of operations strategy. When major communications or energy infrastructure is unreliable or not functional, the City can utilize a wide range of redundant systems and equipment, including satellite communications, backup generators, fuel reserves, and a variety of other equipment. Though these systems are dependable and are situated to play a major role in the event of an emergency, these redundant power sources can only supply a finite amount of energy.





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In order to secure the City's energy resiliency for longer-term disasters or emergency events, non-exhaustible backup energy systems could be considered. A microgrid can achieve this by providing a localized system for electricity generation and energy storage that can be operated independently from other energy infrastructure systems. Microgrids could be used to strengthen emergency response and continuity of operations strategies by providing an additional backup power source based on renewable energies, such as wind or solar, that would be more resilient to disruptions to the City's existing energy infrastructure.

## Regulatory Compliance

The agencies responsible for the provision, maintenance, and management of emergency response infrastructure are expected to meet a number of regulatory requirements. These codes and regulations have a direct impact on every detailed design component, management technique, maintenance system, and new construction practice utilized for City-owned buildings, facilities, and apparatus. Relevant legislation, regulations, and regulatory agencies are listed in the Regulatory Compliance section for Civic Facilities & Assets.

## Investment Strategy

### Process

As with the other sections in the Other Essential Facilities & Assets chapter, investments in emergency response infrastructure are not typically the result of linear decision-making or long-range planning efforts. Emergency response and life safety are undoubtedly essential public services, but land-use and infrastructure planning for these services is not mandated by the State like it is for water, sewer, or transportation services. The result is that the Citywide Systems Plan does not include a detailed 20-year project list for public safety and other emergency response facilities and services because comprehensive system plans, including lists of needed investments, costs, and funding sources, are not available at this time. Therefore, the recommendations within this section are primarily oriented towards improving upon current investment practices and preparing for foreseeable major expenditures in the future.

Investments in police facilities are managed by OMF, which performs asset management for police buildings using the same processes and principles employed for other City-owned buildings managed through BIBS Facilities. Fire facilities and apparatus are managed separately, with PF&R taking on management responsibilities instead of BIBS Facilities. Though emergency response infrastructure is managed by multiple bureaus, the processes used to make investment decisions for police and fire assets are similar. Both PF&R and BIBS Facilities take efforts to assess the condition of emergency response assets, including annual inspections, reviews, and other periodic inventory assessments. This information can be utilized to inform annual budget discussions, or it can be used by individual bureaus to justify more opportunistic and less predictable investments based on funding availability or shared interests with other bureaus.

Similar to civic facilities and assets, investments in emergency response infrastructure often benefit from agency partnerships and resourceful financial strategies. For example, the new Police Training Center was able to be constructed after the property was purchased by the City in early 2012. This opportunistic


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investment allowed PPB to respond to market availability in a cost-effective manner in order to address previously identified training needs.

The following projects and recommendations provide a snapshot of the City's emergency response infrastructure needs. It should be noted, however, that more holistic and detailed assessment efforts are necessary in order to effectively consider facility needs across all City bureaus.

### Recent and Ongoing Projects

Emergency response bureaus regularly seek new projects and improvements to increase their capacity to provide public services and address facility needs. At the current time, projects in the construction phase include a new fire station on the east side of the Willamette River and an expanded PPB training facility on Airport Way. The Civic Facilities & Assets section includes more information about other planned projects relevant to emergency response, including a planned renovation of the 9-1-1 Center.



*Inner SE Fire Station*

In 2010, Portland voters approved a general obligation bond measure that included funding for the replacement of a fire station in Inner Southeast. The new PF&R fire station will sit along the Willamette River near the Oregon Museum of Science and Industry. Construction is currently underway, and the facility is scheduled to be completed by November 2014.


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*Police Training Center*

A new training complex for PPB is slated to open in 2014 at a location on NE Airport Way. The complex will include a shooting range, a practice driving track, a tactical scenario village, and several other training-related facilities. This expands the training capacity of PPB, making it easier to respond to evolving policies and regulations related to the provision of police services in Portland. This will allow PPB to relocate from current training facilities in order to centralize these operations at the new training center.

## Major Needs & Recommended Improvements

The following list of major needs and recommended improvements could serve as a starting point for emergency response investment decisions in future years. The Major Needs and Recommended Improvements section for Civic Facilities & Assets includes for other recommendations related to emergency response, including a discussion of a potential Westside emergency operations facility at the current site of the SFC Jerome F. Sears U.S. Army Reserve Center. This list is not complete, and there are a number of other notable facility needs relevant to emergency response that are not addressed in this section.

*24-7 Repair and Maintenance*

Emergency response facilities and vehicles are utilized on a constant, 24-7 basis in order to ensure life safety services are available at all times. This results in disproportionate wear and tear on these highly-used assets, and also impacts the amount of time that emergency response facilities and vehicles can be out of commission for repair or maintenance purposes. BIBS Facilities and PF&R use a number of employees and programs in order to stay aware of repair needs and maintenance priorities, but a more around-the-clock approach could prove to be useful for unanticipated facility or vehicle failures.

Major maintenance needs for emergency response assets can include roof replacements, emergency generator repair, vehicle maintenance and repair, and other projects that impact critical pieces of the City's emergency response capacity. Because these assets are essential to the continuity of operations of the City as a whole, they deserve special consideration when prioritizing investments.

*311 Call Center*

City Council passed a resolution in 2012 that established intent to create a 311 Non-emergency Call Center. The project would enable BOEC to run an operation parallel to the 9-1-1 Center that would provide a single point of contact for community requests for information or services in non-emergency situations. Similar 311 systems have been successfully initiated in 80 cities across the country, including Minneapolis, San Francisco, and Los Angeles. These cities have found that using one easy-to-remember number to access all non-emergency City services has had positive impacts on their 9-1-1 systems, including reduced call wait times and more efficient and effective responses.

The City has established an exploratory committee for a 311 Call Center, and a project assessment has already been funded. While nothing decisive has yet come from these efforts, there is a high likelihood that a decision will be made within the next couple of years. A 311 system would establish a communications infrastructure in Portland for non-emergency situations, when residents don't need immediate assistance but still want to contact authorities about a particular issue. This could have a wide range of positive effects on the City's emergency response capacity, and could also improve communications between residents and City agencies in a more general sense. If the City proceeds with a 311 project, facility needs such as office space and communications infrastructure will need to be defined and addressed before implementing the system.

*Mounted Patrol Unit*

As recently as early 2014, PPB's Mounted Patrol Unit (MPU) – or equestrian division – was located in a former horse barn in the Centennial Mills building. The building began to cause some concern when engineers uncovered structural issues with support beams for the roof of the facility, at which point PPB was forced to relocate their horses to a barn in Aurora. The unit has continued to operate since the move,





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with horses being driven by trailer to Portland every day from the Aurora facility to maintain normal MPU operations.

This development has reignited questions about the cost and necessity of the MPU, issues which are currently being explored by the City. The Mounted Patrol Unit currently consists of eight horses, one sergeant, four officers, and three non-sworn staff members. Centennial Mills is owned by the Portland Development Commission[9], and re-development proposals for the site have been under consideration for years. A permanent and easily accessible location for the horse-barn could be necessary once an agreement is reached regarding the future of the MPU.

## Financial Strategy

Financial planning for emergency response infrastructure takes a more flexible, resourceful, and reactive approach than other components of the Citywide Systems Plan. Given the significant challenges to performing long-range planning for the assets covered in this chapter, it is difficult to develop a meaningful list of future projects or talk about how those projects could be financed. Instead of identifying revenue streams and funding mechanisms to support recommendations in the investment strategy – like it does in other chapters – the financial strategy for emergency response infrastructure is more of a description of current practices and existing financial issues.

The following sections discuss funding sources and financial challenges that impact emergency response buildings, facilities, apparatus, vehicles, and equipment. This information can serve as a starting point for future financial planning discussions once a more comprehensive investment strategy has been developed.

### Sources of Revenue

Emergency response infrastructure is funded by many of the same sources as other components of the Other Essential Facilities & Assets chapter.

Because OMF and BIBS Facilities handle financial management for police facilities, sources of revenue for these facilities are identical to those identified in the Civic Facilities & Assets section. Money from the City's General Fund, general obligation bond measures, and debt financing is sometimes used to fund investments in police facilities.

Portland Fire and Rescue's management and maintenance of fire facilities has led to the use of other sources of revenue for these assets. A recent program to rehabilitate, relocate, and construct new City fire stations was financed through a general obligation bond measure approved by voters in 1998. This program, which ended in FY 2012-13, was also designed to address deferred maintenance, seismic requirements, and other program changes at PF&R. A new general obligation bond was passed in 2010 that included funding for the construction of a new fire station in inner Southeast, a project discussed earlier in this chapter. Portland Fire and Rescue also has annual operations and maintenance budgets for

[9] Centennial Mills is included in the "PDC facilities" asset group, covered in the Civic Facilities & Assets section.


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these facilities and vehicles, though the bureau does not have any ongoing budget authority for major maintenance projects at their facilities.

### Financial Challenges

Asset management practices are used by OMF to assess the condition of emergency response facilities and vehicles, and inform investment decisions according to identified needs. Within this asset management framework, the financial condition of assets is indicated by their annual or one-time funding gaps. For emergency response infrastructure, funding gaps are calculated by determining the annual difference between what was collected in rental rates or set aside from net income for major maintenance, and the industry standard of 3 percent of replacement value. See Table 10.11 for annual funding gaps in 2013 for police and fire facilities.

Table 10.11 Emergency Response Annual Funding Gaps, 2013

| | Value* (in millions) | | | | |
|---|---|---|---|---|---|
| **Capital asset type** | **R/R/R** | **Mandate** | **Capacity** | **Total** | **Confidence level** |
| Police facilities | $2.8 | $0.0 | $0.0 | $2.8 | 4 – High |
| Fire facilities | $2.9 | $0.0 | $0.0 | $2.9 | 4 – High |
| **Total for Emergency Response** | $5.7 | $0.0 | $0.0 | **$5.7** | |

R/R/R (Repair, Rehabilitation, Replacement): Additional funding necessary to repair, rehabilitate and replace existing assets to bring them up to established service levels, or replace assets considered functionally obsolete (not meeting those service levels).

Mandate: Additional funding necessary to improve existing assets to meet regulatory requirements, exclusive of improvements that fall under R/R/R or capacity.

Capacity: Additional funding necessary to address existing inequities and deficiencies in levels of service for current customers and citizens.

Currently, OMF is only able to reinvest about 1.2 percent of the replacement value of the assets managed by the bureau, which includes police facilities. This amount has declined from the 3 percent industry standard in recent years due to several factors, including a rise in the cost of building replacements above the level of regular inflation, an increase in the total number of new facilities, and a limit on rental rate increases to the level of regular as opposed to actual inflation. This funding gap will prevent OMF from being able to cover needs for police facilities for the next five years or more, though it is not significant enough to force a decrease in the overall condition of individual assets from their current designations as either “good”, “fair”, or “poor” within the next ten years (See Table 10.10). One way to reduce the funding gap is to direct savings from efficiency improvements to major maintenance reserves. Please see Financial Challenges in the Civic Facilities & Assets section for information about other OMF-managed facilities and assets relevant to emergency response.

For fire facilities and apparatus, PF&R has utilized funds from general obligation (GO) bonds to finance major building seismic upgrades and station remodel projects in recent years. However, aforementioned funding from the GO bond passed in 1998 will shortly be exhausted, and no other ongoing source of major maintenance funding has been identified for future major maintenance expenditures. While this will not cause fire facilities and apparatus to decline in condition from general categories of “good”, “fair”, or “poor” within a ten-year horizon, this strategy could prove problematic in 20 or 30 years when facilities


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needs become larger and more pressing. The City and PF&R could benefit from identifying future funding sources for fire facilities and apparatus to be set aside each budget year, similar to the process outlined above for police facilities. This could also result in less reliance upon voter-approved GO bonds to fund critical major maintenance projects, in addition to preventing deferred maintenance from accruing to the point where it becomes too expensive to fund using existing resources. Preparing for these future expenditures will allow City bureaus to proactively manage their assets, and give bureaus more freedom to modify and improve buildings according to changing needs.

## SUMMARY

The issues, needs, trends, and opportunities described in this chapter provide a baseline level of information to inform public investments in other essential facilities and systems. Though there is still work that needs to be done before these assets are formally incorporated into infrastructure planning discussions, the chapter functions as a starting point for future efforts.

The next twenty years will require a number of investments in order to keep these assets functioning at the levels necessary to maintain State-mandated forms of public facility service provision. Acknowledging the important connections between required service provision and other essential facilities and systems will result in more effective, more efficient public investments and a more resilient financial future.

# Appendix A
# Investment Strategy

This appendix contains a capital Investment Strategy for the Bureau of Environmental Services, Portland Water Bureau, and Bureau of Transportation. The projects and programs included in the Investment Strategy are intended to maintain existing assets, comply with regulatory mandates, and provide key levels of service to existing and future residents and businesses. More information on how each Bureau's draft Investment Strategy was developed can be found in the relevant chapter of this Plan.

As part of the update to the Comprehensive Plan and to meet public facility planning requirements, the City must also adopt a List of Significant Projects. The List of Significant Projects is intended as a long-term plan for meeting the infrastructure needs of residential and employment growth allowed and planned for by a city's land use designations. The List of Significant Projects includes a subset of projects included in the Citywide System Plan's Investment Strategy. The List of Significant Projects for transportation, water, sewer and stormwater is included as a separate component of the Comprehensive Plan.

**Project Maps**

Explore interactive maps of the infrastructure projects included in Appendix A through the online **Comprehensive Plan Map App** at http://www.portlandoregon.gov/bps/mapapp/


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# Bureau of Environmental Services

The Bureau of Environmental Services (BES) project list is based on existing system plans and includes programs for treatment plant upgrades for capacity and regulatory compliance; programs for maintenance of the treatment plants, pump stations, collection system pipes; pipe capacity projects by sanitary and combined sewer basins; watershed programs for each of the major watersheds; a stormwater program area to address system connectivity and water quality; and a sanitary sewer extension program.

The Bureau focuses efforts on comprehensive, multi-purpose solutions in the highest priority areas for work in all four program areas of the Investment Strategy. The Bureau anticipates approximately $2 billion in investment in these programs over the next twenty years. The list assumes that rates are set at a level that is sufficient to meet agreed upon levels of service.

For more information on how this Investment Strategy was developed, please see Chapter 6. Bureau of Environmental Services.



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| Project ID | Project Title | Project Description | Location | Area | Project Objective | Driver | Estimated Cost by Time Period | | | | | | | | Grand Total | Funding Source | Facility Provider (Partner) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | FY 2013-14 | FY 2014-15 | FY 2015-16 | FY 2016-17 | FY 2017-18 | Total FY 2013-18 | FY 2018-23 | FY 2023-33 | FY 2013-33 | | |
| **Sewage Treatment** | | | | | | | | | | | | | | | | | |
| Map SS-1 E10245 | CBWTP Improvements | This program includes a number of mid-size improvements at the Columbia Boulevard Wastewater Treatment Plant. CBWTP such as: Seismic Improvements, Outfall Diffuser Extension, Access / Egress Improvements, Bio-Solids Dryer, Dewatered Sludge Hopper, TWAS Piping Upgrade, Centrifuge. Also includes expansion to Secondary Treatment, if required. All are consistent with the Facilities Plan and the Conditional Use Master Plan. | Columbia Blvd Wastewater Treatment Plant | All | Efficiency & Expansion | Population growth/ regulations | 10,950,000 | 4,325,000 | 11,513,000 | 10,540,000 | 8,516,000 | 45,844,000 | 45,964,000 | 80,000,000 | 171,808,000 | Bonds | BES |
| Map SS-2 E10234 | TCWTP Improvements | Improvements, as identified in the updated facilities plan. Anticipated projects include property acquisition, new headworks/screenhouse, upgrades to the primary clarifier, and construction of an additional secondary clarifier. | Tryon Creek Wastewater Treatment Plant | SW | Efficiency & Expansion | Population growth/ regulations | 216,000 | 210,000 | 3,000,000 | 3,500,000 | 9,000,000 | 15,926,000 | 30,000,000 | 10,000,000 | 55,926,000 | Bonds | BES |
| Map SS-3 E04661 | Pump Station Improvement Program | Program to refurbish or upgrade pump stations not in compliance with current codes, not operating reliably, need improvements because of growth in the receiving sewage basin, and/or are over 20 years old with out-of-date equipment. The Pump Station Improvement Plan guides the selection of projects. This program was developed to ensure the 97 pump stations are maintained in accordance with a scheduled plan to increase pump station reliability. Program will also address the 57 miles of force mains. | Citywide | All | Maintenance & Efficiency | Level of Service | 13,810,000 | 12,091,000 | 4,000,000 | 4,000,000 | 4,000,000 | 37,901,000 | 30,000,000 | 65,000,000 | 132,901,000 | Bonds | BES |
| Map n/a E04891 | Rehab, Repair, and Modifications | This project provides for annual reinvestment in the treatment facilities to protect capital investment and enhance system reliability. It provides best management practice to prevent probable violations of NPDES permit. The aging Columbia and Tryon Creek plants require regular investment. Projects include equipment replacement, capacity upgrades, and restoration of a facility to its original condition and renewal of useful life for more than 10 years, and regulatory mandates. | Columbia Blvd and Tryon Creek Wastewater Treatment Plants | All | Maintenance & Efficiency | Level of Service | 2,000,000 | 2,000,000 | 2,000,000 | 2,000,000 | 2,000,000 | 10,000,000 | 15,000,000 | 30,000,000 | 55,000,000 | Bonds | BES |
| **Maintenance & Reliability** | | | | | | | | | | | | | | | | | |
| n/a | Sewage Pipe Rehabilitation | Based on regular inspection, this program rehabilitates the highest risk pipes. | Citywide | All | Maintenance | Level of Service | 49,895,000 | 51,869,000 | 42,924,000 | 31,285,000 | 19,583,000 | 195,556,000 | 160,000,000 | 300,000,000 | 655,556,000 | Bonds | BES |
| n/a | Sewer Capacity Upgrades | Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized based on risk and benefit/cost. Work may also include high priority pipe rehabilitation. Work will occur is small areas within the combined sewer system that are not addressed by basin specific projects. | Citywide | All | Maintenance | Level of Service | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50,000,000 | 50,000,000 | Bonds | BES |
| Map SS-4 | Holladay/Stark/ Sullivan - capacity upgrades | Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area. | Between Fremont & Stark to NE 24th. South of I-84 to I-205 | NE/SE | Capacity | Level of Service | 500,000 | 1,000,000 | 3,000,000 | 3,000,000 | 3,200,000 | 10,700,000 | 12,000,000 | 12,000,000 | 34,700,000 | Bonds | BES |
| Map SS-5 | Beech/Essex - capacity upgrades | Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area. | Willamette River east to Grand b/w Knott and Alberta. | NE | Capacity | Level of Service | 0 | 100,000 | 900,000 | 4,500,000 | 4,000,000 | 9,500,000 | 9,000,000 | 0 | 18,500,000 | Bonds | BES |
| Map SS-6 | Oak - capacity upgrades | Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area. | Willamette River to NE 24th, b/w Irving and Stark. | NE/SE | Capacity | Level of Service | 2,000,000 | 100,000 | 0 | 0 | 500,000 | 2,600,000 | 20,000,000 | 0 | 22,600,000 | Bonds | BES |
| Map SS-7 | Taggart/Insley - capacity upgrades | Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area. | Willamette River to NE 60th; Stark to south city limit | SE | Capacity | Level of Service | 7,700,000 | 6,200,000 | 2,200,000 | 900,000 | 3,800,000 | 20,800,000 | 30,000,000 | 10,000,000 | 60,800,000 | Bonds | BES |



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| Project ID | Project Title | Project Description | Location | Area | Project Objective | Driver | Estimated Cost by Time Period | | | | | | | | Grand Total | Funding Source | Facility Provider (Partner) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | FY 2013-14 | FY 2014-15 | FY 2015-16 | FY 2016-17 | FY 2017-18 | Total FY 2013-18 | FY 2018-23 | FY 2023-33 | FY 2013-33 | | |
| Map SS-8 | Wheeler - capacity upgrades | Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area. | Willamette River, Grand, Prescott, 24th, Hancock | NE | Capacity | Level of Service | 400,000 | 1,300,000 | 4,300,000 | 4,300,000 | 0 | 10,300,000 | 0 | 0 | 10,300,000 | Bonds | BES |
| Map SS-9 | Lloyd District - capacity upgrades | Based on the Systems Plan and extensive redevelopment activity, program adds capacity by creating a separated stormwater system and/or upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area. | Lloyd District | NE | Capacity | Level of Service | 0 | 500,000 | 1,500,000 | 1,500,000 | 5,000,000 | 8,500,000 | 10,000,000 | 0 | 18,500,000 | Bonds | BES |
| Map: SS-10 | Alder - capacity upgrades | Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area. | Willamette River to SE 42nd bw Stark & Hawthorne; inc. Ladds Addition | SE | Capacity | Level of Service | 0 | 100,000 | 1,600,000 | 5,200,000 | 11,600,000 | 18,500,000 | 22,500,000 | 0 | 41,000,000 | Bonds | BES |
| Map: SS-11 | NE 13th Ave Basin - capacity upgrades | Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area. | Vancouver, Columbia Blvd, NE 42nd, Prescott | NE | Capacity | Level of Service | 500,000 | 1,300,000 | 1,400,000 | 5,000,000 | 8,000,000 | 16,200,000 | 1,200,000 | 0 | 17,400,000 | Bonds | BES |
| Map: SS-12 | Northwest Neighborhoods - capacity upgrades | Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area. | NW inc. hills to ridgeline, excluding downtown | NW | Capacity | Level of Service | 2,700,000 | 2,100,000 | 1,300,000 | 3,400,000 | 3,500,000 | 13,000,000 | 23,000,000 | 5,000,000 | 41,000,000 | Bonds | BES |
| Map: SS-13 | North Portland - capacity upgrades | Based on the Systems Plan, program adds capacity by upsizing pipes and/or adding surface infiltration facilities. Projects are prioritized base on risk and benefit/cost. Work also includes high priority pipe rehabilitation, if located within the project area. | West of Peninsular Ave. | N | Capacity | Level of Service | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,000,000 | 5,000,000 | Bonds | BES |
| Map: SS-14 E10034 E10035 E10474 | Sanitary Sewer Collection system capacity (Infiltration & Inflow) | A series of projects are proposed to address infiltration and inflow in the sanitary sewer system in SW Portland. Projects typically involve rehabilitation of main lines and laterals and disconnecting storm inlets from the sanitary sewer. | SW | SW | Capacity | Level of Service / Regulatory mandate | 2,425,000 | 1,955,000 | 4,695,000 | 7,015,000 | 7,150,000 | 23,240,000 | 18,100,000 | 15,000,000 | 56,340,000 | Bonds | BES |
| **Surface Water Management** | | | | | | | | | | | | | | | | | |
| Map SM-1 E10040 | Johnson Creek Willing Seller Ph. 2 | Based on the Johnson Creek Restoration Plan, acquisition of land in four target areas for floodplain restoration. Properties are purchased at fair market value and used to implement restoration projects detailed in other capital projects on list. | Johnson Creek Target Areas | SE | Flood management, water quality, habitat | Level of Service | 500,000 | 500,000 | 500,000 | 500,000 | 500,000 | 2,500,000 | 2,500,000 | 5,000,000 | 10,000,000 | Bonds | BES |
| Map SM-2 E06941 | West Lents Flood Mitigation | Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the West Lents target area for flood storage and water quality, stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations. | West Lents target area | SE | Flood management, water quality, habitat | Level of Service, regulatory | 0 | 0 | 300,000 | 545,000 | 2,757,000 | 3,602,000 | 2,815,000 | 0 | 6,417,000 | Bonds | BES |
| Map SM-3 E07383 E08382 | East Lents Area Flood projects | Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the East Lents target area for flood storage and water quality, stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations. | East Lents target area | SE | Flood management, water quality, habitat | Level of Service, regulatory | 70,000 | 70,000 | 1,800,000 | 2,300,000 | 1,000,000 | 5,240,000 | 3,000,000 | 0 | 8,240,000 | Bonds | BES |



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| Project ID | Project Title | Project Description | Location | Area | Project Objective | Driver | Estimated Cost by Time Period | | | | | | | | Grand Total | Funding Source | Facility Provider (Partner) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | FY 2013-14 | FY 2014-15 | FY 2015-16 | FY 2016-17 | FY 2017-18 | Total FY 2013-18 | FY 2018-23 | FY 2023-33 | FY 2013-33 | | |
| Map SM-4 E08406 E08247 E07158 | Other Johnson Creek Target Area Floodplain Projects | Based on the Johnson Creek Restoration Plan, restore floodplain and wetland function in the Tideman Johnson and Powell Butte target areas, and smaller target areas, in partnership with creek-side property owners for flood storage and water quality. Stabilize stream banks to protect nearby homes, businesses and downstream sewer infrastructure, and restore habitat. Projects address TMDL requirements, ESA plans and other regulations. | Tideman and Powell Butte Target areas plus CRP | SE | Flood management, water quality, habitat | Level of Service, regulatory | 806,000 | 1,506,000 | 1,306,000 | 1,427,000 | 0 | 5,045,000 | 0 | 0 | 5,045,000 | Bonds | BES |
| Map SM-5 E07466 E06947 | Johnson Creek Restoration Program Projects | Priority projects along the main stem and tributaries of Johnson Creek to mitigate flooding, improve water quality and wildlife habitat, address stormwater outfalls and culverts, and sanitary sewer protection. Includes restoration of floodplain and wetlands, construction of stream enhancements, and partnership projects with other agencies to meet the objectives of the 2001 Johnson Creek Restoration Plan. Projects address TMDL requirements, ESA plans and other regulations. | Johnson Creek Watershed, various | SE | Flood management, maintenance, water quality, habitat | Level of Service, regulatory | 500,000 | 3,000,000 | 650,000 | 875,000 | 0 | 5,025,000 | 2,000,000 | 2,000,000 | 9,025,000 | Bonds | BES |
| Map SM-6 E10563 E05564 | Columbia Slough Outfalls | Design and construction of pollution control facilities for separated stormwater areas flowing through 220-city owned outfalls to the Columbia Slough to address DEQ Sediment Order. Program prioritizes outfalls draining Columbia Boulevard and other high traffic City roadways. | Columbia Boulevard area | N/NE | Water quality | Regulatory | 150,000 | 100,000 | 1,000,000 | 1,000,000 | 2,000,000 | 4,250,000 | 10,000,000 | 0 | 14,250,000 | Bonds | BES |
| Map SM-7 E10377 E07177 E10176 | Columbia Slough Restoration Projects | Culvert replacement, water quality facilities and wetland and habitat restoration and enhancement to improve water quality, habitat and hydrology. Projects address TMDL requirements, infrastructure deficiencies, ESA plans and other regulations and may include partnership with other agencies. Includes in-stream restoration as well as stormwater system improvements. | Columbia Slough Watershed, various | N/NE | Water quality, hydrology, maintenance, habitat | Level of Service, Regulatory | 5,152,000 | 1,144,000 | 0 | 500,000 | 325,000 | 7,121,000 | 2,000,000 | 2,000,000 | 11,121,000 | Bonds | BES |
| Map SM-8 E08676 E08675 E08677 | Fanno Creek Stormwater System Improvements | Projects to address TMDLs, recommended by the Fanno/Tryon TMDL predesign. 1-5 year projects include stormwater retrofits along the Beaverton-Hillsdale Highway, addressing deficient stormwater outfalls, and other stormwater system improvements. | Fanno Watershed: Beaverton-Hillsdale corridor and various | SW | Water quality, capacity, conveyance | Level of Service, Regulatory | 551,000 | 1,616,000 | 533,000 | 0 | 0 | 2,700,000 | 0 | 0 | 2,700,000 | Bonds | |
| Map SM-9 E08679 E08687 | Tryon Creek Stormwater System Improvements | Projects to address TMDLs, recommended by the Fanno/Tryon TMDL predesign. 1-5 year projects include stormwater retrofits along the I-5 and Barbur Blvd. corridors, addressing deficient stormwater outfalls, and other stormwater system improvements. | Tryon Watershed: I-5/Barbur area, and various | SW | Water quality, capacity, conveyance | Level of Service, Regulatory | 2,000,000 | 100,000 | 35,000 | 270,000 | 270,000 | 2,675,000 | 0 | 0 | 2,675,000 | Bonds | |
| Map SM-10 E10373 E10131 | Fanno/Tryon Drainage Shoulder Improvements | Drainage improvements for high priority City maintained roadside ditches along arterials in the Fanno and Tryon watersheds. Projects address water quality, as recommended by Fanno/Tryon TMDL predesign. Includes SW Hamilton and SW Stephenson and future projects. | Fanno and Tryon Creeks watersheds (various) | SW | Water quality, capacity, conveyance | Level of Service, Regulatory | 100,000 | 463,000 | 1,448,000 | 1,195,000 | 1,195,000 | 4,401,000 | 1,000,000 | 0 | 5,401,000 | Bonds | |
| Map SM-11 E08682 E08680 E09105 | Fanno/Tryon Restoration Projects | In-stream restoration and improvements to address water quality, hydrology and habitat, including TMDL requirements, ESA plans and other regulations. Includes culvert replacement, stream daylighting, sanitary sewer protection and other restoration in both the Fanno and Tryon creek watersheds. Projects recommended by the Fanno/Tryon TMDL predesign and watershed plans. | Fanno and Tryon Creeks watersheds, various | SW | Water quality, hydrology, maintenance, habitat | Level of Service, Regulatory | 231,000 | 250,000 | 1,602,000 | 1,179,000 | 295,000 | 3,557,000 | 2,000,000 | 2,000,000 | 7,557,000 | Bonds | |
| Map SM-12 E10498 | Willamette River Restoration Projects | Projects to improve water quality, habitat and hydrology along the main stem river and tributaries (subwatersheds) to address TMDL requirements, ESA plans and other regulations. Includes in-stream and floodplain restoration and enhancement. | Willamette River Watershed | All | Water quality, hydrology, habitat | Level of Service, regulatory | 0 | 0 | 800,000 | 3,400,000 | 3,400,000 | 7,600,000 | 5,000,000 | 5,000,000 | 17,600,000 | Bonds | |
| Map SM-13 E10488 | Stephens Creek Stormwater System Improvements | Address stormwater issues in the Stephens Creek subwatershed, including unmanaged stormwater discharge, pollution reduction and detention facilities, restoration of riparian and wetland functions, erosion and sediment loading at outfalls. | Stephens Creek Subwater-shed | SW | Capacity, conveyance, water quality, habitat | Level of Service, regulatory | 965,000 | 1,162,000 | 996,000 | 800,000 | 200,000 | 4,123,000 | 10,200,000 | 0 | 14,323,000 | Bonds | BES |



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| Project ID | Project Title | Project Description | Location | Area | Project Objective | Driver | Estimated Cost by Time Period | | | | | | | | Grand Total | Funding Source | Facility Provider (Partner) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | FY 2013-14 | FY 2014-15 | FY 2015-16 | FY 2016-17 | FY 2017-18 | Total FY 2013-18 | FY 2018-23 | FY 2023-33 | FY 2013-33 | | |
| n/a | Stormwater Management Program Implementation | Improvements to the stormwater management system resulting from Stormwater System Planning. Areas of particular concern include parts of SW (in addition to Stephens Creek), outer east, and the Columbia Slough. Specific improvements have not been identified as of FY14. | Various/ Citywide | City | Capacity, conveyance, water quality, habitat | Level of Service, regulatory | 0 | 0 | 0 | 300,000 | 1,000,000 | 1,300,000 | 15,000,000 | 40,000,000 | 56,300,000 | Bonds | BES |
| Map n/a E08967 E10372 | Culvert Replacement Program | Replace or improve stream culverts citywide to improve fish passage and water quality, and address flooding and maintenance needs. Includes completion of culvert replacements on Crystal Springs Creek and other priority projects to address ESA plans and other system needs. | Various/ Citywide | City | Habitat, flooding, water quality, maintenance | Level of Service, regulatory | 1,364,000 | 1,507,000 | 1,431,000 | 0 | 0 | 4,302,000 | 5,000,000 | 5,000,000 | 14,302,000 | Bonds | BES |
| Map: n/a E08905 E10486 | Watershed Land Acquisition Ph. 1 & 2 | Program targets acquisition of medium to high functioning natural resource lands in support of watershed health and stormwater management. | Various/ Citywide | City | Water quality, habitat, hydrology | Level of Service, regulatory | 2,000,000 | 2,000,000 | 2,500,000 | 1,500,000 | 2,000,000 | 10,000,000 | 6,000,000 | 0 | 16,000,000 | Bonds | BES |
| **Systems Development** | | | | | | | | | | | | | | | | | |
| Map: n/a | Sewer Extensions | Sewer extensions are proposed to relieve septic systems at risk of failure, to correct party sewer situations, and to provide service where development will be occurring soon and service is currently not available. | Various | City | Replacement; Efficiency | Level of Service | 6,776,000 | 3,594,000 | 4,017,000 | 4,725,000 | 4,350,000 | 23,462,000 | 20,000,000 | 40,000,000 | 83,462,000 | Bonds | BES |
| | | | | | | **Total All Projects** | 114,261,000 | 102,162,000 | 103,250,000 | 106,656,000 | 109,141,000 | 535,470,000 | 513,279,000 | 683,000,000 | **1,731,749,000** | | |


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# Portland Water Bureau

The Portland Water Bureau (PWB) project list is based on existing system plans and includes projects and programs to address longer term infrastructure replacement and maintenance needs, while addressing short-term water system infrastructure needs to ensure compliance with drinking water regulations. The project list focuses on regulatory compliance, improving the condition of aging infrastructure, and addressing operations and maintenance needs.

The Bureau anticipates approximately $1.6 billion in investment in these projects and programs over the next twenty years. The list assumes that rates are set at a level that is sufficient to meet agreed upon levels of service.

For more information on how this Investment Strategy was developed, please see Chapter 7. Portland Water Bureau.


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| Project ID | Project Title | Project Description | Location | Area | Project Objective | Driver | Estimated Cost by Time Period | | | | | | | | Grand Total | Funding Source | Facility Provider |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | FY 2013-14 | FY 2014-15 | FY 2015-16 | FY 2016-17 | FY 2017-18 | Total FY 2013-18 | FY 2018-23 | FY 2023-33 | FY 2013-33 | | |
| **Customer Service** | | | | | | | | | | | | | | | | | |
| n/a | Automated Meter Reading (AMR) Implementation | This project provides for the Installation of automatic water meter reading equipment throughout the City. | Various | All | Efficiency | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 45,000,000 | 0 | 45,000,000 | Bonds | PWB |
| n/a | Dodge Park | Improvements will continue to address security and visitor amenities at the site, trespass/hazard warning signs, alternative park management arrangements, and visitor management. The bureau is committed to improving the maintenance of the park including preservation of existing infrastructure, repairs, replacements and upgrades. New uses for the park include an amphitheater, camping, training area, facility upgrade to the existing building, and special needs assistance for using the park amenities. | Dodge Park | E | Expansion | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 400,000 | 800,000 | 1,200,000 | Bonds | PWB |
| Map W-1 W01401 | Emergency Coordination Center | This project designs and constructs the City's Emergency Coordination Center. The bureau will locate its emergency response and security staff at the location. The project location is adjacent to the City's 911 Call Center at SE 99th Ave and Powell Blvd. The total project cost is $19.85M and PWB is a contributing bureau. | Emer. Coord. Center (SE 99th and Powell) | E | Maintenance | Service Level | 1,807,000 | 0 | 0 | 0 | 0 | 1,807,000 | 0 | 0 | 1,807,000 | Bonds | PWB (POEM) |
| Map: n/a WBCSSE | Security and Emergency Management | The bureau is committed to increasing flexibility and preparedness to meet future security challenges, to enhance security throughout the water system and to modernize security practices and infrastructure. Projects funded by this budget will include physical security improvements to major and smaller facilities as well as improved security in the overall water distribution system and control/communications system. | Various | All | Maintenance | Service Level | 0 | 0 | 250,000 | 500,000 | 500,000 | 1,250,000 | 2,500,000 | 5,000,000 | 8,750,000 | Bonds | PWB (BTS) |
| **Distribution** | | | | | | | | | | | | | | | | | |
| Map W-2 W01632 | Bertha Service Area Improvements | This project will connect the Bertha 962 pressure zone with the 937 pressure zone with new 8-inch and 4-inch main and a new regulator. This work will allow for the abandonment of the existing main that passes through steep, unimproved right-of-way while maintaining an adequate level of service to the Bertha Service Area. | Bertha Service Area | SW | Replacement Efficiency | Service Level | 430,000 | 426,000 | 0 | 0 | 0 | 856,000 | 0 | 0 | 856,000 | Bonds | PWB |
| Map W-3 | Burnside Pump Station Replacement | This project will decommission the old undersized pump station and modify the nearby Verde Vista pump station to serve the Burnside pumping needs for the next 50 years. The project will also acquire property for the future Burnside pump station to be built 50 years from now. | Burnside Pump Station | NW | Maintenance | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 2,000,000 | 0 | 2,000,000 | Bonds | PWB |
| Map W-4 W01674 | Carolina Pump Main Extension, Phase II | This project will connect the existing Carolina Pump Main (Westwood Tanks) and the Fulton Pump Main (Burlingame Tanks) together. This will be a pump main from the intersection of SW Capital Hwy and SW Terwilliger Blvd to the Burlingame Tank site. | SW Capitol Hwy – SW Terwilliger | SW | Expansion | Service Level | 690,000 | 2,494,000 | 0 | 0 | 0 | 3,184,000 | 0 | 0 | 3,184,000 | Bonds | PWB |
| Map: n/a WBDIDM | Distribution Mains | This program includes rehabilitation and replacement of substandard mains, expansion due to applications from private developers, increasing supply for fire protection, improving water quality and water system upgrades due to local improvement districts (LIDs), and street improvements. Water main replacements also include appurtenances such as fire hydrants, valves, pressure regulators, service branches, and other facilities. | Various | All | Replacement | Service Level | 11,717,000 | 13,911,000 | 15,875,000 | 16,775,000 | 17,460,000 | 75,738,000 | 75,000,000 | 150,000,000 | 300,738,000 | Bonds | PWB |
| Map W-5 W01652 | Division Street Piping | This project will design and construct improvements located in the ROW for the Tabor Reservoir Adjustments project. Improvements will be made to the distribution and transmission systems as well as to Conduits 2 and 3 in SE Division St. | SE Division St | SE | Replacement | Service Level | 1,480,000 | 200,000 | 0 | 0 | 0 | 1,680,000 | 0 | 0 | 1,680,000 | Bonds | PWB |



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| Project ID | Project Title | Project Description | Location | Area | Project Objective | Driver | Estimated Cost by Time Period | | | | | | | | Grand Total | Funding Source | Facility Provider |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | FY 2013-14 | FY 2014-15 | FY 2015-16 | FY 2016-17 | FY 2017-18 | Total FY 2013-18 | FY 2018-23 | FY 2023-33 | FY 2013-33 | | |
| Map n/a WBDIFS | Field Support | This project funds vehicles and major equipment purchases, including heavy construction equipment such as dump trucks and backhoes, and Bureau owned computer software with a unit cost greater than $5000. | Various | All | Replacement Efficiency | Service Level | 3,755,600 | 3,501,500 | 3,388,900 | 3,460,138 | 3,459,338 | 17,565,476 | 17,500,000 | 35,000,000 | 70,065,476 | Bonds | PWB |
| Map W-6 W01359 | Forest Park Low Tank | This project will plan, design and construct a single 1.3 million gallon AWWA D110 type 1 tank. This storage is to augment regular system capacity and increase fire flow. | Forest Park Low Tank | NW | Growth | Service Level | 2,210,000 | 0 | 0 | 0 | 0 | 2,210,000 | 0 | 0 | 2,210,000 | Bonds | PWB |
| Map: n/a WBDIFO | Fountains | The bureau has responsibility for 27 decorative fountains, including repairs, replacements and upgrades. Funding includes provisions for repair of drain lines and valves, replacement of liners, repair and replacement of electrical equipment and lighting systems, repair and replacement of pumps, addition of telemetry, and various improvements to exterior surfaces. | Various/ Citywide | All | Maintenance | Service Level | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 750,000 | 750,000 | 1,500,000 | 3,000,000 | Bonds | PWB (PP&R, RACC) |
| Map W-7 W01358 | Fulton Pump Station | This project will replace the Fulton Pump Station with a new pump station located in Willamette Park. | Fulton Pump Station | SW | Replacement Efficiency | Service Level | 2,220,000 | 6,740,000 | 100,000 | 0 | 0 | 9,060,000 | 0 | 0 | 9,060,000 | Bonds | PWB (PPR) |
| Map W-8 | Greenleaf Pump Station | This project will plan, design and construct a replacement Greenleaf pump station at the existing site. Flow upgrades will remove the Penridge tank from the system. The new pump station will pump directly to the distribution system. | Greenleaf Pump Station | NW | Replacement Efficiency | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 3,500,000 | 0 | 3,500,000 | Bonds | PWB (PPR) |
| Map: n/a WBDIHY | Hydrants | The bureau maintains about 16,000 fire hydrants. These hydrants allow Portland the flexibility and preparedness to meet the challenge of a fire emergency through coordination with the Fire Bureau. This project provides for the replacement of fire hydrants that are no longer repairable. Replacements may also occur as part of the bureau's ongoing efforts to standardize hydrant types for more efficient and effective management of maintenance and repair activities. | Various/ Citywide | All | Replacement Efficiency | Service Level | 1,100,000 | 1,200,000 | 1,200,000 | 1,200,000 | 1,200,000 | 5,900,000 | 6,000,000 | 12,000,000 | 23,900,000 | Bonds | PWB (PFB) |
| Map W-9 W01400 | Interstate Facility Renovation | The bureau's System Control Center and Operations and Maintenance Facility, located on North Interstate Avenue, serves as the hub for maintenance and construction crews, vehicles, equipment and materials, and the emergency operations center. This project consists of a comprehensive plan of reconstruction and improvements that will address seismic and other site vulnerabilities, and bring the facility up to current safety and building codes. | Interstate Facility (NE Interstate) | All | Efficiency; Maintenance | Service Level | 12,377,000 | 16,248,390 | 6,138,422 | 560,000 | 0 | 35,323,812 | 0 | 0 | 35,323,812 | Bonds | PWB (OMF) |
| Map: W-10 W01348 | Portland-Milwaukie Light Rail Project | This project consists of planning, design and construction for relocation of over 5,000 feet of main required for the Portland-Milwaukie Light Rail project. PWB Construction crews and Construction Management Team will assist during the construction phase of the project. | PMLR alignment, SW/SE | SW, SE | Replacement | Service Level | 1,100,000 | 0 | 0 | 0 | 0 | 1,100,000 | 0 | 0 | 1,100,000 | Bonds | PWB (PBOT, TriMet) |
| Map: n/a WBDIME | Meters | This project funds the purchase and installation of water meters. The Bureau objective is to maintain meter accuracy to within 3% of actual values. | Various/ Citywide | All | Replacement Efficiency | Service Level | 1,700,000 | 1,590,000 | 1,800,000 | 1,800,000 | 1,800,000 | 8,690,000 | 9,000,000 | 18,000,000 | 35,690,000 | Bonds | PWB |
| Map: n/a WBDIPT | Pump Stations and Tanks | This program maintains a large variety of infrastructure consisting of water storage tanks, pumps, and pump and control facilities. The bureau uses a reliability centered maintenance (RCM) analysis to prioritize projects in these areas. A key focus of the next five years will be to replace the remote telemetry units at over 140 remote sites. The existing units are over 15 years old, and are becoming obsolete. The servers are at the end of their service cycle, and must also be replaced. | Various/ Citywide | All | Replacement Efficiency; Growth | Service Level | 500,000 | 510,000 | 1,480,000 | 1,098,000 | 1,415,000 | 5,003,000 | 5,000,000 | 10,000,000 | 20,003,000 | Bonds | PWB |
| Map: W-11 W01581 | Rose City Sewer Rehabilitation | The project will install 1207 feet of 8 inch DI, 2 new hydrants and 39 new water services 2 inches or smaller. | Rose City area | NE | Replacement | Service Level | 2,000 | 0 | 0 | 0 | 0 | 2,000 | 0 | 0 | 2,000 | Bonds | PWB |


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| Project ID | Project Title | Project Description | Location | Area | Project Objective | Driver | Estimated Cost by Time Period | | | | | | | | Grand Total | Funding Source | Facility Provider |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | FY 2013-14 | FY 2014-15 | FY 2015-16 | FY 2016-17 | FY 2017-18 | Total FY 2013-18 | FY 2018-23 | FY 2023-33 | FY 2013-33 | | |
| Map: W-12 W01651 | Raymond Tank Supply Improvements | This project will design and construct improvements at Raymond Tank Site and at an intersection of SE Holgate Boulevard and SE 136th Avenue. | Raymond Tank, vicinity | SE | Efficiency | Service Level | 125,000 | 410,000 | 0 | 0 | 0 | 535,000 | 0 | 0 | 535,000 | Bonds | PWB |
| Map:W-13 | Sam Jackson Pump Station | This project will add multiple capital improvements including seismic improvements, replacement of RTU and motor controllers, installation of pump control and check valves, extension of the crane rail, a concrete pad, and installation of a security fence and gate. | Sam Jackson Pump Station | SW | Replacement ; Efficiency | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 1,400,000 | 0 | 1,400,000 | Bonds | PWB |
| Map n/a WBDISV | Services | This project constructs replacement and customer requested water services. A water service is the connection between the water main and any given customer's service meter. Service connections are always performed by Water Bureau crews directed by a certified Water Service Mechanic. An ongoing budget of approximately $4 million per fiscal year provides for installation of about 1,000 water service connections annually and other upgrades to existing water services. | Various/ Citywide | All | Expansion | Service Level | 4,000,000 | 4,000,000 | 4,000,000 | 4,000,000 | 4,000,000 | 20,000,000 | 20,000,000 | 40,000,000 | 80,000,000 | Bonds | PWB |
| Map: W-14 W01590 | Willamette River Pipe Crossings | The project replaces major pipelines to strengthen the transmission link between Powell Butte and the service areas west of the Willamette River, including downtown and the storage reservoirs at Washington Park. It includes construction of a new seismically strengthened river crossing to replace the first one of potentially two Willamette River crossings, and new transmission piping on both sides of the river. | Various, Powell Butte – Wash. Park | CC | Expansion | Service Level | 460,000 | 2,600,000 | 5,000,000 | 20,000,000 | 28,540,000 | 56,600,000 | 0 | 55,000,000 | 111,600,000 | Bonds | PWB |
| **Regulatory Compliance** | | | | | | | | | | | | | | | | | |
| Map: n/a W01355 | Bull Run Dam 2 Tower | The Water Bureau plans to install steel multi-level intake structures onto the North Dam 2 Tower located in the Bull Run watershed. Modifications are designed to allow selective water withdrawal, proper operation during flood conditions, and enable the towers to better withstand seismic loadings. | Bull Run | Bull Run | Maintenance | Service Level | 5,975,000 | 475,000 | 0 | 0 | 0 | 6,450,000 | 0 | 0 | 6,450,000 | Bonds | PWB |
| Map: n/a W01534 | HCP Alder Creek Fish Passage | This project will design and install two fish passage facilities as planned in the Habitat Conservation Plan (HCP). The project is in Alder Creek, a tributary to the Sandy River. There will be a fish ladder at the waterfall and a fish ladder at a water diversion. | Bull Run | Bull Run | Maintenance | Service Level | 458,000 | 0 | 0 | 0 | 0 | 458,000 | 0 | 0 | 458,000 | Bonds | PWB |
| Map: n/a WBRCRC | Water Quality and Regulatory Compliance | The bureau recognizes the Bull Run watershed as a diverse ecosystem. The bureau is committed to preserving this habitat and complying with federal regulations using practical, locally driven solutions. Many of the projects in this subprogram respond to the Endangered Species Act (ESA), including the implementation of the Bull Run Habitat Conservation Plan (HCP) as adopted by City Council and approved by the National Marine Fisheries Service. Consistent with HCP commitments, this program funds easements, purchases land, and also supports projects jointly conducted with other watershed partners. | Bull Run | Bull Run | Efficiency | Service Level | 1,304,000 | 3,642,000 | 9,300,000 | 2,350,000 | 2,000,000 | 18,596,000 | 10,000,000 | 20,000,000 | 48,596,000 | Bonds | PWB (EPA, OHHS) |



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| Project ID | Project Title | Project Description | Location | Area | Project Objective | Driver | Estimated Cost by Time Period | | | | | | | | Grand Total | Funding Source | Facility Provider |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | FY 2013-14 | FY 2014-15 | FY 2015-16 | FY 2016-17 | FY 2017-18 | Total FY 2013-18 | FY 2018-23 | FY 2023-33 | FY 2013-33 | | |
| **Supply** | | | | | | | | | | | | | | | | | |
| Map: n/a WBSUBR | Bull Run Watershed | The bureau is committed to updating the Bull Run watershed protection and maintenance procedures and agreements based on the 2007 Bull Run Agreement with the Mt. Hood National Forest. The function of this program is to allocate funds for the capital projects necessary to maintain, improve, and protect the watershed facilities that are not directly related to the water supply system facilities. This includes Bull Run Watershed road reconstruction to ensure continuous, reliable, and safe access to all facilities, as well as maintenance of other city-owned infrastructure within the watershed. | Bull Run | Bull Run | Maintenance | Service Level | 380,000 | 780,000 | 2,500,000 | 2,750,000 | 2,000,000 | 8,410,000 | 10,000,000 | 20,000,000 | 38,410,000 | Bonds | PWB (USFS) |
| Map: n/a | Dams and Headworks Repair and Rehabilitation | This program provides for assessment of the condition and rehabilitation of dams and other facilities at Headworks. As many of these facilities are between 50 and 70 years old, their safe and reliable operation requires ongoing investment. The program includes preliminary engineering and design of needed repairs, rehabilitation of these facilities, and actual repair work. | Bull Run | Bull Run | Maintenance | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 1,000,000 | 2,000,000 | 3,000,000 | Bonds | PWB |
| Map: n/a WBSUGW | Groundwater Improvements | The Columbia South Shore Wellfield (CSSW) is Portland's alternative supply of water should the Bull Run watershed supply be interrupted for any reason. Projects funded in this program improve the maintenance of this aging infrastructure, including repairs, selective replacements and upgrades. | CSSW | NE | Maintenance | Service Level | 300,000 | 450,000 | 450,000 | 500,000 | 500,000 | 2,200,000 | 2,500,000 | 5,000,000 | 9,700,000 | Bonds | PWB |
| Map:W-15 | Groundwater Collection Main Hardening | Much of the piping connecting the wells to the Groundwater Pump Station is located in liquefiable soils which are vulnerable during a seismic event. This project would design and install measures to "harden" the piping and reduce this vulnerability. | CSSW | NE | Maintenance | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20,000,000 | 20,000,000 | Bonds | PWB |
| Map: W-16 W01371 | Groundwater Electrical Supply Improvements | This project designs and constructs a new 115kV/4160V transformer and other components to complete a double-ended electrical substation at the Groundwater Pump Station. It will also design and construct a 5kV main breaker replacement and purchase selected spare components. | CSSW | NE | Efficiency | Service Level | 79,000 | 1,992,000 | 0 | 0 | 0 | 2,071,000 | 0 | 0 | 2,071,000 | Bonds | PWB |
| Map: W-17 | Groundwater Pump Station Expansion | As water demand increases, the bureau will need to increase the available flows from the groundwater system. The system expansion will include upgrade of the Groundwater Pump Station to provide additional capacity. | CSSW | NE | Expansion | Population | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,000,000 | 10,000,000 | Bonds | PWB |
| Map: W-18 | Groundwater Wellfield Expansion | As water demand increases, the bureau will need to increase the available flows from the groundwater system. The system expansion will include additional well development and collection mains in the Columbia South Shore area. | CSSW | NE | Expansion | Growth | 0 | 0 | 0 | 0 | 0 | 0 | 2,000,000 | 10,000,000 | 12,000,000 | Bonds | PWB |
| Map: W-19 | Groundwater Wellfield Reliability Enhancement | The bureau is attempting to increase the flexibility and preparedness to meet the future challenge of an interruption of Bull Run water. The bureau is improving its emergency preparedness by evaluating electrical vulnerability for the pumping system, reviewing the flood inundation vulnerability of the site, and development of a Groundwater Intertie that would reduce transmission system vulnerability. The inundation review may be partially completed through a partnership with Multnomah County Drainage District. | CSSW | NE | Efficiency | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 1,000,000 | 2,000,000 | 3,000,000 | Bonds | PWB |
| Map: W-20 | Powell Valley Well Improvements | The project includes upgrade of the facilities in the previous Powell Valley Road Water District area and connection and integration of these facilities to the PWB water system. | CSSW | NE | Efficiency | Growth | 0 | 0 | 0 | 0 | 0 | 0 | 1,000,000 | 2,000,000 | 3,000,000 | Bonds | PWB |
| Map: n/a W01669 | Road 1008 | This project will design and construct an overlay for the Bull Run 1008 road. | Bull Run | Bull Run | Maintenance | Service Level | 60,000 | 650,000 | 0 | 0 | 0 | 710,000 | 0 | 0 | 710,000 | Bonds | PWB |
| Map: n/a W01670 | Road 10 MP 0.6-1.8 | Design and construct walls, widening, culverts and repave this portion of the Bull Run 10 road. | Bull Run | Bull Run | Maintenance | Service Level | 60,000 | 840,000 | 0 | 0 | 0 | 900,000 | 0 | 0 | 900,000 | Bonds | PWB |



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| Project ID | Project Title | Project Description | Location | Area | Project Objective | Driver | Estimated Cost by Time Period | | | | | | | | Grand Total | Funding Source | Facility Provider |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | FY 2013-14 | FY 2014-15 | FY 2015-16 | FY 2016-17 | FY 2017-18 | Total FY 2013-18 | FY 2018-23 | FY 2023-33 | FY 2013-33 | | |
| **Support** | | | | | | | | | | | | | | | | | |
| Map: n/a | Building Maintenance | The bureau maintains hundreds of structures from the Bull Run watershed to Downtown Portland. These structures range in size from small pump houses to the maintenance hub on Interstate Avenue. The necessary work involves structural repairs and maintenance. | Various/ Citywide | All | Maintenance | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 1,000,000 | 2,000,000 | 3,000,000 | Bonds | PWB (OMF) |
| Map: n/a WBASPL | Planning | This project funds general planning studies for projects that the Water Bureau encounters during operation of the water system. These include pressure zone adjustments, facility modifications, and system element studies. The bureau attempts to employ efficient and effective management practices when evaluating the need for new facilities. | Various/ Citywide | All | Efficiency; Maintenance | Service Level | 1,500,000 | 1,500,000 | 2,000,000 | 2,500,000 | 2,500,000 | 10,000,000 | 12,500,000 | 25,000,000 | 47,500,000 | Bonds | PWB |
| Map: n/a | Sandy River Station Upgrade | This project consists of upgrades to the Sandy River Station facilities including an evaluation of a potential move to a different site. | Sandy River station | E | Efficiency Maintenance | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,000,000 | 5,000,000 | Bonds | PWB (OMF) |
| Map: n/a | West Side Maintenance Facility | A hub is needed on the west side of the Willamette River for maintenance and construction crews, vehicles, equipment and materials, and emergency operations. This project includes construction of the facility within the next 20 years. | West of Willamette River, tbd | W | Efficiency; Maintenance | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 5,000,000 | 0 | 5,000,000 | Bonds | PWB (OMF) |
| **Transmission & Terminal Storage** | | | | | | | | | | | | | | | | | |
| Map: n/a | Conduit 5 | This project would include installation of sections of a new Conduit 5 as growth occurs and the condition of the existing conduits worsens. | Conduit 5, east of city limits | E | Maintenance Expansion | Service Level; Growth | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75,000,000 | 75,000,000 | Bonds | PWB |
| Map: n/a WBTTCT | Conduits and Transmission Mains | The conduits that bring water to Portland from the Bull Run watershed are pipes 56 to 72 inches in diameter. This program funds repairs, replacements and upgrades to these key pipelines. Reliable service to the City and the City's wholesale customers is the key reason for the bureau's commitment to improve maintenance of this aging infrastructure. | Various/ Citywide | E | Maintenance | Service Level | 425,000 | 8,500,000 | 12,600,000 | 5,000,000 | 7,000,000 | 33,525,000 | 10,000,000 | 20,000,000 | 63,525,000 | Bonds | PWB |
| Map W-22 W01424 | Kelly Butte Reservoir | The purpose of this project is to increase storage capacity from 10MG to 25MG by replacing the existing tank with a buried reservoir. This includes site access, construction access and easements, staging areas, and on-site storage areas. This project establishes Kelly Butte as the key facility that will be used for system pressure equalization and in-town terminal storage in lieu of the Mt. Tabor open reservoirs. | Kelly Butte | SE | Replacement | Service Level; Growth | 35,000,000 | 27,000,000 | 4,970,000 | 0 | 0 | 66,970,000 | 0 | 0 | 66,970,000 | Bonds | PWB |
| Map: n/a | New Conduit Intertie | This project would address concerns about the capability of the conduit system to withstand hazards and deliver an uninterruptible supply to the City. The project will improve reliability of flow during emergency conditions and for maintenance by providing additional isolation and interconnectivity. | Conduit, east of city limits | E | Maintenance Efficiency | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,000,000 | 10,000,000 | Bonds | PWB |
| Map W-23 W01343 | Powell Butte Reservoir 2 | This LT2 project is being constructed in 2 phases – Phase 1 is complete. The project is currently in Phase 2, the construction of a 50 million gallon buried reservoir at Powell Butte. It includes a short section of Conduit 5, construction of a maintenance and storage facility, replacing the caretaker's house, construction of an interpretive center and restrooms, reservoir overflow, park improvements and mitigation requirements as part of the conditions for approval in the 2003 LUR Type III CUMP. | Powell Butte | SE | Replacement | Service Level; Growth | 27,520,000 | 7,700,000 | 0 | 0 | 0 | 35,220,000 | 0 | 0 | 35,220,000 | Bonds | PWB |
| Map W-24 | Powell Butte Reservoir 3 | This project constructs a third reservoir at Powell Butte and possible bypass piping around the Butte. | Powell Butte | SE | Expansion | Growth | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100,000,000 | 100,000,000 | Bonds | PWB |
| Map: n/a | Sandy River Conduit Relocation, Phase II | The bureau is committed to increasing the flexibility and preparedness to meet the future challenge of a natural disaster. This project will relocate the Sandy River crossings of Conduit 3. The crossings of Conduit 2 and 4 have already been completed. These conduits were identified in the system vulnerability study as vulnerable to seismic, volcanic, flooding, and other natural and manmade hazards. | Sandy River crossing | E | Replacement | Service Level | 0 | 0 | 0 | 0 | 0 | 0 | 5,000,000 | 0 | 5,000,000 | Bonds | PWB |



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| Project ID | Project Title | Project Description | Location | Area | Project Objective | Driver | Estimated Cost by Time Period | | | | | | | | Grand Total | Funding Source | Facility Provider |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | FY 2013-14 | FY 2014-15 | FY 2015-16 | FY 2016-17 | FY 2017-18 | Total FY 2013-18 | FY 2018-23 | FY 2023-33 | FY 2013-33 | | |
| Map W-25 W01524 | Tabor Reservoir Adjustments | This project includes adjustments to piping, structures and other features at Mt. Tabor in order to move storage elsewhere and physically disconnect the open reservoirs from the public water system for compliance with LT2. Project does not include disposition of the reservoirs after they have been disconnected from the public water system. | Mt. Tabor | SE | Replacement | Service Level | 225,000 | 1,140,000 | 1,990,000 | 0 | 0 | 3,355,000 | 0 | 0 | 3,355,000 | Bonds | PWB |
| Map W-26 W01402 | Washington Park Reservoir 3 | The project will plan, design and construct a new buried reservoir to replace open reservoir No. 3. This project is one solution toward compliance with LT2 replacement of the open reservoirs. It is assumed that Reservoir # 4 will be used as the overflow detention structure. We envision that the buried reservoir would be topped with a reflecting pond and historical features would be protected to retain its visual appeal. | Washington Park | SW | Replacement | Service Level | 3,600,000 | 2,300,000 | 2,900,000 | 19,300,000 | 24,000,000 | 52,100,000 | 0 | 0 | 52,100,000 | Bonds | PWB |
| Map W-27 | West Side Transmission Main Improvements | These mains include the Sam Jackson to Downtown Pipeline and the Jefferson Street Supply mains. These large transmission mains are needed to strengthen the supply to terminal storage located on the west side of the Willamette River. | Various, SW Portland | E | Maintenance Expansion | Service Level; Growth | 0 | 0 | 0 | 0 | 0 | 0 | 10,000,000 | 10,000,000 | 20,000,000 | Bonds | PWB |
| Map: n/a | Wholesale Connections | This project provides for facilities servicing wholesale customers including repairs, replacements, and upgrades of pump stations and meters. Additional interties may be needed in the future. | Bull Run | All | Efficiency | Service Level; Growth | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,000,000 | 2,000,000 | Bonds | PWB |
| **Treatment** | | | | | | | | | | | | | | | | | |
| Map: n/a W01582 | Headworks Flow Meters | This project would install new flow meters on the Primary Intake conduits; install new flow meters and flow control valves on Screen house #3 conduits; and, address the sump pump drainage system in Bailey PRV vault. | Bull Run | Bull Run | Maintenance | Service Level | 2,500,000 | 0 | 0 | 0 | 0 | 2,500,000 | 0 | 0 | 2,500,000 | Bonds | PWB |
| Map: n/a | Treatment Facilities Improvements | Treatment of Portland's drinking water is the most complex activity the bureau engages in while operating the water system. This project would include several related projects for the Bull Run water supply, at Bull Run Headworks and the Lusted Hill Facility. Projects would likely be driven by State and Federal regulations | Bull Run | Bull Run | Maintenance | Service Level; Growth | 0 | 0 | 0 | 0 | 0 | 0 | 50,000,000 | 100,000,000 | 150,000,000 | Bonds | PWB (EPA, OHHS) |
| | | | | | | **Total All Projects** | **125,209,600** | **110,949,890** | **76,092,322** | **81,943,138** | **96,524,338** | **490,719,288** | **309,050,000** | **767,300,000** | **1,567,069,288** | | |



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# Bureau of Transportation

The Portland Bureau of Transportation project list includes planned transportation projects, based on the Portland's Transportation System Plan (TSP) and the Regional Transportation Plan (RTP). These multi-modal projects address the needs of pedestrian, bicyclists, transit users, freight movers, and motorists. Investments in the City's transprotation system are needed to maintain existing facilities and to ensure the system meets the needs of Portlanders for decades to come. Anticipated funding is not adequate to support completion of all projects identified in the Investment Strategy.

The City is updating the Transportation System Plan along with the Comprehensive Plan Update. This update of the Transportation System Plan will include refining the list of projects included here to reflect anticipated funding, project timing; recent plans, new goals and policies, and proposed centers, corridors, and greenways.

For more information on the TSP update project, visit http://www.portlandoregon.gov/transportation/63710.



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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 30019 | Port | Hayden Island/Rivergate, N: Rail Access | Rail access bridge from Rivergate to West Hayden Island development. | Hayden Island/ Rivergate, N | $3,000,000 |
| 30026 | Metro | Kelly Point Park Access Trail/40-Mile Loop Trail, N | Construct multi-use trail for bicycle and pedestrian along the north bank of the Columbia Slough. | Kelly Point Park/40-Mile Loop, N | $115,000 |
| 30028 | Portland | Killingsworth, N (Interstate - MLK Jr Blvd): Street Improvements | Construct street improvements to improve pedestrian connections to Interstate MAX LRT and to establish a main street character promoting pedestrian-oriented activities | Killingsworth, N (Interstate - MLK Jr Blvd) | $4,900,000 |
| 30030 | Portland | Killingsworth, N ( Denver to Greeley): Pedestrian Improvements | Design and implement streetscape and transportation improvements. | Killingsworth, N ( Denver to Greeley) | $1,851,960 |
| 30034 | Portland | Lombard, N/NE (St Johns Bridge - MLK Jr): Bikeway | Design and implement bicycle facilities. | Lombard, N/NE (St Johns Bridge - MLK Jr) | $100,000 |
| 30035 | Portland | Lombard, N/NE (MLK Jr - Philadelphia): ITS | Communications infrastructure including closed circuit TV camera, Bluetooth detection, improved bus priority variable message signs for remote monitoring and control of traffic flow at the intersections with MLK Jr, Interstate, Greeley, Portsmouth, Philadelphia/Ivanhoe. | Lombard, N/NE (MLK Jr - Philadelphia) | $673,440 |
| 30037 | Portland | Lombard, N (I-5 - Denver): Street Improvements | Establish a landscaped boulevard to promote pedestrian-oriented uses and to create a safe, pleasant pedestrian link over I-5, including a signal or other intersection improvement at Montana & Lombard and an improved pedestrian crossing of the Interstate 5 on-ramp.The project will be coordinated with ODOT to address potential impacts to Lombard and the I-5 interchange. | Lombard, N (I-5 - Denver) | $1,703,242 |
| 30038 | Portland | Marine Dr, N/NE (Portland Rd to 185th): ITS | CCTV at N Portland Rd. Changeable message signs at Portland Rd, Vancouver and 185th | Marine Dr, N/NE (Portland Rd to 185th) | $238,510 |
| 30039 | Port | Marine Dr, N (at Rivergate West): Rail Crossing, Phase II | Reroute rail tracks and construct an above-grade rail crossing at Rivergate West entrance to improve safety and reduce vehicle and rail traffic conflicts. | Marine Dr, N (at Rivergate West) | $13,644,200 |
| 30043 | Portland | Prescott Station Area Street Improvements, N | Construct improvements to Prescott & Skidmore (Interstate-Maryland) & Maryland (Interstate-Prescott) to provide neighborhood focal point at LRT | Prescott Station Area, N | $4,770,200 |
| 30050 | Portland | St. Johns Pedestrian District, N | Enhance pedestrian access to transit, improve safety, and enhance the streetscape such as better lighting and crossings. Improvements including realigning the "ivy" island, curb extensions, a new traffic signal at Richmond/Lombard, and pedestrian connections between St. Johns and the riverfront based on the St Johns/Lombard Plan. | St. Johns, N | $5,000,000 |
| 30054 | Port | Barnes Rail Yard - Bonneville Rail Yard, N: Track Expansion | Construct additional unit train trackage between Bonneville and Barnes Yards to support unit train movement between South Rivergate and the Columbia Corridor. | Barnes Rail Yard - Bonneville Rail Yard, N | $11,900,000 |
| 30055 | Port | Penn Junction, N, UP/BNSF Main Line: Track Realignment | Realign track configuration, double track, and upgrade signaling to improve mainline capacity and allow greater train turnout speed. | Penn Junction, N, UP/BNSF Main Line | $3,500,000 |



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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 30056 | Portland | Columbia Bl, N/NE (MLK Jr BL - Lombard): Bikeway | Design and implement bicycle facilities. | Columbia Bl, N/NE (MLK Jr BL - Lombard) | $153,944 |
| 30058 | Portland/ Port | Lombard, N (at Terminal 4): Driveway Consolidation | Consolidate driveways at Terminal 4 and Schnitzer Steel. | Lombard, N (at Terminal 4) | $10,000,000 |
| 30059 | Portland | Lombard, N (N Tyler - N Woolsey) | Implement main street improvements along N Lombard consistent with the St. Johns/Lombard Plan, including curb externsions, street lighting and bicycle improvements. | Lombard, N (N Tyler - N Woolsey) | $1,002,000 |
| 30062 | Port/Railroad | West Hayden Island Rail Yard Expansion, West Hayden Island | Extend rail from BNSF mainline to West Hayden Island and construct rail loop to serve future marine terminal development. | West Hayden Island | $9,500,000 |
| 30063 | Region | BNSF Line at Columbia Bridge, N: Track Improvements | Improve rail track conditions on approaches to movable spans. | BNSF Line at Columbia Bridge, N | $8,000,000 |
| 30065 | Region | N Portland Junction, N: Rail Improvements | Upgrade rail track with revised crossovers, centralized traffic control tie-in and increased turning radius to accommodate higher rail speeds and capacity. | N Portland Junction, N | $23,600,000 |
| 30066 | Region | N Portland Rail Grade Separation, N | Grade separate rail/highway traffic on N Columbia Blvd at Penn Junction at BNSF Rail Bridge and Columbia Slough and N Portland Junction | N Portland Rail, N | $75,000,000 |
| 30069 | Region | Slough Rail Bridge, N | Future rail bridge across Columbia Slough to provide rail connection to south Rivergate from Terminal 6. | Slough Rail Bridge, N | $4,500,000 |
| 30070 | Portland | Columbia Bl/Portland Rd, N: Intersection Improvements | Redesign intersection. | Columbia Bl/Portland Rd, N | $3,000,000 |
| 30072 | Port | Rivergate ITS, N | Connect real-time information to ODOT's Highway ITC systems. | Rivergate, N | $480,000 |
| 30075 | Portland | Lombard, N/NE (MLK Jr - Philadelphia): ITS | CCTV at various intersections; changeable message signs. | Lombard, N/NE (MLK Jr - Philadelphia) | $210,000 |
| 30077 | Port | Barnes to Terminal 4, N: Track Expansion | Add dedicated track for Terminal 4 through Barnes Yard and add new track from Barnes Yard to Terminal 4. | Barnes to Terminal 4, N | $3,000,000 |
| 30080 | Portland | Burgard-Lombard, N: Street Improvements | Widen street to include two 12-foot travel lanes, continuous left turn lane, bike lanes and sidewalk. | Burgard-Lombard, N | $17,000,000 |
| 30081 | ODOT/Portland | Argyle, N (Columbia - Denver): Roadway Improvements | New N Argyle street connection, west of I-5. Construct a new arterial roadway north of existing street alignment and reconstruct existing street as a local street in a Pedestrian District as recommended by the I-5 Delta Park project in the Argyle on the Hill Alternative. | Argyle, N (Columbia - Denver) | $11,773,032 |
| 40003 | Portland | 26th/Regents, NE: Intersection Improvements | Reconstruct intersection including pedestrian refuge to improve traffic flow and safety. | 26th/Regents, NE | $115,000 |
| 40006 | Portland | 33rd/Marine Drive, NE: Intersection Improvements | Signalize intersection for freight movement. | 33rd/Marine Drive, NE | $350,750 |


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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 40007 | Portland/ ODOT | 42nd Bridge, NE (at Lombard): Bridge Replacement | Replace 42nd bridge over Lombard to remove weight restriction. | 42nd Bridge, NE (at Lombard) | $4,900,000 |
| 40008 | Portland | 47th/42nd, NE (Cornfoot - Siskiyou): Bike Lanes | Design and implement bicycle facilities. Project involves shoulder paving and drainage work. | 47th/42nd, NE (Cornfoot - Siskiyou) | $160,000 |
| 40009 | Portland | 47th, NE (Columbia - Cornfoot):Roadway & Intersection Improvements | Widen and reconfigure intersections to better facilitate truck turning movements to the cargo area located within the airport area. Project includes pedestrian and bicycle improvements. | 47th, NE (Columbia - Cornfoot) | $5,541,678 |
| 40010 | Portland | 60th Ave, NE( Killingsworth - Going/Cully): Pedestrian Improvements | Construct sidewalks, curbs, and storm drainage improvements. | 60th Ave, NE( Killingsworth - Going/Cully) | $400,000 |
| 40012 | Portland | 72nd, NE (Killingsworth - Prescott): Pedestrian Improvements | Construct sidewalks, curbs, and storm drainage improvements along 72nd and improve pedestrian crossings at Prescott and Killingsworth. | 72nd, NE (Killingsworth - Prescott) | $750,000 |
| 40016 | Port | 82nd, NE (Airport Way - Columbia Bl): Bike & Pedestrian Improvements | Construct bicycle and pedestrian facilities. | 82nd, NE (Airport Way - Columbia Bl) | $510,000 |
| 40020 | Portland | 92nd Ave, NE (Fremont - Halsey): Bicycle & Pedestrian Improvements | Design and implement bicycle facilities. Construct sidewalks to provide access to transit and schools. | 92nd Ave, NE (Fremont - Halsey) | $360,000 |
| 40023 | Port | Airport Way, NE: Return and Exit Roads | Relocate Airport Way exit roadway and construct new return roadway (Terminal Access Study, projects R4 and R5; to be scoped by PDX Master Plan). | Airport Way, NE | $6,400,900 |
| 40025 | Port | 82nd/Airport Way, NE: Overcrossing | Construct grade-separated overcrossing. | 82nd/Airport Way, NE | $86,000,000 |
| 40027 | Portland/ Port | Alderwood St, NE, (Alderwood Trail - Columbia Bl): Bikeway | Design and implement bicycle facilities. Project includes some shoulder widening. | Alderwood St, NE, (Alderwood Trail - Columbia Bl) | $561,200 |
| 40028 | Portland | Argyle, NE (14th - MLK): Street Extension | Extend NE Argyle to provide better street grid. Will serve as a collector/distributor for industrial businesses & reduce traffic congestion at MLK/Columbia intersection. | Argyle, NE (14th - MLK) | $480,000 |
| 40030 | Portland | Broadway/Weidler, NE (15th - 28th): Multi-modal Improvements, Phases II & III | Boulevard retrofit of street including street trees, traffic signals, curb extensions, wider sidewalks, and bicycle facilities. | Broadway/Weidler, NE (15th - 28th) | $9,058,399 |
| 40032 | Portland | Alderwood/Columbia Blvd/Cully, NE: Intersection Improvements | Reconstruct intersection to provide left turn pockets, enhancing turning radii and improving circulation for trucks serving expanding air cargo facilities south of Portland. | Alderwood/Columbia Blvd/Cully, NE | $1,460,000 |
| 40036 | Portland | Cornfoot, NE (47th - Alderwood): Road Widening & Intersection Improvements | Construct a multi-use path on the north side of Cornfoot Rd and install missing guardrail segments on the south side. | Cornfoot, NE (47th - Alderwood) | $3,626,000 |



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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 40037 | Portland | Cully, NE (Columbia Bl - Fremont): Multi-modal Improvements | Design and implement bicycle facilities. | Cully, NE (Columbia Bl - Fremont) | $500,000 |
| 40039 | Portland | Fremont St, NE (42nd-52nd): Pedestrian and Safety Improvements | Construct streetscape and transportation improvements to improve the pedestrian environment. | Fremont St, NE (42nd-52nd) | $405,116 |
| 40042 | Portland/ ODOT | Halsey, NE (Bridge at I-84): Seismic Retrofit | Seismic bridge retrofit. | Halsey, NE (Bridge at I-84) | $387,000 |
| 40045 | Portland/ ODOT | Hollywood Pedestrian District, NE: Multi-modal Improvements | Multi-modal street improvements including traffic signals, restriping, improved pedestrian crossings and connections to transit center. | Hollywood, NE | $10,776,092 |
| 40052 | Portland | Killingsworth, NE (42nd-72nd): Pedestrian Improvements | Construct sidewalks and crossing improvements for pedestrian travel and access to transit. | Killingsworth, NE (42nd-72nd) | $420,000 |
| 40053 | Portland | Killingsworth, NE (33rd - Williams): Pedestrian Improvements | Design and implement streetscape and transportation improvements to increase opportunities to walk and enhance the main street character of this corridor. | Killingsworth, NE (33rd - Williams) | $900,000 |
| 40058 | Portland/ ODOT | MLK Jr, N (Columbia Bl - CEID): ITS | CCTV at various locations & traffic monitoring stations at Clay and Burnside. | MLK Jr, N (Columbia Bl - CEID) | $989,115 |
| 40061 | Portland | Columbia Blvd/MLK Jr & Lombard/MLK Jr, NE: Intersection Improvements | Intersection and signalization improvements with right turn lane. | Columbia Blvd/MLK Jr & Lombard/MLK Jr, NE | $2,228,909 |
| 40065 | Portland | Prescott, NE (47th - I-205): Pedestrian and Bicycle Improvements | Construct bicycle facilities, sidewalks, and crossing improvements for pedestrian and bike safety and to improve access to transit. | Prescott, NE (47th - I-205) | $1,403,000 |
| 40068 | Portland | Sandy Blvd, NE (47th - 101st): Multi-modal Improvements, Phase II | Retrofit existing street with multi-modal street improvements including bicycle facilities, redesign of selected intersections to improve pedestrian crossings, streetscape, and safety improvements. | Sandy Blvd, NE (47th - 101st) | $6,481,860 |
| 40069 | Portland | Sandy Blvd, NE (82nd - Burnside): ITS | Install ITS infrastructure (communication network, enhanced bus detection, Bluetooth detection, CCTV cameras, and vehicle /pedestrian detectors). These ITS devices allow us to provide more efficient and safe operation of our traffic signal system consistent with our policies of moving people more effectively | Sandy Blvd, NE (82nd - Burnside) | $519,110 |
| 40070 | Portland | Sandy Bl, NE (12th - 47th): Multi-modal Improvements | Design and implement bicycle facilities. | Sandy Bl, NE (12th - 47th) | $500,000 |
| 40071 | Portland | Skidmore, N/NE, (Interstate - Cully): Bikeway | Design and implement a neighborhood greenway. | Skidmore, N/NE, (Interstate - Cully) | $105,330 |
| 40073 | Port | Southwest Quad, NE (at 33rd): Access to PDX Properties | Provide street access from 33rd into the SW Quad property. | Southwest Quad, NE (at 33rd) | $5,917,500 |


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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 40074 | Portland | Twenties Bikeway, NE/SE (Lombard - Clinton) | Design and implement a bikeway from Lombard to Crystal Springs & 45th using neighborhood greenways and bike lanes with a varying alignment along NE/SE 26th to 30th Avenues. | Between 26th and 30th Ave, NE/SE (Lombard - Clinton) | $2,300,000 |
| 40079 | Portland | Marine Dr, NE: Intersection Improvements | Intersection improvements at NE Bridgeton Rd and NE Faloma/6th. | Marine Dr, NE | $2,035,000 |
| 40081 | Port | Airport MAX, NE: Light Rail Track Realignment | Realign light rail track into airport terminal building to accommodate terminal expansion plans. | Airport MAX, NE | $16,330,700 |
| 40082 | Portland | Seventies Neighborhood Greenway, NE (Killingsworth - I-84) | Design and implement a neighborhood greenway from Thomas Cully Park to I-84 with a varying alignment along the "70s" Avenues. | 70s Avenues, NE (Killingsworth - I-84) | $1,409,019 |
| 40084 | Portland/ ODOT | I-405/Kerby, N: Interchange Improvement | Improve I-405/Kerby interchange to calm traffic at off-ramp. | I-405/Kerby, N | $515,000 |
| 40085 | Port | Kenton Rail Line, NE: Additional RR Tracks | Upgrade single track to double track; new sidings; staging tracks | Kenton Rail Line, NE | $25,400,000 |
| 40086 | Portland | Halsey, NE (39th - I-205): Bikeway | Design and implement a bikeway along the NE Halsey Street corridor. | Halsey, NE (39th - I-205) | $500,000 |
| 40091 | Port | PDX PIC Pedestrian & Bicycle Improvements | Bicycle & pedestrian connection between Alderwood and Mt Hood LRT station. | Alderwood to Mt Hood LRT stations | $1,163,835 |
| 40097 | ODOT | Airport Way, NE: Braided Ramps | Braided ramps between I-205 interchange and Cascade interchange. | Airport Way, NE | $59,000,000 |
| 40100 | Portland | 33rd Ramps, NE (at Columbia Bl/Lombard: New Ramps | New ramp system connecting Columbia & Lombard at 33rd. | 33rd Ramps, NE (at Columbia Bl/Lombard | $7,014,016 |
| 40102 | Portland | Columbia BL, NE (60th - 82nd): Road Widening | Widen Columbia Blvd to five lanes in this segment to address a system bottleneck and improve property access. | Columbia BL, NE (60th - 82nd) | $14,859,000 |
| 50001 | Portland | Parkrose Connectivity Improvements, NE | Supplement access route for commercial properties in Parkrose by creating a loop road connection (102nd and 109th, NE, Killingsworth - Sandy; Killingsworth, NE, 109nd - 102nd) serving truck access functions, pedestrian, and bike connections. | Parkrose, NE | $1,403,000 |
| 50003 | Portland | 102nd Blvd & Cherry Blossom, NE/SE (Glisan - Market): Gateway Plan District Multi-modal Improvements, Phase II | Implement Gateway regional center plan with boulevard design retrofit, new traffic signals, improved pedestrian facilities and crossings, street lighting and new bicycle facilities. | 102nd Blvd & Cherry Blossom, NE/SE (Glisan - Market) | $2,200,000 |
| 50004 | Portland | 102nd, N (Sandy - Brazee): Pedestrian Improvements | Construct sidewalks and improved crossings, install bicycle facilities, and make traffic safety improvements. | 102nd, N (Sandy - Brazee) | $720,000 |
| 50005 | Portland | 122nd, NE/SE (Airport Way - Powell): ITS | CCTV at various locations; changeable message signs; traffic monitoring stations. | 122nd, NE/SE (Airport Way - Powell) | $515,703 |
| 50006 | Portland | 122nd, NE (Sandy Dr - Prescott): Pedestrian Improvements | Construct sidewalks along existing street. | 122nd, NE (Sandy Dr - Prescott) | $120,000 |



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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 50008 | Portland | 138th, NE (Marine Dr - Sandy): Street Improvements | Widen street and add vehicle lanes, sidewalks, and bicycle facilities. | 138th, NE (Marine Dr - Sandy) | $2,000,000 |
| 50009 | Portland | 148th, NE (Marine Dr - Glisan): Bicycle & Pedestrian Improvements | Retrofit bike facilities to existing street (Airport Way - I-84) and construct sidewalk and safety improvements including signal/intersection improvements at 148th/Sandy (Airport Way-Glisan). | 148th, NE (Marine Dr - Glisan) | $2,568,893 |
| 50012 | Portland | 162nd Ave, NE (Sandy - Halsey): Bikeway | Design and implement separated in-roadway bicycle facilities. | 162nd Ave, NE (Sandy - Halsey) | $20,000 |
| 50014 | Portland | 99th Ave & Pacific Ave, NE: Gateway Plan District Street Improvements, Phase I | Reconstruct primary local main street network in Gateway Regional Center on NE 99th from Weidler to 300' south of Glisan and NE Pacific from 97th to 102nd. | 99th Ave & Pacific Ave, NE | $4,042,500 |
| 50015 | Portland | 99th & 96th, NE/SE (Glisan-Market: Gateway Plan District Street Improvements, Phase II & III | Reconstruct primary local main street in Gateway Regional Center. Phase II - 99th (Glisan - Washington). Phase III - 96th (Washington to Market). | 99th & 96th, NE/SE (Glisan-Market | $4,910,500 |
| 50016 | Port/Portland | Airport Way, NE (I-205 - 158th): ITS | Install needed ITS infrastructure (communication network, new traffic controllers, CCTV cameras, and vehicle /pedestrian detectors). These ITS devices allow us to provide more efficient and safe operation of our traffic signal system. | Airport Way, NE (I-205 - 158th) | $278,251 |
| 50018 | Portland | Gateway Regional Center, NE/SE: Local Street Improvements, Phase I | High priority local street and pedestrian improvements in regional center | Gateway Regional Center, NE/SE | $3,000,000 |
| 50019 | Portland | Gateway Regional Center, NE/SE: Local Street Improvements, Phase II | High priority local street and pedestrian improvements in regional center. | Gateway Regional Center, NE/SE | $8,418,000 |
| 50020 | Portland | Gateway Regional Center, NE/SE: Local Street Improvements, Phase III | High priority local street and pedestrian improvements in regional center. | Gateway Regional Center, NE/SE | $8,418,000 |
| 50023 | Portland | Glisan St, NE (106th - 122nd): Bikeway | Design and implement bicycle facilities. | Glisan St, NE (106th - 122nd) | $81,023 |
| 50024 | Portland | Glisan St, NE (I-205 - 106th): Gateway Plan District Multi-modal Improvements | Implement Gateway regional center plan with boulevard design retrofit, new traffic signals, bike facilities, improved pedestrian facilities and crossings, and street lighting. | Glisan St, NE (I-205 - 106th) | $3,240,930 |
| 50027 | Portland | Halsey to San Rafael & 118th to 132nd, NE: Pedestrian Improvements | Improve pedestrian access to San Rafael Shopping Center including street trees. | Halsey to San Rafael & 118th to 132nd, NE | $250,000 |
| 50028 | Portland | Halsey St, NE (122nd-162nd): Pedestrian Improvements | Construct sidewalks, crossing improvements for ped travel and access to transit. | Halsey St, NE (122nd-162nd) | $1,000,000 |


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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 50030 | Portland | Marine Drive/122nd, NE: Intersection Improvements | Signalize and widen dike to install left turn lane on Marine Drive. | Marine Drive/122nd, NE | $2,361,249 |
| 50032 | Portland | 105th & Prescott, NE: Parkrose Pedestrian Enhancements | Construct sidewalk and crossing improvements to provide access to transit and schools. | 105th & Prescott, NE | $500,000 |
| 50033 | Portland | Prescott St, NE (122nd - I-205): Bikeway | Design and implement a bikeway along the NE Prescott corridor. | Prescott St, NE (122nd - I-205) | $1,000,000 |
| 50036 | Portland | Shaver St, NE (116th to 122nd): Pedestrian Improvements | Construct sidewalks and crossing improvements for pedestrian travel and access to transit and schools. | Shaver St, NE (116th to 122nd) | $210,000 |
| 50037 | Portland | San Rafael/Tillamook, NE (102nd - 148th): Bikeway | Design and implement a neighborhood greenway. | San Rafael/Tillamook, NE (102nd - 148th) | $1,300,000 |
| 50038 | Portland | Woodland Park, NE: Pedestrian Improvements | Construct sidewalks and crossing improvements on San Rafael (111th-122nd), Sacramento (111th-117th), & 111th (San Rafael-Sacramento) to provide access to transit & schools. | Woodland Park, NE | $500,000 |
| 50039 | Portland | Halsey/Weidler, NE (I-205 - 114th): Multi-modal Improvements | Implement Gateway Regional Center Plan boulevard design including new traffic signals, improved pedestrian facilities and crossings and street lighting. | Halsey/Weidler, NE (I-205 - 114th) | $17,014,883 |
| 50041 | | Marine Dr, NE:(I-205 - 122nd) Multi-Use Path | Add multi-use path along Marine Dr. | Marine Dr, NE | $1,100,000 |
| 60004 | ODOT | Bridge Ave, NW (St Helens Rd - St Helens Rd): Pedestrian/Bicycle trail at St. Johns Bridge | Construct a multi-use path along Bridge Avenue between both St Helens Rd intersections. | Bridge Ave, NW (St Helens Rd - St Helens Rd) | $346,500 |
| 60005 | Portland | Barnes/Burnside, NW: Intersection Access Improvements | Install signal or 4-way stop near Wildwood Trail and entrance to Pittock. | Barnes/Burnside, NW | $500,000 |
| 60006 | Portland | Burnside, W (23rd - Skyline): Multi-modal Improvements | Design and implement separated in-roadway bicycle facilities. Construct and improve sidewalks, lighting, and crossings. The project will include intersection improvements at Burnside/Skyline to improve pedestrian/bicycle crossings and traffic safety. | Burnside, W (23rd - Skyline) | $2,000,000 |
| 60007 | Portland | Cornell, NW (30th - City Limits): Bikeway | Design and implement bicycle facilities. | Cornell, NW (30th - City Limits) | $1,000,000 |
| 60008 | Portland | Everett St, NW, (Broadway - 23rd): Corridor Safety Improvements | Install improved pedestrian crossing at NW Park Ave, remodel traffic signal and improve overhead signage at NW 16th Ave, and provide additional minor improvements along corridor to improve safety at high crash locations. | Everett St, NW, (Broadway - 23rd) | $2,000,000 |
| 60009 | Portland | Everett/Glisan, NW (Front - 14th & 18th - 24th): Bikeway | Design and implement bicycle facilities. | Everett/Glisan, NW (Front - 14th & 18th - 24th) | $200,000 |



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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 60012 | Portland | Kittridge, NW (Bridge at Yeon): Seismic Retrofit | Seismic retrofit. | Kittridge, NW (Bridge at Yeon) | $2,100,000 |
| 60015 | Portland | Skyline, NW (Hwy 26 - City Limits): Bikeway | Widen street in order to add bicycle facilities and gravel shoulders. | Skyline, NW (Hwy 26 - City Limits) | $8,088,812 |
| 60023 | Portland/ ODOT | Yeon/St. Helens, NW: ITS | CCTV at various locations; changeable signs; monitoring stations at Nicolai and Kittridge. | Yeon/St. Helens, NW | $885,499 |
| 60024 | Portland | Wildwood Trail Bridge, NW/SW | Construct pedestrian overcrossing where Burnside intersects the Wildwood Trail to eliminate at-grade crossing. | Wildwood Trail Bridge, NW/SW | $2,126,948 |
| 60025 | Portland | Fairview, SW (Kingston - City Limits): Bikeway | Design and implement bicycle facilities. | Fairview, SW (Kingston - City Limits) | $2,000,000 |
| 60026 | Portland | Champlain, SW: Viaduct Replacement10292 | Replace existing viaduct with retaining wall and geofoam fill. | Champlain, SW | $282,269 |
| 60027 | Portland/ ODOT | 23rd/Vaughn, NW: Intersection Improvements | Improve the intersection of NW 23rd & Vaughn and extend NW 20th Ave from Upshur to Thurman in accordance with the Northwest Master Plan for Con-way Site. | 23rd/Vaughn, NW | $1,540,000 |
| 60029 | Mult Co/Portland | Miller, NW (Stark - Cornell): Multimodal Improvements | Add bicycle and pedestrian facilities. | Miller, NW (Stark - Cornell) | $261,000 |
| 70001 | Portland | 13th Ave, SE(Malden - Tacoma): Streetscape Improvements | Plan and implement streetscape and transportation improvements to increase opportunities to walk and enhance the main street character. | 13th Ave, SE(Malden - Tacoma) | $2,000,000 |
| 70005 | Portland | Ceasar E, Chavez., NE/SE (Sandy - Woodstock): Safety & Pedestrian Improvements | Reconstruct street and upgrade sidewalks as necessary to meet current standards and add pedestrian/bicycle crossing improvements (Stark - Schiller). Upgrade signals and make striping changes to improve traffic safety and transit operations. | Ceasar E, Chavez., NE/SE (Sandy - Woodstock) | $3,086,600 |
| 70006 | Portland | 60th Ave, NE/SE (Glisan - Belmont): Corridor Safety Improvements | Signal improvements, modifications, and realignment to improve safety at high accident locations. Includes the intersections with Belmont, Glisan, and Stark. | 60th Ave, NE/SE (Glisan - Belmont) | $380,000 |
| 70008 | Portland | 92nd Ave, SE (Powell - City Limits): Bicycle & Pedestrian Improvements | Construct sidewalks, crossing improvements and bicycle facilities. | 92nd Ave, SE (Powell - City Limits) | $4,910,500 |
| 70009 | Portland | Belmont St, SE (25th - 43rd): Street and Pedestrian Improvements | Design and implement streetscape improvements to enhance sidewalks, lighting, crossings, transit stops, and signals. Evaluate the feasibility of bicycle facilities along the Belmont corridor. | Belmont St, SE (25th - 43rd) | $3,240,930 |
| 70010 | Portland | Burnside, E (28th - 82nd): Bicycle & Pedestrian Improvements | Install separated in-roadway bicycle facilities (32nd - 68th), construct traffic safety and pedestrian improvements (16th - Cesar Chavez), and improve pedestrian crossings to provide access to schools and transit (60th - 82nd). | Burnside, E (28th - 82nd) | $500,000 |


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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 70013 | Portland | Division St, SE (Grand - 60th): Multi-modal Improvements, Phase I | Design and implement streetscape improvements to enhance sidewalks, lighting, crossings, access to transit, transit stops, and signals. Add separated in-roadway bicycle facilities (52nd - 60th). | Division St, SE (Grand - 60th) | $5,848,135 |
| 70014 | Portland | Division St, SE (60th - I-205): Multimodal Improvements, Phase II | Design and implement streetscape improvements to enhance sidewalks, lighting, crossings, access to transit, transit stops, and signals. | Division St, SE (60th - I-205) | $2,806,000 |
| 70017 | Portland | Ellis St, SE (92nd - Foster): Bikeway | Design and implement bicycle facilities. | Ellis St, SE (92nd - Foster) | $648,186 |
| 70019 | Portland | Flavel Dr, SE (45th - Clatsop): Multimodal Improvements | Fully improve street from SE 45th to Clatsop Street with travel lanes, curbs, swales, sidewalks, and separated in-roadway bicycle facilities from 52nd to Clatsop. | Flavel Dr, SE (45th - Clatsop) | $7,294,088 |
| 70020 | Portland | Flavel St, SE (82nd - 92nd): Pedestrian Improvements | Construct sidewalks and crossing improvements. | Flavel St, SE (82nd - 92nd) | $340,000 |
| 70021 | Portland | Foster Rd, SE (Powell - 90th): Pedestrian/Bicycle/Safety Improvements | Improve sidewalks, lighting, crossings, bus shelters, and benches on Foster and improve pedestrian crossings to benefit access to transit. Install separated in-roadway bicycle facilities. | Foster Rd, SE (Powell - 90th) | $5,250,000 |
| 70024 | Portland | Foster & Woodstock, SE (94th - 101th): Street Improvements, Phase II | Implement Lents Town Center Business District Plan with new traffic signals, pedestrian amenities, wider sidewalks, pedestrian crossings, and street lighting. | Foster & Woodstock, SE (94th - 101th) | $11,510,000 |
| 70027 | Portland | Harney Dr, SE (52nd - Flavel): Bikeway | Design and implement bicycle facilities. | Harney Dr, SE (52nd - Flavel) | $1,252,000 |
| 70028 | Portland | Harold St, SE (52nd - Foster): Bikeway | Design and implement bicycle facilities. | Harold St, SE (52nd - Foster) | $200,000 |
| 70030 | ODOT | McLoughlin (99E), SE (Ross Island Bridge - Clatsop): Street Improvements | Provide access management and operational improvements from Ross Island Bridge to Harold and widen to six lanes from Harold to Tacoma. | McLoughlin (99E), SE (Ross Island Bridge - Clatsop) | $50,000,000 |
| 70031 | Portland | Holgate Bl, SE (52nd - I-205): Bikeway, Phase I | Design and implement bicycle facilities. | Holgate Bl, SE (52nd - I-205) | $100,000 |
| 70032 | Portland | Holgate Bl, SE (39th - 52nd): Street Improvements | Reconstruct pavement structure and stormwater drainage facilities, improve corner curb ramps to ADA standards, improve pedestrian crossings, and add separated in-roadway bicycle facilities. | Holgate Bl, SE (39th - 52nd) | $10,000,000 |
| 70033 | Portland | Holgate Bl, SE (McLoughlin - 39th): Bikeway, Phase II | Design and implement bicycle facilities. | Holgate Bl, SE (McLoughlin - 39th) | $2,000,000 |



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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 70040 | Portland | McLoughlin Blvd, SE (at Ross Island Sand and Gravel signalized entrance): Brooklyn Neighborhood Access Improvements | Upgrade intersection at Ross Island Sand and Gravel entrance to accommodate safe pedestrian crossing of McLoughlin Blvd. Alternative crossing opportunities will be considered if location is found to be infeasible or unsafe. | McLoughlin Blvd, SE (at Ross Island Sand and Gravel signalized entrance) | $330,000 |
| 70041 | Portland | Milwaukie, SE (Gideon - Mall): Bicycle & Pedestrian Improvements | Design and implement streetscape and pedestrian/bike improvements. | Milwaukie, SE (Gideon - Mall) | $350,000 |
| 70042 | Portland | Milwaukie, SE (Yukon - Tacoma): Bicycle & Pedestrian Improvements | Design and implement streetscape and pedestrian/bike improvements. | Milwaukie, SE (Yukon - Tacoma) | $1,403,000 |
| 70044 | Portland | Mt. Scott Bl, SE (92nd - 112th): Pedestrian Improvements | Build a continuous walkway for pedestrian travel and access to transit with crossing improvements at transit stop locations. | Mt. Scott Bl, SE (92nd - 112th) | $1,900,000 |
| 70045 | ODOT/Portland | Powell, SE (Ross Island Bridge - 50th): Multi-modal Improvements | Retrofit existing street with multimodal safety improvements including enhanced pedestrian and bicycle crossings, pedestrian and bike activated signals, median islands with trees, redesign of selected intersections and stormwater management facilities. | Powell, SE (Ross Island Bridge - 50th) | $7,997,100 |
| 70047 | Tri Met | Powell - Foster Rapid Bus, SE | Construct improvements that enhance frequent bus service along the Foster corridor. | Powell - Foster, SE | $745,368 |
| 70049 | Portland | Reedway St, SE (McLoughlin - 29th): Multi-Use Path | Construct a multi-use path from 23rd to 26th crossing McLoughlin Blvd and connecting to the McLoughlin multi-use path. | Reedway St, SE (McLoughlin - 29th) | $1,000,000 |
| 70052 | Portland | Seventies Greenstreet and Bikeway, SE (I-84 - Clatsop) | Design and implement a neighborhood greenway from I-84 to Clatsop with a varying alignment along the "70s" Avenues. | 70s Avenues, SE (I-84 - Clatsop) | $2,818,037 |
| 70053 | Portland | Springwater Corridor Trail, SE (Umatilla - 19th): Trail | Construct trail-with-rail multi-use path between Umatilla and 19th to fill in the "Springwater Gap." | Springwater Corridor Trail, SE (Umatilla - 19th) | $3,032,411 |
| 70055 | Portland | Tacoma St, SE (Sellwood Bridge - McLoughlin): Multi-modal Improvements | Implement boulevard design based on Tacoma Main Street study recommendations and incorporate McLoughlin Neighborhoods Project recommendations. | Tacoma St, SE (Sellwood Bridge - McLoughlin) | $1,400,000 |
| 70057 | Portland | Tacoma, SE (Sellwood Bridge - 45th/Johnson Creek): ITS | Communications infrastructure; closed circuit TV cameras, variable message signs for remote monitoring and control of traffic flow for four signals. | Tacoma, SE (Sellwood Bridge - 45th/Johnson Creek) | $231,495 |
| 70059 | Portland | Glisan St, NE (47th - I-205): Bikeway | Design and implement bicycle facilities. | Glisan St, NE (47th - I-205) | $81,023 |
| 70060 | Portland | 92nd, SE (Stark - Lincoln): Bikeway | Design and implement bicycle facilities. | 92nd, SE (Stark - Lincoln) | $50,000 |
| 70064 | Portland | Foster Rd, SE/FSE: ITS | CCTV at various locations; changeable signs; monitoring stations | Foster Rd, SE/FSE | $145,000 |
| 70065 | ODOT | McLoughlin/SE: ITS | CCTV at various locations; variable sign; monitoring stations. | McLoughlin/SE | $250,000 |


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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 80001 | Portland | 111th/112th Ave, SE (Market - Mt. Scott Bl): Bicycle & Pedestrian Improvements | Design and implement bicycle facilities on existing street (Market - Mt. Scott Bl) and construct sidewalks (Holgate - Mt. Scott Bl). | 111th/112th Ave, SE (Market - Mt. Scott Bl) | $2,070,127 |
| 80004 | Portland | 136th Ave, SE (Division - Foster): Bikeway | Improve streetscape to provide curbs, sidewalks, swales, and bicycle facilities from Division to Foster. | 136th Ave, SE (Division - Foster) | $5,000,000 |
| 80005 | Portland | 148th Ave, SE (Burnside - Powell): Pedestrian Improvements | Construct sidewalks, curbs, ADA ramps. | 148th Ave, SE (Burnside - Powell) | $980,000 |
| 80007 | Portland | 174th & Jenne Rd , SE (Foster - Powell): Multi-modal Improvements | Roadway improvements to increase safety and capacity to accommodate increased residential development. Widen roadway to 3 lanes and provide bicycle facilities and sidewalks. | 174th & Jenne Rd , SE (Foster - Powell) | $7,155,300 |
| 80008 | Portland | Barbara Welch Rd, SE (Foster - City Limits):Multimodal Improvements | Widen travel lanes, improve sidewalks, and improve intersection at Foster. Design and implement bicycle facilities on existing roadway. | Barbara Welch Rd, SE (Foster - City Limits) | $20,191,557 |
| 80009 | Portland | Division St, SE (I-205 - 174th): Multimodal Improvements, Phase III | Improve sidewalks, lighting, crossings, bus shelters and benches, and bicycle facilties. | Division St, SE (I-205 - 174th) | $5,710,912 |
| 80010 | Portland | Foster Rd, SE (102nd - Foster Pl): Pedestrian Improvements | | Foster Rd, SE (102nd - Foster Pl) | $1,403,000 |
| 80011 | Portland | Foster Rd, SE (136th - Jenne): Multi-modal Improvements | Widen street to three lanes to provide two travel lanes, continuous turn lane, bike lanes, sidewalks, crossing improvements, and drainage. Reconstruct Foster/162nd intersection. | Foster Rd, SE (136th - Jenne) | $16,963,756 |
| 80012 | Portland | Holgate Bl, SE (92nd - 142nd): Pedestrian Improvements | Construct sidewalks and crossing improvements to facilitate pedestrian travel and access to transit. Provide bicycle facilities (122nd - 136th). | Holgate Bl, SE (92nd - 142nd) | $1,260,000 |
| 80014 | Portland | Mill Park Pedestrian Improvements, SE | Construct sidewalks & crossing improvements to improve pedestrian travel and access to transit and schools on Market (96th - 112nd), 101st (Market - Division), 117th (Stark - Division). | Mill Park, SE | $1,185,000 |
| 80015 | ODOT | Powell, SE (99th - 174th): Multi-modal Improvements | Widen street to three to four lanes (inclusive of a center turn lane) with sidewalks and buffered bike lanes or other enhanced bike facility. Add enhanced pedestrian and bike crossings. | Powell, SE (99th - 174th) | $66,551,572 |
| 80016 | Portland | Powellhurst/ Gilbert Pedestrian Improvements, SE | Construct sidewalks & crossing improvements to enhance pedestrian travel and access to transit and schools on Harold (102nd-128th), 122nd (Bush-Harold), 110th (Harold-Foster); 103rd/104th (Powell-Foster). | Powellhurst/ Gilbert, SE | $1,473,288 |
| 80017 | Portland | Stark, SE (111th - City Limits): Bicycle and Pedestrian Improvements | Construct sidewalks and crossing improvements and provide separated in-roadway bicycle facilities. | Stark, SE (111th - City Limits) | $243,070 |



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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 80018 | Portland | Stark & Washington, SE (92nd - 111th): Gateway Plan District Street Improvements | Implement Gateway regional center plan with boulevard design retrofit including new traffic signals, improved pedestrian facilities and crossings, and street lighting. | Stark & Washington, SE (92nd - 111th) | $6,157,767 |
| 80020 | Portland | Market/Mill/Main, SE (72nd - 175th): Bikeway | Design and implement a neighborhood greenway. | Market/Mill/Main, SE (72nd - 175th) | $600,000 |
| 80021 | Portland/ Clackamas Co | Clatsop, SE (Deardorf/132nd - 162nd): Multimodal Improvements | Multimodal improvements based on PV Implementation Plan. | Clatsop, SE (Deardorf/132nd - 162nd) | $2,000,000 |
| 80022 | ODOT | I-205, SE (Division - Powell Blvd): Interchange Improvements | Add full access ramps to I-205 at Powell. | I-205, SE (Division - Powell Blvd) | $12,000,000 |
| 80023 | Portland | 162nd/Clatsop, SE: Intersection Improvements | Install signal at intersection. | 162nd/Clatsop, SE | $250,000 |
| 80024 | Portland/ Gresham | Clatsop, SE (162nd - City Limits): Street Extension | Extend street east into PV based on PV Implementation Plan. | Clatsop, SE (162nd - City Limits) | $4,202,582 |
| 80025 | Portland/ Gresham | Foster Rd, SE (162nd - Giese Rd): Multi-modal Street Improvements | Multimodal improvements based on PV Implementaiton Plan. | Foster Rd, SE (162nd - Giese Rd) | $2,525,400 |
| 80026 | Portland | 162nd, SE (Foster Rd - Clatsop): Street Improvements | Multimodal improvements based on PV Implementation Plan. | 162nd, SE (Foster Rd - Clatsop) | $7,000,000 |
| 90001 | Portland | 12th, Broadway, Cardinell & Davenport, SW (Montgomery - Vista): Bikeway | Design and implement bicycle facilities. | 12th, Broadway, Cardinell & Davenport, SW (Montgomery - Vista) | $4,508,000 |
| 90002 | Portland | 19th, SW (Barbur - Spring Garden): Bicycle and Pedestrian Improvements | Design and implement bicycle and pedestrian facilities. | 19th, SW (Barbur - Spring Garden) | $200,000 |
| 90003 | Portland | 25th Ave & Kanan, SW (23rd - B-H Hwy): Pedestrian Improvements | Construct a walkway for pedestrian travel and access to transit. | 25th Ave & Kanan, SW (23rd - B-H Hwy) | $450,000 |
| 90004 | Portland | 26th Ave, SW (Spring Garden - Taylors Ferry): Pedestrian Improvements | Construct a walkway for ped travel and access to transit and install street lighting. | 26th Ave, SW (Spring Garden - Taylors Ferry) | $350,000 |
| 90005 | Portland | 30th Ave, SW (Vermont to B-H Hwy): Bicycle & Pedestrian Improvements | Design and implement bicycle facilities, construct sidewalks, and improve the pedestrian crossing at Beaverton-Hillsdale Hwy & 30th. | 30th Ave, SW (Vermont to B-H Hwy) | $1,839,333 |
| 90006 | Portland | 35th Ave, SW (Vermont - Barbur): Bicycle & Pedestrian Improvements | Add bike facilities (Vermont - Barbur), sidewalks, and crossing improvements (Multnomah - Barbur). | 35th Ave, SW (Vermont - Barbur) | $690,000 |


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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 90007 | Portland | 35th Ave, SW (Taylors Ferry - Stephenson): Bicycle & Pedestrian Improvements | Add bicycle facilities (Taylors Ferry - Stephenson), sidewalks, crossing improvements, and median islands (Taylors Ferry - Dickinson) to improve safety. | 35th Ave, SW (Taylors Ferry - Stephenson) | $1,570,000 |
| 90009 | Portland | 48th/Alfred, SW (Taylors Ferry - 55th): Bikeway | Design and implement bicycle facilities. | 48th/Alfred, SW (Taylors Ferry - 55th) | $500,000 |
| 90011 | Portland | 55th/Pasadena/ Pomona, SW (Taylors Ferry - Barbur): Bikeway | Design and implement bicycle facilities. | 55th/Pasadena/ Pomona, SW (Taylors Ferry - Barbur) | $2,000,000 |
| 90012 | Portland | 61st/62nd, SW (Taylors Ferry - Pomona): Bikeway | Design and implement bicycle facilities. | 61st/62nd, SW (Taylors Ferry - Pomona) | $1,000,000 |
| 90013 | Portland | Arnold, SW (Boones Ferry - 35th): Bicycle & Pedestrian Improvements | Design and implement bicycle and pedestrian facilities. | Arnold, SW (Boones Ferry - 35th) | $3,479,000 |
| 90014 | Portland/ ODOT | Barbur Blvd, SW: ITS | Install intelligent transportation system infrastructure to improve safety and enhance traffic flow. | Barbur Blvd, SW | $550,000 |
| 90016 | Portland | Barbur Blvd, SW (3rd - Terwilliger): Multi-modal Improvements | Construct Improvements for transit, bikes and pedestrians. Transit improvements include preferential signals, pullouts, shelters, left turn lanes and sidewalks. | Barbur Blvd, SW (3rd - Terwilliger) | $4,000,000 |
| 90017 | Portland/ ODOT | Barbur Blvd, SW (Terwilliger - City Limits): Multi-modal Improvements | Complete boulevard design improvements including sidewalks and street trees, safe pedestrian crossings, enhanced transit access and stop locations, traffic signal at Barbur/30th, and bicycle facilities (Bertha - City Limits). | Barbur Blvd, SW (Terwilliger - City Limits) | $24,833,100 |
| 90019 | Portland | Beaverton-Hillsdale Hwy, SW: ITS | CCTV at Terwilliger, Berth, shattuck; changeable signs. | Beaverton-Hillsdale Hwy, SW | $315,675 |
| 90020 | Portland | Beaverton-Hillsdale Hwy, SW (Capitol Hwy - 65th): Multi-modal Improvements | Improve streetscape to include better sidewalks, crossings, and other improvements to enhance access to transit. | Beaverton-Hillsdale Hwy, SW (Capitol Hwy - 65th) | $3,565,023 |
| 90022 | Portland | Bertha, SW (B-H Hwy - Barbur): Multi-modal Improvements | Design and implement bicycle facilities on Bertha Blvd (Vermont-B-H Hwy), construct walkway for pedestrian travel and access to schools (Barbur-B-H Hwy); and improve street to City standards (Vermont-Capitol). | Bertha, SW (B-H Hwy - Barbur) | $2,104,500 |
| 90023 | Portland | Boones Ferry Rd, SW (Terwilliger - City Limits): Bikeway | Design and implement bicycle facilities. | Boones Ferry Rd, SW (Terwilliger - City Limits) | $7,015,000 |
| 90024 | Portland | Broadway Dr, SW (Sherwood - Grant): Pedestrian Improvements | Construct a sidewalk and crossing improvements. | Broadway Dr, SW (Sherwood - Grant) | $1,100,000 |
| 90025 | Portland | Cameron Rd, SW (45th - Shattuck): Multi-modal Improvements | Design and implement bicycle facilities, construct sidewalks, and provide safety improvements at the Cameron/Shattuck intersection. | Cameron Rd, SW (45th - Shattuck) | $3,068,000 |



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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 90026 | Portland | Capitol Hwy, SW (Multnomah Bl - Taylors Ferry): Bicycle & Pedestrian Improvements | Replace existing roadway and add sidewalks, improved crossings, bike lanes, and green stormwater features. | Capitol Hwy, SW (Multnomah Bl - Taylors Ferry) | $19,100,000 |
| 90027 | Portland | Capitol Hwy, SW (West Portland Town Center - 49th): Pedestrian Improvements | Complete curb extensions and medians recommended in the Capitol Hwy Plan. | Capitol Hwy, SW (West Portland Town Center - 49th) | $1,403,000 |
| 90028 | Portland | Beaverton-Hillsdale /Bertha/Capitol Hwy, SW: Intersection Improvements | Redesign intersection to improve safety. | Beaverton-Hillsdale /Bertha/Capitol Hwy, SW | $1,403,000 |
| 90029 | Portland | Capitol Hwy, SW (Terwilliger - Sunset): Multi-modal Improvements | Construct sidewalks, crossing improvements for access to transit and bike improvements, and install left turn lane at the Capitol/Burlingame intersection. | Capitol Hwy, SW (Terwilliger - Sunset) | $1,403,000 |
| 90031 | Portland | Dosch Rd, SW (Patton - B-H Hwy): Bicycle & Pedestrian Improvements | Design and implement bicycle and pedestrian facilities. | Dosch Rd, SW (Patton - B-H Hwy) | $5,745,000 |
| 90033 | Portland | Garden Home Rd, SW (Capitol Hwy - Multnomah): Multi-modal Improvements | Reconstruct road to three lanes with signal improvements at Multnomah intersection, drainage, bike lanes, sidewalks and curbs. | Garden Home Rd, SW (Capitol Hwy - Multnomah) | $1,931,033 |
| 90034 | Portland | Hamilton St, SW (Dosch - Scholls Ferry): Bicycle & Pedestrian Improvements | Design and implement bicycle facilities and construct sidewalks to provide access to transit and schools. | Hamilton St, SW (Dosch - Scholls Ferry) | $12,420,360 |
| 90038 | Portland | Humphrey Bl, SW (Patton - Scholls Ferry): Bicycle & Pedestrian Improvements | Construct bicycle facilities and sidewalks. | Humphrey Bl, SW (Patton - Scholls Ferry) | $4,000,000 |
| 90043 | Portland | Lancaster Rd, SW (Taylors Ferry - Stephenson): Pedestrian Improvements | Construct pedestrian facilities. | Lancaster Rd, SW (Taylors Ferry - Stephenson) | $1,000,000 |
| 90044 | Portland | 43rd & Lee, SW: Pedestrian Bridge & Path | Construct a bridge and path to connect SW Lee to SW 43rd within the existing ROW. | 43rd & Lee, SW | $90,000 |
| 90046 | Portland | Macadam, SW (Bancroft - Sellwood Br): ITS | CCTV at various locations; variable sign; monitoring station. | Macadam, SW (Bancroft - Sellwood Br) | $401,794 |
| 90047 | Portland | Macadam, SW (Bancroft - County line): Multi-modal Improvements | Improve pedestrian and bicycle crossings of Macadam and connections to the Willamette Greenway Trail. | Macadam, SW (Bancroft - County line) | $1,000,000 |
| 90048 | Portland/ ODOT | Pedestrian Overpass near Markham School, SW | Construct pedestrian path and bridge over Barbur Bl and I-5 to connect SW Alfred and SW 52nd to the rear of Markham School. | Between Alfred and 52nd, SW | $4,861,395 |


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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 90049 | Portland | Marquam Hill, SW (13th/Gibbs - 11th/Curry): Pedestrian Improvements | Construct a walkway and crossing improvements. | Marquam Hill, SW (13th/Gibbs - 11th/Curry) | $1,000,000 |
| 90050 | Portland | Multnomah Bl, SW (Barbur - 45th): Street Improvements | Reconstruct street to urban standards including curb, sidewalks, storm sewers and upgraded street lights. | Multnomah Bl, SW (Barbur - 45th) | $4,225,000 |
| 90051 | Portland | Nevada St/Ct, SW: Path & Stair/Bridge | Construct a path and bridge over Stevens Creek to connect Nevada Ct to Capitol Hill Road & Bertha Blvd at Chestnut. | Nevada St/Ct, SW | $400,000 |
| 90052 | Portland/ Mult Co | Palatine Hill Rd, SW (Boones Ferry - City Limits): Bikeway | Design and implement bicycle facilities. | Palatine Hill Rd, SW (Boones Ferry - City Limits) | $10,000,000 |
| 90053 | Portland | Palatine St, SW (27th-Lancaster): Street Extension | Complete neighborhood collector to provide multi-modal access to Lancaster Rd. | Palatine St, SW (27th-Lancaster) | $672,228 |
| 90054 | Portland | Patton Rd, SW (Vista - Scholls Ferry): Bicycle & Pedestrian Improvements | Construct bikeway (Vista - Scholls Ferry) and walkway (Homar to Shattuck). | Patton Rd, SW (Vista - Scholls Ferry) | $1,220,000 |
| 90055 | Portland | Pomona St, SW (35th - Barbur): Bicycle & Pedestrian Improvements | Provide bicycle facilities (35th - Capitol) and sidewalks (35th - Barbur). | Pomona St, SW (35th - Barbur) | $2,700,000 |
| 90059 | Portland | Shattuck Rd, SW (Patton - Vermont): Bicycle & Pedestrian Improvements | Provide bicycle facilities and sidewalks. | Shattuck Rd, SW (Patton - Vermont) | $6,405,000 |
| 90060 | Portland | South Portland Improvements | Reconstruct Naito Pkwy as two-lane road w/bike lanes, sidewalks, left turn pockets, & on-street parking. Includes realignment/regrading at intersecting streets; removal of Barbur tunnel, Ross Is Br ramps, Arthur/Kelly viaduct & Grover ped bridge. This project will be coordinated with ODOT and with the Southwest Corridor Plan, and will consider impacts to ODOT facilities including Naito Parkway and the Ross Island Bridge. | Natio Pkwy, SW | $39,695,079 |
| 90061 | Portland | Spring Garden, SW (Taylors Ferry - Capitol Hwy): Bicycle and Pedestrian Improvements | Provide bicycle facilities on existing street and construct pedestrian facilities. | Spring Garden, SW (Taylors Ferry - Capitol Hwy) | $4,165,000 |
| 90062 | Portland | Stephenson, SW (Boones Ferry - 35th): Multi-modal Improvements | Design and implement bicycle and pedestrian facilities. Improve safety at the Stephenson & Boones Ferry intersection. | Stephenson, SW (Boones Ferry - 35th) | $2,374,408 |
| 90063 | Portland | Sunset Bl, SW (Dosch - Capitol): Bicycle & Pedestrian Improvements | Construct bicycle facilities, sidewalks, and crossing improvements. | Sunset Bl, SW (Dosch - Capitol) | $1,683,600 |


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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 90064 | Portland | Taylors Ferry, SW (Capitol Hwy - City Limits): Bicycle & Pedestrian Improvements | Provide bicycle facilities, including shoulder widening and drainage, and construct sidewalk for access to transit (40th - 60th). | Taylors Ferry, SW (Capitol Hwy - City Limits) | $4,400,000 |
| 90065 | Portland | Taylors Ferry, SW (Macadam - 35th): Bicycle & Pedestrian Improvements | Widen shoulder in uphill direction on SW Taylors Ferry Rd from Macadam to Terwilliger to provide bicycle climbing lane and stripe bike lanes from Terwilliger to 35th. Construct sidewalks for pedestrian travel and access to transit. | Taylors Ferry, SW (Macadam - 35th) | $1,800,000 |
| 90066 | Portland/ Mult Co | Terwilliger, SW, (Troy - County line): Pedestrian Improvements | Provide pedestrian improvements including missing sidewalks and improved pedestrian crossings at Lewis & Clark and Maplecrest. | Terwilliger, SW, (Troy - County line) | $1,280,000 |
| 90067 | Portland | Vermont St, SW, (30th - Oleson): Bicycle and Pedestrian Improvements | Add bicycle facilities to existing street (30th - Oleson), construct sidewalk (37th - Shattuck), and redesign intersection at 25th. | Vermont St, SW, (30th - Oleson) | $7,909,800 |
| 90068 | Portland | West Portland Town Center, SW: Pedestrian Improvements | Improve sidewalks, lighting, crossings, bus shelters, and benches on Barbur, Capitol Hwy, and surrounding neighborhood streets. | West Portland Town Center, SW | $7,015,000 |
| 90069 | Portland | Barbur/Capitol/Huber/Taylors Ferry, SW: Intersection Improvements | Construct safety improvements for all modes at the intersection of Capitol Hwy, Taylors Ferry, Huber, and Barbur, including possible modifications to the I-5 ramps. This project will be coordinated with ODOT because it is within the interchange influence area. | Barbur/Capitol/Huber/Taylors Ferry, SW | $40,000,000 |
| 90070 | Portland | Capitol Hwy, SW (Vermont - Florida): Intersection Improvements | Realign the Capitol/Vermont/30th intersection and provide sidewalks, bike lanes, and drainage improvements. | Capitol Hwy, SW (Vermont - Florida) | $1,898,314 |
| 90071 | Portland/ Mult Co | Willamette Greenway, SW: Trail Extension | Extend Greenway Trail from Sellwood Bridge to the County line. | Willamette Greenway, SW | $500,000 |
| 90072 | Portland | Capitol Hwy & Lesser, SW (49th - Kruse Ridge): Bicycle & Pedestrian Improvements | Add bicycle facilities to existing roadway and construct sidewalks. | Capitol Hwy & Lesser, SW (49th - Kruse Ridge) | $1,400,000 |
| 90073 | Portland | Dolph Ct, SW (26th - Capitol Hwy): Pedestrian Improvements | Construct a walkway. | Dolph Ct, SW (26th - Capitol Hwy) | $640,000 |
| 90075 | Portland | 35th and Stephenson, SW: Pedestrian Improvements | Construct a walkway for pedestrian travel and access to schools on 35th (Stephenson-Dickenson) and on Stephenson (27th - 35th). | 35th and Stephenson, SW | $850,000 |
| 90077 | ODOT | Capitol Hwy, SW (Barbur): Ramp Seismic Retrofit | Seismic retrofit. | Capitol Hwy, SW (Barbur) | $1,039,000 |
| 90078 | Mult Co/Portland | Scholls Ferry, SW (Humphrey - County line): Multimodal Improvements | Add bicycle and pedestrian facilities; intersection improvements at Patton. | Scholls Ferry, SW (Humphrey - County line) | $2,300,000 |


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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 90079 | Mult Co/Portland | 55th Dr, SW (South of Patton Road): Pedestrian Improvements | Add sidewalks to both sides of street. | 55th Dr, SW (South of Patton Road) | $211,000 |
| 102040 | Portland | Gateway Regional Center, Local and Collector Streets, Phase 2 | High priority local and collector streets and pedestrian improvements in the Gateway Regional Center. | Gateway Regional Center, E | $32,648,540 |
| 102050 | Portland | Gateway Regional Center, Local and Collector Streets, Phase 1 | High priority local and collector streets and pedestrian improvements in the Gateway Regional Center. | Gateway Regional Center, E | $4,209,000 |
| 102290 | Portland | Saint Johns Truck Strategy Implementation phase II | Implement traffic calming pedestrian and bicycle improvements along the Fessenden/St. Louis corridor. Implement freight and other multimodal improvements on N. Lombard street from N. Bruce to St. Louis Ave. | Saint Johns, N | $3,345,990 |
| 102340 | Portland | Columbia Slough Trail Gaps | Close gaps in Columbia Slough Trail: North Slough to North Portland Rd; Landfill to Pier Park; I-5 to NE Elrod; NE Elrod to NE 82nd Ave; NE 82nd Ave to 92nd Ave; I-205 to approx. NE 128th; NE 145th to 158th, Peninsula Canal, Cross-Levee, Delta Park Trail. | Columbia Slough Trail, N/NE | $8,460,000 |
| 103540 | Portland | Fanno Creek Greenway (Red Electric) Trail | Provide east-west route for pedestrians and cyclists in SW Portland that connects the existing Fanno Creek Greenway Trail to Willamette Park. | Fanno Creek Greenway (Red Electric) Trail | $17,653,000 |
| 105420 | Portland | Foster Rd. Improvements (162 - Jenne) | Improve Foster Rd. to Minor Arterial (Parkway) standards, 2 lanes, with turn pockets where appropriate. | Foster Rd. Improvements (162 - Jenne) | $3,014,698 |
| 108570 | Portland | Jenne/Foster | Modify the intersection to improve traffic safety and operations. Evaluate adding a second EB left turn lane from Foster to Jenne. | Jenne/Foster | $540,780 |
| 108580 | Portland | 174th/Powell | Modify the intersection to improve traffic safety and operations. | 174th/Powell | $1,860,824 |
| 110910 | Portland/ Port | Columbia Blvd./I-205 Interchange: SB On-Ramp Improvement | Widen the southbound on-ramp to three lanes, including for one for Freight and HOV use. | Columbia Blvd./I-205 Interchange | $750,000 |
| 111020 | Portland | Streetcar Extension to Hollywood via Sandy Blvd or Broadway/ Weidler | Corridor Alternatives Analysis, public outreach, planning, design, engineering, and construction for future streetcar extension from Lloyd District/Central Eastside to Hollywood Town Center. The new extension intended to provide streetcar service from Northwest Portland to Hollywood. | Sandy Blvd or Broadway/ Weidler, NE | $70,000,000 |
| 111330 | Portland | St. Johns Truck Strategy Implementation Phase III | Addresses pedestrian safety, bicycle safely and neighborhood livability impacts associated with cut-through truck traffic on N. Fessenden St. The project will construct pedestrian crossing safety and traffic calming improvements, such as curb extensions and median islands. | St. Johns, N | $1,000,000 |


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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 111970 | Portland | Swan Island Active Transportation Access and Mobility Improvements | Improve access and mobility on Swan Island by constructing the recommended bikeway and trail network. | Swan Island, N | $9,000,000 |
| 111980 | Portland | Portland-Milwaukie Light Rail Active Transportation Enhancements Project | Construct a shared-use path along SE McLoughlin Blvd from 17th Ave to the Springwater Corridor Trail and build a bicycle parking center at the Tacoma/Springwater light rail station. This project will be coordinated with ODOT to determine the alignment along McLoughlin Blvd. | Portland-Milwaukie Light Rail, SE | $8,000,000 |
| 113160 | Portland | Lents Town Center Active Transportation Demonstration Project | Expand from existing 26 miles of developed bikeway to 53 miles, including improvements of existing facilities. Construct 4 miles of new sidewalks and undertake encouragement programs in support of new infrastructure. | Lents Town Center, SE | $57,000,000 |
| 113180 | Portland | MLK (Broadway Killingworth) Streetcar Corridor | Corridor Alternatives Analysis, public outreach, planning, design, engineering, and construction for future streetcar extension from Lloyd District to NE Portland. The new extension intended to provide streetcar service from South Waterfront District to Northeast Portland neighborhoods. | MLK (Broadway-Killingworth) | $65,000,000 |
| 113190 | Portland | NW 18th/19th (Saiver/Thurman Streetcar Corridor) | Corridor Alternatives Analysis, public outreach, planning, design, engineering, and construction for future streetcar extension to Con-Way and NW Portland. | NW 18th/19th (Saiver/Thurman) | $35,000,000 |
| 113200 | Portland | NE 60th & Glisan LRT Station Area | Implement pedestrian and bicycle improvements in the 60th Ave MAX Station Area. | NE 60th & Glisan LRT Station Area | $7,570,723 |
| 113230 | Portland | Sullivan's Gulch Trail, Phase 1 | Construct a multi-use trail for pedestrians and bicycles within the Banfield (I-84) Corridor from the Eastbank Esplanade to NE 21st Ave. | Sullivan's Gulch Trail, NE | $7,700,000 |
| 113240 | Portland | Barbur Bridges | Reconstruct existing viaducts. Include bicycle and pedestrian facilities on or parallel to the structures. | Barbur Blvd, SW | $32,000,000 |
| 113610 | Portland | Portland Bike Share | Design and implement a bike share system. | Citywide | $4,690,000 |
| 115590 | Portland | NE Halsey Safety Improvements (40th - 92nd) | Make safety improvements including pedestrian/bicycle crossings, left turn pockets, and improved signal timing. | NE Halsey Safety Improvements (40th - 92nd) | $150,000 |
| 115600 | Portland | Central City Multimodal Safety Improvements | Identify, prioritize, and implement multi-modal safety improvements in the Portland Central City. Includes preliminary development of a new greenway trail south of the Marquam Bridge, providing access to the Tilikum Bridge and the South Waterfront neighborhood. | Central City | $6,616,200 |
| 115610 | Portland | South Rivergate Freight | Make roadway improvements and evaluate alternatives to resolve rail blockages, and reconstruct the N Lombard/Rivergate intersection to accommodate truck turning movements. Install ITS communication infrastructure including advance notification systems for rail blockage and CCTV cameras to monitor truck and rail traffic in the South Rivergate Industrial District | Rivergate, N | $3,552,899 |
| 115620 | Portland | Swan Island ITS | Improve signal timing to improve access to and from Swan Island Industrial area. | Swan Island, N | $551,350 |


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| TSP ID | Lead Agency | Project Title | Project Description | Location | Cost Estimate |
|---|---|---|---|---|---|
| 115640 | Portland | Barbur Demonstration Project 19th Ave. to 26th Ave. | The project will make minor improvements to existing signalized intersections and provide two new enhanced crossings for pedestrians and cyclists along SW Barbur Boulevard. | Barbur (19th Ave. - 26th Ave) | $2,100,000 |
| 115670 | Portland | Downtown I-405 Pedestrian Safety and Operational Improvements | Improve pedestrian and bike access from NW Portland to Central City across I-405. Improves traffic operations for I-405 off-ramp. | Central City | $2,240,000 |
| 115690 | Portland | Willamette Greenway Trail/Chimney Park | Construct a pedestrian/bicycle bridge over Columbia Blvd and adjacent connections. Connects North Portland Greenway Trail segments 1 and 2. | Willamette Greenway Trail/Chimney Park, N | $2,612,381 |
| 115700 | Portland | Columbia/ Alderwood | Improve traffic operations and freight mobility on Columbia Blvd between Cully and Alderwood. | Columbia/Alderwood, N | $5,527,534 |
| 115710 | Portland | Barbur/99W Corridor Safety and Access to Transit | This project makes improvements for safety, access to transit, and transit operations in the Barbur-99W corridor. | Barbur/99W, SW | $3,605,001 |
| 115720 | Portland | Powell-Division Safety and Access to Transit | This project makes improvements for safety, access to transit and transit operations in the Powell and Division corridors. | Powell-Division, SE | $2,800,000 |
| 116320 | Portland/ Port | North Hayden Island Drive | Reconstruct North Hayden Island Drive from the Burlington Northern Rail Bridge to the I-5 Hayden island Interchange. | North Hayden Island Drive, N | $12,350,000 |
| 116330 | Portland/ Gresham | Gresham Fairview Trail Phase V | Multi-use path on 185th from Sandy to Marine drive | Gresham Fairview Trail, NE | $1,000,000 |
| 116340 | Portland | 9th Ave Neighborhood Greenway NE | Design and implement a neighborhood greenway along 7th Ave and/or 9th Ave through NE Portland and the Lloyd District. | 9th Ave, NE | $700,000 |
| 116350 | Portland | 9th Ave Neighborhood Greenway SE | Design and implement a neighborhood greenway along 9th Ave through the Central Eastside Industrial District. | 9th Ave, SE | $700,000 |
| 116360 | Portland | NE Multnomah multi-modal improvements | Construct permanent improvements to the NE Multnomah protected bikeway. | Multnomah, NE | $1,000,000 |
| 116380 | Portland | Capitol Highway Safety Improvements | Make safety improvements including pedestrian/bicycle crossings, left turn pockets, and improved signal timing. | Capitol Highway, SW | $150,000 |
| 116390 | Portland | Johns Landing Streetcar | Corridor Alternatives Analysis, public outreach, planning, design, engineering, and construction for future streetcar extension from Portland to Johns Landing. | Johns Landing, SW | $80,000,000 |
| 116400 | Portland | North Portland Greenway Segment 1 | Build a multi-use trail connecting Kelley Point Park to N Columbia Blvd at Chimney Park. | North Portland Greenway, N | $9,559,102 |
| 116410 | Portland | North Portland Greenway Segment 2 | Build a multi-use trail connecting Chimney Park, Pier Park, Baltimore Woods, Cathedral Park, and St Johns. | North Portland Greenway, N | $2,083,874 |
| 116420 | Portland | North Portland Greenway Segment 3 | Build a multi-use trail connecting the Cathedral Park with Swan Island via University of Portland and Willamette Cove. | North Portland Greenway, N | $14,787,630 |
| 116430 | Portland | North Portland Greenway Segment 4 | Build a multi-use trail connecting Waud Bluff Trail to N Going Street through Swan Island. | North Portland Greenway, N | $5,256,420 |
| 116440 | Portland | North Portland Greenway Segment 5 | Build a multi-use trail along the Albina Yard connecting Swan Island to the Rose Quarter. | North Portland Greenway, N | $7,306,910 |
| 116460 | Portland | NE Broadway Multi-modal improvements (Broadway Bridge - 42nd) | Construct a protected bikeway and enhanced pedestrian/bicycle crossings. | Broadway (Broadway Bridge - 42nd), NE | $3,500,000 |



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# Appendix B
# Urban Service Agreements

Urban service agreements are being reviewed and updated as part of the Comprehensive Plan Update implementation phase (Task 5). When available, a list of relevant agreements will be added here to comply with Oregon Revised Statutes 195 and 197.


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# Appendix C
# Resources

| **Document** | Date | Source |
|---|---|---|
| Airport Futures | 2010 | BPS/Port |
| Bicycle Plan for 2030 (Bicycle Master Plan) | 2010 | PBOT |
| Bull Run Water Supply Habitat Conservation Plan | 2008 | PWB |
| Bureau of Environmental Services Strategic Plan | 2011 | BES |
| BES Capital Improvement Plan | Annual | BES |
| Climate Action Plan | 2009 | BPS |
| Columbia Boulevard Wastewater Treatment Plant Conditional Use Master Plan | 2010 | BES |
| Columbia Boulevard Wastewater Treatment Plant Facilities Plan | 2008 | BES |
| Combined Sewer System Plan | | BES |
| Comprehensive Plan | 1980-2010 | BPS |
| CSO Facilities Plan | 2011 | BES |
| Distribution System Master Plan | 2007 | PWB |
| Fanno and Tryon Creeks Watershed Management Plan | 2005 | BES |
| Freight Master Plan | 2006 | PBOT |
| Infrastructure Master Plan | 2000 | PWB |
| Johnson Creek Restoration Plan | 2001 | BES |
| Metro 2040 Growth Concept | 1995/2012 | Metro |
| Metro Regional Framework Plan | 1997/2005 | Metro |
| Metropolitan Greenspaces Master Plan | 1992 | Metro |


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| | | |
|---|---|---|
| Mt. Hood National Forest Land and Resource Management Plan | 1990 | USDA Forest Service |
| Natural Area Acquisition Strategy | 2006 | PP&R |
| Natural Areas Restoration Plan | 2010 | PP&R |
| Northwest Forest Plan | 1994 | USDA Forest Service |
| Oregon Highway Plan (OHP) | 1999 | ODOT |
| Oregon Transportation Plan (OTP) | 2006 | ODOT |
| Parks 2020 Vision | 2001 | PP&R |
| Pedestrian Master Plan | 1998 | PBOT |
| Portland Parks & Recreation Strategic Plan | 2012 | PP&R |
| Portland Plan | 2012 | BPS |
| Portland Watershed Management Plan (PWMP) | 2006 | BES |
| Powell Valley Road Water District Wellhead Protection Plan | 1998 | PVRWD |
| PWMP 5-Year Implementation Strategy 2012-2017 | 2012 | BES |
| Regional Transportation Plan (RTP) | 2013 | Metro |
| Regional Water Supply Plan | 1996/2004 | RWPC |
| Seasonal Water Supply Augmentation and Contingency Plan, also referred to as the Summer Supply Plan (SSP) | Annual | PWB |
| Statewide Comprehensive Outdoor Recreation Plan (SCORP) | 2008 | OPRD |
| Stephens Creek Stormwater System Plan | 2012 | BES |
| Stormwater Discharge Monitoring Plan | 2012 | BES |
| Stormwater Management Manual | 2008 | BES |
| Stormwater Management Plan | 2011 | BES |
| Streetcar Concept Plan | 2009 | PBOT |
| Transportation System Plan | 2006 | PBOT |


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| | | |
|---|---|---|
| Tryon Creek Wastewater Treatment Plant Facilities Plan | 1999 | BES |
| UIC Corrective Action Plan | 2006 | BES |
| Underground Injection Control (UIC) Management Plan | 2012 | BES |
| Urban Forest Action Plan | 2007 | PP&R |
| Urban Forestry Management Plan | 2004 | PP&R |
| Urban Growth Management Functional Plan | 1996/2013 | Metro |
| Water Management and Conservation Plan | 2010 | PWB |


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# Appendix D
# Glossary

### Bureau abbreviations

- BES - Bureau of Environmental Services
- BES - Bureau of Environmental Services
- BPS - Bureau of Planning and Sustainability
- PBOT - Portland Bureau of Transportation
- PBEM - Portland Bureau of Emergency Management
- PPB - Portland Police Bureau
- PP&R - Portland Parks & Recreation
- PWB - Portland Water Bureau

### Local, State and Federal Agency abbreviations

- DEQ - Oregon Department of Environmental Quality
- EPA - U.S. Environmental Protection Agency
- MCDD - Multnomah County Drainage District
- Metro - Elected regional government for the Portland metropolitan area
- ODOT - Oregon Department of Transportation
- ORPD - Oregon Parks and Recreation Department
- RWPC - Regional Water Providers Consortium
- USDA - U.S. Department of Agriculture

**Portlanders:** People who live, work, do business, own property, or visit Portland, including people of any race, ethnicity, sex, gender or gender identity, sexual orientation, belief system, political ideology, ability, socioeconomic status, educational status, veteran status, place of origin, language spoken, age or geography.

**Active transportation:** Transportation that involves physical activity, including walking, biking, and using transit (because usually one must walk or roll to the bus or train).

**Adaptive management:** A dynamic planning and implementation process that applies scientific principles, methods, and tools to improve management activities incrementally as better information and as analytical tools become available. Involves frequent modification of planning and management strategies, goals, objectives and benchmarks. Requires frequent monitoring and analysis of the results of past actions and application of those results to current decisions.


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**Asset management:** The continuous cycle of asset inventory, condition, and performance assessment that has as its goal the cost-effective provision of a desired level of service for physical assets. Investment decisions consider planning, design, construction, maintenance, operation, rehabilitation, and replacing assets on a sustainable basis that considers social, economic, and environmental impacts.

**Best practice:** An activity that has proven its effectiveness in multiple situations and may have applicability in other situations.

**Center:** Places with concentrations of commercial and community services, housing, gathering places, and transit connections. Centers provide services to surrounding neighborhoods and are intended to be places that are a focus of growth, where increasing numbers of people will live, work, and visit. Different types of centers have varying functions, levels of activity, and scale and intensity of development:

**Central City:** Corresponds to the Central City plan district, which serves as the region's premier center, anchoring an interconnected system of centers.

**Centers and corridors:** When used together, "centers and corridors" refers generally to places where development is concentrated, including the Central City, Gateway Regional Center, Town Centers, Neighborhood Centers, Transit Station Areas, Civic Corridors, and Neighborhood Corridors.

**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):** A federal law, commonly known as Superfund, that was enacted in1980 and established requirements for hazardous waste sites; authorized actions to address releases or threatened releases of hazardous waste; provided for liability for responsible parties; and established a trust fund to provide for cleanup of hazardous waste when no responsible party can be identified.

**Civic Corridors:** These are a prioritized subset of the city's most prominent transit and transportation streets. They connect centers, provide regional connections, and include segments where commercial development and housing are focused. Civic Corridors are intended to become places that continue their important transportation functions while providing livable environments for people and evolving into distinctive places that are models of ecological design.

**Clean Water Act (CWA)**: A law passed by the U.S. Congress in 1972 that makes the discharge of pollution into surface or ground waters without a permit illegal, and that encourages the use of the best achievable pollution control technology to reduce the impact of discharged effluent.

**Combined sewer overflow (CSO)**: In areas with combined sewers that convey both sewage and stormwater in a single pipe, stormwater runoff during rainstorms can exceed the capacity of pipes, causing overflow of sewage and stormwater into a waterbody.

**Corridor:** When an area is designated as a corridor (such as a Civic or Neighborhood Corridor), it may be a single major street or a broader mobility corridor for a range of transportation modes (transit, pedestrians, cyclists, freight, motor vehicles, and so forth), although not necessarily on the same street.


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**Critical infrastructure:** Assets and systems that are essential for the functioning of society and the economy, including energy generation, transmission and distribution; telecommunications; water supply and wastewater; transportation systems; public health; and security and emergency response services.

**Ecological function:** The physical, chemical, and biological functions of a watershed such as flow conveyance and storage, channel dynamics, nutrient cycling, microclimate, filtration, control of pollution and sedimentation, water quality, terrestrial and aquatic habitat, and biodiversity.

**Ecosystem services:** The contribution of ecosystem conditions and processes to human well-being. Examples include pollination of trees and plants, climate regulation, clean air and water, flood mitigation, stormwater management, recreational opportunities, and satisfaction of aesthetic and spiritual needs.

**Endangered Species Act (ESA)**: A law passed by the U.S. Congress in 1973 that established programs for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The U.S. Fish and Wildlife Service maintains the list of threatened and endangered species.

**Green infrastructure:** Public or private assets—either natural resources or engineered green facilities—that protect, support, or mimic natural systems to provide stormwater management, water quality, public health and safety, open space, and other complementary ecosystem services. Examples include tress, natural areas, ecoroofs, green street facilities, wetlands, and natural waterways.

**Greenways:** A system of accessible pedestrian- and bike-friendly green streets and trails that link neighborhood centers, parks, schools, natural areas, and other key community destinations. The Greenways system is a prioritized subset of pedestrian and bicycle connections that use multi-objective, distinctive design approaches that draw on and contribute to Portland's pedestrian, bicycle, green street, and parks and open space systems.

**Habitat Corridors:** Stream and/or vegetation connections that provide habitat values and allow wildlife to move between habitats.

**Habitat-friendly development:** Strategies to provide habitat for and prevent harm to native resident and migratory wildlife. Examples include habitat-oriented and wildlife-friendly ecoroofs, bridges, buildings and sites, including features such as nest platforms and bat boxes. Strategies also involve development designs and practices that limit the amount of light, noise, vibration, and other disturbance that affect wildlife and wildlife habitat, especially during vulnerable wildlife life cycles (such as mating/nesting season and migration), improve wildlife access and passage, limit fencing, roads, culverts and other barriers between important habitats (between desirable feeding and watering sites, for example), and limit impacts related to construction in rivers.

**Healthy watershed**: A healthy urban watershed has the hydrologic, habitat, and water quality conditions suitable to protect human health and maintain viable ecological functions and processes, including self-sustaining populations of native fish and wildlife species whose natural ranges include the Portland area.

**High-Capacity Transit Corridors:** The system of light rail and other high-capacity transit stations. Some of these stations are located along streets that serve as Civic Corridors (such as Interstate Avenue), but


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others are located along freeways or other locations where the primary focus of activity and development is in Transit Station Areas.

**High-risk infrastructure:** Infrastructure assets that have a high risk of failure, based on the likelihood and consequence of that failure.

**Hydrologic cycles:** The movement of water on, in, and above the earth, through processes of evaporation, condensation, precipitation, infiltration, runoff, and subsurface flow.

**Infrastructure:** Generally long-lived capital assets that serve whole communities, are normally stationary, and can be preserved for a significant number of years. Two of the most basic types of infrastructure are transportation and utilities. Examples include streets, bridges, tunnels, drainage systems, water and sewer lines, pump stations and treatment plants, dams, and lighting systems. Beyond transportation and utility networks, Portland includes buildings, green infrastructure, parks and recreation, communications, and information technology as necessary infrastructure investments that serve the community.

**Level of service standard:** A defined standard against which the quality and quantity of service can be measured. A level of service can take into account reliability, responsiveness, environmental acceptability, customer values, and cost.

**Low-impact development:** Strategies to reduce the environmental impact of development on natural systems, including hydrology and vegetation. These strategies include using paving and roofing materials to reduce effective impervious area, clustered or small lot development that reduces disturbance area, the use of vegetated stormwater management to mimic pre-development site hydrology, alternative road layout and narrower streets, natural area protection, and landscaping with native plants.

**Municipal Separate Storm Sewer System (MS4)**: A publicly-owned conveyance or system of conveyances that discharges to waters of the U.S. and is designed or used for collecting or conveying stormwater, but is not a combined sewer or part of a publicly-owned treatment system. The MS4 stormwater system is regulated under the Clean Water Act.

**National Environmental Protection Act (NEPA):** A federal law that promotes protection and enhancement of the environment and established procedural requirements for environmental assessments (EAs) and impact statements (EISs) for proposed federal agency actions.

**National Pollutant Discharge Elimination System (NPDES)**: Wastewater and Surface water quality program authorized by Congress as part of the 1987 Clean Water Act, and administered by the state Department of Environmental Quality. NPDES provides guidance to municipalities and state and federal permitting authorities on how to meet wastewater and stormwater pollution control goals as flexibly and cost-effectively as possible.

**Total Maximum Daily Loads (TMDLs)**: A calculation of the maximum amount of a pollutant a waterbody can receive and still meet water quality standards. The Clean Water Act establishes and regulates TMDLs.

**Underground Injection Controls (UIC)**: An injection system that distributes or injects fluids such as stormwater runoff or wastewater below the surface of the ground.


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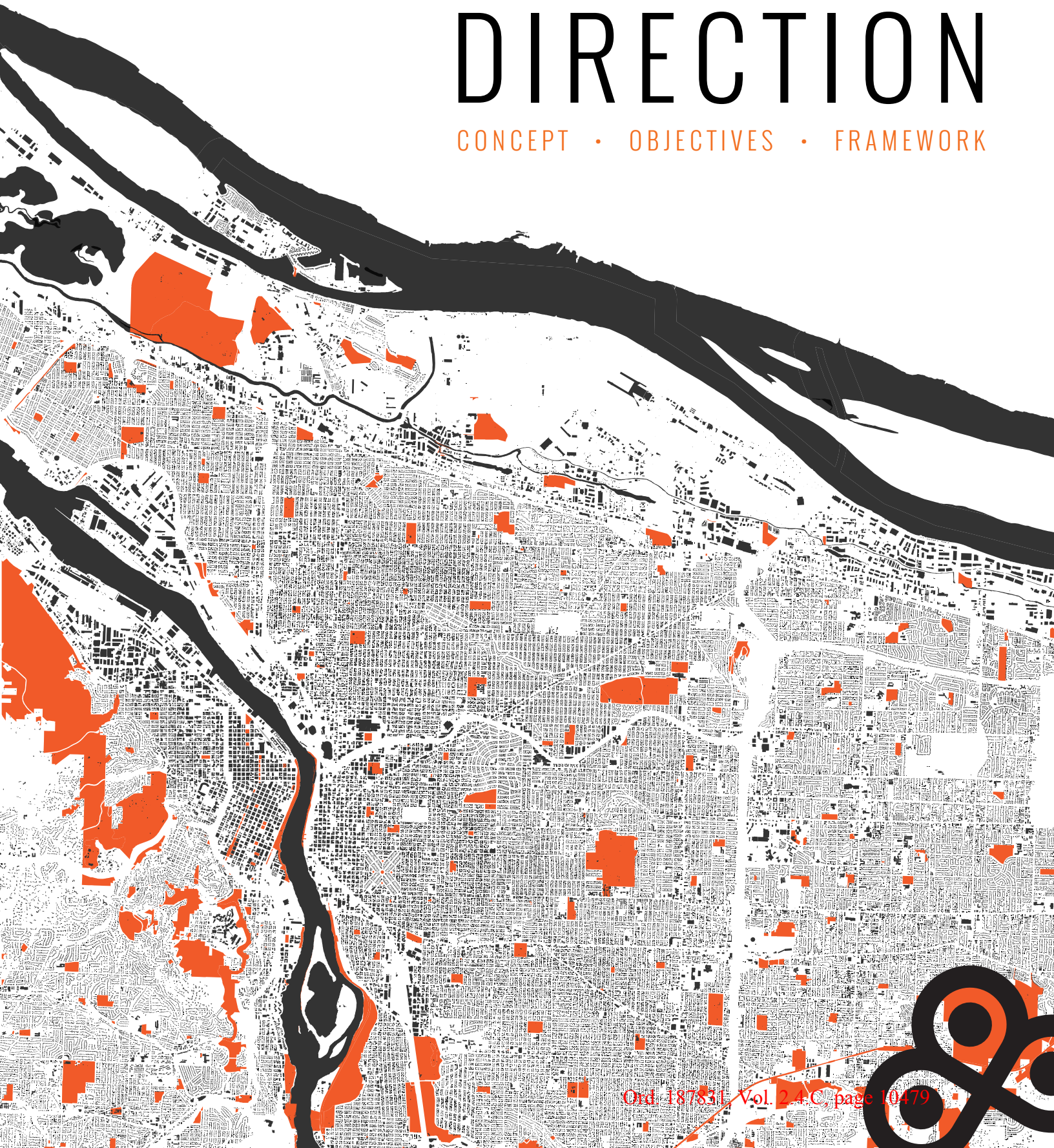
DRAFT 7.21.2014

COMPREHENSIVE PLAN UPDATE 2014

# URBAN DESIGN DIRECTION

CONCEPT • OBJECTIVES • FRAMEWORK



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# PURPOSE OF THIS DOCUMENT

This document compiles and summarizes the key urban design components of Portland's Comprehensive Plan. To read the full Comprehensive Plan, its goals and policies and see the project list or land use/zoning map, please visit this website: www.portlandoregon.gov/bps/pdxcompplan or call the Bureau of Planning and Sustainability at (503) 823-7700 for assistance.

This document provides context and background to help understand the Urban Design Framework. The document focuses on elements of the city, existing and proposed, that make up the city's physical form. It sets the context by describing the evolution of the physical form. It compiles and illustrates the urban design concept and objectives from the comprehensive plan. It also illustrates how the city intends to grow, how people will experience the public spaces within it, and how different places in the city can be enhanced.

The Urban Design Framework and its illustrations show how to strengthen existing and help make new places throughout Portland. They will be implemented through changes to city regulatory tools, including the Zoning Code, street plans and standards, land use and design review procedures and design guidelines. Part of the impact of the Urban Design Framework is the focus it brings to key issues and systems for the city that affect the quality, character and potential of places and experiences found in Portland now and in the future.



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## PORTLAND IS A GREAT AMERICAN CITY

It is defined by a rich and diverse collection of neighborhoods and districts, strong connections to the Pacific Northwest environment, and an active and vital central city.



Portlanders cherish the city's natural setting and landscape defined by the Willamette and Columbia Rivers, the Tualatin foothills to the west, a series of buttes and stands of Douglas Fir trees to the east and the Cascade Mountain Range on the horizon.

Residents and business owners alike value its attractive walkable neighborhoods, active downtown, growing main streets and neighborhood centers, and improving industrial and recreational waterfronts.



People enjoy its historic buildings and districts, local food and drink culture, arts and music scenes, and collection of schools and universities.

## PAST



Early platting from the 19th Century looking east across downtown



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## LESSONS LEARNED

Portland's is seen as a leader nationally in land use/ transportation planning, urban design and sustainable city development. The next 25 years require continued innovation and leadership to build on lessons learned locally and internationally about city building.

- It is critical to further integrate higher density land uses with safe active transportation and transit if we hope to reduce the city's overall carbon emissions.

- Complete communities that offer a range of well-designed housing options and costs are the best way to support a diverse, resilient and age-friendly city.

- Compact neighborhoods and districts that offer walkable access to everyday services – like grocery stores – support a healthier lifestyle as more people choose to walk, bike and take transit instead of drive.

- Developing well-designed buildings, open spaces, and streetscapes is critical to create successful places. Diversity is essential -- there needs to be openness to innovation; as well as respect for existing local character; and responsiveness to how that character is different in different parts of the city.

## PRESENT



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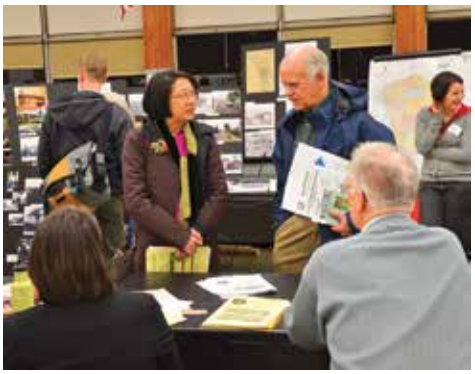
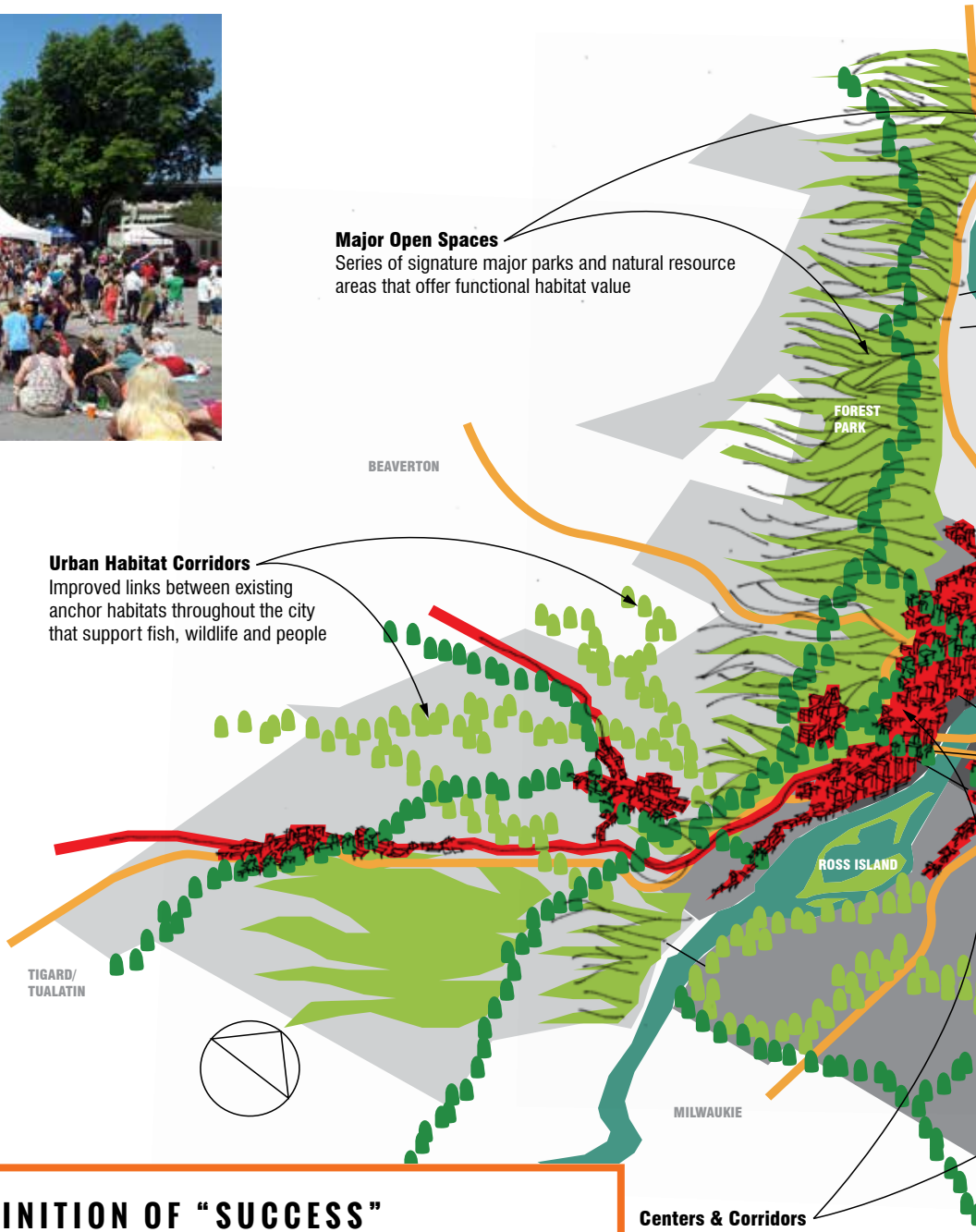
# URBAN DESIGN CONCEPT










## LOOKING AHEAD... A DEFINITION OF "SUCCESS"

The physical space of Portland generates a variety of urban experiences for residents, workers and visitors. Portland is visually and physically linked to its natural setting and landscape - the Columbia and Willamette Rivers, meandering waterways, buttes, ridges, and hills. . Complete districts and neighborhoods, from the West Hills to Powell Butte, share and connect around local centers and corridors. These vibrant and more densely developed places attract and serve residents with shopping, services, social interaction and transit lines. These shared places offer people the opportunity to build supportive community that serves them through the different phases of their lives.

**PEOPLE AND PLACES SHAPE THE EVOLUTION OF PORTLAND.**



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**City Greenways**
System of quieter, park-like walking and biking routes linking centers, parks and other destinations

**Regional Transit/Transportation Corridors**
Network of regional high capacity transit, freight, freeway, rail and airport facilities supporting movement of goods, services and people

**Pattern Areas**
Broad geographies of the city defined by distinctive built and natural features



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# PORTLAND'S PHYSICAL EVOLUTION

## PORTLAND LANDSCAPE

The city of Portland is situated on the banks of the Willamette River roughly ten miles from its confluence with the larger Columbia, and some 70 miles inland from the Pacific Ocean. The city sits at the northern end of the Willamette River Valley, between the Oregon Coast and Cascade Ranges. Portions of north and southwest Portland are in the Tualatin Mountains, more commonly known as the West Hills. Much of East Portland sits on the Boring Lava Field, an expansive extinct volcanic plateau that generated roughly 30 cinder cones, including Mount Tabor.







## THE PORTLAND BASIN

This distinctive landscape at the gateway to the Columbia River Gorge was home to many groups of Chinookan -speaking peoples for thousands of years prior to settlement by Euro -Americans in the nineteenth century. Rich riverine and forest habitats offered an abundance of food - salmon, large and small game and a variety of plant foods, including Wapato. The relatively mild climate and plentiful natural resources supported one of the densest populations of Native Americans in North America, with numerous villages of large, multi-family plank houses.



Early 1850s Sketch of Chinook Plankhouse and Canoes

## A NINETEENTH-CENTURY WESTERN CITY

Portland was founded in 1843 on the Donation Land Claim owned by William Overton and Asa Lovejoy, on a spot known as "The Clearing," where Native Americans and traders rested en route along the Willamette River between Oregon City and Fort Vancouver. The spot was appealing because of its access to both the fertile Willamette Valley and the Pacific Ocean via the Willamette and Columbia rivers. Incorporated in 1851, Portland grew to almost 20,000 residents by 1880 and was the largest city in the Pacific Northwest, driven by a maritime trade economy that supplied a large hinterland and linked the region's agricultural and natural resources to markets around the globe. The city was anchored by a dense central business district characterized by multi-story cast-iron commercial buildings and an active waterfront, closely surrounded by low-scale, wood frame residences.

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## THE STREETCAR ERA

From the late 1800s through roughly 1930, Portland expanded with development of a tight grid of streets and small single-family lots laid out along streetcar lines that extended from downtown. The streetcar streets were typically lined with mixed use, multi-story buildings that had ground floor storefronts and housing or offices above. In the early twentieth century, Portland's first city plans (Olmstead 1903, Bennett 1912, and Cheney 1921) sought to impose a more formal order to the cityscape. These plans proposed systems of civic spaces and parks, lush parkways and grand boulevards, and the regulation of land uses.

## POST WORLD WAR II

Like the rest of the nation after World War II, Portland experienced the euphoria of transportation independence enabled by the private automobile. Population was attracted to the residential suburbs at the city's edges and demand for space in the central city declined. This led to the demolition of numerous historic buildings in the city's core, in part to create parking lots. Local freeway and arterial street construction to serve suburban growth and urban renewal programs to revitalize central Portland demolished neighborhoods and displaced thousands of Portlanders.

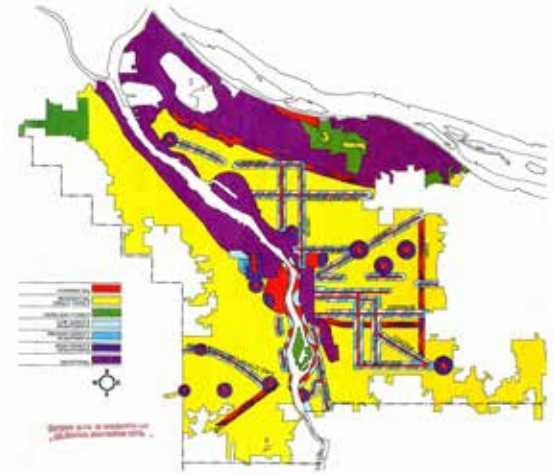
## 1980 COMPREHENSIVE PLAN

In 1973 Oregon Senate Bill 100 was passed. It required all jurisdictions in Oregon to develop comprehensive plans to guide their growth. Its goal was to protect the state's signature agricultural and natural resource areas.

In 1980, Portland adopted its first Comprehensive Plan. This plan was developed around a concept of "Nodes and Noodles". Nodes were places of concentrated urban activity, including higher density housing, and employment. Noodles were the primary corridors or streets that connected the nodes. At the time of this plan, the city's geography was 25% smaller than it is today. After adoption of the plan, Portland grew through annexations of lands in East and Southwest Portland. The pattern of and level of development in the annexed areas was very different from pre -annexation streetcar era neighborhoods. The newly annexed areas urbanized during the post-World War II period. Development in that time was characterized by expressways and state highways, larger blocks, fewer local street connections, and single-use commercial buildings with large surface parking lots.




Streetcar System Map, 1918



"Nodes and Noodles" Concept

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# EMERGING ISSUES

The vision and community role in developing past plans helped make Portland what it is today. The city's livability, its distinctive places, the character of its different communities and the manageability of its transportation network have all contributed to its attractiveness when compared to other American cities. But change is inevitable and success requires proactive and thoughtful action to respond to new challenges and opportunities... Among them:

## RE-EMERGING (AND EMERGING) MAIN STREET CORRIDORS

The parts of Portland developed in the streetcar era (roughly 1915 – 1930) already have many features of walkable complete neighborhoods - multi-story buildings along well scaled streets with neighborhood-serving businesses, shops and restaurants. In these areas, the need is to track development issues and seek high quality building designs that build on the strengths of these places.

East Portland and some parts of Southwest Portland grew later (roughly 1946 – 1965), with fewer intersections, sidewalks and multi-story buildings. Retail and services were spread out on arterial roads with fewer distinct centers are far less walkability. In these parts of town, a new model for center and corridor development is needed as, in some cases, investment in streets, sidewalks and other infrastructure was not provided as the areas grew originally. These new models must be better tailored to the different physical qualities of these unique parts of the city.

## A SAFER SYSTEM OF CONNECTIONS AND PATHWAYS

Portland has been a national leader in working with regional partners to develop networks of corridors for buses, light rail (MAX) walking and bicycling. These systems have been effective in creating high numbers (roughly 35%) of transit riders, walkers, and bicyclists - especially into and around downtown from inner parts of the city. Citywide, however, the numbers are lower and an approach that is attractive to more riders -- offering more safety, diversity and clarity -- may be necessary to encourage more walking, bicycling and transit trips into the future.






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## EMPLOYMENT LANDS ARE IN SHORT SUPPLY

Portland has many successful and growing business sectors, ranging from office clusters in the Central City to medical or college centers to industrial lands and districts. These sectors and employment areas have special physical space and infrastructure needs, and are frequently in competition with more lucrative mixed use or residential development. Ensuring the city can provide enough space for these vital businesses and districts will be critical to accommodate business and job growth.

## PORTLAND WILL GROW AND GET DENSER

Portland is growing, and is expected to continue to grow. There are over 200,000 new people expected to arrive in the next 25 years, and more will likely follow. Despite its reputation, Portland is still less than half as dense as the vastly more spread-out Los Angeles, California. Most of Portland's centers and corridors, including the Central City, have a lot of potential for new buildings. These places may have numerous sites that are surface parking areas, underutilized lots or simply vacant, all of which pose fewer challenges to future redevelopment. Developing well-designed urban places, centers, corridors, and experiences will strengthen the character of the city's existing places while cultivating many new ones.

## ENVIRONMENTAL GROWTH AND IMPROVED RESILIENCY

Previous planning efforts were not confronted with the climate change and carbon emissions issues facing the city and region today. Most of the city's larger parks, open spaces and natural resource areas are at its edges, with few incursions into the heart of the city and rare connections between them. These areas, and potential future links between them, provide not only critical green spaces offering relief for Portland residents, workers and visitors, but also vital habitat for native species of fish, birds, pollinators and other types of wildlife.





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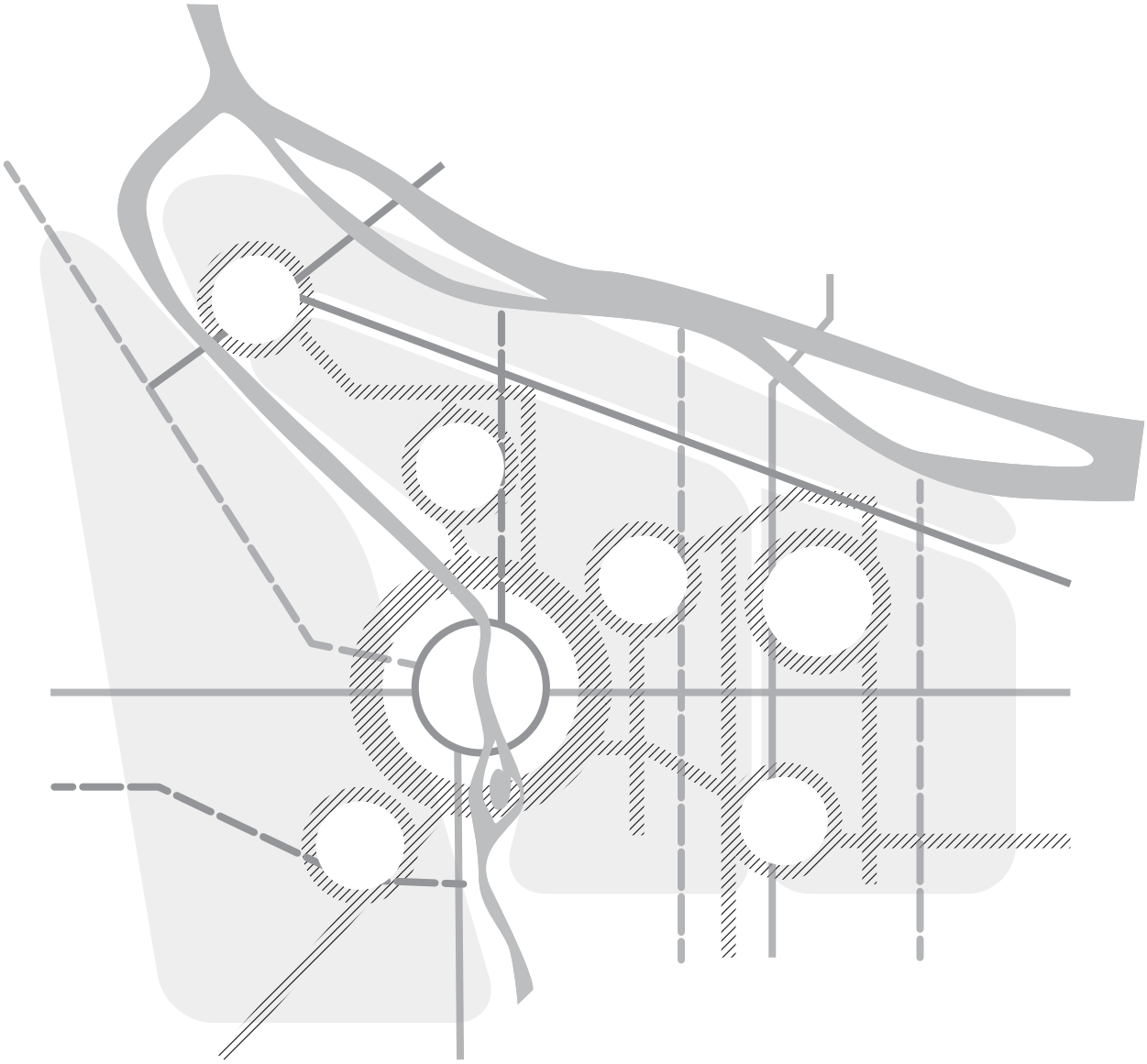



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The URBAN DESIGN OBJECTIVES describe what the city's design intentions are and will shape the city's physical landscape over the next 25 years. While these objectives are similar to the seven Key Directions of the Comprehensive Plan, they focus on those portions of the key directions that most directly relate to the physical form of Portland. Embedded within the objectives are strategies that improve the city's resilience and lower carbon emissions.

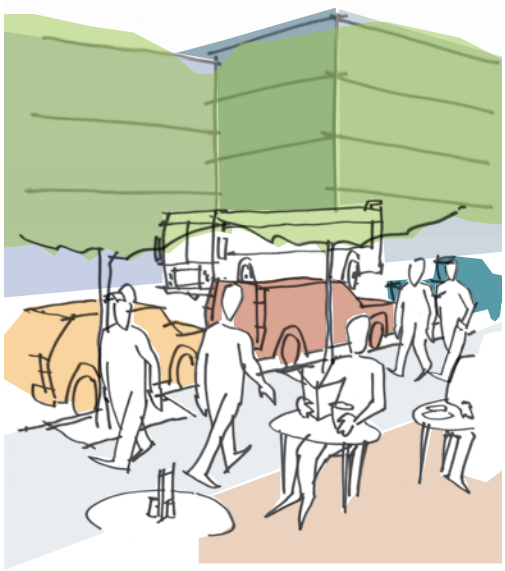


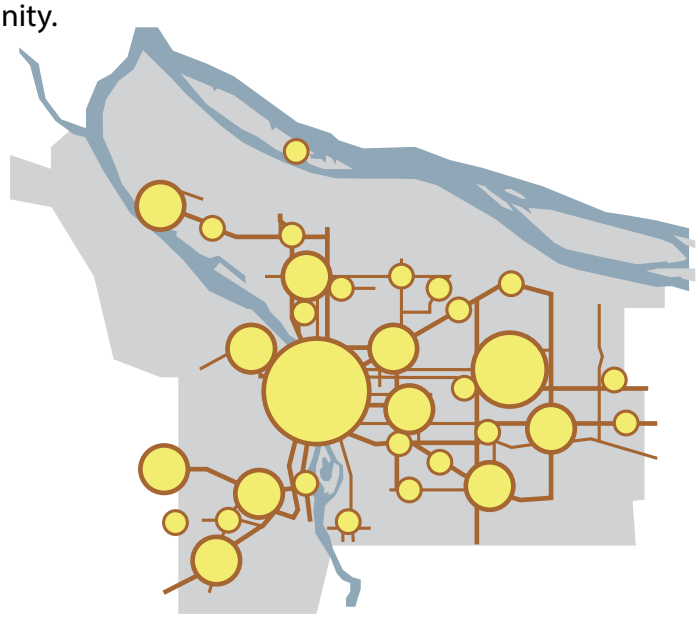
The urban design objectives including the city's preferred growth scenario (centers and corridors) and build on the existing physical assets of Portland -- its people, places and distinctive features. The diagrams illustrating how the city will grow and include both existing and aspirational information, such as proposed centers, open spaces or connections.

As the objective diagrams are not maps, they do not describe every place, connection or feature. The objectives were developed looking at the entire city holistically, and are intended to set broad direction for future urban design work in the city. The framework maps that directly follow this section provide more detailed information.

## CREATE COMPLETE NEIGHBORHOODS

The city's preferred growth scenario creates complete neighborhoods by locating new households and jobs in centers and corridors, maximizing investments in infrastructure, reducing redevelopment pressures on open spaces, employment districts and lower density residential areas, and adding new people, businesses and activities to the community.





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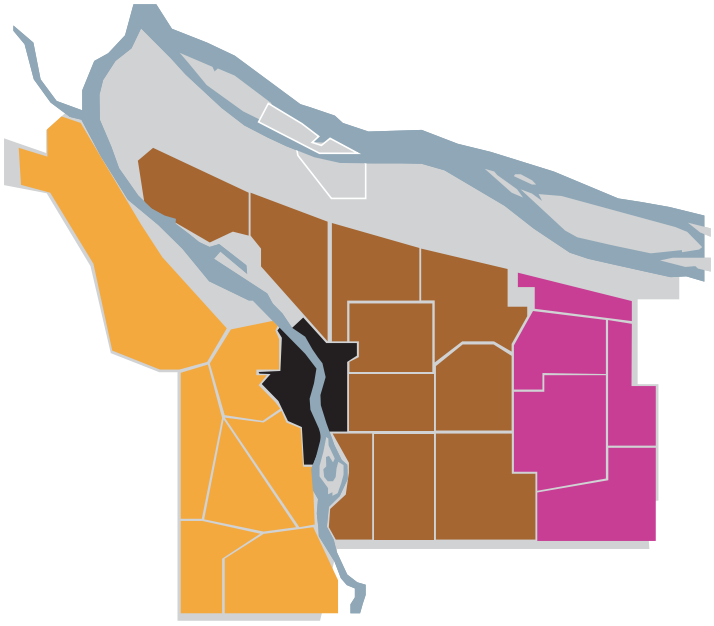
## PLAN & DESIGN TO FIT LOCAL CONDITIONS

While all parts of the city will see redevelopment and change as the city continues to grow, the form and character of the new buildings, open spaces and connections will vary by pattern area, responding to local characteristics and building on them in new innovative ways.

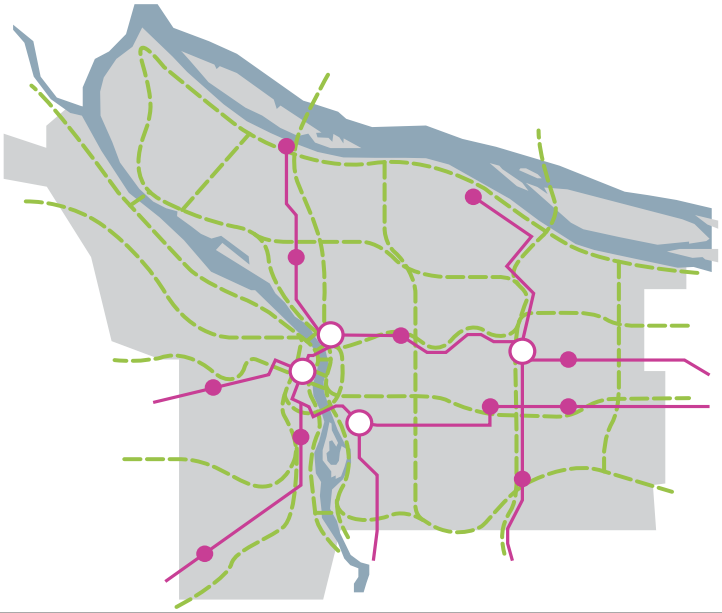




## CONNECT PEOPLE AND NEIGHBORHOODS

Developing a series of different types of connections, such as transit lines and city greenways will support more Portlanders by offering alternative experiences to strengthen a sense of place, reduce reliance on the automobile, and encourage active, healthy lifestyles.







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## IMPROVE NATURAL AREAS AND OPEN SPACES

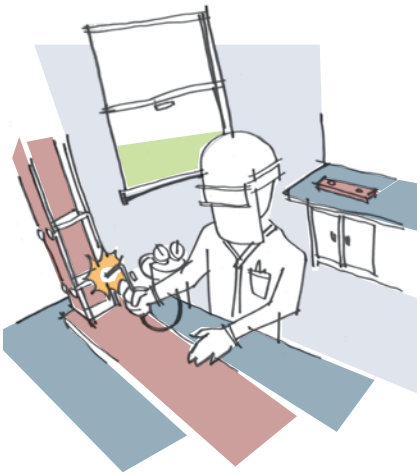
Improving and expanding natural areas and open spaces, and linking them with urban habitat corridors and other connections, will ensure that Portland will continue to be a healthy place to live and a resilient urban landscape in the face of global climate change.

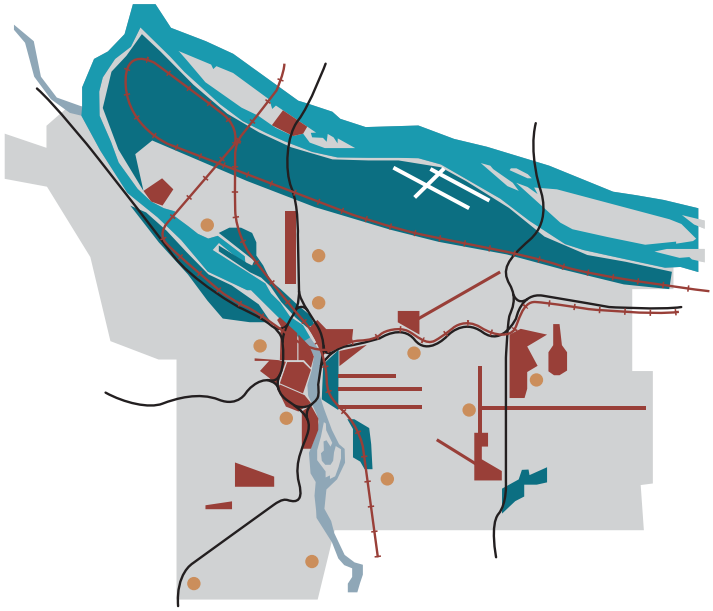




## ENCOURAGE JOB GROWTH

Industrial and employment districts have specialized building needs and system connections such as river ports, the airport, freeways, and heavy rail lines that must be improved to maintain Portland's role as a diverse job center, key northwest port to Asia and home to several growing campuses, institutions and other business sectors.





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# PRIORITIZE GROWTH AND CHANGE

## AN INTENTIONAL INVESTMENT STRATEGY IS ESSENTIAL.

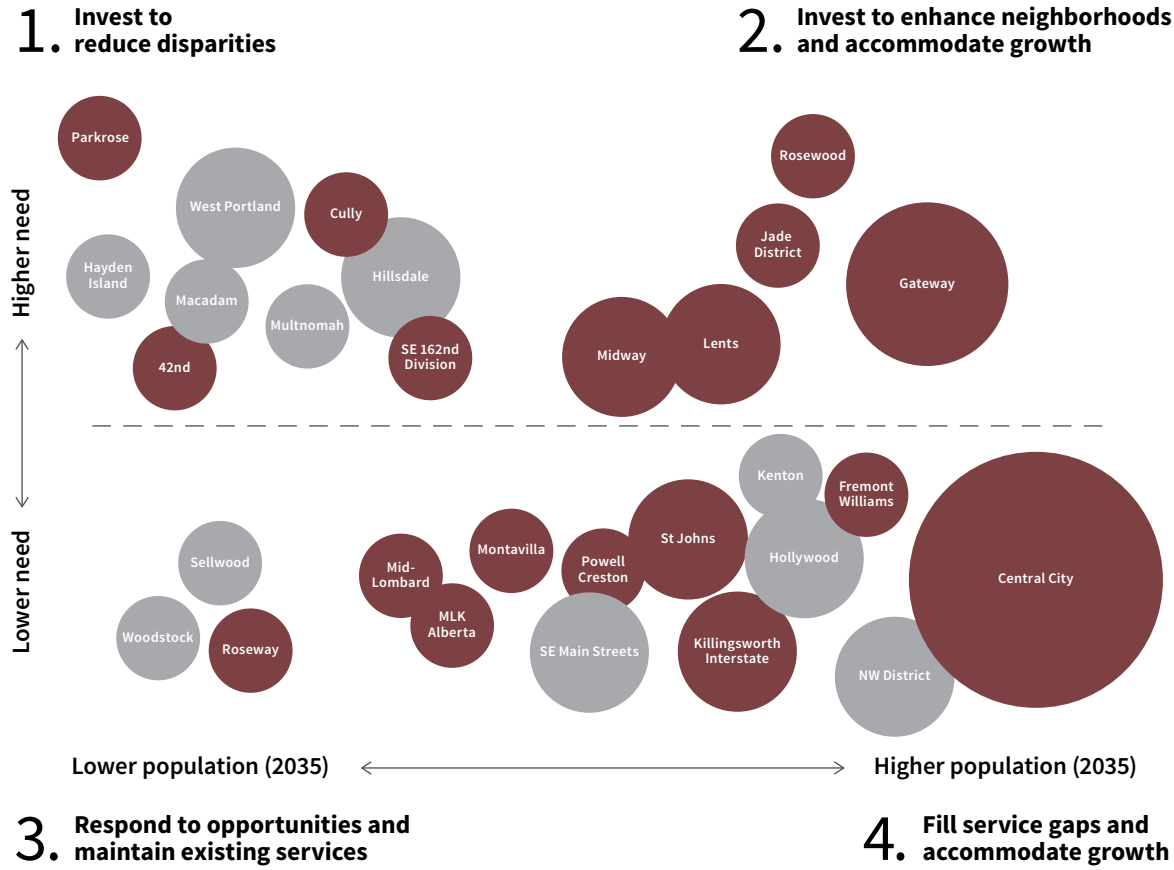
Portland's neighborhoods vary in size and local conditions. The Comprehensive Plan supports four investment strategies that tailor the type of investment to local needs and context.

**1. Invest to reduce infrastructure disparities and improve livability.**
This strategy is appropriate for places that are not expected to grow significantly, but have existing infrastructure deficiencies. Investments could improve the safety of streets, bicycle and pedestrian routes, and local parks. Economic development programs could support existing and new businesses, and improve neighborhood prosperity and vitality.

**2. Invest to enhance neighborhoods, maintain affordability and accommodate growth.**
This strategy is aimed at places that lack basic infrastructure or services and either have many of residents now, or will in the future. Investments could include improving streets, creating new parks, and addressing other deficiencies. Economic development programs could help increase jobs and community services and preserve businesses in the area.

**3. Invest to maintain existing services and respond to opportunities.**
In these places, investments focus on maintaining existing infrastructure, increasing safety, as well as responding to opportunities.

**4. Invest to reduce disparities, enhance affordability and accommodate growth.**
Some places have already benefited from public and private investments in services like light rail, complete streets and neighborhood business districts. Future investments should focus on making sure infrastructure can serve new residents, increase safety, fill remaining service gaps, and expand affordable housing choices.



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# EXPECTATION FOR CHANGE

Portland's preferred strategy of targeting new growth in centers and corridors is on the right track, but the city has a long way to go to accommodate this change. The growth won't arrive overnight, and the pace of change will vary in different parts of the city based on changing market conditions.

Generally, centers and corridors throughout the city are likely to see new, mixed use and multi-story buildings on sites with the most redevelopment potential, such as surface parking lots, underutilized parcels and vacant lands.

## EXISTING



## 5-10 YEARS



## 25+ YEARS



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# URBAN DESIGN FRAMEWORK




**CENTERS**
- Central City
- Gateway Regional Center
- Town Centers
- Neighborhood Centers

**dashed lines indicate centers without adopted boundaries*

**CORRIDORS**
- Civic Corridors
- Neighborhood Corridors
- High Capacity Transit
- Rail

**CITY GREENWAYS**
- Enhanced Greenway Corridors
- Existing Trails
- Proposed Trails

**URBAN HABITAT CORRIDORS**
- Parks & Open Spaces
- Enhanced & Potential Habitat Corridor
- Waterbodies

**PATTERN AREAS**
- Central City
- Inner Neighborhoods
- Western Neighborhoods
- Eastern Neighborhoods
- Rivers
- Inner Ring Districts



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The **URBAN DESIGN FRAMEWORK** brings the urban design objectives to the ground and describes how the city will achieve them. It locates centers and corridors – areas expected to grow and change – within the context of the City's distinctive natural and topographic features. It is intended to help shape conversations about existing and future places, connections and experiences, and the public infrastructure investments needed to support them.



### CENTERS
Compact, mixed use urban areas targeted for growth will provide access to jobs, commercial services, transit connections, and housing options.



### CORRIDORS
Major city streets with new growth offer critical connections to centers, links to transit, commercial services, jobs, and housing options.



### TRANSIT STATION AREAS
Station areas along high capacity transit lines connect people to important areas of residential, employment, and urban development.



### CITY GREENWAYS
A citywide network of trails, greenways, and heritage parkways connect people to nature, parks, and major destinations or centers.



### URBAN HABITAT CORRIDORS
A system of enhanced urban habitat corridors connect fish, wildlife, and people to key natural features throughout the city.



### EMPLOYMENT AREAS
Diverse and growing areas of employment host a variety of business sectors in different parts of the city.



### PATTERN AREAS
Portland's broad geographies are defined by existing patterns of natural and built features.

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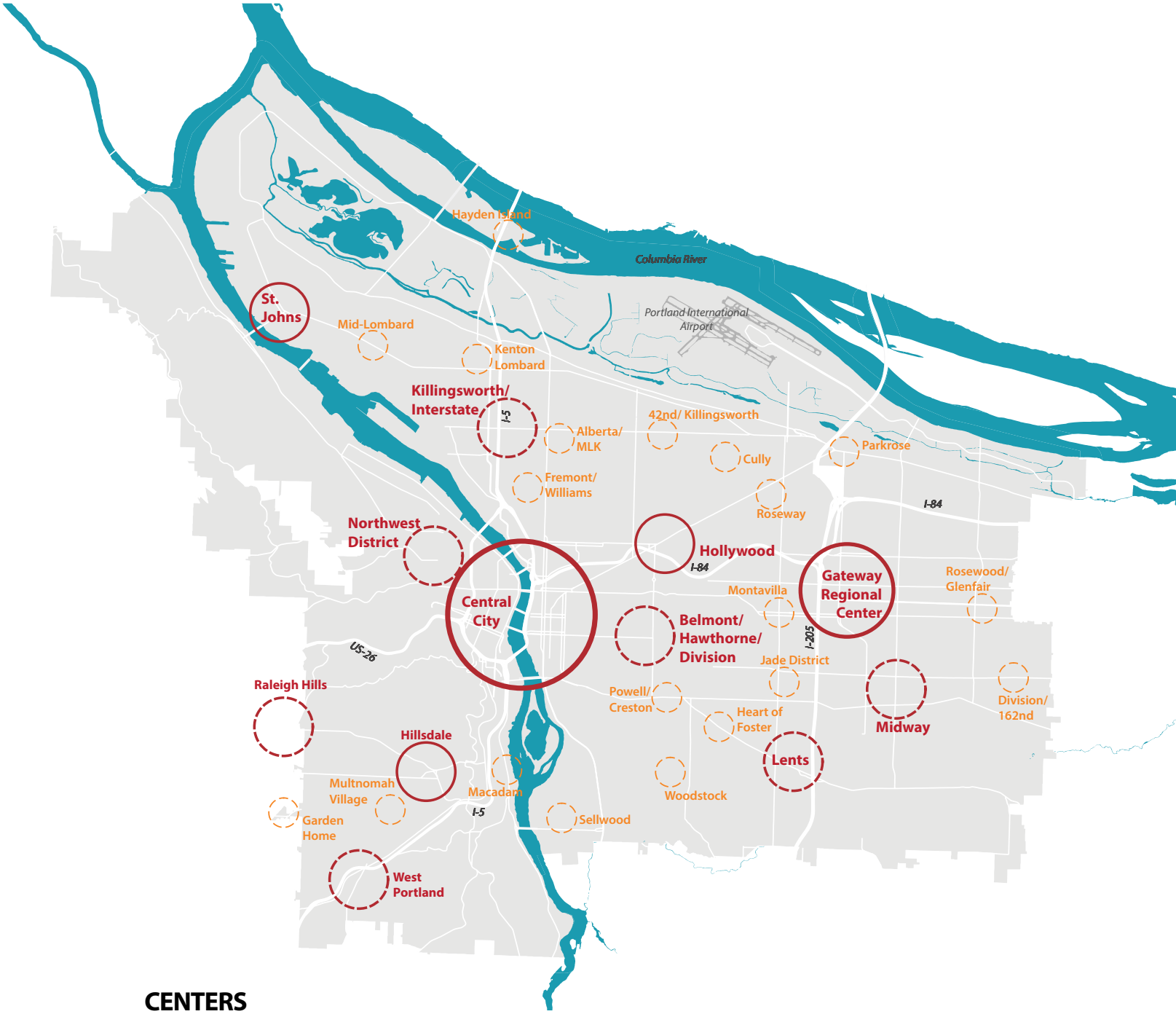
# CENTERS




## CENTERS

- Central City
- Gateway Regional Center
- Town Centers
- Neighborhood Centers

**dashed lines indicate centers without boundaries*



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Part of the preferred growth scenario, centers provide the primary areas for growth and change in Portland over the next 25 years. They are compact urban places that serve as anchors to complete neighborhoods, featuring retail store and businesses (grocery stores, restaurants, markets, shops,etc.) civic amenities (libraries, schools, community centers, churches, temples, etc.) housing options, health clinics, employment centers and parks or other public gathering places. Targeting new growth in centers helps achieve goals to have more Portlanders living in complete neighborhoods, using more mass transit and active transportation choices, and addressing global climate change issues with local initiatives.



## CENTRAL CITY

The Central City serves as the region's premier center with jobs, services, and civic and cultural institutions that support the entire city and region. It includes attractions, amenities and institutions not found anywhere else in the city, such as Portland State University, Tom McCall Waterfront Park, the Oregon Convention Center, the Portland Art Museum and the region's Transit Mall.



## GATEWAY REGIONAL CENTER

Gateway Regional Center is East Portland's major center, serving the area and region with civic, employment and community services. It includes the City's second largest transit hub outside of downtown and good freeway access to regional destinations, such as Portland International Airport.



## TOWN CENTERS

Town Centers serve a broad area of the City. They are typically anchored by employment centers or institutions, feature a wide range of commercial and community services, and have a wide range of housing options.



## NEIGHBORHOOD CENTERS

Neighborhood Centers are smaller centers – frequently areas of focused activities along streets – that include a mixture of higher density commercial and residential buildings. Because these centers are smaller, there are many more of these citywide, meaning that more Portlanders are likely to be closer to a neighborhood center than any other kind.

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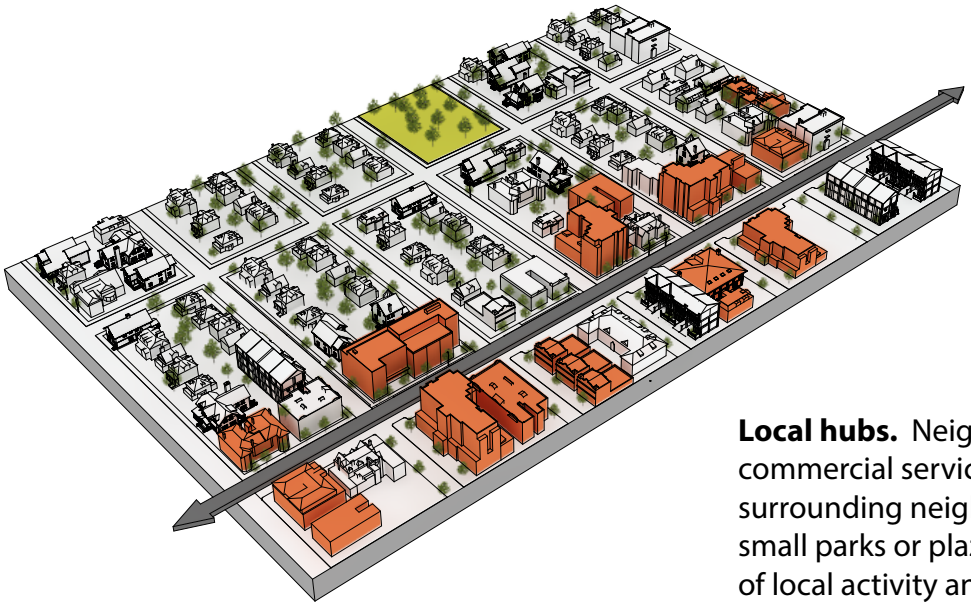
# CENTERS: A COMPARISON

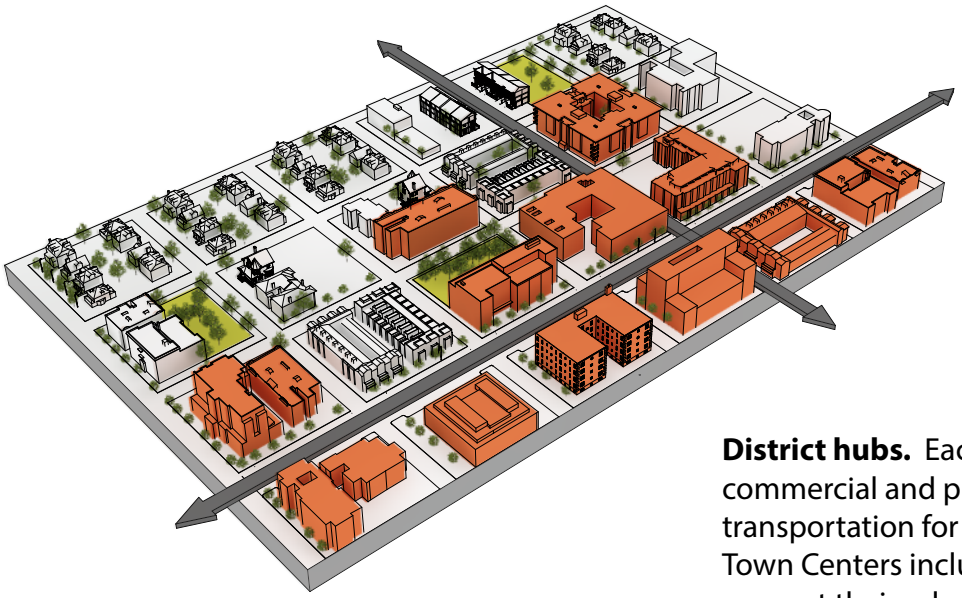
## NEIGHBORHOOD CENTER



| | |
|---|---|
| **HOUSING** | 3,500 units |
| **JOBS** | Primarily retail/ service |
| **BUILDING SCALE** | Up to 4 stories |

**Local hubs.** Neighborhood centers are hubs of commercial services, activity, and transportation for surrounding neighborhoods. They typically include small parks or plazas to support their roles as places of local activity and gathering. These smaller centers provide housing capacity within a half-mile radius for about half the population needed to support a full-service neighborhood business district (surrounding neighborhoods provide the rest of this population base).

## TOWN CENTER



| | |
|---|---|
| **HOUSING** | 7,000 units |
| **JOBS** | Diverse employment/ institutions |
| **BUILDING SCALE** | Up to 5-7 stories |

**District hubs.** Each Town Center is a hub of commercial and public services, activity, and transportation for the broad area of the city it serves. Town Centers include parks or public squares to support their roles as places of focused activity and population. They provide housing capacity within a half-mile radius for enough population to support a full-service neighborhood business district.

Corridor

New Development



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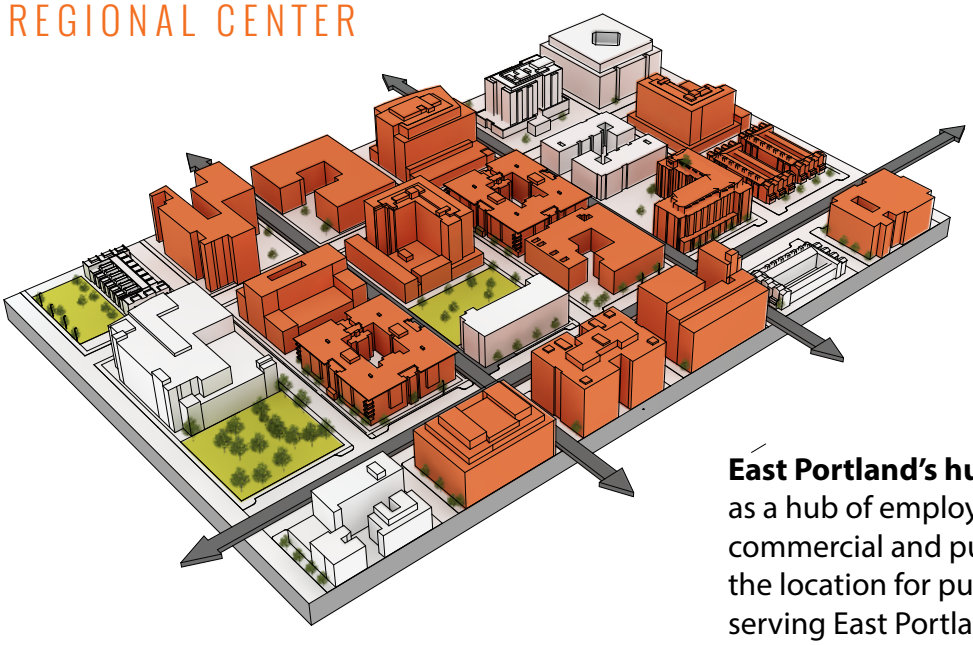
## REGIONAL CENTER



| | |
|---|---|
| **HOUSING** | 23,000 units |
| **JOBS** | Employment hub for East Portland (capacity for 23,000 jobs) |
| **BUILDING SCALE** | Up to 5-12 stories |

**East Portland's hub.** Gateway anchors East Portland as a hub of employment, transportation, and commercial and public services. Gateway will be the location for public services and gathering places serving East Portland and the broader region. It has an important regional role in accommodating employment and housing growth.

## CENTRAL CITY



| | |
|---|---|
| **HOUSING** | 67,000 units |
| **JOBS** | Regional employment hub (capacity for 248,000 jobs) |
| **BUILDING SCALE** | Up to 30+ |

**The region's central hub.** The Central City anchors Portland and the entire region with concentrations of jobs, services, and civic and cultural institutions, and is the region's central transportation hub. Its mixed-use districts are the location of Portland's largest concentrations of high-density housing, and its public places and the Willamette River waterfront are places of activity and gathering for the city and region.

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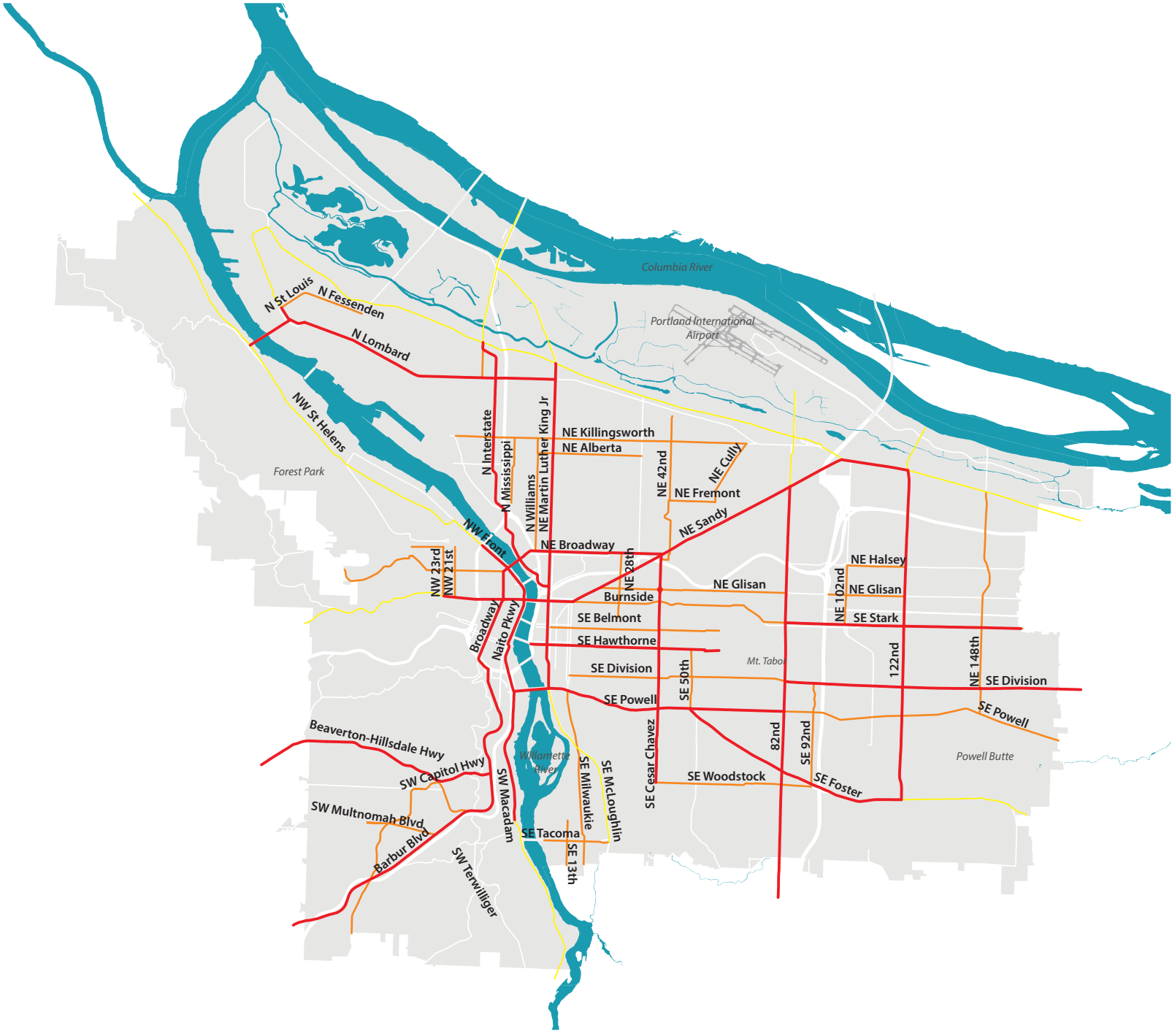
# CORRIDORS




## CORRIDORS

- Civic Corridors
- Neighborhood Corridors
- Freight Corridors



Ord. 187831, Vol. 2.4.C, page 10502

Corridors, like centers, are part of the preferred growth scenario and are targeted areas for growth and change in Portland over the next 25 years. These are the City's busiest and most visible streets, offering good connections between different centers within the city as well as those outside of the city boundary. These corridors offer a considerable amount of redevelopment potential, and are currently the places that are closest to most Portlanders, linking them to transit services, neighborhood stores and shops, and a mix of housing and employment options.



## CIVIC CORRIDORS

Civic Corridors are the City's busiest, widest and most prominent streets. They connect centers, help unite the City and region, and have the potential to be distinctive civic places of community pride. Besides their key transportation functions for traffic, freight and transit, Civic Corridors offer unique opportunities for signature types of lights, signs and street trees, as well as new pedestrian spaces to improve safety, visibility and livability.



## NEIGHBORHOOD CORRIDORS

Neighborhood Corridors are narrower main streets that connect neighborhoods with each other and to other parts of the city. They support the viability of neighborhood business districts and provide locations for additional housing opportunities close to local services, amenities and transit lines.

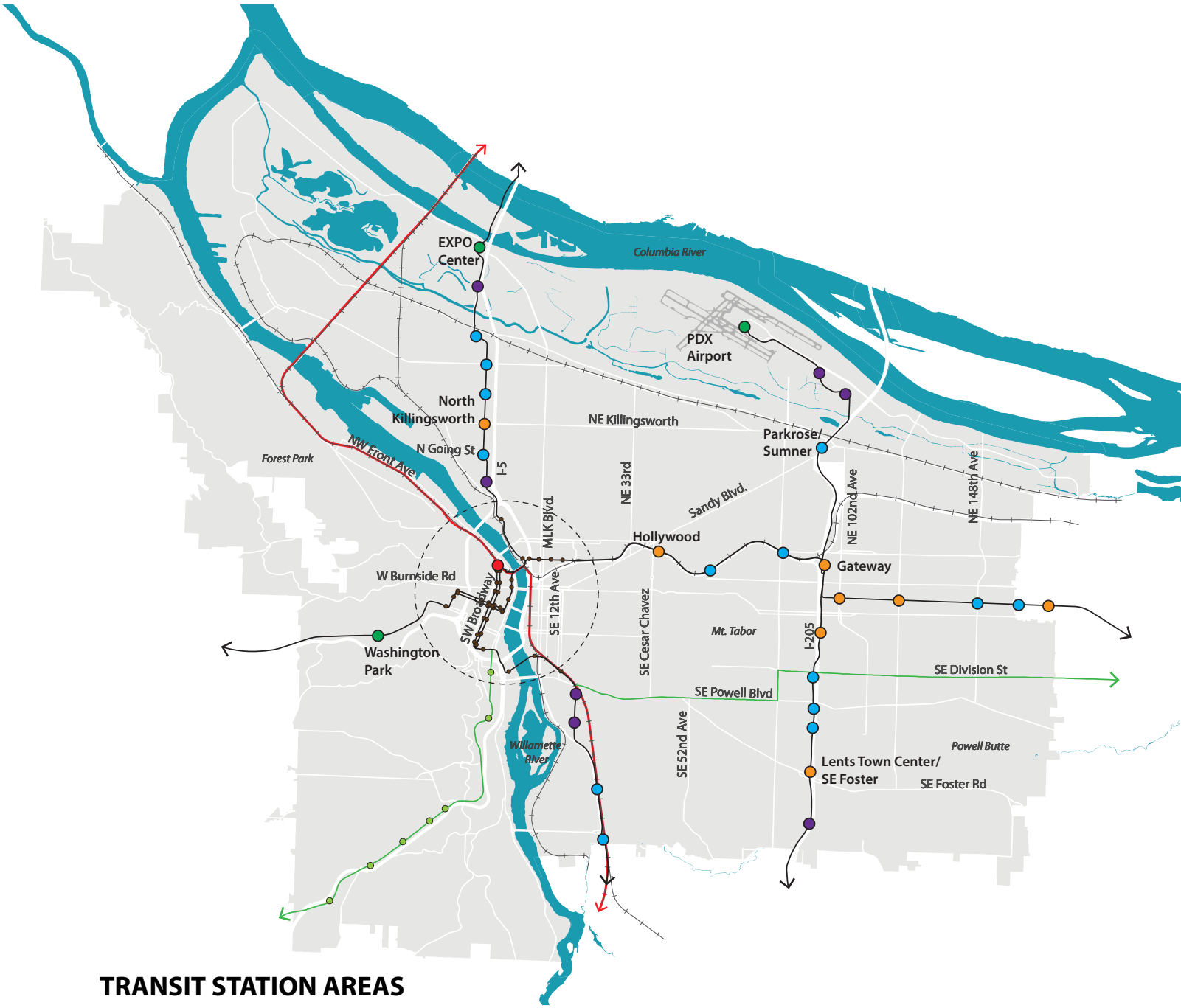



## FREIGHT CORRIDORS

Fright Corridors are the primary routes into and through the city for trucks, trains, airplanes, ships and more. They help form the network that supports Portland as an important West Coast hub and a gateway for international and domestic trade. While the forms of these corridors, streets and lines are not expected to change significantly over the next 25 years as the city grows, these facilities are integral to the growth of traded sector businesses such as manufacturing, warehousing and distribution industries.

Ord. 187831, Vol. 2.4.C, page 10503

# TRANSIT STATION AREAS




## TRANSIT STATION AREAS

- Center Stations
- Employment Stations
- Transit Neighborhood Stations
- Destination Stations
- Central City Stations
- Intercity passenger rail alignment
- Future transit alignment & potential station areas
- Rail



Ord. 187831, Vol. 2.4.C, page 10504

Portland today has over 30 light rail station areas, many of which will be part of the City's centers and corridors growth strategy. Some station areas will be integrated into higher density environments that include a wide range of uses, development scales and connections to trails, paths or other transit lines. At other station locations, the surrounding development patterns may reflect a bias toward residential or employment uses and in some cases the station area may just be at a regional destination or attraction without a lot of associated development.



## CENTER STATIONS

Center Stations are part of a mixed-use center or corridor. They have the highest potential for mixed use development because they are proximate to local services and businesses and they typically offer connections to other transit routes.



## EMPLOYMENT STATIONS

Employment Stations serve areas with employment centers, concentrations of businesses or clusters of commercial uses. Residential development may not be an important component at these station locations.



## TRANSIT NEIGHBORHOOD STATIONS

Transit Neighborhood Stations serve high-density housing areas and districts due to their less compromised locations. Areas around these station areas are targeted to expand housing opportunities and choices for people living close to transit.



## DESTINATION STATIONS

Destination Stations provide access to important destinations or attractions such as large parks, regional trail systems, the airport or the EXPO Center. While they are well connected to the surrounding transportation network, they may not have significant new development around them.

Ord. 187831, Vol. 2.4.C, page 10505

# CITY GREENWAYS




**CITY GREENWAYS**

- Existing Trails
- Proposed Trails
- Enhanced Greenway Corridors
- Heritage Parkways
- Parks & Open Spaces



Ord. 187831, Vol. 2.4.C, page 10506

City Greenways are a citywide network of trails and green, park-like corridors linking major centers, destinations, the rivers and other large open spaces. By occurring at regular intervals, they help to promote active living, both for recreation and transportation, for people of all ages and abilities. The City Greenways system is made up of trails, heritage parkways, enhanced greenway corridors, and neighborhood greenways. Neighborhood greenways, not illustrated here, extend the system into all neighborhoods of the city.



## HERITAGE PARKWAYS

Heritage Parkways are iconic streets – or segments of streets -- that include elements such as linear parks, views, planted median strips or other types of distinctive landscaping or street design. Some heritage parkways will become parts of enhanced greenway corridors.



## CITYWIDE TRAILS

Citywide Trails typically provide off-street pedestrian and bicycle access, and are often located in natural areas, hillside areas, adjacent to freeways, and along the rivers.



## ENHANCED GREENWAY CORRIDORS

Enhanced Greenway Corridors are extensions of the trails and parkways system through the heart of the city. These corridors will offer distinctive park-like connections that prioritize pedestrians and bicycles, and incorporate broader spreading trees and planted areas to help filter stormwater and air.

Ord. 187831, Vol. 2.4.C, page 10507

# URBAN HABITAT CORRIDORS




## URBAN HABITAT CORRIDORS

- Enhanced Habitat Corridor
- Potential Habitat Corridor
- Parks & Open Space
- Waterbodies
- Elevation over 300'



Ord. 187831, Vol. 2.4.C, page 10508

Today's habitat corridors will be enhanced by protecting, restoring, and improving connectivity between existing large anchor habitats and along corridors that support fish, wildlife and people. Potential habitat corridors will eventually connect existing habitats, parks, and tree canopy by "greening up" neighborhoods and business areas. Landscaping with native plants, tree plantings, vegetated stormwater facilities, and ecological development, such as ecoroofs, are approaches that support urban habitat corridors and will help the City remain resilient to climate change and natural hazards.



## FISH, WILDLIFE AND PEOPLE

Urban habitats provide safe, healthy places for a myriad of resident and migratory fish and wildlife species to live and move through the city. Maintaining diverse, connected habitat corridors will help fish and wildlife adapt to continued human population growth and development, and to climate change. Urban habitats also benefit Portlanders by keeping the air and water clean and cool, reducing the risks from landslides and flooding, and providing places for people to play, learn and experience nature.



## KEY HABITAT FEATURES

Urban habitats encompass the City's most valuable and distinctive natural features -- the Willamette and Columbia Rivers, streams and sloughs, wetlands, large forested areas such as Tryon Creek State Park, and topographic features including West Hills, Willamette Bluff, Mt Tabor, Kelly Butte, and Powell Butte. Some urban habitats are rare or declining, such as remnant native oak, bottomland hardwood forest or river islands. Urban habitats can also include street and yard trees, backyard plantings, parks, and built features like bridges that provide opportunities for Peregrine Falcon nesting.



## HABITAT CORRIDORS IN NEIGHBORHOODS AND BUSINESS DISTRICTS

Urban habitats exist today within Portland's developed areas. Rivers, streams and sloughs flow through many neighborhoods and business districts; and the city is known for abundant trees and vegetation. Enhancing urban habitats means preserving and restoring existing natural features, creating connections between tree canopy and greenspaces, and incorporating nature into the design of buildings and landscaping, streetscapes, parking lots, and infrastructure.

Ord. 187831, Vol. 2.4.C, page 10509

# EMPLOYMENT AREAS




## EMPLOYMENT AREAS

- Central City
- Industrial
- Commercial
- Institutional
- Heavy Rail



Ord. 187831, Vol. 2.4.C, page 10510

Portland's diversity as an employment center is spread evenly among four types of business sectors that thrive in different parts of the city. Each of these areas are growing and have different types of prosperity benefits. Traded sector (export) businesses that bring income and jobs into the region are mainly in the industrial and office sectors. Leading job growth opportunities are in the institutional sectors. Neighborhood business districts are a highly valued source of neighborhood prosperity. Middle-wage jobs that require less college education and improve equity are concentrated in the industrial sectors.



## CENTRAL CITY

Central City is the region's high-density employment center. It is primarily an office district for professional and business services, finance, information, and government. It is also a key location for the entertainment, small industry, and education sectors.



## INDUSTRIAL

Industrial districts are in the low, flat areas along Portland Harbor and the Columbia Corridor, Oregon's freight infrastructure hub. The manufacturing and distribution sectors concentrate here. They typically need one-story buildings, medium to large sites, and locations buffered from housing.



## COMMERCIAL

Commercial areas are mainly home to the retail, personal service, and related sectors that serve customers on-site. These businesses locate amid their market areas, lining corridors in neighborhoods across the city. They generally need ground-floor space along pedestrian or auto-oriented streets.

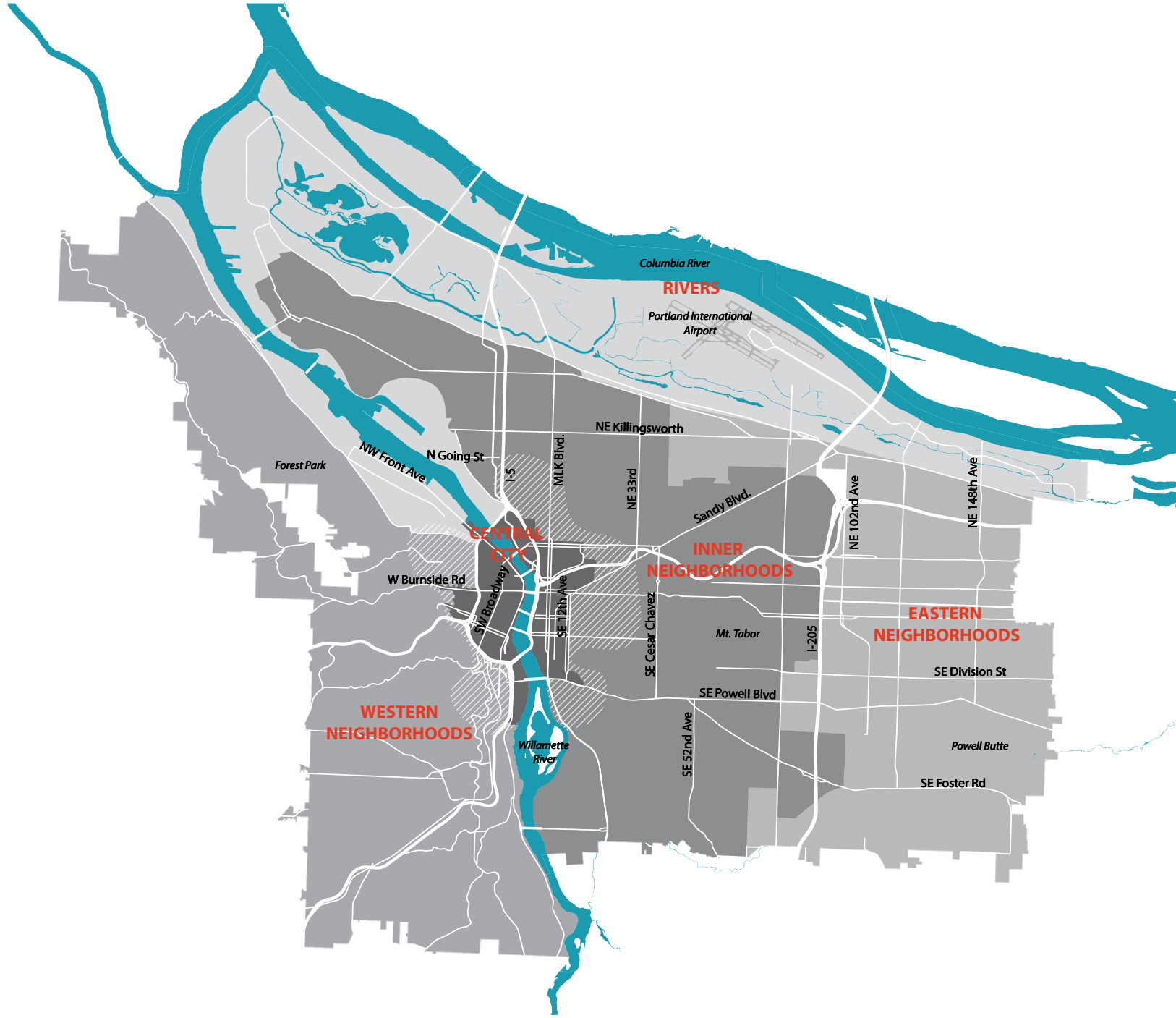


## INSTITUTIONS

Institutions in the health care and education sectors are concentrated in large hospital and college campuses and dispersed smaller facilities. Major institutions are large employers with campuses that vary from pastoral expanses to more concentrated urban grounds.

Ord. 187831, Vol. 2.4.C, page 10511

# PATTERN AREAS




**PATTERN AREAS**

- Central City
- Inner Neighborhoods
- Western Neighborhoods
- Eastern Neighborhoods
- Rivers
- Inner Ring Districts



Ord. 187831, Vol. 2.4.C, page 10512

Portland's natural and built patterns – its hills and streams, street and block types, buildings and open spaces – give Portland's different geographies their distinct characters. Acknowledgment that "one size does not fit all" will help tailor more specific policies and regulations to better respond to each area's unique natural and built assets.



### CENTRAL CITY

New development in the Central City should support its role as the region's center for innovation and exchange. New buildings and spaces should contribute to its highly urbanized and evolving built form; its high density employment, cultural and institutional centers; and its tight network of streets and pedestrian pathways, recognizing that a healthy city must have a healthy core.



### INNER NEIGHBORHOODS

New development in inner neighborhoods should enhance the fine-grain, pedestrian-scaled built environment of main streets, mixed-use districts and residential areas. In the inner-ring districts, new development should take advantage of the area's proximity to the Central City with increased densities while working to enhance and preserve identified historic and cultural resources.




### WESTERN NEIGHBORHOODS

New development in western neighborhoods should respond to the area's prominent hilly topography, its streams, ravines and forested slopes, and its prevalent views to other parts of the city.



### EASTERN NEIGHBORHOODS

New development in eastern neighborhoods should enhance the area's distinctive mix of built patterns, improve street and pathway connectivity, and integrate natural and landscape features such as buttes, streams and copses of large native trees.



### RIVERS

New development in the Rivers pattern area should support the diverse activities and physical patterns of its natural resource and wildlife habitat areas, prime industrial lands and connections to the rivers. New buildings, adaptively reused structures and public spaces should enhance human access to the water where it will not conflict with ecological functions for native species of fish and wildlife. These facilities should also enhance access and mobility for large industrial delivery vehicles, including trucks, trains and ships. Where practical, new development should strive to integrate nature, and natural systems enhancements, with industrial development and activities.

Ord. 187831, Vol. 2.4.C, page 10513

COMPREHENSIVE PLAN UPDATE

# Growth Scenarios Report



MAY 2013

Bureau of Planning and Sustainability
Innovation. Collaboration. Practical Solutions.

*City of Portland, Oregon*
*Charlie Hales, Mayor • Susan Anderson, Director*

Ord. 187831, Vol. 2.4.C, page 10514

# Acknowledgments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# COMPREHENSIVE PLAN UPDATE

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To help ensure equal access to City programs, services and activities, the City of Portland will reasonably modify policies/procedures and provide auxiliary aids/services to persons with disabilities. Call (503) 823-7700 with such requests.

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## EXECUTIVE SUMMARY

The Growth Scenarios report is a background report of the Comprehensive Plan and is a required element of Portland's Periodic Review work program (Task 3). The purpose of this report is to describe how and where Portland is expected to grow over the next 25 years, and to measure the performance of different alternate growth patterns and their ability to help meet Portland's goals and objectives. This analysis is rooted in the Measures of Success adopted with the 2012 Portland Plan.

The Growth Scenarios report offers a basis for making informed decisions about which investments and growth patterns will bring the greatest benefit to the most Portlanders, reduce disparities, increase opportunities and move the city closer to meeting performance goals, such as reducing carbon emissions, improving access to living-wage jobs, reducing carbon emissions and providing safe and convenient access to goods and services within walking distance of where people live.

This report includes four alternative growth scenarios:

**Default** – The Default Scenario is based on existing development patterns and development trends. This scenario distributes future growth in the same places Portland has seen growth over the past 15 years.

**Centers** – The Centers Scenario focuses more growth in established centers like Lents, Hillsdale and Gateway and less growth along the length of commercial and mixed-use streets.

**Corridors** – The Corridors Scenario focuses more development along streets like SE Powell, SE Foster, SW Barbur and N Lombard and less growth in centers.

**Central City Focused** – The Central City Focused Scenario concentrates nearly all new growth in the Central City and the inner neighborhoods near the Central City, both east and west of the Willamette River.

Portland is expected to add approximately 280,000 people (132,000 households) and 147,000 new jobs by 2035. Portland's existing zoning has more than enough development capacity to accommodate future residential growth and most of employment growth, except for industrial uses. This excess capacity creates an opportunity to make choices about where to focus or prioritize that growth.

However, the forecasted growth represents only about one-third of the total households and employment in Portland in 2035. Two-thirds of the future built environment already exists today. Thus, Portland's existing development pattern defines many of the challenges in achieving the goals identified in the Portland Plan. The city's legacy development pattern has a significant impact on how well future development patterns perform over the next 25 years. Large improvements in performance from land use changes will take time, and the City will need to make strategic investment and development decisions to meet those goals.


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## CHALLENGES AND OPPORTUNITIES

**Two Investment Strategies** – Portland needs to pursue a public investment strategy on two tracks simultaneously to meet its objectives. One strategy supports growth in high-performing areas that already have a relatively complete infrastructure support system. The other fills gaps in historically underserved areas to reduce disparities and increase equity. This two track strategy will allow Portland to improve performance across the board by focusing growth in high-performing areas, while at the same time improving conditions in areas previously neglected.

**Transportation Choice** – Transportation priorities in the next 25 years need to emphasize active transportation and freight. Investing in sidewalks, bicycle facilities and transit can significantly improve performance across several measures, such as reducing carbon emissions, improving affordability, and improving access to jobs for more Portlanders. Determining where investments will have the greatest positive benefit will help make choices about where to invest City of Portland dollars.

**Complete Neighborhoods** – The Portland Plan set the goal of providing most Portlanders with safe, walkable access to services. This goal cannot be achieved simply by only focusing growth in existing complete neighborhoods. Meeting this goal will require public and private investments in East and Southwest Portland to create more complete neighborhoods across Portland.

**A Central Role for the Central City** – In each scenario, the Central City accommodates between 20 and 35 percent of future growth. Focusing growth in and around the Central City may be the most cost-effective way to provide the greatest level of service to the greatest number of Portlanders; each incremental investment in this service-rich area has disproportionate benefits. However, in order to grow as a residential area, it will be necessary to ensure that the needs of a great variety of families can be met within the Central City.

**Jobs and Better Transit Connections in East Portland** – East Portland has Portland's largest pool of affordable housing and is home to a large number of families with children. However, the area does not have many family-wage jobs, and it is not easy or quick to travel from East Portland to major job centers. Convenient and reliable access to work is one of the major contributors to job success (others include overall employment opportunities and relevant education and training). Developing more jobs in East Portland and providing better connections to and from East Portland are critical to improving household economic self-sufficiency.

**More Affordable Housing** – None of the growth scenarios provide enough affordable housing, especially for the lowest income households. Public investments to increase services can create gentrification pressure. Portland will need to better align growth management, public investment and affordable housing development, anticipate the consequences of investments, minimize displacement and engage communities.

**Prepare for the Future** – While short-term development trends show a market preference for the Central City and Inner Neighborhoods, East Portland has significant growth potential and is home to many households with school-age children. Today, there is a window of opportunity to address the infrastructure gap in East Portland. The timing and location of East Portland infrastructure investments are a pressing issue.


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**Connect to Nature** – In each scenario most growth occurs on previously developed land, replacing parking lots and under-used buildings with higher performing buildings that have a greater intensity of use. This is positive because it keeps new development away from natural habitat areas and sensitive watersheds. However, as more people live in urbanized areas, it becomes increasingly important that nature is integrated into the city. This can be accomplished with urban parks, plazas, green infrastructure and street trees. Better connections to streams, lakes and rivers and the regional trail and park network is also important.

## NEXT STEPS

These scenarios and performance measures provide a starting point for a community discussion about how and where Portland can accommodate future growth. In particular, the performance measures provide a framework for evaluating different growth and investment options. The proposed new Comprehensive Plan that is created from this process will reflect a preferred scenario. The next steps include:

Model the Effects of Infrastructure Investments – The scenarios in this report model the likely effects of 25 years of growth (the location of new jobs and housing), but not infrastructure investments. The next planning step is to add 25 years of corresponding infrastructure investments that will be necessary to serve that growth. This next step will show additional performance gains and how these investments will most help Portland improve prosperity, education, health, equity and resilience.

Community Mapping – Later in 2013, community members will be engaged in a mapping exercise where they will discuss preferred approaches for managing growth and will identify needed investments.

Citywide Systems Plan and Transportation System Plan – To meet State requirements, the City must complete new fiscally constrained Citywide Systems and Transportation System Plans that will describe the infrastructure (sewer, water, transportation) system improvements that will be necessary to serve anticipated growth. Those reports also will have to describe strategies to pay for those improvements, and determine what level of improvements are affordable. An addendum to this report will be prepared to incorporate the content of those plans.


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# 1. INTRODUCTION

Portland is growing and will continue to grow over the next 25 years. By 2035, there will be approximately 280,000 more people and 147,000 new jobs in Portland.[1] While the forecasted growth rate is consistent with Portland's historical growth rates, these numbers still raise important questions about how and where Portland will grow and the effect that growth will have on Portlanders' quality of life.

## PURPOSE

This report is intended to provide information about the potential implications of growth that will help answer key questions like:

- Where will new housing will be built?
- What types of development will be seen on Portland streets?
- Where will new businesses be located?
- Will existing businesses be able to expand?
- How will this growth affect carbon emissions?
- How will this growth affect significant natural resources?
- Will this growth help reduce disparities and improve access to opportunity for more Portlanders?
- Where and how can Portland focus investments in public facilities and services to improve how well the city functions?

In addition to facilitating discussions about the questions listed above, this report will:

- Provide four comparative alternative growth scenarios that illustrate the potential locations and intensity of growth over the next 25 years, given Portland's existing development pattern and development capacity.
- Measure the performance of the alternative growth scenarios, including their effect on the city's ability to meet goals and objectives based on the Portland Plan's Measures of Success.[2]
- Develop a basis for creating a Preferred Growth Scenario for the City of Portland.
- Provide the basis for developing an infrastructure investment approach that will improve Portland's ability to meet its identified goals and objectives.
- Meet the requirements of Task 3 of the City of Portland's State of Oregon-approved Periodic Review Work Program, which calls for the development and analysis of alternative growth scenarios.[3]

---

[1] Metro Regional Forecast, Gamma version, November 2011. Forecasts indicate that Portland will grow by approximately 132,000 new households between today and 2035. The current average household size is 2.28; however, it is expected that Portland's average household size will decrease in coming decades. A proxy household size of 2.1 was used in the calculation.

[2] The Portland Plan is a citywide strategic plan to promote prosperity, education, health and equity. It includes guiding policies, a five-year action plan and measures of success. The goals and objectives used to evaluate the scenarios are adapted from the Portland Plan's Measures of Success. The Portland Plan was adopted in 2012.

[3] In November 2007, the Oregon Department of Land Conservation and Development (DLCD) informed the City of Portland that its Comprehensive Plan is subject to Periodic Review. DLCD has the authority to compel a local jurisdiction to enter Periodic Review (ORS 197.628 to 197.650 and OAR 660-25). Periodic Review is a substantial evaluation and revision of a local Comprehensive Plan, the purpose of which is to ensure that a city's Comprehensive Plan is up-to-date and responsive to local, regional and state conditions, complies with the Statewide Planning Goals and provides necessary provisions for economic development, needed housing, transportation and urbanization or growth needs.


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## ORGANIZATION

This report has five primary sections: Introduction, Context, Scenario Alternatives, Performance Measures and Key Findings.

- The **Introduction** provides a brief overview of the report's purpose and organization, as well as basic background and process information.
- The **Context** section provides detailed information on existing conditions, development trends, development capacity and housing and employment growth forecasts.
- The **Scenario Alternatives** section provides information on each of the four growth scenarios and their implications.
- The **Performance Measures** addresses how well the four scenarios affect Portland's ability to meet established goals and objectives, as well as options for improving performance.
- The **Key Findings** provides a summary of the lessons learned from this analysis.

The **Appendices** provide additional detailed information on how different areas of the city perform under each of the four alternative growth scenarios.

## BACKGROUND AND PROCESS

### What are growth scenarios?

Growth scenarios reflect choices about growth. They are illustrations of where Portland could choose to grow and develop in different parts of the city over the next 25 years. The scenarios are an opportunity to test how different growth patterns will affect different aspects of livability for Portlanders, such as access to transit, jobs, parks and commercial services. The performance evaluation also looks at carbon emissions, housing affordability and risk of gentrification.

### Why develop growth scenarios?

Growth scenarios allow the public to make educated and informed decisions in the Comprehensive Plan Update. These are decisions about where to focus housing and job development, where to conserve and protect land, where to develop, and where and when to invest to improve services to increase equity, improve performance, and maintain and improve overall quality of life.

As a nearly fully developed city that is both largely surrounded by other cities and in a region with an urban growth boundary, Portland cannot expand by annexing substantial tracts of land outside the city limits, or by developing large areas of vacant land. As a result, nearly all of Portland's growth will occur on smaller underdeveloped parcels or through the redevelopment of previously developed properties.


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## Portland's growth scenarios

This report includes four alternative growth scenarios:

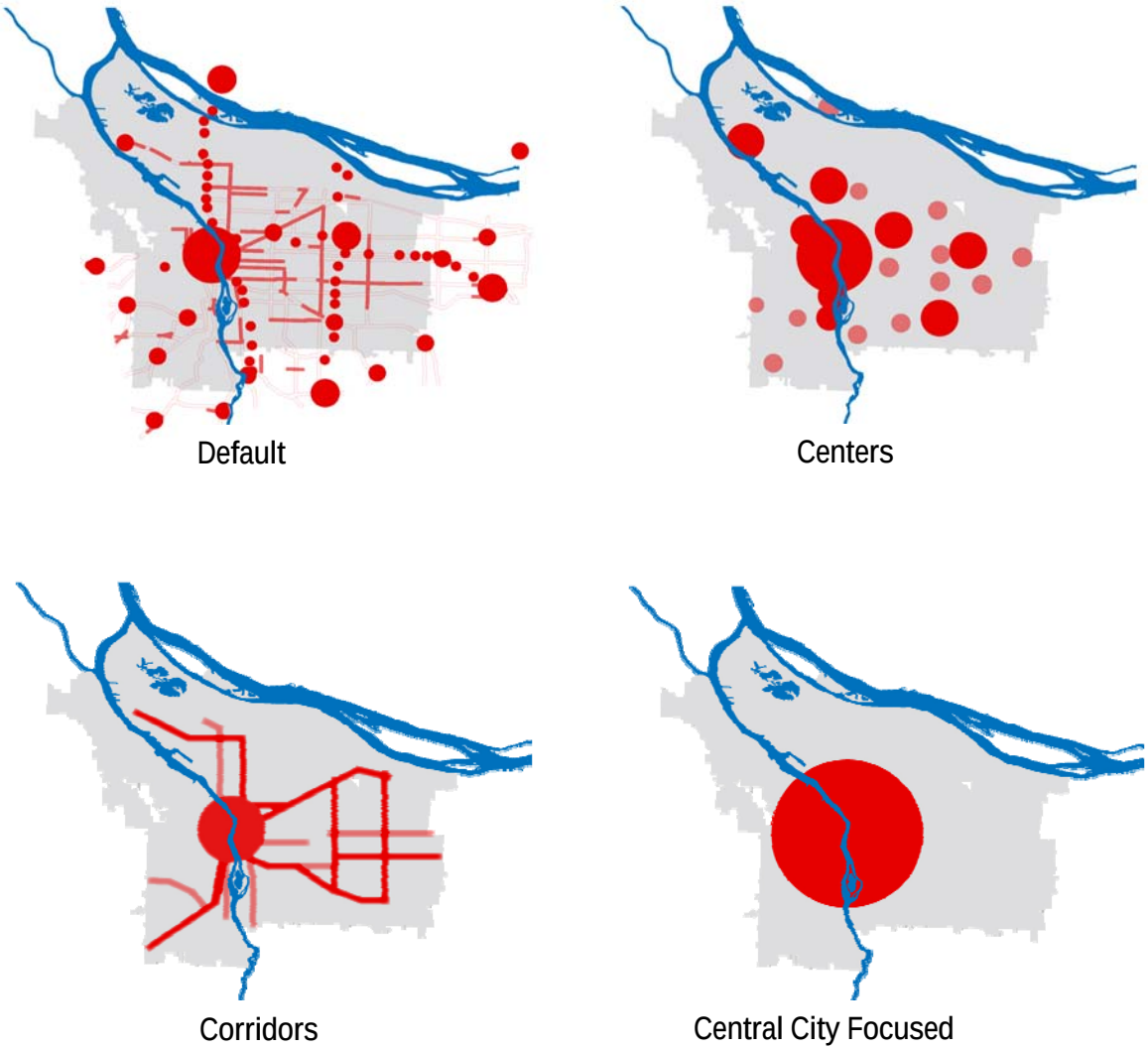
**Default** – The Default Scenario is based on existing development patterns and development trends. This scenario distributes future growth in the same places Portland has seen growth over the past 15 years.

**Centers** – The Centers Scenario focuses more growth in areas like Lents, Hillsdale and Gateway and less growth along the length of commercial and mixed-use streets.

**Corridors** – The Corridors Scenario focuses more development along streets like SE Powell, SE Foster, SW Barbur and N Lombard and less growth in centers.

**Central City Focused** – The Central City Focused Scenario concentrates nearly all new growth in the Central City and the inner neighborhoods near the Central City, both east and west of the Willamette River.

Figure 1. Growth Scenario Alternatives





Ord. 187831, Vol. 2.4.C, page 10322

## HOW ARE THE SCENARIOS EVALUATED?

Each scenario is evaluated according to how well it performs with respect to the following Portland Plan objectives and the associated performance measures.

### Performance Measures

Access to Family-Wage Jobs

Housing Mix and Affordability

Risk of Displacement/Gentrification

Complete Neighborhoods

Access to Frequent Transit

Access to Low-Stress Bikeways

Vehicle Miles Traveled

Mode Share

Greenhouse Gas/Carbon Emissions

Access to Parks

Watershed Health

Tree Canopy

Access to Nature

For each scenario a performance evaluation is used to help answer the following questions:

- Does this development pattern help the city move closer to its goals?
  For example: Does the Central City Focused scenario make it more likely that the percentage of Portlanders who live in complete neighborhoods will increase? Will it increase the likelihood that more Portlanders will have access to family-wage jobs?
- How do the performance results for each scenario compare to those of the other scenarios?
  For example: Do the Centers and Corridors scenarios each provide the same mix of affordable housing?

The performance evaluation focuses on how well each scenario performs at the citywide level. Evaluations of how well each scenario performs at the district scale (East, North, Southeast, West and Central City) or neighborhood scale are provided in the appendix.

### How will the scenario evaluations be used?

The evaluations will be used to support discussions about policies and investments related to issues such as land use, environmental conservation, affordable housing, urban design, and public infrastructure. The evaluations will prompt discussions to consider the following:

- Is there a form of growth that will help Portland advance prosperity, equity and sustainability?
- What investments are needed to support that pattern?
- How do the anticipated development patterns help achieve the goals?
- What problems will these patterns create?
- How and where can investments help to meet specific performance goals?
- Which scenarios bring the greatest benefit to different parts of the city?

This analysis and public input will be used to develop a Preferred Development Scenario, which will likely be an amalgam of different parts of the four growth scenarios. When complete, the Preferred Development Scenario will guide the development of the Comprehensive Plan Map, the Transportation System Plan, the Citywide Systems Plan and the List of Significant Projects.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# 2. CONTEXT

Developing future growth scenarios involves looking at forecasts of future growth and learning from how the city is performing today in terms of conditions and trends. Portland's current context, including the existing built environment, recent development trends and current plans and policies, have a tremendous influence on how the city will develop and perform in the future.

The history of the past 30 years shows that thoughtful and intentional land use policies, regulations and investments can help improve quality of life for many. It also offers proof that people who live in areas without high-quality services may find it harder to meet their full potential. Growth often brings challenges, but it also offers opportunities to bring more services to more Portlanders.

This section of the report provides the background information needed to review the growth scenarios and make recommendations about growth and investments to improve livability for all Portlanders. The information includes an overview of the local growth forecasts; a primer on Portland's existing land use patterns, development trends and performance; information on existing development capacity; and ideas about the ways in which new development may benefit different parts of Portland.

## GROWTH FORECASTS

Metro forecasts that the Portland metropolitan region will grow by 410,000 new households and 518,000 new jobs between 2010 and 2035. The City of Portland is forecast to grow by 132,000 new households and 147,000 new jobs. The Metro forecasted growth rates are consistent with historical trends.

Metro develops the forecast and allocates the forecasted growth to each of the jurisdictions within its boundaries. Each local jurisdiction is responsible for determining how to best manage and direct that growth within its boundaries. This means that Portland must figure out how and where to accommodate the future growth forecast.

### Household Forecast

Today, Portland has 270,000 households with an average of 2.3 persons per household. Of those households, 28 percent include children. Both the average size of Portland households and the percentage of households with children are expected to continue to decline. By 2035, the average household size is expected to be just over 2 persons per household and the percentage of households with children is expected to decline to 25 percent of all households. At the same time, a greater proportion of Portlanders will be older. These anticipated demographic changes are consistent with national trends and will affect the demand for different types of housing. [4]

Currently, about 60 percent of the dwellings in Portland are single family detached homes. Although little change is expected to the character of Portland's predominantly single family residential neighborhoods (they will remain single family residential neighborhoods), single family homes are expected to make up a smaller share (47 percent by 2035) of the housing mix in coming years.

Driving this change is the increased demand for multifamily dwellings . Estimates suggest that 80 percent of all new housing built in Portland between now and 2035 will be multifamily housing. This change can already be seen in recent development trends: Between 2008 to 2012, 64 percent of new housing units built in Portland were multifamily dwellings. Similarly, the majority of new growth between 2010 and 2035 within the Urban Growth Boundary (61%) will be multifamily dwellings.

[4] More information is available in the Housing Demand and Supply Background Report.


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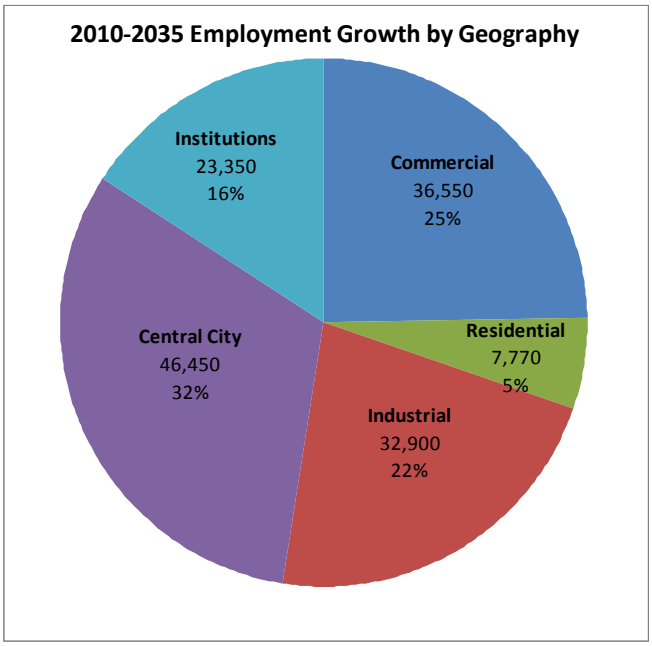
Figure 2. Employment Growth by Geography




## Employment Demand

Portland is expected to add 147,000 new jobs by 2035, which is a 27 percent capture rate of the regional job growth – similar to Portland's historical 25 percent capture rate.

These new jobs are anticipated to be distributed across the city in a manner similar to the current distribution of employment. The Central City will see the largest share (46,450 jobs) of the job growth, with neighborhood commercial areas (36,550) and industrial areas (32,900) seeing significant growth.

Institutional campuses are a strong growth sector (23,350), and home-based employment in residential areas (7,700) remains a relatively small share of future employment growth.[5]

[5] More information is available in the Economic Opportunities Analysis.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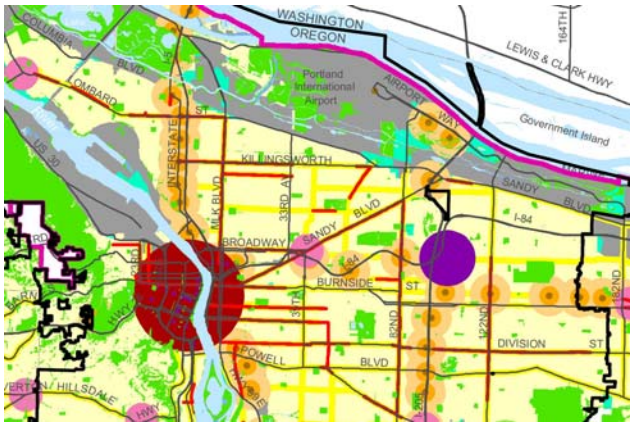
## CURRENT PLANS AND DEVELOPMENT CAPACITY

### Metro 2040 Growth Concept and Portland's Comprehensive Plan

Growth in the Portland metropolitan region is guided by regional land use and transportation plans developed by Metro, including the Metro Regional Framework Plan and the Metro 2040 Urban Growth Concept. The Metro plans provide the region with a preferred regional urban form.[6]

Figure 3. Metro 2040 Growth Concept Zoomed to Portland




As with the growth forecasts, each jurisdiction is responsible for implementing the regional growth concept in local comprehensive plans.

The core ideas in the Metro 2040 Growth Concept, which are also reflected in Portland's Comprehensive Plan, include:

- A hierarchy of mixed-use, pedestrian friendly centers. The mixed-use centers identified in both the Metro 2040 Growth Concept and Portland's current Comprehensive Plan include: the Central City, Gateway Regional Center and the Hollywood, St. Johns, Lents, Hillsdale and West Portland town centers.
- Corridors and main streets that are connected to each other and the centers by high-capacity and high-quality transit.
- A multi-modal transportation system that emphasizes transit, bicycle and pedestrian systems to ensure continued mobility of more people and goods throughout the region.
- A jobs/housing balance in centers, protected industrial sanctuaries and stable residential neighborhoods, outside of mixed-use centers, corridors and main streets.

The principles that support Metro 2040 and that are embodied in Portland's current Comprehensive Plan were not new when they were initially adopted. They were built on Portland's legacy and historical development pattern. These principles and Portland's historical development pattern will continue in the forthcoming updated Comprehensive Plan and will continue to influence the physical development of Portland over the next 25 years.

A significant question to consider is: Within Portland's existing development capacity, and using the Metro 2040 principles as guides, how and where should Portland refine the Comprehensive Plan and focus investments in infrastructure and services to create a move livable and functional city?

[6] For more information, please visit Metro's website: www.oregonmetro.gov.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## Development Capacity

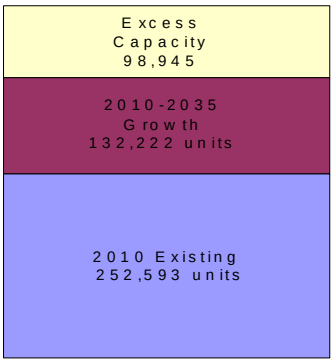
Development capacity is defined as the likely number of new dwelling units or jobs that can be accommodated in the city under existing regulations and the current infrastructure system.

The 2012 Buildable Lands Inventory (BLI) is the estimate of the development potential that is possible under current plans and zoning after considering infrastructure and physical constraints, like steep slopes.[7] The BLI identifies lands that could potentially be available for development should a market demand exist.

### Residential Capacity

The BLI shows that under the current Comprehensive Plan and existing zoning, the estimated residential capacity is 230,000 dwelling units, which is more than sufficient capacity to accommodate Metro's 2035 housing growth forecast of 132,000 households.

Figure 4. Residential Development Capacity




The surplus capacity enables Portland to shift or manage growth to encourage a development pattern that helps to achieve the goals and objectives. The scenarios explore different ways to use that development capacity to accommodate 25 years of future growth.

Most of this capacity (70 percent) is in mixed-use corridors and neighborhood centers. The Central City (with capacity for 32,000 additional dwellings) has significant growth capacity. Other areas with high growth capacity are the Gateway Regional Center, North Interstate Corridor, the Lents Town Center and some parts of East Portland.

Areas with the least capacity for additional growth are parts of Northeast Portland and most of West Portland. Portland's predominantly single family residential neighborhoods (the areas outside of the centers and corridors) will see limited new housing development, and will remain single family residential neighborhoods. About 17 percent of the development capacity is in land available for single-dwelling residential development (detached or attached homes on their own lot).

Figure 5. BLI Housing Development Capacity



[7] City of Portland, Bureau of Planning and Sustainability, Buildable Land Inventory (2012)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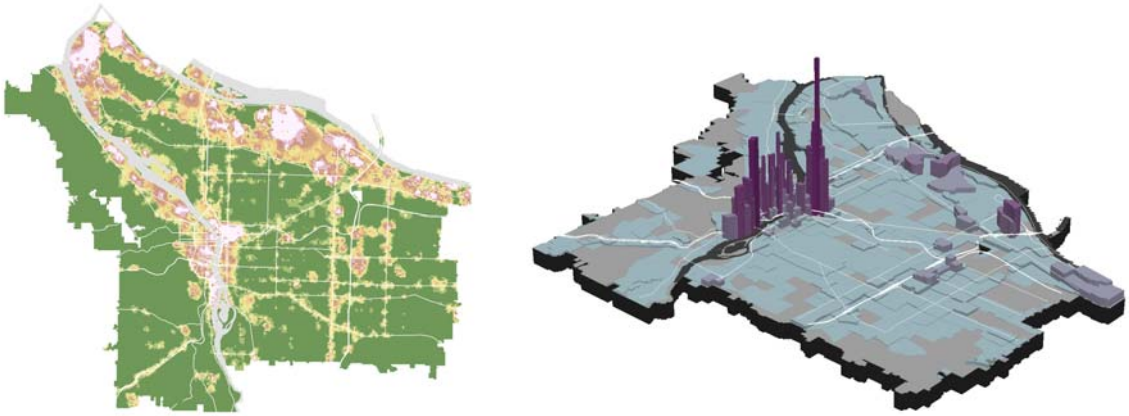
Employment Capacity

The employment capacity analysis uses the same approach as the residential capacity analysis. The estimated employment development capacity is about 101 million square feet of new employment floor area citywide. In general, there is adequate capacity in the Central City; a surplus capacity in the neighborhood commercial areas; and shortfalls in industrial areas and for campus institutions, such as colleges and hospitals.

Table 1. Employment Development Capacity

| Aggregate Geography | Share |
|---|---|
| Central City | 37% |
| Industrial | 21% |
| Neighborhood Commercial | 32% |
| Campus Institutions | 10% |

Figure 6. BLI Employment Development Capacity





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## PORTLAND'S EXISTING LAND USE PATTERN

Portland is a nearly fully developed city, therefore, new growth and development must be accommodated within city boundaries. Portland's existing development patterns provide the framework for managing future growth and development. A brief description of the overall land use pattern, as well as more detailed information on Portland's "Pattern Areas," is provided below.

### Citywide Development Pattern

Portland's overall development pattern includes a strong Central City, a series of centers (e.g. Hollywood, St. Johns and Hillsdale), and main streets and corridors (e.g. NE Sandy and N Interstate) that connect areas like Hollywood and Hillsdale to the Central City and beyond. The centers and corridors contain a mix of commercial and residential uses. The pattern also includes large swaths of residential development between the centers and corridors and across all areas of the city. Residential areas vary from predominantly single family dwellings to areas with greater concentrations of multifamily dwellings. For detailed information on Portland's existing development pattern, please review the Urban Form Background Report.

Figure 7. Existing Residential Density

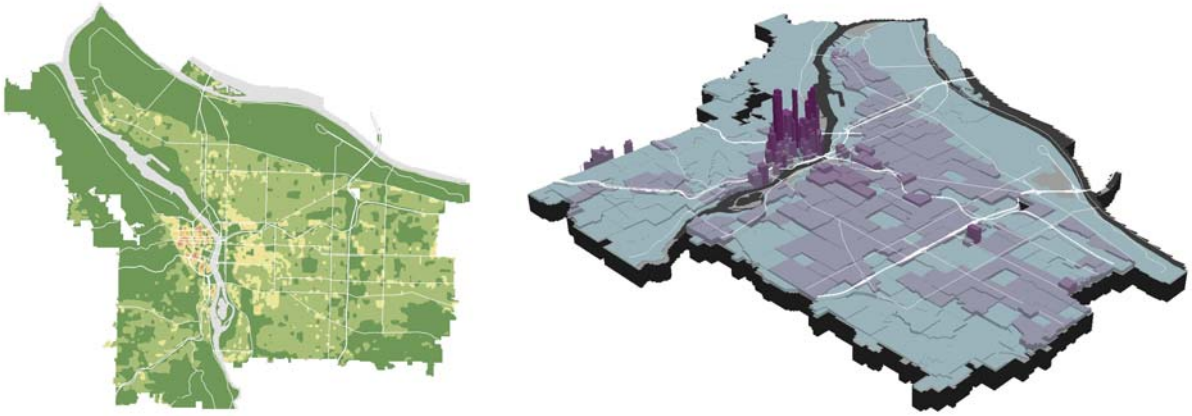

Figure 8. Existing Employment Density




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## DEVELOPMENT TRENDS

Growth and development have shaped, and will continue to shape, the character of Portland's neighborhoods, streets, commercial areas, and other key places. Three broad trends have defined development over the past 15 years:

- Robust growth and development have occurred in the Central City.
- East Portland experienced a period of particularly strong development activity in the 1990s and early 2000s. This growth occurred after annexation of East Portland and much of this development included multifamily residential development and new subdivisions.
- In the late 2000s, coincident with the deep recession, development activity shifted from East Portland to the Inner Neighborhoods surrounding the Central City. The most intensive development has occurred along frequent transit lines, such as SE Division, North Williams, and North Interstate Avenue. Rising property values and rents have led to some displacement of lower income residents.
-

Figure 9. Areas with High Development Activity




Table 2. New Dwelling Units by Portland Plan Analysis Area

| **15 Year Trend: 1996-2010** | | | | **5 Year Trend: 2008-2012** | | | |
|---|---|---|---|---|---|---|---|
| Rank | Analysis Area | New Units | Share | Rank | Analysis Area | New Units | Share |
| 1 | Central City | 12,214 | 25% | 1 | Central City | 3,047 | 32% |
| 2 | 122nd-Division | 3,759 | 8% | 2 | Interstate Corridor | 876 | 9% |
| 3 | Lents-Foster | 3,013 | 6% | 3 | Belmont-Hawthorne-Division | 746 | 8% |
| 4 | St. Johns | 2,931 | 6% | 4 | MLK-Alberta | 699 | 7% |
| 5 | Gateway | 2,793 | 6% | 5 | Northwest | 576 | 6% |
| 6 | Centennial-Glenfair-Wilkes | 2,045 | 4% | 6 | St. Johns | 569 | 6% |
| 7 | Forest Park-Northwest Hills | 2,012 | 4% | 7 | Gateway | 460 | 5% |
| | Citywide | 48,116 | 100% | | Citywide | 9,542 | 100% |


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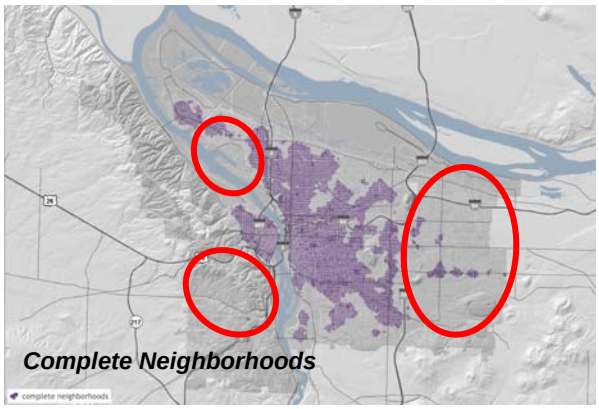
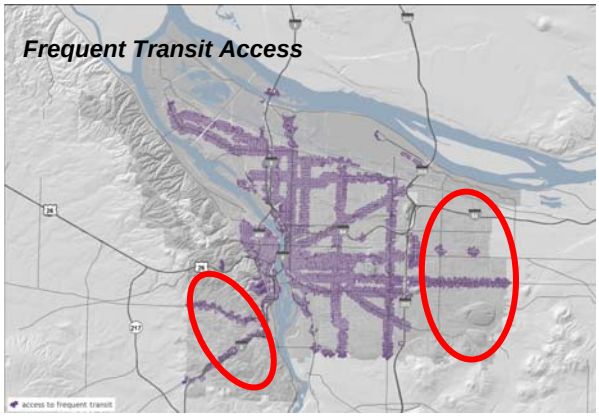
## WHERE AND HOW CAN GROWTH BENEFIT THE CITY IN THE FUTURE?

Growth brings change, but it also offers opportunities to solve problems and bring more services to more Portlanders—making it easier for people to get to work by bus or train, walk to the grocery store or school and get to the park or community center. A few of Portland's key land use and infrastructure-related challenges are highlighted below.

**Complete Neighborhoods:** Today, only 45 percent of Portland households are in complete neighborhoods, with significant gaps in East and Southwest Portland.




**Frequent Transit Access:** Currently, 47 percent of Portland households are located within a convenient (1/4-mile) walk to the frequent transit network. While the Central City and most of the Inner Portland neighborhoods have good access to transit, there are significant gaps in coverage in East and Southwest Portland. Access to transit also is an important component of complete neighborhoods and access to employment.




**Access to Jobs:** Households in most of East Portland and parts of North Portland may have a more than 60-minute commute to locations with family-wage jobs.

A good job is one of the keys to household prosperity. The opportunity for a good job is dependent on three major factors: overall employment, education and workforce training, and access – the ability to get to the job. In general, most Portlanders have reasonable access (a 60-minute transit trip) to a number of family-wage jobs.




These are some of the many performance measures against which the growth scenarios will be evaluated. For more information, please review the Portland Plan Measures of Success at www.pdxplan.com.

The challenges highlighted on these maps are but a few of the issues that need to be addressed through the Comprehensive Plan update process.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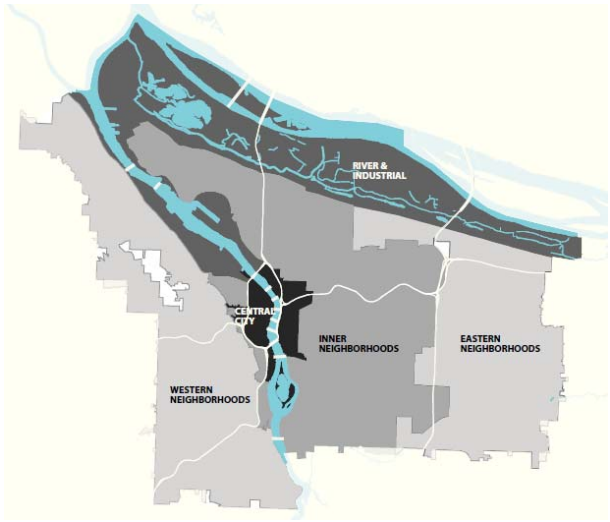
## PATTERN AREAS

Portland has five distinct areas or "Pattern Areas," each with unique needs and characteristics: Central City, Inner Neighborhoods, Eastern Neighborhoods, Western Neighborhoods and the Industrial and River Area.

Pattern Areas are defined by characteristics such as topography and physical features; street, land use, and block pattern; form and intensity of development; character, size, and function of natural resource areas; and the period in which the area was developed. Each area also has conditions and challenges related to its physical environment, development, history and the histories of the people who live there.

Figure 10. Portland's Five Pattern Areas




### Central City

Central City includes the Downtown core, South Waterfront, portions of the east and west banks of the Willamette River, the Central Eastside Industrial District, the Lloyd District and Rose Quarter, Old Town/Chinatown and the Pearl District. The Central City is the region's business center, with an intensely urbanized built form. It also includes some of the city's industrial sanctuaries and higher education institutions. Today, more than 34,000 people live in the Central City, making it Portland's most densely populated residential area. It is a regional cultural hub—home to numerous concert halls, performance venues, museums, schools and universities. The Central City must remain an attractive and highly functional office, education and residential location.

**Figure 11. Central City 2035**



New development in the Central City may:

- Strengthen its role as the region's center for innovation by increasing education and new entrepreneurial business opportunities.
- Contribute to the region's densest clusters of office, employment and residential districts.
- Enhance the fine-grain patterns of blocks and buildings offering a highly connected system of sidewalks and pathways.
- Improve connections to the Willamette River.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## Inner Neighborhoods (North, Northeast, Southeast)

From Lents to St. Johns to Northwest Portland, this area primarily includes neighborhoods that were developed in a "streetcar era" pattern. The area is characterized by compact development, a highly connected grid of streets and sidewalks, active main street business districts, buildings that face the streets, street trees and a relatively pedestrian- and bicycle-friendly transportation system. With more than 140,000 households, more than half of Portland's population lives in the Inner Neighborhoods.

In the past 15 years, housing in Inner Neighborhoods has become increasingly expensive. As a result, many long-time residents have needed to move to less expensive, but also less service-rich parts of the Portland region. At the same time, new multifamily residential development has been built along mixed-use corridors, like N Interstate, N Mississippi and SE Hawthorne and SE Division. These trends highlight the need to provide a greater variety of housing types at a much wider variety of prices, to expand and upgrade existing community facilities, like parks and sports fields, and to increase pedestrian and gathering spaces in the public right-of-way.

New development may:

- Make it easier for residents to meet their daily needs. More residents can support a broader range of neighborhood-serving businesses.
- Provide more housing at a range of prices, so that more Portlanders can afford to live in areas with access to services and transit.
- Create plazas and community gathering places.

Figure 12. Inner Neighborhoods 2035




The Impact of Community Amenities on Development Feasibility

Metro conducted a series of studies on how investments in public amenities, such as parks, sidewalks, bike facilities, and transit affect development feasibility. The studies showed that investment in public amenities can help attract people to a neighborhood, which in turn can increase rents by 10 to 20 percent and can increase sales prices enough to make new development financially feasible, especially for higher density development types.

In the July 2012 report, *Development Feasibility in Portland's 20-Minute Neighborhoods*, Fregonese Associates found that development feasibility dramatically increases with increasing amenities and rents. For example, in the Interstate neighborhood, Fregonese found that amenity investments that resulted in a 10 percent increase in rents increased development potential by 35 percent. However, the analysis also showed that in some neighborhoods with lower property values, amenity investments alone are not enough to spur a significant amount of new development.

Fregonese Associates. Development Feasibility in Portland's 20-Minute Neighborhoods. July 2012.


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## Eastern Neighborhoods

This area includes neighborhoods east of I-205. Most of this area was annexed into the City of Portland after the adoption of the 1980 Comprehensive Plan. The Eastern Neighborhoods have a mix of urban and semi-rural development, with towering Douglas firs and multiple buttes. Despite being home to one-quarter of the City's population (about 50,000 households), the area has nearly 40 percent of Portland's youth. During the late 1990s and early 2000s East Portland saw rapid growth. This growth highlighted many infrastructure deficiencies in the area, including the need for sidewalks, paved roads, safer street crossings and more frequent transit connections. Development in East Portland dramatically increased the area's population, changed the demographic makeup of the community, and highlighted remaining infrastructure deficiencies. School districts in East Portland have struggled to accommodate the corresponding growth in student enrollment.

Other issues highlighted by growth in East Portland include the need for developed parks and more neighborhood-serving businesses, so that residents can meet their needs close to home, and the need to provide a way to support local entrepreneurs and small businesses.

Figure 13. Eastern Neighborhoods 2035



New development may:

- Help provide needed public infrastructure, such as parks and sidewalks.
- Create safer and friendlier pedestrian environments along major streets.
- Increase the viability of commercial services in areas that have limited access to goods and services.
- Provide space for community markets, business incubators, and start-up space for businesses and entrepreneurs.

Portland Infrastructure Investment Pilot Study

The Portland Infrastructure Investment Study examined existing conditions in the Lents and Powellhurst-Gilbert neighborhoods and the potential for public investments to leverage private investment and enhance community livability.

The study assessed the cost of providing the basic infrastructure needed to make each area a more "complete community" (e.g., sidewalks, safe pedestrian crossings, etc). The study also looked at development readiness indicators, such as housing mix, rents/prices and long-term growth forecasts. A Return on Investment (ROI) analysis compared the cost of providing basic infrastructure with fiscal revenues (property taxes, SDCs, utility revenues, etc.) from forecasted development.

The study found that strategic public investments to provide basic infrastructure, especially pedestrian, bicycle and street networks improvements, are likely to have a net positive fiscal impact for the City, while also improving public health, safety, and neighborhood livability. Opportunity areas that currently have average scores on development readiness indicators are likely to have the greatest potential return on investment.


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## Western Neighborhoods

This area includes neighborhoods west of the Willamette River. The Western Neighborhoods have a mix of urban corridors (including SW Barbur Boulevard, Beaverton-Hillsdale Highway, and SW Capitol Highway) and more suburban development patterns that respond to challenging topography, sensitive natural areas, and lower densities. The Western Neighborhoods' most prominent characteristics are the hilly topography, streams, ravines, forested slopes, variably sized lots, and curvilinear street patterns.

Other issues highlighted by growth in West Portland includes the improved transportation options, more neighborhood-serving businesses so residents can meet their needs close to home, and the need to provide a way to support local vibrant activity centers and support a diversity of small businesses.

Figure 14. Western Neighborhoods 2035




New development can:

- Improve watershed health by daylighting streams and restoring other natural features that builds on the distinctive topography and environmental character of the west side.
- Increase tree canopy by developing green setbacks with new trees and other plants to build on the area's green character and create buffers from busy streets.
- Improve safety for pedestrians, bicyclists, transit riders and motorists where there are limited streets through the hilly topography.

## Industrial and River Area

This pattern area serves a key role as a location for port facilities, the airport, major land-based freight transportation networks such as pipelines and railroads, industry and other employment centers, and river habitat. Hayden Island, Bridgeton and scattered riverfront and houseboat communities have a strong river orientation.


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# 3. ALTERNATIVE GROWTH SCENARIOS

## HOW WERE THE SCENARIOS DEVELOPED?

The scenarios are based on the existing development pattern; current Comprehensive Plan and Zoning Code designations and regulations; the Buildable Lands Inventory (BLI), which provides information on how much land and which land is likely to be redeveloped given market conditions, development constraints and the current level of investment in properties; and reviewed recent development trends. The scenarios are also based on Metro's 2040 Growth Concept. The different scenarios emphasize different aspects of existing plans. For example, which of these regionally designated centers are expected to develop over the next 25 years, and how much growth is expected in each?

Each scenario assumes the same level of employment and residential growth – 132,000 new households and 147,000 new jobs between now and 2035. They do not assume any increases in allowed density or radical changes to Portland's current land use plans. Under each scenario, most of the future development (85 percent) is allocated to multi-dwelling housing types. Each of the scenarios shares a base set of assumptions, including:

- No changes to existing zoning regulations.
- Approximately 80 percent of all new multifamily housing will locate in the Central City, along corridors or in centers. These mixed-use areas can expect to see the most change, while most single-dwelling residential neighborhoods will see less change.
- Approximately 20 percent of all new housing will be in single-dwelling residential areas.

Recognizing the significant influence of the current development and infrastructure, like bridges and light rail lines, each of the scenarios is a variation of Portland's current development pattern:

**Default** – The Default Scenario is based on existing development patterns and development trends. This scenario distributes future growth in the same places Portland has seen growth over the past 15 years.

**Centers** – The Centers Scenario focuses more growth in distinct hubs like Lents, Hillsdale and Gateway and less growth along the length of commercial and mixed use streets.

**Corridors** – The Corridors Scenario focuses more development along streets like SE Powell, SE Foster, SW Barbur and N Lombard and less growth in centers.

**Central City Focused** – The Central City Focused Scenario concentrates nearly all new growth in the Central City and the inner neighborhoods near the Central City, both east and west of the Willamette River.


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## Housing Growth Allocations

Although each scenario assumes the same level of household growth, the distribution of that growth varies in each scenario. Using the Default scenario for comparison, the range of household growth in each district can be significant, especially in the Central City and East Portland.

Table 3. Residential Growth Forecast Allocation

| District | Default | Other Scenarios |
|---|---|---|
| Central City | 26,000 | 29,000 – 43,000 |
| East | 41,000 | 20,000 – 42,000 |
| North | 18,000 | 12,000 – 18,000 |
| Northeast | 14,000 | 12,000 – 20,000 |
| Southeast | 21,000 | 20,000 – 25,000 |
| West | 11,000 | 10,000 – 11,000 |

## Growth Factor

In addition to looking at the number of new households, it can also be helpful to look at the magnitude of expected growth. The magnitude of growth, or growth factor, quantifies the potential amount of change anticipated in a given area. A growth factor of 1.0 means there is little or no growth or change potential. A growth factor of 2.0 is equal to a 100 percent growth rate or doubling of the number of housing units in a given location. For Portland as a whole, the Metro forecast projects a 50 percent increase in the number of households, which is a growth factor of 1.5 (or 132,000 new dwelling units).

If the Metro-projected growth were to be proportionately distributed across Portland, then each district would have a growth factor of 1.5. However, development capacity is not evenly distributed across the city, nor is it expected that growth will be evenly distributed across Portland. Therefore, the scenarios do not assume an even growth pattern across the city. The Central City, East Portland, and North Portland see higher growth factors in most of the scenarios.

Table 4. Growth Factor Comparison by Scenario

| District | Default | Centers | Corridors | Central City Focused |
|---|---|---|---|---|
| Central City | 1.9 | 2.0 | 2.1 | 2.5 |
| Southeast Portland | 1.3 | 1.3 | 1.3 | 1.4 |
| Northeast Portland | 1.3 | 1.3 | 1.3 | 1.5 |
| North Portland | 1.7 | 1.7 | 1.7 | 1.5 |
| East Portland | 1.8 | 1.8 | 1.7 | 1.4 |
| West Portland | 1.3 | 1.3 | 1.3 | 1.3 |
| **Citywide Average** | **1.5** | **1.5** | **1.5** | **1.5** |


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## Employment Allocation

The four growth scenarios also address the potential future location of neighborhood commercial job growth. The employment distribution in each scenario does not vary much because many of the employment geographies are essentially fixed in place. The Central City, the campus institutions and the industrial areas are not expected to move or relocate, so all of the scenarios use the same job distribution to these geographies. It is the employment in the neighborhood commercial areas, which represents about 25 percent of the employment growth, that changes with each scenario.

Therefore, in each scenario new neighborhood commercial jobs are allocated to employment areas that are also residential focus growth areas. For example, in the Centers scenario, neighborhood commercial jobs are located in centers. This assumption is based on the premise that new employment growth follows new household growth. New households bring more disposable income to an area, which in turn drives the demand for goods and services that creates the employment. Consequently, the scenario descriptions are focused on the differences in residential growth.

The other employment, such as the industrial areas and campus institutions, has been allocated across Portland based on the current employment distribution as identified in the 2012 Employment Opportunities Analysis (EOA). These scenarios do not address the industrial and campus institution development capacity shortfalls identified in the EOA, which are being addressed through a different process, because those solutions have a minor impact on the overall performance of the scenarios.


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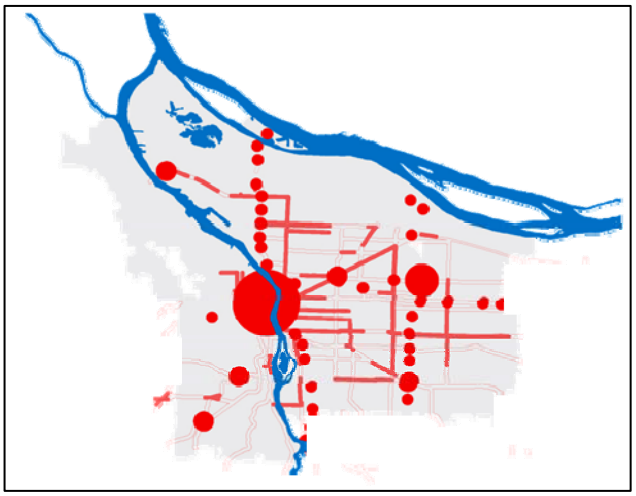
## DEFAULT SCENARIO



The growth distribution in the Default scenario is based on Portland's 15-year development trends. As a result, in this scenario a significant amount of growth is allocated to both East Portland (41,225 new households) and the Inner Neighborhoods (53,768 new households). However, less growth than in other scenarios is allocated to the Central City (25,956).

In East Portland, much of the projected growth is located in Gateway and near SE 122nd Avenue and SE Division Street.

In the Inner Neighborhoods, most growth is expected along corridors and in centers, like Hollywood. Although growth is also allocated to the Central City, under the Default scenario the Central City has the least amount of growth: 26,000 households.

Figure 15. Default Scenario: New Household Growth Distribution

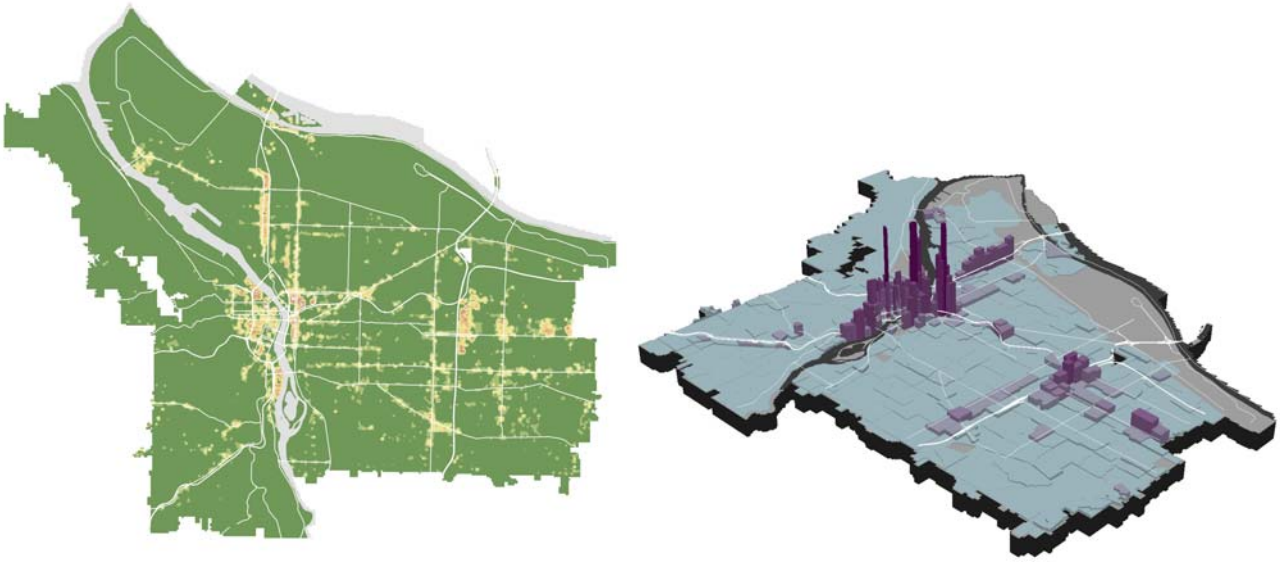


Table 5. Default Scenario: New Household Growth Distribution

| District | New Growth | 2035 Total | Growth Factor |
|---|---|---|---|
| Central City | 25,956 | 54,242 | 1.9 |
| Southeast Portland | 21,053 | 87,487 | 1.3 |
| Northeast Portland | 14,311 | 57,683 | 1.3 |
| North Portland | 18,404 | 43,780 | 1.7 |
| East Portland | 41,225 | 93,934 | 1.8 |
| West Portland | 11,040 | 45,604 | 1.3 |
| **Citywide** | **131,989** | **382,730** | **1.5** |


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Figure 16. Default Scenario: 2035 Development Pattern

## Default Scenario Development Pattern

The resulting development pattern is relatively dispersed. It does not have significant concentrations of mixed-use areas. This dispersed distribution pattern may make it more difficult to provide most Portlanders with walkable access to services, make cost-effective infrastructure investments and provide enhanced transit access.

**Complete Neighborhoods** – Widely distributed growth makes it less likely there will be the critical mass of activity needed to support the development of highly functioning mixed-use centers. Without mixed-use centers, fewer residents will have safe and walkable access to needed goods and services.

**Infrastructure Investment** – This growth pattern may also make it more difficult and less efficient to provide needed infrastructure services to all Portlanders. With a dispersed development pattern, there will be fewer residents within service areas, increasing the need to provide more facilities and services, without increases in financial resources.

**Access to Transit and Jobs** – Transit service is more efficient when there are concentrations of jobs and housing. This pattern will necessitate more transit lines, and may result in less frequent service.


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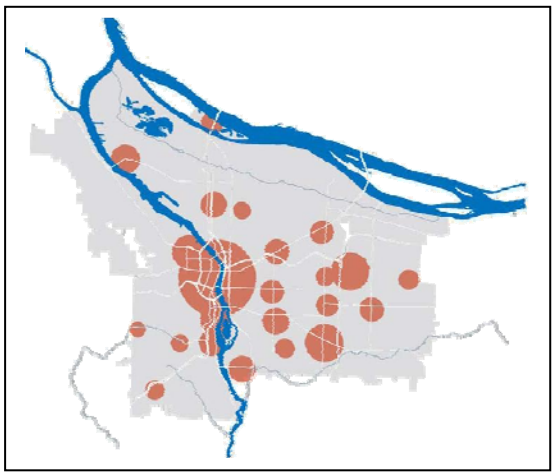
## CENTERS SCENARIO



In this scenario, growth is focused in Centers. Centers are compact mixed-use, walkable areas with shops and services that are well served by transit and connected to employment centers. Centers also have a housing mix that provides a range of choices for various household sizes and income levels. The Centers scenario builds off of the Healthy Connected City strategy in the Portland Plan, as well as the current Comprehensive Plan and Metro's 2040 Growth Concept, all of which prioritize growth in centers.

This scenario has a more compact growth pattern than the Default. It directs approximately 80 percent of new multifamily household growth into a more limited set of existing and emerging urban centers, including SE Lents, St. Johns and Hillsdale, the Central City and SE Hawthorne-Division-Belmont, among others.

Figure 17. Centers Scenario: New Household Growth Distribution



Table 6. Centers Scenario: New Household Growth Distribution

| District | New Growth | 2035 Total | Growth Factor |
|---|---|---|---|
| Central City | 29,061 | 57,347 | 2.0 |
| Southeast Portland | 20,019 | 86,453 | 1.3 |
| Northeast Portland | 12,634 | 56,006 | 1.3 |
| North Portland | 17,643 | 43,019 | 1.7 |
| East Portland | 42,094 | 94,803 | 1.8 |
| West Portland | 10,543 | 45,107 | 1.3 |
| **Citywide** | **131,994** | **382,735** | **1.5** |


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Figure 18. Centers Scenario: 2035 Development Pattern

## Centers Scenario Development Pattern

The Centers scenario yields a series of compact, walkable, mixed-use areas with commercial services and residential buildings. Residential areas within centers will see more development, but residential areas outside centers will remain largely unchanged from today.

In order to encourage private development in Centers, the City and other agencies may need to invest in infrastructure facilities, like sidewalks, to improve safety and access to transit and streetscape improvements to create more pleasant walking environments and gathering spaces. These improvements will increase the attractiveness of centers and make it easier for residents in surrounding neighborhoods to safely and easily walk, bike or roll to local services to meet their household needs.


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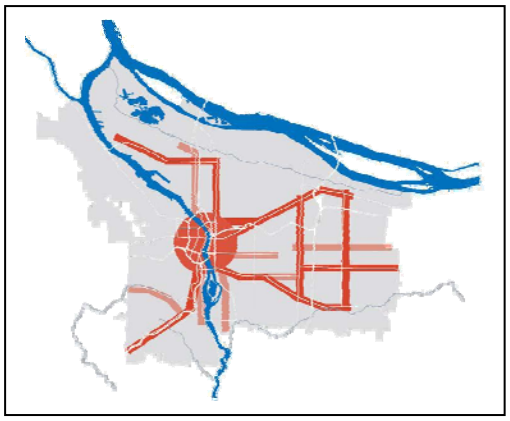
## CORRIDORS SCENARIO



This scenario prioritizes growth along Civic Corridors. Civic Corridors are typically long and significant streets that link different parts of the city together. They have frequent transit service and have the potential for a high level of development on either side.

The Corridors scenario builds off a significant component of the Healthy Connected City strategy in the Portland Plan, as well as the current Comprehensive Plan and Metro's 2040 Growth Concept.

This scenario allocates approximately 80 percent of new multifamily household growth into corridors, such as SW Barbur Boulevard, North Interstate, 82nd Avenue, and 122nd Avenue.

Figure 19. Corridors Scenario: New Growth Distribution



Table 7. Corridors Scenario: New Growth Distribution

| Districts | New Growth | 2035 Total | Growth Factor |
|---|---|---|---|
| Central City | 31,908 | 60,194 | 2.1 |
| Southeast Portland | 21,631 | 88,065 | 1.3 |
| Northeast Portland | 13,423 | 56,795 | 1.3 |
| North Portland | 18,585 | 43,961 | 1.7 |
| East Portland | 35,936 | 88,645 | 1.7 |
| West Portland | 10,564 | 45,128 | 1.3 |
| Citywide | 132,047 | 382,788 | 1.5 |


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Figure 20. Corridor Scenario: 2035 Development Pattern

## Corridor Scenario Development Pattern

This scenario results in a linear growth pattern with much development along major streets, but with minimized impacts to established single family neighborhoods. It supports distinctly urban corridors with more intense uses and levels of activity than there are today or in the Default.

A corridor growth pattern may improve watershed health by shifting growth from more environmentally sensitive areas into redevelopment of already urbanized corridors. It also may be more cost effective to serve with sewer and water infrastructure.


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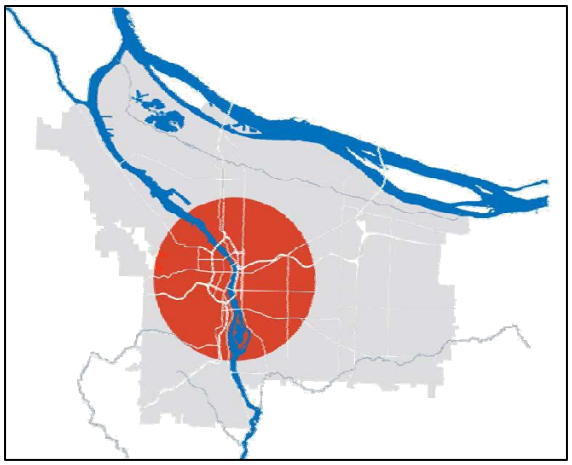
## CENTRAL CITY FOCUSED

This scenario focuses most future household growth into the Central City and Inner Neighborhoods within 3 miles of the Central City (a short transit or bike trip). Some additional growth is also directed to Gateway. This scenario reflects Portland's most recent (2008-2012) development trends.



With this scenario, 17,000 more households would be directed to the Central City than in the Default. Inner Southeast and Northeast Portland would see 11,000 more households than in the Default. This distribution alleviates growth pressures in East Portland.

Figure 21. Central City Focused Scenario: New Household Growth Distribution

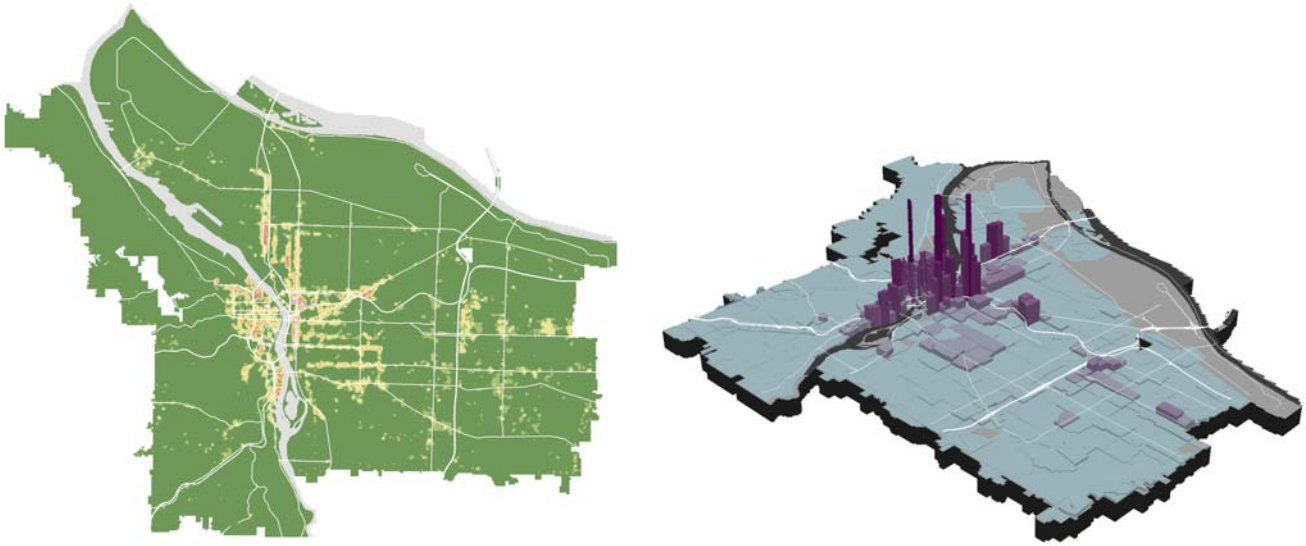


Table 8. Central City Focused Scenario: New Household Growth Distribution

| Districts | New Growth | 2035 Total | Growth Factor |
|---|---|---|---|
| Central City | 42,878 | 71,164 | 2.5 |
| Southeast Portland | 25,318 | 91,752 | 1.4 |
| Northeast Portland | 20,391 | 63,763 | 1.5 |
| North Portland | 12,522 | 37,898 | 1.5 |
| East Portland | 20,387 | 73,096 | 1.4 |
| West Portland | 10,631 | 45,195 | 1.3 |
| **Citywide** | **132,127** | **382,868** | **1.5** |


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Figure 22. Central City Focused Scenario: 2035 Development Pattern

## Central City Focused Development Pattern

The overall land development pattern includes a highly developed Central City, with more tall buildings and significantly more residential development than today. Some additional development in the Central City may be achieved by encouraging the use of height and density bonuses. This scenario also includes developed mixed-use corridors within 3 miles of the Central City.

This scenario represents an opportunity to capitalize on existing infrastructure – these areas have a complete street network and good access to existing bicycle and transit networks. It may require less expensive infrastructure investment with a focus on amenities such as community centers and schools.

At the same time, the decrease in development pressure on East Portland may provide the opportunity to invest in much-needed infrastructure, such as schools and sidewalks.


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# 4. PERFORMANCE MEASURES

A major purpose of this report is to establish a framework to evaluate the alternative growth scenarios against a set of performance measures. This framework will allow Portlanders to weigh the tradeoffs between different growth patterns and investment priorities.




The performance measures are based on the Portland Plan's Measures of Success and cover a wide range of subjects, from complete neighborhoods to watershed health. This list of measures provides a snapshot or overall sense of current conditions and where Portland will be in 2035. The evaluation identifies challenges and gaps to achieving the performance goals as well as the potential impact of different infrastructure investments. The scenarios also provide an opportunity to evaluate performance at different scales – citywide, district and neighborhood.

Finally, these measures are a starting point. They are not intended to provide a complete analysis of the issues, and some Portland Plan measures, such as high school graduation rates, are not directly dependent on the geographic distribution of growth.

## LONG-TERM VALUE

This evaluation framework will be used throughout the development of a preferred growth scenario and the final Comprehensive Plan Map. Each step in the planning process can include a performance evaluation to show how specific options might affect the indicator performance.

Eventually, the preferred scenario will be reflected in the Urban Design Framework and the policies, infrastructure projects and maps in the adopted Comprehensive Plan. The performance measures will help inform those decisions and then serve as a framework for ongoing monitoring and evaluation of the plan's implementation. The information in this background report focuses primarily on housing growth in Portland, with an emphasis on highlighting the performance of existing infrastructure and highlighting key opportunities and the relationships between Portland's existing deficiencies and potential future gaps. The evaluation can be used to identify actions to address gaps in performance; however, because these issues are beyond the scope of this report, they are not addressed in depth. Subsequent analyses will focus on understanding different approaches to overcoming performance gaps.

The purpose of this section is to outline to what degree different scenarios affect performance on a series of measures. These measures evaluate how well existing infrastructure and zoning perform under different growth patterns. The results of these measures begin to indicate performance gaps. This, in turn, can help in clarifying goals, policies, infrastructure, investments, programs and partnerships that can best help Portland to reach performance targets.


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Table 9. Portland Plan Performance Measures

| Portland Plan Objective | Performance Measure |
|---|---|
| **Prosperity and Affordability** | |
| By 2035, extend upward mobility pathways so that at least 90 percent of households are economically self-sufficient. By 2035, Portland has 27 percent of the region's new jobs, more of which provide a living wage, and continues to serve as the largest job center in Oregon. | Access to Family-Wage Jobs |
| By 2035, preserve and add to the supply of affordable housing so that no less than 15 percent of the total housing stock is affordable to low-income households, including seniors on fixed incomes and persons with disabilities. | Housing Mix and Affordability |
| By 2035, no more than 30 percent of city households (owners and renters) are cost burdened, which is defined as spending 50 percent or more of their household income on housing and transportation costs. | Risk of Displacement/Gentrification |
| **Healthy Connected City** | |
| By 2035, 80 percent of Portlanders live in a complete neighborhood with safe and convenient access to the goods and services needed in daily life. | Complete Neighborhoods |
| By 2035, Portlanders have reduced the number of miles they travel by car to 11 miles per day on average and 70 percent of commuters walk, bike, take transit, carpool or telecommute to work. By 2035, Portland's transportation-related carbon emissions are 50 percent below 1990 levels, and effective strategies to adapt to climate change are in place and being implemented. | Access to Frequent Transit<br>Access to Low-Stress Bikeways<br><br>Vehicle Miles Traveled (VMT)<br>Mode Share<br>GHG/Carbon Emissions |
| By 2035, all Portlanders live within a half-mile safe walking distance of a park or greenspace. By 2035, all Portlanders can conveniently get to and enjoy the Willamette and Columbia Rivers. The regional Trail System is substantially complete and is an integrated component of a Healthy Connected City network. | Access to Parks<br>Access to Natural Areas |
| By 2035, watershed health is improved, and the Willamette River and local streams meet water quality standards. Tree canopy covers at least one-third of the city and is more equitably distributed. Fewer homes and businesses are at risk from flooding. A diversity of critical habitats (including floodplains, riparian areas, wetlands, oak groves, native forests and remnant meadows) are protected, connected and enhanced to support a rich diversity of native and migratory wildlife. High-quality trees are routinely preserved and planted on development sites. | Watershed Heath<br>Tree Canopy |


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## METHODOLOGY

Most of the performance measures can be mapped as an area or geography that represents a part of Portland that meets the performance objective. The evaluation analyzes the amount of growth and the total number of 2035 households that occur within the high-performance geography. This evaluation includes the existing (2010) households, the 2010-2035 growth, and the total (existing plus growth) 2035 households for each scenario. For example, the Complete Neighborhoods geography represents the parts of Portland that are relatively complete based on an index that measures walkable access to shops, services and civic amenities. The 2035 Portland Plan objective is that 80 percent of Portland households are located in a “complete neighborhood.” The performance evaluation shows that 45 percent of current households are located in complete neighborhoods and the scenarios show a 2 to 6 percent increase for the different scenarios.

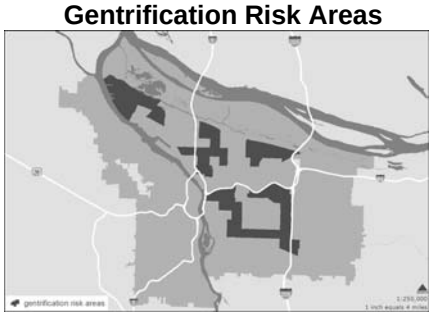
The dark areas on the maps represent the high-performance geography. For the most part, these measures are positive indicators, which means increasing performance by maximizing the number of households in these geographies or expanding the coverage area of the geographies. The Gentrification Risk Areas is the one exception, where performance in this geography is achieved by minimizing the amount of growth occurring in these areas.

Figure 23. Performance Geographies

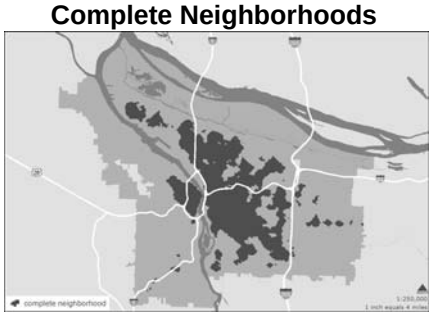
**Access to Family-Wage Jobs**



**Gentrification Risk Areas**



**Complete Neighborhoods**



**Frequent Transit**



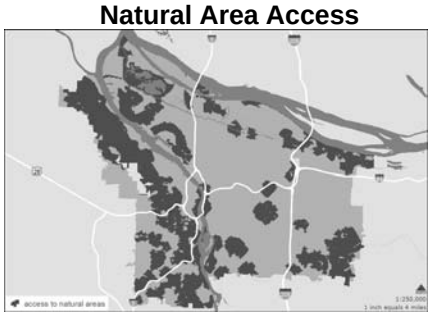
**Low-Stress Bike Network**



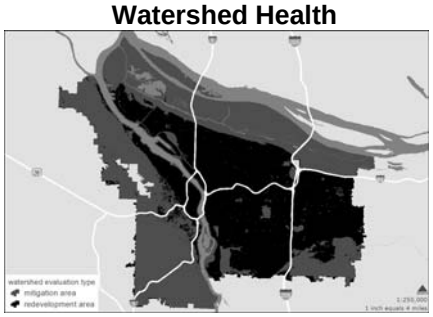
**Parks Access**



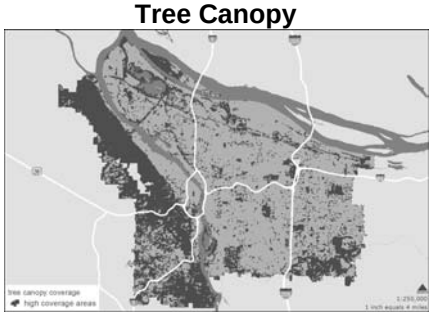
**Natural Area Access**



**Watershed Health**



**Tree Canopy**



See Appendix for full-color versions of these maps.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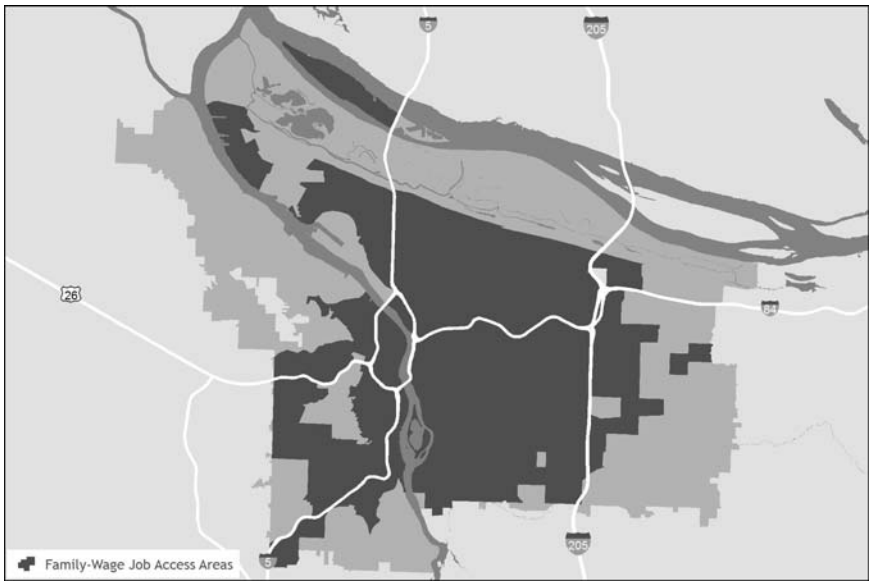
## ACCESS TO FAMILY-WAGE JOBS

**PORTLAND PLAN**

By 2035, extend upward mobility pathways so that at least 90 percent of households are economically self-sufficient.

By 2035, Portland has 27 percent of the region's new jobs, more of which provide a living wage, and continues to serve as the largest job center in Oregon.

Locating housing with access to a variety of higher paying jobs is a critical component of household prosperity. This performance measure is based on the number of family-wage jobs accessible within a 60-minute transit trip. A family-wage job is one that can meet the basic needs of a single-income household of one adult, one infant and one preschooler. In Multnomah County, the family-wage employment threshold is $47,244 per year. This basic measure only accounts for access to the quantity of jobs as an indicator of opportunity, without considering skills, qualifications or education attainment levels. While this analysis is influenced by proximity to the Central City, the region's largest job center, it also accounts for employment destinations accessible by transit in cities throughout the region.




**Family-Wage Job Access Areas** are places where households have good transit access and are reasonably close to employment centers with concentrations of jobs.

Prioritizing development, especially affordable housing, in these areas will be beneficial to household prosperity by increasing the number of family-wage jobs that are accessible to a household with reduced dependence on an automobile.

**Family-Wage Job Gap Areas** are places where households have reduced access to family-wage jobs.

Focusing public investments to increase access to transit or to support business growth to increase employment opportunities in or near these areas will help to expand the access to family-wage jobs.


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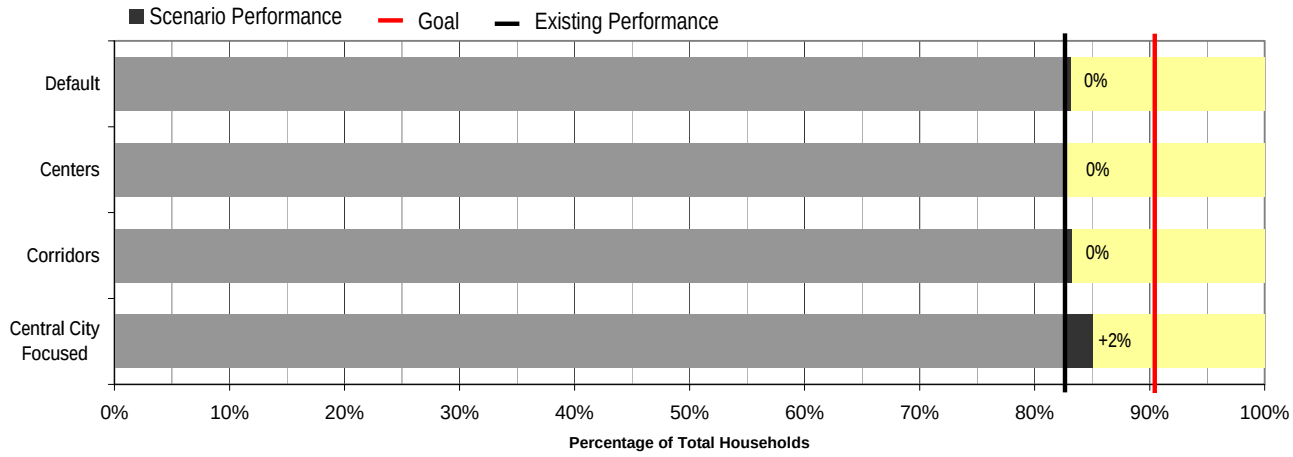
Chart 1. Performance Measure: Access to Family-Wage Jobs

Households in Job Access Area




## Performance Summary

The performance goal is a translation of the Portland Plan objective that 90 percent of households are economically self-sufficient – in order to be a prosperous household, wage-earners need access to family-wage jobs. Currently, 82 percent of Portland households are located in areas with good transit access to family-wage jobs. The alternatives do not change this performance, except for the Central City Focused scenario, which shows a marginal 2 percent increase.

## Options for Improving Performance

In order to meet the 90 percent goal, approximately 38,000 additional households need to have improved access to family-wage jobs. This change could be accomplished by increasing access to transit or creating more job opportunities in or near these low-access areas.

**Lesson Learned: More Jobs in East Portland**
If our pool of family-wage jobs is too far away from the pool of affordable housing, access to opportunity is reduced. East Portland is Portland's largest pool of affordable housing, but it lacks access to family-wage employment.

<u>Increase Transit Service in East Portland</u>
This measure is a function of transit travel time to employment centers. One strategy is to increase transit service in East Portland to provide faster or more direct connections to regional employment centers, especially the Columbia Corridor.

<u>Increase Employment Opportunities in East Portland</u>
Another option is to support business growth in order to increase job opportunities, especially middle-skill, family-wage jobs in East Portland. This business growth could be achieved through continuation and expansion of PDC's Neighborhood Prosperity Initiative. It also could be achieved through zoning changes to increase the amount of land available for light industrial uses and manufacturing.

## Supporting Portland Plan Actions:

PP Action #68 – Industrial Growth Capacity
PP Action #72 – Neighborhood Business Development
PP Action #73 – Small Business Development
PP Action #89 – Reduce Barriers to Employment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## HOUSING CHOICE

**PORTLAND PLAN**

By 2035, preserve and add to the supply of affordable housing so that no less than 15 percent of the total housing stock is affordable to low-income households, including seniors on fixed incomes and persons with disabilities. By 2035, no more than 30 percent of city households (owners and renters) are cost burdened, which is defined as spending 50 percent or more of their household income on housing and transportation costs.

Housing choice is a complex issue that is dependent on a series of individual choices or preferences based on factors such as age, family size and income level. These different factors can make it difficult to assess the housing choice impact of different scenarios. The housing choice analysis encompasses the mix of housing types (buildings) and how those types are expected to meet forecasted demand for different households (people). On a basic level, Portland has the zoned capacity to enable the private sector to produce a sufficient supply of new housing units to meet forecasted demand. The scenarios also allow for a wide range of housing types that are expected to meet a wide range of household needs with minor shifts in unit mix that can affect affordability and gentrification risk.

Expanding housing choice is dependent on three key components:

**Location diversity**: Location matters. Housing choice in Portland always takes place within the context of the larger regional housing market, which offers different amenities and opportunities. Portland can increase location diversity by (1) targeting growth into key centers and corridors, and (2) creating more complete neighborhoods by improving services and access in areas that are currently not well served.

**Unit affordability**: Affordability is a function of two components: housing cost/rent and household income. A mismatch between these two factors can result in a cost-burdened household, wherein 50 percent or more of household income is spent on housing and transportation costs. For many low-income households, housing affordability is difficult in the private market and they must rely on programs that create below-market rents to achieve a manageable level of affordability. Affordability can also be affected by supply and demand. Failing to enable mixed-income housing development in high-demand areas can create tight market conditions, driving prices up.

**Unit diversity**: Housing unit diversity in an area can support a range of housing choices that respond to changing household needs such as larger family-sized units or multifamily rental opportunities adjacent to established single family neighborhoods.

The interaction of these components affects the level of housing choice available to each household differently. It is important to note that choice can be expanded independent of affordability by building more housing units and creating more complete neighborhoods (attractive locations). These issues have impacts on Portland's performance to the degree that Portland continues to grow. Housing unit diversity offers regional and citywide benefits, including lessening the burden of automobile travel across the region (resulting in fewer vehicle miles traveled), using existing infrastructure efficiently and supporting regional transportation corridors and employment centers.


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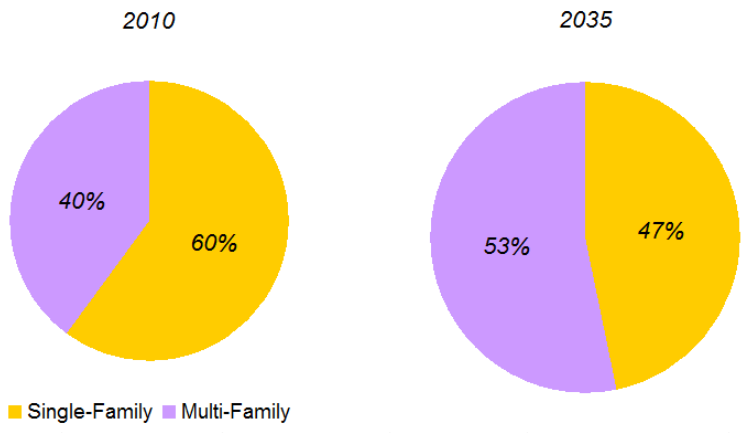
## Housing Mix

Overall, Portland provides a relatively balanced mix of housing types. Currently, single family houses make up nearly 60 percent of Portland's housing stock. As a result of Portland being largely developed, with limited opportunities for single family residential development, the vast majority (80 percent) of new housing units are expected to be in multifamily units. The supply of multifamily units is expected to grow by 105,000 units, far exceeding the expected single family growth of 27,000 units. Even though the new growth is skewed toward multifamily housing types, the overall mix in 2035 is still relatively balanced, with 47 percent being single family houses.

**School Enrollment**
A growing community raises concerns about school enrollment and the impact on school facilities. The share of households with children is expected to decline by 3 percent, but given the overall growth in households, the total number of children is expected to increase. Forecasting accurate long-range school enrollment is complicated, but to meet the anticipated need it will be important to align strategies to expand choice for households with children while making upgrades to existing school facilities.

Chart 2. Single Family- Multi Family Split




Although the housing mix will shift, the share of the land area zoned within the City of Portland will remain consistent, with Single Family Residential covering about 42 percent of Portland's land area. The mixed-use commercial areas and multifamily residential areas make up only about 10 percent of the land area, with the balance largely in industrial areas and open space.

Figure 24. Land Area by Zoning Designation



Multifamily & Commercial Zones



Single Family Zones


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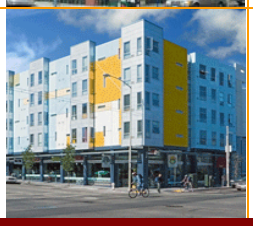
Table 10. Housing Types

| SINGLE FAMILY RESIDENCES | | CORRIDOR APARTMENTS | |
|---|---|---|---|
|  | **Detached House**<br>A one- to three-story detached, single family dwelling on its own lot. Typically, lot size is more than 5,000 square feet. |  | **Plex**<br>A dwelling having apartments with separate entrances to six or more units. This includes two-story houses having a complete apartment on each floor and side-by-side apartments on a single lot that share a common wall. |
|  | **Small Lot Single Family Residence**<br>A one- to three-story detached, single family dwelling on its own lot, but a smaller (2500 sq foot) lot. |  | **Corridor Apartment**<br>A four-story residential apartment building, typically with one on-street entrance and internal entrances to individual units. |
|  | **Attached House (Medium Density)**<br>Characterized by individual units that share a common wall, with each unit on its own lot. Examples include townhomes and rowhouses. |  | **Neighborhood Mixed Use**<br>A four-story residential apartment building with commercial uses on the ground floor. |
|  | **Attached House (High Density)**<br>Characterized by individual units that share a common wall. Many high-density attached houses include shared open space amenities in backyards or courtyards. Examples include duplexes, triplexes and units with shared courtyards. |  | **Single Room Occupancy Unit (SRO)**<br>A studio apartment that does not have its own washing, laundry and kitchen facilities. Examples include affordable housing projects, assisted living facilities and college dormitories. |
| **MID- TO HIGH-RISE APARTMENTS** | | | |
|  | **Mid-Rise Mixed Use (Small Units)**<br>A six- to ten-story building with ground floor office or retail uses. Allocated units of this type tend to be predominantly studios and one-bedroom units and tend to have smaller units. | | |
|  | **Mid-Rise Mixed Use (Large Units)**<br>A six- to ten-story building with ground floor office or retail uses. Typical units are larger, one- to four-bedroom units, and have a smaller number of studio units as part of the overall mix. | | |
|  | **High-Rise Tower**<br>A 10+ story building containing residential apartments or condominium units. In addition to spectacular views, most high rises offer their residents a full range of amenities. Building features may include 24-hour concierge service, swimming pools, spas, saunas, tennis courts, exercise areas, party rooms and guest suites. | | |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## Housing Types

The scenario model reflects the diversity of housing unit types that is found in Portland. These housing types fall into three broad categories: single family residential, corridor apartments, and mid- to high-rise units. These categories are based on building types and include both rental and ownership/condos. Distribution is based on recent development trends. The analysis shows that Portland expects to produce a wide range of housing types, with all of the scenarios producing a similar mix. The one exception is the Central City Focused scenario, which produces more high-rise towers and fewer plexes and corridor apartments, which could negatively affect housing affordability.

Chart 3. Housing Type Production by Scenario

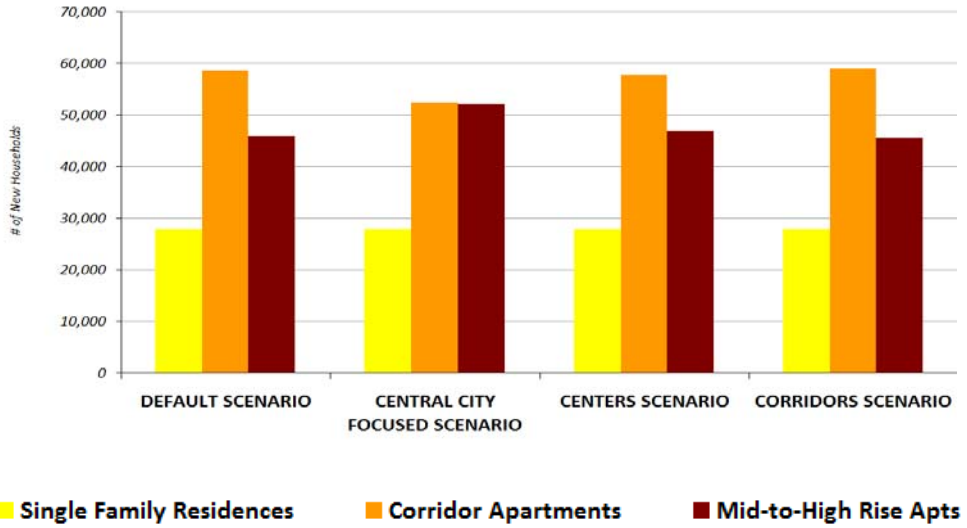


Table 11. Housing Type Production by Scenario

| | Default | Centers | Corridors | Central City Focused |
|---|---|---|---|---|
| SINGLE FAMILY RESIDENCES | | | | |
| Detached Houses | 15,380 | 15,023 | 14,891 | 14,883 |
| Small-Lot Houses | 3,290 | 3,299 | 3,291 | 3,355 |
| Attached Med Density | 5,332 | 5,487 | 5,535 | 5,435 |
| Attached High Density | 3,772 | 3,967 | 4,057 | 4,102 |
| CORRIDOR APARTMENTS | | | | |
| Plexes | 9,304 | 8,956 | 8,127 | 6,688 |
| Corridor Apts | 17,294 | 17,066 | 17,368 | 11,746 |
| SRO/Studios | 9,434 | 9,644 | 10,522 | 11,130 |
| Neighborhood Mixed Use | 22,518 | 21,913 | 22,939 | 22,795 |
| MID-TO-HIGH RISE APARTMENTS | | | | |
| Mid-Rise (small units) | 21,328 | 21,238 | 20,273 | 16,741 |
| Mid-Rise (large units) | 3,572 | 3,543 | 3,378 | 2,699 |
| High-Rise | 20,984 | 22,078 | 21,831 | 32,648 |


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## Household Types

Housing choice and preference are shaped by income. Metro considers the age of the head of household, income, household size and presence of children to define eight household types. Thus, the characteristics of each group will still vary, and could include renters and owners, old and young, singles or groups. However, income is a key aspect of the groups, with groups ordered from lowest to highest income levels.

Table 12. Household Types

| | |
|---|---|
| GROUP 1<br><$15,000 | These are the lowest income households, whether they are renters or owners. Of the renters in this group, all live alone, and most are elderly. Among owners in Group 1, age and the number of people in the household are more evenly distributed. Example: A woman in her seventies renting an apartment, living alone on a very low income. |
| GROUP 2<br>$15,000<$25,000 | These households can be any age, but their income is among the lowest. There are more renters than owners. About two-thirds are childless. However, one-third of the renter households in this group have school-age children, while only about one in six of the owners in this group have school-age children. Example: A family renting a home, two adults working at low-wage jobs, raising young children. |
| GROUP 3<br>$25,000<$35,000 | With a bit more income than Group 2 households, these people are primarily in the 25-44 age bracket. The renters are mostly single-person households. Among owners, about half are two-person households, approximately one-third of which are families with school-age children. Example: Two thirty-somethings, both of whom work, and who have just bought their first home. |
| GROUP 4<br>$35,000<$45,000 | With a broad age distribution, these households are usually childless, especially if they are renters. Owner households in Group 4 have more residents than renter households, and almost 40 percent of the group include school-age children. Example: Two people renting a home, both working, and with children who are grown up and living elsewhere. |
| GROUP 5<br>$45,000<$60,000 | Group 5 households are larger and wealthier. People in the renter households of this category are not only older than those in the owner households, but also have smaller household sizes. The owners are more likely than not to have children. Example: Two parents in their late thirties, living in a home they own with children in junior high and high school. |
| GROUP 6<br>$60,000<$75,000 | With more income than Group 5 households, almost half of the people in this group are between 25 and 44. Although the majority do not have school-age children, two- and three-person households are most common. The owner households are larger and more likely to have school-age children. Example: Two adults with well-paying jobs, one working full-time, the other part-time, raising elementary-school-age children and living in a home they own. |
| GROUP 7<br>$75,000<$100,000 | Mostly without children, these households include the very high-income couples, especially for owners. Interestingly, the renter households in Group 7 are more likely to have children than the owner households in the group. Example: Two early-fifties adults working at well-paying jobs, owning their home. |
| GROUP 8<br>>$100,000 | Among owners, most of these households have children; about 60 percent of renter households have children. They are the highest earners, in their prime earning years. Example: A family with two parents in their late forties or early fifties, both working fulltime in high-paying jobs, raising children who are still in school and living with them in the home they own. |

Source: City of Portland. Housing Demand and Supply Background Report, October 2012


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From Portland's 2010 Housing Needs Analysis, the Metro forecast predicts minor changes or shifts between the income groups, with the middle-income groups declining and the highest income group seeing the most increase. In general, 46 percent of Portland households are in the three lower income groups. These groups struggle to find suitable affordable housing today and the challenge will get more difficult as these groups grow by another 60,000 households.

Table 13. Households by Income Type (2005-2035)

| | Household Type | Income | 2005 Share | 2005 Households | 2035 Share | 2035 Households | Percent Change | Amount Increase |
|---|---|---|---|---|---|---|---|---|
| Low | Group 1 | <$15,000 | 18% | 43,214 | 18% | 69,267 | 0% | 26,053 |
| | Group 2 | $15,000-$24,999 | 14% | 33,611 | 15% | 57,722 | 1% | 24,111 |
| | Group 3 | $25,000-$34,999 | 13% | 31,210 | 13% | 50,026 | 0% | 18,816 |
| Middle | Group 4 | $35,000-$44,999 | 12% | 28,809 | 12% | 46,178 | 0% | 17,368 |
| | Group 5 | $45,000-$59,999 | 13% | 31,210 | 12% | 46,178 | -1% | 14,968 |
| | Group 6 | $60,000-$74,999 | 9% | 21,607 | 7% | 26,937 | -2% | 5,330 |
| High | Group 7 | $75,000-$99,999 | 9% | 21,607 | 7% | 26,937 | -2% | 5,330 |
| | Group 8 | $100,000+ | 12% | 28,809 | 16% | 61,570 | 4% | 32,761 |
| | Total | - | 100% | 240,078 | 100% | 384,815 | - | 144,737 |

## Affordability and Cost Burden by Household Type

Choice is shaped by both existing and new housing stock. Not every new household will be matched to a new unit. Older housing stock tends to be more affordable than new construction in many areas, and Portland's existing housing stock will continue to be the predominant housing stock in the market. Market demand, amenity level and location can put increased market pressure on these areas due to low vacancy rates and lack of choice within a particular segment of stock (i.e. family housing, studios, etc.).

In general, the diversity of the housing type production should be sufficient to produce enough housing units to meet the future demand, except for the low-income groups, which will have fewer choices from new development. For example, the number of Group 1 households is expected to grow by 25,000, but the scenarios expect to develop only another 10,000 units of SRO/studio housing. This gap will put pressure on the existing affordable units and increase the number of cost-burdened households in this category. For Groups 2 and 3, the housing situation is a little better – they are expected to grow by another 43,000 households by 2035 with the expectation that an additional 68,000 housing units will be developed in categories that could be suitable and affordable to them. However, these households will face competition for that housing from the other higher income groups that will limit their housing choices. Ensuring that excess capacity exists in those housing types could help protect against upward price pressure.


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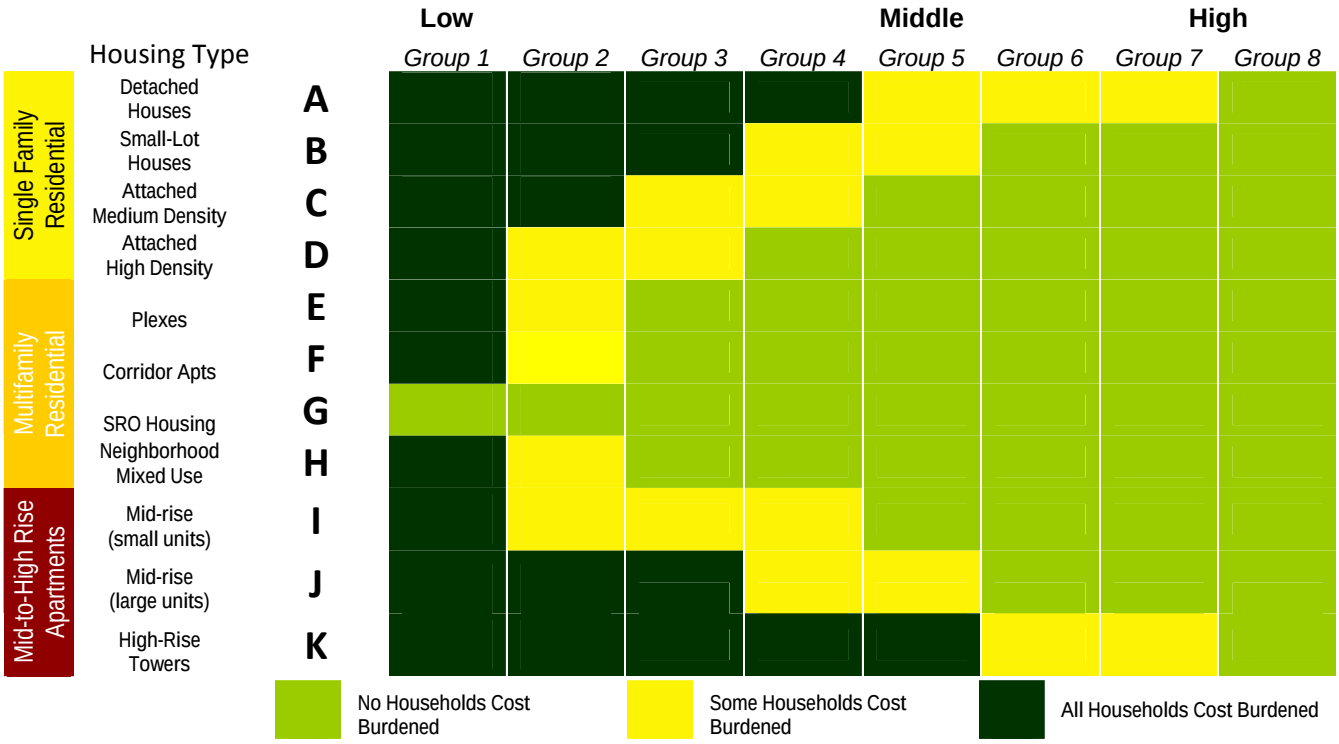
Table 14. Housing Affordability by Household Type




## Options for Improving Performance

Affordability will continue to be an issue that will need to be addressed, especially to meet the needs of low-income households, communities of color, aging populations and people with disabilities.

### Keep Housing Affordable

The City needs to focus on keeping housing affordable and increasing the ability of the most vulnerable households to live in complete neighborhoods. This can be achieved through building more affordable units in accessible amenity-rich locations, lowering transportation costs and increasing household prosperity, and improving services in areas that are affordable but not well served.

### Create a Wide Range of Housing Choices

Producing a diverse supply of housing creates diverse communities with the opportunity for households to remain in their neighborhood as their lifestyles and housing needs change, especially in allowing older adults to age within their community.

### Support Development of New and Nontraditional Housing Types

Changing household needs and preferences will create demand for new and different housing types. Recently, Portland has seen the development of different, non-traditional housing, such co-housing, micro-apartments and accessory dwelling units.

## Supporting Portland Plan Actions:

PP Action #76 – Housing Strategy

PP Action #77 – Affordable Housing Strategy

PP Action #82 – Physically Accessible Housing

PP Action #83 – Moderate-income Workforce Housing



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## GENTRIFICATION RISK AREAS

**PORTLAND PLAN**

By 2035, no more than 30 percent of city households (owners and renters) are cost burdened, which is defined as spending 50 percent or more of their household income on housing and transportation costs.

The Portland Plan provides new direction on the issue of balancing neighborhood revitalization with the ability of residents to stay in place to enjoy the new amenities and benefits of that revitalization. The City has committed to ensuring that all communities are prosperous, healthy and accessible—but with increasing numbers of highly educated and more affluent newcomers coming to Portland, housing pressures rise. As some neighborhoods become more desirable, long-time residents with lower incomes, particularly in communities of color, have found themselves priced out and moving out—often to areas with fewer services, amenities and institutions. A risk assessment based on demographic and housing market changes that are indicators of changes in neighborhood character has identified areas of Portland that are at increased risk of gentrification or displacement. This performance measure assesses the level of risk based on the number of households that are in these areas.




**Gentrification Risk Areas** identify places where there is risk of gentrification or displacement.

**Stable Neighborhoods** identify places where the risk of gentrification is less. These areas represent areas that have had relatively consistent indicators on property values, ownership and rental rates, household income and diversity.


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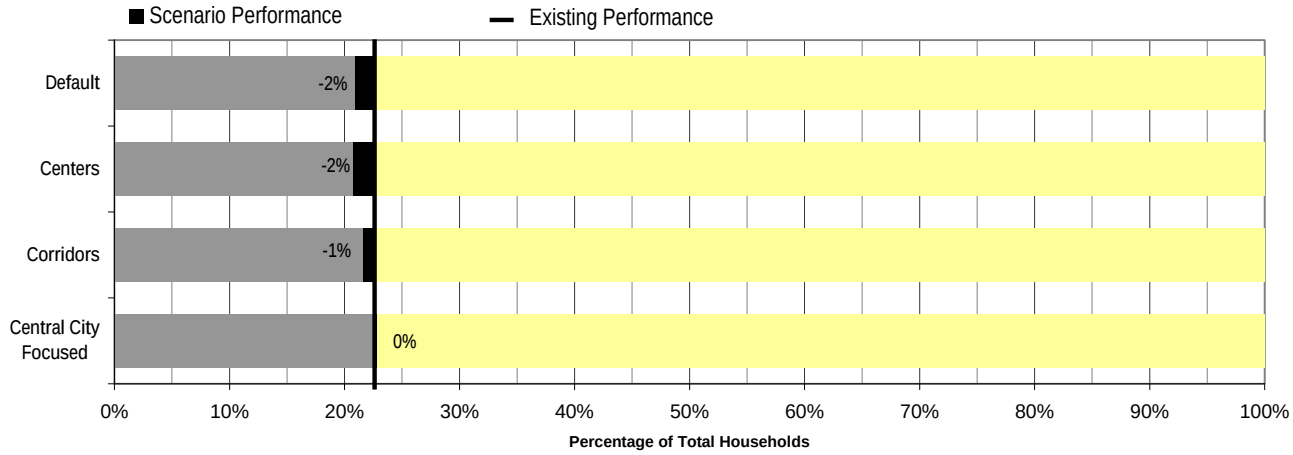
Chart 4. Performance Measures: Gentrification
Households in Gentrification Risk Areas




## Performance Summary

The level of development within gentrification risk areas is relatively consistent across all of the scenarios. The Central City Focused scenario has the highest level of gentrification risk (22 percent).

## Options for Improving Performance

Develop More Affordable Housing
Development of affordable housing is at the heart of displacement mitigation strategies. The City should focus on creating more affordable housing and increasing the ability of low-income and minority households, and the most vulnerable households, to have the opportunity to stay in the neighborhood.

Lesson Learned: More Affordable Housing
Making investments to focus growth in high-performing areas can create more gentrification pressure. This means Portland will need to do a better job of aligning growth management and public investment strategies with affordable housing strategies.

Business Development
As development or public investment occurs in at-risk neighborhoods, businesses facing gentrification need assistance through programs such as the City's Neighborhood Prosperity Initiative. The City also could focus workforce development and job training programs to enable lower income residents to qualify for a better job that would enable them to afford the increased housing costs.

Tracking and Program Evaluation
Using the Portland Plan's Framework for Equity as a guide to track neighborhood change, including changes in race, age, disability, ownership and other factors, could help the City anticipate the impacts of new policies and programs.

## Supporting Portland Plan Actions:

PP Action #1 – Enforce Title VI
PP Action #2 – Track Information on Disparity
PP Action #3 – Evaluate Equity Impacts
PP Action #4 – Improve Evaluation Methods
PP Action #5 – Mitigate Disparities
PP Action #12 – Community Dialogue
PP Action #34 – Housing Stability
PP Action #79 – Equity in Neighborhood Change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COMPLETE NEIGHBORHOODS

**PORTLAND PLAN**

By 2035, 80 percent of Portlanders live in a complete neighborhood with safe and convenient access to the goods and services needed in daily life. At least 80 percent of Portland's neighborhood market areas are economically healthy. They promote economic self-sufficiency of households through the strength and performance of local retail markets, job and business growth, and access to transit and nearby services that lower household costs.

A "complete neighborhood" is a neighborhood where people have convenient access to the goods and services needed in daily life, which includes a variety of housing options, grocery stores and other commercial services, high-quality public schools, public open spaces, active transportation options and civic amenities. Providing more opportunities for more households to live in complete neighborhoods can help reduce household transportation costs, improve pubic health by making it easier to incorporate exercise into daily life and reduce carbon emissions. This performance measure is based on the City's 20-minute neighborhood index. The performance measure is based on the number of households located in a complete neighborhood.




**Complete Neighborhoods** identify places that are considered relatively complete on the 20-minute neighborhood index. Prioritizing development in these high-performing areas will take advantage of the existing infrastructure and services. These areas have a good active transportation system that connects neighborhood business districts, schools, parks and other amenities.

**Complete Neighborhood Gap Areas** identify places that lack access to one or more of the key components of a complete neighborhood. Some areas lack a strong neighborhood business district. Other areas lack a complete transportation system (sidewalks are missing, streets are unimproved, etc.), which can make it take longer or be more difficult to access the services one needs for daily living.


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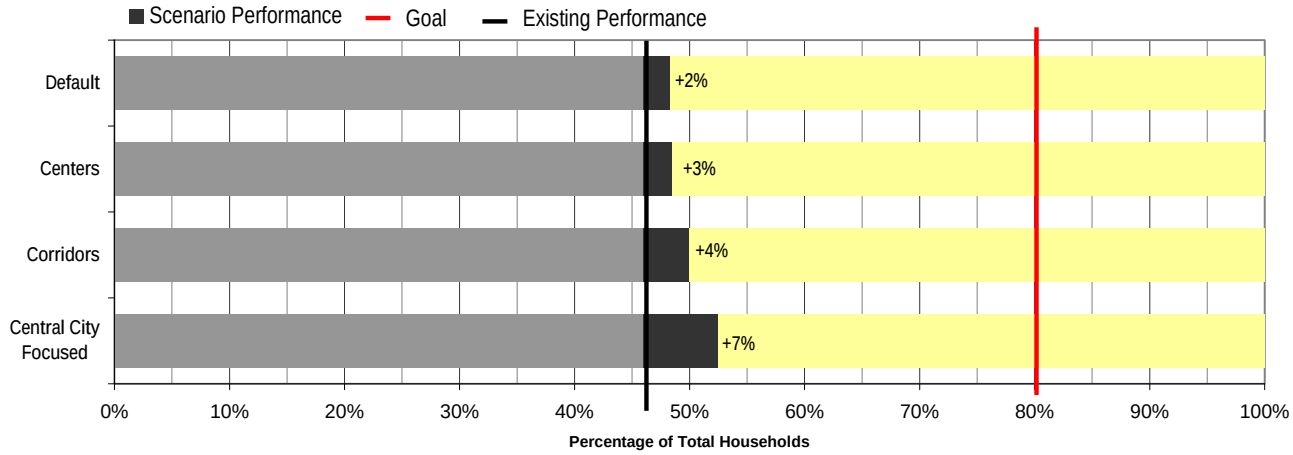
Chart 5. Performance Measures: Complete Neighborhoods
Households in a Complete Neighborhood




## Performance Summary

Today, nearly half (47 percent) of all Portland households live in complete neighborhoods. New growth will occur in these high-performing areas, but it will not be enough to meet the goals. The Central City Focused scenario performs best because most of Portland's complete neighborhoods are located in the Central City and the surrounding Inner Neighborhoods.

## Options for Improving Performance

Lesson Learned: More Complete Neighborhoods
Portland's legacy development pattern means that to fully achieve this goal requires creating more complete neighborhoods, especially in East and Southwest Portland.

Create More Complete Neighborhoods in East Portland
The success in meeting this performance measure is dependent on creating more complete neighborhoods in East Portland, by providing more frequent transit, more sidewalks and bikeways and stronger business districts that serve neighborhood needs.

Create More Complete Neighborhoods in Southwest Portland
Much of Southwest Portland is challenged by topography, densities too low to support frequent transit, a relative scarcity of neighborhood commercial services and an incomplete street network. However, there are opportunities to create more complete neighborhoods along the Barbur Boulevard corridor and existing neighborhood business districts in Hillsdale, Multnomah Village and West Portland.

Expand Access and Create More Housing Options in Complete Neighborhoods
An important element of a complete neighborhood is that it has housing options to accommodate the needs of people of all ages and abilities. Neighborhoods in areas of North, Northeast and Southeast Portland present an opportunity to increase access to existing neighborhood business districts that will expand the coverage of complete neighborhoods. Also, encouraging the development of a range of housing types in these areas can expand the diversity of households that live in these areas.

## Supporting Portland Plan Actions:

PP Action #84 – Align Housing and Transportation Investments

PP Action #103 – Age Friendly City

PP Action #127 – Civic Corridors

PP Action #129 – Sidewalk Infill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## FREQUENT TRANSIT ACCESS

**PORTLAND PLAN**

By 2035, Portlanders have reduced the number of miles they travel by car to 11 miles per day on average and 70 percent of commuters walk, bike, take transit, carpool or telecommute to work.

Portland has adopted policies to increase the share of trips made using green and active transportation modes and to make transit the preferred mode for longer commuting trips. The goal of having 70 percent of commuters use active transportation is rooted in the climate action/carbon reduction, air quality and public health goals. The performance measure is based on convenient access to the highest quality elements of the transit network – MAX, Portland Streetcar and frequent TriMet bus service. Providing access by a short, ¼-mile walk can make it convenient for residents to use the transit system for many of their daily needs. This measure is a simple method of determining access to transit based on proximity to the frequent transit network.




**Frequent Transit Access Areas** identify places within ¼ mile of the frequent transit, which represents the best service that Portland has to offer. Development in these areas will have better access and presumably greater transit use than in other areas of the city.

**Transit Access Gap Areas** identify places that lack access to the frequent transit network. A bus route may be available in some areas, but the service levels or frequency may not be enough to represent a true alternative to the automobile.


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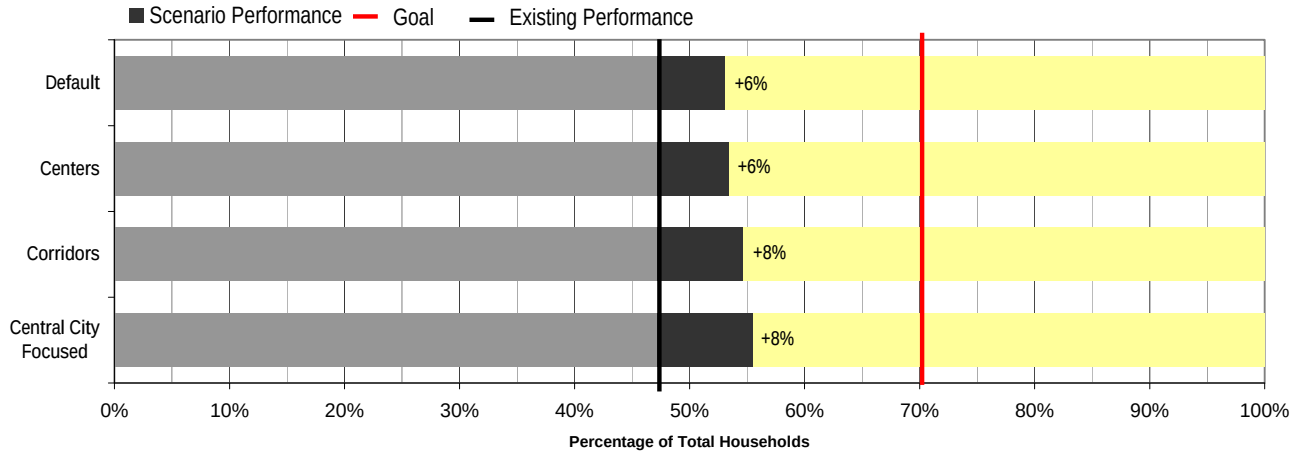
Chart 6. Performance Measures: Frequent Transit Access
Households within ¼ Mile of Frequent Transit




## Performance Summary

Currently, 47 percent of Portland households have good access to the frequent transit network. All of the scenarios show some increase in access to transit, with the Corridors and Central City Focused scenarios showing slightly better improvement because most of the growth is directed to the areas where the existing frequent transit network converges on the Central City.

## Options for Improving Performance

Lesson Learned: More Transportation Choices
Increasing transportation choices has multiple benefits beyond the transportation system. Access and mobility play a significant role in creating complete neighborhoods and increasing access to family-wage jobs.

Expand the Frequent Transit Network
The existing network does not cover all parts of Portland, even if people are willing to walk longer distances. There are significant gaps in East Portland, especially on north-south routes such as 122nd Avenue, 136th Avenue and 148th Avenue.

Provide Better Access to Transit
Completing a network of sidewalks and bicycle facilities to and from transit routes can make it easier and more convenient for people to ride transit and can extend the coverage area of a frequent transit route.

## Supporting Portland Plan Actions:

PP Action #96 – Transportation Modal Policy

PP Action #107 – Transit and Active Transportation

PP Action #121 – Regional and Local Trails

PP Action #122 – Neighborhood Greenways

PP Action #126 – Pedestrian Facilities

PP Action #130 – Streetcar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## LOW-STRESS BIKE NETWORK ACCESS

**PORTLAND PLAN**

By 2035, Portland residents have reduced the number of miles they travel by car to 11 miles per day on average and 70 percent of commuters walk, bike, take transit, carpool or telecommute to work.

By 2035, all Portlanders have safe and reliable transportation choices.

The Portland Bicycle Plan for 2030 sets the goal that all Portlanders have equal access to the benefits of bicycling. A low-stress or family-friendly bicycle network, based on the best design practices of great bicycling cities around the world, creates safe, comfortable and attractive bikeways that can carry more bicyclists and serve all types and ages of users. In many parts of Portland, the common destinations of daily life are already within a 20-minute bicycle ride, but some areas lack the bicycle facilities to support such trips. When supported by a well-designed network, the bicycle offers residents a transportation alternative that allows them to access basic services safely and efficiently without reliance on an automobile. Adopted City policies seek to increase the share of trips made using green and active transportation modes and to make bicycling more attractive than driving for short trips. A comprehensive bike network provides equity and access to viable, affordable transportation options and creates fun, vibrant and livable neighborhoods. The performance measure is based on convenient (¼-mile) access to the highest quality elements of the bicycle network.




**Low-Stress Bikeway Access Areas** identify places that are within ¼-mile of a low-stress bike facility that support the widest range of users. These facilities include separated bikeways, neighborhood greenways, and trails.

**Low-Stress Bikeway Gap Areas** identify places where bicycle facilities may be missing, connectivity is poor or the existing bike infrastructure may be attractive only to more confident cyclists due to safety concerns.


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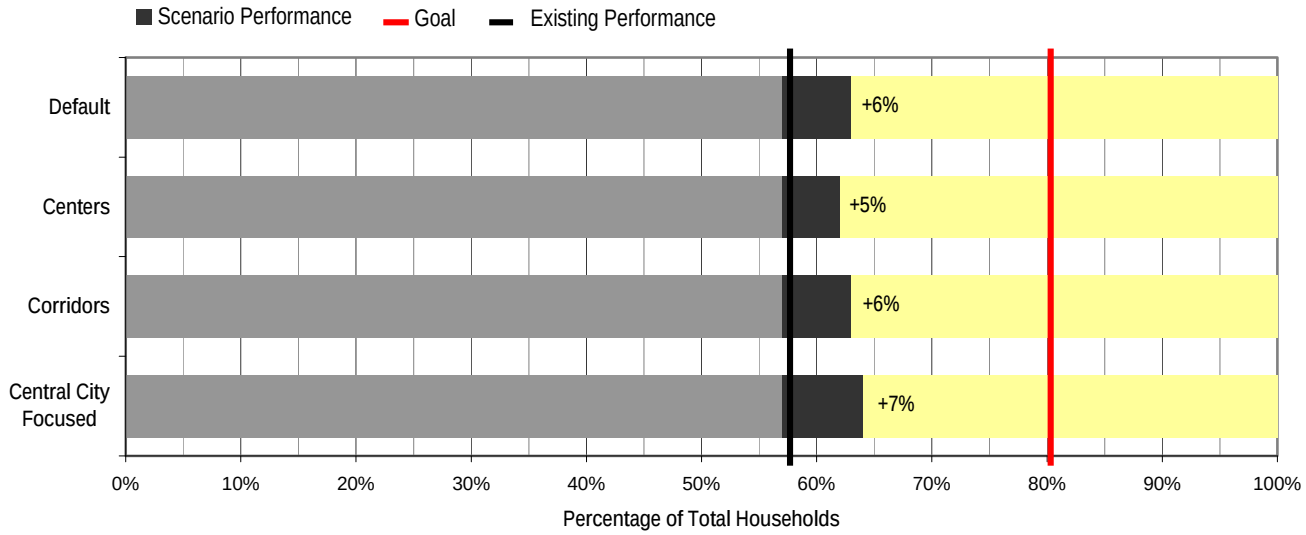
Chart 7. Performance Measures: Low-Stress Bike Network
Households within ¼ Mile of Low-Stress Bike Network




## Performance Summary

Currently, 56 percent of Portland households have good access to the existing low-stress bikeway network. All of the scenarios show some increase in access to the bikeways, with the Central City Focused scenario performing best because more households are located in the inner neighborhoods that are well served by this existing network.

## Options for Improving Performance

Expand Neighborhood Greenways to Fill Gaps

The Bicycle Plan for 2030 identifies a network of low-stress facilities to ensure that all neighborhoods have adequate low-stress bicycle facilities that connect to neighborhood commercial corridors and centers so that local residents can safely and comfortably access the facilities by bicycle or on foot.

Strategic Considerations (Age, Income, Communities of Color)

Designing these low-stress facilities to meet the needs of the communities they serve may emphasize connections to neighborhood business districts, parks and open spaces, or community destinations like banks, places of worship and community centers. These considerations will ensure that these places will support transportation choice, recreational opportunities that lead to better health outcomes and expanded access to services or transit.

## Supporting Portland Plan Actions:

PP Action #96 – Transportation Modal Policy

PP Action #107 – Transit and Active Transportation

PP Action #121 – Regional and Local Trails

PP Action #122 – Neighborhood Greenways

PP Action #126 – Pedestrian Facilities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## TRANSPORTATION: VEHICLE MILES TRAVELED AND MODE SHARE

**PORTLAND PLAN**

By 2035, Portlanders have reduced the number of miles they travel by car to 11 miles per day on average and 70 percent of commuters walk, bike, take transit, carpool or telecommute to work.

For Portland to achieve the health and carbon reduction goals in the Portland Plan and the Climate Action Plan (CAP), more Portlanders will need to choose alternatives to driving a car to meet their transportation needs. Today, approximately 29 percent of Portland residents walk, bike, take transit to work or work from home, which is a higher level than many other U.S. cities, but it is far below leading cities in Europe and North America.

Performance measures tracking the growth scenario impacts on the transportation system include vehicle miles traveled and mode share. Vehicle miles traveled (VMT) is a measure that is commonly used to describe automobile use on a daily or annual basis. It incorporates both the number of vehicle trips and the length of those trips by residents and businesses (excluding buses, heavy trucks and through trips). Mode share describes the number of trips or the percentage of travelers using a particular mode (or type) of transportation, such as driving alone, carpooling, walking, biking or riding transit.

These measures are calculated using the City of Portland's transportation models to estimate the changes in travel behavior that result from the different development patterns in the scenarios. This analysis uses a simpler form of the model to give some preliminary results. A more sophisticated model will be used to analyze the preferred scenario.

### Vehicle Miles Traveled (VMT)

VMT is reported as a total number of miles per weekday. With all of the scenarios, the model results suggest that by 2035 daily VMT increases by 25 to 30 percent, but not as fast as the household or employment growth rates (53 and 43 percent, respectively). In addition, Portland's share of the regional VMT drops from 45 percent in 2010 to 36 percent in 2035.

The CAP set a target of reducing 2030 per capita daily vehicle miles traveled by 30 percent from 2008 levels. This reduction must occur in addition to vehicle fuel efficiency improvements and the development of cleaner fuels. Model results project that VMT on a per capita basis drops 4 percent for Portland as a whole. However, the Central City experiences a projected per-capita reduction of 26 percent, whereas the rest of Portland sees a per capita reduction of only about 2 to 5 percent.

Table 15. Total Change in Vehicle Miles Traveled 2010 to 2035

| | Daily VMT | 2010-2035 Change |
|---|---|---|
| **2010** | 16,210,000 | - |
| | | |
| **2035** | | |
| Default | 21,148,000 | + 30% |
| Centers | 20,786,000 | + 28% |
| Corridors | 20,754,000 | + 28% |
| Central City Focused | 20,337,000 | + 25% |


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## Mode Share

Mode share measures the share of Portland's travel that is made by different modes of transportation, including driving alone (single-occupancy vehicles), carpooling, transit, biking and walking. In this case, mode share is defined in terms of automobile trips. The Portland Plan set an objective that 70 percent of commuters use transit or active transportation, carpool, or work from home. The simple model analysis includes all types of trips, but uses the same overall goal of 30% automobile share.

Chart 8. Performance Measure: Mode Share
Percent of Trips by Automobile

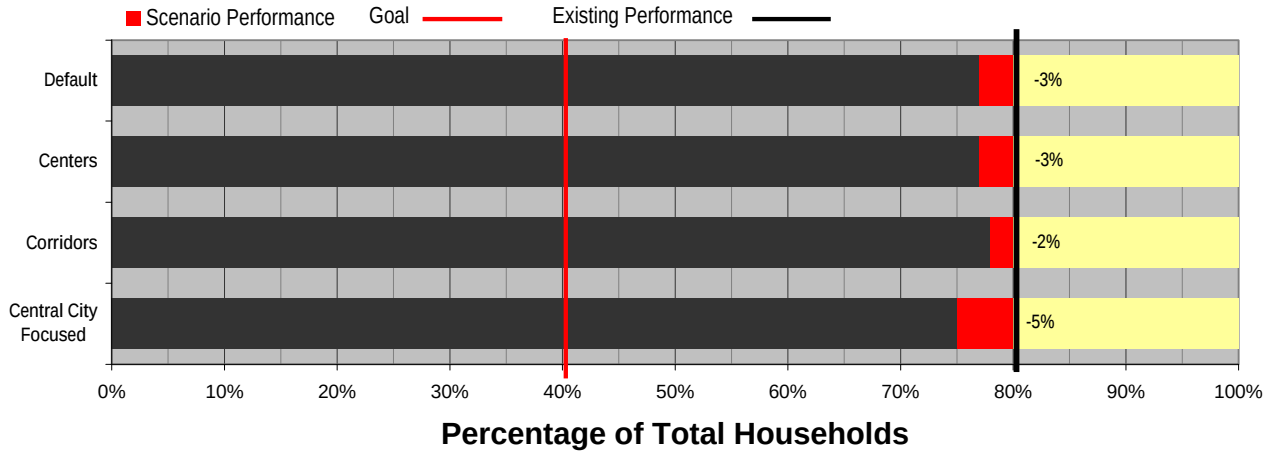


Table 16. Change in Automobile Mode Share 2010 to 2035

| | Share of Trips by Automobile | Change from 2010 |
|---|---|---|
| **2010** | 79.6% | - |
| | | |
| **2035** | | |
| Default | 77.2% | -2.4% |
| Centers | 76.7% | -2.9% |
| Corridors | 77.8% | -1.8% |
| Central City Focused | 74.6% | -5.0% |

The model results project only a small shift in mode share between 2010 and 2035. Again, the Central City Focused scenario shows the largest shift to non-automobile modes, because that scenario focuses growth in higher density mixed-use areas that are already well-served by transit.

## Options for Improving Performance

Reducing vehicle miles traveled and increasing non-automobile mode share can be achieved by shifting vehicle trips to active transportation trips — walking, bicycling and taking transit — and by shortening trips by providing more destinations close to households.

A variety of land use and transportation strategies, including better transit services, bicycling facilities, pedestrian facilities and amenities, can make these modes more attractive than autos. These measures are closely related to the Complete Neighborhood measure in that improving connectivity and providing more attractive destinations will have complementary impacts on VMT and mode share.


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## GREENHOUSE GAS EMISSIONS

**PORTLAND PLAN**

By 2035, Portland's transportation-related carbon emissions are 50 percent below 1990 levels.

Portland and Multnomah County have achieved considerable success in limiting the growth of greenhouse gas or carbon emissions. Land use and transportation policies have resulted in almost no increase in emissions from transportation since 1990, despite a population increase of more than 25 percent. Overall, the Climate Action Plan (CAP) set the goal of an 80 percent reduction of all types of carbon emissions from 1990 levels by 2050. While the CAP identified strategies to reduce emissions from a wide range of sectors, the growth scenarios influence the carbon emissions related to transportation and residential buildings.

### Transportation

Reducing per capita VMT while maintaining the mobility of Portlanders will require significant increases in walking, bicycling and transit. This shift is expected to produce community health and economic benefits as well. Portland-area residents and businesses reap a "green dividend" of more than $1 billion annually in reduced transportation costs as a result of people driving less than do residents of other comparable American cities. Similarly, evidence is increasingly emerging of the health benefits of reducing vehicle miles traveled, both in terms of improved air quality and increased levels of physical activity.

Despite total VMT increases in each growth scenario, improvements in vehicle fuel efficiency standards across all vehicle classes and a reduction of the carbon content of fuels result in a projected 55 percent reduction in carbon emissions from cars and light trucks. However, while the CAP set a goal of reducing VMT by 30 percent by 2030, all of the growth scenarios are projected to produce a 25 to 30 percent increase.

Table 17. Transportation Emissions

| | **Carbon Emissions (metric tons/year)** | **Percentage Reduction from 2010** |
|---|---|---|
| **2010** | 2,480,000 | |
| **2035** | | |
| Default | 1,149,000 | 54% |
| Centers | 1,128,000 | 55% |
| Corridors | 1,127,000 | 55% |
| Central City Focused | 1,105,000 | 55% |

### Household Energy

Buildings are the single largest contributor to carbon emissions in Multnomah County, accounting for more than 40 percent of total emissions. Reducing carbon emissions from building energy use can result from two types of changes: improving energy efficiency and reducing the carbon intensity of energy supplies, such as by increasing renewable sources of electricity like solar and wind power.


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The different variations in housing types in each scenario impacts the overall carbon emissions. The trend to more multifamily housing types leads to lower carbon emissions because those types of units are more likely to be small and have shared walls, which is more energy efficient. There is no significant difference in the projected housing mix for each of the scenarios. For all the scenarios, this analysis suggests that total residential carbon emissions will increase by 42 percent, which is slightly less than the anticipated 52 percent increase in the number of households.

Table 18. Residential Carbon Emissions

| | Carbon Emissions (metric tons/year) | Share of 2035 Carbon Emissions |
|---|---|---|
| **2010** | | |
| Existing Single Family | 1,197,000 | 51% |
| Existing Multifamily | 433,000 | 19% |
| **2010-2035** | | |
| New Single Family | 199,000 | 9% |
| New Multifamily | 493,000 | 21% |
| **2035 Total** | 2,322,000 | |

It is important to note that the majority of Portland's 2035 residential carbon emissions are expected to come from the existing housing stock, which is not affected by the different growth scenarios. The key to meeting the CAP reduction goals is through home energy efficiency retrofits on existing housing. Achieving the combination of CAP objectives could make it possible to reduce residential building carbon emissions by 36 percent, while the number of households increases by 52 percent.

Table 19. Strategies to Reduce Residential Sector Carbon Emissions

| | CAP Reduction Goal | Carbon Emissions (metric tons/year) |
|---|---|---|
| Existing Building Retrofits | 25% | 400,000 |
| Onsite Renewable Energy | 10% | 190,000 |
| Energy Code Improvements | 20% | 140,000 |
| Net Zero Buildings after 2030 | | 100,000 |
| Total | | 830,000 |

## Options for Improving Performance

Over the long term, land use and transportation planning can greatly influence transportation-related carbon emissions. Emissions reduction depends critically on coordinated land use policies and the development of infrastructure for low-carbon modes of transportation.

### Expand Complete Neighborhoods

A critical and basic step to reducing automobile dependence is to ensure that residents live in complete neighborhoods, meaning that they can comfortably fulfill most of their daily needs within a 20-minute walk from home. This means providing a wide range of destinations near a diversity of housing types that are connected by a network of sidewalks, bicycle facilities and transit service. Expanding complete neighborhoods involves (1) identifying the land use planning changes and infrastructure investments,


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including public-private partnerships, that are needed for each mixed-use center to achieve a highly walkable and bikeable neighborhood, and (2) developing an implementation action plan.

More Active Transportation Trips

Expanding pedestrian and bicycle facilities as well as transit service will make these modes more attractive, especially for short trips. Shifting trips to active transportation modes will help reduce emissions. This network expansion also can decrease travel costs for lower income households.

More Efficient Homes

Because buildings last for many decades, efforts to reduce emissions by improving the energy efficiency of existing buildings will be critical to meeting the reduction goals. The City of Portland, Energy Trust of Oregon, Oregon Department of Energy, utilities and other organizations already have undertaken significant work to increase energy efficiency and decrease energy-related carbon emissions. Much work remains to be done, and it will be important to leverage existing efforts and expertise to accelerate this work.

Maximize Energy Performance of New Buildings

Buildings that have been designed and built with low-carbon performance as a primary goal can significantly outperforming similar, previously built buildings that have been retrofitted for efficiency. Because total emissions from buildings must be reduced by more than can be accomplished with retrofits alone, it is critical that buildings built after 2030 generate more energy from clean sources than they consume, resulting in a net emissions reduction. The CAP has a goal of net-zero energy use for all new buildings after 2030.

Onsite Renewable Energy

In parallel with the improvements to the building stock, CAP objectives seek to produce 10 percent of the total energy used from on-site renewable sources and clean district energy systems. District- and neighborhood-scale energy systems, as well as on-site renewables and distributed generation sources, also provide opportunities for efficiency gains by reducing transmission losses.

## Supporting Portland Plan Actions:

PP Action #96 – Transportation Mode Policy

PP Action #107 – Transit and Active Transportation

PP Action #121 – Regional and local trails

PP Action #122 – Neighborhood Greenways

PP Action #123 – Stable Transportation Funding

PP Action #126 – Pedestrian Facilities

PP Action #127 – Civic Corridor Designs

PP Action #128 – Civic Corridor Integration

PP Action #129 – Sidewalk Infill

PP Action #130 – Streetcar Planning

PP Action #55 – Clean Tech and Green Building Innovation

PP Action #56 – Growing Green Development Expertise

PP Action #57 – Building Markets for Energy Efficiency

PP Action #100 – Resiliency Planning

PP Action #115 – District-scale Environmental Performance


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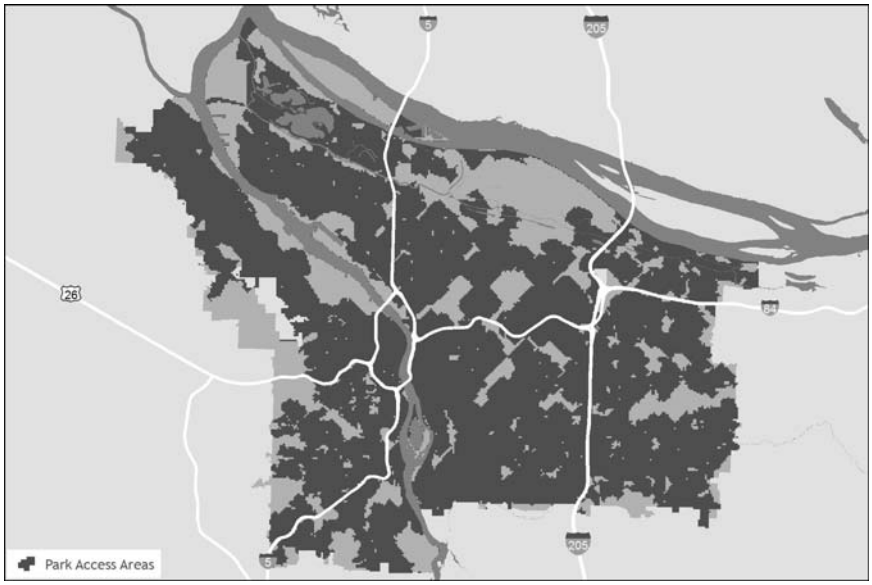
## PARKS ACCESS

**PORTLAND PLAN**

By 2035, all Portlanders live within a half-mile safe walking distance of a park or greenspace. All Portlanders can conveniently get to and enjoy the Willamette and Columbia Rivers. The regional Trail System is substantially complete and is an integrated component of a Healthy Connected City network.

Access to parks and greenspace is a critical component of a healthy complete neighborhood. Nearby parks and natural areas give Portlanders places to recreate, relax and spend time with friends and family. The City of Portland's Parks 2020 Vision set the goal of providing all Portlanders with a recreational opportunity – such as a developed park or access to a natural area – within a ½-mile walk (approximately 15 minutes). The performance measure is about access and is based on the number of households located within a convenient, ½-mile walking distance to a park or greenspace. Parks and greenspace areas used in this analysis are more than one-eighth of an acre and include existing parks, as well as land acquired by Portland Parks and Recreation that will be developed as parks in the future. Public school playgrounds and playing fields are not included in this analysis, although they do supplement the City's park system. Distance was determined from park and greenspace public access points via streets and trails.




**Park Access Areas** identify places with walkable ½-mile access to parks. These areas take into account network connectivity and true walking distance.

**Park Gap Areas** identify places that are lacking convenient access.


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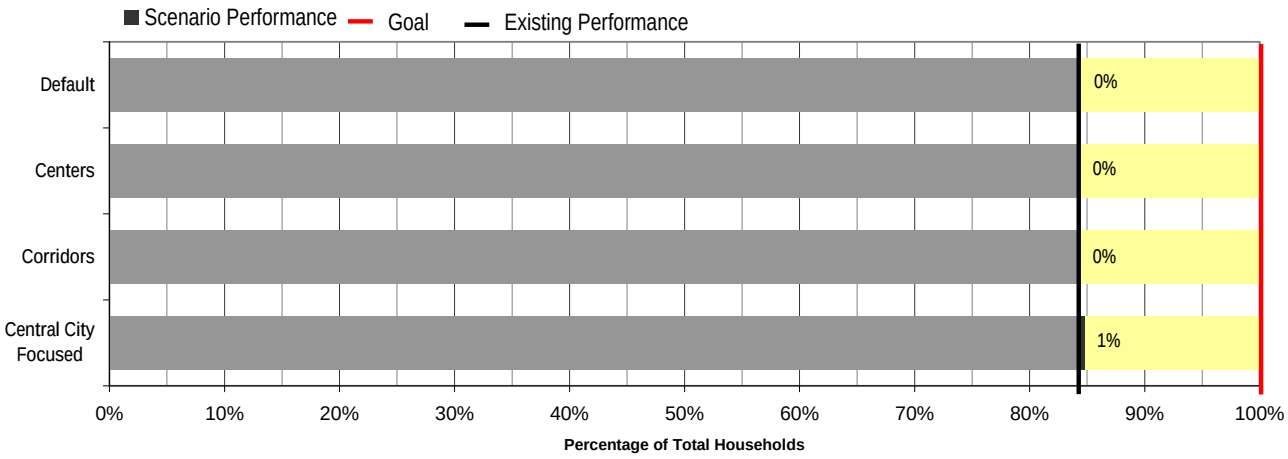
Chart 9. Performance Measures: Parks Access
Households within ½ Mile of a Park




## Performance Summary

Portland's parks are well distributed across Portland, so this is one measure in which Portland performs reasonably well. There is little difference between the scenarios. The Central City scenario performs best, offering a 1 percent increase. However, there are persistent gaps in Northeast and East Portland.

## Options for Improving Performance

Develop Parks in Gap Areas
New park development in target areas will fill gaps and meet the needs of rapidly developing areas. As well-served areas experience growth, existing parks may require more maintenance or re-designed for higher-intensity uses. They will be used more heavily, require additional operations and serve more people.

Create Opportunities for Urban Plazas and Community Gathering Areas
Development of urban plazas and squares can fill gaps in areas where larger parcels may not be available. These smaller community gathering areas can fill in gaps where park needs are high and where other options are not feasible.

Increase Access to Parks through Transit, Trails, Sidewalks and Bicycling Facilities
Improving sidewalks, bicycle lanes, and transit can enable park users to more safely and conveniently access existing park facilities.

Parks in Emerging Centers
Places like Gateway, Hollywood and the Lloyd District have access convenient access to parks, but these higher density mixed-use neighborhoods may need additional park space or consider park designs intended for more high-intensity use.

## Supporting Portland Plan Actions:

PP Action #117 – Natural Resources

PP Action #122 – Neighborhood Greenways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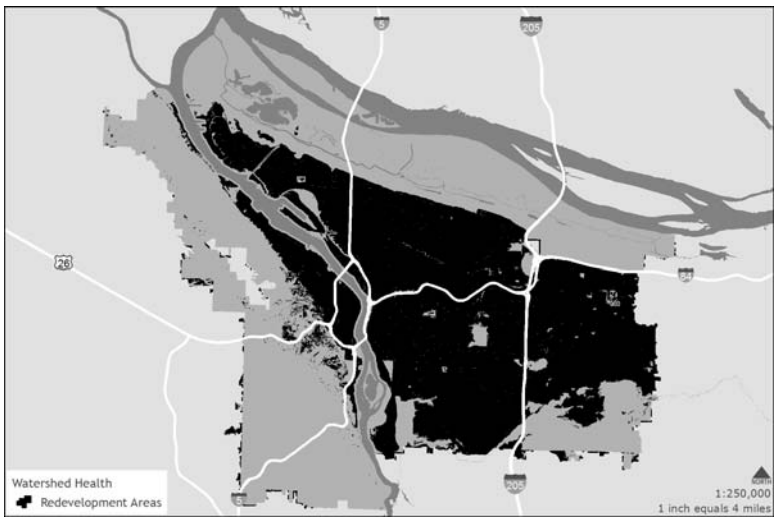
## WATERSHED HEALTH

### PORTLAND PLAN

By 2035, watershed health is improved, and the Willamette River and local streams meet water quality standards. Tree canopy covers at least one-third of the city and is more equitably distributed. Fewer homes and businesses are at risk from flooding. A diversity of critical habitats (including floodplains, riparian areas, wetlands, oak groves, native forests and remnant meadows) are protected, connected and enhanced to support a rich diversity of native and migratory wildlife.

Healthy watersheds support clean air and water, help moderate temperatures, reduce the risk of flooding and landslides, preserve places to enjoy nature, and help the city adapt to climate change. Many factors affect the health of Portland's watersheds: the interaction of rainwater with the land, the amount of impervious surface covering the land, chemicals and bacteria that are carried into groundwater and streams, the extent and characteristics of the tree canopy and the number and type of invasive species. This performance measure identifies parts of Portland where, from a watershed health perspective, development may improve conditions by incorporating sustainable stormwater management and other citywide greening efforts. The performance measure is based on the number of households located in these development opportunity areas.




**Development Opportunity Areas** identify places that in general have the ability to accommodate additional growth without significant impact. Future development would trigger stormwater management requirements that would improve conditions by increasing on-site sustainable stormwater infiltration, tree canopy and vegetation.

**Constrained Areas** identify places where natural resources and green infrastructure, such as streams, wetlands, soils and vegetation- have limited capacity to accommodate new growth without detrimental impacts on watershed health. In the most sensitive areas, encroachment from development would likely have negative impacts on natural ecological functions, habitat connectivity and the risk of landslides or flooding.


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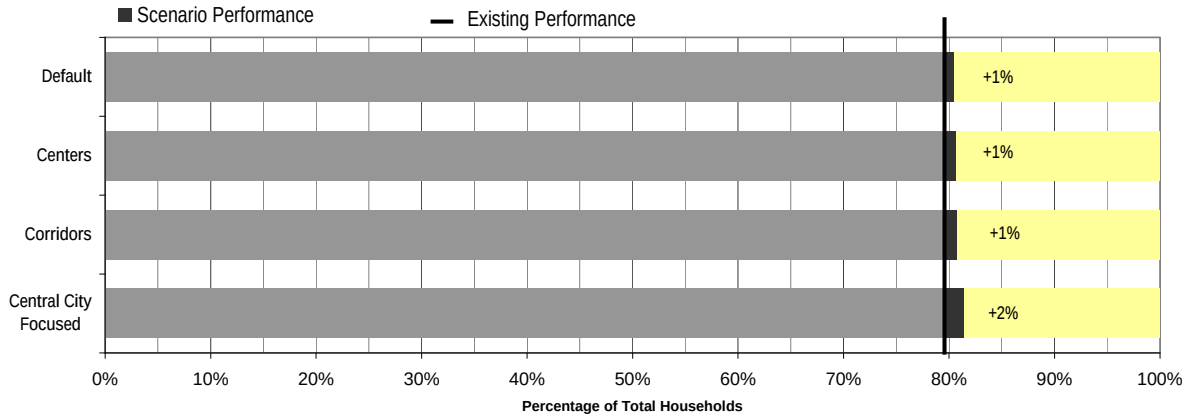
Chart 10. Performance Measure: Watershed Health
Households in Development Opportunity Areas




## Performance Summary

As a general trend, all of the alternatives perform marginally better than existing conditions, because most of the available growth capacity would be accommodated in urbanized areas that have a high proportion of existing impervious surface. The Central City Focused scenario would perform the best by shifting some of the development pressure in more environmentally-sensitive parts of North, East and West Portland to more urban redevelopment sites in Inner Portland.

## Options for Improving Performance

### Limit Development Impacts in Constrained Areas

Growth in constrained areas needs to be carefully considered because of drainage and infiltration issues, the risk of natural hazards and potential adverse impacts on significant natural resources. Development impacts could be avoided by limiting development in these areas. Where development is allowed, impacts could be minimized by encouraging ecologically sensitive site design, purchasing of land from willing sellers or using of conservation easements.

### Encourage Growth in Development Opportunity Areas

Overall, much of North, Northeast and Southeast Portland is well-suited to accommodate new development because of natural conditions and the availability of infrastructure. The City can encourage growth in Development Opportunity areas by promoting development on underutilized sites through a combination of land use plans, infrastructure investments, and by establishing public-private partnerships such as the EcoDistrict efforts.

### Shift in Development Approaches

Some development types are better suited to reducing impacts than others. Focusing growth in key centers and corridors could relieve pressure on the most sensitive environmental areas and take full advantage of existing infrastructure. The City can facilitate this by designing with nature, updating development standards and streamlining permitting for ecologically sensitive development. Additional tools include incentives such as the Portland Ecoroof Incentive Program.

## Supporting Portland Plan Actions:

PP Action #100 – Resiliency Planning

PP Action #116- Natural Resource Inventory

PP Action # 118- Fish Passage

PP Action # 119- Tree Canopy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TREE CANOPY

## PORTLAND PLAN

By 2035, watershed health is improved, and the Willamette River and local streams meet water quality standards. Tree Canopy covers at least one-third of the city and is more equitably distributed. Fewer homes and businesses are at risk from flooding. A diversity of critical habitats (including floodplains, riparian areas, wetlands, oak groves, native forests and remnant meadows) are protected, connected and enhanced to support a rich diversity of native and migratory wildlife. High quality trees are routinely preserved and planted on development sites.

Portland's trees provide more than a sense of identity as a "green city" – they help manage stormwater, reduce pollution, capture carbon dioxide, decrease flooding and erosion, cool and clean the air and water, provide wildlife habitat and improve neighborhood appearance. The Portland Watershed Management Plan (2005) and the City's Climate Action Plan (2009) call for protecting and expanding the urban forest to improve watershed health and reduce greenhouse gas emissions. The Urban Forestry Management Plan (2004) establishes tree canopy targets for different types of development in Portland. The performance measure is based on the number of households located in areas that do not meet these tree canopy targets. Development in these Canopy Opportunity Areas would have less of an impact on Portland's existing tree canopy than development in areas with more existing canopy and should help add tree canopy over time through new development standards that require additional tree planting.




**Tree Canopy Areas** are places that meet or exceed tree canopy targets identified in the Urban Forestry Plan. Development in these areas may result in loss of tree canopy that could hamper the ability to meet citywide tree canopy targets.

**Canopy Opportunity Areas** are places that do not currently meet the tree canopy targets and where development may result in an increase in canopy over time through tree preservation and mitigation planting. Focusing development in these areas will have less impact on the existing canopy.


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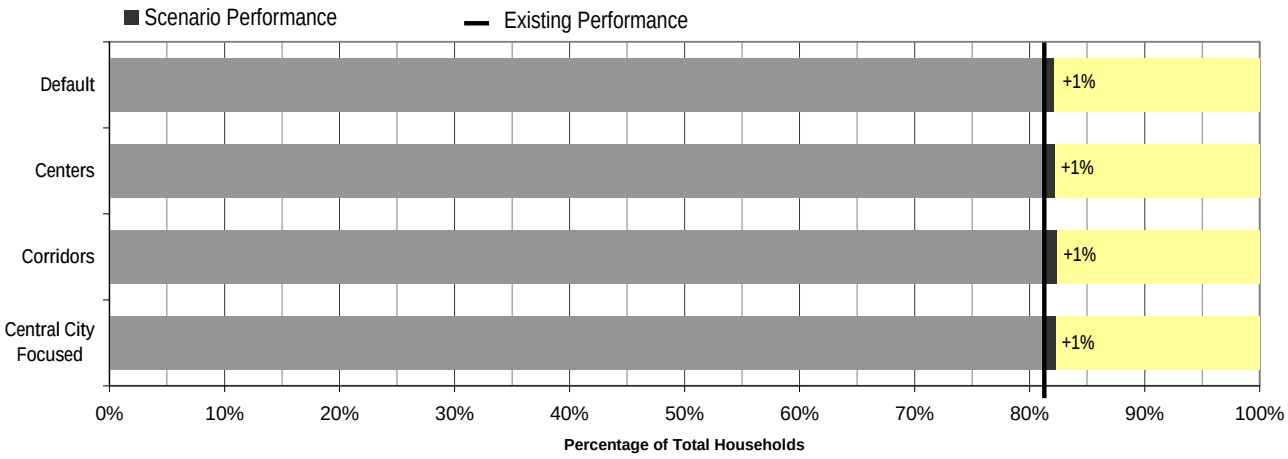
Chart 11. Performance Measures: Tree Canopy
Households in Canopy Opportunity Areas




## Performance Summary

There is little difference among the alternatives because in all scenarios the majority of new households are projected to be developed in Canopy Opportunity Areas. As a general trend, all of the scenarios perform better than existing conditions.

## Options for Improving Performance

Citywide Canopy Target: Plant and Preserve
Many established single family neighborhoods across the city could increase the level of canopy with more tree planting by homeowners, community groups and business associations, in partnership with organizations such as Friends of Trees and Depave. As development occurs in high-canopy areas, the City can promote design solutions that seek to preserve and maximize the existing canopy. In addition, forested sites with high natural resource values could be prioritized for protection through public purchase, zoning regulations or other policy tools.

Shift Growth to Canopy Opportunity Areas
Focusing development in low canopy areas would help preserve the existing canopy while potentially increasing canopy on development sites. As key civic corridors and centers develop, tree plantings can support place-making, enhance the street experience, shade and cool the street and extend the benefits of trees into more urban areas.

Design with Nature
New development can provide opportunities to incorporate new tree plantings onto the site and streetscape. Focusing development along key corridors that lack significant tree canopy, like SW Barbur Boulevard and NE Sandy Boulevard, could increase tree coverage as part of a civic corridor design.

## Supporting Portland Plan Actions:

PP Action #116- Natural Resource Inventory

PP Action #119- Tree Canopy

PP Action #122 – Neighborhood Greenways

PP Action #127 – Civic Corridor Designs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## NATURAL AREA ACCESS

**PORTLAND PLAN**

By 2035, all Portlanders can conveniently get to and enjoy the Willamette and Columbia Rivers. All Portlanders live within a half-mile safe walking distance of a park or greenspace. The regional Trail System is substantially complete and is an integrated component of a Healthy Connected City network.

Access to natural areas is a critical component of a healthy complete neighborhood. Nearby natural areas give Portlanders places to recreate, relax and spend time with friends and family. The Portland region's 40-mile loop and other elements of The Intertwine — the regional trail park system — provide access along rivers and through major natural areas like Forest Park, Johnson Creek and the Columbia Slough. However, this system of trails is incomplete and has few connections to neighborhoods. This performance measure is similar to the Park Access measure but is more focused on access to nature and is based on the number of households located within a convenient, ½-mile walk of a natural area or river.




**Natural Area Access Areas** identify places within a ½-mile walkable distance of natural areas, including the Willamette and Columbia Rivers and Portland's large natural area parks.

**Natural Area Gap Areas** are outside of a ½-mile walkable distance to a major river or a natural area. These areas present a range of opportunities to improve transportation and trail access to natural areas and weave nature into the neighborhoods.


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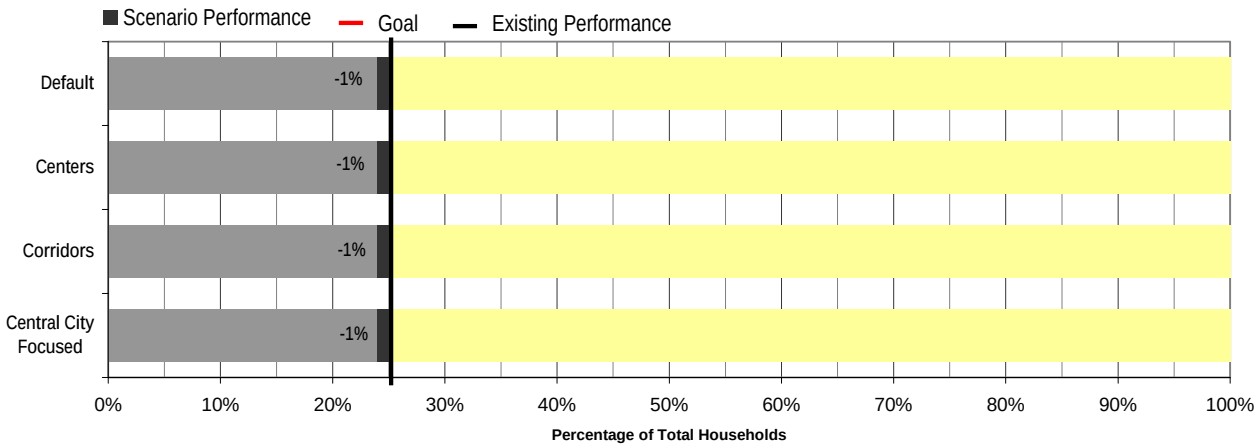
Chart 12. Performance Measures: Natural Area Access
Households within ½ Mile of a River or Natural Area




## Performance Summary

Overall, only 25 percent of Portland households currently have convenient access to a river or natural area. All of the scenario alternatives show a slight decline in performance because the majority of new growth is anticipated in mixed-use corridors and centers away from natural areas. This result also suggests that there is less pressure to develop sensitive areas adjacent to natural areas.

## Options for Improving Performance

Lesson Learned: Connect to Nature
Development in more urban locations means less impact on natural habitat areas and sensitive watersheds. But these urban locations do not provide direct access to nature for residents. We will need to do more in the future to create other opportunities for Portlanders to experience nature.

Weave Nature into the City
Developing habitat corridors, promoting backyard habitats and enhancing neighborhood tree canopy can weave nature into the city. Actions could include enhancement of existing parks through native plantings and creation of habitat for birds, pollinators and other beneficial wildlife.

Habitat Enhancement in Large Parks
Large neighborhood parks can serve as anchor habitats that provide significant natural functions within the city. For example, Mt. Tabor, Powell Butte and Oaks Bottom all are important habitat areas that also provide access to nature for many Portlanders. Coverage gaps between these areas are an opportunity to create connections between places like Alameda Ridge and Rocky Butte.

Development of Neighborhood Greenways and Transit Connections
Neighborhood greenways and civic corridors should be designed to improve public access to Portland's largest natural areas and improved public access to the Willamette and Columbia Rivers. Greenways can provide park-like experiences along streets, paths and trails that emphasize large trees and green streets, modeled after programs like Tabor to the River, which integrate the function of natural areas into urban environments and assist the movement of people, water and wildlife.

## Supporting Portland Plan Actions:

PP Action #117 – Natural Resources

PP Action #119 – Tree Canopy

PP Action #121- Regional and local trails

PP Action #122 – Neighborhood Greenways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# 5. KEY FINDINGS

The Portland Plan set the expectation that there will be more strategic and more intentional actions in how growth and public investment are made to achieve the vision for a future Portland. The Measures of Success adopted with the Portland Plan established some specific numerical goals. This report examines how growth management can influence those outcomes over the long term. The Growth Scenarios analysis also highlights several opportunities and challenges:

**Choices for Prioritizing Growth:** Portland's existing zoning allows for more than enough development capacity to accommodate the future growth forecast of 132,000 new households. This capacity creates an opportunity to make choices about where to focus or prioritize that growth.

**A Legacy Landscape:** As an already urbanized city, Portland's existing development pattern defines many of the challenges. The forecasted growth represents roughly one-third of the total households and employment that will make up Portland in 2035, which means that two-thirds of the future built environment is already in place. This legacy development pattern will have a significant impact and moderating influence on how well future development patterns perform over the next 25 years. Large improvements in performance from land use changes will take more time. Other interventions will be necessary to achieve the goals identified in the Portland Plan.

**Investment Priorities:** How and where will public infrastructure investment make a significant difference in how Portland performs?

The performance of the different scenarios explored in this report shows that most of the anticipated new growth should occur in a way that provides progress towards meeting the objectives. However, at this point the metrics in this report are measuring 25 years of growth without 25 years of related investment. Completing a new Citywide Systems Plan is another state-mandated element of the Comprehensive Plan update. It will describe the infrastructure (sewer, water, transportation) system improvements that will be necessary to serve anticipated growth. As that plan emerges, an addendum to this report will be prepared to update these findings.

As the Comprehensive Plan update process proceeds, there will be competing mandates or priorities for public infrastructure investments. The inclusion of investment decisions in the Growth Scenarios model will show more significant differences among the scenarios. In some cases, these priorities may overlap, such as focusing growth in an area that is currently underserved. In other cases, there will be competing priorities. One advantage in focusing growth in highly performing areas is that the infrastructure is largely in place and may only need incremental investment to accommodate the future growth. The ability to finance necessary infrastructure maintenance and improvements will be a significant challenge.

## LESSONS LEARNED

**Two Investment Strategies** – Portland needs to pursue a public investment strategy on two tracks simultaneously to meet its objectives. One strategy supports growth in high-performing areas that already have a relatively complete infrastructure support system. The other fills gaps in historically underserved areas to reduce disparities and increase equity. This two track strategy will allow Portland to improve performance across the board by focusing growth in high-performing areas, while at the same time improving conditions in areas previously neglected.


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**Transportation Choice** – Transportation priorities in the next 25 years need to emphasize active transportation and freight. Investing in sidewalks, bicycle facilities and transit can significantly improve performance across several measures, such as reducing carbon emissions and improving access to jobs for more Portlanders. Determining where investments will have the greatest positive benefit will help make difficult choices about where to invest City of Portland dollars.

**Complete Neighborhoods** – The Portland Plan set the goal of providing most Portlanders with safe, walkable access to services. This goal cannot be achieved simply by only focusing growth in existing complete neighborhoods. Meeting this goal will require public and private investments in East and Southwest Portland to create more complete neighborhoods across Portland.

**A Central Role for the Central City** – In each scenario, the Central City accommodates between 20 and 35 percent of future growth. Focusing growth in and around the Central City may be the most cost-effective way to provide the greatest level of service to the greatest number of Portlanders; each incremental investment in this service-rich area has exponential benefits. However, in order to grow as a residential area, it will be necessary to ensure that the needs of a great variety of families can be met within the Central City.

**Jobs and Better Transit Connections in East Portland** – East Portland has Portland's largest pool of affordable housing and is home to a large number of families with children. However, the area does not have many family-wage jobs, and it is not easy or quick to travel from East Portland to major job centers. Convenient and reliable access to work is one of the major contributors to job success (others include overall employment opportunities and relevant education and training). Developing more jobs in East Portland and providing better connections to and from East Portland are critical to improving household economic self-sufficiency.

**More Affordable Housing** – None of the growth scenarios provide enough affordable housing, especially for the lowest income households. Public investments to increase services can create gentrification pressure. Portland will need to better align growth management, public investment and affordable housing development, anticipate the consequences of investments, minimize displacement and engage communities.

**Prepare for the Future** – While short-term development trends show a market preference for the Central City and Inner Neighborhoods, East Portland has significant growth potential and is home to many households with school-age children. Today, there is a window of opportunity to address the infrastructure gap in East Portland. The timing and location of East Portland infrastructure investments are a pressing issue.

**Connect to Nature** – In each scenario most growth occurs on previously developed land, replacing parking lots and under-used buildings with higher performing buildings that have a greater intensity of use. This is positive because it keeps new development away from natural habitat areas and sensitive watersheds. However, as more people live in urbanized areas, it becomes increasingly important that to integrate nature into the city. This can be accomplished with urban parks, plazas, green infrastructure and street trees. Better connections to streams, lakes and rivers and the regional trail and park network is also important.


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## NEXT STEPS

These scenarios and performance measures provide a starting point for a community discussion about how and where Portland can accommodate future growth. In particular, the performance measures provide a framework for evaluating different growth and investment options. The proposed new Comprehensive Plan that is created from this process will reflect a preferred scenario. The next steps include:

Model the Effects of Infrastructure Investments – The scenarios in this report model the likely effects of 25 years of growth (the location of new jobs and housing), but not infrastructure investments. The next planning step is to add 25 years of corresponding infrastructure investments that will be necessary to serve that growth. This next step will show additional performance gains and how these investments will most help Portland improve prosperity, education, health, equity and resilience.

Community Mapping – Later in 2013, community members will be engaged in a mapping exercise where they will discuss preferred approaches for managing growth and will identify needed investments.

Citywide Systems Plan and Transportation System Plan – To meet State requirements, the City must complete new fiscally constrained Citywide Systems and Transportation System Plans that will describe the infrastructure (sewer, water, transportation) system improvements that will be necessary to serve anticipated growth. Those reports also will have to describe strategies to pay for those improvements, and determine what level of improvements is affordable. An addendum to this report will be prepared to incorporate the content of those plans.


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