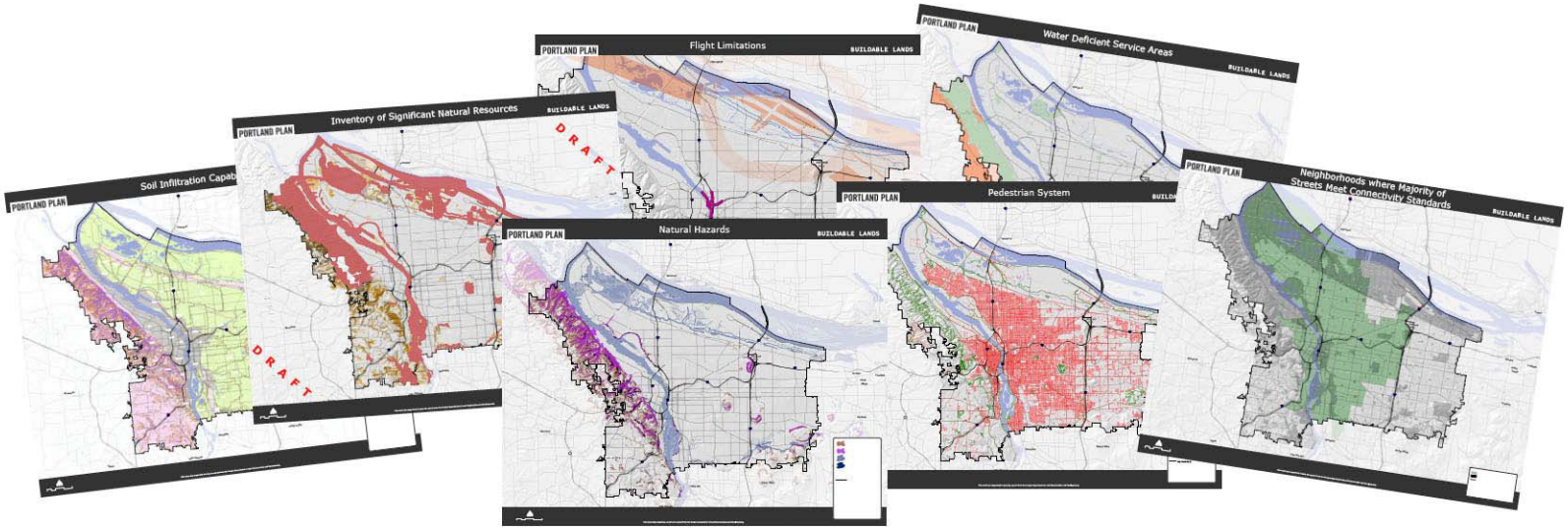
Buildable Lands Inventory – Appendix A: Constraint Maps and Model Assumptions



City of Portland Development Capacity Analysis, May 2011

City of Portland Bureau of
Planning and Sustainability
Sam Adams, Mayor | Susan Anderson, Director

THE PORTLAND PLAN

Acknowledgements:

Mayor Sam Adams, Commissioner-in-Charge
Susan Anderson, Director, Bureau of Planning and Sustainability
Joe Zehnder, Chief Planner
Eric Engstrom, Principal Planner
Steve Dotterer, Principal Planner
Deborah Stein, Supervising Planner
Alexandra Howard, Program Coordinator
Tom Armstrong, Sr. Management Analyst
Michelle Kunec, Management Analyst
Marty Stockton, Community Outreach Specialist
Eden Dabbs, Communications
Gary Odenthal, Technical Services Manager
Kevin Martin, GIS Analyst
Al Burns, Sr. City Planner
Mark Walhood, City Planner II
Bill Cunningham, City Planner II
Emily Sandy, City Planner II
Uma Krishnan, Demographer
Julie Hernandez, Web design
Courtney Duke, Bureau of Transportation
Marie Johnson, Bureau of Environmental Services

This report was funded in part with a grant from the Oregon Department of Land Conservation and Development (DLCD).

To help ensure equal access to City programs, services and activities, the City of Portland will reasonably modify policies/procedures and provide auxiliary aids /services to persons with disabilities. Call 503-823-7700 with such requests.

Appendix A – Constraint Maps and Model Assumptions

The Buildable Lands Inventory (BLI) is an inventory of land that has capacity to accommodate additional development. One step in the inventory process is identification and an analysis of constrained lands. Constrained lands include sites that lack needed urban infrastructure (for example, sites without sewer service), and also include physical and regulatory barriers to development (such as environmentally sensitive areas, historic landmarks, flood hazards, etc.). This Appendix provides additional more detailed explanation of how constraints were identified and considered. Each constraint is defined, and the BLI modeling methodology is described. Assumptions have been made about the degree of impact each constraint has on development capacity (none, low, medium, high, or total). This Appendix describes the rationale for those assumptions.

The BLI is focused on vacant and underutilized land. A separate report entitled '**Development Capacity Analysis GIS Model**' describes the methodology used to identify those lands.

A Transportation (Vehicular Level of Service)

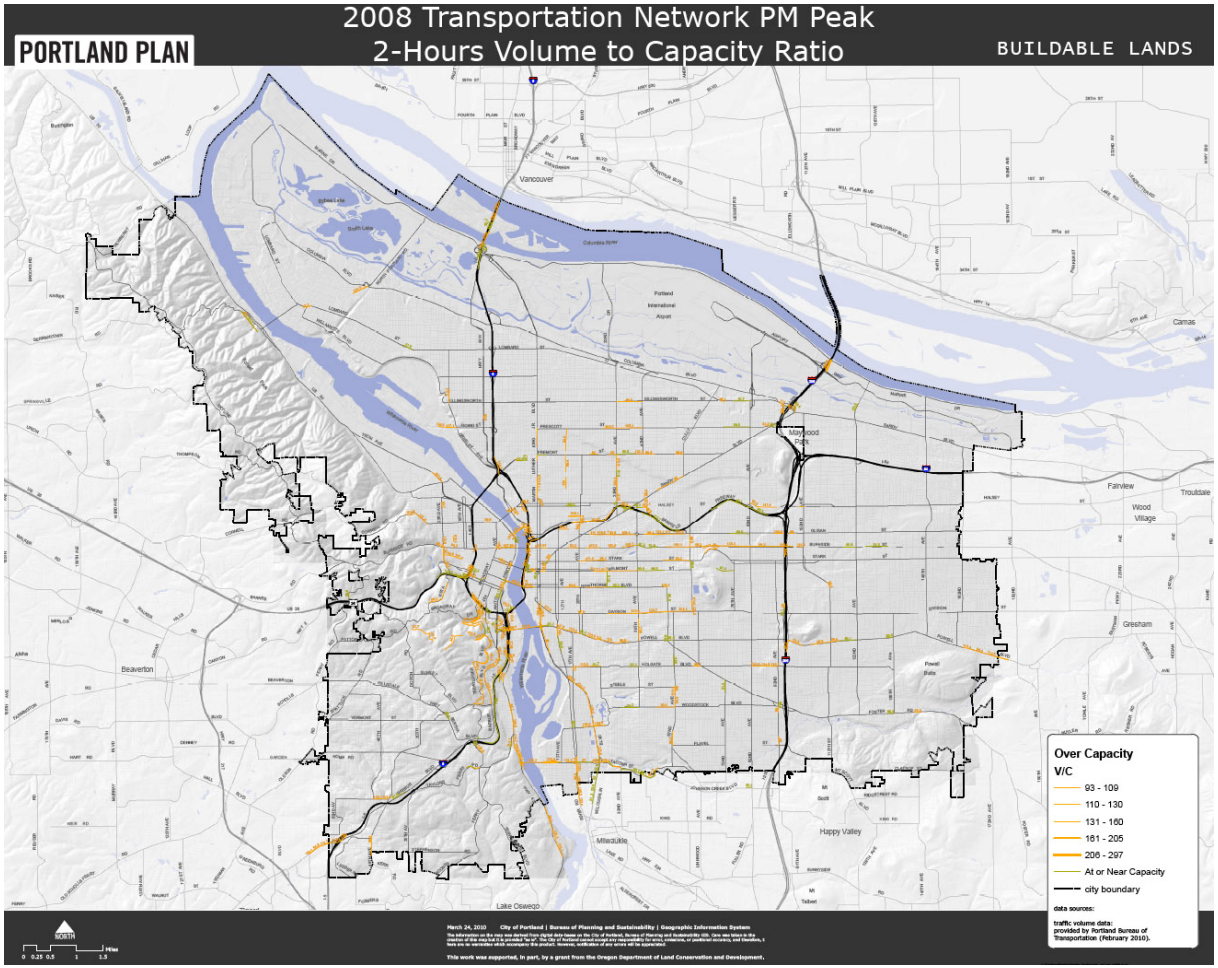
A1 2008 Volume to Capacity Ratios
A2 Neighborhoods where Majority of Streets Meet Connectivity Standards
A3 ODOT Highway Interchanges

Definition: Catchment areas for over-capacity street segments (see Map A1) were defined as 1/8 mile in neighborhoods with where the majority of streets meet adopted connectivity standards (see Map A2) and ¼ mile in neighborhoods where connectivity does not meet adopted standards. However, only parcels subject to discretionary review were considered constrained, not those where development is allowed by right.

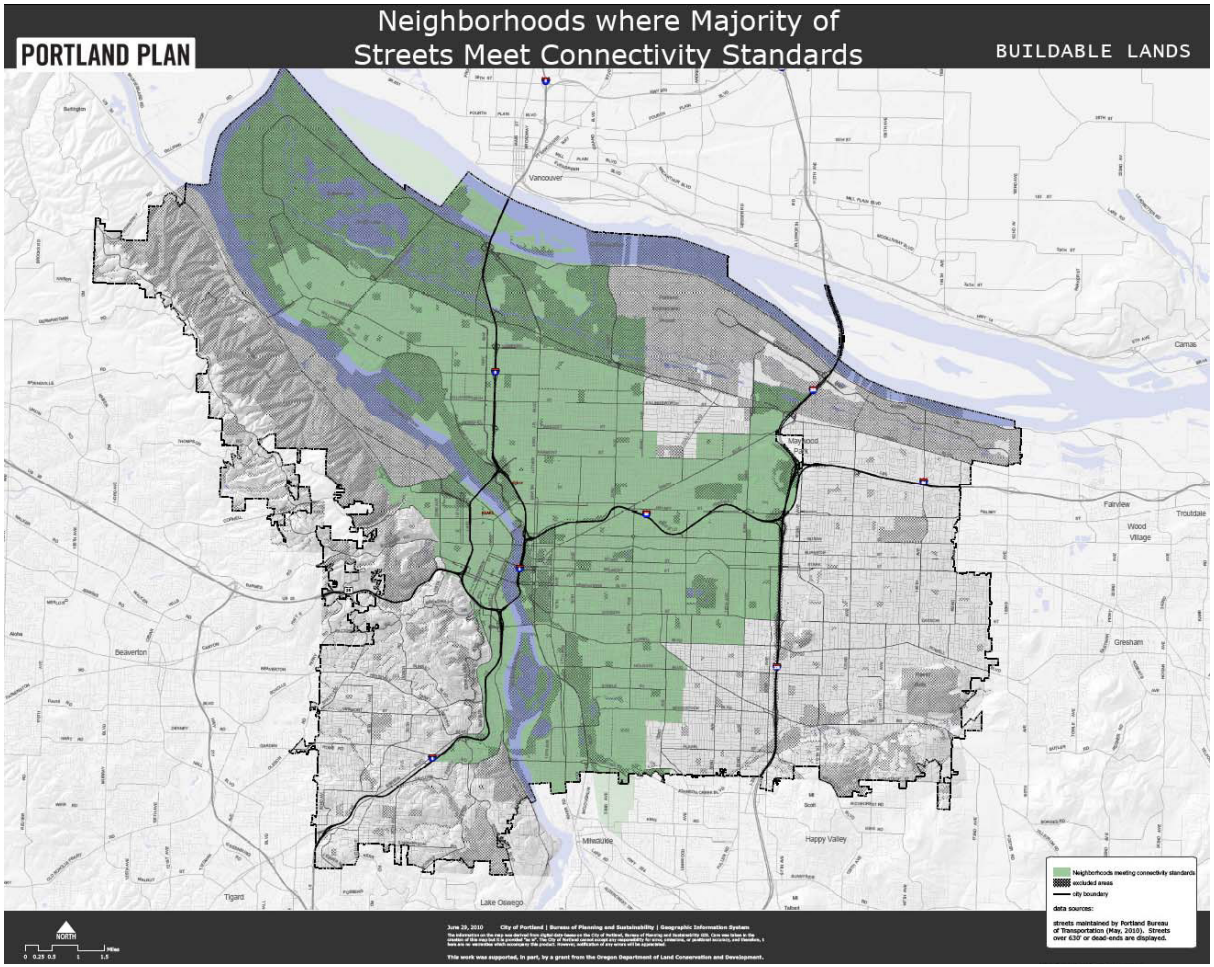
Methodology: This layer reflects service and market constraints that add expense or time to development. Based on information from the Bureau of Transportation and the Bureau of Development Services, areas along or within the catchment areas of over-capacity facilities (as defined by vehicular level of service standards) have been considered partially constrained. Since it is difficult to delineate catchment areas for each facility for this analysis, level of street connectivity were used to assign approximate catchment areas. In addition, areas within 1/4 mile of on- and off-ramps for over-capacity ODOT facilities (see Map A3) were considered constrained due to additional ODOT review requirements.

The above layers combined to create a low constraint, because in most cases the constraint can be overcome by on-site or off-site improvements made by the developer (exactions).

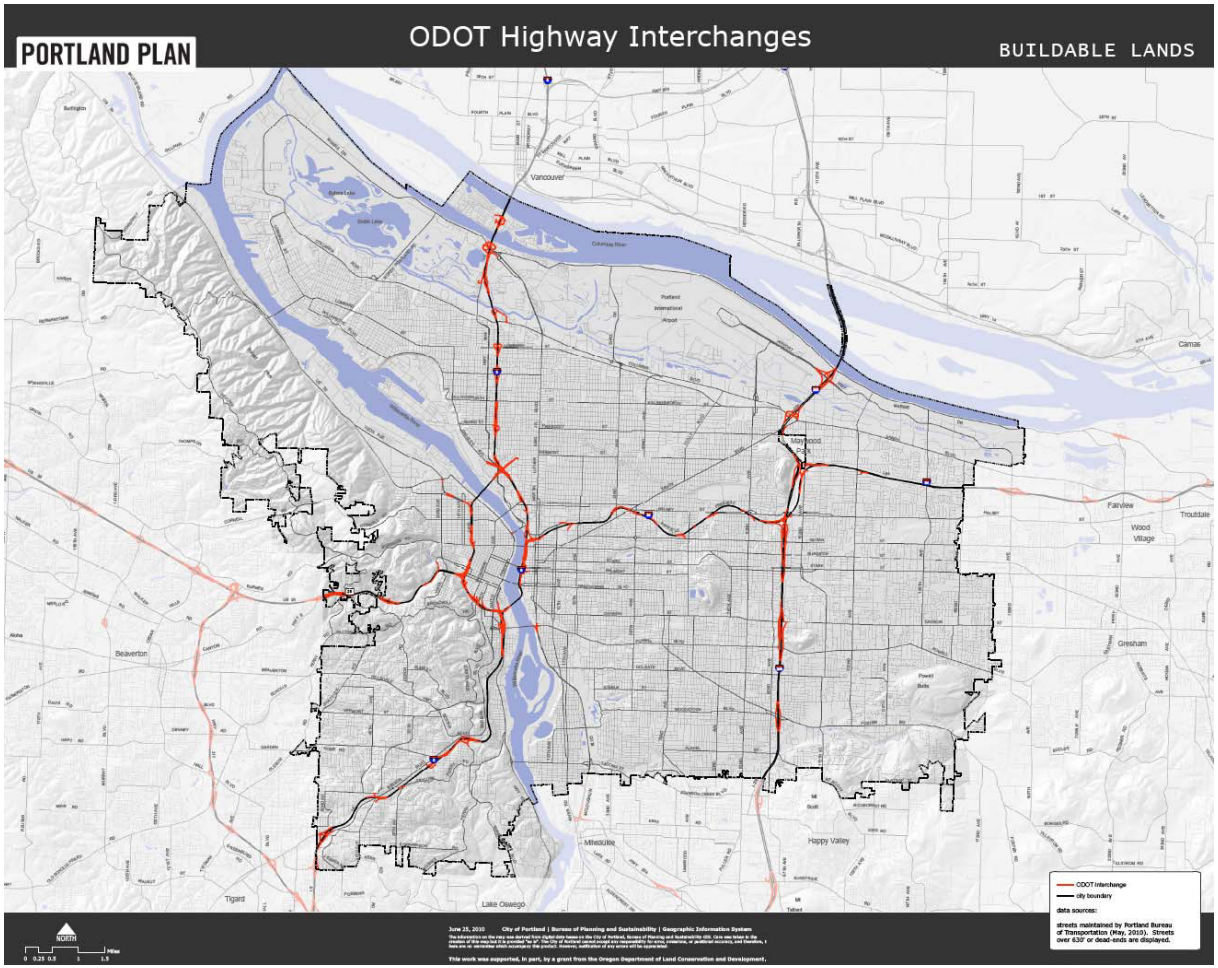
Appendix A – Constraint Maps and Model Assumptions



Appendix A – Constraint Maps and Model Assumptions



Appendix A – Constraint Maps and Model Assumptions



B Transportation (Other)

B1 Substandard and Unimproved Streets
B2 Pedestrian System

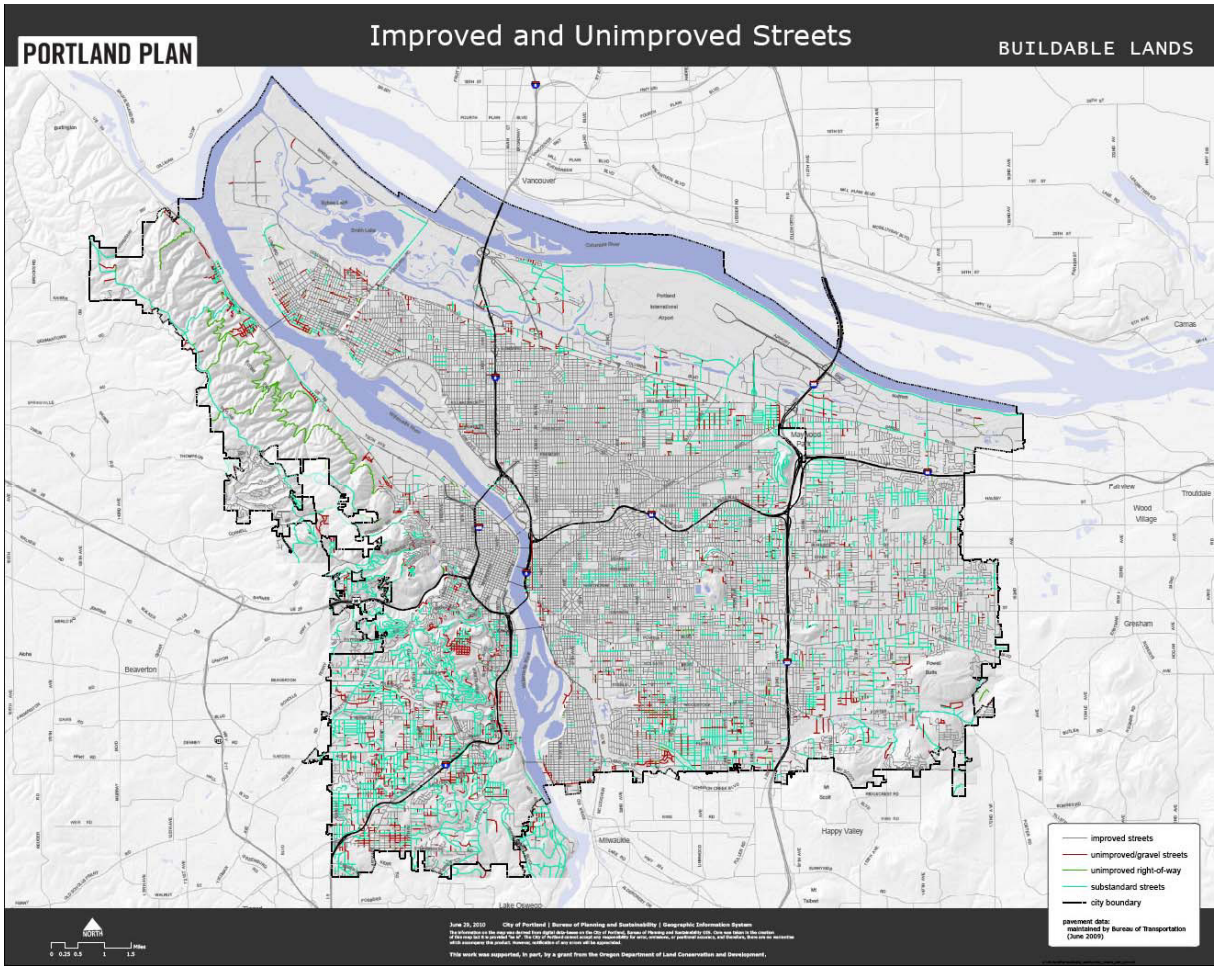
Definition: Constrained parcels are those immediately adjacent to substandard or unimproved streets or rights-of-way (see Map B1), or adjacent to existing streets that lack sidewalks (see Map B2). Sidewalk data is originally from photogrametric data (digitized from aerial photos flown from 1987 to 1994, updated by Portland Bureau of Transporation in 2004). This data is kept current with as-built drawings and/or subtantially complete designs. Sub-standard street data is derived from street center line with attributes regularly maintained by Portland Bureau of Transportation.

Methodology: This layer reflects market constraints that add expense or time to development. Based on conversations with the Bureau of Transportation and the Bureau of Development Services, parcels adjacent to incomplete and substandard streets and rights-of-way, including those without sidewalks, have been designated as having a partial market constraint, due to the additional cost of street improvements.

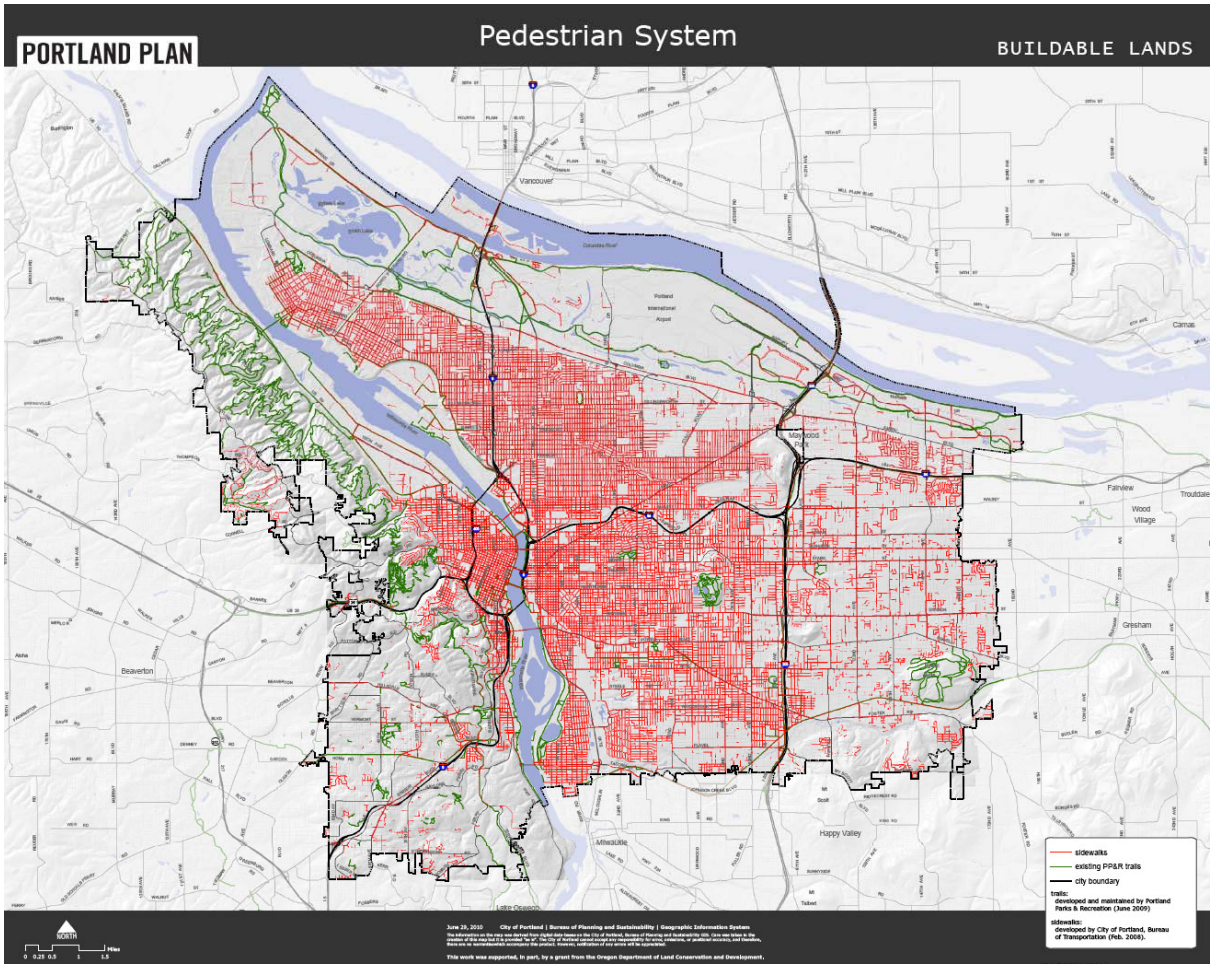
Note on Parking: The need to construct parking for new development was also discussed as a potential market constraint. However, since parking is not considered a public facility it was not be included in this analysis.

The above layers combined to create a low constraint, because in most cases the constraint can be overcome by on-site or off-site improvements made by the developer (exactions).

Appendix A – Constraint Maps and Model Assumptions



Appendix A – Constraint Maps and Model Assumptions



C Water Service

C1 Water System
C2 Deficient Service Areas

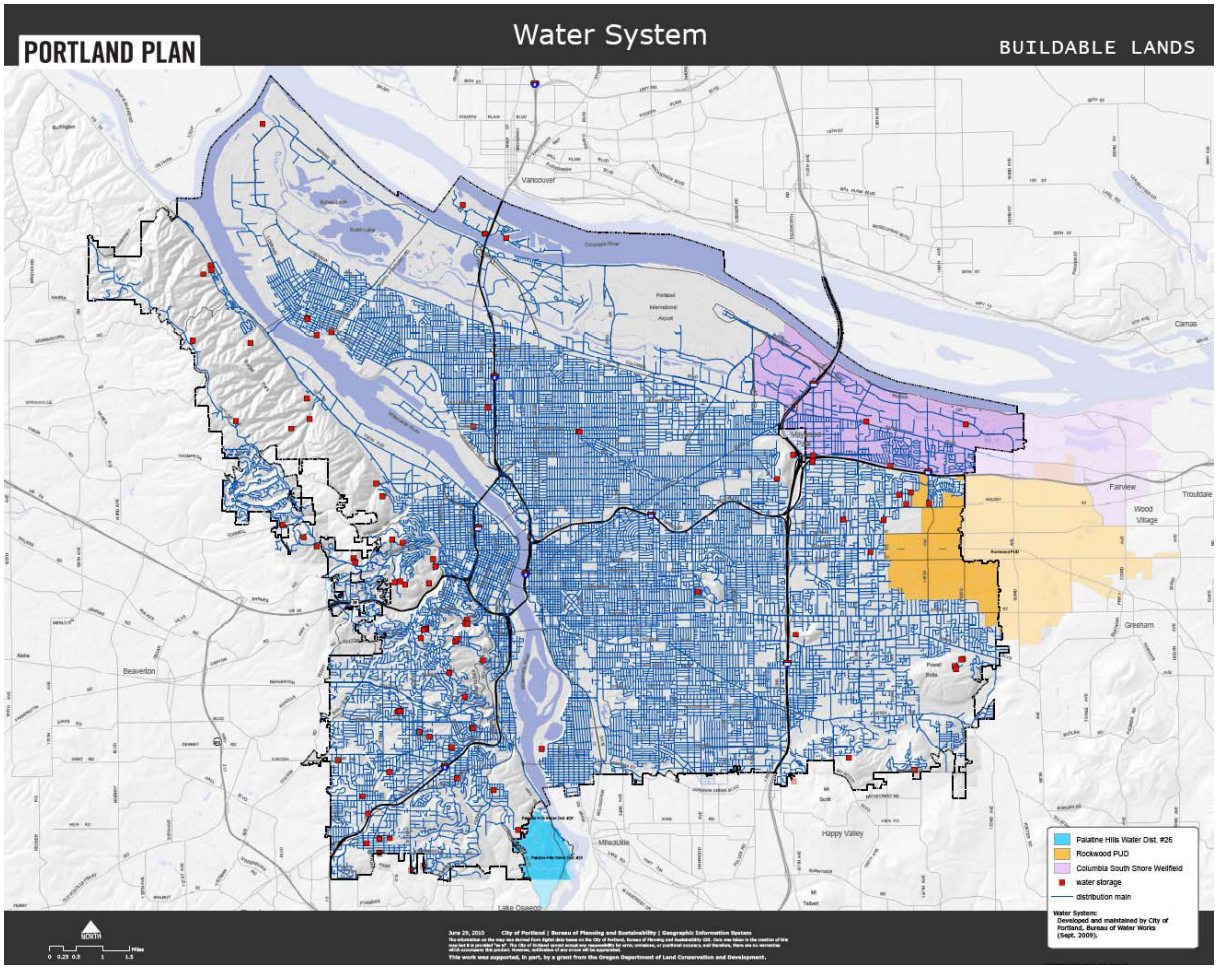
Definition: This data was developed by the Bureau of Water Works (January 2010). Parcels meeting the following criteria were identified as constrained:

- Parcels served only by a 2-inch main (see Map C1). These mains may be insufficient to provide adequate flow and development may be required to upgrade service mains. The Portland Water Bureau provides 65% of the cost of these upgrades (for improvements up to $125,000) for residential projects.
- Parcels located in areas with substandard fire flow (see Map C2). In these cases, sprinklers and/or other fire protection improvements may be required.
- Parcels located adjacent to streets that lack water service (see Map C1). These parcels are required to construct the water facilities necessary to deliver water to their parcel. The Portland Water Bureau provides 40% of the cost of water main upgrades for improvements up to $125,000.

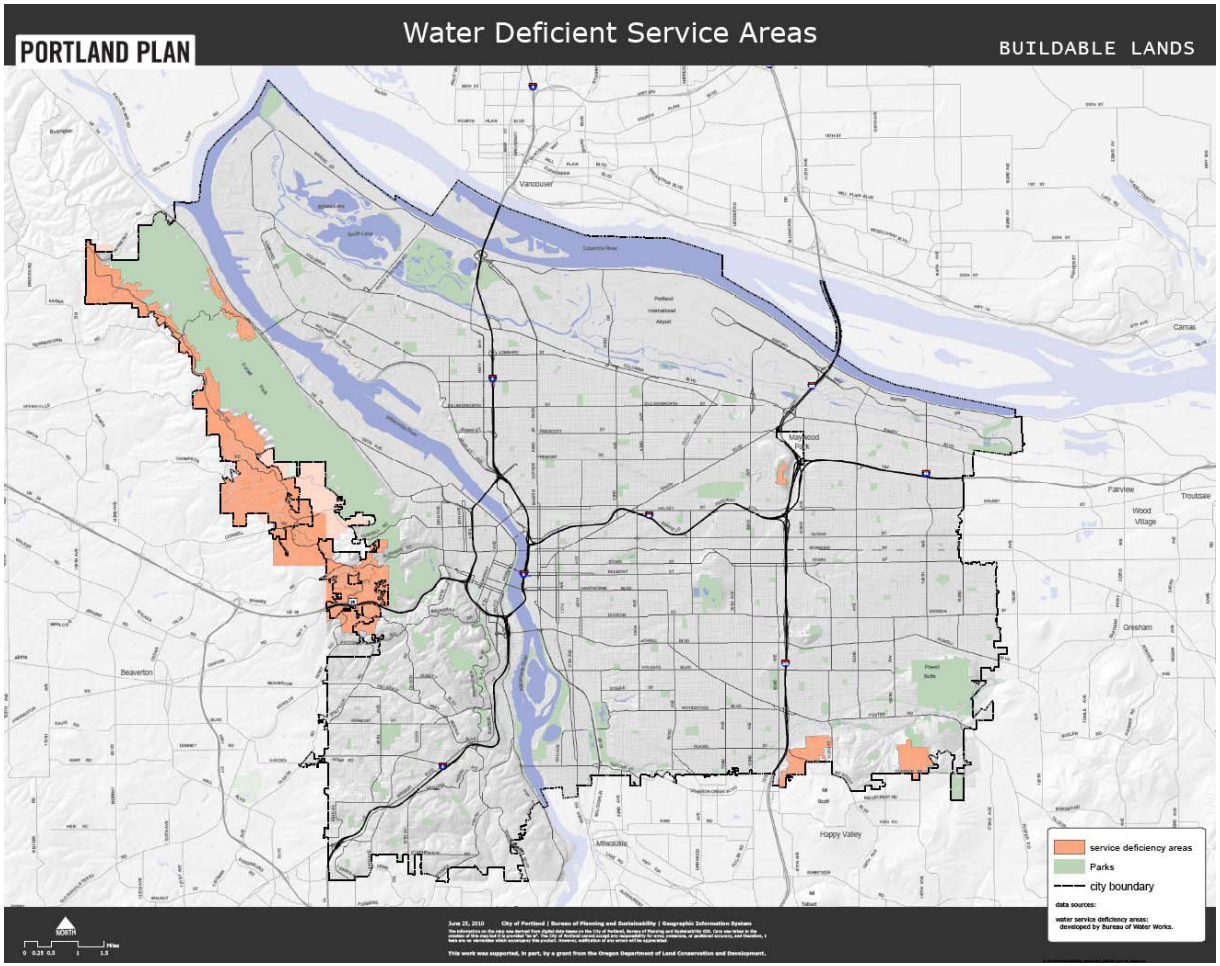
Methodology: This layer reflects market constraints that add expense or time to development. Based on conversations with the Portland Water Bureau and the Bureau of Development Services, water service can be provided to all parcels within the Portland urban services boundary through public or private systems. Development of parcels meeting one or more of the definition criteria may experience additional development costs related to installation or improvement of water infrastructure.

The above layers combined to create a low constraint, because in most cases the constraint can be overcome by on-site or off-site improvements made by the developer (exactions), and because existing zoning density already accounts for this service deficiency.

Appendix A – Constraint Maps and Model Assumptions



Appendix A – Constraint Maps and Model Assumptions



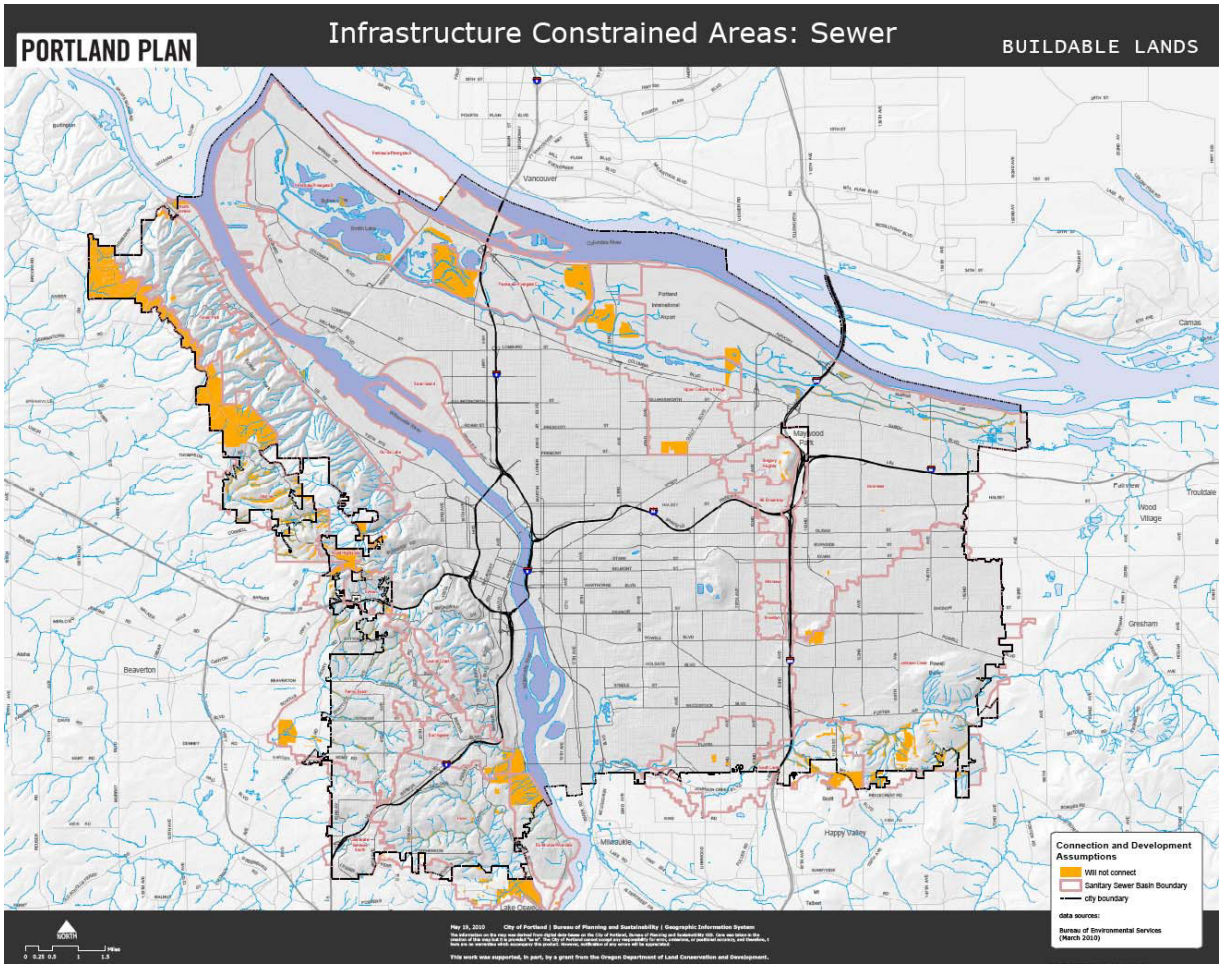
D Sewer Conveyance

D1 Development Assumptions for Sanitary Sewer

Definition: A limited number of parcels were considered constrained as they may not be able to connect to a public sewer system due to topographic or other constraints (see Map D1). This data was provided by the Bureau of Environmental Services (March 2010).

Methodology: This layer reflects infrastructure/service constraints. Based on information from the Bureau of Environmental Services and the Bureau of Development Services, existing service level deficiencies for combined and separated sanitary sewers were not identified as development constraints. However, there are a few areas of the City that may be unable to connect to a public system due to topographic or other constraints. This was considered a low constraint because in most cases the constraint can be overcome by on-site or off-site improvements made by the developer (exactions), and because existing zoning density already accounts for this service deficiency. For example, many of the sewer-constrained areas have low density RF semi-rural zoning.

Appendix A – Constraint Maps and Model Assumptions



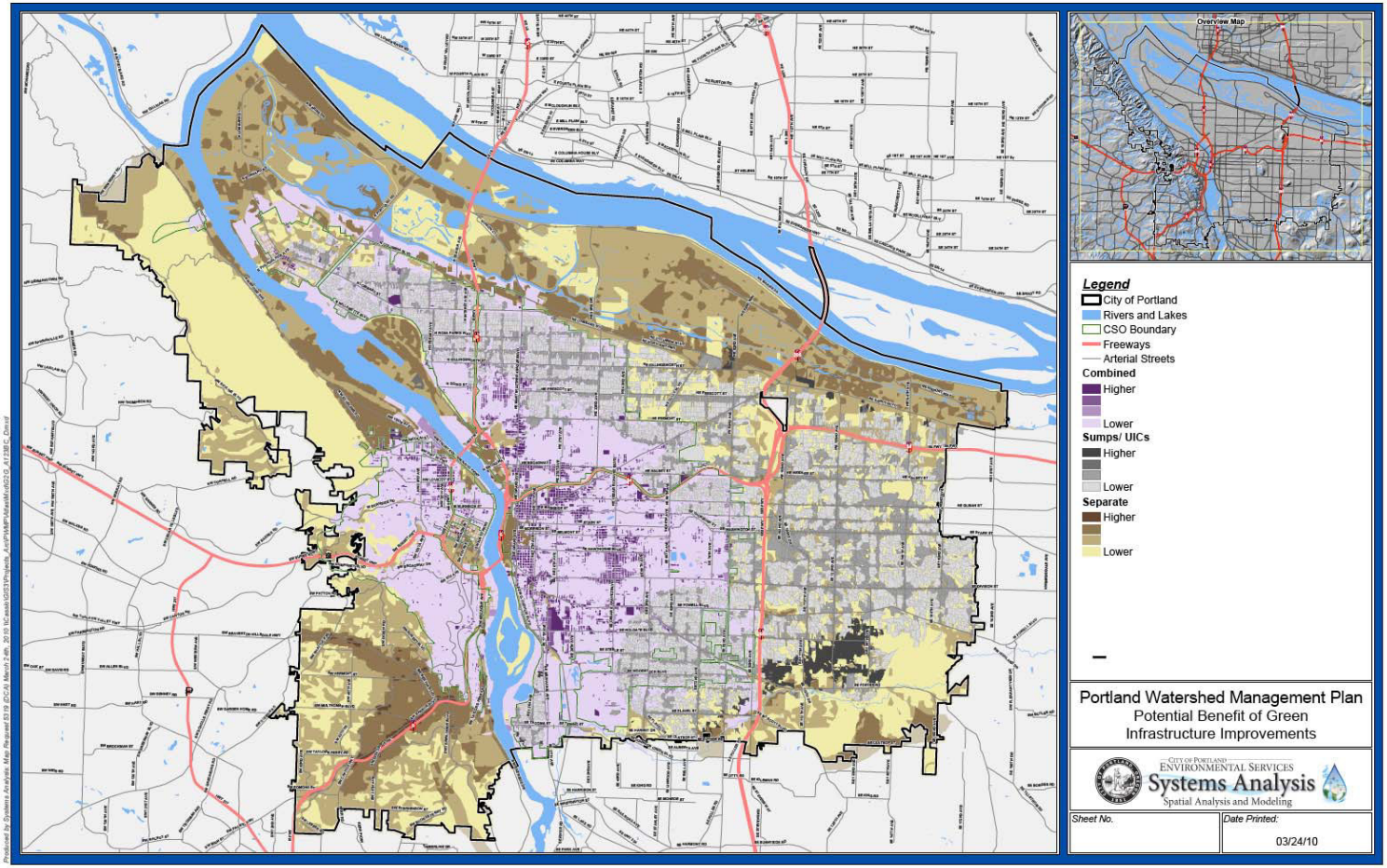
E Stormwater

E1 Stormwater System
E2 Depth to Seasonal High Water
E3 Soil Infiltration Capability
E4 Wellfield Protection Areas

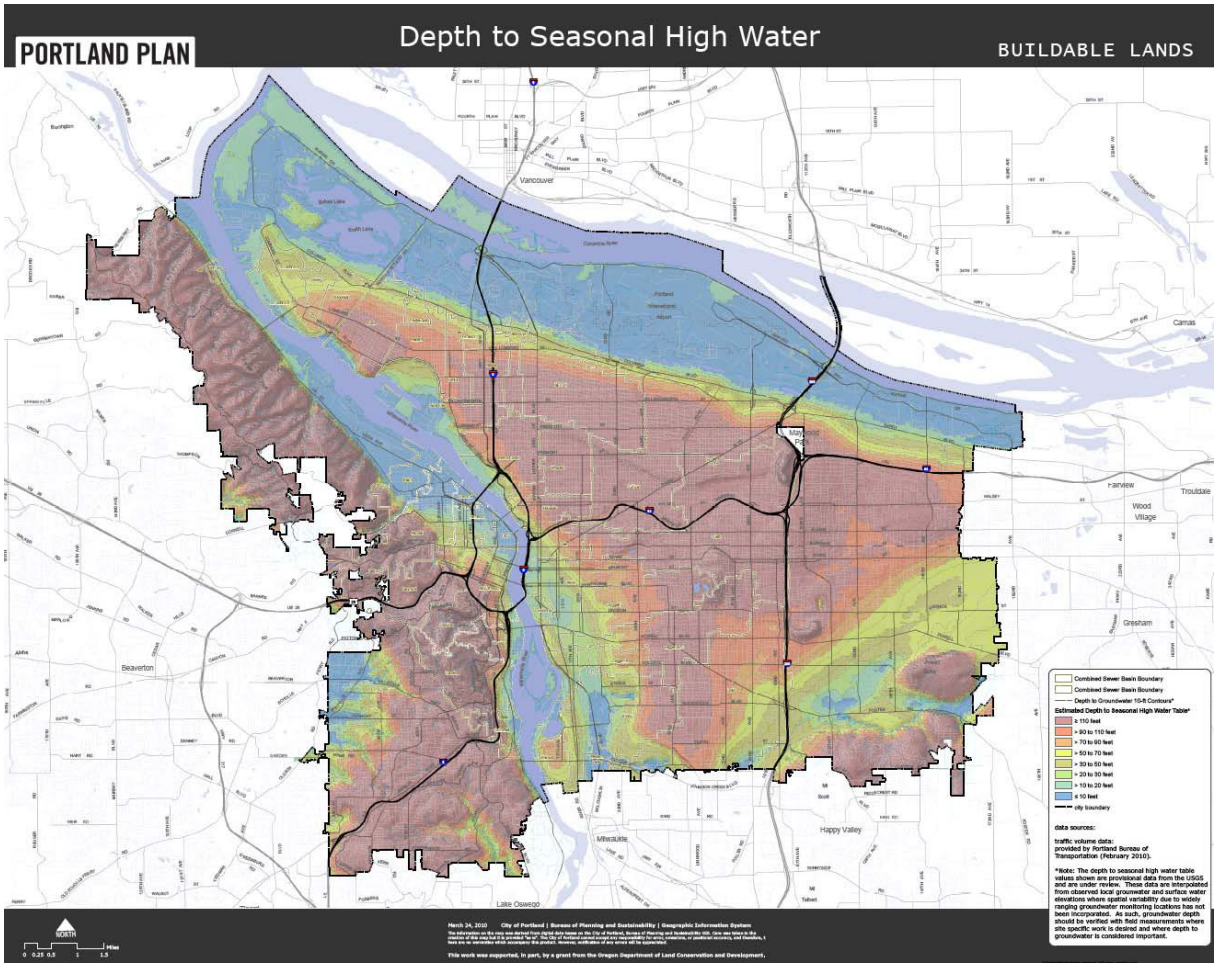
Definition: Parcels in areas that are not suitable for infiltration, based on depth to seasonal high groundwater (see Map E2), soil infiltration capability (see Map E3), and wellhead protection designation (see Map E4) and do not have access to a stormwater pipe or culvert, combined sewer pipe, stream or drainageway (see Map E1) were considered constrained. Stormwater data is developed and maintained by Bureau of Environmental Services (March 2010) including stormwater system, depth to seasonal ground water and wellfield protection areas (existing and proposed). Infiltration areas were primarily derived from mapping provided by the US Dept. of Agriculture Natural Resources Conservation Service from the SSURGO database.

Methodology: This layer reflects infrastructure/service and market constraints that add expense or time to development. Based on conversations with the Bureau of Environmental Services and the Bureau of Development Services, parcels in areas that are not suitable for infiltration (based on definition criteria) were considered constrained. These parcels may face market constraints due to increased cost of stormwater infrastructure or may be unable to meet stormwater requirements. The above layers combined to create a low constraint, because in most cases the constraint can be overcome by on-site or off-site improvements made by the developer (exactions), and because existing zoning density already accounts for this service deficiency. For example, many of the sewer-constrained areas have lower density RF or R10 zoning, and are also constrained by a number of other layers (such as slope, the natural resource inventory, and floodplains).

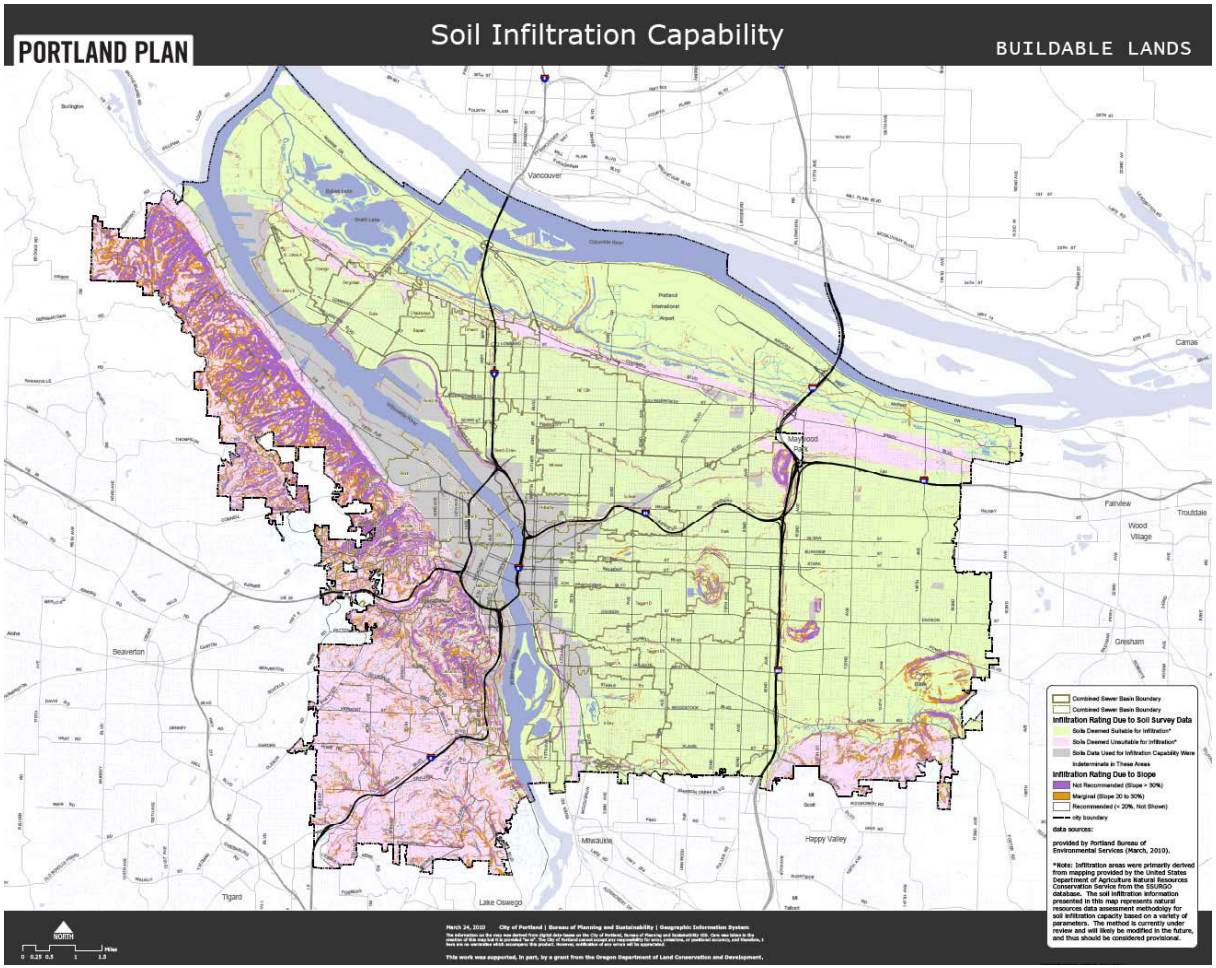
Appendix A – Constraint Maps and Model Assumptions

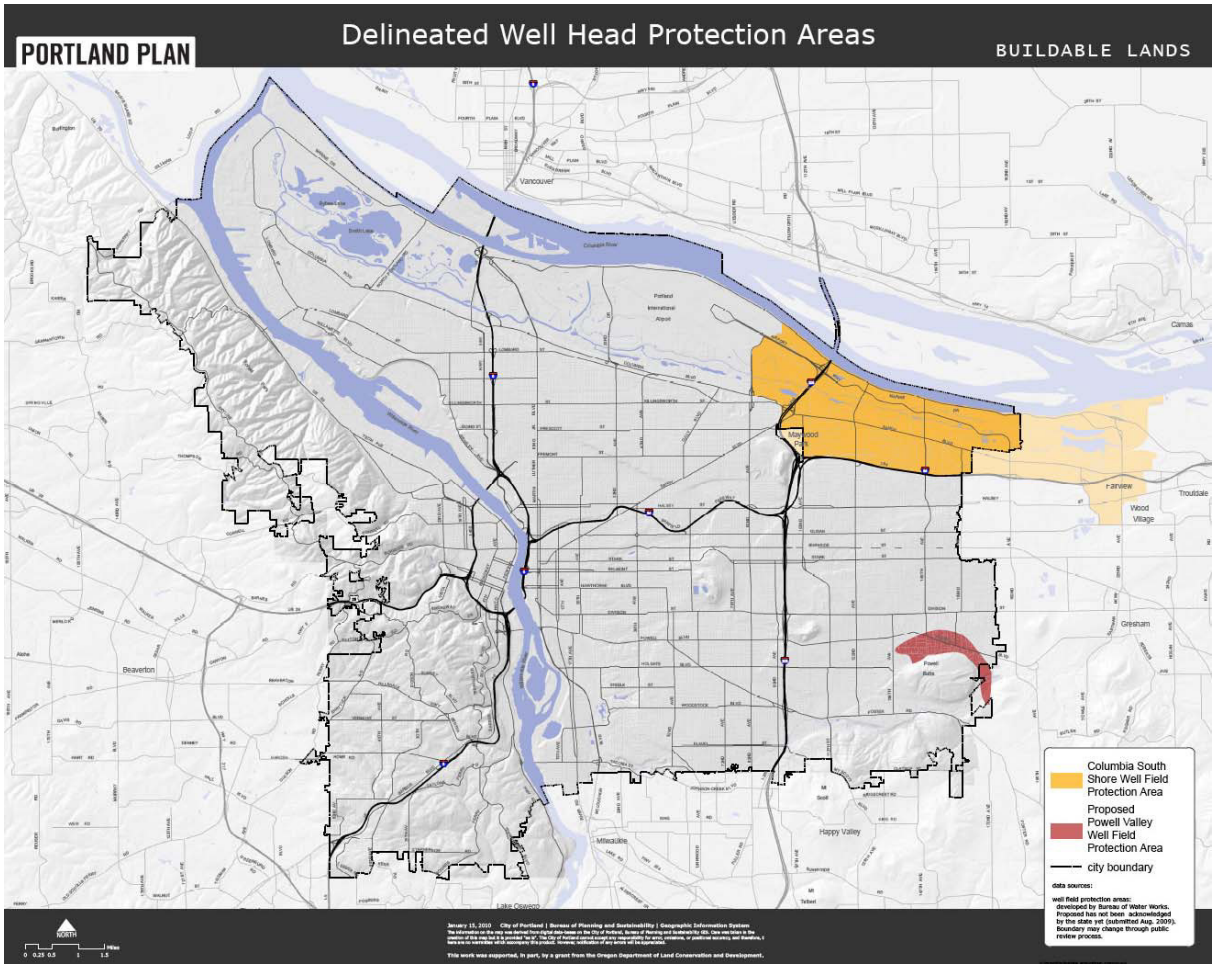


Appendix A – Constraint Maps and Model Assumptions



Appendix A – Constraint Maps and Model Assumptions




PORTLAND PLAN
Delineated Well Head Protection Areas
BUILDABLE LANDS
Vancouver
Portland International Airport
Camas
Troutdale
Wood Village
Gresham
Beaverton
Happy Valley
Columbia South Shore Well Field Protection Area
Proposed Powell Valley Well Field Protection Area
city boundary
data sources:
well field protection areas: developed by Bureau of Water Works. Proposed has not been acknowledged by the state yet (submitted Aug. 2009). Boundary may change through public review process.
January 15, 2010 City of Portland | Bureau of Planning and Sustainability | Geographic Information System
This work was supported, in part, by a grant from the Oregon Department of Land Conservation and Development.

F Airport Flight Limitations

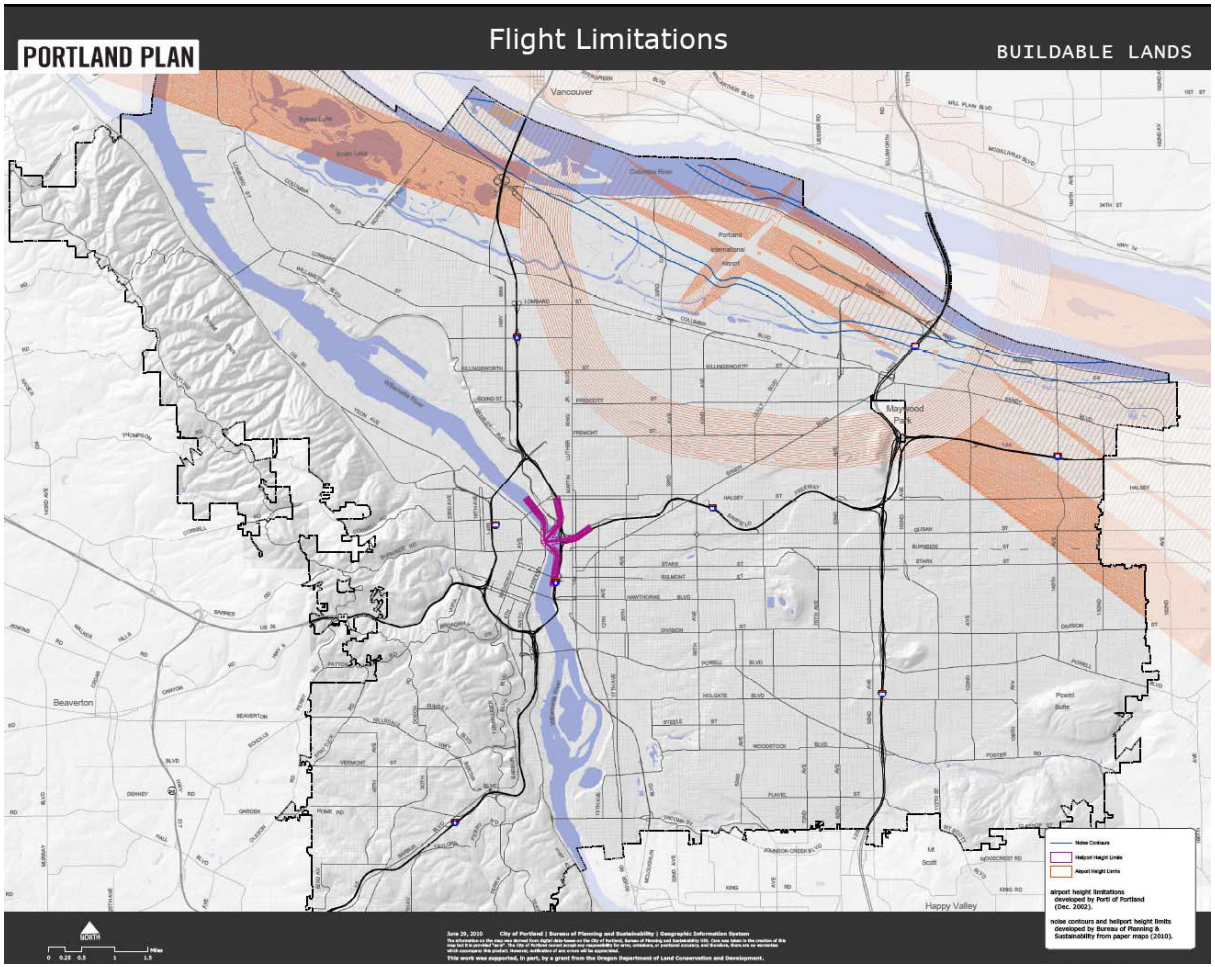
F1 Approach and departure cones

Definition: The Aircraft Landing overlay zone provides safer operating conditions for aircraft in the vicinity of Portland International Airport by limiting the height of structures and vegetation (Code Section 33.400). Airport height limitations data was developed by Port of Portland (Dec. 2002).

Methodology: This layer reflects regulatory constraints that make a portion of the site unavailable for development because overlay zone height limits near the airport landing and takeoff cone are regulated to lower heights in some cases below the base zone height maximum.

This layer has a low capacity reduction because the areas with reduced height potential, primarily Rocky Butte and the Alameda Ridge areas may realize less residential development over time in response to regulatory height constraints. The constraint is low because in most cases height limits can be appealed to the FAA that allows development over the maximum standard.

Appendix A – Constraint Maps and Model Assumptions



F Airport Flight Limitations

F2 Noise contours

Definition: Definition: The Portland International Airport Noise Impact overlay zone reduces the impact of aircraft noise on development within the noise impact area surrounding the Portland International Airport. This area is indicated by an 'x' on the official zoning maps, and can be described as the x overlay zone. The zone achieves this by limiting residential densities and by requiring noise insulation, noise disclosure statements, and noise easements. There are two noise contours within the x overlay zone, covering most of Hayden Island and portions of the Bridgeton Neighborhood: the Ldn 65 and Ldn 68 noise contours. Within the larger Ldn 65 noise contour, equal to the outer boundary of the x overlay zone, regulations limit development on sites with a residential Comprehensive Plan Map designation to a maximum R10 zone density (1 lot per 10,000 square feet of site area). In the Ldn 65 noise contour, development on sites with a commercial Comprehensive Plan Map designation is limited by code to a maximum R1 density (1 unit per 1,000 square feet of site area). Within the smaller, more restrictive Ldn 68 noise contour, new residential uses are prohibited, unless it meets limited exceptions for replacement of existing housing, or if the site was zoned for residential use on January 1, 1981. Noise contours data was developed by Port of Portland. Maps were adopted as part of the Airport Futures Plan effective May 18, 2011.

Methodology: Given the significant housing developed in both the Bridgeton and Hayden Island areas over the past years, no market or physical constraints have been associated with this layer. Also, unlike other constraint layers in this analysis, the regulatory considerations are expressed for the noise contours as specific limitations on residential density only, without impact to non-residential properties. Therefore, instead of being applied as ranked constraint on the scale of high, medium, low, etc., this constraint has been applied as a reduction in the base-zoned capacity for the area, consistent with the residential density limitations noted

above. Parcels (primarily on Hayden Island) where residential development is limited or prohibited were adjusted individually to match these requirements.

F Airport Flight Limitations

F3 Areas where building height must be limited near the Portland Heliport (on top of Old Town parking garage)

Definition: Regulations for the helicopter landing facilities impose restrictions on new buildings and trees/landscaping within the 8 (horizontal) to 1 (vertical) from the landing pad in the four approach/departure flight paths, extending North, Northeast, East and Southeast from the heliport. Chapter 33.243 outlines these regulations. The Portland Heliport atop the Smart Park Garage at NW 1st & Davis has vacant surface parking lots and parcels in at least two different directions. Because the approach/departure flight paths are located primarily above Waterfront Park, the river, and the I-5 and I-84 freeways, no significant reductions in housing or employment density are expected of this layer. Heliport height limitations data was developed by Bureau of Planning and Sustainability from paper maps (2010). This layer is shown in Map F1.

Methodology: This layer reflects a regulatory constraint that makes a portion of the site unavailable for development.

This layer has a low capacity reduction because the geographic area subject to the height limit extends 1-2 blocks in a perimeter around the heliport, and does not impact the entire allowed floor area of any of the impacted blocks.

G Natural Resource Features

G1 Streams, Lakes, Rivers and other Water Bodies

Definitions:

Drainageway: An open linear depression, whether constructed or natural, which functions for the collection and drainage of surface water. It may be permanently or temporarily inundated. Drainageways include sloughs. Road-side ditches are not drainageways unless the open channel is a segment of an existing stream or drainageway. (Chapter 33.910)

Stream: An area where enough natural surface water flows to produce a stream channel, such as a river or creek, that carries flowing surface water during some portion of the year. This includes:

- The water itself, including any vegetation, aquatic life, or habitat;
- Beds and banks below the high water level which may contain water, whether or not water is actually present;
- The floodplain between the high water level of connected side channels;
- Beaver ponds, oxbows, and side channels if they are connected by surface flow to the stream during a portion of the year; and
- Stream-associated wetlands.

Perennial stream: Stream that flows throughout the year; permanent stream.

Intermittent stream: Stream that flows only at certain times of the year, as when receiving water from springs or from evaporation or seepage exceed the available stream flow.

Ephemeral stream: Stream or portion of stream that flows briefly in direct response to precipitation in the immediate vicinity, and with channels at all times above water table. (Chapter 33.910)

Water bodies: Permanently or temporarily flooded lands which may lie below the deepwater boundary of wetlands. Water depth is such that water, and not the air, is the principal medium in which prevalent organisms live, whether or not they are attached to the bottom. The bottom may sometimes be considered nonsoil or the water may be too deep or otherwise unable to support emergent vegetation. Water bodies include rivers, streams, creeks, sloughs, drainageways, lakes, and ponds. (Chapter 33.910)

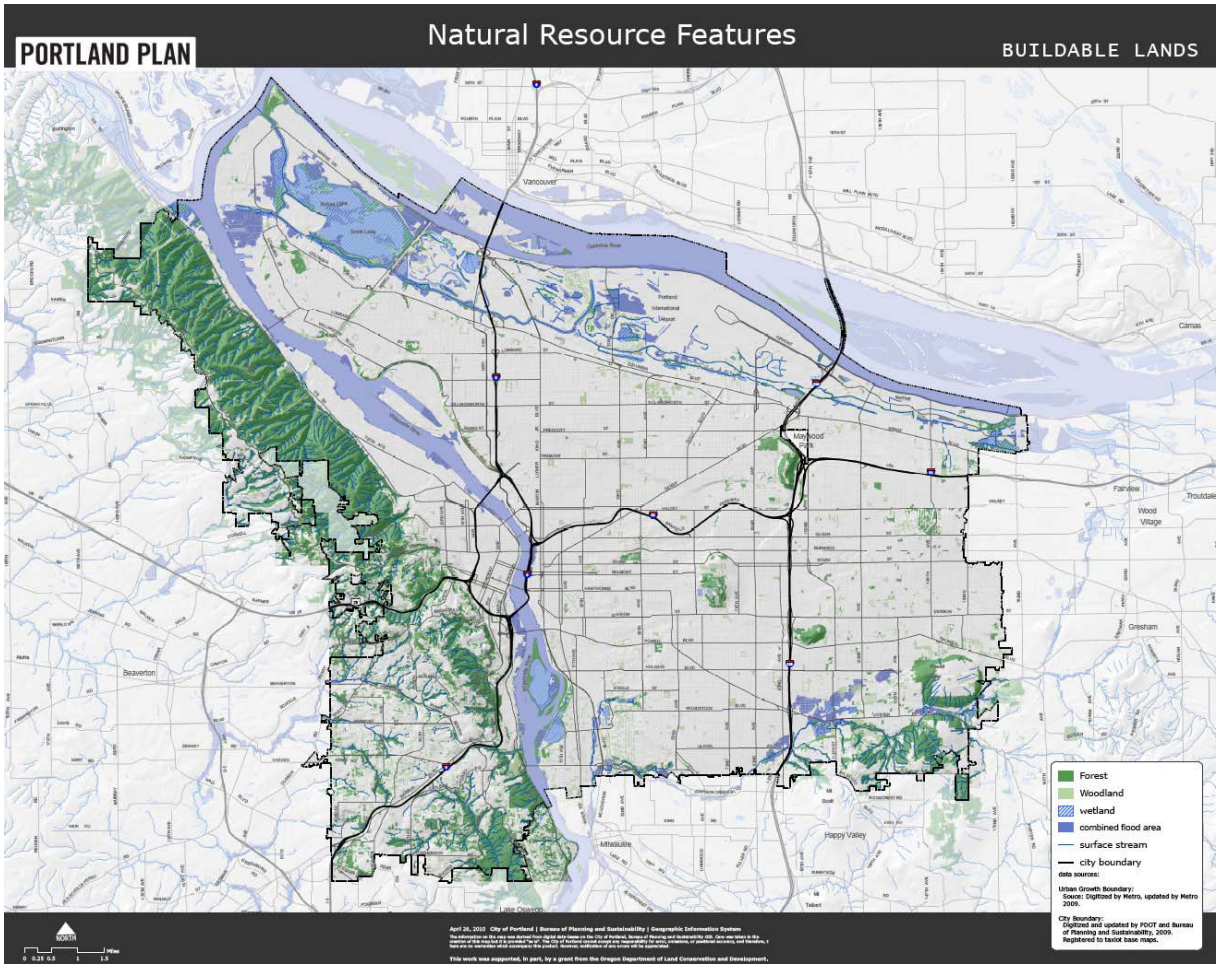
Original streams data was digitized by Metro (Aug. 1999). City of Portland and Multnomah County pockets are updated and maintained by City of Portland, Bureau of Planning and Sustainability to refine stream centerline geometry, remove erroneously mapped streams, add missing stream centerlines, and route the streams through the City of Portland sewer and stormwater network. LiDAR, BES Collection Lines, and aerial photos were among the data used as reference.

Methodology: This layer reflects physical and regulatory constraints that make a portion of the site unavailable for development. The presence of surface water during all or parts of the year, and the dynamic nature of these features poses a physical constraint to development. Most, but not all of these features are also located within existing environmental overlay zones, the impacts of which are addressed separately. However, the City also applies drainage reserve rules to ensure that hydraulic conveyance is maintained. The Drainage Reserve rules apply to an area within 15 feet of the centerline of a stream. The presence of water and dynamic nature of these features, combined with the requirements of the City's Drainage Reserve Rules, may necessitate the

use of special construction methods for developments within or adjacent to these features.

This layer has a full capacity reduction (no assumed capacity for impacted lands). The combination of physical constraints and regulatory requirements will greatly discourage development in these features.

Appendix A – Constraint Maps and Model Assumptions



G Natural Resource Features

G2 Wetlands

Definition: An area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, and similar areas. (33.910)

Methodology: This layer reflects physical, regulatory and market constraints that can make a portion of the site unavailable for development. Many wetlands in Portland are regulated under City, state and/or federal regulations, including the City's environmental overlay zones and Clean Water Act fill and removal requirements. In addition to the City's environmental overlay zones and state/federal regulations can limit encroachment into the wetland, and require mitigation to compensate for lost function. There also may be additional costs associated with developing in or around a wetland due to the presence of surface water or high groundwater table.

This layer has a medium capacity reduction because these features add expense or time to development (additional reviews, permits, conditions of approval, or mitigation actions may be required). There also may be additional costs associated with developing in or around a wetland due to the presence of surface water or high groundwater table.

G Natural Resource Features

G3 Forests

Definition: Maps shows vegetation patches larger than 1/2 acre. Based on information from reference data sources including 6" resolution 2002 and 2004 aerial photos, Parks and Recreation natural area assessments, and vegetation surveys along the banks of the Willamette and Columbia rivers. Vegetation patches are classified as forest or woodland. Forests are patches of trees with their crowns overlapping (generally forming 60-100% of cover. Woodlands are open stands of trees with crowns not usually touching, generally forming 25-60% of cover Forest s data was mapped by Bureau of Planning and Sustainability using reference data including aerial photos, Parks and Recreation natural area assessments, and vegetation surveys along the banks of the Willamette and Columbia rivers. Vegetation patches area classified as forest, woodland, shrubland, or herbaceous. The mapping area includes all land within the City of Portland and the unincorporated parts of Multnomah County that are administered by the City of Portland. Updated as needed.

Methodology: This layer reflects regulatory and market constraints that could make a portion of the site unavailable for development. This layer may add expense or time to development because tree removal is subject to special permits or reviews, potential conditions of approval, and mitigation for unavoidable impacts. This layer has no residential capacity reduction because the regulations provide flexibility to achieve density goals through modifying other development standards (such as setbacks). Off-site mitigation is allowed.

G Natural Resource Features

G4. Flood Areas

Definition: This layer is equivalent to the hazard layers N8-N10.

G Natural Resource Features

G5 Groundwater Recharge Areas

Definition: Groundwater Sensitive Areas. Areas from which groundwater is replenished and the flow enables contaminants to be carried into aquifers (aquifer recharge areas), or areas of an aquifer in which the groundwater level and flow characteristics are influenced by the withdrawal of groundwater (areas of influence). (Chapter 33.910) There is no GIS layer for groundwater recharge areas. General location information can be found in adopted City Natural Resource Inventories and Protection Plans.

Methodology: This layer does not in itself reflect physical, market, or regulatory constraints except when located within an environmental overlay zone.

This layer has no capacity reduction. Groundwater recharge areas do not require any special construction approaches or designs, except when located within an environmental overlay zone (considered as a separate layer – L1 and L2).

H Inventory of Significant Natural Resources (Riparian Areas & Fish and Wildlife Habitats)

H1 Natural Resource Inventory Low Ranked Resource Areas
H2 Natural Resource Inventory Medium Ranked Resource Areas
H3 Natural Resource Inventory High Ranked Resource Areas (not including Special Habitat Areas)
H4 Significant Habitat Area (SHA)

Definitions:

Riparian Areas. Lands which are adjacent to rivers, streams, lakes, ponds, and other water bodies. They are transitional between aquatic and upland zones, and as such, contain elements of both aquatic and terrestrial ecosystems. They have high water tables because of their close proximity to aquatic systems, soils which are usually made up largely of water-carried sediments, and some vegetation that requires free (unbound) water or conditions that are more moist than normal. (Chapter 33.910)

Fish and wildlife habitat areas: Lands which contain significant food, water, or cover for native terrestrial and aquatic species of animals. Examples include forests, fields, riparian areas, wetlands, and water bodies. (Chapter 33.910)

High Ranked Resource Areas: These areas contribute to the broad array of riparian and/or wildlife habitat functions evaluated in the Natural Resource Inventory, and are critical to the health of Portland's watersheds. Most of these areas also coincide with Metro Title 13 Habitat Conservation Areas, which local jurisdictions are required to address through their regulatory and/or non-regulatory programs. Often, high ranked natural resources are aquatic or riparian areas (lands near streams and rivers).

Medium Ranked Resource Areas: Larger upland forest patches, or other habitat types that are not in close proximity to water. They are often important wildlife habitat areas, and are critical to the health of Portland's watersheds.

Low Ranked Resource Areas: Areas comprised primarily of smaller, isolated upland forested wildlife habitat areas, as well as low-structure vegetated portions of riparian corridors that are located relatively more than 200-300 feet from a river, stream or wetland. Low ranked areas also include portions of the flood areas that are developed or paved. These areas provide significant flood storage function but do not contribute to other basic riparian functions.

Special Habitat Areas include rare or declining habitat types (native oak stands, bottomland hardwood forest, habitats that are vital to plant and animal species at risk (wetlands, grasslands), and migrating species such as neotropical birds and elk (buttes, Forest Park). They also include urban features that vital to species at risk, such as bridges that provide nesting sites for the Peregrine falcon. From a policy perspective, and based on recent City Council action on the River Plan/North Reach, it is expected that the City would consider action needed to avoid, minimize and mitigate adverse impacts on the values and functions provided by these resource areas.

Methodology:
The City's updated inventory of natural resources includes riparian corridors and wildlife habitat areas. The City's methodology is based on the methodology Metro used to develop its adopted Title 13 inventory of regionally significant riparian corridors and wildlife habitat. Note that "riparian corridors" include rivers, streams and wetland features, and adjacent riparian areas as defined above. The inventory methodology started with mapping key natural resource features including rivers, streams, flood areas, wetlands, large

vegetated areas). The inventory identifies the specific riparian functions provided by these resource features (streamflow moderation and flood storage, bank and water quality functions, microclimate and shade, organic inputs, channel dynamics, wildlife movement corridor) and their wildlife habitat attributes (size, interior habitat area, connectivity between patches and proximity to water). Relative ranks are assigned to natural resources based on these functions and attributes. Separate ranks are assigned to riparian corridors and wildlife habitat areas. The ranks are then combined to create a single relative resource rank of low, medium, or high. The inventory also identifies special habitat areas which incorporate and refine the regional Habitats of Concern identified in Metro's adopted Title 13 inventory of regionally significant riparian corridors and wildlife habitat. Special Habitat Areas include rare or declining habitat types, or features or habitats that are vital to plant and animal species at risk, and migrating species such as neotropical birds and elk.

The Natural Resources Inventory is not a regulatory designation in most areas, at this time. The City does, however, have an obligation under Periodic Review to consider information about environmentally sensitive lands for planning purposes, and an obligation under Metro Title 13 to consider regulation of some portion of this land area. For purposes of this land supply analysis, an assumption is being made that the City will regulate these areas in the future in a manner similar to the existing environmental overlay zoning program. For purposes of this land supply analysis, the assumption is that existing policies and regulatory mandates mean that the City must continue to refine the environmental zoning program in coming years using the Natural Resources Inventory maps. Making that assumption at this time enables analysis of the implications of that policy scenario (essentially, projecting forward the City's existing policy direction). These assumptions are made for modeling purposes only, and are not intended to suggest a specific regulatory proposal. Other scenarios may also be examined as the Portland Plan progresses. The specific mapping methodology is described in the **Natural Resources Inventory Background Report**.

Low Ranked Resource Areas: For purposes of this model, we assume none of these areas would be strictly limited, e.g., Environmental "p" protection overlay zone. In some areas, development could potentially be limited. This would not affect housing density given existing policies that allow development to cluster, take advantage of reduced lot size and setbacks, or transfer development rights. This layer has no capacity reduction because, if past regulatory practices continued, this layer is not expected to become the basis of new limitations on housing development.

Medium Ranked Resource Areas: For purposes of this model, we assume some of these areas could be strictly limited, e.g., Environmental "p" protection overlay zone and some moderately limited, e.g., Environmental "c" conservation overlay zone. Many of these resource areas coincide with Metro Title 13 Habitat Conservation Areas which local jurisdictions must protect, conserve and restore through their regulatory and/or non-regulatory programs. These areas contribute significantly to multiple riparian corridor and/or wildlife habitat functions, and are important to the overall condition of Portland's watersheds. From a policy perspective, and based on recent City Council action on the River Plan/North Reach, it is expected that the City would consider action needed to avoid, minimize and mitigate adverse impacts on the values and functions provided by these resource areas. If the City were to apply environmental overlay zones or other tools to protect the Medium-ranked resources, consistent with past practice, it is likely that development would continue to be allowed, but would be subject to additional standards or review. In general, the existing City regulatory approaches allow housing development to cluster on the least sensitive portions of a site, which allows the same number of dwelling units to be built. That said, the additional review, permit, or mitigation requirements could add expense or time to development. As a result, this layer is assumed to have a "Low" impact level in residential zones.

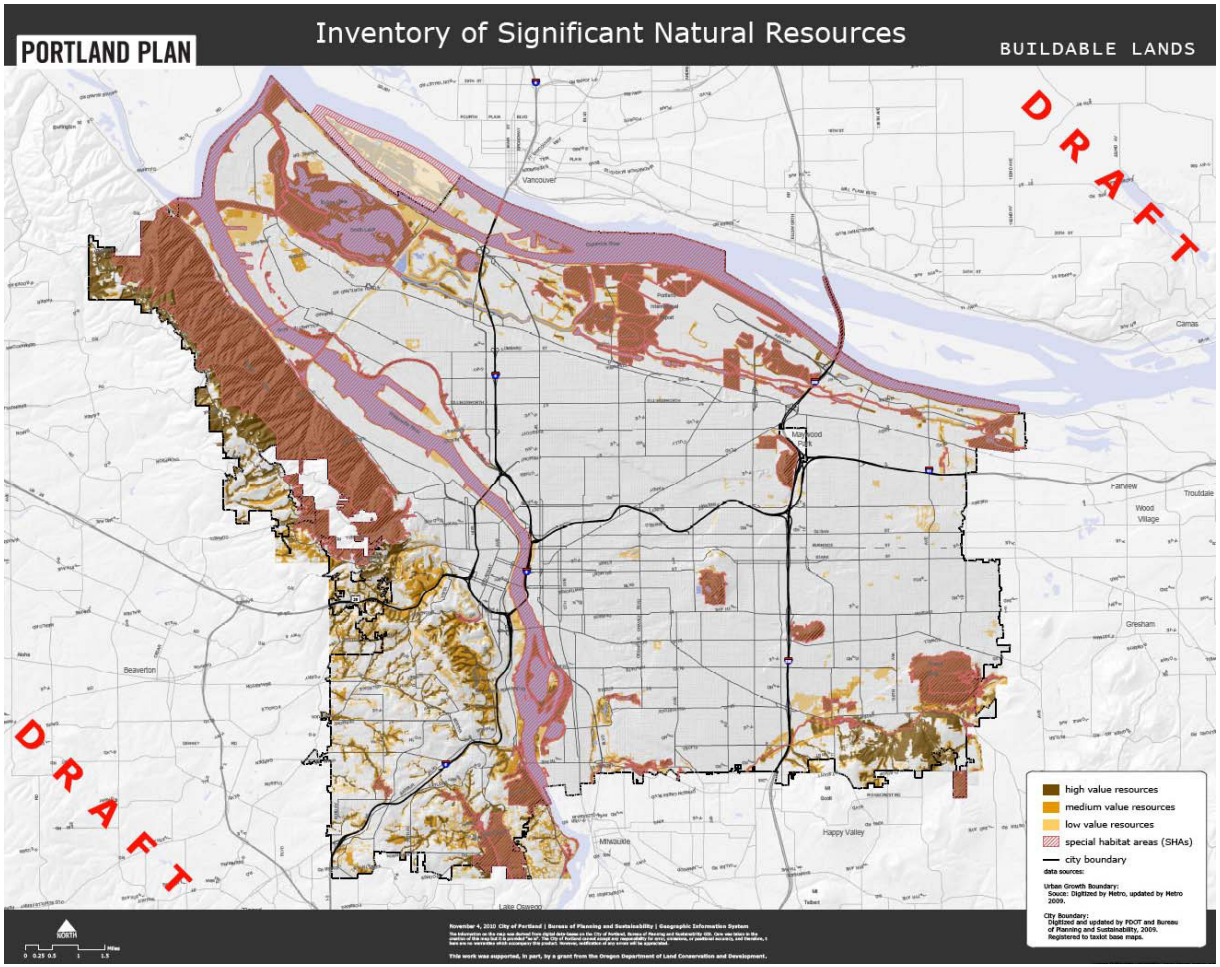
High Ranked Resource Areas: For purposes of this model, we assume some of these areas could be strictly limited (e.g., Environmental "p" protection overlay zone), and some could be moderately limited (e.g., Environmental "c" conservation overlay zone). These areas represent the highest functioning riparian corridors and wildlife habitat areas in the City. The include rivers, streams, wetlands, and vegetated flood areas, as well as forested riparian vegetation, often within 50 – 100 feet from a water body or on steep slopes. Most of these resource areas coincide with Metro Title 13 Habitat Conservation Areas which local jurisdictions must protect, conserve and restore through their regulatory and/or non-regulatory programs. Many of these resource areas are within existing City environmental zones, however considerable areas are not. These areas contribute significantly to a broad array of riparian corridor and/or wildlife habitat functions, and are critical to the overall condition of Portland's watersheds. From a policy perspective, and based on recent City Council action on the River Plan/North Reach, it is likely the City will consider taking action if needed to avoid, minimize or mitigate adverse impacts on the values and functions provided by these resource areas. If the City were to apply environmental overlay zones or other tool to protect the High-ranked resources, consistent with past practice, development might be strictly limited or prohibited in these areas, particularly areas adjacent to streams and wetlands. In other areas it is likely the City would moderately limit development to protect resource values and functions. However, given the flexibility provided by the City's existing development standards, and opportunities for innovative housing project design (cluster development, PUDs), this layer is assumed to have a "Medium" impact level in residential zones.

Special Habitat Areas: For purposes of this model, we assume if past practice were continued, no Special Habitat Areas would be strictly limited, e.g., Environmental "p" overlay zone. Some areas could potentially be moderately limited.

These areas are important for watershed health and biodiversity. Many SHAs coincide High-ranked resource areas in the City Natural Resource Inventory, and with Habitats of Concern identified in Metro's inventory of significant riparian corridors and wildlife habitat. They also correspond with Title 13 Habitat Conservation Areas that local jurisdictions are required to protect, conserve, and restore through their regulatory and non-regulatory programs.

If, consistent with past practice, the City were to apply environmental overlay zones or other tools to protect Special Habitat Areas, it is likely that the City would strictly limit some areas, particularly those located within or adjacent to streams and wetlands, and would moderately limit development in other areas. However, given the flexibility provided by the City's existing development standards, and opportunities for innovative housing project design, it is expected that this layer (taken by itself) would be associated with a 0% housing capacity reduction.

Appendix A – Constraint Maps and Model Assumptions



I Scenic Areas

I1 Views
I2 Sites
I3 Corridors

Definitions: Scenic View Points and Corridors data was developed by Bureau of Planning (July 2000) from Scenic Resources Protection Plan adopted by council Mar. 13, 1991. Plan includes new resources and previously identified resources from the Willamette Greenway Plan, Central City Plan, and Terwilliger Plan. Scenic Views, Sites, and Corridors: ESEE Analysis Recommendations (Oct. 1990) was used as the primary reference document for locating the sites. Additional sites and corridors added with the adoption of the South Waterfront Plan (2002).

Scenic Views: The 1991 Scenic Resources Protection Plan identified important scenic view corridors with height restrictions and scenic viewpoints with no special height restrictions. Individual sites are mapped in the Plan identifying any relevant height restrictions. In the Central City height restrictions associated with Scenic Views have been incorporated into the Plan District Height Limits.

Scenic Sites were included citywide in the 1991 Scenic Resources Protection Plan. No regulatory or physical capacity-reducing regulations are associated with Scenic Sites.

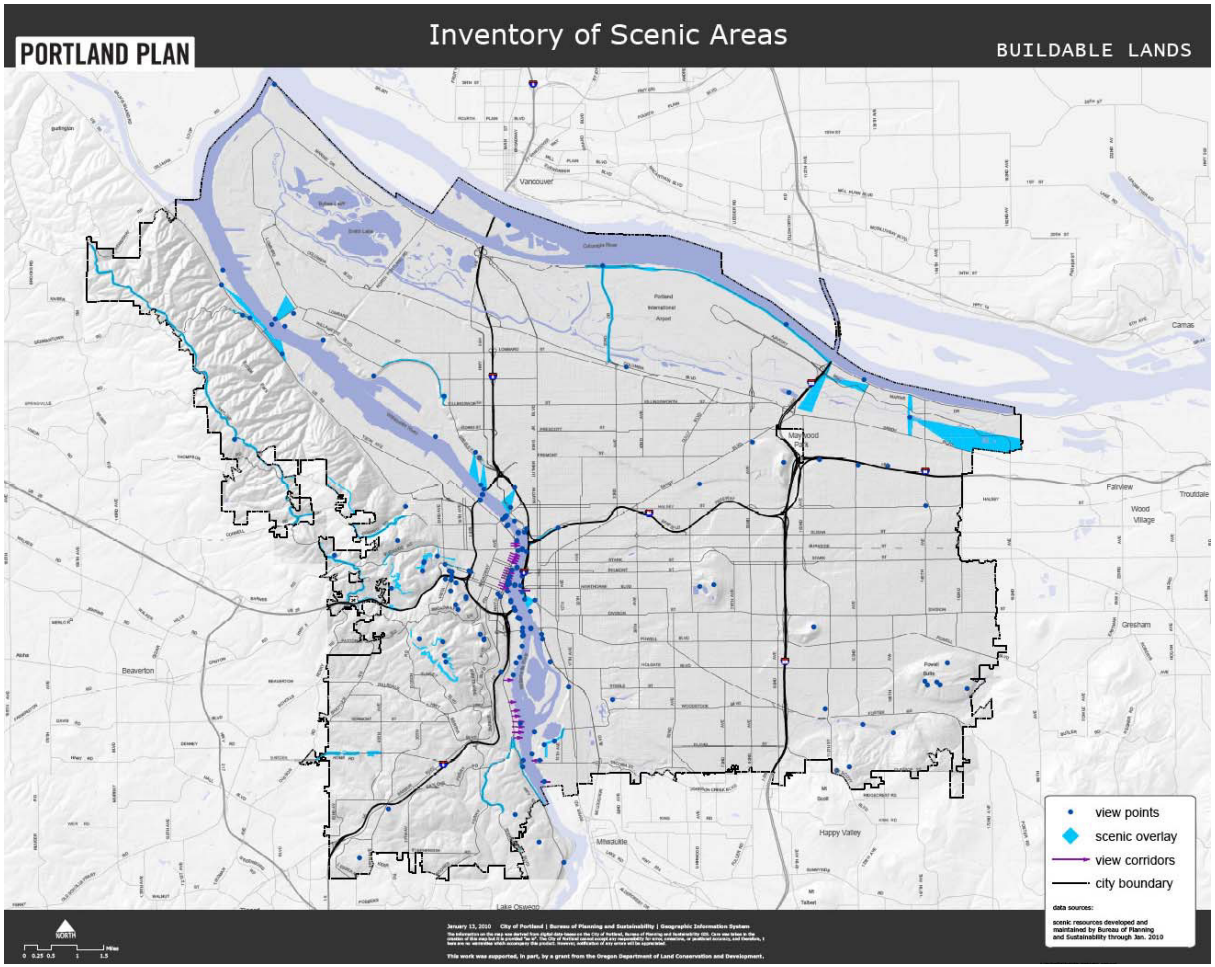
Scenic Corridors: The 1991 Scenic Resources Protection Plan identified two linear scenic corridors throughout the city. Development within or adjacent to the Scenic Corridors must meet the additional landscaping and setback regulations of Chapter 33.480. Development is allowed but limitations on building length, tree removal, signage and mechanical equipment are imposed, and additional landscaping standards apply.

Methodology:

Scenic Views: This layer reflects a regulatory constraint that reduces the allowed height on various properties outside the central city that fall within a mapped view corridor with a height restriction in the Scenic Resources Protection Plan. These view corridors with height restrictions occur in the vicinity of the St. John's Bridge, the Linnton Neighborhood, above the Albina Rail Yards and in the Columbia South Shore Area. This layer has a low capacity reduction because most development will be allowed; only development above the mapped height limit would be restricted.

Scenic Sites: This layer is not associated with any physical or regulatory constraints that would make a portion of the site unavailable for development. As a result, this layer is not assumed to have any capacity reduction.

Scenic Corridors: These areas are subject to additional development standards, but the standards are design-related and do not reduce the achievable level of housing. As a result, this layer is not assumed to have any capacity reduction.

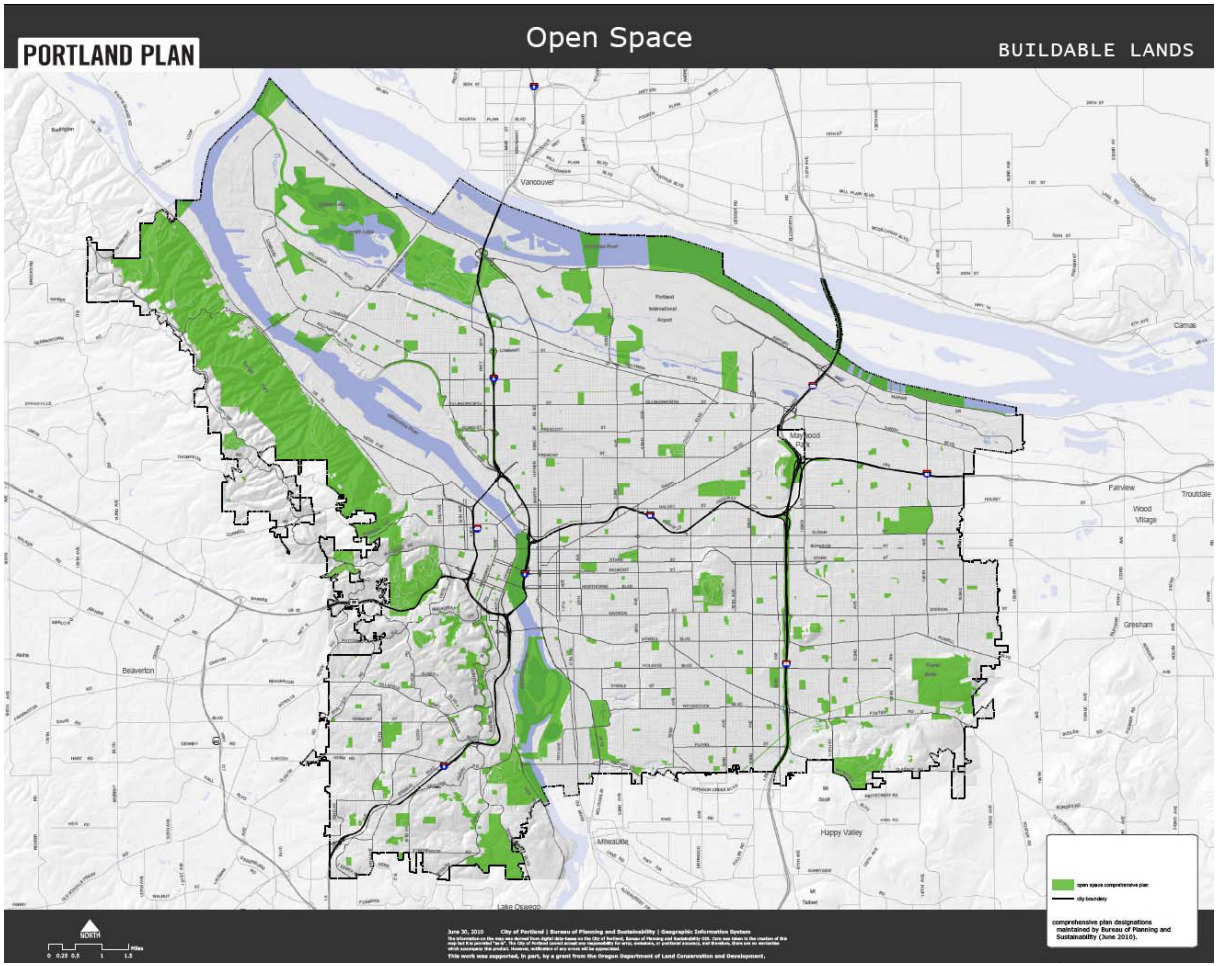

PORTLAND PLAN
Inventory of Scenic Areas
BUILDABLE LANDS
Vancouver
Portland International Airport
Camas
Fairview
Troutdale
Wood Village
Gresham
Beaverton
Aloha
Happy Valley
Milwaukie
Lake Oswego
view points
scenic overlay
view corridors
city boundary
data sources:
scenic resources developed and maintained by Bureau of Planning and Sustainability through Jan. 2010
NORTH
0 0.25 0.5 1 1.5 Miles
January 13, 2010 City of Portland | Bureau of Planning and Sustainability | Geographic Information System
This work was supported, in part, by a grant from the Oregon Department of Land Conservation and Development.

J Open space

J1 OS comp plan map designation

Definition: The Open Space zone is intended to preserve and enhance public and private open, natural, and improved park and recreational areas identified in the Comprehensive Plan. (Chapter 33.100). Comprehensive Plan Designations were digitized from bureau zoning maps by Roy F. Weston, Inc. for Portland Planning Bureau. The data is Registered to taxlots. It was updated through June 2010.

Methodology: This layer reflects a regulatory capacity reduction because it removes land from the available supply. This layer has a full capacity reduction because housing is prohibited in the Open Space Zone.


PORTLAND PLAN
Open Space
BUILDABLE LANDS
Vancouver
Portland International Airport
Camas
Maywood Park
Fairview
Troutdale
Wood Village
Gresham
Beaverton
Hillsboro
Happy Valley
Lake Oswego
NORTH
0 0.25 0.5 1 1.5 Miles
June 30, 2010 City of Portland | Bureau of Planning and Sustainability | Geographic Information System
This work was supported, in part, by a grant from the Oregon Department of Land Conservation and Development.
open space comprehensive plan
city boundary
comprehensive plan designations maintained by Bureau of Planning and Sustainability (June 2010).

J Open Space

J2 Lots open space tax assessment

Definition: Specially Assessed Value is a value established by statute. The state legislature has established several programs that create value levels below market value for certain types of property. Each program has specific applications and use requirements. Examples of types of property that may qualify for special assessment are farm land, forest land, historic property, and property which qualify as "open space". There are different types of deferral programs, and all have monetary penalties for taking land out of deferral. The Open Space deferral is by application only and its Exemption Code is ZB = Open Space Deferral. (Source: Multnomah County)

Methodology: This layer reflects a regulatory constraint that could make a portion of the site unavailable for development. This layer has a full capacity reduction because housing development would disqualify individual properties from receiving the Open Space Tax Assessment.

J Open Space

J3 Lots with riparian tax assessment

Definition: "Designated riparian land" means the beds of streams, the adjacent vegetation communities, and the land thereunder, which are predominantly influenced by their association with water, not to extend more than 100 feet landward of the line of nonaquatic vegetation, which are privately owned and which qualify for exemption under ORS 308A.350 to 308A.383. An owner of land defined as "designated riparian land" may request exemption of that land from ad valorem taxation as riparian land under ORS 308A.350 to 308A.383. (ORS 308A.350 (3)) There are different types of deferral programs, and all have monetary penalties for taking land out of deferral. The Open Space deferral is by application only and its code RP = Riparian Deferral. (Source: Multnomah County)

Methodology: There are no designated riparian lands that are under tax exemption within the City of Portland.

J Open Space

J4 Lots with farm tax assessment

Definition: Specially Assessed Value is a value established by statute. The state legislature has established several programs that create value levels below market value for certain types of property. Each program has specific applications and use requirements. Examples of types of property that may qualify for special assessment are farm land, forest land, historic property, and property which qualify as "open space". There are different types of deferral programs, and all have monetary penalties for taking land out of deferral. For lots with houses it is usual to remove some amount of property that surrounds the home from the deferral. This is called a homestead exclusion. If allowed by the zoning code these homestead sites could redevelop. Homesteads can be identified by the following codes: NQ, NA, NB, QH. Deferrals are automatic in the Exclusive Farm Use zones. Other deferrals are by application, such as a farm exemption in non-EFU zones. The farm exemption codes are: EFU = Farm Deferral, NON EFU = Farm Deferral by Application (Source: Multnomah County)

Methodology: This layer reflects market constraints that add expense to development because redevelopment of properties receiving the tax assessment would be required to pay retroactive taxes if the land was developed for other than farm uses. This layer has a full capacity reduction because it removes otherwise re-developable land from the supply.

J Open space

J5 Lots with forest tax assessment

Definition: Specially Assessed Value is a value established by statute. The state legislature has established several programs that create value levels below market value for certain types of property. Each program has specific applications and use requirements. Examples of types of property that may qualify for special assessment are farm land, forest land, historic property, and property which qualify as "open space". Under this program, land is assessed at a special rate based upon the typical price paid for land managed for the production of harvestable timber. This value is often less than the real market value used for taxing other properties. There are different types of deferral programs, and all have monetary penalties for taking land out of deferral. The Open Space deferral is by application only and its Exemption Codes are: ZN or ZNA = Forest Deferral, CLS of CLASS = Small Tract Forest Deferral (Source: Multnomah County).

Methodology: This layer reflects market constraints that add expense to development because redevelopment of properties receiving the tax assessment would be required to pay retroactive taxes if the land was developed for other than forest uses. This layer has a full capacity reduction because it removes otherwise re-developable land from the supply.

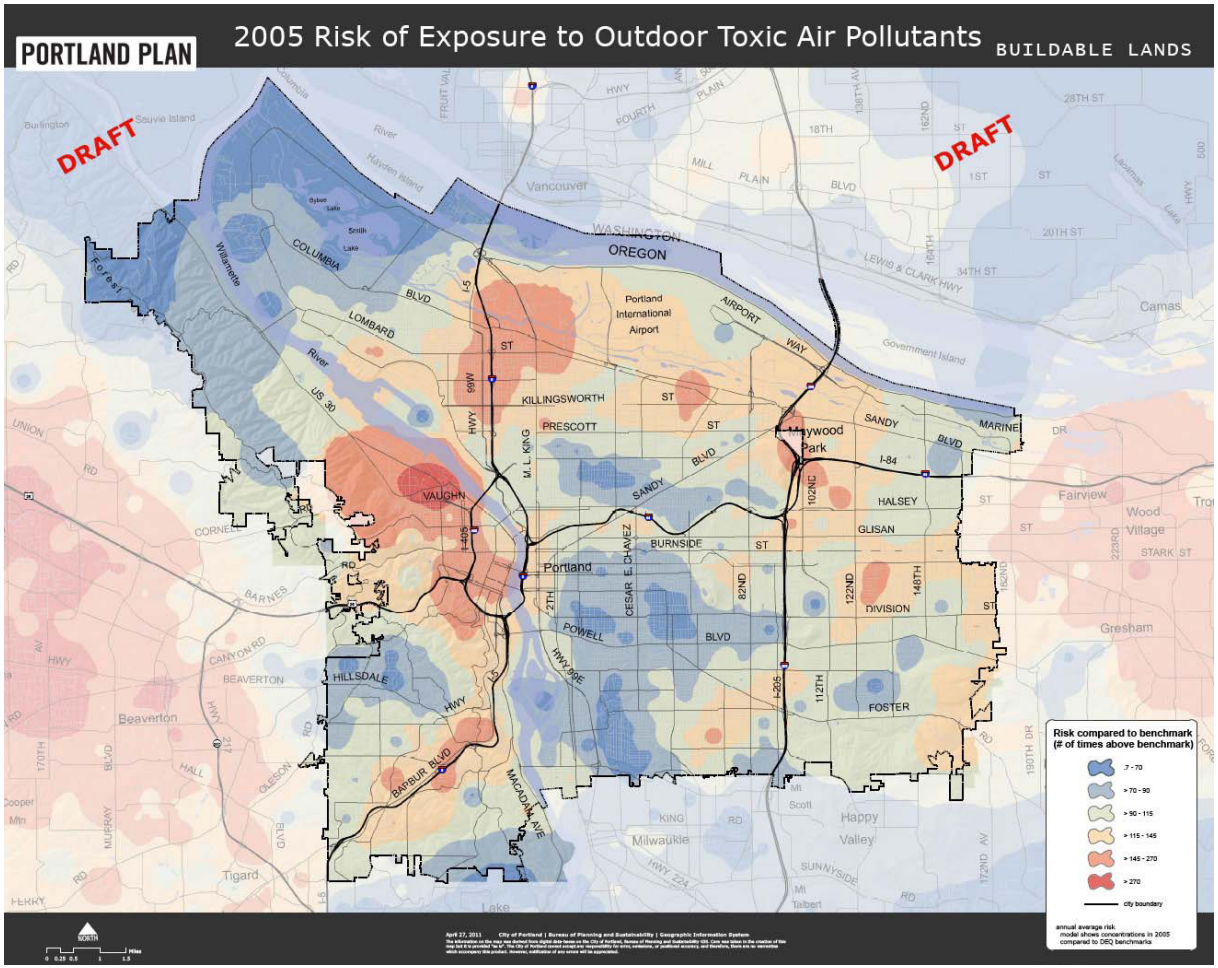
K Air Quality

K1 Risk of Exposure to Outdoor Toxic Air Pollutants

Definition: Outdoor Toxic Risks mapping is the product of a model compiled by DEQ from a variety of data sources. Data includes an array of toxics from both point source and areas external to the region. All data is summed by census tract and compared to the DEQ benchmarks. Data points were then modeled as a surface using an Inverse Distant Weighting methodology.

Methodology: This layer is not associated with any physical, market, or regulatory constraints that would make a portion of the site unavailable for development. As a result, this layer is not assumed to have any capacity reduction.

Appendix A – Constraint Maps and Model Assumptions



L Environmental Overlay Zones

L1 Environmental Conservation Overlay Zones
L2 Environmental Protection Overlay Zones

Definitions:
Environmental zones protect resources and functional values that have been identified by the City as providing benefits to the public. The environmental regulations encourage flexibility and innovation in site planning and provide for development that is carefully designed to be sensitive to the site's protected resources. These regulations also help meet other City goals, along with other regional, state, and federal goals and regulations. The environmental regulations also carry out Comprehensive Plan policies and objectives.

The Environmental Conservation zone conserves important resources and functional values in areas where the resources and functional values can be protected while allowing environmentally sensitive urban development (Chapter 33.430.017).

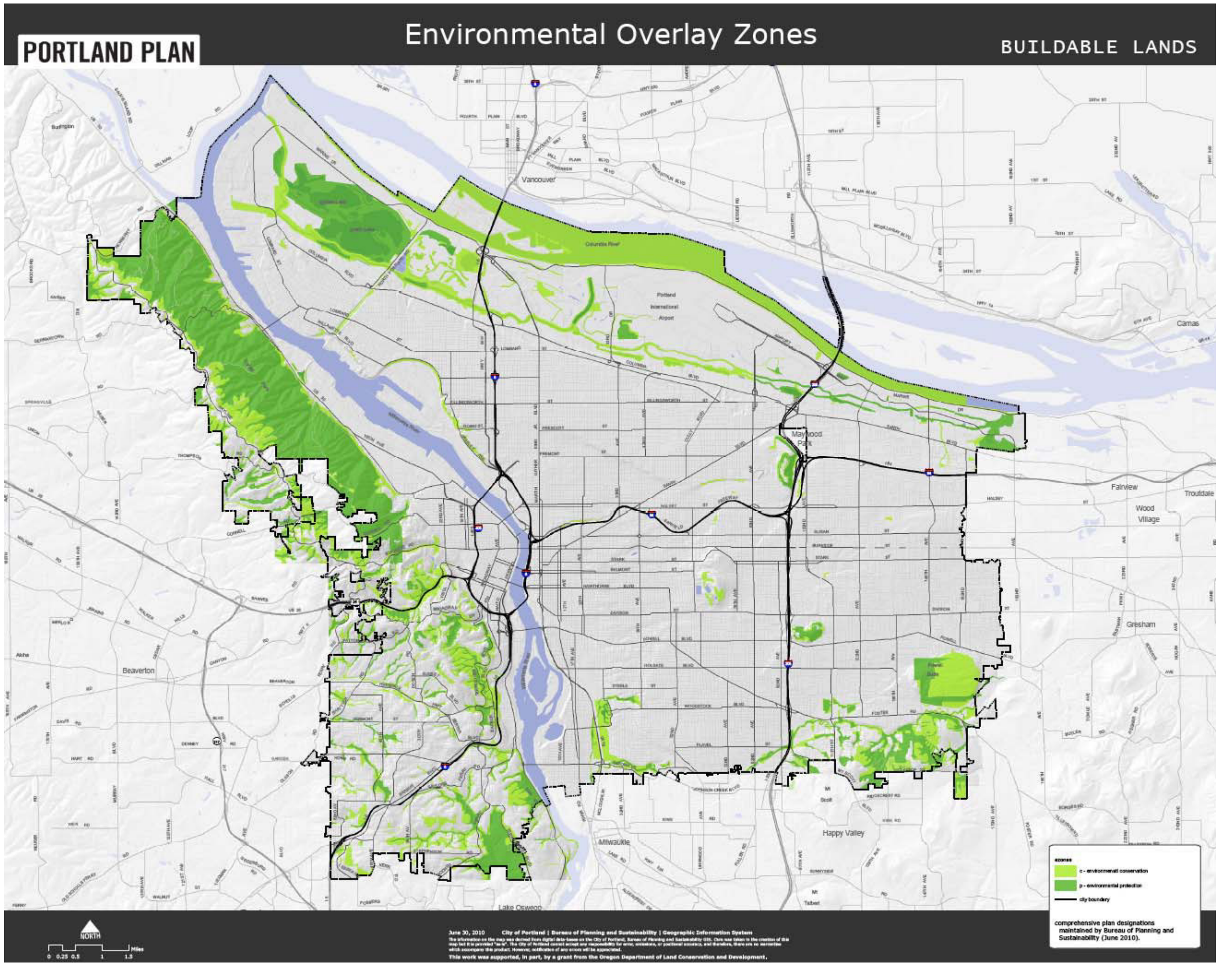
The Environmental Protection zone provides the highest level of protection to the most important resources and functional values. These resources and functional values are identified and assigned value in the inventory and economic, social, environmental, and energy (ESEE) analysis for each specific study area. Development will be approved in the environmental protection zone only in rare and unusual circumstances (Chapter 33.430.015).

Zoning data was digitized from bureau zoning maps by Roy F. Weston, Inc. for Portland Planning Bureau. Registered to taxlots. This data is updated by Bureau of Planning and Sustainability as needed.

Methodology:

The Environmental Conservation Zone: This layer reflects regulatory and market constraints that could make a portion of the site unavailable for development. This layer may add expense or time to development because proposed development in the resource area of the conservation zone is subject to special permits or reviews, potential conditions of approval, and mitigation for unavoidable adverse impacts on natural resources. This layer has no residential capacity reduction because the regulations provide flexibility to achieve density goals through allowed disturbance areas, clustering, reducing lot sizes, and modifying setbacks. Mitigation is allowed to compensate for unavoidable adverse impacts and is not typically costly relative to overall project costs.

The Environmental Protection Zone: This layer reflects regulatory constraints that make a portion of the site unavailable for development because most uses and development types are not allowed within the environmental protection overlay zones. The City may approve development in the protection overlay zone if needed for required access across a property, or if anticipated public benefit would outweigh the adverse impacts on natural resource values and functions. Accordingly, this layer has a full capacity reduction because housing would not typically be allowed within the environmental protection overlay zone.


PORTLAND PLAN
Environmental Overlay Zones
BUILDABLE LANDS
Vancouver
Portland International Airport
Maywood Park
Fairview
Wood Village
Troutdale
Gresham
Camas
Beaverton
Milwaukie
Happy Valley
Lake Oswego
NORTH
Miles
c - environmental conservation
p - environmental protection
city boundary
comprehensive plan designations maintained by Bureau of Planning and Sustainability (June 2010).
June 30, 2010 City of Portland | Bureau of Planning and Sustainability | Geographic Information System
This work was supported, in part, by a grant from the Oregon Department of Land Conservation and Development.

M Significant Cultural Resources

M1 Historic and Conservation Districts
M2 Historic and Conservation Landmarks

Definitions:

A Historic Resource is a structure or object that has historic significance. Historic Districts and Landmarks data is mapped and maintained by Bureau of Planning and Sustainability as part of the zoning data. It is updated as needed. Historic Resources include:

- Historic Landmarks, including those that are listed in the National Register of Historic Places;
- Conservation Landmarks;
- Conservation Districts;
- Historic Districts, including those listed in the National Register of Historic Places;
- Structures or objects that are identified as contributing to the historic significance of a Historic District or a Conservation District; and
- Structures or objects that are included in the Historic Resources Inventory. (Chapter 33.910)

Historic and Conservation Districts are geographic areas where the City, the State of Oregon, and/or the Federal Government has determined there are a collection of buildings or other structures with historic significance. The City of Portland has twelve historic districts, and six conservation districts. Historic districts are collection of individual resources that are of historical or cultural significance at the local, state, or national level. Information supporting a specific historic district's designation is found in the City's Historic Resources Inventory, it's National Register nomination, or the local evaluation done in support of the district's

designation. Conservation districts are a collection of individual resources of historical or cultural significance at the local or neighborhood level. Information supporting a specific conservation district's designation is found in the City's Historic Resource Inventory or the local evaluation done in support of the district's designation.

Historic landmarks may be an individual structure, site, tree, landscape, or other object that is of historic or cultural significance. Historic Landmarks are indicated by a round 'dot' on the official zoning maps, and information supporting a specific resource designation is found in the City's Historic Resource Inventory, its National Register nomination, or the local evaluation done in support of the district's designation. Conservation landmarks may be an individual structure, site, tree, landscape, or other object that is of historical or cultural interest at the local or neighborhood level. Conservation landmarks are examples of developments that have helped create the character of the region's districts and neighborhoods. Information supporting a specific resource's designation is found in the City's Historic Resources Inventory or the local evaluation done in support of the resource's designation. Note that individual properties listed on the City's Historic Resources Inventory (HRI) are not included in this layer, since HRI properties face few regulatory burdens, and Oregon State Law allows a property owner to remove any individual property from the HRI and associated regulatory impacts with a letter to the City.

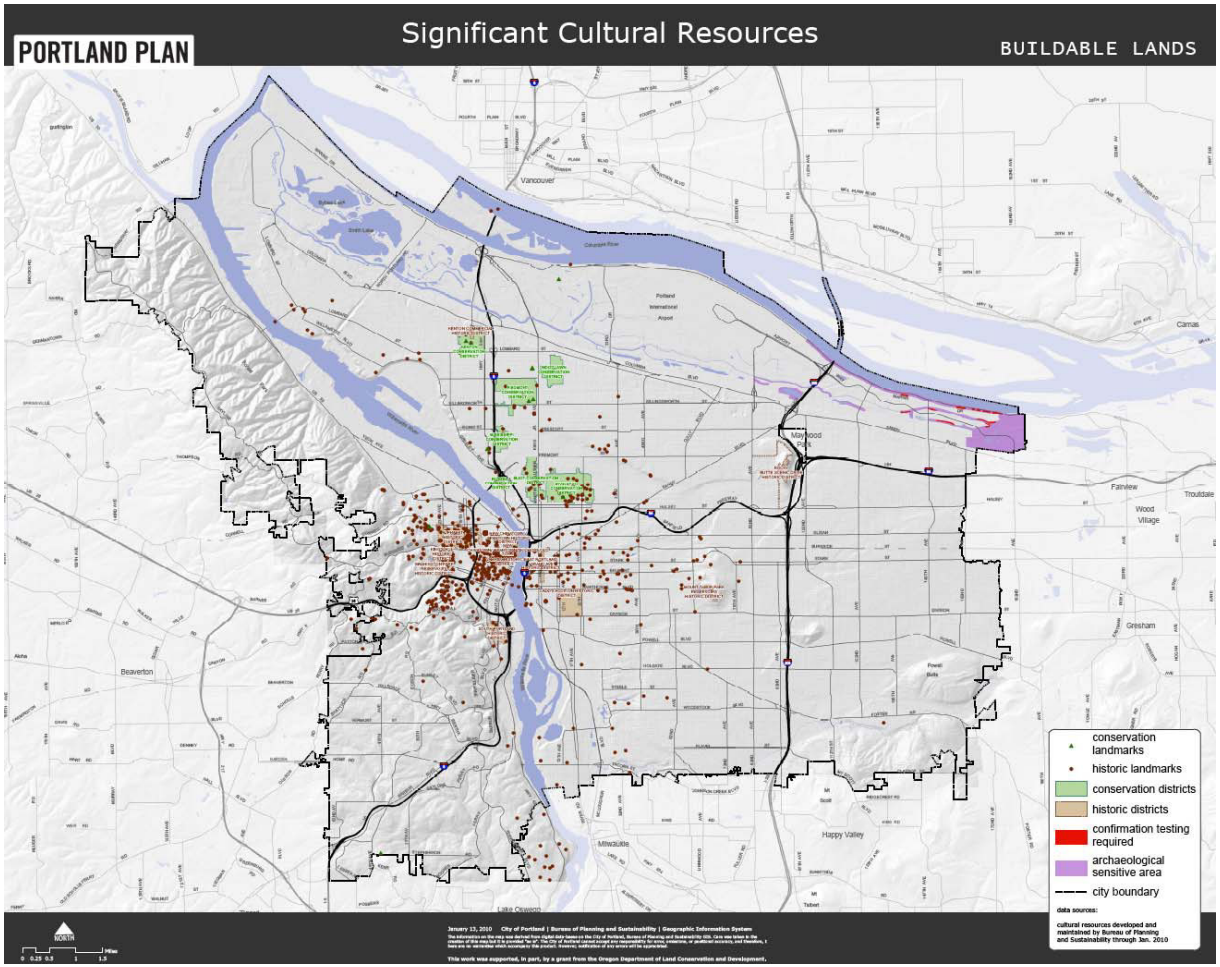
Methodology:

Historic and Conservation Districts: Historic and conservation districts may make a portion of the zoned development capacity of a site unavailable by regulatory tools that may limit significant density increases, use changes, or intensification of existing uses. With historic districts, federal and/or state law may prohibit local governments from altering these districts. A historic or conservation district designation involves additional regulatory considerations about building size, scale, materials, and other issues that may make development

more difficult or expensive than elsewhere, in order to retain the district's character. Specifically, both historic and conservation districts must meet additional historic design-related reviews and regulations, depending on the individual district or resource in question. Market impacts associated with these regulatory issues may add expense, time, or difficulty to a project versus other locations, with a modest reduction in likely development potential. For both housing and employment capacity, this layer is considered to have a low capacity reduction, since redevelopment occurs and is possible in historic and conservation districts, but not typically at the same scale or intensity as nearby properties outside the district.

Historic and Conservation Landmarks: This layer imposes physical or regulatory constraints that may make these sites more difficult to redevelop, or otherwise limit the potential for increased density. Significant additions or changes in use may be difficult to achieve given additional regulatory considerations about building size, scale, materials, and other issues that may make development more difficult or expensive than elsewhere, in order to maintain the landmark's character. Specifically, both historic and conservation landmarks must meet additional historic design-related reviews and regulations, depending on the individual landmark in question. Market impacts associated with these regulatory issues may add expense, time, or difficulty to a project versus other locations, with a reduction in likely development potential. For both housing and employment capacity, this layer is considered to have a medium capacity reduction, since alterations to landmarks do occur, but rarely at the same scale or intensity as nearby properties without historic or conservation landmark status.

Appendix A – Constraint Maps and Model Assumptions



M Significant Cultural Resources

M3 Areas requiring archaeological scan or consultation with Native American tribal Governments

Definition: Historical and archaeological evidence has confirmed that Native Americans peoples were present in significant numbers prior to entry of Euro-Americans to the Portland area. Archaeological resources have historic, cultural, and scientific value to the general public and heritage value to associated tribes, whose ancestors lived in the area and harvested local natural resources for subsistence and spiritual/ceremonial uses. Of special concern is the potential for ground disturbance activities to uncover human remains and archaeological resources that may be eligible for listing on the National Register of Historic Places. The Portland Zoning Code maps Archaeological Sensitivity Areas and specifies testing and construction protocols where confirmation testing has not yet been completed. (Chapter 33.515.262). Areas of Archaeological Interest data was developed by Bureau of Planning (2002).

Methodology: This layer reflects regulatory constraints that make a portion of the site unavailable for development. Archaeological resources (if found) reduce development potential for the lot and make development more expensive due to archaeological analysis. This layer has no residential capacity reduction because the Archaeological Sensitivity Areas are only found in one specific Plan District, and all occur within employment or industrial lands.

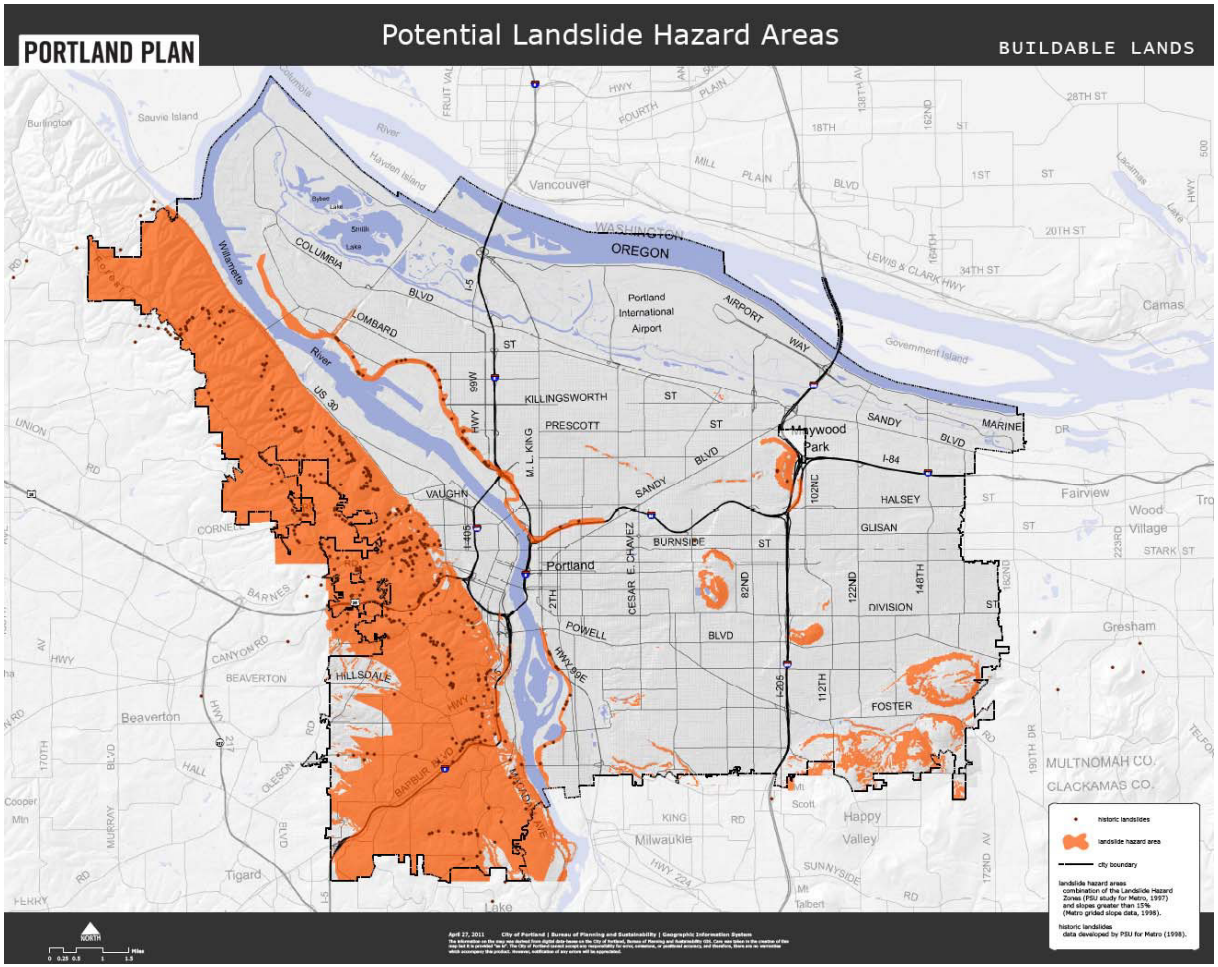
N Hazards

N1 City of Portland Potential Landslide Hazard Areas (includes historic landslide point data)

Definition: The potential landslide hazard areas map maintained by the City is used as a broad filter to flag development applications, land divisions, and other city reviews for consideration of soil stability and other geotechnical concerns. Two data sources were used to create the map, including a Landslide Hazard Zones map resulting from a PSU landslide study completed for Metro in 1997, and 1998 gridded slope data showing areas with slopes greater than 15% provided by Metro. The intention of this map is to indicate areas in need of further investigation by geotechnical experts during the development review process, as opposed to indicating the exact boundaries of hazardous areas on any specific site. The historic landslide point data was developed by PSU for Metro in 1998. Not updated.

Methodology: This layer reflects a regulatory constraint that adds expense or time to development. Development within this layer may be subject to more detailed geotechnical or engineering analysis. This layer was not assigned any capacity reduction, by itself. The layer is highly correlated with slopes, and other hazard layers. The potential added permitting complexity is already captured by the low constraint assigned to Layer N2 (Slopes over 25%).

Appendix A – Constraint Maps and Model Assumptions



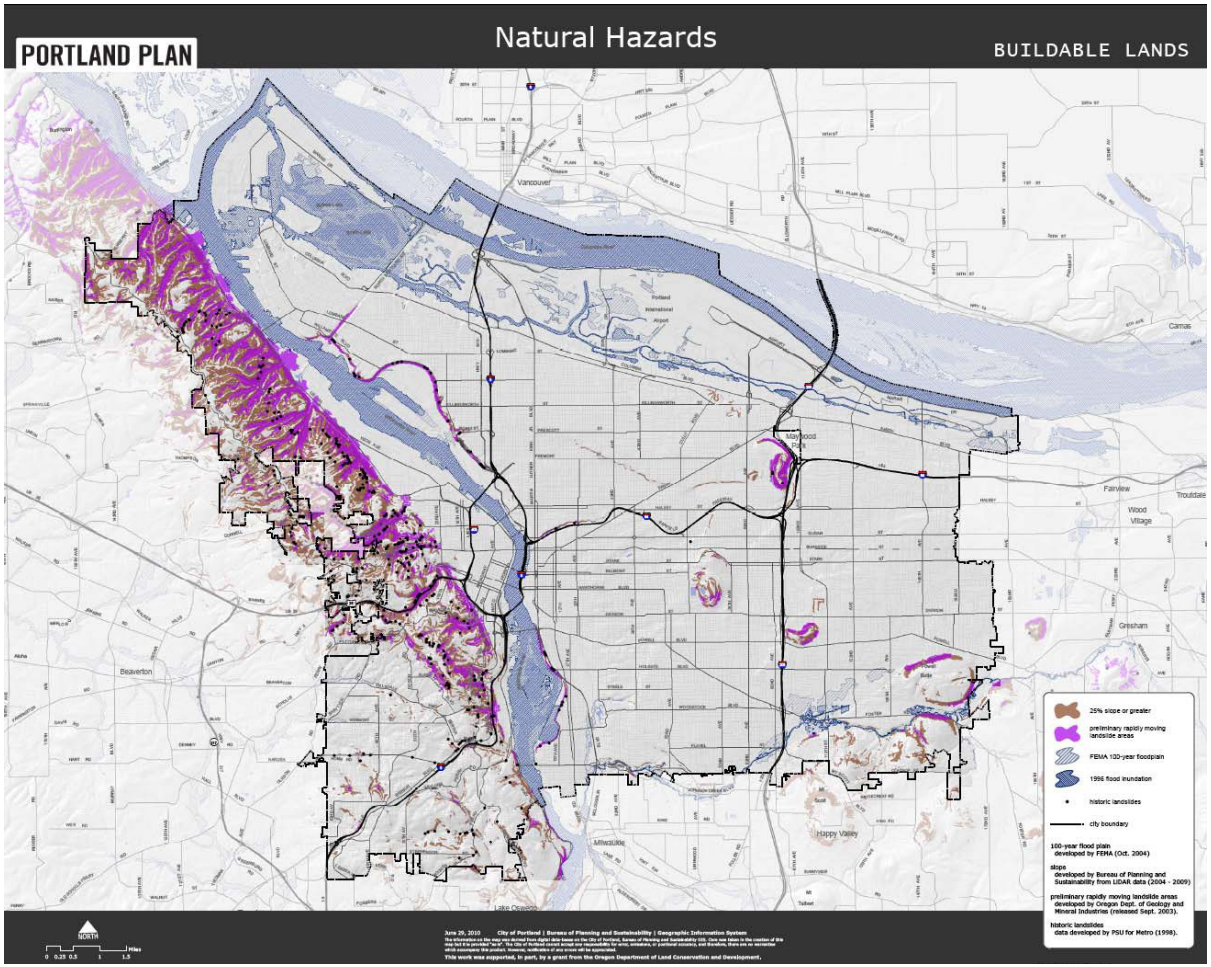
N Hazards

N2 All slopes over 25%.

Definition: Slopes greater than 25%. Slopes data developed by Bureau of Planning and Sustainability using LiDAR-based methodology (2004 – 2009).

Methodology: This layer reflects a physical, market and regulatory constraint that adds expense or time to development because additional structural design and associated construction add expense to secure structures on steep slopes. This layer has a low capacity reduction because development is still permitted at the same density, but some capacity may be lost due to market avoidance.

Appendix A – Constraint Maps and Model Assumptions



N Hazards

N3 Oregon Department of Geology and Mineral Industries Statewide Digital Landslide Database (SLIDO)

Definition: The Statewide Landslide Information Database of Oregon (SLIDO) was created to improve understanding of the landslide hazard in Oregon and to create a statewide base level of landslide data. SLIDO data was developed by DOGAMI in June 2008. The resulting database includes more than 15,000 landslide and landslide-related features (polygons) extracted from 257 published and non-published studies. This provides a base level of landslide information statewide, and differentiates areas of higher and lower hazards. This spatial information is basic to emergency and land use applications; some common uses are to:

- Identify vulnerable areas that may require planning considerations
- Estimate potential losses from specific hazard events (before or after a disaster hits)
- Decide how to allocate resources for most effective and efficient response and recovery
- Prioritize mitigation measures that need to be implemented to reduce future losses

The database is available online from the Oregon Department of Geology and Mineral Industries: http://www.oregongeology.org/sub/slido/index.htm

Methodology: This layer reflects physical constraints that may make a portion of the site unavailable for development. This layer has a low capacity reduction because landslide hazard areas are relatively small in area, hazards can be mitigated, and the majority of these areas in Portland are already developed.

N Hazards

N4 Oregon Department of Geology and Mineral Industries Rapidly Moving Landslide Hazard Zones (IMS-22)

Definition: The potential rapidly moving landslide hazard zones shown apply specifically and only to debris flow hazards. Debris flows are mixtures of water, soil, rock, and/or debris that have become a slurry and commonly move rapidly downslope. (Source: Oregon Department of Geology and Mineral Industries). This layer included with Map N2. Maps also available from DOGAMI: http://www.oregongeology.org/sub/publications/IMS/ims.htm

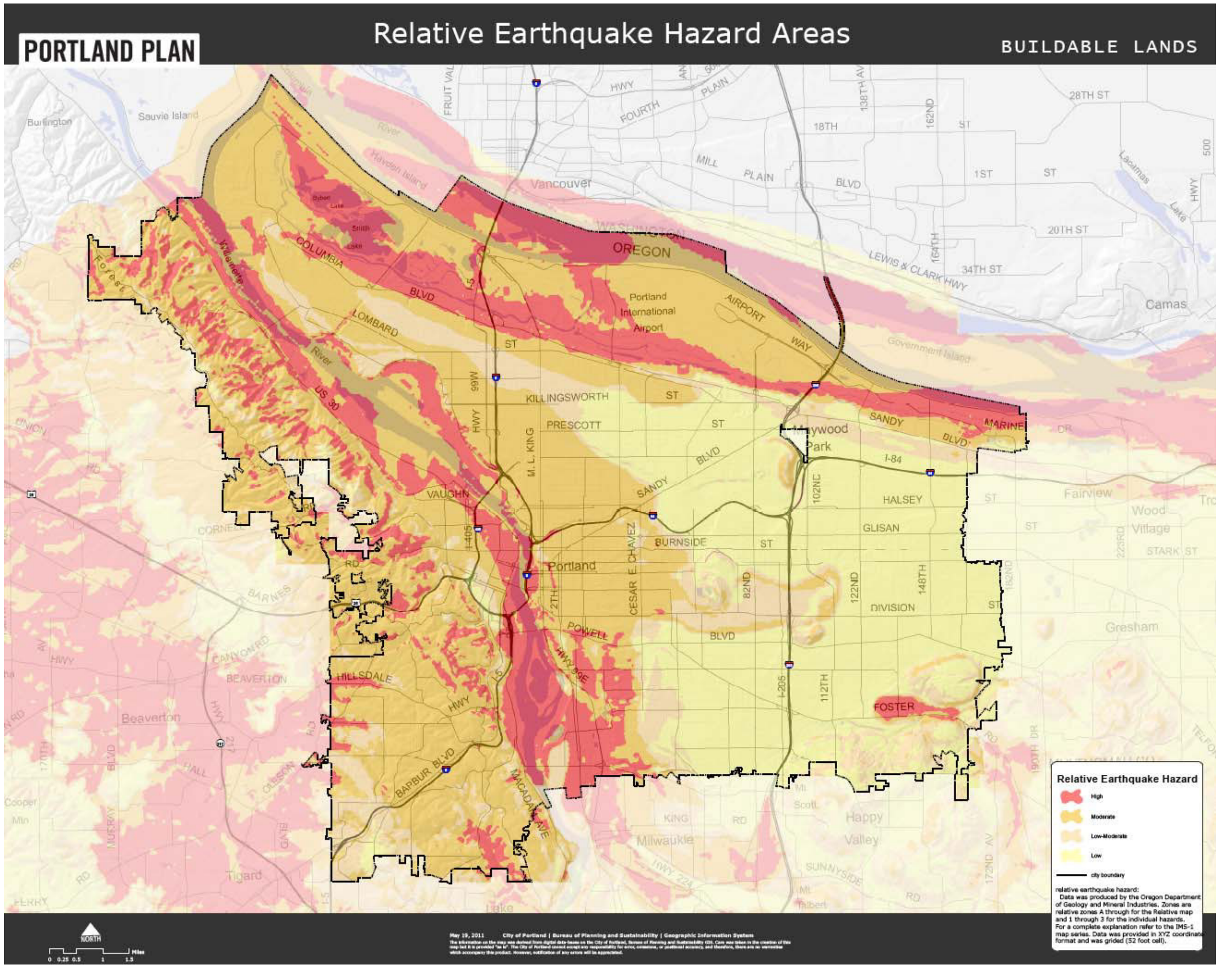
Methodology: This layer reflects physical constraints that make a portion of the site unavailable for development because development may be limited by the landslide potential. This layer has a low capacity reduction because landslide hazard areas are relatively small in area and typically do not cover an entire site, hazards can be mitigated, and the majority of these areas in Portland are already developed.

N Hazards

N5 Oregon Department of Geology and Mineral Industries database IMS-1 (Earthquake Hazards)

Definition: Oregon Interpretive Map Series (IMS). IMS-1 is a relative earthquake hazard map of the Portland metro region, Clackamas, Multnomah, and Washington counties, Oregon (Source: Oregon Department of Geology and Mineral Industries).

Methodology: Earthquake hazard considerations are addressed in Portland through the application of life safety and seismic considerations in residential and commercial building codes. Earthquake safety issues in construction are determined based on site-specific conditions and geologic studies, as opposed to the location of any property within the ranked hazard areas of this map. Therefore, no capacity reduction for either housing or employment has been applied to this layer with regards to physical, market, or infrastructure/service constraints.


PORTLAND PLAN
Relative Earthquake Hazard Areas
BUILDABLE LANDS
OREGON
Portland International Airport
Vancouver
Portland
Gresham
Beaverton
Camas
Milwaukie
KILLINGSWORTH
PRESCOTT
BURNSIDE
HALSEY
GLISAN
DIVISION
FOSTER
POWELL
SANDY
COLUMBIA
LOMBARD
Relative Earthquake Hazard
High
Moderate
Low-Moderate
Low
city boundary

N Hazards

N6 Oregon Department of Geology and Mineral Industries database IMS-16

Definition: Earthquake scenario and probabilistic ground shaking maps for the Portland metropolitan area. Eleven different maps make up the IMS-16 series, analyzing different potential ground shaking impacts associated with different types of earthquakes and on various time scales and different horizontal and spectral accelerations at the ground surface. (Source: Oregon Department of Geology and Mineral Industries). Maps available from DOGAMI: http://www.oregongeology.org/sub/publications/IMS/ims.htm

Methodology: Earthquake hazard considerations are addressed in Portland through the application of life safety and seismic considerations in residential and commercial building codes. Earthquake safety issues in construction are determined based on site-specific conditions and geologic studies, as opposed to the location of any property within the ranked hazard areas of this map. Therefore, no capacity reduction for either housing or employment has been applied to this layer with regards to physical, market, or infrastructure/service constraints.

N Hazards

N7 Federal Emergency Management Agency 100-year flood (flood plain) maps
N8 Federal Emergency Management Agency Floodway maps

Definitions:
FEMA 100-Year Floodplain: The channel of watercourse and adjacent land areas which are subject to inundation by the base flood. The Base Flood (100-year flood) means the flood having 1 percent chance of being equaled or exceeded in any given year. Designation on maps always includes the letters A or V. (Chapter 24.50). This layer is shown on Map N2.

FEMA Floodway: A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations. For streams and other watercourses where FEMA has provided Base Flood Elevations (BFEs), but no floodway has been designated, the community must review floodplain development on a case-by-case basis to ensure that increases in water surface elevations do not occur, or identify the need to adopt a floodway if adequate information is available. This layer is shown on Map N2. (Source: FEMA)

100 Year Flood Plain and Floodway maps developed under contract for FEMA, updated March 2010.

Methodology:

FEMA 100-Year Floodplain: This layer reflects physical, market, and regulatory constraints that may make a portion of the site unavailable for development. Title 24.50.060.F. requires balanced cut and fill. All fill placed at or below the base flood elevation shall be balanced with at least an equal amount of soil material removal. This layer has a medium capacity reduction because regulations may limit the placement of housing due to physical site constraints and/or the cost of meeting balanced cut and fill requirements.

FEMA Floodway: This layer reflects physical and regulatory constraints that make a portion of the site unavailable for development. Under Title 24, encroachments into the floodway by development and structures defined in Section 24.50.020 are prohibited unless it is demonstrated by technical analysis from a registered engineer that the development will result in no increase in the base flood elevation. Technical analysis shall be reviewed and approved by the Sewage System Administrator. However, the minimum width of the floodway shall not be less than 15 feet. This layer has a full capacity reduction because development would not typically be allowed in the floodway.

N Hazards

N9 1996 actual flooded

Definitions: 1996 Flood Inundation Line: US Army Corps of Engineers. Digitized using aerial photos taken during the February 1996 flood. Not registered to taxlot base maps. This layer is shown on Map N2.

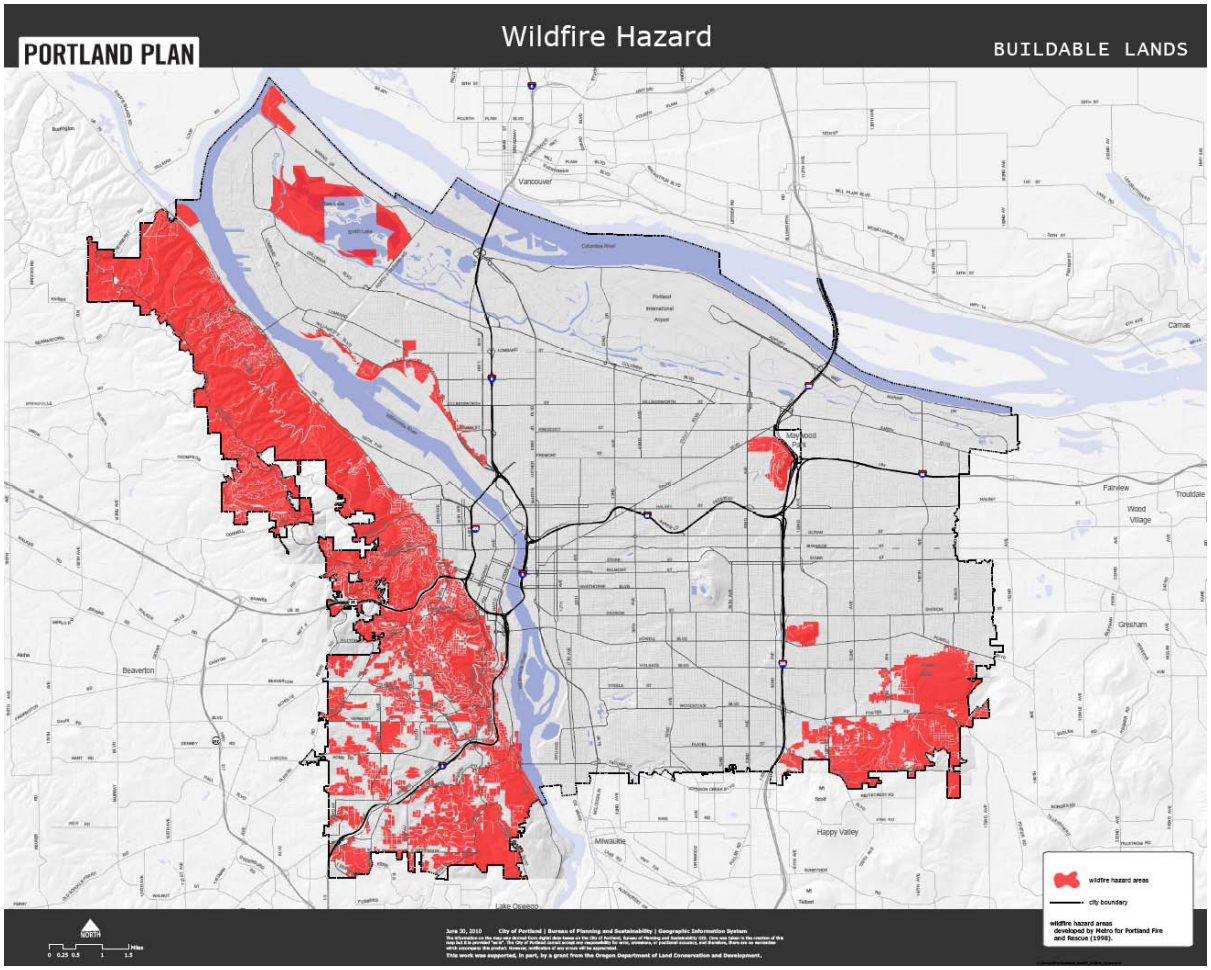
Methodology: This layer represents information about a specific recent flood event. Flood-related regulations are associated with both layers N7 and N8. Therefore, no separate capacity reduction for either housing or employment has been applied to this layer.

N Hazards

N10 Wildfire Hazard

Definition: Sites identified by the Portland Fire Bureau as having wildfire hazards. This data was developed for Portland Fire and Rescure by Metro with review by Oregon State Forestry (1998). ORS 93.270(4) enacted by the 1993 legislature and changes to Oregon's Building Code encourage local governments to voluntarily designate those portions of their jurisdictions subject to catastrophic fire as Wildfire Hazard Zones.

Methodology: No physical, market or regulatory constraint impacts were associated with this layer. There are several construction and site related standards in the Fire Code that may apply in these areas, but the standards do not impact allowed residential density.


PORTLAND PLAN
Wildfire Hazard
BUILDABLE LANDS
Vancouver
Columbia River
Portland International Airport
Camas
Fairview
Troutdale
Wood Village
Gresham
Beaverton
Hillsboro
Milwaukie
Happy Valley
Lake Oswego
wildfire hazard areas
city boundary
wildfire hazard areas developed by Metro for Portland Fire and Rescue (1998).
NORTH
0 0.25 0.5 1 1.5 Miles
June 30, 2010 City of Portland | Bureau of Planning and Sustainability | Geographic Information System
This work was supported, in part, by a grant from the Oregon Department of Land Conservation and Development.

O Potentially Contaminated Sites (Brownfields)

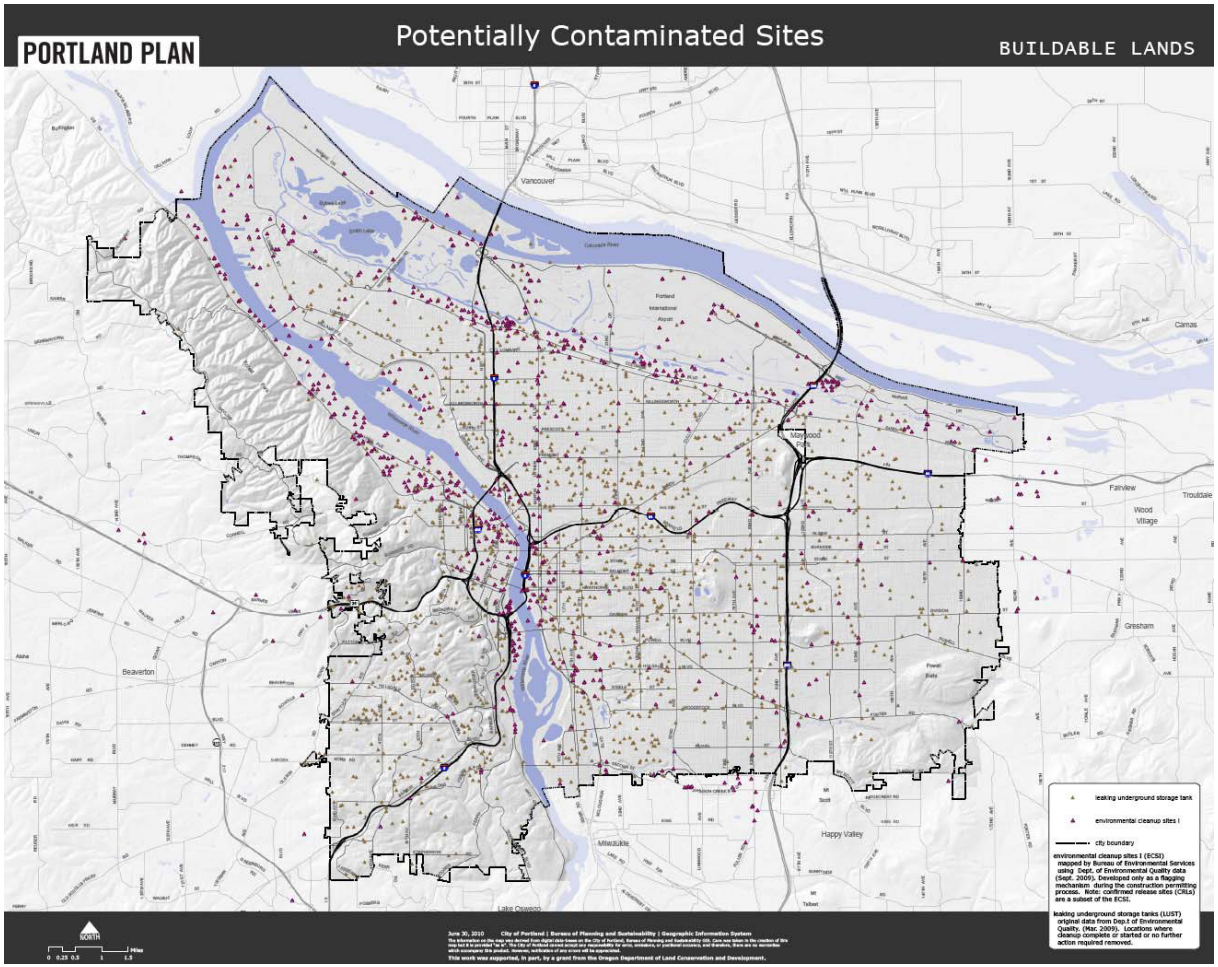
O1 Contaminated Areas identified by the Oregon Department of Environmental Quality, Environmental Cleanup Sites I (ECSI)
O2 Contaminated Areas identified by the Oregon Department of Environmental Quality, Confirmed Release Sites (CRL)
O3 Contaminated Areas identified by the Oregon Department of Environmental Quality, Leaking Underground Storage Tank Cleanup Sites (LUST)
#
Definitions:

Environmental Cleanup Sites I (ESCI): Sites with known or potential contamination from hazardous substances (Source: Oregon Department of Environ Environmental Quality). ECSI generally excludes sites with petroleum releases from underground storage tanks). This data includes sites that DEQ has determined require no further action. (Source: Oregon Department of Environ Environmental Quality). ECSI data was mapped by Bureau of Environmental Services using Department of Environmental Quality data (Sept. 2009).

Confirmed Release Sites (CRL): The CRL is a subset of ECSI and includes sites where a release of hazardous substances has been documented.

Leaking Underground Storage Tank Cleanup Sites (LUST): The LUST Cleanup List is a listing of all sites with reported releases of petroleum products from regulated underground storage tanks (USTs), unregulated USTs, and home heating oil tanks. (Source: Oregon Department of Environ Environmental Quality). Original data from Oregon Department of Environmental Quality (Mar. 2009).

Methodology: This data is point data which is used to identify impacted parcels. Parcels with any of the above layers have been assigned low capacity constraints because the presence of potential contamination poses an additional development expense, and may reduce market interest in a property. The most heavily-contaminated property is industrially-zoned, and not available for residential development.

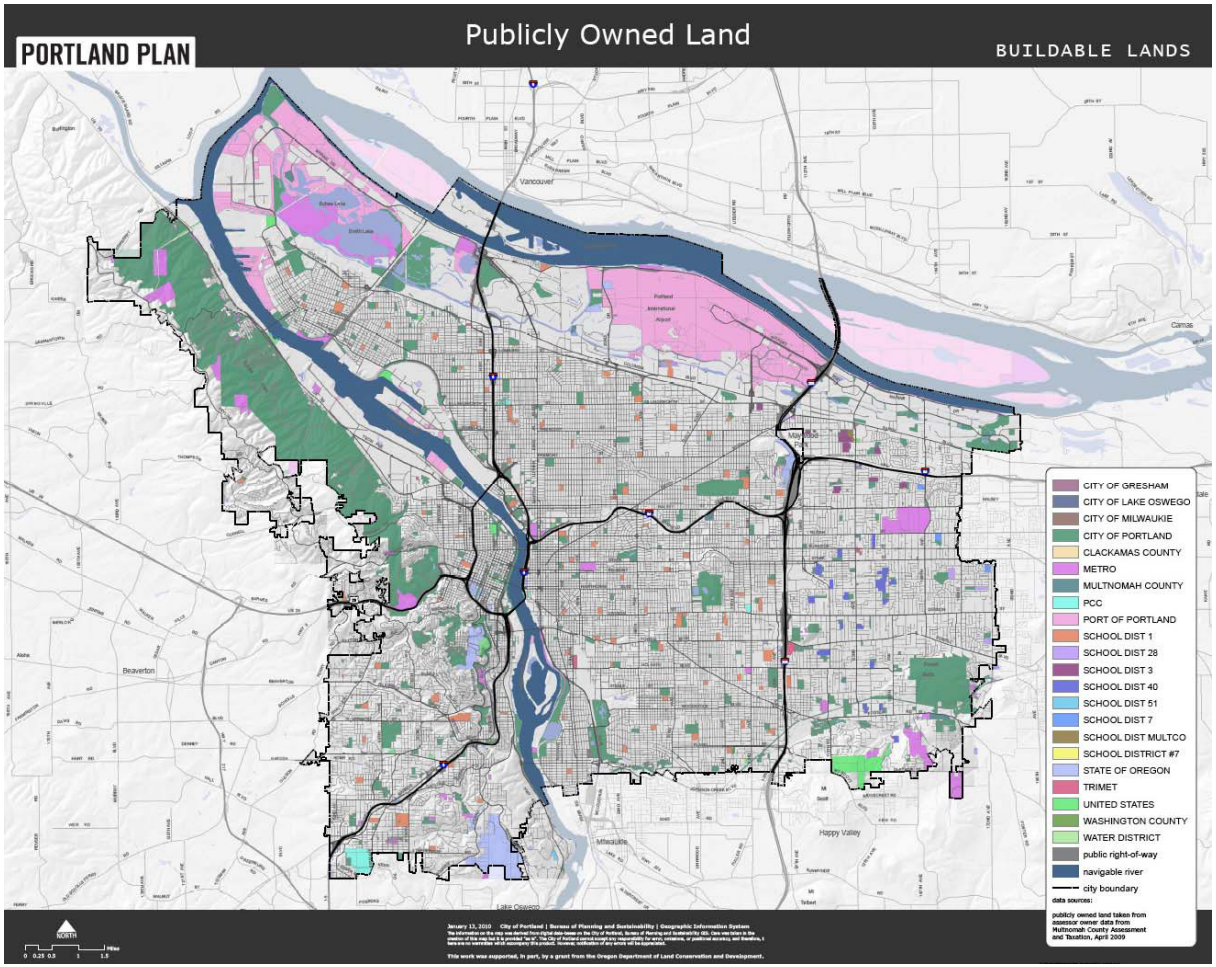

PORTLAND PLAN
Potentially Contaminated Sites
BUILDABLE LANDS
Vancouver
Portland International Airport
Camas
Maywood Park
Fairview
Troutdale
Wood Village
Gresham
Beaverton
Aloha
Powell Butte
Happy Valley
Milwaukie
Lake Oswego
leaking underground storage tank
environmental cleanup sites I
city boundary
environmental cleanup sites I (ECSI) mapped by Bureau of Environmental Services using Dept. of Environmental Quality data (Sept. 2009). Developed only as a flagging mechanism during the construction permitting process. Note: confirmed release sites (CRLs) are a subset of the ECSI.
leaking underground storage tanks (LUST) original data from Dep.t of Environmental Quality. (Mar. 2009). Locations where cleanup complete or started or no further action required removed.
NORTH
0 0.25 0.5 1 1.5 Miles
June 30, 2010 City of Portland | Bureau of Planning and Sustainability | Geographic Information System
This work was supported, in part, by a grant from the Oregon Department of Land Conservation and Development.

P Public and Commonly Owned Land

P1 Publicly owned or controlled lots and parcels

Definition: Land owned or controlled by a federal, state, regional, or local government, or by a special district. Most of public land is not available for housing, but some land is available for employment. For this reason, the following large publicly-owned parcels or groups of parcels were excluded from this data set for purposes of analyzing constraints: all Port of Portland and Housing Authority of Portland lands, OHSU, Veteran's Hospital, Downtown Main Post Office, PCC Central Eastside and 82nd/Division Campuses, OMSI, and the Oregon Convention Center. Publicly Owned Land maps developed by Bureau of Planning and Sustainability from Multnomah County Assessment and Taxation ownership data. Updated February 2011.

Methodology: This layer reflects market constraints that make sites unavailable for development because they are owned by the public and being used for other public purposes. This layer has a high capacity reduction because publicly-owned land is often residentially zoned, but is typically used for parks, open space, schools, and institutions. Some residential capacity is retained within this layer because some publicly-owned residentially-zoned land has historically been redeveloped for a mix of residential and employment uses (surplus property, housing on public college campuses, land seized by the County tax Assessor for nonpayment of taxes, etc.).


PORTLAND PLAN
Publicly Owned Land
BUILDABLE LANDS
CITY OF GRESHAM
CITY OF LAKE OSWEGO
CITY OF MILWAUKIE
CITY OF PORTLAND
CLACKAMAS COUNTY
METRO
MULTNOMAH COUNTY
PCC
PORT OF PORTLAND
SCHOOL DIST 1
SCHOOL DIST 28
SCHOOL DIST 3
SCHOOL DIST 40
SCHOOL DIST 51
SCHOOL DIST 7
SCHOOL DIST MULTCO
SCHOOL DISTRICT #7
STATE OF OREGON
TRIMET
UNITED STATES
WASHINGTON COUNTY
WATER DISTRICT
public right-of-way
navigable river
city boundary
data sources:
publicly owned land taken from assessor owner data from Multnomah County Assessment and Taxation, April 2009
Vancouver
Beaverton
Happy Valley
Lake Oswego
Camas
NORTH
0 0.25 0.5 1 1.5 Miles

P Public and Commonly Owned Land

P2 Public and Private Rights-of-Way

Definition: The area between property lines of a street, easement, tract or other area dedicated to the movement of vehicles, pedestrians and/or goods. A public right-of-way is dedicated or deeded to the public for public use and under the control of a public agency. A private right-of-way is in private ownership, for use by the owner and those having express or implied permission from the owner, but not by others. (Chapter 16.90.302) Neither public or private rights-of-way are typically available for housing or employment. Public Rights-of-way data was originally produced by Oregon Dept. of Revenue. Maps were codified and updated by Multnomah County Assessment & Taxation and Portland Bureau of Transportation. This data is updated weekly by City of Portland. Accuracy - +/- .1 feet.

Methodology: This layer reflects physical and regulatory constraints, and is assumed to have a full capacity reduction (no public and private rights-of-way are available for development).

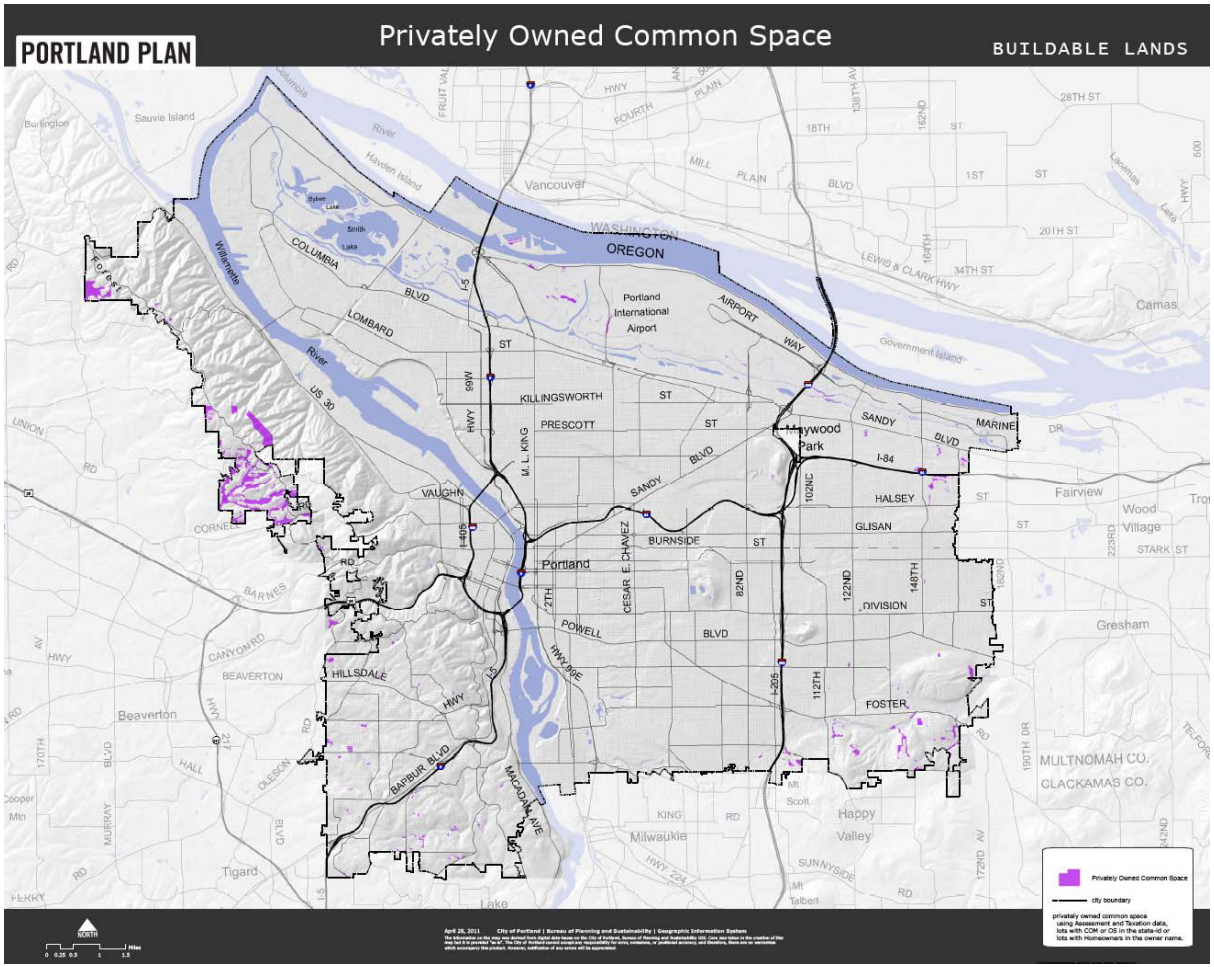
P Public and Commonly Owned Land

P3 Private Open Space

Definition: This layer includes privately-owned tracts that serve community functions, but where the land within the tract has been permanently dedicated to a use which does not allow for additional housing units or employment potential. Such tracts include common open space tracts, common green tracts, stormwater management tracts, private streets, and other similar tracts in residential subdivisions, as well as comparable elements in commercial or industrial subdivisions. Oregon subdivision and real estate law allows creation of commonly held open space. These tracts are typically created as part of a Planned Unit Development (PUD), and subject to CC&Rs requiring that they remain in common ownership and jointly maintained as open space. Portland's subdivision code requires creation of these kind of ownership arrangements as a strategy to preserve environmentally sensitive lands (Chapter 33.430). The largest examples of this situation are found in Forest Heights in Northwest Portland, in the Arnold Creek area of Southwest Portland, and in outer Southeast Portland, in Pleasant Valley. Privately Owned Common Space maps were developed by Bureau of Planning and Sustainability using Multnomah County Assessment and Taxation ownership data (April 2011). Includes common space owned by homeowner associations.

Methodology: Similar to streets, these layers have been dedicated to a specific function to serve the surrounding community, and will not serve as additional land to provide future housing units or employment opportunities. Since these tracts are unavailable for future housing or employment potential, they have been given a full or 100% capacity reduction for both housing and employment.

Appendix A – Constraint Maps and Model Assumptions



P Public and Commonly Owned Land

P4 Beds and Banks of Navigable Waterways

Definition: The people of Oregon own and have the right to use the beds and banks of all navigable streams, rivers, and lakes up to the ordinary high water line. These lands are publicly owned and managed by the Division of State Lands. This layer is included within Map G1 (Natural Resource Features). (Source: Oregon Department of State Lands.)

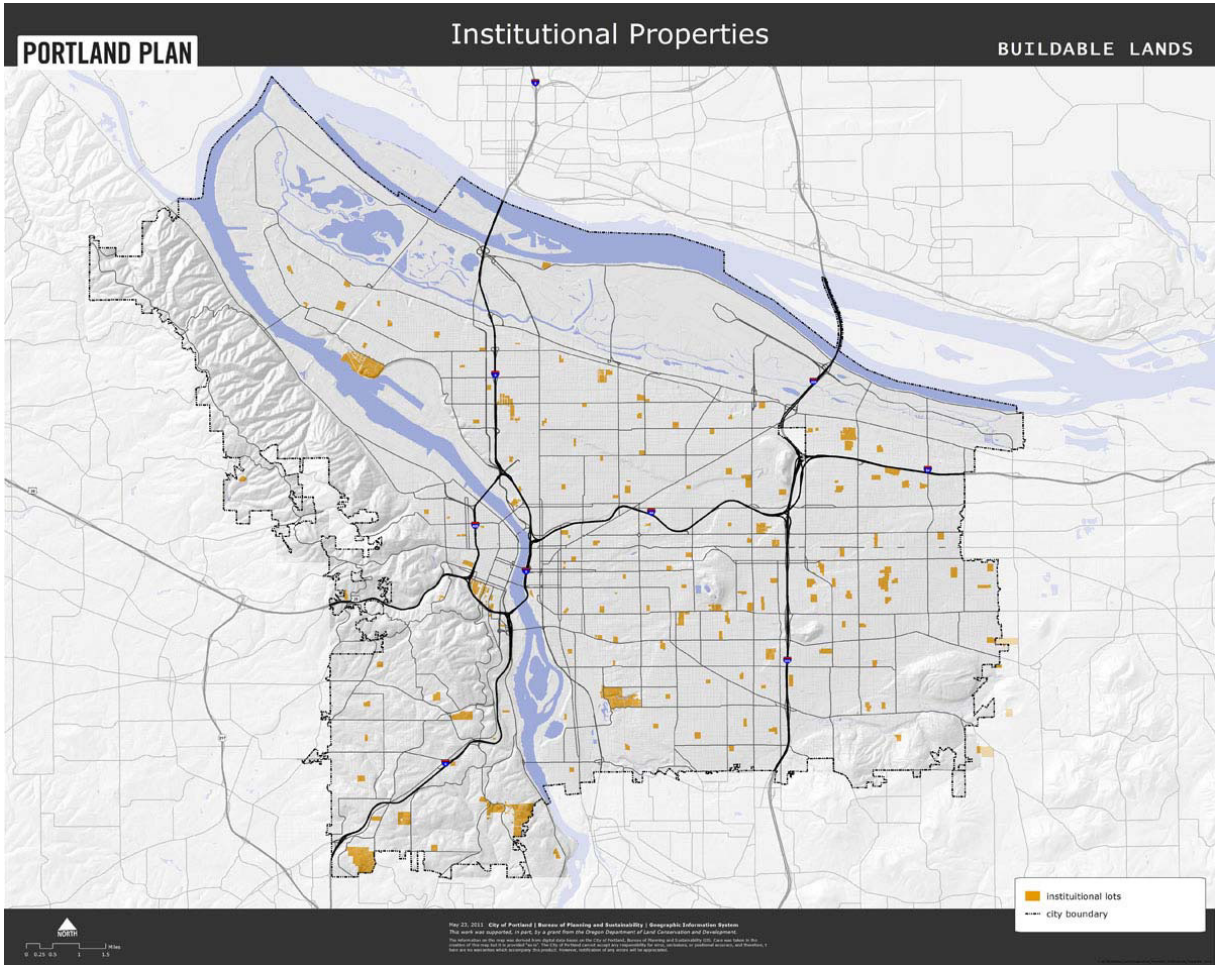
Methodology: This layer reflects physical or regulatory constraints that make a portion of the site unavailable for development. No submerged land is presumed to be available for housing or employment. Some submerged land is leased for residential or employment use. Examples include state leases for floating homes and marinas and aggregate extraction at Ross Island. These exceptions provide negligible housing and jobs capacity. This layer has a full capacity reduction.

P Public and Commonly Owned Land

P5 Institutional Campuses

Definition: Educational institutions, colleges and large medical centers outside of the Central City, many of which are subject to Conditional Use Master Plans.

Methodology: This layer reflects regulatory constraints that make a portion of the site unavailable for some types of development. For purposes of the BLI, Institutional Campus land is presumed to be available for employment, but not residential development. Dormitory and hospital rooms have not been counted as new dwelling units in this model.


PORTLAND PLAN
Institutional Properties
BUILDABLE LANDS
instituitional lots
city boundary

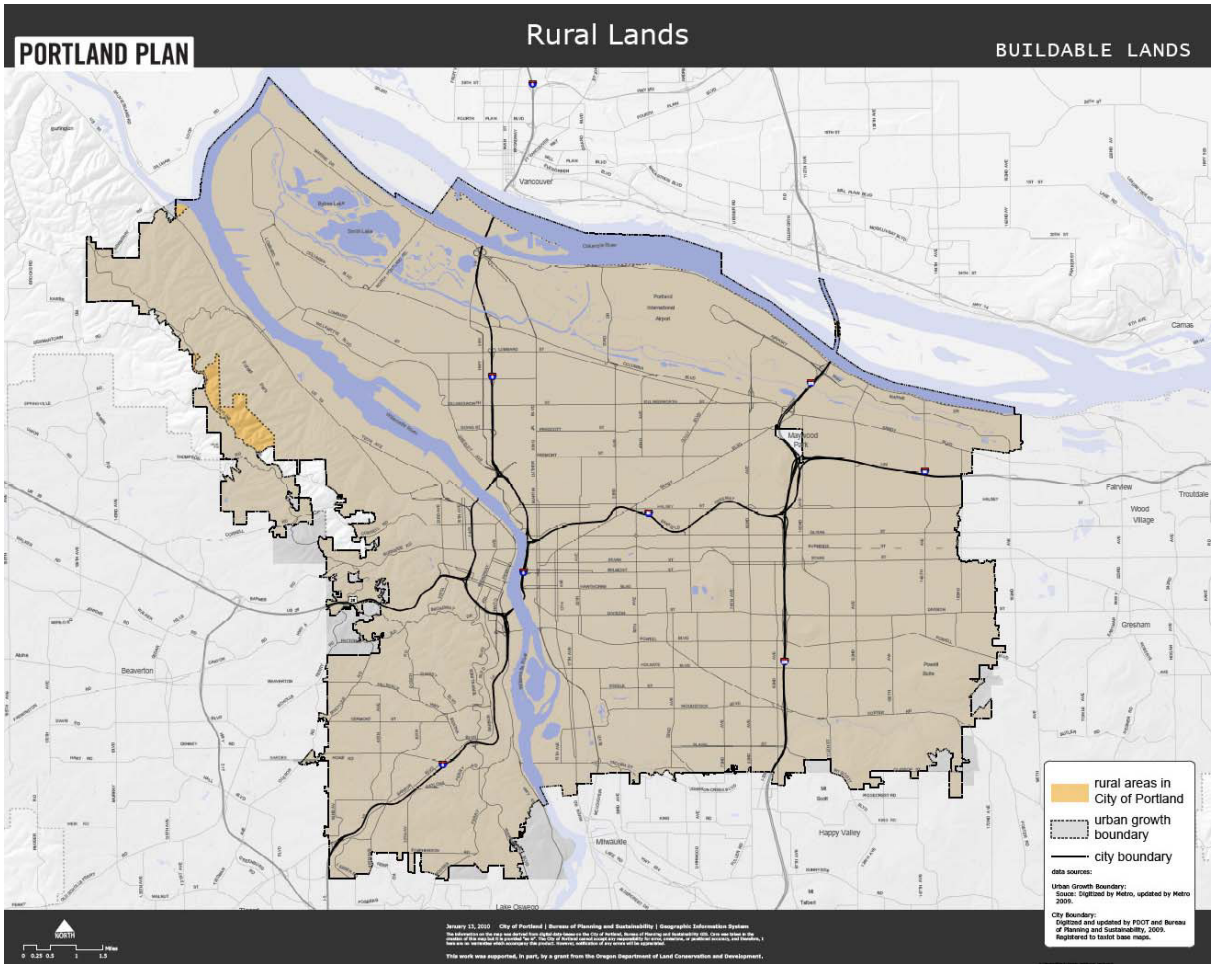
Q Rural lands

Q1 Land within the city limits but beyond the urban growth boundary.

Definition: Because the City of Portland's boundaries pre-date the creation of the UGB, approximately 500 acres of land is within the city limits but beyond the urban growth boundary. That land is zoned Residential Farm/Forest (RF), with an "f" overlay. Rural lands data was extracted from Multnomah County taxlot dataset (April 2011), and from Portland Zoning data.

Methodology: None of this land is available for urban development. Although some of this land is designated by the City for future urban development, this designation will be superseded by a 2010 decision of the Metro Council acting under the authority of SB 1011 (2007). Also, a 2002 decision of the Metro Council to place this land in the urban growth boundary was reversed by the Oregon Court of Appeals in City of West Linn v Metro, finding this land amongst the least suitable for urban development. While this land does have potential for more rural residences and for some farm and forest employment; these are, by state definition, rural uses which are not to be included in urban capacity calculations. This layer has a full(100%) capacity reduction because any remaining housing potential is by definition rural rather than urban.

Appendix A – Constraint Maps and Model Assumptions



For More Information:

About the Portland Plan:
www.pdxplan.com
Twitter: @PDXPlan|#PDXPlan
Facebook: www.facebook.com/PDXPlan

About the Buildable Lands Inventory:
www.pdxplan.com/bli
www.pdxplan.com/atlas

About Metro's forecast model, Metroscope:
www.metro-region.org

Staff Contacts:
Eric Engstrom | Bureau of Planning and Sustainability| Portland Plan Project Manager| 503-823-3329
eric.engstrom@portlandoregon.gov
Tom Armstrong | Bureau of Planning and Sustainability| *| 503-823-3329
tom.armstrong@portlandoregon.gov
Mark Walhood | Bureau of Planning and Sustainability| City Planner II| 503-823-0168
mark.walhood@portlandoregon.gov
Kevin Martin | Bureau of Planning and Sustainability| GIS Analyst | 503-823-7710
kmartin@portlandoregon.gov