CITY OF PORTLAND
ECONOMIC OPPORTUNITIES ANALYSIS:

Section 2 and 3 – Employment Land Needs and Supply Analysis



Prepared for:

City of Portland Bureau of Planning & Sustainability

PSC Recommended Draft (Amended)

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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. Policy Alternatives

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 517,000 jobs to the City of Portland in 2035, an addition of 147,000 new jobs in the 2010-2035 period.
- This job forecast translates into a demand for 72.5 million square feet of building space, the equivalent of 2,660 acres of employment land.
- Portland's traded-sector economy needs an additional 580 acres of land for marine terminals, rail yards, and airport facilities.
- 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 in the Columbia Harbor area.
- Additional development capacity is needed on the major institutional campuses, as well as addressing zoning capacity and market supply issues in the Central City Incubator areas (the Central Eastside and Lower Albina districts) and the town centers, Dispersed Industrial and Town Center 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 517,000 of these future jobs by 2035 to the City of Portland. When compared with actual 2010 employment of 370,000 jobs, the projected Portland job gain is approximately 147,000 jobs over the 2010-35 forecast period – an annual average growth rate of 1.3% and a 27% 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 2,660 acres of employment land in Portland, with over half of it in industrial areas.

Portland is a key freight distribution hub on the West Coast. As such, in addition to the building space and related land needed for employment uses, additional land is needed for shipping/transportation related facilities, such as air, marine, and rail terminals that are needed to support the overall traded sector economy, where land needs relate more directly to increasing transportation throughput than on-site employment growth. These types of freight transportation drivers 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 580 acres of land is needed for these facilities and is added to the demand for industrial land.

Figure 1. 2035 Employment Forecast and Land Demand

Aggregate Geography	Jobs	%	Acres	%
Central City	46,450	32%	160	6%
Industrial	32,900	22%	1,410	53%
Commercial	36,550	25%	720	27%
Institutions	23,350	16%	380	14%
Residential	7,770	5%	NA	
Total	**147,000**		**2,670**	
Traded Sector Support Facilities				
Rail Yards			200	
Marine Terminals			350	
Airport Facilities			30	
Total			**580**	

Source: E.D. Hovee & Company, LLC.

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 protections. 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 city-wide employment development capacity is about 101 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 (Figure 2).

Figure 2. Summary of 2035 Employment Development Capacity

Aggregate Geography	Bldg Sq.Ft.	
Central City	37,443,000	37%
Industrial	21,612,000	20%
Commercial	33,000,000	33%
Institutions	10,676,000	11%
Total	**102,731,000**	

Source: BPS

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	Demand	Land Supply	Surplus/Deficit	% Capacity
Central City Commercial	60	149	89	248%
Central City Incubator	100	40	(60)	40%
Columbia Harbor	1,490	855	(635)	57%
Harbor Access Lands	*450*	*94*	*(356)*	21%
Columbia East of 82nd	360	394	34	109%
Dispersed Industrial	140	112	(28)	80%
Gateway Regional Center	50	135	85	270%
Town Centers	140	90	(50)	64%
Neighborhood Commercial	530	1,118	588	211%
Institutions	380	306	(74)	81%
Total	**3,250**	**3,198**		
Aggregate Geography				
Central City	160	189	29	118%
Industrial	1,990	1,361	(629)	68%
Commercial	720	1,342	622	186%
Institutions	380	306	(74)	81%
Total	**3,250**	**3,198**		

Note: Columbia Harbor includes 580ac for traded sector facilities.
Harbor Access Lands include 350ac for marine terminals

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 Incubator, Columbia Harbor (especially Harbor Access Lands), Dispersed Industrial, Town Centers,** and **Institutional** 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.

Table of Contents

Table of Figures

Note: This EOA report has been funded through a grant from the State of Oregon Department of Land Conservation and Development.

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.

Figure 4. EOA Methodology

Demand

Forecast land demand to 2035

Supply

Inventory current land capacity

Region/City Forecast

Metro forecasts 537,000 new jobs in 7-county MSA from 2010 to 2035 and a 27% capture rate for Portland, consistent with post-1980 growth trends. Portland's employment forecast is for 147,000 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.

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 without corresponding increases in employment.

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 October 2011, 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).

[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.

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 approximately 147,000 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 9 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)	27% Capture (1.3% AAGR)	Figure 29
1+2 Resulting Portland Job Forecast (25 Year)	147,000	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% Other non-industrial by 10% 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. A projection for Harbor Access Lands as a subset of the Columbia Harbor geography has also been separately prepared.

9. **Traded-Sector Support Facilities.** In addition to typical land absorption corresponding to employment growth in each sector, 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 Columbia Harbor geography 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 nine 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 14 in the Section 1 report).

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. Methodologically, the geographies represent a way of linking 25-year demand by site type to location advantages and developable land supply.

These employment geographies are summarized into four larger aggregate categories of: Central City, industrial, commercial, and institutional (Figures 6, 7 and 8). 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).

In some cases, a separate estimate for the Harbor Access Lands subarea is shown, which is a subarea of the Columbia Harbor employment geography that represents the working waterfront along the Willamette and Columbia rivers (Figure 9).

Figure 6. Employment Geographies

Category	Employment Geography
Central City	Central City Commercial
	Central City Incubator
Industrial	Columbia Harbor
	Harbor Access Lands
	Columbia East (east of 82nd Ave)
	Dispersed Industrial
Commercial	Gateway Regional Center
	Town Centers
	Neighborhood Commercial
Institutions	Institutional Campuses
Residential	Residential areas 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 Bible College	
Western States Chiropractic College	

Institutions included in other employment geographies:

Portland State University (Central City) *Adventist Medical Center (Gateway)*

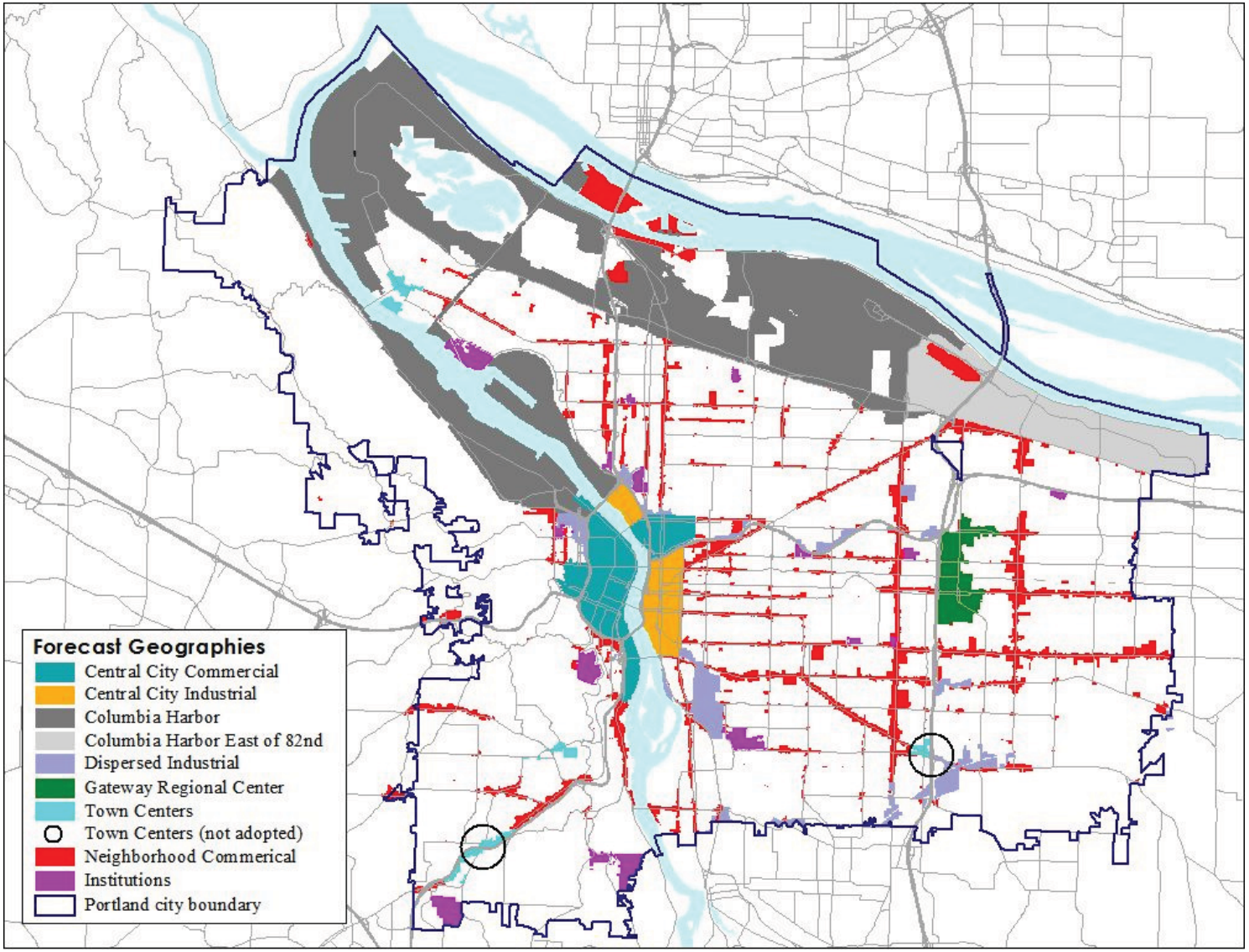
Figure 7. Employment Forecast Geographies Predominant Site Conditions

Location	Sectors	Density/site size	Features
Central City			
Central City Commercial			
CBD, Lloyd District	Office, mixed employment	High, <1 acre	Regional CBD
Central City Incubator			
Central Eastside, L. Albina	Industrial, mixed employment	Medium, <3 acres	Hybrid industrial area
Industrial			
Columbia Harbor			
Harbor/Airport districts	Distribution, manufacturing	Low, 1-100+ acres	Marine/rail/air hub
Harbor Access Lands*	River-dependent 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 Industrial			
Neighborhoods	Industrial, mixed employment	Low, <1-10 acres	Freeway proximity
Commercial			
Gateway Regional Center			
I-84 at I-205	Mixed commercial, institutional	Medium, <1-6 acres	Transit/freeway hub
Town Centers			
Neighborhoods	Mixed commercial, institutional	Low/med., <1-3 acres	Mixed-use centers
Neighborhood Commercial			
Neighborhoods	Retail, mixed employment	Low, <1-10 acres	Commercial corridors
Campus Institutions			
Campus Institutions			
Neighborhoods	Hospitals, colleges	Low/med., >10 acres	17 large campuses

* Harbor Access Lands are a subarea of Columbia Harbor with deepwater channel access for river-dependent uses.

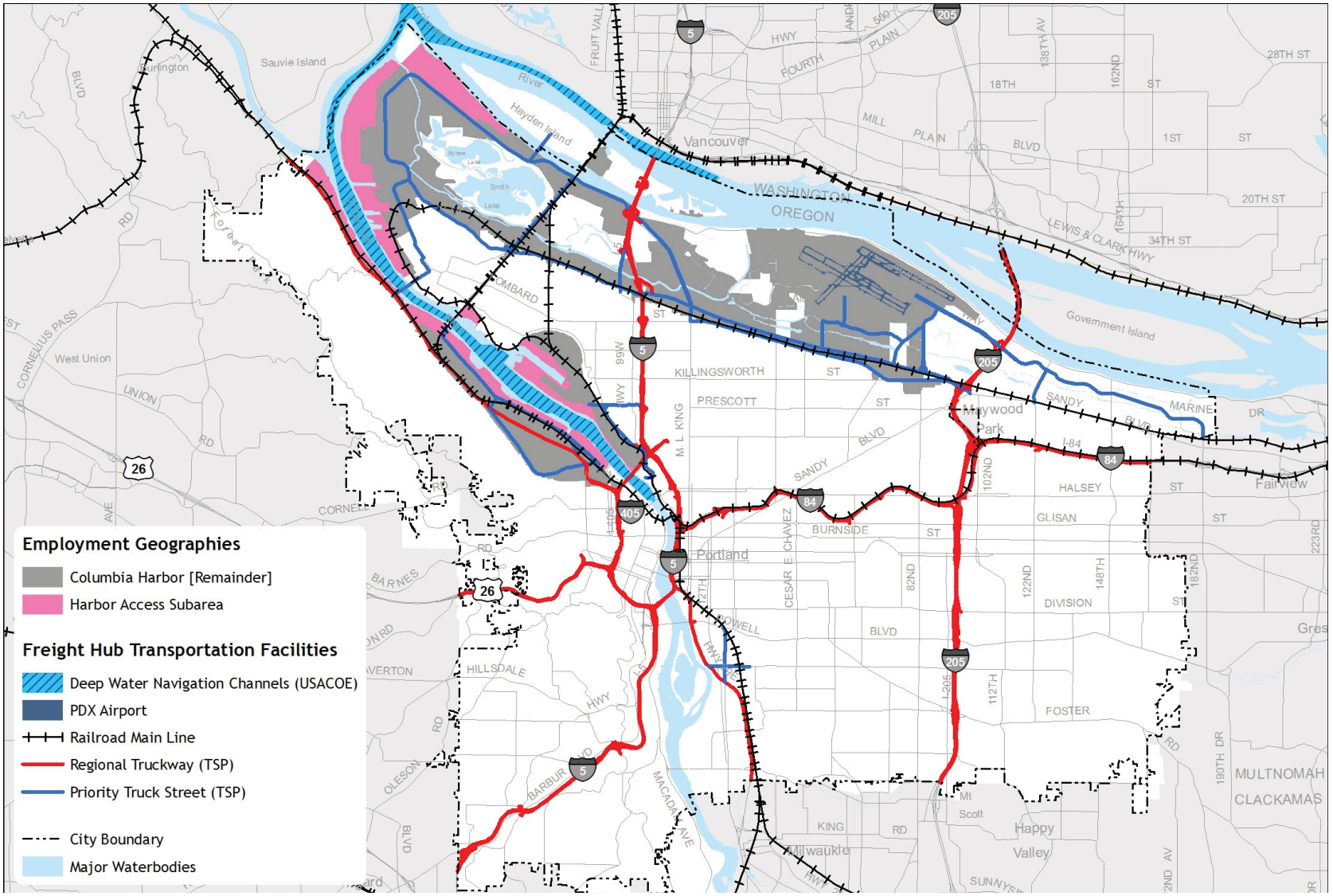
Source: Bureau of Planning and Sustainability

Figure 8. Forecast Geographies



Source: E.D. Hovee & Company, LLC, City of Portland Bureau of Planning & Sustainability.

Figure 9. Harbor Access Lands



Source: E.D. Hovee & Company, LLC, City of Portland Bureau of Planning & Sustainability.

EMPLOYMENT FORECAST RESULTS

Overall, the Portland employment growth is expected to capture approximately 27% of the regional employment growth. The forecast reflects an expectation of a 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 35% 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 53,000 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	357	(35)	-0.4%
Construction	14,224	21,765	7,541	1.7%
Manufacturing	25,035	24,328	(707)	-0.1%
Wholesale Trade	18,009	23,250	5,241	1.0%
Retail Trade	31,060	33,309	2,249	0.3%
Transportation, Warehousing & Utilities	23,676	35,345	11,669	1.6%
Information	9,640	13,906	4,266	1.5%
Finance	17,048	24,524	7,476	1.5%
Real Estate	7,946	15,527	7,581	2.7%
Professional Services	26,943	39,268	12,325	1.5%
Management	14,322	21,910	7,588	1.7%
Administrative & Waste Services	18,449	28,404	9,955	1.7%
Educational Services	37,937	61,838	23,901	2.0%
Health & Social Services	50,616	79,702	29,086	1.8%
Arts, Entertainment & Recreation	6,741	8,582	1,841	1.0%
Accommodation & Food Services	35,102	44,686	9,584	1.0%
Other Services	16,802	23,318	6,516	1.3%
Government (Civilian)	15,498	16,422	924	0.2%
TOTAL EMPLOYMENT	**369,440**	**516,440**	**147,000**	**1.3%**
City Share of Portland Metro Employment	39%	35%		

Source: E. D. Hovee & Company, LLC based on Metro Gamma forecast, November 2011.

The City of Portland employment forecast allocation of 147,000 additional jobs is distributed to the employment geographies based on actual employment distribution in 2010 and trends from 2000 to -2008 (Figure 11).

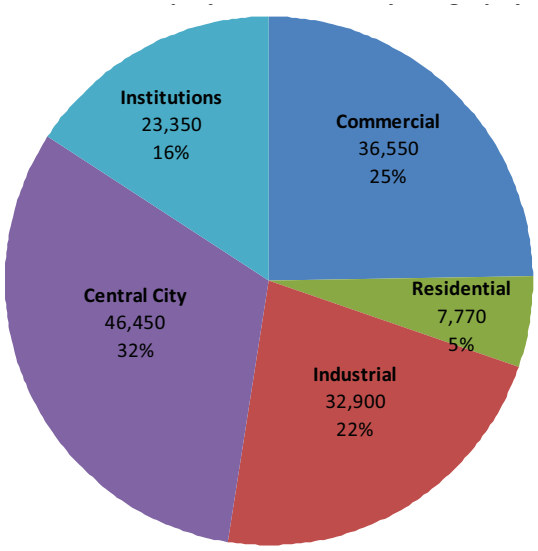
Figure 11. Employment Forecast by Employment Geography

	2010 Actual		Added Jobs		2035 Total	
Employment Geography	**#**	**%**	**#**	**%**	**#**	**%**
Central City Commercial	104,394	28%	35,500	24%	139,894	27%
Central City Incubator	19,171	5%	10,950	7%	30,111	6%
Columbia Harbor	53,853	15%	18,900	13%	72,743	14%
Harbor Access Lands	*7,880*	*2%*	*2,000*	*1%*	*9,880*	*2%*
Columbia East of 82nd	17,764	5%	9,600	7%	27,354	5%
Dispersed Industrial	15,286	4%	4,400	3%	19,696	4%
Gateway Regional Center	10,059	3%	4,100	3%	14,169	3%
Town Centers	11,557	3%	6,350	4%	17,897	3%
Neighborhood Commercial	71,233	19%	26,100	18%	97,333	19%
Institutions	34,675	9%	23,350	16%	58,025	11%
Residential	31,868	9%	7,770	5%	39,638	8%
Total	**369,860**		**147,000**		**516,860**	
Aggregate Geography						
Central City	118,850	32%	46,450	32%	65,330	32%
Industrial	86,900	23%	32,900	22%	119,810	23%
Commercial	92,850	25%	36,550	25%	129,060	25%
Institutions	34,680	9%	23,350	16%	58,040	11%
Residential	36,580	10%	7,770	5%	44,620	9%
Total	**369,860**		**147,000**		**516,860**	

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 46,000 new jobs are expected in the Central City (Figure 12). Industrial jobs are forecast to account for about 22% of city-wide 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 2,660 acres of buildable land area. The Central City land demand is 160 acres, with an additional 650 acres of land needed for commercial development in other geographies elsewhere in Portland. Job growth on institutional campuses will need capacity for about 13 million square feet of buildings or about 380 acres of buildable land. The largest demand for land will be for approximately 1,400 acres of industrial land, which is to be expected given the lower employment densities (jobs per acre) and FARs for industrial buildings.

Also noted is that approximately 8,000 of the new jobs created (or 5% of the job growth) would be 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	Total Building Square Feet	Total Acres	Avg FAR
Central City Commercial	35,500	14,143,000	60	5.42
Central City Incubator	10,950	5,387,000	100	1.24
Columbia Harbor	18,900	13,985,000	910	0.35
Harbor Access Lands	*2,000*	*1,491,000*	*100*	*0.34*
Columbia East of 82nd	9,600	6,326,000	360	0.40
Dispersed Industrial	4,400	2,178,000	140	0.36
Gateway Regional Center	4,100	2,064,000	50	0.95
Town Centers	6,350	3,287,000	140	0.54
Neighborhood Commercial	26,100	12,058,000	530	0.52
Institutions	23,350	13,241,000	380	0.80
Residential	7,770	NA	NA	NA
Total	**147,000**	**72,669,000**	**2,670**	
Aggregate Geography				
Central City	46,450	19,530,000	160	2.80
Industrial	32,900	22,489,000	1,410	0.37
Commercial	36,550	17,409,000	720	0.56
Institutions	23,350	13,241,000	380	0.80
Residential	7,770	NA	NA	NA
Total	**147,000**	**72,669,000**	**2,670**	

Source: E.D. Hovee & Company, LLC.

The Harbor Access Lands subarea – a portion of the overall Columbia Harbor employment geography is forecasted to add approximately 2,000 jobs, with a demand for 100 acres of land. These jobs account for about 11% of the job growth in the Columbia Harbor geography. This reflects an assumption of a continued but slowing erosion of Harbor Lands Access job base as a share of the Columbia Harbor area total in the years ahead – as Harbor Access Land have gone from 20.7% to 18.5% of Columbia Harbor area employment between the years 2000 and 2008. However, as noted in the Section 1 report, job growth is not the best indicator of economic activity in the harbor lands. The ECONorthwest analysis of economic activity within the Portland Harbor from 2002 to 2008 showed that value added, real market value, and cargo tonnage all grew at a faster pace than developed industrial acres, but employment in the Portland Harbor declined (both in absolute terms, and per acre of developed industrial land). [4] Therefore, the total demand for harbor access land will be adjusted by an additional 350 acres based on the marine cargo forecast (see below).

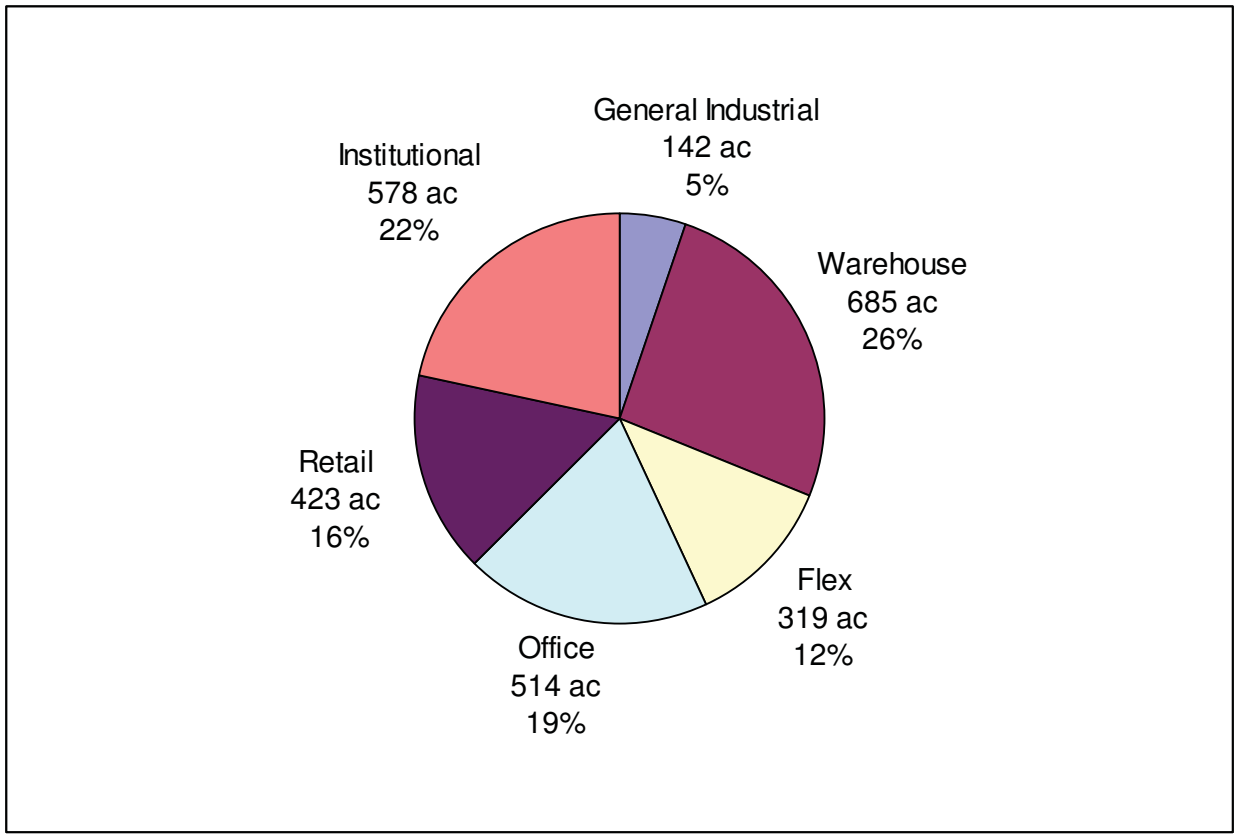
[4] ECONorthwest, Portland Harbor: Industrial Land Supply Analysis, February 2012.

EMPLOYMENT LAND NEED BY BUILDING TYPE

Figure 14 disaggregates 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, 62% of the land demand forecasted is associated with commercial building types – including office, retail and institutional space.

Figure 14. Employment Land Demand by Building Type



Source: E.D. Hovee & Company, LLC.

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 retail and office space.

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 SqFt	Acres		Jobs	Bldg SqFt	Acres
	General Industrial				Office		
Central City Commercial	(200)	(58,000)	(0)		23,100	8,087,000	24
Central City Incubator	500	506,000	12		5,300	1,871,000	20
Columbia Harbor	600	602,000	39		7,000	2,453,000	154
Columbia East of 82nd	800	745,000	43		3,700	1,302,000	72
Dispersed Industrial	600	549,000	36		3,200	1,131,000	71
Gateway Regional Center	0	6,000	0		1,100	386,000	5
Town Centers	100	20,000	1		1,400	484,000	17
Neighborhood Commercial	100	126,000	11		10,800	3,776,000	132
Institutions	0	0	(0)		2,000	695,000	18
Total	2,500	2,496,000	142		57,600	20,185,000	514
	Warehouse & Distribution				Retail		
Central City Commercial	200	58,000	0		6,300	2,970,000	22
Central City Incubator	1,000	801,000	18		1,500	725,000	32
Columbia Harbor	6,000	7,537,000	494		2,000	945,000	62
Columbia East of 82nd	1,900	2,362,000	136		1,600	750,000	43
Dispersed Industrial	0	3,000	0		(300)	(119,000)	(8)
Gateway Regional Center	0	(10,000)	(0)		1,000	453,000	29
Town Centers	0	(1,000)	(0)		1,000	456,000	34
Neighborhood Commercial	500	405,000	36		8,000	3,756,000	166
Institutions	0	4,000	0		2,100	978,000	43
Total	9,600	11,160,000	684		23,200	10,914,000	423
	Flex				Institutional		
Central City Commercial	2,200	781,000	3		3,800	2,306,000	10
Central City Incubator	1,100	631,000	7		1,400	852,000	9
Columbia Harbor	2,900	2,255,000	148		300	195,000	13
Columbia East of 82nd	1,200	939,000	54		400	229,000	13
Dispersed Industrial	700	524,000	34		200	90,000	6
Gateway Regional Center	0	7,000	0		2,000	1,222,000	18
Town Centers	100	45,000	2		3,800	2,284,000	83
Neighborhood Commercial	1,600	942,000	70		5,100	3,051,000	110
Institutions	0	3,000	0		19,300	11,561,000	315
Total	9,800	6,127,000	319		36,300	21,790,000	578
	Total Industrial				Total Commercial		
Central City Commercial	2,200	781,000	4		33,200	13,363,000	56
Central City Incubator	2,600	1,938,000	37		8,200	3,448,000	61
Columbia Harbor*	9,500	10,393,000	682		9,300	3,593,000	229
Columbia East of 82nd	3,900	4,045,000	232		5,700	2,281,000	128
Dispersed Industrial	1,300	1,076,000	71		3,100	1,102,000	69
Gateway Regional Center	0	3,000	0		4,100	2,061,000	52
Town Centers	200	64,000	3		6,200	3,224,000	134
Neighborhood Commercial	2,200	1,474,000	118		23,900	10,583,000	409
Institutions	0	7,000	0		23,400	13,234,000	377
Total	**21,900**	**19,781,000**	**1,146**		**116,800**	**52,889,000**	**1,515**

* Total acreage for Columbia Harbor shown here does not include 580 acres of Traded Sector freight terminal needs.

Source: E.D. Hovee & Company, LLC.

ADDITIONAL DEMAND FOR INDUSTRIAL LAND

Portland is a key freight distribution hub on the West Coast. As such, there are types of land uses such as air, marine, and rail terminals that are needed to support the overall traded sector economy. These land uses are exceptionally land intensive. On-site employment at these national/international transportation facilities is exceptionally low, but substantial direct and supported job impacts of these facilities located at other sites in the city, region, and Pacific Northwest.[5] Their land demand is estimated based on forecast transportation/freight throughput at these terminals and distinct facility characteristics, rather than average job growth of the transportation sector and standard building types (e.g., warehouse, flex space). In order to avoid double-counting, these additional demand sources include minor adjustments to account for employment-based land demand already included in the previous section. This type of land need adds to the demand for industrial land in the Columbia Harbor.

Figure 16. Traded Sector Land Needs

Traded Sector Land Needs (Acres)	
PDX Aviation Support	30
Railyard Expansion	200
Marine Terminal	350
Total	**580**

Source: BPS

Railyard Expansion

Portland is the Pacific Northwest's rail transportation hub, and seven rail yards currently occupy approximately 700 acres in Portland's industrial districts. The employment-based forecast allocates no land for railroad or railyard 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, potential 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[6]:

- 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

[5] Martin Associates, *Economic Impact of the Port of Portland*, 2011

[6] BST Associates, *Pacific NW Marine Cargo Forecast Update and Rail Capacity Assessment*, October, 2011

- 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 intermodal yards between 2000 and 2005, ranging from 130 to 320 acres in size and averaging 224 acres. To accommodate increasing rail operations, railyard 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 conceptual rail demand forecast to 2035 is not unreasonable. The railroad's plans are unclear in the current economic climate. The organization has a five year plan that describes track capacity. For the Portland area, short-term plans focus on working with what they have, given the land-locked nature of their holdings. The railroad focuses on consolidation and efficiencies within urban areas, and if necessary, relocation.

Marine Terminals

The 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. 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.[7]

Harbor industrial development tends to have low floor-to-area ratios (FAR) and a relatively low number of jobs per acre. But industrial lands in general, and harbor lands in particular, are an important piece of the regional economy. 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. [8]

Therefore, given the cargo forecasts and projected marine terminal needs described in Section 1 and the disconnected relationship between employment growth and cargo activity in the harbor, there is a need for vacant developable land for marine terminals that is in addition to any land needed to support future employment growth in the Portland Harbor area.

The ECONorthwest analysis of the marine cargo forecasts results in a projected marine terminal land need that range from 270 acres to 1,277 acres, with 470 acres as the "Most Likely Scenario"

[7] Entrix, Inc., West Hayden Island (WHI) Economic Foundation Study, July 2010.

[8] ECONorthwest, Portland Harbor: Industrial Land Supply Analysis, May 2012.

in 2040 (see Section 1)[9]. The 2040 marine terminal land need is prorated for the year 2035, which reduces the most likely scenario to 392 acres. There is a further reduction to account for the overlap with the employment-based forecast. The marine terminal employment is estimated to be 850 jobs, which translates to 50 acres of land demand in the Columbia Harbor geography for marine terminals by 2035. Therefore, an additional 342 acres, rounded to 350 acres of land demand is needed.

Based on the development 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.[10] The most modern rail-served facilities are 270 acres or more.

PDX Airport

The PDX Airport today occupies approximately 2,800 acres, excluding the Cascade Station and Portland International Center areas. The 2010 Airport Futures Plan and PDX Master Plan were adopted in 2010 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 allocated to the airport geography is equivalent to 175 acres of land demand. This employment land demand is deducted from the facilities need, which results in 30 acres of land for airport facilities.

Figure 17 below 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 32 acres of 2010-2035 land demand for airport facilities beyond the employment-based forecast. This additional demand for aviation support facilities is rounded to 30 acres and applied as a separate line item in the land demand forecast.

[9] ECONorthwest, Portland Harbor: Industrial Land Supply Analysis, May 2012.

[10] Entrix, Inc., West Hayden Island (WHI) Economic Foundation Study, July 2010.

Figure 17. Estimated 2010-2035 Land Demand for New Airport Facilities

	Estimated Land Demand at PDX (acres)		
Facility	PDX Master Plan	Jobs-Based Land Demand	Difference
Air Transportation & Terminal Services	52	141	-89
Rental Car Agencies	21	11	10
General Aviation	20	0.2	20
Air Cargo Couriers	113	18	95
Other Airport Employers		5	-5
Total	**207**	**175**	**32**

Source: BPS from Airport Futures Plan and Oregon Employment Department (2010 QCEW data).

TOTAL EMPLOYMENT LAND DEMAND

The employment growth forecast demand is combined with the traded sector transportation facilities to determine the total land need – 3,300 acres (Figure 18).

Figure 18. 2035 Employment Development Capacity Demand

Employment Geography	Added Jobs	Total Building Square Feet	Total Acres
Central City Commercial	35,500	14,143,000	60
Central City Incubator	10,950	5,387,000	100
Columbia Harbor	18,900	13,985,000	910
Harbor Access Lands	*2,000*	*1,491,000*	*100*
Columbia East of 82nd	9,600	6,326,000	360
Dispersed Industrial	4,400	2,178,000	140
Gateway Regional Center	4,100	2,064,000	50
Town Centers	6,350	3,287,000	140
Neighborhood Commercial	26,100	12,058,000	530
Institutions	23,350	13,241,000	380
Residential	7,770	NA	NA
Total	147,000	72,669,000	2,670
Aggregate Geography			
Central City	46,450	19,530,000	160
Industrial	32,900	22,489,000	1,410
Commercial	36,550	17,409,000	720
Institutions	23,350	13,241,000	380
Residential	7,770	NA	NA
Total	**147,000**	**72,669,000**	**2,670**
Traded Sector Land Needs (Acres) in Columbia Harbor			
PDX Aviation Support			30
Railyard Expansion			200
Marine Terminal			350
Total			580
Total Land Demand	**147,000**	**76,686,000**	**3,250**

Source: E.D. Hovee & Company, LLC.

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 61,000 jobs or 41% of the forecasted employment growth in the 2010-2015 period. If this predicted growth occurs, it will generate the demand for 1,380 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, with additional freight terminal demand occurring episodically after 2020 through individual terminal investment decisions.

Figure 19. Short-Term (5-year) Employment Forecast and Land Demand

Employment Geography	Added Jobs	Bldg SqFt	Acres
Central City Commercial	14,420	5,667,000	30
Central City Incubator	5,130	2,715,000	50
Columbia Harbor	10,480	8,639,000	570
Harbor Access Lands	*1,080*	*1,104,000*	*60*
Columbia East of 82nd	4,900	3,527,000	200
Dispersed Industrial	2,090	1,243,000	80
Gateway Regional Center	1,490	727,000	20
Town Centers	2,360	1,203,000	50
Neighborhood Commercial	10,330	4,928,000	250
Institutions	7,740	4,317,000	130
Residential	2,210	NA	NA
Total	**61,150**	**32,966,000**	**1,380**

Source: E.D. Hovee & Company, LLC.

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 Columbia Harbor. This demand assessment also includes the traded sector land needs, which are expected to be located in the Columbia Harbor area as well.

Figure 20. Land Demand by Parcel Size (acres)

	Gross Acreage Land Need (2010-35) by Parcel Size									
EOA Geographies	**< 1**	**1 - 3**	**3-6**	**6-10**	**10-20**	**20-50**	**50-100**	**100+**	**Total**	**Total >1**
Central City Commercial	33	9	9	10	-	-	-		61	28
Central City Incubator	60	40	-	-	-	-	-		100	40
Columbia Harbor	76	147	232	185	145	***106***	***50***	***550***	1,491	1,415
Columbia East	10	88	80	68	114	-	-		360	350
Dispersed Industrial	40	28	25	25	22	-	-		140	100
Regional Center	18	13	11	9	-	-	-		51	33
Town Centers	91	49	-	-	-	-	-		140	49
Neighborhood Commercial	282	79	93	66	-	-	-		520	238
Total	609	453	450	363	281	106	50	550	2,863	2,253
Aggregate Geographies										
Central City	92	49	9	10	-	-	-		160	68
Industrial	126	263	337	278	281	***106***	***50***	***550***	2,040	1,914
Commercial	390	141	104	75	-	-	-		710	406
Total	609	453	450	363	281	106	50	550	2,863	2,253

Source: E.D. Hovee & Company, LLC.

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 adjoining (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 details the Buildable Land Inventory that drives the supply of employment land.

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 gross 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 straight forward 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 uses 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). Improvement and land values are not as accurate or consistently recorded outside Portland's Central City, so they are not used in other parts of the City at this

time. 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, flood hazards. Each constraint is defined and mapped and a discount factor is determined to reflect the degree of impact each constraint has on development.

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.[11] 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.[12] 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

[11] BPS, 2012 Buildable Land Inventory, Appendix A

[12] 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.

included in this adjustment factor because the master planning process to establish the development capacity has already factored most of these constraints.

Figure 21. Development Constraint Factors

Constraint	Adjusted Capacity	Constraint	Adjusted Capacity
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 corridors from 2002-2008.[13]

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

[13] 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.[14] The development capacity of industrial areas is not regulated by FARs so no factor is needed. 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 101 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 (Figure 24). Appendix C includes a more detailed analysis of the land supply with vacant and redevelopment capacity distributed by lot size.

[14] 2012 Central City Development Capacity Analysis

Figure 24. Buildable Land Inventory by Employment Geography

	Base Supply	Constrained Supply		Market Adjusted Supply		
Employment Geography	Bldg Sq Ft	Bldg Sq Ft	% of Base	Bldg Sq Ft	% of Base	Acres
Central City Commercial	52,916,000	35,293,000	67%	35,293,000	67%	149
Central City Incubator	3,871,000	2,150,000	56%	2,150,000	56%	40
Columbia Harbor	21,875,000	13,031,000	60%	13,031,000	60%	855
Harbor Access Lands	*5,138,000*	*1,435,000*	*28%*	1,435,000	*28%*	*94*
Columbia East of 82nd	11,242,000	6,868,000	61%	6,868,000	61%	394
Dispersed Industrial	3,220,000	1,713,000	53%	1,713,000	53%	112
Gateway Regional Center	12,596,000	9,797,000	78%	5,568,000	44%	1356
Town Centers	7,560,000	5,858,000	77%	2,109,000	28%	90
Neighborhood Commercial	130,313,000	96,434,000	74%	25,323,000	19%	1,118
Institutions	10,703,000	10,676,000	100%	10,676,000	100%	306
Total	**254,296,000**	**181,820,000**		**102,731,000**		**3,199**
Aggregate Geography						
Central City	56,787,000	37,443,000		37,443,000		189
Industrial	36,337,000	21,612,000		21,612,000		1,361
Commercial	150,469,000	112,089,000		33,000,000		1,343
Institutions	10,703,000	10,676,000		10,676,000		306
Total	**254,296,000**	**181,820,000**		**102,731,000**		**3,199**

Source: Bureau of Planning and Sustainability

The City of Portland has about 3,200 acres of buildable land. Approximately 63% of the development capacity is vacant land and 37% is underutilized redevelopable land.

The Central City Commercial geography has a significant amount of zoned development capacity for employment uses – 53 million square feet. Various constraints reduce that capacity by 33% to 35.3 million square feet, the equivalent of 149 acres. The Central City Incubator geography is composed primarily of industrial zoned land, so there is less capacity – about 3.9 million square feet of base supply that constraints reduce by 45% to 2.1 million square feet, or 40 acres of buildable land.

The City of Portland's industrial areas have about 2,000 acres of vacant land, but 40% of that capacity is constrained, leaving about 1,350 acres available for future employment growth. Columbia Harbor has the bulk of this industrial capacity – 855 acres, with about 94 acres located along the waterfront in the Harbor Access Lands subarea. The Columbia East geography has another 394 acres of capacity with another 112 acres scattered through the Dispersed Industrial areas.

The commercial areas outside the Central City have a tremendous amount of development capacity, even after accounting for mixed use residential development, about 150 million square feet. Constraints reduce this capacity by 24%, but it is the market adjustment factor (based largely on patterns of development activity experienced in recent years) that reduces the capacity by another 64%. The net result is capacity for 33 million square feet, or 1,300 acres.

Institutional campuses have the potential for about 10.7 million square feet of development, or 300 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 200 acres of development capacity.

Figure 25. Short-Term Land Supply

	Building Square Feet			
Employment Geography	Base Supply	Constrained Supply	Market Adjusted Supply	Acres
Central City Commercial	52,916,000	29,891,000	29,891,000	127
Central City Incubator	3,871,000	1,873,000	1,873,000	35
Columbia Harbor	21,875,000	10,764,098	10,764,098	706
Harbor Access Lands	*5,138,000*	*446,225*	446,225	*29*
Columbia East of 82nd	4,496,800	6,587,069	6,587,069	378
Dispersed Industrial	3,220,000	1,600,579	1,600,579	105
Gateway Regional Center	12,596,000	8,624,609	4,822,000	106
Town Centers	7,560,000	5,580,685	2,039,000	84
Neighborhood Commercial	130,313,000	92,189,202	24,264,000	1,048
Institutions	10,703,000	10,676,000	10,676,000	306
Total	**247,550,800**	**167,786,242**	**92,516,746**	**2,895**
Aggregate Geography				
Central City	56,787,000	31,764,000	31,764,000	162
Industrial	29,591,800	18,951,746	18,951,746	1,189
Commercial	150,469,000	106,394,496	31,125,000	1,238
Institutions	10,703,000	10,676,000	10,676,000	306
Total	**247,550,800**	**167,786,242**	**92,516,746**	**2,895**

Source: 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, only about 42% of the industrial capacity is on parcels greater than 20 acres, with no vacant parcels greater than 100 acres. About 68% of the Central City capacity and 66% of the commercial capacity is tied up in small parcels that are less than one acre.

Figure 26. Land Supply by Parcel Size (acres)

	Gross Acreage Land Need (2010-35) by Parcel Size									
EOA Geographies	**< 1**	**1 - 3**	**3-6**	**6-10**	**10-20**	**20-50**	**50-100**	**100+**	**Total**	**Total >1**
Central City Commercial	99	33	12	6	0	0	0	0	149	50
Central City Incubator	31	8	0	0	0	0	0	0	40	8
Columbia Harbor	30	118	80	108	137	201	181	0	855	825
Columbia East	13	59	89	57	61	114	0	0	394	381
Dispersed Industrial	13	28	15	16	4	37	0	0	112	99
Regional Center	61	42	16	8	8	0	0	0	135	74
Town Centers	62	14	8	6	0	0	0	0	90	28
Neighborhood Commercial	767	140	88	72	47	0	4	0	1,118	351
Total	**1,076**	**442**	**308**	**273**	**257**	**352**	**185**	**0**	**2,893**	**1,816**
Aggregate Geographies										
Central City	130	41	12	6	0	0	0	0	189	58
Industrial	56	205	184	181	202	352	181	0	1,361	1,305
Commercial	890	196	112	86	55	0	4	0	1,343	453
Total	**1,076**	**442**	**308**	**273**	**257**	**352**	**185**	**0**	**2,893**	**1,816**

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	Demand	Land Supply	Surplus/Deficit	% Capacity
Central City Commercial	60	149	89	248%
Central City Incubator	100	40	(60)	40%
Columbia Harbor	1,490	855	(635)	57%
Harbor Access Lands	*450*	*94*	*(356)*	21%
Columbia East of 82nd	360	394	34	109%
Dispersed Industrial	140	112	(28)	80%
Gateway Regional Center	50	135	856	270%
Town Centers	140	90	(50)	64%
Neighborhood Commercial	530	1,118	588	211%
Institutions	380	306	(74)	81%
Total	3,250	3,198		
Aggregate Geography				
Central City	160	189	29	118%
Industrial	1,990	1,361	(629)	68%
Commercial	720	1,342	622	186%
Institutions	380	306	(74)	81%
Total	3,250	3,198		

Source: E.D. Hovee & Company, LLC and Bureau of Planning and Sustainability
Note: Columbia Harbor includes 580ac for traded sector facilities.
Harbor Access Lands include 400ac for marine terminals

Figure 28. 2010-2035 Parcel Size Assessment Reconciliation

	Gross Acreage Surpluses (Shortfalls) by Parcel Size									
EOA Geographies	**< 1**	**1 - 3**	**3-6**	**6-10**	**10-20**	**20-50**	**50-100**	**100+**	**Total**	**Total >1**
Central City Commercial	66	24	3	(4)	0	0	0	0	88	22
Central City Incubator	(29)	(32)	0	0	0	0	0	0	(60)	(32)
Columbia Harbor	(46)	(29)	(152)	(77)	(8)	***95***	***131***	***(550)***	(636)	(590)
Columbia East	3	(29)	9	(11)	(53)	114	0	0	34	31
Dispersed Industrial	(27)	0	(10)	(9)	(18)	37	0	0	(28)	(1)
Regional Center	43	29	5	(1)	8	0	0	0	84	41
Town Centers	(29)	(35)	8	6	0	0	0	0	(50)	(21)
Neighborhood Commercial	485	61	(5)	6	47	0	4	0	598	113
Total	467	(11)	(142)	(90)	(24)	246	135	(550)	30	(437)
Aggregate Geographies										
Central City	38	(8)	3	(4)	0	0	0	0	29	(10)
Industrial	(70)	(58)	(153)	(97)	(79)	***246***	***131***	***(550)***	(679)	(609)
Commercial	500	55	8	11	55	0	4	0	633	47
Total	467	(11)	(142)	(90)	(24)	246	135	(550)	30	(437)

Source: 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. There may be a minor need for aggregating some of the smaller parcels to provide additional capacity in 6-10 acre parcel size range.

Central City Incubator: The incubators areas of 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 office space that account for about 48% of the employment growth. The buildable land supply only covers 40% of the demand. Even if the City of Portland could reduce all of the constraints in this geography, the base supply is not sufficient to meet the demand. To effectively overcome the shortfall, additional capacity should be targeted to the specific demand opportunities of the 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 potential actions are discussed in Section 4 of this report.

Columbia Harbor: The Columbia Harbor contains more vacant land (1,335 acres) than any other geography, though much of it is constrained by brownfield contamination, infrastructure deficiencies, and environmental overlays that reduce the effective supply to 855 acres.

Columbia Harbor is a distinctive geography with 60% of the land demand related to employment growth and 40% associated with traded-sector transportation facilities as the major focus of the region's marine, rail and air terminals. When regional transportation needs are included, the City of Portland only has about 57% of the land needed, with a shortfall of about 635 acres.

The Harbor Access Lands, as a subset of the Columbia Harbor employment geography, focuses on the water-related transportation needs. The 350 acre shortfall in this subarea accounts for one-half of the land need in the Columbia Harbor.

Columbia East: This industrial area has a minor surplus of 34 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 37% of the base supply, which if remedied through public investment and incentives could provide additional capacity.

Dispersed Industrial: Strong employment demand for this relatively small employment geography creates a shortfall of 28 acres, with the need for a range of parcel sizes of less than 20 acres. Of note, 50% of the development capacity is reduced by some kind of constraint.

Gateway Regional Center: This geography has a surplus of 85 acres of development capacity, even after discounting the zoned capacity by 55% for constraint and market factors. The Gateway supply consists predominantly (75%) of smaller parcels of less than 3 acres, but is matched to the expected demand.

Town Centers: Portland's five town centers are forecasted for strong employment growth, especially for institutional space that accounts for 60% of the demand. Taken together, the town centers have a shortfall of 50 acres based on the effective supply, but have a surplus of zoned capacity (260 acres) before market factors are taken into account. The parcel size demand consists of small parcels that are less than 3 acres that could be conducive to utilizing the zoned capacity and increased rates of redevelopment – with 85% of the capacity in underutilized, redevelopable sites. The capacity shortfall may be concentrated in particular town centers. In the 2000-08 period, nearly all of the town center job growth was in Hollywood, attributable primarily to medical office expansion from the nearby Providence hospital campus.

Neighborhood Commercial: Nearly 25% of the employment growth is allocated to this geography which drives a demand for over 500 acres of employment land. This geography also has a surplus of almost 600 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 2.6 million square feet of development or about 74 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 61,000 jobs or 41% of the forecasted employment growth in the next five years. If this predicted growth occurs, it will generate the demand for 1,380 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. 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 60% of the gross development capacity of vacant and underutilized land, and the remaining market-effective supply is expected to be generally available as short-term supply with the exception of brownfields. Potential short-term capacity shortfalls in the Central City Incubator and Harbor Access Lands geographies.

Figure 29. 2010-15 Short-Term Employment Land Needs

Employment Geography	Demand	Land Supply	Surplus/Deficit
Central City Commercial	30	127	97
Central City Incubator	50	35	(15)
Columbia Harbor	570	706	136
Harbor Access Lands	*70*	*29*	*(41)*
Columbia East of 82nd	200	378	178
Dispersed Industrial	80	105	25
Gateway Regional Center	20	106	86
Town Centers	50	84	34
Neighborhood Commercial	250	1,048	798
Institutions	130	306	176
Total	**1,380**	**2,924**	**1,544**

Source: E.D. Hovee & Company, LLC and Bureau of Planning and Sustainability
Note: Columbia Harbor demand does not include land for traded sector facilities.

Lot Size Assessment

The reconciliation of the lot size assessment varies widely, but overall about 50% of the demand is for parcels of less than 6 acres while 60% 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 Incubator geography the need is for small parcels of less than 3 acres, which matches the supply, but there is not enough overall capacity. The Columbia Harbor is 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 Industrial 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	AAGR 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	106,459	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	100,603	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	113,861	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	Accomodation & 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)	141,530	142,570	150,950	159,400	167,560	179,590	38,060	1.0%
	TOTAL EMPLOYMENT	**949,696**	**1,090,800**	**1,189,640**	**1,282,160**	**1,380,180**	**1,486,940**	**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 Gamma forecast, November 2011

Figure 31. City Share of PMSA Employment: 2008 and Projected

		Portland as % 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%	34.4%	33.2%	31.6%	29.8%
23	Construction	30.9%	32.6%	32.2%	31.5%	30.4%	28.9%	27.2%
31-33	Manufacturing	24.7%	23.5%	23.2%	22.7%	21.9%	20.9%	19.6%
42	Wholesale Trade	35.4%	34.0%	33.6%	32.8%	31.7%	30.2%	28.4%
44-45	Retail Trade	30.6%	30.9%	30.5%	29.8%	28.7%	27.4%	25.8%
22, 48-49	Transportation, Warehousing & Utilities	72.7%	73.9%	73.0%	71.3%	68.8%	65.5%	61.7%
51	Information	46.4%	43.0%	42.5%	41.5%	40.0%	38.1%	35.9%
52	Finance	44.7%	43.4%	42.8%	41.8%	40.4%	38.5%	36.2%
53	Real Estate	47.7%	49.8%	49.3%	48.1%	46.4%	44.2%	41.6%
54	Professional Services	50.6%	51.9%	51.3%	50.1%	48.3%	46.0%	43.3%
55	Management	60.4%	62.1%	61.4%	59.9%	57.8%	55.1%	51.8%
56	Administrative & Waste Services	37.9%	35.8%	35.3%	34.5%	33.3%	31.7%	29.9%
61	Educational Services*	194.2%	192.4%	190.1%	185.7%	179.1%	170.7%	160.7%
62	Health & Social Services	45.2%	44.5%	43.9%	42.9%	41.4%	39.4%	37.1%
71	Arts, Entertainment & Recreation	43.6%	49.7%	49.1%	47.9%	46.2%	44.1%	41.5%
72	Accommodation & Food Services	42.2%	43.5%	43.0%	42.0%	40.5%	38.6%	36.3%
81	Other Services	43.1%	42.8%	42.3%	41.3%	39.8%	38.0%	35.7%
92	Government (Civilian)*	12.5%	11.0%	10.8%	10.6%	10.2%	9.7%	9.1%
	TOTAL	**38.3%**	**38.9%**	**39.5%**	**39.1%**	**38.1%**	**36.6%**	**34.7%**

* Note: Metro public education re-allocated to educational services to match OED.

Added Notes: 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	Jobs within City of Portland: QCEW 2010	Forecast Employment by Year 2015	2020	2025	2030	2035	Job Change 2010-35	Avg Rate of Growth 2010-35
11 & 21	Agriculture & Mining	392	539	481	438	395	357	(35)	-0.4%
23	Construction	14,224	19,835	20,457	20,950	21,426	21,765	7,541	1.7%
31-33	Manufacturing	25,035	27,214	27,173	26,499	25,528	24,328	(707)	-0.1%
42	Wholesale Trade	18,009	20,542	21,854	22,666	23,169	23,250	5,241	1.0%
44-45	Retail Trade	31,060	34,538	34,209	33,994	33,825	33,309	2,249	0.3%
22, 48-49	Transportation, Warehousing & Utilities	23,676	31,456	33,604	34,509	35,114	35,345	11,669	1.6%
51	Information	9,640	10,433	11,586	12,594	13,443	13,906	4,266	1.5%
52	Finance	17,048	21,067	22,471	23,454	23,990	24,524	7,476	1.5%
53	Real Estate	7,946	13,380	14,335	14,948	15,346	15,527	7,581	2.7%
54	Professional Services	26,943	30,524	33,736	36,023	37,896	39,268	12,325	1.5%
55	Management	14,322	15,315	17,196	18,838	20,458	21,910	7,588	1.7%
56	Administrative & Waste Services	18,449	24,062	26,025	27,387	28,164	28,404	9,955	1.7%
61	Educational Services	37,937	47,458	52,636	56,655	59,521	61,838	23,901	2.0%
62	Health & Social Services	50,616	55,964	64,580	70,608	75,743	79,702	29,086	1.8%
71	Arts, Entertainment & Recreation	6,741	6,990	7,684	8,185	8,488	8,582	1,841	1.0%
72	Accommodation & Food Services	35,102	38,540	41,333	43,103	44,219	44,686	9,584	1.0%
81	Other Services	16,802	17,309	19,686	21,415	22,694	23,318	6,516	1.3%
92	Government (Civilian)	15,498	15,428	15,951	16,250	16,278	16,422	924	0.2%
	TOTAL EMPLOYMENT	**369,440**	**430,595**	**464,997**	**488,517**	**505,699**	**516,440**	**147,000**	**1.3%**
	City Share of Portland Metro Employment	38.9%	39.5%	39.1%	38.1%	36.6%	34.7%		

Source: Metro and E. D. Hovee & Company, LLC. based on Metro projection and City/Metro forecast 2035 allocation.

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, Entertain, Rec	-	-	-	79%	21%	-
72	Accomm & Food Service	-	-	-	45%	55%	-
81	Other Services	-	-	-	34%	66%	-
92	Government	-	-	-	87%	13%	-

Source: Metro, BPS, and E. D. Hovee & Company, LLC.

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	(166)	166	2,232	23,105	6,319	3,843	35,498
Central City Incubator	546	1,028	1,054	5,346	1,542	1,420	10,937
Columbia Harbor	648	5,971	2,934	7,008	2,011	324	18,895
Columbia East of 82nd	804	1,871	1,221	3,719	1,597	382	9,593
Dispersed Industrial	593	2	682	3,232	(254)	150	4,405
Gateway Regional Center	17	(28)	21	1,102	963	2,036	4,111
Town Centers	56	(3)	129	1,383	970	3,807	6,341
Neighborhood Commercial	137	519	1,574	10,787	7,992	5,086	26,096
Institutions	(0)	11	5	1,987	2,080	19,268	23,350
TOTAL	**2,634**	**9,539**	**9,852**	**57,669**	**23,219**	**36,315**	**139,227**
Central City	380	1,194	3,287	28,451	7,861	5,263	46,435
Industrial	2,044	7,844	4,837	13,959	3,353	856	32,893
Neighborhoods	211	489	1,724	13,272	9,924	10,928	36,548
Institutions	(0)	11	5	1,987	2,080	19,268	23,350
Total	**2,634**	**9,539**	**9,852**	**57,669**	**23,219**	**36,315**	**139,227**

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.

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 Incubator	926	780	599	350	470	600
Columbia Harbor	926	1,263	769	350	470	600
Columbia East of 82nd	926	1,263	769	350	470	600
Dispersed Industrial	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 Commercial	926	780	599	350	470	600
Residential	926	780	599	350	470	600
Institutions	350	350	599	350	470	600
Notes	*Portland Industrial Atlas + acts like office in urban geogs*	*Portland Industrial Atlas + acts like office in urban geogs*	*Portland Industrial Atlas + acts like office in urban geogs*	*Industry standard range: 250-350*	*Industry standard assumption*	*Metro assumption*

Source: Metro and E. D. Hovee & Company, LLC.

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 Incubator	1.00	1.00	2.00	2.00	0.50	2.00
Columbia Harbor	0.35	0.35	0.35	0.35	0.35	0.35
Columbia East of 82nd	0.40	0.40	0.40	0.40	0.40	0.40
Dispersed Industrial	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
Neighborhood Commercial	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 Incubator	1.16	1.16	2.32	2.68	0.58	2.32
Columbia Harbor	0.35	0.35	0.35	0.41	0.35	0.35
Columbia East of 82nd	0.40	0.40	0.40	0.46	0.40	0.40
Dispersed Industrial	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
Neighborhood Commercial	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

Streams, lakes, river and other water bodies
Wetlands
Environmental Conservation Overlay Zones
City of Portland Landslide Hazard Areas
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

APPENDIX C. BUILDABLE LAND INVENTORY TABLES

On the following pages provide the detailed tables of the Buildable Land Inventory.

The net building square footage is the total allowed building square footage allowed under current comprehensive plan designations less existing building square footage.

The industrial land supply is for vacant land greater than 0.5 acres only, although underutilized parcels are reported.

Institutional campus capacity is based on approved master plans.

Figure 40. 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 6 acres			6 to 10 acres			Employment Geography
	Before Constraints	After Constraints	After market FAR	Before Constraints	After Constraints	After market FAR	Before Constraints	After Constraints	After market FAR	Before Constraints	After Constraints	After market FAR	Before Constraints	After Constraints	After market FAR	
Central City Commercial	18,361,829	15,346,890	15,346,890	11,848,623	7,937,540	7,937,540	13,396,504	7,908,465	7,908,465	7,145,531	2,745,540	2,745,540	2,163,797	1,354,349	1,354,349	Central City Commercial
Redevelopment	5,709,630	5,420,157	5,420,157	3,504,831	3,130,512	3,130,512	3,778,981	2,900,343	2,900,343	465,223	426,646	426,646	897,823	546,165	546,165	Redevelopment
Vacant	12,652,199	9,926,733	9,926,733	8,343,792	4,807,028	4,807,028	9,617,523	5,008,122	5,008,122	6,680,309	2,318,894	2,318,894	1,265,974	808,184	808,184	Vacant
Central City Incubator	2,752,776	1,526,581	1,526,581	441,412	158,268	158,268	646,493	446,419	446,419	30,124	18,951	18,951	0	0	0	Central City Incubator
Redevelopment	696,808	471,710	471,710	66,006	62,004	62,004	431,586	282,439	282,439	0	0	0	0	0	0	Redevelopment
Vacant	2,055,968	1,054,870	1,054,870	375,405	96,264	96,264	214,907	163,980	163,980	30,124	18,951	18,951	0	0	0	Vacant
Columbia Harbor	1,537,546	1,179,672	1,179,672	1,840,362	1,296,123	1,296,123	7,598,802	5,140,866	5,140,866	5,557,895	3,481,975	3,481,975	7,106,952	4,710,008	4,710,008	Columbia Harbor
Redevelopment	665,329	541,329	541,329	741,816	571,930	571,930	1,025,998	829,591	829,591	925,351	753,974	753,974	880,387	572,571	572,571	Redevelopment
Vacant	872,217	638,343	638,343	1,098,545	724,192	724,192	6,572,804	4,311,276	4,311,276	4,632,544	2,728,001	2,728,001	6,226,565	4,137,438	4,137,438	Vacant
Harbor Access Subarea	*86,859*	*27,787*	*27,787*	*90,222*	*34,645*	*34,645*	*926,593*	*261,991*	*261,991*	*692,324*	*191,872*	*191,872*	*1,737,486*	*675,011*	*675,011*	*Harbor Access Subarea*
Redevelopment	*1,339*	*540*	*540*	*0*	*0*	*0*	*66,820*	*30,671*	*30,671*	*158,176*	*47,135*	*47,135*	*281,531*	*112,612*	*112,612*	*Redevelopment*
Vacant	*85,519*	*27,248*	*27,248*	*90,222*	*34,645*	*34,645*	*859,773*	*231,321*	*231,321*	*534,148*	*144,737*	*144,737*	*1,455,955*	*562,399*	*562,399*	*Vacant*
Columbia East	400,772	307,293	307,293	765,212	580,878	580,878	4,291,686	2,581,354	2,581,354	5,398,387	3,885,959	3,885,959	3,788,184	2,492,874	2,492,874	Columbia East
Redevelopment	13,298	3,989	3,989	89,006	57,259	57,259	360,623	341,893	341,893	0	0	0	0	0	0	Redevelopment
Vacant	387,475	303,304	303,304	676,206	523,618	523,618	3,931,063	2,239,460	2,239,460	5,398,387	3,885,959	3,885,959	3,788,184	2,492,874	2,492,874	Vacant
Dispersed Industrial	1,360,813	1,076,056	1,076,056	878,654	581,061	581,061	2,006,251	1,205,138	1,205,138	1,869,395	632,054	632,054	1,021,626	685,037	685,037	Dispersed Industrial
Redevelopment	680,931	590,683	590,683	415,649	332,553	332,553	765,761	428,149	428,149	687,884	332,665	332,665	382,485	174,188	174,188	Redevelopment
Vacant	679,882	485,373	485,373	463,005	248,508	248,508	1,240,490	776,989	776,989	1,181,511	299,389	299,389	639,140	510,849	510,849	Vacant
Gateway Regional Center	2,917,111	2,544,509	1,570,465	2,062,390	1,760,279	969,293	4,256,391	3,413,382	1,743,370	1,537,580	1,202,453	653,377	935,331	558,858	314,316	Gateway Regional Center
Redevelopment	2,388,335	2,127,552	1,282,358	1,428,430	1,296,229	714,976	3,727,490	3,074,645	1,457,215	1,537,580	1,202,453	653,377	935,331	558,858	314,316	Redevelopment
Vacant	528,776	416,957	288,107	633,960	464,051	254,316	528,901	338,737	286,155	0	0	0	0	0	0	Vacant
Town Center	2,795,108	2,376,942	969,088	2,020,107	1,617,262	492,796	1,387,876	982,988	322,435	911,476	745,513	190,278	445,812	134,885	134,885	Town Center
Redevelopment	2,277,612	1,963,122	748,850	1,826,991	1,458,854	424,171	1,200,750	861,599	255,092	911,476	745,513	190,278	195,139	43,216	43,216	Redevelopment
Vacant	517,497	413,820	220,237	193,116	158,408	68,625	187,126	121,389	67,343	0	0	0	250,672	91,668	91,668	Vacant
Neighborhood Commercial	51,325,567	44,928,011	13,415,313	18,710,886	15,260,515	3,958,535	19,877,312	15,406,443	3,173,656	11,324,957	8,238,542	1,986,528	11,735,063	8,864,292	1,640,899	Neighborhood Commercia
Redevelopment	44,142,736	39,273,353	11,074,444	15,235,225	12,804,217	2,837,751	16,274,988	13,329,904	2,359,968	8,716,724	6,716,234	1,377,411	10,867,784	8,864,292	1,640,899	Redevelopment
Vacant	7,182,831	5,654,658	2,340,869	3,475,662	2,456,298	1,120,784	3,602,324	2,076,539	813,689	2,608,233	1,522,309	609,118	867,279	0	0	Vacant
Institutional	1,110,446	1,105,058	1,105,058	683,870	683,870	683,870	2,895,104	2,874,143	2,874,143	1,540,803	1,540,803	1,540,803	1,792,277	1,792,277	1,792,277	Institutional
Redevelopment	856,136	856,136	856,136	282,731	282,731	282,731	943,650	943,650	943,650	760,403	760,403	760,403	592,767	592,767	592,767	Redevelopment
Vacant	254,310	248,922	248,922	401,139	401,139	401,139	1,951,454	1,930,493	1,930,493	780,400	780,400	780,400	1,199,510	1,199,510	1,199,510	Vacant
Outside Geographies	1,503,377	1,092,524	1,092,524	92,077	73,271	73,271	965,728	621,827	621,827	282,157	282,157	282,157	743,306	729,831	729,831	Outside Geographies
Redevelopment	1,106,405	835,551	835,551	66,365	51,415	51,415	418,807	333,151	333,151	282,157	282,157	282,157	743,306	729,831	729,831	Redevelopment
Vacant	396,972	256,972	256,972	25,712	21,855	21,855	546,921	288,676	288,676	0	0	0	0	0	0	Vacant
Grand Total	**82,954,899**	**70,378,478**	**36,483,881**	**38,659,721**	**29,265,198**	**16,047,765**	**54,427,043**	**37,706,883**	**23,143,532**	**34,057,502**	**21,233,144**	**13,876,819**	**27,940,071**	**19,530,134**	**12,062,199**	**Grand Total**
Aggregate Geography																**Aggregate Geograph**
Central City	21,114,605	16,873,471	16,873,471	12,290,034	8,095,808	8,095,808	14,042,998	8,354,884	8,354,884	7,175,656	2,764,491	2,764,491	2,163,797	1,354,349	1,354,349	Central City
Industrial	3,299,132	2,563,021	2,563,021	3,484,227	2,458,062	2,458,062	13,896,740	8,927,359	8,927,359	12,825,677	7,999,988	7,999,988	11,916,762	7,887,918	7,887,918	Industrial
Commercial	57,037,786	49,849,462	15,954,866	22,793,383	18,638,057	5,420,624	25,521,578	19,802,813	5,239,462	13,774,013	10,186,508	2,830,183	13,116,206	9,558,036	2,090,100	Commercial
Institutions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Institutions
Outside Geographies	1,503,377	1,092,524	1,092,524	92,077	73,271	73,271	965,728	621,827	621,827	282,157	282,157	282,157	743,306	729,831	729,831	Outside Geographies
Total	**82,954,899**	**70,378,478**	**36,483,881**	**38,659,721**	**29,265,198**	**16,047,765**	**54,427,043**	**37,706,883**	**23,143,532**	**34,057,502**	**21,233,144**	**13,876,819**	**27,940,071**	**19,530,134**	**12,062,199**	**Total**

Source: Bureau of Planning and Sustainability

Figure 41. Buildable Land Inventory – Net Building Square Footage (part 2)

	10 to 20 acres			20 to 50 acres			More than 50 acres			Total	Total	Total	
Employment Geography	Before Constraints	After Constraints	After market FAR	Before Constraints	After Constraints	After market FAR	Before Constraints	After Constraints	After market FAR	Before Constraints	After Constraints	After market FAR	Employment Geography
Central City Commercial	0	0	0	0	0	0	0	0	0	**52,916,285**	**35,292,784**	**35,292,784**	Central City Commercial
Redevelopment	0	0	0	0	0	0	0	0	0	**14,356,488**	**12,423,823**	**12,423,823**	Redevelopment
Vacant	0	0	0	0	0	0	0	0	0	**38,559,797**	**22,868,961**	**22,868,961**	Vacant
Central City Incubator	0	0	0	0	0	0	0	0	0	**3,870,805**	**2,150,219**	**2,150,219**	Central City Incubator
Redevelopment	0	0	0	0	0	0	0	0	0	**1,194,400**	**816,153**	**816,153**	Redevelopment
Vacant	0	0	0	0	0	0	0	0	0	**2,676,405**	**1,334,066**	**1,334,066**	Vacant
Columbia Harbor	9,204,098	5,955,218	5,955,218	16,358,101	8,756,076	8,756,076	14,834,713	7,896,322	7,896,322	**62,500,922**	**37,236,588**	**37,236,588**	Columbia Harbor
Redevelopment	786,249	786,249	786,249	0	0	0	0	0	0	**4,359,800**	**3,514,314**	**3,514,314**	Redevelopment
Vacant	8,417,849	5,168,969	5,168,969	16,358,101	8,756,076	8,756,076	14,834,713	7,896,322	7,896,322	**58,141,122**	**33,722,274**	**33,722,274**	Vacant
Harbor Access Subarea	*2,805,567*	*795,917*	*795,917*	*8,426,701*	*2,141,559*	*2,141,559*	*0*	*0*	*0*	***14,678,893***	***4,100,995***	***4,100,995***	*Harbor Access Subarea*
Redevelopment	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	***506,527***	***190,419***	***190,419***	*Redevelopment*
Vacant	*2,805,567*	*795,917*	*795,917*	*8,426,701*	*2,141,559*	*2,141,559*	*0*	*0*	*0*	***14,172,366***	***3,910,576***	***3,910,576***	*Vacant*
Columbia East	4,346,304	2,660,596	2,660,596	9,515,955	4,967,432	4,967,432	0	0	0	**28,105,728**	**17,169,092**	**17,169,092**	Columbia East
Redevelopment	0	0	0	1,025,722	669,919	669,919	0	0	0	**1,475,351**	**1,069,072**	**1,069,072**	Redevelopment
Vacant	4,346,304	2,660,596	2,660,596	8,490,233	4,297,513	4,297,513	0	0	0	**26,630,378**	**16,100,020**	**16,100,020**	Vacant
Dispersed Industrial	353,286	187,387	187,387	3,071,933	1,604,686	1,604,686	0	0	0	**9,201,145**	**4,895,364**	**4,895,364**	Dispersed Industrial
Redevelopment	353,286	187,387	187,387	1,066,286	549,325	549,325	0	0	0	**3,671,351**	**2,004,267**	**2,004,267**	Redevelopment
Vacant	0	0	0	2,005,648	1,055,361	1,055,361	0	0	0	**5,529,794**	**2,891,097**	**2,891,097**	Vacant
Gateway Regional Center	887,065	317,618	317,618	0	0	0	0	0	0	**12,595,867**	**9,797,100**	**5,568,439**	Gateway Regional Center
Redevelopment	887,065	317,618	317,618	0	0	0	0	0	0	**10,904,230**	**8,577,355**	**4,739,860**	Redevelopment
Vacant	0	0	0	0	0	0	0	0	0	**1,691,636**	**1,219,745**	**828,579**	Vacant
Town Center	0	0	0	0	0	0	0	0	0	**7,560,379**	**5,857,590**	**2,109,482**	Town Center
Redevelopment	0	0	0	0	0	0	0	0	0	**6,411,967**	**5,072,305**	**1,661,608**	Redevelopment
Vacant	0	0	0	0	0	0	0	0	0	**1,148,411**	**785,285**	**447,874**	Vacant
Neighborhood Commercial	8,215,960	3,613,133	1,053,848	4,068,684	3,149	2,523	5,054,895	120,248	91,255	**130,313,324**	**96,434,335**	**25,322,557**	Neighborhood Commercial
Redevelopment	4,312,838	2,003,712	427,703	4,068,684	3,149	2,523	5,054,895	120,248	91,255	**108,673,874**	**83,115,111**	**19,811,953**	Redevelopment
Vacant	3,903,122	1,609,421	626,144	0	0	0	0	0	0	**21,639,450**	**13,319,225**	**5,510,604**	Vacant
Institutional	1,373,501	1,373,501	1,373,501	424,994	424,994	424,994	881,640	881,640	881,640	**10,702,635**	**10,676,287**	**10,676,287**	Institutional
Redevelopment	1,085,887	1,085,887	1,085,887	299,829	299,829	299,829	881,640	881,640	881,640	**5,703,042**	**5,703,042**	**5,703,042**	Redevelopment
Vacant	287,615	287,615	287,615	125,165	125,165	125,165	0	0	0	**4,999,593**	**4,973,244**	**4,973,244**	Vacant
Outside Geographies	1,181,855	303,154	303,154	0	0	0	0	0	0	**4,768,500**	**3,102,763**	**3,102,763**	Outside Geographies
Redevelopment	1,181,855	303,154	303,154	0	0	0	0	0	0	**3,798,895**	**2,535,259**	**2,535,259**	Redevelopment
Vacant	0	0	0	0	0	0	0	0	0	**969,605**	**567,504**	**567,504**	Vacant
Grand Total	**24,188,567**	**13,037,106**	**10,477,821**	**33,014,674**	**15,331,343**	**15,330,716**	**19,889,608**	**8,016,571**	**7,987,577**	**322,535,589**	**222,612,122**	**143,523,575**	**Grand Total**

Aggregate Geography													Aggregate Geography
Central City	0	0	0	0	0	0	0	0	0	56,787,089	37,443,003	37,443,003	Central City
Industrial	13,903,688	8,803,201	8,803,201	28,945,989	15,328,194	15,328,194	14,834,713	7,896,322	7,896,322	99,807,795	59,301,044	59,301,044	Industrial
Commercial	9,103,024	3,930,751	1,371,465	4,068,684	3,149	2,523	5,054,895	120,248	91,255	150,469,569	112,089,025	33,000,478	Commercial
Institutions	-	-	-	-	-	-	-	-	-	10,702,635	10,676,287	10,676,287	Institutions
Outside Geographies	1,181,855	303,154	303,154	0	0	0	0	0	0	4,768,500	3,102,763	3,102,763	Outside Geographies
Total	**24,188,567**	**13,037,106**	**10,477,821**	**33,014,674**	**15,331,343**	**15,330,716**	**19,889,608**	**8,016,571**	**7,987,577**	**322,535,589**	**222,612,122**	**143,523,575**	**Total**

Source: Bureau of Planning and Sustainability

Figure 42. Buildable Land Inventory – Net Land Acres (part 1)

Employment Geography	Less than .5 acres			.5 to 1 acre			1 to 3 acres			3 to 6 acres			6 to 10 acres			Employment Geography
	Before Constraints	After Constraints	After market FAR	Before Constraints	After Constraints	After market FAR	Before Constraints	After Constraints	After market FAR	Before Constraints	After Constraints	After market FAR	Before Constraints	After Constraints	After market FAR	
Central City Commercial	78	65	65	50	34	34	57	33	33	30	12	12	9	6	6	Central City Commercial
Redevelopment	24	23	23	15	13	13	16	12	12	2	2	2	4	2	2	Redevelopment
Vacant	54	42	42	35	20	20	41	21	21	28	10	10	5	3	3	Vacant
Central City Incubator	51	28	28	8	3	3	12	8	8	1	0	0	0	0	0	Central City Incubator
Redevelopment	13	9	9	1	1	1	8	5	5	0	0	0	0	0	0	Redevelopment
Vacant	38	20	20	7	2	2	4	3	3	1	0	0	0	0	0	Vacant
Columbia Harbor	35	27	27	42	30	30	174	118	118	128	80	80	163	108	108	Columbia Harbor
Redevelopment	15	12	12	17	13	13	24	19	19	21	17	17	20	13	13	Redevelopment
Vacant	20	15	15	25	17	17	151	99	99	106	63	63	143	95	95	Vacant
Harbor Access Subarea	*2*	*1*	*1*	*2*	*1*	*1*	*21*	*6*	*6*	*16*	*4*	*4*	*40*	*15*	*15*	*Harbor Access Subarea*
Redevelopment	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*1*	*1*	*4*	*1*	*1*	*6*	*3*	*3*	*Redevelopment*
Vacant	*2*	*1*	*1*	*2*	*1*	*1*	*20*	*5*	*5*	*12*	*3*	*3*	*33*	*13*	*13*	*Vacant*
Columbia East	9	7	7	18	13	13	99	59	59	124	89	89	87	57	57	Columbia East
Redevelopment	0	0	0	2	1	1	8	8	8	0	0	0	0	0	0	Redevelopment
Vacant	9	7	7	16	12	12	90	51	51	124	89	89	87	57	57	Vacant
Dispersed Industrial	31	25	25	20	13	13	46	28	28	43	15	15	23	16	16	Dispersed Industrial
Redevelopment	16	14	14	10	8	8	18	10	10	16	8	8	9	4	4	Redevelopment
Vacant	16	11	11	11	6	6	28	18	18	27	7	7	15	12	12	Vacant
Gateway Regional Center	70	61	38	50	43	23	103	82	42	37	29	16	23	14	8	Gateway Regional Center
Redevelopment	58	51	31	35	31	17	90	74	35	37	29	16	23	14	8	Redevelopment
Vacant	13	10	7	15	11	6	13	8	7	0	0	0	0	0	0	Vacant
Town Center	119	101	41	86	69	21	59	42	14	39	32	8	19	6	6	Town Center
Redevelopment	97	83	32	78	62	18	51	37	11	39	32	8	8	2	2	Redevelopment
Vacant	22	18	9	8	7	3	8	5	3	0	0	0	11	4	4	Vacant
Neighborhood Commercial	2,266	1,983	592	826	674	175	878	680	140	500	364	88	518	391	72	Neighborhood Commercia
Redevelopment	1,949	1,734	489	673	565	125	719	588	104	385	297	61	480	391	72	Redevelopment
Vacant	317	250	103	153	108	49	159	92	36	115	67	27	38	0	0	Vacant
Institutional																Institutional
Redevelopment																Redevelopment
Vacant																Vacant
Outside Geographies	35	25	25	2	2	2	22	14	14	6	6	6	17	17	17	Outside Geographies
Redevelopment	25	19	19	2	1	1	10	8	8	6	6	6	17	17	17	Redevelopment
Vacant	9	6	6	1	1	1	13	7	7	0	0	0	0	0	0	Vacant
Grand Total	**2,694**	**2,323**	**849**	**1,102**	**880**	**314**	**1,449**	**1,065**	**457**	**908**	**627**	**314**	**859**	**614**	**289**	**Grand Total**
Aggregate Geography																**Aggregate Geograph**
Central City	129	93	93	58	37	37	69	42	42	31	12	12	9	6	6	Central City
Industrial	76	59	59	80	56	56	319	205	205	294	184	184	274	181	181	Industrial
Commercial	2,455	2,146	671	962	785	219	1,039	804	196	576	424	112	560	411	86	Commercial
Institutions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Institutions
Outside Geographies	35	25	25	2	2	2	22	14	14	6	6	6	17	17	17	Outside Geographies
Total	**2,694**	**2,323**	**849**	**1,102**	**880**	**314**	**1,449**	**1,065**	**457**	**908**	**627**	**314**	**859**	**614**	**289**	**Total**

Source: Bureau of Planning and Sustainability

Figure 43. 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 FAR	20 to 50 acres Before Constraints	20 to 50 acres After Constraints	20 to 50 acres After market FAR	More than 50 acres Before Constraints	More than 50 acres After Constraints	More than 50 acres After market FAR	Total Before Constraints	Total After Constraints	Total After market FAR	Employment Geography
Central City Commercial	0	0	0	0	0	0	0	0	0	**224**	**149**	**149**	Central City Commercial
Redevelopment	0	0	0	0	0	0	0	0	0	**61**	**53**	**53**	Redevelopment
Vacant	0	0	0	0	0	0	0	0	0	**163**	**97**	**97**	Vacant
Central City Incubator	0	0	0	0	0	0	0	0	0	**72**	**40**	**40**	Central City Incubator
Redevelopment	0	0	0	0	0	0	0	0	0	**22**	**15**	**15**	Redevelopment
Vacant	0	0	0	0	0	0	0	0	0	**50**	**25**	**25**	Vacant
Columbia Harbor	211	137	137	376	201	201	341	181	181	**1,435**	**855**	**855**	Columbia Harbor
Redevelopment	18	18	18	0	0	0	0	0	0	**100**	**81**	**81**	Redevelopment
Vacant	193	119	119	376	201	201	341	181	181	**1,335**	**774**	**774**	Vacant
Harbor Access Subarea	*64*	*18*	*18*	*193*	*49*	*49*	*0*	*0*	*0*	***337***	***94***	***94***	*Harbor Access Subarea*
Redevelopment	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	***12***	***4***	***4***	*Redevelopment*
Vacant	*64*	*18*	*18*	*193*	*49*	*49*	*0*	*0*	*0*	***325***	***90***	***90***	*Vacant*
Columbia East	100	61	61	218	114	114	0	0	0	**645**	**394**	**394**	Columbia East
Redevelopment	0	0	0	24	15	15	0	0	0	**34**	**25**	**25**	Redevelopment
Vacant	100	61	61	195	99	99	0	0	0	**611**	**370**	**370**	Vacant
Dispersed Industrial	8	4	4	71	37	37	0	0	0	**211**	**112**	**112**	Dispersed Industrial
Redevelopment	8	4	4	24	13	13	0	0	0	**84**	**46**	**46**	Redevelopment
Vacant	0	0	0	46	24	24	0	0	0	**127**	**66**	**66**	Vacant
Gateway Regional Center	21	8	8	0	0	0	0	0	0	**304**	**237**	**135**	Gateway Regional Center
Redevelopment	21	8	8	0	0	0	0	0	0	**264**	**207**	**115**	Redevelopment
Vacant	0	0	0	0	0	0	0	0	0	**41**	**29**	**20**	Vacant
Town Center	0	0	0	0	0	0	0	0	0	**321**	**249**	**90**	Town Center
Redevelopment	0	0	0	0	0	0	0	0	0	**273**	**216**	**71**	Redevelopment
Vacant	0	0	0	0	0	0	0	0	0	**49**	**33**	**19**	Vacant
Neighborhood Commercial	363	160	47	180	0	0	223	5	4	**5,753**	**4,257**	**1,118**	Neighborhood Commercial
Redevelopment	190	88	19	180	0	0	223	5	4	**4,798**	**3,669**	**875**	Redevelopment
Vacant	172	71	28	0	0	0	0	0	0	**955**	**588**	**243**	Vacant
Institutional										**307**	**306**	**306**	Institutional
Redevelopment										**164**	**164**	**164**	Redevelopment
Vacant										**143**	**143**	**143**	Vacant
Outside Geographies	27	7	7	0	0	0	0	0	0	**109**	**71**	**71**	Outside Geographies
Redevelopment	27	7	7	0	0	0	0	0	0	**87**	**58**	**58**	Redevelopment
Vacant	0	0	0	0	0	0	0	0	0	**22**	**13**	**13**	Vacant
Grand Total	**730**	**376**	**263**	**844**	**352**	**352**	**564**	**187**	**185**	**9,164**	**6,520**	**3,270**	**Grand Total**

Aggregate Geography													Aggregate Geography
Central City	0	0	0	0	0	0	0	0	0	296	189	189	Central City
Industrial	319	202	202	665	352	352	341	181	181	2,291	1,361	1,361	Industrial
Commercial	384	167	54	180	0	0	223	5	4	6,379	4,743	1,342	Commercial
Institutions	-	-	-	-	-	-	-	-	-	307	306	306	Institutions
Outside Geographies	27	7	7	0	0	0	0	0	0	109	71	71	Outside Geographies
Total	**730**	**376**	**263**	**844**	**352**	**352**	**564**	**187**	**185**	**9,382**	**6,671**	**3,270**	**Total**

Source: Bureau of Planning and Sustainability

APPENDIX D. BUILDABLE LAND INVENTORY MAP