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Metro | *People places. Open spaces.*

Date: July 8, 2009

To: Metro Council

From: Stephan A. Lashbrook, Deputy Director of Planning and Placemaking

Re: Summary Report – Infrastructure Case Studies

Last fall we released a discussion draft of the public infrastructure costs in 17 locations around the region. Substantial public discussion ensued, and the report has since been updated and revised. This analysis is the first of its kind in the region, and should add to the knowledge base for decision makers when considering policy changes and public investments. Key findings from the case study analysis include:

- Public infrastructure is expensive. Even in locations where existing infrastructure has adequate capacity and can be extended to serve newly developing properties, infrastructure is not cheap.
- The lack of infrastructure has been a critical factor in the slow development of areas that have been added to the Urban Growth Boundary in recent years.
- Needs and costs vary greatly. There is so much variation from one site to the next that it is difficult to make meaningful comparisons. One site already has available infrastructure and the next does not. One has steep slopes and the next does not. One has good connectivity and the next does not.
- All sites, however, require some amount of infrastructure investment, and most require significant investments to achieve local development aspirations.
- Infrastructure to serve development is generally less expensive where a basic framework of infrastructure is already in place, even if the existing infrastructure needs maintenance work or capacity upgrades. There are exceptions to this, however, and the availability of infrastructure to serve new growth must be evaluated on a case-by-case basis.
- Only the developments that have been fully built-out can claim to have accurate information on infrastructure cost. All the rest are estimates. Even where sites have been fully developed, it is not possible to accurately identify all of the regional infrastructure costs that result.
- Nonetheless, development adds demand for regional infrastructure, and there is currently no mechanism to collect revenue to address the added costs to the region's infrastructure. Regional costs vary depending upon the form of development and distinct travel patterns created by local developments.
- Public infrastructure is an essential part of our quality of life. Given that the region must find a way to accommodate a million more residents in the next 20 to 30 years, and we hope to do this in vibrant and sustainable communities, the public will need to understand the importance of building and maintaining infrastructure. Infrastructure will demand significant public investments and the public has every right to expect a reasonable return on those investments.

Draft "Outcomes" Policy for the Regional Framework Plan

It is the policy of the Metro Council to manage growth in the region to achieve the following outcomes:

- People live and work in vibrant communities where they can choose to walk for pleasure and to meet everyday needs.
- Current and future residents benefit from the region's sustained economic competitiveness and prosperity.
- People have safe and reliable transportation choices that enhance their quality of life.
- The region is a leader in minimizing contributions to global warming.
- Current and future generations enjoy clean air, clean water and healthy ecosystems.
- The benefits and burdens of growth and change are distributed equitably.

Metro and local governments will adopt strategies and take actions to achieve these outcomes, measure the effectiveness of its strategies and actions in achieving the outcomes and adjust the strategies and actions over time to make them more effective. Local government strategies and actions will be defined in the Urban Growth Management Functional Plan and the Regional Transportation Functional Plan. The performance measures shall be included in an appendix to this Regional Framework Plan and may be revised as more and better data become available. The following framework and targets shall guide selecting more detailed performance measures:

Economy	**Wealth creation** – By 2035, the number of living-wage jobs in centers, corridors, employment and industrial areas increases by XX percent compared to 2000.
	Compact urban form – By 2035, the number of residents who live in centers and corridors doubles compared to 2000.
	Traveler safety – By 2035, crashes, injuries and fatalities decline by 50 percent compared to 2005.
	Business efficiency – By 2035, the cost of delay for freight and goods movement declines by XX percent compared to 2005.
	Infrastructure resilience – By 2035, the share of the region's infrastructure systems in good condition increases by 50 percent compared to 2006.
Environment	**Climate change** – By 2035, the region reduces its greenhouse gas emissions by 40 percent from 2007 levels.
	Active transportation – By 2035, the region triples walking, biking and transit trips compared to 2005.
	Clean air – By 2035, zero percent of the region's population is exposed to at-risk levels of air pollution.
	Clean water – By 2035, all of the region's streams and rivers are fishable[1] and swimmable.
	Healthy ecosystems – By 2035, tree and other vegetative cover in the region increases by 5 percent and impervious surface declines by 10 percent compared to 2007.
Equity	**Affordability** – By 2035, the share of the region's households that are cost-burdened declines by 20 percent compared to 2000.
	Access to daily needs – By 2035, the share of region's low-income, minority, senior and disabled populations that live within 30 minutes of essential destinations by public transit increases by 50 percent compared to 2000.
	Access to nature – By 2035, XX percent of the region's residents live within ½-mile of a park, open space or regional trail.

July 8, 2009

[1] Rivers and streams that have historically been fish-bearing.

Approach:
The data supporting this report were compiled over the last year by Metro staff and consultants, working with the local jurisdictions where the subject properties exist. A wide variety of sites have been addressed. The list includes sites that have been fully developed in recent years as well as sites that are still at the concept planning level. Some have been partially developed. The case study areas include some with a focus on employment, some with a focus on housing, and some that combine the two. Some sites are redevelopment areas (e.g., the Brewery Blocks and Lake View Village). Others are primarily greenfield locations (e.g., Springwater).

The staff distributed the new draft case study report to all of the communities that have development areas listed, asking for their edits, suggestions and updated information. We received responses from a number of the local jurisdictions, including some new information. The report has been edited and includes those corrections.

Key revisions:
First, the earlier report combined local and regional infrastructure costs for each case study area. The regional infrastructure cost analysis used projected commute distances as a proxy for impacts to the regional infrastructure system. In the revised report, the projected commute distances are shown, but no specific dollar figures are estimated for regional costs. Given that the regional cost estimates are based on national infrastructure cost averages and the fact that the analysis works well at a regional scale but, like all modeled results, becomes less precise for specific locations, the emphasis of this report is on local and community infrastructure costs.

Second, the earlier report converted non-residential development (i.e., jobs) to equivalent dwelling units (EDUs) at a five-to-one ratio. While this sort of formula is useful for region-wide modeling, it has limitations on an individual case-study basis. For example, the 200 retail, restaurant and office jobs created in a one-block portion of Lake Oswego's downtown redevelopment area can be expected to generate substantially different infrastructure demands than 200 manufacturing jobs in Hillsboro or 200 warehouse jobs in Wilsonville. Comparing them to one-another, and assuming that they all have the same relationship to residential infrastructure demands, is problematic. For those reasons, the revised report lists all projected housing units and jobs without attempting to equate the infrastructure demands of jobs to those of housing.

Connection to Making the Greatest Place Initiative:
The findings of the infrastructure case study analysis support Metro's efforts to work with cities and counties across the region to achieve their local aspirations and the six Desired Outcomes of a successful region,

- Case studies show that we can not draw universal conclusions about the costs of public infrastructure. There are both financial and qualitative decisions to be made. We must ask what we hope to accomplish with our infrastructure investments in terms of the development that will result. We must make strategic choices about how we invest limited public infrastructure dollars.

- Investment produces results – or, conversely, not investing will ensure we do not produce results. Public investments help to shape the built environment, and the region will need to invest to achieve the six Desired Outcomes.

- Every community in the region needs infrastructure investment. We need to be proactive in working with our regional partners to find the revenue for these investments.

- The focus of our growth management decisions this year is to identify the gap between demand and supply. However, in 2010 we will need to figure out how best to fill that gap. Information about the adequacy and cost of infrastructure will help to inform those decisions. Our investment decisions, and those of local service providers, will help shape the region as we go forward

Public Infrastructure Costs

Case Studies

July 2009

Introduction

Purpose

The region is in the process of deciding where and how to grow. These decisions will have long-term financial costs and benefits for current and future residents. An understanding of the factors that contribute to infrastructure costs will be essential to making those decisions.

To assist in the region's discussions about growth management, this report focuses on the capital costs and capacity of public infrastructure provision for new and infill developments throughout the region. This report uses a variety of analyses and information to provide a beginning framework for future conversations on infrastructure investment. Local case studies analyzing residential and employment areas throughout the region help illustrate the distinct factors that influence infrastructure costs.

Report Findings and Conclusions

A few things are readily apparent from the information gained in this report:

- Public infrastructure is extremely expensive. Even in locations where existing infrastructure has adequate capacity and can be extended to serve newly developing properties, it is not cheap.

- There is so much variation from one site to the next that it is difficult to make meaningful comparisons. One site already has available infrastructure and the next does not. One has steep slopes and the next does not. One has good connectivity and the next does not. The list goes on.

- Infrastructure to serve development is generally less expensive where infrastructure is already in place, even if the existing infrastructure needs maintenance work or capacity upgrades.

- Only the developments that have been fully built-out can claim to have accurate information on infrastructure cost. All the rest are estimates. Even where sites have been fully developed, it is not possible to accurately identify all of the regional infrastructure costs that result.

- Public infrastructure is an essential part of our quality of life. Given that the region must find a way to accommodate a million more residents in the next 20 to 30 years, and to do it in vibrant and sustainable communities, the public's understanding of the costs of building and maintaining that infrastructure is critical. The public will be asked to invest

even more in infrastructure in the future and should demand a meaningful return on that investment.

- This report provides only a general estimate of the demands created by local development on regional infrastructure. Each case study includes data on average commute distances, but does not include specific cost estimates for regional infrastructure. Unlike local and community infrastructure costs, there is no mechanism in place to collect revenues from developments to pay for regional infrastructure.

Summary of Cost Findings

Some of the developments studied here have already been built, others are still at the concept planning stage. Some are intended exclusively for housing development, while others are intended to create new jobs. Most include both jobs and housing. The following list shows the range of cost estimates for local infrastructure that have been found.

A review of the summary numbers that follow makes it obvious how varied these case studies are. Comparing the first four cases listed below (Shute Road, Coffee Creek, S.W. Tualatin and Lake View Village) shows how different they are – in spite of the fact that they are all planned for non-residential development. Additional to the infrastructure costs per job created, the following differences are noted:

Lake View Village is a commercial development within a downtown redevelopment area. While it created more than 200 jobs, its primary function was to support and stimulate redevelopment of the surrounding properties. Most of its costs went for the development of a public parking structure; something not anticipated in the other three areas. The other three areas are primarily planned for industrial uses.

Shute Road has the lowest anticipated local infrastructure cost per job. That is primarily because of the existing infrastructure and road network in the area.

S. W. Tualatin will require major upgrades to its surrounding streets to be viable. On a per-job basis, these local transportation costs are expected to be more than four times as high as those of the Shute Road area.

The Coffee Creek area is expected to have local infrastructure costs that are almost as high as the Shute Road area, while resulting in less than half as much job creation.

Project status (as of April 2009):

*	Planning not complete
**	Plan complete (not necessarily adopted)
***	Development underway
****	Development complete

Job Creation Only

Shute Road area (Hillsboro)***
3,660 jobs $9,136,000 local infrastructure cost: +/-$2,500/job

Coffee Creek area (Wilsonville)**
1,474 jobs $8,058,000 local infrastructure cost: +/-$5,500/job

S.W. Tualatin*
5,760 jobs $60,627,000 local infrastructure cost:+/- $10,500/job

Lake View Village (Lake Oswego)****
207 jobs $5,116,000 local infrastructure cost: +/-$24,500/job

Housing Only

Witch Hazel area (Hillsboro)***
2,000 units $39,560,000 local infrastructure cost: +/- $20,000/unit

Park Place area (Oregon City)**
1,458 units $71,760,000 local infrastructure cost: +/-$49,000/unit

In other areas studied, which have been planned primarily (but not exclusively) for housing or for job creation, per unit and per job costs are somewhat more generalized and should be considered only as "order of magnitude" estimates. These include:

Primarily Job Creation

Brewery Blocks (Portland)****
2,440 jobs (113 units) $40,647,000 local infrastructure cost: +/- $13,500 to $15,000/job

Springwater (Gresham)**
15,330 jobs (1,456 units) $375,791,000 local infrastructure cost: +/- $16,500 to $24,000/job

Primarily Housing

Rock Creek (Happy Valley)***
2,932 units (619 jobs) $48,796,000 local infrastructure cost: +/- $14,000 to $16,000/unit

South Hillsboro**
10,182 units (879 jobs) $295,517,000 local infrastructure cost: +/- $26,000 to $28,500/unit

North Bethany (Washington County)**
5,000 units (276 jobs) $416,633,000 local infrastructure cost: +/- $79,000 to $82,500/unit

Job/Housing Mix

N. Main (Milwaukie)****
95 units (40 jobs) $919,000 local infrastructure cost

Civic (Gresham)****
636 units (2,433 jobs) $11,606,000 local infrastructure cost

Beavercreek Road (Oregon City)**
1,450 units (3.652 jobs) $115,900,000 local infrastructure cost

Pleasant Valley (Gresham and Portland)**
4,926 units (4,935 jobs) $304,073,000 local infrastructure cost

S. Waterfront (Portland) ***
10,000 units (3,600 jobs) $323,457,000 local infrastructure cost

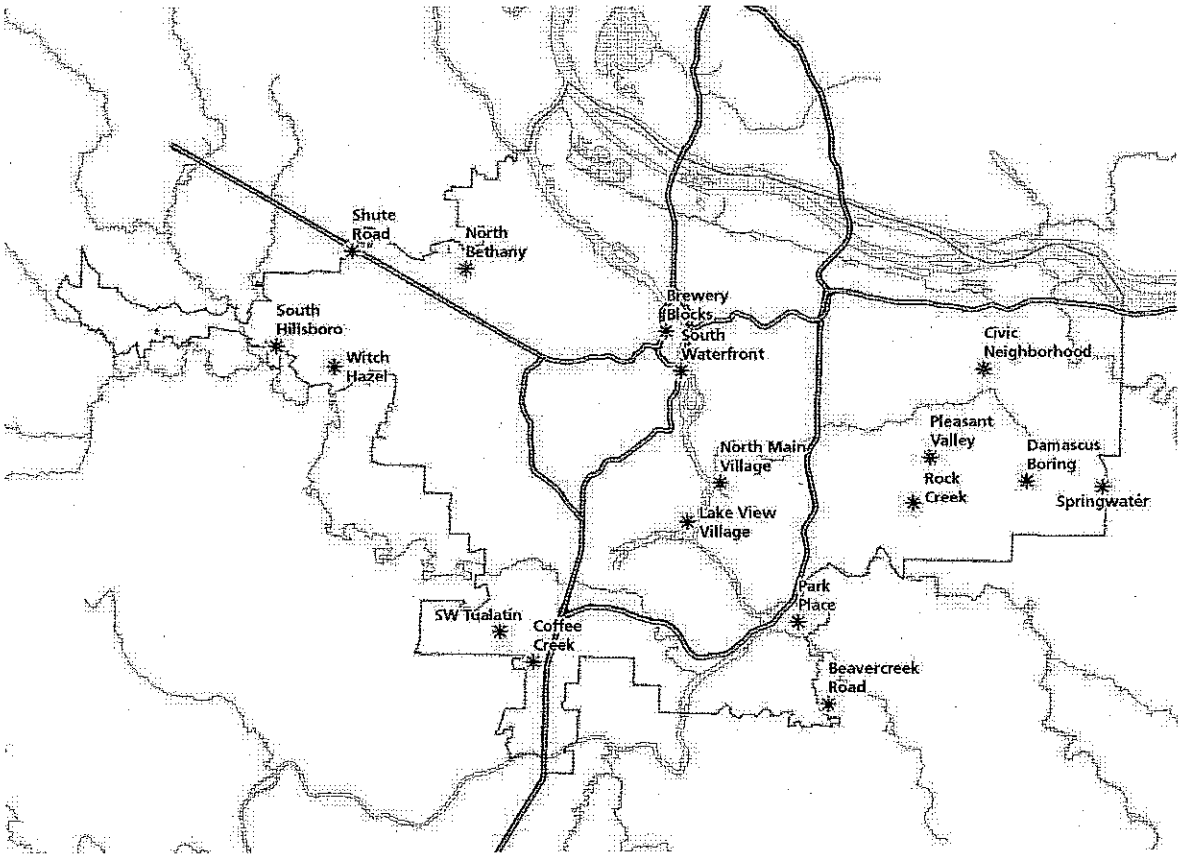
Damascus/East Happy Valley* (Planning complete for Happy Valley portion.)
21,934 units (45,000 jobs) $3,119,295,000 local infrastructure cost

Local Case Study Analysis

The developments used in the local case study analysis are each unique, having different benefits, proposed uses, levels of service, surrounding uses, and topography. Since each case study is distinct, the analysis clearly shows factors that differ between case study areas. So, as a whole, the case studies help to illustrate the general lessons that can be learned from current infrastructure investments and provide one useful means of understanding what factors can influence infrastructure costs.

Although these case studies focus on specific geographic areas, each location exists as part of a larger community. Because of this, it is not possible to isolate every cost or benefit of the study areas relative to those larger communities. For instance, a study area may include amenities (e.g., a public park or a parking structure) that serve surrounding properties. In another instance, properties near the study area may be providing amenities that benefit the study area. No effort has been made to attempt to quantify these characteristics.

Case study locations



Methods

Types of infrastructure considered

The focus of this analysis is on the following categories of infrastructure:

- Civic buildings, parking structures, public plazas
- Regional facilities such as marine and air ports
- Parks
- Sanitary Sewers
- Schools
- Stormwater
- Transportation
    - Roads, bridges, highways
    - Transit, bike, pedestrian
- Water

Reconciling differences between case studies

Generally speaking, one job will place fewer demands on infrastructure than will one household. However, different kinds of employment can place very different demands on infrastructure. It is also not possible to be exact in comparing costs from one unique geographic area to another.

Because the developments included in this analysis span several years, all costs have been shown in first quarter 2008 dollars.

Return on public investment

In an era of insufficient infrastructure funding, a primary concern for policy makers needs to be cost effectiveness of different public infrastructure investments. This report is intended to allow for some discussion of the return on public investments in infrastructure. This report documents how much it costs to provide infrastructure to serve new households and employees in each study area. This analysis, however, does not incorporate all of the costs faced by the private sector in building out any given development.

The number of households and jobs created as a result of public infrastructure investment is by no means the only return on investment that should be considered. The quality of the communities that are created through these investments and their possible contributions to local and regional goals are also essential considerations. This report does not attempt to judge the relative benefits of investments in different developments as each area is different.

Types of costs

This analysis used case studies to evaluate and identify factors that can influence infrastructure costs, but it is limited in its scope. Specifically, this report only documents the capital costs of providing new local infrastructure. Nor does it include the cost of ongoing maintenance and operations of public facilities. It should be emphasized that those ongoing costs can be more significant than the initial costs of infrastructure. (A good example would be sewer service to a specific site. It might be initially less expensive to serve the area with pumps than with gravity, but the long-term costs of operating and maintaining a pump system could easily exceed the initial savings.) Finally, this report does not capture the infrastructure costs and savings to individual homeowners and employers in the region.

Different scales of infrastructure

This report divides infrastructure into two categories, depending on the infrastructure's user base:

- Local / community infrastructure
- Regional infrastructure

These two categories are described below.

Local / Community Infrastructure

Local / community facilities are those that are most directly necessitated by a particular development. The costs of these facilities are typically well documented and case studies are a useful way to understand them.

- Costs for newly urbanizing areas were taken from concept plans. These costs are early estimates that will, no doubt, change as plans are refined.

- Costs for urban redevelopment projects were provided by the responsible urban renewal and planning agencies and are for completed projects.

- Costs that were included in concept plans, but that can be categorized as regional costs (e.g., state highway improvements), were deducted from local/community costs.

- Local planning and urban renewal departments had the opportunity to review, comment on and correct case studies within their jurisdictions.

Regional Infrastructure

Regional infrastructure includes facilities such as highways, light rail, bridges, and marine and air terminals. Unlike local and community level facilities, it is difficult to link any particular development with the need for a regional facility. Instead, the need for regional facilities is cumulative in nature and their costs are rarely included in estimates for a particular development. It is also hard to separate the need to replace obsolete regional infrastructure from the need to replace regional infrastructure in order to increase capacity for increased population growth. However, local development does place certain demands on regional facilities and no direct method exists to pay for these regional costs to roads and bridges. Due to these factors, regional infrastructure costs can be difficult to completely isolate and understand, but still need to be considered in this analysis. Therefore, this report includes a general statement of the costs that these case study areas will place on regional infrastructure.

Past studies have focused on the costs of regional infrastructure. The cost assumptions listed below were based on these secondary sources: (Balboni, 2006) (Cogan, Sharpe, Cogan, 1990) (Sonny Conder Fiscal and Economic Consulting, 1991) (Speir & Stephenson, 2002) (United States Bureau of Economic Analysis, 1960-2005) (Waier, 2007).

Given that the trip generation patterns of different non-residential land uses vary so widely (e.g., from retail to warehousing) no effort has been made in this study to quantify the regional infrastructure costs that are attributable to each new job. Instead, each case study lists the projected commute distance in 2035 relative to the regional average, and the reader is encouraged to consider the regional cost implications of new jobs that result in different commute distances.

The estimated average cost of regional infrastructure per dwelling unit in the 7-county area (Clackamas, Multnomah, Washington, Clark, Yamhill, Marion, and Columbia counties) is approximately:

Transportation – transit (variable cost)	$ 3,000
Transportation – roads, bridges (variable cost)	$20,000
Transportation – marine, air (flat cost)	$ 1,500
Public facilities (flat cost)	$ 5,500
Average cost per dwelling unit of regional infrastructure	**$ 30,000**

Flat regional infrastructure costs

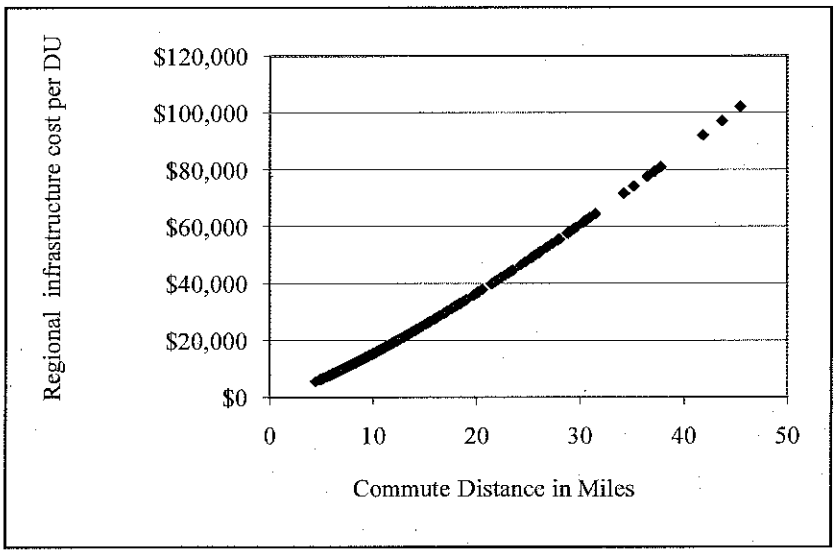
Using the above-cited sources of cost estimates, flat costs can be applied to each new household (with a somewhat lower assumption for each new job) for marine, air, and other non-transportation regional facilities. These costs are not for specific facilities, but are, instead, intended to represent the typical regional infrastructure demands that new households and jobs create. The use of a flat cost for these facilities is based on the assumption that, generally speaking, most households in the study areas will place similar demands on these types of facilities[1].

[1] Though this is clearly not the case, a flat cost is used in the absence of a more accurate means of estimating how frequently a particular household may, for instance, use the airport or purchase goods that were received in our region's marine ports.

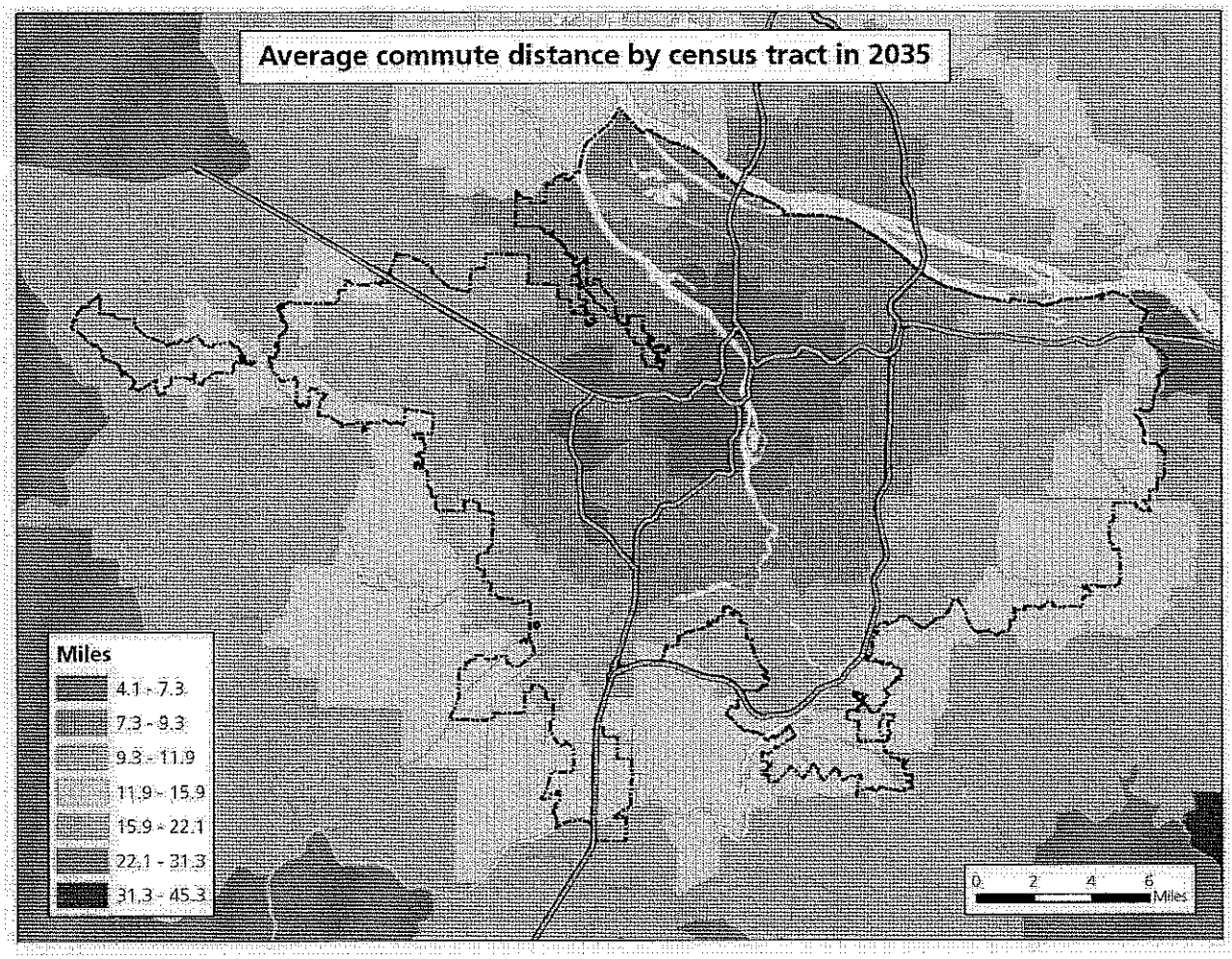
Variable regional infrastructure costs

To more accurately represent the differences in demand that different case study locations may place on regional transportation facilities (such as highways, transit and bridges), variable costs can be attributed.

A household that makes longer distance trips places greater demands on transportation facilities than a household that makes shorter trips. A household's demand for regional transportation facilities was assumed to vary according to forecast commute distances[2].



[2] Though commute travel is a relatively small portion of a household's total travel, it serves as a reasonable proxy for overall travel behavior. Households with relatively short commutes also tend to be relatively close to retail and other services, thereby reducing the length of other trips.



Using MetroScope[3], an integrated land use and transportation forecasting model, commute distances were estimated for new households and jobs in the region by the year 2035[4]. Commute distances that are reported in this analysis are one-way and calculated based on the job and household distributions that result from the modeled scenario.

The MetroScope model does not assume that all workers commute to the central city. Instead, the model measures commute distances from census tracts to a variety of employment centers throughout the region. As a result, proximity to any employment center in the region reduces the commute distance of a census tract.

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[3] Because MetroScope cannot predict future policy changes made by cities or actions taken by firms or individuals, these forecasted commute distances are not a foregone conclusion. Policy changes and other dynamics (e.g. new regulations or changes in fuel costs) can serve to shorten or lengthen forecasted commutes. Generally, however, MetroScope scenarios can give reliable estimates of the likely outcomes of a given set of policy choices. The set of assumptions used in this scenario represents an extrapolation of past and current policy direction.

[4] Average commute distances are calculated at the census tract level.

Primary findings

Factors that can influence infrastructure costs

This case study analysis is not a statistical analysis that can definitively determine the effects of any particular factor on infrastructure costs. However, some general lessons can be gleaned. Some factors that can influence the costs of serving new development include:

- Site topography
- Environmental features
- Land ownership patterns
- Distance from existing infrastructure
- Presence or absence of existing infrastructure capacity
- Development density
- Proposed use
- Level of service or quality of amenities
- Travel behavior (of residents or employees)

Site topography

Flat sites tend to be less expensive to serve than sloped sites. For instance, sloped sites can either benefit or complicate the use of gravity systems for water or wastewater or can require the use of a non-grid street network. Sites with steep slopes are also typically built at lower densities, which can also have the effect of increasing the cost of infrastructure.

Environmental features

Though site features such as riparian areas or wetlands can be viewed as green infrastructure (for instance, as open space or as stormwater facilities), their presence can make an area more expensive to serve by reducing the potential development density of a site or by increasing actual construction costs.

Land ownership patterns

Fragmented land ownership patterns can require coordination with numerous land owners and can add time and cost to the development of an area. Having to cross multiple ownerships with streets, trails, or pipelines can add significantly to costs.

Distance from existing infrastructure

Increased distance from existing facilities can raise infrastructure costs. For instance, a new development that is further from existing facilities could require additional lengths of sewer pipe to connect to existing facilities or, an even more expensive proposition, the construction of a new sewage treatment plant.

Presence or absence of existing infrastructure capacity

In most cases, using existing infrastructure capacity before constructing new capacity makes sound financial sense. There is, however, a tipping point at which existing capacity will be fully utilized. This tipping point is inherently captured in these case studies. If additional capacity is necessitated by a particular development, the costs of those facilities have been included, where known.

Development density

Higher density developments tend to be less expensive to serve (on a per unit basis) than lower density developments. The relationship between residential density and infrastructure demand is fairly intuitive – larger lots require more lineal feet of pipes and pavement per household. These increased lengths generally

translate into higher infrastructure costs for both initial construction and long-term maintenance (Speir & Stephenson, 2002).

Despite this general rule, however, the lower density case study areas reveal a great deal of variation in the costs per job or per household. This variation is attributable to the many other factors that can influence costs. These factors may include level of service or the provision of amenities such as parks and sidewalks and other facilities such as schools.

Proposed uses

The case studies include both employment and residential uses and do not indicate that one type of use is inherently more expensive than the other. When considered on a cost-per-job basis, there are examples of both relatively inexpensive (e.g., Shute Road) and relatively expensive (e.g., Lake View Village) employment uses. This small sampling of case studies appears to indicate that variations in costs are contingent upon factors other than land use.

Level of service / quality of amenities

Two of the more important determinants of infrastructure cost are level of service and the presence of community amenities. Different case study areas need different facilities to support their intended use. Some of the case study developments require the entire gamut of new infrastructure facilities while others require little more than the addition of structured parking. This variation in the mix of facilities shows up in the information below. These facilities are all elements of creating great communities and it should be recognized that providing them is desirable.

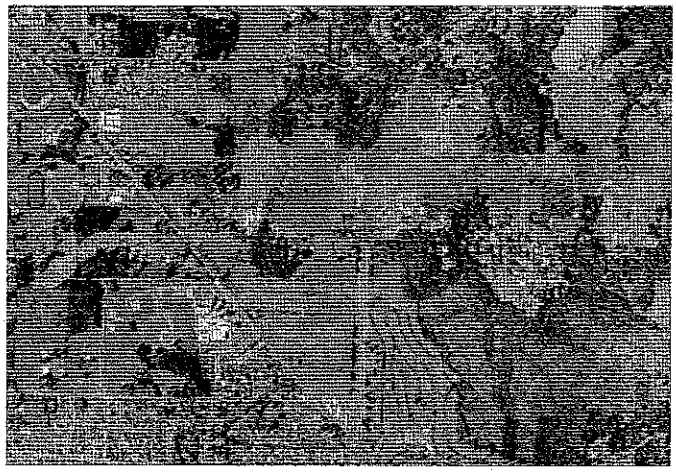
Redevelopment projects that make use of existing facilities can provide a high level of service/amenity, while also controlling costs. This is not to suggest that there are no costs associated with using existing infrastructure capacity, but merely that a large portion of those costs are already sunk and that it makes more sense to use that available capacity where possible.

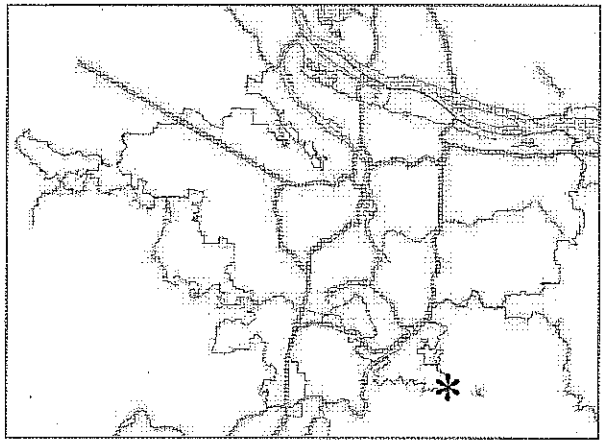
Travel behavior

The relationship between travel behavior and infrastructure demand is intuitive. More frequent and longer trips place greater demands on the transportation system, resulting in a collective need for more highway, bridge and transit capacity. Residents of areas near employment centers tend to have shorter trips by all modes.

Beavercreek Road concept planning area

Oregon City





Estimated local infrastructure capital costs:
$115,900,000

Total acres:	453
Gross buildable acres:	292
Net new households:	1,450
Net new jobs:	3,652
Avg. commute miles in the year 2035:	17.09

Proposed Use

The plan for this newly urbanizing area envisions a diverse mix of uses (an employment campus north of Loder Road, mixed use districts along Beavercreek Road, and two mixed use neighborhoods). One purpose of the plan is to improve the jobs-housing balance in Clackamas County. Transit-oriented land uses are planned to increase the feasibility of transit service in the future. The concept area is adjacent to Clackamas Community College, providing workforce-training opportunities for future area residents and employees.

Existing Conditions and planned improvements – Beavercreek Road

Transportation

The site is adjacent to Beavercreek Road and south of the intersection of Highways 213 and 205. Traffic on Highway 213 is congested during peak hours. Beavercreek Road is a major local connector. There is very limited bike and pedestrian infrastructure. Of the projected infrastructure costs, 57% 0f the local share is for transportation improvements. It should also be noted that regional infrastructure costs will be affected by average commute distances from the Beavercreek area that are nearly 5 miles longer than the regional average.

Commute Distances
Longer travel distances translate into a need for more regional infrastructure per household. Residents of the census tract that comprises the Beavercreek Road area are forecasted to have an average commute distance of 17.09 miles in the year 2035, significantly higher than the 7-county average (12.32 miles).

Water
Water is sourced from the Clackamas River. While there is sufficient water supply, the study area currently lacks an onsite distribution system.

Wastewater
An existing treatment plant has the capacity to serve the study area. There is a 12-inch sewer trunk that runs the length of Beavercreek Road, but this line lacks the capacity to serve the projected development.

Stormwater
The concept plan area drains into two basins, Abernethy Creek and Caufield Creek, both of which drain into the Willamette River, south of downtown Oregon City. Stormwater systems are largely undeveloped. This is one reason why stormwater infrastructure costs are expected to be significantly above the regional average at 22% of the total local infrastructure costs. The Beavercreek Road concept plan calls for green streets and onsite stormwater management. The plan also includes public open space in areas designated for natural stormwater treatment, which is intended to serve a dual function as both park and stormwater conveyance.

Parks, plazas, public places
There are no existing public parks within the plan area. There is an existing golf course on a portion of the site.

How do Beavercreek Road's infrastructure costs add up?

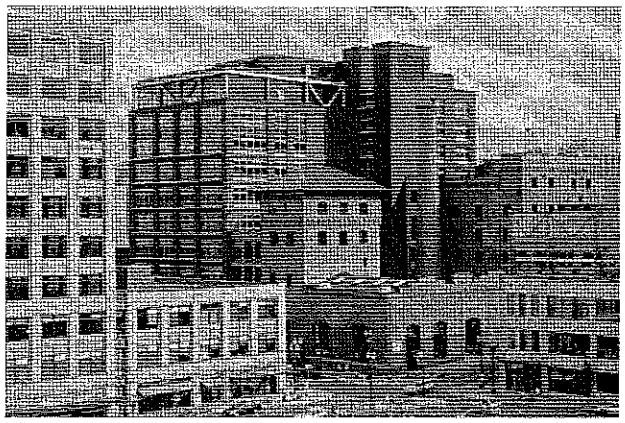
Estimated local infrastructure capital costs:

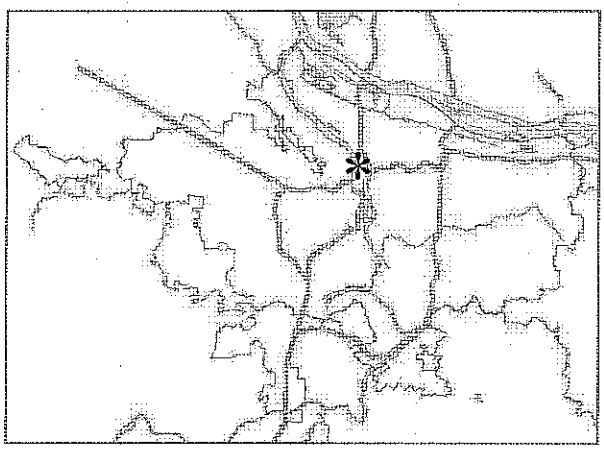
	Beavercreek Rd.
Transportation	$66,300,000
Transit, Bike, Pedestrian	-
Sewer	$8,500,000
Water	$15,900,000
Stormwater	$25,200,000
Parks	-
Other	-
Total	$115,900,000

Note that costs are related to both housing and job creation. Approximately 57% of costs are attributed to transportation infrastructure and approximately 22% are attributed to stormwater systems, including natural stormwater areas. The concept plan for the Beavercreek Road area does not project the need for any additional schools as a result of this development. Costs for regional transportation improvements (not included above) are significantly higher than average, due to commute distances projected to 2035.

Brewery Blocks

Portland





Estimated local infrastructure capital costs
$40,647,000

Total acres:	4.6
Gross buildable acres:	4.6
Net new households:	113
Net new jobs:	2,440
Avg. commute miles in the year 2035:	4.99

Proposed Use (completed project)

The Brewery Blocks redevelopment consists of a mix of high-density residential and commercial uses. The primary focus has been on job creation, with roughly 20 times as many new jobs as new housing units. It should be noted that the Brewery Blocks are located within a thriving redevelopment area of Portland, with the activities within this area completely interconnected with surrounding land uses. The Brewery Blocks have been able to take advantage of existing facilities, including transit, sewer, water, parks, and streets.

Existing Conditions – Brewery Blocks

Transportation

An urban street grid exists and the area is accessible by multiple modes. The streetcar system was developed as a part of the larger River District redevelopment. Many of the residents and employees within the Brewery Blocks are able to meet their transportation needs without their own motor vehicles.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include the Brewery Blocks are forecasted to have an average commute distance of 4.99 miles in the year

2035, considerably shorter than the 7-county average of 12.32 miles. This is expected to significantly reduce regional infrastructure costs over time.

Water
Sufficient water facilities already existed within the area in advance of development.

Wastewater
Sufficient wastewater facilities already existed within the area in advance of development.

Stormwater
Sufficient stormwater facilities already existed within the area in advance of development.

Parks, plazas, public places
Though there are no public parks within the Brewery Blocks, the development is able to take advantage of an existing park system that includes the North and South Park Blocks, Jamison Square, and Tanner Springs.

Structured parking and other improvements: The public costs associated with the redevelopment of the Brewery Blocks were attributed to the construction of structured parking, provision of street furnishings, and sidewalk improvements.

How do the Brewery Blocks' infrastructure costs add up?

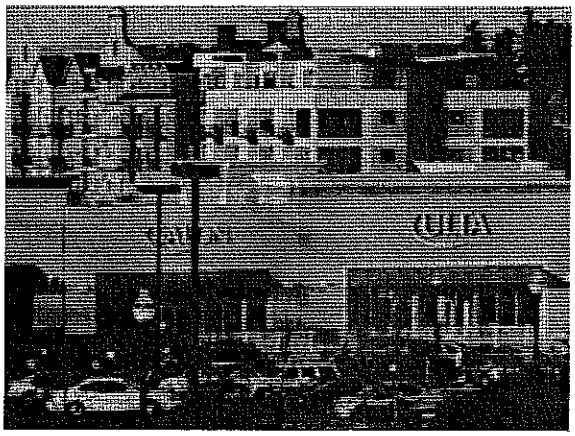
Estimated local infrastructure capital costs:

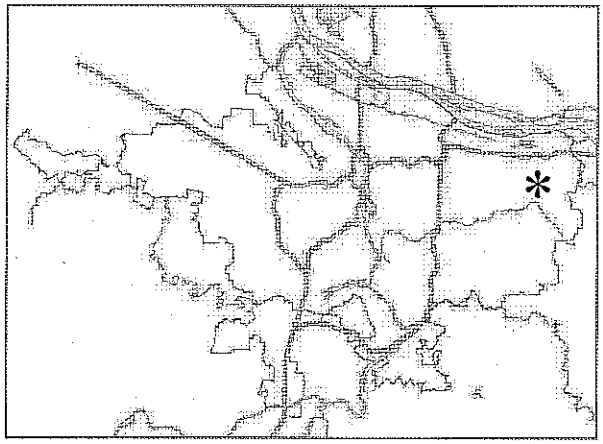
	Brewery Blocks
Transportation	-
Transit, Bike, Pedestrian	-
Sewer	-
Water	-
Stormwater	-
Parks	-
Other (See structured parking and other improvements, noted above)	$40,647,000
Total	$40,647,000

Note that, if all costs were related to job creation, the local infrastructure costs would average less than $17,000 per new job. Costs for regional transportation improvements attributed to the Brewery Blocks (not included above) are significantly lower than average, due to commute distances projected to 2035.

Civic Neighborhood

Gresham





Estimated local infrastructure capital costs: $11,606,000

Total acres:	5
Gross buildable acres:	5
Net new households:	636
Net new jobs:	2,433
Avg. commute miles in the year 2035:	11.13

Proposed Use

The City of Gresham intends the Civic Neighborhood, a redevelopment project, as an extension of its downtown. The area consists of a mix of residential, retail, and office uses served by transit. This case study area represents a 5 acre portion of the larger 130 acre Civic Neighborhood.

Existing Conditions and Planned Improvements – Civic Neighborhood

Transportation

The site is bisected by a light rail line and is served by four-lane major arterials and one local connector: Burnside Road, Division St., Eastman Parkway and the two-lane Wallula Road. Division St. was recently improved. The bulk of projected Civic Neighborhood infrastructure costs are attributable to transit ($6,194,000) and transportation ($3,413,000) improvements.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that includes Civic Neighborhood are forecasted to have an average commute distance of 11.13 miles in the year 2035, more than a mile less than the 7-county average of 12.32 miles.

Water
The site is integrated into Gresham's existing water infrastructure.

Wastewater
The site is integrated into Gresham's existing sewer infrastructure.

Stormwater
Stormwater is handled by existing City of Gresham infrastructure.

Parks, plazas, public places
Though there are no parks within the Civic Neighborhood area, it is being developed with a pedestrian orientation.

Existing facilities: Civic Neighborhood is able to take advantage of existing facilities, including streets, sewer and water.

How do Civic Neighborhood's infrastructure costs add up?

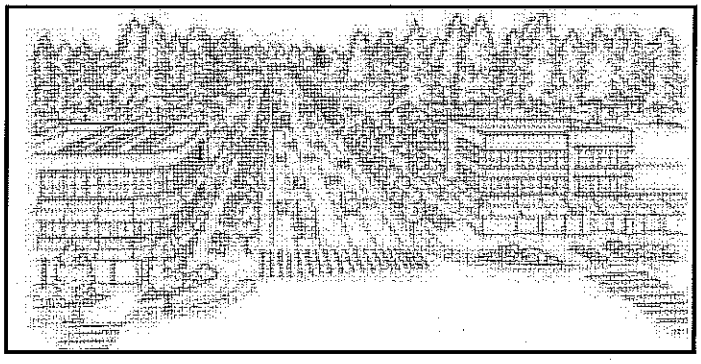
Estimated local infrastructure capital costs:

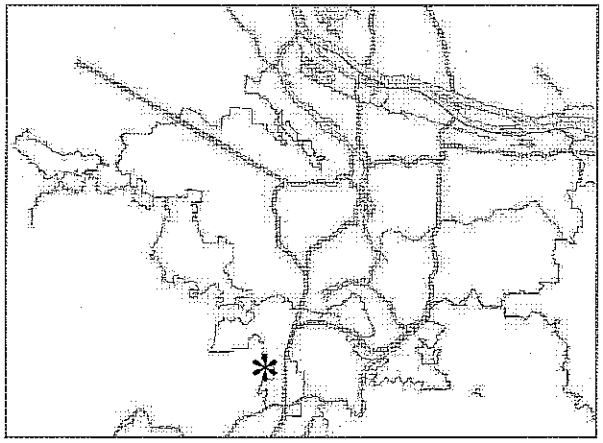
	Civic Neighborhood
Transportation	$3,413,000
Transit, Bike, Pedestrian	$6,194,000
Sewer	$366,000
Water	$266,000
Stormwater	$1,365,000
Parks	-
Other	-
Total	$11,606,000

Note that, even if all costs were related to job creation, the local infrastructure costs would average less than $5,000 per new job. More than 50% of all local infrastructure costs in the Civic Neighborhood are attributed to transit, bicycle, and pedestrian improvements. Costs for regional transportation improvements (not included above) are lower than average, due to commute distances projected to 2035.

Coffee Creek (1) master plan area

Wilsonville





Estimated local infrastructure capital costs:
$ 8,058,000

Total acres:	216
Gross buildable acres:	196
Net decrease in households:	10
Net new jobs:	1,474
Jobs per gross buildable acre:	7.5
Avg. commute miles in the year 2035:	12.82

Proposed Use

The Coffee Creek area is being planned as an employment area and is mapped as a Regionally Significant Industrial Area. Note that the area is planned to have no net increase in residential uses.

Existing Conditions and planned improvements – Coffee Creek

Transportation

The area is within 1/2 mile of the Wilsonville I-5 north interchange, with vehicle access via SW Lower Boones Ferry Road, Day Road and SW Grahams Ferry Road. There are few existing bicycle and pedestrian facilities and no transit service within the Coffee Creek Master Plan area. The closest transit stop is located nearby with a SMART bus line that provides stops along 95th Avenue and Commerce Circle (within ½ mile of the Master Plan area). West side commuter rail also provides service to the area. Over half of Coffee Creek's projected local infrastructure costs are attributable to transportation improvements ($4,518,000).

Commute distance

Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that includes Coffee Creek are forecasted to have an average commute distance of 12.82 miles in the year 2035. This distance is ½ mile longer than the average for the 7-county region (12.32 miles).

Water
Water main transmission supply lines exist through the central and southern portions of the Master Plan area. An additional reservoir will be needed at some point to provide adequate peak capacity prior to build out of the Master Plan area.

Wastewater
Sewer main trunk links are located within the central portion of the Coffee Creek Master Plan area. Site survey work will need to occur and the City will need to update its sewer system model to determine on and offsite sewer system improvements and trunk line size/location, pump station requirements, and more detailed cost estimates.

Stormwater
The north tributary to Basalt Creek is located south of Day Road. Basalt Creek drains into Coffee Creek Lake and extends north of Day Road into the City of Tualatin UGB. The master plan area is relatively flat with topography that varies only a few feet in elevation, and gently slopes from north to south. The City requires each new development within the Coffee Creek Industrial Master Plan area to detain and treat run off.

Parks, plazas, public places
There are no existing park facilities within the Master Plan area.

How do Coffee Creek's infrastructure costs add up?

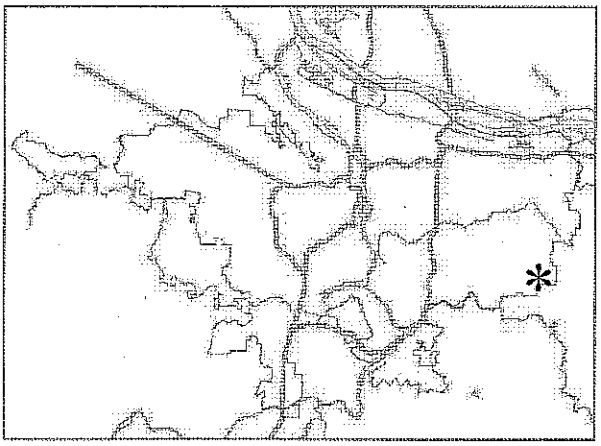
Estimated local infrastructure capital costs:

	Cost per job	Totals
Transportation	$3,065	$4,518,000
Transit, Bike, Pedestrian	-	-
Sewer	$1,038	$1,530,000
Water	$773	$1,140,000
Storm	$204	$300,000
Parks	$387	$570,000
Other	-	-
Total	$5,467	$8,058,000

Note that all costs are related to job creation. The local infrastructure costs are projected to average less than $5,500 per new job. More than 55% of all local infrastructure costs in the Coffee Creek area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly higher than average, due to commute distances projected to 2035.

Damascus / East Happy Valley Concept Plan

Damascus and Happy Valley



Estimated local infrastructure capital costs:
$3,119,295,000

Total acres:	12,200
Gross buildable acres:	5,739
Net new households:	21,934
Net new jobs:	45,000
Avg. commute miles in the year 2035:	13.5

Proposed Use

The Damascus area is a newly urbanizing area, and is being planned as a new community that will include a variety of housing densities, mixed-use areas, and employment zones. The study area includes both the City of Damascus and some land in eastern Happy Valley. The concept plan has not yet been adopted. With estimated local infrastructure capital costs totaling more than $3 billion, it is easy to see why creating a new city is so difficult.

Existing Conditions and planned improvements -- Damascus

Transportation

The area is served by a transportation system that was designed for farm-to-market travel purposes. The street system is primarily made up of narrow, two-lane roads that carry urban levels of traffic. Highway 212, 172nd Avenue, Foster Road, 242nd Avenue, 222nd Avenue and Sunnyside Road are the primary routes that connect the communities of Damascus and Boring to other parts of the region. Some roads perform adequately during rush hour, but significant congestion and safety issues exist in the current Damascus city center (where Sunnyside, Highway 212, and Foster Road converge). Streets do not have bicycle and pedestrian facilities, except for sidewalks along limited sections of Highway 212 in the Damascus and Boring rural centers. Transit service is limited to two bus lines; a park-and-ride lot is located in Carver. The majority of the study area is located outside of the TriMet service

boundary. $1,731,623,000 of the projected local infrastructure costs for Damascus are for transportation improvements. Regional transportation facilities (Sunrise Hwy) have not been included in the cost estimates.

Commute distance: Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tracts that comprise the Damascus area are forecasted to have an average commute distance of 13.5 miles in the year 2035. This distance is more than a mile longer than the average for the 7-county region (12.32 miles).

Water
Two water districts, the Boring Water District and the Sunrise Water Authority, serve portions of the study area. Substantial portions of the area have no public water service.

Wastewater
Most of the primary study area has no sanitary sewer service. Only the far eastern edge of Damascus (Rock Creek corridor) has sanitary service. There are no sanitary sewage treatment facilities within the primary study area. There is a small, publicly-owned sanitary sewage treatment facility in the Boring rural center, but it is not available for additional hook-ups.

Stormwater
There is no existing public stormwater service in the study area.

Parks, plazas, public places
North Clackamas County contains a wide range of regional, state and county parks and recreation facilities. Metro owns a parcel in the Damascus Buttes area. Clackamas County, the City of Portland, and the state own the right-of-way for the Cazadero and Springwater trails, which are currently undeveloped. Clackamas County provides parks near the study area, including Barton Park, a 116-acre county recreation facility located along the Clackamas River.

Topography / natural features: Buttes and transition areas (15-25% slopes) cover large portions of the Damascus area. Riparian areas are also found throughout the concept plan area. These features reduce average densities, making each unit more expensive to serve. The topography is expected to split the wastewater system to the east and to the west, resulting in increased cost of collection and conveyance. Existing treatment facilities are located some distance from the urban centers.

How do Damascus' infrastructure costs add up?

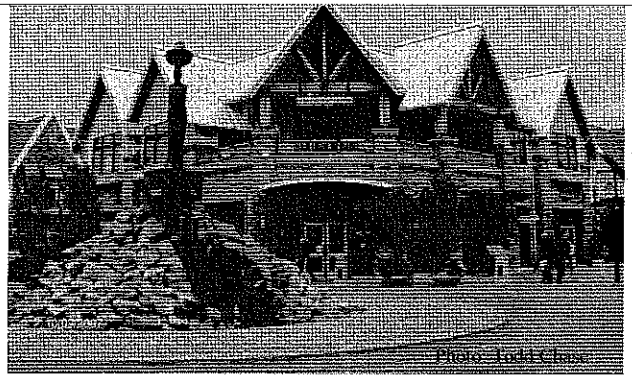
Estimated local infrastructure capital costs:

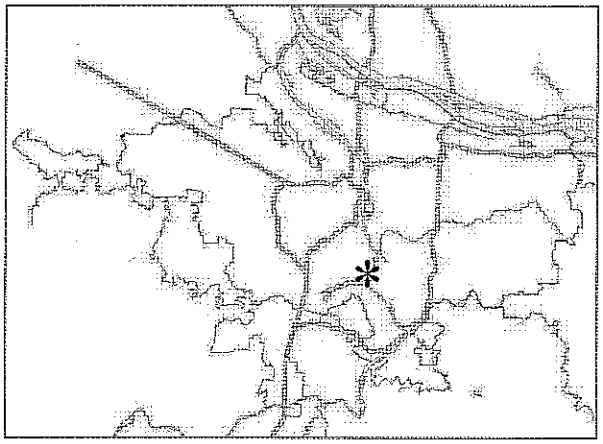
	Damascus
Transportation	$1,731,623,000
Transit, Bike, Pedestrian	-
Sewer	$162,200,000
Water	$282,843,000
Stormwater	$75,712,000
Parks	$390,203,000
Other	$476,674,000
Total	$3,119,295,000

Note that costs are related to both new housing and job creation. More than 55% of all local infrastructure costs in the Damascus area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly higher than average, due to commute distances projected to 2035.

Lake View Village Center

Lake Oswego





Estimated local infrastructure capital costs: $5,116,000

Total acres:	2.39
Gross buildable acres:	2.39
Net new households:	0
Net new jobs:	207
New jobs per gross buildable acre:	86.6
Avg. commute miles in the year 2035:	8.83

Proposed Use (project completed)

Lake View Village Center is a redevelopment project that includes mixed uses (restaurant, retail, office) with structured parking. Although the Lake View Village Center development included no housing units, this commercial development has stimulated the construction of numerous housing units on surrounding blocks. The focus has been on job creation, and on stimulating new development in the rest of downtown Lake Oswego. The land uses resulting from redevelopment of this area are completely interconnected with surrounding land uses. This area has been able to take advantage of existing facilities, including sewer, water, parks, and streets.

Existing Conditions – Lake View Village Center

Transportation

An existing street network serves the area.

Commute distance: Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include Lake View Village are forecasted to have an average commute distance of about 8.83 miles in the year 2035, approximately 3 ½ miles less than the 7-county average of 12.32 miles

Water
Adequate water supply exists for the plan area.

Wastewater
Adequate sewer capacity exists in the plan area.

Stormwater
Adequate capacity to handle stormwater exists in the plan area.

Parks, plazas, public places
Millennium Plaza Park is adjacent to the project area.

Structured parking: Most of the local infrastructure costs are attributable to the construction of a structured parking garage which provides service to the subject area and to surrounding businesses.

How do Lake View Village's infrastructure costs add up?

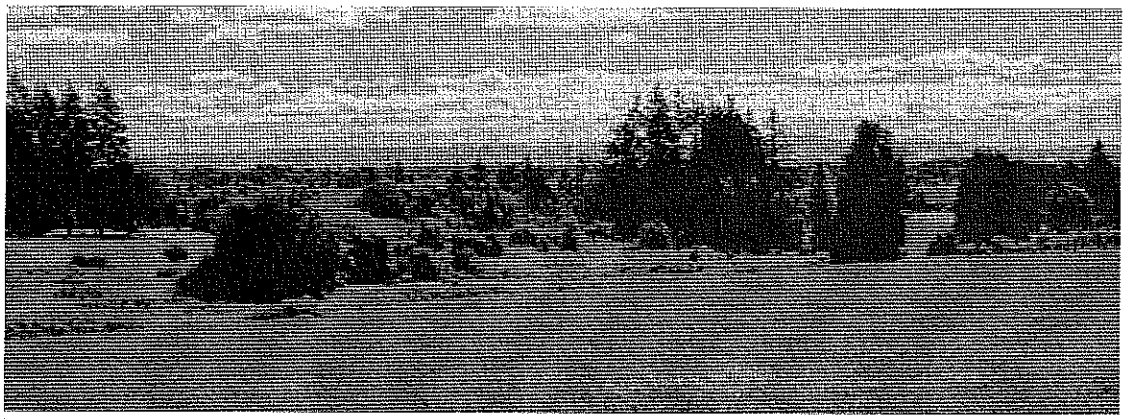
Estimated local infrastructure capital costs:

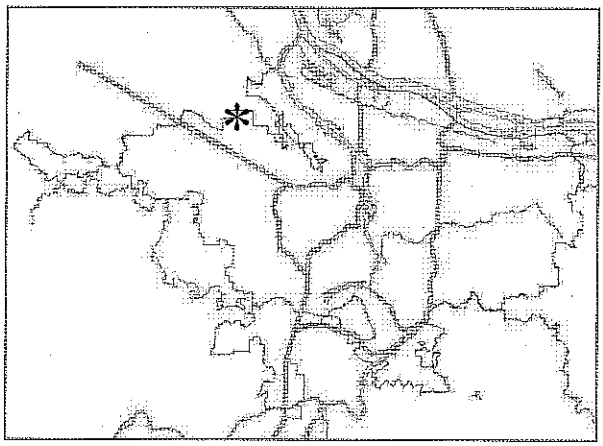
	Cost per job	Totals
Transportation	$3,850	$797,000
Transit, Bike, Pedestrian	-	-
Sewer		
Water		
Storm		
Parks		
Other	$20,865	$4,319,000
Total	$24,715	$5,116,000

Note that all costs are related to job creation. The local infrastructure costs averaged almost $25,000 per new job. More than 80% of all local infrastructure costs in the Lake View Village development are attributed to the construction of a public parking structure. Costs for regional transportation improvements (not included above) are considerably lower than average, due to average commute distances projected to 2035.

North Bethany concept planning area

Washington County





Estimated local infrastructure capital costs:
$416,633,000

Total acres:	800
Gross buildable acres:	680
Net new households:	5,000
Net new jobs:	276
Avg. commute miles in the year 2035:	11.92

Proposed Use

The North Bethany area is a newly urbanizing area that is being planned as a primarily residential community with ancillary commercial and institutional uses.

Existing Conditions and planned improvements – North Bethany

Transportation

Major transportation facilities in the vicinity of the plan area include Springville Rd., Kaiser, 185th, and Germantown Rd. There is bus service on Springville, 185th, and Kaiser. The Concept Plan includes costs for off-site improvements (Bethany Blvd. / US 26 overpass). Those costs have not been included in North Bethany's local infrastructure costs since they are regional facilities.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that comprises North Bethany are forecasted to have an average commute distance of 11.92 miles in the year 2035, slightly lower than the 7-county average (12.32 miles).

Water
The current source of water in the concept area is private wells. When developed, the area will be served by Tualatin Valley Water District.

Wastewater
Wastewater is currently handled on-site through the use of septic systems.

Stormwater
Stormwater runoff from the project site follows the natural topography, and is generally managed by several stream channels and culverts. The western end of the project site drains directly to Rock Creek. The remainder of the site is the headwaters of small drainages that are tributaries to Abbey Creek and Bethany Creek.

Topography and natural areas
The North Bethany area is relatively flat with the exception of the northern portion, which is sloped. A number of riparian zones cross the area.

Parks, plazas, public places
Though there are a number of open spaces, trails, and parks in the vicinity, there are no such areas that currently exist within the concept plan area. Envisioned as a "Community of Distinction," the North Bethany Concept Plan projects significant amounts of parkland ($38,700,000 estimated cost). These parks would match the level-of-service standards of the Tualatin Hills Park and Recreation District.

Schools: North Bethany's local infrastructure costs include the construction of 3 schools ($90 -$111 million). These projected costs include both land purchase and school construction.

How do North Bethany's infrastructure costs add up?

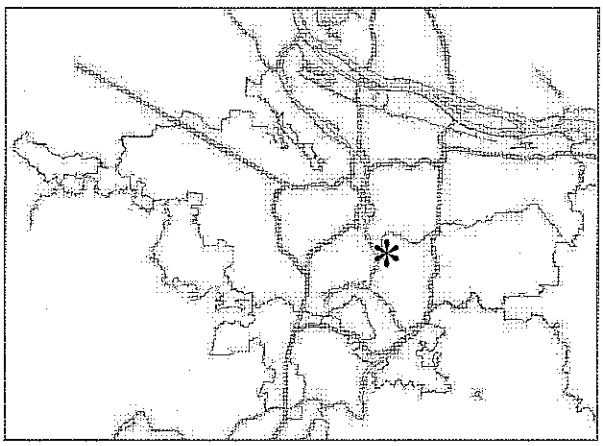
Estimated local infrastructure capital costs:

	North Bethany
Transportation (including Transit, Bike, Pedestrian)	$170,460,000
Sewer	$14,602,000
Water	$16,873,000
Stormwater	$14,926,000
Parks	$41,858,000
Other (schools, fire station and civic building)	$157,914,000
Total	$416,633,000

Note that, if all costs were related to housing, the local infrastructure costs would average about $83,500 per housing unit. More than 40% of all local infrastructure costs in the North Bethany area are attributed to transportation improvements. Washington County also calculated an additional $23,000,000 cost in providing affordable housing and another $131,300,000 in off-site transportation improvements (not included above). Costs for regional transportation improvements (not included above) are slightly lower than average, due to commute distances projected to 2035.

North Main Village

Milwaukie



Estimated local infrastructure capital costs
$ 919,000

Total acres:	1.9
Gross buildable acres:	1.9
Net new households:	95
Net new jobs:	40
Avg. commute miles in the year 2035:	7.99

Proposed Use (completed)

North Main Village is a redevelopment project located in downtown Milwaukie that consists of three-story townhomes, each with a garage and ground floor commercial element with two stories of living space above. The project also includes twenty condominium units.

Existing Conditions – North Main Village

Transportation

North Main Village's location in an already urbanized setting affords it access to existing transportation facilities including the Milwaukie Transit Center. However, transportation improvements are necessary to serve the area's growth.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that includes North Main Village are forecasted to have an average commute distance of 7.99 miles in the year 2035, considerably lower than the 7-county average of 12.32 miles. This is expected to reduce regional infrastructure costs over time.

Water
Existing water facilities are sufficient to serve North Main Village.

Wastewater
Existing wastewater facilities are sufficient to serve North Main Village.

Stormwater
Existing stormwater facilities are sufficient to serve North Main Village.

Parks, plazas, public places
North Main Village has no on-site parks, but a number of parks are nearby: Milwaukie Riverfront Park, Scott Park, and Dogwood Park.

Land write-downs
About $108,000 is attributable to land write-downs (included in "other" costs).

How do North Main Village's infrastructure costs add up?

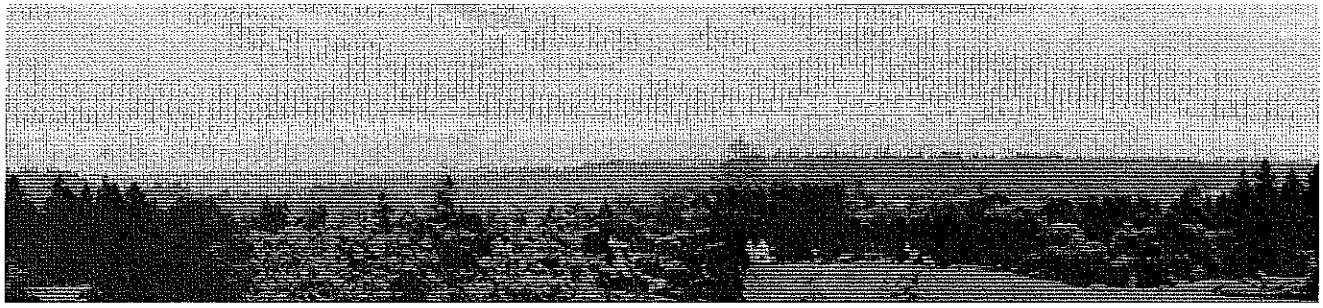
Estimated local infrastructure capital costs:

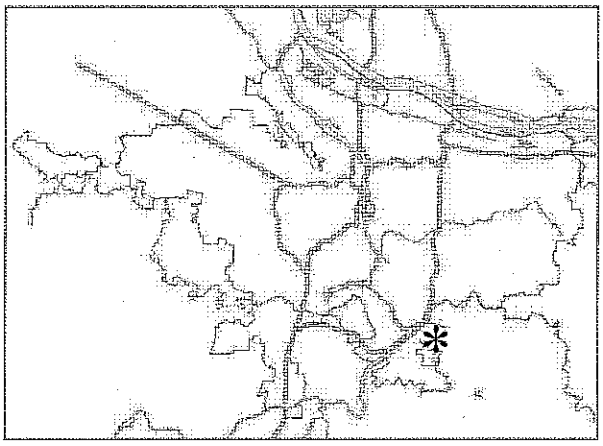
	North Main Village
Transportation	$811,000
Transit, Bike, Pedestrian	-
Sewer	-
Water	-
Stormwater	-
Parks	-
Other	$108,000
Total	$919,000

More than 88% of all local infrastructure costs in the North Main Village area are related to transportation improvements. Costs for regional transportation improvements (not included above) are significantly lower than average, when compared to commute distances projected to 2035.

Park Place concept planning area

Oregon City





Estimated local infrastructure capital costs:
$ 71,760,000

Total acres:	480
Gross buildable acres:	266
Net new households:	1,458
Net new jobs:	0
New households per gross buildable acre:	5.48
Avg. commute miles in the year 2035:	12.27

Proposed Use

Park Place is a newly urbanizing area, planned as a residential community with neighborhood retail and service uses. A developer has been consolidating ownership of over half of the plan area. It is hoped that ownership consolidation will simplify the provision of public facilities.

Existing Conditions and planned improvements – Park Place

Transportation

Isolated portions of the roadway system experience congestion and delays. The Highway 213 corridor is approaching capacity, particularly on the segment between Redland Road and the I-205 interchange. The public transit system provides limited service to this low-density, suburban location. The bicycle and pedestrian systems are incomplete, but plans exist to make incremental improvements. Park Place's transportation costs are projected to be $58,400,000, and make up the bulk of its local / community level infrastructure costs.

Commute distance

Travel distances correlate to more regional infrastructure needed per household. Park Place residents are forecasted to have an average commute distance of 12.27 miles in the year 2035. This distance is about average for the 7-county region (12.32 miles).

Water

Water conveyance facilities are limited within the study area. The Oregon City water system has sufficient water supply to serve the study area.

Wastewater
Limited wastewater collection facilities exist within the study area. Most properties are on septic systems. Two trunk interceptor lines, owned by the Tri-City Sewer District, pass through the study area. These interceptors connect with the Highway 213/ Newell interceptor, which conveys their flows to the wastewater treatment plant. These interceptors and the treatment plant have capacity to serve future development within the study area.

Stormwater
Stormwater is currently managed with roadside ditches and natural drainage channels. No other major stormwater facilities exist on site. All stormwater within the study area is conveyed to Abernethy Creek, Newell Creek, and Livesay Creek. Abernethy Creek and Newell Creek are subject to occasional flooding.

Topography / natural features
Large portions of the Park Place concept area have limited development potential because of constraints such as steep slopes and wetlands. These natural features provide valuable site amenities.

Parks, plazas, public places
Clackamas County and Metro own open spaces within the concept plan area.

How do Park Place's infrastructure costs add up?

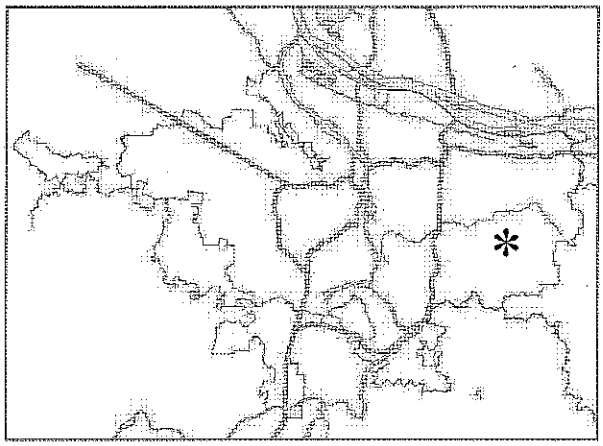
Estimated local infrastructure capital costs:

	Cost per housing unit	Totals
Transportation	$40,055	$58,400,000
Transit, Bike, Pedestrian	-	-
Sewer	$3,780	$5,520,000
Water	$2,606	$3,800,000
Storm	$562	$820,000
Parks	$2,209	$3,220,000
Other	-	-
Total	$49,218	$71,760,000

Note that all costs are related to new housing. The local infrastructure costs are projected to average more than $49,000 per housing unit. More than 80% of all local infrastructure costs in the Park Place area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are about average, due to commute distances projected to 2035.

Pleasant Valley concept planning area

Gresham and Portland



Estimated local infrastructure capital costs: $304,073,000

Total acres:	1,530
Gross buildable acres:	1,071
Net new households:	4,926
Net new jobs:	4,935
Avg. commute miles in the year 2035:	10.8

Proposed Use

Pleasant Valley is a newly urbanizing area that is planned with a town center, residential neighborhoods, and employment zones. Of the total planning area, approximately 290 acres are within the City of Portland.

Existing Conditions and Planned Improvements – Pleasant Valley

Transportation
Foster Blvd., a two-lane rural road, is the main road that currently provides access to the area.

Commute distance
Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that comprise the Pleasant Valley area are forecasted to have an average commute distance of about 10.8 miles in the year 2035, lower than the 7-county average (12.32 miles).

Water
The area is primarily served by private wells.

Wastewater
Wastewater is handled with private septic systems.

Stormwater
Stormwater is currently directed to ditches along local roads.

Parks, plazas, public places
The Springwater Corridor, a regional trail, passes through the Pleasant Valley plan area. There are no other existing parks within the area, though there is open space associated with Pleasant Valley Elementary School (existing). About ¼ of Pleasant Valley's projected local infrastructure costs are attributable to parks ($70,186,000).

Topography
The Pleasant Valley area is mostly flat, but has a number of riparian areas.

Green practices
Most of the streets will be green streets. All stream crossings will use bridges (no culverts).

How do Pleasant Valley's infrastructure costs add up?

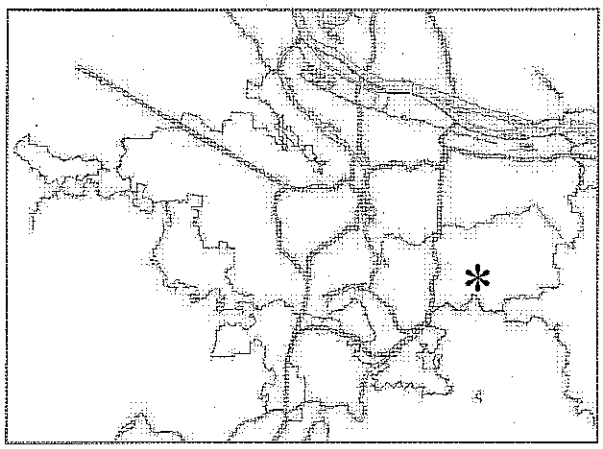
Estimated local infrastructure capital costs:

	Pleasant Valley
Transportation	$103,823,000
Transit, Bike, Pedestrian	-
Sewer	$22,686,000
Water	$21,172,000
Stormwater	$32,213,000
Parks	$70,186,000
Other	$53,993,000
Total	$304,073,000

Note that costs are related to a mix of new housing and new jobs. Approximately 34% of all local infrastructure costs in the Pleasant Valley area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly lower than average, when compared to commute distances projected to 2035.

Rock Creek concept planning area

Happy Valley



Estimated local infrastructure capital costs
$ 48,796,000

Total acres:	670
Gross buildable acres:	357
Net new households:	2,815
Net new jobs:	619
Avg. commute miles in the year 2035:	10.72

Proposed Use

Rock Creek is a newly urbanizing area that is planned for residential, mixed-use, and employment uses.

Existing Conditions and Planned Improvements – Rock Creek

Transportation
Two-lane rural roads with soft shoulders and roadside drainage ditches are typical in the plan area. Approximately 2/3 of Rock Creek's local infrastructure costs are attributable to transportation improvements ($33,576,000). Roads, including Sunnyside Road, and 147th Avenue, have been improved to urban standards to provide multimodal access.

Commute distance
Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include the Rock Creek area are forecasted to have an average commute distance of 10.72 miles in the year 2035, less than the 7-county average (12.32 miles).

Water
Two wells and water from the Clackamas River supply the area. According to the Mt. Scott Water District, all necessary facilities are in place for any new developments in the planning area with the exception of a 12" water line for the higher areas.

Wastewater
There are three points of connection to the existing sewer system. There will need to be additional pumps installed in order to get the effluent to a point where a gravity flow system will work.

Stormwater
Storm drainage in the area is mostly over land, with some culverts under existing roads and ditches running alongside these roads. The area is split into two drainage areas that flow into Rock Creek and Sieben Creek.

Parks, plazas, public places
The area does not have any existing parks.

Topography
The Rock Creek area has slopes to the north (over 30% slopes) and Rock Creek and its tributaries flow through the area. South of Sunnyside Road, the area is relatively flat.

How do Rock Creek's infrastructure costs add up?

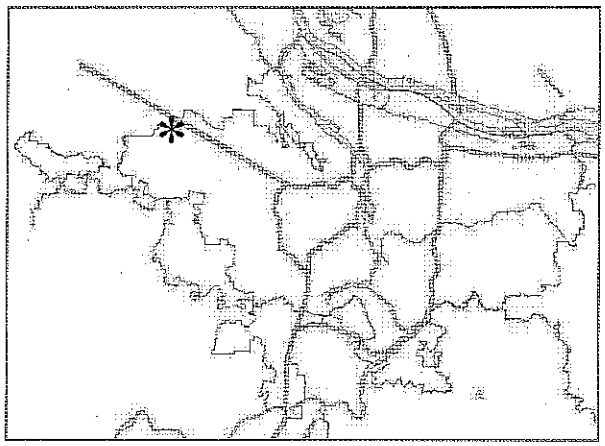
Estimated local infrastructure capital costs:

Transportation	$33,576,000
Transit, Bike, Pedestrian	-
Sewer	$1,076,000
Water	$3,185,000
Stormwater	$4,664,000
Parks	$6,295,000
Other	-
Total	$48,796,000

Note that most costs are related to housing. Almost 70% of all local infrastructure costs in the Rock Creek area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly lower than average, when compared to commute distances projected to 2035.

Shute Road concept planning area

Washington County



Estimated local infrastructure capital costs:
$ 9,136,000

Total acres:	215
Gross buildable acres:	175
Net new households:	0
Net new jobs:	3,660
New jobs per gross buildable acre:	20.91
Avg. commute miles in the year 2035:	13.99

Proposed Use

The Shute Road concept area is a newly urbanizing area that is being planned to provide large lots for industrial uses. Genentech, an international biomedical manufacturer, has acquired nearly half of this site (85 acres). Genentech has developed phase 1 facilities and will provide 300-400 jobs in the first phase. Genentech has developed approximately 15% of the total planning area.

Existing Conditions and Planned Improvements – Shute Rd.

Transportation
The site is adjacent to the Shute Road exit of the Sunset Highway. Shute Road and Evergreen Road, both five-lane local connectors, intersect at the southwest corner of the site. Approximately 2/3 of local infrastructure cost for the Shute Road area is attributable to transportation improvements ($6,350,000).

Commute distance
Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that comprises the Shute Rd. area are forecasted to have an average commute distance of 13.99 miles in the year 2035, longer than the 7-county average (12.32 miles).

Water
Water mains run along Shute Road and Evergreen Road, adjacent to the site.

Wastewater
There are currently no sanitary lines running though the site. One trunk line runs up Evergreen Road to the corner of the site and another line dead-ends into Shute Road near the center of the site.

Stormwater
Storm lines parallel water lines along Shute Road and Evergreen Road.

Parks, plazas, public places
There are no existing public parks or green spaces within the site.

Topography
The Shute Rd. concept area is relatively flat with a small riparian area associated with Waibel Creek. The area around the creek is not considered to be wetland.

How do Shute Road's infrastructure costs add up?

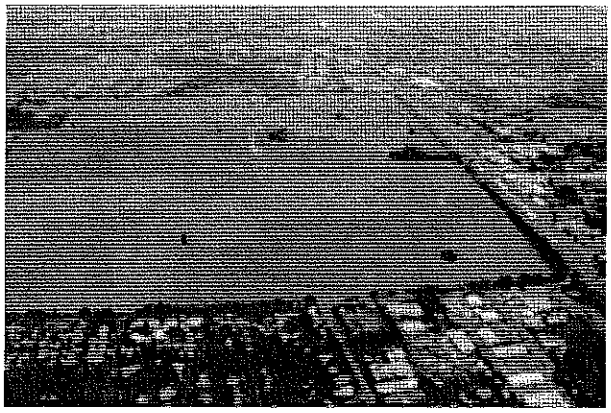
Estimated local infrastructure capital costs per new job:

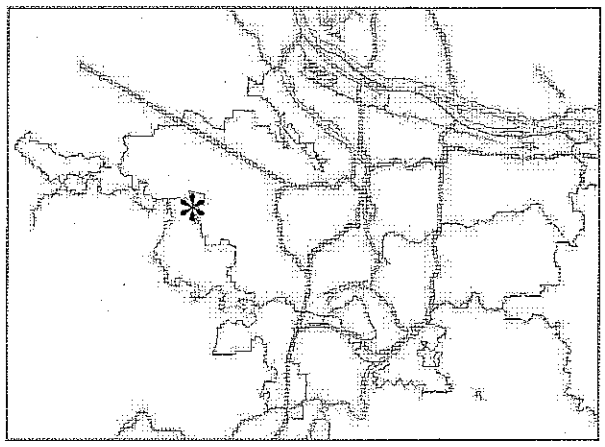
	Cost per job	Totals
Transportation	$1,735	$6,350,000
Transit, Bike, Pedestrian	-	-
Sewer	$264	$967,000
Water	$169	$619,000
Stormwater	$328	$1,200,000
Parks	$387	$570,000
Other	-	-
Total	$2,496	$9,136,000

Note that all costs are related to new job creation. Approximately 70% of all local infrastructure costs in the Shute Road area are attributed to transportation improvements. Roughly 13% of costs are for stormwater conveyance. Costs for regional transportation improvements (not included above) are slightly higher than average, when compared to commute distances projected to 2035.

South Hillsboro concept planning area

Hillsboro





Estimated local infrastructure capital costs:
$295,517,000

Total acres:	1,565
Gross buildable acres:	1,030
Net new households:	10,182
Net new jobs:	879
Avg. commute miles in the year 2035:	12.2

Proposed Use

South Hillsboro is an area that includes land both inside and adjacent to the Urban Growth Boundary. The concept plan for the area includes residential, retail, and office uses. Note that the area is planned to include roughly 11 ½ housing units for each new job.

Existing Conditions and Planned Improvements – South Hillsboro

Transportation

Current transportation facilities generally consist of two lane sections without curbs. Drainage crossings are primarily culverts with some minor retaining / transition structures. At-grade railroad crossings connect the study area to Tualatin Valley Highway.

Commute distance

Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that comprises the South Hillsboro area are forecasted to have an average commute distance of 12.2 miles in the year 2035, slightly less than the 7-county average.

Water
Existing 8" and 10" waterlines to the northwest of the study area provide distribution to current development in that area and will eventually be connected to the grid for the South Hillsboro planning area. An existing 42" transmission line is located at the south side of the railroad tracks along the north edge of the South Hillsboro planning area. Connection to this line will be made to serve south into the planning area.

Wastewater
A 24" trunk sewer in Davis Road extending from the River Road Pump Station to SW 234th Avenue is currently being constructed. The trunk sewer is designed to serve 525 acres, including a significant portion of the South Hillsboro planning area. Area 71 is within this service area. The Clean Water Services "Aloha Pump Station" on SW 209th Avenue near SW Stoddard Drive and the Cross Creek Pump Station further south on 209th Avenue near SW Murphy Lane can serve Area 69 of the South Hillsboro planning area.

Stormwater
Development to the west and north of the study area includes storm drainage conveyance, storage and treatment of the areas consistent with standards in place at the time of the respective land use action. Outfall from these systems is to natural drainage tributaries of the Tualatin River. Throughout the South Hillsboro planning area, ditches provide storm water management along roadways. Large agricultural tracts have surface ditches that direct flow to natural conveyances, including a number of creeks. No stormwater facility costs have been identified for the area.

Topography
The South Hillsboro area is relatively flat.

Parks, plazas, public places
The City of Hillsboro currently has no park or recreation facilities located within the South Hillsboro Community Plan Study Area. The Bonneville Power Administration right-of-way north of Tualatin Highway extends south into the study area and could accommodate a trail.

How do South Hillsboro's infrastructure costs add up?

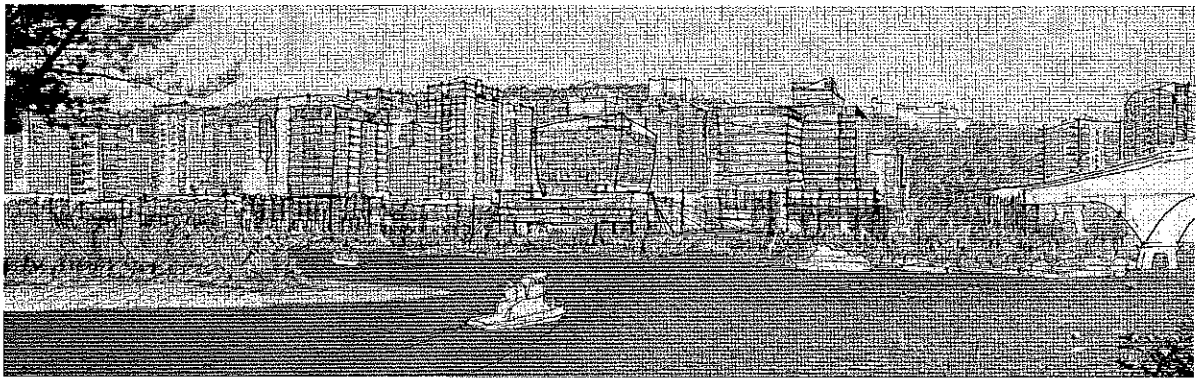
Estimated local infrastructure capital costs:

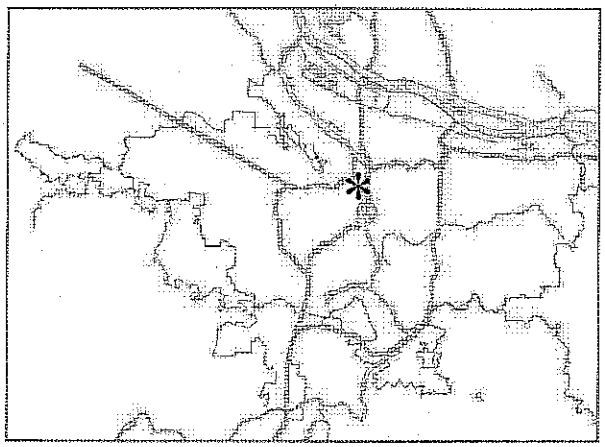
	South Hillsboro
Transportation	$203,057,000
Transit, Bike, Pedestrian	-
Sewer	$7,550,000
Water	$11,316,000
Stormwater	-
Parks	$56,894,000
Other	$16,700,000
Total	$295,517,000

Note that costs are related to both new housing and job creation. Approximately 69% of all local infrastructure costs in the South Hillsboro area are attributed to transportation improvements. No costs were projected for either schools or stormwater facilities. Costs for regional transportation improvements (not included above) are slightly lower than average, when compared to commute distances projected to 2035.

South Waterfront

Portland





Estimated local infrastructure capital costs:
$323,457,000

Total acres:	130
Gross buildable acres:	100
Net new households:	3,600
Net new jobs:	10,000
Avg. commute miles in the year 2035:	5.33

Proposed Use

The South Waterfront District offered a unique opportunity for redevelopment as it provided the largest block of vacant or underutilized land within the city's core. The district is being redeveloped with a mix of urban-scale offices, housing, hotels, parks and retail uses – with substantially more new jobs than housing units. The area is served by a multimodal transportation system and may serve as a transit hub for south downtown. Redevelopment in the district is meant to serve as a catalyst for the creation of a larger science and technology-based economy in the Central City.

Existing Conditions – South Waterfront

Existing facilities

South Waterfront is able to take advantage of existing streets, sewer, and water facilities. Most local / community costs are attributable to transportation ($148,445,000), transit / bike / pedestrian ($29,900,000), park ($92,553,000), and affordable housing requirements.

Transportation

Though the South Waterfront's central Portland location affords it extensive transportation connections, a substantial amount of redevelopment is contemplated.

Commute distance
Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include South Waterfront are forecasted to have an average commute distance of 5.33 miles in the year 2035, almost 7 miles shorter than the 7-county average of 12.32 miles. This is expected to significantly reduce regional infrastructure costs over time.

Water
Existing water facilities are sufficient to serve South Waterfront.

Wastewater
Existing sewer facilities are sufficient to serve South Waterfront.

Stormwater
Upgrades to the areas stormwater system will be necessary to serve the planned development.

Parks, plazas, public places
There is a park within the plan area. The plan also includes the restoration of the Willamette River Greenway through the site. Given the area's central location, numerous parks and trails are in the vicinity.

How do South Waterfront's infrastructure costs add up?

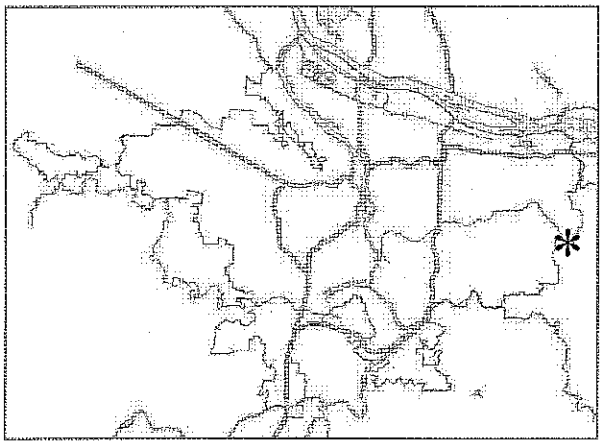
Estimated local infrastructure capital costs:

	South Waterfront
Transportation	$148,445,000
Transit, Bike, Pedestrian	$29,900,000
Sewer	-
Water	-
Stormwater	$710,000
Parks	$92,553,000
Other	$51,850,000
Total	$353,457,000

Note that costs are related to both new housing and job creation. Approximately 46% of all local infrastructure costs in the South Waterfront area are attributed to transportation improvements, with 29% for parks and open spaces. Costs for regional transportation improvements (not included above) are significantly lower than average, when compared to commute distances projected to 2035.

Springwater Community Plan

Gresham



Estimated local infrastructure capital costs
$375,791,000

Total acres:	1,272
Gross buildable acres:	762
Net new households:	1,609
Net new jobs:	15,330
Avg. commute miles in the year 2035:	12.82

Proposed Use

The Springwater area is a newly urbanizing area that is planned for industrial/high-tech campuses. To augment the mixed-use theme of the City as a whole, a village center with mixed retail and housing, and low-density residential development are also planned for areas too sloped for industrial use.

Existing Conditions and Planned Improvements -- Springwater

Transportation

The existing transportation system was designed primarily to serve rural residential and farm-to-market uses. The arterials are generally fast moving with most intersections either having no traffic control or only stop signs. Highway 26 is the major thoroughfare that traverses the study area, connecting Gresham with both Portland (to the west) and Sandy (to the southeast). Hogan Road/242nd Avenue also provides a north/south connection through the western portion of Springwater. Almost 2/3 of the projected local infrastructure costs ($237,231,000) for the Springwater area are attributable to transportation improvements.

Commute distance
Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that includes the Springwater area are forecasted to have an average commute distance of 12.82 miles in the year 2035. This distance is ½ mile longer than the average for the 7-county region (12.32 miles).

Water
The area has no public water system. Private wells currently serve the area.

Wastewater
The area has no public sewer system. Waste is directed to private septic systems.

Stormwater
The area has no public stormwater system. Stormwater is directed to creeks and to drainage ditches along roads.

Parks, plazas, public places
The area has no public parks, but is bisected by the Springwater Corridor, a regional trail that connects Portland to Boring.

Topography / natural features
With the exception of its western portion, the Springwater area is relatively flat. The sloped, western portion of the area is planned for low-density residential development. The concept area also has a number of riparian areas. These features reduce average densities, making the area more expensive to serve, but may enhance property values.

How do Springwater's infrastructure costs add up?

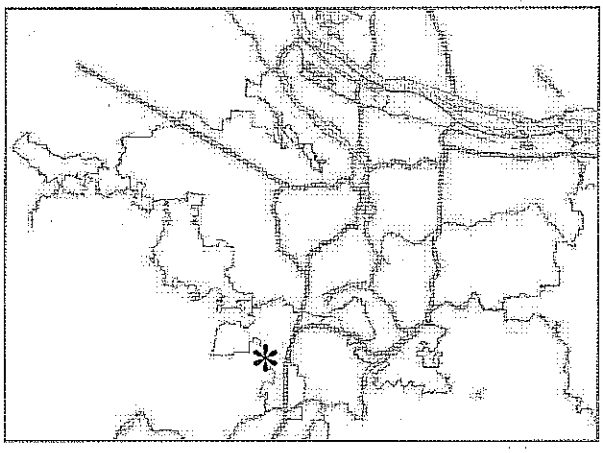
Estimated local infrastructure capital costs:

	Springwater
Transportation	$237,231,000
Transit, Bike, Pedestrian	-
Sewer	$28,894
Water	$35,032
Stormwater	$29,993
Parks	$44,642
Other	-
Total	$375,791,000

Note that costs are related primarily to job creation. Approximately 68% of all local infrastructure costs in the Springwater area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly higher than average, when compared to average commute distances projected to 2035.

SW Tualatin Concept Plan

Tualatin



Estimated local infrastructure capital costs
$ 60,628,000

Total acres:	431
Gross buildable acres:	352
Net new households:	0
Net new jobs:	5,760
New jobs per gross buildable acre:	16.36
Avg. commute miles in the year 2035:	12.36

Proposed Use

SW Tualatin is a newly urbanizing area that is planned for industrial uses. Note that no residential uses are planned in this area.

Existing Conditions and Planned Improvements – SW Tualatin

Transportation

SW Tualatin-Sherwood Road, SW 115th Avenue and SW 120th Ave to the north and SW Tonquin Road and SW Waldo Way to the south serve the SW Tualatin concept area. A future SW 124th Avenue arterial connection is planned to connect Tualatin-Sherwood Road with SW Tonquin Road, and is expected to become a primary point of vehicle access in the future. This connection would be regarded as a community level facility as it would serve both Tualatin and Sherwood. SW 115th Avenue will serve as a secondary north-south access between SW Tualatin-Sherwood Road and SW Tonquin Road. A railroad line boarders the east boundary of the study area.

A substantial portion of the projected local infrastructure costs for SW Tualatin are attributable to transportation improvements. Since the writing of the concept plan, estimated costs for 124th Avenue have gone up significantly. Other transportation projects have also increased in cost since 2005, including SW 115 Avenue, SW Blake Street, SW 120 Avenue, Tonquin Road and Waldo Way. Tualatin now anticipates dividing a portion of those transportation costs with the county and state.

Commute distance

The SW Tualatin area is forecasted to have an average commute distance of 12.36 miles in the year 2035, roughly the same as the 7-county average (12.32 miles).

Water

No public water lines currently serve the study area.

Wastewater

No sanitary sewer system of adequate size to serve the proposed development exists on or near the study area.

Stormwater

No storm water system exists within the study area. The plan area rises gradually in elevation. Drainage is imperfect, but generally toward the north and toward the south, with a break point at approximately the middle of the Concept

Plan area. Drainage in the northern portion around and in the quarry infiltrates through the fragmented basalt. Drainage to the south flows toward Coffee Lake Creek/Seely Ditch, which flows to the Willamette River.

Parks, plazas, public places

There are no existing parks within the concept area. However, there are long-term plans for a regional trail that would follow the Bonneville Power Administration easement through the area. Additionally, a forested area is envisioned west of a railroad line located in the eastern boundary of the study area to create a transition from residential to industrial uses.

How do S.W. Tualatin's infrastructure costs add up?

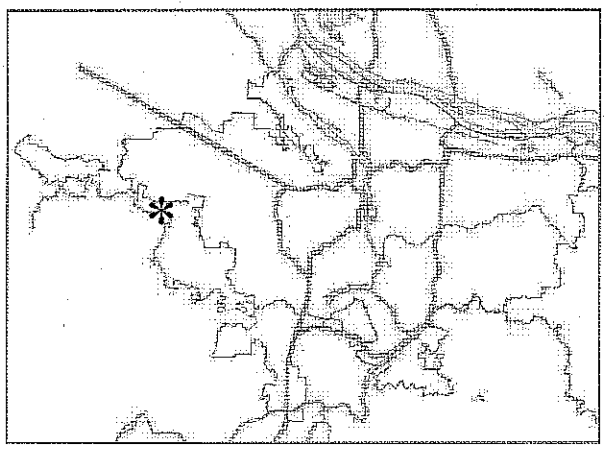
Estimated local infrastructure capital costs:

	Cost per job	Totals
Transportation	$7,147	$41,168,000
Transit, Bike, Pedestrian	-	-
Sewer	$1,680	$9,674,000
Water	$1,601	$9,224,000
Stormwater	$98	$562,000
Parks		
Other	-	-
Total	$10,526	$60,628,000

Note that all costs are related to job creation. Approximately 68% of all local infrastructure costs in the S.W. Tualatin area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are about average, when compared to commute distances projected to 2035.

Witch Hazel concept planning area

Hillsboro



Estimated local infrastructure capital costs:
$39,559,000

Total acres:	318
Gross buildable acres:	270
Net new households:	2,000
Net new jobs:	0
New households per gross buildable acre:	7.41
Avg. commute miles in the year 2035:	12.20

Proposed Use

Witch Hazel is a newly urbanizing area that is planned as a residential community with eventual mixed-use zones. At this time, however, the concept plan lists only new residential units in the area.

Existing Conditions and Planned Improvements – Witch Hazel

Transportation

Direct north-south access to the Witch Hazel Village plan area is provided by three county roadways: SW River Road (along the western edge), SW 247th / Brookwood Avenue (at the center), and SW 234th/Century Boulevard (along the eastern edge); and east-west access is provided by one city roadway, SE Alexander Street (along the northern edge). Except for River Road, which has a bike lane, the roads are without sidewalks, curbs and bike/pedestrian infrastructure.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that comprises the Witch Hazel area are forecasted to have an average commute distance of 12.2 miles in the year 2035, slightly less than the 7-county average (12.32 miles).

Water

Current residents are on private well systems. Water service exists to the north of the area. When the plan area is annexed to the City and is urbanized, water will be supplied by the City of Hillsboro.

Wastewater

With the exception of the new Witch Hazel Elementary School (which has sewer service), all developed properties within the plan area are currently served by private septic systems. Sanitary sewer service exists to the north of the area.

Stormwater

The existing stormwater system within the plan area includes pipes/culverts, subsurface tiling, overland flow, natural swales, irrigation and roadway drainage ditches, all of which flow to Witch Hazel Creek or Gordon Creek, eventually draining to the Tualatin River.

Parks, plazas, public places
There are no existing public parks within the Witch Hazel Village plan area. However, Clean Water Services owns a wetland area in the northwest portion of the concept area.

Schools
There is an existing public school in the area. Note that no capital costs for new school construction have been included in these estimates.

How do Witch Hazel's infrastructure costs compare to the regional average?

Estimated local infrastructure capital costs:

	Cost per housing unit	Totals
Transportation	$3,431	$6,862,000
Transit, Bike, Pedestrian	-	-
Sewer	$4,638	$9,275,000
Water	$4,288	$8,575,000
Stormwater	$5,118	$10,236,000
Parks	$2,306	$4,612,000
Other	-	-
Total	$19,780	$35,559,000

Note that all costs are related to new housing. Approximately 71% of all local infrastructure costs in the Witch Hazel area are attributed to a combination of sewer, water and stormwater improvements. Costs for regional transportation improvements (not included above) are about average, when compared to commute distances projected to 2035.

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DRAFT: July 15, 2009

Risk Analysis: UGB Expansion

Outcome	Less expansion	More expansion
Vibrant communities	• Redevelopment does not occur at expected rates • Increased cost per square foot of building (either residential or employment)	• Dilution of investments in centers and corridors • Future market demand in UGB expansion areas diminishes (potential causes could include demographic shifts, escalating fuel prices, or changing tastes) • Value of existing homes and neighborhoods is undercut •
Sustained economic competitiveness and prosperity	• Inadequate funding for upgrades, maintenance and operations of existing infrastructure compromises the region's ability to accommodate growth • Loss of potential employers seeking large sites • Potential for higher cost of doing business if local expansion requires increased building intensity	• Inadequate funding for new urban services and facilities renders UGB expansions ineffective • Loss of local farms leads to decreased food security, impacts important agricultural industry • Expansion areas intended for industrial use get used for commercial or residential purposes • Loss of region's "brand" that attracts a talented workforce and employers
Safe and reliable transportation choices	• Traffic congestion due to increased development in existing communities	• Traffic congestion, particularly on longer commutes to newly urbanized areas • Less compact urban form makes it more difficult to provide transit
Minimize contributions to global warming	• Failure to satisfy the housing preferences of a segment of the market displaces growth to Clark County and neighboring cities, increasing automobile reliance.	• Dispersed urban form results in increased automobile dependence • Large houses and longer auto travel increase CO2 emissions
Clean air, clean water and healthy ecosystems	• Increased pressure on urban greenspaces for development	• Fragmentation of habitat • Increase in impervious surface coverage causes irreversible damage to rivers and creeks • Land values in centers and corridors are undercut, resulting in less redevelopment and brownfield cleanup. Vacant and contaminated lots remain so.
Benefits and burdens of growth and change are distributed equitably	• Changes to existing neighborhoods (infill) are perceived as destructive to community	• Housing produced in expansion areas is typically too expensive for many households • UGB expansions intended to create a local jobs/housing balance fail to shorten commutes • Loss of sense of place

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Risk Analysis: Range population and employment forecast*

Outcome	Low forecast	High forecast
Vibrant communities	• Public investments in infrastructure and amenities don't keep pace with growth (e.g., parks)	• If policy solution is to add land, large UGB expansions could: o Increase price pressure on nearby agricultural lands, making profitable farming less viable o Detract attention and investments from the region's centers and corridors • If policy solution is to invest in existing communities, then more public money may be spent than necessary
Sustained economic competitiveness and prosperity	• Potential lost opportunities for economic development by planning for lower employment forecast	• If policy solution is to add land, expansions could result in land parcelization, taking land out of agricultural production • If policy solution is to invest in existing communities, then more public money may be spent than necessary
Safe and reliable transportation choices	• Public services, infrastructure and transportation facilities may be undersized, resulting in a decreased level of service and increased traffic congestion • Transportation rights-of-way may become more expensive if their purchase is postponed	• Infrastructure including transportation facilities may be overbuilt, adding financial costs • Expensive infrastructure investments could be made in locations that are not supported by future markets
Minimize contributions to global warming	• A portion of unexpected residential growth may occur in neighbor cities and Clark County, Washington. Past experience indicates that many of these households would commute back inside the Metro UGB, resulting in increased traffic congestion and increases in greenhouse gas emissions.	• If policy solution is to add land, VMT and travel time could increase which would result in increased greenhouse gas emissions
Clean air, clean water and healthy ecosystems	• Increased pressure on urban greenspaces for development	• If policy solution is to add land, construction of transportation facilities in expansion areas would increase impervious surface coverage and have a detrimental impact on rivers, streams and other bodies of water. Increase in impervious surface coverage causes irreversible damage to rivers and creeks
Benefits and burdens of growth and change are distributed equitably	• Increased housing prices if there is an undersupply of housing choices • A portion of unexpected residential growth may occur in established single-family neighborhoods inside the UGB • Current policies and trends are likely to result in an increase in cost-burdened households, even at low end of forecast	• Current policies and trends are likely to result in the number of cost-burdened households in the region almost doubles; six percent increase in cost burdened households

*Some of the risks of planning for either the high or low ends of the range forecast are mitigated by the fact that Metro is required to re-evaluate growth and capacity every five years, allowing for regular "course corrections."

*This analysis not targeted at 40/50 year choice for reserves timeframe.

Risk Analysis: Urban Reserves*

Outcome	Smaller Urban Reserves	Larger Urban Reserves
Vibrant communities	• Perception that long-term strategy will have negative effects in existing neighborhoods (e.g. higher densities) • Fewer choices of land for greenfield development • Decreased ability to create entirely new "complete communities" with best management practices • Decreased ability to site new parks and schools on greenfield sites	• Dilution of effort/investments in centers and corridors; more difficult to achieve community and regional aspirations following 2040 Growth Concept • Increase pressure to expand UGB every five years • Decreased separation from neighboring cities •
Sustained economic competitiveness and prosperity	• Decreased flexibility in future growth management decisions to choose lands matching particular needs • Reduced ability to site employers on greenfield sites •	• Inadequate funding for new urban services and facilities renders UGB expansions ineffective • Loss of region's "brand" that attracts a talented workforce and employers • Negative impacts on agriculture and forestry industries
Safe and reliable transportation choices	• Upon development, traffic congestion from increased development in existing communities •	• More difficult to proactively target infrastructure and investments • Increased infrastructure costs to serve all areas • Upon development, traffic congestion particularly on longer commutes from newly urbanized areas
Minimize contributions to global warming	• Long-term shift in development pattern to increase growth to Clark County and neighboring cities, increasing automobile reliance.	• Dispersed urban form results in increased automobile dependence, less use of transit, increasing CO2 emissions •
Clean air, clean water and healthy ecosystems	• Increased pressure on urban greenspaces for development • Potential increase in impervious surface in Metro region and neighboring cities	• Reduced protection of significant natural landscape features • Fragmentation of habitat and working farmland • Speculation in UR areas diminishes ability to farm
Benefits and burdens of growth and change are distributed equitably	• Changes to existing neighborhoods (infill) are perceived as destructive to community •	• Loss of sense of place • More difficult to target investments that benefit burdened communities •

* Independent of location and form of reserves (i.e., bands, buffers, "blobs")

*Urban reserve size does not necessarily imply rural reserve size (large urban reserves could be accompanied by either large or small rural reserves)

Risk Analysis: Rural Reserves*

Outcome	Smaller Rural Reserves	Larger Rural Reserves
Vibrant communities	• Decreased certainty of preservation of rural areas near urbanization •	• More critical to correctly target urban reserve designations now due to decreased ease of additional designations in future • More pressure on redevelopment strategy if urban reserves are smaller
Sustained economic competitiveness and prosperity	• Perceived reliance on undesignated areas for future needs rather than focus on existing areas • Perceived decrease in protection for agriculture/forest economy	• More difficult in future to add greenfield development sites
Safe and reliable transportation choices	• Perceived lack of protection of rural transportation corridors ("farm to market")	•
Minimize contributions to global warming	• Potential long-term loss of forest lands that play an important role in carbon cycle	• Risk of displacing growth over long-term to Clark Co. and neighboring cities, increasing CO2 emissions
Clean air, clean water and healthy ecosystems	• Perceived decreased protection of rural lands and resources	• Perceived increased protection for rural lands and resources
Benefits and burdens of growth and change are distributed equitably	• Increase pressure on non-reserve land for UR designations in future	• Perceived loss of future flexibility for rural landowners • Perception that Measure 49 claims would increase • Increased pressure to successfully target infrastructure and investments to burdened communities if urban reserves are smaller

* Independent of location and form of reserves (i.e., bands, buffers, "blobs")

Topic: infrastructure and investments

Group questions:

- Do you have a funding/investment strategy that allows you to achieve your aspirations? Why or why not?
- What proportion of your dollars will be spent in centers, corridors or employment areas vs. other areas?
- For those communities that want UGB expansions, what proportion of your dollars do you anticipate spending in those expansion areas?
- How do we link regional commitments to local aspirations and local commitments?
- How do we pay for infrastructure needed to achieve local aspirations?
- How can we use public investments to leverage private investments?

Background:

The *Regional Infrastructure Analysis* conducted in 2008 identified funding needs of between $27 and $41 billion for a broad range of infrastructure to upgrade current systems and accommodate new growth over the next 30 years. Currently available revenue sources can finance about half of that amount, leaving the region with an infrastructure funding gap of roughly $15-$20 billion. A series of development and redevelopment case studies have shown that the cost of infrastructure for all types of development is very high. The shortage of infrastructure finance is frequently cited as the reason little development has occurred in recent UGB expansion areas. The region's work on the UGR, the HCT Plan, and updating the RTP, as well as the local aspirations process have highlighted some of the kinds of local and regional investments we aspire to make.

Group decision:

Group's reasoning for decision:

Infrastructure finance



Regional infrastructure analysis

presented by Andy Shaw

Regional infrastructure analysis

- Identify the region's current and 2040 infrastructure needs
- Assess costs for a variety of infrastructure types
- Explore strategies and options

Infrastructure needs

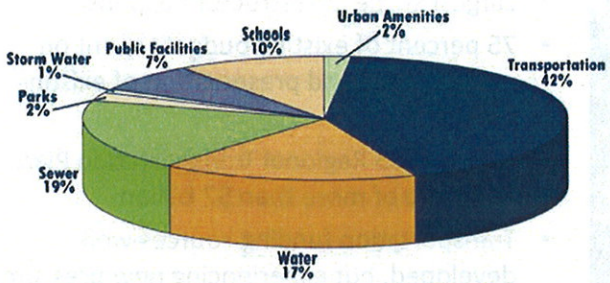
Vibrant communities require a range of infrastructure types:

- **Pipes, Pavement and Wires**: transportation, transit, sewer, water, stormwater and energy
- **Spaces and Structures**: urban parks and greenspaces, parking, schools, civic buildings and facilities (including police and fire stations, libraries, and plazas)

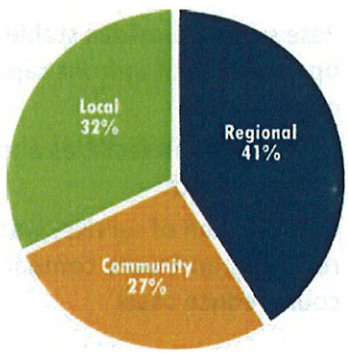
The region's challenge

- Significant deferred maintenance backlog
- Tens of billions in costs to expand capacity
- Existing funding mechanisms insufficient
  - Federal spending continuing decades-long decline
  - State investments declining
  - Local revenues limited
- 30-year population growth estimate: one million more residents in the 7-county region

Infrastructure needs



Infrastructure needs



Transportation

- Largest single infrastructure expense
- 75 percent of existing budgets spent on maintenance and preservation of existing assets
- Metro 2035 Regional Transportation Plan has a gap of more than $7 billion
- Transportation funding sources well developed, but experiencing new pressures

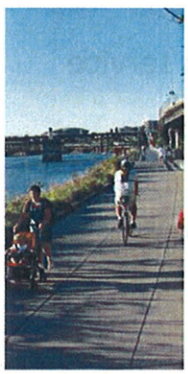
Water, sewer, stormwater

- Rate system provides stable source for operations, but upfront capital is hard to obtain
- New treatment facilities and new sources of water needed
- Coordination of service, water reuse and recycling, and more compact development could reduce costs

Schools

- Up to 150 new school facilities required by 2035
- Existing capacity and future demand not well aligned
- Cost of land and size of school facilities impacts siting
- Creative facility design, building reuse, and coordination could reduce cost estimates

Parks, open space, civic buildings



- Urban park land increasingly important asset
- Region needs over 5,000 acres of new urban parks and over 8,000 acres of natural areas
- Urban amenities such as plazas and streetscapes support redevelopment
- Challenging to identify funding

Energy

- Business as usual would require two to three new 400 Mw power plants
- Demand management and pricing can help reduce peak demand
- Coordination with other service providers can increase efficiencies

Strategies and options

- Encouraging efficiency and innovation in service delivery
- Exploring demand management
- Identifying and supporting new investment strategies

Walking the Walk

How Walkability Raises Home Values in U.S. Cities

Joe Cortright, Impresa, Inc.,
for CEOs for Cities
August 2009

CEOs FOR CITIES
INSPIRE · CONNECT · SUCCEED

supported by a generous grant from The Richard H. Driehaus Foundation

Summary

More than just a pleasant amenity, the walkability of cities translates directly into increases in home values. Homes located in more walkable neighborhoods—those with a mix of common daily shopping and social destinations within a short distance—command a price premium over otherwise similar homes in less walkable areas. Houses with the above-average levels of walkability command a premium of about $4,000 to $34,000 over houses with just average levels of walkability in the typical metropolitan areas studied.

This paper explores the connection between home values and walkability, as measured by the Walk Score algorithm. Walk Score measures the number of typical consumer destinations within walking distance of a house, with scores ranging from 0 (car dependent) to 100 (most walkable). By the Walk Score measure, walkability is a direct function of how many destinations are located within a short distance (generally between one-quarter mile and one mile of a home). Our measure of walkability reflects the convenience and proximity of having shopping and cultural activities close at hand, as well as the value households attach to mixed-use neighborhoods.

Using an economic technique called hedonic regression, we estimate how much market value homebuyers implicitly attach to houses with higher Walk Scores. We looked at data for more than 90,000 recent home sales in 15 different markets around the nation. Our statistical approach controlled for key characteristics of individual housing units (their size, number of bedrooms and bathrooms, age and other factors), as well as for the neighborhoods in which they were located (including the neighborhood's income level, proximity to the urban center and relative accessibility to employment opportunities).

After controlling for all of these other factors that are known to influence housing value, our study showed a positive correlation between walkability and housing prices in 13 of the 15 housing markets we studied. In the typical market, an additional one point increase in Walk Score was associated with between a $700 and $3,000 increase in home values. In one market (Las Vegas) there was a negative correlation—housing prices decreased with higher Walk Scores, and in one market (Bakersfield) there was no statistically significant correlation between prices and walkability after controlling for other factors.

These results show that consumers and housing markets attach a

positive value to living within easy walking distance of shopping, services, schools and parks. The property value premium for walkability seems to be higher in more populous urban areas and those with extensive transit, suggesting that the value gains associated with walkability are greatest when people have real alternatives to living without an automobile.

It should be stressed that our measure of walkability captures not just the benefits associated with walking but with greater accessibility generally. Even households that don't walk to every destination have shorter trips (and more nearby choices) than households with lower Walk Scores. And because places with higher walk scores tend to have more mixed uses and better transit services, some of the value measured here may be attributable to those assets.

This research makes it clear that walkability is strongly associated with higher housing values in nearly all metropolitan areas. The choice, convenience and variety of walkable neighborhoods are reflected in housing markets and are the product of consumer demand for these attributes. The nation's urban leaders should pay close attention to walkability as a key measure of urban vitality and as impetus for public policy that will increase overall property values – a key source of individual wealth and of revenues for cash-strapped governments in a tough economy.

Introduction

Walking and cities go hand in hand. Sidewalks, streetscapes and destinations all define urban space. The resurgent interest in downtowns and in promoting mixed-use developments throughout metropolitan areas is, in part, driven by a recognition of the value of walkability.

For a long time, walking has received little respect as a means of transportation or as an essential part of vibrant urban spaces. This report reconsiders the value of walkability using a new web-based assessment tool—Walk Score—to look at how walkability influences housing values in selected U.S. metropolitan areas.

Our analysis of walkability and its connection to urban housing values unfolds in five parts. First, we explore the concept of walkability, what it is and how it is measured. We describe the Walk Score measure developed by Front Seat and how it provides a tool for measuring the relative accessibility of common destinations to housing units. Part two discusses the tool of hedonic analysis developed by economists to decompose the contribution

of different attributes to the value consumers place on complex products. Part three outlines the data we use to analyze home values and neighborhood characteristics. Part four lays out the results of our hedonic modeling and the relative contribution of walkability to housing prices. Part five discusses the economic and policy implications of our findings and suggests next steps for further research.

This work was commissioned by CEOs for Cities to build on its growing body of work to help urban leaders understand how cities build and hold on to value and to uncover more evidence that demonstrates why cities and urbanism matter to the success of our nation as a whole.

CEOs for Cities and the author gratefully acknowledge the assistance of Front Seat, Inc., for supplying data on Walk Scores for subject properties, and ZipRealty for providing transaction data used in this study. We also appreciate the advice of Noelwah Netusil and Niko Drake in undertaking this study. Any errors are the author's responsibility.

I. Walkability

A key asset of cities is the relative ease with which people can access a wide range of jobs, goods, services and opportunities for social interaction. People and businesses value city locations for the accessibility they provide. Places that are walkable—that have a variety of services and destinations in close proximity to one another—are more convenient and more lively.

Walking is a largely unmeasured and grossly under appreciated component of the urban transportation system. Transportation data often focus exclusively on car and transit trips, ignoring pedestrian travel, even when it is an important component, i.e., walking to a transit stop or from a parking area (Litman, 2007). Consequently, walkability has been under emphasized or ignored as a vital form of urban transportation.

Walking is both important in and of itself and as a marker of vibrant urban spaces. Urban spaces are, almost by definition, places where it is more convenient and common for people to walk between destinations than to take other modes of transportation. Places that are conducive to walking frequently have a host of other related characteristics: they are generally denser, better served by transit, more central, and have more of a mix of different land uses. As Jane Jacobs has observed, walkability is at the heart of urban vibrancy, short blocks, population density and diversity and a mix of uses, building types and ages that all play out in a "sidewalk ballet" (Jacobs, 1961).

Economists have paid increasing attention to Jacob's views. Two decades ago, Robert Lucas –subsequently awarded Nobel laureate in economics – asked rhetorically what forces held a city together:

> "If we postulate only the usual list of economic forces, cities should fly apart. The theory of production contains nothing to hold a city together. A city is simply a collection of factors of production: capital, people and land -- and land is always far cheaper outside cities than inside. Why don't capital and people move outside, combining themselves with cheaper land and increasing profits?" (Lucas, 1988)

The answer to this puzzle, Lucas suggested, was that people paid high rents in places like Manhattan or downtown Chicago for the opportunity to be near other people. Our study shines some additional light on that phenomenon, illustrating the value that homeowners attach to locations that enable them to easily access a variety of urban destinations by walking and other means.

Consumers and businesses attach value to the closeness and choice of things found in cities. The intrinsic advantages of cities revolve around the variety of consumption choices and experiences they provide, the relative ease of accessing those choices, and the opportunity to discover new goods, services and experiences (Cortright, 2007). Walking provides a range of benefits including mobility, consumer cost savings, fitness and health and social interaction (Litman, 2007).

Walking has important social benefits as well. More people walking on the streets is a signal that an area is safe and interesting. A prominent characteristic of vital urban neighborhoods is their vibrant pedestrian street life (Jacobs, 1961).

Land use policies prevalent during much of the twentieth century had the effect of greatly reducing walkability. Local governments adopted land use planning that intentionally separated different types of land uses. Many zoning codes not only outlawed the corner grocery store and the corner bar, but winding suburban streets and cul de sacs effectively outlawed corners as well. In addition, the scale of commercial development and public facilities increased rapidly—fewer and larger schools and stores, which are, by definition, farther from the average student or shopper and less walkable.

Part of the value associated with walkability may reflect the relative

scarcity of walkable, mixed-use neighborhoods in many U.S. metropolitan areas. There is some evidence that there are fewer pedestrian-friendly, transit-oriented residential neighborhoods in most metropolitan areas that consumers would prefer, given a choice between these and more sprawling, auto-oriented developments (Levine, Inam, & Torng, 2005).

Concerns about urban sprawl, global warming and the health and social effects of an automobile-dominated transportation system have rekindled interest in walkability in the United States, especially over the past 15 years. Walkability is a central feature of efforts to revitalize urban centers, promote transit-oriented development and in new urbanist planning (Leinberger, 2007).

As a result of the emphasis on automobiles in most metropolitan transportation planning, walking has been less studied and is less well understood than other forms of transportation. Many transportation surveys either ignore or discount walking trips (or the portion of travel spent walking) and good data on walking is rare (Litman, 2007). In an effort to shed greater light on the urban characteristics that facilitate walkability, Front Seat has developed Walk Score, a web-based algorithm for computing the relative walkability of different residential locations. The idea for counting close-by destinations as means of assessing walkability was suggested by Alan Durning of the Sightline Institute. The Walk Score index is freely available on the Internet and is increasingly being used in the real estate market. Launched in 2007, Walk Score has been integrated into many online real estate listing services. In fact, ZipRealty.com, which provided the data for this inquiry, was the first large real estate website to add Walk Score to all their listings. Today more than 2 million Walk Scores are shown each day by all Walk Score partners.

Walk Score uses Google maps to compute the distance between residential addresses and nearby destinations. The Walk Score algorithm looks at destinations in 13 categories and awards points for each destination that is between one-quarter mile and one mile of the subject residential property:

- grocery store
- coffee shop
- movie theater
- park
- bookstore
- drug store
- clothing and music store
- restaurant
- bar
- school
- library
- fitness
- hardware store

Destinations get maximum points if they are one quarter mile or less from the residence and no points if they are more than one-mile away. Only the closest destination in each category is evaluated (additional destinations in a category within one mile have no additional effect on Walk Score). Each destination category is weighted equally, and scores are normalized from zero to 100.

Walk Score has both conceptual and technical limitations. Whether people weight all destinations equally or are indifferent to the number of additional destinations in a category is unknown. The Walk Score depends on the accuracy of the database of destinations used by Google Maps. It appears that this database has been compiled from the Dun and Bradstreet database, although Google allows users to add additional destinations (subject to verification and quality control) (Drake, 2009). In addition, Walk Score simply measures the straight-line distance to each of these locations and makes no adjustments for the ease of walking, the width or connectivity of streets, and traffic or other obstacles to walking.

In essence, Walk Score is a measure of the proximity of a range of typical goods, services and activities to a particular household. As a result, locations with high Walk Scores are not only more conducive to walking, they are also similarly more conducive to cycling and are more likely to be well-served by transit. In addition, because a wide range of activities are available close at hand, locations with high Walk Scores enable households to drive shorter distances when they do choose to travel by car.

It's also worth noting that Walk Score is a measure of opportunity and not necessarily a measure of activity. Households with high Walk Scores may choose not to walk for all of their trips, but places with higher Walk Scores are more convenient for walking, generally speaking, than places with lower Walk Scores.

II. Hedonic Analysis: Estimating Values of Housing and Neighborhood Attributes

Over the past several decades, economists have developed a statistical technique, called hedonic regression, to break out the contribution of each of a house's attributes to its market price. The pioneering application of hedonic analysis to real estate was developed by Sherwin Rosen three decades ago (Rosen, 1974).

By looking at hundreds (or thousands) of different transactions over time and examining the relationship between variations in price and variations in house characteristics, it is possible to estimate statistically the separate or marginal contribution of each attribute to a house's selling price. Hedonic analysis is a more rigorous, quantitative way of measuring our intuition that larger houses or those located in nicer neighborhoods command higher prices than otherwise similar houses.

To some readers, it may seem counterintuitive to use higher housing prices as an indicator of improvements in livability. But price variations among houses, particularly within a metropolitan market, reflect the value that consumers derive from the characteristics of those houses (and the neighborhoods in which they are located).

We know that the reverse is certainly true. Low and declining prices are the hallmark of troubled and declining neighborhoods. Declining prices prompt disinvestment and a lack of maintenance, perpetuating a cycle of decline, leading in extreme cases to housing abandonment that mars many troubled urban neighborhoods. Rising prices are a key leading indicator of neighborhood revitalization (Weissbourd, 2008).

Economists say that the positive attributes of particular properties are capitalized into the price of land. For decades, urban economists have talked about an urban rent gradient—property closer to the center of an urban area commands higher prices because it is more accessible to jobs and shopping and customers and workers than more peripheral locations. The rent gradient visualizes rents as being highest in the center of the region and then declining as one moves outward (McMillen, 2002).

Hedonic regression is used to decompose the values that consumers attach to different attributes of complex products. Because houses differ widely in terms of size, location and amenities, simply comparing sales prices reflects differences in quality as much as differences in costs. From the view of hedonic analysis, complex, highly varied products like houses can be thought of as consisting of a bundle of more fundamental attributes that

consumers value. Hedonic analysis statistically unbundles these different attributes and estimates their separate value. Economists have used hedonic price estimation in a variety of ways. For example, the Bureau of Labor Statistics uses hedonic methods to control for quality changes in cars and computers in calculating the rate of price increases over time.

Hedonic models of housing prices estimate the values consumers attach to a variety of characteristics including some characteristics of the building and others of the site or neighborhood in which it is located.

Hedonic analysis rests on a number of key assumptions about markets, pricing and consumer behavior, the details of which are beyond the scope of this paper. For an excellent review of these issues, the reader may wish to consult one of several academic reviews of hedonic analysis (Gibbons & Machin, 2008).

Many different characteristics contribute to the value of a house. After controlling for other factors like home and lot size, location and number of bedrooms and bathrooms, one study found positive and significant values for fireplaces, decks, basements, pools, porches, central air conditioning and brick construction (Yinger, 2009).

Neighborhood and environmental factors also play a role in shaping housing prices. Academic research has identified school quality, employment accessibility and crime rates as important influences on housing prices within cities (Gibbons & Machin, 2008). One study attributes a portion of the appreciation of housing values in New York to the decline in crime rates over the past two decades. High crime rates held down housing prices, and when crime subsided, housing values increased (Schwartz, Susin, & Voicu, 2003).

Poor environmental quality also has a negative effect on housing values. Households are willing to pay more for an otherwise similar house in a neighborhood with low levels of air pollution than a neighborhood with high levels of pollution. This revealed willingness to pay is one way economists estimate the economic costs associated with air pollution (Kahn, 2004).

Most hedonic pricing models address location using a variety of measures. A study of housing values in Seattle in the late 1990s found that accessibility (by car) to commercial and university uses had a positive effect on housing values, while accessibility to K-12 schools and industrial land uses was associated with a negative affect on housing prices (Franklin & Waddell, 2002).

Bina, et al studied 900 housing sales in Austin, Texas, and reported that accessibility shapes residential values. Home prices rise with proximity to the Central Business District (by $8,000 per mile) and shorter average commute times ($4,700 per minute saved in daily travel time), everything else constant. Most studies focus on home sales, but the hedonic pricing technique has also been used to study variations in apartment rents. A study of Portland, Oregon, confirmed the classic negative rent gradient—rents declined with increased distance from the central business district (Wilson & Frew, 2007).

Few studies deal directly with walkability as a factor in shaping home prices. A recent analysis of home price trends in Portland, Oregon, found that houses in pre-war (i.e. those built prior to 1940) neighborhoods had appreciated more than housing in more contemporary neighborhoods (Hohndel, Conder, & Cser, 2008). One of the key distinctions between these two eras was the preponderance of grid-street systems in pre-war neighborhoods compared to cul-de-sacs in post-war neighborhoods.

Two studies have looked at the effects of "new urbanism" on property values, i.e. how connected streets, higher density, mixed uses—all attributes connected to walkability—are statistically related to housing prices. One study developed hedonic regressions for housing prices in metropolitan areas that had identified "traditional neighborhood developments" marked by connected street systems, higher densities, mixed uses and other characteristics. The study found that after controlling for other observable characteristics of housing including size, age and quality, buyers paid premiums of 4 percent to 15 percent for otherwise similar houses located in new urbanist developments (Tu & Eppli, 2001).

A second study looked at neighborhood level characteristics in the suburbs of Portland, Oregon, constructing measures for census block groups of median distance of each single family home to the nearest commercial land use. This study found a positive effect of proximity to commercial land uses but a negative effect for proximity to bus stops (Song & Knaap, 2003).

While these two studies considered the effects of neighborhood level variations in walkability, they don't account for variations in walkability at the level of an individual household, nor do they reflect a wide range of destinations. Using Walk Score measures – which are based on 13 different destinations – and examining variations for individual properties may provide us with added insight into the value placed on walkability.

III. The Data

ZipRealty and Front Seat provided us with data on 93,725 housing transactions in 15 housing markets around the United States. These data included the street address of the property as well as key variables on each property. We excluded from this database incomplete and anomalous records, for example, properties with sales prices of less than $25,000, properties built prior to 1800, and properties missing data for any of the listed variables used in our analysis.

Table 1: Metropolitan Areas Included in the Study

	Population	Rank	Median Home Value, 2007
Austin-Round Rock, TX	**1,652,602**	**36**	**177,500**
Bakersfield, CA	**800,458**	**63**	**256,800**
Charlotte-Gastonia-Concord, NC-SC	**1,701,799**	**34**	**167,000**
Chicago-Naperville-Joliet, IL-IN-WI	**9,569,624**	**3**	**261,100**
Dallas-Fort Worth-Arlington, TX	**6,300,006**	**4**	**145,400**
Fresno, CA	**909,153**	**54**	**296,300**
Jacksonville, FL	**1,313,228**	**40**	**201,400**
Las Vegas-Paradise, NV	**1,865,746**	**30**	**315,300**
Phoenix-Mesa-Scottsdale, AZ	**4,281,899**	**12**	**260,300**
Sacramento--Arden-Arcade--Roseville, CA	**2,109,832**	**25**	**400,800**
San Francisco-Oakland-Fremont, CA	**4,274,531**	**13**	**706,100**
Seattle-Tacoma-Bellevue, WA	**3,344,813**	**15**	**379,100**
Stockton, CA	**672,388**	**78**	**399,500**
Tucson, AZ	**1,012,018**	**52**	**210,700**
Washington-Arlington-Alexandria, DC-VA-MD-WV	**5,358,130**	**9**	**458,500**

Source: U.S. Census Bureau, Population Estimates, 2008
American Community Survey, 2007.
Rank is rank among U.S. metropolitan areas in population.

Market coverage varied substantially across metropolitan areas. In most cases, our sample was drawn from all parts of the metropolitan area. In several cases, however the sample was drawn from certain jurisdictions (cities, counties or sub-markets within a metropolitan area). Our data for Chicago, for example, include only selected neighborhoods on the near north side and south side; our data for the San Francisco Bay include suburban

jurisdictions but not the cities of San Francisco or Oakland.

Our sample included high priced housing markets (San Francisco) as well as markets with lower prices, such as Tucson, as shown in Table 2. The number of properties included in our sample also varied considerably from city to city.

Table 2: Summary of Data for Cities

	Observations	Sales Price (N)	Home Size (SF)
Arlington	**1,226**	**393,136**	**1,319**
Austin	**3,333**	**249,706**	**1,446**
Bakersfield	**2,566**	**224,233**	**1,812**
Charlotte	**5,313**	**279,727**	**1,508**
Chicago	**1,525**	**386,785**	**1,638**
Dallas	**13,959**	**231,236**	**2,075**
Fresno	**2,651**	**217,805**	**1,689**
Jacksonville	**4,719**	**179,873**	**1,660**
Las Vegas	**5,227**	**313,903**	**2,021**
Phoenix	**13,801**	**311,480**	**1,862**
Sacramento	**5,754**	**284,076**	**1,415**
San Francisco	**15,246**	**728,101**	**1,619**
Seattle	**9,600**	**487,404**	**1,738**
Stockton	**4,890**	**248,513**	**1,702**
Tucson	**2,466**	**190,194**	**1,462**

For each property, we identified a set of variables describing its important characteristics in two categories: housing variables (characteristics of the individual residence) and neighborhood characteristics (attributes related to location).

Housing Variables

The real estate transaction data provided by ZipRealty identified several basic characteristics of each home sale, including the price of the transaction, size of the home, the number of bedrooms and bathrooms, the year the house was built, and whether the residence was a condominium or single-family home.

These variables are commonly used in the real estate community in describing and categorizing homes. Table 3 contains data on the mean and standard deviation of selected variables in the study for each of these cities.

ZipRealty also provided us with the street address of each property. From this information, Front Seat used its Walk Score algorithm to generate a Walk Score for each property.

Table 3: Mean and Standard Deviation Selected Variables
(Standard Deviation in Parentheses)

	Price	SF	Age	MHI	CBD	Jobs	Walk
Arlington	**393,136** (227,357)	**1,319** (652)	**33** (24)	**67,023** (23,449)	**6** (1)	**180,711** (19,374)	**70** (15)
Austin	**249,706** (165,689)	**1,446** (1,293)	**37** (22)	**44,081** (21,013)	**4** (3)	**118,877** (34,217)	**58** (20)
Bakersfield	**224,233** (227,357)	**1,812** (652)	**21** (24)	**52,376** (18,231)	**11** (1)	**51,099** (19,374)	**34** (15)
Charlotte	**279,727** (306,854)	**1,508** (904)	**36** (30)	**44,299** (25,201)	**3** (2)	**152,816** (21,875)	**55** (21)
Chicago	**386,785** (413,046)	**1,638** (1,006)	**51** (37)	**54,058** (22,163)	**6** (4)	**283,233** (212,572)	**79** (17)
Dallas	**231,236** (298,829)	**2,075** (1,029)	**30** (22)	**67,088** (32,542)	**13** (7)	**148,744** (94,122)	**47** (19)
Fresno	**217,805** (377,707)	**1,689** (590)	**32** (23)	**45,570** (18,587)	**6** (3)	**76,162** (16,870)	**47** (18)
Jacksonville	**179,873** (163,357)	**1,660** (661)	**28** (25)	**46,125** (19,084)	**8** (4)	**79,079** (36,157)	**36** (20)
Las Vegas	**313,903** (298,090)	**2,021** (984)	**11** (8)	**63,379** (18,037)	**12** (4)	**75,354** (56,196)	**42** (18)
Phoenix	**311,480** (353,160)	**1,862** (837)	**24** (18)	**57,326** (24,701)	**12** (7)	**122,307** (65,333)	**44** (20)
Sacramento	**284,076** (196,847)	**1,415** (512)	**42** (25)	**41,198** (16,700)	**5** (3)	**104,381** (50,916)	**49** (19)
San Francisco	**728,101** (620,428)	**1,619** (834)	**43** (22)	**77,590** (31,261)	**11** (5)	**107,343** (47,887)	**55** (20)
Seattle	**487,404** (369,853)	**1,738** (923)	**41** (34)	**53,867** (21,149)	**9** (8)	**162,594** (81,669)	**65** (20)
Stockton	**248,513** (135,144)	**1,702** (626)	**26** (25)	**47,256** (18,744)	**5** (2)	**62,244** (16,007)	**39** (18)
Tucson	**190,194** (99,339)	**1,462** (500)	**34** (21)	**37,999** (13,630)	**7** (5)	**82,223** (35,863)	**49** (19)

Neighborhood Characteristics

We used the location information provided by ZipRealty to identify the zip code and census tract in which each property was located. Using GIS software, we looked up or computed several key variables describing the larger neighborhood in which each property was located.

Centrality (distance to CBD). Using the Census Bureau's definition of central business districts and the Maptitude GIS system, we computed the distance from the center of the central business district to the centroid of each zip code in the metropolitan area. Common central place models of urban form hold that property values are higher closer to the center of a region, reflecting accessibility to the rich and dense work and consumption opportunities that tend to be located in the center.

Job Access (Jobs within 3 miles). Using data drawn from the Census Bureau's Zip Code Business Patterns database and the Maptitude GIS system, we computed the number of jobs within 3 miles of the centroid of each zip code in the metropolitan area. Our measure of job accessibility aims at capturing the value that households attach to locations that are relatively proximate to employment opportunities.

Neighborhood Income. Using the Maptitude GIS system, we determined the Census 2000's reported values for median household income for the census block group in which each house was located. We use income levels as a proxy for perceived differences in neighborhood quality and to reflect the external effects associated with the income level of one's neighbors. Neighborhood income levels are frequently associated with crime rates and school quality, two factors which we have not modeled directly. (High-income neighborhoods tend to have better local schools, neighborhoods with lower incomes tend to have higher crime rates.)

IV. Regression Results

We conducted separate regressions for each of the 15 metropolitan areas included in our sample. Table 4 outlines the results of these regressions.

Functional Form. Hedonic models estimate the statistical relationship between housing characteristics and home prices. Some models assume these relationships are linear (each additional square foot of a house is worth a certain number of dollars), while other models assume a proportional, or log-linear relationship—each 10 percent improvement in size results in a 10 percent im-

provement in price. We tested both linear and log-linear specifications of the hedonic model for our 15 cities. In general, the log-linear version of the model better fit the data than did the linear version, so we used this for our estimates.

Each of the variables entered in our equations were statistically significant for the majority of cities evaluated. A summary of the results of our analysis are shown in Table 4.

Table 4: Regression Results: Log Linear Model Coefficient

(t-statistics in parentheses)

	R2	Constant	SF	BRs	BA	Age	Type	MHI	CBD	Jobs	Walk
Arlington	**.77**	**12.6816**	**0.0003**	**0.0419**	**0.1398**	**-0.0009**	**-0.0162**	**0.0052**	**-0.1266**	**-0.0264**	**0.0044**
		(115.31)	(12.47)	(2.98)	(8.19)	(-2.51)	(-0.56)	(15.81)	(-17.64)	(-6.93)	(8.83)
Austin	**.56**	**10.8255**	**0.0001**	**-0.018**	**0.3478**	**0.0002**	**-0.3049**	**0.0105**	**-0.0626**	**0.0105**	**0.0083**
		(198.36)	(15.07)	(-1.54)	(26.15)	(0.58)	(-13.8)	(29)	(-18.76)	(4.48)	(17.04)
Bakersfield	**.75**	**11.1423**	**0.0004**	**0.0051**	**0.0267**	**-0.0043**	**-0.2366**	**0.0065**	**0.0003**	**-0.0075**	**-0.0005**
		(233.1)	(30.9)	(0.52)	(1.86)	(-11.14)	(-5.46)	(17.91)	(0.26)	(-2.28)	(-1.43)
Charlotte	**.71**	**11.0902**	**0.0005**	**-0.0513**	**0.2047**	**0.0008**	**0.0967**	**0.0063**	**-0.1112**	**-0.0214**	**0.0071**
		(142.99)	(33.35)	(-4.19)	(14.33)	(3)	(4.6)	(20.68)	(-20.35)	(-6.56)	(15.54)
Chicago	**.75**	**9.8439**	**0.0003**	**-0.0141**	**0.1927**	**-0.0045**	**0.4383**	**0.0088**	**0.0068**	**0.002**	**0.0136**
		(57.91)	(11.3)	(-0.65)	(6.36)	(-10.47)	(8.3)	(10.29)	(0.91)	(1.86)	(8.08)
Dallas	**.75**	**10.2171**	**0.0004**	**-0.1074**	**0.0594**	**-0.0052**	**-0.1444**	**0.0058**	**0.0091**	**0.0373**	**0.0037**
		(370.56)	(53)	(-14.82)	(6.57)	(-23.02)	(-9.33)	(37.4)	(10.78)	(57.78)	(14.96)
Fresno	**.68**	**10.6887**	**0.0005**	**0.0129**	**-0.0174**	**-0.0039**	**-0.0319**	**0.0096**	**0.0026**	**0.0248**	**0.0031**
		(204.67)	(26.14)	(1.13)	(-1.02)	(-9.05)	(-1.06)	(21.06)	(0.74)	(6.81)	(7.91)
Jacksonville	**.62**	**10.3225**	**0.0006**	**-0.0711**	**0.1045**	**-0.0071**	**0.0085**	**0.0077**	**0.0229**	**0.0073**	**0.0045**
		(196.29)	(30.74)	(-5.41)	(5.97)	(-19.21)	(-1.06)	(16.91)	(7.74)	(3.13)	(10.41)
Las Vegas	**.76**	**11.4812**	**0.0004**	**-0.063**	**-0.036**	**-0.0065**	**-0.1961**	**0.0032**	**0.0193**	**0.0175**	**-0.0019**
		(381.5)	(66.37)	(-10.54)	(-3.96)	(-12.81)	(-16.84)	(14.4)	(16.72)	(20.63)	(-8.04)
Phoenix	**.73**	**10.415**	**0.0005**	**-0.1005**	**0.0586**	**-0.004**	**-0.0479**	**0.0104**	**0.0194**	**0.0244**	**0.005**
		(419.55)	(66.05)	(-18.48)	(7.43)	(-17.58)	(-4.55)	(63.17)	(26.71)	(33.95)	(25.34)
Sacramento	**.51**	**10.6764**	**0.0006**	**-0.1046**	**0.0363**	**0.0006**	**-0.1576**	**0.0159**	**0.0054**	**-0.0143**	**0.0093**
		(188.74)	(29.95)	(-8.7)	(2.13)	(1.56)	(-5.13)	(38.12)	(1.59)	(-6.65)	(21.19)
Seattle	**.77**	**11.9592**	**0.0004**	**-0.0102**	**0.0754**	**-0.0009**	**0.0103**	**0.0054**	**-0.0252**	**-0.0004**	**0.0029**
		(501.64)	(65.96)	(-2.26)	(13.37)	(-8.44)	(1.22)	(32.3)	(-52.38)	(-0.76)	(15.1)
Stockton	**.35**	**11.5287**	**0.0004**	**-0.0147**	**-0.0009**	**-0.0031**	**-0.179**	**0.007**	**-0.0126**	**-0.02**	**0.0032**
		(181.11)	(19.95)	(-1.18)	(-0.05)	(-7.39)	(-5.42)	(16.84)	(-3.02)	(-4.11)	(6.08)
Tucson	**.60**	**10.878**	**0.0005**	**-0.0645**	**0.1125**	**-0.0036**	**-0.1836**	**0.0089**	**-0.0146**	**0.0159**	**0.0038**
		(165.69)	(27.56)	(-5.94)	(6.74)	(-9.46)	(-9.64)	(15.42)	(-5.25)	(3.89)	(9.29)

Key to variables: R^2 = adjusted R^2 for Equation, SF = Square Feet of Interior Floor Area, BR = Number of Bedrooms, BA = Number of Bathrooms, Age = Age (Years), Type = Housing Type Dummy (Condo = 1), MHI = Median Household Income of Census Tract (Divided by 1000), CBD = Distance to Central Business District, Jobs = Number of Jobs within 3 miles (divided by 10,000), Walk = Walk Score

Housing Variables

House Size. House size, or the number of square feet in a housing unit, was positively correlated with housing prices. Each additional hundred square feet of space in a house increases that home's selling price by about 4 percent. House size was statistically significant in each city examined.

Bedrooms. The number of bedrooms in a house generally had a negative correlation with housing value. Although this seems counterintuitive, much of the effect of house size is accounted for by the number of square feet, rather than the number of bedrooms. All things being equal, for example, a 1,200 square foot, three-bedroom house commands a higher price than a 1,200 square foot, four-bedroom house. (The additional bedroom implies that there is less space for other uses in this house, either smaller bedrooms or less space in other common rooms.) The coefficient of the number of bedrooms was significant and negative in eight cities. It was insignificant in six cities. Arlington, Virginia, was an anomaly: housing prices were significantly and positively correlated with the number of bedrooms, even controlling for other factors.

Bathrooms. True to the belief of home remodelers everywhere, additional bathrooms are associated with additional value. In 12 of our cities, the number of bathrooms had a positive and significant association with increased home value. In two cities—Bakersfield and Fresno—the relationship was statistically insignificant. Las Vegas was an outlier—the number of bathrooms had a negative and significant relationship with house prices.

House Type. Except in Charlotte and Chicago, single family residences commanded a price premium over otherwise similar condominiums. In four cities, there was no statistically significant relationship between housing type and sales prices.

House Age. The effect of housing age on house prices varied across markets. In 11 cities, older houses had somewhat lower prices, all other things equal. In two markets—San Francisco and Charlotte, older homes commanded a premium over similar newer homes, on average. In two cities—Sacramento and Austin—there was no statistically significant relationship between housing age and prices. (However, see box on page 18 for an alternative analysis of the effect of house age on housing prices in Austin.)

Table 5: Estimated Effects of 1 Point Change in Walk Score by Metropolitan Area
Log-Linear Model

	Effect of Walk Score	t-statistic for Walk Score	R^2 for equation
Arlington	**1730**	**8.83**	**0.77**
Austin	**2073**	**17.04**	**0.56**
Bakersfield	**-112**	**-1.43**	**0.75**
Charlotte	**1986**	**15.54**	**0.71**
Chicago	**5260**	**8.08**	**0.75**
Dallas	**856**	**14.96**	**0.75**
Fresno	**675**	**7.91**	**0.68**
Jacksonville	**809**	**10.41**	**0.62**
Las Vegas	**-596**	**-8.04**	**0.76**
Phoenix	**1557**	**25.34**	**0.73**
Sacramento	**2642**	**21.19**	**0.51**
San Francisco	**2985**	**22.46**	**0.66**
Seattle	**1413**	**15.10**	**0.77**
Stockton	**795**	**6.08**	**0.35**
Tucson	**723**	**9.29**	**0.60**

Note: Except for Bakersfield, all result significant at the .01 level. Effect of Walk Score calculated based on a one-point Walk Score improvement for the mean-priced house in each metropolitan area, holding all other factors constant.

Neighborhood Characteristics

Distance to Central Business District. Proximity to the center of a region's commercial core had very different effects in different cities. Six cities—Austin, Stockton, Charlotte, Seattle, Tucson and Arlington—had higher values closer to the center, all other things equal. Five cities—Dallas, Jacksonville, Las Vegas, Phoenix and San Francisco—had higher values farther from the central business district. The relationship between proximity to the core and housing values was statistically insignificant in the remaining four cities.

Proximity to Employment Opportunities. In eight cities, proximity to employment was associated with higher housing values. The number of jobs

within 3 miles of a household was negatively correlated with housing prices in four metropolitan areas—Sacramento, Arlington, Stockton and Bakersfield. Negative correlations may reflect the disamenities associated with proximity to non-residential uses (too near a manufacturing zone, for example), or may reflect the absence of other amenities (if an area has a high concentration of jobs, it may have relatively few parks or open spaces).

Neighborhood Average Income. We measured average neighborhood income by determining the median household income for the census tract in which the subject property was located. Income levels are a proxy for neighborhood quality and are likely to overlap with neighborhood schools and, in some cases, environmental amenities. The coefficient for median household income was positive and significantly correlated with housing values in each of the metropolitan areas examined.

Walk Score. Walk Score was positively and significantly correlated with housing values in 13 of the 15 metropolitan areas included in our study. Only in Las Vegas was the relationship between Walk Score and housing prices significant and negative. In Bakersfield, the coefficient of the Walk Score variable was not significant.

Comparing our model with another

In one city—Austin, Texas—we had access to a reasonably similar hedonic price study that had been carried out recently (Bina, Kockelman, & Suescun, 2006). To evaluate the robustness of our estimates, we developed a version of our hedonic model that approximately followed the same approach. Bina, et al used a linear specification for their model and added quadratic terms for bedrooms, baths and the age of the structure to account for scale effects in each of these variables. (The squared terms account for the fact that while a 20-year-old house may be worth less than a new one, all things equal, an otherwise similar house that was 100 years old might be worth more).

The results of the two models are shown in Table 6. In some cases the two models use different variables. Where a variable present in one model was not included in the other, this is indicated as "na". The table shows the estimated linear coefficients associated with each variable as well as the standardized beta coefficient (the linear coefficient divided by each variable's standard deviation).

While there are some differences—the Bina et al model better fits the data—the sign and size of each of the variables is strikingly similar between the two models. Both models imply, for example, that an additional square foot of housing space is worth about $40 and that home values deteriorate up to about age 35 and appreciate thereafter. Condominiums are worth about $30,000 to $40,000 less than comparable single family homes. The effect of a neighborhood's median home price (Bina, et al) is the same as the measured effect of a neighborhood's median household income in our model, as measured by standardized coefficients. The Bina et al model has somewhat different estimates for the effects of bedrooms and bathrooms: our model suggests that variations in these attributes have a larger effect on house prices than the Bina et al model.

The Bina et al model does not include a measure of Walk Score. The most similar variable is likely to be number of bus stops per square mile, which may be correlated with Walk Score, because bus stops tend to be more common on major arterials and near the kinds of destinations included in Walk Score calculation (schools, stores, parks and libraries).

The fact that, despite the differences, these two models, based on different data sets produce similar results for common variables gives us increased confidence in the reliability of our model, even though it is constructed with fewer variables than other hedonic equations.

Table 6: Comparison of Hedonic House Price Models for Austin

Variable	Bina, et al Coefficient	Std. Beta	Walk Value Coefficient	Std. Beta
Attached Housing	**(32,066.0)**	**-0.06**	**(39,035.6)**	**-0.11**
Bedrooms	**41,834.0**	**0.24**	**50,916.6**	**0.28**
Bedrooms Squared	**(6,979.0)**	**-0.24**	**(10,117.0)**	**-0.31**
Bathrooms	**(46,359.0)**	**-0.23**	**(123,355.3)**	**-0.50**
Bathrooms Squared	**19,691.0**	**0.40**	**53,360.0**	**0.93**
Number of Living Areas	**10,846.0**	**0.07**	**na**	
Age of Dwelling	**(1,402.0)**	**-0.24**	**(4,236.6)**	**-0.56**
Age Squared	**20.7**	**0.29**	**60.6**	**0.65**
Interior Square Footage	**39.9**	**0.31**	**36.3**	**0.28**
Lot Size	**52,762.0**	**0.09**	**na**	
Rural	**12,584.0**	**0.03**		
Distance to CBD	**(8,001.0)**	**-0.26**	**(11,750.8)**	**-0.19**
Bus Stops	**44.3**	**0.08**	**na**	
Mean Travel Time	**(4,666.0)**	**-0.18**	**na**	
Median Home Value	**0.3**	**0.30**	**na**	
Logsum for Work Trips	**(26.9)**	**-0.20**	**na**	
Mean SAT Score	**149.8**	**0.13**	**na**	
Walk Score	**na**		**1,460.2**	**0.18**
Median HH Income	**na**		**2.4**	**0.30**
Jobs within 3 miles	**na**		**0.6**	**0.13**
Adjusted R2	**0.823**		**0.660**	
N	**729**		**3332**	

Source: Bina, et al, Table 4
Note: na: variable not estimated in this model.

Analysis

Our study shows that walkability improves housing values. Housing values are positively and significantly correlated with walkability in almost all metropolitan markets.

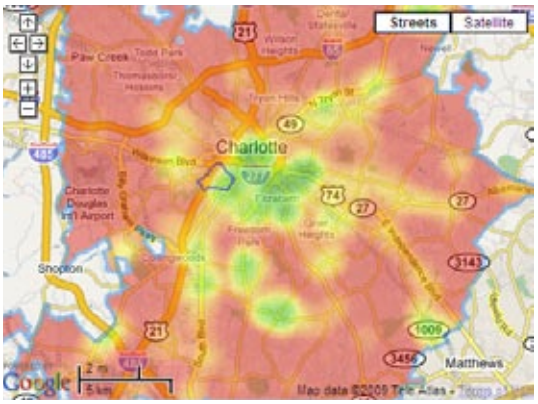
Walkability was correlated with high housing values in metropolitan areas of different sizes and in different regions of the country. Walkability was correlated with housing prices both in older, denser markets (Chicago) and in faster growing Sunbelt markets (Phoenix, Jacksonville). Only two very fast-growing metropolitan areas (Las Vegas and Bakersfield) did not exhibit the positive relationship between walkability and home prices.

Interestingly, walkability was positively correlated with prices both in metropolitan areas with relatively high levels of walkability and those with relatively low levels of walkability. For example, Walk Scores had a positive impact on values in Jacksonville and Dallas (median Walk Scores for the metro area of 35 and 46 respectively) and also in Seattle and Austin (median Walk Scores 68 and 62). Walkability has a larger impact on housing values in more populous, denser metropolitan areas and those with larger transit systems.

To give some idea of the impact of Walk Score on actual housing values, consider the median house in Charlotte with a typical Walk Score. It would be worth about $280,000 (the median sales price of all house units in our sample). If that house's Walk Score were increased from a Walk Score of 54 (the average for our sample of houses in Charlotte) to a Walk Score of 71, it would add about $34,000 (or about 12 percent) to its value, holding all other features of the house constant. For comparison, that would be the equivalent of moving the house from the Ashley Park neighborhood to the Wilmore neighborhood.

Figure 1: Walk Scores in Charlotte, NC, by Neighborhood

Ashley Park (Average Walkscore 54)



Wilmore (Average Walkscore 71)

The impact of walkability on home values varies across metropolitan areas. An additional one point improvement in average Walk Scores adds between $700 and $3,000 to the value of a typical house, holding all other factors constant. Since the distribution of Walk Scores varies considerably across metropolitan areas, it's useful to consider each metropolitan area separately.

For each metropolitan area in our study, we estimate the gain in value that a typical house would gain from going from an average level of walkability (for that metropolitan area) to an above average level of walkability. To establish these averages, we look at the distribution of Walk Scores in the sample of homes in each metropolitan area. We define as "average" the median Walk Score for the sample, i.e. the Walk Score that half of the houses in the sample exceed and that half fall below. For the "above average" Walk Score, we use the 75th percentile Walk Score, i.e. the Walk Score that 75 percent of all households fall below and that 25 percent of all houses exceed. Values for the 25th percentile, median, and 75th percentile Walk Score are shown in Table 7.

Table 7: Distribution of Walk Scores within Metropolitan Areas

	25% Percentile	Median	75% Percentile
Arlington	**60**	**71**	**82**
Austin	**45**	**62**	**74**
Bakersfield	**15**	**3**	**51**
Charlotte	**40**	**54**	**71**
Chicago	**63**	**86**	**92**
Dallas	**34**	**46**	**51**
Fresno	**35**	**49**	**60**
Jacksonville	**20**	**35**	**51**
Las Vegas	**29**	**43**	**55**
Phoenix	**31**	**46**	**58**
Sacramento	**35**	**49**	**62**
San Francisco	**43**	**57**	**68**
Seattle	**52**	**68**	**82**
Stockton	**23**	**38**	**51**
Tucson	**34**	**51**	**66**

Source: Computed from sample data. Note: Arlington reflects data for the District of Columbia. Neighborhood average estimates not available for the City of Arlington.

In most metropolitan areas, improving from median to the 75th percentile requires a Walk Score improvement of about 12 points, with a range of from a five point gain (Dallas) to a 20 point gain (Bakersfield). Table 8 shows how much a typical home would gain in value if it were located in neighborhood with above average walkability, compared to an otherwise identical home with an average level of walkability, for that metropolitan area. The premium for a house with an above average Walk Score ranges from $4,200 in Dallas to more than $30,000 in Chicago, Charlotte, San Francisco and Sacramento. (Las Vegas is the exception: a house with above average walkability is valued about $7,200 less than a house with just average walkability).

Table 8: Contribution of Walk Score to Housing Values

	Walk Score Median	75% Percentile	Estimated Housing Gain from Moving to 75% Percentile
Arlington	**71**	**82**	**19,028**
Austin	**62**	**74**	**24,871**
Bakersfield	**31**	**51**	**(2,242)***
Charlotte	**54**	**71**	**33,763**
Chicago	**86**	**92**	**31,562**
Dallas	**46**	**51**	**4,278**
Fresno	**49**	**60**	**7,427**
Jacksonville	**35**	**51**	**12,951**
Las Vegas	**43**	**55**	**(7,157)**
Phoenix	**46**	**58**	**18,689**
Sacramento	**49**	**62**	**34,345**
San Francisco	**57**	**68**	**32,837**
Seattle	**68**	**82**	**19,789**
Stockton	**38**	**51**	**10,338**
Tucson	**51**	**66**	**10,841**

Note: Value for Bakersfield not statistically significant at the 90% level.

Front Seat has computed the average Walk Scores of different neighborhoods in most of the major cities in our study. From this data, it is possible to identify particular neighborhoods that, on average, have levels of walkability that are equal to the median and the 75th percentile for each metropolitan area. Table 9 shows neighborhoods which have average Walk Scores approximately equal to these values. Not every house in each neighborhood has the same Walk Score, but the differences between these neighborhoods illustrate the relative change in Walk Score associated with the value differences identified in Table 8.

Table 9: Selected Neighborhoods with Walk Scores at the Metro Median and 75th Percentile

	Median	75% Percentile
Arlington	**Takoma Park 71**	**Woodley Park 82**
Austin	**Rosewood 62**	**Zilker 75**
Bakersfield	**31**	**51**
Charlotte	**Ashley Park 54**	**Willmore 71**
Chicago	**Logan Square 86**	**Uptown 92**
Dallas	**Urbandale 47**	**Northeast Dallas 54**
Fresno	**Bullard 53**	**Hoover 62**
Jacksonville	**Deerwood 35**	**University Park 51**
Las Vegas	**Centennial Hills 42**	**Twin Lakes 56**
Phoenix	**Maryvale 47**	**Camelback East 61**
Sacramento	**Del Pas Heights 49**	**Land Park 62**
San Francisco	**57**	**68**
Seattle	**South Delridge 68**	**Greenwood 82**
Stockton	**38**	**51**
Tucson	**North Dodge 51**	**Mitman 66**

Source: Front Seat. Note: Front Seat has not computed average Walk Scores for neighborhoods in Bakersfield, Stockton, or the suburbs of the San Francisco Bay Area. For comparison to Arlington, neighborhoods in the District of Columbia are shown.

On average, home buyers attach greater value to walkable homes relative to other housing units in the same metropolitan area, controlling for other observable characteristics. These results provide a strong basis for concluding that improved walkability produces real economic value for city residents.

The apparent value that consumers attach to walkability likely stems from many sources. Consumers in more walkable neighborhoods may save money on driving (and transit) by virtue of the closer proximity of many destinations. It seems likely that many consumers value the time savings associated with walkable neighborhoods – even for trips taken by other modes. The variety of uses close by and the implied opportunities for serendipitous interaction may also make a neighborhood more interesting.

V. Implications

Our research confirms the intuition of Jane Jacobs that walkability has an important connection to the function of urban economies. The data presented here show that home buyers attach a significant economic value to the attributes captured by Walk Score.

Neighborhood walkability is the product of both public and private decisions. The public sector dictates the land use framework, regulating the location and composition of commercial land uses and the types and density of housing units. The public sector is also responsible for streets and sidewalks and choosing the number, size and location of important destinations (i.e., schools and parks).

If we're looking to shore up value in local housing markets, it appears that promoting more walkable neighborhoods is one way to do so.

The implicit price attached to improved walkability shows that there is a market value for this kind of neighborhood. This is true both in markets with relatively high levels of walkability and lower levels of walkability. The fact that, on average, the impact of walkability on value is higher in metropolitan areas with higher average Walk Scores suggests that there may be some increasing returns to improving walkability: having more walkable housing region wide is associated with a larger value gain from improved walkability for all housing in the region.

And improved walkability may assist fiscally strapped local governments. Because most local governments depend heavily on property taxes to finance local services, improved walkability may mean higher property values and higher tax revenues than for less walkable development.

These are turbulent times for the nation, particularly in the two sectors of the economy most closely tied to the built landscape: transportation and housing. General Motors and Chrysler have entered bankruptcy, held together with infusions of tens of billions of dollars of federal money. And over the past three years, housing values—which many imagined could only go up—have plummeted as the housing bubble has imploded.

Many Americans are re-examining their communities and lifestyles, and asking whether their might be some alternatives that are more sustainable, both economically and environmentally. From new urbanists comes an interest in recasting our communities along traditional lines, with a closer mixing of commercial and residential uses, better transit and connected, complete streets.

One of the key challenges of the next few years will be to revisit the pattern of land uses in U.S. communities, particularly in traditional suburbs. Already, there are pioneering examples of adaptation of now obsolete land use patterns into more diverse, mixed and walkable communities (Dunham-Jones & Williamson, 2008).

There may be opportunities to rebuild malls as mixed-use centers. In Denver, the aging Villa Italia Mall in suburban Lakewood was demolished and replaced with a commercial and residential district with 1,300 apartments, 200 condominiums and single family homes, offices, and a neo-traditional main street (Davis, 2008). The current decline in shopping malls nationally creates abundant opportunities to re-think the distribution of land uses in metropolitan areas. By one recent count, 84 malls nationally are either dead or on the verge of closing (Hudson & O'Connell, 2009).

A 2007 survey commissioned by the National Association of Realtors showed that 57 percent of Americans agreed with the statement that "business and homes should be built closer together, so that stores and shops are within walking distance and don't require the use of an automobiles" (Ulm, 2007).

The upheaval in financing markets, the dramatic decline in housing prices, retrenchment in the retail sector and the ongoing restructuring of the automobile industry are all harbingers of change for the nation's cities. Continued uncertainty about future energy prices and the need to deal aggressively with climate change will demand new strategies in the years ahead. Our research suggests that walkability is already an important component of the value proposition of the nation's cities, and that improving walkability can be an important key to their future as well.

Next Steps

Our research highlights a strong connection between walkability, as measured by Walk Score, and variations in home values. The relationship holds across most metropolitan markets we've studied, and our hedonic modeling produces results that are consistent with other investigations of housing prices. Still, there is much more to be learned about how walkability contributes to home values. We think there are several important questions that should be high on the research agenda.

What parts of Walk Score contribute most to home values? Walk Score is a composite measure. Walk Score is computed based on the proximity of

a housing unit to 13 different destinations. We've made no attempt in our analysis to evaluate the separate contributions of different destinations to the value associated with accessibility. It may well be that one or a few destinations are the most highly valued, and that a more precise scoring formula would attach different weights to the different categories of destinations (Walk Score weights them equally).

Part of what Walk Score is capturing is the value consumers attach to mixed-use development—living in an area with a range of different uses in close proximity. Houses located in exclusively residential neighborhoods will tend to have lower Walk Scores because a majority of Walk Score points are awarded for proximity to commercial uses that would generally be prohibited in most residential zones.

How do other aspects of walkability influence home values? The Walk Score measure is based on straight line distances between housing units and various destinations and doesn't account for many of the physical factors—sidewalks, street connectivity, urban design, traffic, slopes and vegetation—that are known to influence walkability. Additional research is needed to know how these factors—in addition to proximity—affect home values.

How does transit accessibility relate to Walk Score? We have good reason to suspect that Walk Scores, in part, reflect transit accessibility. Other studies have shown that home values are influenced by proximity to transit, particularly high-capacity transit with frequent service, like light rail. Because transit stops are often located in commercial areas, it seems likely that high Walk Scores are associated with high levels of transit service. In this case, some of the effect we attribute to walkability may reflect the value consumers attach to transit. Our study lacked data to investigate this effect, and it would be a logical next step for further research.

How has the collapse of the housing bubble affected the market value attached to walkability (and other factors)? Our data were gathered from sales that took place in 2006 through 2008. During this time, housing prices peaked and then declined. We have not investigated the extent to which house price declines influenced the impact of different attributes. Our earlier analysis of housing price trends at the metropolitan level suggests that price declines have been more severe in more outlying neighborhoods within metropolitan areas, which suggests consumers may be putting an even higher premium on accessibility, including walkability (Cortright, 2008).

Further research could also address some of the limitations of the dataset used in this study. Our data did not include many detailed housing attributes known to influence home values, and so we were unable to model them. For example, research has shown that other variables are important in explaining home values, including lot size, environmental amenities, building improvements (fireplaces, swimming pools, garages), and the quality of local schools. We are presently working with other researchers to include Walk Score data in a hedonic model that includes a much wider array of variables, including those listed.

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PORTLAND PLAN

Household Demand and Supply Projections

PORTLAND PLAN BACKGROUND REPORT
FALL 2009

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

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Household Demand and Supply Projections

PROSPERITY AND BUSINESS SUCCESS

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City of Portland Bureau of
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EXECUTIVE SUMMARY

This Portland Plan Background Report considers the effects that projected population growth will have on the City's housing needs over the 30-year timeframe to 2035. Specifically, the report examines whether the supply of existing and new housing will be able to meet demand, and in which areas of the City certain types of housing could be needed most.

In recent decades, the populations of both the Portland Metropolitan region and the City itself have experienced a steady net increase. This increase is likely to continue in coming decades. In 1980, Portland's population was about 368,000; by 2005, that total had grown to nearly 555,000. Some of this population growth was a result of changed boundaries as the City expanded its land area by about one-third through annexations, mostly of land on the eastside. In another 25 years, how many people will live here on Portland's nearly 93,000 acres?

METRO'S REGIONAL FORECAST

The Metro regional government is responsible for forecasting the amount of growth the metropolitan area will experience. The Metroscope computer model calculates a wealth of detailed projections of what the region's population and demographics will be in 2035.

Regarding housing needs in the City of Portland in 2035 (and stated in the broadest of terms), the model tells us that:

- *The **number of households** in the Metro region and the City of Portland **will grow***
- *There **will be adequate supply** of housing for the additional residents*
- *The **highest** level of **demand** will be for **multi-family** residences*

The Metroscope model forecasts total households in the three-county region in 2035 will be between 1.3 and 1.5 million, an increase of between 56 and 74 percent. The model projects total households in the City of Portland will be between 345,000 and 376,000, an increase of 44 to 57 percent from the 2005 baseline of 240,000 households.

Metroscope forecasts the projections for households, not individual people, because people "shop" for housing and live in households; obviously the increases in numbers of households mean an increase in population. Household sizes are typically estimated to be about two people on average, but it is important to note that what seems like a tiny change in that estimate – for instance, 2.1 vs. 2.0 – has a large effect on total population numbers when we apply the household estimate to the entire city or region.

> ***Why do we count households instead of people?*** The short answer is that people live in households, whether the household is one person or many, and whether the space is a large freestanding house or a small apartment in a high-density multi-family building. Thus while we plan for individual people, these people will "shop" as a "household" for a housing unit which may be small or large.

Metro's projections are important information to help the City of Portland and other local communities plan responsibly. After all, population growth triggers the need not only for new housing but also for a complex web of additional urban services, from water pipes and sewers to parks and open spaces, roads, railways, schools and hospitals, all of which need to be planned far in advance.

No matter what the population, providing adequate housing is never a simple task. Households vary not only in size but also by age and income. These variations are taken into account in the Metro computer model by the inclusion of eight different household "consumption profile" types.

Metroscope also projects where the housing demand will locate geographically within the urban growth boundary (UGB) of the metropolitan region. The model defines 39 subareas and projects the numbers and types of households that are likely to locate in each of them. The City of Portland contains six of these Metro subareas. It is important to note that these subareas do not correspond directly to the City of Portland's neighborhood or district planning boundaries. Rather, the model's subarea boundaries are consistent with Census tract boundaries, since the baseline data for the forecast originates in Census data.

To give a complete picture of future housing needs, the Metroscope model projects not only demand but also supply. This is done by determining the "capacity" of lands in the region to contain new housing units. For instance, are there vacant lands that could be built on? These would be included as "development capacity." Metroscope is therefore an "equilibrium" model, balancing supply with demand, offering a projected supply number as well as demand number. The geographic subareas are important in terms of where the supply may be located, and the Metroscope model allocates certain percentages of the projected overall regional household growth to the 39 different subareas in the region.

To complement Metroscope projections of housing supply, and further illuminate the forecast of where new housing might be located, the City of Portland uses its own model as well to project "development capacity." Differences between the two models relate to assumptions about underutilization of parcels, feasibility of redevelopment, and development densities by zone. The two separate models, Metro's and the City's, essentially present high and low range figures.

The forecast is a baseline. The Metroscope model assumes that existing policies and trends continue; in this way, the forecast is useful as a baseline by which to evaluate potential changes in relevant land use and transportation policies. The forecast calculates three growth level scenarios - high, medium and low.

This Background Report summarizes projections regarding the high, medium and low growth scenarios to answer ***four basic housing questions***. Three are related to demand, one to supply.

Demand

- Growth of Households: How many new households will there be in Portland?
- Distribution of Households: In which of the six subareas of Portland will the new households be?
- Types of Households: Which types of households will locate in the region overall, within the City of Portland itself, and lastly in which of the six specific subareas of the City? (The types of households are described as eight household "consumption profiles" based on income, numbers of people, and their ages, especially if they are school-age children.)

Supply

- Available land: What is the capacity of the land in the City's six subareas to accommodate the numbers of housing units projected to be needed?

Key Findings
In answering the four basic housing questions above, several key findings arise from the Metroscope model. These findings will be explained in more detail in the body of the report, but can be summarized as follows.

Demand
Growth of Households:

- The total *number of households in Portland in 2035 is projected to increase* to between 344,800 and 376,300, compared to a baseline of 240,000 households in 2005.
- The increase in households in Portland will be between 105,000 and 136,000, accounting for an *annual percent rate change of 1.2 percent - 1.6 percent.*
- This annual percent growth rate translates into a need for *3,500 - 4,500 housing units to be added each year* for the 30-year timeframe to 2035.
- *As a frame of reference*, the city built 29,300 new units between *1997 and 2007*, an average of just under *3,000 new units each year.* (Please note that this number does not include renovations, additions, or conversions of spaces such as garages into living units.
- The City of Portland's share of all (not just newly built) households regionally is projected to decline, from a baseline year (2005) share of about 29%, *to approximately 22%* in 2035. This decline occurs in all three growth level scenarios.
- The 1997-2007 growth rate of new units in Portland accounted for an *average share of 36 percent* of the total of new units built in the metro region in that period.
- Nationally, regionally, and within the city, *household size is projected to decline*.
- The housing type in highest demand will shift in favor of *multi-family units* as evidenced by construction of more multi-family units since 2005.

Supply
Available Land:

- *Currently zoned land "capacity" in Portland is sufficient to meet housing demands* - that is, enough land in Portland is currently zoned so as to be available to house the projected numbers of new households citywide and in each particular subarea. Capacity is determined not only by current zoning but also by expected redevelopment levels (vacant land plus redevelopment of existing built sites). (For further explanation of the methods for determining available land, please refer to the appendix to this report.)
- Land capacity for new Portland housing units is projected to range *up to 189,100 units* by 2035 (at the upper level of capacity, according to the calculations used by Metro), down to *at least 141,191 units* (the City of Portland model, with its somewhat more restrictive definitions of land development "capacity"). These figures are well above the projected need by 2035 for 105,000 to 136,000 new units, as noted above.

Supply and Demand
Distribution of Households:
Regarding the geographic distribution of housing on both the supply and demand sides, the model forecasts most subareas to be relatively stable, with more changes occurring in the Central, North and East Portland subareas. Key findings related to the distribution of types of households include the following.

The most *dramatic changes are forecast for the Portland Central Business subarea* (which, as noted previously, is not the same as the Central City District as designated by City planning regulations):

- The Portland Central Business subarea will *grow in households at the highest percentage rate of all the region's* 39 subareas.
- The Portland Central Business subarea is projected nearly to *triple its number of households*, from 12,267 in 2005 to a 2035 total of 46,187 (low-growth scenario/276% rate of growth) to 52,530 (high-growth scenario/327% rate of growth).

- Portland Central Business subarea will *increase its share of citywide housing units* to just under 14% (low-growth scenario) from 5%.
- A *significant shift will occur toward owning rather than renting* housing in the Central subarea - that is, households will shift in "tenure" from renting to owning, bringing ownership to 61% from a 20% share of all housing units.
- The Central subarea is also forecast to have relatively *significant shifts in the proportions of all the household groups*. Groups with children will increase (up 6% and 4%), while groups at the highest and lowest income levels will decrease (down 8% and 10%).

Distribution & Concentration of Household Types:
Differences are projected in where the eight household types will distribute themselves within the six subareas, though most of the distributions are relatively consistent with the baseline year. The most significant concentrations are forecast to be in West Portland (with about *half* of the city's *highest* income households) and North Portland (with about *one-third* of the city's *lowest* income households). Whereas most of the subareas are projected to be fairly stable in their household type make-up, East Portland is forecast to see a slight shift to lower income levels.

The Metroscope model groups households into eight categories by considering various factors including size of household, family composition, age of residents, income, and other criteria. The groups are numbered one through eight, with the lowest, Group 1, corresponding to the lowest household income, and the highest, Group 8, to the highest income. Each numbered group is also given a descriptive name such as "Young Middle Income Families."

The model forecasts some variation particularly in where the highest and lowest income households will be located. Of all the Portland households in the highest income group (Group 8 earning $100,000/year or more), 50% are projected to be located in the West Portland subarea. That concentration of higher income households translates into 23% of the West Portland households; when these are added to the next two next highest income groups (7 & 6, earning at least $75,000 and $60,000 respectively), more than half of the households in West Portland are forecast to be in the top three earning groups, a distribution which is consistent with that of 2005.

The concentration of higher income households forecast to be in West Portland appears to be the reverse of the forecast for the East Portland and North Portland subareas. For instance, only 4% of households in the East Portland subarea are in the highest income group (vs. the 23%, as noted above, in West Portland). When that group is combined with the next two top earning groups, the three highest income groups make up 18% of the households in East Portland (vs. 52% in West Portland). These figures are drop from the baseline year 2005 (the top three earning groups making up 21% of East Portland households in the baseline year, for instance).

More of the lowest income households are projected to live in East Portland and North Portland. The lowest earning group, type 1, has annual income of less than $15,000. Groups 2 and 3 earn at least $15,000 or between $25,000 to $34,999 per year, respectively. The model forecasts relatively higher proportions of the bottom three categories of household incomes in both East Portland and North Portland (57% and 67% respectively, vs. the 29% in West Portland). Moreover, the 57% figure for East Portland households marks an increase in lower income households at the baseline, which was 52% in 2005.

The next highest income groups, Groups 7 & 6, are also projected to continue to be relatively concentrated, in the Southeast and the West subareas.

While the Central subarea, as mentioned earlier, is projected to gain in its share of the households citywide, a relative *drop in share* is forecast for both the *Northeast* and *Southeast* subareas. However, *Southeast will continue to have more total households than any other subarea* in the city, at just over 80,000, edging out

West Portland even though Southeast land area accounts for 15% of the city's acreage, versus West Portland accounting for 25%.

Types of Households
As described earlier, the eight household groups are categorized by several factors, one of which is annual household income. The lowest earning households (group 1) have annual income of less than $15,000. These figures only include income, however, and not accumulated wealth that a household may be drawing from. Income level distributions citywide are projected to be much the same as in the baseline year. A few categories see some changes in the forecast, however.

- *Top earning households* (group 8 – those making more than $100,000/year) as a percentage of citywide households will *increase* to 16% from 12%.
- *Middle income households* (groups 5, 6 and 7 – earning $45,000 and up) will each *drop*, with the three middle income groups combined dropping to 26% of citywide households from 31%.

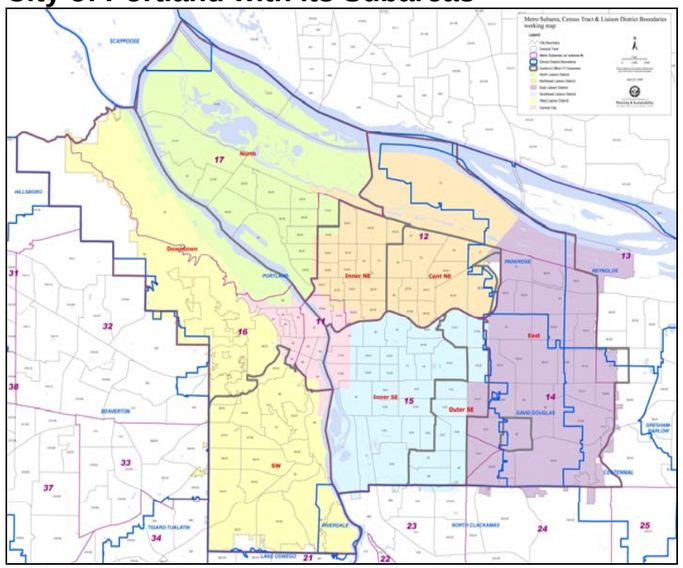
How to Use This Information
As mentioned earlier, we need a clear idea of expected growth so that we can plan well ahead for transportation, schools, and other facilities and services for the city and region. Just as we ask, "Where will the new households go?" we will need to decide where the new facilities should be located. The geographic distribution of the different types of households, with their various ages, incomes, and other characteristics, has many implications. Will the housing units be small (studios for young single people) or larger (three- and four-bedroom homes for families with young children)?

A good example of the importance of this question is the projected rise in lowest income households (Group 1 - "Low-income Singles") forecast for the North Portland subarea. Metro's profile of characteristics for this group is not just that they are low income and single, but also that they are primarily older people. To see the numbers of this type of household increase in North Portland from 29% to 34% means an increase in the numbers of housing units that will need, for instance, to be able to accommodate people of varied mobility levels. If we built only new "live-work" units accessible by stairs in North Portland, that would not be a good match to what the population expected there will need.

The sorts of facts and figures provided in the Metroscope model for 2035 will help us make intelligent choices and create appropriate policies in the Portland Plan. Housing projections are important to consider alongside job forecasts for the Portland metro region and its subareas. Economic development and jobs information is described in detail in the Economic Development Background Report. The public-driven Portland Plan process will encompass all these factors in setting forth a comprehensive guide to the city's future.

City of Portland Growth Profile: 2035

City of Portland with its Subareas



City Characteristics (2005)	
Population (estimate)	554,600
Households (estimate)	240,078
Land Area	100,182 Acres
Tenure	
Ownership	59%
Rental	41%

Household Projections (2035)

City of Portland

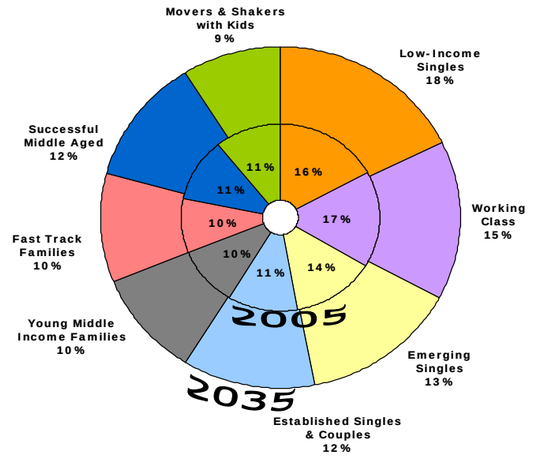
Low Growth Scenario 2035 (Existing + New)	Medium Growth Scenario 2035 (Existing + New)	High Growth Scenario 2035 (Existing + New)
344,806	360,982	376,343
104,728 ↑	120,904 ↑	136,265 ↑
Percent Growth 44%	Percent Growth 50%	Percent Growth 57%

Portland Metro -3 County Area (Clackamas, Multnomah, Washington)

Households in Base Year (2005): 836,407

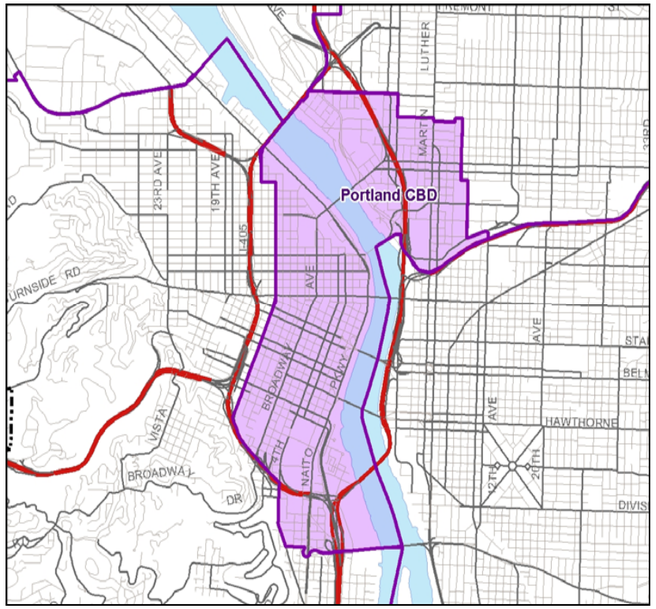
Low Growth Scenario 2035 (Existing + New)	Medium Growth Scenario 2035 (Existing + New)	High Growth Scenario 2035 (Existing + New)
1,300,845	1,377,810	1,456,035
464,438 ↑	541,403 ↑	619,628 ↑
Percent Growth 56%	Percent Growth 65%	Percent Growth 74%

Profile of Household Types in City of Portland: Current Estimate (2005) vs. Projected Future (2035 Medium Growth)



Household Characteristics	2005	2035 (Medium Growth)
Households with Children		
No	72%	75%
Yes	28%	25%
Household Income		
< $15,000	18%	18%
$15,000 - $24,999	14%	15%
$25,000 - $34,999	13%	13%
$35,000 - $44,999	12%	12%
$45,000 - $59,999	13%	12%
$60,000 - $74,999	9%	7%
$75,000 - $99,999	9%	7%
$100,000 +	12%	16%

Portland Central Business District



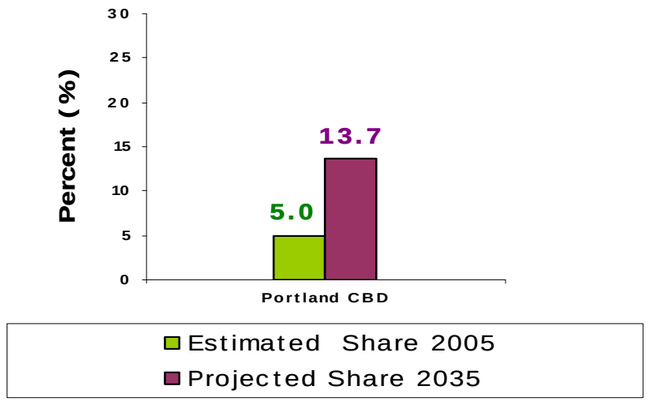
Subarea Characteristics (2005)	
Population (estimate)	16,700
Households (estimate)	12,267
Land Area	1,690 Acres 1.7% of City's Acreage
Tenure	
Ownership	20%
Rental	80%

Portland CBD Growth Profile: 2035

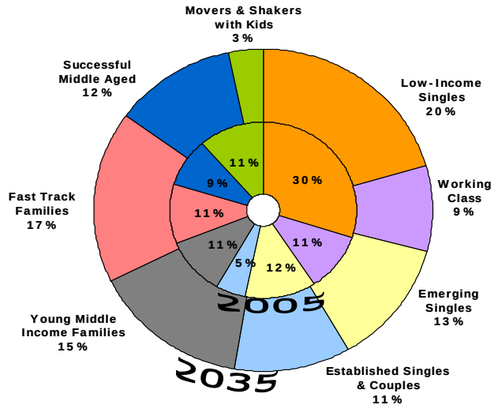
Household Projections (2035)

Low Growth Scenario 2035 (Existing + New)	Medium Growth Scenario 2035 (Existing + New)	High Growth Scenario 2035 (Existing + New)
46,187	49,429	52,530
33,920	37,162	40,263
Percent Growth 276%	Percent Growth 303%	Percent Growth 327%

Comparison of Estimated and Projected Shares of Housing Stock for Portland CBD: 2005 & 2035

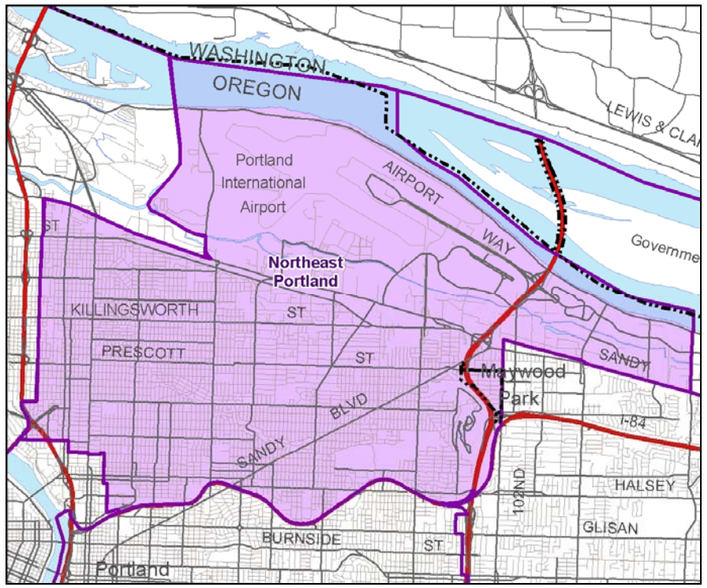


Profile of Household Types in Portland CBD: Current Estimate (2005) vs. Projected Future (2035 Medium Growth)



Household Characteristics	2005	2035 (Medium Growth)
Households with Children		
No	87%	88%
Yes	13%	12%
Household Income		
< $15,000	41%	21%
$15,000 - $24,999	13%	9%
$25,000 - $34,999	5%	9%
$35,000 - $44,999	5%	8%
$45,000 - $59,999	9%	12%
$60,000 - $74,999	7%	9%
$75,000 - $99,999	11%	13%
$100,000 +	9%	19%

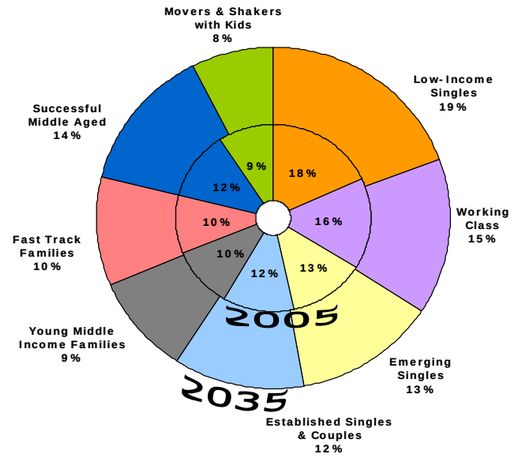
Northeast Portland



Northeast Portland Growth Profile: 2035

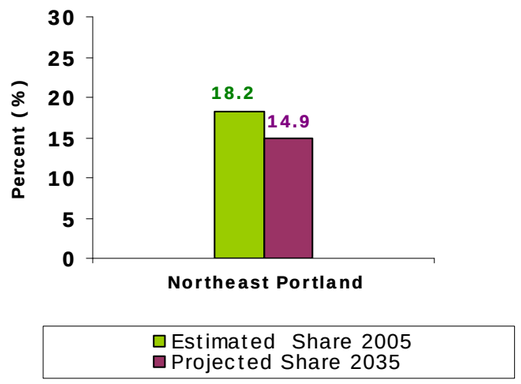
Household Projections (2035)		
Low Growth Scenario 2035 (Existing + New)	**Medium Growth Scenario 2035 (Existing + New)**	**High Growth Scenario 2035 (Existing + New)**
52,005	53,835	55,696
7,642 ↑	9,472 ↑	11,333 ↑
Percent Growth 17%	Percent Growth 21%	Percent Growth 26%

Profile of Household Types in Northeast Portland: Current Estimate (2005) vs. Projected Future (2035 Medium Growth)



Subarea Characteristics (2005)	
Population (estimate)	108,000
Households (estimate)	44,363
Land Area	17,325 Acres 17.3% of City's Acreage
Tenure	
Ownership	67%
Rental	33%

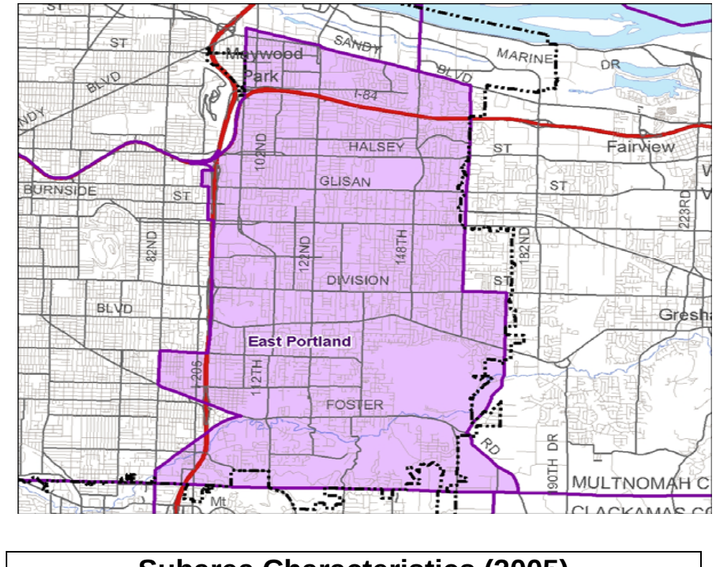
Comparison of Estimated and Projected Shares of Housing Stock for Northeast Portland: 2005 & 2035



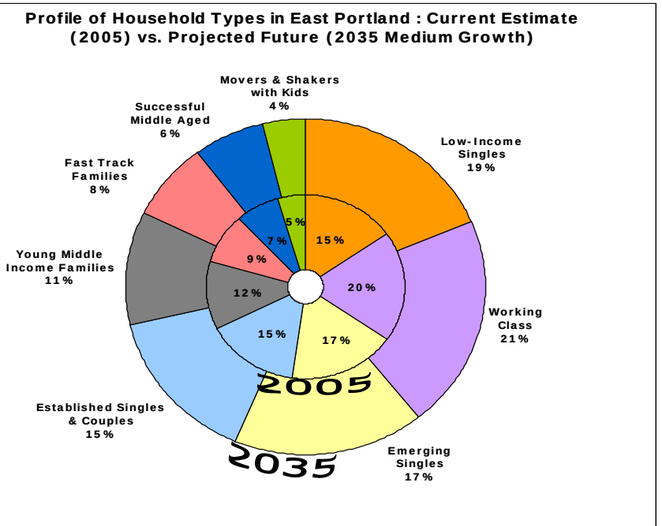
Household Characteristics		
	2005	**2035 (Medium Growth)**
Households with Children		
No	71%	72%
Yes	29%	28%
Household Income		
< $15,000	17%	17%
$15,000 - $24,999	13%	14%
$25,000 - $34,999	12%	14%
$35,000 - $44,999	13%	13%
$45,000 - $59,999	15%	13%
$60,000 - $74,999	10%	8%
$75,000 - $99,999	9%	7%
$100,000 +	11%	14%

East Portland Growth Profile: 2035

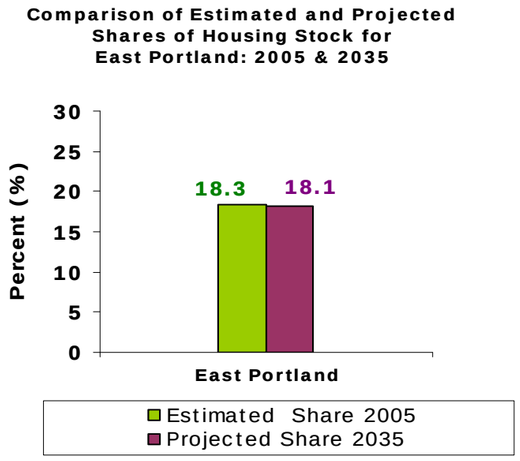
East Portland



Household Projections (2035)		
Low Growth Scenario 2035 (Existing + New)	**Medium Growth Scenario 2035 (Existing + New)**	**High Growth Scenario 2035 (Existing + New)**
61,576	65,236	68,916
17,608 ↑	21,268 ↑	24,948 ↑
Percent Growth 40%	Percent Growth 48%	Percent Growth 57%



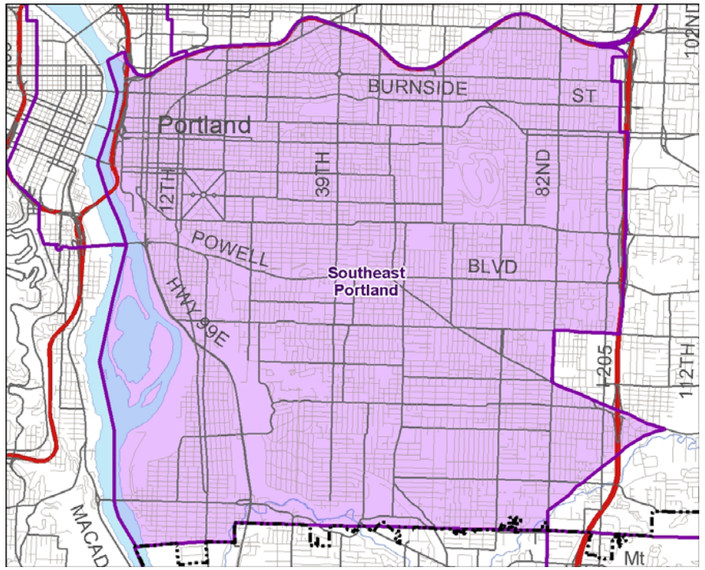
Subarea Characteristics (2005)	
Population (estimate)	117,100
Households (estimate)	43,968
Land Area	15,075 Acres 15.0% of City's Acreage
Tenure	
Ownership	64%
Rental	36%



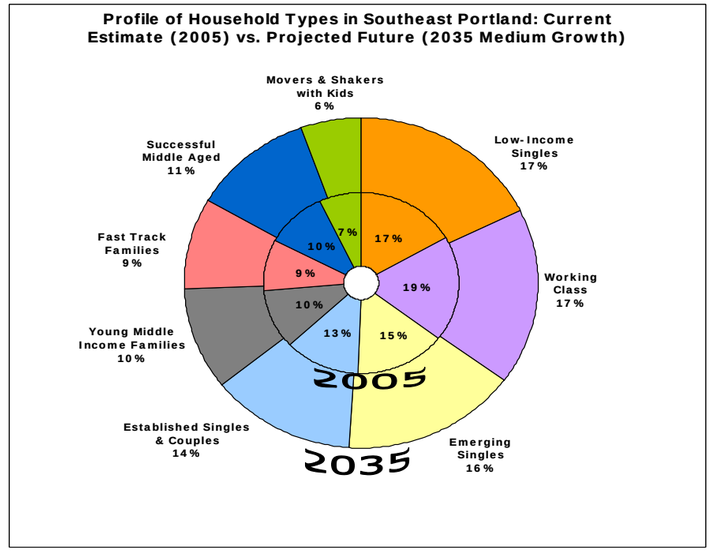
Household Characteristics	2005	2035 (Medium Growth)
Households with Children		
No	73%	75%
Yes	27%	25%
Household Income		
< $15,000	15%	18%
$15,000 - $24,999	16%	18%
$25,000 - $34,999	15%	18%
$35,000 - $44,999	17%	15%
$45,000 - $59,999	16%	15%
$60,000 - $74,999	9%	7%
$75,000 - $99,999	7%	5%
$100,000 +	5%	4%

Southeast Portland Growth Profile: 2035

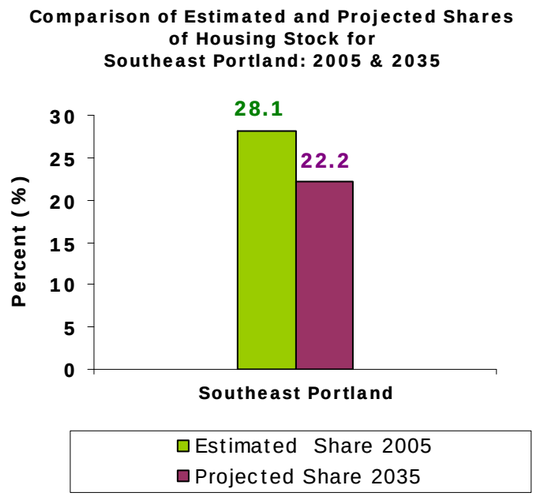
Southeast Portland



Household Projections (2035)		
Low Growth Scenario 2035 (Existing + New)	**Medium Growth Scenario 2035 (Existing + New)**	**High Growth Scenario 2035 (Existing + New)**
78,602	80,192	81,644
10,270 ↑	11,860 ↑	13,312 ↑
Percent Growth 15%	Percent Growth 17%	Percent Growth 20%



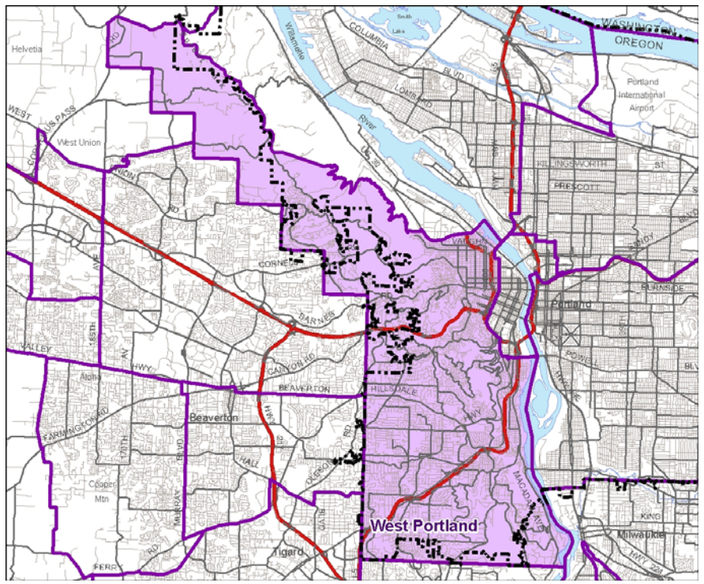
Subarea Characteristics (2005)	
Population (estimate)	158,000
Households (estimate)	68,332
Land Area	14,881 Acres 14.9% of City's Acreage
Tenure	
Ownership	57%
Rental	43%



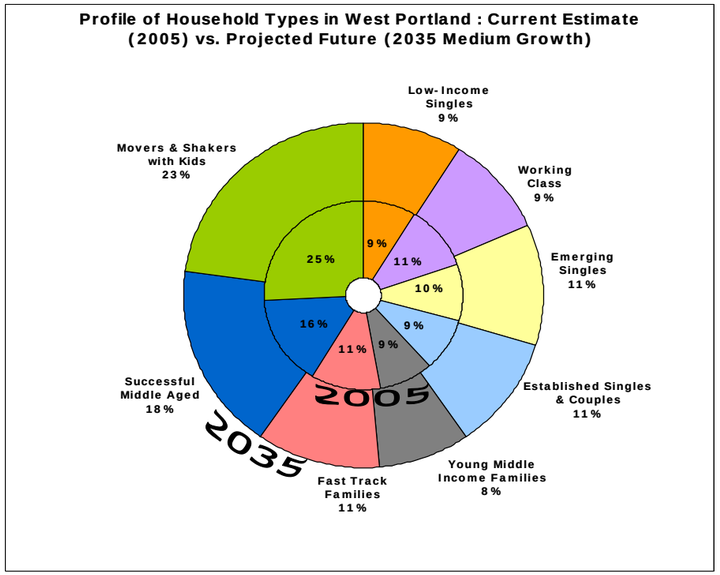
Household Characteristics		
	2005	**2035 (Medium Growth)**
Households with Children		
No	75%	75%
Yes	25%	25%
Household Income		
< $15,000	19%	18%
$15,000 - $24,999	15%	17%
$25,000 - $34,999	12%	16%
$35,000 - $44,999	15%	13%
$45,000 - $59,999	14%	13%
$60,000 - $74,999	9%	7%
$75,000 - $99,999	8%	6%
$100,000 +	8%	10%

West Portland Growth Profile: 2035

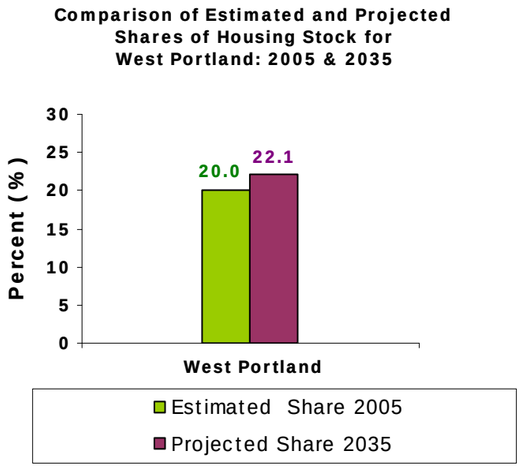
West Portland



Household Projections (2035)		
Low Growth Scenario 2035 (Existing + New)	**Medium Growth Scenario 2035 (Existing + New)**	**High Growth Scenario 2035 (Existing + New)**
75,707	79,611	82,857
26,946 ↑	30,850 ↑	34,096 ↑
Percent Growth 55%	Percent Growth 63%	Percent Growth 70%

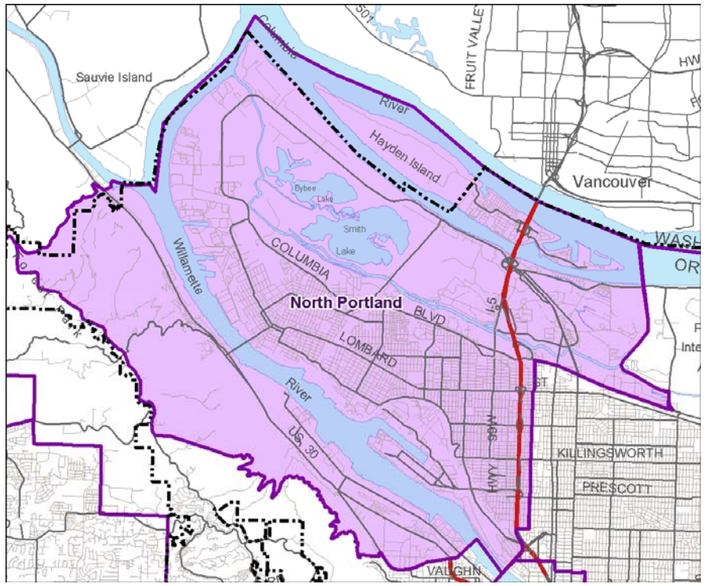


Subarea Characteristics (2005)	
Population (estimate)	101,800
Households (estimate)	48,761
Land Area	24,818 Acres 24.8% of City's Acreage
Tenure	
Ownership	58%
Rental	42%



Household Characteristics		
	2005	**2035 (Medium Growth)**
Households with Children		
No	64%	67%
Yes	36%	33%
Household Income		
< $15,000	16%	12%
$15,000 - $24,999	9%	10%
$25,000 - $34,999	7%	9%
$35,000 - $44,999	8%	8%
$45,000 - $59,999	10%	10%
$60,000 - $74,999	9%	7%
$75,000 - $99,999	13%	9%
$100,000 +	28%	35%

North Portland



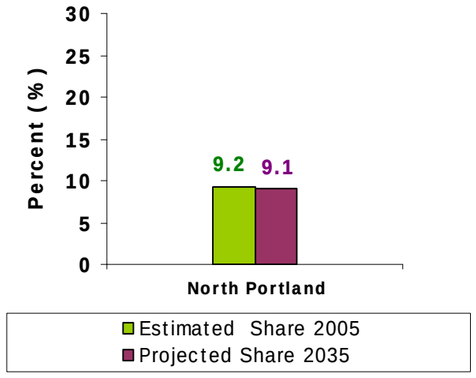
Subarea Characteristics (2005)	
Population (estimate)	53,000
Households (estimate)	22,387
Land Area	26,393 Acres 26.3% of City's Acreage
Tenure	
Ownership	66%
Rental	34%

North Portland Growth Profile: 2035

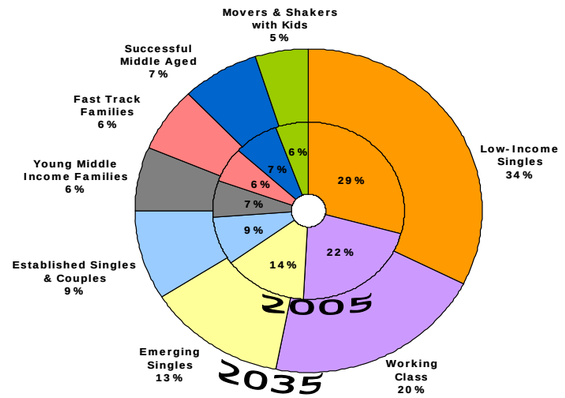
Household Projections (2035)

Low Growth Scenario 2035 (Existing + New)	Medium Growth Scenario 2035 (Existing + New)	High Growth Scenario 2035 (Existing + New)
30,728	32,679	34,700
8,341 ↑	10,292 ↑	12,313 ↑
Percent Growth 37%	Percent Growth 46%	Percent Growth 55%

Comparison of Estimated and Projected Shares of Housing Stock for North Portland: 2005 & 2035



Profile of Household Types in North Portland: Current Estimate (2005) vs. Projected Future (2035 Medium Growth)



Household Characteristics	2005	2035 (Medium Growth)
Households with Children		
No	76%	78%
Yes	24%	22%
Household Income		
< $15,000	22%	25%
$15,000 - $24,999	19%	22%
$25,000 - $34,999	13%	17%
$35,000 - $44,999	17%	13%
$45,000 - $59,999	13%	11%
$60,000 - $74,999	6%	5%
$75,000 - $99,999	5%	3%
$100,000 +	5%	4%

INTRODUCTION

This Portland Plan Background Report considers the effects that projected population growth will have on the City's housing needs over the 30-year timeframe to 2035. Specifically, the report examines whether housing supply will be able to meet demand, and in which geographic areas of the City certain types of housing could be needed most.

In recent decades, the populations of both the Portland Metropolitan region and the City itself have experienced a steady net increase. This increase is likely to continue in coming decades. In 1980, Portland's population was about 368,000; by 2005, that total had grown to nearly 555,000. Some of this population growth was a result of changed boundaries as the City expanded its land area by about one-third through annexations, mostly of land on the eastside. In another 25 years, how many people will live here on Portland's nearly 93,000 acres?

MAKING PROJECTIONS: THE METROSCOPE MODEL

Metro, Portland's regional government and planning agency, is responsible for forecasting the amount of long term growth the seven-county Metropolitan Statistical Area (MSA) will experience. Its Metroscope computer model calculates a wealth of detailed projections of what the region's population, employment and demographics will be in 2035, based on the assumption that existing regional policies and trends continue. It creates an as-is baseline scenario of what the future would bring, so that we can make well-informed and responsible decisions about any changes in our current investments and policies.

What is Metroscope? Metroscope is the computer model that the Metro regional government uses to formulate projections. It is an "urban simulation model," integrating residential housing data with transportation, land use, and commercial location data. As it integrates land use and transportation, Metroscope provides a rich and realistic model of housing development that incorporates the impact of household choice, development economics, and commuting preferences. Metroscope is comprised of 4 inter-related models. All sub-models are interrelated, and they influence and provide inputs for one another.

- **Economic Model:** Forecasts region-wide population and employment by industry. It converts the forecasted population into number of households (HH) and groups them into 400 possible combinations of HH Size, Income Category, Age-of-household-head and Children present/absent;

- **Location Model(s):** (comprised of residential and non-residential sub models) that predicts where and how much housing will exist in the future based on predictions of how much and where employment activity will occur, the price of housing, household income and other wealth factors, and the age of the householder;

- **Travel Model:** estimates trip origins and destinations, and measures perceived cost of travel between regions which affects where people work and decide to reside;

- **GIS/ land tools & database:** contains the land and development data and tracks where and how much land (parcels) will be available for development in the future, provides an inventory and accounting of developable land that is available, and its capacity for housing units and employment.

More information on the Metroscope model is available in the appendix to this report.

Under the Metroscope model, projected population growth triggers the formation of "households" which will need to live in a home or "dwelling unit." While the model assumes that each new household equals one new home or dwelling unit, it also accounts for the fact that not everyone lives alone - the number of people living a household will vary. Therefore, household types or "consumption profiles" are also factored into the model.

Metro considers age, income, and household size to predict how people will be living together in a household. For ease of analysis, they bundle more than 400 combinations into eight "household types," each given a short descriptive name. Thus, the characteristics of each group will still vary, and could include renters and owners, old and young, singles or groups. However, income is a key aspect of the groups, and thus they are *numbered in order of lowest to highest income levels*. Another key factor is age - that of the "designated head of household" - and whether there are any school-age children in the household.

A summary of the groups is as follows:

- **Group 1** ("Low-Income Singles"): These are the lowest income households, whether they are renters or owners. Of the renters in this group, all live alone, and most are elderly. Among owners in Group 1, age and number of people in the household is more evenly distributed. *Example:* A *woman in her seventies renting an apartment, living alone on a very low income. Total income less than $15,000.*

- **Group 2** ("Working Class"): These households can be any age, but their income is among the lowest. More are renters rather than owners. About two-thirds are childless. However, one-third of the renter households in this group have school-age children, while only about one in six of the owners in this group have school-age children. *Example: A family renting a home, two adults working at low-wage jobs, raising young children. Total income at least $15,000, less than $25,000.*

- **Group 3** ("Emerging Singles"): With a bit more income than Group 2 households, these people are primarily in the 25-44 age bracket. The renters are mostly single-person households. The owners are about half made up of two-person households, about one third of them being families with school-age children. *Example: Two thirty-somethings, both of whom work, and who have just bought their first home. Total income at least $25,000, less than $35,000.*

- **Group 4** ("Established Singles and Couples"): With a broad age distribution and approaching middle income, these households are usually childless, especially if they are renters. Owner households in Group 4 have more residents and almost 40 percent include school-age children. *Example: Two people renting a home, both working, and with children who are grown up and living elsewhere. Total income at least $35,000, less than $45,000.*

- **Group 5** ("Young Middle-income families"): Group 5 households are larger and wealthier. People in the renter households of this category are not only older than those in the owner households, but also have smaller household sizes. The owners are more likely than not to have children. *Example: Two parents in their late thirties, living in a home they own with children in junior high and high school. Total income at least $45,000, less than $60,000.*

- **Group 6** ("Fast Track Families"): With more income than Group 5 households, almost half of this group is between 25 and 44. Although the majority do not have school-age children, two- and three-person households are most common. The owner households are larger and more likely to have school-age children. *Example: Two adults with well-paying jobs, one working full-time, the other part-time, raising elementary-school-age children, and living in a home they own. Total income at least $60,000, less than $75,000.*

- **Group 7:** ("Successful Middle Aged"): Mostly without children, these households include the very high-income couples, especially for owners. Interestingly, the renter households in Group 7 are more likely to have children. *Example: Two early-fifties adults working at very well-paying jobs, owning their home. Total income at least $75,000, less than $100,000.*

- **Group 8:** ("Movers and Shakers with Kids")**:** Among owners, most of these households have children; about 60 percent of renter households have children. They are the highest earners in their prime earning years. *Example: A family with two parents in their late forties or early fifties, both working full-time in high-paying jobs, raising children who are still in school and living with them in the home they own. Total income $100,000 or more.*

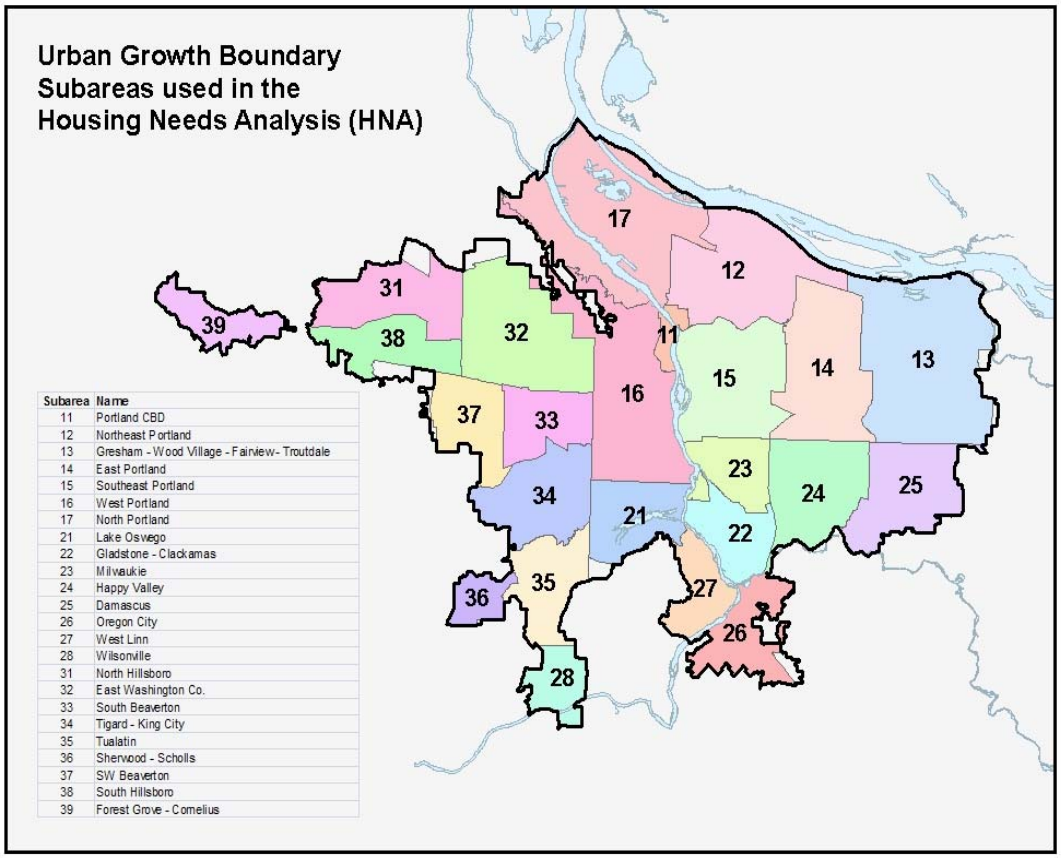
It is important to note that these eight groups actually represent a bundling together of the more than 400 different household consumption profiles and not a simple grouping of households based on *Income, Size or Age.* However, as "consumption" of housing is strongly influenced by a household's age, size, income or presence of children, there is some pattern with regard to these characteristics.

Patterns we find when comparing across groups are that:

- Household *income is generally lower for renters than for owners*.
- For both renters and owners, income increases as we move from one group to the next.
- Age varies more for renters than for owners.
- *Group 1* includes many *elderly*, while *Group 2* has a much higher concentration of *young* adults. The average age rises again for Groups 3 and 4 and then falls for Groups 5 and 6, rises slightly for 7, then falls again for group 8.
- Household *size is generally higher* for the *higher number groups* (which also have the *higher incomes*). However, Group 2 renters have a larger household size than renters in Groups 3 and 4. Group 8 renters and owners have both the highest household size and the highest percentage of households with school-aged children.

Geographic Subareas

To facilitate analysis of housing needs at smaller geographies than the region as a whole, Metro has grouped relatively permanent geographies called the Census Tracts into a number of "subareas." The following illustration is a map of the 39 subareas in Portland Metro:



Subarea	Name
11	Portland CBD
12	Northeast Portland
13	Gresham - Wood Village - Fairview - Troutdale
14	East Portland
15	Southeast Portland
16	West Portland
17	North Portland
21	Lake Oswego
22	Gladstone - Clackamas
23	Milwaukie
24	Happy Valley
25	Damascus
26	Oregon City
27	West Linn
28	Wilsonville
31	North Hillsboro
32	East Washington Co.
33	South Beaverton
34	Tigard - King City
35	Tualatin
36	Sherwood - Scholls
37	SW Beaverton
38	South Hillsboro
39	Forest Grove - Cornelius

Six Portland Subareas

As mentioned earlier, Metroscope's application of six subarea boundaries to Portland matches with neither the City of Portland's planning districts nor with its neighborhood association boundaries, and should not be mistaken with these designations. Rather, the model's subarea boundaries are combinations of Census data tracts, because much of the data in the forecast originates in Census data. Even so, the six subareas can be easily understood as five basic "quadrants" of the city surrounding a transportation/business hub at the center.

While the lack of coordination between the city's designated planning boundaries and the Metroscope subarea boundaries makes an already complicated topic even more complex, it is unavoidable. We use data collected by many different organizations, at different times and in different places. Each set of data has its own original intentions, and cannot anticipate all the ways in which people might use it later.

The six Portland subareas are shown on the map above and are listed below:

- *Portland Central Area* (CBD[1]) (Subarea 11) - while Metroscope uses the term "CBD" for "Central business district," this subarea includes only these parts of the Central City plan district: the downtown core, Pearl District and other areas within the I-405 freeway loop on the west side of the river; east of the river, the Rose Quarter transit and entertainment area north of Interstate 84.
- *Northeast Portland* (Subarea 12) - north of I-84, west of Vancouver Avenue: the majority of the NE quadrant of the city.
- *East Portland* (Subarea 14) - primarily east of I-205, south of Sandy Boulevard.
- *Southeast Portland* (Subarea 15) - west of I-205, south of I-84, and including the Central Eastside industrial sanctuary (which is a subdistrict of the Central City plan district)
- *West Portland* (Subarea 16) - west of the I-405 freeway loop, and south of Forest Park and the Route 30/industrial sanctuary area along the river.
- *North Portland* (Subarea 17) - the northern "quadrant" of the city plus the Forest Park/Route 30/industrial sanctuary area southwest of the river but not included in the West subarea.

[1] Metro designated Portland CBD is a much smaller geography than the City designated "Central City". Notably, the Metro Subarea excludes Central Eastside, Goose Hollow and a small portion of South Waterfront These areas get clustered into Metro's "West Portland" Subarea.

HOUSEHOLD PROJECTIONS AND DISTRIBUTIONS

Based on historical trends, the Portland *Metro area is projecting continued modest population growth over the coming decades*. In Metro's latest population forecast, its Metroscope computer model projects the population of the seven county Portland Metropolitan Statistical Area (MSA) out to the year 2030. The MSA population in 2030 is projected to be about **3 million** people (2.9-3.2 million, for an annual percentage growth rate of between **1.4%** and **1.7%**). In order to project housing demand, Metro converts its population numbers into a forecast of the number of households, estimating that **1.2 million** to **1.3 million** households will live in the MSA by 2030.

As the timeframe for the Portland Plan is 2035, this report uses Metroscope simulations that extend the 2030 population forecast to 2040 in five-year increments. As mentioned earlier, the Metroscope model assumes that existing policies, investment patterns and trends continue, creating an equivalent basis for comparing baseline year data with corresponding forecast data. As the region continues to grow, the City of Portland will inevitably capture a significant portion of the projected growth. The household totals projected in the model also reflect the interplay between the population and employment forecasts.

This section presents several data tables and illustrations documenting the expected growth in number of households and their projected distribution within the City's six subareas. Base year is 2005; projections are for 2035.

Key findings from the three tables on the following pages are provided below:

- Portland will likely have between **344,800 – 376,300** households by the year 2035. The base estimates (2005) put the number of existing households at **240,000**. At the low end of the forecast, this translates to a percentage growth of about **44%** in the 30 year time frame. If this growth is spread evenly on an annual basis, it means that the City will see an annual percent rate change of **1.2%,** slightly below the Portland Metro area growth rate of 1.4%. At the higher end, the annual percentage rate change will be at **1.6%.**

- The **net increase** in number of households is projected to range between **105,000 – 136,000** households. Spread out on an equal annual basis, the City will need between **3,500-4,500** housing units each year in the 30 year Portland Plan time frame to accommodate the projected demand.

- The forecasted distribution amongst the City's subareas indicates that *Southeast Portland* is projected to contain the largest share of households (23%).

- The *Portland CBD* is expected to capture the largest share of the new growth, adding households at a rate of nearly **277%** in the projected time frame. The resulting number of households is expected to range between **46,200- 52,500**. In terms of "percent growth" this subarea is projected to have the highest growth rate of the entire metro region. For all other subareas, growth is expected to remain below 50%.

- In terms of absolute number of households, *Southeast Portland, and West Portland* are all projected to house well over 60,000 households.

- *Northeast* and *Southeast Portland* are projected for rather small "percent growth"- 17% and 15% respectively.

- Projections indicate maximum growth for owner-occupied multi-family housing units.

Table 1: Forecasted Distribution of Households in Portland Citywide and by Subarea in 2005 and 2035 (Assuming Current Policies & Trends)

	Estimate	Projections (2035)					
	Estimated Dwelling Units, 2005	Low Growth Scenario, ~~2035~~ (Existing + New)		Medium Growth Scenario, ~~2035~~ (Existing + New)		High Growth Scenario, ~~2035~~ (Existing + New)	
Total		**344,806**		**360,982**		**376,343**	
Expected Growth	**240,078**	**104,728**		**120,904**		**136,265**	
Subareas		Forecasted # Households	Pct. Forecasted Total	Forecasted # Households	Pct. Forecasted Total	Forecasted # Households	Pct. Forecasted Total
Portland Central Business District	12,267	46,187	13.4%	49,429	13.7%	52,530	14.0%
Northeast Portland	44,363	52,005	15.1%	53,835	14.9%	55,696	14.8%
East Portland	43,968	61,576	17.9%	65,236	18.1%	68,916	18.3%
Southeast Portland	68,332	78,602	22.8%	80,192	22.2%	81,644	21.7%
West Portland	48,761	75,707	22.0%	79,611	22.1%	82,857	22.0%
North Portland	22,387	30,728	8.9%	32,679	9.1%	34,700	9.2%

Source: 2009 MetroScope Scenario Allocations, Metro

Note: Estimates & Projections Exclude Population in Group Quarters.

Table 2: Forecasted Growth for Metro Region, Portland Citywide & City Subareas, 2005-2035

	Estimate	Forecasted Growth			
	Estimated Households 2005	Low Growth Scenario 2035 (Existing +New)	Percent Growth	High Growth Scenario 2035 (Existing +New)	Percent Growth
Portland Metro (Clackamas, Multnomah, Washington)	**836, 400**	**1,300,800**	**56%**	**1,456,000**	**74%**
City of Portland	**240,000**	**344,800**	**43.7%**	**376,300**	**56.8%**
Subareas					
Portland Central Business District	12,300	46,200	**275.6%**	52,500	**326.8%**
Northeast Portland	44,400	52,000	**17.1%**	55,700	**25.5%**
East Portland	44,000	61,600	**40.0%**	68,900	**56.6%**
Southeast Portland	68,300	78,600	**15.1%**	81,600	**19.5%**
West Portland	48,800	75,700	**55.1%**	82,900	**69.9%**
North Portland	22,400	30,700	**37.1%**	34,700	**54.9%**

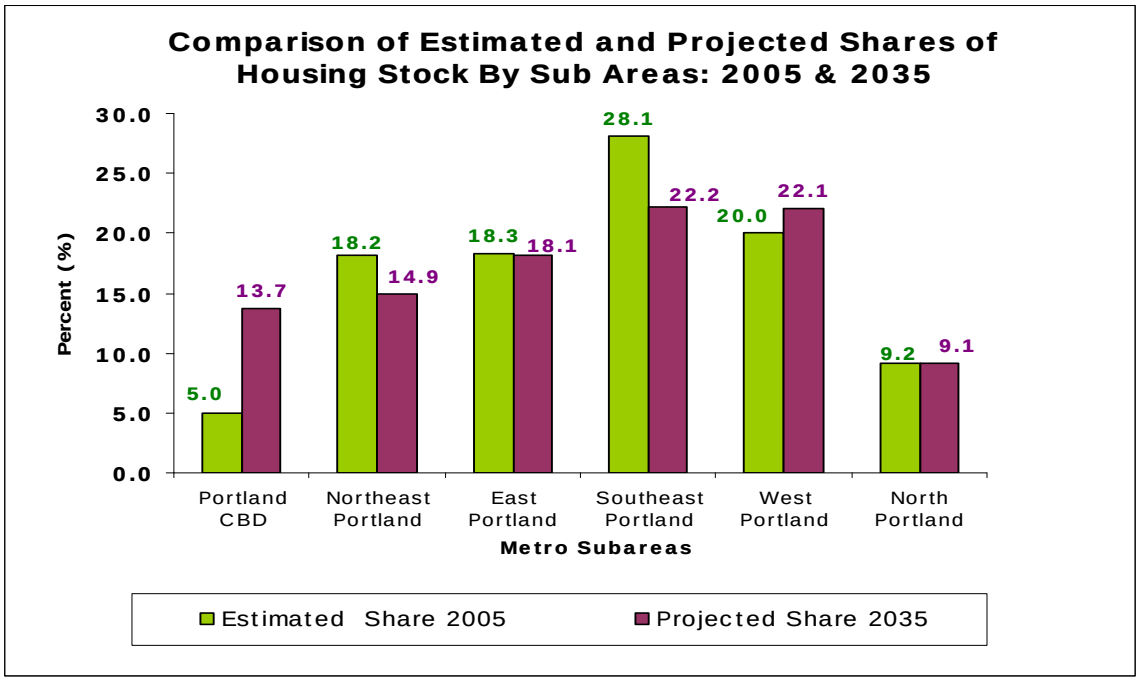
Source: 2009 MetroScope Scenario Allocations, Metro

Table 3: Forecasted Dwelling Unit Demand by 2035

	Estimated Dwelling Units, 2005	Growth Scenarios	Projected Net Demand
Low Growth Scenario			
Total	**240,078**	**344,806**	**104,728**
Subareas			
Portland Central Business District	12,267	46,187	**33,920**
Northeast Portland	44,363	52,005	**7,642**
East Portland	43,968	61,576	**17,608**
Southeast Portland	68,332	78,602	**10,270**
West Portland	48,761	75,707	**26,946**
North Portland	22,387	30,728	**8,341**
Medium Growth Scenario			
Total	**240,078**	**360,982**	**120,904**
Subareas			
Portland Central Business District	12,267	49,429	**37,162**
Northeast Portland	44,363	53,835	**9,472**
East Portland	43,968	65,236	**21,268**
Southeast Portland	68,332	80,192	**11,860**
West Portland	48,761	79,611	**30,850**
North Portland	22,387	32,679	**10,292**
High Growth Scenario			
Total	**240,078**	**376,343**	**136,265**
Subareas			
Portland Central Business District	12,267	52,530	**40,263**
Northeast Portland	44,363	55,696	**11,333**
East Portland	43,968	68,916	**24,948**
Southeast Portland	68,332	81,644	**13,312**
West Portland	48,761	82,857	**34,096**
North Portland	22,387	34,700	**12,313**

Source: 2009 MetroScope Scenario Allocations, Metro

Figure 1: Estimated (2005) and Projected (2035) Distribution of Households in City Subareas



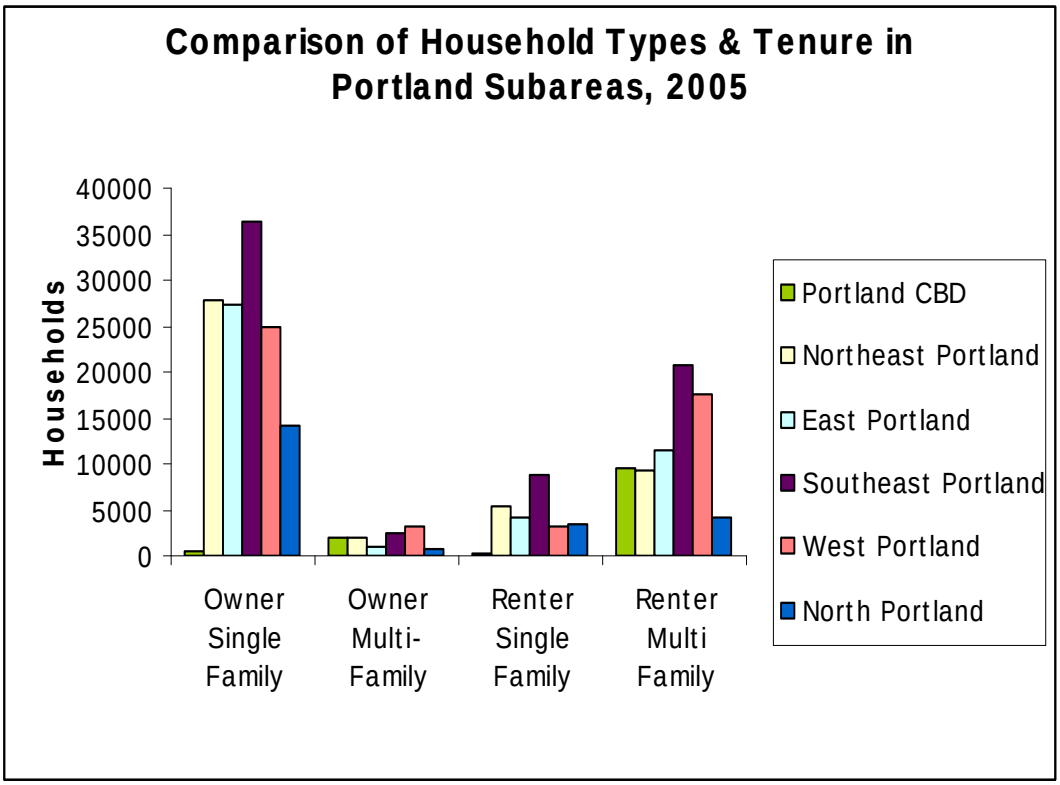
Key findings from Figure 1: Estimated (2005) and Projected (2035) Distribution of Households in City Subareas include the following:

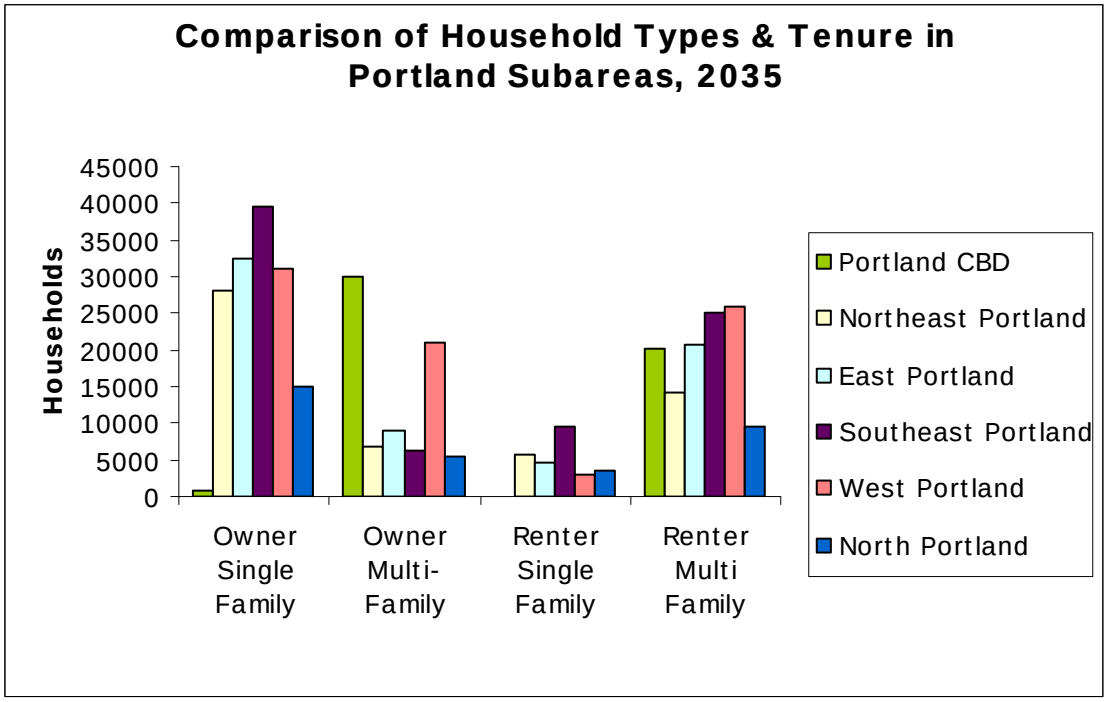
- The number of total households in the *Portland Central/CBD* is projected to nearly triple, with Portland Central subarea increasing its share of housing stock in the City to just under 14%.

- Southeast Portland's share of housing stock is projected to decline by 2035. Still this subarea will be home to the largest number of households. In other words, decline in share does not mean loss of households.

The following figures illustrate the estimated and projected mix of housing type and tenure in 2005 and in 2035:

Figures 2a and 2b: Housing Type & Tenure: 2005 & 2035





Key findings from Figures 2a and 2b: Housing Type and Tenure, 2005 and 2035 include the following:

- Projections indicate significant growth in owner-occupied multi-family housing units in all of Portland's subareas.
- Dramatic growth in owner-occupied multi-family units is projected for Portland Central/CBD. Projections indicate an addition of 28,000 units (from a base of 2000 units in 2005). This amounts to a percent growth of 1456% and notably alters the housing tenure. Based on these projections, the tenure changes from a base of 20% to 61%, that is, an increase in ownership.
- All City subareas are projected to increase their share of rental multi-family housing units as well.
- As a percentage of all household unit types, rental single-family housing units will see a decline in the coming years.
- *East Portland* is the only subarea which is expected to increase its share of owner-occupied single family units.

The following set of tables (Tables 4 a-c) provides a cross tabulation of *Portland Subareas* and the eight *Household Types*. These tables provide data for the low, medium and high growth scenarios.

Table 4(a): Low Growth Scenario 2035	Portland Subareas (Metro Designated)						
	CBD	Northeast	East	Southeast	West	North	Row Total
Household Types							
Group 1- Low-Income Singles	9531	9945	11188	14017	6963	9937	61581
Pct. Subareas HHs (Column %)	20.6%	19.1%	18.2%	17.8%	9.2%	32.3%	
Pct. Household Type (Row %)	15.5%	16.1%	18.2%	22.8%	11.3%	16.1%	
Group 2 - Working Class	4078	7730	12566	13533	7282	6307	51497
Pct. Subareas HHs (Column %)	8.8%	14.9%	20.4%	17.2%	9.6%	20.5%	
Pct. Household Type (Row %)	7.9%	15.0%	24.4%	26.3%	14.1%	12.2%	
Group 3 - Emerging Singles	5836	6732	10556	12389	8756	4005	48274
Pct. Subareas HHs (Column %)	12.6%	12.9%	17.1%	15.8%	11.6%	13.0%	
Pct. Household Type (Row %)	12.1%	13.9%	21.9%	25.7%	18.1%	8.3%	
Group 4 - Established Singles & Couples	6154	6356	9774	10932	8229	2884	44329
Pct. Subareas HHs (Column %)	13.3%	12.2%	15.9%	13.9%	10.5%	9.4%	
Pct. Household Type (Row %)	13.9%	14.3%	22.0%	24.7%	18.6%	6.5%	
Group 5 - Young Middle Income Families	6778	4893	6438	7576	6129	1880	33693
Pct. Subareas HHs (Column %)	14.7%	9.4%	10.5%	9.6%	8.1%	6.1%	
Pct. Household Type (Row %)	20.1%	14.5%	19.1%	22.5%	18.2%	5.6%	
Group 6 - Fast Track Families	7626	5115	4581	6856	7973	1910	34061
Pct. Subareas HHs (Column %)	16.5%	9.8%	7.4%	8.7%	10.5%	6.2%	
Pct. Household Type (Row %)	22.4%	15.0%	13.4%	20.1%	23.4%	5.6%	
Group 7 - Successful Middle Aged	4701	7104	4002	8809	13358	2180	40155
Pct. Subareas HHs (Column %)	10.2%	13.7%	6.5%	11.2%	17.6%	7.1%	
Pct. Household Type (Row %)	11.7%	17.7%	10.0%	21.9%	33.3%	5.4%	
Group 8 - Movers & Shakers with Kids	1482	4129	2471	4490	17018	1625	31215
Pct. Subareas HHs (Column %)	3.2%	7.9%	4.0%	5.7%	22.5%	5.3%	
Pct. Household Type (Row %)	4.7%	13.2%	7.9%	14.4%	54.5%	5.2%	
Column Total	46187	52005	61576	78602	75707	30728	
Grand Total							**344806**

Table 4(b): Medium Growth Scenario 2035	Portland Subareas (Metro Designated)						
	CBD	Northeast	East	Southeast	West	North	Row Total
Household Types							
Group 1- Low-Income Singles	10182	10394	12072	14270	7048	10642	64608
Pct. Subareas HHs (Column %)	20.6%	19.3%	18.5%	17.8%	8.9%	32.6%	
Pct. Household Type (Row %)	15.8%	16.1%	18.7%	22.1%	10.9%	16.5%	
Group 2 - Working Class	4267	8039	13412	13857	7525	6652	53752
Pct. Subareas HHs (Column %)	8.6%	14.9%	20.6%	17.3%	9.5%	20.4%	
Pct. Household Type (Row %)	7.9%	15.0%	25.0%	25.8%	14.0%	12.4%	
Group 3 - Emerging Singles	6208	7054	11216	12775	9121	4271	50645
Pct. Subareas HHs (Column %)	12.6%	13.1%	17.2%	15.9%	11.5%	13.1%	
Pct. Household Type (Row %)	12.3%	13.9%	22.1%	25.2%	18.0%	8.4%	
Group 4 - Established Singles & Couples	5494	6348	9914	10884	8447	2987	44075
Pct. Subareas HHs (Column %)	11.1%	11.8%	15.2%	13.6%	10.6%	9.1%	
Pct. Household Type (Row %)	12.5%	14.4%	22.5%	24.7%	19.2%	6.8%	
Group 5 - Young Middle Income Families	7365	5103	6968	7939	6469	2034	35878
Pct. Subareas HHs (Column %)	14.9%	9.5%	10.7%	9.9%	8.1%	6.2%	
Pct. Household Type (Row %)	20.5%	14.2%	19.4%	22.1%	18.0%	5.7%	
Group 6 - Fast Track Families	8532	5500	4922	7160	8866	2084	37063
Pct. Subareas HHs (Column %)	17.3%	10.2%	7.5%	8.9%	11.1%	6.4%	
Pct. Household Type (Row %)	23.0%	14.8%	13.3%	19.3%	23.9%	5.6%	
Group 7 - Successful Middle Aged	5707	7287	4212	8885	13962	2337	42390
Pct. Subareas HHs (Column %)	11.5%	13.5%	6.5%	11.1%	17.5%	7.2%	
Pct. Household Type (Row %)	13.5%	17.2%	9.9%	21.0%	32.9%	5.5%	
Group 8 - Movers & Shakers with Kids	1674	4110	2521	4421	18173	1672	32571
Pct. Subareas HHs (Column %)	3.4%	7.6%	3.9%	5.5%	22.8%	5.1%	
Pct. Household Type (Row %)	5.1%	12.6%	7.7%	13.6%	55.8%	5.1%	
Column Total Grand Total	49429	53835	65236	80192	79611	32679	**360982**

Table 4(c): High Growth Scenario 2035	Portland Subareas (Metro Designated)						
	CBD	Northeast	East	Southeast	West	North	Row Total
Household Types							
Group 1- Low-Income Singles	10828	10970	13014	14655	7116	11394	67977
Pct. Subareas HHs (Column %)	20.6%	19.7%	18.9%	18.0%	8.6%	32.8%	
Pct. Household Type (Row %)	15.9%	16.1%	19.1%	21.6%	10.5%	16.8%	
Group 2- Working Class	4597	8433	14366	14357	7725	7119	56596
Pct. Subareas HHs (Column %)	8.8%	15.1%	20.8%	17.6%	9.3%	20.5%	
Pct. Household Type (Row %)	8.1%	14.9%	25.4%	25.4%	13.6%	12.6%	
Group 3 - Emerging Singles	6666	7416	11965	13209	9380	4565	53201
Pct. Subareas HHs (Column %)	12.7%	13.3%	17.4%	16.2%	11.3%	13.2%	
Pct. Household Type (Row %)	12.5%	13.9%	22.5%	24.8%	17.6%	8.6%	
Group 4 - Established Singles & Couples	6148	6531	10365	11178	8768	3136	46126
Pct. Subareas HHs (Column %)	11.7%	11.7%	15.0%	13.7%	10.6%	9.0%	
Pct. Household Type (Row %)	13.3%	14.2%	22.5%	24.2%	19.0%	6.8%	
Group 5 - Young Middle Income Families	7597	5236	7261	8065	6710	2141	37010
Pct. Subareas HHs (Column %)	14.5%	9.4%	10.5%	9.9%	8.1%	6.2%	
Pct. Household Type (Row %)	20.5%	14.1%	19.6%	21.8%	18.1%	5.8%	
Group 6 - Fast Track Families	6348	4570	4631	5955	6741	2040	30286
Pct. Subareas HHs (Column %)	12.1%	8.2%	6.7%	7.3%	8.1%	5.9%	
Pct. Household Type (Row %)	21.0%	15.1%	15.3%	19.7%	22.3%	6.7%	
Group 7 - Successful Middle Aged	8589	8412	4708	9815	17196	2578	51297
Pct. Subareas HHs (Column %)	16.4%	15.1%	6.8%	12.0%	20.8%	7.4%	
Pct. Household Type (Row %)	16.7%	16.4%	9.2%	19.1%	33.5%	5.0%	
Group 8 - Movers & Shakers with Kids	1757	4128	2606	4410	19222	1726	33850
Pct. Subareas HHs (Column %)	3.3%	7.4%	3.8%	5.4%	23.2%	5.0%	
Pct. Household Type (Row %)	5.2%	12.2%	7.7%	13.0%	56.8%	5.1%	
Column Total	52530	55696	68916	81644	82857	34700	
Grand Total							**376343**

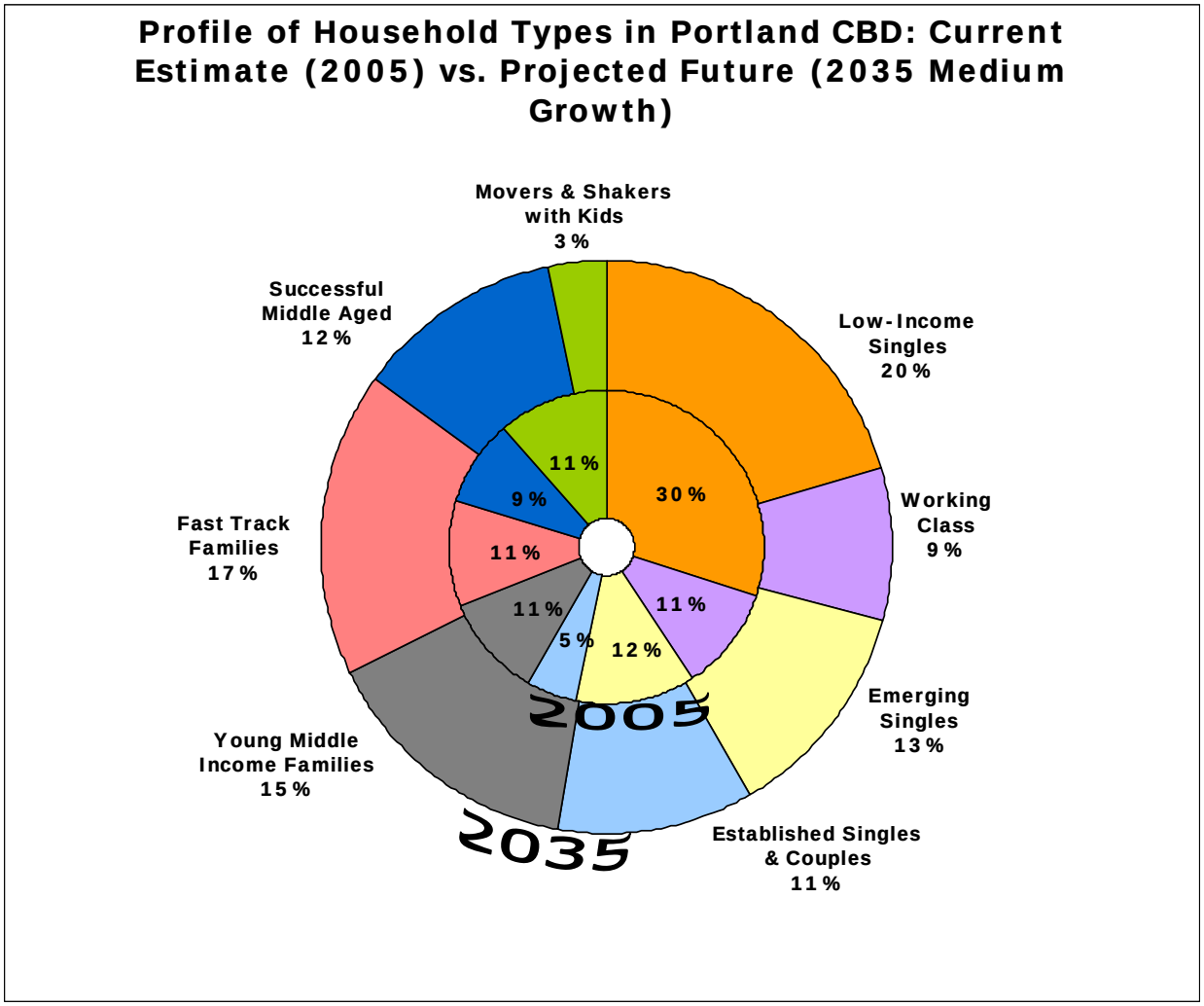
Key findings from Tables 4a through c are provided below:

- A comparison of low, medium and high growth scenario reveals that the distribution of household types does not significantly change with increase in number of households.
- The cross tabulations reveal that the City's subareas are not likely to be uniform with regards to distribution of household types.
- The household type distribution is more uneven for *North, East and West Portland* subareas as compared to *the Portland CBD, Northeast and Southeast Portland.*
- In terms of significantly high concentration of a certain household type, the projections show over 50% of Group 8 households (Movers & Shakers with kids) in *West Portland.* Households in groups 6 & 7 are also projected for geographic concentration in *Southeast and West Portland.*
- The *Portland CBD* is projected to house relatively low proportions of Groups 2 & 8.
- *East Portland* is projected to accommodate very low proportions of Groups 6, 7, 8.
- The *North Portland* subarea is projected to accommodate a significantly high (33%) concentration of households from Group 1.

It is important to note that this distribution of projected household types in City subareas is based on the assumption that existing policies and investment choices continue; a change in any of these existing baseline assumptions could impact the forecast, as is the case for all the projections discussed in this report.

The following set of graphs illustrates the current (2005) and projected (2035) distribution of the eight household types in the six subareas of the City:

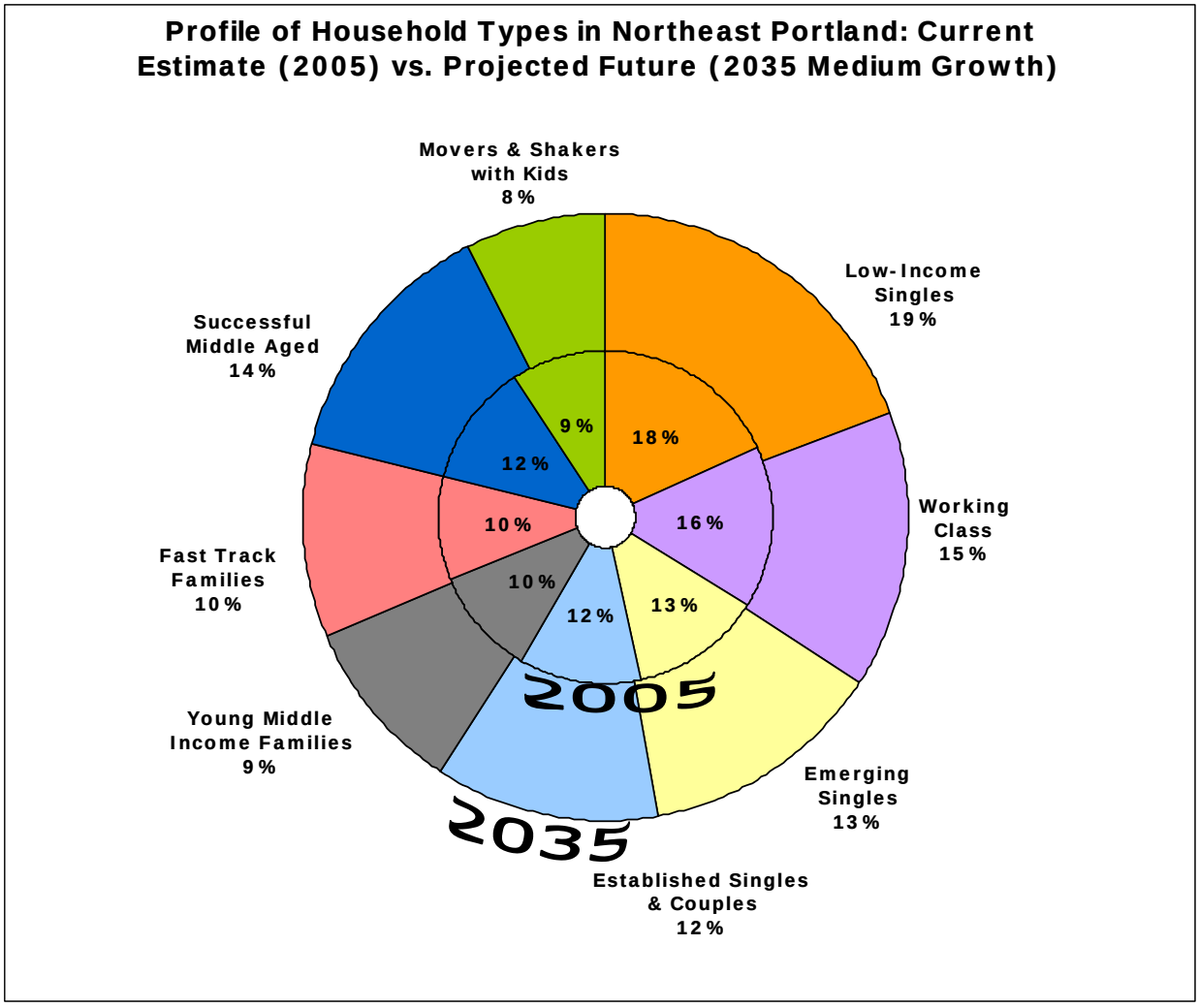
Figure 3:
Profile of Household Types in Portland CBD
Current estimate (2005) vs. Projected Future (2035)



Key findings from Figure 3 are provided below:

- Notable shifts in household types living in the **Central** area include that of **Group 4 (Established Singles),** which is projected to **increase to 11% from 5%.** Groups 5, 6, and 7 will also see some growth.
- A notable **decline** is projected for **Group 8 (Movers & Shakers with kids)** - **to 3% from 11%**. Groups 1 and 2 are also projected to decline.

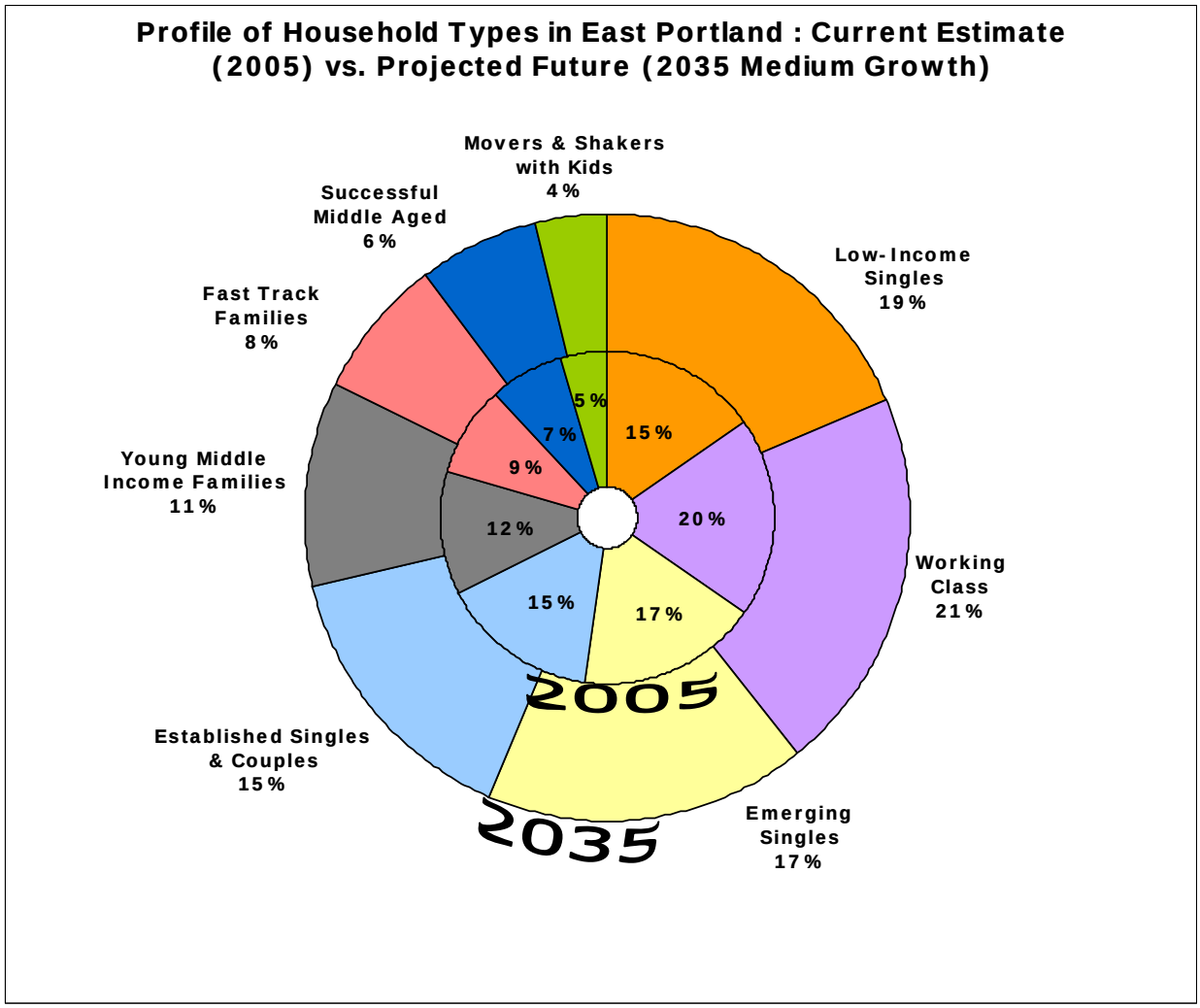
Figure 4:
Profile of Household Types in Northeast Portland
Current estimate (2005) vs. Projected Future (2035)



A key finding from Figure 4 is provided below:

- ***Northeast** Portland* will **not experience any significant changes** in distribution of household types in the projected future. Each of eight groups is projected for a small increase or decrease in geographic sharing of the subarea.

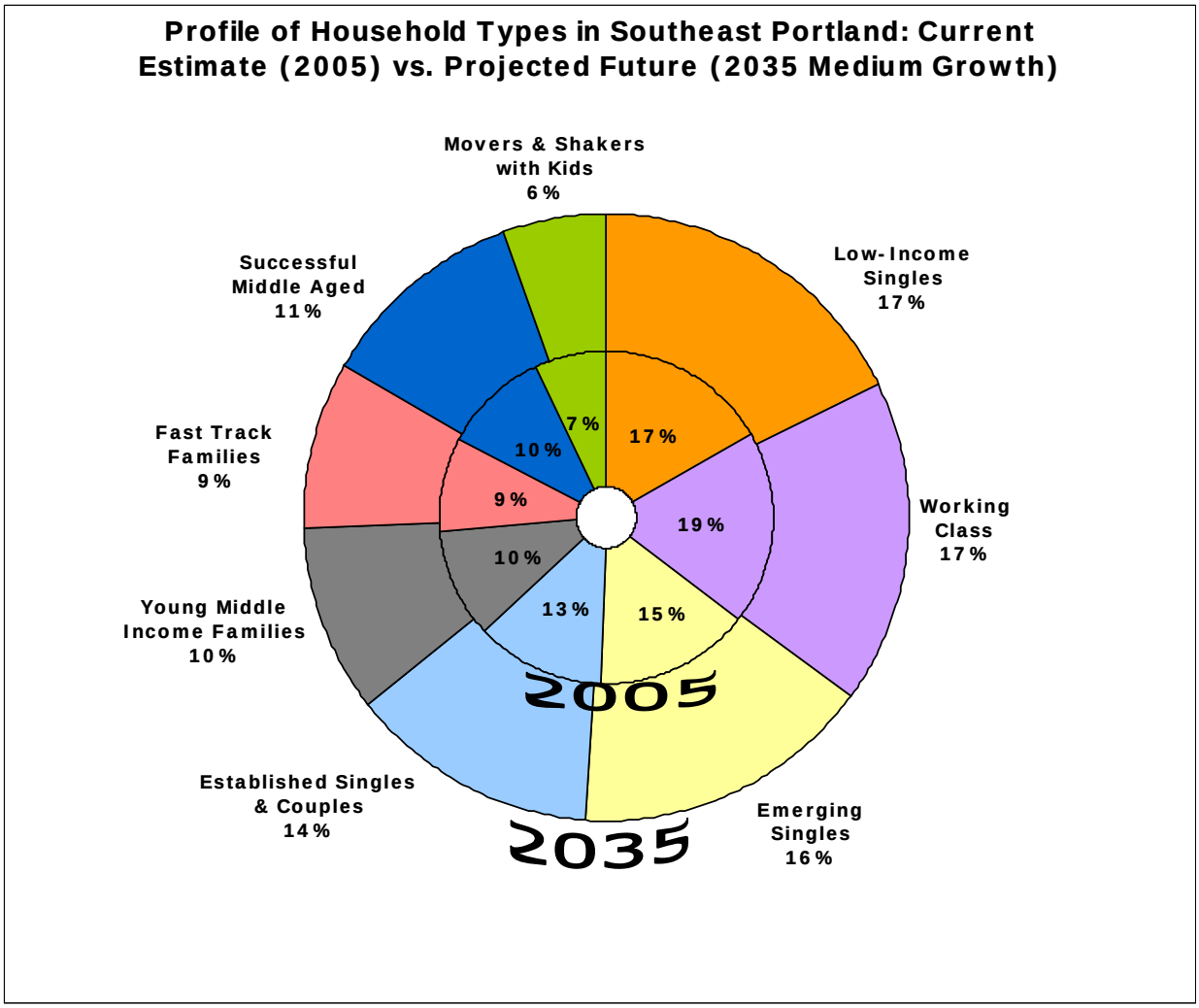
Figure 5:
Profile of Household Types in East Portland
Current estimate (2005) vs. Projected Future (2035)



A key finding from figure 5 is provided below:

- The distribution of the eight household types in ***East** Portland* is projected to shift only slightly. However, it is noteworthy that the share of **higher income groups** (3-8) will be **declining** while the **lower income groups are slated for an increase** in their respective subarea proportion (Group 1, the lowest income group, increasing to 19% from 15%).

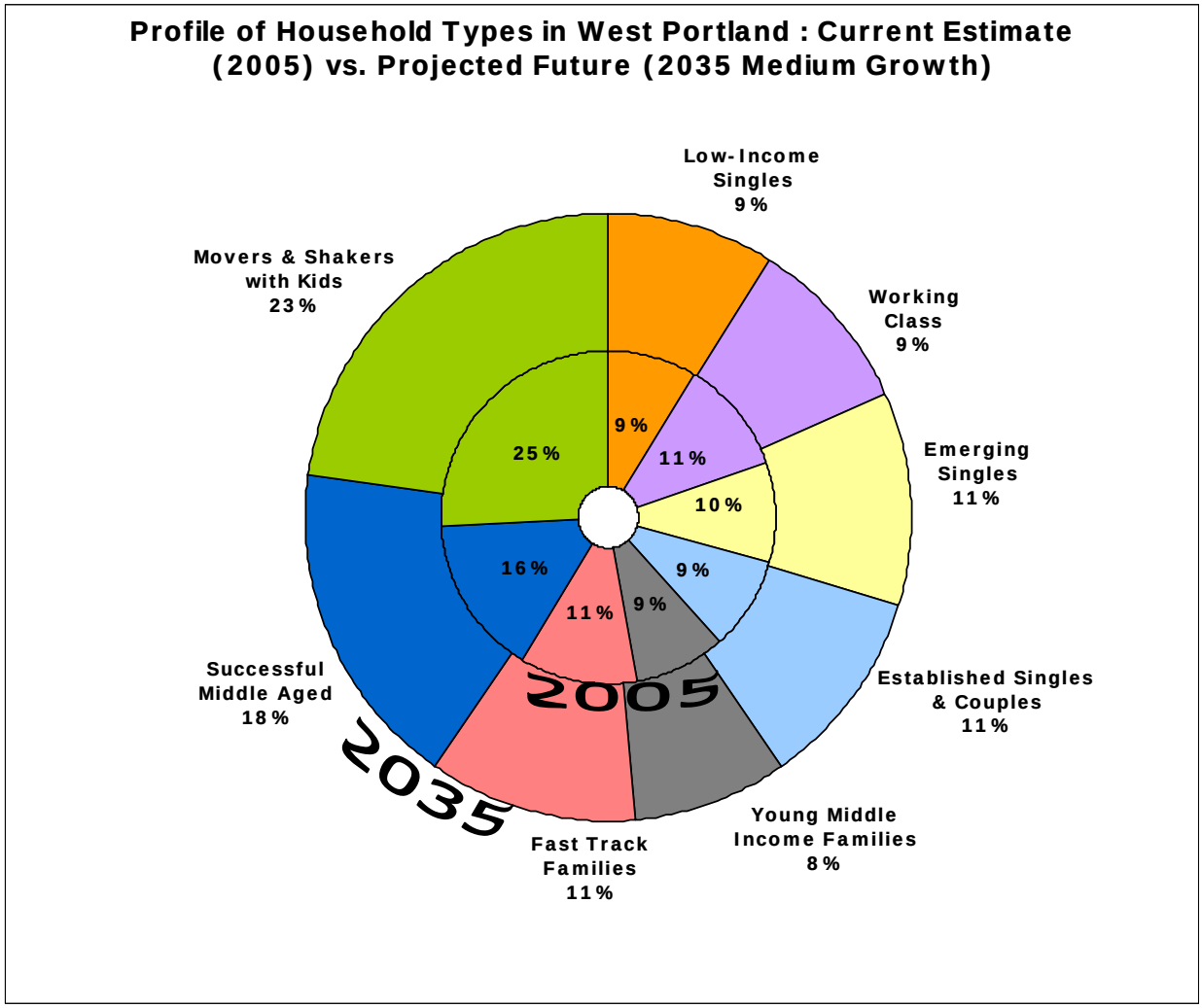
Figure 6:
Profile of Household Types in Southeast Portland
Current estimate (2005) vs. Projected Future (2035)



A key finding from figure 6 is provided below:

- The ***Southeast*** subarea household type distribution is not projected to see any dramatic shifts. However, the projections indicate that regardless of income, the area will see an **increase in households of smaller size**. For instance, Group 2 (Working Class) has larger households than Group 4 (Established Singles & Couples); Group 2 households are slated for a decline by 2035 while Group 4 is slated for an increase.

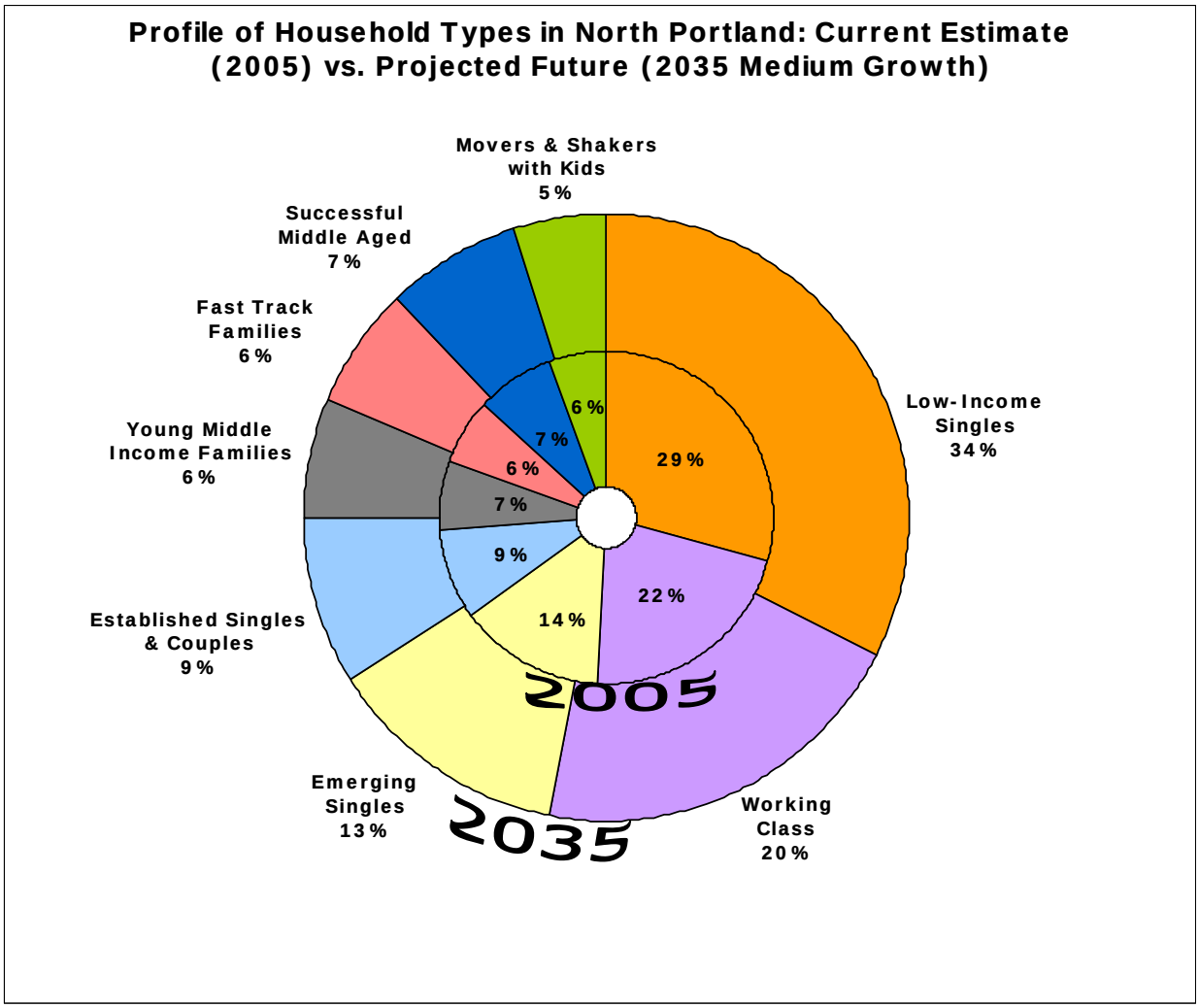
Figure 7:
Profile of Household Types in West Portland
Current estimate (2005) vs. Projected Future (2035)



A key finding from Figure 7 is provided below:

- Groups (6-8) form just **over half (51%)** of the household types in ***West*** *Portland* and this distribution is **projected to continue** into the future. Notably, these groups have **higher household income** than the other groups.

Figure 8:
Profile of Household Types in North Portland
Current estimate (2005) vs. Projected Future (2035)

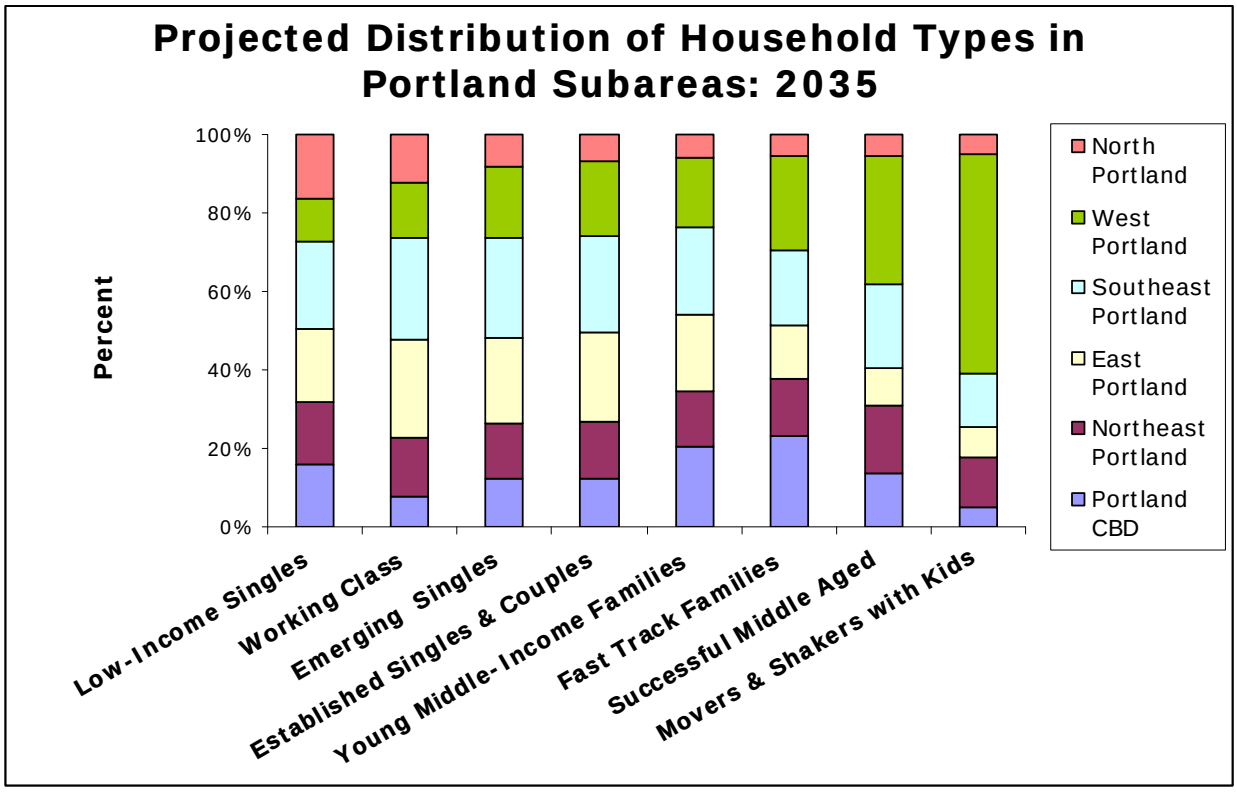


A key finding from Figure 8 is provided below:

- The above illustration reveals that nearly a **third** of the households in ***North*** *Portland* are from **Group 1, the lowest income group**, and that this group is **increasing its geographic share** of the North subarea by 2035. As the renter households in this group are elderly singles with low incomes, this pattern has implications for housing type and also human services.

The following bar graph (Figure 9) illustrates how each of the eight household group types are projected to be geographically distributed in the six subareas of Portland in 2035. It should be noted that the bars representing each household group type are not to scale relative to each other. That is, each bar is shown as the same size even though each represents a different total number of households. Group 1 (Low income singles) is the largest total citywide, with 18% of city households in 2035 in the medium growth scenario.

Figure 9: Projective Distribution of Household Types in Portland Subareas (2035)



Key findings from Figure 9 are provided below:

- The eight groups representing the various household consumption profiles are not projected to be uniformly distributed in the six Portland subareas. In particular, Group 8, the highest-income group, (Movers & Shakers with Kids), are predominately in West Portland. Group 1 (Low-Income Singles) is most evenly distributed.

- Groups 2, 3 and 4 are projected to be relatively evenly distributed across the city. A significant portion of these households are allocated to the *Southeast and East* subareas of Portland.

- Groups 5, 6, 7, and 8 (the upper income levels of the eight groups), are similar in their small allocations to *North Portland,* as well as to the *East and Southeast* subareas. By contrast, the upper income level groups make up a significantly large share in *West Portland.* Groups 5 and 6 also have a significant share of households in the Portland Central subarea.

DEVELOPMENT CAPACITY

The ability of the city and its subareas to meet future housing demand depends on many factors, but a basic one is simply whether there is enough land to build new units on. Therefore this background report includes discussion of projections for the "supply side" of the housing needs equation as well as the demand side covered in the chapters thus far. Just as the Metroscope model forecasts demand for new households, the model projects the supply, or "development capacity" of the land to house **new units** for new households. Development Capacity can be defined as the likely number of new dwelling units that could be built in the city under existing regulations and assuming the continuation of recent market trends. The City of Portland also calculates a development capacity forecast, using slightly different assumptions and methodology than Metroscope does. (The methodology of each model and corresponding assumptions regarding capacity are described in the in more detail in the appendix of this report.)

The amount of development capacity relates to how many **new** homes can be built, under existing zoning and regulations, either on **vacant land** or through a combination of infill or redevelopment of land referred to as "**refill**." Based on recent trends in home construction, a **significant portion of dwelling unit production for Portland has occurred through the refill process**. Unlike development that occurs in vacant land, production through refill poses more challenges to the effort of calculating "Dwelling Unit Capacity."

Based on permit activity and housing construction trends in the region, Metro has ascribed refill rates for various local jurisdictions; those refill rates affect the capacity numbers Metro provides for Portland and its subareas. It is important to note that the capacity as defined by the Metroscope model includes:

- All vacant capacity in the Metro area, plus
- All capacity likely resulting from refill over the next 35 years, plus
- Capacity likely to be generated by existing policies such as urban renewal.

Because of the above Metroscope assumptions, the capacity numbers projected by Metro are likely to be at the higher end of a range of possible numbers.

Table 5 provides the development capacity for Portland's subareas, according to Metroscope and also as calculated by the City of Portland using its Development Capacity Model. Unlike the Metroscope numbers, the City of Portland numbers include only the "likely redevelopable" lands in the six subareas of the City. "Likely redevelopable" lands are considered to be so because they are "underutilized" – that is, whatever is currently built on them is significantly less than what is allowed to be built under existing zoning. This second set of capacity numbers, from the City, is thus more conservative, and should be interpreted as **"at least this number of Dwelling Units."** Again, the two models projecting the dwelling unit capacity numbers are explained in detail in the appendix of this report.

Together, Metroscope's and the City's Development Capacity Model numbers serve to provide the upper and the lower bounds for a range of possible housing units in the City subareas, as Table 5 illustrates.

Table 5: Housing Demand Analysis

	Estimate	Projected Need (Growth -Supply)			Metroscope Ascribed Development Capacity	City of Portland's Development Capacity Model [1]
	Estimated Dwelling Units, 2005	Low Growth Scenario, 2035	Medium Growth Scenario, 2035	High Growth Scenario, 2035	Future Development Capacity:	Future Development Capacity:
Total	**240,078**	**104,728**	**120,904**	**136,265**	**189,137**	**141,191**
		Needed DU	Needed DU	Needed DU		
Subareas						
Portland Central Business District	12,267	33,920	37,162	40,263	47,436	46,621
Northeast Portland	44,363	7,642	9,472	11,333	18,052	8,300
East Portland	43,968	17,608	21,268	24,948	42,182	35,740
Southeast Portland	68,332	10,270	11,860	13,312	19,098	15,380
West Portland	48,761	26,946	30,850	34,096	41,106	24,600
North Portland	22,387	8,341	10,292	12,313	21,263	10,550
	240,078	104,728	120,904	136,265	**189,137**	**141,191**

Development Capacity Model [1] : based on lots using less than 20% of available development capacity (not including bonuses)

Key findings for Table 5 are provided below:

- Based on the Development Capacity numbers provided by the Metro model, all six subareas of Portland have adequate capacity to meet projected need. Nearly **189,100** housing units (mostly multi-family unit type) can be built in the City.

- Based on the City's Development Capacity Model, construction in **vacant and underutilized lots alone** can add at least **141,191** units in the various subareas of the City.

- The total capacity numbers can be best interpreted as follows:

  - According to Metroscope **up to 189,100** Dwelling Units can be built;
  - According to Development Capacity Model **at least 141,191** Dwelling Units can be built;

- The *Portland Central/CBD*. projected for nearly 300% growth by 2035, can **easily accommodate even the highest level growth scenario**. Both sets of capacity numbers corroborate this finding. The same trend holds true for *East Portland.*

- The *Southeast* and *North Portland* subareas have the **capacity** to meet low and medium growth forecasts through **new construction and refills in underutilized lands alone**.

APPENDIX

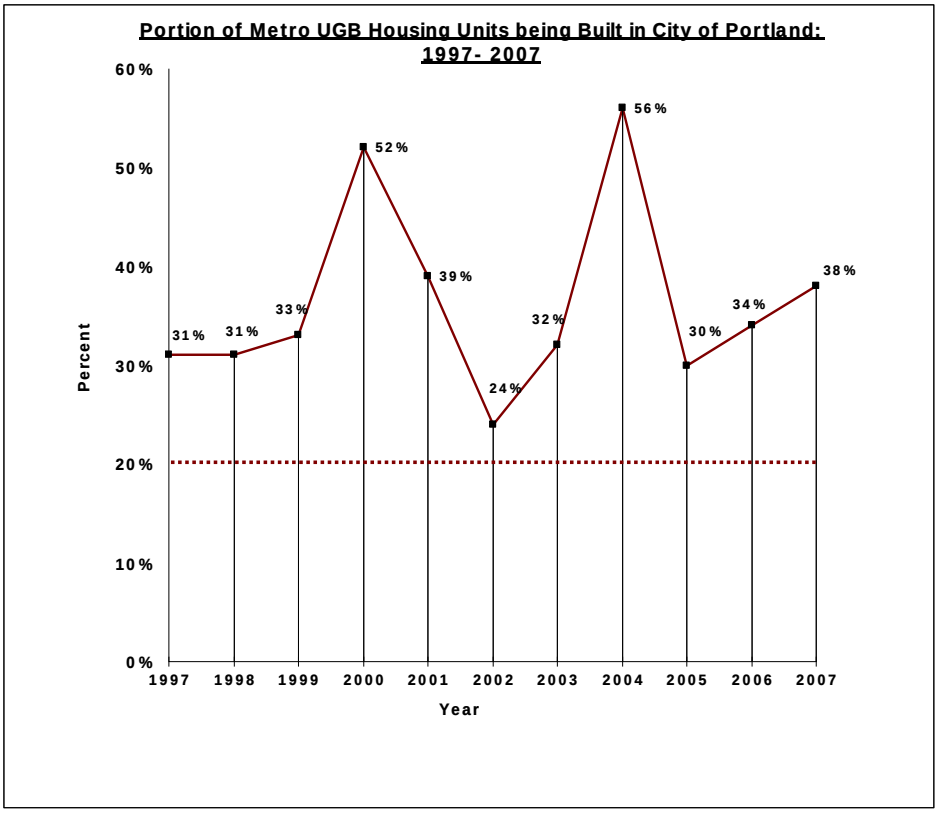
APPENDIX 1: RESIDENTIAL DEVELOPMENT IN PORTLAND - TRENDS, CAPACITY AND TOOLS

Portland has grown by about 200,000 people in 25 years, from a population of 380,000 in the mid 1980's to nearly 570,000 in 2008. Much of this population growth occurred on a fraction of the city's developable land. Over the last 15 years, the city and its private and non-profit developers have emerged as leaders and innovators in developing housing construction types that address a wide range of urban household needs, that fit changing demographics and life styles and that respond to economic conditions and rising fuel prices.

Increasing share of regional growth: Through the 1960s, 70s, and 80s the city captured 3 to 5 percent of the region's residential growth. More recently, however, that trend dramatically changed. Over the past 15 years, Portland captured more than one-third of the region's new housing starts, averaging over 36 percent. In 1992, the City Council Portland Future Focus initiative set a target of capturing at least 20% of the region's new housing starts. Since 1995, Portland has met or exceeded that target; in two of those years, the capture rate topped 50 percent. This remarkable 15-year trend is due in large part to intentional planning initiatives. Portland uses an array of regulatory and municipal tax finance tools, incentives, and state and federal funding sources, including Urban Renewal Area (URA) Tax Increment Financing (TIF), Transit-Oriented Limited Tax Abatement (TOD-LTA), System Development Charges (SDC's), targeted Capital Improvement Program (CIP) funds, development agreements, Floor Area Ratio (FAR) bonuses and transfers, and parking maximums and other state and federal funds.

The following figure shows Portland's housing capture rate for a ten year period, 1997-2007:

Figure 10: Portion of Metro UGB Housing Units Built in Portland, 1997-2007



Source: City of Portland Permits Data & Metro Information from Construction Monitor

Additionally, an analysis of the over 7,300 Multi-family residential permits issued from 1999 through 2008 showed a significant increase in *units per acre* permitted in all of our highest density mixed-use zoned lands.

- EX increased from 42 du/ac to 67 du/ac;
- CX zoned lands changed from16 du/ac to 40 du/ac; and the
- RX changed from 121 du/ac to 300 du/ac.

Another sign of successful implementation of new construction of higher densities is that In the last 15 years, the city can count about 100 examples of mixed use transit-oriented development (TOD) project development – where in the early 1990's there were fewer than a dozen. These are trends we do not expect to abate. In addition to our regular level of growth, rising energy prices, global economic trends and demographic trends will cause Portland and other developed regional centers to continue to attract a significant share of the growth coming to the region.

APPENDIX 2: METROSCOPE MODEL OVERVIEW

Metroscope is an “urban simulation model” that integrates the residential housing model with transportation, land use, and commercial location models. As it integrates land use and transportation, Metroscope provides a rich and realistic model of housing development that incorporates the impact of household choice, development economics, and commuting preferences. Metroscope is comprised of four inter-related models:

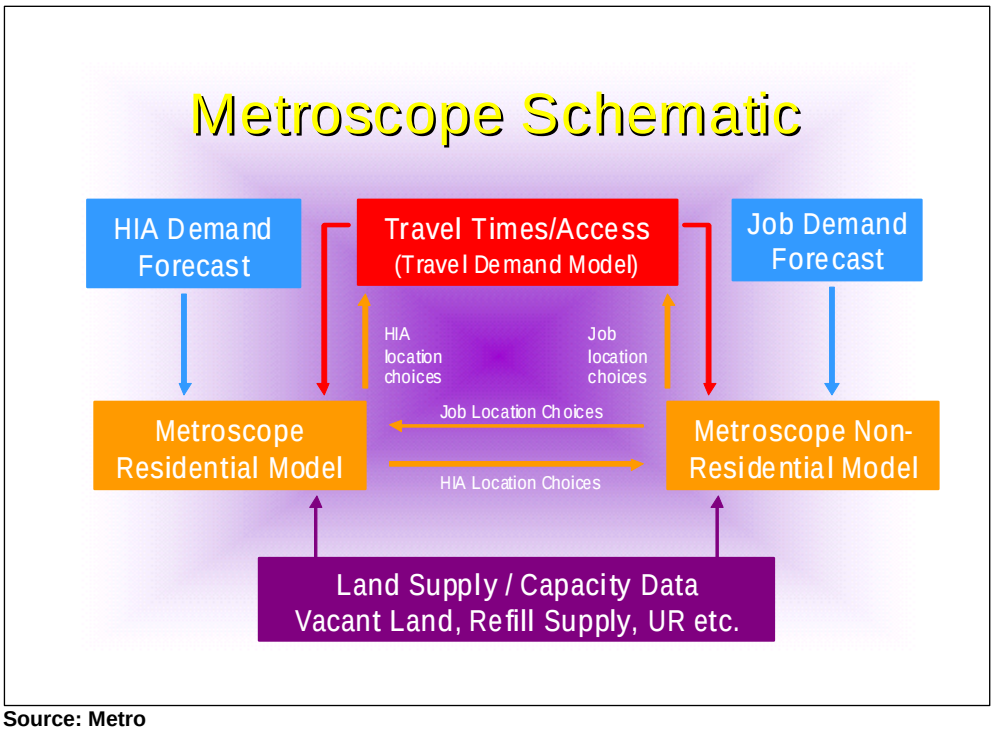
- **Economic Model:** Forecasts region-wide population and employment by industry. It converts the forecasted population into number of households (HH) and groups them into 400 possible combinations of HH Size, Income Category, Age-of-household-head and Children present/absent;

- **Location Model(s):** (comprised of residential and non-residential sub models) that predicts where and how much housing will exist in the future based on predictions of how much and where employment activity will occur, the price of housing, household income and other wealth factors, and the age of the householder;

- **Travel Model:** estimates trip origins and destinations, and measures perceived cost of travel between regions which affects where people work and decide to reside;

- **GIS/ land tools & database:** contains the land and development data and tracks where and how much land (parcels) will be available for development in the future, provides an inventory and accounting of developable land that is available, and its capacity for housing units and employment.

All sub-models are interrelated, and they influence and provide inputs for one another.



Source: Metro

While a detailed explanation of the model is beyond the scope of this report, it is important to note that the MetroScope is an equilibrium model that balances housing demand and housing supply by adjusting vacancy rates, prices, rents, and production. Housing prices and rents are bounded by household incomes to some extent, and housing production is determined partly by land use and zoning policies and by the interaction of rents, prices, and construction costs. The use of this model can help theoretically illustrate the implications of continuing with current policies and investments. Similarly, the Model can help illustrate changes to relevant policy assumptions and/or investments. In the model, households are expressed as "dwelling units" and so the following relation holds true:

1 Dwelling Unit (DU) = 1 Household

Also, the projections exclude population in group quarters[2] and so demands to house this segment must be dealt with separately. The household distributions that have been presented in this report do not test different policy options but only different population and employment growth rates. Consequently, there are three sets of household projections: the low growth scenario, the medium growth scenario and the high growth scenario tied to low, middle and high end population forecasts.

Relationship: Household Projections and Metroscope Allocations

The population and household forecasts produced by the economic model are among the inputs for the other three Metroscope sub models. As this input is subjected to a different set of assumptions and a different timeframe, the household numbers reported as Metroscope results, while similar, are not the same as the projected population, households and employment numbers released for the Portland metro area. In other words, Metroscope modeling provides the ability to take projected household numbers by type and allocates them to specific subareas. The Model's usefulness rests in its abilities to simulate changes to household allocations in response to changes to development policies, transportation investments and other incentives of local jurisdictions.

[2] A group quarters is a place where people live or stay, in a group living arrangement, that is owned or managed by an entity or organization providing housing and/or services for the residents. Nearly 3% of Portland's population lives in some form of group quarters. In comparison, about 2% of Metro area residents live in group quarters.

APPENDIX 3: UNDERSTANDING DEVELOPMENT CAPACITY METHODOLOGY – A COMMON LANGUAGE DEFINITION

"Development capacity" is an economic and urban planning term that is not necessarily easily understood or defined, yet is important in making projections, plans and long-term strategies for a city or region. Understanding these seemingly complicated terms helps us plan well for the future of Portland. The Household Demand and Supply Projections Background Report relies on development capacity numbers in making decisions about the future residential population of Portland.

Development capacity is essentially the ability of land to hold more "development," that is, to house more or larger buildings than what is there now. The buildings could be for any use; they could be a new home on a vacant site, or an addition to an existing commercial building, or even a demolition of an existing building and replacement with a larger, taller building in the same space. Either way, the development capacity is a number representing how much buildable space is judged as remaining on the land.

Indeed, the development capacity number is a judgment, because it depends on many different criteria which must be decided upon – first, related to the land itself, and then, to a set of realistic assumptions made about that land. Thus the development capacity number can change, depending on the assumptions. The assumptions fall into a set of questions which define or "judge" the capacity of the land by describing what if any constraints there might be to building on the land:

1. The physical **land** area itself –
   - **What** is on the land now? – Is it vacant? Is there a large or small building on it; an historically significant landmark? An uninhabited and about-to-fall-down shack?
   - **Where** is the land? Is it located near services like water, sewer, and transportation that would be needed for development on the parcel? Or is it far from other buildings, with no water lines and no roads connected to it?
   - What are the **landscape features** of the parcel? Does it have limitations such as steep (and thus unbuildable) hills? Is it in a floodplain and likely to flood?

2. The **assumptions** about the land –
   - What is **legally allowable** on the land? What is the zoning? Are there other regulatory restrictions, such as limits to height or massing? Is it designated sensitive environmental land that cannot be built on?
   - What is economically **feasible** to build on the land, judging by recent and historical local **real estate market trends**?

At the simplest level, one can summarize the development capacity number as depending on three easy to remember factors: the *land*; the "*allowable*" by law; and the *"likely."* Those factors can be expressed as a formula of sorts: "land, minus constraints or limitations, multiplied by the likelihood of development and the type of development that would likely be."

(Total Land Area minus Constrained/Limited Lands) times Likely Development

(The capacity number itself will be expressed differently depending on whether the likely development is residential or commercial. Residential development is commonly referred to as numbers of "dwelling units," commercial development, by number of "square feet" of space. Thus "dwelling unit capacity" is stated as numbers of residences, while "development capacity" is referred to more generically as square feet (since it could be any number of types of commercial, retail, institutional, or industrial buildings, for instance). In either case, the capacity is a reflection of what *could* be built, given available vacant and redevelopable lands.)

In the world of economics, real estate and planning, calculating development capacity is an exercise at *projections,* but a different sort from that of traditional projections, which start from a base number and expand from there. For instance, in the case of the Metroscope model and its residential demand projections, the base number is the Portland population in the year 2005. The traditional model projects a future number by starting with the base number and adding *likely* growth (mathematically either linear or exponential) to it. By contrast, development capacity numbers do not start from a base number per se. Instead, there are different models and methodologies that can be used to calculate development capacity.

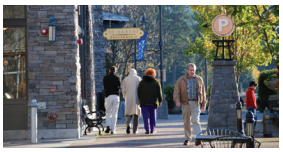
Furthermore (and to make matters more complicated), the Metro regional government uses a slightly different method to figure capacity for its Metroscope model than does the City of Portland. For the City of Portland, the methodology for determining the dwelling unit capacity number is essentially a two step process, first figuring the land area available and then figuring the amount of building that could go on it, for residential units. The City's Bureau of Planning & Sustainability (BPS) has developed an in-house Development Capacity Analysis (DCA) GIS model with restrictive criteria that essentially calculates the net supply of buildable land that is available to accommodate future growth in population and employment.

Obviously, the assumptions made about the development trends, and average unit sizes, for example, have a vast impact on what development and dwelling capacity figures result in these models. For instance, if recent historical trends showed that on a parcel of one-tenth of an acre (a typical Portland residential lot) the average structure built would be 1000 sf single family home, that's a very different judgment of the development capacity of that parcel than if trends show a preponderance of 20 story apartment towers (with typical unit size of 1000 sf) being built on such a lot.

Even depending on the geographic part of the city, the conversion to units formula is different, to accommodate the differences in development patterns and densities in Portland's Central City vs. other areas of the City.

Because it is possible to make multiple assumptions for selecting the sites and converting them into dwelling units, the result is an estimate of the City's development capacity, not a forecast of actual development and not a prediction of which parcels are actually likely to develop.











MAKING THE GREATEST PLACE

Strategies for a sustainable and prosperous region

A report from
Metro's Chief Operating Officer

September 15, 2009

Metro | *People places. Open spaces.*

Dear Friend,

After four years of study, analysis, number crunching and hard work with our local government partners – and people like you from around the region – I am pleased to provide you with a comprehensive set of proposed strategies for creating a sustainable and prosperous region.

This document contains a brief overview, with a summary of recommendations located on pages 14 and 15 For more detailed information, including supporting documents and appendices, visit www.oregonmetro.gov/greatestplace.

I want to stress that these are *recommendations* from Metro's staff – not decisions. They are intended to spark conversation and promote dialogue to inform future decisions by the Metro Council and other elected officials around the region.

One of the primary reasons our region is successful is because Metro does not make decisions or plan in a vacuum. Instead, we work with our local partners and the region's residents to achieve the outcomes we value as a community. Those outcomes include preserving our urban growth boundary to protect farmland, forestland and outdoor recreation opportunities while ensuring we have enough land to accommodate new residents and businesses for at least the next 20 years; making the most of our existing roads, sidewalks, sewers, parks, schools, and other public investments; and, perhaps most importantly, doing everything we can to ensure there are enough good jobs for the people who are here now and those who will come.

As Metro's chief operating officer, I present these recommendations to you and invite you to voice your opinion. Each of us bears responsibility for helping make our region the greatest place it can be.

The Metro Council and all the elected policymakers from our region look forward to hearing from you.

Sincerely,

Michael Jordan
Metro Chief Operating Officer

INVESTING IN OUR FUTURE

These are difficult times in our nation and our state. Unemployment is high, trust in traditional institutions is low, and an unprecedented array of challenges loom over our future.

Yet even in the face of extraordinary economic difficulties, the people of the greater Portland metropolitan region remain optimistic. We value the exceptional quality of life that is supported both by our unmatched natural setting and by the creativity and civic spirit that have enabled us to build lively communities throughout our region. We understand that in the long run, our livability provides a competitive advantage that allows us to attract and keep a talented work force and cutting-edge employers.

We also understand that while the place we call home is the envy of people across the nation, we face both local and global changes that will require us to do better.

The people of the region expect leadership that respects our common values and builds upon the legacy we have inherited. We deserve government that is careful with our money, responsive to our needs and sensitive to the challenges we face.

The city and county governments of the region reflect the aspirations of the people they serve. They want to cultivate great communities that can thrive in a changing world. Their relationship with their residents is direct and immediate, and when times are tough they get squeezed between budget cuts and increased demand for services. They expect their regional government to be a partner in serving their communities.

a high quality of life

80
Eighty percent of residents of the Portland metropolitan region mention the environment when asked what they enjoy most about the quality of life in the region.

83
Eighty-three percent of residents believe that land use regulations are an essential tool to protect the region's quality of life.

83
Eighty-three percent of residents agree that maintaining the region's quality of life will bring jobs to the region.

It is in this spirit of innovation, partnership and service that I offer my recommendations for the next phase of our efforts to make this region the greatest place it can be.

These recommendations have many elements, but they revolve around a single imperative: we must invest in our communities to secure the future the people of the region desire. This means we must invest existing dollars strategically; focus our investments for maximum impact; elevate our level of overall investment; and deploy our public resources in a way that supports private investment. Only if we do all of these things can we ensure a strong economy, a healthy environment and communities that serve the needs of all.

We must invest in our communities to secure the future the people of the region desire.

Investing in public priorities

Specifically, I recommend that we invest in ways that:

Focus our growth in city and town centers and main streets within the current urban growth boundary to the greatest extent possible – to preserve farms, forests and natural areas outside the boundary while protecting single-family neighborhoods within our existing communities.

Repair and maintain our existing public works and community assets – roads, water and sewer lines, schools, parks and public places – to get the most out of what we already have, bring increased vitality to our communities and create a solid foundation for meeting the needs of the future.

Protect and create good jobs for the people who live here now, and those who will come.

thriving, compact communities

15,000

There are 15,000 acres of vacant, buildable land within the urban growth boundary, a combined area roughly 35 times the size of downtown Portland.

95

In the last ten years, almost 95 percent of all new residential development occurred inside the original 1979 urban growth boundary.

33

In a nationwide study, compact communities were shown to reduce average driving by as much as 33 percent.

WHERE WE'VE BEEN AND WHAT WE'VE LEARNED

Fortunately, we are not starting from scratch. For years, the Portland region has been widely celebrated for its dedication to planning for the future. Our successes are well-known and defy national trends:

By accommodating rapid growth while limiting expansion of the urban growth boundary, we have reaped many benefits. Unlike most communities nationwide, we are consuming land at a rate less than our rate of population growth. Our efficient use of urban land protects valuable farms, forests and natural areas, makes our communities more vibrant, reduces the region's carbon footprint, and saves both public and private dollars.

By increasing travel choices, we have made it possible for people to meet their needs while driving less. Our transit use and biking are increasing much faster than our population, and compact growth has helped to shorten trips and make our communities more walkable. As a result, while the average American drives more miles every year, the average amount each of us drives has been declining for more than a decade. Because we are able to drive less, more than $1 billion a year remains in our pockets, most of which returns to our regional economy.

We have acted to protect our region's natural heritage. By purchasing thousands of acres of natural areas with voter-approved funds, we are protecting and restoring wildlife habitat and water quality and enhancing access to nature for current and future residents. Now a broad coalition of public, private and nonprofit partners is working to link the region's parks, trails and natural areas into a seamless system that makes the experience of the outdoors more accessible to all.

We have cleaned up our air and stabilized our greenhouse gas emissions. Portland's air quality violations have declined from 180 days a year in the 1960s to zero today. While greenhouse gas emissions nationwide have increased by 17 percent since 1990, in Portland and surrounding Multnomah County they have declined by 0.7 percent.

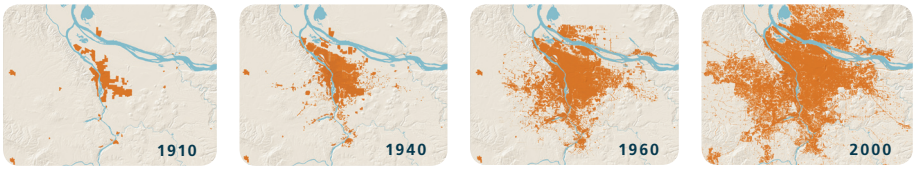
The bottom line is that we've created a place where people want to live. Longtime residents fiercely defend the livability of their communities, and our excellent quality of life continues to attract new residents, including members of the highly sought-after cohort of educated young adults – even during the current economic downturn.

But patting ourselves on the back will only take us so far. Yes, our long-range plan, the 2040 Growth Concept (see box, page 6), enjoys local support and national admiration and our planning expertise gives us a leg up on many other urban regions. But a decade and a half after the adoption of our long-range plan, we have yet to fully achieve our regional vision. We have reached a point where planning alone will not suffice.

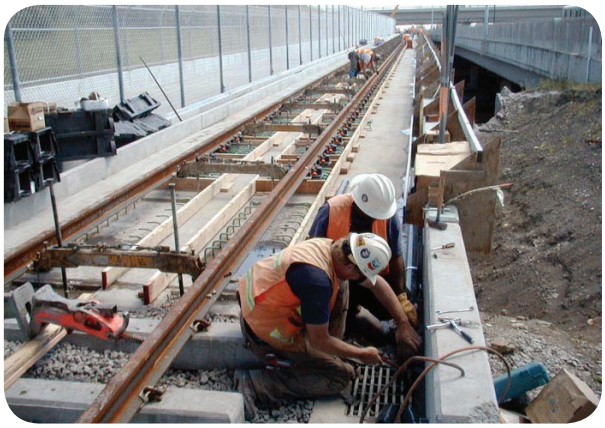
Put bluntly, the tools of the past are not enough to address the increasingly complex challenges of the future.

For example:

Our population is growing and changing. Within 25 years, we can expect to be joined by one million new neighbors – a much faster rate of growth than was forecast when the region developed its long-range plan. We are becoming more diverse, we are growing older, our household size is shrinking and there is a growing gulf between haves and have-nots.



We are failing to maintain our existing public facilities, and can't afford the investments we need to protect our livability as we grow. Meanwhile, the costs of providing, maintaining, and replacing pipes, pavement, parks and other public facilities and services are skyrocketing, even as traditional sources of funding – including federal dollars that have financed much of the region's infrastructure – are drying up.



public assets and investments

27

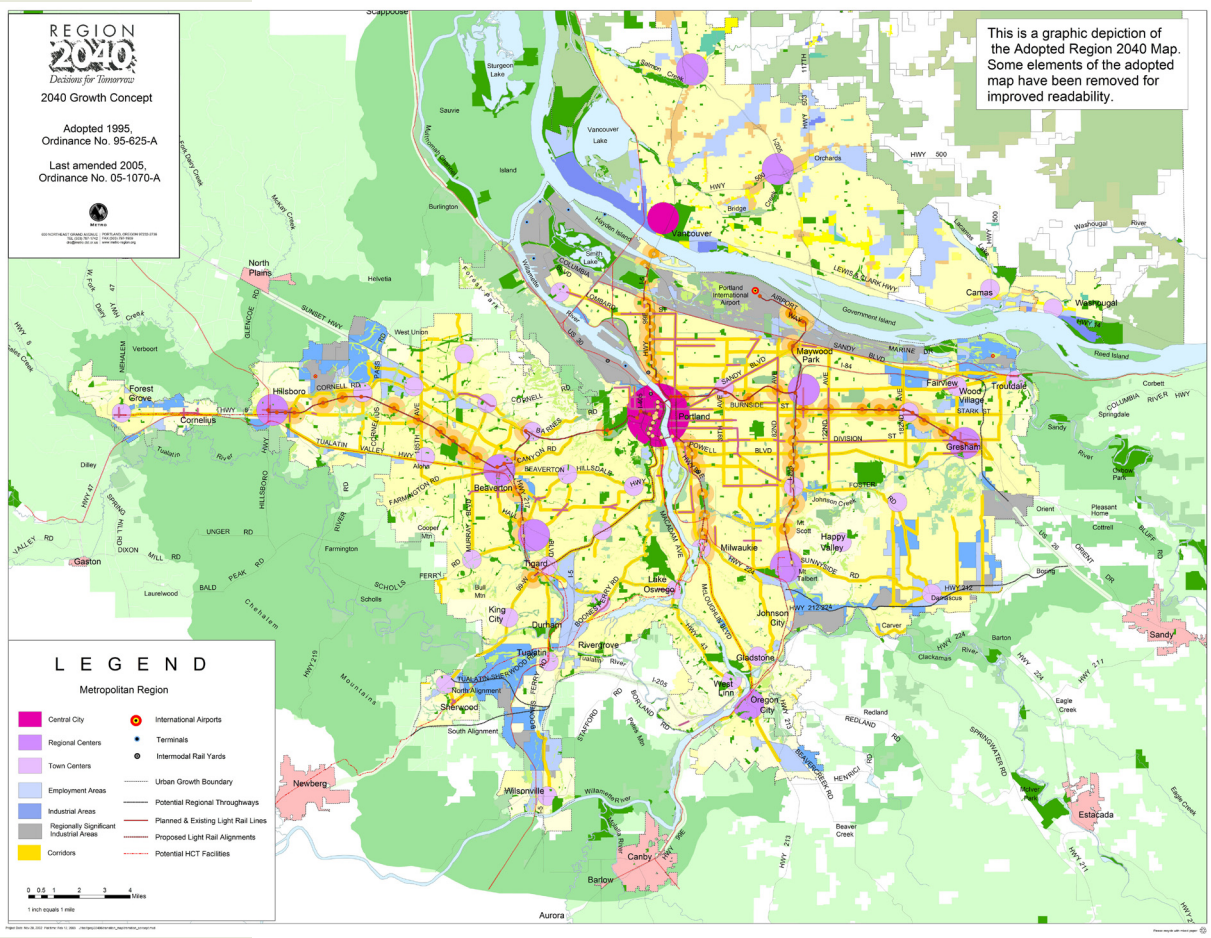
Since 1965, government spending on transportation, sewers and water systems has declined from 39 cents to 25 cents for every dollar spent on private residential construction.

10 billion

Our region will need approximately $10 billion during the next few decades just to repair and rebuild our existing infrastructure. To meet the demands of anticipated growth in jobs and housing in the region through 2035, we will need as much as $31 billion in additional funding.

8th place

Oregon ranks last in total auto taxes collected compared with other Western states (Arizona, California, Idaho, Montana, Nevada, Washington and Utah).



greenspaces

8,100

Acres purchased by Metro through bond funds approved by voters in 1995. Thousands more acres will be purchased by Metro through a second bond measure approved by voters in 2006.

8,000

Based on population projections, the region will likely need 5,000 acres of urban parks and 8,000 additional acres of open space by 2035.

The 2040 Growth Concept – In 1995, the Metro Council adopted the 2040 Growth Concept, a long-range plan designed with the participation of thousands of Oregonians. This innovative blueprint for the future acknowledges population growth as a fact of life, but expresses the region's intent to incorporate growth within existing urban areas as much as possible and expand the urban growth boundary only when necessary. Implicit in the plan is the understanding that compact development is more sustainable, more livable and more fiscally responsible than low-density sprawl, and will reduce the region's carbon footprint.

Our fragmented governance structures and antiquated public finance systems frustrate our ability to deliver on our regional development goals. Many areas of the region are served by a hodgepodge of local governments and service providers whose jurisdictions are often artifacts of history that do not coincide with current community boundaries, infrastructure capacity or demand. This situation raises questions of equity and hampers coordination of regional development.

Our economy is globalizing, greening and changing in other ways we cannot anticipate. Our region's status as both a hub for domestic commerce and a gateway for international trade provides tremendous benefits but also makes us highly vulnerable to global economic changes. We are also rapidly becoming an international epicenter of the movement toward a sustainable economy. While these and other factors confound our ability to predict the character of future employment, it is clear that the future will not look like the past.

Energy instability and climate change require us to rethink everything – from where we live to where we get our food to how we get around. Even though our region is a national leader in stabilizing carbon emissions, our current efforts fall far short of what is needed to meet carbon reduction targets established in state law.

In the face of these and other challenges, we will need to be smarter, work harder and dig deeper to achieve the aspirations of our communities and truly realize our regional vision. Now is the time to adopt new approaches that will enable us to maintain and improve our communities, protect our urban growth boundary and our natural environment, and support a strong economy that benefits all of the people of our growing region.

jobs and the economy

1.0 to 1.3
The region must plan for between 1.0 and 1.3 million total jobs by 2030.

71
71 percent of the Portland region's largest employers originated here.

10,000
There are nearly 10,000 acres of vacant employment land inside the UGB and thousands more acres of dilapidated, contaminated and underutilized employment sites.

getting from here to there

70
More than 70 percent of the region's residents live within 1/4 mile of public transit.

34
Transportation activities are the second largest source of greenhouse gases in the state, accounting for approximately 34 percent of the state's carbon dioxide emissions.

100 million
Commuters here spend 100 million fewer hours per year getting to work compared with the 33 other largest metro areas in the nation. People here are twice as likely to use transit and seven times as likely to bike than other large metro areas, leaving more room on the road for moving goods and freight.

$1.1 billion
The region's shorter commute translates into $1.1 billion in savings on transportation costs, most of which is reinvested in the local economy.

Meeting the challenge: MAKING THE GREATEST PLACE

For all of these reasons, the region has been working for four years to develop a new, integrated approach to guiding the growth and development of our communities.

This new approach builds on the strong foundation of the 2040 Growth Concept, which calls for focusing development in city and town centers, along transportation corridors and near employment areas. But while that plan reflects a regional agreement about what we want the future to look like, the new approach – known as "Making the Greatest Place" – represents a concerted effort to decide how we are going to get there. It responds to new challenges with new tools and marks a renewed commitment to making this region the greatest place to live, work, learn and play.

In September 2005, the region's leaders received a wake-up call: a forecast that more than one million more people would live here within 25 years. This dose of reality stimulated a burst of activity region-wide that will culminate during the coming year in a series of major decisions that will change the way we tackle the challenges – and seize the opportunities – that come with growth.

Since 2005, the region has:

Embraced a comprehensive new definition of the attributes that comprise successful communities (see box).

Completed the "Shape of the Region" study, which evaluated the importance of land outside the urban growth boundary for agriculture, forestry and the protection of natural landscape features, and identified the common attributes of great communities

Collaborated to obtain legislative authority to jointly establish urban and rural reserves directing where the region will and will not grow over the next 40 to 50 years

Required major construction projects to support planning for the development of areas included in the urban growth boundary

Analyzed the region's long-term need to increase public investments in infrastructure

Undertaken a new, outcome-oriented approach to transportation planning

Endorsed a long-term plan to expand the region's high-capacity transit system

Initiated a conversation about the local aspirations of communities throughout the region

Begun to integrate the imperative to reduce carbon pollution into our land use and transportation plans

Developed and refined a series of "scenarios" to illustrate the implications of various land use and investment choices

Produced 20- and 50- year population and employment range forecasts that illustrate the need to make decisions in the face of uncertainty

Generated an analysis of the capacity of the current urban growth boundary to accommodate growth while anticipating potential changes in both policy and market behavior

Attributes of great communities: The region's desired outcomes

The "Making the Greatest Place" initiative represents a renewed effort to attain objectives the region has long sought to achieve. However, policy documents of the past often focused on strategies (e.g., "compact urban form") rather than on the actual outcomes that are important to people's lives.

In 2008, the region agreed on a set of desired outcomes that not only reflect what really matters to the citizens of the region, but also may be used to develop benchmarks against which we can measure our progress toward creating great communities. It is these outcomes that this recommendation is designed to achieve:

Vibrant communities – People live and work in vibrant communities where they can choose to walk for pleasure and to meet their everyday needs.

Economic prosperity – Current and future residents benefit from the region's sustained economic competitiveness and prosperity.

Safe and reliable transportation – People have safe and reliable transportation choices that enhance their quality of life.

Leadership on climate change – The region is a leader in minimizing contributions to global warming.

Clean air and water – Current and future generations enjoy clean air, clean water, and healthy ecosystems.

Equity – The benefits and burdens of growth and change are distributed equitably.

Guiding principles

All of this work has contributed to the emergence of a common understanding of what we need to do to realize our shared vision. We have learned that "making the greatest place" will require many actions by many players. Now we begin the task of weaving together these different threads to strengthen the fabric of our existing and future communities.

In developing these recommendations, I have been guided by several key principles that have emerged from the conversations in which the region has been engaged for the last four years:

Focus on outcomes. Our actions should be specifically designed to achieve six desired outcomes that matter to the people of the region: vibrant communities, economic prosperity, safe and reliable transportation choices, clean air and water, reduced contributions to global warming, and fair distribution of the benefits and burdens of growth.

Move from "what" to "how." Having agreed on what we are trying to achieve, we must accelerate the fundamental shift in emphasis from developing a vision of the future to making the vision we have already embraced a reality.

Minimize risk. Even with Metro's tremendous forecasting capabilities, the future remains uncertain. We should act based on the best available information, but in ways that leave future generations the flexibility to make adjustments if our assumptions are wrong.

Don't chase numbers. We need to devote our energy to creating great communities. We can't allow ourselves to get bogged down in a numbers game where we squabble about how many dwelling units can fit on the head of a pin.

Work together. We have come this far because of our history of public involvement and collaborative governance. Future success will require us to forge new partnerships and will entail a range of highly interdependent decisions and actions by many players beyond Metro – chiefly city and county governments, but also other public agencies and the private sector.

1,450,000	residents living within the urban growth boundary
65,600	businesses
33,229	acres of public parks and natural areas
830	miles of rivers and streams
25	cities
3	counties
1	region

Some people want to live in the suburbs and feel strongly that their quality of life, their American dream, is a house and a yard and a fence. Others want to live in a vital city where they're a regular at the coffee shop down the street. It's not that one is better than the other, but it is a fact that within this region, you can choose either, and that's what we're trying to achieve – not that everyone chooses the same, but that people can find what they want.

— Ethan Seltzer, director, Toulan School of Urban Studies and Planning, Portland State University

RECOMMENDATIONS

Today, I am recommending the following three categories of actions:

Make the most of what we have. Our top priority must be to improve the quality of life for the people who live here now by investing in our existing communities. We should leverage previous investments, rebuild dilapidated buildings and decaying infrastructure, revitalize town and city centers and maintain community assets before taking care of people who are not here yet.

Protect our urban growth boundary. Second, by leveraging both strategic investment and innovative policies, we should accommodate most of our population growth in our existing communities rather than by adding large amounts of farm and forest land to the boundary at the edge of the region.

Walk our talk. Finally, to ensure that our actions and investments are responsive to the values and priorities of the region's residents, we must develop and adopt performance targets specifically based upon the region's desired outcomes, and use those targets to hold ourselves accountable for achieving those outcomes.

My specific recommendations, which are summarized on pages 14 and 15 and detailed in Section 2 of this report, represent the integration of several policy areas that, until now, have been considered in discrete processes, sometimes with conflicting results. During the last four years, the region has explored the linkages among various policy "streams" and the ways they inform each other. This recommendation represents the "confluence" of those various streams into a coordinated strategy.

It is important to remember that this document does not represent a *decision* by anyone; it is a set of *recommendations* that are intended to invite, and give focus to, the regional conversation that will ensue. And once these recommendations have been acted upon by the decision makers of the region, we will not be finished. Many questions will remain, but the choices we make today will determine the choices we are able to make in the future.

integrating habitats and greenspaces

64

Sixty-four percent of metro area residents live within 1/4 mile of a public park, greenspace or regional trail. Ninety-seven percent of Boston's children live within 1/4 mile of a park.

53

Approximately 53 percent of the region's park land and 60 percent of land within 50 feet of streams and wetlands are deforested.

10

About 10 percent of the region's floodplains are developed, substantially degrading ground and stream water quality.

Strategies for a sustainable and prosperous region

1

MAKE THE MOST OF WHAT WE HAVE
Invest to maintain and improve our existing communities.

By December, 2010, adopt an integrated regional investment strategy focused on revitalizing our downtowns, main streets and employment areas consistent with the 2040 Growth Concept.

Place the highest priority on maintaining the public investments we have already made, including our roads, sidewalks, water and sewer lines, and parks.

Reuse and revitalize dilapidated buildings, vacant and under-used lots, and decaying infrastructure in already developed areas, accommodating growth within the urban growth boundary and bringing increased economic activity to those areas.

Get more for the public's money by ensuring that regional investments are coordinated with each other, and with the goals and investments of local communities.

Leverage private investment through strategic coordination of public investments with the private sector.

Protect existing residential neighborhoods by focusing new residential and commercial development in downtowns and along main streets.

Consider the natural environment, personal and public costs, individual and regional equity, and health in all of our investment decisions.

Identify local and regional actions needed to pursue new sources of funding to maintain and improve existing communities, accommodate growth and create favorable conditions for job creation within the UGB.

Make transportation investments that increase safe, affordable and convenient travel options for everyone and help the region's businesses and industry remain competitive.

Get the most out of the transportation system we already have by:

- Repairing and maintaining our existing roads, bridges, public transit and bicycle and pedestrian facilities.
- Employing market incentives and pricing strategies to use our transportation system as efficiently as possible.
- Investing in smart technological solutions to reduce and manage congestion.

Attract and retain businesses and family-wage jobs through strategic investments in roads and transit as well as critical air, marine and freight rail facilities.

Increase transportation choices, protect air quality, and reduce congestion by accelerating development of transit, biking and walking facilities.

Maintain compact communities that allow for more cost-effective transportation investments and make it easier for residents to perform the tasks of their day-to-day lives.

2

PROTECT OUR URBAN GROWTH BOUNDARY

To the maximum extent possible, ensure that growth is accommodated within the existing boundary.

Manage the urban growth boundary to protect farm and forest land, support a strong economy, and maintain and create great communities.

Accommodate most growth through investment within the existing UGB.

Use land inside the boundary more efficiently to reduce residents' transportation costs, get the most from our public investments, and limit unnecessary urban expansion into farmland, forest land and natural areas.

Support job creation and economic opportunity and enhance development in existing communities by making strategic UGB expansions as needed to take advantage of real opportunities to attract key employers.

Protect the region's industrial land supply from conversion to non-industrial uses and improve and protect access to major industrial areas.

Require rigorous urban and financial planning prior to UGB expansion to address land use, infrastructure, and governance issues.

Protect farms, forests and natural areas outside the boundary.

Use urban and rural reserves to achieve the region's long-term goals.

Designate urban reserves based on successful implementation of Strategy 1 calling for strong investment within existing communities, where most growth will occur.

Establish urban reserves in areas that will:

- Strengthen and complement existing downtowns, main streets and employment areas.
- Protect the agricultural industry from the impacts of urban development.
- Support good jobs and a healthy economy by facilitating addition of industrial land to the urban growth boundary when needed.
- Use less land and less carbon and offer citizens more economical living choices.

Designate rural reserves to provide long-term protection for the agriculture and forest industries and for important natural landscape features.

Prepare for and support private investment in efficient development through greater use of existing zoning strategies and financial incentives.

Use existing financial incentives more aggressively and creatively to help local communities achieve their aspirations for their downtowns, main streets and employment areas.

Encourage innovative approaches to zoning to encourage development of downtowns and town centers, make transportation corridors ready for high capacity transit, and protect industrial land for industrial use.

3

WALK OUR TALK

Be accountable for our actions and responsible with the public's money.

Ensure that public investments are consistent with the public's values and priorities.

Develop and adopt performance targets specifically based on the region's desired outcomes.

Measure our performance against these targets.

Adapt our policies and investment strategies based on what we learn.

Hold ourselves accountable to achieving the region's desired outcomes.

FULFILLING THE PROMISE OF OUR REGION

For longer than we can remember, this special place has nourished the bodies and the souls of the people lucky enough to have found their way here. The abundance and splendor in our common backyard inspire not just awe, but action, as the land invites us to engage with it in myriad ways.

Our relationship with our surroundings remains at the heart of every resident's experience of life in this evolving region. Today, we enjoy not only the richness of our natural endowment, but also the dynamic communities we have built upon its foundation.

We have been entrusted with this wondrous place at a critical time. Residents of this region have always confronted challenges that tested their resourcefulness and commitment, and we are the beneficiaries of wise decisions made in the face of change by those who came before us. Now we bear the responsibility of carrying forward the legacy of courageous innovation that we have inherited.

However, the changes we face today are unprecedented in their magnitude and complexity. Paradoxically, clinging to our past – or even to things as they are – imperils our future; if we fail to act decisively in anticipation of the upheavals on the horizon, we will squander the opportunities that come with change, and risk losing the very nature of this region.

The decisions we make today will have profound consequences, not only for our descendents but for the land itself, as well as its waters, its wildlife and the very air we breathe. Luckily, the people of this region have the smarts, the guts and the dedication to chart a new and successful course.

Together, we can continue to fulfill the promise of this place.

Section 2 | Recommendations

STRATEGIES FOR A SUSTAINABLE AND PROSPEROUS REGION

A report from Metro's Chief Operating Officer

For the last four years, public officials from throughout the Portland metropolitan area have worked hard to lay the groundwork for major decisions about the future of the region. Together, Metro and its local partners have analyzed past performance and current trends, looked into the future, developed a range of policy alternatives, and sought advice from citizens. We established a set of six outcomes that matter to residents of the region, posed optional courses of action, and studied the contributions of these actions toward the desired outcomes.

We have come to understand that *Making the Greatest Place* will require many actions by many players, coordinated to take full advantage of everyone's efforts and to wring the most public value from the public's dollars. Now we have reached the point at which we must lay some proposals on the regional "table" to allow us to see the whole and how its parts might fit together.

As noted in the previous section, the set of strategies and actions proposed here brings together several strands of policy in order to maintain and improve our existing communities, protect the urban growth boundary and support prosperous economy. This recommendation is intended to set the stage for discussion among the people of the region about the choices we face.

SETTING THE STAGE FOR MAKING THE GREATEST PLACE

Knowing where we're going – the region's desired outcomes

The region has long agreed on its vision of the future, and the people who live here have remained remarkably consistent in their commitment to the values that underlie that vision, as expressed in the 2040 Growth Concept. In the summer of 2008, the region agreed that our planning efforts should start by defining in clear and simple terms the outcomes that residents tell us they want. To that end, the Metro Council and our regional partners in local government adopted the six desired outcomes described in Section 1 of this recommendation to guide our regional planning for the future. Briefly, those outcomes are:

- Vibrant and walkable communities
- Economic competitiveness and prosperity
- Safe and reliable transportation choices
- Leadership in addressing climate change
- Clean air, clean water and healthy ecosystems
- Equitable distribution of the benefits and burdens of growth

Growth forecast – How many people and jobs are we expecting?

With these outcomes in mind, we began the process of developing an integrated regional development strategy with a growth forecast. State law requires Metro to provide sufficient capacity to accommodate the growth in population and employment expected in the next 20 years. To do that, we need to know how many people and jobs to plan for.

The current growth forecast departs from past practice in two ways:

- Taking advantage of an opportunity provided by the Oregon Legislature, the Metro Council decided to look farther into the future – 50 years – to support the designation of "rural reserves" for long-term protection of farms, forests and natural areas, as well as "urban reserves" to identify long-term opportunities for urban expansion (see pages 25-28).
- Acknowledging the uncertainties inherent in long-term forecasting, the Council requested a range of possible growth scenarios rather than a single estimated number of people and of jobs ("point forecast"). The range forecast allows the region to focus less on "chasing numbers" and more on how best to achieve our desired outcomes and create jobs and great communities.

In May, 2008, Metro published the "2005-2060 REGIONAL POPULATION AND EMPLOYMENT FORECAST." The forecast predicts likely ranges in the numbers of people and jobs in the region to the year 2030 (to fulfill the state's 20-year capacity requirement), and also to the year 2060 (to inform the designation of urban and rural reserves).

Depending upon the many factors that will influence our growth, the forecast tells us to expect the seven-county region[1] to have between 2.9 and 3.2 million residents and between 1.3 and 1.7 million jobs by 2030. For the longer term, we should expect between 3.6 and 4.4 million in population and between 1.6 and 2.4 million jobs by 2060.[2]

This recommendation focuses on the middle third of this range as our most likely future. This smaller range will sharpen our options and help the region understand the issues we face.

	Low	Bottom third	Upper third	High
2030 population	1,877,700	1,947,000	1,989,600	2,060,700
2060 population	2,313,900	2,496,500	2,606,300	2,787,800
2030 households	789,700	818,100	835,600	864,700
2060 households	968,500	1,043,300	1,088,300	1,162,700
2030 jobs	1,083,200	1,142,600	1,211,600	1,273,500
2060 jobs	1,345,355	1,473,792	1,608,109	1,754,885

Forecast for Metro urban growth boundary

Metro's forecasts begin with the federally-defined seven-county Portland-Beaverton-Vancouver Metropolitan Statistical Area. In order to estimate what share of this growth is expected to locate within the Metro urban growth boundary, a "capture rate" is applied based on historical and forecast growth trends.

[1] The Portland-Beaverton-Vancouver Primary Metropolitan Statistical Area (PMSA) consists of Clackamas, Columbia, Multnomah, Washington and Yamhill counties in Oregon as well as Clark and Skamania counties in Washington.

[2] Historically, in-migration has accounted for two-thirds of the region's population growth. In the year 2030 in-migration is expected to account for about half of population growth, with births making up the other half.

Capacity analysis – Where will they go?

Our next step was to determine whether our urban growth boundary has sufficient capacity to accommodate the ranges of population and employment projected in our forecast.

The draft *Urban Growth Report* (UGR) gives us a good idea where our existing policies and level of effort would take us during the next 20 years. The UGR finds that, at least "on paper" (in city and county plans and zoning ordinances), the region has the capacity to accommodate population and job growth within the projected ranges over that period.

However, the UGR also concludes that under current market conditions and the policies and financial structures that we have in place today, the region will not be able to actually realize that potential capacity and accommodate projected growth to the year 2030. We face a gap between the UGB's theoretical capacity and the number of housing units and jobs we can reasonably project will actually be created by the private sector under current conditions.

More importantly, the UGR tells us we are falling short of our targets and aspirations for achieving some of the most fundamental objectives of the 2040 Growth Concept. Development in many of the areas we have targeted for more growth – our designated regional centers, town centers, station communities and main streets within the UGB – is lagging: while there has been some progress, there are not yet enough residents and workers to make these areas the centers of vibrant urban life envisioned in our plans and hoped for by our local partners.

State law says that if we cannot accommodate projected growth within the UGB, we need to add land to the boundary. But this does not solve our capacity problem. Areas added to the UGB since 1998 – Pleasant Valley, Damascus, North Bethany and others – are not urbanizing or attracting new homes and jobs because, among other reasons, we have not found a way to pay for the sewers, water systems, parks, streets and roads needed to make them work as urban places. We also have not yet found the right tools to provide full city governance to these new areas. The region would face the same costs and obstacles on any new land added to the UGB. Moreover, expanding the UGB involves other tradeoffs, including loss of productive farmland, diversion of limited public dollars from our existing communities, longer commutes, and increased carbon pollution.

Lagging development also impedes our efforts to provide transportation options to the region's residents, including efforts to connect centers with high capacity transit; this requires more residents and workers plugging the farebox, and therefore higher densities in a given transportation corridor, to be cost-effective. Failing to provide travel choices leaves more people reliant on the most expensive – and most carbon-intensive – mode of surface transportation, the private automobile. Lack of alternatives to auto travel also fills our roads with cars that impede the movement of freight and reduces our economic competitiveness.

In short, our existing policies and levels of investment in our communities will not bring us the outcomes we desire.

CLOSING THE GAP
RECOMMENDATIONS FOR MAKING THE GREATEST PLACE

But there is another message in the *Urban Growth Report*: we can close the gap between the current capacity of the UGB and our forecast growth by investing in our existing communities. That is, we can turn our potential capacity into real capacity by increasing the levels of our investments and taking complementary actions at the policy level. But we must invest at every level – city, county, regional, state, federal and private sector – and we must invest wisely to stimulate private investment.

This recommendation calls for strategic investments and policy actions by all level of government to use land inside the existing urban growth boundary as efficiently as possible to minimize expansion of the urban growth boundary, to make the most of our existing communities and to help make good jobs available to our citizens.

STRATEGY 1 | MAKE THE MOST OF WHAT WE HAVE

Invest to maintain and improve our existing communities

A strategy of investment is the essence of this recommendation. First and foremost, we must find new ways to invest in our future. Specifically:

By December, 2010, the region should adopt an integrated regional investment strategy focused on revitalizing our downtowns, main streets and employment areas consistent with the 2040 Growth Concept.

The region must maintain, replace, and in some cases expand, the public works – water, wastewater and storm water systems, and streets and roads – that are essential to support redevelopment in existing urban areas and new development in areas previously added to the UGB. We must also invest in the community assets essential to making our urban communities better places to live and work: parks, schools, natural areas and trails; town squares and gathering places; and bicycle facilities and sidewalks, for example.

By committing ourselves to maintain and improve these public works and community assets, we will attract complementary investments by the private sector to take advantage of the value added by public investments. By collaborating strategically with private investors and, when appropriate, entering into public-private partnerships, we can further ensure that we will invest the public's dollars in ways that provide the greatest overall benefit to our communities.

Moreover, the region should increase its investments in the reuse and revitalization of old buildings and vacant and underused lots in already developed areas. These investments will bring increased activity and private investment to those areas and support efforts to efficiently accommodate growth within the UGB.

Consideration of the natural environment, impacts on personal and public costs, individual and regional equity, and public health should be factored into all of our investment decisions.

The region should make transportation investments that increase safe, affordable and convenient travel options for everyone, help the region's businesses and traded sector industries remain competitive, and reinforce the region's desired outcomes.

The region has effectively used, and should continue to use, a range of approaches to achieve these outcomes. These approaches include repairing and maintaining our previous investments in transportation facilities and using both market-based and technological means of getting the most out of our existing system. We should also make strategic investments both in transportation facilities that improve freight mobility and in transit, biking and walking facilities to provide residents with more ways to get around.

Perhaps most critically as a stimulus for private investment, we must significantly expand the region's high-capacity transit system to give residents more options than the private auto to travel to work and other daily destinations, to free-up road capacity for movement of freight, to attract and support compact development and to reduce our carbon emissions.

There is not enough money to make all the investments we need. For decades, investments in public facilities have been declining in communities nationwide, and our region is no exception. Despite the current flow of federal "stimulus" dollars, the heyday of nearly limitless federal largesse is over, and state property tax restrictions have further depleted public coffers.

This recommendation, therefore, proposes that we focus public investments in those places around the region where the investments are most likely to help us achieve the outcomes we desire. Moreover, we must link the investments to our desired outcomes, and to one another, to maximize the value of each investment. Finally, we will need to identify the local and regional actions necessary to pursue new sources of funding if we are to maintain and improve our existing communities, accommodate growth efficiently and create favorable conditions for private investment and job creation.

Focus investments in centers, corridors and employment areas

First, we must concentrate investments within the 2040 Growth Concept's places of highest potential density and established infrastructure. These include centers across the region (areas designated as town centers, regional centers, central city and light rail station communities), important employment areas, and the principal highways and roads ("corridors") that connect centers with frequent bus service. Focusing investment in these places will yield the following benefits, each of which supports outcomes the region seeks to achieve:

Local aspirations – The region will invest in the very places cities and counties want to invest local funds to achieve their community aspirations. Regional investments will complement and enhance local investments, and vice versa.

Existing infrastructure – This focus will encourage growth in places where sewer, water, storm water facilities, parks and streets already exist, using these services more efficiently and bringing more ratepayers to share their costs.

Public transit – The region will be able to accommodate a larger share of forecast growth where we have already made major investments in public transit. Concentrating growth in centers and corridors will give more residents access to transit for commuting and other daily travels, thereby reducing their transportation costs and freeing up road capacity for freight movement. More transit rides means more fares paid and more cost-effective transit.

Walking and biking – Higher levels of housing and jobs in centers and corridors will also bring jobs and everyday needs – stores and professional and civic services, for example – within walking and biking distance of many more residents.

Energy and climate – Concentrating development in centers and corridors reduces and shortens our trips, thereby reducing energy consumption and the amount of carbon emissions produced by our travels.

Neighborhood stability – By absorbing most of the forecast growth in centers and corridors, we can protect our existing residential neighborhoods from the impact of this growth.

Regional equity – Because there are centers and corridors in every part of the region, this approach will distribute the benefits of community investments equitably across the region. For example, our Housing Needs Analysis shows a growing number of households in parts of the region spending more than they can afford on housing and transportation during the next 20 years. Investment in new high-capacity transit lines to centers and corridors with disproportionally large numbers of "cost-burdened" households can reduce transportation costs for those households and leave them more money to spend on housing and other essential needs.

Link investments

Second, we must link investments in the following ways:

- Link regional investments to local investments and actions to achieve both regional and local aspirations.
- Link investments to achieve multiple outcomes.
- Link investments to make each investment more effective.
- Link public investments to private investments.

The following examples from across the region teach us that linkages make investments greater than the sum of their parts. These successes are stimulating coordinated investments elsewhere.

Current and future successes

Portland's 1988 plan for the River District (north of downtown) called for 1,800 new dwelling units. Pursuant to the plan, the city and the region made a coordinated set of investments: replacement of the Lovejoy ramp from the Broadway Bridge; a streetcar line to downtown; upgrades to public works; a system of new parks connected to one another and eventually to a trail along the river; bike lanes and sidewalks; and other community assets.

As a result of these investments, private investment has increased dramatically, adding 7,600,000 square feet of new building space within three blocks of the streetcar line. By 2008, the district had added 8,000 dwelling units, several hundred of them "affordable" and rendered more so by access to transit, walking and biking facilities. When currently anticipated projects are completed, the district will have added a total of 10,000 dwelling units and 21,000 jobs. Outcomes: the city has built a vibrant, economically prosperous community, rated one of the most walkable in the country.

Tigard wants to revitalize its downtown – a designated town center under the 2040 Growth Concept, which calls for higher density housing and employment there. The city has adopted a vision plan that calls for 2,500 new housing units and 900,000 sq. ft. of new commercial floor space. The city has also established an urban renewal district and uses tax increment financing to upgrade public works. In partnership with Metro, Tigard is investing in parks and trails along Fanno Creek, using funds secured through the 2006 natural areas bond measure. As provided in the proposed High Capacity Transit System Plan, Metro will invest regional funds to extend light rail to Tigard's town center when conditions justify the investment. City investments make light rail more feasible financially, and the region's investment in light rail will encourage the new housing and job development the city desires.

Cornelius hopes to add jobs to offer more employment opportunities to its residents, who travel long distances to jobs in other cities, and to boost its tax revenues to pay for community assets that would add vitality to its center. The 2040 Growth Concept calls for greater employment and residential capacity along Cornelius' designated main street. The city has asked Metro to designate an area around its main street as a town center to stimulate greater investment. The proposed High Capacity Transit System Plan would provide regional funds to extend light rail from Hillsboro to Forest Grove, passing along Cornelius' main street, when conditions justify the investment. Redesignation of the city's main street as a town center under the 2040 Growth Concept would complement the city's strategy.

Many cities and counties in the region have developed action plans to bring life to their downtowns and other centers. Complementary regional and local investments and actions can shepherd these aspirations to reality. Metro has assembled an inventory of the aspirations of cities and counties for their centers, as well as investments that can help achieve these aspirations (see "Investing in Great Places Matrix" in Section 3 of this recommendation). These collective aspirations, and the investments and policy actions needed to realize them, are ambitious and will require sustained leadership and collaboration to implement.

The region should make use of the full range of existing regional and local investment tools and strategies, including the following:

Tax increment financing (TIF) in urban renewal districts has revitalized many lagging urban areas by raising funds to pay for upgrades to public works and community assets that, in turn, attract private investment that generates new tax revenues to pay for the upgrades. Nine cities and Clackamas County use TIF in urban renewal districts.

Local improvement districts have helped local governments pay for public works and community assets by assessing fees on properties in the districts that benefit from the services.

Economic and business improvement districts have stimulated private investment in industry and businesses in the region's employment areas.

System development charges (SDCs) currently cover a portion of the costs of providing a limited list of public facilities to new development: transportation, water supply, sewer, storm water management, and parks. Revisiting local government capital improvement plans in light of the stated aspirations of local communities could result in SDCs that more accurately reflect the full anticipated costs of accommodating growth.

High-capacity public transit lines have drawn very significant private investment to the corridors along the lines. The region has endorsed an ambitious program of expanding the region's high capacity transit system to connect regional centers and other centers along principal corridors in the High Capacity Transit System Plan. The plan's "System Expansion Policy" sets targets for cities, counties, Metro and TriMet that signal financial and community readiness for new lines.

Transit-oriented development investments by the region have demonstrated that mixed-use, higher density development can succeed in places the private sector has been reluctant to invest. In Gresham, Portland, Milwaukie and other places, transit-oriented development supported by the region's flexible transportation funds is helping to revitalize communities and leading the way for private investment.

Transportation network improvements are under-appreciated investments that close gaps in street, bicycle and pedestrian (sidewalks and trail) networks. Adding these missing links increases mobility and accessibility in our centers and corridors throughout the region, while improvements to the network of freight routes are essential to regional prosperity, especially traded-sector industries that rely on the movement of freight. These connections help the region achieve its desired outcomes for transportation choice, vibrant communities, healthy ecosystems, and reducing carbon emissions.

Natural areas land acquisitions are preserving thousands of acres of critical habitat and other special places across the region. Investments in protecting natural areas provide refuge and recreation to current and future residents of our urban region, enhancing our sense of place; there is a direct link among these investments and increased property values. These areas also support the healthy function of rivers and streams, filter our water, provide connectivity for wildlife, improve our air quality, and sequester carbon.

Parks and Nature in Neighborhoods grants restore and enhance these local and regional assets. These grants support the nature close to home that makes our centers and corridors more livable and connects them to the rest of the region.

Metro and its local government partners should develop an action plan for making the regional and local investments needed to implement Strategy 1, and for linking the investments with the tools described in Strategy 2.

New funding

The region currently lacks the resources to repair and maintain our existing public facilities, let alone build the new sewers, water systems, roads, parks and schools our communities will need to accommodate population and employment growth. The governments of the region must commit to seeking new sources of funding for needed investments in public works and community assets, including local and regional dollars to match federal funds for transportation improvements. This action plan will become the basis for realizing our aspirations and enabling us to protect our urban growth boundary by accommodating growth in our existing communities.

An integrated regional investment strategy would include two major elements:

Transportation investment Implement the transportation investment strategy identified in the Regional Transportation Plan (RTP).

The RTP identifies existing revenues as well as aspirational revenue targets to fund a prioritized list of planned transportation projects. Local and regional follow-up actions are required to enact new revenue sources. The region's transportation leaders should create a "road map" identifying the local and regional action steps to generate the levels of revenue envisioned in the RTP.

Other community investments Develop a regional action plan to make focused investments in the region's downtowns, main streets and employment areas.

To maintain our existing infrastructure and community assets, and to meet the region's collective aspirations for population and employment growth, regional leaders should develop a strategy for closing the finance gap between our aspirations for development and our current means. This strategy should:

- Refine the investment needs identified in the "Regional Infrastructure Analysis" and "Investing in Great Places Matrix" to begin serving as a "project list" for targeting regional and local resources.
- Identify and recommend local and regional revenue actions to increase the resources available to make the public investments required to implement Strategy 1.

STRATEGY 2 | PROTECT OUR URBAN GROWTH BOUNDARY

To the maximum extent possible, ensure that growth is accommodated within the existing UGB.

Residents of this special place understand the relationship between our management of urban growth and the quality of life we enjoy. Metro and its local government partners should employ available policy tools to use land within our existing urban growth boundary more efficiently and avoid adding land to the boundary whenever possible to achieve the outcomes desired by the people of the region. Specifically:

We should manage the urban growth boundary to protect farm and forest land, support a strong economy, and maintain and create great communities.

A complement to the strategy of investment in centers, corridors and employment areas is a policy of maintaining a "tight" urban growth boundary. Expanding the UGB means extension of expensive streets and roads, as well as public water, wastewater and storm water systems, to new areas. Extension of services to new UGB expansion areas diverts limited public dollars from our existing centers and corridors, working against our investment strategy. A tight UGB supports the creation of great communities by sending a signal to the private sector that investments in our downtowns and main streets are investments that will hold their value.

To be clear, this recommendation does not represent a firm resolution against any expansion of the UGB. The *Urban Growth Report* tells us we have a capacity gap; state law tells us we must close the gap. Certainly, we should close as much of the gap as possible by increasing our investments from all levels of government in centers, corridors and employment areas. But if we cannot fully accommodate projected growth through our strategy of investment and the other tools recommended here, we will have to expand the UGB. If we must expand the UGB, we should add land only from our designated urban reserves, and only land that can help us achieve our desired outcomes for our centers, corridors, and employment areas.

The greatest uncertainty facing the region is predicting our industrial capacity needs during the next 20 years. A look back demonstrates how rapidly needs for industrial capacity have changed, how difficult those needs are to predict, and how vulnerable the region is to national and international trends, such as global warming and economic globalization.

In the face of this uncertainty and mindful of our firm desire for a prosperous regional economy, a committee of regional leaders is forming to identify approaches that will allow us to take advantage of real opportunities to attract traded-sector, family-wage jobs in a way that is consistent with the region's overall vision. Options under consideration include:

- Pursuing land assembly and brownfield redevelopment in existing industrial areas;
- Targeting infrastructure investments to make land inside the UGB shovel-ready, and identifying approaches to protect the public's investment;
- Bringing large parcels into the boundary under conditions that severely restrict conversion to non-industrial use; and
- Designating key parcels as urban reserves and creating a fast-track process to bring them into the boundary when needed.

We must recognize there is a risk associated with maintaining a tight urban growth boundary (little or no expansion). If we hold the UGB and fail to use land inside the boundary more efficiently, some of the households that would otherwise be expected to locate within our region will instead spill over to our neighbors: Vancouver, Sandy, Canby, Newberg, North Plains, Banks, and Scappoose. This spillover could be costly: it may use up more farmland if our neighbors do not use land as efficiently as we do; it may outstrip public services in those cities; and it would likely create many new trips between our neighbor cities and the Portland area, which would require expensive new highway capacity and increase carbon emissions. Just as holding the boundary tight is a complement to the investment strategy, so the investment strategy and the zoning tools and financial incentives discussed below are essential complements to the UGB strategy. These tools will help us use more of the zoned capacity we have inside the UGB to make room for people who would like to live in our communities.

We should use urban and rural reserves to achieve the region's long-term goals.

Urban reserves

In 2007 Metro and the local governments of the region concluded that the best way to ensure that land we add to the UGB over time produces great communities is to plan ahead for a longer time horizon than the 20-year UGB planning period. A broad coalition of partners from government, business, agriculture and the environmental community worked together to pass legislation allowing the region to establish urban and rural reserves directing where the region will and will not grow during the next 40 to 50 years. Since then, members of that coalition, led by Metro and Clackamas, Multnomah and Washington Counties, have been working to identify the best areas in which to establish these reserves. We are on track to designate them in 2010 as part of our *Making the Greatest Place* initiative.

Designation of urban reserves constitutes a key strategy in achieving the region's desired outcomes. Because land in urban reserves receives the first priority under state law for addition to the UGB, we will be able to select land from urban reserves when needed, with greater certainty that the expansion will survive a legal challenge. This increased predictability sends clearer signals to investors from all sectors, private and public, about where the region will expand. In addition, it means the region will be better prepared to add land to the UGB quickly if the opportunity should arise to recruit a targeted new industry that cannot be accommodated inside the existing UGB.

The four governments who have authority under state law to jointly designate urban and rural reserves (Metro and the three counties) have completed their assessments of the suitability of land outside the UGB for urban reserves and are currently working to prioritize among suitable land to prepare for designation of reserves in 2010. When the time comes to designate urban reserves, it is expected that the partners will use the same caution we would exercise when adding land to the UGB.

Forecast for Metro urban growth boundary

	Low	Bottom third	Upper third	High
2060 population	2,313,900	2,496,500	2,606,300	2,787,800
2060 households	968,500	1,043,300	1,088,300	1,162,700
2060 jobs	1,345,355	1,473,792	1,608,109	1,754,885

The following recommendations are made with great respect for the work that has already been done by the many public officials and other parties who have been working for over a year to designate reserves, and with the expectation that many, if not most, of these comments are generally consistent with the direction of that process:

- Acknowledging the uncertainties we face predicting the long-term future, the reserves partner governments should designate an amount of urban reserves sufficient to accommodate growth in the middle third of the population and employment forecast ranges.
- Our long-term success in focusing growth in our centers and corridors inside the UGB will reduce the amount of urban reserves we need and use over time.
- We ought to anticipate that communities of the future will develop in patterns that use less land and emit less carbon than communities of the past. Communities that are ultimately built in reserves added to the UGB should provide a more complete array of services near where people live and make it easier for people to choose walking, transit and biking for everyday travel.
- The location of designated urban reserves should complement and reinforce our strategy to focus investment in existing centers, corridors and employment areas.
- We should ensure that the designated urban reserves contain land suitable for industrial use adjacent to or near the existing UGB.
- Our designation of urban reserves should minimize loss of our best farmland, our source of food and many other products that make agriculture one of our steadiest and most important industries.
- When designating urban reserves, we should leave space – including rural reserves when appropriate – between them and our neighbor cities so those cities can retain their identities and achieve their own aspirations.

If the reserves partner governments make the assumptions and apply the recommendations above, the region will be able to accommodate our longer-term residential and employment growth with urban reserves in the range of 15,700 to 29,100 acres. Selecting from the areas described in the Reserve Area Assessments and Recommendations contained in Exhibit 3E-A of this report should enable the designated reserves to fall within that range. These areas include the lands deemed most suitable for future urbanization as great communities by advisory committees in the three counties.

Selection from among lands in these areas will ensure a long-term supply of land for future industries and jobs without undermining the critical farm and forest industries outside the UGB. Selection from these lands will also reinforce our strategies to create great communities inside the UGB.

Finally, Metro and the counties should require that "concept plans" be completed before we add urban reserve land to the UGB. These plans should firmly guide critical decisions about eventual urbanization of this land so it yields the communities that achieve the region's long-term goals. Concept plans should include:

- The location of centers, employment areas, major transportation routes, and public facilities, and how these elements will link to communities and roads, sewers, water systems, trails, parks and open spaces already inside the UGB.
- Formal agreements among responsible local governments that determine which cities will govern the land and who will provide urban services once it is brought inside the boundary.
- A plan to finance public works (e.g., sewer, water, and roads) and essential services (e.g., schools, parks, sidewalks and trails).

Completing this planning before adding land to the UGB, rather than after, will ensure that future expansion areas can quickly and efficiently develop into great communities that achieve the region's desired outcomes.

Rural reserves

Rural reserves are the companion to urban reserves. Designation of urban reserves signals where the region will expand the UGB when necessary. Designation of rural reserves identifies areas where the region will not expand.

The reserves partners have been working for many months to identify the agricultural lands, forests and natural landscape features that should not be added to the UGB at any time during the next 40 to 50 years. Rural reserves will provide the same certainty and security to farmers and foresters that urban reserves provide for investors in urban development: working farms and forests can invest in their operations with confidence that the metropolitan region will not add their farms or woodlots to the UGB for decades. This security for the farm and forest industries – the oldest industries in the region and major employers in our urban communities (in processing, for example) – will help the region achieve the economic competitiveness and prosperity that constitutes one of our key desired outcomes. When the time comes to designate rural reserves, the region should exercise the same caution we would use when designating urban reserves:

- The reserves partner governments should designate the region's most important and threatened farmland as rural reserves to help maintain the critical land base needed to support the agricultural industry, from growers to processors to distributors.
- Because of growing concern for a local supply of safe and healthy food, the reserves partner governments should keep in mind for designation of rural reserves those areas near the UGB with farms that market fresh local food to urban dwellers through the growing network of farmers' markets, co-ops, restaurants and grocery stores.
- The reserves partner governments should designate as rural reserves those important natural landscape features that help define our place, are worthy of protection in their own right, and provide "hard edges" to limit long-term urban expansion.
- The reserves partner governments should use rural reserves to protect our sense of place by ensuring some rural separation remains between our metropolitan region and our neighboring cities.
- The same uncertainties that should cause us to limit the amount of urban reserves we designate should also cause us to leave some land near the urban reserves undesignated as rural reserves.

Designation of rural reserves is evidence of a strong regional commitment to protect these lands from urbanization over the long term. The four partner governments should make good on this commitment to working farm and forest families by pursuing additional actions to keep the farms and woodlots in the reserves available for food and fiber production. For example, voluntary "transferable development credits" programs would reduce the number of new non-resource dwellings in these areas by paying farm and forest landowners for their development rights and selling the rights to developers in centers and corridors within the urban growth boundary.

We should prepare for and support private investment in efficient development through greater use of existing zoning strategies, financial incentives, and other tools.

Zoning tools

The "seeds" of investment will grow best if they germinate on fertile ground. There is much fertile ground in the region as the result of thoughtful planning and zoning by cities and counties to put the 2040 Growth Concept into place. But not all centers, corridors and employment areas are ready for investment. To help make these places ready, the region should work in partnership with cities and counties to link regional investments with local "readiness" actions, including the following:

- Change zoning regulations in centers and corridors to allow use of substandard lots, a broader mix of uses, less parking and higher densities.
- Re-examine current zoning limitations on those corridors identified for future high capacity transit investments in the High Capacity Transit System Plan and make changes to achieve levels of housing and employment capacity needed to support and justify the projects.
- Change zoning regulations in industrial areas to protect these prosperity assets from encroachment by non-industrial uses.

Local governments are already making changes to their zoning codes to achieve higher levels of urban activity in their centers and corridors and to put more of residents' daily needs within walking distance of their homes. These actions will bring more residents and workers to regional and town centers to share the costs of operating and maintaining services and community assets, such as transit and parks. More residents and workers will also support the restaurants, bakeries, coffee shops and other businesses that make our centers lively and prosperous. This recommendation urges cities and counties to take the additional actions that will stimulate the private sector to invest in ways that realize the potential capacity of our centers to accommodate future job and population growth.

Financial tools

Financial incentives encourage private investment in downtowns, main streets and employment areas. Cities across the region use these tools to stimulate housing and employment in key locations, but they are not being used to their fullest potential. Accordingly, local governments across the region should increase the use of these existing tools to prepare for and support investment in efficient development. Examples show the variety of incentive programs available to local governments:

- Gresham and Milwaukie have used the state's Vertical Housing Tax Credit in their downtowns to incentivize private investment in high-density, mixed-use projects by reducing developers' up-front costs through temporary tax relief. Wood Village is applying to the state to establish such a program.
- Portland and Gresham have employed the multiple unit housing tax exemption to encourage private investment in transit-supportive, multi-family housing in their light rail station communities.
- Clackamas County, Beaverton, Sherwood, Milwaukie and Portland are a few of the local jurisdictions who have taken advantage of the U.S. Environmental Protection Agency's Brownfields Assessment and Cleanup funds to clean up "orphan" sites and get them back on the market for private employment and housing projects. Metro uses brownfields funds to assess potential contamination at sites across the region and provide information and other resources to assist local cleanup of the sites.
- System development charges (SDCs) are a principal source of funding for water, sewer and storm water systems, streets and roads, and parks. Oregon City and Gresham have adopted Impact-Based SDCs that vary the charges to more equitably reflect the lower costs associated with development in their downtowns as compared to less urbanized areas and to provide an incentive to develop there.
- Property Tax Abatement programs can entice industries to targeted employment areas. Forest Grove uses tax abatement (three and five-year exemptions) to attract new industries to its Enterprise Zone.
- Main Street programs make funds available for "sprucing up" main streets – adding street trees and benches, pedestrian improvements and new building facades, for example – to attract people and businesses.
- Excise Tax Planning Grants, new in 2009, will help local governments develop action plans for revitalization of their centers.

These financial incentives can stimulate the private market to use land in centers, corridors and employment areas more efficiently, particularly if the incentives are used in concert with investments and other tools. Today, these programs are underutilized. Cities and counties across the region should make more aggressive use of these tools to achieve their aspirations for their centers, corridors, and employment areas while helping the region to close its "capacity gap" and to protect farm and forest land from development.

Efficiency tools

There are many other actions Metro and other local governments can take to encourage efficient use of land and transportation systems. The region should make widespread use of the following tools and strategies:

Land assembly, used by Hillsboro in its remarkably successful strategy to attract high-tech development (a former large proposed residential development today is the site of Intel's Ronler Acres facilities), can provide larger properties that are more attractive to the industries that need large sites.

Transportation system and demand management conserves the capacity of our existing transportation system and yields benefits analogous to energy conservation: by getting more performance out of the same investments, it is often less expensive than creating new capacity by, for example, building a new freeway interchange.

- Gresham installed an "adaptive traffic signal timing system" that reduced travel time by ten percent and saved 74,000 gallons of fuel in a year.
- Portland used an "individualized marketing program" to inform residents along the new MAX Yellow Line about alternatives to drive-alone trips. Auto trips have declined nine percent and transit ridership has increased 24 percent among residents who participated in the program.

Programs such as these increase system efficiency, reduce demand, conserve energy, and reduce carbon emissions. This recommendation proposes a comprehensive program of system and demand management – from incident response to congestion pricing – in the Transportation System Management and Operations Action Plan, part of the Regional Transportation Plan.

Parking management has proven successful in reducing congestion in portions of centers with dense concentrations of retail, professional and civic services. Communities should employ a range of parking management techniques – shared parking, lower minimum and maximum parking standards, structured parking and metered parking – in the Regional Transportation Functional Plan and the investment strategy.

Service agreements can reduce the time and cost of providing urban services to developing areas. For example, the cities of Happy Valley and Damascus signed an agreement to determine which city would annex unincorporated territory between them to avoid time-consuming and expensive case-by-case disputes. To achieve similar benefits, areas designated urban reserves should be covered by service agreements as a pre-requisite to their addition to the UGB. This recommendation also proposes amendments to Metro's boundary change code to ensure that new cities are capable of providing a level of urban services that enables them to be great communities.

These tools, particularly if integrated into an overall strategy of investments and incentives, can facilitate, encourage and support development in centers, corridors and employment areas that will help the region achieve multiple desired outcomes.

STRATEGY 3: WALK OUR TALK

Be accountable for our actions and responsible with the public's money

Both our experience and extensive modeling give us confidence that investing in the downtowns and main streets of our existing communities, maintaining a relatively tight UGB, and using the various policy and financial tools described above will help us achieve the outcomes we desire and close the capacity gap identified in the *Urban Growth Report*. But empirical evidence will be needed to tell us whether the strategies are succeeding and to inform future decisions as the region moves forward.

For that reason, it is critical that we establish a system to measure our progress toward achieving our desired outcomes and respond to the results.

Accordingly, the region should:

Develop and adopt a set of performance targets specifically based on the region's desired outcomes. For example, one of the region's desired outcomes is leadership in minimizing contributions to global warming. A performance indicator associated with this outcome is reduction of carbon emissions. The logical target might be the reduction levels adopted by the Oregon Legislature in 2007.

Measure performance on a periodic basis and report the results to the region. Evaluation against the performance indicators agreed to by regional partners could be conducted by an objective third party.

Adapt our policies and investment strategies based on what we learn.

Be accountable to each other and the people of the region for achieving the outcomes we have agreed to pursue.

Ensure that public investments are consistent with the publics values and priorities.

PUTTING THE STRATEGIES IN PLACE

DECISION	WHEN	WHO
Regional Transportation Plan – accepts policies, projects and funding strategy as the long-range blueprint for the region's transportation system • Revise the 2004 Regional Transportation Plan (RTP) • Adopt new and revised components: the Transportation System Management and Operations Plan, the Regional Freight Plan, and the High Capacity Transit System Plan • Adopt new transportation policies • Adopt a list of transportation projects the region expects to undertake during the planning period • Revise the Regional Transportation Functional Plan to prescribe how cities and counties help implement the new RTP	December 2009	Joint Policy Advisory Committee on Transportation and Metro Policy Advisory Committee make recommendations to Metro Council; Metro Council votes
Urban Growth Report – estimated capacity of the metro region to accommodate population and job growth over the next 20 years	December 2009	Metro Policy Advisory Committee makes recommendation to Metro Council; Metro Council votes
20-year capacity ordinance – describes how the region will accommodate the next 20 years of population and employment growth	December 2010	Metro Policy Advisory Committee makes recommendations to Metro Council; Metro Council decision
Urban reserves – land outside the urban growth boundary identified for potential future urban development	December 2009	Metro Council and three counties identify potential urban reserves through intergovernmental agreements
Rural reserves – land outside the urban growth boundary identified for continued use as farmland or natural area	December 2009	Clackamas, Multnomah and Washington counties identify potential rural reserves through intergovernmental agreements with Metro
Urban reserves designated	Spring 2010	Metro Council designates urban reserves by amending framework and functional plans
Rural reserves designated	Spring 2010	Clackamas, Multnomah and Washington counties designate rural reserves by amending comprehensive land use plans
Regional Transportation Plan – final adoption, which initiates local plan updates	Summer 2010	Joint Policy Advisory Committee on Transportation and Metro Policy Advisory Committee make recommendations to Metro Council; Metro Council votes

NEXT STEPS

This recommendation kicks off the decision-making phase of *Making the Greatest Place*. It is intended to stimulate public discussion of possible courses of action to improve our communities.

Concerted action by Metro and the other local governments of the region can put us on track to build great communities, limit expansion of the UGB, support a strong economy, and achieve important outcomes on behalf of the people of the region. Action by cities and counties to encourage higher levels of development in their centers, corridors and employment areas can help local communities to achieve their own aspirations to become more livable, lively and prosperous, and can also help the region to accommodate growth efficiently.

This recommendation, then, is a call to action. Action comes next.

For Metro's part, the Council will "accept" the *2005-2060 Regional Population and Employment Forecast*, the *Urban Growth Report* and performance indicators to evaluate possible courses of action by resolution in December of this year. Immediately thereafter, Metro will work with its partner local governments and many others to improve each of the draft elements of the three ordinances. Then the Council will take its actions to adopt the ordinances in 2010.

To download the complete report, find out about open houses and public hearings, or to provide comments, visit **www.oregonmetro.gov/greatestplace**

Metro | *People places. Open spaces.*

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and good transportation choices for people and businesses in our region. Voters have asked Metro to help with the challenges that cross those lines and affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to protecting open space, caring for parks, planning for the best use of land, managing garbage disposal and increasing recycling. Metro oversees world-class facilities such as the Oregon Zoo, which contributes to conservation and education, and the Oregon Convention Center, which benefits the region's economy.

Metro representatives

Metro Council President – David Bragdon

Metro Councilors
Rod Park, District 1
Carlotta Collette, District 2
Carl Hosticka, District 3
Kathryn Harrington, District 4
Rex Burkholder, District 5
Robert Liberty, District 6

Auditor – Suzanne Flynn

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This guide is intended to assist readers in finding information in the Adobe Acrobat® Portable Document Format (PDF) version of the "Making the greatest place: strategies for a sustainable and prosperous region".

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Measuring performance to achieve desired outcomes

Section 3A

How will we know we're doing the right things to create a sustainable and prosperous region?

In 2008 the Metro Council passed a resolution to create an outcome-based approach to growth management that defines a successful region and to work with local partners to identify targets and common measurement tools. We have agreed on the region's desired outcomes and now we need to develop ways to measure our performance against these outcomes and hold ourselves accountable for achieving those outcomes.

A draft resolution to be considered by Metro Council in 2009 identifies indicators that can be measured – like travel safety and clean air – and used to inform policy decisions. The targets to be reached will be determined collaboratively in 2010 by Metro Council and regional partners.

Desired regional outcomes

Vibrant communities People live and work in vibrant communities where they can choose to walk for pleasure and to meet their everyday needs.

Economic prosperity Current and future residents benefit from the region's sustained economic competitiveness and prosperity.

Safe and reliable transportation People have safe and reliable transportation choices that enhance their quality of life.

Leadership on climate change The region is a leader in minimizing contributions to global warming.

Clean air and water Current and future generations enjoy clean air, clean water, and healthy ecosystems.

Equity The benefits and burdens of growth and change are distributed equitably.

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Performance Measure Framework and Indicators
Executive summary

The preamble to Metro's Charter states that Metro shall undertake "…as its most important service, planning and policy making to preserve and enhance the quality of life and the environment for ourselves and future generations…" The 2040 Growth Concept and the Regional Framework Plan further clarify quality of life. The Urban Growth Management Functional Plan states that the Metro Council shall adopt and periodically revise performance measures to be used in evaluating and adjusting, as necessary, Metro's functional plans, the urban growth boundary and other regional plans.

An outcomes-based approach

As part of Making the Greatest Place effort, the Metro Council recognized the need to refine the definition of successful communities, to define measures of success and the importance of leveraging local and regional actions to achieve desired outcomes. Making the Greatest Place is based on an outcomes-based approach, including the Regional Transportation Plan, the urban growth report and the urban and rural reserves.

To support an outcomes-based approach to regional growth management, the Metro Council approved Resolution No. 08-3940, in which Metro resolves to:

- Affirm a definition of a successful region and its constituent communities, which have since become known as the "six desired outcomes."
- Work with regional partners to identify the performance indicators, targets actions and decision-making process necessary to create successful communities.

Metro's policy advisory committees, MPAC and JPACT, have begun to consider performance indicators as an approach to gauge progress in achieving the desired outcomes.

A common set of measures

An outcomes-based approach necessitates a common set of measures. Multiple different decisions on transportation investments, urban growth boundary locations, the size and location of urban and rural reserves and other local and regional investments all contribute toward the performance of the region in meeting its desired outcomes.

This draft resolution seeks support for a performance framework that allows broad regional growth management indicators to be considered alongside other quality of life measures in the region. It identifies indicators for which data would be collected, measured and presented to MPAC, JPACT and the Metro Council for their consideration in making investment and policy actions.

The draft resolution is designed to allow time to reach agreement on appropriate targets for the indicators and are intentionally left blank. In 2010 additional research will be completed through the Regional Transportation Plan and analysis of urban growth capacity options that will inform the target-setting process. In 2010, MPAC and JPACT will have the opportunity to advise the Metro Council on the need for targets and how aspirational the targets should be.

The indicators are intended to reflect a larger picture than an individual measure and not substitute for the various measurements currently underway by Metro and others agencies for environmental monitoring, traffic and air quality analysis, redevelopment rates and requirements for other land use, environmental and transportation measures. To be consistent with other decision-making timelines, the horizon year

may vary between indicators. In the refinement and analysis of the data, different geographic scales can be considered, depending on the scale of the relevant actions and investments.

Approval of the resolution by MPAC and JPACT reflects support for the performance framework and indicators as well as a recognition that local and regional actions will be needed to make progress toward the desired outcomes. Performance results are intended to inform regional and local investment and policy actions. The resolution does not propose new requirements for local jurisdiction or Metro action although such requirements may be desired by MPAC, JPACT and the Metro Council after review of performance and establishment of targets.

Part of a broader measurement and decision-making process

Other agencies and jurisdictions are currently considering or have adopted similar performance measure systems for use in informing the decision-making process. As the region increasingly shares similar desired outcomes, the need to use similar performance measures increases. To take advantage of this, Metro is embarking on an effort with PSU's Institute of Metropolitan Studies to develop a coordinated regional approach to develop and utilize performance measures. As this new regional approach is developed, the performance indicators identified in this resolution can be included into a broader, even more wholistic performance measure system.

The region has evaluated performance on a wide-ranging number of measures in the past. This proposed approach builds on this past experience and strengthens it by relating the measurement process directly to the decision-making process. Agreeing on shared, desired outcomes was the first step toward a greater commitment toward an outcomes-based approach to decision-making. Establishing a broader performance measure framework with indicators and targets that apply to all of the region's growth management decisions and other sustainability oriented policy decisions is the next logical step.

BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF APPROVING A FRAMEWORK FOR MEASURING THE PERFORMANCE OF THE REGION'S "MAKING THE GREATEST PLACE" INITIATIVE AND IMPROVING ITS PERFORMANCE OVER TIME	))))))	RESOLUTION NO. 09-XXXX INTRODUCED BY CHIEF OPERATING OFFICER MICHAEL JORDAN WITH THE CONCURRENCE OF COUNCIL PRESIDENT DAVID BRAGDON

WHEREAS, Metro initiated the Making the Greatest Place effort to refine policy and develop a program of investments to implement the 2040 Growth Concept; and

WHEREAS, Metro's Urban Growth Management Functional Plan provides that Metro Council will adopt and revise performance measures periodically for use in evaluating and adjusting, as necessary, Metro's functional plans, the urban growth boundary and other regional plans; and

WHEREAS, Metro Council approved Resolution No. 08-3940 ("For the Purpose of Affirming a Definition of a 'Successful Region' and Committing Metro to Work With Regional Partners to Identify Performance Indicators and Targets and to Develop a Decision-Making Process to Create Successful Communities.") to express the intent of Metro and its regional partners to use a performance-based approach to implementation of the 2040 Growth Concept through the Making the Greatest Place effort; and

WHEREAS, Resolution No. 08-3940 affirmed a set of characteristics of a successful region and successful communities and committed Metro to work with regional partners to identify the performance indicators, targets and decision-making process necessary to measure the performance of regional efforts to achieve those characteristics; and

WHEREAS, monitoring of performance indicators can inform policy and investment decisions and help define appropriate targets that reflect desired outcomes, aspirations and feasibility; and

WHEREAS, Metro's actions, alone, have a limited effect on achieving the desired outcomes for the region and a combination of local and regional public and private actions is needed; and

WHEREAS, a performance framework with indicators that are relevant to public and private sector decisions and reflect a "triple bottom line" is more likely to be useful in the decision-making process;

WHEREAS, the proposed performance indicators, targets and decision-making process were reviewed by the Metro Policy Advisory Committee and the Joint Policy Advisory Committee on Transportation, both of which voted to endorse them; now, therefore

BE IT RESOLVED that the Metro Council:

1. Approves the performance framework and indicators, set forth in Exhibit A to this resolution, for use in measuring progress toward achieving the region's desired outcomes.

2. Commits to working with our regional partners to determine appropriate targets for the indicators in Exhibit A by December, 2010, as part of Performance Measure Framework and Indicators, Exhibit B to this resolution.

3. Commits to working with local governments on strategies and actions to achieve the region's desired outcomes as measured by the performance indicators and targets.

ADOPTED by the Metro Council this 10th day of December, 2009.

David Bragdon, Council President

Approved as to form:

Daniel B. Cooper, Metro Attorney

Exhibit A

Regional Performance Indicators

Wealth Creation – By 2035, increase the percentage of employees with living-wage jobs in the Metro area by xx percent compared to 2010.

Compact urban form – By 2035, increase the share of residents and employees who live and work in centers and corridors by XX percent compared to 2010.

Traveler safety – By 2035, reduce crashes, injuries and fatalities by XX percent compared to 2005.

Congestion – By 2035, reduce the vehicle hours of delay per person by XX percent compared to 2005.

Infrastructure resilience – By 2035, reduce the share of the region's infrastructure systems, including sewer, water, wastewater, utility, schools and other civic buildings that are in poor condition by XX percent compared to 2010.

Climate change – By 2035, reduce greenhouse gas emissions in the region by XX percent compared to 1990.

Active transportation – By 2035, increase walking, biking and transit trips by XX percent compared to 2005.

Energy efficiency – By 2035, reduce the amount of energy used per person by XX percent compared to 2010.

Water efficiency – By 2035, increase the share of the region's wastewater and stormwater that is recycled or beneficially reused by XX percent compared to 2010.

Clean air – By 2035, reduce the share of region's population that is exposed to at-risk levels of air pollution by XX percent compared to 2005.

Clean water – By 2035, increase the share of the region's streams and rivers meet fishable1 and swimmable standards by xx percent compared to 2010.

Healthy ecosystems – By 2035, increase the share of the region with tree and other vegetative cover by XX percent compared to 2010.

Affordability – By 2035, decrease the share of the region's households that are cost-burdened by XX percent compared to 2010.

Poverty - By 2035, reduce the share of the region's elementary school students that qualify for free and reduced lunch programs by XX percent compared to 2010.

Access to daily needs – By 2035, increase the share of region's low-income, minority, senior and disabled populations that live within 30 minutes of essential destinations by bicycle and public transit by XX percent compared to 2005.

Access to nature – By 2035, increase the share of the region's residents live within ½-mile of a park, open space or regional trail by XX percent.

1 Rivers and streams that have historically been fish-bearing.

Urban Growth Report and 20/50 year population and employment forecast

Section 3B

Can the land within the current urban growth boundary accommodate the housing and employment needs of the future?

Oregon law requires Metro to maintain capacity within the urban growth boundary (UGB) sufficient to house the numbers of people anticipated to live in this region during the next 20 years and support the number of jobs that are forecast for the same period. For this reason, every five years Metro conducts an inventory of the current residential and employment capacity within the UGB, forecasts population and employment growth over a 20-year period, calculates the anticipated need for additional capacity inside the UGB and documents the results of these analyses in an urban growth report.

This urban growth report is not intended to recommend specific actions to address any deficiencies in the capacity of the current UGB to accommodate the next 20 years' worth of growth. The report is designed to inform a regional discussion over local and regional policy choices and investment decisions about how best to maintain and enhance the metropolitan region's quality of life while supporting a growing population. The Metro Council will work with the region's leaders to make growth management decisions in 2010.

A 20- and 50-year population and employment forecast for a seven-county area is included as an appendix to the urban growth report. The 20-year forecasts inform the findings of the urban growth report. The 50-year forecasts inform the region's efforts to designate urban and rural reserves, which is discussed more fully in Section 3E.

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BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF ACCEPTING THE POPULATION AND EMPLOYMENT FORECASTS AND THE URBAN GROWTH REPORT AS SUPPORT FOR DETERMINATION OF CAPACITY OF THE URBAN GROWTH BOUNDARY	)))	RESOLUTION NO. 09-XXXX Introduced by Chief Operating Officer Michael Jordan with the Concurrence of Council President David Bragdon

WHEREAS, state law requires Metro to determine the capacity of the urban growth boundary (UGB) to accommodate the next 20 years' worth of population and employment growth by the end of December, 2009; and

WHEREAS, Metro published range forecasts of population and employment growth to the years 2030 and 2060 on March 19, 2009; and

WHEREAS, Metro published a preliminary analysis of the capacity of the existing UGB to accommodate the range of new dwelling units relating to the range of forecast population growth on March 31, 2009; and

WHEREAS, Metro published a preliminary analysis of the capacity of the existing UGB to accommodate the range of new employment relating to the range of forecast employment growth on May 6, 2009; and

WHEREAS, Metro sought and received comments on the preliminary analyses of housing and employment capacity from its Metro Policy Advisory Committee (MPAC) and its Joint Policy Advisory Committee on Transportation (JPACT), local governments in the region, public, private and non-profit organizations and citizens;

WHEREAS, Metro considered the comments and published revised draft analyses of the capacity of the existing UGB to accommodate growth to year 2030 on September 15, 2009; and

WHEREAS, Metro sought and received comments on the revised draft analyses from MPAC and JPACT; local governments in the region; and public, private and non-profit organizations and citizens; and

WHEREAS, the Metro Council held open houses and public hearings on the revised draft analyses on September 21, 22 and 24 and October 1, 8 and 15, 2009; and

WHEREAS, Metro considered comments received and made revisions to the final draft analyses of the capacity of the existing UGB to accommodate the range of new dwelling units and employment relating to the range of forecast population and employment growth; now, therefore,

BE IT RESOLVED that the Metro Council

1. The Council accepts the "20 and 50 year Regional population and employment forecasts" dated December __, 2009, attached and incorporated into this resolution as Exhibit A, as a basis for analysis of need for capacity in the UGB to accommodate growth to the year

2030 and for actions the Council will take to add capacity by ordinance in 2010, pursuant to ORS 197.296(6) and statewide planning Goal 14.

2. The Council accepts the "Urban Growth Report 2009-2030", dated December __, 2009, attached and incorporated into this resolution as Exhibit B, as a basis for analysis of need for capacity in the UGB to accommodate growth to the year 2030 and for actions the Council will take to add housing and employment capacity by ordinance in 2010, pursuant to ORS 197.296(6) and statewide planning Goal 14.
3. Acceptance of Exhibits A and B by the Council meets Metro's responsibility under state law to analyze the capacity of the UGB to accommodate growth to the year 2030 as a preliminary step toward providing sufficient capacity to accommodate that growth. The Council will make a final land use decision to respond to this capacity analysis in 2010.
4. The Council directs the Chief Operating Officer to submit Exhibits A and B, together with such actions the Council adopts by ordinance to add any needed capacity pursuant to ORS 197.296(6) and statewide planning Goal 14, to the Land Conservation and Development Commission as part of periodic review pursuant to ORS 197.626, following adoption of the capacity ordinance in 2010.

ADOPTED by the Metro Council this 17th day of December, 2009

David Bragdon, Council President

Approved as to form:

Daniel B. Cooper, Metro Attorney











DRAFT URBAN GROWTH REPORT

2009 – 2030

Employment and residential Executive summary

September 15, 2009

Metro | *People places. Open spaces.*

EXECUTIVE SUMMARY

INTRODUCTION

Planning for the future is not just an exercise in providing numbers and forecasts. Planning creates opportunities for people and communities to define and articulate their collective desires and aspirations for enhancing the quality of life in our region. It allows citizens and their elected leaders to take stock of the successes that have been achieved in their communities through years of hard work. It also forces us to think carefully about and to be accountable for the costs of our choices, ensuring we get the greatest possible return on public investments.

Planning for the long term provides us with an opportunity to confront new challenges – such as climate change, fluctuating gas prices and changes in the global marketplace – and decide how best to meet them while sustaining a healthy economy, protecting our natural resources and creating safe and vibrant places to live and work. A strong regional economy provides for prosperity and choices in employment opportunities, supports the ability for residents to choose appropriate and affordable places to live, and enhances the quality of life in our region. The economic position of the Portland metropolitan region is partially dependent upon global factors as the world shifts towards new market realities. However, local and regional policy and investment choices can shape this region's contributions to the global economy, impacting the choices in jobs and housing that are available to our citizens.

This region has a track record of planning. Citizens of the Portland metropolitan region are the beneficiaries of a valuable inheritance. Over the last decades, citizen leaders, business owners and elected officials have had the good sense to recognize the beauty and abundance of this region, the foresight to plan for the future and the creativity and wisdom to invest in their vision. Today, this region is characterized by distinctive, compact cities surrounded by farms and forests and connected by an expanding light rail system with networks of parks and natural areas that link the Cascades with the coast.

The region is not starting from scratch, but adding to the firm foundation of a forward-thinking and widely-regarded long range vision, the 2040 Growth Concept, which was adopted in 1995. To date, communities throughout the region have had great success in implementing that vision and its call for compact, vibrant communities. Another tool that the region has for achieving those results is the urban growth boundary (UGB), which was adopted thirty years ago. The UGB and the 2040 Growth Concept encourage efficient use of land, support activity in centers and along main transportation corridors and protect our agricultural and natural heritage. Expansions of the UGB have been made with the aim that the region maintains these qualities while providing additional residential and employment capacity.

Despite adding approximately 28,000 acres to the UGB since 1979, virtually all of this region's growing population has located within the original UGB. In the last ten years alone, almost 95 percent of all new residential development occurred inside the original UGB as established in 1979. In many communities, growth has transformed once-abandoned business districts into bustling centers. In others, public investments are not keeping pace with population growth. As we plan ahead, there is much to be proud of and ample room for improvement.

What is the purpose of an urban growth report?

In the Portland metropolitan area, Metro is the agency legally responsible for anticipating changes and growth in the region's population and employment, monitoring the availability of an array of housing types to meet people's needs and ensuring sufficient capacity to support the region's employers. Oregon land use law requires that Metro ensure, every five years, sufficient capacity to house the number of people anticipated to live here over the next 20 years and support the region's forecasted employment. For this reason, every five years, Metro conducts an inventory of the current residential and employment capacity within the UGB, forecasts population and employment growth over a 20-year period, calculates the anticipated need, and documents the results of these analyses in an urban growth report. This urban growth report provides the analysis of residential and employment capacity and demand, described in the context of a range.

This urban growth report is not intended to recommend specific actions that will address any deficiencies in the capacity of the current UGB to accommodate the next 20 years' worth of growth. That determination remains for discussions among local and regional governments in 2010, specifically through Metro's Making the Greatest Place initiative that connects land use and transportation policies and investments to support vibrant communities across the region.

This demand and supply analysis depicts Metro's best estimate of what is likely to happen over the next 20 years given the policies in place today, policies which may or may not be adequate for adaptation to a changing world. The initial assumptions made in the preliminary urban growth report, issued in spring 2009, have been amended as a result of local and regional discussions and policy changes made in the spring and summer of 2009. The preliminary analysis provided a vehicle for seeking feedback on assumptions. This analysis has been revised and is now released for the Metro Council to consider for adoption in December 2009.

Characteristics of a successful region

In making growth management decisions, the Metro Council and the Metro Policy Advisory Committee (MPAC) have indicated their desire to weigh policy and investment tradeoffs to produce outcomes that our citizens tell us they want. To that end, in the summer of 2008, the Metro Council, following MPAC's recommendation, adopted six desired outcomes that provide guidance for growth management decisions:

1. People live and work in vibrant communities where they can choose to walk for pleasure and to meet their everyday needs.
2. Current and future residents benefit from the region's sustained economic competitiveness and prosperity.
3. People have safe and reliable transportation choices that enhance their quality of life.
4. The region is a leader in minimizing contributions to global warming.
5. Current and future generations enjoy clean air, clean water and healthy ecosystems.
6. The benefits and burdens of growth and change are distributed equitably.

Outcomes-based approach to growth management

Aside from fulfilling statutory requirements, this urban growth report provides the region with an opportunity to assess how it has been performing and decide what policy actions could be taken to improve future outcomes and ensure that our communities are sustainable. The determination of housing and employment demand and capacity is necessarily part art and part science. State law and statewide planning goals direct the region to determine what share of growth can "reasonably" be accommodated inside the existing UGB before expanding it. Ultimately, how the region defines "reasonable" will be a reflection of regional and community values and commitments. At the opposite ends of the spectrum, the Metro UGB could be held tight or expanded significantly. There are tradeoffs that accompany such choices. This urban growth report is intended not just to determine whether there is a need for additional residential or employment capacity within the UGB over the next 20 years, but also to place growth management decisions in the context of the region's desired outcomes.

WHY DO THINGS DIFFERENTLY?

A rapidly changing world compels a reconsideration of how the region's leaders have traditionally planned for growth and requires us to determine whether past assumptions about growth will be valid in the future. Regional leaders must consider whether sticking with familiar ways of doing business could inadvertently lead our communities to be ill-equipped to deal with future uncertainties.

The changing American family

The composition of households is different today than it was in the past and it will change even more in the future. Of U.S. households in 1960, 48 percent included children and 52 percent did not, with 13 percent including just one person. Demographic trends indicate[1] that in the Metro region by the year 2040, only 28 percent of households will include children while 72 percent will not, with 26 percent including just one person. This change in household configuration is partly due to changes in the number of children that people are having, but it mostly occurs because people are living longer and well past child-rearing years. These demographic shifts indicate a need to plan for a different mix of households than the region has experienced in the past.

A warming planet

What changes should be anticipated on the landscape and from the climate? While researchers do not predict significant changes in annual precipitation amounts for this region, they do anticipate that even a modest rise in temperature will reduce the annual snow pack in the Cascade Range, affecting the amount of water available for urban and agricultural use throughout the dry season. A reduction in summer flows will also reduce the energy generated by hydroelectric dams.

The region must plan for reduced water and power availability at the same time a growing population places greater demands on these resources. Oregon law sets ambitious targets for reducing greenhouse gas emissions.[2] Though it has not yet been determined where responsibilities for these reductions will lie, it is clear that the region must redouble efforts to foster the development of compact, walkable, mixed-use communities with access to reliable transit.

[1] *C. Nelson (2008). Metropolitan Portland Mega Trends 2005-2040. Presentation given on October 8, 2008 and available electronically at www.oregonmetro.gov/files/planning/nelson.pdf*

[2] *Oregon House Bill 3543 (2007) mandates a halt in the growth of greenhouse gas emissions by 2010; by 2020, a 10 percent decrease below 1990 levels; by 2050, at least a 75 percent decrease below 1990 levels.*

Fluctuating energy and food prices

Motorists across the country experienced gas pump sticker shock in 2008. For many, filling their tanks became a significant financial investment when fuel prices topped four dollars a gallon during the summer months. In the Portland metro area, transit ridership set new records. The connection between the price of gas and the cost of goods also became startlingly apparent, particularly as food prices skyrocketed due to the rising cost of transporting products from farm to market. Because the region's strong transportation system provides for a variety of ways to get around, we are better positioned than many areas of the country to cope with inevitable future fuel price spikes and shortages. Intelligently planned patterns of urban growth can decrease our dependence on foreign oil sources and the cost of commuting. The region's leaders can also strategically plan future growth to retain or increase access to fresh, locally grown foods.

Expensive pipes and pavement

The Portland metropolitan region, like most cities in the United States, faces a challenge with deteriorating and inadequate infrastructure. A 2008 study commissioned by Metro estimates the cost of building public and private facilities to accommodate growth in the three-county Portland metro area through 2035 will run between $27 billion and $41 billion. Traditional sources of funds would likely cover half of that amount. In addition, the region needs $10 billion to repair and rebuild existing sewers, sidewalks, roads and other public systems.

Regardless of how the region chooses to accommodate more growth, there is much to do and much to pay for. Leaders need to consider the potential return on public investments, pool regional resources where appropriate, strategically manage future demand, embrace emerging technologies and creative approaches, and identify new sources of funding.

Changing economy

In the current economic climate, consumers are being cautious, companies are laying off employees, and businesses are keeping inventories lean. At the same time, baby boomers are nearing retirement age, distinctions between traditional land uses are blurring, and technological advancements for everything from telecommunications systems, inventory management, and on-line shopping are increasing. A sampling of existing and emerging trends informs this analysis of the capacity of the Metro UGB to meet employment needs and support a strong regional economy.

Financial market instability The current economic slowdown became undeniable when, after nearly 20 consecutive quarters of rising employment, the State of Oregon posted its first job losses in the second quarter of 2008. More recently (July 2009), Oregon's seasonally adjusted unemployment rate reached 11.9 percent, tied with California as the fourth highest among 50 U.S. states. [3]

Housing market While not directly an economic development factor, housing values and credit availability affect household wealth and resulting decisions ranging from consumer purchases to job choices. Perceptions of housing availability and pricing also can affect business location decisions and subsequent employment creation.

[3] *U.S. Bureau of Labor and Statistics.*

Fiscal environment The current fiscal environment is forcing governments to find more cost-effective ways to deliver services and, in many cases, to cut services. Declining employment and personal income will result in declining tax revenues, and state and local governments will need to cut services and infrastructure investments which will affect business and consumer location decisions.

Global positioning Key manufacturing sectors of the Pacific Northwest economy are increasingly dependent on international markets as exemplified by high tech, aerospace and machinery. This dependence presents risks as well as opportunities.

Going green Higher energy costs may encourage development of smaller and more dispersed distribution centers and increased driving costs may lead more people to seek shorter commutes. The Portland Metro region may be well positioned for this trend. The region also has an opportunity to focus on the development of alternative energy sources such as wind and solar power.

Development costs Construction material costs are likely to influence future development patterns. In the short-term, construction materials are likely to become more affordable as commodity prices ease, but they may rise again as the global economy rebounds. This combination of factors places more pressure on finding cost-effective ways of delivering urban development while also supporting redevelopment and renovation of existing buildings.

Demographics Aging baby boomers, smaller household sizes, and flat levels of labor force participation have short-, medium-, and long-term implications to the labor market and levels of consumer spending, which will likely outlast the immediate financial situation.

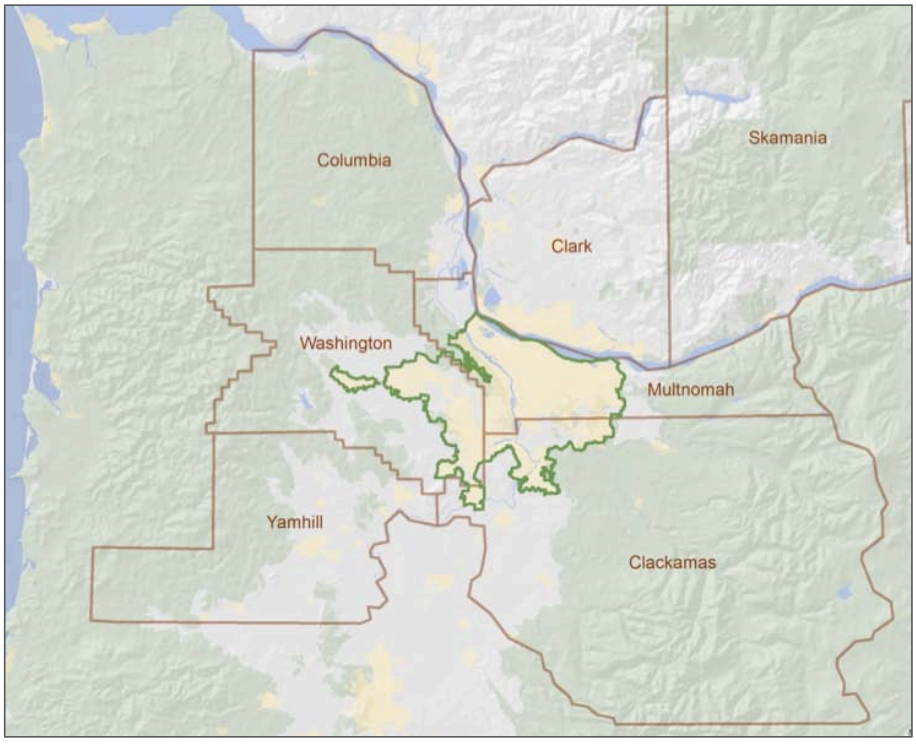
If, as many perceive, the region and the country are in the midst of a fundamental long-term economic transformation, moving from a manufacturing base to an idea-generating base, the regions that thrive are likely to be those that provide an environment where talented, educated professionals can easily interact. This region's long range vision, the 2040 Growth Concept, is the blueprint for creating that environment. Now the region's citizens, business owners, and elected leaders must renew efforts to implement it.

20-YEAR RANGE FORECAST

In addition to reviewing our past, the urban growth report peers into the future to consider the conditions and needs of the people living here decades from today. Most any view into the future is inherently cloudy and because of this lack of precision, it is wise to consider a range of possibilities and plan for contingencies. For that reason, the population and employment forecasts and housing capacity analysis in this report are expressed as ranges, allowing the region's elected officials and citizens the opportunity to err on the side of flexibility and resilience in choosing a path.

The forecasts cover the seven-county Portland-Beaverton-Vancouver Primary Metropolitan Statistical Area (PMSA), as defined by the U.S. Office of Management and Budget (**See Map 1**). The forecasts do not predict where within the statistical area future population and jobs may locate nor do they determine what portion may locate within the Metro UGB. The impact of current trends on the future number and location of jobs and households is considered in the employment and residential analyses.

Map 1: Portland-Beaverton-Vancouver OR-WA PMSA
Source: Metro, 2009



Geographic extent of the regional forecast encompasses seven counties. The Metro urban growth boundary comprises a fraction of the land area of the region.

Where the region's population and employment numbers ultimately land will be affected by several factors. They include varying conditions in the local and global economies, changing population and workforce demographics, and policy decisions and investments made in local communities that may attract particular types of population and employment growth to certain areas of the region.

EMPLOYMENT ANALYSIS

The last time Metro produced an analysis of employment demand and capacity was in 2002. The world has changed significantly since then with shifting global economic conditions, technological innovations, increased understanding of resource limitations, awareness of the effects of individual and collective actions on the global climate and creative approaches to workplace environments, to name just a few. To support a more sophisticated approach for analyzing employment demand and capacity, Metro contracted with a consultant team led by E.D. Hovee & Company, LLC.[4] The Hovee team reviewed global, national, and local trends, conducted focus groups with employers, analyzed recent job location data, updated and categorized the region's employment and industrial land inventory, and developed a new employment demand paradigm.

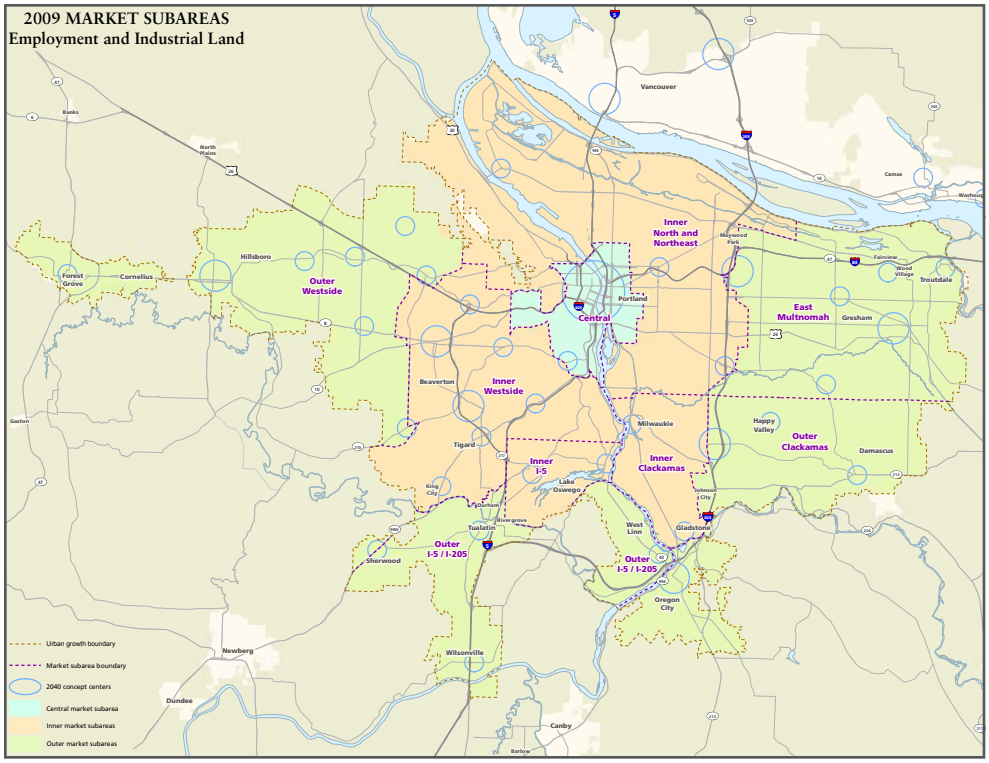
The consultant work informed the methodology in the employment urban growth report. The analysis also makes use of MetroScope, an integrated land use and transportation simulation model that operates on economic principles, to predict where the region's employment and housing will locate in the future. The intent of this approach is to allow policy makers to focus on outcomes and the types of places that support a strong regional economy.

How much and what type of employment growth are we planning for?

The employment forecast begins with the seven-county statistical area and is then narrowed to the area within the Metro UGB. In 2030, the total jobs for the seven-county area ranges from 1.3 million at the low end to 1.7 million at the high end.

Market subareas The first step in the new demand paradigm is to recognize that there are market subareas within the Portland metropolitan region. These market subareas attract different components of the forecasted employment growth. The market subareas are shown in **Map 2.**

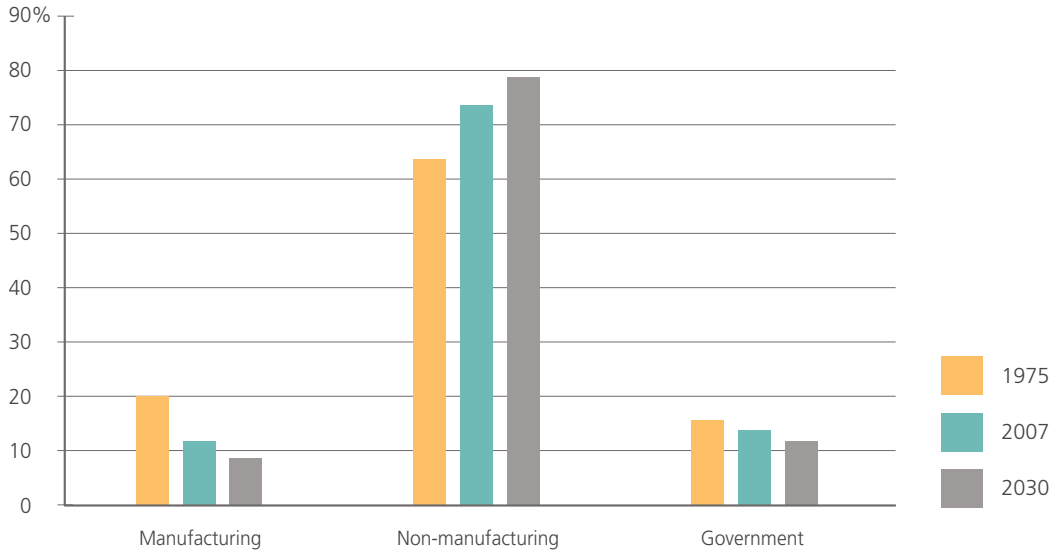
Map 2: 2009 market subareas, employment and industrial analysis
E.D. Hovee and Company, LLC and Metro, 2009



[4] *The E.D. Hovee team included FCS Group, Bonnie Gee Yosick, LLC, and Davis, Hibbitts & Midghall.*

Forecast by sector Employment growth rates are forecast for a number of sectors, which are grouped here for simplicity. The growth rates vary by sector, rather than consistently across all employment. Sector level details are important for this analysis since square footage requirements for industrial, commercial and institutional users vary widely. Population-serving employment sectors, such as healthcare, education, and professional services, grow at a rate commensurate with population growth. Manufacturing job growth is anticipated to be slower than job growth in the service and government sectors, consistent with expected U.S. macroeconomic trends.[5] (**See Figure 1**) Industrial demand is presented separately in this analysis because site usage has historically been very different than for other employment sectors, and industrial employment supports the traded sector that brings wealth into the region.[6]

Figure 1: Employment distribution 1975, 2007, 2030, 7-county statistical area
Source: Metro, U.S. Bureau of Labor Statistics, 2009



Capture rate An employment capture rate is applied to the seven-county range forecast in order to estimate what share of projected job growth is anticipated to locate within the Metro UGB between 2010 and 2030. This rate may be expected to change somewhat depending upon regional (and macroeconomic) economic growth assumptions, land supply assumptions, and regulatory assumptions. Capture rates tend to rise and fall relative to regional business cycles. Capture rates in this analysis vary by employment sector. In the high growth scenario employment the capture rate for 2010 to 2030 is projected to be 73 percent for the Metro UGB (relative to the seven-county PMSA job growth) and a 75 percent capture rate is projected in the low growth scenario. Based on this methodology, the region must plan for between 1.0 and 1.3 million total jobs by 2030.

[5] *Despite this shift in job concentrations, even in recent years, industrial land consumption has held steady at about 300-500 net acres per year. One reason for this is that technological changes allowing for more automation permit companies to use fewer employees in the same amount of space, a finding that was confirmed in the Portland metropolitan region by employer focus group participants.*

[6] *The traded sector is comprised of businesses that sell goods and services in markets broader than the state alone. Traded industries bring income into the state by exporting goods and services and, within the state itself, by substituting for the goods and services that otherwise would be imported.*

Cluster forecast Many recent economic development efforts in this region and others have referred to the concept of economic clusters as an organizing principle. Consequently, several stakeholders and representatives of local governments requested that the concept of clusters be addressed in this urban growth report. The concept makes intuitive sense, but it has its share of detractors and has been criticized for being too vague to be of use for analytical purposes. With that caution in mind, this analysis presents the employment forecast for five of our region's commonly recognized clusters, but it does not extrapolate the forecast into a demand for capacity.

The Portland metropolitan region does not have an agreed upon economic development strategy, nor has Metro been asked to formulate one. Several efforts are currently underway to develop a coordinated approach to supporting economic development in the region, including work by the Regional Partners, Greenlight Greater Portland, and the Oregon Business Development Department (also known as "Business Oregon") supporting local governments in the region. With that caveat, this analysis uses the Portland Development Commission's (PDC) list of five existing clusters[7]:

- Active wear and outdoor gear
- Advanced manufacturing
- Bioscience
- Cleantech
- Software

The geographic distribution of existing (year 2006) cluster employment throughout the region varies from one cluster to another. Employment in the Activewear cluster is concentrated in the Inner ring with much smaller proportions of employment located in the Central and Outer areas. Advanced Manufacturing and Bioscience are concentrated in the Outer ring with some employment in the Inner ring and very little in the Central area of the city. By contrast, the Central City has the highest proportion of Cleantech employment with dimishing Cleantech proportions located in the Inner and Outer rings. Software employment is fairly evenly distrbuted among the three areas.

In 2006, employment in these five clusters represented about 13 percent of total employment in the three-county area. Total cluster employment is forecasted to decrease at the low end of the forecast range and increase at the high end of the forecast range. At both the high and low ends of the range, cluster employment is forecasted to comprise a smaller share of future total employment in the Metro UGB than it did in 2006.

Forecast by building type One of the innovations of this analysis is to consider employment demand and supply in terms of the buildings that accommodate jobs, rather than only on the land. This allows policy makers to discuss both the employment demand and the building form that shapes the way communities look and feel.

Forecasted jobs are assigned to six building types, based on recent trends and professional expertise. The six building types used for purposes of this analysis are: office, institution, flex, general industrial, warehouse and retail. Assumptions as to the building type in which jobs are located could change over time as the real estate market matures, land prices increase, and technologies shift. Once jobs have been assigned to building types, they are converted to building square foot demand using estimates of the amount of building square feet needed for an employee in each of the six building types. Building square feet are then translated into acres based on market-driven floor-to-area ratios.

[7] *PDC's list of clusters for the Portland metropolitan region is consistent with other analyses, including Greenlight Greater Portland and the Oregon Economic and Community Development Department.*

2010-2030 Employment capacity demand: Forecasted capacity demand varies by market subarea, because of market realities and the location decisions made by the region's employers. **Figures 2 and 3** show the forecasted demand for industrial and non-industrial acres by market subarea.

Figure 2: 2010 – 30 Industrial capacity demand
Source: E.D. Hovee and Company, LLC and Metro, 2009

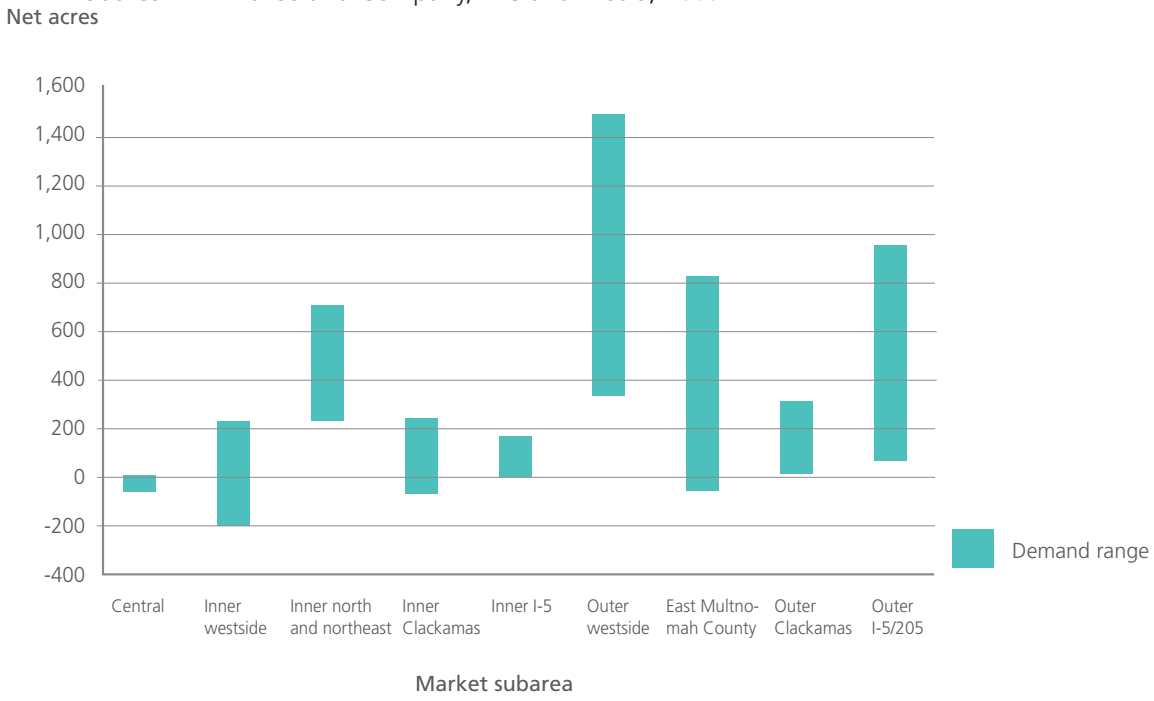


Figure 3: 2010 – 30 Non-industrial capacity demand
Source: E.D. Hovee and Company, LLC and Metro, 2009

Large lot preferences New industrial opportunities that require large vacant, buildable lots are difficult to forecast accurately. Demand for large industrial lots (greater than 25 gross acres) is usually precipitated by one or more large employers looking for a new location for a production or warehousing facility. This is dependent on the decisions of individual firms and not the trends of an industry as a whole. Consequently, forecasts of large-lot demand are inevitably uncertain. With that caveat, this analysis looks at the large-lot preferences of employers and multi-tenant business parks.

Attracting and retaining large employers represents a significant opportunity to diversify the regional economy and support the general economic vitality of the region. Large employers often produce additional supply-chain benefits and attract other manufacturers in the same field. There are also substantial indirect benefits that produce jobs in population serving industries such as retail, personal and business services, real estate and finance.

Large-lot business parks (greater than 25 gross acres) with multiple tenants can also play an important role in the region's economy. Large lot business parks serve a land demand segment that caters to start-up firms and provide opportunities for small business owners to thrive. Characteristics of these firms include: lack of financial wherewithal to purchase or lease standalone buildings; less tolerance for risk; and less ability to absorb up front capital expenditures. However, in some cases, demand for this building format may represent a preference, not a need.

Assuming that past site and building preferences remain the same in the future, the total potential large lot demand, for both single and multi-tenant users, is shown in **Table 1**. This demand is later compared with the current inventory of large lots in the region.

Table 1: Correlation of forecast with historic preference for large lots (single and multi-tenant uses)
Source: Metro, 2009

High Growth

Lot size (acres)	Warehousing/ distribution	General industrial	Flex	Office	Retail	Institution	Total Lots
25 to 50	12	4	4	3	0	4	27
50 to 100	8	1	2	0	0	5	16
100 plus	4	0	1	0	0	0	5
TOTAL	**24**	**5**	**7**	**3**	**0**	**9**	**48**

Low growth

Lot size (acres)	Warehousing/ distribution	General industrial	Flex	Office	Retail	Institution	Total Lots
25 to 50	11	0	1	2	0	3	17
50 to 100	7	0	1	0	0	3	11
100 plus	4	0	1	0	0	0	5
TOTAL	**22**	**0**	**3**	**2**	**0**	**6**	**33**

What is the employment capacity range?

Determining the total employment capacity of the current UGB is not as simple as adding up the maximum-zoned capacity of all parcels. Unlike residential zoning, some of the land zoned for employment uses does not have legal limits to height and other restrictions. However, this does not mean that this analysis assumes infinite capacity in those locations, since the urban real estate market does not intensively use land where achievable rents will not cover the cost.

Capacity changes over time as real estate market conditions change. A primary purpose of this urban growth report is to spark local and regional discussions about how the region might increase the likelihood that existing capacity is used efficiently, both on vacant, buildable land and through redevelopment and infill (refill). This purpose is in keeping with Statewide Planning Goal 14's guidance to determine that growth cannot be "reasonably" accommodated inside the existing UGB before expanding it.

Vacant buildable land capacity A thorough understanding of the region's buildable land supply zoned for employment uses is a crucial first step in analyzing the capacity of the region to meet future employment demand. Metro's buildable land inventory was supplemented by local review and analysis of development readiness by the E.D. Hovee consultant team. The region's vacant employment and industrial land supply is categorized by generalized land use classification, parcel size, and market subareas. This approach allows an analysis of both the amount of land supply as well as its ability to accommodate both the short- and long-term employment demand in the region.

Redevelopment and infill (refill) capacity Like the Metro UGB employment capture rates, the amount of redevelopment and infill fluctuates along with the regional business cycle. The refill rate is impacted by the pace of regional economic growth, macro-economic cycles (such as interest rates, home price valuations, inflation, credit availability to name a few), regional land supply assumptions and regulatory factors. Refill rates are expected to vary during the 2010-30 forecast period by market subareas, which represent uniquely different real estate and labor markets. Refill rates also vary substantially between industrial uses and non-industrial uses. For this analysis, the aggregate refill rates are 20 percent for industrial and 52 percent for non-industrial.

Redevelopment and infill on employment and industrial land falls into four categories:

- Industrial uses redeveloping into other industrial uses
- Vintage (outmoded) industrial uses redeveloping into non-industrial uses
- Non-industrial uses redeveloping into other non-industrial uses
- Vintage non-industrial redeveloping into industrial uses (theoretically possible, but data analysis has not found detectable amounts of this activity)

Table 2 summarizes the assumptions that form the low and high end of the capacity range, including capacity on vacant buildable land as well as redevelopment and infill.

Table 2: Assumptions that establish the range of employment capacity
Source: Metro, 2009

INDUSTRIAL		NON-INDUSTRIAL	
Expected capacity	**Potential capacity**	**Expected capacity**	**Potential capacity**
• Infrastructure limits development in new urban areas • Refill at 20% • FAR reflects current development	• No infrastructure limits • Additional 13% refill • FAR increased by 10%	• Infrastructure limits development in new urban areas • Refill at 52% • FAR reflects current development	• No infrastructure limits • Additional 15% refill • FAR increased by 10%
6,469 acres	**11,493 acres**	**5,575 acres**	**7,872 acres**

Large lot inventory It is likely that some future large-parcel demand will need to be accommodated on vacant buildable land rather than refill. Refill would appear to be a more likely source of capacity for smaller-lot needs. The buildable land inventory for employment uses was amended by Metro's regional partners to incorporate local knowledge of available land.

What is the potential gap between employment demand and capacity?

This assessment acknowledges future uncertainty and describes employment demand and supply in terms of a range, allowing policy makers to consider a range of possibilities and plan for contingencies. This approach supports decision-making focused on the outcomes that characterize a successful region and support vibrant communities.

The current employment demand forecast and the analysis of employment capacity within the UGB do not indicate a regional need to add land to the boundary for industrial or non-industrial purposes to support the region's forecasted employment at the low end of the demand range. However, the analysis does show a need to make investments, policy changes, or expansions to support the high end of the demand range for non-industrial employment. Further analysis of preferences for large lots and the current inventory results in a small potential gap in the land needed to support current preferences for large-lot formats for single and multi-tenant users.

Figures 4 and 5 depict the five- and 20-year acre demand range (from the 20-year forecast) for industrial and non-industrial development along with the capacity range. The demand range is illustrated with two lines that show the upper and lower end of the acreage demand forecast. Two primary types of capacity are shown. The capacity depicted in solid colors can be relied upon with a continuation of current policy and investment trends. The capacity shown in dotted colors is zoned capacity deemed to be market feasible by the year 2030 if additional policy and investment actions are taken. Without those additional actions or market trends that make more efficient use of capacity, the capacity depicted as dotted is illustrative. ***These charts are based on current zoning; no "upzoning" is assumed although it is likely that upzoning will take place in the future as communities develop and implement their aspirations.***

Expected capacity that can be counted in the urban growth report: The first type of capacity shown in Figures 4 and 5 is zoned capacity inside the current UGB that is market feasible (by the year 2030) with no change in policy or investment trends. Land that is classified as "development ready" is included in this category in both the short-term (5- year) and long-term (20-year). Half of the land classified as "needing investment" is included in this category for the long-term. None of the land that requires significant unplanned local investment and policy action, such as investments in infrastructure, environmental cleanup, or local land use action, is included in the long-term supply. Refill rates (the amount of redevelopment and infill), which are different for industrial and non-industrial development, are outputs of the employment demand model (20 percent for industrial and 52 percent for non-industrial). Finally, half of the capacity in new urban areas (land brought into the UGB since 1997) is deemed to be market feasible by the year 2030 and will be counted toward meeting the region's identified 20-year employment demand. This capacity, depicted in solid colors, is the capacity that can be legally counted towards meeting the region's identified 20-year residential demand.

Potential capacity – focus of local and regional effort in 2010: The second type of capacity that is depicted in Figures 4 and 5 is zoned capacity inside the UGB that is likely to require changes to policies and investments to increase the likelihood of its development by the year 2030. Policy and investment actions can increase FARs, increase the refill rate, and increase the market feasibility of developing vacant land. An example is targeted infrastructure investments, such as streetscapes, transit and public plazas. The potential result of these actions, taken at the local or regional level, is shown in the dotted colors in the figures. These actions could support development on land classified as needing investment as well as new urban areas, making them more development ready. ***This capacity, shown in dotted colors, requires documentable local or regional action to count towards meeting the region's identified 20-year residential demand by the end of 2010. Because the individual policy or investment actions that could be pursued are not yet agreed upon, the capacity shown in dotted colors is, at this point, strictly illustrative.***

Though they are not depicted here, future UGB expansions would also fall into the category of potential capacity that would require substantial investments to make it ready to develop.

Figure 4: Industrial demand forecast and capacity range within current Metro UGB, assumes no change in local zoning

Source: Metro, E.D. Hovee & Company, LLC, FCS Group, 2009

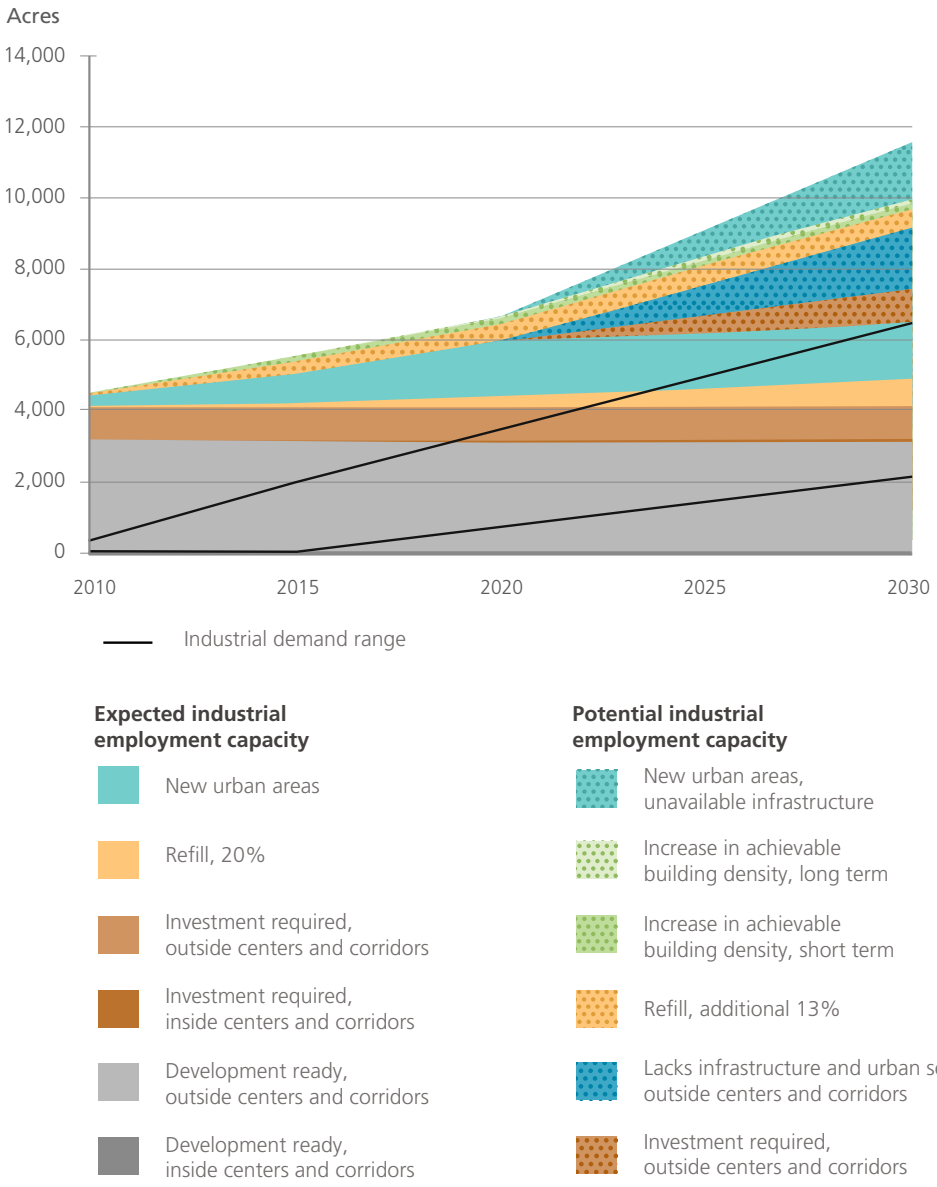
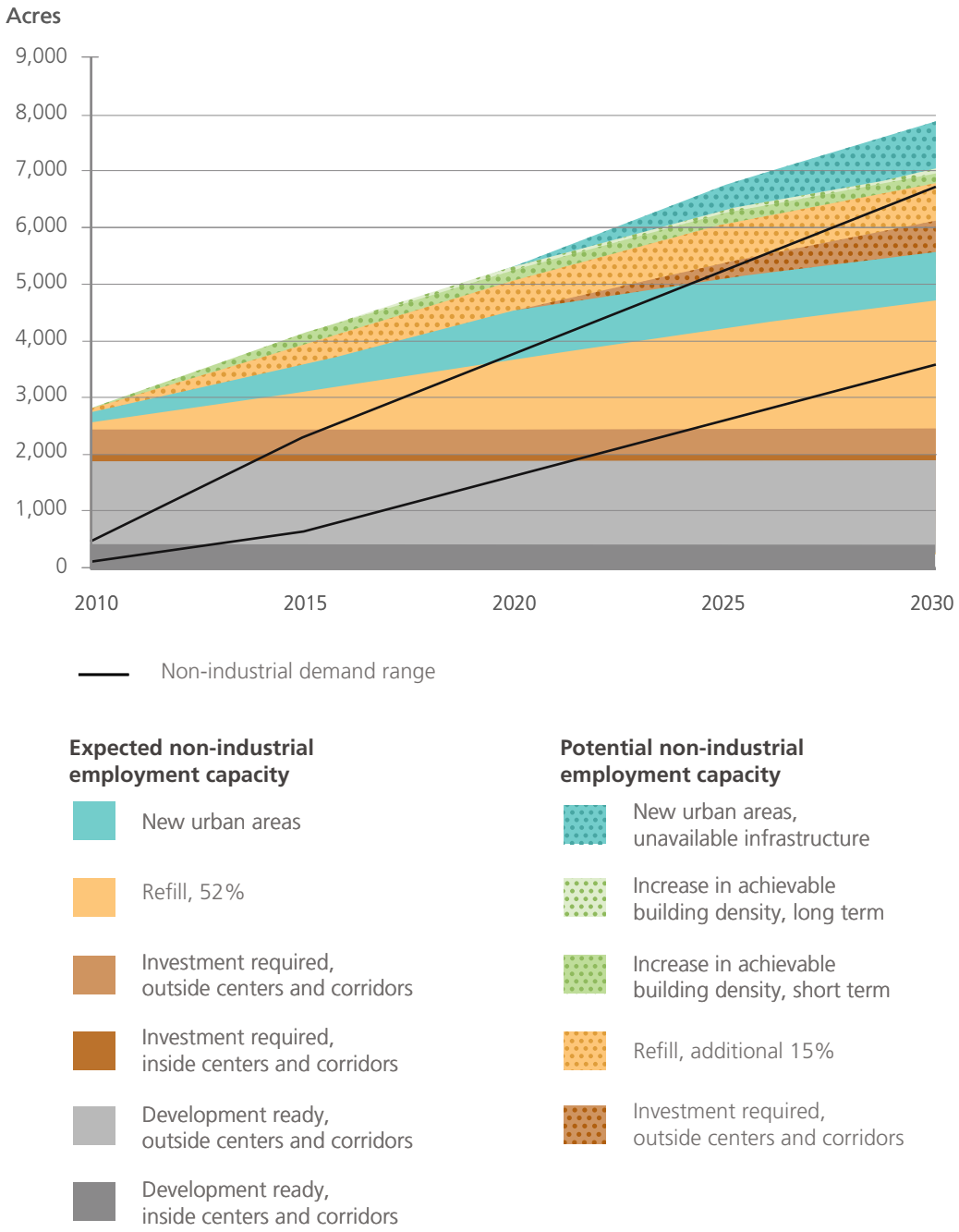


Figure 5: Non-industrial demand forecast and capacity range within current Metro UGB, assumes no change in local zoning

Source: Metro, E.D. Hovee & Company, LLC, FCS Group, 2009



Large lot comparison of demand and supply For the purposes of the large lot analysis, only vacant buildable land is considered as supply. Without any assumption about tax lot assembly, this analysis identifies surplus capacity of 25-to-50-acre lots, but a potential deficit of tax lots over 50 acres and lots over 100 acres (under both the high and low growth forecasts), as shown in **Table 3**.

Table 3: Comparison of large lot supply and the demand range (2010 to 2030) with no tax lot assembly assumption
Source: Metro, 2009.

Lot size (acres)	Lots available	High growth lot demand	Low growth lot demand
25 to 50	37	27	17
50 to 100	9	16	11
100 plus	4	5	5

The analysis of existing large lot users indicates that land assembly is a common practice. Several of the tax lots included in the region's buildable large lot supply are adjacent to one another. **Table 4** compares potential large lot supply and demand if it is assumed that assembly of adjacent large lots is feasible.[8] For land assembly to occur there must be willing sellers. With land assembly, the potential demand for additional large lot supply is significantly reduced. With lot assembly, under the high growth forecast, there is a potential deficit of two 25-to-50-acre lots, a potential deficit of one 50-to-100-acre lot, and a potential deficit of one lot over 100 acres. With lot assembly, under the low growth forecast, there is a potential surplus of eight 25-to-50-acre lots, a potential surplus of four 50-to-100 acre lots and a potential deficit of one tax lot larger than 100 acres.

Table 4: Comparison of large lot supply and the demand range (2010 to 2030) with tax lot assembly assumption
Source: Metro, 2009

Lot size (acres)	Lots available	High growth lot demand	Low growth lot demand
25 to 50	25	27	17
50 to 100	15	16	11
100 plus	4	5	5

There are several ways that potential demand for large lots could be accommodated, such as brownfield cleanup, redevelopment, land assembly, or through UGB expansion.

[8] *Additional tax lot assembly opportunities involving lots smaller than 25 acres are possible, but are not included here. It is likely that assembly of multiple smaller tax lots would be more difficult to achieve.*

Employment capacity policy questions: As regional leaders discuss these choices, questions to consider include:

- How will local and regional investments be targeted to increase development intensity (FARs) in locations that capitalize on and leverage past public investments?
- How important is it to protect past public investments (e.g., transportation improvements) to support future industrial uses?
- Are local and regional leaders willing to put policies and investments in place to support redevelopment of commercial and industrial lands (such as enterprise zones, public subsidy in existing industrial areas, economic development for select industries, brownfield cleanup, system development charge incentives for redevelopment, etc.)?
- Will the region identify an infrastructure funding source to make employment land more "development ready" and support development in past UGB expansion areas?
- What are the relative costs of investing in different locations? How can we ensure that jobs are provided around the region in the future?
- Under what conditions should the region expand the UGB?
- Is there a need for a coordinated regional economic development strategy to support and guide regional and local planning efforts? If so, who should develop a strategy?

RESIDENTIAL ANALYSIS

The residential capacity analysis assesses the potential gap for housing anticipated population growth. The potential gap requires the region to act now to ensure that future generations have housing choices in vibrant, sustainable communities.

HOW MANY HOUSEHOLDS ARE WE PLANNING FOR?

Population growth is a primary factor that influences future housing need. In order to determine whether there may be a need for additional residential capacity within the 20-year planning period, the population forecast is converted to a household range forecast.

The forecast begins with the seven-county Portland PMSA and is then narrowed to the area within the UGB. To identify the range of dwelling unit demand in our region, Metro calculates a capture rate, an estimate of the portion of the seven-county population that could settle within Metro's UGB by the year 2030 (61.8 percent, based on historical experience). In order to assess need, a vacancy rate – the percent of capacity that would need to be vacant at any given moment to allow for people to move from residence to residence--is also calculated (four percent, as used in the 2002 urban growth report).

Table 5: New dwelling unit demand range within the Portland metro area urban growth boundary (2007-2030)[a, b]
Source: Metro, 2009

Low end of forecast range	High end of forecast range
224,000 dwelling units	301,500 dwelling units

a It is estimated that there is a 90 percent chance that the rate of growth will fall within the forecasted range.

b The base year is 2007 because this represents the latest Regional Land Information System (RLIS) buildable land data.

WHAT IS THE RESIDENTIAL CAPACITY RANGE?

The report is intended to launch a discussion of how the region might adapt more of its existing capacity to meet future market demand. This purpose is in keeping with guidance provided in Oregon Statewide Planning Goal 14 to take actions inside the existing UGB first and to determine if growth cannot be "reasonably" accommodated inside the existing UGB before expanding it. This approach supports decision-making that is focused on the possible outcomes of our choices.

Our region's capacity to accommodate growth changes over time as real estate markets mature. Residential capacity within the existing UGB is a product not just of the zoned capacity of vacant buildable land, but also of the amount of redevelopment and infill that is likely to occur within the 20-year time period. In some locations the zoned capacity may exceed demand. Market dynamics can shift because of a variety of public and private sector influences; local investments in development incentives and infrastructure can play an important role. This analysis distinguishes between capacity that may be counted on within the next 20-year period and that which relies upon changing market dynamics. **Table 6** describes the assumptions that establish the range of residential capacity.

Table 6: Assumptions that establish the range of residential capacity
Source: Metro, 2009

Expected capacity	Potential capacity
• Market feasibility factor applied to high-density multi-family and new urban areas • Refill at: 33% • No units from urban renewal or incentives	• Market feasibility factor NOT applied to high-density multi-family and new urban areas • Refill at: additional 7% • Additional units from urban renewal and/or incentives
244,600 dwelling units	**358,300 dwelling units**

Figure 6 depicts the 20-year dwelling unit demand range along with a dwelling unit capacity range. The demand range is illustrated with two black lines that show the upper and lower end of the household forecast. ***This chart is based on current zoning; no "upzoning" is assumed although it is likely that upzoning will take place in the future as communities develop and implement their aspirations.*** Two primary types of dwelling unit capacity are identified in this figure. The capacity depicted with solid colors is considered market-feasible capacity that can be relied upon with a continuation of current policy and investment trends (this is the capacity that may be counted for purposes of the urban growth report). The capacity depicted with dotted colors is zoned capacity deemed to be market feasible by the year 2030 if additional policy and investment actions are taken (local or regional actions or investments need to be put in place by the end of 2010 to count this capacity; without those actions, the capacity depicted as dotted is strictly illustrative).

Expected capacity that may be counted in urban growth report

The first type of capacity depicted in Figure 6 with solid colors is zoned capacity inside the current UGB that is market feasible (by the year 2030) with no change in policy or investment trends. A significant portion of this capacity is on vacant buildable lands. Based on the most up-to- date information on local zoning, vacant land zoned for single-family residential use is a substantial source of market-feasible capacity. There is also market-feasible capacity on vacant lands zoned for multi-family residential and mixed uses. The figure illustrates the forecasted amount of household growth (33 percent, based on scenario modeling of current policies and trends[9]) that is expected to occur through redevelopment and infill ("refill") by the year 2030. Finally, half of the capacity in new urban areas (land brought into the UGB since 1997) is deemed to be market feasible by the year 2030, and will be counted towards meeting the region's identified 20-year residential demand.

Potential capacity: focus of local and regional effort in 2010

The second type of capacity depicted in Figure 6 with dotted colors is zoned capacity inside the UGB that is likely to require changes to public policies and investments to make it market feasible by the year 2030. Policy and investment actions taken at the local and regional levels can increase the refill rate as well as the market feasibility of vacant lands. These are the very actions that can make our communities even greater places to live, work and play.

Though they are not depicted here, future UGB expansions would also fall into the category of potential capacity that would require substantial investments to make it market feasible.

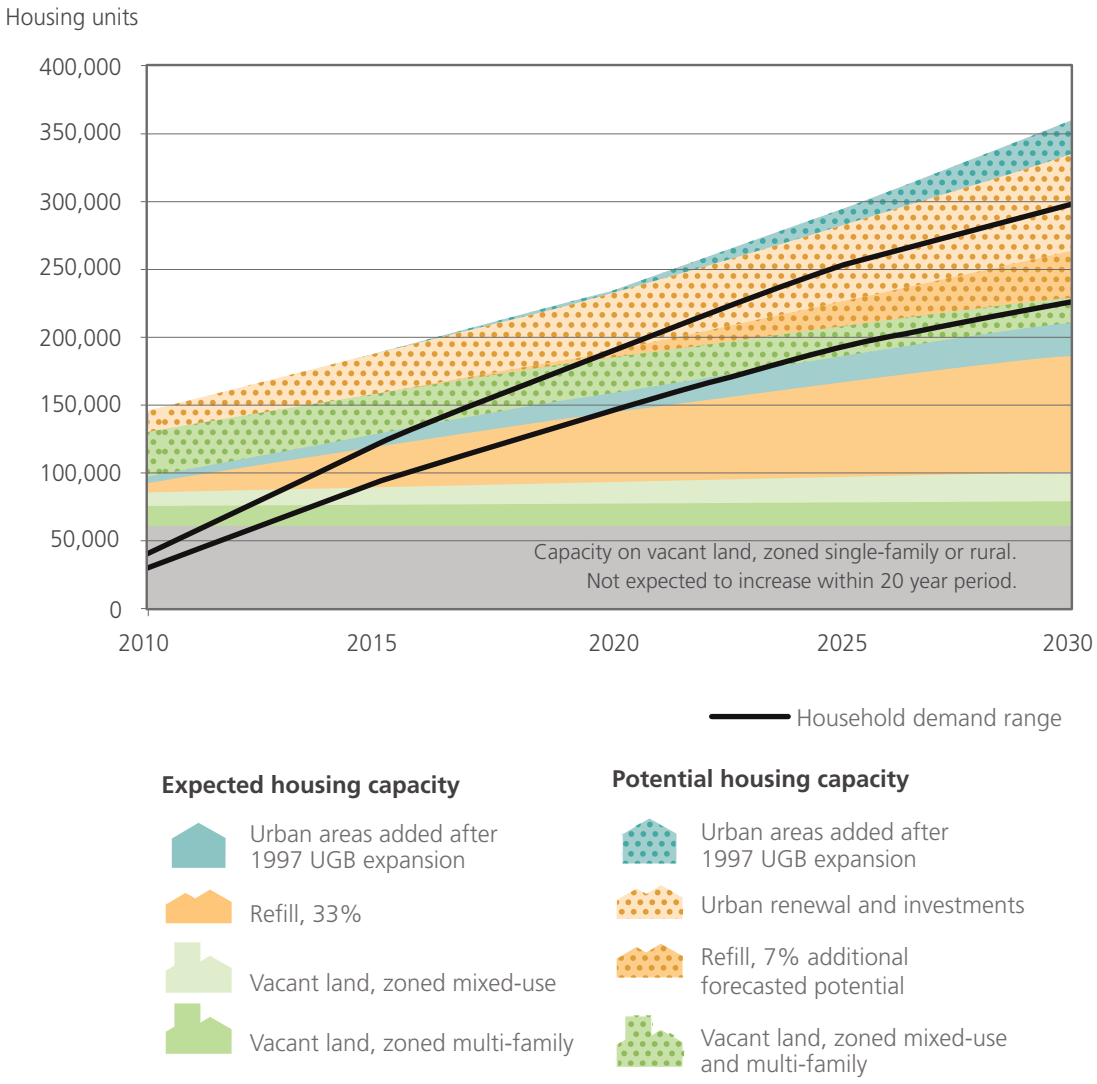
WHAT IS THE POTENTIAL GAP BETWEEN HOUSING DEMAND AND CAPACITY?

Although adequate zoned capacity exists inside the current UGB, in order to meet even the low range of the forecasted demand the region must take some action (make policy changes or investments) to make more of that zoned capacity market feasible. If enough policy changes and investments are put in place, it will be possible to meet the high range of demand without expanding the UGB. These policy and investment actions, by their nature, can make our communities more desirable places to live.

The potential difference between projected dwelling unit demand and supply (in the year 2030) could range from a deficit of 103,600 dwelling units (low supply, high demand) to a surplus of 152,400 units (high supply, low demand). Local and regional policy and investment choices made over the next two years will influence where we settle within these ranges and will shape our region's future.

[9] *Scenarios indicate that a refill rate somewhere between 30 to 35 percent is most likely, considering the context of the larger region and the current assumptions that reflect limited public investments in infrastructure in new urban areas.*

Figure 6: Residential forecast demand and capacity range within current Metro UGB, assumes no change in local zoning
Source: Metro, 2009.



PERFORMANCE

This urban growth report is intended to document the current range of capacity within the existing UGB and, given current policy and investment direction, estimate how that capacity may get used in the future. One of the fundamental principles of this analysis is that there is a range of possible futures for which the region can plan. Possible futures are defined by a range of population growth rates, a range of possible market responses to zoned capacity and a variety of megatrends that insert additional uncertainty. MetroScope, an integrated land use and transportation model, can help to illuminate the possible implications of continuing with current policies and investments.

SCENARIO RESULTS

Some of the key results of scenarios that model the impact of continuing current policies and trends out over the next 20 years, at the high and low ends of the forecast range, are described below.

- Scenarios indicate that, with a continuation of current policy direction, a smaller share of jobs may locate in centers under a high growth scenario than under a low growth scenario. Conversely, a greater share of jobs may locate in "all other areas inside the UGB" under a high growth scenario. Those areas include employment and industrial areas, which are likely locations for industrial sectors that witness healthier growth under the high growth scenario.
- Household growth will continue to have a similar distribution as today, with around 25 percent locating in centers and corridors under both the high and low forecasts. Modeling results show a substantial amount of growth occurring in "existing neighborhoods." This reflects the evolution of parts of existing neighborhoods in keeping with local zoning and comprehensive plans. Local and regional policies and investments that are put in place today or in the future could shift this outcome.
- Even though the scenarios indicate that in 2030 the average household may have a shorter commute than today, there will simply be more people commuting, resulting in an increase in the total daily commute miles for the seven-county region. The region will need to take much more ambitious and coordinated steps to comply with state greenhouse gas reduction targets.
- Counter-intuitively, the residential refill rate in the high growth scenario is lower (38 percent) than it is in the low growth scenario (41 percent).[10] Even though the high growth scenario shows, in absolute numbers of new dwelling units, more refill development than the low growth scenario, the absolute amount of residential growth on vacant lands, particularly in Damascus and in prospective UGB expansion areas assumed in the scenarios, is even more substantial. In essence, refill rate is the share of total growth that occurs through infill or redevelopment, not the absolute amount. In these scenarios, refill capacity gets used more quickly than UGB expansion land because its locations are more accessible.
- Assuming a continuation of current policies and investment trends, the region is likely to see an increase in the total numbers of all housing types by the year 2030. However, the likely increase in multi-family residences (both owned and rented) is particularly noteworthy. This potential increase in multi-family units (123,000 to 176,000 more by 2030) is greater than the increase in single-family units (100,000 to 124,000 more by 2030). Researchers such as Dr. Arthur C. "Chris" Nelson, who has conducted pioneering research on urban settlement patterns, growth management and housing, have suggested that the focus of planning efforts needs to be on providing more apartment and condominium choices to better accommodate changing demographics and future preferences.

[10] These higher modeled rates are not used in the residential analysis capacity assumptions since MetroScope is not currently able to forecast possible interactions with cities outside of the seven-county area and uncertainty regarding when public infrastructure investments may be in place in new urban areas.

FUTURE HOUSING AND TRANSPORTATION AFFORDABILITY

Homeownership represents an economic choice that requires some level of equity investment (recent lending practices notwithstanding). Defining what a "cost-burdened household" is for homeowners is somewhat more difficult than for renters since many homeowners regard their homes as not just a residence but as an investment. Homeowners often spend a substantial portion of their income on their home but do not necessarily regard these expenditures as a burden. This is particularly the case for affluent homeowners. For these reasons, this analysis assumes that to be cost-burdened, a household must rent, not own.

Because this analysis includes housing and transportation costs, the standard rule that no more than 30 percent of one's income should be spent on housing needs adjustment. In 2007, many low-to-moderate-income households in the United States spent well over 50 percent of their income on housing and transportation.[11] In 2007, the national median percentage of income spent on these costs was 45 percent. ***In the absence of an accepted standard, this report proposes that if a household rents its residence and spends 50 percent or more of its income on transportation and housing, it is considered cost-burdened.***

Historically, most residents of this region have been able to choose from a variety of housing types that match their preferences and budgets. However, there is work to be done to ensure that future generations have the same range of choices and that those choices support the region's vision of creating vibrant and walkable communities, protecting air and water quality, and reducing greenhouse gas emissions. If current policies and investments are continued, the number of cost-burdened households in the region may more than double from 94,000 in the year 2005 to 200,000 in the year 2030, bringing the percentage of households that are cost-burdened from 16 percent in 2005 to between 17 to 23 percent in 2030. Many of these households will be seniors on fixed incomes and the working class, some of which will have school-aged children.

[11] *Source: United States Bureau of Labor Statistics*

POLICY AND INVESTMENT CHOICES

The 2040 Growth Concept guides both regional and local growth management decisions. By focusing development in centers, corridors and employment areas, we can foster great communities while accommodating forecasted growth. The urban growth report is part of a continuous effort to implement the 2040 Growth Concept in the context of current conditions and knowledge.

The urban growth report is intended to provide policy makers with an understanding of how well the region accommodates the range of expected growth and how well it achieves the outcomes the region's citizens want. It does not recommend any particular policy direction. Instead, it provides policy makers with information needed to guide policy decisions.

Employment and residential capacity is a product of zoning, public investments, market dynamics and regional growth management policy. It is up to all of the cities and counties in the region to work with Metro to make a determination of where growth should occur and to take policy and investment actions as needed to direct growth in a way that supports local aspirations and the regional vision. How growth is accommodated will play a large part in determining whether or not the region achieves its desired outcomes and creates great communities.

A strong regional economy and vibrant communities into the future will depend on a variety of decisions that are not related to land use. Greenlight Greater Portland, a regional group organized to market the Portland – Vancouver region to attract businesses, focuses on the people and places that make up the region.

> *"What people find here is vitality and livability: great neighborhoods, schools and efficient means of getting around; a creative work environment; a backyard of mountains, rivers and forests. This isn't lost on business leaders, well aware that where there's urban vitality there's talent. The region's skilled workforce is drawing companies to Portland-Vancouver, where they're adding new expertise and innovation to a diverse economic base."*
>
> *Source: 2008 Greater Portland Prosperity Index*

Local and regional policy choices can foster communities that are attractive to the people that make up the regional economy. Some of those choices are described below.

Zoning In most cases, the maximum zoned capacity in centers, corridors, employment and industrial areas is adequate to meet demand. The challenge is to attract the market to more closely approach zoned capacity. Removing barriers to more efficient use of land in industrial areas is a strategy that can be pursued (such as innovative approaches to landscaping requirements such as green walls and green roofs, etc.).

Investments in centers and corridors Past experience and recent scenario modeling indicate that investments in centers and corridors are an effective means of attracting growth to these areas. Employment in these locations creates great places by generating daytime activity. Residential development, as a companion to employment uses, supports retail and entertainment and creates nighttime activity. Urban centers and corridors are also likely to be some of the region's least costly communities in the future, but this does not mean that they are affordable for all. The Metro region's leaders are counting on housing in centers and corridors to remain affordable in order to manage growth in a way that protects existing single-family neighborhoods and addresses new challenges such as climate change. Investments can take the form of:

[12] *Oregon House Bill 3543 (2007) mandates a halt in the growth of greenhouse gas emissions by 2010; by 2020, a ten percent decrease below 1990 levels, by 2050, at least a 75 percent decrease below 1990 levels.*

- Urban renewal
- Urban design improvements (such as street trees, sidewalks, traffic calming design improvements)
- Land assembly
- Investments in structured parking
- Incentives that reduce the costs of construction (such as System Development Charge credits, vertical housing tax abatement, or the other tools explored in Metro's *Community Investment Toolkit: Financial Incentives* (2007))
- Design and technical assistance, including incentives for prototype developments illustrating profitable concepts in a mixed use, sustainable setting

Investments in brownfields A portion of the region's land supply is currently environmentally contaminated. Public investment in cleaning up brownfield sites is good from an environmental perspective, supports redevelopment and reuse of land in existing urban locations that are typically well-served by infrastructure, and allows new private investment to occur without the risk of uncertain cleanup costs.

Targeted infrastructure investments Infrastructure investments determine where population growth can occur. Transportation investments are a key component. Participants in recent employer focus groups emphasized the importance of transit to support employment and industrial areas. These strategies will also be necessary for reducing greenhouse gas emissions.

Urban growth boundary expansions In theory, all future growth could be accommodated either inside the existing UGB or exclusively through future UGB expansions. There are potential limitations and tradeoffs to each approach.

Permit data reveals that relatively little residential growth has actually occurred in UGB expansion areas. Out of all of the residential units permitted in the three-county area during the 1998 to 2008 period, approximately five percent occurred in expansion areas that were added to the UGB after it was originally established in 1979. Accommodating the majority of growth through UGB expansions appears unrealistic for several primary reasons: 1) there is not likely to be adequate funding for infrastructure; 2) there are limits to the market's demand for housing in UGB expansion areas; 3) it has also become clear that a growth strategy that relies primarily on UGB expansions would likely result in increased automobile reliance, making it difficult or impossible to reduce greenhouse gas emissions as mandated by Oregon law.[12] In light of increasing energy costs, automobile dependence would result in higher combined costs of transportation and housing.

There are implications if the UGB is not expanded to accommodate forecasted population and employment growth as well. In that case, more growth is likely to go to neighboring cities (in Oregon and in Washington), potentially increasing congestion on major travel routes. Similarly, opportunities to attract some employers could be lost to other regions if appropriate sites are not available in the Metro UGB. These tradeoffs should be considered as local and regional leaders make decisions that support local aspirations and achieve the outcomes of a successful region.

TIMELINE

This urban growth report is being released well before growth management decisions must be made to allow substantial discussion among policymakers and local planning professionals. Refinements to the data and assumptions as well as documentation of local and regional actions that affect employment and residential capacity have informed revisions that are reflected in this urban growth report. This report is scheduled to be accepted by the Metro Council by the end of this year.

December 2009 Metro Council will accept a 2030 population and employment range forecast and complete a final urban growth report that describes any lack of 20-year capacity of the current UGB to be addressed in 2010.

Throughout 2010 Local and regional governments will continue to implement policies and investments to create and enhance great communities while accommodating anticipated growth.

December 2010 Metro Council will submit plans to accommodate at least 50 percent (up to 100 percent) of any 20-year capacity need (through local and regional actions inside the boundary or through expansions) to the Oregon Land Conservation and Development Commission.

By the end of 2011 If any additional 20-year capacity need remains, the Metro Council will consider UGB expansions into designated urban reserves.

Metro | *People places. Open spaces.*

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and good transportation choices for people and businesses in our region. Voters have asked Metro to help with the challenges that cross those lines and affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to protecting open space, caring for parks, planning for the best use of land, managing garbage disposal and increasing recycling. Metro oversees world-class facilities such as the Oregon Zoo, which contributes to conservation and education, and the Oregon Convention Center, which benefits the region's economy.

Metro representatives

Metro Council President – David Bragdon

Metro Councilors
Rod Park, District 1
Carlotta Collette, District 2
Carl Hosticka, District 3
Kathryn Harrington, District 4
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DRAFT URBAN GROWTH REPORT

2009 – 2030

Employment and residential

September 15, 2009

Metro | *People places. Open spaces.*

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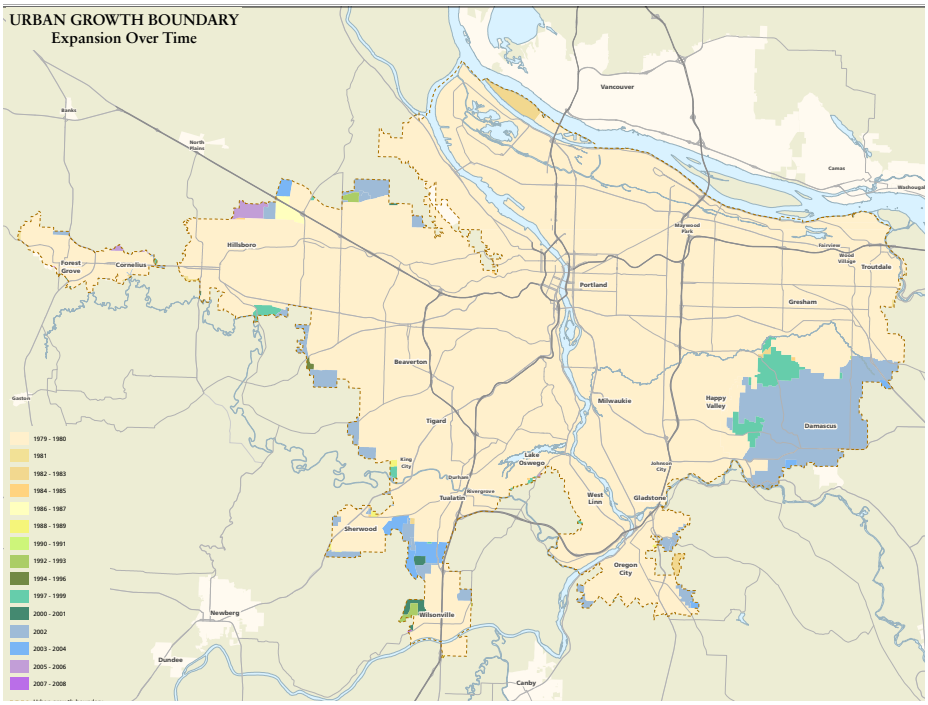
INTRODUCTION

A strong regional economy provides for prosperity and choices in employment opportunities, supports the ability for residents to choose appropriate and affordable places to live, and enhances the quality of life in our region. The economic position of the Portland metropolitan region is partially dependent upon global factors as the world shifts towards new market realities. However, local and regional choices can shape this region's place in the global economy and the way our communities look and feel. Oregon's land use laws were crafted to protect and maintain a high quality of life for our residents; they address how we as a society provide housing opportunities for people and support the regional economy.

In the Portland metropolitan area, Metro is the agency legally responsible for anticipating changes and growth in population and employment, monitoring the availability of an array of housing types to meet people's needs and ensuring sufficient capacity to support the region's employers. Oregon land use law requires that Metro ensure, every five years, sufficient capacity to house the number of people anticipated to live here over the next 20 years. For this reason, every five years, Metro conducts an inventory of the current residential and employment capacity within the urban growth boundary (UGB), forecasts population and employment growth over a 20-year timeframe, determines the capacity of the current UGB to accommodate that growth (and whether additional capacity is needed), and documents the results of these analyses in an urban growth report. Past urban growth boundary expansions are shown on **Map 1**.

Map 1: Historic UGB additions
Source: Metro 2009



This urban growth report provides the analysis of residential and employment capacity and demand, described in the context of a range. This analysis is not intended to recommend specific actions that will address any deficiencies in the capacity of the current UGB to accommodate the next 20 years' worth of growth. That determination remains for discussions among local governments and Metro in 2010, specifically through Metro's Making the Greatest Place initiative that connects land use and transportation policies and investments to support vibrant communities across the region.

This demand and supply analysis depicts Metro's best estimate of what is likely to happen over the next 20 years given the policies in place today, policies which may or may not be adequate for adaptation to a changing world. The initial assumptions made in the preliminary urban growth report, issued in spring 2009, have been amended as a result of local and regional discussions and policy changes made in the spring and summer of 2009. The preliminary analysis provided a vehicle for seeking feedback on assumptions. This analysis has been revised and is now released for the Metro Council to consider for adoption in December 2009.

OUTCOMES-BASED APPROACH TO GROWTH MANAGEMENT

Planning for the future is not just an exercise in providing numbers and forecasts. Planning creates opportunities for people and communities to define and articulate their collective desires and aspirations for enhancing the quality of life in our region. It allows citizens and their elected leaders to take stock of the successes that have been achieved in their communities through years of hard work. It also forces us to think carefully about and to be accountable for the costs of our choices, ensuring we get the greatest possible return on public investments.

Aside from fulfilling statutory requirements, this urban growth report provides the region with an opportunity to assess how it has been performing and decide what policy actions could be taken to improve future outcomes and ensure that our communities are sustainable. Recent events such as the recession and large-scale trends like global warming demand that we do things differently and make a new approach to our growth management responsibilities all the more timely.

Characteristics of a successful region

In making growth management decisions, the Metro Council and the Metro Policy Advisory Committee (MPAC) have indicated their desire to weigh policy and investment tradeoffs to produce outcomes that our citizens tell us they want. To that end, in the summer of 2008, the Metro Council, following MPAC's recommendation, adopted six desired outcomes that provide guidance for growth management decisions:

1. People live and work in vibrant communities where they can choose to walk for pleasure and to meet their everyday needs.
2. Current and future residents benefit from the region's sustained economic competitiveness and prosperity.
3. People have safe and reliable transportation choices that enhance their quality of life.
4. The region is a leader in minimizing contributions to global warming.
5. Current and future generations enjoy clean air, clean water and healthy ecosystems.
6. The benefits and burdens of growth and change are distributed equitably.

The determination of housing and employment demand and capacity is necessarily part art and part science. State law and statewide planning goals direct the region to determine what share of growth can "reasonably" be accommodated inside the existing UGB before expanding it. Ultimately, how the region defines "reasonable" will be a reflection of regional and community values and commitments. At the opposite ends of the spectrum, the Metro UGB could be held tight or expanded significantly. There are tradeoffs that accompany such choices. This urban growth report is intended not just to determine whether there is a need for additional residential or employment capacity within the UGB over the next 20 years, but also to place growth management decisions in the context of the region's desired outcomes.

RANGE FORECAST

In addition to reviewing our past, the urban growth report peers into the future to consider the conditions and the needs of the people living here decades from today. Most any view into the future is inherently cloudy and because of this lack of precision, it is wise to consider a range of possibilities and plan for contingencies. For that reason, the population and employment forecasts and housing capacity analysis in this report are expressed as ranges, allowing the region's elected officials and citizens the opportunity to err on the side of flexibility and resilience in choosing a path.

To inform the regional discussion of growth management choices and the possible implications of those choices, Metro has developed a range population and employment forecast. The regional forecast is derived from Metro's regional macro-economic forecast model. This model has been thoroughly vetted by an independent panel of economic and demographic experts from across the United States, as well as by local economists and demographers. It relies on national growth factors obtained from the economic forecasting firm IHS Global Insight, Inc., as well as birth and death rates derived from the U.S. Census Bureau's most current "middle series" fertility and survival rates.

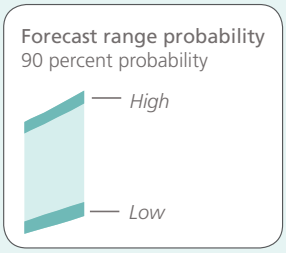
What does the range mean?

As with a weather forecast, this population and employment range forecast is expressed in terms of probability. The methodology for producing the range forecast is described in more detail later in this document.

Low end of range: There is a five percent chance that actual growth will be less than or equal to the low end of the range.

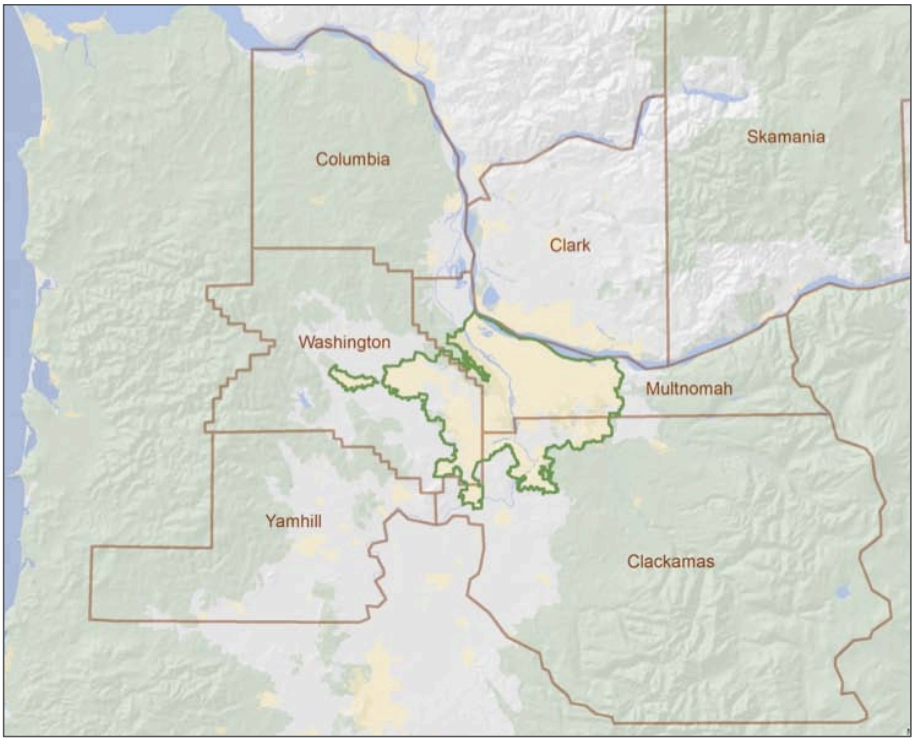
High end of range: There is a five percent chance that actual growth will be greater than the high end of the range.

Stated differently, there is a 90 percent chance that growth will occur within the outer bounds of the forecasted range.



The regional geography for the Portland-Beaverton-Vancouver OR-WA Primary Metropolitan Statistical Area (PMSA), as defined by the federal Office of Management and Budget, now comprises a total of seven counties (Clackamas, Multnomah, Washington, Clark, Columbia, Skamania and Yamhill), consistent with changes to federal data reporting standards. (**See Map 2**) PMSA delineations are revised periodically in order to reflect actual changes in the economic structure of regions as they grow and expand. For purposes of this report, the forecast time period is 2030.

Map 2: Portland-Beaverton-Vancouver OR-WA PMSA
Source: U.S. Office of Management and Budget, Metro 2009



Geographic extent of the regional forecast encompasses seven counties. The Metro urban growth boundary comprises a fraction of the land area of the region.

The forecast indicates a 90 percent chance that the population of the seven-county statistical area in 2030 will be between 2.9 and 3.2 million people. In 2000, the population was 1.9 million people.

On the employment side, the forecast indicates a 90 percent chance that there will be between 1.3 and 1.7 million jobs in the statistical area in 2030. In 2000, there were approximately 973,000 jobs.

Where the region's population and employment numbers ultimately land will be affected by several factors. They include varying conditions in the local and global economies, changing population and workforce demographics, and policy decisions and investments made in local communities that may attract particular types of population and employment growth to certain areas of the region. The employment and residential capacity analyses employ a "capture rate" to this seven-county forecast based on current policies and trends and informed by past experience.

POLICY AND INVESTMENT CHOICES

The 2040 Growth Concept guides both regional and local growth management decisions. By focusing development in centers, corridors and employment areas, we can foster great communities while accommodating forecasted growth. The urban growth report is part of a continuous effort to implement the 2040 Growth Concept in the context of current conditions and knowledge.

This urban growth report is intended to provide policy makers with an understanding of how well the region accommodates the range of expected growth and how well it achieves the outcomes the region's citizens want. It does not recommend any particular policy direction. Instead it provides policy makers with information needed to guide policy decisions. Consequently, this analysis is being released and accepted by the Metro Council in 2009, well in advance of required growth management decisions in 2010 aimed at accommodating future population and employment growth. This allows for adequate consideration of local policy options (such as zoning and public investments) and regional policy options (such as UGB adjustments and transportation investments) and the likely outcomes of those options. To inform that discussion, a report on the region's historic performance looking at land use and transportation measures is attached to this report as Appendix 10.

As the region's leaders review this analysis of forecasted residential and employment demand and the current UGB's capacity to meet that demand, there are a number of questions to keep in mind:

Questions to consider for future employment needs

Supporting the region's place in a shifting global economy

1. The world is changing rapidly – what are our region's unique strengths in a global economy and how do we capitalize on those strengths in ways that are consistent with the region's vision? Should the region be positioned as a leader in the green economy to address greenhouse gas emissions and reduce dependence on imported sources of energy?
2. How important is land supply in the mix of elements that make up a strong regional economy (along with an educated workforce, quality jobs, and other factors)?
3. Global economic conditions change quickly. Is 20 years an appropriate time horizon for planning how to accommodate job growth? How might we be prepared to act upon new opportunities in a timely fashion? How can we design a rapid response system to support a strong regional economy both in the near term and sustainably over the next 40-50 years? How can we maintain capacity for land-extensive industry while protecting the region's strong agricultural and forestry industries?
4. Given the impossibility of predicting with confidence the need for large-scale manufacturing capacity over the 20-year planning period, and given the difficulties experienced in trying to preserve large private parcels for industrial use in the face of pressures from landowners who do not want to "bank" their land for 10-15 years of waiting for a large company to arrive, and since many cities and counties want flexibility to respond to more immediate non-industrial employment opportunities, are there better ways than those used in the past to address the call for large parcels?
5. Is employment land interchangeable or are there specialized needs for certain locations or industries? (For example, is a car manufacturer more likely to locate on Swan Island or in the Columbia Corridor while high tech companies may tend to cluster together?)
6. What strategies can be put in place to ensure that industrial land is used for job-generating industrial purposes in order to protect public investments made to support industrial uses (such as transportation investments and planning efforts) and enhance regional economic competitiveness?

Investing and infrastructure

7. What strategies and investments would support more non-industrial employment in the region's centers and corridors?
8. What is the right balance of strategies and investments to support redevelopment of existing employment areas and development on greenfield industrial sites when there are limited local and regional resources?
9. How should the region prioritize investments, such as transportation, infrastructure, and technical resources? What does a city or county need to have in place to take advantage of regional investments?

Balancing local and regional perspectives and managing risk

10. How do we balance local desires or aversions with a regional perspective? (For example, what if all communities want to attract solar industries, but no communities plan to attract warehousing and distribution)?
11. What are the risks of planning for the high or low end of the employment forecast? Are there different risks when planning for employment (versus housing)?
12. What are the risks of assuming that future employment trends will be the same or different, compared with today? Can the region minimize these risks by targeting high-growth industries or business clusters? Or should there be less attention to identifying potential winners and losers, with more emphasis on assuring competitive capacity to serve the increasingly diverse needs of as yet unknown employers who will grow the jobs of the next 20-50 years?
13. In addition to the creation of employment capacity, are there reasons (based on the six desired outcomes) to expand the UGB?
14. How might our region's policies and investments interact with actions taken in the broader economic region, from Longview to Salem?

Questions to consider for future residential needs

1. How will development patterns and preferences (housing and transportation) change over time? What are the risks and opportunities of assuming that they will be different? What are the demographic characteristics that will lead to changing preferences?
2. What policy and investment choices best position the region to continue to provide a high quality of life and serve as a global leader in sustainability in both the public and private arenas?
3. What are the risks of planning for the high or low end of the population forecast? Are there different risks when planning for land use, for transportation, or for other infrastructure systems? Does the range allow for the potential impact of climate change refugees?
4. What are the public and private costs associated with growth management choices?
5. How do we equitably distribute the benefits and burdens of growth across the region?
6. Should the region prioritize investments that best leverage local commitments? What does a local government need to have in place to take advantage of regional investments?
7. In addition to the creation of residential capacity, are there reasons (based on the six desired outcomes) to expand the UGB? Under what conditions should the UGB be expanded?
8. How might our region's policies and investments interact with actions taken in neighbor cities, Clark County, and Salem?
9. How might public and private actions reinforce each other to achieve the region's desired outcomes?

TIMELINE

December 2009 Metro Council will accept a 2030 population and employment range forecast and complete a final urban growth report that describes any lack of 20-year capacity of the current UGB to be addressed in 2010.

Throughout 2010 Local and regional governments will continue to implement policies and investments to create and enhance great communities while accommodating anticipated growth.

December 2010 Metro Council will submit plans to accommodate at least 50 percent (up to 100 percent) of any 20-year capacity need (through local and regional actions inside the boundary or through expansions) to the Oregon Land Conservation and Development Commission.

By the end of 2011 If any additional 20-year capacity need remains , the Metro Council will consider UGB expansions into designated urban reserves.

REPORT ORGANIZATION

Metro's approach to this urban growth report represents a new direction from past practice and from business as usual, with the outcome of the capacity analysis leading to a regional discussion on growth management choices oriented towards achieving outcomes that support great communities. This report is reflective of the new approach and is designed to serve as a discussion guide to prepare the region for growth management decisions in 2010. The following sections are included:

Employment analysis

- Demand range covers global risks and opportunities for the region, and the 20-year range employment forecast
- Supply range covers historic use of capacity, components of supply range, and methodology for calculating capacity
- Reconciliation compares demand and supply ranges and describes choices

Residential analysis

- Demand range covers housing preferences, megatrends, and the 20-year range forecast
- Supply range covers historic use of capacity, components of supply range, and methodology for calculating capacity
- Reconciliation compares demand and supply ranges and describes choices

Performance

Describes the results of modeled scenarios whose assumptions are intended to represent a continuation of current policy and investment direction. Includes an assessment of future housing affordability.

Next steps

Describes the growth management decision timeline.

Appendices

Metro and its consultants have produced a substantial amount of information that supports the findings of this report. Much of this information is contained in the following appendices:

Appendix 1 Comments and responses on preliminary UGR (attached to this analysis)

The following appendices are available for download on Metro's website at URL or by request

Appendix 2 Documentation of MetroScope scenario assumptions

Appendix 3 Cluster forecast (methodology and results)

Appendix 4 Large employer / large lot analysis (methodology and results)

Appendix 5 Multi-tenant (business park) / large lot analysis (methodology and results)

Appendix 6 Residential capacity methodology

Appendix 7 Housing needs analysis subarea profiles

Appendix 8 Needed housing data tables (complies with ORS 197.296 and 197.303)

Appendix 9 Residential refill study (2001 to 2006)

Appendix 10 Report on past performance (related to six desired outcomes)

Appendix 11 E.D. Hovee consultant team products

Appendix 12 Population and employment forecast

Appendix 13 Capacity definitions

EMPLOYMENT ANALYSIS

INTRODUCTION

Employment capacity is a product of zoning, public investments, market dynamics, technological innovation and regional growth management policy. In addition to job capacity, factors that contribute to a strong regional economy include an educated workforce, high value-added businesses, high wage levels, a diverse mix of jobs, the success of economic development efforts, an efficient multi-modal transportation system, infrastructure investments and quality of life.

The region has decided that it does not want to accommodate future growth through UGB expansions alone. That vision is memorialized in the 2040 Growth Concept, the region's blueprint for managing growth that was adopted in 1995, and was reaffirmed in a series of joint JPACT and MPAC meetings during fall 2008. Additionally, Statewide Planning Goal 14 compels the region to first look inside the UGB for capacity before expanding it. It is up to all of the cities and counties in the region to make the determination of where growth should occur and to take policy and investment actions as needed to direct growth in a way that supports local aspirations and the regional vision. How growth is accommodated will play a large part in determining whether or not the region achieves its desired outcomes and creates great communities.

A strong regional economy into the future will depend on a variety of decisions that are not related to land use. Greenlight Greater Portland, a regional group organized to market the Portland – Vancouver region to attract businesses, focuses on the people and places that make up the region.

A quote from the 2008 Greater Portland Prosperity Index emphasizes the importance of human resources in this region's economic future:

> *What people find here is vitality and livability: great neighborhoods, schools and efficient means of getting around; a creative work environment; a backyard of mountains, rivers and forests. This isn't lost on business leaders, well aware that where there's urban vitality there's talent. The region's skilled workforce is drawing companies to Portland-Vancouver, where they're adding new expertise and innovation to a diverse economic base.*

Local and regional policy choices can foster communities that are attractive to the people that make up the regional economy. Some of those choices are described below.

Zoning In most cases, the maximum zoned capacity in centers, corridors, employment and industrial areas is adequate to meet demand. The challenge is to attract the market to that zoned capacity. Removing barriers to more efficient use of land in industrial areas is a strategy that can be pursued (e.g., innovative approaches to landscaping requirements such as green walls and green roofs, etc.). It is equally important for zoning to recognize and anticipate the technological needs of footloose traded-sector industries and for zoning to be competitive in attracting and retaining strong regional industries.

Investments in centers and corridors Past experience and recent scenario modeling indicate that investments in centers and corridors are an effective means of attracting growth to these areas. Employment in these locations creates great places by generating daytime activity. Residential development, as a companion to employment uses, supports retail and entertainment and creates nighttime activity. Investments can take the form of:

- Urban renewal
- Urban design improvements (such as street trees, sidewalks, traffic calming design improvements)
- Land assembly

- Investments in structured parking
- Incentives that reduce the costs of construction (such as System Development Charge credits, vertical housing tax abatement, or the other tools explored in Metro's *Community Investment Toolkit: Financial Incentives* (2007))

Investments in brownfields A portion of the region's current land supply is environmentally contaminated. Public investment in cleaning up brownfield sites is good from an environmental perspective, supports redevelopment and reuse of land in existing urban locations that are typically well-served by infrastructure, and allows new private investment to occur without the risk of uncertain cleanup costs.

Targeted infrastructure investments Infrastructure investments determine where population growth will occur. Transportation investments are a key component; past experience and recent MetroScope scenarios indicate that high capacity transit and effective system demand management practices hold the greatest promise for attracting growth to the region's centers and corridors. Participants in recent employer focus groups also emphasized the importance of transit to support employment and industrial areas. These strategies will also be necessary for reducing greenhouse gas emissions. All transportation strategies come with tradeoffs, however, and no single strategy will accomplish all goals. Many local governments are struggling to fund ongoing maintenance and operations and additional investments may prove difficult. However, a complete range of infrastructure services is needed to form great communities in keeping with regional goals.

Urban growth boundary expansions In theory, all future growth could be accommodated either inside the existing UGB or exclusively through future U expansions. There are potential limitations and tradeoffs to each approach. Growth management policies that make strategic use of UGB expansions hold the most promise for helping the region achieve its desired outcomes.

Accommodating the majority of growth through UGB expansions appears unrealistic for several primary reasons: 1) there is not likely to be adequate funding for new infrastructure; 2) many types of employment need to locate in urban centers; 3) it has become clear that a growth strategy that relies primarily on UGB expansions would likely result in increased automobile reliance, making it difficult or impossible to meet the greenhouse gas reduction targets set by Oregon law. In light of increasing energy costs, automobile dependence would result in higher combined costs of transportation and housing.

There are implications if the UGB is not expanded to accommodate forecasted population and employment growth as well. In that case, more growth is likely to go to neighboring cities (in Oregon and in Washington), potentially increasing congestion on major travel routes. Similarly, opportunities to attract some employers could be lost to other regions if appropriate sites are not available in the Metro UGB.

NEW METHODS IN THIS EMPLOYMENT ANALYSIS

The last time Metro produced an analysis of employment demand and capacity was in 2002. The world has changed significantly since then with shifting global economic conditions, technological innovations, increased understanding of resource limitations, awareness of individual and collective actions on the global climate and creative approaches to workplace environments, to name just a few. To support a more sophisticated approach for analyzing employment demand and capacity, Metro contracted with a consultant team led by E.D. Hovee & Company, LLC. The Hovee team reviewed global, national, and local trends, conducted focus groups with employers, analyzed recent job location data, updated and categorized the region's employment and industrial land inventory, and developed a new employment demand paradigm.

The consultant work informed the methodology in this employment urban growth report, as described in **Table 1**. The analysis also makes use of MetroScope, an integrated land use and transportation simulation model that operates on economic principles to predict where the region's employment and housing will locate in the future. The intent of this approach is to allow policy makers to focus on outcomes and the types of places that support a strong regional economy.

Table 1: New methods in the 2009 employment urban growth report
Source: Metro, 2009

Demand ranges	**Rationale**
5- and 20-year range forecast	• Acknowledges risk and uncertainty • Consistent with five-year periodic review schedule • Applicable to city and county Goal 9 requirements • Recognition that five- and 20-year markets are different, in the short-term markets are likely to be similar to today, but in the longer-term changes and innovations are more likely
Variable redevelopment rates	• Recognition that redevelopment rates are not the same across the region, higher in some market subareas than others
Market-based FARs	• Incorporates market expectations into assumptions about the intensity of future development
Capacity ranges	**Rationale**
5- and 20-year capacity forecast	• Recognition of uncertainty in supply and that policies and investments can influence capacity
Analysis by 2040 design types	• Region's strategy is to support development consistent with 2040 Growth Concept focused on centers, corridors and employment/industrial areas • Recognition that 2040 design types have special market affinities that policies and investments can impact • Acknowledges that centers, corridors and other design types are not alike and attract different types of development
Floor-to-area ratios (FARs) (measurement of building intensity)	• FAR densities vary across the region, market subarea and design types • FAR densities vary over time, as the market matures • Proxy for variations in achievable rents between market subareas
Market subareas	• Recognition that labor markets are not the same across the region • Rents and FAR intensity differ by market subarea • Allows decision makers to consider more effective policies and investments tailored to local markets • Acknowledges that different industries may be attracted to different locations across the region

STATE LEGAL REQUIREMENTS

Metro has two responsibilities that relate to economic development and the work cities and counties are required to complete under statewide planning Goal 9. First, although Goal 9 does not apply to Metro, Statewide Planning Goal 14 requires Metro to provide capacity for employment growth for the 20-year period of UGB planning. Second, O.R.S. 195.025 and Statewide Planning Goal 2 require Metro to coordinate planning among cities and counties in the region. Together, these requirements tell Metro it must consult with the 25 cities and three counties about their work under Goal 9, including local Economic Opportunity Analyses (EOAs), [1] as Metro determines the region's need for employment capacity. Metro must consider and try to accommodate the cities' and counties' individual plans for economic development. Ultimately, Metro must reconcile all of the Goal 9 plans in light of Metro's overall analysis of housing and employment capacity needs within the UGB, and Metro must make a decision for the region that is consistent with its own forecast as planning coordinator under O.R.S. 195.025.

Oregon statewide planning goal 14 ("Urbanization")

Goal 14 states:

"Urban growth boundaries shall be established and maintained by cities, counties and regional governments to provide land for urban development needs and to identify and separate urban and urbanizable land from rural land. Establishment and change of urban growth boundaries shall be a cooperative process among cities, counties and, where applicable, regional governments."

"Prior to expanding an urban growth boundary, local governments shall demonstrate that needs cannot reasonably be accommodated on land already inside the urban growth boundary."

Oregon statewide planning goal 9 ("Economic development")

"Comprehensive plans and policies shall contribute to a stable and healthy economy in all regions of the state. Such plans shall be based on inventories of areas suitable for increased economic growth and activity after taking into consideration the health of the current economic base; materials and energy availability and cost; labor market factors; educational and technical training programs; availability of key public facilities; necessary support facilities; current market forces; location relative to markets; availability of renewable and non-renewable resources; availability of land; and pollution control requirements."

[1] *The Economic Opportunities Analysis is a technical study that compares projected demand for land for industrial and other employment uses to the existing supply of such land. The Economic Opportunities Analysis process helps communities implement their local economic development objectives and forms the basis for industrial and other employment development policies in the comprehensive plan. Cities and counties are required to periodically update this analysis to comply with Oregon statewide land use planning goal 9.*

EMPLOYMENT DEMAND

The demand range for employment is a function of global, national and regional economic factors, changing demographics, and overall population growth. The Hovee consultant team performed substantial analyses to support understanding of regional economic and employment trends, their work is summarized here (complete reports may be found in Appendix 11). This section includes a brief description of the information gathered from:

- Focus groups consisting of representatives from a variety of employment sectors
- Literature review
- Expert opinions of economic consultants
- Stakeholder and local jurisdiction comments on the preliminary urban growth report

The economic and employment trends provide the context for the 2030 population and employment forecast and a new demand paradigm for assessing the amount and type of employment the region must plan for in the short- and long-term.

Global risks and opportunities

Consumers are being cautious, companies are laying off employees, and businesses are keeping inventories lean. At the same time, baby boomers are nearing retirement age, distinctions between traditional land uses are blurring, and technology for everything from telecommunications systems, inventory management, and on-line shopping is improving. This sampling of existing and emerging trends will inform decisions about the capacity of the Metro region to meet employment needs and support a strong regional economy.

Financial market instability

The current economic slowdown became undeniable when, after nearly 20 consecutive quarters of rising employment, the State of Oregon posted its first job losses in the 2nd quarter of 2008. More recently (July 2009), Oregon's seasonally adjusted unemployment rate reached 11.9 percent, tied with California as the fourth highest among 50 U.S. states.[2] The region's economy has also slowed as national and global concerns over credit availability and high energy prices have taken hold.

These and other macroeconomic issues represent risks to the regional economy and, with it, regional employment and development patterns. Financial market instability is affecting business and consumer confidence, which will affect businesses' capital spending plans. Though the immediate credit crunch is currently perceived as primarily a short-term issue, the ramifications (i.e. the industrial makeup of the economy) will also play out through the mid-term of the next 10 to 20 years and possibly beyond.

Housing market

While not directly an economic development factor, housing values and credit availability affect household wealth and resulting decisions ranging from consumer purchases to job choices. In recent years, lax lending standards and low interest rates resulted in rampant overleveraging in the mortgage market. The resulting home price declines and mortgage equity withdrawal declines have slowed consumer spending and impacted consumer net worth (including retirement funding).

Oregon is particularly susceptible to a major housing correction in California and the rest of the nation due to dependence on forest products (more so for the rest of the state than the Portland Metro area). Oregon's relative advantage in housing cost is narrowing as prices in California fall faster than in Oregon. Additionally, weak residential building demand has resulted in a loss of construction employment.

[2] *U.S. Bureau of Labor and Statistics*

Fiscal environment

The current fiscal environment is forcing governments to find more cost-effective ways to deliver services and, in many cases, to cut services. On the revenue side, the economic slowdown, tax limitations, and the political challenge of increasing revenue streams are constraining local government revenues, while expenses related to provision of service are growing faster than the tax bases which support them.

Oregon's tax structure, with its initiative reforms of the 1990s (Measures 5 and 50), relies particularly heavily on the personal income tax. This system seemed to work during the high-tech boom and its resulting prosperity, but has proved problematic in the dot-com bust several years ago and appears even less sustainable today. Declining employment and personal income will result in declining tax revenues, and state and local governments will need to cut services and infrastructure investment which will affect business and consumer location decisions.

Global positioning

Key manufacturing sectors of the Pacific Northwest economy are increasingly dependent on international markets – as exemplified by high tech, aerospace and machinery. This dependence presents risks as well as opportunities.

Volatility of the dollar The recent decline of the U.S. dollar has helped the region's economy by making exports more competitive on the international market, while at the same time making imported goods more expensive for consumers. A resurgent dollar will lessen the manufacturing competitive advantage. Longer term, continued instability of exchange rates will increase risk to Portland-area companies dependent on staying globally competitive.

Global pathway cities The Urban Land Institute's (ULI) Emerging Trends in Real Estate 2009 report concludes that U.S. pathway cities "which have become investor favorites and global business magnets, reinforce their premier standings in the looming market correction." The report highlights the coastal cities of Seattle, San Francisco, and Los Angeles along the pacific and New York, Boston, and Washington DC to the east, also noting Chicago, Dallas, and Atlanta as "three key metros in the middle of the country." Portland is situated between what are currently the two top-ranked U.S. gateways of Seattle and San Francisco. However, without clear economic drivers, the ULI report notes that "Portland prospers in Seattle's shadow, but increasingly plays second fiddle." A pivotal question for the future is the extent to which this region should align with its larger neighbors or seek to forge its own distinctive identity, both locally and globally.

China and emerging economies In recent years, the rapid growth of China and India created incredible inflationary pressure, especially on basic commodity prices. While perhaps not sustainable, as exemplified by the current economic downturn, global recovery could mean a return to increased competition for products ranging from steel and cement to food to oil – all with effects on the Portland metropolitan economy. At the same time, increasing incomes in developing nations boost demand for Oregon's exports. Short term, the global economic downturn can be expected to dampen demand for Oregon's manufacturing exports. Longer term, the reality of an increasingly global economy and constrained resources will place increasing emphasis on sustainability as good business practice – and as perhaps a key source of competitive advantage for years to come.

Outsourcing of manufacturing operations and professional services Recently, the availability of advanced telecommunications networks has allowed the outsourcing of certain manufacturing operations and professional and technical jobs to regions of the world with lower labor costs. With the U.S. as a current leader in design and development, the need for rapid turnaround in the

development of new products seems to support domestic labor, but the mid- to long-term impact of globalization remains unclear, especially as other countries move quickly up the education and technology curve.

Going green

Higher energy costs may encourage development of smaller and more dispersed distribution centers. The Portland metropolitan region may be well positioned for this role. The region also has an opportunity to focus on the development of alternative energy sources such as wind and solar power. It will be critical that the region take advantage of this position, as other regions develop expertise to close this gap in the mid- and long-term.

Development Costs

Increased capitalization rates indicate higher levels of property income are needed to support new real estate development. Higher income level requirements make it harder for industrial uses to compete for sites with commercial uses. This is particularly the case in thriving urban centers. Construction material costs are also likely to influence future development patterns. In the short-term, construction materials are likely to become more affordable as commodity prices ease, but they may rise again as the global economy rebounds in the mid-term. This combination of factors places more pressure on finding cost-effective ways of delivering urban development, but may encourage redevelopment and renovation of existing buildings in developed areas.

Demographics

Aging baby boomers, smaller household sizes, and flattened levels of labor force participation have short-, medium-, and long-term implications to the labor market and levels of consumer spending, which will likely outlast the immediate financial situation. According to an analysis by the Oregon Employment Department, Oregon's public-sector workforce has a higher proportion of older workers than the private sector, with about one in five workers in state and local government and education estimated to be 55 or older. Among private industries, the transportation sector has the highest proportion of older workers, with over one-third of the total workforce in transit and ground transportation 55 or older. Other industry sectors with a relatively higher proportion of older workers include other services, natural resources and mining, and health care and social assistance. Industry groups with moderate numbers of older workers include financial activities, professional and business services, wholesale trade, and manufacturing. Industry groups with the lowest proportion of older workers include retail trade; arts, entertainment, and recreation; administrative and waste services; construction; information; and accommodation and food services.

The potential economic and financial burdens posed by an aging retired population are offset, at least in part, to the extent that the U.S. remains attractive and facilitates continued in-migration.

REAL ESTATE OUTLOOK
INDUSTRIAL, OFFICE, RETAIL, INSTITUTIONAL, AND MIXED-USE

Global economic conditions affect regional employment which, in turn, affects industrial, office and retail development patterns in the region.

INDUSTRIAL

Building types and uses

Industrial development includes a broad range of product types and settings:

Warehouse/Distribution buildings generally provide storage and distribution of goods. These require large, flat sites with space for maneuvering trucks and access to transportation. They typically have low employee-to-area ratios so parking requirements are typically small. Some buildings may have 10 to 20 percent of their floor area allotted to office uses. Ceiling heights can be as high as 36 feet to provide for higher stacking, and buildings can be as large as 750,000 to 1 million square feet, though facilities in the Portland metropolitan area are generally less than 250,000 square feet.

Manufacturing buildings are designed to house manufacturing processes and can be more than one million square feet. Like warehouse/distribution space, ceiling heights are high and ample room for truck maneuverability is a necessity. Parking ratios are usually low, so the floor area ratio (FAR) is usually relatively high, despite the single-floor format.

Tech-flex space often consists of one- or two-story buildings ranging from 20,000 to one million square feet with internal space a combination of office and warehouse. Building uses vary, though the tech-flex is usually defined as 50 percent or more office space with the balance as warehouse and/or manufacturing space. This class includes buildings devoted exclusively to research and buildings which serve multiple uses, often with office and administration functions in the front of the building and R&D other high-tech uses in the rear. Offices in R&D buildings typically have open floor plans to promote teamwork and collaboration, and activities range from the creation and development of new technologies and products to the development, testing, and manufacture of products from existing technology. Building design is more important for R&D uses than for other industrial uses and is usually tailored to the needs of specific tenants.

Emerging trends

Employment in manufacturing, distribution, and related sectors drives the market for industrial space. Though job gains are expected in the transportation/warehousing and wholesale trade sectors, the Bureau of Labor Statistics has forecast a loss of over 1.5 million U.S. manufacturing jobs between 2006 and 2016. Some job losses are the natural result of automation as employers substitute capital for labor. But job losses coupled with the turmoil of the financial markets will not bode well for businesses making capital investments. Key trends affecting the Portland region's industrial land uses are described below:

Offshoring As globalization continues, an increasing number of workers likely will be vulnerable to the impacts – both negative and positive – of offshoring and other labor market shifts.

Supply-Chain Management Continued consolidation of corporate America and resulting consolidation of distribution facilities have fueled the trend in supply-chain management such as just-in-time inventory management, direct distributing (shipping goods directly from manufacturers to retailers, or – in some cases – consumers), and electronic inventory control.

Clusters Regional "anchors" – large firms providing both stability and volume of ideas – help to fuel start-ups and support their growth. The capabilities of companies to coordinate will drive the degree of commercial success enjoyed within the region. The clusters currently identified by the Regional Partners for Business[3] include: high tech; metals, machinery and transportation equipment; nursery products; specialty foods and food processing; creative services; sports apparel/recreation-related products; bioscience; sustainable industries; and distribution and logistics.

Future outlook (Portland metropolitan region)

Employment in manufacturing, distribution, and related sectors drives the market for industrial space. Cautious consumers and inventory management practices are driving businesses to keep inventories lean, resulting in weak demand for warehousing/distribution space. However, despite increasing availability, rents are holding steady.

Until the more recent economic slowdown, the U.S. and Portland metropolitan region experienced a somewhat unexpected resurgence in some manufacturing sectors following 9/11. The manufacturing sectors enjoying this renaissance seemed to be technologically sophisticated, niche-oriented, leading edge (for their industry) and market responsive (i.e. with rapid turnaround to changing customer requirements). It is not clear whether this was an anomaly (brought about, for example, by the weak U.S. dollar) or represents a longer term and sustainable path for selectively reinventing our industrial base – as tech-savvy and market-focused.

Short-term (5-year) Though still low relative to other regions, vacancies in the seven-county Portland Metro area are rising – putting downward pressure on rental rates, especially while unemployment rates continue to trend upward. The Portland region has a price advantage over other west coast cities and is priced competitively with other similarly-sized cities inland, making it attractive to companies seeking industrial space with good access and a location with high-quality amenities and attractions for staff. To the extent that the dollar remains comparatively weak over this time period, exports may continue as an important source of stability for the regional economy.

Mid-term (20-year) For the 20-year time horizon, the region's prospects are highly dependent on its current competitive position and decisions by major high-tech and Port-related industries within the Portland metropolitan area relative to other U.S. and global alternatives. The opportunity for the region to attract new growth lies with existing industry clusters. Particular emphasis has been on the recent surge in sustainable and renewable energy. The ability of one company – such as Vestas or SolarWorld – to "anchor" the region's sustainable industry cluster could pave the way for spinoff industries.

Other opportunities include building off the region's other industry groupings, including established and emerging industries such as apparel, metals, high-tech, biosciences, and others. Linkages to Oregon's historic natural-resource activities should also not be overlooked, as these resource-based activities may also shift towards an emphasis on sustainability, such as green forest products, and local and organic agriculture, with a preference to agricultural products from Oregon and Southwest Washington.

Improved supply chain management may make distribution centers more highly-automated activity hubs and less passive warehousing space. Volatility in the energy market and fuel prices may encourage development of second-tier distribution locations, and Portland may be well-positioned to satisfy this role.

[3] *Portland Regional Partners for Business is an organization formed to support employer recruitment and retention in the Portland-Vancouver region.*

OFFICE

Building types and uses

Office development is a highly segmented, diverse, and competitive segment of the development industry. Office buildings are categorized by class, building type, use, ownership, and location.

The three main classes are A, B, and C.

Class A office spaces are investment-grade buildings with top-notch location, design, building systems, amenities, and management. They typically are mid-high rise structures and command the market's highest rents and most credit-worthy tenants.

Class B buildings also have good location, management, and construction with a little functional obsolescence or deterioration. This class is generally found in well-located buildings that have been well maintained.

Class C buildings are typically substantially older and have not been modernized.

The office market can also be also categorized as high- (15 or more stories), mid- (four to 15 stories), or low-rise (one to three stories), and garden office (one to five stories with extensive landscaping). Related building product types (often classified by brokers as industrial space) include R & D (typically one or two stories with up to 50 percent office/dry laboratory space and the workshops, storage, and perhaps some light manufacturing), and tech-flex space (one- or two-story buildings often with a mix of warehouse and light industrial and offices).

Most urban areas classify office space by the location and the physical characteristics of the offices and their typical users. The central business district (CBD) usually contains the largest concentration of major office buildings, though the CBD's share of metropolitan office space is declining in most cities. Typical tenants in downtown offices include law firms, insurance companies, and financial institutions that require high-quality space. Creative firms and software are an increasing part of the tenant mix in some metro areas, including Portland. Suburban areas have experienced office nodes clustering near freeway interchanges or major suburban shopping centers and executive housing areas.

Historically, suburban rents have been lower than those in the CBD and tenants have typically included regional headquarters offices and smaller companies and service organizations, but suburban locations have been attracting more major law firms, accounting firms and some corporate entities from the CBD, with construction quality, range of amenities, and rents increasing correspondingly. Neighborhood offices are typically oriented to serve the needs of local residents by providing space for service and professional business along arterial streets near residential areas. Business parks might include several buildings with a range of uses from light industrial to office and are typically in suburban locations.

Emerging trends

Corporate campuses and office decentralization Though downtowns across the United States are enjoying a renaissance with new sports and cultural facilities, restaurants and entertainment districts, lofts and condominiums, the office market has not experienced the same phenomenon. The past decade has revealed an overall trend toward office decentralization – albeit with Central City cores also still experiencing strong office occupancies – and the development of suburban corporate campuses.

Office space "hoteling" Improved technology and cost-cutting pressure is leading more companies to consider telecommuting and other strategies to reduce expenditures on office space. Companies are able to operate with less space by not assigning workers specific offices, but sharing them as needed.

Education systems In choosing a location, businesses look for strong education systems that produce an educated workforce, a user friendly development and regulatory bureaucracy, affordable workforce housing, and proximity to desirable amenities, including executive housing and recreational opportunities for employees.

Ownership in small businesses Small business ownership may continue to rise due to a variety of factors, including low interest rates, the conversion of leasable property to for-sale units motivated by high vacancy rates, the availability of below-market loans from the U.S. Small Business Administration, retirement planning for small business owners, the tax benefits of property ownership, increasing numbers of professional women working part-time while caring for children, all of which might also point to opportunities for condominium- office development.

Live-work space Following the trend to save time and commuting costs, the prevalence of live-work space seems to be increasing. An Urban Land Institute study indicated that local governments are attracted to the home-office model because it allows for higher levels of energy efficiency and potential for increased tax revenue.

Offices serving non-local markets Traded-sector corporate headquarters, research and development, and back-office functions can readily move if the company perceives advantages to one location over another. Over the past two decades much of this corporate activity has gravitated to suburban office park locations.

Offices serving local markets Non-traded-sector office uses are more captive to the local community. This segment is generally comprised of law firms, Certified Public Accountants (CPAs), medical office, financial institutions, insurance providers, real estate professionals, architectural/ engineering firms and others that serve the local business and consumer base of a particular region. As with retail commercial, much of this segment is driven by population growth and general economic conditions in the region.

Future outlook (Portland metropolitan region)

Prospects for the office market are generally tied to financial, technical, and professional services sector employment. The hit to the financial sector directly affects commercial real estate markets serving global financial markets (most particularly New York and London), as job losses and other cost-cutting measures force employers to re-evaluate their space needs. A steady increase in vacancy rates is putting downward pressure on rents, which will result in less short-term development activity.

Compared to other metropolitan areas, the Portland region was still faring well as of the third quarter of 2008. As in many other metro areas of the U.S., central city office product appears to be holding its own better than suburban office product. This phenomenon reflects some back-to-the-city movement that is also being echoed in housing markets across the nation – driven, in part, by the appeal of urban amenities and efforts to reduce the cost of commuting.

Short-term (5-year) With relatively lower vacancy rates than comparable metro areas, the Portland region is expected to perform better than the national average. Even with uncertain economic conditions, building is continuing with over 1.3 million square feet under construction in the CBD, including Portland's Pearl District. However, with increasing vacancies, a slowing of development is expected. The duration of the slowdown depends on the extent of the global financial-sector consolidation now in process and statewide employment stagnation. Unlike many metro areas, there currently appears to be some opportunity for Central City (downtown plus Lloyd and Pearl) to recapture market share with more diverse products, attractive lease rates (in down market), increased transit premium, and LEED certifications. The greatest challenges are for much of the suburban market, including business/tech-flex parks with substantial office tenancies.

Mid-term (20-year) The mid-term future of the office market remains highly uncertain. The labor market – already growing slowly – is expected to further decelerate as baby boomers retire. An additional challenge is the Portland metropolitan region's perceived lack of "global pathway" status, though increasing energy costs may represent an opportunity for the region even as a second-tier center. There are continued opportunities to build on the region's appeal to young creatives and an entrepreneurial strengthening of business, tech-related and creative service sectors. Best opportunities are for transit-rich, higher density and increasingly urban locales marketed for green development. Portland's position as a leader in sustainable and renewable energy in industry and manufacturing may be expanded to include professional services. With high numbers of LEED-accredited professionals currently in the marketplace, there may be opportunity for spinoff firms and other specialized professional services.

RETAIL

Building types and uses

Retail developments are typically categorized by the commercial real estate brokerage and development communities based on market served and tenant characteristics.

Convenience and neighborhood centers Provide convenience (food, drugs, and sundries) and personal services (laundry and dry cleaning, barbershop, etc.) for the needs for the immediate neighborhood. These centers are usually anchored by a supermarket or drug store, and contain up to 100,000 square feet of leasable area. The site is usually 3 to 10 acres in size and typically serves a population of between 3,000 and 40,000 people.

Community centers Provide many of the convenience and personal services by neighborhood center with a wider array of soft lines (apparel) and hard lines (hardware and appliances). Most of these centers are anchored by a junior department store or variety store in addition to a grocery store and ranges in size from 100,000 to 500,000 square feet. The site area is usually 10 to 30 acres and typically serves a population of between 40,000 and 150,000 people.

Regional and super regional centers Provide the general merchandise, apparel, furniture, and home furnishings in depth and variety as well as a range of service and recreational facilities. Typically built around two or more full-service department stores (50,000 square feet each), they typically contain between 500,000 to 1 million square feet or more. The site area required ranges from 10 to 100 acres or more and serves a population of 150,000 to 300,000 or more. In addition, there are several variations of the major types of shopping centers, including Power Centers, Lifestyle Centers, and Downtown or Urban (Street) Retailing. Specialization of shopping centers started in the 1970s, though the trend accelerated through the 1990s.

Emerging trends

Some of the trends involve variations of the major types of shopping centers. Specialization of shopping centers started in the 1970s, though the trend accelerated through the 1990s.

Power centers The power center is a specialized type of super community center which emerged in the 1980s. It usually contains at least four category-specific anchors of 20,000 square feet or more. They tend to be narrowly focused but deeply merchandised "category killers" together with the more broadly merchandised price-oriented warehouse clubs and discount department stores. Anchors in a power center typically occupy 85 percent or more of the total leasable space.

Power towns Further boosting the strength of power centers is the addition of amenities and square footage. This new genre, sometimes referred to as a "power town" may contain 600,000 to 1

million square feet or more and feature expanded components beyond big-box retail anchors, such as lifestyle wings, mix of uses such as residential or office, or a entertainment or hospitality element.

Lifestyle centers Lifestyle centers are another specialized type of super community center. The International Council of Shopping Centers (ICSC) defines a lifestyle center: a location near affluent residential neighborhoods, an upscale orientation, 150,000 to 500,000 square feet of gross leasable area (GLA), an open-air format, and at least 50,000 square feet of national specialty chain stores. The success of these centers, including the region's BridgePort Village, appears to correspond with a downtown renaissance, with the lifestyle center emulating a man-made "town square."

Hybrid centers Hybrid centers provide both big-boxes and in-line boutiques. A pioneer of this combination of power and lifestyle is Developers Diversified with the 1999 Phase 1 opening of Riverdale Village in Coon Rapids (Minneapolis), MN, which featured a Costco, Best Buy, and a Main Street with small shops in an 875,000-square-foot open-air center which includes a man-made lake and pavilion for outdoor events.

Downtown or urban retailing While the postwar suburban shopping centers grew, downtown retailing declined. The late 1970s and early 1980s saw the introduction of festival marketplaces in a few cities, such as the Faneuil Hall Marketplace in Boston, Harborplace in Baltimore, and South Street Seaport in New York. Regional shopping centers were built in a few downtown locations. These new-generation centers form anchors within the downtown retail environment and encourage spillover of retail growth throughout the surrounding neighborhood.

Urban street retail is more difficult to track on a consistent basis as commercial brokerage firms do not typically include independent stand-alone retailers outside of larger shopping centers such as NW 23rd Avenue or SE Hawthorne Street. This type of "Main Street" retail is sometimes configured as neotraditional developments, with ground floor retail and residential and office uses on the upper floors.

Vertical stacking of tenants Retailers are being challenged to adapt successful suburban retail formulas to fit urban spaces, leading to the vertical stacking of tenants. In addition to being more expensive to build than a conventional horizontal center, these projects need to draw shoppers from floor to floor and create the visual connections that allow circulation. There are numerous examples of vertically stacked retail, including Pioneer Place in downtown Portland.

Transportation-integrated retailing Following the restoration of Union Station in Washington DC in the late 1980s demonstrated the potential for shopping centers in major transit stations. The restoration of Grand Central Terminal in New York has created the opportunity for high-end specialty shopping to serve commuters, tourists, and office workers in the Midtown area. Transit-oriented development along light-rail stations is Portland's answer to this type of transportation-integrated retailing. As ridership continues to increase, station areas can expect to become increasingly visible and desirable retail locations.

Online shopping The popularity of on-line shopping has raised questions for bricks-and-mortar stores. According to Forrester Research, more than half of U.S. households regularly shop on the Web, but online purchases still make up only seven percent of total retail sales. The increased integration between on-line and in-person shopping will heighten the demand for integrated transportation networks.

Future outlook

Short-term (5-year) With relatively less square footage of retail space than other comparable metropolitan areas, the Portland metropolitan region should outperform the national average. However, the current economic downturn will certainly affect this region with increasing retail

vacancies, the likely exit of national retailers from the market, and dramatically slowed retail development (especially in outer suburban areas). Overall, the best investment opportunities are expected to be with major regional centers and grocery-anchored neighborhood centers, while older strip centers will face challenges and likely higher vacancy rates as the economic downturn results in a flight to quality. New developments will continue to employ the more population and lower-cost open-air format, in contrast to the former enclosed mall format. There may be an increase in on-line purchases, particularly for smaller, more ubiquitous products.

Mid-term (20-year) As the economy recovers, development will be renewed but at a slower pace with the aging of the prime baby-boomer market. As a result, there may be increased emphasis on redevelopment or reuse of dated centers. Increasing consumer desire for open-air formats and limited real estate for new lifestyle developments may benefit urban street retail with mixed use, possibly including scaled-back infill grocery concepts. Transit-oriented development is likely to benefit from increased ridership. More vertical stacking of retail is also likely. As distribution becomes more centralized and automated, it will become increasingly dependent on public investments in transportation infrastructure.

There is opportunity for retailers with both websites and brick-and-mortar stores to respond to web-savvy consumers with well-integrated, multichannel operating strategies. Some retailers may invest in their web presence not only to sell merchandise directly, but to position their site as a research tool to increase sales at their stores.

INSTITUTIONAL

Building types and uses

There is comparatively little national literature on institutional building types and uses. More than any other employment related real estate product type, institutional users such as medical centers and universities tend to respond more to unique considerations associated with project funding and market demand. Medical office buildings are often developed on the campuses of existing hospitals, but can also be stand-alone buildings in downtowns or even suburban environments. Many universities have embarked on large-scale redevelopment projects, often in partnership with real estate development firms. These university-related projects are frequently extensive mixed-use developments that will serve both daily and visiting populations.

Emerging trends

Demographics As the population continues to age, health-care institutions will continue to flourish. From 2005 to 2020, the under-65 population is expected to grow by nine percent, while the 65-and-over population is expected to grow by 50 percent. Inner-city school districts – which have faced declining enrollment for years – are now seeing their student populations stabilize and may even experience a bit of recovery in coming years. Though these declines are largely offset by gains in suburban school districts (for example, the Beaverton School District has been experienced gains which roughly offset losses in the Portland Public Schools), the flattening of the region's population pyramid is resulting in impacts on institutional planning as students move through the K-12 system to higher education or workforce training programs.

Private redevelopment partnerships Universities can work in partnership with businesses that support both university development and economic development. These neighborhoods will allow students to attend class, then walk next door to apply their learning in related workplaces. The Silicon Valley example shows that adjacency and integration can have synergistic qualities.

Unconventional Sites At a time when universities are running out of room to expand on their

existing campuses, some are thinking beyond their ivy-covered walls and finding ways to use unconventional sites to their advantage. In the process, they are helping to revitalize neighborhoods and creating synergies with other uses. Locally, University of Oregon's Portland satellite campus in the White Stag block of Old Town is an institutional example benefiting the urban area's revitalization efforts. And Oregon Health and Science University's (OHSU) development of South Waterfront allowed much needed expansion, despite severe land-capacity constraints.

Future outlook

Short-term (5-year) Though the prospects are good for increased need for health care and education, the economic downturn will likely provide challenges of constrained funding for education, Medicare/Medicaid reimbursements, and public and nonprofit agencies. In the short term, there could be an emphasis on planning for mid-term development, and the opportunity to accommodate adults returning to school.

Mid-term (20-year) In the mid-term, substantially increased health care demand is anticipated with aging of baby boomers. There may be challenges posed by increased funding uncertainties for Medicare and Medicaid (pending substantial health care reform). Medical office buildings – traditionally located on hospital campuses – will likely need to expand to more stand-alone locations proximate to growing populations. Educational facilities may also be likely to increasingly focus development on satellite campuses, closer to the populations they serve. Workforce training programs will also need to be distributed with population. A South Portland expansion and strengthened linkage of OHSU/PSU campus development is anticipated. Inmate population and capacity of correctional institutions will need to be revisited.

MIXED-USE

Building types and uses

Suburban office/housing/retail The transformation of suburban business districts from poorly linked, auto-dependent, segregated-use projects into well-connected, pedestrian-friendly, mixed-use environments is a development trend gaining momentum in urban areas nationwide, with plans for suburban office parks transitioning to mixed-use developments, sometimes with nearly equal parts of office space, housing, and retail. Because the building form and layout of suburban business districts have an independence and separation not found in downtown business districts, they can prove a major challenge to public transit, which is sometimes unable to serve lower density and fragmented development in a cost-effective manner.

Retail/medical office As described in the office and institutional sections of this report, health care services were historically provided on hospital campuses, but began to move into freestanding medical office buildings. Some medical uses are now moving into retail settings, combing medical office use with neighborhood retail uses.

Redevelopment of obsolete public buildings Obsolete facilities of all kinds can result in newly available parcels of prime land. These facilities might include public uses such as decommissioned military bases, surplus school sites, and hospitals closed due to demographic shifts or private uses, such as industrial sites and buildings intended for development which never occurred. The resulting sites, proximate to transportation infrastructure, are often ideal candidates for redevelopment.

Emerging trends

Mixed-use design has advanced from the traditional main street approach – with residential above retail space – to a diverse mix of property types, users, and strategies to create true urban environments. A key challenge with mixed use will be to successfully address potential conflicts between different uses.

Future outlook

Short-term (5-year) It is likely that there will be a slowdown in mixed use (beyond existing projects and those in the works) due to overall economic contraction, greater financial challenges with urban density projects, and lender caution with what is often viewed as more challenging mixed use project finance. These difficulties may be offset, at least in part, by public-private development programs (as with urban renewal where available).

Mid-term (20-year) In the mid-term, our region has a major rebound opportunity as core urban markets solidify advantages over car-dependent outer ring alternatives. Substantially increased market share depends on extension of mixed use beyond the Central City, as with station area development and streetcar extension, and greater diversity of mixed use application, e.g. work-live, office/retail condos, and use diversification of ground floor space beyond retail. Provision of health-care services will likely become increasingly specialized and geographically segmented as the bulk of baby-boomers reach retirement age.

Focus group analysis

Metro, in cooperation with the business community, hired Adam Davis of Davis, Hibbits & Midgehall to facilitate focus groups to obtain business and industry perspectives on emerging trends in building space needs and changing regional competitive advantage.

The following eight focus groups were conducted:

- Biotech/medical
- Distribution/logistics
- Food/beverage
- High tech
- Metals/machinery
- Business locators
- Regional services
- Retail

Focus group participants were asked about trends that they anticipated over the next 20 years.

Anticipated building and space usage trends

- Rapid industrial change is likely as land and building space become increasingly expensive
- Hi-cube distribution is on the horizon for mid-to-large firms
- Manufacturing will undergo a transformation as companies of all sizes invest in technology
- There will be a diversity of office needs, but with common themes of more collaboration, space-sharing and conferencing
- There will be a retail shift to smaller store concepts, especially grocery in the near-term

Anticipated location/site trends

- Regional competition for industrial sites , extending at least from Woodland to Salem
- For sites of 20+ acres, an increasing need to look outside the metro region
- Distribution centers will continue to require freeway access
- Clustering will occur for competitive advantage – exemplified by clusters including high-tech, metals and professional services
- Access to the labor force will be a growing driver of facility siting
- Customer / client businesses will seek proximity to population centers
- Little eagerness for brownfield redevelopment due to liability issues
- Greater impetus for businesses to say in the same site footprint – to mitigate neighborhood and cost issues

Other anticipated trends

- Transit is now important across all business types, especially for employees
- Transit-oriented development (TOD) is of interest , but is a source of frustration for at least some commercial/industrial firms in this region
- Auto orientation still critical for customer and patient access, but with recognition that auto reliance varies widely across the region. Parking is needed, but is seen as a major cost.
- Work force accessibility is a critical concern. Attracting young talent is easier due to this region's quality of life draw.
- "Going green" is of broad interest , especially when supported by customers, clients, workers and/or investors

Opportunities to use land more efficiently (per focus group participants)

- Multi-story development works best for office / administrative functions
- Mixed opinions on retail suitability for two-plus stories, but agreement that it is most likely at higher value and urban or constrained sites
- Manufacturing typically holding at one to two floors with more floors possible for admin / R&D functions
- Multi-level economics are not workable for distribution yet (despite some global experience) – but hi-cube distribution accomplishes similar results of reduced land footprint
- There is a great impetus for more and more efficient building on site, adaptive reuse, and multi-level parking on constrained sites
- Continued strong and growing interest in sites offering transit accessibility together with opportunities for improved site efficiency (less land can be devoted to parking where supported by project economics and other transportation modes)

RANGE 20-YEAR EMPLOYMENT FORECAST

A primary factor that influences future employment need is population growth. The findings of Metro's current 5- and 20-year employment forecasts are summarized in this urban growth report. In recognition of the uncertainty surrounding future conditions, the forecast is expressed as a range. The full forecast is included in Appendix 12.

Forecast results

Some of the basic variables that inform this forecast are birth, death and immigration rates and anticipated economic conditions. The regional economy is increasingly subject to global and national forces that are beyond the region's influence and are not easily quantifiable through standard economic tools. Economic globalization affects the flow of trade, foreign exchange rates, and the cost and availability of foreign and domestic skilled and unskilled labor. Employment growth in the region continues to reflect the region's status as one of the nation's more desirable metropolitan areas. (**See Figure 1 and Table 2**) This forecast does not address specific firm decisions to locate to this region or relocate outside the seven-county area, but in the aggregate the long-term forecast should capture these individual firm choices.

Figure 1: 2030 employment range forecast Portland, Beaverton, Vancouver, OR-WA PMSA[4]
Source: Metro, U.S. Bureau of Labor Statistics, 2009

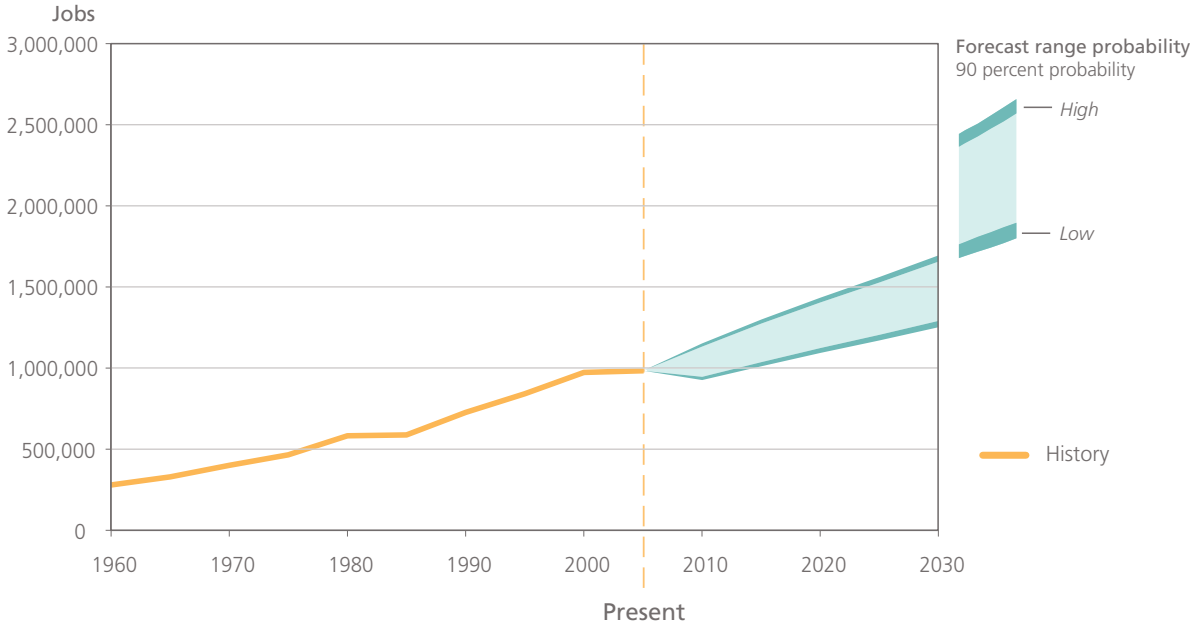


Table 2: Employment range forecast and annual percentage rate (APR) change from year 2000: Portland, Beaverton, Vancouver, OR-WA PMSA
Source: Metro, 2009

Year	Low end of range	High end of range
2000	973,230	973,230
2030	1,252,200 0.84% APR	1,695,300 1.87% APR

[4] *The regional geography for the Portland-Beaverton-Vancouver OR-WA Primary Metropolitan Statistical Area (PMSA), as defined by the federal Office of Management and Budget, now comprises a total of seven counties (Clackamas, Multnomah, Washington, Clark, Columbia, Skamania and Yamhill) – consistent with changes to federal data reporting standards. (See Map 1) PMSA delineations are revised periodically in order to reflect actual changes in the economic structure of regions as they grow and expand.*

Figure 2 depicts the cumulative employment change for the seven-county area, starting in 1980. However, employment growth rates are forecasted for a number of sectors, which are grouped here for simplicity. The growth rates vary by sector, rather than consistently across all employment. Manufacturing job growth is anticipated to be slower than job growth in the service and government sectors, consistent with expected U.S. macroeconomic trends. Though there are forecasted job gains in the manufacturing sector even at the low end of the forecast range, a slower growth rate manifests itself in the 20-year timeframe, resulting in fewer new manufacturing jobs than in the five-year timeframe. Sector level details are important for this urban growth report analysis since square footage requirements for industrial, commercial and institutional users vary widely.

Figure 2: Cumulative employment change in 5-year increments, 1980-2030 (7-county statistical area
Source: Metro, U.S. Bureau of Labor Statistics, 2009

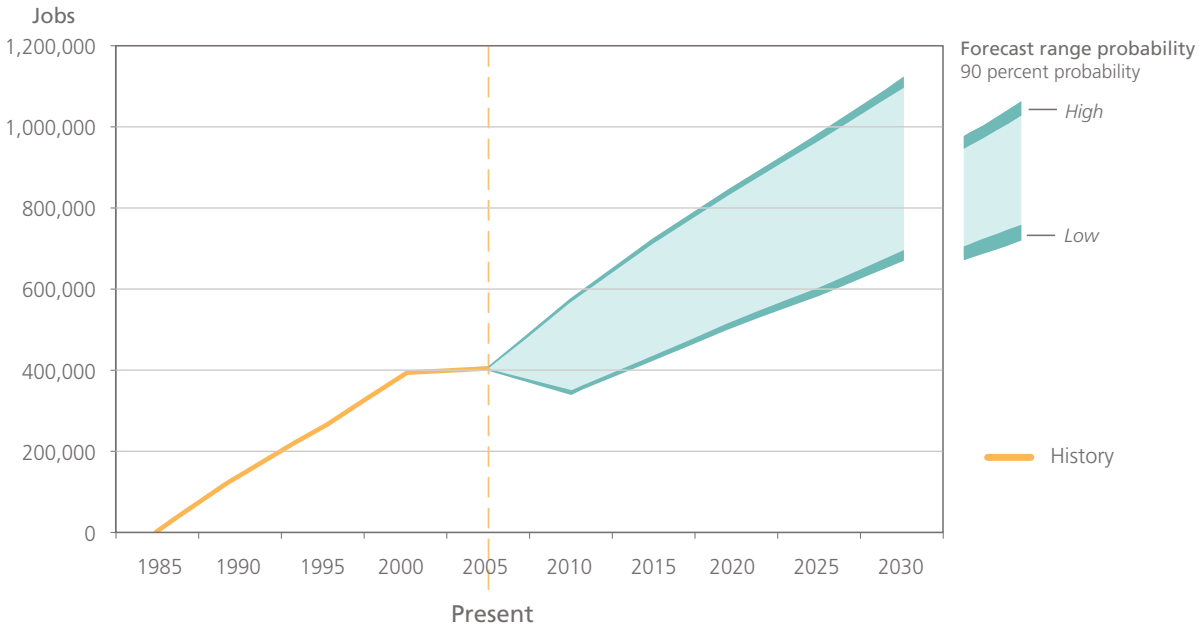
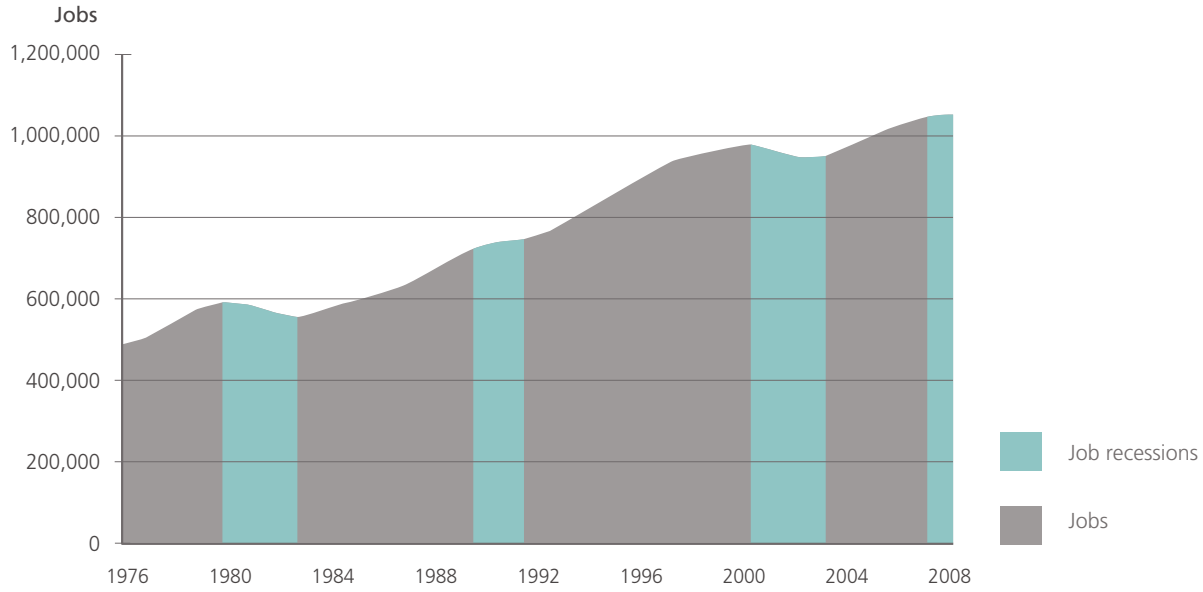


Table 3: Regional employment change, 5 and 20 year forecast by sector
Source: Metro, 2009

	5-year				20-year			
	Low forecast	% Total jobs	High forecast	% Total jobs	Low forecast	% Total jobs	High forecast	% Total jobs
Manufacturing	2,700	3.2%	11,900	8.1%	2,400	0.7%	25,400	4.7%
Non-manufacturing	80,100	94.2%	131,500	89.5%	295,300	90.6%	484,000	89.2%
Government	2,200	2.6%	3,600	2.4%	28,300	8.7%	33,500	6.2%
Total	85,000	100.0%	147,000	100.0%	326,000	100.0%	542,900	100.0%

The region has experienced three periods of job stagnation or decline since the since the 1980's. (**See Figure 3** that shows recessions) Today, the region again faces uncertain economic times.

Figure 3: Annual nonfarm wage and salary payroll employment, 7-county statistical area
Source: U.S. Bureau of Labor Statistics, 2009



The short-term forecast anticipates additional job losses in 2009, and small job gains in 2010, with anemic growth for several years. Service sectors are likely to improve more rapidly. (**See Figures 4-6** showing 7-county employment history and short term forecast)

Figure 4: Total nonfarm wage and salary employment, 7-county statistical area
Source: Metro, U.S. Bureau of Labor Statistics, 2009

Figure 5: Total manufacturing employment, 7-county statistical area
Source: Metro, U.S. Bureau of Labor Statistics, 2009

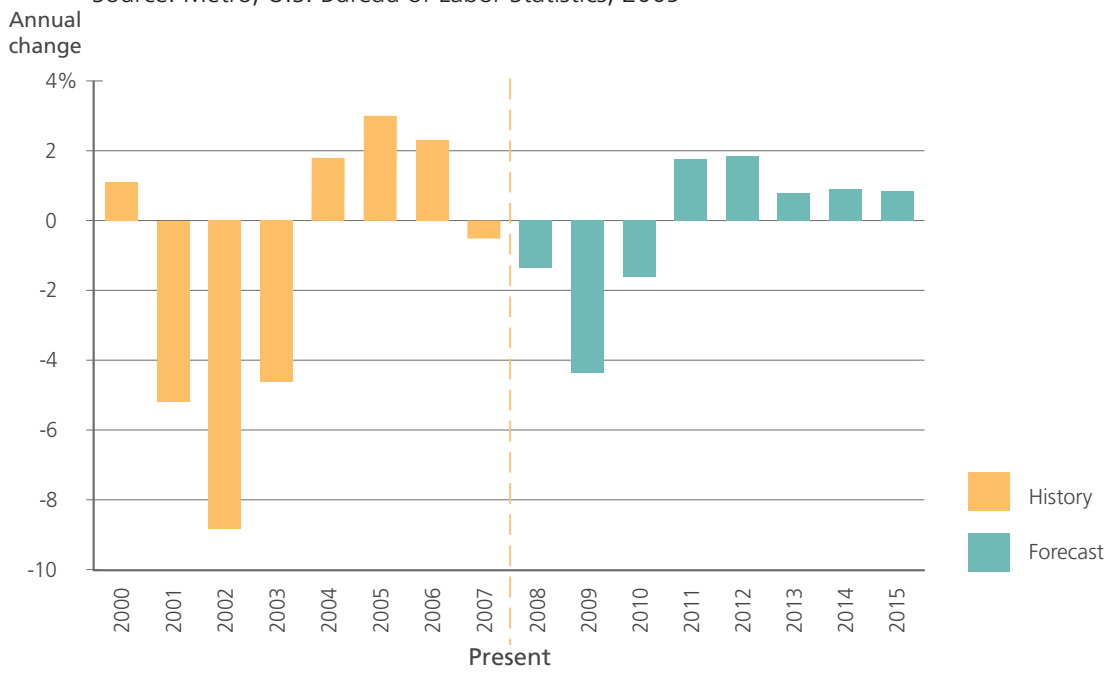
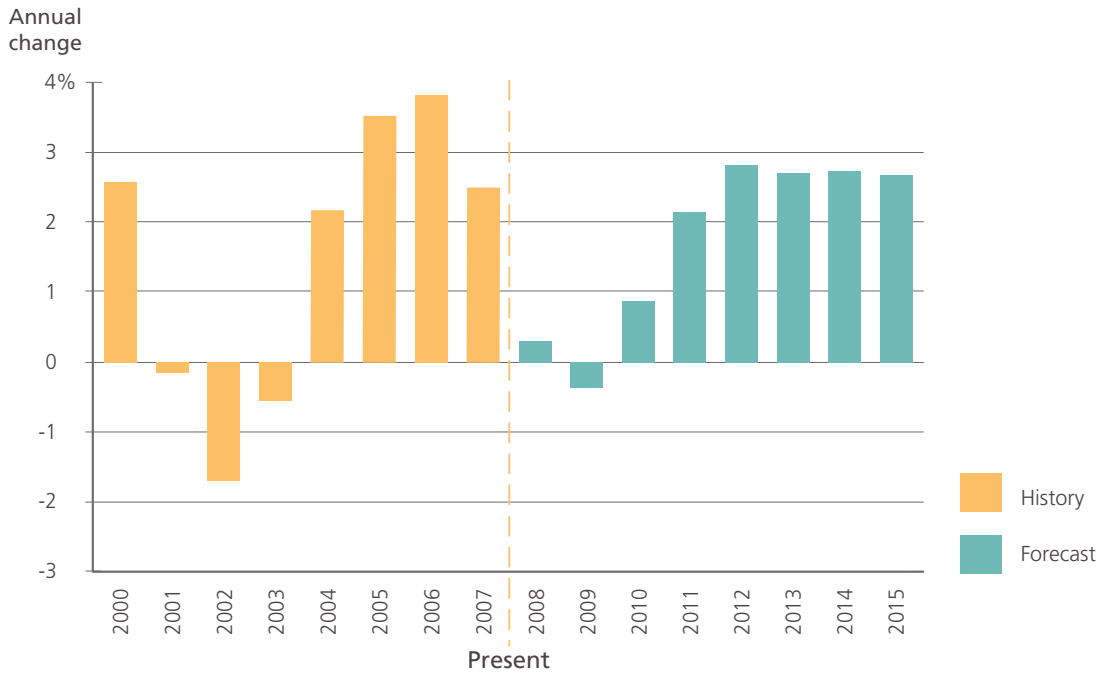
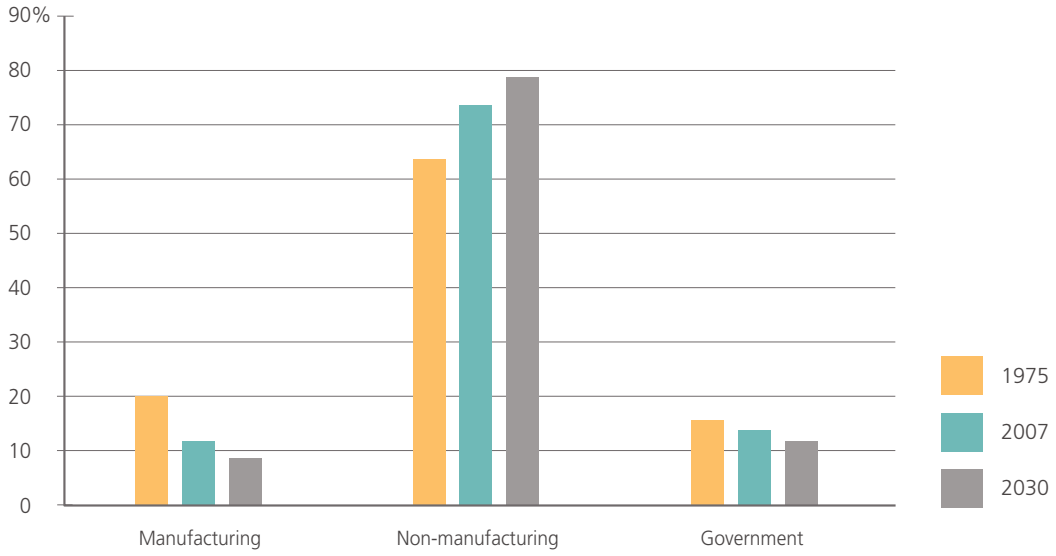


Figure 6: Total non-manufacturing employment, 7-county statistical area
Source: Metro, U.S. Bureau of Labor Statistics, 2009



Over the long-term (20 years), employment trends show a shift in job concentrations from traditional manufacturing towards more non-manufacturing employment. (**See Figure 7** employment distribution for three employment sectors 1975, 2007, and 2030) Despite this shift in job concentrations, even in recent years, industrial land consumption has held steady at about 300-500 net acres per year. Technological changes allowing for more automation allow companies to use fewer employees in the same amount of space.

Figure 7: Employment distribution 1975, 2007, 2030, 7-county statistical area
Source: Metro, U.S. Bureau of Labor Statistics, 2009



Factors that might contribute to a high or low forecast

Our region is not immune to the recession and other recent economic distress. In the short term, it is expected that job growth will slow in our region and drop into negative growth. Employment sectors that tend to be most sensitive to downturns in business cycles include construction, manufacturing and professional business services. However, by the year 2020, growth is expected to have returned to average long-term trend (compared to older forecasts).

High forecast

- The Portland region's economic base includes a proportionally higher than average share of jobs in the manufacturing sector with strong high-tech representation, which could bounce back quicker than the rest of the country.
- The Portland region's cost of living and cost of doing business stays lower than other metropolitan regions on the west coast, attracting more growth.
- The Portland region and the Pacific Northwest remain attractive to the creative class.
- Green industries expand aggressively.

Low forecast

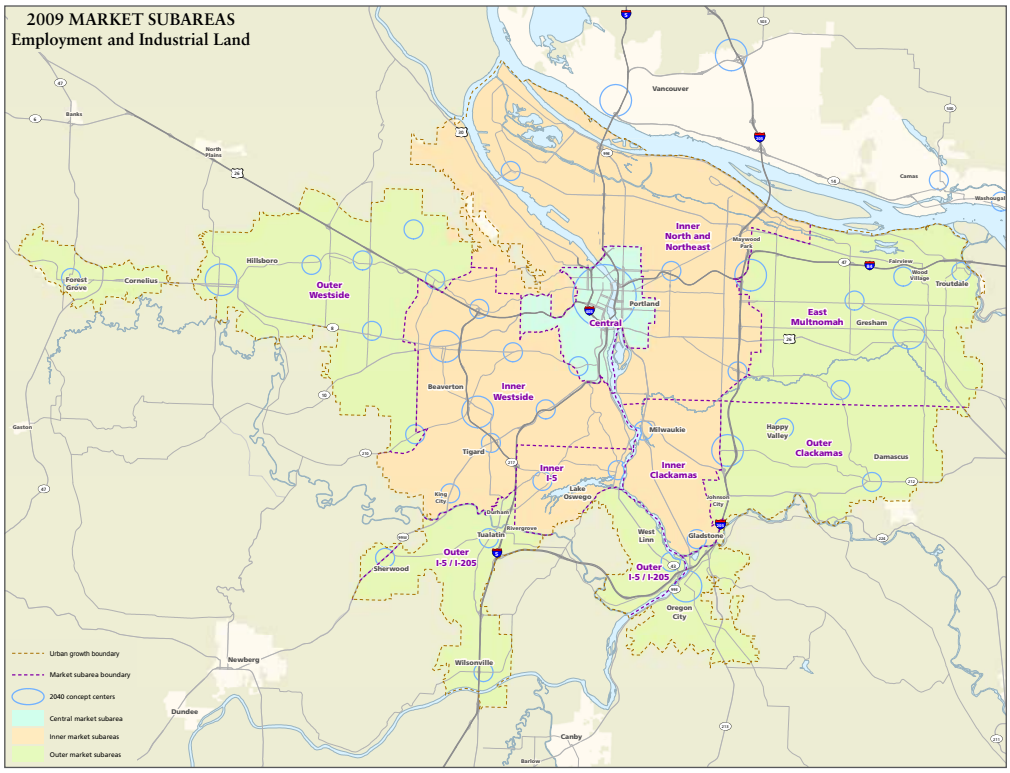
- The current recession continues for an extended period and both the Portland region and the entire state emerge slower than the rest of the country.
- International immigration slows and regional in-migration drops off sharply.
- Lack of a major research university dampens investment from firms requiring high tech and creative class workforce.
- Insufficient resources to invest in the infrastructure needed to support growth.

These factors make it impossible to forecast employment growth with absolute certainty. When choosing which point on the forecast range to plan for, regional leaders should consider the risks and opportunities of planning for higher or lower growth rates. For instance, if plans assume low growth and high growth is realized, there is a risk that employment growth may be lost to other cities, but there is also an opportunity to focus investments on centers and corridors, rather than UGB expansion areas. On the other hand, if plans assume high growth and low growth is realized, there is a risk that excessive urban growth boundary expansions may be made, resulting in price pressure on surrounding agricultural lands, but there is also an opportunity to continue the region's focus on centers and corridors, thereby improving existing communities and positioning the region to reduce greenhouse gas emissions.

Narrowing the forecast to the Metro urban growth boundary

The employment forecast begins with the seven-county statistical area, and then must be narrowed to the area within the Metro urban growth boundary. The first step in the new demand paradigm is to recognize that there are market subareas within the Portland metropolitan region. These market subareas attract different components of the forecasted employment growth. The market subareas are shown in **Map 3**.

Map 3: 2009 market subareas, employment and industrial analysis
Source: Metro, E.D. Hovee and Company, LLC, 2009



Capture rate

An employment capture rate is applied to the 7-county range forecast in order to estimate what share of projected job growth is anticipated to locate within the Metro urban growth boundary between 2010 and 2030. This rate measures the proportion of employment growth (or change) that is to be expected in the Metro urban growth boundary. This rate may be expected to change somewhat depending upon regional (and macroeconomic) economic growth assumptions, land supply assumptions, and regulatory assumptions. Capture rates tend to rise and fall relative to changes to the phase of the regional business cycles.

In analyzing the high growth economic scenario, the employment capture rate for 2010 to 2030 is projected to be 73 percent for the Metro urban growth boundary (relative to the 7-county PMSA job growth) and a 75 percent capture rate is projected in the low growth scenario. (**See Table 4**) Based on this methodology, the region must plan for between 1.0 and 1.3 million total jobs by 2030.

Table 4: Projected industry sector UGB capture rates under two growth scenarios: 2005-2030
Source: MetroScope UGR scenarios, 911 and 912, 2009

Sector	Low Growth	High Growth
Construction	142%	67%
Manufacturing	52%	62%
Wholesale	77%	71%
Retail	63%	62%
Transportation, Warehousing & Utilities	84%	82%
Information	44%	64%
Finance	81%	81%
Real Estate	81%	81%
Professional Services	82%	82%
Management	82%	82%
Admin, Waste	78%	75%
Education	79%	79%
Health & Social Services	79%	79%
Arts, Entertain, Rec	78%	75%
Accomm & Food Service	63%	62%
Other Services	78%	75%
Government	61%	62%
Ag, Mining	86%	82%
Metro UGB Total:	**75%**	**73%**

Note: The construction sector exceeds 100 percent because of projected region-wide job losses in construction employment in the low growth scenario and retrenchment of remaining construction jobs into the Metro UGB.

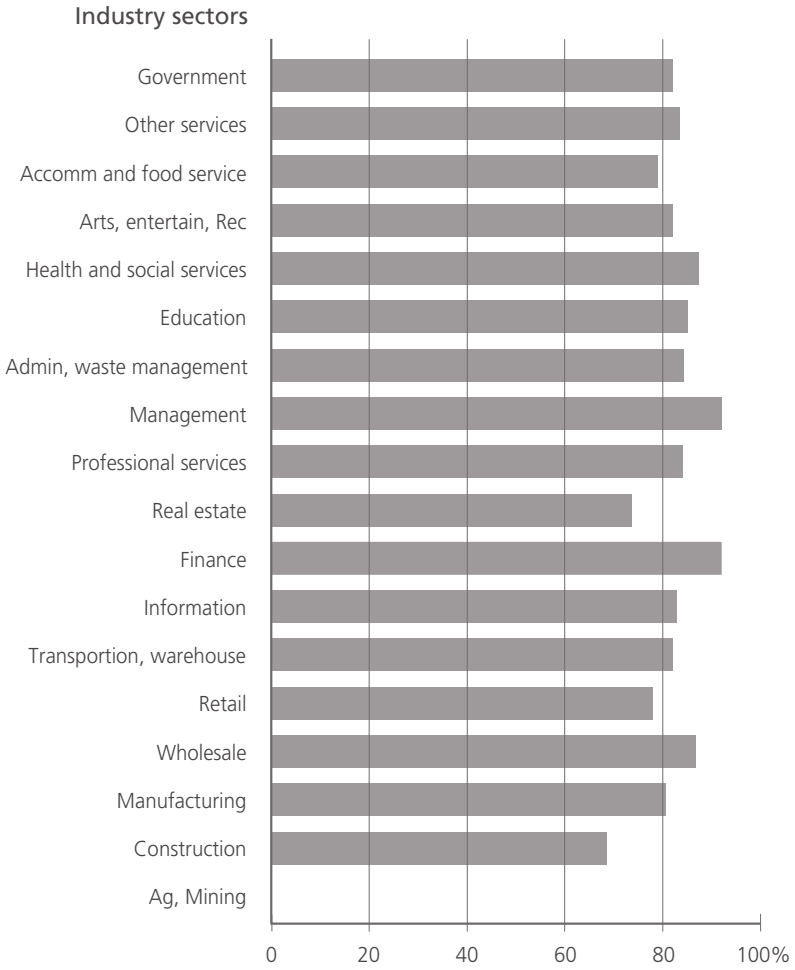
Due to changes in federal employment codes (SIC to NAICS), industry-level capture rates are unavailable. However, historical observed rates for total employment for the Metro UGB are shown in **Table 5.**

Table 5: Historic 20-year urban growth boundary capture rates for total employment Portland, Beaverton, Vancouver PMSA,
Source: Metro, 2009

1980 to 2000	1981 to 2001	1982 to 2002	1983 to 2003	1984 to 2004	1985 to 2005	1986 to 2006	1987 to 2007
83%	84%	86%	87%	85%	81%	80%	NA

The assumptions used in this urban growth report are based on an analysis of the industry sector shares in 2006 (**see Figure 8**) within the urban growth boundary and its proportional share to the 7-county PMSA.

Figure 8: Share of 7-county statistical area jobs that are in the Metro urban growth boundary, by industry sector in 2006
Source: Derived from employment security data and Bureau of Labor Statistics (note: the Metro urban growth boundary share is 82 percent).



Industry cluster forecasts (within the Metro UGB)

Many recent economic development efforts in this region and others have referred to the concept of economic clusters as an organizing principle. Consequently, several stakeholders and representatives of local governments requested that the concept of clusters be addressed in this urban growth report.

Definitions of clusters abound, but the most accepted definition is offered by Michael Porter, who is often identified as the originator of the concept:

> *"A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities. The geographic scope of clusters ranges from a region, a state, or even a single city to span nearby or neighboring countries… The geographic scope of a cluster relates to the distance over which informational, transactional, incentive, and other efficiencies occur." (Porter, 2000)*

Frequently-cited examples of clusters include information technology in California's Silicon Valley, biopharmaceuticals in the Research Triangle in North Carolina, the garment district in New York City, insurance in Hartford, Connecticut, analytical instruments in Oregon, and the winemaking in northern and central California. Porter (2000) states that, in order for the concept of a cluster to be useful, it must not be defined too broadly (e.g. "manufacturing, services, consumer goods, or high tech") or narrowly equating a cluster with a single industry.

The concept of a cluster makes intuitive sense, but it is also a concept that has its share of detractors and has been criticized for being too vague to be of use for analytical purposes. Since it can be a vague concept, some writers (Martin & Sunley, 2002) suggest that it be used carefully within a policy context. With that caution in mind, this analysis presents the employment forecast for five of our region's commonly recognized clusters, but does not extrapolate the forecast into a demand for capacity (specific limitations of a cluster approach to a forecast are described later in this document).

Cluster definitions

The Portland metropolitan region does not have an agreed upon economic development strategy, nor has Metro been asked to formulate one. Several efforts are currently underway to develop a coordinated approach to supporting economic development in the region, including work by the Regional Partners, Greenlight Greater Portland, and the Oregon Business Development Department (also known as "Business Oregon") supporting local governments in the region. With that caveat, this analysis uses the Portland Development Commission's (PDC) list of five existing clusters[5]:

- Active wear and outdoor gear
- Advanced manufacturing
- Bioscience
- Cleantech
- Software

Other cluster definitions could be used for this analysis. Some stakeholders suggested that the National Science Foundation's (NSF) 2006 high tech industry definition be used. Like all definitions, the NSF definition of high tech has limitations. For instance, the NSF definition of high tech does not include NAICS code 2211 (electric power generation, transmission, and distribution), the NAICS code of SolarWorld, one of the region's businesses that most would regard as being high tech.

[5] *PDC's list of clusters for the Portland metropolitan region is consistent with other analyses, including Greenlight Greater Portland and the Oregon Economic and Community Development Department.*

Though it also has limitations, this analysis uses the PDC's definition of the above clusters. Those definitions are given below and include the North American Industry Classification System (NAICS) codes that PDC has associated with each cluster.

Existing cluster employer locations

As shown in **Table 6**, the geographic distribution of existing (year 2006) cluster employment (cluster firms identified by PDC) throughout the region varies from one cluster to another.[6] Employment in the Activewear cluster is concentrated in the Inner ring with much smaller proportions of employment located in the Central and Outer areas. Advanced Manufacturing and Bioscience are concentrated in the Outer ring with some employment in the Inner ring and very little in the Central area of the city. By contrast, the Central City has the highest proportion of Cleantech employment with dimishing Cleantech proportions located in the Inner and Outer rings. Software employment is fairly evenly distrbuted among the three areas.

Table 6: Distribution of existing (year 2006) cluster employment in the Portland metropolitan region by market subarea
Source: 2006 ES202 data

Cluster	Central	Inner	Outer	In Metro UGB
Activewear	12.1%	71.4%	14.5%	98.0%
Advanced Manufacturing	1.6%	36.7%	59.7%	98.1%
Bioscience	14.0%	31.8%	52.9%	98.7%
Cleantech	44.4%	35.3%	17.2%	97.0%
Software	33.1%	33.6%	32.3%	99.1%

Limitations of a cluster approach to the forecast

Data from the economic research firm IHS Global Insight form the basis for the region's employment forecast. Since the Global Insight data use NAICS codes, this cluster forecast is limited to NAICS codes. However, NAICS codes present some challenges for identifying the industry or cluster with which to associate an individual firm. This is because NAICS codes are self-reported and necessarily are a simplification of actual business activities. As Porter (Porter, 2000) states, "cluster boundaries rarely conform to standard industrial classification systems."

This issue is illustrated quite clearly by an examination of the examples of cluster employers provided by PDC. At least one third of the example companies listed by the PDC do not identify themselves under any of the NAICS codes that PDC lists as defining the cluster. Many of these firms are identified with NAICS code 551114 (Corporate, Subsidiary and Regional Managing Offices). Though the forecast does not predict the growth of individual firms, historic employment data, by NAICS code, are used as a starting point for the cluster forecast. More details about the use of historic employment data in this analysis are included in Appendix 3.

The cluster forecast is a subset of the overall employment forecast; it organizes the data in a way that supports local jurisdiction planning for economic development. The cluster forecast is simply a re-aggregation of a portion of the NAICS-based job forecast into the five clusters. The overall employment forecast does not change based on this cluster analysis.

[6] *These market subareas are defined above in the section entitled "Narrowing the forecast to the Metro UGB".*

Cluster forecast methods

To partially alleviate the mismatch between NAICS codes and clusters, this analysis includes the PDC example companies that identified themselves under NAICS code 551114 (Corporate, Subsidiary and Regional Managing Offices), despite the fact that this NAICS code does not appear in the PDC cluster definitions. However, example companies that identified themselves under other codes that are not listed in PDC's cluster definitions were not included. This exclusion was necessary to create a consistent approach. Companies that are listed as NAICS code 551114, but that are not listed by the PDC as cluster examples, were also not included in this analysis (including all of them would make cluster definitions even more unclear). The resulting cluster employment data for the year 2006 is shown in **Table 7**.

Table 7: Cluster employment for the year 2006 for the three-county region
Source: 2006 ES202 data

Cluster	Number of firms	Number of employees
Activewear	542	10,361
Advanced Manufacturing	1,116	64,917
Bioscience	376	5,754
Cleantech	704	9,593
Software	1,478	14,803
Total	**4,216**	**105,428**

In 2006, employment in these five clusters represented about 13 percent of total employment in the 3-county area.

Full documentation of the methods used to arrive at a cluster forecast is included in Appendix 3.

Cluster forecast results

Cluster forecast results are for jobs in the Metro UGB, and are shown in **Tables 8 and 9**.

Table 8: High growth cluster employment forecast for UGB by cluster (thousands of employees)
Source: Metro, 2009

Cluster	2006	2010	2015	2020	2025	2030
Activewear	10.4	11.0	12.4	13.0	14.2	15.3
Adv Mfg	64.9	72.0	78.7	74.4	76.7	78.9
Bioscience	5.8	7.1	8.1	8.4	9.1	9.8
Cleantech	9.6	11.8	13.9	14.8	16.4	18.0
Software	14.8	18.9	22.3	23.8	26.8	29.9
All Clusters	105.4	120.9	135.4	134.4	143.1	152.0
Cluster share of all employment	13%	13%	13%	12%	11%	11%

Table 9: Low growth cluster employment forecast by cluster (thousands of employees)
Source: Metro, 2009

Cluster	2006	2010	2015	2020	2025	2030
Activewear	10.4	9.2	10.2	10.8	11.7	12.5
Adv Mfg	64.9	49.4	51.1	48.0	48.1	48.2
Bioscience	5.8	5.6	6.2	6.5	7.0	7.5
Cleantech	9.6	9.0	10.1	10.7	11.7	12.9
Software	14.8	14.1	15.5	16.3	18.1	20.1
All Clusters	105.4	87.4	93.1	92.3	96.6	101.3
Cluster share of all employment	13%	11%	11%	10%	10%	10%

Total cluster employment is forecasted to decrease at the low end of the forecast range and increase at the high end of the forecast range. At both the high and low ends of the range, cluster employment is forecasted to comprise a smaller share of total employment in the Metro UGB than it did in 2006.

Figure 9: Projected cluster employment by cluster through 2030 (high and low growth forecasts)
Source: Metro, 2009

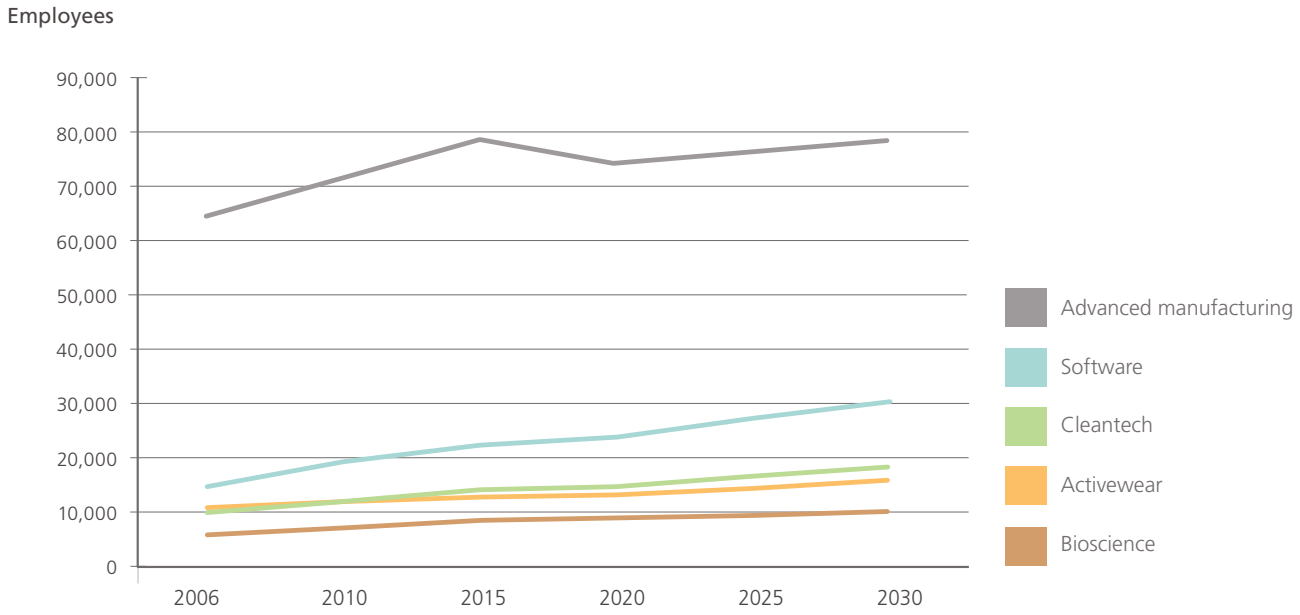
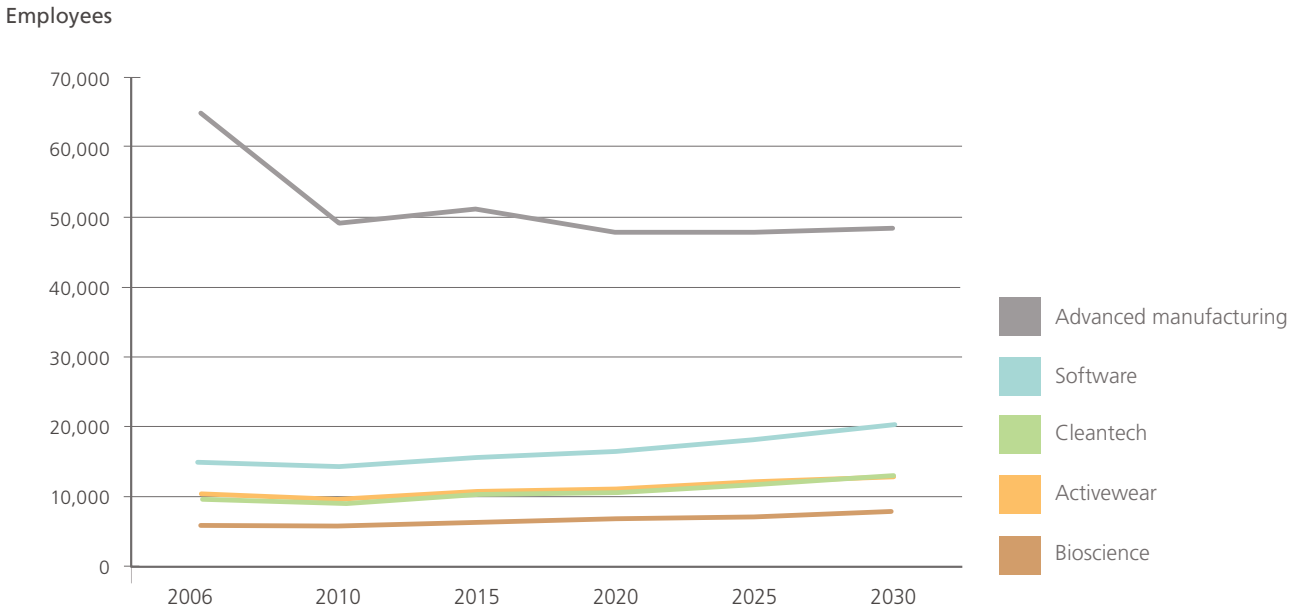


Figure 10: Projected cluster employment by cluster through 2030 (low growth forecast)
Source: Metro, 2009



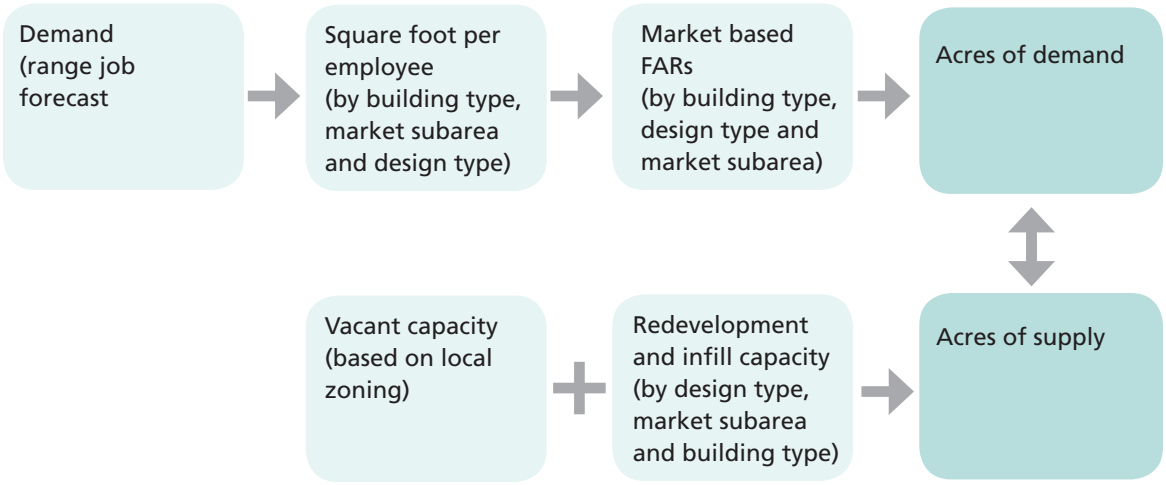
Under the high growth forecast, all five of the identified clusters would realize growth in employment by the year 2030. Under the low growth forecast, the Advanced Manufacturing cluster is forecasted to suffer the most of the five clusters, with no recovery to 2010 employment levels by the year 2030. Under the low forecast, growth in the remaining four clusters is expected to occur, but at a slower rate than under the high growth forecast.

Due to the limitations associated with cluster definitions, the cluster concept is not taken any further beyond a cluster employment forecast. For the remainder of this employment analysis, the standard 2010 – 2030 forecast for all sectors is used.

Employment forecast range to building square footage and acreage demand

One of the innovations of this analysis is to consider employment demand and supply in terms of the buildings that accommodate jobs, in addition to the land. This allows policy makers to discuss both the employment demand and the building form that shapes the way communities look and feel for residents and employees. In order to compare with the region's acreage capacity, the employment forecast (numbers of jobs by sector) is converted to building square footage demand and then uses employee space needs and market-driven building forms by market subarea to assess acreage demands. This is then compared to a capacity estimate that is also expressed in acres as illustrated in **Figure 11**.

Figure 11: illustration of the UGR analysis methodology
Source: Metro, 2009



The first step is to assign jobs to six building types, based on recent trends and professional expertise. The six building types used for purposes of the design paradigm are: office, institution, flex, general industrial, warehouse, and retail. Assumptions as to the building type in which jobs are located could change over time as the real estate market matures, land prices increase, and technology shifts. **Table 10** shows how jobs are assigned to building types.

Table 10: Job sectors and building types
Source: E.D. Hovee and Company, LLC, 2009

	Office	Institution	Flex / Bus. Park	Gen Industrial	Warehouse	Retail
Ag, Mining	0%	0%	0%	0%	0%	0%
Construction	14%	0%	18%	40%	18%	10%
Manufacturing	8%	0%	24%	60%	8%	0%
Wholesale	8%	0%	22%	20%	40%	10%
Retail	5%	1%	6%	0%	12%	76%
Transportation, Warehouse & Utilities	15%	0%	12%	13%	55%	5%
Information	25%	0%	25%	40%	0%	10%
Finance	72%	1%	5%	1%	1%	20%
Real Estate	72%	1%	5%	1%	1%	20%
Professional Services	72%	1%	5%	1%	1%	20%
Management	79%	5%	8%	0%	0%	8%
Admin, Waste	72%	1%	5%	1%	1%	20%
Education	30%	53%	5%	1%	1%	10%
Health & Social Services	30%	53%	2%	0%	0%	15%
Arts, Entertain, Rec	35%	0%	10%	0%	0%	55%
Accomm & Food Service	20%	1%	7%	1%	1%	70%
Other Services	72%	1%	5%	1%	1%	20%
Government	43%	35%	5%	1%	1%	15%

Once jobs have been assigned to building types, they are converted to building square foot demand estimates using assumptions based on data analysis and professional expertise on the amount of building square feet needed for an employee in each of the six building types. [7] (See **Table 11**) These assumptions could change over time based on industry changes and policy and investment choices and other trends. [8]

[7] *Metro has worked with professional economists and local planners to gather best available data on the mployee per square foot usage by building type in different locations around the region. However, this is an area that would benefit from future data gathering and analysis.*

[8] *The square feet per employee ratios for the 2010 to 2015 timeframe reflect current regional averages. Though the employment demand model would allow for variation of these assumptions in the 2015 to 2030 timeframe, this analysis does not assume any changes in square feet per employee. There is presently insufficient evidence to ratchet these assumptions higher or lower for the long-term period. Experts have mixed opinions on the subject—it is unclear whether technological improvements will result in more efficient use of space or in fewer employees for the same amount of production (which would increase the number of square feet per employee).*

Table 11: Building square feet demand per employee by building type, market ring, and time period

Sources: E.D. Hovee, Metro 1999 Employment Density Study, City of Portland, Regional Industrial Land Study, CREEC representatives, Hillsboro and MetroScope Reference Scenarios.

CENTRAL AREA	2010-2015	2015-2030
General Industrial	925	925
Warehousing/ Distributing	800	800
Tech / Flex	600	600
Office	350	350
Retail	475	475
Institutional	600	600
INNER RING	**2010-2015**	**2015-2030**
General Industrial	800	800
Warehousing/ Distributing	1,250	1,250
Tech / Flex	625	625
Office	375	375
Retail	500	500
Institutional	625	625
OUTER RING	**2010-2015**	**2015-2030**
General Industrial	600	600
Warehousing/ Distributing	1,850	1,850
Tech / Flex	990	990
Office	375	375
Retail	550	550
Institutional	650	650

NOTES

Employment densities are based on a number of studies, research and review comments from experts and professionals.

Densities for the central subarea were synchronized with the Portland / Hovee employment land demand model.

Densities in the inner ring were averaged between the preliminary figures and the Portland / Hovee model to reflect overlap of Portland city areas and non-Portland areas

Densities for the outer ring were left unchanged from the preliminary UGR except for FLEX / Tech category. Data provided by Hillsboro indicated alternative density values for this product type.

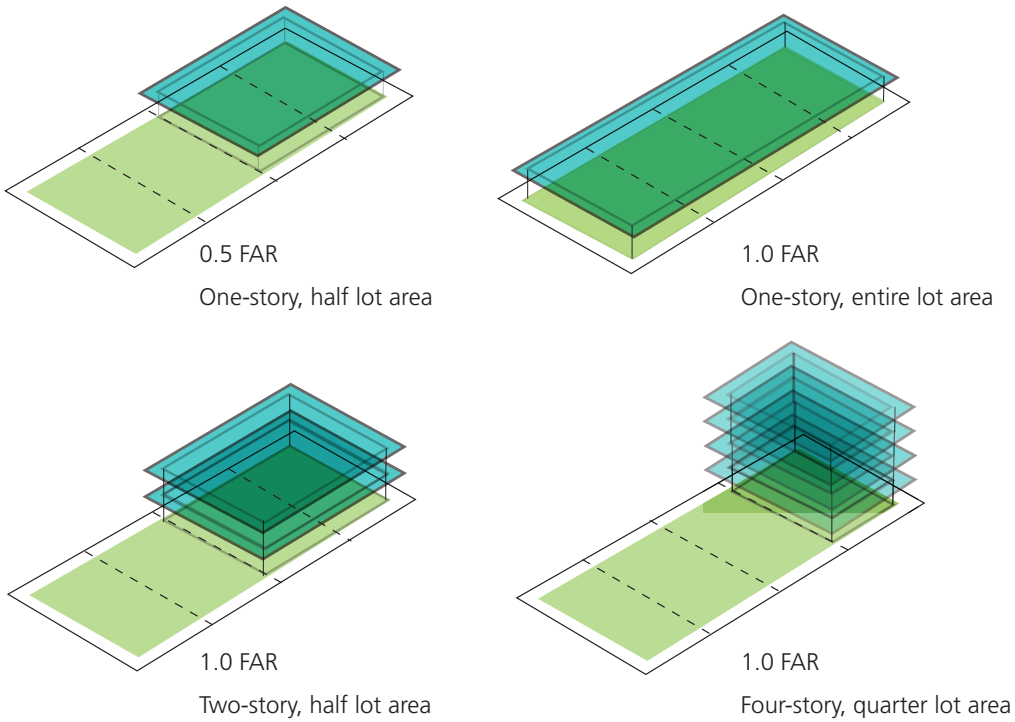
Building square feet to acres

To translate building square feet demand into acreage demand requires an intermediate step that considers floor area ratios (FARs). Two types of FARs are used in this analysis, supply-side FARs and demand-side FARs. Supply-side FARs reflect current zoning, but because zoning for employment uses rarely stipulates a maximum FAR, supply-side FARs are tempered by market realities. Supply-side FARs are inputs to the demand model and are set at levels that will not limit the potential results of the model. In this case, the model outputs are demand-side FARs that forecast a market response to zoned capacity. Market subareas and design types that show no or very limited employment demand in the model result in very small or null FAR values.

Intensity of development or floor area ratios

Floor area ratios (FARs) allow for an assessment of the intensity of development on a parcel of land. An FAR of 0.5 indicates that the total building square feet is equal to half of the land area of the parcel it is on (for example, a single story building with 50 percent lot coverage) as shown in **Figure 12**. An FAR above this often indicates a multi-story building with some form of structured parking or fewer parking spots, as the portion of a lot not covered by the building is typically required for on-site parking, landscaping and setbacks.

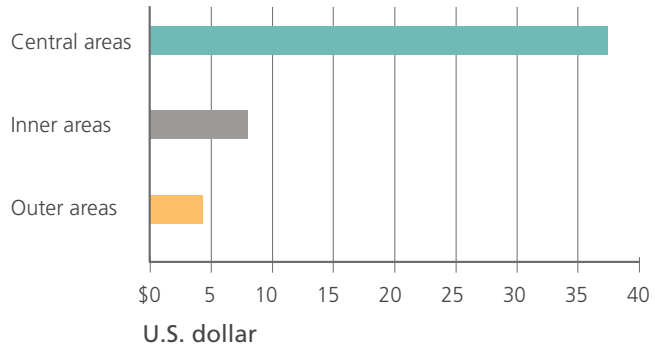
Figure 12: Illustration of floor area ratio (FAR)
Source: Metro, 2009



FARs are not consistent across the region. Buildings with higher FARs have been built in the central market subarea and the region's centers and corridors. FARs vary based on the real estate product type which can be distributed to zoning classification. For example, a multi-story-style "office" building may be built in any of the zoning classes but is most likely to occur in commercial, mixed-use, or public facility zones. There is a smaller likelihood that the same building may be built in industrial zones. Building type and form also evolve over time, with more intensive land use occurring when the market allows for higher achievable rents.

Higher density of development (or FAR) can occur as land becomes more valuable, requiring more efficient use of space including multi-level development, lower parking ratios with greater use of transit and shift to structured parking[9] (See **Figure 13**). Higher density of employment is also expected to the extent that an increasing share of regional employment takes place with service and office-related functions compared with traditional manufacturing or distribution space. As noted elsewhere in this report, supporting office functions are becoming more common in industrial areas.

Figure 13: Effective assessed land value per square foot of vacant land
Source: FCS Group, 2009



Demand-side, supply-side and effective FARs

Any transition in density of employment should be expected to occur over time, and to the extent supported by market trends globally as well regionally. The experience of the last several years demonstrates that increasing development intensity is more readily experienced with urban 2040 design types and commercial corridors. The transition will prove more challenging with industrial lands, requiring on-going dialogue both with end users and land use planners to understand best management practices and effects on regional competitiveness. This analysis recognizes variations by market subarea, 2040 design type and zoning, as well as varying the expected achievable FAR over time.

[9] *The FAR threshold where structured parking becomes more necessary appears to occur at around .45 to .60 FAR. Retail establishments that require high customer throughput tend towards lower FAR thresholds or structured parking than do office uses. At about $20,000 per parking stall, the need for structured parking can add substantial cost to a development project.*

Supply side FARs The FAR assumptions shown in **Table 12** are derived from local zoning ordinances and represents the maximum regulatory capacity. These FARs were utilized in the preliminary UGR to estimate both the industrial and commercial building square foot capacity from vacant buildable land. Applying these FAR values to the buildable land inventory (vetted by consultants and reviewed in part by local governments) resulted in a set of building supply estimates for industrial and commercial building space capacity. Using the regulatory or supply-side FAR values allowed for an estimate of the regulatory capacity of the buildable land to accommodate a variety of industrial and commercial building formats and types. Conversion from acres of supply to building density capacity estimates allowed policymakers to compare how regulations and not just vacant land can be utilized to accommodate realized and potential capacity demand in the future.

However, a shortcoming of using supply-side or regulatory FAR values is that many zoning ordinances are well ahead of building densities that the market can feasibly build in the next 5 to 20 years. In some instances, the FAR values were unrealistic given prevailing and expected market conditions. As a result, this revised employment analysis employs expected market-based FAR projections. This approach provides less potential capacity than the regulatory FARs but is more reflective of market conditions. These demand-side or market-based FAR values have been vetted with local governments and a variety of trade and business organizations as well as by the Hovee consultant team. The demand-side FARs are also consistent with MetroScope scenario results reflecting current policies and trends.

Table 12: Supply-side floor-to-area ratios by market subarea, 2040 design type and zone class, short/long-term by regional zoning classification
Source: FCS Group, 2009

	MUR	CC	CG/CN	CO	MUE/EMP	IL	IH/RSIA
Central market subarea							
Centers/corridors	5.0 / 7.0	4.0 / 6.0			5.0 / 7.0	0.5 / 1.0	0.5 / 1.0
Other design type	5.0 / 7.0	4.0 / 6.0			5.0 / 7.0	0.5 / 1.0	0.5 / 1.0
Inner market subareas							
Centers/corridors	0.75 / 1.0	1.0 / 2.0	0.5 / 0.7	0.75 / 1.1	0.4 / 0.4	0.3 / 0.3	0.3 / 0.3
Other design type	0.35 / 0.6	0.75 / 1.1	0.4 / 0.6	0.65 / 1.0	0.4 / 0.5	0.3 / 0.3	0.3 / 0.3
Outer market subareas							
Centers/corridors	0.35 / 0.6	0.75 / 1.1	0.4 / 0.36	0.65 / 1.0	0.5 / 0.5	0.3 / 0.3	0.3 / 0.3
Other design type	0.3 / 0.35	0.3 / 0.35	0.3 / 0.35	0.3 / 0.35	0.35 / 0.35	0.25 / 0.3	0.25 / 0.3

Note: Supply-side FAR assumptions in most instances exceed today's market-based (demand-side) FAR assumptions. Zoning regulations have been found to be ahead of the market and thus provide plenty of regulatory "head room" to allow additional density and growth to be accommodated in the near term as well as long-run time frame. These FARs describe an average of maximum zoning densities permitted by local zoning codes.

Look up table for zone and use descriptions.

MUR	Mixed Use Commercial and Residential: FAR varies by location.
CC	Central Commercial: allows a full range of commercial typically associated with CBD's and downtowns. More restrictive than general commercial in the case of large lot and highway-oriented uses. Encourages higher FAR uses including multi-story development.
CG	General Commercial: larger scale commercial districts, often with a more regional orientation for providing goods and services. Businesses offering a wider variety of goods and services (including large format retailers) are permitted in this district and include mid-rise office buildings, and highway and strip commercial zones.
CN	Neighborhood Commercial: small-scale commercial districts permitting retail and serice activities such as grocery stores and neighborhood service establishments that support the local residential community. Floor space and/or lot sizes are usually limited to between 5,000 to 10,000 square feet.
CO	Office Commercial: districts accommodating a range of low-rise offices; supports various community business establishments, professional and medical offices; typically as a buffer between residential areas and more intensive commercial districts.
MUE	Multiple use employment: an employment district that accommodates a broad range of users including offices, retail stores, warehouse distribution, and light industrial including manufacturing, fabrication, and assembly.
IL	Light Industrial: districts permit warehousing and distribution facilities, light manufacturing, processing, fabrication or assembly. May allow limited commercial activities such as retail and service functions that support the businesses and workers in the district.
IH/RSIA	Heavy Industrial: districts permit light industrial and intensive industrial activity such as bottling, chemical processing, heavy manufacturing and similar uses with noxious externalities.
EMP	Employment: designation under Title 4 of Metro's Urban Growth Management Functional Plan
PUB	Public facilities

Demand-side FARs The demand FAR values are used in this analysis to convert building demand square footages into acreage demand estimates, and are shown in **Tables 13-16**. In the preliminary UGR, the building square footage demand estimates were derived from a Metro UGB employment forecast by industry sector and grouped into six building types. The building type employment forecasts (which have high and low employment growth range values) were matched to regional average square feet per employee (SFE) density assumptions (see **Table 11**). This revised approach incorporates the demand-side FAR assumptions to generate capacity demand estimates in acres of land.

This analysis uses short and long-term expected FAR densities. In the short-term the FAR densities match up with prevailing market conditions. The analysis assumes that during the next five years (2010-15), the market will not likely see a dramatic increase in FAR densities. Therefore, the FAR values in the near term reflect typical upper-end (though not the highest value range) of densities by subarea, design type and building type. Where realistic, the analysis includes a slight increase for current FAR densities. In the long-run, the expectation is that, due to a variety of regulatory and market-response mechanisms, FAR densities will increase by 10 percent for non-industrial employment, with less of an increase for industrial employment.

The demand side FAR assumptions in this model are meant to illustrate the densities that would be market feasible if there was sufficient demand and there is available inventory (vacant buildable and refill) to accommodate additional growth and development. These assumptions were reviewed by local governments, stakeholder groups and the Hovee consultant team. The demand FARs shown in the following tables are input assumptions to the model. These FARs are arrayed by building type, time period, subarea, and by 2040 design type. With these variables, there are over 800 different FAR values used in the demand model.

Effective FARs The model includes possible demand-side FAR assumptions for every conceivable type of development by building type, design type and subarea. However, if the modeling result assumes that relatively less development or no development will occur in any specified combination of building type, design type and subarea, then the overall effective FAR rate will differ from the assumption. The effective FAR is therefore the weighted average of the assumed FARs by building type, design type and subarea. The weights for calculating the effective FAR value are based on projected gross building square footage (before redevelopment and infill are subtracted from land demand). Thus the region's overall FAR density is a combination of the demand-side FAR values weighted by development square footage demand estimates derived from the model.

The effective FAR densities by building type are shown in **Tables 17 and 18** by building type and subarea for the near and long-term. The building demand square footages are also shown to document the weights used to compute the effective FAR values.

Table 13: Demand side FARs (2010-15 – short run assumptions), Manufacturing/industrial
Source: E.D. Hovee and Company, LLC and Metro, 2009*

INDUSTRIAL BUILDINGS	Central	Corridors	Regional center	Town center	RSIA	Industrial	Employment	Other
Central	1.00	0.50	-	0.60	0.50	0.50	0.50	0.50
Inner Westside	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Inner North & East	1.00	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner Clackamas	-	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner I-5	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Outer Westside	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
East Mult Co	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
Outer Clackamas	-	-	-	0.50	0.25	0.25	0.25	0.25
Outer I-5/205	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
WAREHOUSE DISTRIBUTION BUILDINGS	**Central**	**Corridors**	**Regional center**	**Town center**	**RSIA**	**Industrial**	**Employment**	**Other**
Central	1.00	0.50	-	0.60	0.50	0.50	0.50	0.50
Inner Westside	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Inner North & East	1.00	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner Clackamas	-	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner I-5	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Outer Westside	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
East Mult Co	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
Outer Clackamas	-	-	-	0.50	0.25	0.25	0.25	0.25
Outer I-5/205	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
FLEX BUILDINGS	**Central**	**Corridors**	**Regional center**	**Town center**	**RSIA**	**Industrial**	**Employment**	**Other**
Central	1.00	0.50	-	0.60	0.50	0.50	0.50	0.50
Inner Westside	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Inner North & East	1.00	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner Clackamas	-	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner I-5	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Outer Westside	-	0.25	0.50	0.50	0.25	0.25	0.25	0.25
East Mult Co	-	0.25	0.50	0.50	0.25	0.25	0.25	0.25
Outer Clackamas	-	-	-	0.50	0.25	0.25	0.25	0.25
Outer I-5/205	-	0.25	0.50	0.50	0.25	0.25	0.25	0.25

** Metro's revisions are based upon input from CREEC, ICSC and Hillsboro.*

Table 14: Demand side FARs (2010-15 – short run assumptions), Commercial/non-Industrial
Source: E.D. Hovee and Company, LLC and Metro, 2009*

OFFICE BUILDINGS	Central	Corridors	Regional center	Town center	RSIA	Industrial	Employment	Other
Central	6.00	1.50	-	1.00	1.00	1.00	1.00	1.00
Inner Westside	-	0.50	1.50	0.60	-	0.50	0.50	0.50
Inner North & East	4.00	0.50	1.50	1.00	0.30	0.50	0.50	0.50
Inner Clackamas	-	0.50	1.00	0.60	0.30	0.50	0.50	0.50
Inner I-5	-	0.50	1.50	0.60	-	0.50	0.50	0.50
Outer Westside	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35
East Mult Co	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35
Outer Clackamas	-	-	-	0.60	0.35	0.35	0.35	0.35
Outer I-5/205	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35

RETAIL BUILDINGS	Central	Corridors	Regional center	Town center	RSIA	Industrial	Employment	Other
Central	1.00	0.50	-	0.60	0.50	0.50	0.50	0.50
Inner Westside	-	0.30	0.40	0.35	-	0.35	0.30	0.35
Inner North & East	1.00	0.30	0.40	0.35	0.30	0.35	0.30	0.35
Inner Clackamas	-	0.30	0.40	0.35	0.30	0.35	0.30	0.35
Inner I-5	-	0.30	0.40	0.35	-	0.35	0.30	0.35
Outer Westside	-	0.27	0.35	0.30	0.30	0.30	0.27	0.30
East Mult Co	-	0.27	0.35	0.30	0.30	0.30	0.27	0.30
Outer Clackamas	-	-	-	0.30	0.30	0.30	0.27	0.30
Outer I-5/205	-	0.27	0.35	0.30	0.30	0.30	0.27	0.30

INSTITUTIONAL BUILDINGS	Central	Corridors	Regional center	Town center	RSIA	Industrial	Employment	Other
Central	6.00	1.50	-	1.00	1.00	1.00	1.00	1.00
Inner Westside	-	0.50	1.50	0.60	-	0.50	0.50	0.50
Inner North & East	4.00	0.50	1.50	1.00	0.30	0.50	0.50	0.50
Inner Clackamas	-	0.50	1.00	0.60	0.30	0.50	0.50	0.50
Inner I-5	-	0.50	1.50	0.60	-	0.50	0.50	0.50
Outer Westside	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35
East Mult Co	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35
Outer Clackamas	-	-	-	0.60	0.35	0.35	0.35	0.35
Outer I-5/205	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35

** Metro's revisions are based upon input from CREEC, ICSC and Hillsboro.*

Table 15 Demand side FARs (2015-30 – long run assumptions), Manufacturing/industrial
Source: E.D. Hovee and Company, LLC and Metro, 2009*

INDUSTRIAL BUILDINGS	Central	Corridors	Regional center	Town center	RSIA	Industrial	Employment	Other
Central	1.00	0.50	-	0.60	0.50	0.50	0.50	0.50
Inner Westside	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Inner North & East	1.00	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner Clackamas	-	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner I-5	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Outer Westside	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
East Mult Co	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
Outer Clackamas	-	-	-	0.50	0.25	0.25	0.25	0.25
Outer I-5/205	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
WAREHOUSE DISTRIBUTION BUILDINGS	**Central**	**Corridors**	**Regional center**	**Town center**	**RSIA**	**Industrial**	**Employment**	**Other**
Central	1.00	0.50	-	0.60	0.50	0.50	0.50	0.50
Inner Westside	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Inner North & East	1.00	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner Clackamas	-	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner I-5	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Outer Westside	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
East Mult Co	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
Outer Clackamas	-	-	-	0.50	0.25	0.25	0.25	0.25
Outer I-5/205	-	0.30	0.50	0.50	0.25	0.25	0.25	0.25
FLEX BUILDINGS	**Central**	**Corridors**	**Regional center**	**Town center**	**RSIA**	**Industrial**	**Employment**	**Other**
Central	1.00	0.50	-	0.60	0.50	0.50	0.50	0.50
Inner Westside	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Inner North & East	1.00	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner Clackamas	-	0.30	0.60	0.60	0.25	0.30	0.30	0.30
Inner I-5	-	0.30	0.60	0.60	-	0.30	0.30	0.30
Outer Westside	-	0.25	0.50	0.50	0.25	0.25	0.25	0.25
East Mult Co	-	0.25	0.50	0.50	0.25	0.25	0.25	0.25
Outer Clackamas	-	-	-	0.50	0.25	0.25	0.25	0.25
Outer I-5/205	-	0.25	0.50	0.50	0.25	0.25	0.25	0.25

** Metro's revisions are based upon input from CREEC, ICSC and Hillsboro.*

Table 16: Demand side FARs (2015-30 – long run assumptions) Commercial/non-Industrial
Source: E.D. Hovee and Company, LLC and Metro, 2009*

OFFICE BUILDINGS	Central	Corridors	Regional center	Town center	RSIA	Industrial	Employment	Other
Central	6.00	1.50	-	1.00	1.00	1.00	1.00	1.00
Inner Westside	-	0.50	1.50	0.60	-	0.50	0.50	0.50
Inner North & East	4.00	0.50	1.50	1.00	0.30	0.50	0.50	0.50
Inner Clackamas	-	0.50	1.00	0.60	0.30	0.50	0.50	0.50
Inner I-5	-	0.50	1.50	0.60	-	0.50	0.50	0.50
Outer Westside	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35
East Mult Co	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35
Outer Clackamas	-	-	-	0.60	0.35	0.35	0.35	0.35
Outer I-5/205	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35

RETAIL BUILDINGS	Central	Corridors	Regional center	Town center	RSIA	Industrial	Employment	Other
Central	1.00	0.50	-	0.60	0.50	0.50	0.50	0.50
Inner Westside	-	0.33	0.75	0.50	-	0.35	0.33	0.35
Inner North & East	1.00	0.33	0.75	0.50	0.30	0.35	0.33	0.35
Inner Clackamas	-	0.33	0.75	0.50	0.30	0.35	0.33	0.35
Inner I-5	-	0.33	0.75	0.50	-	0.35	0.33	0.35
Outer Westside	-	0.30	0.39	0.33	0.30	0.30	0.30	0.30
East Mult Co	-	0.30	0.39	0.33	0.30	0.30	0.30	0.30
Outer Clackamas	-	-	-	0.33	0.30	0.30	0.30	0.30
Outer I-5/205	-	0.30	0.39	0.33	0.30	0.30	0.30	0.30

INSTITUTIONAL BUILDINGS	Central	Corridors	Regional center	Town center	RSIA	Industrial	Employment	Other
Central	6.00	1.50	-	1.00	1.00	1.00	1.00	1.00
Inner Westside	-	0.50	1.50	0.60	-	0.50	0.50	0.50
Inner North & East	4.00	0.50	1.50	1.00	0.30	0.50	0.50	0.50
Inner Clackamas	-	0.50	1.00	0.60	0.30	0.50	0.50	0.50
Inner I-5	-	0.50	1.50	0.60	-	0.50	0.50	0.50
Outer Westside	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35
East Mult Co	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35
Outer Clackamas	-	-	-	0.60	0.35	0.35	0.35	0.35
Outer I-5/205	-	0.35	1.00	0.60	0.35	0.35	0.35	0.35

** Metro's revisions are based upon input from CREEC, ICSC and Hillsboro.*

Table 17: Effective FARs (short run) and gross building square footage projections: 2010-15
Source: Metro, 2009

	Industrial	W/D	Flex	Office	Retail	Institutional	Industrial	Non-Industrial	REGION
Central	-	-	0.75	1.89	0.66	1.33	0.75	1.36	1.34
Inner Westside	0.32	-	0.33	0.54	0.33	0.54	0.32	0.48	0.46
Inner North & East	-	0.27	0.27	0.44	0.32	0.55	0.27	0.44	0.41
Inner Clackamas	0.29	-	0.30	0.51	0.33	0.59	0.30	0.47	0.45
Inner I-5	0.33	0.35	0.34	0.55	0.33	0.53	0.34	0.47	0.46
Outer Westside	0.26	0.28	0.26	0.42	0.29	0.47	0.26	0.40	0.34
East Mult Co	-	0.27	0.27	0.39	0.30	0.39	0.27	0.36	0.35
Outer Clackamas	0.27	-	0.27	0.38	-	0.37	0.27	0.37	0.28
Outer I-5/205	0.26	0.27	0.27	0.38	0.29	0.37	0.27	0.35	0.32
Regional FAR	0.27	0.27	0.33	0.92	0.41	0.75	0.29	0.71	0.64
Central	-	-	0.75	1.89	0.66	1.33	0.75	1.36	1.34
Inner	0.31	0.27	0.31	0.50	0.33	0.55	0.29	0.46	0.44
Outer	0.26	0.27	0.26	0.40	0.29	0.41	0.26	0.37	0.33

Total Square Ft. Demand (2010-15)

	Industrial	W/D	Flex	Office	Retail	Institutional	Industrial	Non-Industrial	REGION
Central	(102,301)	(81,554)	377,021	4,132,911	2,947,587	2,862,470	193,166	9,942,969	10,136,135
Inner Westside	161,297	(142,358)	354,321	2,032,958	1,571,018	1,432,935	373,260	5,036,911	5,410,171
Inner North & East	(129,874)	1,009,084	267,977	2,200,088	1,914,962	1,978,002	1,147,187	6,093,051	7,240,237
Inner Clackamas	141,906	(66,825)	175,715	813,506	803,976	669,391	250,796	2,286,873	2,537,669
Inner I-5	29,465	38,619	114,774	1,098,270	944,114	577,031	182,858	2,619,416	2,802,274
Outer Westside	804,729	205,803	848,646	937,099	685,941	709,576	1,859,178	2,332,615	4,191,793
East Mult Co	(43,482)	27,213	121,692	637,288	802,184	656,664	105,423	2,096,135	2,201,558
Outer Clackamas	221,212	(142,985)	168,418	10,636	(378)	43,116	246,645	53,373	300,018
Outer I-5/205	657,621	144,167	826,531	1,157,819	891,721	799,126	1,628,319	2,848,666	4,476,985

Table 18 Effective FARs (long run) and gross building square footage projections: 2015-30
Source: Metro, 2009

	Industrial	W/D	Flex	Office	Retail	Institutional	Industrial	Non-Industrial	REGION
Central	-	0.80	0.75	1.89	0.66	1.33	0.78	1.29	1.24
Inner Westside	-	0.32	0.33	0.54	0.38	0.54	0.32	0.49	0.47
Inner North & East	-	0.27	0.27	0.44	0.34	0.55	0.27	0.45	0.39
Inner Clackamas	-	0.29	0.30	0.51	0.39	0.59	0.30	0.49	0.45
Inner I-5	0.33	0.35	0.34	0.55	0.40	0.53	0.34	0.49	0.47
Outer Westside	0.26	0.28	0.26	0.42	0.31	0.47	0.26	0.41	0.32
East Mult Co	0.26	0.27	0.27	0.39	0.31	0.39	0.26	0.37	0.33
Outer Clackamas	0.27	0.27	0.27	0.38	0.31	0.37	0.27	0.37	0.32
Outer I-5/205	0.26	0.27	0.27	0.38	0.31	0.37	0.27	0.35	0.31
Regional FAR	0.26	0.31	0.30	0.75	0.44	0.67	0.28	0.63	0.52
Central	-	0.80	0.75	1.89	0.66	1.33	0.78	1.29	1.24
Inner	0.33	0.28	0.31	0.50	0.37	0.55	0.29	0.48	0.43
Outer	0.26	0.27	0.26	0.40	0.31	0.41	0.27	0.38	0.32

Total Square Ft. Demand (2015-30)

	Industrial	W/D	Flex	Office	Retail	Institutional	Industrial	Non-Industrial	REGION
Central	(1,103,230)	1,110,403	793,162	7,005,058	6,954,862	4,370,464	800,334	18,330,384	19,130,718
Inner Westside	(1,001,867)	1,433,580	611,664	5,450,666	3,676,059	3,585,195	1,043,376	12,711,920	13,755,296
Inner North & East	(2,188,965)	6,466,378	566,077	5,611,738	3,576,372	4,590,865	4,843,490	13,778,975	18,622,465
Inner Clackamas	(253,601)	1,252,402	315,313	1,887,580	1,832,919	1,446,529	1,314,114	5,167,028	6,481,142
Inner I-5	93,567	858,579	493,770	3,200,131	2,525,997	1,425,219	1,445,916	7,151,347	8,597,263
Outer Westside	5,023,026	4,330,122	4,931,762	4,299,708	1,349,825	2,024,067	14,284,910	7,673,599	21,958,510
East Mult Co	662,646	1,799,102	1,693,491	3,286,192	2,272,763	2,021,438	4,155,240	7,580,392	11,735,632
Outer Clackamas	319,083	487,273	663,871	1,321,780	239,559	154,950	1,470,227	1,716,289	3,186,516
Outer I-5/205	1,502,881	3,955,714	2,229,737	2,752,946	2,200,093	2,053,558	7,688,332	7,006,598	14,694,930

Regional weighted averages Using a weighted average of gross building square footage, demand-side (effective) FAR values are derived by subarea and are shown by building format in **Table 19.**

Table 19: Effective FARs by building type (model results)
Source: Metro, 2009

	w-avg. SFE	w-avg. FAR
General Industrial	780	0.26
Warehousing/ Distributing	1,300	0.30
Tech / Flex	740	0.31
Office	370	0.79
Retail	510	0.43
Institutional	630	0.69

Regional 20-year employment capacity demand

The demand forecast is summarized in **Table 20,** which lists net new jobs by market ring and the resulting building square footage and acreage demand.

Table 20: Net new employment, square feet and acreage demand by market ring under two growth forecasts (2010 to 2030)
Source: Metro and E.D. Hovee and Company, LLC, 2009

Low growth forecast	Central Ring	Inner Ring	Outer Ring
Net new Jobs	84,953	143,498	79,679
Net new Jobs in industrial bldgs.	-738	9,019	14,209
Net new Jobs in non-industrial bldgs.	85,690	134,479	65,470
Building sq. ft. new demand	3,232,205	18,171,149	18,165,966
Acres - total new demand	49	934	1,235
Industrial acres new demand	(60)	(24)	358
Non-industrial acres new demand	109	958	877
High growth forecast			
Net new Jobs	120,135	260,308	219,305
Net new Jobs in industrial bldgs.	6,770	35,961	82,375
Net new Jobs in non-industrial bldgs.	113,365	224,347	136,930
Building sq. ft. new demand	7,735,733	51,131,671	71,582,367
Acres - total new demand	159	3,111	5,492
Industrial acres new demand	9	1,343	3,578
Non-industrial acres new demand	150	1,768	1,914

The demand forecast by market subarea is aggregated to identify the regional demand range for industrial and non-industrial building square feet. This demand is then compared with the supply range.

Capacity demand varies by market subarea, accounting for market realities in the location decisions made by the region's employers. Based on analysis of the trends just described, there will be a need of between 274 and 4,930 acres of additional industrial capacity and between 1,944 and 3,832 acres of additional non-industrial capacity within the UGB by 2030.

Figures 14-17 show the 20-year capacity demand (net of redevelopment demand) by market subarea. At the low end of the population and employment forecast there is a projected flat demand for industrial jobs, commensurate with national trends showing a decline in manufacturing. This analysis carries forward recent job location trends and also reflects an assumed continuation of current policy and investment trends. Key assumptions include that infrastructure is not available in Damascus until the year 2020, that prospective UGB expansions aren't served with infrastructure until 2025 and that prospective UGB expansions follow the State's hierarchy of lands, irrespective of yet-to-be-designated urban reserves. These assumptions influence the employment forecast in different market subareas. For instance, forecast industrial employment demand shifts from some locations, such as the central city, to locations in outer areas with lower land costs. Infrastructure funding is a limiting factor in some areas such as Damascus and is reflected in low demand forecasts in the Outer Clackamas market subarea. Different local and regional policy and investment actions could shift this demand to different locations.

Figure 14: 2010-15 Industrial capacity demand
Source: Metro and E.D. Hovee and Company, LLC, 2009

Figure 15: 2010-15 non-industrial capacity demand
Source: Metro and E.D. Hovee and Company, LLC, 2009

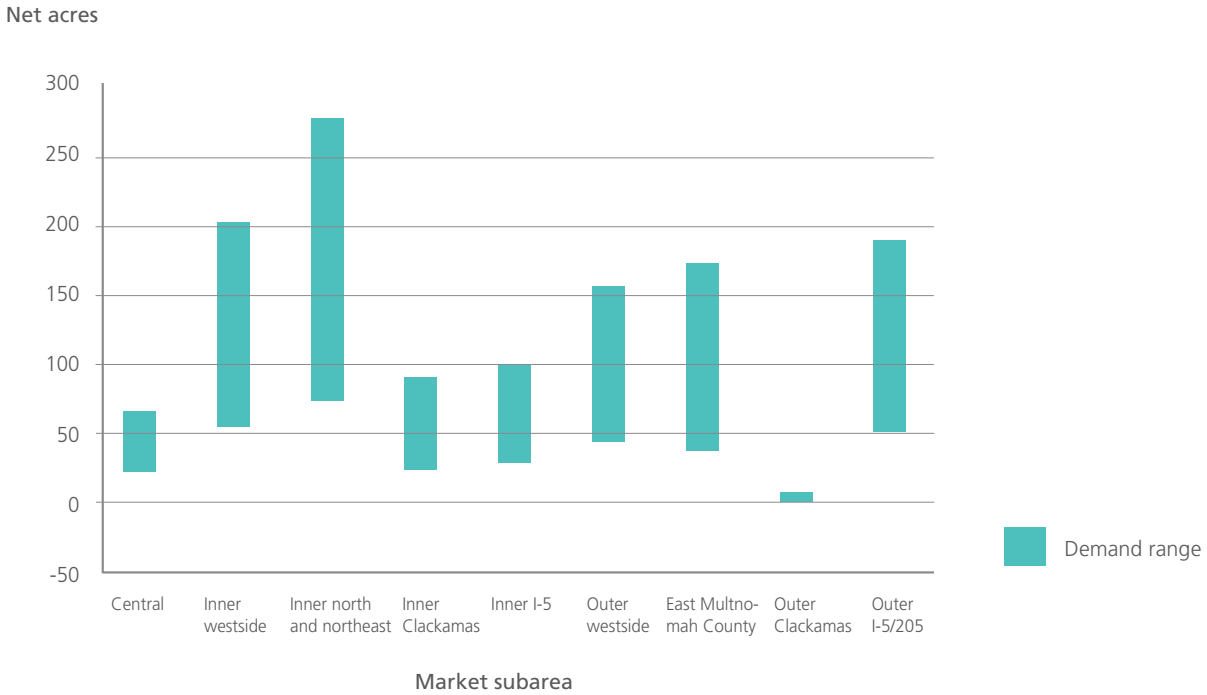


Figure 16: 2010-30 Industrial capacity demand
Source: Metro and E.D. Hovee and Company, LLC, 2009

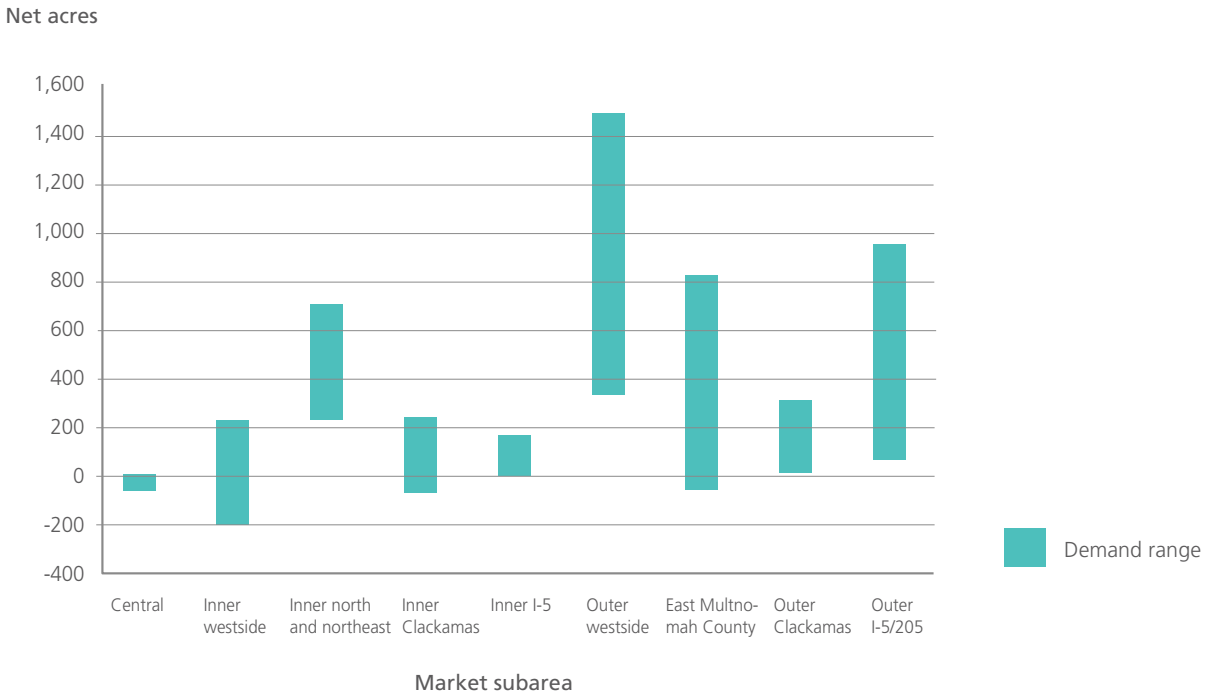
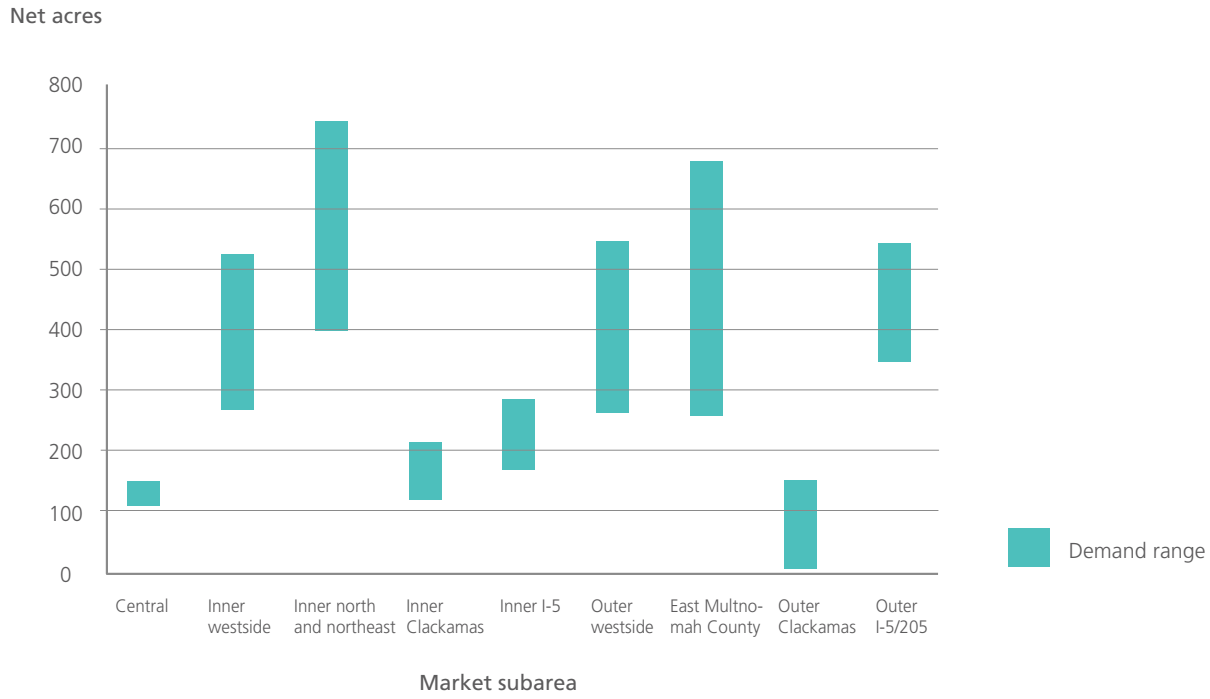


Figure 17: 2010-30 non-industrial capacity demand
Source: Metro and E.D. Hovee and Company, LLC, 2009



LARGE LOT PREFERENCES

New industrial opportunities that require large buildable lots are difficult to forecast accurately. Demand for large industrial lots (greater than 25 gross acres) is usually precipitated by one or more large employers looking for a new location for a production or warehouse facility. This is dependent on the decisions of individual firms and not the trends of an industry as a whole. Consequently, forecasts of large lot demand are inevitably uncertain. With that caveat, this analysis looks at the large lot preferences of large employers and multi-tenant business parks.

Attracting and retaining large employers represents a significant opportunity to diversify the regional economy and support the general economic vitality of the region. Large employers often produce additional supply-chain benefits and attract other manufacturers in the same field. There are also substantial indirect benefits that produce jobs in population serving industries such as retail, personal and business services, real estate and finance. Large employers are housed in a variety of formats, from multi-story office towers to sprawling campuses and industrial facilities. This analysis considers only employers that have historically preferred to locate on large parcels of land.

Large-lot business parks (greater than 25 gross acres) with multiple tenants can also play an important role in the region's economy. Large lot business parks serve a land demand segment that caters to start-up firms and provide opportunities for small business owners to thrive. Characteristics of these firms include: lack of financial wherewithal to purchase or lease standalone buildings; less tolerance for risk; and less ability to absorb up front capital expenditures. Business parks have provided these firms with less costly and less risky space. It is likely that some of the mid-sized and larger parcels in the region will develop as business parks to accommodate such firms in the future. There are other building formats in the region, too, that can meet these preferences, such as locations and buildings with higher FARs.[10]

Large-lot demand for marine and rail terminal uses is not included in this analysis. These types of facilities may have relatively few employees and little building square footage. Consequently, a job forecast may be an inadequate means of forecasting land demand for these uses. Furthermore, these uses are extremely location specific and are not likely to be accommodated through UGB expansions.

[10] *This study was conducted in order to forecast future preferences for employment space in large business parks, assuming that preferences for these building formats are the same in the future. The demand for land for smaller business parks (less than 25 acres) is addressed through the broader employment UGR analysis.*

Inventory of existing large employers

An inventory of existing (2006) large employers [11] inside the UGB suggests that not all large employers use large parcels of land. Many of the region's large employers have called the Portland metropolitan area home for decades. Existing employers play a critical role in supporting the region's economy, and their needs should not be forgotten amongst efforts to attract new employers.

Inventory of existing large parcel users

In addition to looking at large employers, the analysis considers existing large parcel users. For the purposes of this analysis, a large parcel is 25 acres or bigger. Large parcel users accounted for about eight percent of employment in the UGB in 2006. This inventory indicates that lot assembly is a common practice among large parcel users and that many large parcel users hold land for future business expansion opportunities.

The Portland Metro region's existing large lot users include some of the most recognizable business names in the world, such as Nike and Intel. Many large lot users are in traded sector industries that compete on a national or global scale. Traded sector industries are those that have the ability to bring wealth to our region. As such, our region must compete with other metropolitan areas throughout the world to attract and retain these companies.

Existing large lot business parks

An understanding of existing large-lot business parks informs the forecast preference for this building format. The distribution of existing business parks by employment is shown in **Table 21**. These data show, for example, that seven of the large business parks in this analysis housed between 500 and 1,000 employees. Additional information about existing large lot business parks is available in Appendix 5.

Table 21 : Distribution of large business parks by employment (2006)
Source: 2006 ES202 data

Business Park Size (employees)	Number of Business Parks	Proportion of Business Parks
< 500	4	17.4%
500 – 1000	7	30.4%
1000-2000	9	39.1%
2000-3000	1	4.3%
3000 +	2	8.7%
Total	**23**	**100.0%**

[11] *Large employers are defined based on the number of employees per square foot, with different assumptions for each building type. More information on this approach may be found in Appendix 4.*

Forecasted large employer preference for large lots (2010 to 2030)

With the previous caveats about the difficulty of forecasting large lot demands in mind, this portion of the analysis was conducted to examine the potential demand for large parcels of land (greater than 25 acres) to accommodate future employment growth in the region. In order to acknowledge future uncertainty, two different growth scenarios--high and low growth--were examined. Potential large parcel demand was forecast as follows:

1. The analysis begins with the 20-year range employment forecast by industry sector.
2. To translate the forecast into space usage, the industry sectors were distributed among six building types (warehouse/distribution, general industrial, tech/flex, office, retail, medical [12]).
3. For each building type, it was necessary to estimate the sizes (number of employees) of future firms. It was assumed the future distribution of jobs by firm size will be the same as that observed in the 2006 employment data.
4. Using the above assumptions and applying a 75 percent Metro UGB capture rate to the seven-county forecast, a range forecast by building type and firm size was generated. For example, under the high growth scenario, it is forecasted that by the year 2030, there will be two more firms in the warehouse/distribution building type that have between 500 to 999 employees.
5. A jobs-per-acre assumption (varying, depending on building type) was then applied to come up with a range demand forecast by parcel size for each building type.

As shown in **Table 22** and **Table 23**, large employer demand may amount to between 29 and 43 large lots (larger than 25 acres) by the year 2030.

Table 22: Correlation of high growth forecast with historic preference of large employers for large lots (by lot size and building type (2010 to 2030))
Source: Metro, 2009

Lot size (acres)	Ware. / Dist.	Gen. Ind.	Tech Flex	Office	Retail	Medical	Total
25 to 50	11	4	4	1	0	4	**24**
50 to 100	7	1	2	0	0	5	**15**
100 plus	3	0	1	0	0	0	**4**
Subtotal	**21**	**5**	**7**	**1**	**0**	**9**	**43**

Table 23: Correlation of low growth forecast with historic preference of large employers for large lots (by lot size and building type (2010 to 2030))
Source: Metro, 2009

Lot size (acres)	Ware. / Dist.	Gen. Ind.	Tech Flex	Office	Retail	Medical	Total
25 to 50	10	0	1	1	0	3	**15**
50 to 100	6	0	1	0	0	3	**10**
100 plus	3	0	1	0	0	0	**4**
Subtotal	**19**	**0**	**3**	**1**	**0**	**6**	**29**

[12] *Schools and other public institutions are excluded from this analysis since there is a Major UGB amendment process that is specifically for public facilities.*

Forecasted preference for large business parks (2010-2030)

The forecast assumes that fixed proportions of employment, by sector, will locate in large business parks in the future. The proportions observed for 2006, shown in Table 11, were used to scale the full employment forecast from 2010 to 2030 to large business park employment. Whether or not those preferences are "needs" remains for policy discussion.

The methodology used to forecast potential preferences for large business parks generally follows the steps of the large-lot analysis for large individual employers. However, a few changes are made to account for the smaller employers involved in this analysis as well as the mixture of building types in a single business park. Those methods are detailed in Appendix 5.

Projected changes in large business park employment from 2010 to 2030 under two different growth scenarios are shown in **Table 24**.

Table 24: Projected employment changes in large business parks from 2010 to 2030, adjusted for refill
Source: Metro, 2009

Growth Scenario	Change in Business Park Employment by Building Type, 2010 to 2030						Total Change
	WD	GI	TF	Office	Retail	Inst	
High	2,250	1,220	970	8,510	990	460	14,300
Low	2,060	-100	330	4,600	660	380	7,840

The correlation of the forecast with historic preferences for large business parks is shown in **Table 25**.

Table 25: Correlation of forecast with historic preference for large business park lots (2010 to 2030, high and low growth)
Source: Metro, 2009

HIGH GROWTH							
Lot size (acres)	**WD**	**GI**	**TF**	**Office**	**Retail**	**Institution**	**Total Lots**
25 to 50	1	0	0	2	0	0	3
50 to 100	1	0	0	0	0	0	1
100 plus	1	0	0	0	0	0	1
Total Large Lots	**3**	**0**	**0**	**2**	**0**	**0**	**5**

Low Growth							
Lot size (acres)	**WD**	**GI**	**TF**	**Office**	**Retail**	**Institution**	**Total Lots**
25 to 50	1	0	0	1	0	0	2
50 to 100	1	0	0	0	0	0	1
100 plus	1	0	0	0	0	0	1
Total Large Lots	**3**	**0**	**0**	**1**	**0**	**0**	**4**

Assuming a continuation of historic preferences for large business parks, this analysis shows a forecasted preference for four to five large business parks (tax lots of at least 25 acres), depending on the amount of growth that is realized. One to two of the large lots are forecasted for office uses, which could be accommodated in more efficient building formats.

Correlation of forecast with historic preference for large lots

The total potential large lot demand, for both single and multi-tenant users, is shown in **Table 26**. This demand is later compared with the current inventory of large lots in the region.

Table 26: Correlation of forecast with historic preference for large lots (single and multi tenant uses)
Source: Metro, 2009

HIGH GROWTH							
Lot size (acres)	**WD**	**GI**	**TF**	**Office**	**Retail**	**Institution**	**Total Lots**
25 to 50	12	4	4	3	0	4	27
50 to 100	8	1	2	0	0	5	16
100 plus	4	0	1	0	0	0	5
Total Large Lots	**24**	**5**	**7**	**3**	**0**	**9**	**48**

Low Growth							
Lot size (acres)	**WD**	**GI**	**TF**	**Office**	**Retail**	**Institution**	**Total Lots**
25 to 50	11	0	1	2	0	3	17
50 to 100	7	0	1	0	0	3	11
100 plus	4	0	1	0	0	0	5
Total Large Lots	**22**	**0**	**3**	**2**	**0**	**6**	**33**

SUMMARY

The overall forecasted employment capacity demand for the region and the large-lot preferences are compared with the region's supply of employment and industrial land in the next section.

EMPLOYMENT CAPACITY (SUPPLY RANGE)

Determining the total employment capacity of the current urban growth boundary is not as simple as adding up the maximum-zoned capacity of all parcels. Unlike residential zoning, some of the land zoned for employment uses does not have legal limits to height and other restrictions. However, this does not mean that this analysis assumes infinite capacity in those locations, since the urban real estate market does not intensively use land where achievable rents will not cover the cost.

Capacity changes over time as real estate market conditions change. A primary purpose of this urban growth report is to begin a discussion of how the region might make more of its existing capacity market-feasible, both on buildable land and through refill. This purpose is in keeping with Statewide Planning Goal 14's guidance to determine that growth cannot be "reasonably" accommodated inside the existing urban growth boundary before expanding it. The region's stated desire to pursue an outcomes-based approach can spark a discussion that can lend greater definition to the word "reasonable":

- How might different choices support or confound the region's attempts to achieve desired outcomes?
- What are the possible tradeoffs of those choices?

Many parcels inside the urban growth boundary are developed below maximum allowed density or are partially developed. Some parcels have buildings that have less value than the underlying land and are ripe for redevelopment. Others have viable buildings that are not likely to be redeveloped and simply do not fully utilize the allowed density. Due to market conditions, some of these parcels are more likely to see infill or redevelopment ("refill") than others. Similarly, in the case of some vacant buildable lands, there is a very limited market for their development. Limited market feasibility could be the consequence of the location of the parcels, inadequate funding for infrastructure, macroeconomic conditions, credit availability, individual entrepreneurship and public actions taken inside the boundary, in Clark County, Washington and in neighboring cities.

Recent location and development trends

An understanding of where employment has been locating and how land has been used to provide employment capacity inform this assessment of the region's short- and long-term employment capacity. Metro contracted with a consultant team led by E.D. Hovee & Company, LLC to complete an analysis of employment and economic trends to inform this employment urban growth report. Much of the following information is drawn from the consultant team's work. Additional information may be found in the complete consultant reports found in Appendix 11.

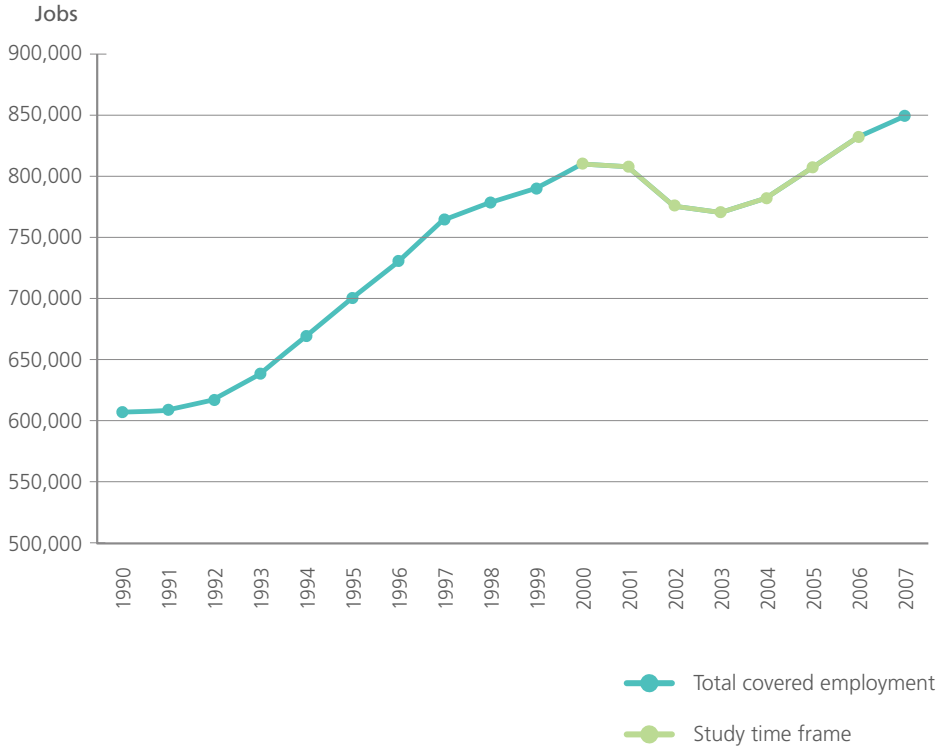
Employment trends

E.D. Hovee & Company, LLC analyzed recent employment trends using the best available information, which included Employment Security 202 (ES 202) data from 2000-2006.[13] See **Figure 18**. As of 2006, the Portland metropolitan region had an estimated 842,000 non-agricultural jobs.[14] Employment in the Metro urban growth boundary represents 83 percent of the job base for the seven-county Primary Metropolitan Statistical Area (PMSA), with the bulk of remaining jobs located in Clark County, Washington.

[13] *Recent employment trends were analyzed using geocoded Employment Security 202 (ES 202) data for 2000-2006. This data is collected by the state for unemployment insurance purposes. 2006 is the latest year for which detailed geocoded employment information is currently available. The ES 202 data captures about 85 percent of employment, the self-employed are not included.*

[14] *Because this analysis is concerned with employment capacity inside the urban growth boundary, it focuses on non-agricultural jobs. State land use laws are, in part, intended to protect the viability of the agriculture outside of urban growth boundaries.*

Figure 18: Employment trends within Metro UGB, 1990-2007
Source: E.D. Hovee & Company, LLC



Between 2000 and 2006, the region added approximately 22,500 jobs – representing a 0.5 percent annual job growth over a period marked by an economic downturn and subsequent recovery. The Portland metropolitan region's job growth, while low, was still above the national average of 0.3 percent for the same time period. Employment growth was far weaker in this most recent cycle than the 2.9 percent annual job growth experienced during the previous decade of the 1990s. Job gains in the 1990s were high by comparative standards, about one-third higher than the rate of growth in the preceding decade of the 1980s.

The type of jobs in the region also impacts the region's employment capacity, as different industry sectors use space in different ways. Shifts in the region's employment sectors reflect job classification changes and actual job losses and gains. Several key trends include:

- The service sector had the largest amount of growth; in 2006 it accounted for 56 percent of the region's covered employment. Health care and social assistance has dominated service sector job growth, with a net gain of 17,000 jobs.
- In 2006, the industrial sector comprised 30 percent of the region's jobs, a decline from a 32 percent share in 2000. Manufacturing, a subset of the industrial sector, had a net loss of 6,700 jobs from 2000 to 2006.
- Jobs associated with retail (excluding dining) also declined – a reversal of prior experience in the 1990s.

Job location by market subarea

As described in the Demand Section of this report, for this analysis, the Portland metropolitan region was divided into nine geographic market subareas and further aggregated to three overall ring geographies:

Central, also a subarea of its own.

Inner ring Inner North and East, Inner Westside, Inner I-5 and Inner Clackamas.

Outer ring Outer Westside, East Multnomah County, Outer Clackamas and Outer I-5/205

Key trends for these market subarea geographies include:

- In 2006, about one-half of the region's employment was located within the largely developed inner ring subarea, with the remainder divided between the central and outer rings.
- From 2000 to 2006, the central and inner ring subareas lost jobs, while outer ring geographies added jobs at a pace above three percent per year.
- Within the inner ring, the Central and Inner North and Northeast subareas showed the largest job loss, especially for industrial jobs.
- In contrast, outer ring subareas added industrial jobs – enough to offset about 65 percent of inner and central ring losses (but still resulting in an overall industrial employment decline in the region).
- Retail job growth appears to have migrated to the outer ring subareas (+3,200 jobs), enough to offset about 50 percent of inner and central ring employment decline.
- Clark County also reported rapid job growth during this time period of 2.2 percent annually, well above the overall job growth rate indicated for the Oregon side of the Columbia River, but somewhat consistent with the growth rates of outer ring subareas.

The analysis shows substantial shifting between market subareas by industry sector, particularly for industrial jobs. Despite the shifts, the central and inner rings still house more than 75 percent of the region's jobs in utilities, wholesale trade, transportation and warehousing. **Figures 19 and 20** depict employment sector trends by market subarea.

Figure 19: Job change by market subarea, central and inner rings, 2000-2006
Source: E.D. Hovee & Company, LLC

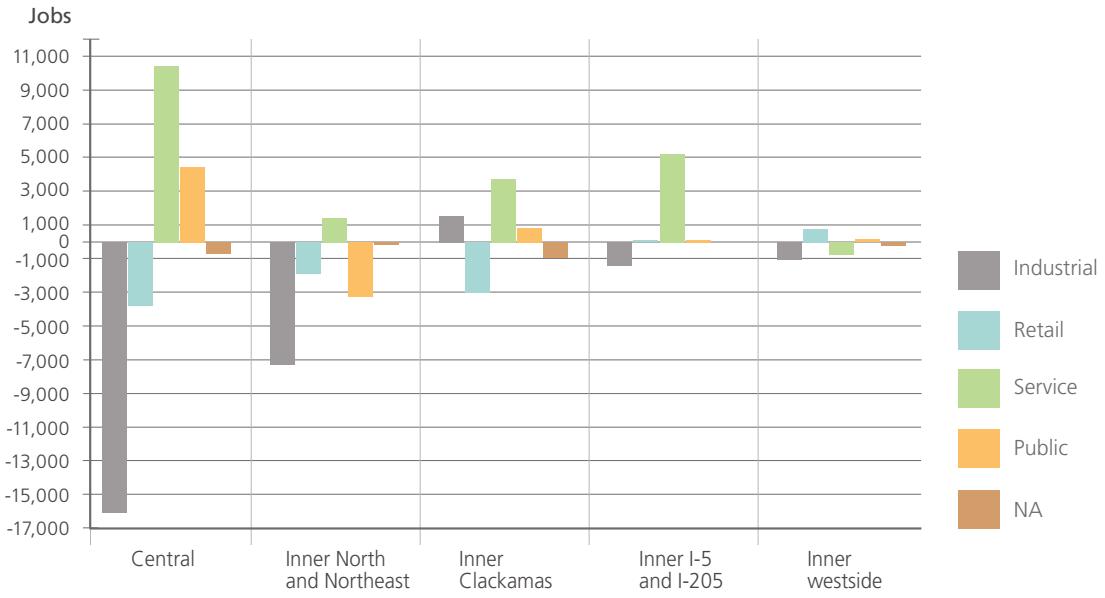
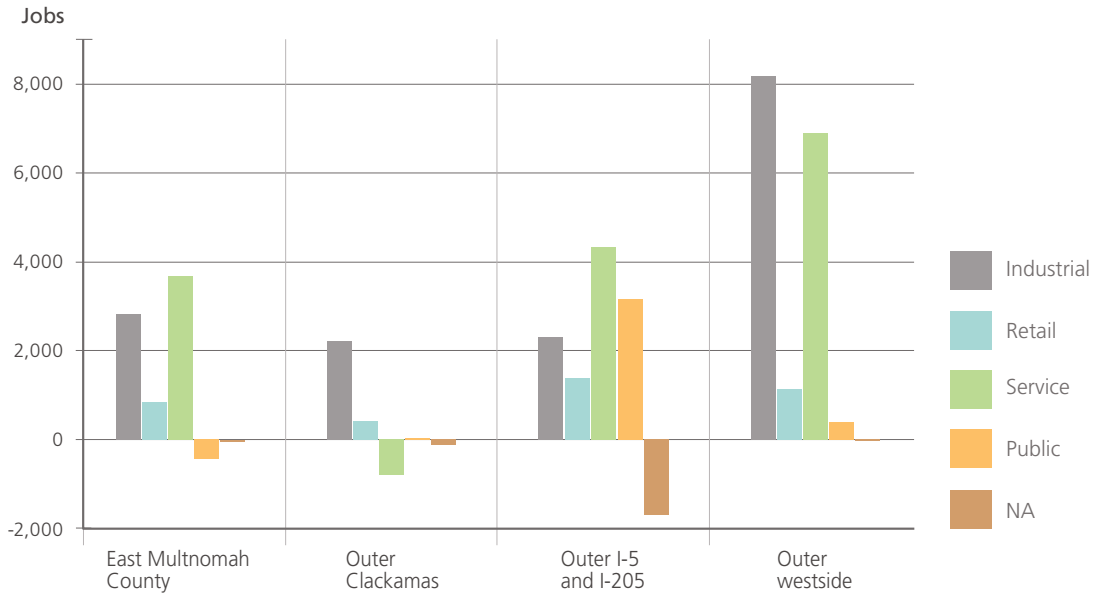


Figure 20: Job change by market subarea, outer rings, 2000-2006
Source: E.D. Hovee & Company, LLC



Job location by 2040 design type

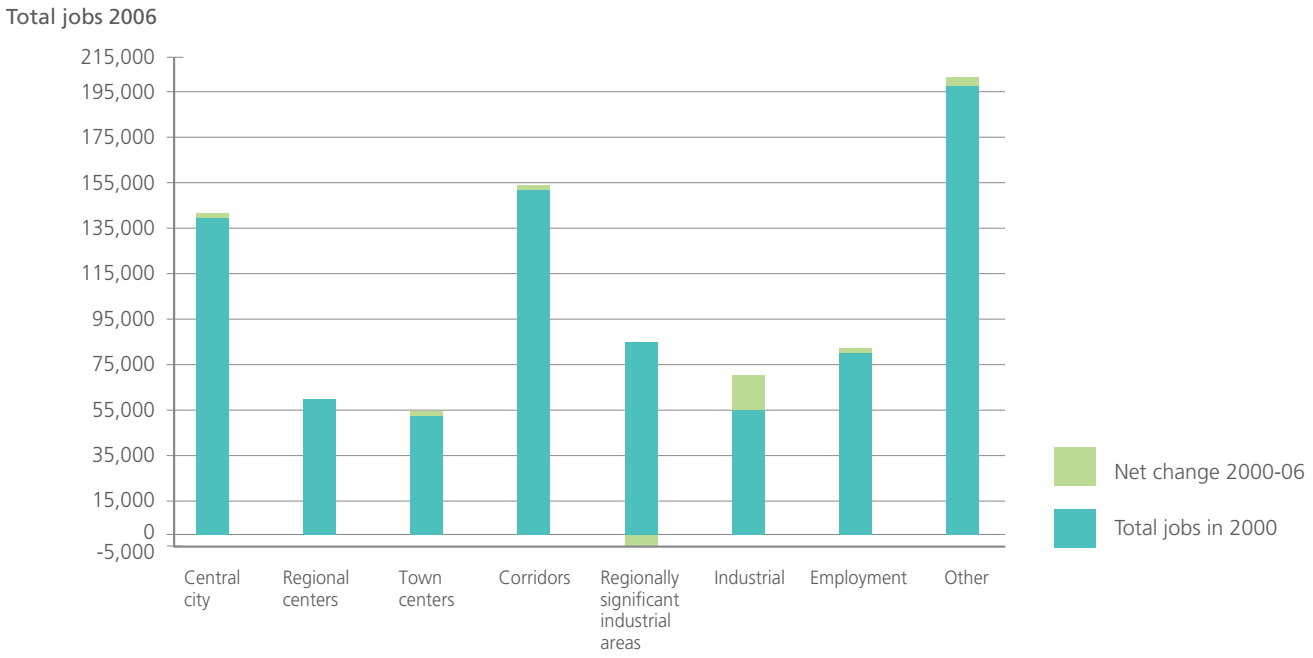
The region's 2040 Growth Concept calls for development to be focused in centers, corridors, employment and industrial areas. To better understand how successful current policies have been and to develop a basis for further policy discussion this analysis considers job growth by 2040 design types from 2000 to 2006 (see **Figure 21**):

Urban-focused 2040 design types (central city, centers and corridors – including main streets) report job growth, but at rates below the 0.5 percent annual growth rate experienced region-wide. An exception is noted for town centers, which grew at a pace equivalent to the overall region. Service and public sector jobs fueled the job growth occurring in the other 2040 design types (city center, regional centers and corridors).

Industrial areas (areas designated as Regionally-Significant Industrial Areas, Industrial and Employment Areas under Title 4 of the Urban Growth Management Functional Plan) are associated with the strongest growth rates, averaging 4.5 percent per year. The largest share of the growth has occurred for industrial jobs. But, about 30 percent of net new jobs locating in industrial areas were non-industrial (primarily service sector) jobs. Employment areas experienced slower job growth and Regionally Significant Industrial Areas (RSIAs) reported some job base erosion from 2000-2006.

Other areas (inner and outer neighborhoods) currently account for about one-quarter of all Portland metropolitan region employment but very little of the job growth experienced post-2000. This employment includes neighborhood corner stores and other population serving businesses.

Figure 21: Jobs by design type, 2000-2006
Source: E.D. Hovee & Company, LLC



Development trends

Development of industrial, commercial and mixed use building space for employment use was evaluated at the market subarea level using proprietary CoStar real estate industry data (proprietary data tracked at the regional and national levels).

Industrial and commercial development trends

Primary commercial real estate classifications include:

- Office (Class A, B, C)
- Retail (roughly defined by size)
- Industrial (distribution, warehouse, general manufacturing)
- Flex (typically includes a mix of at least 50 percent office space with the remainder as industrial/distribution)

These categories provide a means to compare growth within job sectors to growth in commercial real estate sectors, but there is not always a one-to-one relationship between how jobs and buildings are described or between the kinds of buildings in which a certain job sector is housed. For example, a service sector job may be in an office structure, retail center or industrial building.

As of January 2009, the Portland metropolitan region had an estimated 275 million square feet of industrial and commercial building space (as tracked by CoStar) (see **Figures 22 and 23**):

- An estimated 34 million square feet has been added post-2000 – with industrial and retail sectors increasing their respective shares of the total identified space inventory.
- Industrial space represents 43 percent of the region's total employment space inventory and 51 percent of new construction. Flex space (typically with 50 percent or more office use) remains a small component of the overall industrial market, with about 16 percent of the overall industrial inventory.

- The single largest share of new office product, 41 percent of all recent development, has located within the inner ring.
- Retail space has also become an increased share of the region's employment building inventory.
- New retail development has favored outer ring market subareas, which have captured close to 50 percent of post-2000 retail development
- Overall, this analysis suggests that the development of industrial and commercial real estate product has out-paced job gains since 2000 throughout the region, possibly due to increased automation and larger products for manufacturing and warehousing.
- Also noted is that both industrial and retail space types have accounted for a greater proportion of added building space in recent years than was previously the case. This is accounted for, in large part, by service-related uses that gravitate to retail center and industrial (including flex / business park space) as well as to office space commercial real estate product types.

Figure 22: Employment real estate inventory, Jan. 2009
Source: CoStar, E.D. Hovee & Company, LLC

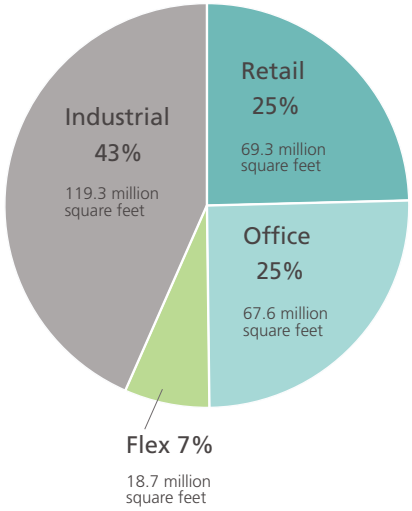
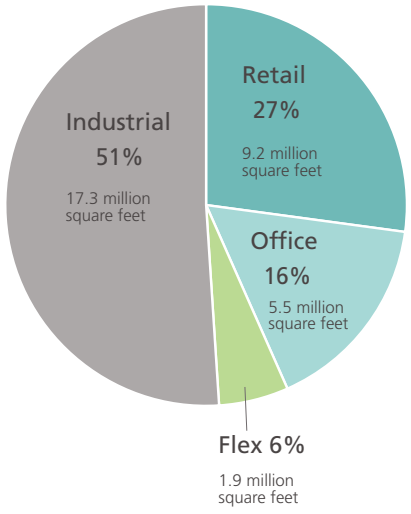


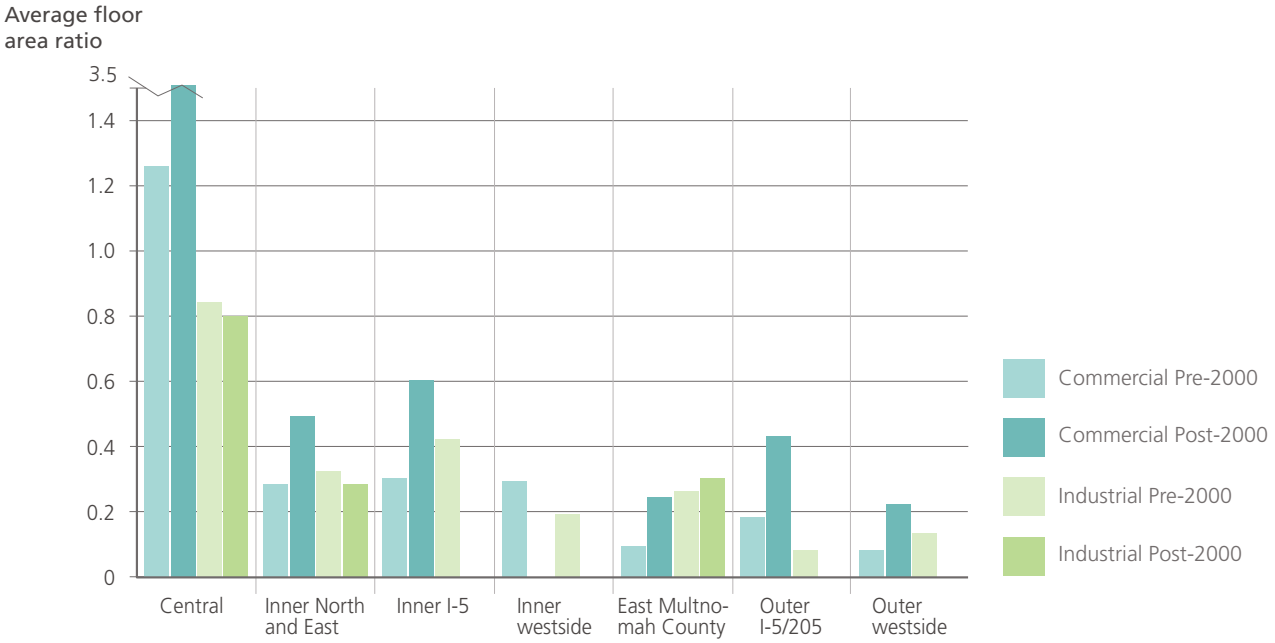
Figure 23: Inventory additions, post 2000
Source: CoStar, E.D. Hovee & Company, LLC



Intensity of employment development

As described in the employment demand section, floor- area ratios (FARs) can be used as a measure of development density. The development density for non-industrial buildings has increased substantially for buildings constructed since 2000, as compared to what was on the ground pre-2000. Densities for the central city, centers and corridors have increased since 2000 across the region. [15] However, only the Central market subarea of the region currently achieves FARs that average above 1.0. See **Figure 24**.

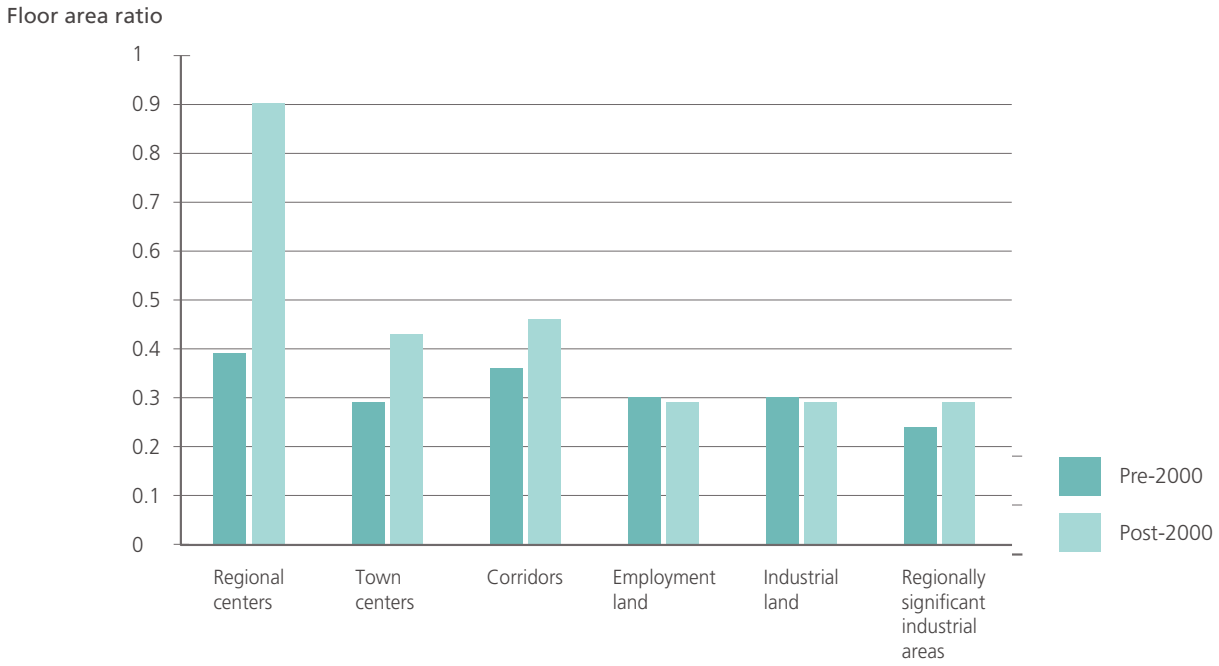
Figure 24: Floor area ratios by market subarea
Source: E.D. Hovee & Company, LLC



Industrial and employment area densities have experienced little overall FAR change since 2000, remaining relatively stable at close to 0.30. However, all of the urban design types showed an increase in FAR with post-2000 development. FARs increased substantially when residential development associated with mixed-use retail or office is included. **Figure 25** shows FARs by design type, not including residential related development.

[15] *A caveat for this data is that limited square footage data is available for lots in Washington County, and no data for Clackamas County. Most of the data are from Multnomah County. Further description of the data may be found in Appendix 11, Employment Demand Factors and Trends: Task 1 Report.*

Figure 25: FAR by design type (not including central city)
Source: Metro Data Resource Center RLIS and E.D. Hovee & Company, LLC



Employment and industrial buildable land supply inventory

A thorough understanding of the region's buildable land supply that is zoned for employment uses is a crucial first step in analyzing the capacity of the region to meet future employment demand. This land inventory includes analyses of tax lots that were characterized as vacant or partially vacant in 2007 [16] by Metro's Regional Land Information System (RLIS). Employment capacity in areas added to the UGB from 1998 onward ("new urban areas") is handled separately in this analysis. Metro's buildable land inventory was supplemented by local review and analysis of development readiness by the E.D. Hovee consultant team. [17] Tasks 1-3 were completed twice during the development of this inventory: once with Todd Chase from the E.D. Hovee consultant team and a second time to review the results of the consultant provided inventory. Metro revised the inventory based on comments received from several local governments. [18] The approach included the following tasks:

1. Review draft buildable land supply maps with city and county staff
2. Compile city and staff comments on additions and removals to the inventory
3. Estimate the buildable land area for each tax lot by analyzing environmental features and future streets and pedestrian corridors (some local governments performed this calculation using local methodologies)
4. Remove tax lots that have recently developed, tax lots that no longer have an "employment land use" classification category (based on local comments), and tax lots with less than 0.2 buildable acres after accounting for environmental constraints
5. Sort tax lots into tiers reflecting development readiness

[16] *2007 is the most recent information available for analysis due to the timing of aerial photography and the analysis period to produce vacant/buildable land GIS layer.*

[17] *Additional information on the methodology used and resulting data may be found in Appendix 11.*

[18] *Cornelius, Forest Grove, Gresham, Happy Valley, Hillsboro, Milwaukie, Portland, Troutdale, Tualatin, and Wilsonville*

Environmental constraints and streets

An important component of the inventory methodology was to assess the impact of environmental constraints on the site development potential of vacant and partially vacant land. Ten cities and Washington County used local zoning to account for environmental constraints and streets. For all other areas, environmental constraints were calculated as follows:

- Water quality and floodplain protection (Title 3) overlays (for Wilsonville, local zoning was used);
- Slopes over 10 percent for tax lots zoned for industrial land uses;
- Slopes over 25 percent for tax lots zoned for other employment or mixed-use;
- Streets and sidewalks reduce the amount of buildable land available on any specific tax lot. This analysis used the same methodology described for the residential capacity analysis, setting aside the following amounts for future streets:
- Tax lots under 3/8 acre: assume zero percent
- Tax lots between 3/8 acre and one acre: assume 10 percent
- Tax lots greater than one acre: assume 18.5 percent

The basis for these net street deduction ratios derive from previous research completed by Metro's Research Center and local governments during the 2002 urban growth report. The current street set aside rates are based on "skinny street" assumptions.

Local jurisdiction corrections to buildable land inventory

City and county staff played an important role in reviewing the buildable land inventory. This local review of the inventory resulted in more up-to-date information about the land supply. Tax lots that have been developed since the 2007 aerial photographs were taken were removed and reclassified as developed land. Tax lots that no longer have an employment zoning category were removed from the inventory. Very small tax lots, less than 0.2 buildable acres [19] after accounting for environmental constraints, were also removed from the inventory. Of the inventoried tax lots over one acre in size, about 20 percent of the land was deducted because it is now owned by or developed for public and non-profit uses (such as churches, schools and parks).

Local governments also identified land that was missing from the original inventory. After accounting for corrections made by local governments, there are approximately 9,751 vacant buildable acres inside the Metro UGB (not including land brought into the UGB since 1997).

Development readiness: "tiers"

An innovation in this employment and industrial land inventory is to expand the assessment of development readiness that has been used for industrial land in the Regional Industrial Land Supply work to the entire landscape of vacant employment and industrial land. This analysis allows a better assessment of the short- and long-term employment and industrial land supply in the region based on the public or private investments that must be made prior to development for employment uses. The tiers are shown in **Table 27**, and range from vacant land over one acre with no constraints to small lots in infill locations with no urban services.

[19] *Unlike the methodology used in the Regional Industrial Land Study (1999-2003 reports, 2007 update), this analysis includes all types of employment land and therefore includes tax lots less than one acre in size.*

Table 27: Employment and industrial buildable land development readiness tiers
Source: Metro, FCS Group, based on local review, 2009

Tier	Title	Description	Development readiness	Industrial acres	Non-industrial acres
A	Vacant, unconstrained	Over one net buildable acre** with no known constraints	Great	274	497
B	Vacant, constrained	Over one net buildable acre with one or more constraints	Good	4,771	2,491
C	Small lot, vacant or partially vacant	Infill development, 0.2-1 acre in size; zoned and provided with urban services			
D	Partially vacant, with constraints	Over one net buildable acre on a developed lot, after subtracting any existing buildings*** and parking; zoned and provided with urban services			
E	Vacant, not served	Over one net buildable acre**; no urban services, infrastructure, or zoning	Fair	761	0
F	Partially vacant, not served	Over one net buildable acre on a developed lot, after subtracting any existing buildings*** and parking; no urban services, infrastructure, or zoning	Poor	953	2
G	Small lot (0.2-1 acre), vacant or partially vacant, not served	Infill development; 0.2-1 acre in size; no urban services, infrastructure, or zoning			

Tax lots were sorted into the tiers described in **Table 27** based on an analysis of location, existing building and land value, environmental constraints, infrastructure availability, transportation access, local zoning, and owner constraints (e.g., land banking). Local cities and counties provided input on this assessment of development readiness.

For purposes of this analysis, tax lots within one quarter mile of a major arterial roadway with a peak hour volume to capacity ratio greater than 1.0 (V/C>1.0) were identified as transportation deficient. Land use policy constraints include tax lots that currently have rural zoning or specific development restrictions (e.g., brownfields, aviation flight protection overlay zone, marine use restrictions). The current assessed market value for building improvements helped determine if a site should be considered vacant or partially vacant. In this analysis, tax lots with less than $25,000 in building valuation are assumed to be vacant and those above are considered partially vacant.

Buildable employment and industrial land inventory results

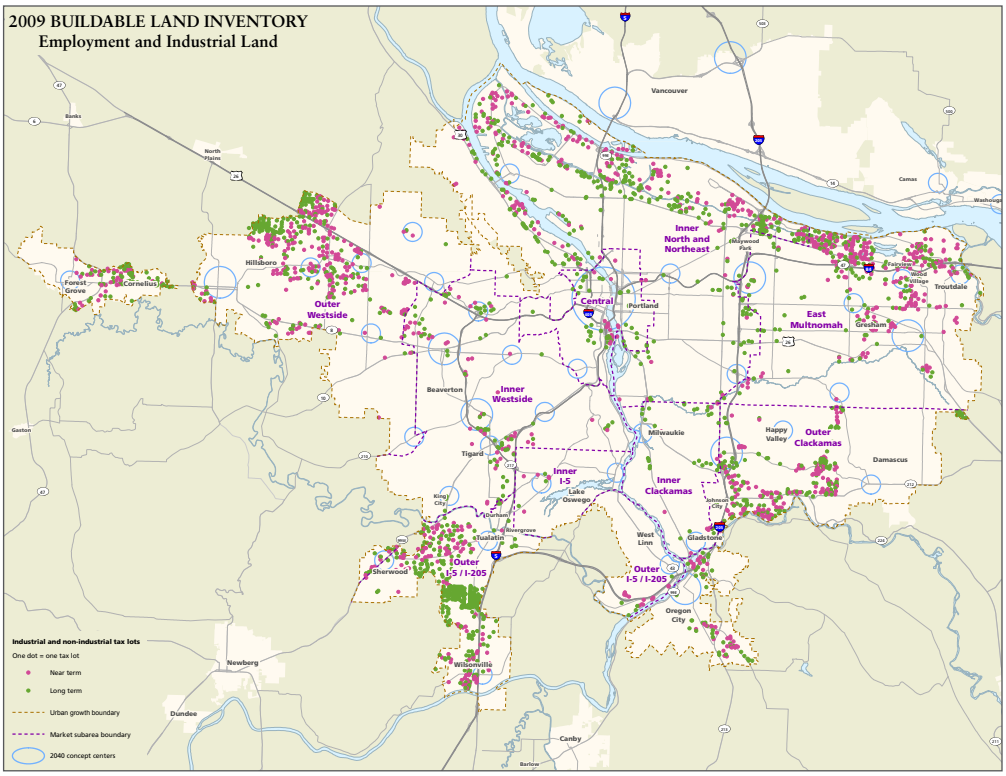
The region's buildable employment and industrial land supply is categorized by generalized land use classification, parcel size, and market subareas. This approach allows an analysis of both the amount of land supply as well as its ability to accommodate both the short- and long-term employment demand in the region. Land supply that is included in tiers A, and B, as well as half of that classified as C and D ("great" and "good" categories) is regarded as being available in the short-term. One half of the land in C and D is assumed to be available in the long term. The land in tiers E, F, and G ("fair" and "poor" categories) is assumed to need substantial investment to be made available within the next 20 years. **Table 28** describes the number of acres available for employment uses in the short- and long-term by subarea.

Table 28: Acres of buildable employment and industrial land by market subarea and development readiness, (9,751 acres total, not including land brought into the boundary after 1997)
Source: Metro, FCS Group, based on local review, 2009

	ACRES AVAILABLE IN SHORT-TERM				ACRES AVAILABLE IN LONG-TERM			
	Great		Good		Fair		Poor	
	Ind	Non-ind	Ind	Non-ind	Ind	Non-ind	Ind	Non-ind
Central	0	3	5	107	0	0	0	0
Inner Clackamas	15	32	333	162	0	0	0	0
Inner I-5	0	9	1	145	0	0	0	0
Inner north & east	27	45	1930	352	0	0	429	0
Inner westside	6	47	80	457	0	0	0	0
East Multnomah	128	112	1212	361	0	0	0	0
Outer Clackamas	0	28	0	128	6	0	13	0
Outer I-5	68	41	714	360	458	0	299	2
Outer westside	31	181	497	420	297	0	213	0
Total	**274**	**497**	**4771**	**2491**	**761**	**0**	**953**	**2**

Map 4 shows the results of the buildable land inventory, coded for short- and long-term development readiness.

Map 4: 2009 buildable land inventory (employment and industrial land)
Source: Metro, FCS Group, based on local review, 2009



New urban areas

Since most of the new urban areas (defined as land brought into the UGB after 1997) lack zoning, they are not included in the buildable land inventory. Instead, concept plans inform an estimate of employment capacity. Many of these new urban areas are planned for residential and employment uses. This analysis estimates that approximately 4,100 acres in new urban areas will be developed for employment uses. As described in the following sections of this analysis, land supply is converted to employment capacity.

New urban areas are in various stages of development readiness. For example, some of the employment land in Damascus is still in the concept plan stage, the land around Happy Valley and in the Springwater Corridor has local zoning in place, and land near Hillsboro has already been developed.

Capacity range for employment and industrial land

Local zoning for employment uses does not lend itself to an assessment of capacity in the same way that it does for residential. Residential zoning is explicit about the maximum number of units allowed within a particular zone and the urban form those units may take. For example, an R5 zone allows single-family detached units on 5,000 square foot lots, and MFR 7 allows up to 60 units per acre. Calculating the residential capacity is therefore a simple mathematical exercise. Many employment zones are much more flexible, leaving more uncertainty in the assessment of capacity.

Generally, as the zoning in employment and industrial areas does not tend to restrict the intensity of development on the ground, more likely restrictions on development include the land development market and the extent of infrastructure investments. In contrast to the preliminary employment analysis, the approach in the draft urban growth report is to account for building form assumptions on the demand side, rather than on the supply side. Building intensity assumptions, as described by floor area ratios, still inform the translation from the number of jobs forecasted to the amount of capacity needed in acres.

Figures 26 and 27 show the industrial and non-industrial capacity in acres by market subarea.

Figure 26: Industrial capacity on vacant buildable land in acres, by market subarea
Source: Metro, FCS Group, based on local review, 2009

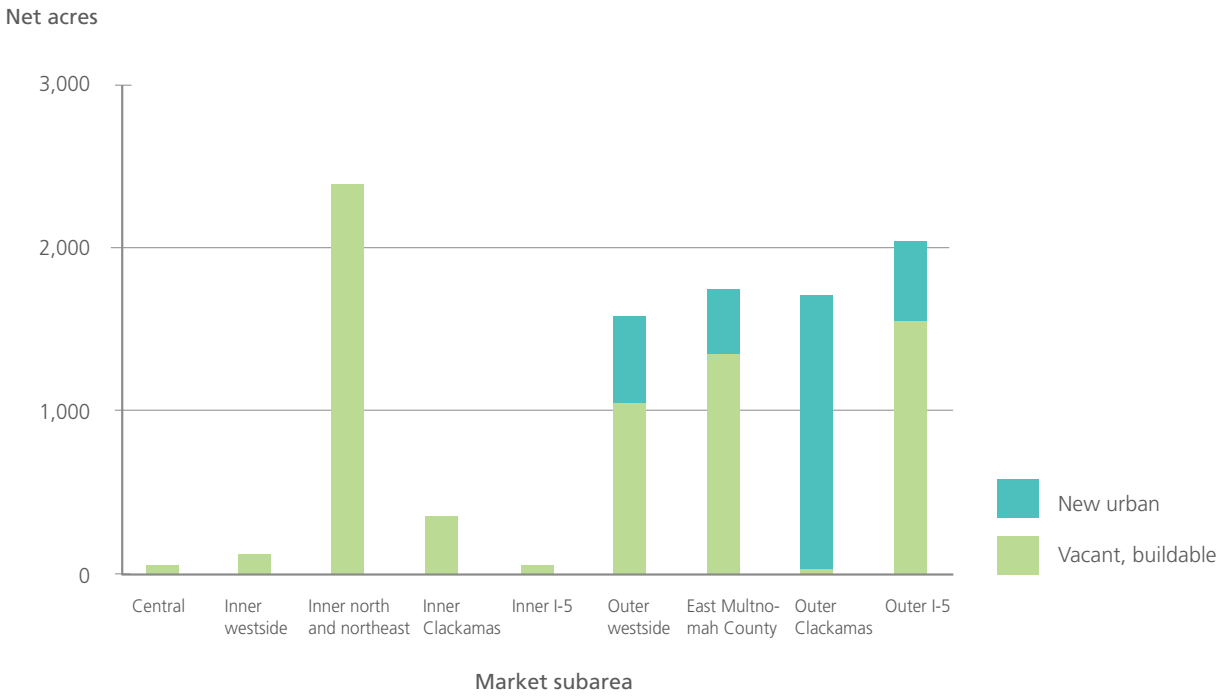
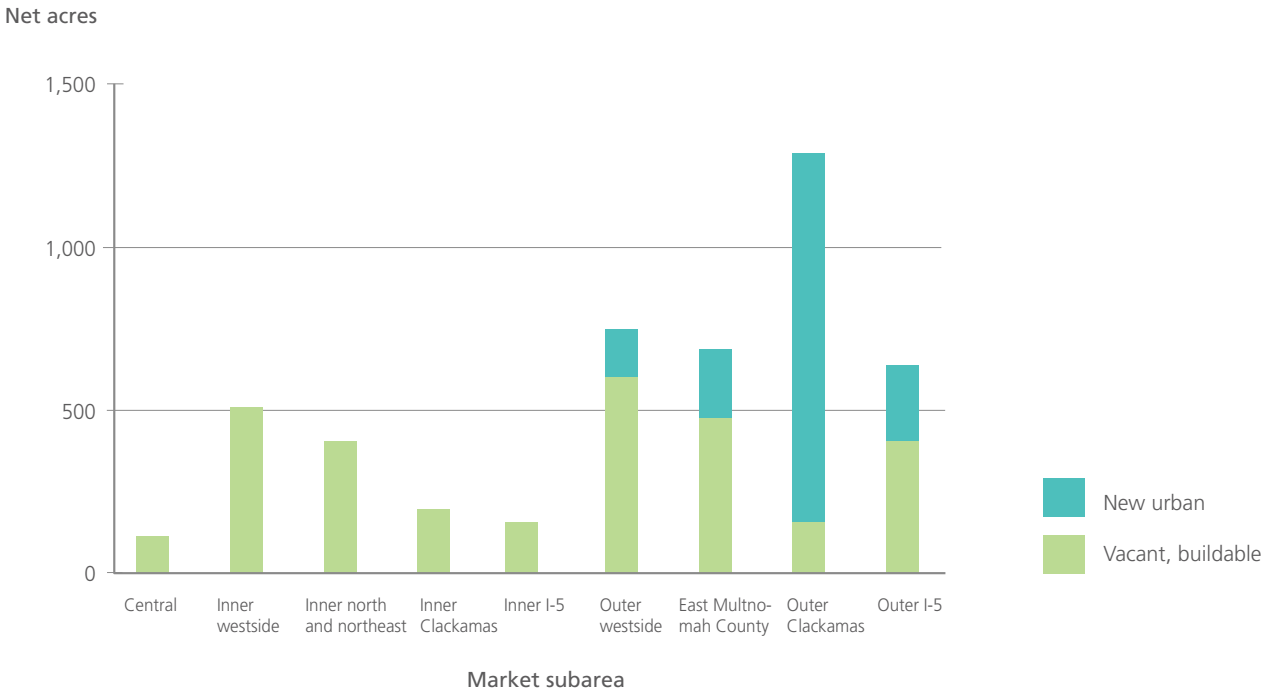


Figure 27: Non-industrial capacity on vacant buildable land in acres by market subarea
Source: Metro, FCS Group, based on local review, 2009



"Refill" capacity

Like the Metro UGB capture rate, the UGB redevelopment and infill ("refill") rate may also rise and fall with fluctuations in regional business cycle activity. The refill rate is impacted by the pace of regional economic growth, macro-economic cycles (such as interest rates, home price valuations, inflation and credit availability, to name a few), regional land supply assumptions and regulatory factors. Refill rates also are expected to vary during the 2010-30 forecast period by market subareas. The market subareas represent uniquely different labor markets. Refill rates also vary substantially between industrial uses and non-industrial uses.

Employment land redevelopment and infill occur in several forms:

- Industrial uses redeveloping into other industrial uses
- Vintage industrial uses redeveloping into non-industrial uses
- Non-industrial uses redeveloping into other non-industrial uses
- Vintage non-industrial uses redeveloping into industrial uses (while it is theoretically possible, data analysis has found undetectable amounts of this activity)

"Effective" refill rates

Effective refill rates are the rates of refill that occur in a modeled scenario (effective refill rates are outputs of the demand model that assume a continuation of current policy and investment trends).

Table 29 summarizes the effective refill rates for the medium growth scenario. These refill rates describe what proportion of new development by building type, subarea and design type is expected to materialize as redevelopment or infill. Higher refill rates indicate locations that are already largely built out where, in order to accommodate additional growth, the next increment would have to occur mostly through redevelopment or infill. Locations with relatively more vacant buildable land are assumed to possess lower redevelopment rates.

Table 29: Effective refill rates (medium growth scenario)
Source: E.D. Hovee and Company, LLC, Metro, 2009

2010-2015	Industrial	WD	Flex	Office	Retail	Instit	Ind	Non-Ind
Central	0%	0%	67%	80%	77%	75%	67%	77%
Inner Westside	19%	0%	20%	50%	50%	59%	20%	53%
Inner North & East	0%	36%	36%	47%	47%	57%	36%	50%
Inner Clackamas	18%	0%	19%	51%	50%	60%	19%	53%
Inner I-5	20%	21%	21%	51%	51%	58%	21%	53%
Outer Westside	20%	20%	20%	30%	25%	37%	20%	31%
East Multnomah Co	0%	10%	10%	30%	25%	36%	10%	30%
Outer Clackamas	20%	0%	20%	30%	0%	36%	20%	35%
Outer I-5/205	10%	10%	10%	30%	25%	36%	10%	30%
REGION	17%	30%	24%	55%	51%	58%	22%	55%

2015-2030	Industrial	WD	Flex	Office	Retail	Instit	Ind	Non-Ind
Central	0%	68%	67%	80%	77%	75%	68%	77%
Inner Westside	0%	20%	20%	50%	50%	59%	20%	53%
Inner North & East	0%	36%	36%	47%	47%	57%	36%	50%
Inner Clackamas	0%	19%	19%	51%	50%	60%	19%	53%
Inner I-5	20%	21%	21%	51%	51%	58%	21%	52%
Outer Westside	20%	20%	20%	30%	25%	37%	20%	31%
East Multnomah Co	10%	10%	10%	30%	25%	36%	10%	30%
Outer Clackamas	20%	20%	20%	30%	25%	36%	20%	30%
Outer I-5/205	10%	10%	10%	30%	25%	36%	10%	30%
REGION	17%	24%	21%	49%	51%	55%	20%	51%
2010-2030 REGIONAL WEIGHTED AVERAGE							**20%**	**52%**

The effective refill rates are the weighted-average refill rates derived from the growth patterns forecasted in the UGR demand model. The weights are based on gross building square footage demand estimates (not net of the refill rate).

This analysis uses the 2010 to 2030 regional weighted averages of 20% refill for industrial development and 52% refill for non-industrial development.

New urban area infrastructure limits

New urban areas, which were brought inside the UGB after 1997, are not expected to yield full development at maximum planned density in the next 20 years due to infeasible market conditions and lack of infrastructure or other financing ability to produce urban densities. Market feasibility is derived from a discrete MetroScope scenario showing half of the capacity of new urban areas will be available within the 20-year period under current infrastructure investment expectations.

Capacity range

This analysis distinguishes between capacity that may be counted on within short-term (5- year) and long-term (20-year) periods and that which relies upon changing market dynamics. Due to the fact that industrial and non-industrial development currently are built in such different building forms, this analysis separates the two main types of land uses that provide capacity to meet employment demand.

Figure 28 depicts the range of potential industrial capacity, and **Figure 29** shows the range of potential non-industrial capacity in the current urban growth boundary. Two primary types of capacity are shown. The capacity depicted in solid colors can be relied upon with a continuation of current policy and investment trends. The capacity shown in dotted colors is deemed to be zoned capacity that requires additional policy or investment actions to increase the likelihood of its development by the year 2030.

The capacity shown in this chart is all based on current zoning; no "upzoning" is assumed.

Capacity is broken into six main categories:

Development ready Tier A or B vacant land, over one net buildable acre.

Investment required Tier C or D partially vacant land, some constraints such as environmental or infrastructure.

Lacks infrastructure Tier E, F or G, no urban services, infrastructure, or zoning.

New urban areas Land brought into the UGB since 1997.

Refill Redevelopment and infill.

Increase in achievable building intensity Increased FAR achieved through public investments like parking structures or changing market conditions.

Expected employment and industrial capacity based on current policies

The first type of capacity shown in **Figures 28 and 29** is zoned capacity inside the current UGB that is market feasible (by the year 2030) with no change in policy or investment trends. Land that is classified as tier A or B is included in this category in both the short-term (5- year) and long-term (20-year) periods. Half of the land classified as tier C or D is included in this category for the long-term. None of the land in tiers E, F, and G, which will require investments in infrastructure, environmental cleanup, or local land use action, is included in the long-term supply. Refill rates (the amount of redevelopment and infill), which are different for industrial and non-industrial development, are outputs of the employment demand model (20 percent for industrial and 52 percent for non-industrial). Finally, half of the capacity in new urban areas (land brought into the

urban growth boundary since 1997) is deemed to be market feasible by the year 2030 and will be counted towards meeting the region's 20-year employment demand. This capacity, depicted in solid colors, is the capacity that can be legally counted towards meeting the region's identified 20-year residential demand.

Potential employment and industrial capacity based on future policy choices

The second type of capacity that is depicted in **Figures 28 and 29** is zoned capacity inside the urban growth boundary that is likely to require changes to policies and investments to make it market feasible by the year 2030. Policy and investment actions can increase FARs, increase the refill rate and increase the market feasibility of developing vacant land. An example of these types of actions is targeted infrastructure investments. The potential result of these actions, taken at the local or regional level, is shown in the dotted colors in the figures. These actions could support development on land classified in tiers C-G as well as new urban areas, making them more development-ready. This capacity, shown in dotted colors, requires documentable local or regional action to count towards meeting the region's identified 20-year residential demand by the end of 2010. Because the individual policy or investment actions that could be pursued are not yet agreed upon, the capacity shown in dotted colors is, at this point, strictly illustrative.

Table 30 shows the complete range of capacity over the next twenty years, including key assumptions that influence the low and high ends of the supply range.

Table 30: Assumptions that establish the range of capacity
Source: Metro, 2009

INDUSTRIAL		NON-INDUSTRIAL	
Expected supply	**Potential supply**	**Expected supply**	**Potential supply**
• Infrastructure limits development in new urban areas • Refill at 20% • FAR reflects current development	• No infrastructure limits • Additional 13% refill • FAR increased by 10%	• Infrastructure limits development in new urban areas • Refill at 52% • FAR reflects current development	• No infrastructure limits • Additional 15% refill • FAR increased by 10%
6,469 acres	**11,493 acres**	**5,575 acres**	**7,872 acres**

Figure 28: Industrial capacity range, within current Metro UGB, assumes no change in local zoning
Source: Metro, Hovee consultant team, 2009

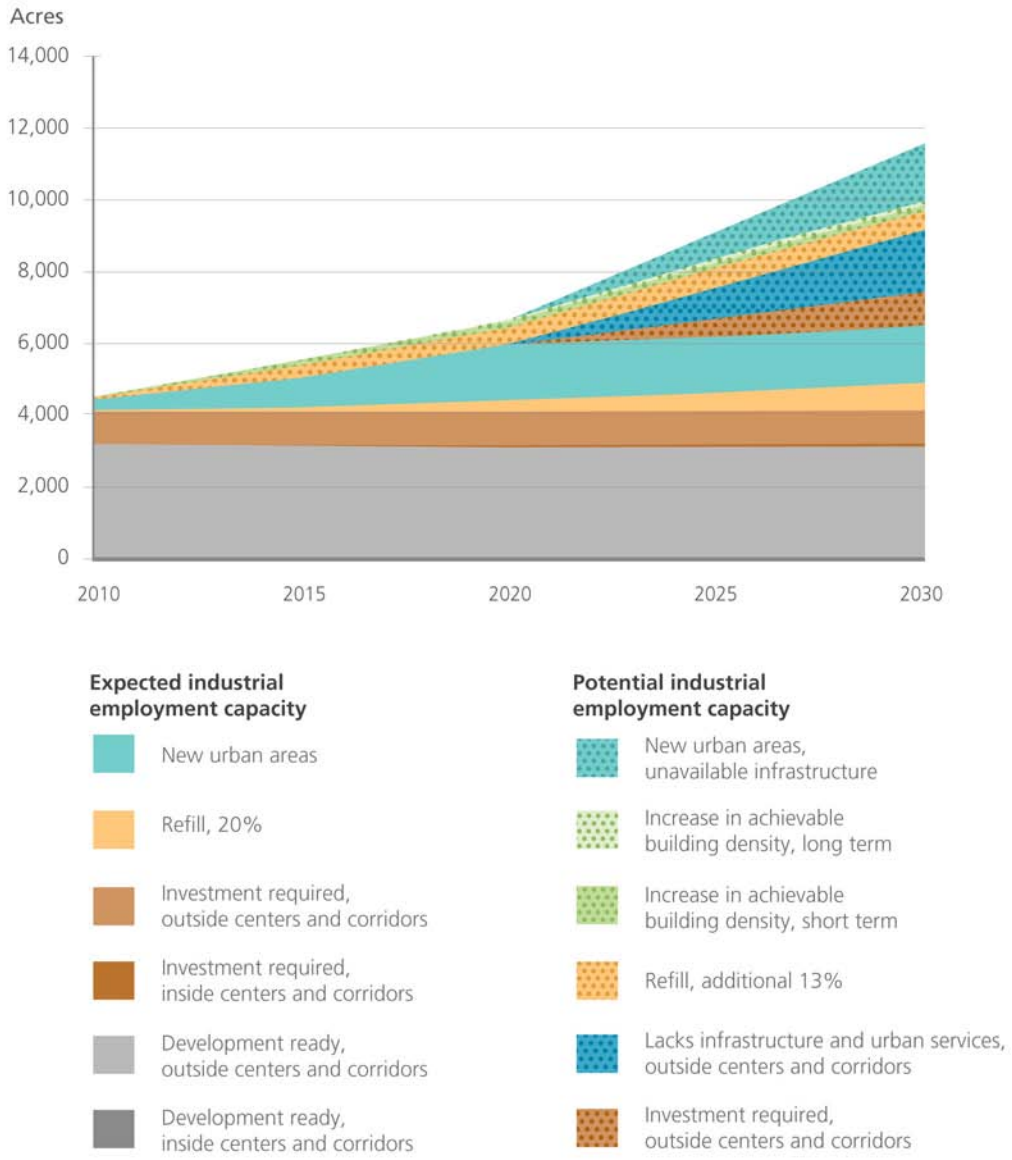
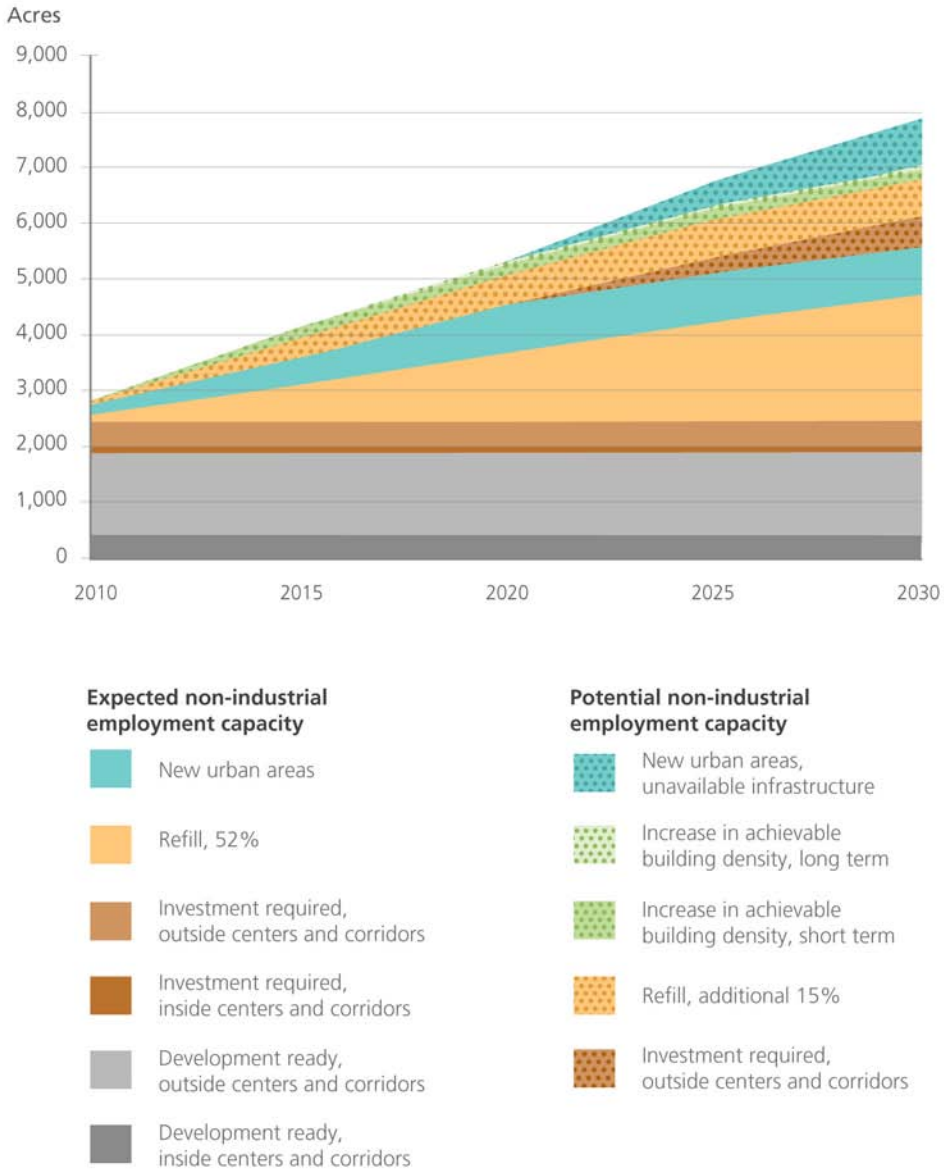


Figure 29: Non-industrial capacity range, within current Metro UGB, assumes no change in local zoning
Source: Metro, Hovee consultant team, 2009



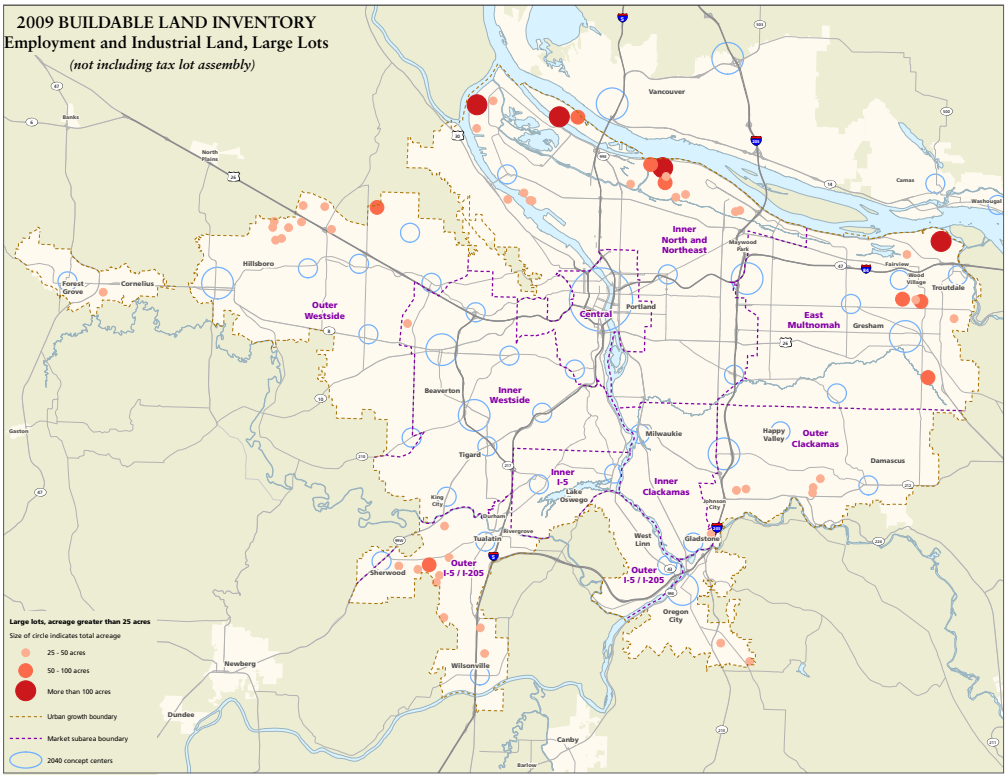
Buildable large lot supply

It is likely that many future large parcel needs will need to be accommodated on vacant buildable land rather than refill. Refill would appear to be a more likely source of capacity for smaller lot needs. The buildable land inventory for employment uses was amended by Metro's regional partners to incorporate local knowledge of available land. The regional supply of large vacant buildable tax lots based on this new inventory is summarized in **Table 31.** [20] The lot sizes shown in this table reflect the acreage of vacant buildable land on the lot.

Table 31: Inventory of large tax lots inside UGB by lot size (net buildable)
Source: Metro, based on local review, 2009

Lot size (acres)	IND	COM	Total
25 to 50	28	9	37
50 to 100	6	3	9
100 plus	4	0	4
Total	**38**	**12**	**50**

Map 5: Vacant buildable large lot map
Source: Metro, 2009



[20] *There are three lots in the large lot inventory that have questionable buildable acreage values reported by the jurisdictions that amended the vacant lands inventory. Two lots in the 25 to 50 acre range reportedly have more buildable acres than total acres. The total acreage for each of these lots is in the 25 to 50 acre range, so they are assumed to be 100% developable and are included here. One lot over 100 acres appears to have been previously developed but the full tax lot area is reported as buildable acres. This lot might more properly be identified as a redevelopment opportunity than a large vacant lot, however it is still included here.*

As documented in this report's inventory of existing large lot users, it is common practice to assemble multiple tax lots. A number of the large lots (over 25 acres) listed in **Table 31** are adjacent to one another. In addition there might also be opportunities to assemble smaller lots that are already under common ownership into parcels of at least 25 acres. The comparison of supply and demand in the following section will begin with the large lot supply as it currently stands before addressing the possibilities of tax lot assembly to meet projected large lot demands.

RECONCILIATION OF DEMAND AND SUPPLY

This assessment is reflective of uncertainty and describes employment demand and supply in terms of a range, allowing policy makers to consider a range of possibilities and plan for contingencies. This approach supports decision-making focused on the outcomes that characterize a successful region and support vibrant communities.

The current employment demand forecast and the analysis of employment capacity within the UGB do not indicate a need to add land to the boundary for industrial or non-industrial purposes at the regional level to maintain sufficient capacity to support the region's forecasted employment at the low end of the demand range. However, the analysis does show a need for additional capacity through investments, policy changes, or expansions to support the high end of the demand range for non-industrial employment. Further analysis of preferences for large lots and the current inventory results in a small potential gap in the land needed to support current preferences for large lot formats for single and multi-tenant users.

Comparison of market subarea demand and supply

This analysis shows that the region's capacity on vacant land is not always located where demand is projected to be. It highlights the importance of redevelopment and infill to support the region's economy as well as creating vibrant communities.

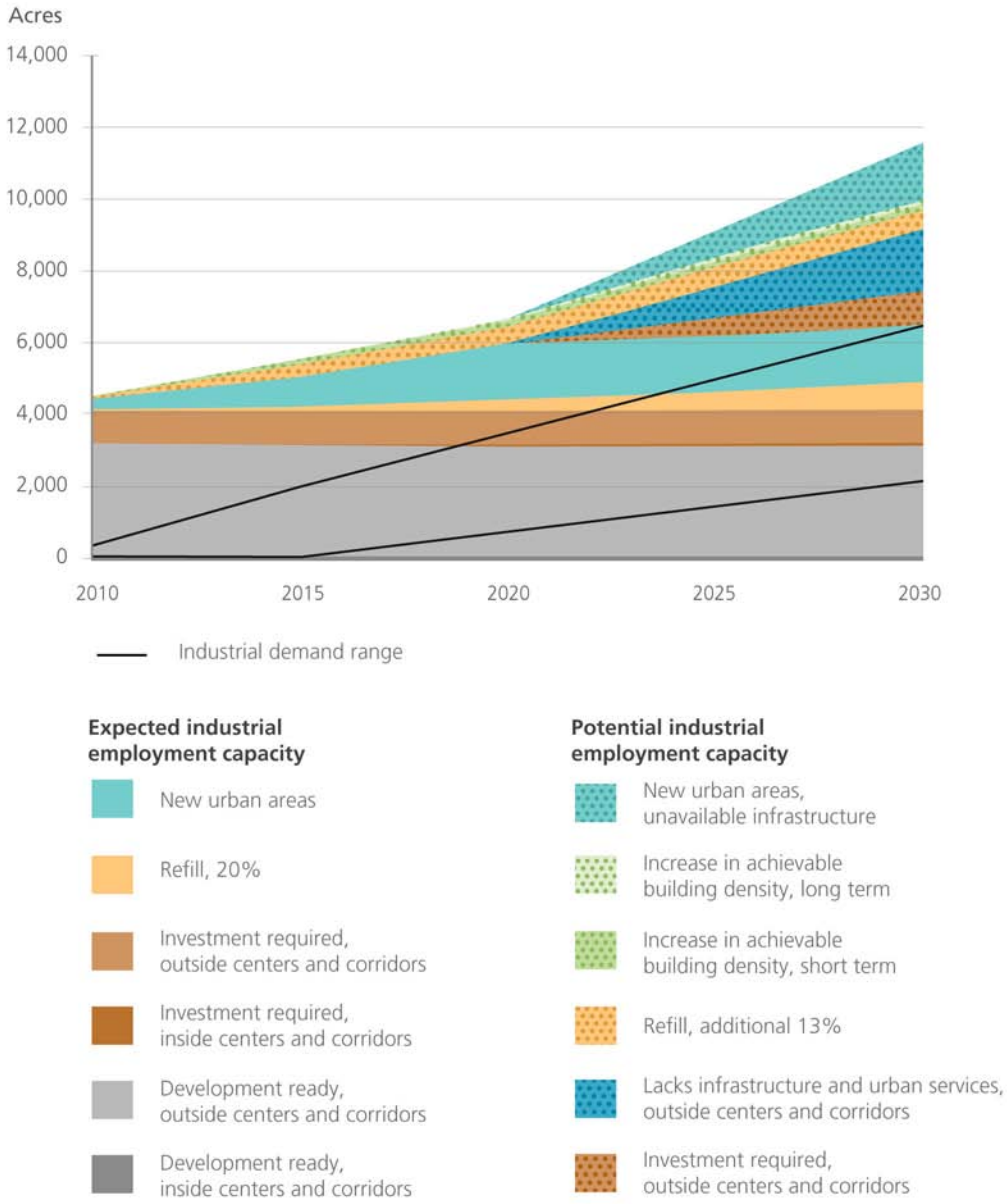
For industrial, the outer I-5/205, outer westside, inner north and northeast and east Multnomah County market subareas show sufficient capacity to meet forecasted demand. The vacant buildable capacity in outer Clackamas is almost entirely in new urban areas, requiring infrastructure and other investments to become developable (one reason that projected demand is low). Inner I-5, inner westside, and the central city do not have sufficient vacant buildable capacity to meet projected demand and must rely on redevelopment and infill.

Non-industrial demand and supply by market subarea shows sufficient capacity to meet demand in outer I-5/205, east Multnomah County, outer westside and outer Clackamas. Demand is projected to be much higher than vacant buildable capacity in the inner north and northeast, inner westside, and the central city. Local and regional policies and investments can help to address the disparity between capacity and demand.

Demand and capacity ranges

Figures 30 and 31 depict the 5- and 20-year building square foot demand range (from the 20-year forecast) for industrial and commercial along with the previously described capacity range. The demand range is illustrated with two lines that show the upper and lower end of the building square foot demand forecast.

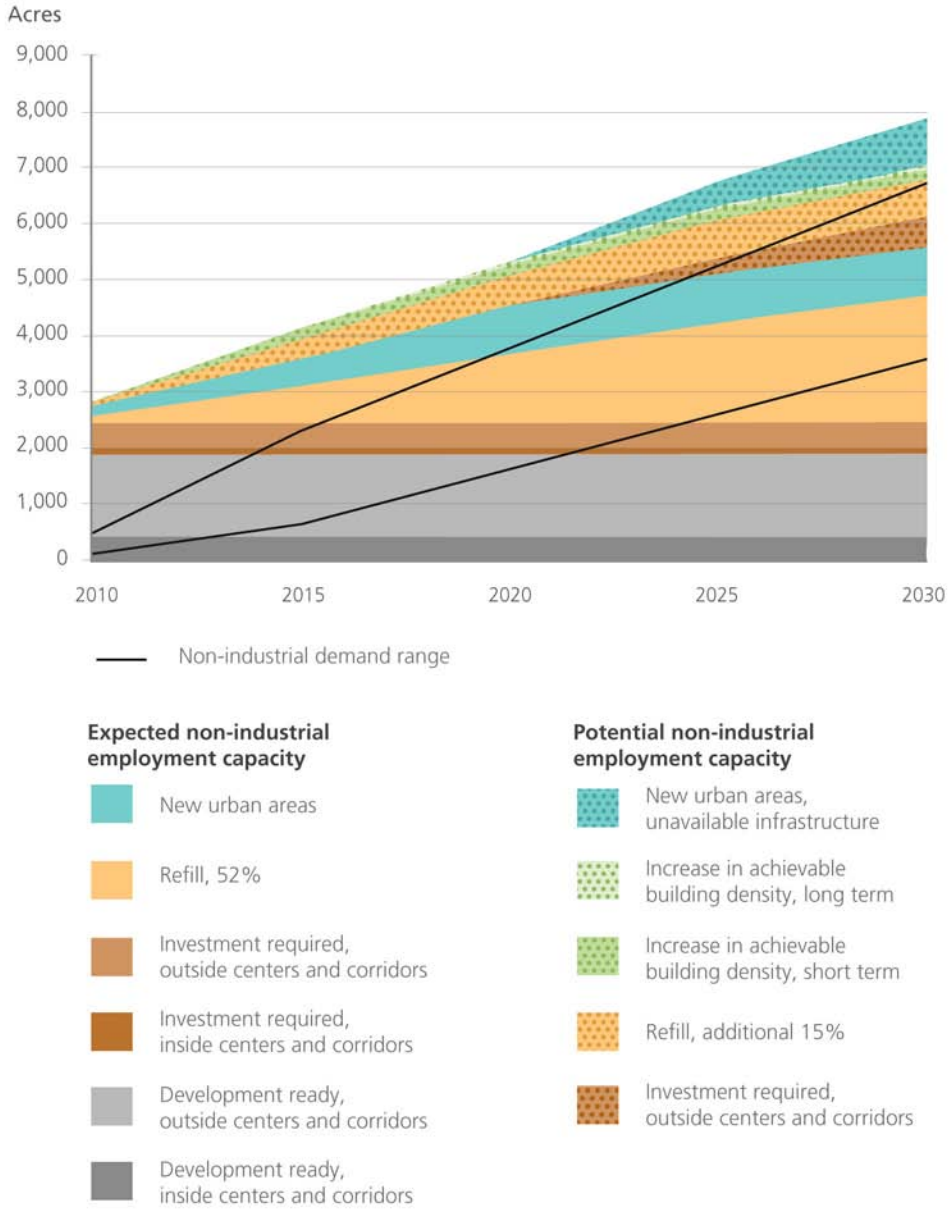
Figure 30: Industrial demand forecast and range, within current Metro UGB, assumes no change in local zoning
Source: Metro, Hovee consultant team, 2009



NOTE: This analysis does not specifically address unique situations such as large lot industrial/employment demand. Demand for large lots is described separately, below.

Figure 31: Non-industrial demand forecast and range, within current Metro UGB, assumes no change in local zoning

Source: Metro, Hovee consultant team, 2009



Comparison of large lot supply with potential large lot demand

It is likely that much future large parcel demand (single and multi-tenant users) will need to be accommodated on vacant buildable land unless other measures are taken. Redevelopment and infill (refill) would appear to be a more likely source of capacity for smaller lot needs. For the purposes of this large lot analysis, only vacant buildable land is considered as supply.

Without any assumption about tax lot assembly, this analysis identifies surplus capacity of 25-to-50-acre lots, but a potential deficit of tax lots over 50 acres and lots over 100 acres (under both the high and low growth forecasts), as shown in **Table 32**.

Table 32: Comparison of large lot supply and the demand range (2010 to 2030) with no tax lot assembly assumption
Source: Metro, based on local review, 2009

Lot size (acres)	Lots available	High growth lot demand	Low growth lot demand
25 to 50	37	27	17
50 to 100	9	16	11
100 plus	4	5	5

As previously mentioned, the analysis of existing large lot users indicates that land assembly is a common practice. Several of the tax lots included in the region's vacant buildable large lot supply are adjacent to one another. **Table 33** compares potential large lot supply and demand if it is assumed that assembly of adjacent large lots is feasible.[21] For land assembly to occur there must be willing sellers. With land assembly, the potential demand for additional large lot supply is significantly reduced. With lot assembly, under the high growth forecast, there is a potential deficit of two 25-to-50-acre lots, a potential deficit of one 50-to-100-acre lot, and a potential deficit of one lot over 100 acres.

With lot assembly, under the low growth forecast, there is a potential surplus of eight 25-to-50-acre lots, a potential surplus of four 50-to-100 acre lots and a potential deficit of one tax lot larger than 100 acres.

Table 33: Comparison of large lot supply and the demand range (2010 to 2030) with tax lot assembly assumption
Source: Metro, based on local review, 2009

Lot size (acres)	Lots available	High growth lot demand	Low growth lot demand
25 to 50	25	27	17
50 to 100	15	16	11
100 plus	4	5	5

[21] *Additional tax lot assembly opportunities involving lots smaller than 25 acres are possible, but are not included here. It is likely that assembly of multiple smaller tax lots would be more difficult to achieve.*

There are several ways that potential demand for large lots could be accommodated:

- Brownfield cleanup
- Redevelopment
- Land assembly
- UGB expansion

As regional leaders discuss these choices, questions to consider include:

- Can local and regional investments be targeted to increase development intensity (FARs) in locations that capitalize on and leverage past public investments?
- How important is it to protect past public investments (e.g., transportation improvements) to support future industrial uses?
- Are local and regional leaders willing to put policies and investments in place to support redevelopment of commercial and industrial lands (e.g., enterprise zones, public subsidy in existing industrial areas, economic development for select industries, brownfield cleanup, system development charge incentives for redevelopment, etc.)?
- Will the region identify an infrastructure funding source to make employment land more "development ready" and support development in past UGB expansion areas?
- What are the relative costs of investing in different locations?
- Under what conditions should the region expand the UGB?
- Is there a need for a coordinated regional economic development strategy to support and guide regional and local planning efforts? If so, who should develop a strategy?

RESIDENTIAL ANALYSIS

Anticipating how to best provide our region's residents with housing choices is more than an exercise in analyzing numbers. It is a process of understanding how people in different stages of their lives and with varied incomes choose how and where to live, of considering the capability of our region's public policies and the private market to meet resident's needs, and of exploring the implications of supporting a variety of housing choices. Broader trends such as infrastructure funding shortages and shifting demographics compel a reassessment of past practices in order to ensure housing choices in the future.

Residential capacity is a product of zoning, public investments, market dynamics and regional growth management policy. The region has decided that it does not want to accommodate future growth through urban growth boundary (UGB) expansions alone. That vision is memorialized in the 2040 Growth Concept and was reaffirmed in a series of joint JPACT and MPAC meetings during fall 2008. Additionally, Statewide Planning Goal 14 compels the region to first look inside the boundary for capacity before expanding the UGB. It is up to all of the cities and counties in the region to make the determination of where growth should occur and to take policy and investment actions as needed to direct growth in a way that supports local aspirations and the regional vision. How growth is accommodated will play a large part in determining whether or not the region achieves its desired outcomes and creates great communities.

Zoning: In most cases, the maximum zoned capacity in centers and corridors is adequate to meet demand. The challenge is to attract the market to that zoned capacity. However, some locations (e.g. along transit lines) may still benefit from re-zoning and the creation of mixed-use zones to accommodate unmet residential demand.

Investments in centers and corridors: Past experience and recent scenario modeling [22] indicate that investments in centers and corridors are an effective means of attracting growth to these areas. Such investments can take the form of:

- Urban renewal
- Urban design improvements (such as street trees, sidewalks, traffic calming design improvements)
- Land assembly
- Investments in structured parking
- Incentives that reduce the costs of residential construction (such as System Development Charge credits, vertical housing tax abatement, or the other tools explored in Metro's *Community Investment Toolkit: Financial Incentives* (2007))

[22] *Results of "cause and effect" scenarios conducted during Fall 2008 can be found at: www.oregonmetro.gov/files/planning/landusescenariosguide.pdf (land use and investment scenarios) www.oregonmetro.gov/files/planning/transportationscenariosguide.pdf (transportation scenarios)*

Targeted infrastructure investments: Infrastructure investments determine where population growth will occur. Transportation investments are a key component; past experience and recent MetroScope scenarios indicate that high capacity transit and system demand management hold the greatest promise for attracting growth to the region's centers and corridors. These strategies also hold the greatest promise for reducing greenhouse gas emissions. All transportation strategies come with tradeoffs, however, and no single strategy will accomplish all goals. Many local governments are struggling to fund ongoing maintenance and operations and additional investments may prove difficult. However, a complete range of infrastructure services is needed to form great communities in keeping with regional goals.

Urban growth boundary expansions: In theory, all future growth could be accommodated either inside the existing UGB or exclusively through future UGB expansions. There are potential limitations and tradeoffs to each approach.

Permit data reveals that relatively little residential growth has actually occurred in UGB expansion areas. Out of all of the residential units permitted in the three-county area during the 1998 to 2008 period, approximately five percent occurred in expansion areas that were added to the UGB after it was originally put in place thirty years ago, in 1979. Accommodating the majority of growth through UGB expansions appears unrealistic for several primary reasons: 1) there is not likely to be adequate funding for infrastructure; 2) there are limits to the market's demand for housing in UGB expansion areas; 3) it has also become clear that a growth strategy that relies primarily on UGB expansions would likely result in increased automobile reliance, making it difficult or impossible to reduce greenhouse gas emissions as mandated by Oregon law.[23] In light of increasing energy costs, automobile dependence would result in higher combined costs of transportation and housing.

STATE LEGAL REQUIREMENTS

This capacity analysis is conducted to fulfill several Statewide Planning Goals and statutes.

Oregon statewide planning Goal 10 ("Housing") and Oregon Revised Statutes 197.296 to 197.303: Oregon Revised Statutes 197.296 through 197.303 (the "needed housing statutes") were adopted to implement Goal 10. Metro is responsible for performing the analysis of housing capacity and need for the region. Goal 10 states:

> *"Buildable lands for residential use shall be inventoried and plans shall encourage the availability of adequate numbers of needed housing units at price ranges and rent levels which are commensurate with the financial capabilities of Oregon households and allow for flexibility of housing location, type and density.*
>
> *"'Buildable lands' refers to lands in both urban and urbanizable areas that are suitable, available and necessary for residential use.*
>
> *"'Needed housing units' means housing types determined to meet the need shown for housing within an urban growth boundary at particular price ranges and rent levels. 'Needed housing units' also includes (but is not limited to) government assisted housing, attached and detached single- family housing, multiple-family housing, and manufactured homes, whether occupied by owners or renters."*

[23] *Oregon House Bill 3543 (2007) mandates a halt in the growth of greenhouse gas emissions by 2010; by 2020, a ten percent decrease below 1990 levels, by 2050, at least a 75 percent decrease below 1990 levels.*

Oregon Statewide Planning Goal 14 ("Urbanization"): Goal 14 states:

> *"Urban growth boundaries shall be established and maintained by cities, counties and regional governments to provide land for urban development needs and to identify and separate urban and urbanizable land from rural land. Establishment and change of urban growth boundaries shall be a cooperative process among cities, counties and, where applicable, regional governments.*
>
> *"Prior to expanding an urban growth boundary, local governments shall demonstrate that needs cannot reasonably be accommodated on land already inside the urban growth boundary."*

COMPONENTS OF THE 2009 RESIDENTIAL CAPACITY ANALYSIS

The following sections comprise the residential capacity analysis:

Demand range: covers housing preferences, megatrends, and the 20-year range forecast

Supply range: covers historic use of capacity, components of supply range, and methodology for calculating capacity

Reconciliation: compares demand and supply ranges and describes performance: describes how well existing policies measure against a series of indicators, including housing affordability

Appendix 8: includes data tables to meet state legal requirements

RESIDENTIAL DEMAND RANGE

The demand for housing is a function of individual preferences, demographics, shifting market dynamics and overall population growth. Housing demand shifts over time and is not the same around the world. This section includes a brief description of:

- Housing preferences,
- Megatrends, and
- 20-year forecasted demand range.

Housing preferences

Housing preferences play a critical role in determining how much capacity is needed to accommodate future growth. For instance, preferences for larger lots could result in more land consumption. However, housing preferences are a product of a number of variables and are not static. As variables such as those listed below change, so too can housing preferences:

- Property tax rates
- Perception of personal safety in different locations (e.g. urban or suburban)
- Transportation costs (e.g. gasoline and the value of time)
- Income tax policy (e.g. ability to deduct mortgage interest)
- Public investments in transportation
- Public investments or disinvestments in different locations
- Demographics (e.g. family size, number of workers and income or age of householder)
- Lending practices
- Policies and investments that address or fail to address negative externalities (e.g. air pollution)
- Share of infrastructure cost burden that is borne by a household
- Customs and norms.

Historically, these factors have favored owner-occupied single-family residences and, as a consequence, housing preference surveys typically reveal a strong preference for that housing type. However, some demographers point out significant limitations of housing preference surveys (Myers & Gearin, 2001).

Many surveys only include respondents who are current homeowners or who intend to purchase a home in the near future. Thus, the preferences of those who may prefer multi-family residences or rentals are not represented.

Surveys are often aimed at new construction, rather than resale, buyers. There is evidence to suggest that the preferences of these two groups are quite different. By definition, resale buyers appear more likely to prefer community characteristics that are found in established urban areas (e.g. mature trees and easy walks to stores), while new construction buyers tend to prefer the characteristics of new suburban construction (e.g. large lots and auto-orientation).

Preference surveys reveal internally inconsistent preferences such as the desire to reduce auto dependence and the desire for low density.

The future will not necessarily be like the past. However, in the absence of other information, this UGR and other estimates of future housing demand (Goodman, 1999) (Nelson, 2006) (Leinberger, 2008) assume that a particular household type (age, income, size, etc) will have the same housing preferences in the future as they have today. Clearly, this is an imperfect assumption that should be weighed by policy makers.

Megatrends that may influence future housing preferences

A number of megatrends have emerged that are likely to influence future housing preferences:

- Climate change
- Demographic changes
- Changing lending practices
- Increasing traffic congestion
- Infrastructure funding shortages
- Increasing energy prices.

Given the uncertainty surrounding how these megatrends will play out, it is not possible to know for sure how housing preferences may change. The answer to the question depends, in part, on upcoming policy choices. What is clear is that those policy choices should position communities to be adaptable in the face of change. The intent of the following brief summary of megatrends is not to definitively predict how megatrends may play out or how housing preferences may change, but to provide policy makers with a basic framework for considering the potential tradeoffs of planning for one future versus another.

Climate change and residential demand

The University of Washington's Climate Impacts Group (2009) estimates that the Pacific Northwest will witness average annual temperature increases of 2.2° F by the 2020s, 3.5° F by the 2040s, and 5.9° F by the 2080s (compared to average annual temperatures during the 1970 to 1999 time period). Climate change is likely to affect our region's precipitation, water storage, and hydroelectric generation, all of which have implications for the Metro region's population carrying capacity and residential demand. Many of us will witness these changes in our lifetimes.

Precipitation and water supply: Little change in total annual precipitation amounts is expected, but changes in the form (snow/rain) and seasonal timing of precipitation could have implications for year-round water supply. (Field, et al., 2007)

Decreased year-round water supply in the Portland region by the 2040s (Field, et al., 2007):

- Reduced precipitation stored as snow results in lower Columbia River flows during summer and fall.
- Decreased water supply of 4.9 million cubic meters per year.

Increased water demand in the Portland region by the 2040s (Field, et al., 2007).

- Total additional water demand of 26.5 million cubic meters per year: additional demand of 20.8 million cubic meters per year due to population growth
- Additional demand of 5.7 million cubic meters per year due to 3.6°F warming

Hydropower generation: Decreased Columbia River hydroelectric reliability (Field, et al., 2007)

- 10 to 20 percent[24] reductions in firm hydropower would be required to maintain prescribed instream water flows for Columbia River salmonids (developed under the National Marine Fishery Service biological opinion).
- Summer months: decreased hydroelectric generation accompanied by increased cooling demand (per capita and total demand) (University of Washington Climate Impacts Group, 2009)
- Winter months: increased hydroelectric generation accompanied decreased per capita heating demand. (University of Washington Climate Impacts Group, 2009)

[24] *"Firm" hydropower refers to a conservative estimate of hydropower capacity that can be used for planning purposes.*

Stormwater infrastructure: Stormwater facilities built using mid-20th century rainfall records may be subjected to different precipitation regimes in the future (University of Washington Climate Impacts Group, 2009). Peak capacity may need to be increased in order to handle an increase in extreme weather events.

Possible implications for residential demand

- Higher water prices could reduce demand for large lot residences, which typically require watering during summer months. This, in turn, affects the sizing of the water supply system that is based on peak usage in summer months.
- An increased likelihood of winter flood and landslide events could influence the desirability of different locations for residential uses.
- New federal or state regulations aimed at curbing greenhouse gas emissions may affect housing or transportation costs, thereby influencing residential preferences.

Demographic change and residential demand

Demographers (Chiswick & Miller, 2003) (Masnick & Di, 2003) (Riche, 2003) generally point to a few noteworthy trends for population growth in the United States over the upcoming decades:

- For the first time in United States history, the population will be fairly evenly distributed amongst different age cohorts. In the past, there were progressively fewer people at more advanced ages.
- A greater proportion of households will be without children.
- Minorities will make up a greater proportion of the population.

Possible implications for residential demand: Beyond these generally agreed upon trends, however, it's not clear how these demographic changes may relate to housing preferences (Johnson & Cigna, 2003; Goodman, 1999). Acknowledging the shortcomings of doing so, most researchers assume that a household of a given type (income, age of householder, and number of occupants) will have the same housing preferences in the future as they have today and that as the relative share of that household type changes (e.g. more high-income, middle-aged, two-person households), so too will the demand for their historically preferred housing type (e.g. owned, multi-family). For example, some researchers have posited that an increased share of one and two-person households will translate into an increased preference for compact residential development (Myers & Gearin, 2001; Leinberger, 2008; Nelson, 2006). Such assumptions are perhaps as good as any, but should be considered in the context of other variables and megatrends.

Lending practices and residential demand

The recent global economic crisis and high foreclosure rates across the United States have made it clear that mortgage lending practices will change in the future. One likely consequence, already materializing, is the tightened availability of credit for homebuyers and developers. Anticipated regulation of mortgage markets could further reduce the availability of credit.

Possible implications for residential demand: Tightened mortgage markets could result in rental units making up a greater share of future housing stock and a trend towards smaller units and lot sizes (McIlwain, 2007). Beyond that speculation, there are too many uncertainties (at the time of this preliminary report) to determine other possible effects of the financial crisis.

Growing traffic congestion and residential demand

Anthony Downs, a noted expert on economics and transportation policy, has posited that traffic congestion is an unavoidable urban condition – a side effect of auto dependence, population growth and economic prosperity (since urban economies are organized to have most people working and commuting during the same hours) (Downs, 2004). Downs further suggests that policies, investments and fees can help to control congestion, but cannot do away with it as long as individuals seek the convenience of automobile travel.

With population growth, it is likely that traffic congestion in the Metro region will worsen in the future. A series of transportation investment scenarios conducted by Metro during the fall of 2008 (Metro, Choices: Transportation Investment Scenarios, 2008) all showed significant increases in congestion and travel delay by the year 2035, regardless of whether there is an emphasis on managing demand, expanding the highway system or expanding transit.

Possible implications for residential demand: Worsening congestion could potentially cause individuals to reassess the tradeoffs of more time spent in traffic, the costs of gasoline, the convenience of an automobile and the ability to own a larger house on a larger lot. This reassessment could result in a shift in housing preferences towards more central locations with mixed uses and access to transit.

Infrastructure funding shortfalls and residential demand

The estimated cost to build infrastructure to accommodate existing and projected job and housing growth in the three-county Portland region is $27-41 billion (Metro, Regional Infrastructure Analysis, 2008). Even if the region does not experience this projected growth, a need for $10 billion for repairs and reconstruction alone is expected. Traditional funding sources are expected to cover only about half of the total amount.

Systems development charges, the gas tax and other revenue sources are not keeping pace with rising infrastructure costs while ballot initiatives limit the ability of local revenue streams to help fund these services. Oregon's reliance on personal income taxes as the primary source of revenue has left the state particularly vulnerable to economic downturns. (See **Figure 32**) Even in prosperous times, Oregon's "kicker" law requires that surplus funds be refunded to taxpayers, making revenues unavailable for infrastructure investments. In addition, education funding has shifted from property tax to income tax revenues, further limiting the viability of current revenue sources for infrastructure funding.

The Oregon Task Force on Comprehensive Revenue Restructuring has estimated that if we continue with the same policies, the gap between city and county revenues and expenditures will continue to grow in the future (Shetterly, 2008). (See **Figure 33**) Jurisdictions within the Metro region have already experienced difficulties paying for needed public facilities and services.

Possible implications for residential demand: Given these shortfalls, it is possible that developers (and homebuyers) will need to pay a greater share of infrastructure capital costs. This shifting of cost burden could influence housing preferences, favoring development locations and patterns that have lower costs. Differences in cost-capturing policies from jurisdiction to jurisdiction (both inside and outside of the Metro region) could make some locations more desirable than others. More compact development forms, regardless of location, could be favored as a result.

Figure 32 Percent of state tax collections in 2006
Source: Oregon Taskforce on Comprehensive Revenue Restructuring, 2008

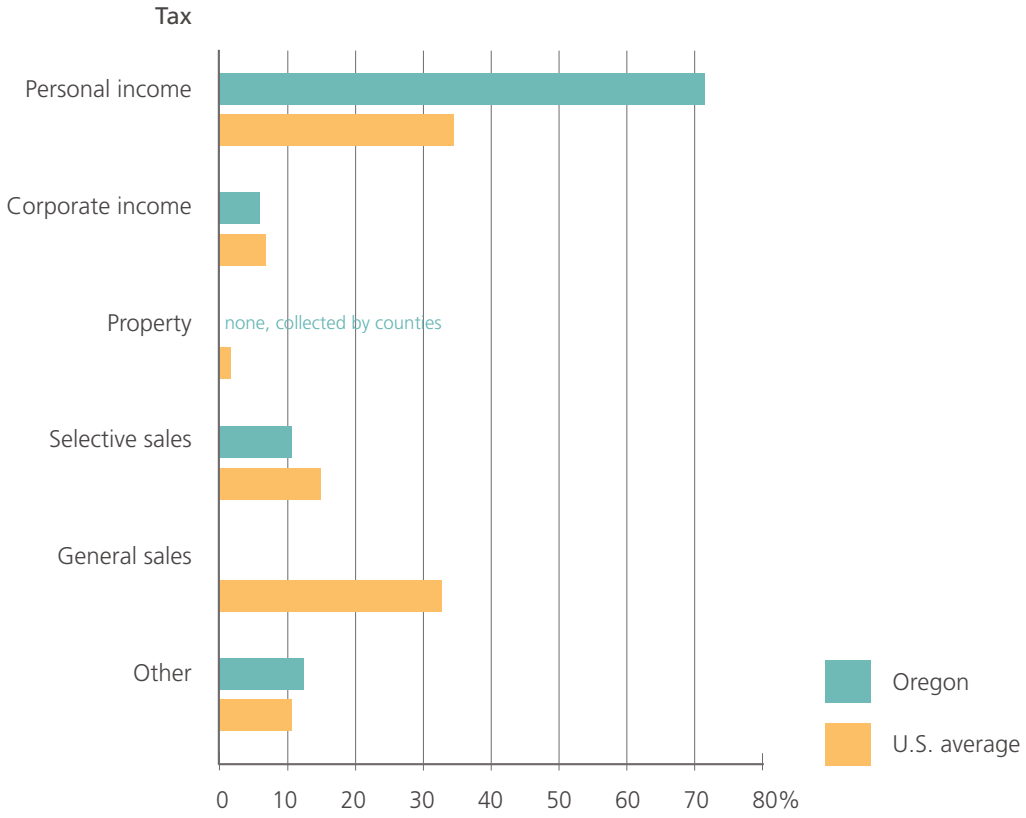
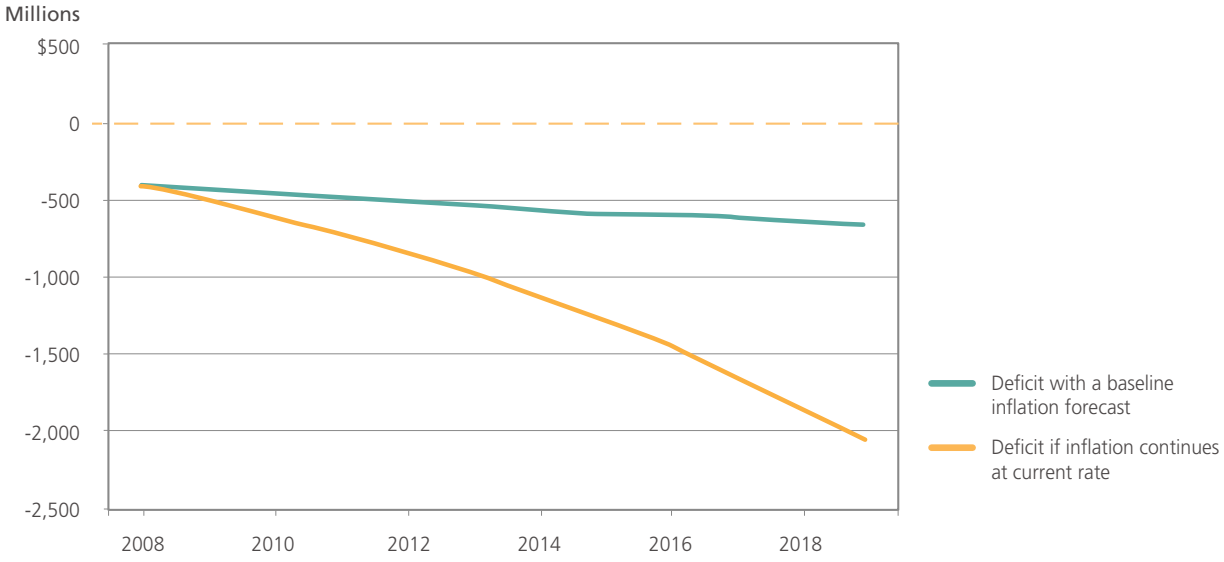


Figure 33 Projected gap between city/county revenue and expenditures under two inflation scenarios
Source: Oregon Taskforce on Comprehensive Revenue Restructuring, 2008



Energy prices and residential demand

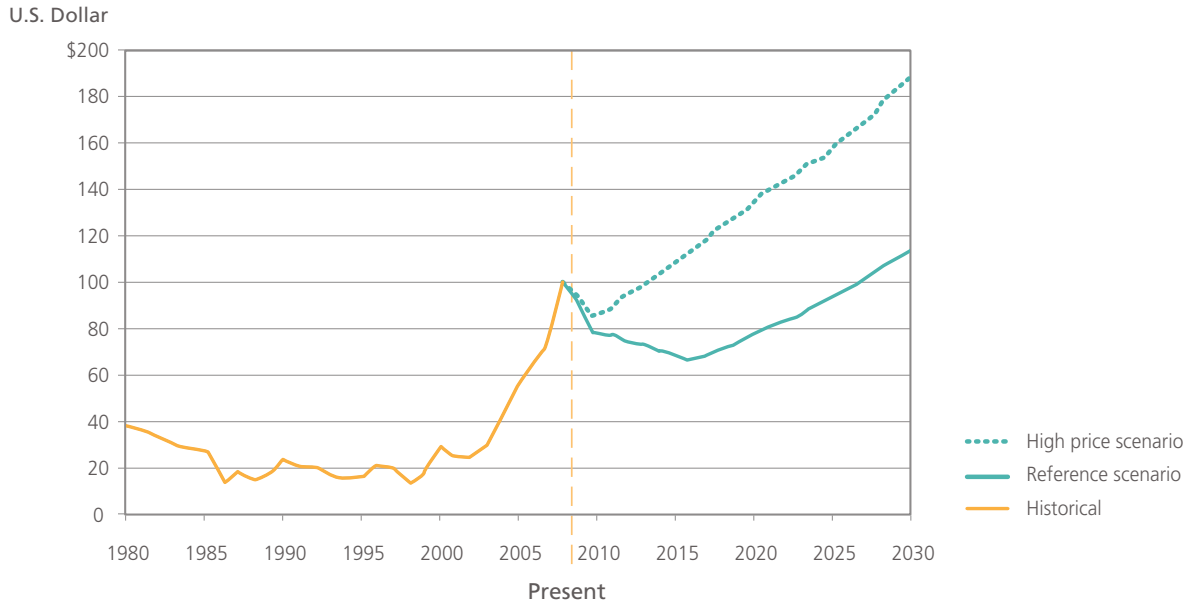
The energy costs that households incur for transportation and for operation of the household (e.g. heating, lighting) can influence a number of choices, including:

- Residential location
- Employment location
- Transportation mode
- Choice of automobile (fuel efficiency)
- Housing square footage
- Other discretionary expenditures

The U.S. Energy Information Administration (EIA) forecasts that future oil prices will increase (United States Energy Information Administration, 2008). (See **Figure 34**) The range of possible prices forecasted by the EIA indicates the high degree of uncertainty surrounding the matter. Recent oil price volatility underscores this point. Oil prices may, in fact, exceed the upper end of this range, which does not account for possible federal climate change legislation or supply disruptions because of international conflicts.

Possible implications for residential demand In an era of increasing energy prices, it is unclear where households will attempt to find savings. During the summer and fall of 2008, as gasoline prices spiked, our region's transit ridership set new records and gasoline sales dropped (TriMet, 2008). In the future, it is possible that more households could favor smaller residences with transit access as a means to manage energy costs. Technological improvements in energy efficiency are likely, however, and may help to mitigate increasing energy costs.

Figure 34 Forecasted world oil price per barrel under two scenarios
Source: U.S. Energy Information Administration, 2008



RANGE 20-YEAR POPULATION FORECAST

A primary factor that influences future housing need is population growth. The findings of Metro's current 20-year population and household forecast are summarized in this UGR. In recognition of the uncertainty surrounding future conditions, the forecast is expressed as a range. The full forecast is attached as Appendix 12.

Forecast results

Some of the basic variables that inform this forecast are birth, death and immigration rates and anticipated economic conditions. The regional economy is increasingly subject to global and national forces that are beyond the region's influence and are not easily quantifiable through standard economic tools. Economic globalization affects the flow of trade, foreign exchange rates, and the cost and availability of foreign and domestic skilled and unskilled labor. Population growth in the region continues to reflect the region's status as one of the nation's more desirable metropolitan areas; in the early part of this decade, our region's population continued to grow even as employment stagnated during the recession. (See **Figure 35** and **Table 34**) These are but a few examples of the many factors that will ultimately affect both population and employment trends in the region.

Figure 35: 2007 – 2060 Population forecast, Portland, Beaverton, Vancouver PMSA,
Source: Metro, U.S. Bureau of Labor Statistics, 2009

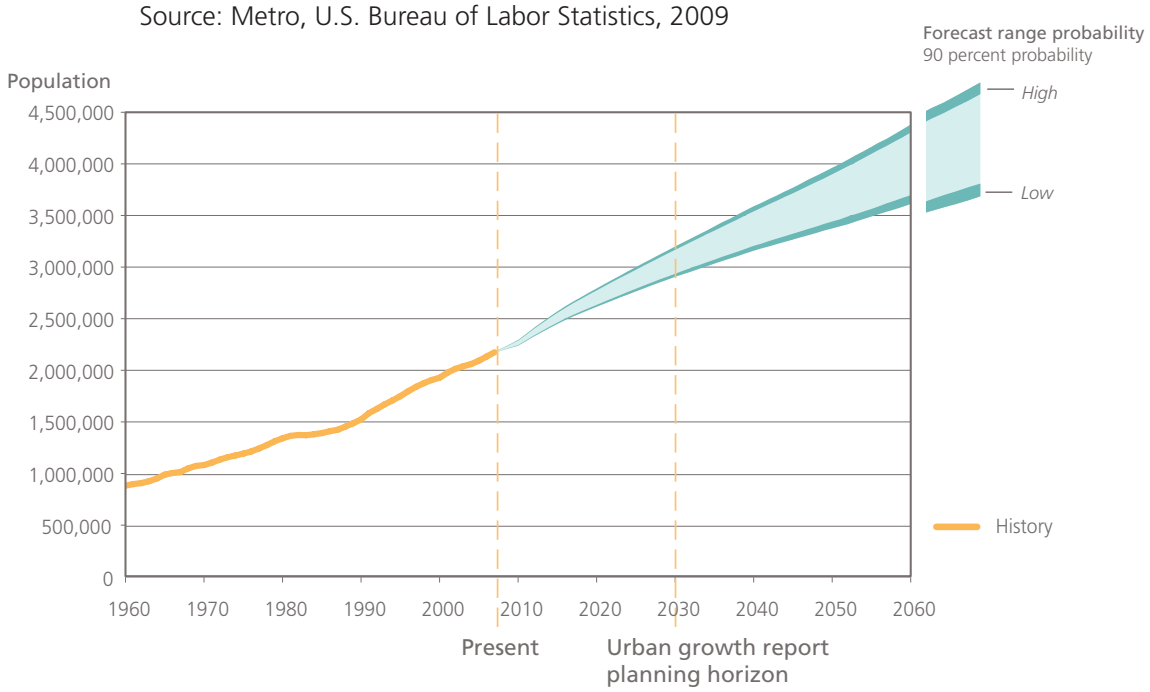


Table 34: Population range forecast and annual percentage rate change from year 2000, Portland, Beaverton, Vancouver PMSA,
Source: Metro, 2009

Year	Low end of range	High end of range
2000 *1,927,881 Actual*		
2030	2,903,300	3,199,500
	1.37% APR	1.70% APR

Factors that might contribute to a high or low forecast: Our region is not immune to the recession and other recent economic distress. In the short term, it is expected that job growth will slow in our region. Employment sectors that tend to be most sensitive to downturns in business cycles include construction, manufacturing and professional business services. However, by the year 2020, growth is expected to have returned to average long-term trend (compared to older forecasts).

High

- The Portland region's economic base includes a higher than average manufacturing sector with strong high-tech representation which could bounce back quicker than the rest of the country.
- The Portland region's cost of living and cost of doing business stays lower than other metropolitan regions on the West Coast.
- The Portland region and the Pacific Northwest remain attractive to the creative class.
- High energy prices and climate change mandates drive residential growth to more central locations.
- Green industries expand aggressively.

Low

- The current recession continues for an extended period and the Portland region emerges slower than the rest of the country.
- International immigration slows.
- Lack of a major research university.
- Insufficient resources to invest in the infrastructure needed to support growth.
- Insufficient land for single-family housing pushes more families to jurisdictions outside the
- Metro boundary.
- The mortgage crisis continues slowing new home construction.

Household range forecast results

The population forecast is converted to a forecast of number of households. To do this we calculate the likelihood of future residents to create new household arrangements based on the age and life cycle of the future population, derived from Census information and Metro's regional macro-economic model. Household composition is expected to change over time as family sizes decrease and the average age of the population increases making single-person households more prevalent in the future. The Census estimates of average household size for the statistical area was 2.57 in the year 2000, based on demographic changes it ends up at 2.45 in 2030. Based on these changes in household size, the resulting household forecast range is shown in **Table 35**.

Table 35: Household forecast and annual percentage rate change from year 2000, Portland, Beaverton, Vancouver PMSA
Source: Metro, 2009

Year	Low end of range	High end of range
2000 *742,300 Actual*		
2030	1,181,300	1,301,800
	1.56% APR	1.89% APR

Possible implications of planning for the high or low end of the range forecast: There may be risks and costs associated with planning for the **high** end of the range forecast if actual population growth occurs at a slower rate:

- Infrastructure, including transportation facilities may be overbuilt, adding financial costs.
- Expensive infrastructure investments could be made in locations that are not supported by the housing market.
- Construction of transportation facilities in urban growth boundary expansion areas would increase impervious surface coverage and have a detrimental impact on rivers, streams and other bodies of water.
- Large urban growth boundary expansions could result in increased price pressure on nearby agricultural lands, making profitable farming less viable.
- Large urban growth boundary expansions could detract attention and investments from the region's centers and corridors.

There may be risks and costs associated with planning for the **low** end of the range forecast if actual population growth occurs at a faster rate:

- Public services, infrastructure and transportation facilities may be undersized, resulting in a decreased level of service and increased traffic congestion.
- Transportation rights-of-way may become exorbitantly expensive if their purchase is postponed.
- A portion of unexpected residential growth may occur in established single-family neighborhoods inside the boundary.
- A portion of unexpected residential growth may occur in neighbor cities and Clark County, Washington. Past experience indicates that many of these households would commute back inside the boundary, resulting in increased traffic congestion and increases in greenhouse gas emissions.

However, some of the risks of planning for either the high or low ends of the range forecast are mitigated by the fact that Metro is required to re-evaluate growth and capacity every five years, allowing for regular "course corrections."

Possible implications of climate change for population forecast: Though this forecast uses state-of-the-art methodologies, there remain additional factors that could influence future population growth, the effects of which are difficult to predict. Though impossible to forecast with precision, these additional factors should be considered in growth management policy discussions. As discussed previously, one such factor is climate change, which may adversely impact some regions more than others, having the potential to influence human migration patterns throughout the world (Kalin, 2008).

While there may be an optimistic temptation to believe that the Pacific Northwest will fare better than other regions (and thereby attract more population growth than forecasted), there is much that is not known about the possible effects of climate change on interregional or international human migration. Acknowledging this uncertainty, it is a worthwhile exercise for policy makers to deliberate the possible risks or benefits of planning for either the higher or lower ends of the forecast.

NARROWING THE FORECAST TO THE METRO URBAN GROWTH BOUNDARY

The forecast begins with the seven-county statistical area, and then must be narrowed to the area within the Metro urban growth boundary. To do this, Metro applies a capture rate, based on historical experience, to the larger forecast and a vacancy rate to identify the range of dwelling unit demand.

Capture rate: Capture rate is defined as the share of future households expected to locate within the Metro urban growth boundary (with the remainder then locating elsewhere within the statistical area). The capture rate assumption (61.8 percent) in this analysis is based on historical data from 1980 to present. ORS 197.296(5)(2) directs Metro to base assumptions on the last five years of data unless a longer timeframe provides more accurate or reliable information. The last five years comprised a period of extreme economic turmoil, therefore Metro has chosen to use the last 20 years of data to inform the capture rate. (See **Table 36**) MetroScope scenarios also produce a forecast of Metro urban growth boundary capture rate that can inform future policy choices, the rates derived from the set of assumptions (described in Appendix 2) for this urban growth report are included in the "Performance" section of this report.

Table 36: Metro urban growth boundary 20-year capture rate, Portland, Beaverton, Vancouver PMSA,
Source: Metro, 2009

1980 to 2000	1981 to 2001	1982 to 2002	1983 to 2003	1984 to 2004	1985 to 2005	1986 to 2006	1987 to 2007	**Average**
62.2%	62.2%	62.2%	63.1%	62.2%	61.8%	60.4%	60.0%	**61.8%**

Vacancy rate: In order to allow for moves from one residence to another, it is assumed that a certain number of housing units would need to be vacant at any given time. Theoretically, without this vacant capacity, a household that wished to move would need to wait for the moment when another household was moving (that household's move would also be predicated on a yet another simultaneous move, and so on). A vacancy rate exists because the market cannot instantaneously calibrate the demand for housing from households and the supply of housing built by developers. Housing is developed in waves, while demand for housing is much smoother. There also exists a natural rate of vacancy to account for the loss in fidelity of information flow (one could also say it accounts for the finance and closing time needed as well for homebuyers) in the marketplace. Homebuyers and renters do not know instantaneously when housing becomes available. This lag time is the vacancy rate and allows households the time to find housing or to move from one housing unit to another as economic situations for households change over time. Maintaining a 20-year supply for housing that is updated every five years may avoid this complication.

Housing unit estimates are converted from households using the vacancy rate applied in the 2002 urban growth report: four percent. Housing units are not the same as the number of households. The definition of housing units introduces differences in housing types, i.e., single family, multifamily, and manufactured housing as dwelling types that should be considered under existing housing need statues (ORS 197.296). The vacancy rate that we assume is therefore the natural rate of vacancy and not the measurement of economic business cycles such as the boom-and-bust housing cycle the nation is currently experiencing.

Dwelling unit demand range: The result of calculating the percentage of people who will settle within the three metro area counties, capture rate (61.8 percent based on historical experience), to the larger forecast as well as a vacancy rate (four percent, as used in the 2002 urban growth report) is a range of dwelling unit demand over the 20-year period within the boundary, as shown in **Table 37.**

Table 37: Dwelling unit demand range in Metro urban growth boundary, 2007-2030 [25]
61.8% capture rate, 4% vacancy rate
Source: Metro, 2009

Low end of forecast range	High end of forecast range
224,000 dwelling units	301,500 dwelling units

[25] *The base year is necessarily 2007 because this represents the latest Regional Land Information System (RLIS) buildable land data.*

SUPPLY (CAPACITY) RANGE

Determining the total residential capacity of the current UGB is not as simple as adding up the maximum zoned capacity of all parcels. Many parcels inside the UGB are developed below maximum allowed density or are partially developed. Some parcels have buildings that have less value than the underlying land and are ripe for redevelopment. Others have viable buildings that are not likely to be redeveloped and simply do not fully utilize the allowed density. Due to market conditions, some of these parcels are more likely to see infill or redevelopment ("refill") than others. Similarly, in the case of some vacant buildable lands, there is a very limited market for their development. Limited market feasibility could be the consequence of the location of the parcels, lack of governance, inadequate funding for infrastructure, macroeconomic conditions, credit availability, individual entrepreneurship and public actions taken inside the UGB, in Clark County, Washington and in neighboring cities.

Capacity changes over time as real estate market conditions change. A primary purpose of this urban growth report is to begin a discussion of how the region might make more of its existing capacity market-feasible, both on vacant buildable land and through refill. This purpose is in keeping with Statewide Planning Goal 14's guidance to determine that growth cannot be "reasonably" accommodated inside the existing UGB before expanding it. The region's stated desire to pursue an outcomes-based approach can spark a discussion that can lend greater definition to the word "reasonable":

- How might different choices support or confound the region's attempts to achieve desired outcomes?
- What are the possible tradeoffs of those choices?

HISTORIC USE OF RESIDENTIAL CAPACITY INSIDE THE METRO URBAN GROWTH BOUNDARY

In order to begin to understand how residential capacity may be used in the future, it is useful to assess our region's historic performance. (More information on the region's past performance may be found in Appendix 10). The 2040 Growth Concept calls for encouraging growth in centers and corridors to minimize impacts on existing neighborhoods and the need for UGB expansions.

Development in urban growth boundary expansion areas

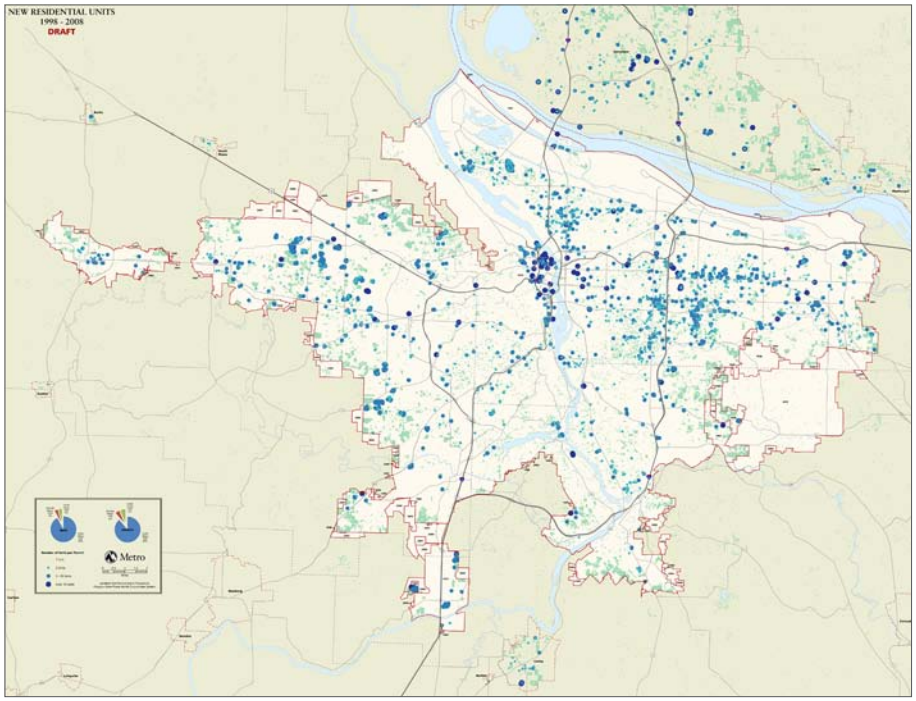
The region's original UGB was put into place thirty years ago (1979) with the purpose of encouraging the efficient use of land, creating vibrant communities and protecting our agricultural and natural heritage. The original UGB contained 227,491 acres. Subsequent expansions have added a total of 28,000 acres to the UGB and make up about 11 percent of the land area of the current UGB. These expansions have been made with the aim that they maintain these qualities while providing additional residential and employment capacity.

Permit data for the ten-year period from 1998 through 2008 [26] provide some insight into where development has happened and whether it is in keeping with the 2040 regional vision. The permit data indicate that relatively little new development has occurred in these UGB expansion areas (approximately five percent of permitted units) when compared with the amount that has occurred inside the original UGB (approximately 95 percent of permitted units). (See **Table 38**) This is despite the fact that the 28,000 acres of UGB expansions comprise 11 percent of the land area of the current UGB. Also of note, the majority of the development that has occurred in post-1980 UGB expansions has been single-family development. There appears to be a limited market for higher density housing products in UGB expansion areas.

Table 38: Dwelling unit permits by UGB expansion area, 1998-2008
Source: Construction Monitor, Metro 2009

	Single family dwelling unit permits	Multi-family dwelling unit permits	All dwelling unit permits
In current boundary	58%	42%	100%
In original 1979 boundary	54%	41%	95%
In 1980-1999 boundary expansion areas	4%	<1%	5%
In 2000-2008 boundary expansion areas	0	<1%	<1%

Map 6: New residential units by permit type, 1998-2008
Metro 2009



[26] *Caveats: A limitation of this data is that not all permitted units were necessarily built. All permit data is from the Construction Monitor and is not from Metro's Regional Land Information System, limited efforts were made to remove duplicate records and correct unit values. Locations of building permits are derived by geocoding address information and include an inherent level of error. Permit and unit summaries include the entire 1998-2008 data set, not limited to the range of historic annexations.*

Development in centers and corridors

Over the past ten years (from 1998 to 2008), approximately 32 percent of the residential building permits issued in the current UGB were in the region's central city, centers, and corridors, the very places identified in our long-range vision, the 2040 Growth Concept. These permit data indicate that, of the various 2040 design types[27], the region's designated corridors have accommodated a significant share of residential growth. Corridors, accommodating about 15 percent of new residential units (permits) over this time period, are followed by town centers at around eight percent, the Central City at about seven percent, and regional centers at around two percent. (See **Table 39**)

Table 39: Dwelling unit permits by 2040 design type, 1998-2008
Source: Construction Monitor, Metro 2009

	Single family dwelling unit permits	Multi-family dwelling unit permits	All dwelling unit permits
In current boundary	58%	42%	100%
Within central city	0%	7%	7%
Within regional centers	<1%	2%	2%
Within town centers	2%	6%	8%
Within corridors	6%	10%	15%
Within centers and corridors	8%	24%	32%

Redevelopment and infill (refill)

Not all residential development occurs on vacant land – a significant portion is considered redevelopment and infill, or "refill". Redevelopment means demolishing an existing structure to build a new dwelling. An example of redevelopment would be tearing down an old house to build four townhouses in its place. Infill means building on land that is classified as developed, but does not require tearing down an existing structure to build a new one. For example, a homeowner owns a half acre lot with one house built on it and the lot is classified as developed in Metro's Regional Land Information System (RLIS). Zoning allows the lot to be split into two lots so the homeowner divides the property and builds a second house on the vacant land. This is infill because the original house is still standing.

The "refill rate" is the percentage of new dwelling units that are built on land that is already considered to be developed, instead of on vacant land. It is important to note that the comparison is between the number of refill units to the total of all new units built over a particular time period. So the refill rate is a proportion of new development, not a proportion of the land base.

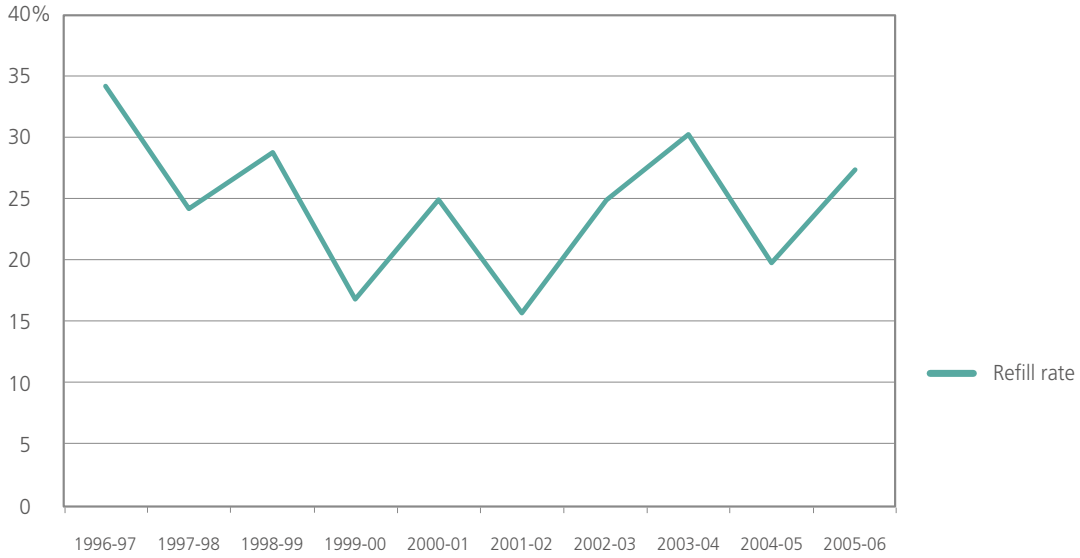
The subject of residential refill is significant in terms of both the legal and policy contexts. Metro accounts for a "refill" factor when estimating the residential land supply available within the urban growth boundary per the requirements of ORS 197.296 and 197.301. For instance, if the residential refill rate is estimated at 20 percent and Metro's 20-year growth is assumed to be 215,000 dwelling units, this means 20 percent of 215,000 units (43,000) will be built on land Metro considers

[27] *Applied design types, as mapped by boundaries identified by local jurisdictions where possible.*

previously developed. If the refill rate were 100 percent, all residential development would occur on developed land and Metro would require no additional vacant land for housing. Conversely, if the refill rate were zero, all future residential development would require vacant land. Clearly, estimates of the present residential refill rate and projections of its future value strongly influence calculations of how much residential land will need to be included within the UGB to meet future residential demand.

Figure 36 depicts the residential refill rate from 1996-2006. As can be seen in the chart, the rate varies significantly from year to year. More information on Metro's analysis of redevelopment and infill may be found in Appendix 9.

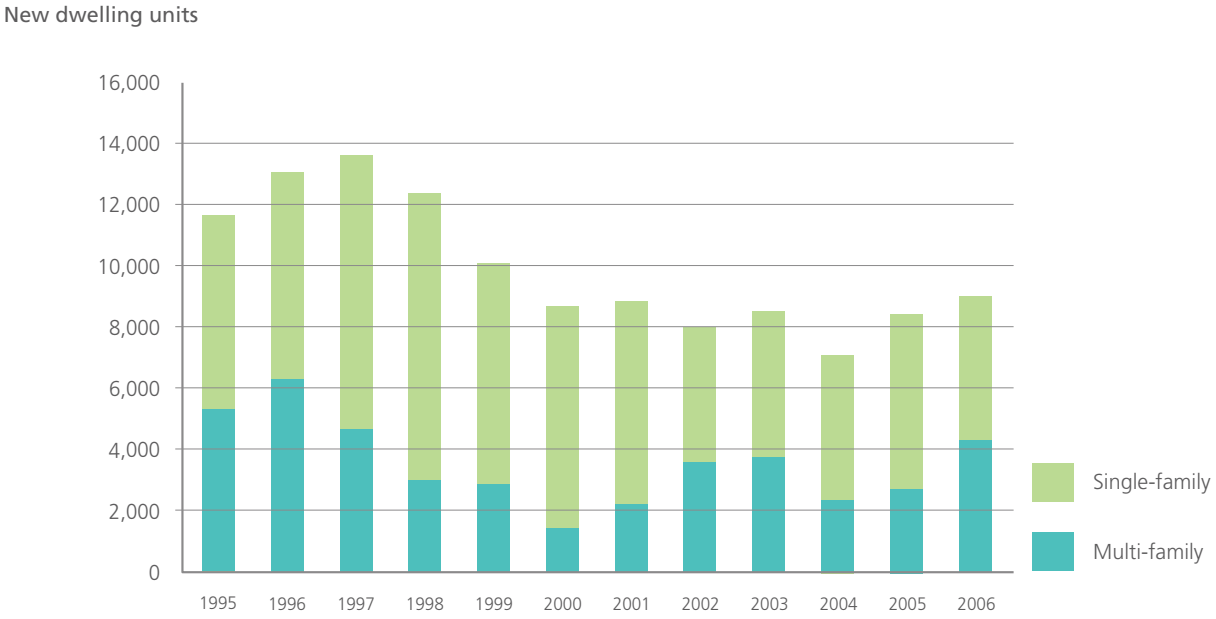
Figure 36: Residential refill rates over time
Source: Metro, 2009



Mix of housing types

One way to create the activity levels necessary to sustain small businesses and vibrant downtowns is to encourage the construction of a greater share of multi-family residences in centers, corridors and main streets. In our region, the share of new construction that is multi-family has varied from year to year: from as low as 17 percent in 2000 to as high as 48 percent in the years 1996 and 2006 (see **Figure 37**). A higher share of multi-family production is generally associated with healthy economic activity, higher redevelopment rates, smaller lot sizes and a shift in housing demand toward central urban locations. All of these can be influenced through future policy and investment choices.

Figure 37: New single-family and multi-family dwellings in the UGB 1995 – 2006
Source: Metro, 2009

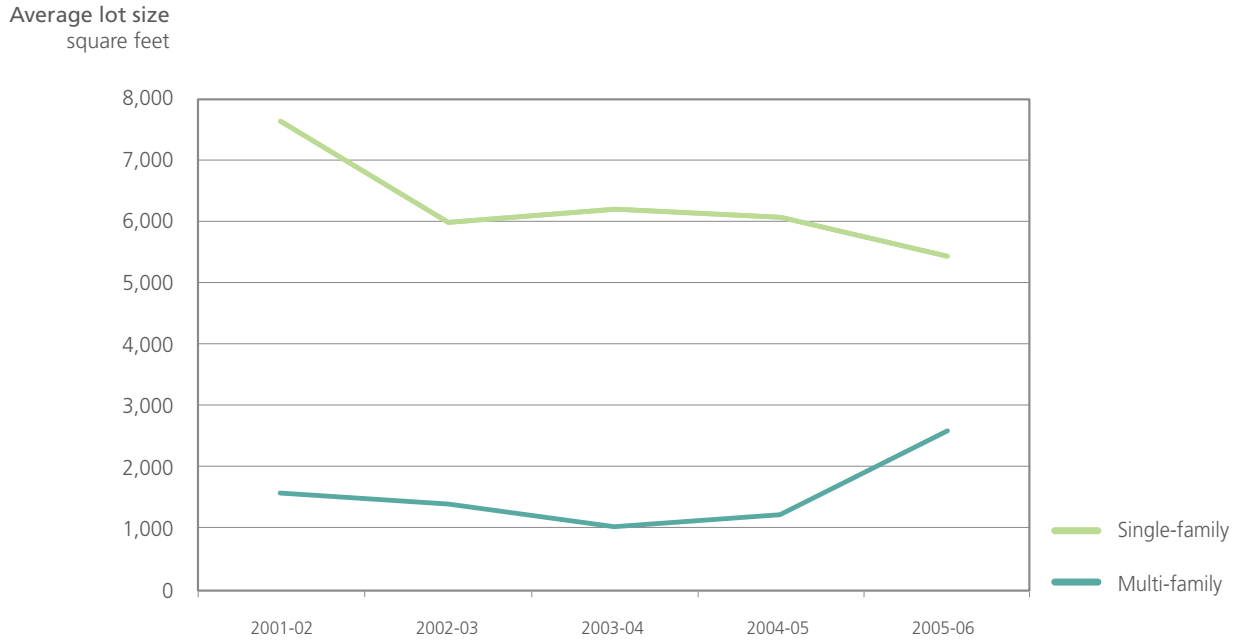


Density

Smaller average lot sizes indicate that the region is using its land more efficiently. During the 2001 to 2006 time period, average lot sizes for new residential construction inside the Metro UGB varied from 4,000 to 4,800 square feet, with a weighted average of about 4,400 square feet. This is a reduction from the 1997 to 2001 time period when the average lot size for new construction was 5,700 square feet.

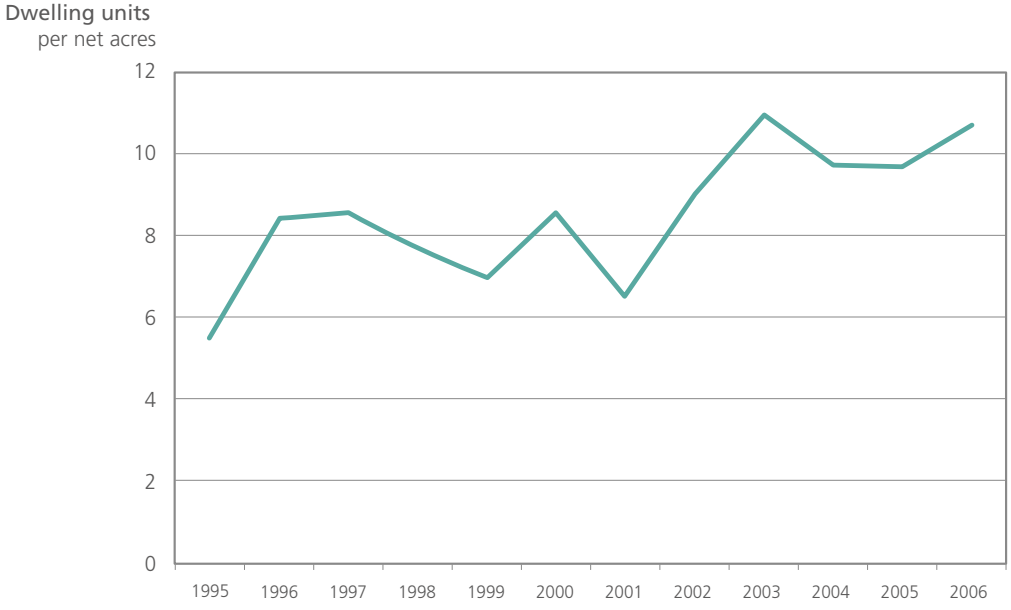
Figure 38 shows the trends in lot sizes for new single-family and multi-family construction. On average, new multi-family dwellings used about one quarter of the amount of land per unit that new single-family dwellings did, but in recent years there has been a trend of increasing multi-family lot size and decreasing single-family lot size.

Figure 38: Average lot sizes per unit for new construction in the Metro UGB (2001-2006)
Source: Metro, 2009



Average densities for new dwelling units have increased since 1995 as shown in **Figure 39.**

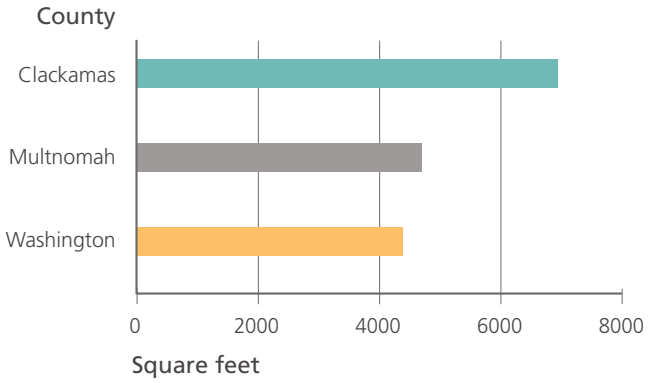
Figure 39: Average density per net acre of new dwelling units in the Metro UGB (1995-2006)
Source: Metro, 2009



Trends in single-family residences (newly built homes from 2000-2005)

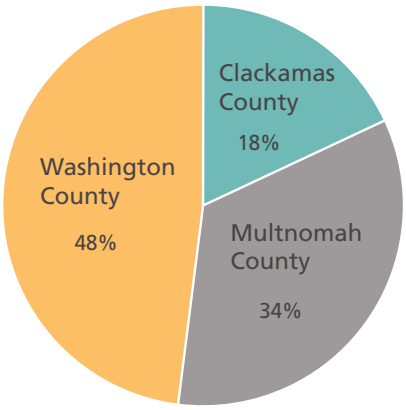
Average lot sizes for new construction vary considerably from county to county with lot sizes in Multnomah and Washington counties averaging about 4,500 square feet, about 2/3 of the average lot size in Clackamas County (7,000 square feet). (See **Figure 40**) These data are for entire counties, not just areas inside the UGB.

Figure 40: Average lot size for new single family construction, 2000-2005
Source: Metro, Clackamas, Multnomah and Washington County assessment and taxation data, 2008



Almost half of the newly built (2000 to 2005) single-family residences are in Washington County.

Figure 41: Percentage of newly built single-family houses, 2000-2005
Source: Metro, Clackamas, Multnomah and Washington County assessment and taxation data, 2008



Affordability

In the past, the general rule of thumb has been that housing is affordable if it costs no more than 30 percent of a household's income. However, for a number of reasons, affordability is a concept that is hard to define.

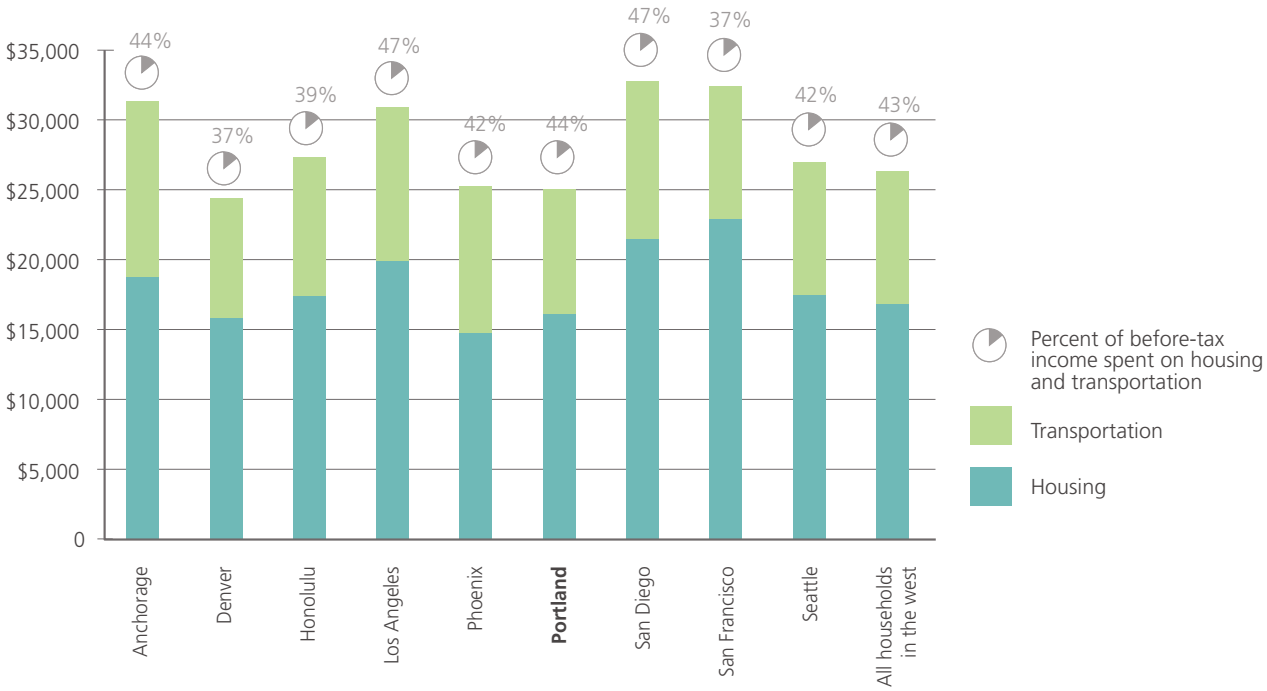
To get a sense of affordability, housing and transportation expenditures can be expressed as a percent of income. However, this metric has some shortcomings: some people are relatively wealthy despite having little current income and many people treat their home as not just shelter but an investment. With those caveats in mind, by this measure the Portland region is about average when compared with other cities in the western United States.

In 2005[28], the average household in the United States spent $15,167 on housing and $8,344 on transportation[29], for a total average expense of $23,511 per year.

In the Portland region, the average household spent $16,039 on housing and $8,845 on transportation, for a total of average expense of $24,884 per year. While this is higher than the national average, it is lower than average for metropolitan areas in the western United States.

When housing and transportation expenditures are expressed as a percentage of household income, the Portland region is average among cities in the western United States. As shown in **Figure 42** , in 2005, the average household in the Portland region spent about 44 percent of its income on housing and transportation.

Figure 42: Average annual housing and transportation expenditures per household and share of household income in western United States (2005)
Source: United States Bureau of Labor Statistics, 2009

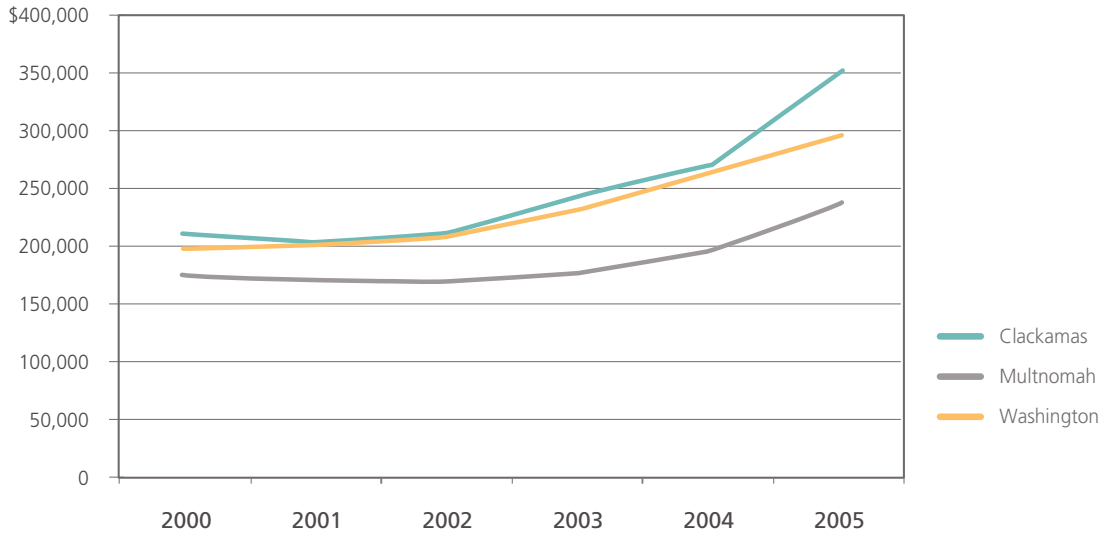


[28] *The year 2005 is used because data for the Portland region is only available through that year. The source of data is the United States Bureau of Labor Statistics.*

[29] *Included here are all housing and transportation expenditures tracked by the Bureau of Labor Statistics. Housing costs include, for example, rent, mortgage payment, homeowners insurance, utilities, and furnishings. Transportation costs include, for example, vehicle purchase, gasoline, insurance, and transit fares.*

While the median price for newly built single-family homes went up in all three counties, the largest increase occurred in Clackamas County. The data collected for this analysis end in 2005. Recent economic events have caused declines in median home sale prices that are not illustrated here. (See **Figure 43**)

Figure 43: Median home sale price for newly built homes, 2000-2005
Source: Metro, 2008. Analysis of single family home sales, 2000-2005.



Though escalating housing prices are often attributed to a constrained land supply, historic experience does not indicate that UGB expansions are an adequate means of ensuring housing affordability. New market rate houses in UGB expansion areas are often larger and more expensive than new market rate housing in established urban areas. **Table 40** compares the size, price, and type of residences constructed and sold after 1997 in the 1997 UGB with those in post-1997 UGB expansion areas. The median sales price of new homes in post-1997 UGB expansion areas is 140% that of new homes in the 1997 UGB. This can be explained by the larger median size of the homes and lots in post-1997 UGB expansion areas as well as the apparent lack of multi-family housing options. These expansion areas would not appear to offer adequate market rate choices that match the budgets of households with median to low incomes, particularly when higher transportation costs are considered.

Table 40: Comparison of sales of newly constructed residences in the 1997 UGB and post-1997 UGB expansion areas
Source: Regional Land Information System (RLIS) tax lot data

	1997 UGB	Post-1997 UGB expansion areas
Median sales price	$262,000	$367,500
Average square feet of residence	2,008	2,801
Average lot square feet	4,622	13,906
Total residential tax lots (with sales data)	64,724	1,432
Total number of multi-family residences built and sold post 1997	17,073	0
Percent multi-family residences	26%	0%
Cost per sq ft of median priced residence	$130	$131

Analysis only includes tax lots zoned single-family, multi-family, mixed-use, and rural residential
Only tax lots with a residence constructed and sold after 1997 are included
Limitations: analysis excludes tax lots that have no associated sales data

Implementation of the 2040 Growth Concept through local zoning changes

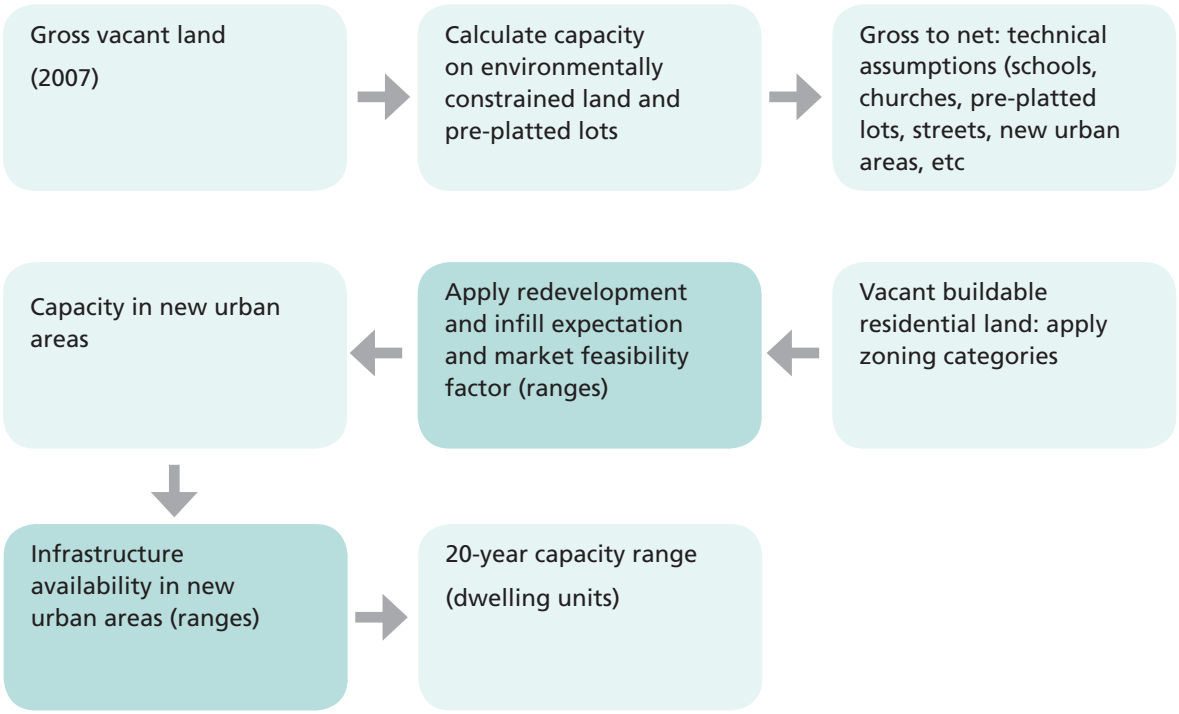
Local governments have taken substantial steps to implement the region's vision for its centers and corridors. From the years 2000 to 2007, many vacant lands have been rezoned as mixed-use residential, adding capacity for an additional 18,254 dwelling units. These types of actions are critical for protecting the character of existing, single-family neighborhoods.

ANALYZING THE RESIDENTIAL CAPACITY RANGE

Residential capacity within the existing UGB is based not just on the zoned capacity of vacant buildable land, but also on the amount of redevelopment and infill that is likely to occur within the 20-year time period. In some locations, the zoned capacity may exceed the current market feasibility of development. The amount of market-feasible residential capacity can be increased if governments take policy actions and make targeted public investments. This analysis distinguishes between capacity that may be counted on within the next 20-year period and that which relies upon changing market dynamics. Market dynamics can shift because of a variety of public and private sector influences; local investments in incentives and infrastructure can play an important role.

There are several steps that make up the process of calculating capacity at the regional scale. **Figure 44** depicts the process. The darker boxes indicate the areas that create the supply range and are most relevant for policy discussion. The analysis methodology is described in brief here and in more detail in Appendix 6.

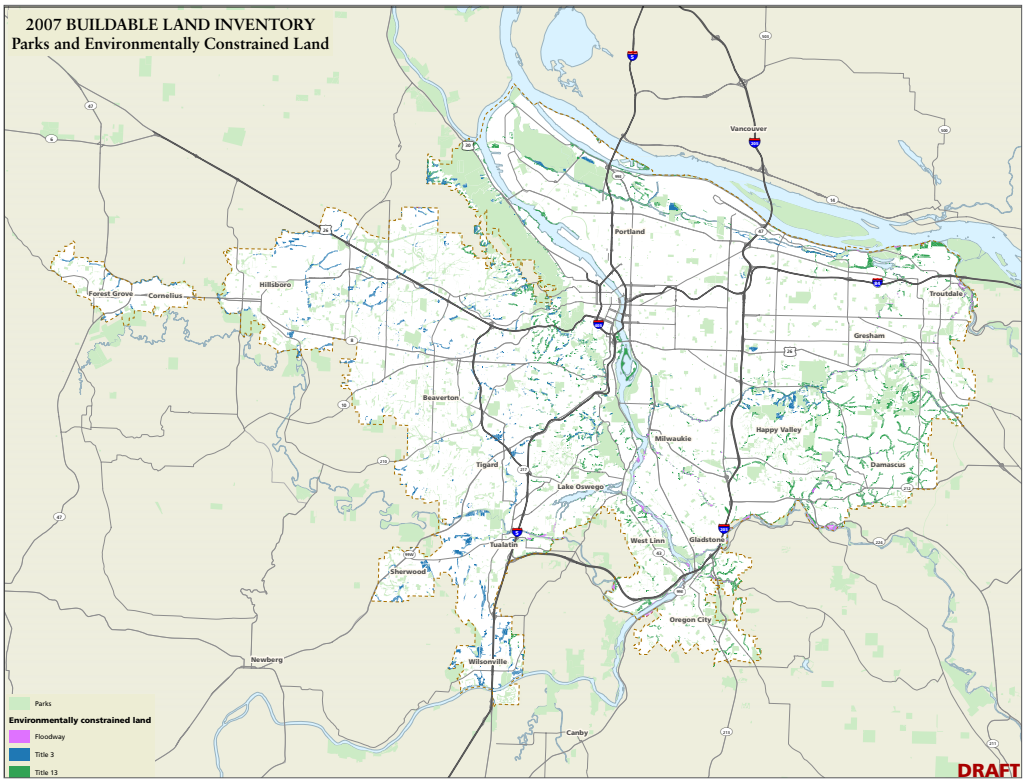
Figure 44: Steps in analyzing residential capacity
Source: Metro, 2009



Gross vacant land: Vacant land inside the current (as of January 2009) Metro UGB is calculated based on exacting manual measurements of vacant land using photogrammetric techniques and supplementary GIS data (including building permits and assessor tax lot information).

Environmental protection: The region's citizens value open space, habitat protection, and clean water protection for their contributions to the quality of life they enjoy. (See **Map 7**) The first step in analyzing capacity is to subtract from the gross vacant land those areas protected by Title 3 (water quality and floodplains) and Title 13 (habitat protection) of Metro's Urban Growth Management Functional Plan. Recognizing habitat friendly development and the incentive based nature of Title 13, development capacity in habitat conservation areas is estimated to be about 80 percent of zoned capacity. Protecting water quality (Title 3) is achieved through more stringent development standards, reflected in the capacity analysis by counting only one dwelling unit per tax lot.

Map 7: Parks and protective overlays
Source: Metro, 2009



Gross-to-net technical assumptions

Land owned by governments or covered by utility easements can be presumed to be off-limits for residential development and is subtracted from the gross vacant buildable land supply. Pre-platted residential lots can be expected to develop at the density at which they are platted, regardless of the underlying allowed zoning.

Schools, parks and churches are important elements of great communities. Therefore, assumptions based on population growth are made to set aside land from the gross vacant buildable land supply to meet these community needs.

Schools: According to the 2007 vacant land supply inventory, school districts in the Metro UGB already own 1,000 acres of vacant land within the UGB. The regional forecast includes a projection of student population and enrollment for residents inside the UGB. A land need forecast for future schools is calculated from the regional forecast and student-acre ratios. Metro met with school district superintendents and facility planners during the process of producing the Regional Infrastructure Analysis in 2008. The students-per-acre ratios reviewed for the infrastructure analysis are lower than those used in this capacity analysis. However, due to the extensive review of school assumptions for the 2002 UGR, this 2009 UGR retains the higher student/acre ratios identified in 2002.

During review of the preliminary UGR, school district representatives requested that additional research be completed on school district growth plans and future capacity needs. Metro collected the most recent plans available from all of the school districts in the region. (This information is included in Appendix 6.) School districts in Oregon with an enrollment of 2,500 students or greater are required by ORS 195.110 to create a long range facility plan that outlines expected growth in enrollment as well as strategies to accommodate that growth.

In accordance with this statute, a majority of school districts in the Portland metropolitan region have developed long-range plans that propose physical, operational and financial strategies to manage and accommodate projected changes in enrollment. Some school districts in the region are not required to develop these plans and have not done so. Depending on the particular physical, financial and expected growth characteristics of each school district, plans for accommodating projected increases in enrollment vary. Recommended strategies proposed by school districts in the region range from building new schools to using portable classrooms and renovating existing facilities to redrawing school boundaries to increase capacity in high need areas.

This forecast, performed at a regional scale, identified no additional land need other than what schools presently own; thus no additional set aside is assumed except for the 1,000 acres that schools have already land banked. Review of the 16 school districts' plans shows that some anticipate growth, others see declining enrollment, and none look out over the 20-year timeframe that this capacity analysis considers. School districts are able to take advantage of special provisions under the Major UGB Amendment process to petition the Metro Council to bring land into the UGB to meet school needs that are not anticipated in five-year UGB review cycle. The Major Amendment Process may be a more appropriate means of addressing specific school district needs than can be accommodated through UGB expansions.

School districts may also wish to consider the potential for new approaches to addressing school needs, such as facility sharing with other local service providers, cooperation across district boundaries, and creative re-use of existing buildings.

Churches: The per capita estimate of future land need for this category is based on 1.4 acres per 1,000 future residents (source: 1997 urban growth report church per capita rate assumption). In this capacity analysis a total of 700 acres are needed to accommodate the expected increase in church and social organization land needs. However, churches already own 600 vacant acres of land within the current UGB. The net amount that is deducted from other (i.e., residential or employment) future uses is thus calculated to be 100 acres for the 20-year forecast horizon.

Parks: To calculate the UGB's capacity for residential growth, this urban growth report deducts the amount of vacant land inside the UGB that may be used for future parks (effectively, this amount of land is not available for residential development). This calculation only includes future parks that are intended for active uses, such as ball fields or playgrounds. Habitat or natural areas are not included since they are already deducted from the vacant land inventory.

There are several possible ways to calculate the number of acres that may be used for future parks. One approach would be to use a level-of-service standard for parks. However, an agreed upon regional standard does not exist. Since no alternative approach has been suggested, this urban growth report uses the same methodology that was used for the 2002 report. This methodology estimates park land acquisition revenues, based on system development charges (SDCs).

To inform the analysis in this report, current park SDC rates were inventoried for each city in the region. (Information may be found in Appendix 6.) Most of the local governments that levied parks SDCs in 2002 have increased their rates. In addition, two cities, King City and Rivergrove, have started levying parks SDCs since 2002. Also, a few local governments are currently employing a system whereby different fees are levied in different locations.

The 2002 urban growth report estimated that 1,100 acres of vacant land inside the UGB would be used for future parks. Like other possible approaches to estimating future park acreage inside the UGB, this SDC approach has its limitations and should be taken as a reasonable estimate rather than a precise accounting. Due to these limitations (summarized below), the updated inventory of park SDC rates does not provide a compelling reason to change this assumption:

- Each city will respond to residential growth in different ways. For instance, some cities may not have much vacant land left for parks, but will use SDC revenues to make capital improvements to existing parks.
- Different cities will witness different amounts of residential growth. A local government with high parks SDCs may not see a lot of growth over the next 20 years, while a local government with low SDC rates may see tremendous growth, or vice versa.
- While a majority of local governments around the region have increased their parks SDCs over the last several years, this does not mean that there is additional money for land acquisition.

  It is likely that the increased rates are an attempt to more fully recuperate land acquisition or capital improvement costs and that updated SDC rates still do not cover all costs.

  The cost of flat, vacant land will continue to increase. SDC revenues will not necessarily keep pace with land values.
- Funding for parks is and probably will continue to be limited. Metro's 2008 Regional Infrastructure Analysis found that the cost and availability of land is one of the biggest challenges in providing sufficient parks to accommodate future growth.
- A line item in an urban growth report for parks will not necessarily result in parks for citizens to enjoy. The effect is simply that the vacant land supply assumption is reduced, increasing the potential need for UGB expansions. A UGB expansion will not address park needs in existing urban areas, which are likely to see substantial growth.

  There is a Major UGB Amendment process that can be initiated by local jurisdictions to bring land into the UGB for park needs that are not anticipated in cyclical legislative UGB expansions (as contemplated in the context of this report). The Major Amendment Process may be a more appropriate means of addressing specific park needs that can be accommodated through UGB expansions.

Limited funding and limited vacant land in urban locations point to a need for creative and collaborative solutions that help ensure the future provision of parks throughout the region:

- Efficient use of existing land and infrastructure by taking advantage of power line easements or the space around reservoirs and water towers. For example, Tualatin Hills Park and Recreation District utilizes existing Bonneville Power Administration rights of way to operate parks and trails.
- Collaboration between multiple districts or other local governments. Sunnyside Village Green Park is a collaborative effort between North Clackamas Parks and Recreation District and Clackamas County's Water Environment Services Department that combines park facilities with stormwater management infrastructure.
- The Trust for Public Land's 2009 article on "shoehorn parks" recognizes that school facilities can be leveraged to create park capacity, but doing so requires great collaboration and commitment to success from park districts and the school system (Harnik, 2009). Popular events like Portland's Sunday Parkways demonstrate that streets can serve as temporary park space.

Streets: A portion of the vacant land supply is set aside in order to accommodate future streets to serve undeveloped land inside the current boundary. This is calculated on a per tax lot basis:

- Tax lots under 3/8 acre: assume zero percent set aside for future streets
- Tax lots between 3/8 acre and one acre: assume a 10 percent set aside for future streets
- Tax lots greater than one acre: assume an 18.5 percent set aside for future streets

The basis for these net street deduction ratios derive from previous research completed by the Data Resource Center and local jurisdictions during the 2002 urban growth report. The current street set aside rates are based on "skinny street" assumptions for a total of 4,900 acres.

New urban areas: New urban areas added to the boundary after 1997 are separated from the gross vacant land supply. The purpose is to recognize that some of the new urban areas which were brought into the boundary have yet to receive urban zoning densities – zoning, in some cases, still retains rural residential zoning densities or other rural designation. Including new urban areas through the conventional land density calculation and assuming rural densities would provide an inaccurate assessment of future residential capacity of new urban areas. A more accurate means of forecasting residential capacity for the new urban areas is to rely on the most current concept plan density assumptions, therefore these units are calculated separately as detailed below. The most up-to-date information available from local governments was used to assess capacity.

Capacity calculations

Maximum residential dwelling unit capacity is calculated from local zoning and comprehensive plan designations (comprehensive plans only for Portland and Wilsonville) and based on the net vacant buildable acres, after reflecting the technical assumptions described above. **Figure 45** shows the current generalized zoning of this vacant land (this does not include post 1997 UGB expansion capacity). The total dwelling unit capacity and density from unconstrained vacant land totals a maximum yield of 92,700 units for a dwelling unit per net acre of approximately 10.8 units per net acre. (See **Table 44**)

Figure 45: Percentage of dwelling unit capacity on vacant lands inside the urban growth boundary
Source: Metro, 2009

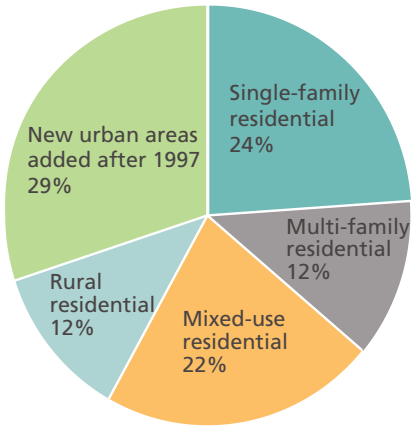


Table 44: Initial dwelling unit estimate from environmentally unconstrained vacant land
Source: Metro, 2009

Type of capacity	Number of dwelling units	Average units per acre
Rural in UGB	17,300	10 units per net acre
Single family	28,200	5 units per net acre
Multifamily	18,100	26.5 units per net acre
	63,600	7.9 units per net acre
Mixed use residential	29,100	28.5 units per net acre
TOTAL	**92,700**	**10.8 units per net acre**

Figure 46 shows the more specific zoning classes for this land and highlights where some of the capacity lands within the region. Much of the higher density capacity occurs on very few acres. For instance, the higher-density mixed-use residential (MUR) capacity consists primarily of relatively small acreages in centers with very high maximum zoned densities. A substantial portion of the dwelling unit capacity on vacant lands is in unincorporated areas in Washington County.

Figure 46: Percentage of dwelling unit capacity on vacant land by zone class
Excludes post 1997 urban growth boundary expansion land
Source: Metro, 2009

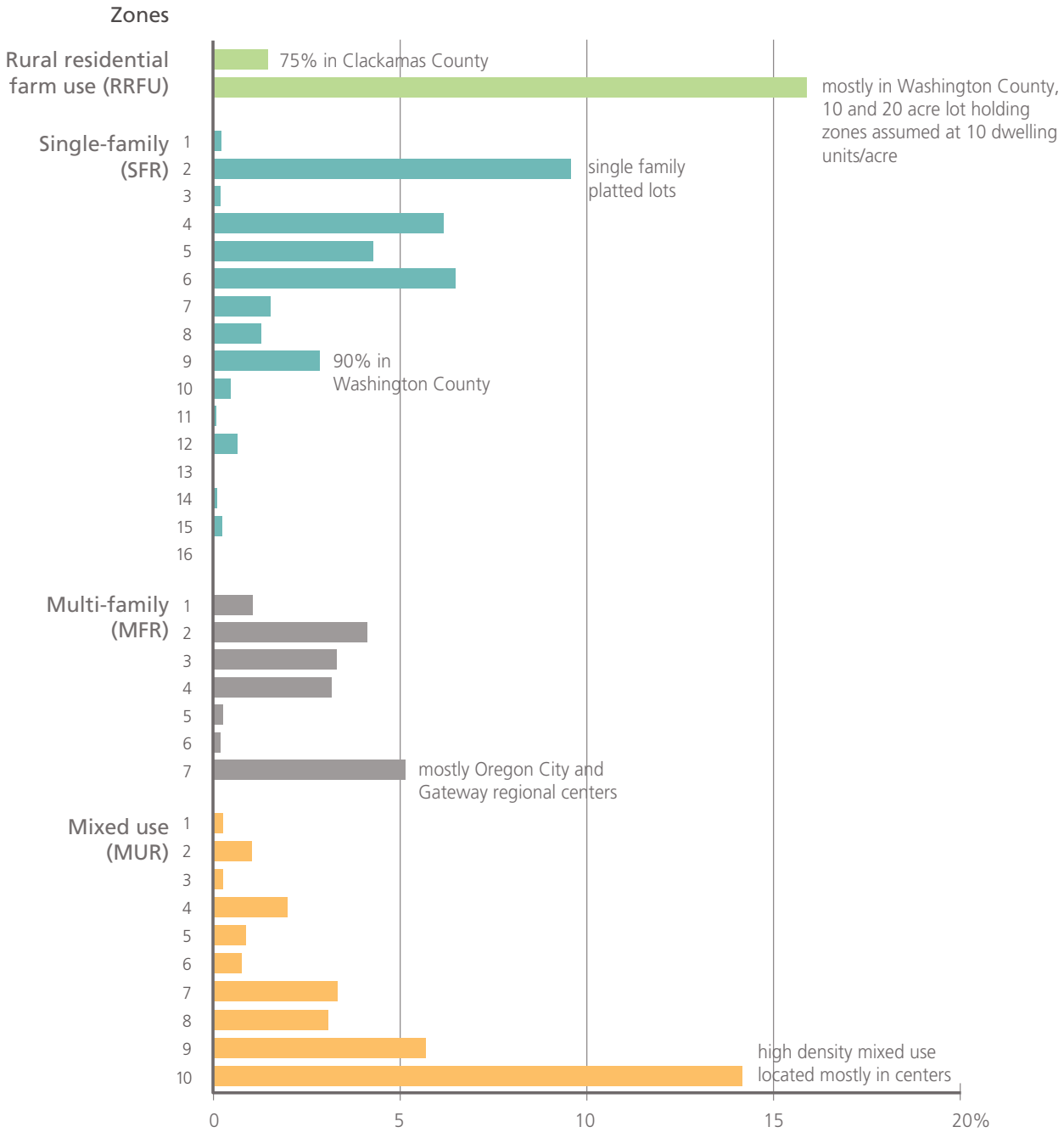


Figure 47 zoning types

Rural residential or farm use (RRFU)

Agriculture or Forestry – activities suited to commercial scale agricultural production or forestry, typically with lot sizes of 10, 20 or 30 acres or more.

Rural Residential or Future Urban - residential uses permitted on rural lands (1 dwelling unit per lot) or areas designated for future urban development, typically lots are 10 or more acres

Single family, detached housing (SFR)

1 Minimum lot size from 35,000 sq. ft.
2 Minimum lot size from 15,000 sq. ft. to a net acre
3 Lot sizes from about 10,000 sq. ft. to 15,000 sq. ft.
4 Lot sizes around 9,000 sq. ft.
5 Lot sizes around 7,000 sq. ft.
6 Lot sizes around 6,000 sq. ft.
7 Lot sizes around 5,000 sq. ft.
8 Lot sizes around 4,500 sq. ft.
9 Lot sizes around 4,000 sq. ft.

Single family, detached or attached housing

10 Lot sizes around 3,500 sq. ft.
11 Lot sizes around 3,000 sq. ft.
12 Lot sizes around 2,900 sq. ft.
13 Lot sizes around 2,700 sq. ft.
14 Lot sizes around 2,500 sq. ft.
15 Lot sizes around 2,300 sq. ft.
16 Lot sizes around 2,000 sq. ft.

Multi-family, single family and townhouses permitted outright (MFR)

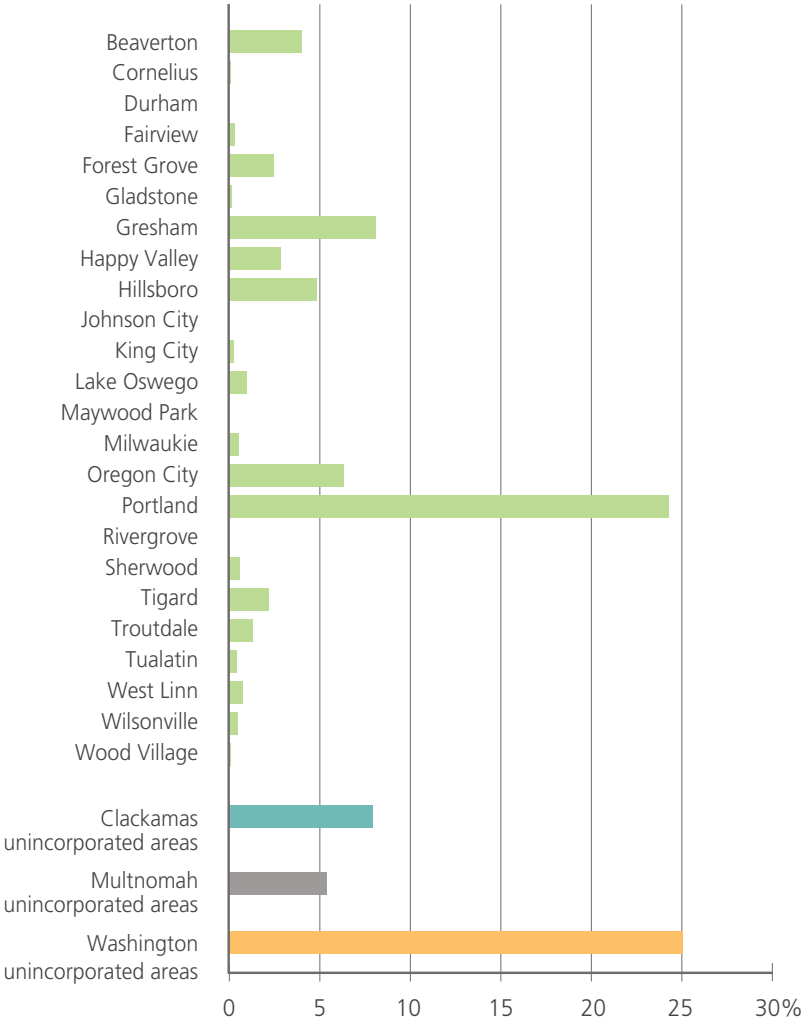
1 Max density permitted is 15 units / net acre.
2 Max density permitted is 20 units / net acre.
3 Max density permitted is 25 units / net acre.
4 Max density permitted is 30 units / net acre.
5 Max density permitted is 35 units / net acre.
6 Max density permitted is 40 units / net acre.
7 Max density permitted is 60 units / net acre.

Mixed-use commercial and residential (MUR)

1 Floor area ratio maximum of about 0.35
2 Floor area ratio maximum of about 0.5
3 Floor area ratio maximum of about 0.75
4 Floor area ratio maximum of about 1.25
5 Floor area ratio maximum of about 1.5
6 Floor area ratio maximum of about 1.75
7 Floor area ratio maximum of about 2
8 Floor area ratio maximum of about 3
9 Floor area ratio maximum of about 4
10 Floor area ratio maximum of about 12.5

Figure 48 shows the same zoned capacity on vacant land (excluding post-1997 boundary expansion areas) by jurisdiction. Most of the region's residential capacity on vacant land is in the City of Portland and unincorporated Washington County. A substantial amount of the region's residential capacity is in unincorporated areas inside the urban growth boundary.

Figure 48: Percentage of dwelling unit capacity on net vacant buildable land by jurisdiction (maximum zoning applied), Excludes post 1997 urban growth boundary expansion land
Source: Metro, 2009



Farm and forest capacity: Farm and Forest designated land in the urban growth boundary (not in new urban areas) = 10 units per net acre [source: 2002 UGR]. Sixty-five percent of rural residential and farm/forest use (RRFU) designated land is assumed to go towards future residential capacity. The rest will go towards employment uses. This assumption is based on a cross tabulation of vacant RRFU land and 2040 design types. This residential capacity amounts to approximately 17,300 dwelling units.

Residential single family and multi-family capacity: All 6,400 acres of residential land is calculated into residential capacity, based on maximum zoning (or comp plan) density per local zoning ordinances as of the 3rd quarter 2008 RLIS database. Zoning capacity and densities vary for SFR1 (1 unit per acre) thru SFR16 (16 units per acre) and MFR1 (13.3 units per acre) thru MFR 7 (53.5 units per acre). Based on the RLIS vacant land inventory, urban growth report gross to net reductions and zoning density assumptions, the maximum residential dwelling unit capacity derived from residential vacant land produces about 46,300 dwelling units (28,200 SF and 18,100 MF). Overall dwelling unit density is about 7.9 units per net acre, which averages in RRFU, SFR and MFR vacant land and zoning assumptions.

Mixed-use residential zoned capacity: Mixed-use residential density and capacity are calculated from zoning (or comprehensive plans). Mixed-use districts recognize vertical and horizontal forms of mixed use. There is evidence that mixed-use development to date includes both forms of mixed-use development. There is very little regionally representative data to determine how much horizontal mixed use is actually occurring. Nevertheless, in order to recognize that horizontal mixed use does and will occur in the future, we assume a 50 percent ratio of the two forms of mixed-use development. Maximum densities vary from 8.9 dwelling units per net acre up to 350 dwelling units per net acre, and are specific to the applicable local zoning. The estimated residential unit capacity from 500 (derived from 1,000 acres X 50% MUR ratio = 500 acres) acres of MUR zoned vacant land represents 29,100 dwelling units. The average dwelling units per acre is approximately 28.5 units per net acre.

Underbuild due to physical development constraints: Underbuild represents a statistical estimate of the dwelling unit capacity lost due to residential development at less than maximum permitted densities in residential zones. Underbuild accounts for such factors as poor access, steep slopes, small or odd shaped lots, neighborhood common areas, greenways, storm water detention areas and many other site specific conditions, that make it difficult to develop at full capacity as indicated by the zoning. Under the Metro Code Section 3.07.120, regulations establish a minimum density requirement that specifies that residential development must at least be constructed at 80 percent of the maximum density. This requirement was adopted by Metro Council in November 1996 and has been implemented by local governments through code changes.

In effect, the Urban Growth Management Functional Plan provided assurance that underbuild would be no more than 20 percent for residential development within the UGB. However, since the 2002 urban growth report was issued and that portion of the Functional Plan was repealed, staff from many local governments noticed a significant decrease in the amount of underbuild that was occurring on new housing construction projects. In an attempt to clarify how much underbuild has been occurring throughout the region since the last urban growth report, Metro staff collected housing data from selected local communities. Specifically, Metro requested that local communities identify recent housing projects and provide data comparing allowable densities on the property prior to construction, and actual densities on the property post-development. Data was collected from the following local governments: Hillsboro, Wilsonville, and Clackamas County. Metro's data collection has indicated that the region is performing better than previously expected, with very little underbuild occurring in single-family developments. Therefore, this analysis assumes a five percent loss from maximum single-family dwelling unit capacity.

Policy-based assumptions

An analysis of capacity is inherently based on a number of assumptions. Most are made with firm historical data, but many could differ depending on policies and investments. Apart from changing local zoning, the components of the analysis that create a capacity range are residential redevelopment and infill demand, market feasibility for high-density multi-family development, and infrastructure availability in new urban areas.

Residential refill demand

The refill rate is the share of residential development that occurs through redevelopment and infill (see Appendix 13 for definitions and illustrations of these terms). When forecasting a refill rate for use in the urban growth report, it is assumed that the region continues its current policy and investment direction. Because the refill rate is a forecast, it is a best estimate that is informed by several sources:

History: Refill rates vary from year to year and are influenced by economic cycles and the types of public policies and investments that are made. During the period from 1997 to 2006, the residential refill rate varied from 15.6 percent to 34.2 percent, with an average of 24.6 percent.

Housing preferences: When a greater share of the housing built is multi-family, the refill rate tends to increase. This is because a lot of multi-family construction occurs through redevelopment and infill rather than construction on vacant land. Shifts in housing preferences indicate that multi-family housing in urban areas should represent a greater share of all housing in the future. This trend is reinforced by the need to create compact communities to reduce energy consumption and greenhouse gas emissions.

Scenarios: MetroScope is an integrated land use and transportation simulation model that forecasts how real estate markets will react to a set of policy and investment inputs. One of MetroScope's outputs is a residential refill rate. The scenarios that inform the urban growth report assume a continuation of current policy and investment trends. These scenarios indicate that the future refill rate could be between 37.9 and 41.2 percent by the year 2030 (depending on the amount of population growth that occurs).

The forecasted year 2030 refill rate should be understood in the context of the scenario assumptions and the limitations of scenario modeling. One of the scenario assumptions that affect refill rates is that there will be a delay in providing infrastructure to recent UGB expansions such as Damascus. As a consequence, it is assumed that Damascus will not be available for urban-level development until the year 2020. Subsequent prospective UGB expansions are not assumed to be available for development until 2025.

In the shorter term, this infrastructure delay has the effect of encouraging a greater share of redevelopment and infill. The higher refill rate is, however, accompanied by a lower UGB capture rate (59.7 percent), signaling an increase in the number of households that choose to locate in neighboring cities in the seven-county region. Though scenarios illustrate this interaction between the Metro region and neighboring cities, MetroScope is not currently able to forecast possible interactions with cities outside of the seven-county area. It is possible that the forecasted refill rates of 37.9 to 41.2 percent may ignore the possibility of additional losses of residential growth to areas outside of the seven-county area.

The longer term (by 2040) scenarios indicate that this trend of relatively high refill rates and low capture rates is moderated by additional assumed UGB expansions, resulting in a refill rate between 29 and 32.3 percent (depending on the amount of population growth that occurs). Considering the 2030 and 2040 refill rates and potential inter-regional dynamics (outside of the seven-county area), scenarios indicate that a refill rate somewhere between 30 to 35 percent is most likely.

Stated regional objectives To a degree, the refill rate that is used in the UGR is a self-fulfilling prophecy. If a low refill rate is assumed, it could lead to more UGB expansions, which may beget a lower refill rate. In adopting the 2040 Growth Concept, the region's citizens expressed their desire to focus growth in centers and corridors. The focus on existing UGB capacity is also mandated by Statewide Planning Goal 14.

On the other hand, assuming a refill rate that is too high could lead to land use policies that displace more households to neighbor cities. Many of those households would commute back to the Metro region for work, potentially making it difficult to achieve regional objectives such as reducing vehicle miles travelled and carbon reduction.

Refill rate Forecasting a future refill rate is part art and part science. Taking into consideration past refill rates, shifts in housing preferences, scenario results and the stated objectives of the region's citizens, it is estimated that current policy direction and investment trends will produce an average refill rate of approximately 33 percent through the year 2030. Potential refill rates that result from MetroScope scenarios that reflect increased investments in centers are shown to illustrate future potential capacity.

High-density multi-family residential feasibility factor

Market feasibility is derived from a discrete MetroScope scenario. This factor is a capacity discount for high-density multifamily (MFR7, MUR8-MUR10 zoning) product that is forecasted not to develop in the next 20-year growth horizon. This product is a non-performing capacity asset that is not predicted to be utilized by the market because the zoning is far ahead of projected market demand. MetroScope scenarios lead to a 50 percent market feasibility factor applied to high-density multi-family, which is reduced over the 20-year period as the market "catches up" to the zoning.

New urban area market feasibility factor

New urban areas are not expected to yield full development at maximum planned density in the next 20 years due to infeasible market conditions, lack of infrastructure and/or financing ability to produce urban densities. Market feasibility is derived from a MetroScope scenario showing half of the capacity of the new urban areas will be available within the 20-year period under current infrastructure investment expectations.

CAPACITY RANGE

As previously stated, this analysis distinguishes between capacity that may be counted on within the next 20-year period and that which relies upon changing market dynamics.

Figure 49 depicts the range of potential residential capacity in the current UGB. Two primary types of dwelling unit capacity are identified in this figure. The capacity depicted with solid wedges can be relied upon with a continuation of current policy and investment trends. The capacity depicted with dotted wedges is zoned capacity deemed to be market feasible by the year 2030, if additional policy and investment actions are taken.

Expected housing capacity based on current policies

The first type of capacity that is depicted in **Figure 49** is zoned capacity inside the current UGB that is market feasible (by the year 2030) with no change in policy or investment trends. A significant portion of this capacity is on vacant lands. Based on the most up-to-date information on local zoning, vacant land zoned for single-family residential use is a substantial source of market-feasible capacity (shown in gray). There is also market-feasible capacity on vacant lands zoned for multi-family residential and mixed uses (shown in green). The figure illustrates the minimum amount of residential development (33 percent) that could occur through redevelopment and infill ("refill") by the year 2030 (shown in orange). Finally, half of the capacity in new urban areas (land brought into the UGB since 1997) is deemed to be market feasible by the year 2030 and will be counted towards meeting the region's identified 20-year residential demand (shown in blue). This capacity, depicted in solid colors, is the capacity that can be legally counted towards meeting the region's identified 20-year residential demand.

Potential housing capacity based on future policy choices

The second type of capacity that is depicted in **Figure 49** is zoned capacity inside the UGB that is likely to require changes to policies and investments to make it market feasible by the year 2030. These are the very actions that will make our communities even greater places to live, work and play. Policy and investment actions taken at the local and regional level can increase the refill rate as well as the market feasibility of vacant lands. The refill and market feasibility rates that are illustrated with dotted wedges in **Figure 49** are derived from MetroScope scenarios that test the effects of different policy and investment options. A final potential source of capacity is through future UGB expansions (not shown in **Figure 49**). These expansions, if they occur, will also require significant investments to be market-feasible. This capacity, shown in dotted colors, requires documentable local or regional action to count towards meeting the region's identified 20-year residential demand by the end of 2010.

Figure 49: Residential dwelling unit capacity range: 2010-2030, assumes no change in local zoning
Source: Metro, 2009

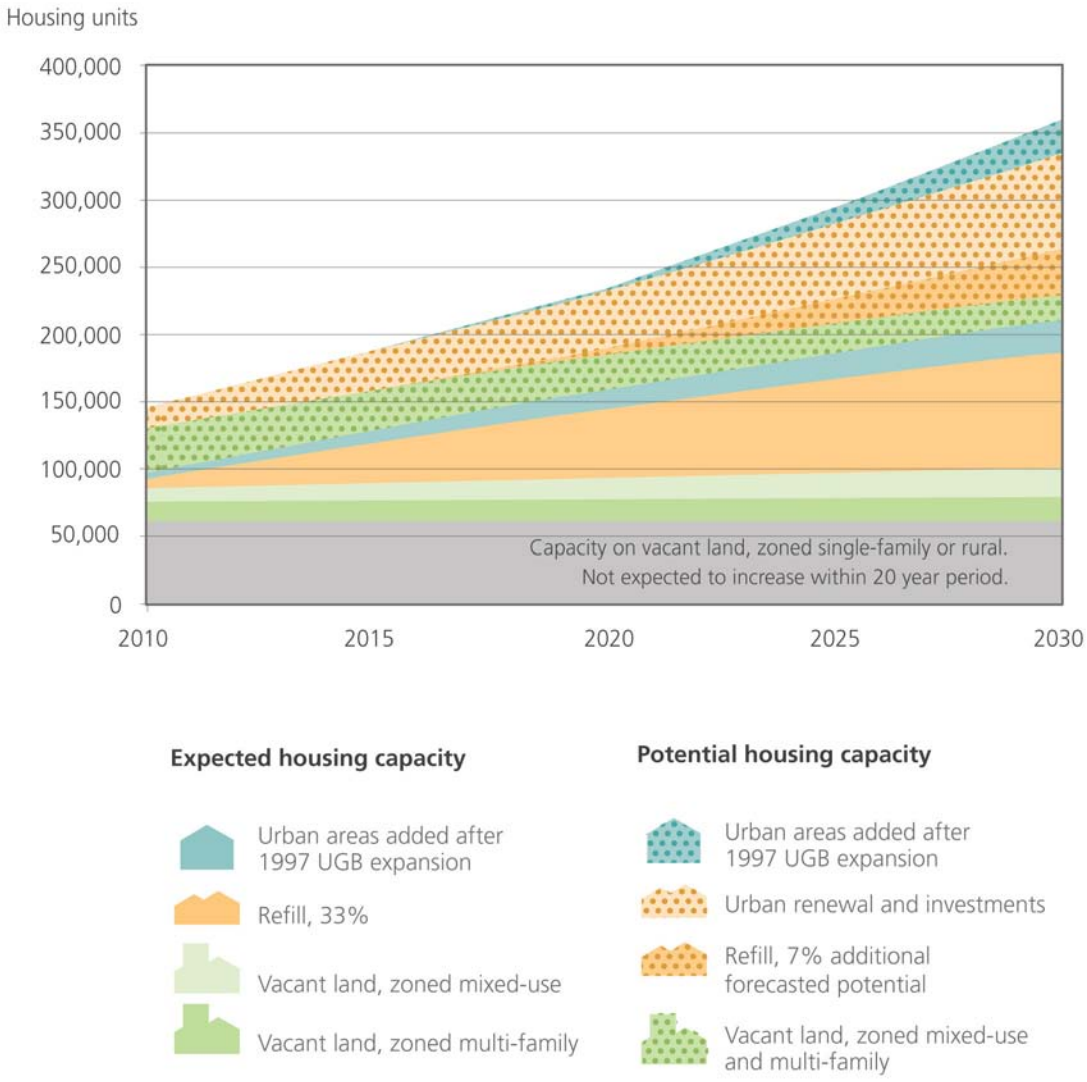


Table 42 shows the complete range of capacity over the next twenty years, as well as a description of the key assumptions that influence the low and high ends of the supply range.

Table 42: Assumptions that establish the range of capacity
Source: Metro, 2009

Expected supply assumptions:	**Potential supply assumptions:**
• Market feasibility factor applied to high-density multi-family and new urban areas • Refill at 33% • No new urban renewal or incentives	• Market feasibility factor NOT applied to high-density multi-family and new urban areas • Refill at 40% • Additional units from urban renewal and/or incentives
244,600 dwelling units	**358,300 dwelling units**

There are two categories of potential capacity within the current UGB. The key policy questions regarding how much of this potential capacity will be realized within the 20-year period of this assessment are:

- How much are cities and counties willing to invest in their centers, corridors and main streets for vibrant communities that support redevelopment and infill?
- Is the region willing to invest in infrastructure in the new urban areas to allow development to occur? What is the market for taking advantage of these investments?

The answers to these questions will inform growth management decisions through the next several years. Local or regional decisions that are adopted by the end of 2009 can be included in the final residential capacity analysis and will shift more capacity into the solid portion of the chart. Further actions will be the focus in 2010.

The next section of this report reconciles the 20-year supply range described in this section with the projected demand range and lays out policy choices and implications.

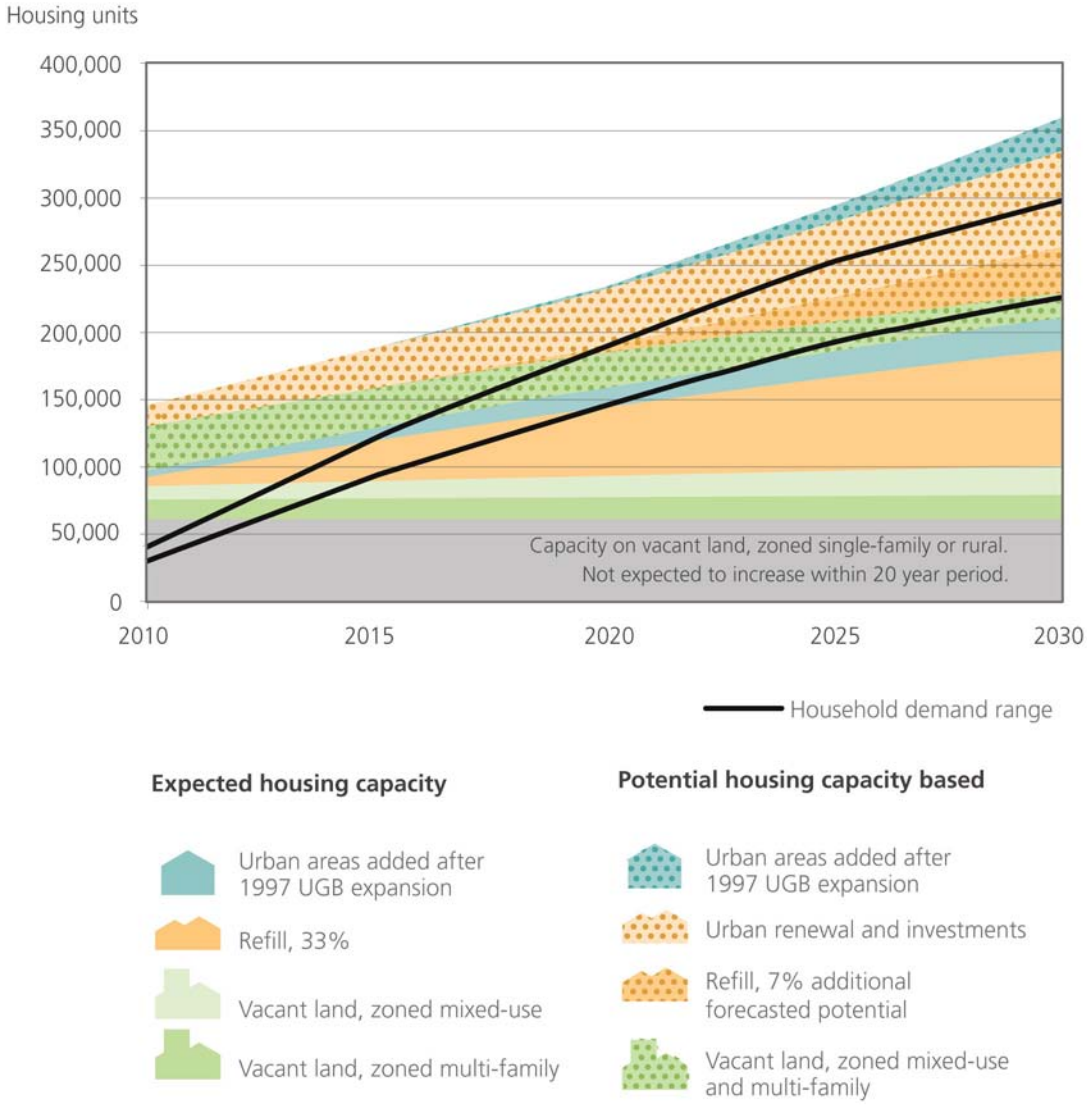
RECONCILIATION OF SUPPLY AND DEMAND

This assessment is reflective of uncertainty and describes both demand and supply in terms of a range, allowing policy makers to consider a range of possibilities and plan for contingencies. This approach supports decision-making focused on the outcomes that characterize a successful region and support vibrant communities.

Figure 50 depicts the 20-year dwelling unit demand range (from the 20-year forecast) along with the previously described capacity range. The demand range is illustrated with two lines that show the upper and lower end of the household forecast. ***The capacity that can be legally counted towards meeting the region's identified 20-year residential demand is indicated in solid colors. The "dotted" capacity, allowed under current zoning but not supported by existing policies and investment trends, requires documentable local or regional action to count towards meeting the region's identified 20-year residential demand by the end of 2010.***

It is important to emphasize that achieving the "solid" capacity requires a continuation of local and regional investments and policies, and assumes no changes to local zoning over the next 20 years. It is evident that the region must take some action (make policy changes or increase public investments) to provide sufficient capacity to support the number of people anticipated to live here at the low range of the forecast demand. However, if enough policy changes and investments are put in place to capitalize on the potential capacity that is not yet considered market feasible, it is possible to meet the high range of demand without changing current zoning or expanding the UGB.

Figure 50: Household demand forecast and sources of residential capacity within current Metro urban growth boundary, assumes no change in local zoning
Source: Metro, 2009



The potential difference between projected dwelling unit demand and supply (in the year 2030) could range from a deficit of 103,600 dwelling units (low supply, high demand) to a surplus of 152,400 units (high supply, low demand). Local and regional choices made over the next two years will influence where we land within these ranges and will shape our region's future.

As regional leaders discuss these choices, questions to consider include:

- What are some policy changes that could be made to increase the financial feasibility of higher density, mixed-use development, allowing the region to build closer to its current zoned capacity?
- What is the right balance of incentives and UGB expansion policy to increase the region's rate of redevelopment and infill in centers, corridors and main streets?
- Will the region identify an infrastructure funding source to make past UGB expansion areas developable?
- Is a higher density residential product market feasible in UGB expansion areas (past and prospective)? If so, during what time frame? What are the characteristics of expansion areas where this higher density product is market feasible?
- What are the relative costs of investing in different locations?
- Under what conditions should the region expand the UGB?
- What are some ways that policies could be tailored so that they encourage the market to provide more housing choices such as accessory dwellings, cottage housing, and high quality manufactured housing?
- Is the region willing to address inequity in the distribution of cost-burdened households? Can public investments minimize the impact?

PERFORMANCE

This urban growth report is intended to document the current range of capacity within the existing urban growth boundary and, given current policy and investment direction, estimate how that capacity may get used in the future. One of the fundamental principles of this analysis is that there is a range of possible futures for which the region can plan. Possible futures are defined by: a range of population growth rates, a range of possible market responses to zoned capacity, and a variety of megatrends that insert additional uncertainty.

MetroScope, an integrated land use and transportation model can help to illuminate the possible implications of continuing with current policies and investments.

MetroScope is an equilibrium model and, as such, always "solves the problem" by distributing forecasted new households and jobs. Unlike a game of musical chairs, MetroScope scenarios do not conclude with households lacking a residence. Since MetroScope scenarios do not identify whether or not there is a capacity gap, the scenarios do not produce the capacity analysis. Rather, scenarios inform the capacity analysis. As previously mentioned in the Residential and Employment sections of this urban growth report, MetroScope scenarios are also used to help to determine reasonable estimates for future refill rates and the market feasibility of vacant/buildable land.

KEY SCENARIO ASSUMPTIONS

Two scenarios were conducted for the specific purpose of informing this analysis:

- Low end of population and employment range forecast
- High end of population and employment range forecast

The assumptions made for these scenarios are intended to be a reflection of current policy and investment direction. Documentation of scenario assumptions can be found in Appendix 2. In order to insure that scenario assumptions reflect current policies and investments, all assumptions were reviewed ahead of time by representatives of the three counties, the City of Portland, and the Metro Technical Advisory Committee (MTAC). These scenarios are intended as a starting point for discussions. It is anticipated that many of these assumptions will need to change to reflect ongoing work being done by local jurisdictions both through the "Local Aspirations" work program and through the periodic review of a number of cities' comprehensive plans. Furthermore, these scenarios do not account for the implications of possible shifts in future housing preferences (due to factors such as fuel prices, credit availability, etc.).

Six desired outcomes

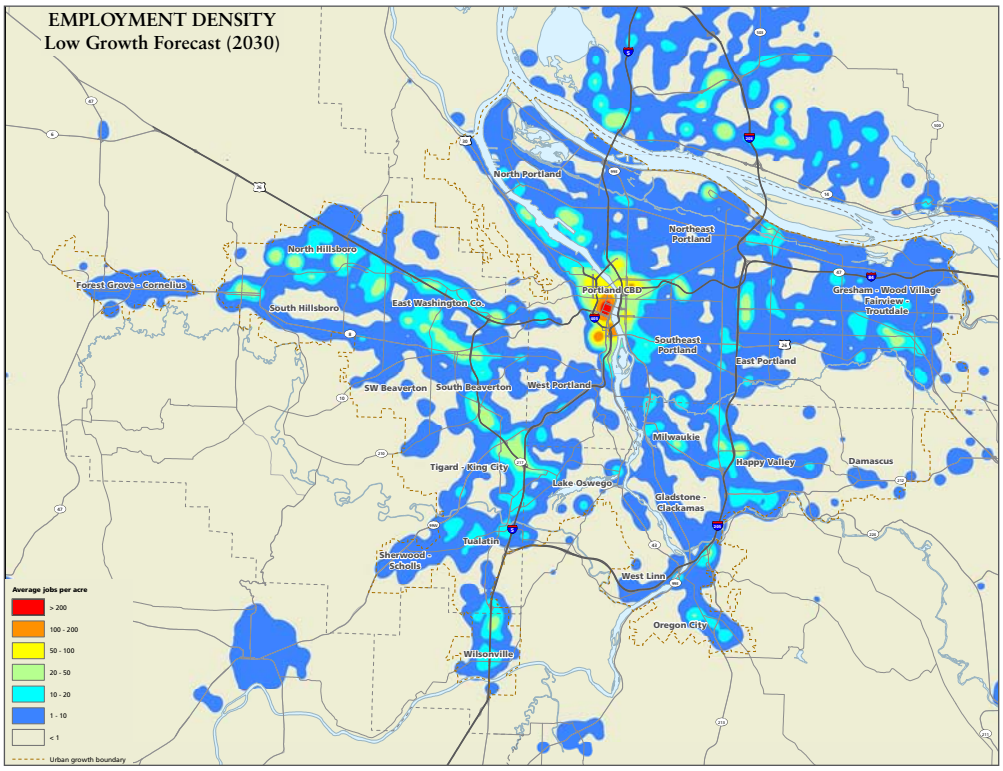
Scenario outputs can give a sense of where the region is headed in relation to our six desired outcomes.

- Vibrant, walkable communities
- Economic competitiveness and prosperity
- Transportation choices
- Reduce greenhouse gas emissions
- Clean air and water, healthy ecosystems
- Equity

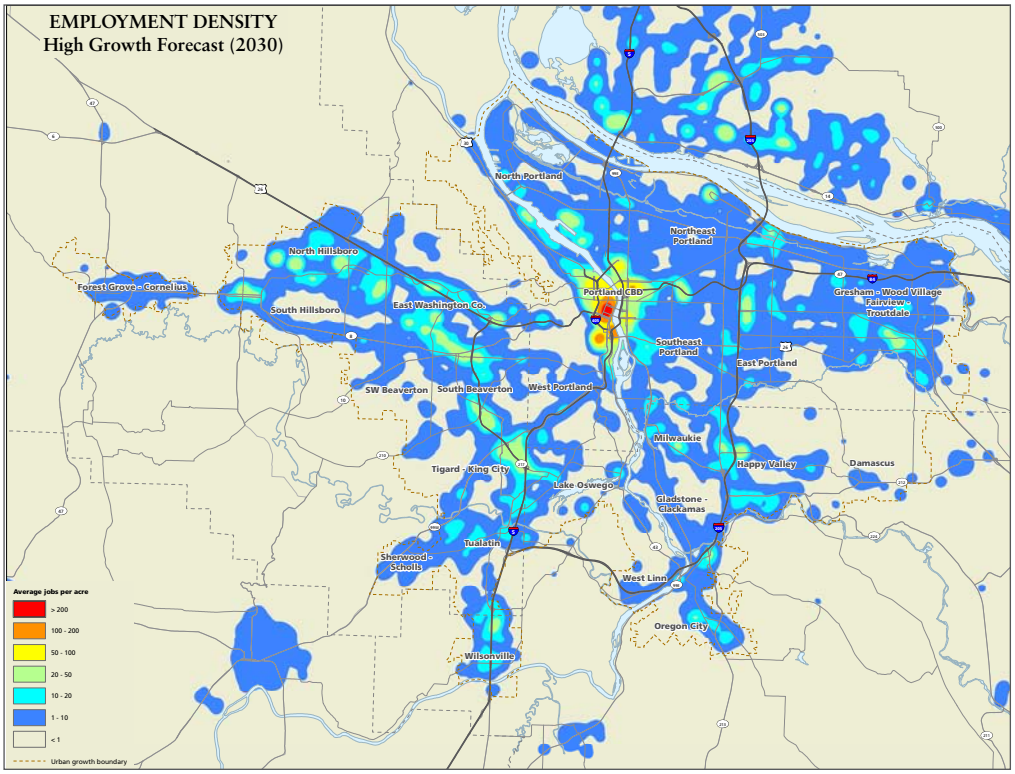
SCENARIO FINDINGS

One of the primary outputs of MetroScope scenarios is the job distributions that could occur, given assumed policies and investment. The maps below show job distributions in the year 2030 for the low growth and high growth scenarios. Since the two scenarios only test the effects of high or low population growth (i.e. they don't test different policy or investment options), these two maps show similar patterns.

Map 8: Distribution of jobs in the year 2030, low growth scenario
Source: MetroScope scenario 912, 2009



Map 9: Distribution of jobs in the year 2030, high growth scenario
Source: MetroScope scenario 911, 2009



Distributions of jobs in the 7-county area (year 2030)

Figure 51: Low growth scenario
Source: MetroScope scenario 912, 2009

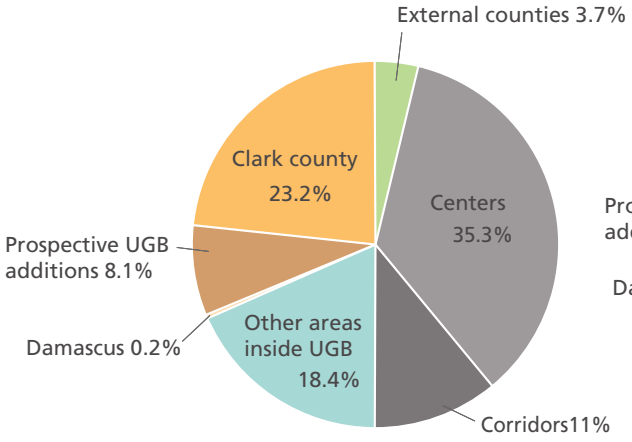
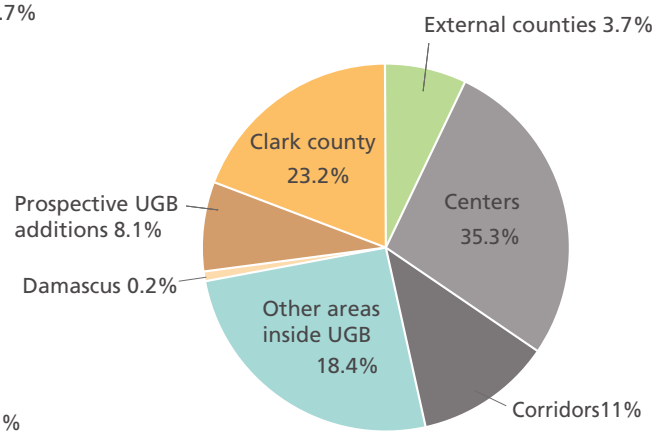


Figure 52: High growth scenario
Source: MetroScope scenario 911, 2009



Why does this measure matter?

The 2040 Growth Concept specifies the areas where the region's citizens decided they wanted growth to go. Job growth is intended to go to centers, corridors and employment areas.[30] Centers and corridors are areas that are most likely to provide people with walkable access to everyday needs and transportation choices. These characteristics offer potential to reduce transportation costs to the individual and to the employer, and will be crucial to reducing greenhouse gas emissions. Employment areas are designated as such to minimize conflicts with other uses.

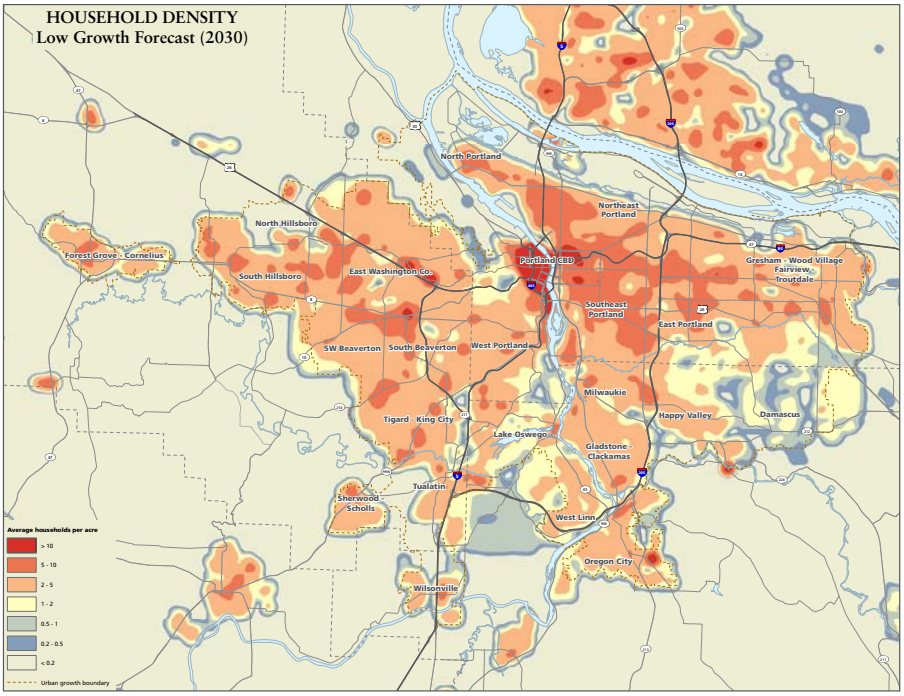
Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Reduce greenhouse gas emissions
- ✓ Clean air and water, healthy ecosystems
- ✓ Equity

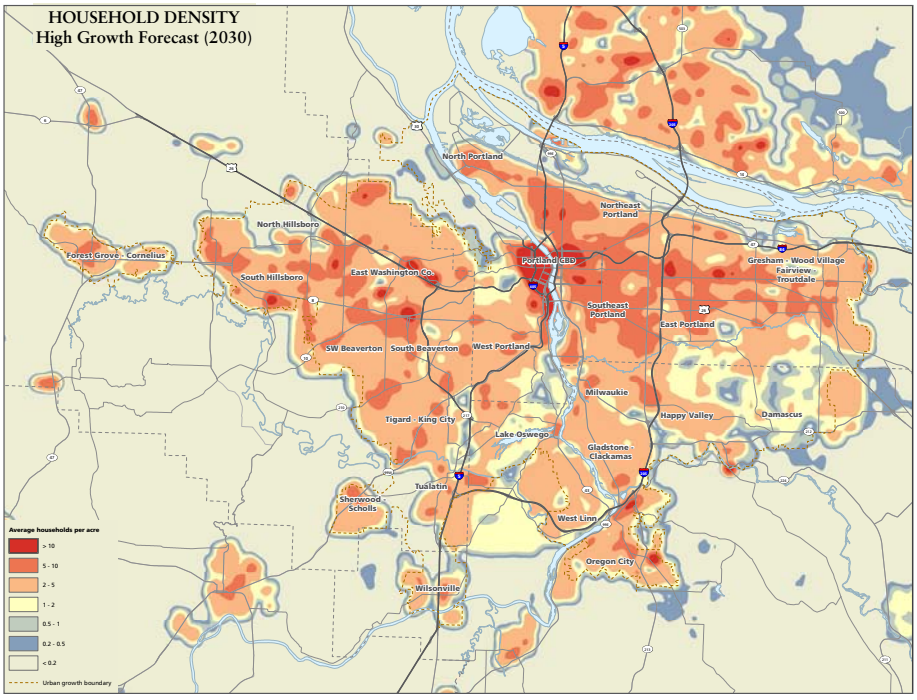
Scenarios indicate that, with a continuation of current policy direction, a smaller share of jobs may locate in centers under a high growth scenario than under a low growth scenario. Conversely, a greater share of jobs may locate in "all other areas inside the UGB" under a high growth scenario. Those areas include Title 4 employment areas, which are likely locations for industrial sectors that witness healthier growth under the high growth scenario.

[30] *RSIA, Industrial, and Employment areas designated under Title 4 of the Urban Growth Management Functional Plan are included in "other areas" here. "Other areas" also includes neighborhoods. Jobs that locate in neighborhoods would be consistent with local zoning and are likely to be retail and service uses that serve the neighborhood.*

Map 10: Distribution of households in the year 2030, low growth scenario
Source: MetroScope scenario 912, 2009



Map 11: Distribution of households in the year 2030, high growth scenario
Source: MetroScope scenario 911, 2009



One of the primary outputs of MetroScope scenarios is the household distributions that could occur, given assumed policies and investment. These maps show household distributions in the year 2030 for the low growth and high growth scenarios. Since the two scenarios only test the effects of high or low population growth (i.e. they don't test different policy or investment options), these two maps show similar patterns.

Distributions of new households in the 7-county area (year 2030)

Figure 53: Low growth scenario
Source: MetroScope scenario 912, 2009

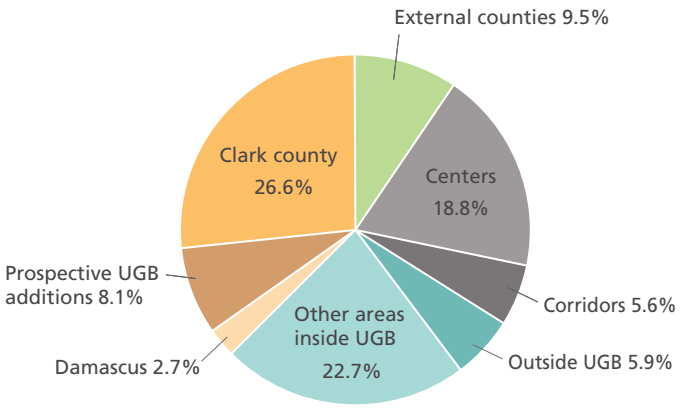
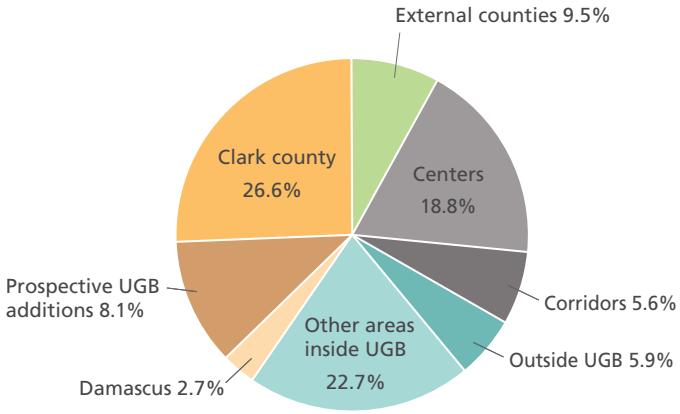


Figure 54: High growth scenario
Source: MetroScope scenario 911, 2009



Why does this measure matter?

Centers and corridors are areas that are most likely to provide people with walkable access to everyday needs, access to jobs, and access to transportation choices. These characteristics reduce transportation costs to the individual and will be crucial to reducing greenhouse gas emissions.

Historically, about 30 percent of new household growth in the 3-county area[31] has been in centers and corridors (1998 to 2008 permit data). The amount of growth that would occur in Damascus, Oregon's newest city, is called out in these figures. The charts also show a substantial amount of growth occurring in "existing neighborhoods" – this reflects the evolution of parts of existing neighborhoods in keeping with local zoning and comprehensive plans.

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Reduce greenhouse gas emissions
- ✓ Clean air and water, healthy ecosystems
- ✓ Equity

[31] *This is a smaller geography than the seven-county area used to report scenario results. This difference in geography explains some of the difference between historic and forecasted trends. The source for the historic data is building permits. Not all permitted units were necessarily built.*

SCENARIO RESULTS

UGB capture rate (2005 to 2030)

Residential capture rate

Low growth scenario	High growth scenario
58.5%	61.2%

Employment capture rate

Low growth scenario	High growth scenario
73.0%	73.7%

The UGB capture rate is the measure of the percentage of new households or jobs in the 7-county region that locate within the Metro UGB. The capture rate is used in the UGR to inform how much capacity may be needed inside the UGB. However, it should be remembered that the capture rate reported for these scenarios is a product of the scenario's assumptions, including assumptions about future UGB expansions. Generally speaking UGB expansions are likely to increase the capture rate by attracting more new households that may otherwise choose to locate in neighbor cities or Clark County. Likewise, policies and investments that attract households can increase the capture rate.

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Reduce greenhouse gas emissions
- ✓ Clean air and water, healthy ecosystems
- ✓ Equity

Note: The forecasted year 2030 capture rate should be understood in the context of the scenario assumptions and the limitations of scenario modeling. One of the scenario assumptions that affects refill rates is that there will be a delay in providing infrastructure to recent UGB expansions such as Damascus. As a consequence, it is assumed that Damascus will not be available for urban-level development until the year 2020. Subsequent prospective UGB expansions are not assumed to be available for development until 2025.

In the shorter term, this infrastructure delay results in a lower UGB capture rate, signaling an increase in the number of households and jobs that choose to locate in neighboring cities in the seven-county region. This trend is would be expected to moderate in the longer term as prospective UGB expansions become available, thereby increasing the capture rate.

SCENARIO RESULTS

Residential refill rate (2005 to 2030)

Low growth scenario	High growth scenario
41.2%*	37.9%

Why does this measure matter?

Refill capacity is one of the components of total capacity that is considered in the UGR that can be influenced through policy and investment actions.

The refill rate is the percent of new residential development (percent of new dwelling units) that occurs through redevelopment or infill (in the case of these scenarios, the percent by the year 2030). Thus, refill rate is an important measure of the efficiency with which the region is using its land. Higher refill rates are a good indication that market conditions support the implementation of the 2040 Growth Concept with its emphasis on focusing growth in existing urban areas.

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Reduce greenhouse gas emissions
- ✓ Clean air and water, healthy ecosystems
- ✓ Equity

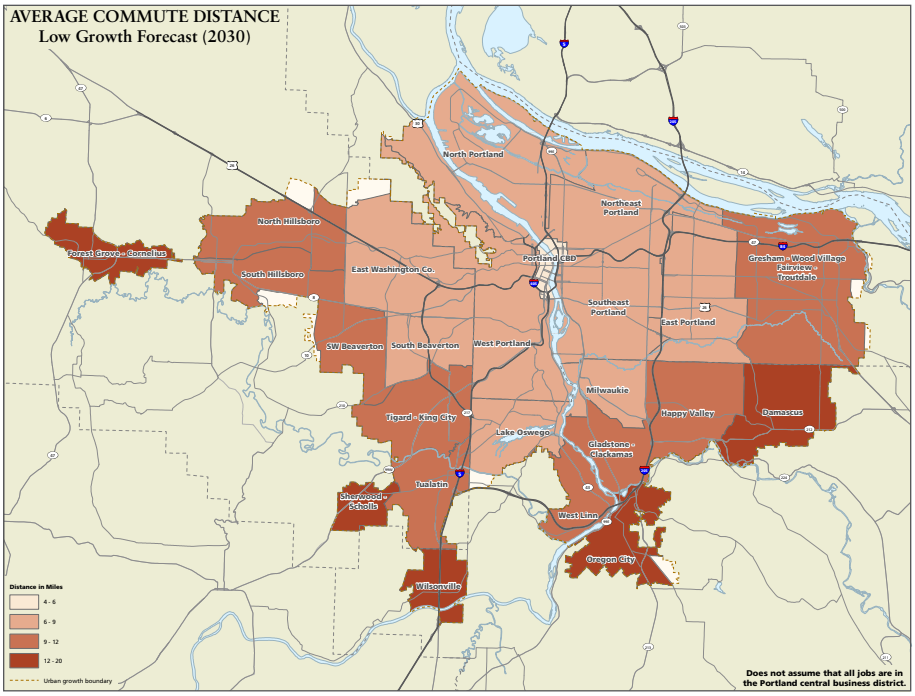
Counter intuitively, the refill rate in the high growth scenario is lower than it is in the low growth scenario. Even though the high growth scenario shows, in absolute numbers of new dwelling units, more refill development than the low growth scenario, the absolute amount of residential growth on vacant lands, particularly in Damascus and in prospective UGB expansion areas assumed in the scenarios, is even more substantial. In essence, refill rate is the share of total growth that occurs through infill or redevelopment, not the absolute amount. In these scenarios, refill capacity gets used more quickly than UGB expansion land because its locations are more accessible. As a higher growth rate is assumed, there is a need for the increased growth to transition to less accessible UGB expansion land.

However, these refill results are predicated on the assumptions that preferences for lower density residences will remain the same in the future and that there will be infrastructure funding for UGB expansion areas. If preferences shift towards higher density, urban locations or if infrastructure funding is not available in UGB expansion areas, a higher refill rate would be expected.

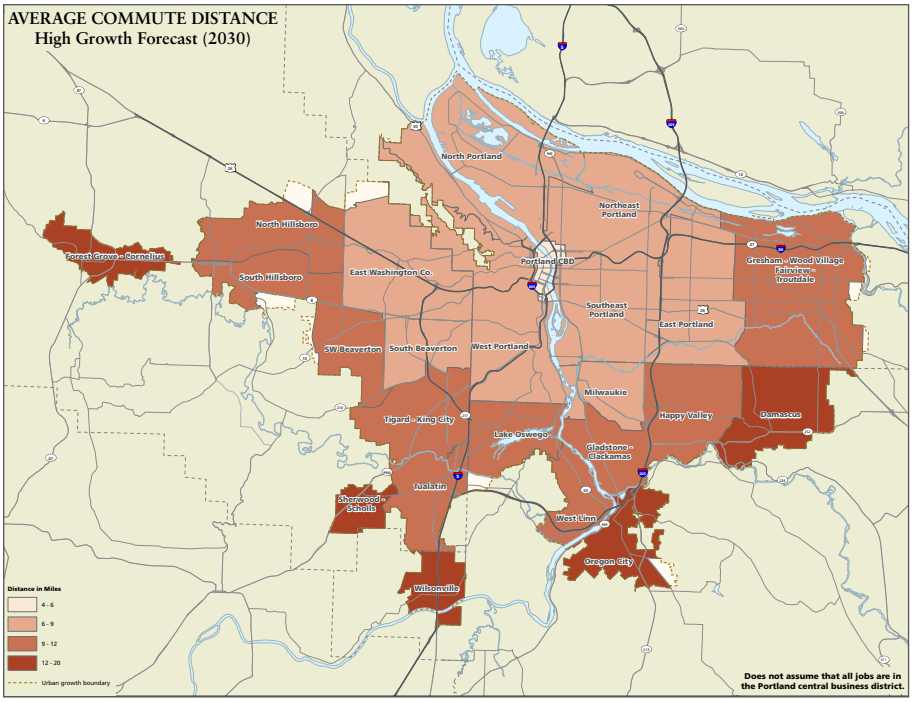
** Note: The forecasted year 2030 refill rate should be understood in the context of the scenario assumptions and the limitations of scenario modeling. One of the scenario assumptions that affects refill rates is that there will be a delay in providing infrastructure to recent UGB expansions such as Damascus. As a consequence, it is assumed that Damascus will not be available for urban-level development until the year 2020. Subsequent prospective UGB expansions are not assumed to be available for development until 2025.*

In the shorter term, this infrastructure delay has the effect of encouraging a greater share of redevelopment and infill. The higher refill rate is, however, accompanied by a lower UGB capture rate, signaling an increase in the number of households that choose to locate in neighboring cities in the seven-county region. Though scenarios illustrate this interaction between the Metro region and neighboring cities, MetroScope is not currently able to forecast possible interactions with cities outside of the 7-county area. It is possible that the forecasted refill rates of 37.9 to 41.2 percent may ignore the possibility of additional losses of residential growth to areas outside of the 7-county area.

Map 12: Average one-way commute distance, low growth scenario (all households)
Source: MetroScope scenario 912, 2009



Map 13: Average one-way commute distance, high growth scenario (all households)
Source: MetroScope scenario 911, 2009



SCENARIO RESULTS

Average one-way commute distance (for households in the 7-county area in the year 2030)

Low growth scenario	High growth scenario
12.5 miles	12.4 miles

Why does this measure matter?

Commute miles are a useful indicator of overall travel behavior. Longer commutes tend to be an outcome of living in suburban or exurban locations. A local jobs/housing balance can help to reduce non-commute trip distance and frequency, but, historically, has not decreased commute distances. This is because workers do not choose the job that is closest to their home and because many households have two or more workers (more discussion of jobs/housing balance in the historic performance section). These same location choices also tend to produce long trips for meeting other needs, such as going to the grocery store. Longer travel distances mean that the public would be footing a larger bill to build and maintain the roads and transit necessary to accommodate those trips. The scenarios indicate that there could be big differences in average commute distance, depending on where residents and employers locate.

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Reduce greenhouse gas emissions
- ✓ Clean air and water, healthy ecosystems

SCENARIO RESULTS

Total daily commute miles (for households in the seven-county area in the year 2030)

Low growth scenario	High growth scenario
29.5 million miles per day	32.3 million miles per day

Why does this measure matter?

The State of Oregon has adopted greenhouse gas reduction targets that call for a halt in increases in emissions by 2010, a 10 percent reduction in emissions below 1990 levels by 2020 and a 75 percent reduction in emissions below 1990 levels by 2050. A critical aspect of reducing emissions will be to reduce commute and other trip distances not just in our region, but also in the larger 7-county area.

Even though the scenarios indicate that in 2030 the average household may have a shorter commute than today, there will simply be more people commuting, resulting in an increase in the total daily commute miles for the seven-county region. The region will need to take much more ambitious and coordinated steps to comply with State greenhouse gas reduction targets.

Applies to desired outcomes

- ✓ Transportation choices
- ✓ Reduce greenhouse gas emissions
- ✓ Clean air and water, healthy ecosystems

SCENARIO RESULTS

Total infrastructure capital costs to serve new households and jobs (in 7-county area from the year 2005 to 2030)

Low growth scenario	High growth scenario
$36.2 billion	$53.2 billion

Why does this measure matter?

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Equity

The United States faces a crisis in deteriorating and inadequate infrastructure. The Portland metropolitan region shares in this crisis. A 2008 infrastructure study commissioned by Metro estimates the cost of building public and private facilities to accommodate growth in the three-county Portland metro area through 2035 will run between $27 and 41 billion. Traditional sources of funds would likely cover half of that. In addition, the region needs $10 billion to repair and rebuild existing systems. System development charges, gas taxes and other revenue sources are not keeping pace with rising costs. Voter approved tax limitations and other ballot initiatives further constrain the ability of communities to provide services. There is much to do. We need to consider the return on these kinds of public investments; pool regional resources where appropriate; strategically manage future demand; embrace emerging technologies and creative approaches; and identify new sources of funding.

The region needs to take on the challenge of paying for infrastructure, not just to accommodate growth, but for ongoing maintenance and replacement. One way to address this challenge is to reduce demand for infrastructure by capitalizing on investments the public has already made. Shorter commutes require fewer miles of road or transit service per household. Likewise, higher densities lead to more efficient use of infrastructure, not just transportation but also sewer and water as well as schools and parks.

MetroScope estimates public infrastructure costs using national construction cost data and a formula that is based on development densities and commute distances. These estimated costs are only the capital costs of building new infrastructure to serve new households and jobs and do not include maintenance of these new facilities or the maintenance and upgrade of existing facilities. This measure does assume urban levels of service, which are not likely in rural parts of the 7-county area. Thus, costs in rural areas (and thus the total) are likely to be exaggerated. Costs are in 2005$ and are not adjusted for inflation.

SCENARIO RESULTS

Average capital costs of infrastructure to serve one new job (average for all new jobs in 7-county area from 2005 to 2030)

Low growth scenario	High growth scenario
$16,600	$16,400

Why does this measure matter?

Different growth patterns produce different costs and different benefits. The equitable distribution of costs and benefits should be kept in mind as policies and investments are considered. The benefits of spending public money wisely can include, for instance, the creation of walkable communities and transportation choices.

This measure includes estimated capital costs for all facilities, including local, community, and regional facilities, needed to serve a new job. This measure does not include ongoing operations and maintenance costs. These costs are based on estimated demand for infrastructure, which varies according to travel behavior and development density. [32] Costs are in 2005$ and are not adjusted for inflation.

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Equity

These scenarios indicate that, the types and locations of new jobs that accompany higher growth rates may be more infrastructure-intensive, leading to higher infrastructure costs per new employee. Different policy and investment choices and economic trends may produce different results.

[32] *This measure assumes urban levels of service, which are not likely in rural parts of the seven-county area. Thus, costs in rural areas (and the average cost for the seven-county area) are likely to be somewhat exaggerated.*

Average capital costs of infrastructure to serve one new household (average for all new households in 7-county area from 2005 to 2030)

Low growth scenario	High growth scenario
$80,800	$79,900

Why does this measure matter?

Different growth patterns produce different costs and different benefits. The equitable distribution of costs and benefits should be kept in mind as policies and investments are considered. The benefits of spending public money wisely can include, for instance, the creation of walkable communities and transportation choices.

This measure includes estimated capital costs for all facilities, including local, community, and regional facilities, needed to serve a new household. This measure does not include ongoing operations and maintenance costs. These costs are based on estimated household demand for infrastructure, which varies according to commute distance and residential density. Costs are in 2005$ and are not adjusted for inflation.

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Transportation choices
- ✓ Equity

These scenarios indicate that there may be some per-household cost savings to be realized through the economies of scale that accompany higher population growth rates. Additional cost savings may be realized through compact development.

SCENARIO RESULTS

Residential source greenhouse gas emissions (in billions of pounds per year)

Low growth scenario	High growth scenario
30.7 billion pounds per year	33.46 billion pounds per year

Why does this measure matter?

Residential sources are responsible for a large portion of greenhouse gas emissions. In 2004, residential and commercial energy consumption accounted for 30 percent of all emissions in the state of Oregon (State of Oregon, 2008). There is a real need to show leadership for how a region can reduce its carbon footprint while also creating great communities.

In these scenarios, no technological improvements in energy efficiency are assumed. Greenhouse gas emissions are calculated based on historic residential energy consumption patterns for various housing types and sizes. Any reductions in residential-source greenhouse gas emissions in these scenarios would be the result of smaller residential square footages. Smaller square footages tend to accompany shifts to multi-family housing.

Applies to desired outcomes

- ✓ Reduce greenhouse gas emissions

Though this analysis does not provide a comparison with historic residential emission rates, it is a safe assertion that with more households in the region by the year 2040, both scenarios would represent an increase in greenhouse gas emissions (all other things being equal). In a study of greenhouse gas emissions in Toronto, Canada, Norman et al (2006) found that lower density residences produced approximately 2 to 2.5 times more greenhouse gases than higher density residences. These scenarios indicate that current policies will be insufficient to meet State greenhouse gas reduction targets. Along with shifts to smaller residences and compact development patterns, technological improvements in energy efficiency will be essential.

HOUSING PERFORMANCE

Metro's responsibilities under Statewide Planning Goal 10 and ORS 197.296 and ORS 197.303 ("needed housing") call for an assessment of growth management choices on future housing choices. A variety of indicators are measured here, describing the implications of continuing current policies and trends.

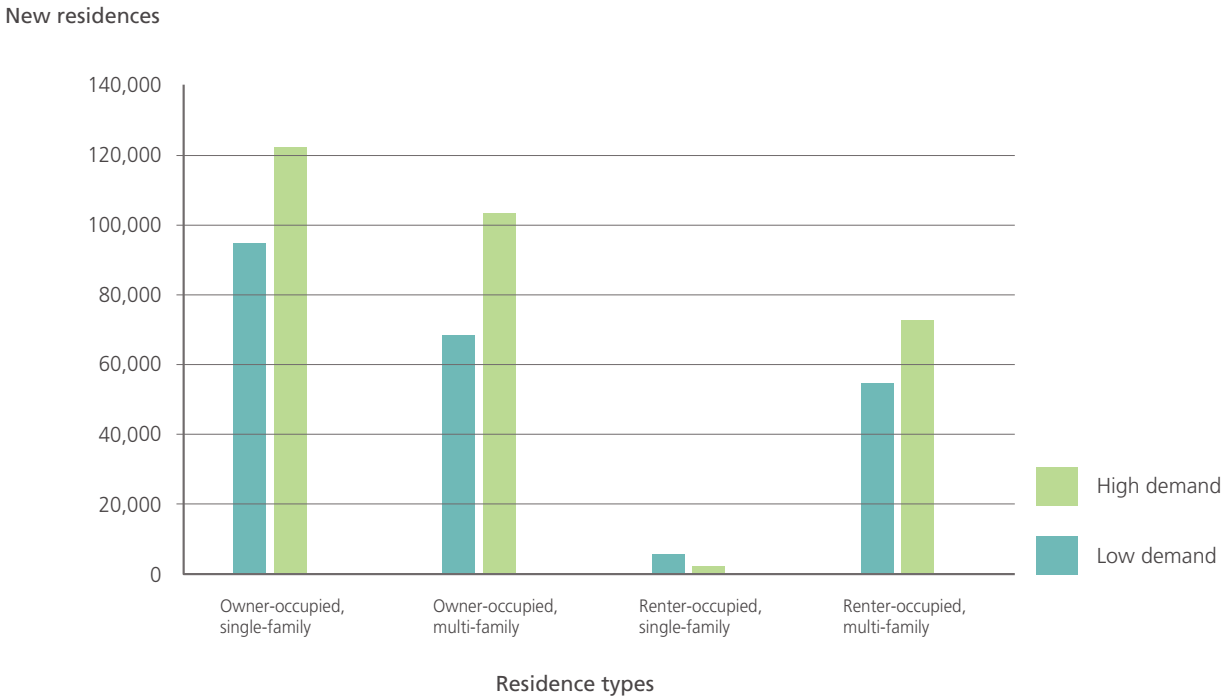
Future mix of housing types and ownership

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Equity

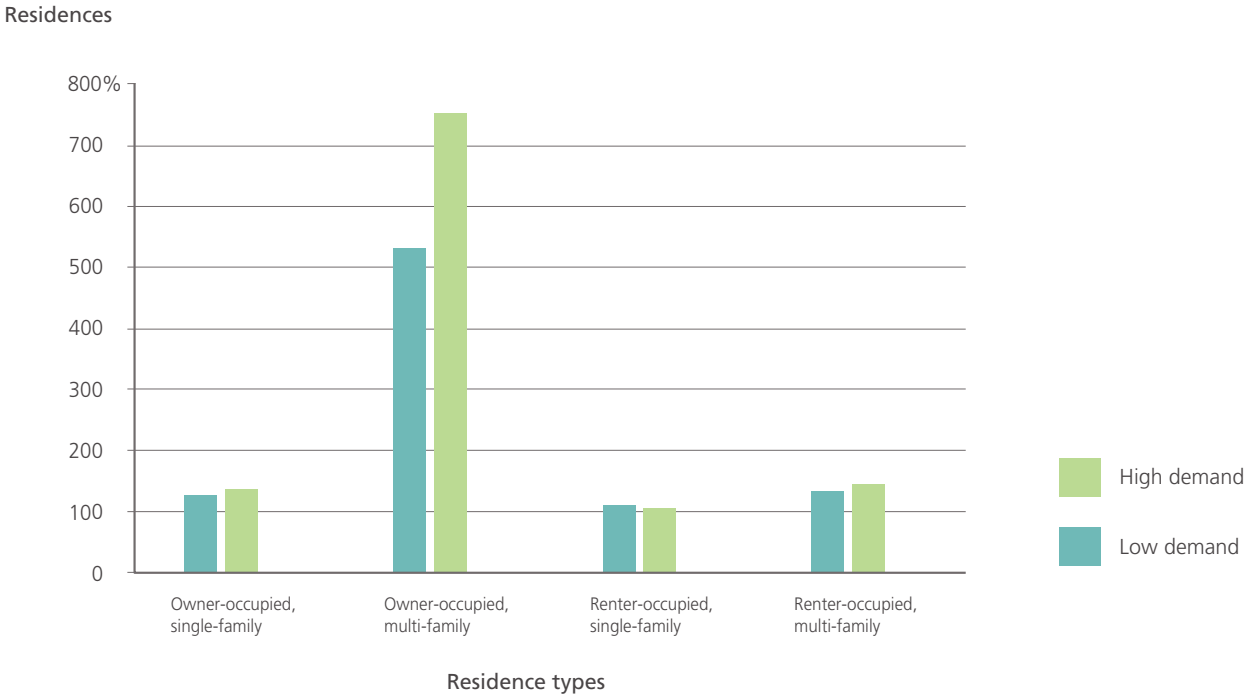
Assuming a continuation of current policies and investment trends, the region is likely to see an increase in the total numbers of all housing types by the year 2030 (see **Figure 55**). However, the likely increase in multi-family residences (both owned and rented) is particularly noteworthy. This potential increase in multi-family units (123,000 to 176,000 more by 2030) is greater than the increase in single-family units (100,000 to 124,000 more by 2030). Researchers such as Dr. Arthur C. "Chris" Nelson, who has conducted pioneering research on urban settlement patterns, growth management and housing, have suggested that the focus of planning efforts needs to be on providing more apartment and condominium choices.

Figure 55: New residences by type under two growth forecasts (2005 to 2030)
Source: MetroScope scenarios 911 and 912, 2009



Expressed as a percent change, as shown in **Figure 56**, the substantial increase in multi-family residences, particularly owner-occupied multi-family (condos and townhomes), is all the more evident.

Figure 56: Percent change in number of residences by type under two growth forecasts (2005 to 2030)
Source: MetroScope scenarios 911 and 912, 2009



Future household incomes

Household incomes are forecasted to vary considerably from location to location. More detail regarding this regional variation is available in the individual sub-area summary sheets included in this report. **Table 43** depicts average annual household incomes for the years 2005 and 2030 under two population growth forecasts. These forecasts assume a continuation of current policies and investment trends and indicate that the average household income is likely to remain similar in the future (not accounting for possible inflation). The average household income for residents of renter-occupied multi-family units is forecasted to be slightly more than half that of the average household in the Metro UGB.

Applies to desired outcomes

- ✓ Economic competitiveness and prosperity
- ✓ Equity

Table 43: Forecasted annual average household income (2005$), assuming a continuation of current policies and investment trends (households in Metro UGB)
Source: MetroScope scenarios 911 and 912, 2009

	2005	2030 (low growth forecast)	2030 (high growth forecast)
All households	$59,900	$59,500	$59,600
Renter-occupied, multi-family	$34,400	$34,300	$34,500

Future mix of household types

The MetroScope scenario model uses 400 types of households[33] that are determined by household size, income, household age and whether children are present. To make analysis and presentation feasible, the 400 types have been simplified to eight household types.

These eight household types are ranked roughly commensurate with income (income generally increases from household type one to household type eight). Differences in household characteristics translate into different choices of housing types and locations and transportation modes, as well as level of cost burden.

Applies to desired outcomes

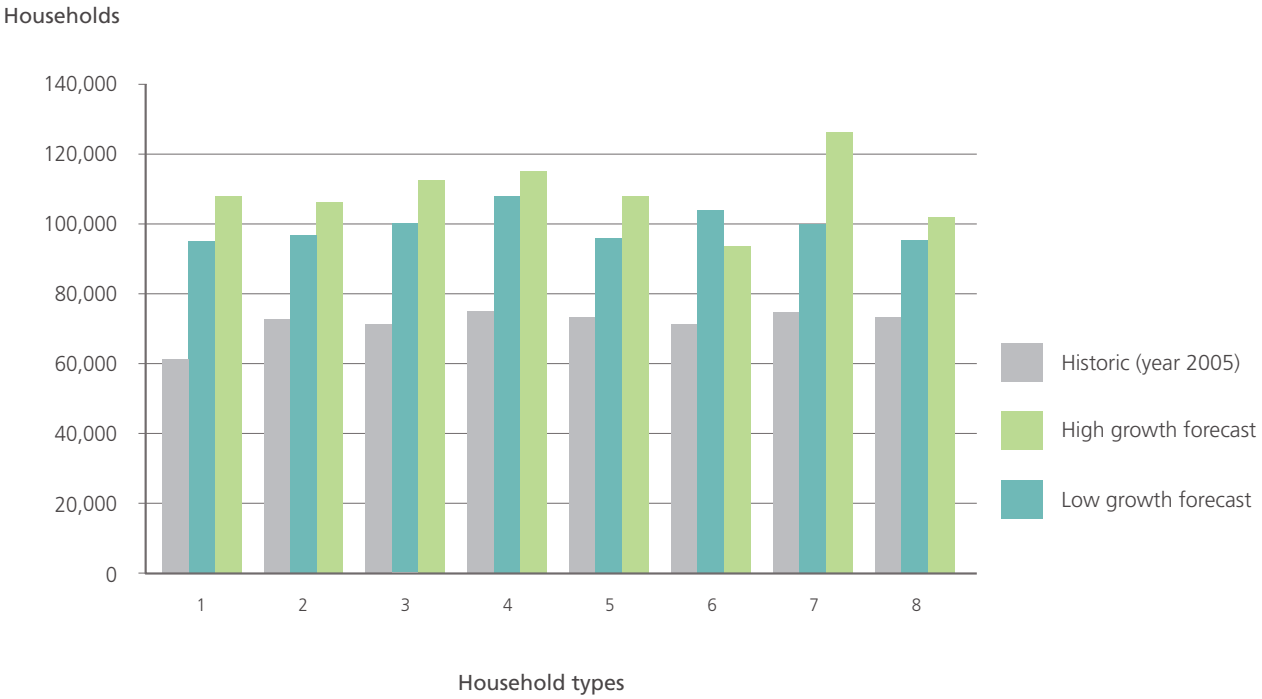
- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Equity

Table 44: Forecasted annual average household income (2005$), assuming a continuation of current policies and investment trends (households in Metro UGB)
Source: Metro, 2009

Household type	Characteristics
1.	These are some of the lowest-income households. Among renters, these are exclusively single-person households—primarily the elderly. Owners have a more even age and household size distribution.
2.	These households can be of any age, but their income is among the lowest. These households are primarily childless.
3.	With a bit more income than household type two, these households are primarily in the 25 to 44 age bracket, mostly without children, although about a third of homeowners have children.
4.	With a broad age distribution and approaching middle income, these households are usually childless, especially among renters.
5.	These households are larger and wealthier. The majority of homeowners have children.
6.	With more income than household type five. Almost half of these households are between 25 to 44 years of age. Although the majority do not have children, two- and three-person households are most common.
7.	Mostly without children, these households include very high-income couples, especially among owners.
8.	Most of the homeowners in this household type have children. They are high wage earners.

[33] *Household refers to the residents, not the residence*

Figure 57: Forecasted number of households in UGB by household type, assuming a continuation of current policies and investment trends
Source: MetroScope scenarios 911 and 912, 2009



Future housing and transportation affordability

A definition of "cost-burdened"

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Equity

Homeownership represents an economic choice that requires some level of equity investment (recent lending practices notwithstanding). Defining cost-burden for homeowners is somewhat more difficult than for renters since many homeowners regard their homes as not just a residence but as an investment. Homeowners often spend a substantial portion of their income on their home, but do not necessarily regard these expenditures as a burden. This is particularly the case for affluent homeowners. For these reasons, this analysis assumes that to be cost-burdened, a household must rent, not own.

Because this analysis includes housing and transportation costs, the standard rule that no more than 30 percent of one's income should be spent on housing needs adjustment. In 2007, many low-to-moderate-income households in the United States spent well over 50 percent of their income on housing and transportation. [34] In 2007, the national median percentage of income spent on these costs was 45 percent. In the absence of an accepted standard, ***this report proposes that if a household rents its residence and spends 50 percent or more of its income on transportation and housing, it is considered cost-burdened.***

Key findings and policy choices

Historically, most residents of this region have been able to choose from a variety of housing types that match their preferences and budgets. However, there is work to be done to ensure that future generations have the same range of choices and that those choices support the region's vision of creating vibrant and walkable communities, protecting air and water quality, and reducing greenhouse gas emissions. If current policies and investments are continued, the number of cost-burdened households in the region may more than double from 94,000 in the year 2005 to 200,000 in the year 2030, bringing the percentage of households that are cost-burdened from 16 percent in 2005 to between 17 to 23 percent in 2030. Many of these households will be seniors on fixed incomes and the working class, some of which will have school-aged children.

Likely causes of cost burden

- Increased numbers of future cost-burdened households appear to be caused by escalating housing costs rather than rising transportation costs.
- Inadequate funding for infrastructure: this constrains housing supply, which in turn makes it unaffordable for some households.
- High market demand in urban centers and transportation corridors: this increases the value of land and the per-square-foot cost of housing. Multi-story development often requires more expensive construction materials and structured parking. Without public investments or choices of smaller residences, these higher costs get passed on to residents.
- Insufficient transportation cost savings: Transportation cost savings offset housing price increases, but are not enough to guarantee affordability.
- Market rate housing is out of reach at lower wage levels.

[34] *Source: United States Bureau of Labor Statistics*

Policy choices

- Urban centers and corridors are likely to be some of the region's least costly communities in the future, but this does not mean that they are affordable for all. The Metro region's leaders are counting on housing in centers and corridors to remain affordable in order to manage growth in a way that protects existing single-family neighborhoods and addresses new challenges such as climate change. To do so, concerted efforts are needed.
- New infrastructure investments can make better use of existing land inside the UGB.
- Incentives for mixed-use, multi-family development can reduce housing costs even further in urban centers and corridors.
- Policies that encourage the construction of smaller residences can provide more housing choices.
- Transit investments in centers and corridors can reduce transportation costs for residents.
- Wages are an important component of affordability. Ensuring a healthy regional economy will be essential.

Calculating housing and transportation affordability

In order to produce estimates of future housing and transportation expenditures for different household types in different locations, both historic and forecasted data are used:

Historic data: United States Bureau of Labor Statistics data on housing and transportation expenditures are augmented with other historic data on income levels, demographics, housing preferences and travel behavior.

Forecasted data: MetroScope scenarios produce forecasted data on household types (household size, income, age of householder), patterns of renting versus owning, and location choices.

Scenario results are analyzed and linked with the historic data. This analysis produces expenditure estimates for future households, depending on factors such as the household type, renting versus owning, and location.

Possible outcomes of continuing current policies and investment trends

As is the case today, in the year 2030, the amount that households spend on transportation and housing costs is likely to vary widely from community to community. Costs are likely to be lowest for those living in smaller square footage condos or apartments, particularly in locations with access to multiple modes of transportation, including transit. Many of the region's urban centers and transportation corridors will be the most affordable places to live. The variation in costs is detailed in the subarea profiles, included as Appendix 7 to this UGR.

Future housing costs

Scenarios indicate that, with a continuation of current policies and investment trends, housing costs for households inside the Metro UGB will, on average, increase in the future. The increase in housing costs is greater under the high growth scenario where additional population growth increases housing demand (and prices). **Table 45** depicts annual housing expenditures for all households and for households in renter-occupied, multi-family housing, which are often most susceptible to cost-burden. **Table 46** expresses housing costs as a share of household income.

Table 45: Forecasted annual average housing expenditures (2005$) per household, assuming a continuation of current policies and investment trends (households in Metro UGB)
Source: MetroScope scenarios 911 and 912, 2009

	2005	2030 (low growth forecast)	2030 (high growth forecast)
All households	$20,000	$25,100	$30,900
Renter-occupied, multi-family	$8,800	$10,100	$11,700

Table 46: Forecasted average percent of annual household income (2005$) spent on housing, assuming a continuation of current policies and investment trends (households in Metro UGB)
Source: MetroScope scenarios 911 and 912, 2009

	2005	2030 (low growth forecast)	2030 (high growth forecast)
All households	33%	42%	52%
Renter-occupied, multi-family	26%	30%	34%

Future transportation costs

Scenarios indicate that, with a continuation of current policies and investment trends, transportation costs for households inside the Metro UGB will, on average, remain about the same in the future (not accounting for possible inflation), regardless of the amount of population growth that is realized (see **Table 47**). As depicted in **Table 48**, residents of renter-occupied multi-family housing are forecasted to spend a greater portion of their income on transportation than the average household in the Metro UGB.

Table 47: Forecasted annual average transportation expenditures (2005$) per household, assuming a continuation of current policies and investment trends (households in Metro UGB)
Source: MetroScope scenarios 911 and 912, 2009

	2005	2030 (low growth forecast)	2030 (high growth forecast)
All households	$6,500	$6,500	$6,400
Renter-occupied, multi-family	$4,500	$4,500	$4,500

Table 48: Forecasted average percent of annual household income (2005$) spent on transportation, assuming a continuation of current policies and investment trends (households in Metro UGB)
Source: MetroScope scenarios 911 and 912, 2009

	2005	2030 (low growth forecast)	2030 (high growth forecast)
All households	11%	11%	11%
Renter-occupied, multi-family	13%	13%	13%

Future cost burden

If we continue with current policy and investment direction, the number of cost-burdened households could double by the year 2030. In the year 2005, there were approximately 94,000 cost-burdened households inside the Metro UGB (about 16 percent of the households in Metro region). By the year 2030, if current trends and policies continue, between 17 to 23 percent of the households inside the Metro region could be described as cost-burdened. If the high end of the population range forecast is reached by the year 2030 and new policies and investments are not pursued, the number of cost- burdened households may more than double, totaling 200,000 households.

The distribution of cost-burden is uneven throughout the region. These scenarios indicate that with a continuation of current policies and investment trends, this uneven distribution will persist in the future. Locations that offer the most affordable housing and transportation are likely to have higher concentrations of cost-burdened households. These scenarios indicate that urban center and corridor locations that offer the most affordable housing and transportation options could be home to many cost-burdened households. The central city, centers, corridors, and centrally-located neighborhoods are areas that are likely to remain in high demand amongst higher income households as well.

While high market demand supports the development of multi-story buildings (where zoning allows), this type of construction often requires more expensive materials and structured parking, leading to higher costs per square foot of residence. However, these are also the communities where residents are likely to have the choice of smaller residences and multiple transportation options that save money.

Table 49 provides a summary of the possible distribution of cost-burdened households in the years 2005 and 2030. Areas that have lower numbers and percentages of cost-burdened households have not necessarily provided affordable housing options. In many cases, there are fewer cost-burdened households simply because there are limited affordable options from which to choose.

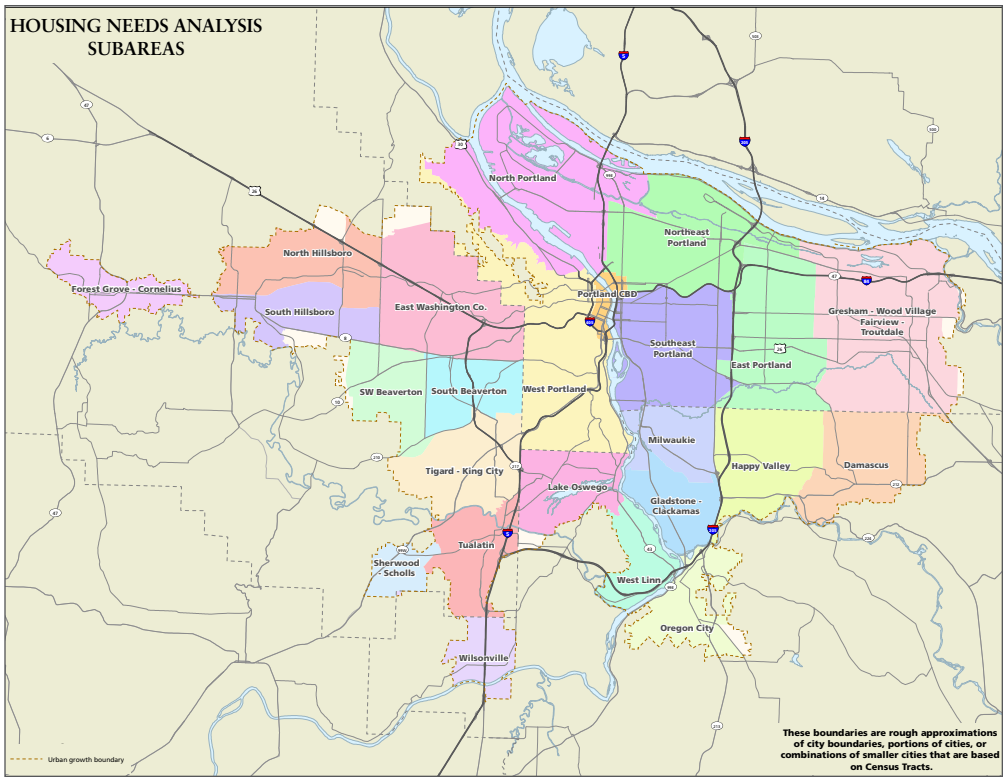
The subareas used in **Table 49** are illustrated in **Map 14**.

Table 49: Forecasted number and percent of cost-burdened households by subarea, assuming a continuation of current policies and investment trends (2005 and 2030)

Source: MetroScope scenarios 911 and 912, 2009

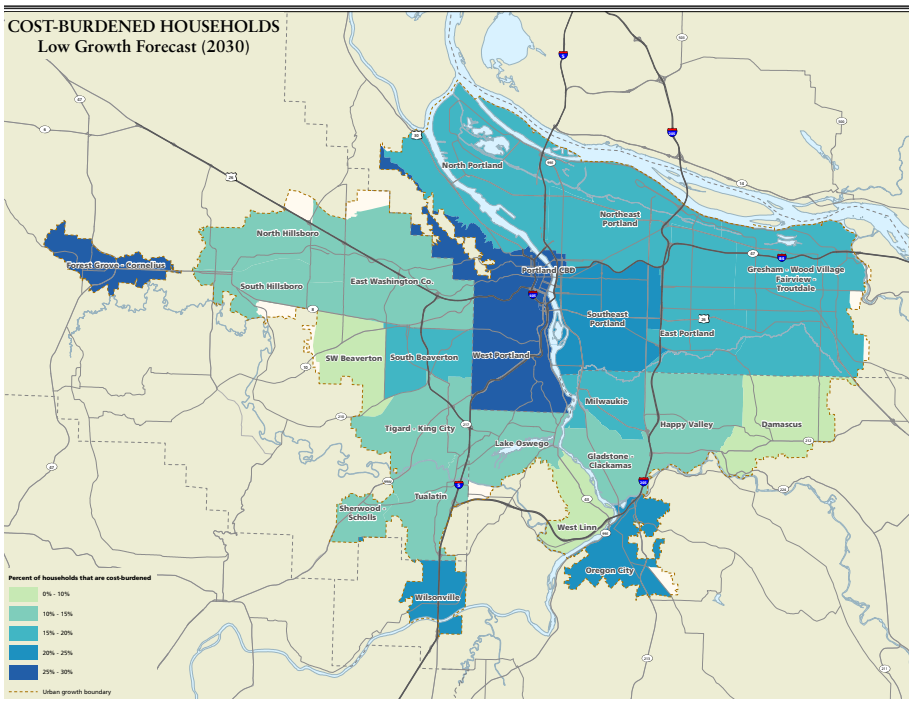
	2005		2030 LOW GROWTH FORECAST		2030 HIGH GROWTH FORECAST	
	Cost-burdened households	Percent of households cost-burdened	Cost-burdened households	Percent of households cost-burdened	Cost-burdened households	Percent of households cost-burdened
Portland central city	6,500	53%	12,900	29%	16,800	33%
Northeast Portland	7,400	17%	9,300	18%	13,100	24%
Gresham – Wood Village - Fairview - Troutdale	7,400	16%	9,800	16%	17,900	26%
East Portland	7,800	18%	11,000	18%	12,400	19%
Southeast Portland	16,200	24%	18,500	24%	26,100	32%
West Portland	11,700	24%	19,100	26%	23,800	29%
North Portland	4,000	18%	5,700	19%	6,600	20%
Lake Oswego	900	5%	2,000	11%	2,500	13%
Gladstone - Clackamas	2,100	13%	2,800	15%	4,200	21%
Milwaukie	2,700	18%	3,400	19%	3,500	19%
Happy Valley	1,600	10%	2,400	11%	4,800	20%
Damascus	200	3%	600	4%	1,400	6%
Oregon City	1,600	11%	5,300	21%	7,100	22%
West Linn	500	5%	900	5%	900	4%
Wilsonville	1,300	17%	2,200	20%	2,900	24%
North Hillsboro	1,800	9%	3,500	13%	7,800	27%
East Washington County	5,100	12%	7,300	12%	14,300	21%
South Beaverton	4,200	18%	5,000	19%	8,000	30%
Tigard - King City	3,300	12%	4,300	12%	7,500	21%
Tualatin	1,300	13%	1,700	12%	3,000	17%
Sherwood - Scholls	400	5%	1,000	10%	1,400	14%
SW Beaverton	1,900	8%	2,600	9%	5,000	15%
South Hillsboro	1,900	9%	2,800	10%	4,600	16%
Forest Grove - Cornelius	2,400	21%	4,400	28%	4,700	29%
TOTAL	**94,100**	**16%**	**138,400**	**17%**	**200,300**	**23%**

Map 14 **Housing needs analysis subareas**
Source; Metro, 2009

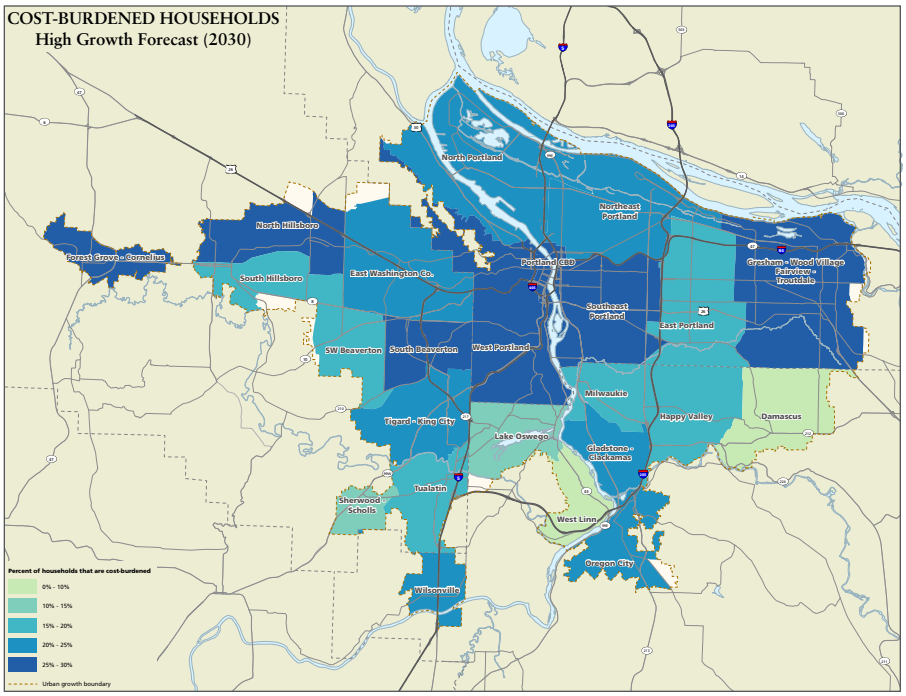


Maps 15 and 16 depict the percent of households that could be cost-burdened in the year 2030 (by subarea—rough approximations of city boundaries, portions of larger cities, or combinations of smaller cities). Though cost-burdened households are predicted to be distributed throughout the region, there are several concentrations including ones in the Portland central business district, southeast Portland, and west Portland, where housing and transportation options could be most affordable, and in outlying areas where housing prices may be lower, but transportation costs are higher.

Map 15: Share of households that are cost-burdened, LOW growth scenario
Source: MetroScope scenarios 912, 2009



Map 16: Share of households that are cost-burdened, HIGH growth scenario
Source: MetroScope scenarios 911, 2009



Policy implications

In order to implement the region's long-range vision and address new challenges such as climate change, the region needs to maintain housing affordability in the central city, centers and corridors. These scenarios indicate that many urban centers and corridors, particularly areas in the City of Portland, will offer the most affordable housing and transportation options. However, if the region continues the current policy trends, many households will still be cost-burdened as housing prices continue to increase in all locations.

Increases in housing prices are not caused by a lack of zoned capacity or vacant land. It appears that the primary causes of increased housing prices are the very success of efforts to enliven centers and corridors (which inherently leads to increased demand), the continued underfunding of infrastructure (which effectively reduces housing supply), inadequate public investments to offset multi-family construction costs, and a shortage of choices for people who want smaller, less expensive residences.

New ideas are needed to preserve our region's livability and affordability. A failure to maintain affordable housing choices in the central city, centers, and corridors may put additional growth pressures on existing single-family neighborhoods and push more residents to less central locations where they could be more susceptible to increases in energy prices.

Local and regional policy and investment choices will influence housing choice and affordability in the Portland metropolitan region. As regional leaders make these choices, questions to consider include:

- Are cities and counties willing to invest to make housing affordable in locations with good accessibility to various transportation options and essential services?
- Will the region identify an infrastructure funding source to support more housing choices in centers and corridors, thus reducing the effects of population growth on single-family neighborhoods?
- What are some ways that policies could be tailored so that they encourage the market to provide more housing choices such as accessory dwellings, cottage housing, and high quality manufactured housing?
- Is the region willing to address inequity in the distribution of cost-burdened households? Can public investments minimize the impact?

SUMMARY AND NEXT STEPS

This urban growth report is being released well before growth management decisions must be made to allow substantial discussion among policymakers and local planning professionals. Refinements to the data and assumptions as well as documenting local and regional actions that affect employment and residential capacity have informed revisions included in this urban growth report that is scheduled to be accepted by the Metro Council by the end of the year.

This assessment is reflective of uncertainty and describes both demand and supply in terms of a range, allowing policy makers to consider a range of possibilities and plan for contingencies. This approach supports decision-making focused on the outcomes that characterize a successful region and support vibrant communities.

RESIDENTIAL ANALYSIS SUMMARY

It is important to emphasize that achieving the "solid" capacity requires a continuation of local and regional investments and policies, and assumes no changes to local zoning over the next 20 years. It is evident that the region must take some action (make policy changes or increase public investments) to provide sufficient capacity to house the number of people anticipated to live here over the next 20 years at the low range of the forecast demand. However, if enough policy changes and investments are put in place to capitalize on the potential capacity that is not yet considered market feasible, it is possible to support the high range of demand without changing current zoning or expanding the UGB.

The potential difference between projected dwelling unit demand and supply (in the year 2030) could range from a deficit of 103,600 dwelling units (low supply, high demand) to a surplus of 152,400 units (high supply, low demand). Local and regional choices made over the next two years will influence where we land within these ranges and will shape our region's future.

As regional leaders discuss these choices, questions to consider include:

- What are some policy changes that could be made to increase the financial feasibility of higher density, mixed-use development, allowing the region to build closer to its current zoned capacity?
- What is the right balance of incentives and UGB expansion policy to increase the region's rate of redevelopment and infill in centers, corridors and main streets?
- Will the region identify an infrastructure funding source to make past UGB expansion areas developable?
- Is a higher density residential product market feasible in UGB expansion areas (past and prospective)? If so, during what time frame? What are the characteristics of expansion areas where this higher density product is market feasible?
- What are the relative costs of investing in different locations?
- Under what conditions should the region expand the UGB?
- What are some ways that policies could be tailored so that they encourage the market to provide more housing choices such as accessory dwellings, cottage housing, and high quality manufactured housing?
- Is the region willing to address inequity in the distribution of cost-burdened households? Can public investments minimize the impact?

EMPLOYMENT ANALYSIS SUMMARY

The current employment demand forecast and the analysis of employment capacity within the UGB do not indicate a need to add land to the boundary for industrial or non-industrial purposes at the regional level to meet statutory requirements to ensure sufficient capacity to support the region's forecasted employment at the low end of the demand range. However, the analysis does show a need for additional capacity through investments, policy changes, or expansions to support the high end of the demand range for non-industrial employment. Further analysis of preferences for large lots and the current inventory results in a small potential gap in the land needed to support current preferences for large lot formats for single and multi-tenant users.

It is likely that much future large parcel demand (single and multi-tenant users) will need to be accommodated on vacant buildable land unless other measures are taken. Redevelopment and infill (refill) would appear to be a more likely source of capacity for smaller lot needs. For the purposes of this large lot analysis, only vacant buildable land is considered as supply.

As regional leaders discuss these choices, questions to consider include:

- Can local and regional investments be targeted to increase development intensity (FARs) in locations that capitalize on and leverage past public investments?
- How important is it to protect past public investments (e.g., transportation improvements) to support future industrial uses?
- Are local and regional leaders willing to put policies and investments in place to support redevelopment of commercial and industrial lands (e.g., enterprise zones, public subsidy in existing industrial areas, economic development for select industries, brownfield cleanup, system development charge incentives for redevelopment, etc.)?
- Will the region identify an infrastructure funding source to make employment land more "development ready" and support development in past UGB expansion areas?
- What are the relative costs of investing in different locations?
- Under what conditions should the region expand the UGB?
- Is there a need for a coordinated regional economic development strategy to support and guide regional and local planning efforts? If so, who should develop a strategy?

NEXT STEPS

December 2009 Metro Council will accept a 2030 population and employment range forecast and complete a final urban growth report that describes any capacity gap to be addressed in 2010.

Throughout 2010 Local and regional governments will continue to implement policies and investments to create and enhance great communities while accommodating anticipated growth.

December 2010 The Metro Council will submit plans to accommodate at least 50 percent (up to 100 percent) of any 20-year capacity need (through local and regional actions inside the boundary or through expansions) to the Oregon Land Conservation and Development Commission.

December 2011 Final state deadline to accommodate identified 20-year capacity need through urban growth boundary expansions.

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Appendix 1: Preliminary urban growth reports: comments and responses

This document contains the following:

- A summary of the suggestions made by the forecast peer review panel and a summary of how those suggestions are being addressed.
- An index of comments received
- A summary of the comments received on the preliminary residential and employment urban growth reports. Also included is a summary of Metro staff responses or a description of how the comments were addressed in the draft urban growth report
- A memo from E.D. Hovee and Company (consultants that provided input on the employment analysis) that provides additional responses to comments received on the preliminary employment urban growth report.

Forecast peer review summary

In order to ensure the validity of the growth forecast being used as a basis for the urban growth report, a peer review was conducted.

Peer review participants

Steve Kelley, Washington County
Scott Bailey, Washington State Economist, Vancouver area focus
Brendan Buckley, Johnson Reid
Eric Hovee, Hovee and Associates
Uma Krishnan, City of Portland demographer
Todd Chase, FCS group
Scott Drumm, Port of Portland

Peer review general conclusions

- Comfortable with range, region is likely to end up on the mid to low end of range, but should plan for higher than that to be sure needs can be met
- Add more description to methodology, particularly on household size and link between employment and population forecasts

How peer review comments are being addressed

- Will clarify link between population and employment forecasts, methodology, and employment/population ratios
- Will incorporate household size changes, etc. from executive summary into full report, add short discussion of how projected shifts make sense
- Describe how 7-county forecast is not constrained by land supply, but that the urban growth report addresses potential land supply needs

RESIDENTIAL AND EMPLOYMENT URBAN GROWTH REPORT COMMENT INDEX

RESIDENTIAL UGR COMMENTS

Date	*From*	*To*
June 5, 2009	Beaverton School District	Malu Wilkinson
June 5, 2009	Margie J. Bradley	Metro Council
June 1, 2009	City of Cornelius	Robin McArthur
June 30, 2009	Robert Duvoisin	Malu Wilkinson
June 10, 2009	City of Forest Grove	Malu Wilkinson
April 6, 2009	Leslie Hidula	Metro Council
June 29, 2009	Home Builders Association Metropolitan Portland	Malu Wilkinson
June 15, 2009	Johnson Reid	John Williams and Malu Wilkinson
June 28, 2009	Matrix Development Corporation	Malu Wilkinson
June 23, 2009	Metro Technical Advisory Committee	Metro Policy Advisory Committee
July 8, 2009	1000 Friends of Oregon	Malu Wilkinson
June 12, 2009	City of Portland	Malu Wilkinson
March 25, 2009	Pat Russell	Metro Council
July 6, 2009	South Hillsboro Partners	Metro Council
June 8, 2009	Tualatin Hills Park & Recreation District	Malu Wilkinson
July 2, 2009	City of Vancouver	Dick Benner
June 7, 2009	City of West Linn	Councilor Carl Hosticka
June 24, 2009	Westside Economic Alliance	Council President David Bragdon
June 11, 2009	City of Wilsonville	Malu Wilkinson
June 29, 2009	City of Wilsonville	Malu Wilkinson

EMPLOYMENT UGR COMMENTS

Date	*From*	*To*
June 22, 2009	Multiple Jurisdictions	Malu Wilkinson
June 30, 2009	Commercial Realty Advisors	Malu Wilkinson
June 30, 2009	City of Forest Grove	Brian Harper
June 30, 2009	Greater Hillsboro Chamber of Commerce	Chris Deffebach, Malu Wilkinson & Dennis Yee
June 22, 2009	City of Hillsboro	Chris Deffebach, Malu Wilkinson & Dennis Yee
July 9, 2009	City of Hillsboro	
June 30, 2009	Johnson Reid	Malu Wilkinson; Joint MTAC/ECAC Committee
July 13, 2009	Johnson Reid	Malu Wilkinson; Joint MTAC/ECAC Committee
July 8, 2009	Metro Technical Advisory Committee	Metro Policy Advisory Committee
June 16, 2009	Port of Portland	Malu Wilkinson
July 10, 2009	Port of Portland	Malu Wilkinson
June 30, 2009	City of Portland	
June 30, 2009	City of Portland	Malu Wilkinson
July 2, 2009	Portland General Electric	Malu Wilkinson
July 13, 2009	Carter Stein	Malu Wilkinson

GENERAL UGR COMMENTS

Date	*From*	*To*
June 8, 2009	William Bours	Malu Wilkinson
June 15, 2009	Markus Brown	Malu Wilkinson
June 16, 2009	Frederick Butzer	Malu Wilkinson
June 11, 2009	Sattie Clark	Malu Wilkinson
June 10, 2009	Keith Daly	Malu Wilkinson
June 23, 2009	Jim Emerson	Multnomah County Reserves Citizens Advisory Committee
June 10, 2009	Dave Feucht	Malu Wilkinson
June 10, 2009	Peter Finley Fry	Ken Ray
June 7, 2009	Elizabeth Graser-Lindsey	Malu Wilkinson
June 11, 2009	Daniel Kaven	Malu Wilkinson
June 20, 2009	Catherine Keith	Malu Wilkinson
June 5, 2009	John Keith	Malu Wilkinson
June 12, 2009	Richard Mills	Malu Wilkinson
June 8, 2009	Councilor Jim Needham, Molalla	Malu Wilkinson
June 11, 2009	Mike	Malu Wilkinson
June 8, 2009	Scott Prose	Malu Wilkinson
June 8, 2009	Janice I. Troxler	Malu Wilkinson
June 9, 2009	Michael Wagner	Malu Wilkinson

Policy[1] comments (residential)

Policy comments: residential	Attribution	Response
UGR has bias towards no UGB expansion	Cornelius Forest Grove	• State law and statewide planning goals direct the region to determine what share of growth can "reasonably" be accommodated inside the existing UGB before expanding it. Ultimately, how the region defines "reasonable" will be a reflection of regional and community values and commitments. At the opposite ends of the spectrum, the Metro UGB could be held tight or expanded significantly. There are tradeoffs that accompany such choices. This urban growth report is intended not just to determine whether there is a need for additional residential or employment capacity within the UGB over the next 20 years, but also to place growth management decisions in the context of the region's desired outcomes. • The region's 2040 Growth Concept calls for future growth to be focused in centers and corridors, additionally experience has shown that centers and corridors need increased investments (public and private) to become vibrant places that support residents and jobs. Public dollars to invest in public works and other community assets have dwindled, necessitating more focused and targeted strategies to support local and regional goals. • This analysis distinguishes between capacity that may be counted on within the next 20-year period and that which relies upon changing market dynamics. All of the capacity is based on local zoning – no upzoning assumptions are included, despite the fact that local jurisdictions are likely to revise their zoning over the next 20 years to achieve local aspirations. The UGR only counts the capacity that is likely to be realized within the next 20 years, capacity that relies on increased investments will be the focus of discussion in 2010.
Lack of housing choices (i.e. not enough single-family)	Cornelius Forest Grove Johnson Reid[2] HBA	• Housing preferences play a critical role in determining how much capacity is needed to accommodate future growth. For instance, preferences for larger lots could result in more land consumption. However, housing preferences are a product of a number of variables and are not static. Changing global dynamics (e.g., global warming, fuel prices, demographics) are likely to result in changes in housing preferences. • Metro's analysis is conducted at a regional scale, local imbalances in housing choice may be addressed when growth management decisions are considered.

[1] Comments are characterized as "policy comments" when additional technical analysis would present a false degree of precision or if more analysis is unlikely to change people's minds.

[2] Johnson Reid performed a critique of the UGR on behalf of HBA, Commercial Real Estate Economic Coalition, NAIOP, Associated General Contractors, PBA, Westside Economic Alliance, Realtors, Clackamas County Business Alliance, and the East Metro Economic Alliance

Policy comments: residential	Attribution	Response
Overly ambitious future refill rates No money for the level of investments contemplated	Cornelius HBA Forest Grove Johnson Reid	• Past experience and recent scenario modeling indicate that investments in centers and corridors are an effective means of attracting growth to these areas. • Forecasting a future refill rate is part art and part science. Taking into consideration past refill rates, shifts in housing preferences, scenario results and the stated objectives of the region's citizens, it is estimated that current policy direction and investment trends will produce an average refill rate of approximately 33 percent through the year 2030. In 2010, part of Metro's work will include a scenario that will help to determine what the refill rate is likely to be with new policy and investment inputs. • Public dollars for investments in existing communities and new urban areas are limited and are often in competition, sometimes diluting the potential impact of public investments.
Refill is "infill in existing neighborhoods" (statement made in comments)	Johnson Reid HBA	• This analysis assumes current local zoning, despite the fact that many cities and counties will change their zoning within the next 20 years to support local aspirations. • The 2040 Growth Concept focus is on centers and corridors to take pressure off of existing neighborhoods (which the market finds desirable).
Local needs for expansion not acknowledged in UGR	Cornelius	• The UGR analysis is conducted at a regional scale, Metro may consider local needs when making specific UGB expansion decisions.
Disagreement with infrastructure cost estimates (and widespread misunderstandings of methodology)	Cornelius Forest Grove Wilsonville Johnson Reid HBA	• Metro's assessment of infrastructure costs as a performance indicator was completed to inform local and regional discussion about choices. The analysis uses MetroScope to assess the comparative costs of infrastructure in different scenarios. This is informed by VMT and household density. Future growth management decisions are likely to be informed by more location specific infrastructure costs.
Misconception that the UGR contemplates zoning changes	Cornelius HBA	• Metro's UGR analysis assumes current zoning, as provided by cities and counties to Metro's Research Center on a quarterly basis.
Housing affordability compromised by focus on centers and corridors	Johnson Reid	• The revised draft integrates the housing needs analysis and includes cost-burdened household information. Metro's approach to cost-burdened looks at housing and transportation costs combined, since both are important components of a household's expense. Centers and corridors may have higher housing prices but often have better transportation choices, lowering the transportation costs. • Work by respected researchers Arthur C. "Chris" Nelson and Chris Leinberger tell us housing at the center has risen in cost more than housing at the edge because the market is not producing enough product.
What are the tradeoffs of providing infrastructure in one place versus another (i.e. existing urban areas versus expansions)	1000 Friends	• Infrastructure costs money, regardless of location. Metro's Case Study Analysis describes some of the different public infrastructure costs in a variety of locations.

Technical comments (residential)

Technical comments: residential	Attribution	Response
SCENARIO ASSUMPTIONS		
Change MetroScope assumptions for Villebois subsidies	Wilsonville	• Requested changes to scenario assumptions have been made and are reflected in the revised draft.
Change Clark County expansion assumptions for scenario	Vancouver (based on Superior Court decision)	• Requested changes to scenario assumptions have been made and are reflected in the revised draft.
Keep infrastructure timing assumptions the same for scenarios	MTAC	• No change needed.
Remove Beaverton from list of subsidized centers in scenario	Beaverton	• Requested changes to scenario assumptions have been made and are reflected in the revised draft.
Remove Troutdale from list of subsidized centers in scenario	Troutdale	• Requested changes to scenario assumptions have been made and are reflected in the revised draft.
ACREAGE "TAKEOUTS"		
Better explanation for vacancy rate (no argument with the rate itself)	Wilsonville	• Text was edited to clarify the purpose of a vacancy rate, see revised UGR.
Title 13 areas not likely to be built out to the degree assumed	Wilsonville	• Metro convened a group of local planners to determine a methology to account for the impact of Title 13 on residential capacity. Recognizing habitat friendly development and the incentive based nature of Title 13, development capacity in habitat conservation areas is estimated to be about 80 percent of zoned capacity, based on the input of those local experts. However, Wilsonville was treated differently than most of the jurisdictions due to the specific nature of local mapping. None of the land that falls within Wilsonville's Sensitive Resource Overlay Zone is considered for residential capacity.
"Skinny streets" assumption often doesn't work for arterials and collectors	Wilsonville	• Street assumptions are consistent with the methodology used in the 2002 UGR, which was vetted by local and regional leaders and accepted by LCDC.
Future parks acreage assumption is too low	Wilsonville THPRD MTAC HBA	• Metro reviewed local jurisdiction's that charge an SDC for parks to determine if enough had changed to revise the methodology that was vetted in the 2002 process. While two additional jurisdictions charge a parks SDC and most have raised their rates, land prices have also increased and SDCs are not constructed to completely cover the costs of land acquisition. Parks often share facilities with other public agencies, and bringing additional land for parks into the UGB without actually purchasing the land will not necessarily result in more parks for citizens to use. Based on these factors, the analysis of need for additional park land is unchanged from the preliminary draft.

Technical comments: residential	Attribution	Response
Future school and church acreage assumption is too low	Wilsonville Beaverton Schools MTAC HBA	• Metro gathered information on growth plans from all of the school districts in the region. However, reviewing the data does not result in a change in methodology. Similar to housing, Metro's analysis is conducted at a regional scale. Specific school district needs may be considered at the time of growth management decisions. There is also a specific provision for schools in the UGB Major Amendment process.
MARKET FEASIBILITY		
Agree with UGR approach of not counting new urban areas that are unlikely to have infrastructure	Wilsonville	• No change needed
MUR density assumptions appear reasonable	Wilsonville	• No change needed
Disagreement with statement that there is a limited market for multi-family in expansion areas	Wilsonville	• Current modeling preferences indicate that there is limited market for multi-family in these areas. However, as more development occurs in these locations the model assumptions will be changed over time.
No valid rationale for using a vacancy rate	Portland	• A vacancy rate exists because the market cannot instantaneously calibrate the demand for housing from households and the supply of housing built by developers. Housing is developed in waves, while demand for housing is much smoother. There also exists a natural rate of vacancy to account for the loss in fidelity of information flow (one could also say it accounts for the finance and closing time needed as well for homebuyers) in the marketplace. Homebuyers and renters do not know instantaneously when housing becomes available. This lag time is the vacancy rate and allows households the time to find housing or to move from one housing unit to another as economic situations for households change over time.
Maintain refill range	MTAC	• Forecasting a future refill rate is part art and part science. Taking into consideration past refill rates, shifts in housing preferences, scenario results and the stated objectives of the region's citizens, it is estimated that current policy direction and investment trends will produce an average refill rate of approximately 33 percent through the year 2030. The refill range in the draft UGR is 33 percent that can be counted in the capacity analysis and a potential of up to 40 percent based on a number of MetroScope scenarios that reflect increased investments in the region's centers.

Technical comments: residential	Attribution	Response
More underbuild needs to be accounted for	HBA	• Underbuild represents a statistical estimate of the dwelling unit capacity lost due to residential development at less than maximum permitted densities in residential zones. The underbuild accounts for such factors as poor access, steep slopes, small or odd shaped lots, neighborhood common areas, greenways, storm water detention areas and many other site specific conditions, that make it difficult to develop at full capacity as indicated by the zoning. Under the Metro Code Section 3.07.120, regulations establish a minimum density requirement that specifies that residential development must at least be constructed at 80 percent of the maximum density. This requirement was adopted by Metro Council in November 1996 and has been implemented by local jurisdictions through code changes. • In effect, the Functional Plan has provided assurance that underbuild would be no more than 20 percent for residential development within the UGB. However, since the last UGR was completed, staff from multiple jurisdictions noticed a significant decrease in the amount of underbuild that was occurring on new housing construction projects. In an attempt to clarify how much underbuild has been occurring throughout the region since the last UGR, Metro staff collected housing data from selected local jurisdictions. Specifically, Metro staff requested that cities and counties identify recent housing projects and provide data comparing allowable densities on the property prior to construction, and actual densities on the property post-development. Data was collected from the following jurisdictions: Hillsboro, Wilsonville, and Clackamas County. Metro's data collection has indicated that the region is performing better than previously expected, resulting in an underbuild factor for single family of 5 percent. • The 2009 UGR does not include underbuild for multi-family, but instead includes a market discount factor of 50 percent for high-density multi-family and mixed-use residential to reflect the fact that much of the region's zoning is "ahead of the market".
Elaborate on policy options and investments that could be made to increase use of zoned capacity	1000 Friends	• Metro's *Financial Incentives Toolkit* describes many of the investments that have been used successfully by cities and counties in the region. Further work on the implementation and documentation of local and regional actions will be the focus of Metro's work in 2010.
DEMAND FORECAST		
Forecast range methodology is clear	Johnson Reid	• No change to household range
Use of range makes sense	1000 Friends	• No change needed
MISC.		

Technical comments: residential	Attribution	Response
What densities are necessary to provide improved transit?	1000 Friends	• Metro's work developing a High Capacity Transit Plan along with the information gathered from the Local Aspirations effort begin to address this issue of determining what level of density support different types of improved transit. A summary of the key studies that are being referenced is included in the notes section of this appendix. Metro is in a process to determine the best number of hh/gross acre to use for the HCT System Expansion Policy targets and thresholds.
Compare costs of infrastructure for realizing existing zoned capacity versus cost of infrastructure in an expansion area.	1000 Friends	• Information available in the infrastructure case studies. • All options are expensive, but in locations where new development can capitalize on and leverage past investments development can be less expensive today. • On average, redevelopment appears to be less expensive, since much of the infrastructure is already in place.
Integrate HNA into draft UGR, particularly the information about affordability	Portland 1000 Friends	• The HNA has been integrated into the revised draft.

Policy comments (employment)

Policy comments: employment	Attribution	Response
Large lot need is not episodic, it's constant	Group of 10[3] Hillsboro	• MPAC subcommittee to discuss regional implications. • Metro's large lot analysis considers the need to be constant over time, not episodic. • Several entities suggested that they would be able to submit data to support this point, however the closest was the Johnson Reid analysis of OBDD lead sheets. Eric Hovee points out some of the issues with using that analysis to drive regional policy in the attached memo. In summary, Hovee emphasizes that there is no way to know how many of those potential leads ever put Oregon on their short list, and also there is not an analysis of the reasons why, if Oregon was on a short-list, a location within the state wasn't chosen.
Fast-track process will not be fast enough	Group of 10 Hillsboro	• MPAC subcommittee to discuss regional implications. • The Employment Coordination and Advisory Committee discussed this issue and determined that a fast-track process may be most suitable for existing companies looking to relocate within the region.
Test of adequate capacity does not address specific needs of industry (land not fungible)	Group of 10 Hillsboro Port of Portland Johnson Reid[4]	• MPAC subcommittee to discuss regional implications. • Several entities suggested that they would be able to submit data to support this point, however the closest was the Johnson Reid analysis of OBDD lead sheets. Metro's analysis does allow for consideration of imbalances between demand and supply within market subareas, but this analysis may be most pertinent at the time of a growth management decision rather than determining if there is a capacity deficit at the regional level.
Job forecast is inadequate for forecasting some needs (land extensive uses with few employees or little building space).	Group of 10 Portland Hillsboro MTAC/ECAC Port of Portland Johnson Reid	• Metro's subsequent large lot analysis, which is incorporated into the revised UGR, considers land extensive uses with fewer employees. The overall demand model assumptions on employees per square foot by building type have also been revised based on the feedback received on the preliminary analysis.

[3] "Group of 10" refers to a letter received from 10 reps from of the Port, Gresham, Cornelius, Hillsboro, Troutdale, PDC, Regional Economic Development Partners of Clackamas Co., Forest Grove

[4] Johnson Reid provided comments on the employment UGR on behalf of CREEC, CAR, NAIOP, PBA, CCBA, SIOR, ICSC, & Davis Wright Tremaine

Policy comments: employment	Attribution	Response
Analysis may underestimate industrial need	Portland Johnson Reid Hillsboro	• The large lot analysis addresses some of the concerns about the demand model underestimating industrial capacity need. However, the forecast for industrial uses is based on national trends that indicate a decline in manufacturing across the nation in the future as more companies relocate for less expensive labor and other industrial inputs.
References to "homegrown" employers are unnecessary and "elitist"	Hillsboro Port of Portland ECAC Johnson Reid	• The analysis replaces the term "homegrown" with "Oregon-originated" as directed by the ECAC. This analysis is simply additional information that does not enter into the large lot demand analysis, rather it provides context for policy discussion.
References to "homegrown" employers are important reminder of where the majority of growth will come from.	1000 Friends	• The analysis is not removed, but the term "homegrown" was replaced with "Oregon-originated" as directed by the ECAC.
There is a risk of over-emphasizing the large lot issue. It won't be the source of most future employment.	1000 Friends	• Large parcel uses, particularly in recent years, tend to support the traded sector that brings wealth into the region and can have a "multiplier effect" on the surrounding local economy. However, as stated in the analysis, only a small percentage of the region's jobs are located on large parcels.
More analysis of the future needs of existing employers (not just large employers)	1000 Friends	• The overall demand forecast is not limited to existing or new employers, but addresses the overall expected employment in the region.
Outcomes-based approach and policy questions can't replace technical analysis	Hillsboro	• The technical analysis presented in the UGR frames the policy debate about how the region wants to grow to support the outcomes that define a successful region. This UGR includes both the technical analysis and consideration of the outcomes.
Large lot analysis is too complex—may present unreliable conclusions	Hillsboro	• The methodology used in the large lot analysis is very similar to that developed in the Regional Industrial Lands Study process, with the involvement of numerous local government and business stakeholders, and used in the 2002 UGR. Metro has added an analysis of multi-tenant uses on large lots to enhance the approach.
Analysis lacks discussion of economic development aspirations, targeted industry need	Johnson Reid Hillsboro	• Metro is not charged with setting economic development priorities for the region. However, the revised analysis includes consideration of five economic clusters to support local economic development aspirations. Metro's analysis considers employment over the next 20 years, during which targeted industry needs are likely to change.

Policy comments: employment	Attribution	Response
Analysis is overly reliant on models. Need to have room for subjective analysis and informed estimates.	Port of Portland	• The model assumptions for this UGR have been discussed and tested with business and local government stakeholders and are intended to reflect current policies and trends. The outputs of MetroScope and the demand model developed by the Hovee team are provided in the form of a range to allow for policy discussion and informed regional decision making. • This UGR uses an outcomes-based approach to allow growth management decisions that support achievement of the region's outcomes (which include a strong regional economy).
Land assembly is not as viable an option as it once was (Kelo decision)	Hillsboro	• The revised UGR includes discussion about the potential difficulty of land assembly. • The "Kelo" decision only has implications when condemnation comes into play, significant land assembly can occur without public condemnation. • MPAC subcommittee to discuss regional implications.
Land banking is a necessary business practice	Hillsboro Port of Portland ECAC Johnson Reid	• Land banking is implicitly included in the demand model through the FAR assumptions by market subarea and design type. Lower FARs imply land banking. These FARs were modified based on substantial input from local governments and the business community. • MPAC subcommittee to discuss regional implications.
There is a need for a regional economic development strategy	Hillsboro Johnson Reid	• Metro is not charged with developing a regional economic development strategy and is not subject to statewide planning goal 9. Several groups in the region are working toward developing such a strategy (Regional Partners, Greenlight Greater Portland). If such a strategy is agreed upon and approved by cities and counties in the region it would greatly benefit regional land use planning.
The region is missing eco-dev opportunities because of a lack of land	Port of Portland ECAC	• Metro has requested data that can quantify this concern, none has been provided. The closest is the analysis of OBDD lead sheets conducted by Johnson Reid. Concerns regarding this analysis are addressed in Eric Hovee's attached memo, but the lead sheets do not distinguish between "solid" missed opportunities and those inquiries that were not likely to locate in Oregon in the first place. • The region has many positive characteristics that attract companies, land is only one of many elements that support a strong economy. • MPAC subcommittee to discuss regional implications.
Engage business site selectors in process to identify need and expansion sites	Port of Portland	• MPAC subcommittee to discuss regional implications. The subcommittee membership includes site selectors.

Policy comments: employment	Attribution	Response
Efficient land market will require 50 to 300% more industrial land than forecasted demand	Johnson Reid Hillsboro	• Goal 14 does not allow a significant oversupply of land (Metro could justify a few extra employment acres, as in 2002, but not 300% more land). Oversupply of industrial land in urban areas is likely to adversely affect the agriculture industry, which will be harmed by undersupply. The short term need that should allow for market choice is addressed by maintaining a long-term supply of land (20 years) within the boundary while focusing investments to ensure that sufficient short-term supply is well-served with infrastructure and other necessary services.
Describe downside of oversupplying land	Port of Portland	• The revised UGR includes a summary of the risks of over or under supplying land over the 20-year period. Too much land supply can lead to diluted public investments, reducing the effectiveness of limited public dollars to spend on public works and transit. Identifying urban reserves specifically for employment uses will allow for future market choice.
Lack of empirical evidence regarding conversion of industrial land to other uses	Johnson Reid Hillsboro	• As Hovee describes in his memo (attached), the majority of jobs in industrial areas are now classified as service jobs. In some instances parks, schools and institutional uses have gone into land zoned for industrial purposes.
Is it our policy to lose 25% of growth to neighbor cities (75% capture rate)?	Johnson Reid Hillsboro	• Not all jobs will locate in the Metro UGB, regardless of how much we expand it. Metro does not have a policy to capture a certain percentage of jobs, rather to ensure the growth management choices support the regional outcomes. Our neighboring cities are also growing, and increased job choice in neighboring communities can reduce impact on the regional transportation system.
Firms "often desire a campus environment with major landscaping and open space…"	Johnson Reid Hillsboro	• The UGR analysis covers a 20 year time period. Development practices have shifted in the past and are likely to shift again in the future. Many global trends are impacting business practices today and have the potential to have an even larger impact in coming years. For example, the region and the state have been focused on "green" jobs, part of which is the built form within which those jobs are housed. Green development standards are consistent with the 2040 Growth Concept and the efficient use of land and other resources. While many firms have historically preferred to locate in a campus setting with major landscaping features, preferences may change over time to focus on efficiency and resource conservation, particularly in a "green" economy.
"Firms frequently prefer to purchase land for later expansion at lower initial holding cost…"	Johnson Reid Hillsboro	• State law does not require that Metro expand the UGB to fulfill preferences for inexpensive land. The region's leaders may wish to consider approaches such as publicly holding land for economic development in order to manage land costs.
Who is responsible for land assembly and its costs?	Johnson Reid Hillsboro	• Individual firms are typically responsible for land assembly. However, in many cities and counties public agencies have assembled land for economic development purposes.

Policy comments: employment	Attribution	Response
Who will pay for brownfield cleanup?	Johnson Reid Hillsboro	• Many cities and counties in the region, along with Metro, have been working to obtain federal funds to help clean up the brownfields in the region to allow for the reuse of those lands. Concerted effort in this area will be necessary in the future.

Technical comments (employment)

Technical comments: employment	Attribution	Response
DEMAND FORECAST		
Job forecast assumes available capacity (may not occur). Forecast should be based on capacity.	Johnson Reid Hillsboro[5]	• Suggested approach presumes that growth can only occur on vacant land--refill capacity is a product of demand (forecasted). • The forecast shows up as potential need in the analysis, in other words, it is not lost when we compare it with the capacity. • If Metro produced a forecast only based on current capacity assumptions then there would be no need to expand the boundary to accommodate future growth.
MetroScope job distributions in Portland are consistent with city's analysis	Portland	• The city's analysis used a different methodology and approach, so it is good confirmation to learn that the results are consistent with Metro's methodology.
Use of range makes sense	MTAC 1000 Friends	• No change needed.
Translate demand into acreage and assess site suitability	Hillsboro Johnson Reid	• Revised UGR translates demand into acreage, based on market-based FAR assumptions. The site suitability assessment is more appropriately done at the time of UGB expansion decisions.
Difficult to reconcile short-term market subarea demand numbers with known development projects (e.g. old Reynolds Aluminum site, Solar World)	MTAC/ECAC Johnson Reid Hillsboro	• The forecast is done at a regional scale and uses a methodology that has been accepted and reviewed by local and national peers. While it does not capture individual firm decisions to locate within or leave the region, in the aggregate it does a good job of describing future population and employment. Additional comparison of history and forecast may be found in Appendix 12.
VACANT LAND INVENTORY		
Use Portland's vacant land inventory	Portland	• The revised analysis uses Portland's employment land inventory.
Portland has identified "potential brownfields" (acknowledges that we may not be able to use the info for the UGR)	Portland	• Development potential on brownfields is included in the refill rate. At this time Metro is not able to use Portland's more detailed local information.
Analyze potential brownfield redevelopment separately and more extensively (good source of capacity for existing and small businesses, which will be the source of most jobs)	1000 Friends	• Development potential on brownfields is included in the refill rate.
Use Portland's definitions of buildable, unbuildable, and partially buildable	Portland	• The revised analysis uses Portland's data set, which uses local definitions.

[5] Hillsboro has requested that all of Johnson Reid's comments be included as part of Hillsboro's comments

Technical comments: employment	Attribution	Response
Vacant land inventory in Hillsboro overstates available land	Hillsboro	• The inventory submitted by Hillsboro is used in the revised analysis.
Can't determine how land readiness tiers were determined for a number of sites	Hillsboro	• Tiers were identified using professional expertise by Todd Chase, FCS Group, as part of the Hovee consultant team work.
Inventory of vacant land needs to address tax lot size (rather than reporting aggregate acres)	Hillsboro Johnson Reid	• The large lot analysis considers tax lot size.
Include map of large lot supply	Port of Portland	• Map of the large lot supply is included in the revised draft.
REFILL, FAR, SQ. FT PER EMPLOYEE		
Variable refill rates by subarea make sense	Portland 1000 Friends	• Revised analysis continues to use variable refill rates.
Analysis of demand and capacity by variable FARs and building types makes sense	1000 Friends	• Revised analysis continues to use this approach.
Different refill rates for industrial and non-industrial, by market subarea make sense	1000 Friends	• Revised analysis continues to use this approach.
Use different sq ft, FAR, and refill rates for Portland	Portland	• Revised analysis includes new assumptions for the City of Portland, based on Portland recent EOA completed by Eric Hovee.
Portland has different assessment of refill capacity (acknowledges that we may not be able to use)	Portland	• Metro looks forward to further discussing refinements to the UGR methodology with Portland in the future, but currently Metro is using a regionally consistent approach for refill.
How do the refill rates presented in table 11 relate to the potential 50% refill shown in figure 26?	Hillsboro	• Revised draft includes clarification of the difference between refill with current investments and refill with new investments. • Also, new rates are included in the revised draft.
Assumptions about sq ft per employee appear reasonable. Check with Portland and Hillsboro on where their numbers differ.	MTAC/ECAC	• Revised draft includes changed assumptions based on coordination with Portland and Hillsboro on sq ft/employee assumptions.
FAR assumptions appear reasonable. Cities to provide observed FAR data where available.	MTAC/ECAC	• Revised draft incorporates observed FAR data from cities where possible, particularly from Hillsboro and Portland.
FAR assumption table needs to show a regional center in the Outer Clackamas market subarea	MTAC/ECAC	• Made correction to FAR table, this was a mapping error.

Technical comments: employment	Attribution	Response
Assumed retail FARs are too high	ICSC (Bob LeFeber)	• Revised draft incorporates new retail FAR assumptions for the short and long term based on feedback from ICSC.
FARs are wrong (can't rely on CoStar)	Johnson Reid Hillsboro	• Johnson Reid's concerns, which are also based on CoStar, are addressed in Eric Hovee's attached memo. In sum, Hovee used CoStar but also ground-truthed with county assessor data where possible. This is an area for future research, but the revised UGR incorporates the best available information.
Include information about demand FARs	Johnson Reid Hillsboro	• Demand-side FARs are included in the revised UGR, and were thoroughly reviewed by local governments and stakeholder groups.
Professional expertise is insufficient basis for assumed refill rates. Refill rates appear too high (according to Johnson Reid professional expertise)	Johnson Reid Hillsboro	• Professional expertise must remain a component of this analysis. There are not always solid empirical data. However, Hovee's model and MetroScope both resulted in similar refill rates as an output.
How do our MetroScope residential subsidy assumptions affect employment refill?	Johnson Reid Hillsboro	• Indirect effects on employment (probably understates the attraction of employment to centers).
LARGE LOT / LARGE EMPLOYER		
Historic employee densities do not match up with the large lot analysis assumptions (tech-flex, in particular)	Hillsboro	• Employee densities have been adjusted based on comments from Hillsboro and others. However, the analysis is not necessarily carrying historic densities into the future as trends.
Include Genentech's FAR (.19) in large lot analysis tables and clarify why some firms were not included	Hillsboro	• Revised analysis uses information provided by Hillsboro and clarifies that the methodology includes only firms that use more than 25 acres.
Additional existing large lot users need to be included in list	Port of Portland	• Revised analysis includes additional firms identified by Port of Portland.
Large lot analysis does not need information about large employers	Port of Portland	• While the information does not directly impact the analysis it is useful for policy makers to consider when making growth management decisions.
Include refill as source of potential capacity for large lot needs	1000 Friends	• One of the solutions identified to address large lot needs is brownfield clean up and land assembly – both of which would be considered refill. However, most are likely to locate on vacant land.
Provide more information about historic land assembly and potential policy tools to help.	1000 Friends	• Some analysis of past land assembly is included in the UGR. Future work on policy tools to help with land assembly could be a focus of future work.
Analysis should address large lot need for business parks	ECAC Johnson Reid Hillsboro	• Revised UGR includes an analysis of multi-tenant / large lot use. Additional information on the methodology may be found in Appendices 4 and 5.

Technical comments: employment	Attribution	Response
Analysis should address large lot need for shopping centers	Johnson Reid Hillsboro	• Shopping centers are not a need, they are a format preference. Focus groups conducted by the Hovee consultant team confirmed that the region is "under-retailed" by national standards, but this has resulted in better sales per square foot for this region compared to others. Retail has historically fit into the urban environment in such a way as to be convenient to their customers. Economist Joe Cortright and others have also observed that this also results in fewer closures than elsewhere in the US in a downturn. More information may be found in Appendix 11.
Analysis should address large lot need for multi-tenant industrial parks	Johnson Reid Hillsboro	• Revised UGR includes an analysis of multi-tenant / large lot use. Additional information on the methodology may be found in Appendices 4 and 5.
Analysis should mention need for large lot marine terminal and rail yard needs	ECAC Port of Portland City of Portland	• Those who have made this comment have agreed that UGB expansions cannot address this need due to the specific location demands of such facilities.
Definition of large employer for flex category should be changed (current definition has too many employees/acre)	Johnson Reid Hillsboro	• Metro revised assumptions based on comments received from Hillsboro and Johnson Reid.
Analysis should factor in need for land banking for industrial business expansion	Johnson Reid Hillsboro	• Land banking is implicitly included in the lower FAR assumptions, particularly in the outer ring market subareas. The question of whether to provide explicit allowance for land banking (or holding) beyond 20-year needs is an appropriate matter for policy discussion, particularly by the MPAC employment subcommittee. • Metro's approach accounts for land banking in the inventory of land available to accommodate employment need. Goal 14 probably would not allow Metro to include hundreds of extra acres to meet a "land banking" need distinct from and above the calculated need for employment capacity.
Large lot capacity is not fungible	Johnson Reid Hillsboro	• Metro is charged with providing capacity to meet growth, not with selecting sites for unknown future businesses.
CAPTURE RATES		
Capture rates will vary with different policy and investment assumptions. MetroScope appears to offer a reasonable estimate.	MTAC	• MetroScope scenarios can inform our assumed capture rates.
Do neighboring cities have large lot capacity for the employment that we don't capture?	Port of Portland	• Capture rate depends on policies and investments (not set in stone). • Inventory of supply and demand in neighbor cities is beyond the scope of this UGR.
SCENARIOS		

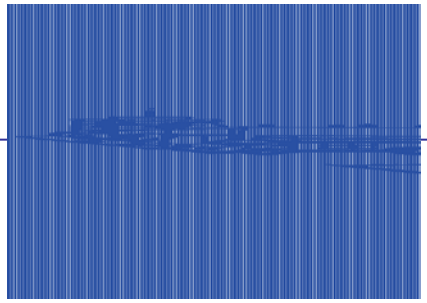
Technical comments: employment	Attribution	Response
Suggests that there are misconceptions about tight UGB assumptions in scenario (references to MPAC voting last fall)	Johnson Reid Hillsboro	• The scenario assumptions for this UGR have been vetted by MTAC and local governments. They are described in Appendix 2. The assumptions include future UGB expansions based on historical experience and in accordance with current state law (including the land hierarchy).
How do infrastructure costs affect results of scenarios	Johnson Reid Hillsboro	• MetroScope assumes that infrastructure is in place – or not, but it does not include an assumption about the specific cost of infrastructure. Scenario assumptions are documented in Appendix 2. For the UGR the assumptions include infrastructure in place in east Happy Valley in 2010, other recent expansion areas in 2015, Damascus in 2020, and future UGB expansion areas in 2025. • Infrastructure costs (beyond the $25,000 SDC) are not added to real estate prices, they are calculated as an output of the scenario since they aren't recouped in reality either.
Scenario should model alternative UGB expansions	Johnson Reid Hillsboro	• UGR is intended to represent current policy direction, not model various alternative scenarios. Future modeling in 2010 may test growth management choices.
Scenario results present a future trend (jobs in central locations) that runs contrary to recent experience (jobs moving outward)	Johnson Reid Hillsboro	• Scenarios are based on current policy direction. Infrastructure timing assumptions amount to a relatively tight UGB that pulls growth inward.
MISC.		
Portland makes several suggestions for improving future UGRs (finer grain of detail in geography and industries)	Portland	• Metro looks forward to continuing further discussions with Portland and others in region about refining our approach in the future.
Priority clusters are obscured in NAICS codes; address multiplier effects	Hillsboro Johnson Reid	• The revised draft UGR incorporates clusters into demand analysis at a regional scale.
Need for large transportation facilities (rail yards, marine terminals) should be mentioned in UGR with the caveat that UGB expansions aren't a solution	Port of Portland 1000 Friends	• The revised UGR includes a description of the need, and that it can't be met through UGB expansions.
Existing businesses will need to relocate in future, creating a need for UGB expansion	Port of Portland	• Existing employers are included in the demand analysis along with future new employment. Employment urban reserves could provide a continual source of land for existing employers looking to relocate within the region.

Technical comments: employment	Attribution	Response
How does the UGR relate to local economic opportunity analyses?	Port of Portland	• Metro has two responsibilities that relate to economic development and the work cities and counties are required to complete under statewide planning Goal 9. First, although Goal 9 does not apply to Metro, Statewide Planning Goal 14 requires Metro to provide capacity for employment growth for the 20-year period of UGB planning. Second, O.R.S. 195.025 and Statewide Planning Goal 2 require Metro to coordinate planning among cities and counties in the region. Together, these requirements tell Metro it must consult with the 25 cities and three counties about their work under Goal 9, including local Economic Opportunity Analyses (EOAs),[6] as Metro determines the region's need for employment capacity. Metro must consider and try to accommodate the cities' and counties' individual plans for economic development. Ultimately, Metro must reconcile all of the Goal 9 plans in light of Metro's overall analysis of housing and employment capacity needs within the UGB, and Metro must make a decision for the region that is consistent with its own forecast as planning coordinator under O.R.S. 195.025. • Metro convened the Employment Coordination and Advisory Group partly to provide a forum to share and discuss local EOAs. Metro has also been reviewing local jurisdiction EOAs as part of its responsibility as planning coordinator and to ensure consistency with the 2040 Growth Concept and the Urban Growth Management Functional Plan.
Elaborate on policy and investment options for making greater use of zoned capacity	1000 Friends	• Further work on the policy and investment options for making greater use of zoned capacity will be the focus in 2010. Metro is currently working on a toolkit for more efficient use of employment and industrial land that should be available for local governments and other stakeholders in 2010.
Compare infrastructure costs for accommodating growth inside and outside UGB	1000 Friends	• Infrastructure case study analysis is available describing the public infrastructure costs in different locations. • All options are expensive, and there are limited public dollars available.

[6] The Economic Opportunities Analysis is a technical study that compares projected demand for land for industrial and other employment uses to the existing supply of such land. The Economic Opportunities Analysis process helps communities implement their local economic development objectives and forms the basis for industrial and other employment development policies in the comprehensive plan. Cities and counties are required to periodically update this analysis to comply with Oregon statewide land use planning goal 9.

Technical comments: employment	Attribution	Response
Explain how the re-use of vacant buildings and multiple work shifts get accounted for in the analysis	1000 Friends	• Re-use of vacant buildings is accounted for in the refill rate for industrial and non-industrial uses. • The employment data Metro forecasts is NOT FTE based, but includes anyone who held a job on the 12th (or closest day to the 12th if a weekend) of every month gets counted. Therefore shift-work employees also get counted in the "job forecast". What we don't do very well is to figure out what proportion of the shift work gets "doubled up" and thus we would (if we were 100% accurate) not need to provide "extra" capacity for shift work. Our impression is that shift work still is a very small percentage of employment, roughly less than 10%. Since this is a small impact and further complicates an already complex analysis, this is not accounted for in Metro's current approach.

E. D. Hovee
& Company, LLC
Economic and Development Services



MEMORANDUM

To:	Malu Wilkinson, Metro
From:	Eric Hovee
Subject:	Review of Comments to Metro Preliminary UGR Employment Report
Date:	September 10, 2009

This memorandum is intended to provide a summary review of comments provided to Metro in regard to the *Preliminary Urban Growth Report: 2009-2030 – Employment,* dated May 2009. Comments that we have reviewed are listed as follows:

- Bill Reid, Johnson Reid LLC, *Review of Metro's May 2009 Preliminary Urban Growth Report for Employment Land,* prepared for a consortium of private business organizations, June 30, 2009.[1]
- Anne Fifield, Johnson Reid LLC, *Summary of OBDD Lead Sheets,* July 7, 2009
- Bill Reid, Johnson Reid LLC, *Review of Metro's June 2009 Large Lot/Large Employer Analysis Addendum to the Preliminary Urban Growth Report for Employment Land,* prepared for a consortium of private business organizations, July 13, 2009.
- *Development Pattern Types Matrix,* prepared for City of Hillsboro Economic Opportunities Analysis and Long-Term Land Need by Johnson-Reid.

The comments that we have been reviewed contain items of a policy as well as technical nature. The focus of this review is on technical comments related to work resulting from our completed Employment and Economic Trends Analysis conducted on behalf of Metro. Review notes are organized by document.

[1] Consortium parties are identified by the Johnson Reid memorandum as CREEC, CAR, NAIOP, PBA, CCBA, SIOR, ICSC, and Davis Wright Tremaine. Our understanding is that the City of Hillsboro has requested that all of Johnson-Reid's comments be included as part of Hillsboro's comments.

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Preliminary Employment UGR

Comments are addressed in the order raised by the Johnson Reid memorandum of June 30.

1. A Basic Confusion of the Roles of Land Supply and Demand in Economic Growth. The first substantive point made by the Johnson Reid memorandum (page 2) is that "job growth will only materialize if the location, type and quality of buildings and land are available as specifically required by industry sectors."

Since Metro is not required to comply with statewide Planning Goal 9 associated with periodic review for local jurisdictions, our understanding is that there is no statutory requirement for Metro to provide the level of detail requested by the consortium analysis. Rather, Metro's UGR analysis is focused on the question of whether and how to expand the UGB for projected jobs. However, this analytical approach does provide a regional framework in which more detailed levels of analysis can be conducted by local jurisdictions as part of their individual Goal 9 analyses.

Several added clarifications can be noted:

- The Metro employment forecast is built on NAICS employment classifications which often do not readily coincide with business clusters identified for economic development marketing – such as photovoltaic solar manufacturing. A related challenge for integrating NAICS based forecasts with economic development marketing is that definitions for business clusters also are not always consistent, and frequently change over time.
- Despite this technical issue, my understanding is that the final UGR may include regional scale forecasts of specific business clusters of regional interest as for high technology.
- Also noted is that specific subarea demand/supply analyses are intended for analytical rather than prescriptive purposes. However, the preliminary UGR report (as at p. 62) does acknowledge absence of sufficient capacity to meet demand in specific market subareas. Also noted by the UGR is that "local and regional policies and investments can help to address the disparity between supply and demand."

2. The Urban Growth Report is Not Consistent with Statewide Planning Goal 9 – Employment Land. Contrary to the preliminary UGR, the Johnson Reid memorandum (page 3) asserts that Metro is subject to conformance with Goal 9. This is a legal question, beyond our direct purview.

3. The "New Paradigm" Focus on Building Types Critically Mischaracterized Industry Land Demand. While noting that this *new paradigm* offers "constructive additions to understanding land usage by regional industry," the Johnson Reid memo (pages 4-5) points out what are identified as several "shortcomings" of the approach. Comments are noted as including:

- Concern with use of CoStar, an industry standard commercial real estate data base. As is pointed out, there are shortcomings with this data base. However, based on discussions with CoStar representatives and our own spot-checking, the data base is continually being expanded to cover not only speculative for-lease space, but also owner-occupied end-user

space. We also note Johnson Reid's own use and reliance on CoStar in discussion of FARs (a topic covered in more detail later in this memorandum).

- More importantly, it is noted that CoStar is not relied upon as a primary source for data inputs into the economic forecast process. Rather, as noted with our Employment and Economic Trends Analysis, its use was to provide "additional context to inform assumptions regarding the extent and form of future employment-related development and how this will vary across the region." More specifically, CoStar data has proved useful a) to reflect an *industry perspective* on industrial and commercial building demand as widely used within the real estate community; and b) to provide *supplemental information* that otherwise would not be as readily available through other sources such as GIS/assessor's and ES-202 covered employment information.
- Johnson Reid cites absence of large lot demand as a shortcoming, a concern acknowledged by Metro and addressed with a subsequent June 2009 Metro large lot report (a topic of added comments and review later in this memo).
- Suggested is that the UGR not ignore the "importance of the non-residential land market, including recent transaction prices." This is a topic that was extensively discussed with Metro as part of our Employment and Economic Trends Analysis.

  One concern is that land pricing data means very little on its own. Land prices serve as a useful indicator to the extent that can be readily compared – whether over time or as a cross-sectional analysis as with other uses in the region and/or between this region and other metro areas that might be viewed as otherwise comparable. While this type of analysis is potentially useful, it can involve a rather substantial research effort of its own and results are often subject to dispute – especially if all relevant factors are not carefully accounted for in the analysis.

  A partial proxy for land pricing is indicated by floor area ratios (FARs), albeit perhaps more so for commercial than industrial property. This was a key component of the new paradigm represented by this employment and economic trends analysis – particularly for its consistency with design types of the adopted *2040 Growth Concept.*

  The most direct indicator of land adequacy or shortage is provided by the comparison of projected demand (in building square footage) with supply (based on seven tiers of industrial land categorization and a refill factor). This is the major focus of the UGR report and is consistent with the 2002 UGR and with state approved methodologies for local jurisdiction Goal 9 industrial/commercial land need evaluations.

4. Metro Policy Assumptions and Impact Upon Findings are Not Clearly Explained. The questions raised by the Johnson Reid memo (pages 5-6) reflect policy discussion items in which we have not been directly involved.

Specific Methodology and Findings Comments – Demand. Specific comments provided by Johnson Reid (pages 6-7) are responded to in the order presented:

- Part of the difference between where the region lands between the 5-year low and high range forecast of 2,700-11,900 added jobs depends on whether and in what fashion new employers like Solar World actually materialize as projected. Also noted is that the 2,000 potential Solar World employees are not necessarily all *net new* manufacturing jobs to the

region; they may be important to address job losses from other manufacturers (depending on continued length and severity of the recession). Also noted is that while documented employer commitments can be helpful to know, build-out projections are not always realized. This has certainly been the experience in this region with many of the unrealized high tech employment projections made in the 1980s and 1990s.

- While the question of NAICS classification and relationship to forecasting is primarily one for Dennis Yee who prepared the employment forecast, I would note that one of the benefits of this forecasting process is less about the precision of specific sector forecasts (for which there can be wide variance) and more about the reasonableness of broader employment categories of importance for land use planning, e.g. reasonableness of overall allocations by industrial/commercial use, building and design types within the 2040 Growth Concept and associated land designations.
- Land availability is acknowledged through the UGR process as being of pivotal importance to accommodating rapid expansion. Addressing the 20-year need is important for the longer term perspective. More critical to assuring capacity to address unforeseen economic development opportunities is assurance of adequate supply that is more than ample for the 5-year need. Adequacy of this short-term capacity is assured by updates every five years.

  Also noted is that factors other than land availability likely accounted for more rapid employment growth in the 1980s and 1990s than in the current decade. The post-2000 time period has been a period of slower job growth not just for this region, but for the nation, as well. As in the past, Portland metro area growth moves in cycles that mirror those of the national and, increasingly, the global economy.
- Declining capture can occur for a variety of potential reasons, of which one factor might be lack of suitable land. Other factors affecting UGB capture might include improved jobs-population balance (as the non-UGB portion of the Metro region currently has a higher proportion of the region's population than employment), proximity to specific work force skills and labor availability and, depending on the industry, tax or other incentive programs that may be available.
- The six building types used in the analysis reflect more than speculative space. Office space includes both speculative/multi-tenant uses and owner-user uses, as does retail and warehouse. Institutional and general industrial are primarily though not exclusively owner-user facilities. Flex space is typically constituted largely by multi-tenant facilities.

  The employment forecast model would likely categorize a single use industry such as Intel primarily as general industrial or office rather than flex. For example, out of approximately 1.6 million square feet identified by CoStar for Intel's Ronler Acres campus, over 70% is categorized as industrial space with the remainder as office space. *Note:* there is not uniform consistency between various industry definitions of flex/business park space as this is an evolving classification. However, we would understand business park/flex space as typically being multi-user / multi-tenant.
- As noted by the preliminary UGR report (page 62), "the region's capacity is not always where demand is projected to be." The economic model allocates demand based on a combination of observed and forecast experience (in terms of employment and associated square footage needs together with FAR of development) influenced by MetroScope output related to available capacity for added development. This preliminary UGR

analysis is not intended as a policy prescription, but rather as the calculated outcome of a technical analysis. While beyond the legal requirement for the UGR, the question of subarea distribution may be appropriately considered at the time of potential UGB expansions.

- As with the note above, forecasting of non-industrial space is affected both by observed demand from 2000-06, the regional forecast employment and MetroScope outputs for changing employment by subarea over time.
- With finalization of the employment UGR, further documentation of the scope of the CoStar database could be provided (at page 43 of the preliminary UGR and elsewhere). As previously noted, while coverage is greater for speculative (or multi-tenant) space than for owner-user space, our understanding is that CoStar is increasingly improving its coverage of owner-user space. Again emphasized is that CoStar data is supplemental to rather than a primary source of inputs to the employment and demand modeling process.
- We are not aware of literature that distinguishes FARs based primarily on size of building user or tenant. There is empirical research that was conducted for the Metro 2040 Means Business Committee (Hobson Johnson & Associates, April 1996) that distinguishes FARs between multi-tenant and owner-user industrial space. While now somewhat dated and conducted on a sample basis, this indicates that multi-tenant business park properties have higher FARs than owner-occupant industrial properties. Added data recently compiled by Metro for the business park portion of the large lot analysis further supports this prior analysis (as detailed later in this memorandum). To the extent that large lot demand is targeted to single users rather than multi-tenant development, lower FARs may be most appropriate for consideration with large lot, single user demand.

Specific Methodology and Findings Comments – Supply. The Johnson Reid report (pages 7-9) suggests that the "buildable land supply analysis makes no efforts to discuss the size of existing, buildable parcels." In fact, the supply development capacity analysis and detailed inventory worksheets prepared by FCS Group / Real Urban Geographics and reviewed with the Employment Coordination and Advisory Committee (with local jurisdiction and industry representation) includes detailed analysis of the inventory by size of parcel and geographic subarea. This inventory is further detailed to distinguish between gross acres (Tiers A-G) and vacant/unconstrained acres (Tier A).

It is not unusual for a land inventory to be comprised of primarily smaller parcels, especially in an urban or metro market (when measured in terms of number of parcels). These distributions typically tend to be "long tail" – meaning that there is a large number of relatively small parcels with a smaller number of much larger parcels.

A pivotal question is whether the number of larger parcels (of 25+ acres) is adequate to meet future industry needs. This question is the focus of the separate large lot analysis (discussed below).

Specific Methodology and Findings Comments – Floor Area Ratios. Despite concerns expressed earlier with CoStar as not adequately representing the full industrial/commercial space market, Johnson Reid (pages 8-11) relies on this data base as its primary basis to determine floor area ratios (FARs). Our experience with CoStar appears to be somewhat the opposite of Johnson Reid's. The

CoStar data generally seems to be more representative when considered for building square footages by real estate produce type than when CoStar data is used to compare building square footage to site area.

While restating their earlier concern with the lack of comprehensiveness of the CoStar data base, Johnson Reid misses an issue which may be of greater concern with reliable estimation of FARs. In effect, our experience is that CoStar pays greater attention to the reliability of the building square footage information than to that of the underlying site acreage. This issue is indirectly acknowledged by Johnson Reid, which notes that there are clear outliers in the CoStar data base that may be in error.

Very often, the building square footages described by CoStar do not align with what is represented as corresponding site acreage. This is particularly the case for multi-parcel developments (as in a shopping center or business park) and for owner-user or multi-tenant uses with varied or multiple underlying property ownerships. Consequently, in cases where our firm has used CoStar to correlate building square footages with land area, we have often found it necessary to cross-reference with GIS data to get a more accurate representation of accompanying land area.

For these reasons, the analysis of the Employment and Economic Trends report relies more directly on Metro RLIS and associated tax assessor data. This data base is also not without its problems, as noted in our reporting to Metro. Multnomah County assessment data is much more complete (in providing both building square footage and land area) for individual parcels than Washington County (partial coverage) and Clackamas County (virtually no coverage).

Using GIS and assessors data, it was possible to obtain a large number of sample FAR observations. Overall averages converged (for post-2000 development) on FARs averaging 0.29 each for employment, industrial and RSIA Title 4 geographies. However, recognizing the more limited representation of parcel data from outer ring geographies, the preliminary draft UGR included *a step down* in the industrial FARs from 0.30 (for inner ring geographies) to 0.25 (outer rings). RSIAs were held at 0.25 for both inner and outer rings.

Also noted is that the recent business park analysis conducted by Metro as a supplement to the large lot analysis indicates an overall average 0.33 FAR for the 22 largest business parks in the region. This is above the FAR for all industrial uses because business parks tend to be built-out more fully with higher site coverage than is sometimes the case for individual industrial users, especially firms holding a portion of the site for future potential expansion. However, this added business park dataset serves as a further useful cross-check to better document the FARs utilized with the employment UGR analysis.

As noted by the Johnson Reid report, Metro (Dennis Yee) is continuing to take input on FARs and has agreed to further adjustments (in FARs) for retail as a result of coordination with Consortium members. As has been mentioned previously in our discussions with Metro, we would continue to advocate on-going discussions between Metro and county assessor offices to facilitate improvements in A&T parcel data. We see this effort as important to better assure complete and up-to-date building square footage as well as land area information to better inform future employment UGR and reserves updating.

Specific Methodology and Findings Comments – Refill & Infill. Johnson Reid (pages 11-12) states that refill rates used with the preliminary UGR are based on "professional expertise." This mischaracterizes the data source since our understanding is that refill rates applied are quantitative outputs of the MetroScope model. In addition, we provided supplemental data based on detailed RLIS analysis with the Employment and Economic Trends report process for documented refill by Central, Inner and Outer Ring geographies. This analysis was based on RLIS data for a sampling of 450 industrial and commercial parcels region-wide for complete parcel data was available.

The concern that areas with lower achievable lease rates will have less likelihood for redevelopment is acknowledged and reflected in preliminary UGR refill rates that are varied between industrial and non-industrial uses and between market subarea geographies. Also noted is that refill rates can change over time, especially as a market subarea or building type becomes more mature with fewer remaining greenfield opportunities.

While Johnson Reid identifies retail uses as having "little ability to change the basic configuration of single story space and surface parking under current rent levels," this assertion is not fully supported by the evidence available. Regional centers such as Washington Square and Clackamas Town Center have transitioned to more structured parking over time. This has also occurred with redevelopment of the Tanasbourne site, with new development at Bridgeport Village and with intensified retail use on urban corridors and centers and as with NW 23rd Avenue, Hawthorne Avenue and Lake Oswego's Lakeview Village. Structured parking at all of these locations has been accomplished largely without public subsidy. Downtown Portland represents the most notable exception due to a long-standing public commitment to Smart Park public parking for retail as pivotal to on-going downtown development.

Smaller centers such as Jantzen Beach, Eastport, and Mall 205 have undergone extensive redevelopment but as yet without a significant changeover to structured parking and increased FAR. This step-down approach is reflected in FAR assumptions for retail (including recent revisions by Dennis Yee with business input) – providing for higher FARs with regional centers, then reduced FARs for town centers and corridors. Also noted is a step-down from inner ring to outer ring subareas.

The only market geographies that assume structured parking with the preliminary UGR (and planned revisions) are the Central City, inner ring Regional Centers (post-2015) and, to a lesser (or mixed degree), inner ring town centers (also post-2015). In both the inner ring Regional and Town Centers, a greater range of options including increased mode split for reduced parking ratios together with a mix of street, surface lot and structured parking is assumed (post-2015).

Summary of OBDD Lead Sheets

A July 7 memorandum summarizes the results of analysis by Johnson Reid of a small sample of "lead sheets" for firms who had contacted the Oregon Business Development Department (OBDD) seeking to locate a new or expanded industrial facility. While not stated in the July 7 memorandum, a later July 13 memo from Bill Reid (described below) indicates that this analysis is drawn from a sample of 36 firms. As

noted by Johnson Reid, these prospect firms are generally comparing sites across "a wide geography, including Washington, Idaho and California."

Methodological Challenge. For purposes of our discussion, pertinent comments from both memoranda are considered together. From the outset, a key methodological challenge centers on the question of determining how best to incorporate analysis of *marketing activity* with:

- *What ends up on the ground*, in terms of a new employer actually deciding to locate in Oregon and within the UGB of the Portland metro area.
- *What would have come* to the Portland metro area "but for" the absence of some critical factor within the purview of Metro's jurisdiction – notably the inventory of appropriately designated, sized and served industrial and commercial land parcels.

Relevance to Metro Employment UGR. The primary reason for Johnson Reid submitting this analysis appears to be as a means of further demonstrating the shortage of suitable large lots. This is indicated in the statement from the June 13 memorandum that "the vast majority of firms (in the OBDD sample) seeking to locate or expand in the Portland metropolitan area, required parcels greater than 30 acres in size."

Other factors that may be germane to Metro discussion are referenced by the earlier July 7 memorandum and include preference by "most of the firms" for major highway (primarily interstate freeway) connections, consistently stated needs for flat sites, and ability to obtain permits so as to "become operational in less than one year."

Of less uniform importance from the OBDD sample are needs for rail (wanted only by some and not wanted at all by others), access to an international airport (within the vicinity seems generally acceptable), and firm-specific requirements related to utilities.

In effect, this OBDD lead sheet analysis can be considered as informative in a way similar to that of the business focus groups conducted for the Employment and Economic Trends Analysis. The data should be viewed as primarily qualitative in nature. The OBDD information does seem to reinforce the importance of addressing large site needs to reduce (as yet un-quantified) opportunity costs to the metro region if these sites are not provided. OBDD results also support the importance of key location features including freeway and topography requirements together with needs for rapid permitting processes to be competitive with other sites considered in the U.S. or internationally.

Linking Economic Development Marketing & Employment Land Needs Analysis. For the future, the ability to more readily utilize OBDD lead sheet or other similar economic development marketing data as a means to also *better quantify* large lot demand could result from cooperative information sharing agreements between Metro and regionally significant economic development agencies involving:

- Reporting of lead sheet information for the *full spectrum* of leads (or at least a larger sampling) and over a longer time period than the 9 months indicated.

- Greater detail on *sectoral composition* of prospect firms.
- *Outcomes reporting* to distinguish (as best available) between leads that: a) locate in the region (and why); b) those that were high probability to locate here but did not (and why); and c) those for whom an Oregon / PDX metro location was not a high probability priority (or for which the region did not make the short list). More detailed data analysis for category (a) and (b) firms would be of particular importance to inform refinements to large lot analysis in the future beyond the current UGR update process.

Large Lot/Large Employer Analysis

As noted, Johnson Reid also submitted a more detailed assessment of Metro's recent large lot/large employer analysis addendum to the preliminary employment UGR via memorandum dated July 13, 2009.

While our firm was participated in earlier discussions and subsequent review of a draft large lot/large employer analysis by Metro, our involvement with the large lot analysis has been that of a review role. Consequently, the following comments are focused less on methodological aspects of the large lot analysis and more on the substantive issues raised in the context of our previous Employment and Economic Trends analysis.

Comments are addressed in the order raised by this Johnson Reid memorandum of July 13.

1. Questionable Definition of "Large Employers" Driving Large-Lot Demand. While much of the Johnson Reid discussion (pages 3-4) is focused on methodological issues, a couple of items raise broader substantive questions more within the purview of our Employment and Economic Trends Analysis:

- Johnson-Reid questions the focus of the large lot analysis on individual large employers rather than also considering multi-tenant centers for retail and office space (which might also use sites of 25+ acres). Subsequent to the preliminary UGR, Metro has now completed a multi-tenant business park analysis as a further supplement to its large lot analysis. This research focuses on a listing of 23 large privately owned business parks of about 25 acres or more within the tri-county area, with detailed analysis of business park tenancy by employment type, number of employees as was conducted with the large lot analysis. Forecast needs are for an added 4-5 large business parks of 25+ acres to 2030 (with low to high range scenarios), assuming that the 2006 pattern of employment is projected forward over this UGR forecast horizon.

  Metro's analysis, based on an assumption of fixed proportions of employment continuing to locate in large business parks, also appropriately raises the observation that: "Whether or not these preferences are 'needs' remains for policy discussion." For this policy discussion, it is important to note that while there may be a developer preference for larger properties (depending on economies of scale in a particular market cycle or real estate product type), individual business tenants themselves typically can adapt to smaller sites (as long as they individually take no more than 20-25 acres). And our experience (including recent focus group and interview work) indicates that developers will respond

to using smaller sites than they might otherwise prefer. This includes not just developers of multi-user office and retail, but also multi-tenant industrial and distribution space.

- The last point made by Johnson Reid is that the analysis does not adequately account for land banking (or holding). We agree that land banking is important for some firms, and this is accounted for by lower FARs as are reported for Hillsboro. However, the determination of whether and under what conditions to consider and/or encourage land-banking for purposes of future employment land needs is a policy as well as methodological question for Metro to determine.

2. Troubling Comparison of "Home-grown" and New Large Firms for Policy Implications. Independent of choice of terminology, distinguishing between large lot needs for existing versus new large lot private employers is an important component of the analysis. For example, while the majority of firms covered are identified as "home-grown," all three of the firms that indicate their decade of origin in this Metro region as being from 2000-06 appear to be firms that were recruited into the Metro area. In effect, this distinction should help to inform the discussion as to the extent of reliance on growth of existing large firms vs. recruitment of new large employers to augment regional job potential in the future.

3. Large-Parcel Demand Driven Solely by Large Employers. Two issues are raised by Johnson Reid (pages 4-5):

- Whether to identify large lot users solely based on large employers as defined by Metro. While Metro's approach does not take into account employers or other uses of large lots that fall below the minimum job thresholds set by building type, Metro's approach has two distinct advantages: a) it avoids a much more cumbersome research process to identify all users of large industrial / commercial lots (including adjoining ownerships); and b) appears more consistent with the adopted *2040 Growth Concept* to discourage urban sprawl and make more efficient use of land by targeting future large lots for users providing greater density of job activity.
- Johnson Reid again raises the question of evaluating multi-tenant uses of large sites, an item responded to with #1 above (including the previously noted recent completion of a supplemental business park analysis by Metro to better address this question).

4. Previously-Documented Land Banking and Market Choice Factors Altogether Unconsidered. Johnson Reid (pages 4-7) recommends that the UGR explicitly address land-banking and market choice (or a market factor):

- As has been discussed with the ECAC through the Employment and Economic Trends Analysis and subsequent preliminary employment UGR, the question of whether to provide explicit allowance for land banking (or holding) beyond 20-year needs is an appropriate matter for policy discussion. If more explicitly addressed, this is an item that might be most appropriately addressed within the context of a refined large lot analysis and/or employment reserves (beyond 2030).

- Johnson Reid also indicates that local jurisdictions and metro regions provide a market factor stating that: "Typically, local jurisdictions and metropolitan regions provide 50 to 300 percent more industrial land than the forecasted demand for a 20-year planning period." Our understanding is that there is no statutory provision in Oregon that directly addresses a land market factor for Goal 9 analyses, especially for long-term (20-year) needs.

  However, supplemental documentation provided for DLCD and OECD suggests the option of adjusting *short-term* parcel demand upward by between 50-200% of baseline demand forecasts.[8] In the State of Washington, market factors have been allowed through determinations of the Growth Management Hearings Boards have generally been in the range of up to for a 50% market factor for industrial and up to 25 % for commercial lands. With the Oregon provision, this short-term need can be covered within the context of the long-term (20-year) inventory which implicitly provides an added market factor, but with added attention to readiness for short-term development.

5. Concern About Conversion of Industrial Land to Non-Industrial Uses: Lack of Empirical Evidence. The Johnson Reid memorandum (page 7) states that it is "unaware of any robust body of evidence that industrial land conversion has occurred on any significant scale, particularly in the Portland metropolitan area." However, the March 2009 Employment Demand Factors & Trends report that we prepared as part of the Employment and Economic Trends Analysis does include information (specifically at Page 32, Figure 13) indicating that the majority of employment growth between 2000-2006 within the region's Title 4 RSIA and Employment Areas has consisted of service sector jobs.

In contrast, Title 4 Industrial Areas show more industrial than service sector job growth. However, when considered on a combined basis, Title 4 areas overall show non-agricultural employment gains in service sector jobs (from 2000-06) that have exceeded gains in industrial jobs by a considerable margin of approximately 5:1.

6. Municipal, Regional, & State Economic Development Policies & Aspirations Not Considered. Johnson Reid is correct in noting that the UGR does not take into account local jurisdiction or state-level economic development policies and aspirations (pages 7-8). Our understanding is that Metro is not charged with setting economic development priorities for the region.

Limitations faced as a result of not having a consistent region-wide economic development strategy also have been acknowledged throughout our involvement in the Employment and Economic Trends Analysis process. We also understand that linkages between economic development strategy and associated land needs may be addressed through the MPAC subcommittee process prior to regional decisions on growth management next year.

7. Large Parcel Supply Analysis Ignores All Supply Factors but Parcel Size and Adjacent Assembly. Johnson Reid requests that the large user analysis consider large user suitability of large

[8] Source is Otak, Inc. and ECONorthwest, *Methods for Evaluating Commercial and Industrial Land Sufficiency: A Recommendation for Oregon Communities,* prepared for the Advisory Committee on Commercial and Industrial Development (pursuant to HB 3557), December 9, 2002.

lots inventory, applying a wide range of criteria ranging from location to owner intention (pages 8-9). A similar comment was made with Johnson Reid's overall UGR review memorandum of June 30.

The level of detailed location-specific analysis requested goes well beyond what we understand to be Metro's statutory requirements for this type of analysis. As previously indicated, the preliminary UGR does acknowledge that there may not be sufficient capacity to meet demand in specific market subareas.

Metro has addressed this question beyond its statutory requirements to an extent that appears reasonable based on data availability and utility. A topic that is extensively explored with Metro's analysis is the evaluation of opportunities for lot aggregation to increase the supply of 25+ acre sites in the region. The analysis presents the data both ways – with and without aggregation – for further discussion before the employment UGR is finalized.

Also covered by the large lot analysis is the observation that refill likely can not be relied on as a means of addressing large lot supply needs. The conclusion is that "future large parcel needs will need to be accommodated on vacant land rather than refill."

While there may be other questions related to site suitability important to be addressed primarily via more detailed and location specific local jurisdiction Goal 9 analyses, the UGR also identifies the importance of "local and regional policies and investments" to help address disparities that might be identified between supply and demand. This is a subject that could involve more detailed discussion and direction with the MPAC subcommittee.

8. Demand and Supply Reconciliation Flawed. All but one of the items raised in the Johnson Reid discussion (page 9) extend beyond the scope of our technical analyses for Metro. The one question that may be germane to our input has been posed by Johnson Reid as: "Finally, how does this and future large-lot demand analysis relate to or affect existing employment land findings?"

Our thoughts on this question are essentially two-fold:

- Large lot use potential should not affect overall demand forecasts of the employment UGR, provided that employment associated with large lot uses is considered *as part of*, rather than *in addition to* the low-high range job forecast of the UGR.
- Consequently, the demand-capacity analysis of the preliminary UGR would still hold – without need for revision but potentially with augmentation to more closely address the size distribution of employment needs to 2030. Rather than requiring added building and land capacity, the goal of any augmented analysis would be to assess adequacy of distribution within the capacity control total.

In summary, we would see no need to revise the overall demand-capacity of the preliminary UGR. Rather, it is our understanding that the demand and supply reconciliation concerns identified by the Johnson-Reid memo are being addressed within the context of Metro's subsequent large lot analysis and any resulting large lot findings that might be incorporated with a final employment UGR.

Development Pattern Types Matrix

A final submittal provided by Johnson Reid and the City of Hillsboro is a copy of a *development pattern types matrix* prepared for the City of Hillsboro Economic Opportunities Analysis (EOA). This distinguishes characteristics of office, retail, industrial, and campus institutional uses – in terms of such factors as target industries, access, public facilities and utilities, site sizes and development pattern, ownership/leasing, and parking/loading/storage considerations.

This appears to be the type of detailed analysis that, while not required for regional UGR purposes, is highly appropriate and useful for a local jurisdiction Goal 9 related EOA. At Metro's discretion, it also may serve to inform the UGR process in a manner similar to the business focus groups conducted in late 2008 and early 2009 as part of the Employment and Economic Trends Analysis.

Appendices 2-13 are available electronically or printed upon request

ACKNOWLEDGEMENTS

This analysis was developed through extensive research and collaboration with representatives from local governments and stakeholder groups. Special thanks to the Employment Coordination and Advisory Committee for many hours spent reviewing the employment analysis methodology and the Metro Technical Advisory Committee for thoughtful consideration of the methods in both the employment and residential analyses. The methods were strengthened and refined based on numerous written comments on the preliminary reports released in Spring 2009.

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Metro | *People places. Open spaces.*

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and good transportation choices for people and businesses in our region. Voters have asked Metro to help with the challenges that cross those lines and affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to protecting open space, caring for parks, planning for the best use of land, managing garbage disposal and increasing recycling. Metro oversees world-class facilities such as the Oregon Zoo, which contributes to conservation and education, and the Oregon Convention Center, which benefits the region's economy.

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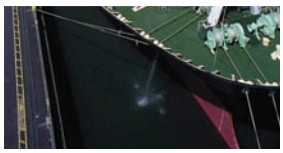

DRAFT URBAN GROWTH REPORT

2009 – 2030

Appendices 2 - 13

September 15, 2009

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2003

Appendix 2: Documentation of MetroScope scenario assumptions

Purpose

This technical appendix is intended to provide documentation of the policy and investment assumptions that were made for the MetroScope scenarios described in the UGR. The purpose of these scenarios is to illustrate the possible future outcomes of current policies and investments.

Disclaimer

The assumptions made for these scenarios are for research purposes only and are not intended to reflect future policy direction. It is anticipated that many of these policy and investment assumptions will be subject to change as more is learned about local aspirations and as cities update their comprehensive plans through periodic review.

About MetroScope

MetroScope is an integrated land use and transportation simulation model that operates on economic principles. The model's main purpose is to predict where the region's employment and housing will locate in the future. The total population number that the model attempts to locate is determined in a separate population forecast. Along with the prediction of location choices, the model estimates outcomes such as housing price appreciation. These outcomes are, in part, the consequences of explicit policy choices made both by Metro and local jurisdictions. Such policy choices include, for example, UGB expansions, investments in infrastructure, and zoning designations. MetroScope provides a means of considering how the market might respond to those choices in the long term.

A MetroScope scenario seeks equilibrium, the price point(s) at which housing or employment demand matches supply. For example, if demand for housing in a particular census tract outstrips capacity, prices will increase until a supply and demand equilibrium is reached.

Local jurisdiction input on scenario assumptions

Metro staff consulted with representatives of the three counties (Clackamas, Multnomah, and Washington) the City of Portland in determining what assumptions should be made for these preliminary scenarios. These assumptions were also vetted with the Metro Technical Advisory Committee (MTAC).

Major categories of scenario assumptions

The assumptions used for this and other MetroScope scenarios fall into three major categories. The details of these categories are explained further in this document.

- **Demand:** A range forecast establishes the total number of new households and jobs in the 7-county region that are distributed in the scenario.

- **Supply:** Capacity assumptions in the Metro UGB, Clark County, neighbor cities, and rural areas are based on inventories of vacant and buildable land as well as existing zoning.
- **Other variables:** Other assumptions that affect scenario behavior include the transportation network, construction costs and subsidies, and consumer preferences.

Demand:

Population and employment range forecast assumptions

MetroScope scenarios assume fixed population and employment control totals. The assumed totals are from a range forecast for the year 2040 for the larger 7-county region that includes all of Washington, Clackamas, Multnomah, Columbia and Clark counties, most of Yamhill County, and a small portion of Marion County.

Given a set of policy and investment assumptions, MetroScope predicts a possible future distribution of new households and jobs in the 7-county region. As an equilibrium model, MetroScope will find a "home" for all forecasted households and jobs; the model will not identify a capacity gap (because the maximum zoned capacity for the 7-county area easily accommodates the growth forecast).

In order to incorporate a range forecast into scenario modeling, it was necessary to conduct multiple scenarios, each with a different population and employment control total assumption. Three scenarios were conducted for the purposes of this preliminary UGR: high end of range forecast, low end of forecast, and midpoint of forecast. Control totals for each of these scenarios are summarized below:

Scenario	Household control total	Employment control total
High end of range forecast	1,469,400	1,985,697
Midpoint of range forecast	1,381,000	1,707,414
Low end of range forecast	1,292,600	1,433,738

Supply:

Metro UGB supply: zoning

Regional Land Information System (RLIS) data, maintained by Metro, provide zoning assumptions for scenarios. The three counties (Clackamas, Multnomah, and Washington) provide Metro with quarterly updates to the RLIS zoning data. Local zoning designations are translated into 44 generalized zoning classifications, each of which has an assumed maximum zoned capacity.

Metro UGB supply: vacant land

Vacant land is defined in two ways:

1) Tax lots with no improvement value or buildings.
2) Partially developed parcels with an undeveloped portion of at least one-half acre.

Using aerial photography, Metro conducts surveys of vacant land inside the UGB. This survey is conducted using the aerial photographs as well as building permit and tax assessor data. All parcels inside the UGB are examined to determine if they qualify as vacant.

The vacant land designation does not indicate whether or not the parcel is for sale, if there are plans to develop it, if there are constraints to its development (e.g. zoning or environmental constraints such as wetlands or steep slopes), or if there is a market demand for its development.

This MetroScope scenario assumes the 2007 vacant land survey, the most up-to-date buildable land information that is available (the process of analyzing the aerial photographs and applying the buildable land definition is a time consuming one that prevents the use of a more current inventory).

Metro UGB supply: buildable land

Buildable land is identified by deducting environmentally constrained land from the vacant land inventory. This MetroScope scenario assumes the 2007 buildable lands survey.

Metro UGB supply: refill land

"Refill" refers to both redevelopment and infill development. Redevelopment occurs when a structure is removed and another is built in its place. Infill occurs when more units are constructed on an already-developed site. Since "vacant" land includes any tax lot or any part of a tax lot that has a vacant portion larger than ½ acre, infill only includes development on an existing developed lot or partially developed lot with a vacant portion smaller than ½ acre.

Refill development tends to occur when market conditions make it profitable to develop (or redevelop) these tax lots, typically when land prices reach a certain level. Thus, refill capacity is based on the relationship between a tax lot's size, land value, and improvement value. Metro calculates refill capacity in consultation with local jurisdiction staff.

For scenario modeling purposes, tax lots that have a high enough ratio of land to improvement value and that are of sufficient size are counted as refill capacity. This determination varies by county and by

zoning designation. Like zoned capacity, refill capacity will not necessarily get used in the model simply because it exists. MetroScope scenarios subject refill capacity to a simulated market test. Whether or not the capacity gets used in the scenario is a function of many factors including price, accessibility, and zoning.

Metro UGB supply: recent UGB expansion areas

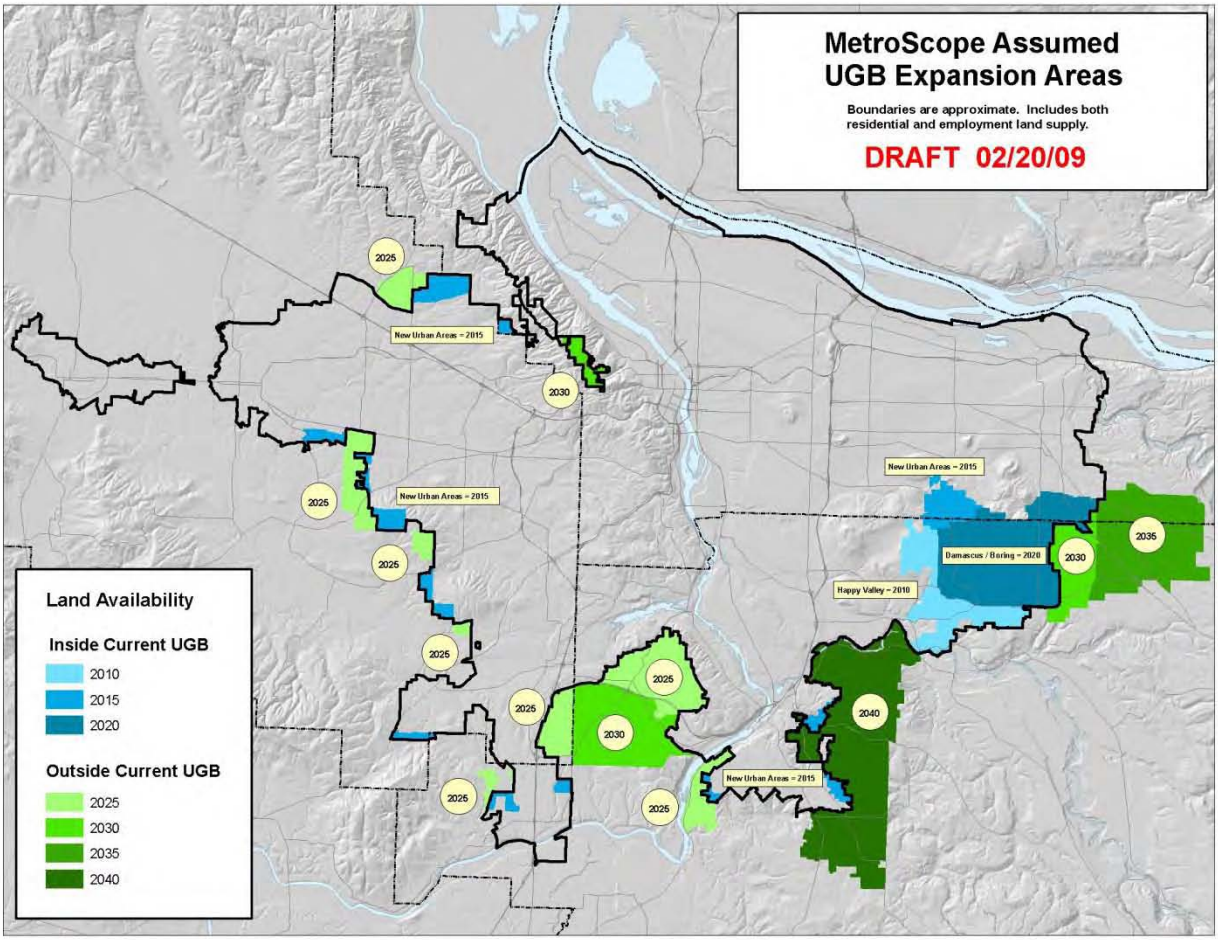
In reality, lands are not immediately developable upon their inclusion in the UGB. In order for lands to be developable, planning must have been completed and infrastructure financing needs to be in place. To mimic that delay, these scenarios assume that there is a development delay for lands that have previously been added to the UGB. By the end of the delay, it is assumed that infrastructure funding has become available through an unspecified mechanism.

Metro UGB expansion area (past expansions only)	Assumed date of availability for development
Happy Valley	2010
Damascus	2020
All other areas added to the Metro UGB since 1998 (other than Happy Valley and Damascus)	2015

Metro UGB supply: prospective UGB expansions

This scenario assumes a continuation of past policies and trends, including the trend of expanding the UGB according to state-mandated land hierarchies. It is assumed that there is no need for prospective UGB expansions until five years after the date that Damascus becomes available to the model (prospective UGB expansions are available in 2025, five years after Damascus is assumed available).

The map below shows the sequence of prospective UGB expansions that are assumed for this scenario, including the aforementioned areas that have been added to the UGB since 1998.



Clark County supply: zoning

Zoning for Clark County is assumed to be the zoning that was in place in the year 2005.

Clark County supply: vacant, buildable land

For vacant buildable land in Clark County, Washington, Metro uses the county's 2005 data. Clark County uses a different methodology for inventorying its vacant, buildable land than Metro.

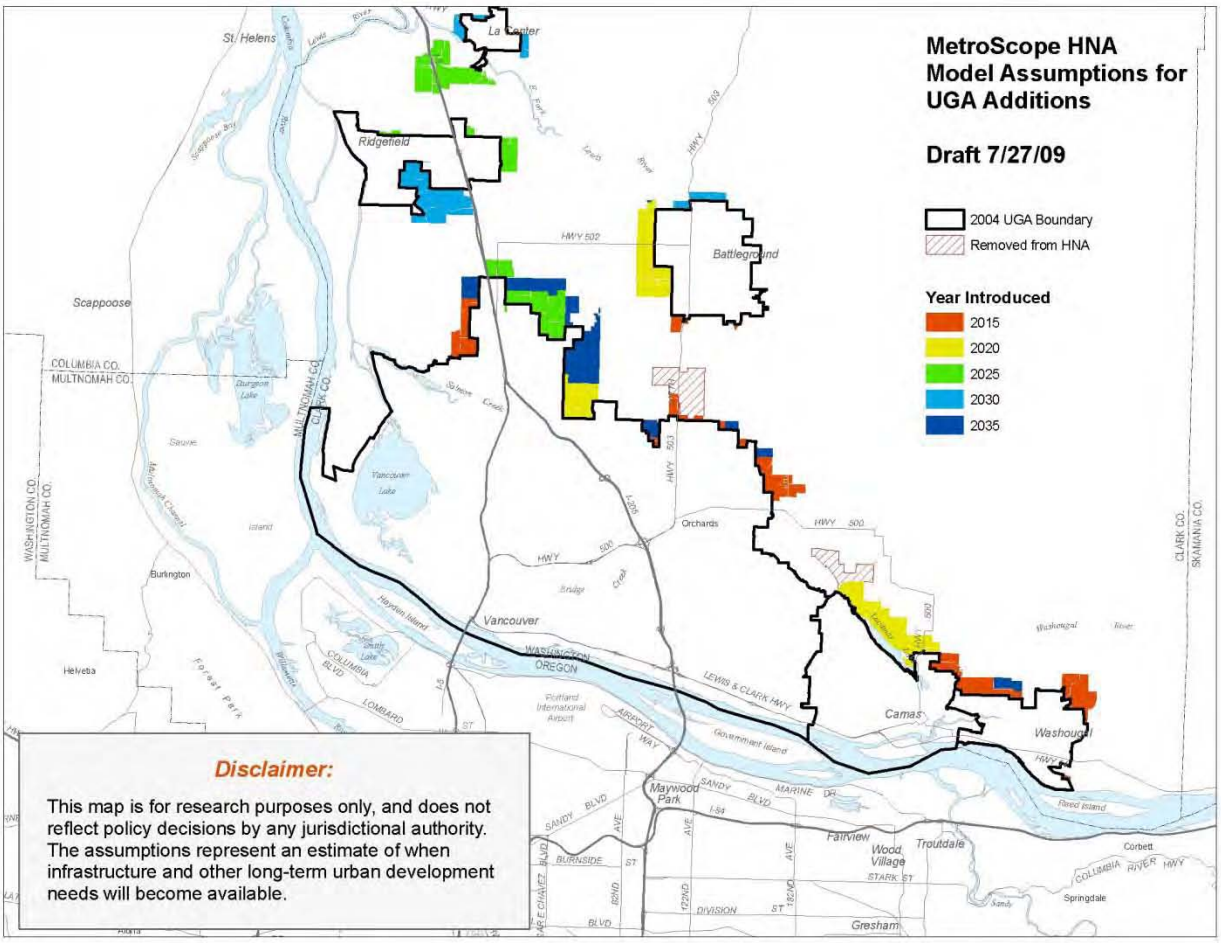
Clark County supply: refill land

Clark County has a different method than Metro for identifying refill capacity. However, for MetroScope modeling purposes, Metro applies its refill definitions to Clark County land.

Clark County supply: prospective urban growth area expansions

In January 2008, Clark County added approximately 19 square miles of urban growth areas. A portion of the 19 square mile expansion was overturned and was appealed at the Washington State Superior Court.

Scenario assumptions for Clark County urban growth boundary expansions are based on the Superior Court decision. It is assumed that the urban reserve areas are metered in roughly equal proportions as depicted on the map below. Areas removed as a result of the Superior Court decision are depicted as "removed from HNA." This scenario assumes the zoning found in current comprehensive plans.



Neighbor City supply:

MetroScope scenarios distribute growth not just to the Metro UGB and to Clark County, but to cities outside of the Metro UGB that are within the 7-county area (e.g. Canby, Sandy, Banks, North Plains, Newberg, etc.). Oregon's State economist's 2004 county-level population forecast is used to estimate future growth in these cities. Neighbor city capacities are assumed to match forecasted population growth.

City	County	Assumed capacity for new dwelling units
Canby	Clackamas	7500
Sandy	Clackamas	3000
Molalla	Clackamas	5000
Estacada	Clackamas	1000
North Plains	Washington	2500
Gaston	Washington	1000
Banks	Washington	2000
Clatskanie	Columbia	1000
Ranier	Columbia	600
Prescott	Columbia	400
Columbia City	Columbia	800
St. Helens	Columbia	2400
Scapoose	Columbia	1100
Vernonia	Columbia	500
Newberg	Yamhill	16000
Dundee	Yamhill	1000
Yamhill	Yamhill	2400
McMinville	Yamhill	8400
Dayton	Yamhill	1500
Amity	Yamhill	3400
St. Paul	Marion	1000
Aurora	Marion	3500
Gervais	Marion	2500
Woodburn	Marion	8500

Measure 49 rural residential supply:

The passage of Measure 37 and its subsequent replacement by Measure 49 created the possibility of additional residential capacity outside of urban growth boundaries. The maximum possible amount of rural (non-UGB) Measure 49 capacity was assumed for these scenarios: three dwelling units of capacity for each residential-zoned Measure 37 claim, for a total of 6,087 dwelling units. It is unlikely that all of those Measure 37 claims have been re-filed under Measure 49 and unlikely that all those that were re-filed will be built. However, they are considered as available capacity in these scenarios. The effects of

this Measure 49 capacity on the overall (7-county) household distributions in these scenarios is likely negligible.

Other variables:

Accessibility: transportation network

This MetroScope scenario assumes the 2005 network for the 2005, 2010 and 2015 Metroscope allocation runs and then uses the 2035 RTP "true" financially constrained network for the 2020, 2025 and 2035 iterations. The "True" Financially Constrained RTP network only includes those projects that are in the Financially Constrained RTP for which there is an identified source of funding for construction (some projects in the Financially Constrained RTP only have an identified source of funding for planning and engineering).

Notable projects **included** in this scenario's transportation network:

- Sunrise from I-205 to 122nd
- Interchange improvements to US 26, OR 217 and I-205
- Milwaukie light rail
- Portland to Lake Oswego streetcar
- Eastside streetcar; Burnside/Couch streetcar to Hollywood Transit Center
- Bus rapid transit on McLoughlin from Milwaukie to OR City
- All day service for the WES commuter train
- New street connections and arterial street expansion are provided throughout the system. Major streets are retrofitted for walking, biking and transit (wider sidewalks, safer street crossings, landscaped buffers, improved bus stops and bikeways)
- Parking costs are increased in the Portland central city, regional centers and town centers

Notable projects that are **not included** in this scenario's transportation network for lack of an identified source of construction funding**:**

- I-5/99W connector
- The Columbia River Crossing
- I-5/I-84 interchange improvements

The 2035 Financially Constrained RTP assumes:

- An increase of one cent per gallon per year in the statewide gas tax for system operations and maintenance.
- A $15 increase in the state vehicle registration fee every eight years to pay for system expansion.
- Continuation of past local and federal funding levels for system expansion.
- $9.07 billion of investments that can be funded with resources the region expects.

Construction costs: system development charges

This scenario assumes that all new dwelling units are assessed a $25,000 per dwelling unit system development charge. This charge appears as an additional construction cost.

Construction costs: residential subsidies

Cities throughout the region have implemented effective strategies for attracting more households to their centers and corridors. These strategies include urban renewal, tax abatement, and investments in public amenities. These scenarios assume that residential subsidies will be in place in the future as well. The guiding principle for making subsidy assumptions for these scenarios was to err on the side of being conservative and only include those locations that have active urban renewal or that have some other identifiable tool in place that acts as a residential subsidy (for instance, a vertical housing tax credit).

These scenarios assume varying levels of residential subsidies in different locations. Three different subsidy levels are assigned:

Tier A: $50,000 per dwelling unit
Tier B: $25,000 per dwelling unit
Tier C: $10,000 per dwelling unit.

The upper end of the range, $50,000 per dwelling unit, was estimated through staff conversations with the Portland Development Commission.

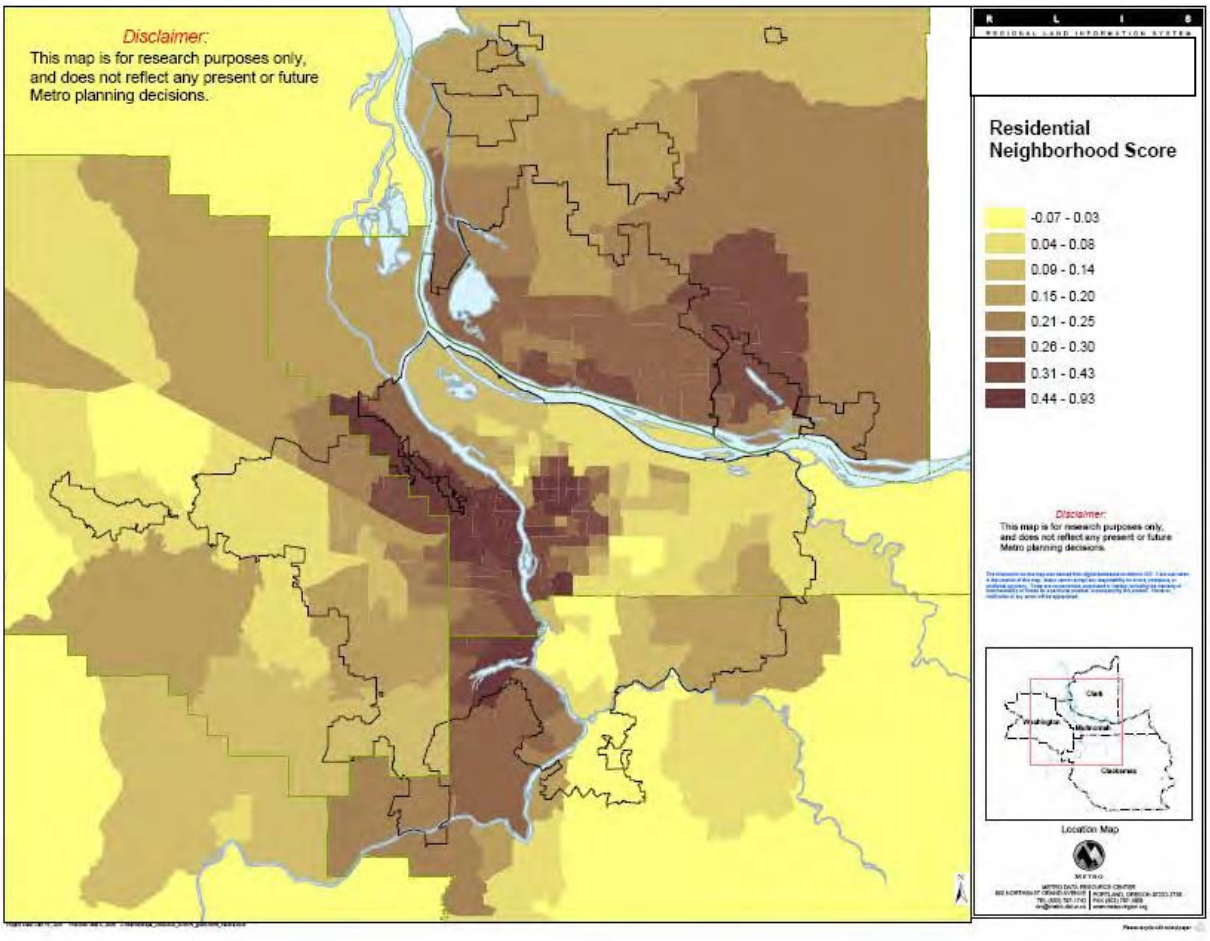
Assumptions are also made regarding the timing of the subsidy (expressed as the percentage of the total number of subsidized units that are available to the market in each five year increment). The level and timing of subsidies assumed in this scenario are professional judgments made by staff and, like all other scenario assumptions, were reviewed by representatives of the three counties, the City of Portland, and MTAC.

					Percent of subsidized dwelling units available (timing)							
Location	Type	Active urban renewal? (residential only)	Reason for subsidy assumption (other than active urban renewal)	Tier*	2010	2015	2020	2025	2030	2035	2040	Total number of subsidized units
Downtown	CC	yes		A	20%	40%	40%					13500
North Macadam	CC	yes		A	33%	33%	33%					7500
Oregon Conv. Center	CC	yes		A	33%	33%	33%					3000
River District	CC	yes		A	25%	25%	25%	25%				24000
South Park Blocks	CC	yes		A	25%	25%	25%	25%				2000
Clackamas	Reg. Ctr.	yes		B	25%	25%	25%	25%				2000
Gateway	Reg. Ctr.	yes		B	25%	25%	25%	25%				2000
Gresham	Reg. Ctr.		Vertical housing tax abatement	B	33%	33%	33%					2000
Oregon City	Reg. Ctr.	yes		C	33%	33%	33%					2000
Vancouver	Reg. Ctr.		Parking revenues go to redevelopment. City built parking structure	B	20%	20%	20%	20%	20%			6000
Gladstone	Town Ctr.	yes		C	20%	20%	20%	20%	20%			1200
Hollywood	Town Ctr.		tax abatement, TOD subsidies	B	25%	25%	25%	25%				1200
Lake Oswego	Town Ctr.	yes		B		20%	20%	20%	20%	20%		1200
Lents	Town Ctr.	yes		B		20%	20%	20%	20%	20%		1200
Milwaukie	Town Ctr.		light rail to be built; vertical housing tax abatement	C				25%	25%	25%	25%	1200
Rockwood	Town Ctr.	yes		B			20%	20%	20%	20%	20%	1200
Sherwood	Town Ctr.	yes		C		20%	20%	20%	20%	20%		1200
Tigard	Town Ctr.	yes		C			20%	20%	20%	20%	20%	1200
Interstate	Non-ctr. UR	yes		A	25%	25%	25%	25%				8000
MLK	Non-ctr. UR	yes		A	20%	20%	20%	20%	20%			3500
Villebois	Non-Ctr UR	yes		C	33%	33%	33%					2,500
Canby	City	yes		C			20%	20%	20%	20%	20%	600
Sandy	City	yes		C			20%	20%	20%	20%	20%	600

Consumer preferences: neighborhood score

Recognizing that consumers would be willing to pay different prices for the same residence, were it in different locations, MetroScope scenarios have an input assumption called neighborhood score. A neighborhood score is assigned to each census tract. The score represents the relative market desirability of the census tract and is based on historic residential sales prices. Statistical regression analysis is used to determine what portion of a residence's value can be attributed to its location (neighborhood). This statistical analysis controls for private improvements (e.g. lot size, residential square footage, number of bathrooms, age of house, number of bedrooms, etc). The neighborhood score remains static through the course of the scenario.

The map below displays this scenario's neighborhood score assumptions. A higher score (darker color) indicates that the census tract historically has had a higher market desirability.[1]



[1] Areas with sparse residential sales data (i.e. rural areas) may exhibit exaggerated neighborhood scores (the result of a small number of high value sales). Urbanized areas with more sales activity are likely to have more accurate neighborhood scores.

Appendix 3: Industry cluster forecast

Many recent economic development efforts in this region and others have referred to the concept of *economic clusters* as an organizing principle. Definitions of clusters abound, but the most accepted definition is offered by Michael Porter, who is often identified as having originally coined the term:

> *"A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities. The geographic scope of clusters ranges from a region, a state, or even a single city to span nearby or neighboring countries… The geographic scope of a cluster relates to the distance over which informational, transactional, incentive, and other efficiencies occur."* (Porter, 2000)

Frequently-cited examples of clusters include information technology in California's Silicon Valley, biopharmaceuticals in the Research Triangle in North Carolina, the garment district in New York City, insurance in Hartford, Connecticut, analytical instruments in Oregon, and the winemaking in northern and central California. Porter (2000) states that, in order for the concept of a cluster to be useful, it must not be defined too broadly (e.g. "manufacturing, services, consumer goods, or high tech") or narrowly equating a cluster with a single industry.

Several stakeholders and representatives of local jurisdictions have suggested that the concept of clusters should be incorporated into the UGR's analysis. The concept of a cluster makes intuitive sense, but it is also a concept that has its share of detractors, criticized for being too vague to be of use for analysis purposes. Because it can be a vague concept, some writers (Martin & Sunley, 2002) suggest that it be used carefully within a policy context. With that caution in mind, this Draft UGR presents the employment forecast for five of our region's commonly-recognized clusters, but does not extrapolate the forecast into a demand for capacity (specific limitations of a cluster approach to a forecast are listed later in this document).

Cluster definitions

The Portland metropolitan region does not have an agreed upon economic development strategy, nor has Metro been asked to formulate one. With that caveat, this analysis uses the Portland Development Commission's (PDC) list of five existing clusters:

- Active wear and outdoor gear
- Advanced manufacturing
- Bioscience
- Cleantech
- Software

Other cluster definitions could be used for this analysis. Some stakeholders suggested that the National Science Foundation's (NSF) 2006 high tech industry definition be used. Like all definitions, the NSF definition of high tech has limitations. For instance, the NSF definition of high tech does not include North American Industry Classification System (NAICS) code 2211 (electric power generation, transmission, and distribution), the NAICS code of SolarWorld, one of the region's businesses that most

would regard as being high tech. Though it also has limitation, this analysis uses the PDC's definition of the above clusters. Those definitions are given below and include the NAICS codes that PDC has associated with each cluster. The following information is taken from a series of "Cluster Profiles" published by PDC and available on their website at http://www.pdc.us/pubs/inv_detail.asp?id=932&ty=46

Active wear and outdoor gear includes two general categories:

Activewear and Outdoor Gear: Companies that design, manufacture, and/or market sporting and athletic apparel and camping, hiking and outdoor gear.

(NAICS: 315, 33992, 3162, 5414, 42391, 4243)

Bicycle Frame Building: Companies that design, manufacture, and/or market bicycles and bicycle accessories.

(NAICS: 336991)

Example companies: Nike, Icebreaker, Nau, END Outdoor, Adidas, Keen, Yakima, Nautilus, Ziba, Columbia, S Group

Advanced manufacturing

This cluster includes companies that produce or shape metal into parts or machinery; companies that manufacture equipment for transportation purposes; companies that manufacture computer, electronic and semiconductor components. PDC's cluster definition excludes wood product manufacturing, food manufacturing and paper manufacturing.

(NAICS: 331, 332, 333, 334, 336)

Example companies: Precision Castparts, Intel, Tektronix, Esco, Blount, Sapa Profiles, Columbia Steel Casting, Evraz, Xerox

Bioscience

This cluster is comprised of companies that manipulate living cells and their components to make therapeutic drugs; genetically modified plants; and medical diagnostic tools. The regional cluster is anchored by Oregon Health and Sciences University (OHSU) and Genentech in Hillsboro. However, the Portland metropolitan region's niche within this industry is in the development of medical devices, rather than in medicinal drug development.

(NAICS: 3254, 3391, 42345, 54171, 62151)

Example companies: FEI, Acrymed/I-Flow, Welch Allyn, Biotronik, Precision Wire, Components, AVI Biopharma, Acumed, Genentech, HemCon, Virogenomics

Cleantech includes four general categories, however only two of them are identifiable by NAICS codes.

Alternative energy: Companies that research, develop, or operate alternative energy facilities, such as biomass, ethanol, solar and wind power generation facilities.

(NAICS: 221119, 333611)

Environmental consultation and remediation services: Companies that provide environmental engineering and consulting; environmental testing and analysis; and remediation services.

(NAICS: 54162, 541330, 562111, 562910)

Green Buildings: Companies that design, develop, or provide general contracting, remodeling and renovation services for residential, industrial or commercial buildings and use the LEED or comparable certification standards to ensure the buildings meet energy efficiency and environmental impact reduction standards. (No NAICS codes associated)

Energy Efficiency: Companies that promote weatherization and other energy efficiency investments, policies, and infrastructure. This cluster is growing rapidly in the Portland region. (No NAICS codes associated)

In addition, PDC includes companies that recycle industrial waste (NAICS: 42393).

Example companies: CH2M Hill, PECI, Solaicx, SERA Architects, Gerding Edlen, Vestas, David Evans and Associates, SolarWorld, Brightworks Northwest, Suzlon Wind Energy Co., Enxco, Energy Trust of Oregon

Software

This cluster includes companies that design, develop, market, and support systems and application software used in personal computers, servers, embedded systems, and mobile devices.

(NAICS: 5112, 518, 5415)

Example companies: Jive Software, Webtrends, Survey Monkey, Vidoop, Tripwire, OpenSourcery, Sage Software, eRoi, AboutUs, Coaxis, Imagebuilder, i-OP

Existing cluster employer locations

As shown in Table 1, the geographic distribution of existing (year 2006) cluster employment (cluster firms identified by PDC) throughout the region varies from one cluster to another. These market subareas are defined in the UGR. Employment in the Activewear cluster is concentrated in the Inner ring with much smaller proportions of employment located in the Central and Outer areas. Advanced Manufacturing and Bioscience are concentrated in the Outer ring with some employment in the Inner ring and very little in the Central area of the city. By contrast, the Central City has the highest proportion of Cleantech employment with dimishing Cleantech proportions located in the Inner and Outer rings. Software employment is fairly evenly distrbuted among the three areas.

Table 1: Distribution of existing (year 2006) cluster employment in the Portland metropolitan region by market subarea

Cluster	Central	Inner	Outer	In Metro UGB
Activewear	12%	71%	15%	98%
Advanced Manufacturing	2%	37%	60%	98%
Bioscience	14%	32%	53%	99%
Cleantech	44%	35%	17%	97%
Software	33%	34%	32%	99%

Limitations of a cluster approach to the forecast

Global Insight data are the basis for the region's employment forecast. Because the Global Insight data use NAICS codes, it is also necessary to conduct this cluster forecast using NAICS codes. However, NAICS codes present some challenges for identifying the industry or cluster with which to associate an individual firm. This is because NAICS codes are self-reported and necessarily are a simplification of actual business activities. As Porter (Porter, 2000) states, "cluster boundaries rarely conform to standard industrial classification systems."

This issue is illustrated quite clearly by an examination of the examples of cluster employers provided by PDC. At least one third of the example companies listed by the PDC do not identify themselves under any of the NAICS codes that PDC lists as defining the cluster. Many of these firms are identified with NAICS code 551114 (Corporate, Subsidiary and Regional Managing Offices). Though the forecast does not predict the growth of individual firms, the unclear relationship between NAICS codes and clusters presents a complication for conducting a cluster forecast since historic employment data, by NAICS code, are used as a starting point. More details about the use of historic employment data in this analysis are included in the methods section, below.

Given the above challenges of linking NAICS codes to clusters, this cluster forecast should be interpreted with those caveats in mind. It should also be remembered that the original employment forecast results remain the same. The cluster analysis simply provides a way of organizing the forecast data in a format that resonates with some readers.

Cluster forecast methods

To partially alleviate the mismatch between NAICS codes and clusters, this analysis includes the PDC example companies that identified themselves under NAICS code 551114 (Corporate, Subsidiary and Regional Managing Offices) despite the fact that this NAICS code does not appear in the PDC cluster definitions. However, example companies that identified themselves under other codes that are not listed in PDC's cluster definitions were not included. This exclusion was necessary to create a consistent approach. Companies that are listed as NAICS code 551114, but that are not listed by the PDC as cluster examples were also not included in this analysis (including all of them would make cluster definitions even more fuzzy). The resulting cluster employment data for the year 2006 is shown in Table 2.

Table 2: Cluster employment for the year 2006 for the three-county region (ES202 data)

Cluster	Number of firms	Number of employees
Activewear	542	10,361
Advanced Manufacturing	1,116	64,917
Bioscience	376	5,754
Cleantech	704	9,593
Software	1,478	14,803
Total	4,216	105,428

Steps to forecast employment for the identified clusters:

(1) Categorize identified cluster NAICS codes in sectors (e.g. wholesale or information). Each cluster is divided among two to four sectors.
(2) Determine what proportion of each sector's employment should be attributed to each cluster using the 2006 employment data. The proportions of sector employment by cluster for the 3-county area are shown in Table 3.

Table 3: Year 2006 proportions of sector employment by cluster in 3-county area (from 2006 ES202 data)

			Cluster				
NAICS	**Sector**	**Sector employment (3-county)**	**Active Wear**	**Adv Mfg**	**Bioscience**	**Cleantech**	**Software**
334	Mfg – High tech	33,539		100.0%			
31,32,33 (except 334)	Mfg – Non-high tech	69,056	1.7%	45.4%	3.2%		
42	Wholesale	49,178	13.9%		1.4%	2.3%	
51	Information	20,019					42.9%
54	Professional Services	43,273	2.8%		4.2%	15.4%	14.4%
55	Management	20,745	5.6%	0.3%		1.2%	
56	Admin, Waste	52,938				3.0%	
62	Health & Social Services	84,801			1.2%		
	Total (all sectors)	808,389	1.3%	8.0%	0.7%	1.2%	1.8%

(3) The original employment forecast is for the 7-county region, while the cluster data is for the 3-county area. In order to align the geographies of the employment forecast and the 2006 cluster data, both datasets have been scaled down to the UGB for the rest of this analysis. Historic 3-county employment data indicates that the UGB capture rate for cluster employment is between 97 and 99 percent (depending on the cluster). The proportions of sector employment by cluster for the Metro UGB are shown in Table 4.

Table 4: Year 2006 proportions of sector employment by cluster in UGB (from 2006 ES202 data)

NAICS	Sector	Sector Employment (UGB)	Active Wear	Adv Mfg	Bioscience	Cleantech	Software
334	Mfg – High tech	33,246		100.0%			
31,32,33 (except 334)	Mfg – Non-high tech	64,872	1.7%	47.4%	3.3%		
42	Wholesale	47,675	14.0%		1.4%	2.3%	
51	Information	19,449					43.7%
54	Professional Services	42,596	2.8%		4.2%	15.1%	14.5%
55	Management	20,686	5.5%	0.3%		1.2%	
56	Admin, Waste	51,554				3.0%	
62	Health & Social Services	83,491			1.2%		
	Total (all sectors)	772,140	1.3%	8.2%	0.7%	1.2%	1.9%

The 7-county high and low growth employment projections were narrowed to the UGB using sector specific UGB capture rates derived from modeled scenarios (same capture rates by sector as reported elsewhere in this UGR). These high and low employment forecasts are shown in Tables 5 and 6.

Table 5: High growth UGB employment forecast (thousands of employees)

	UGB Capture Rates		UGB Employment Projections (thousands)				
NAICS	2010-2015	2015-2030	2010	2015	2020	2025	2030
11, 21	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0
23	68.6%	73.3%	53.4	58.3	68.7	76.3	85.9
334	80.6%	68.6%	31.6	35.1	31.9	33.6	35.4
31,32,33 (except 334)	86.7%	82.2%	85.4	91.8	89.6	90.8	91.6
42	78.0%	74.6%	47.9	52.9	55.3	59.6	64.1
44,45	82.0%	86.5%	98.9	108.5	117.9	122.9	129.3
22, 48,49	82.8%	70.8%	33.8	40.0	37.5	40.1	43.0
51	92.0%	85.7%	24.8	29.0	31.3	35.7	40.3
52	73.6%	85.7%	35.4	41.7	53.3	57.9	62.1
53	84.0%	84.9%	23.9	26.5	29.4	31.9	34.5
54	92.0%	84.9%	55.9	66.1	69.5	77.1	85.1
55	84.2%	81.0%	22.6	28.2	32.2	37.2	42.7
56	85.0%	81.2%	65.5	81.0	88.4	98.4	107.8
61	87.3%	81.2%	22.6	25.3	27.0	30.4	33.8
62	82.1%	81.0%	98.4	117.9	138.1	157.4	178.0
71	78.9%	74.6%	12.0	13.3	14.1	15.6	17.1
72	83.5%	81.0%	73.5	81.9	87.5	94.9	102.4
81	82.0%	73.9%	34.3	42.0	44.5	50.4	56.2
92	82.3%	78.1%	132.8	135.8	137.1	145.0	152.6
Total			952.5	1,075.3	1,153.4	1,255.5	1,361.9

Table 6: Low growth UGB employment forecast (thousands of employees)

	UGB Capture Rates		UGB Employment Projections (thousands)				
NAICS	2010-2015	2015-2030	2010	2015	2020	2025	2030
11, 21	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0
23	68.6%	73.4%	30.1	31.3	32.9	31.8	30.3
334	80.6%	70.0%	20.1	21.2	19.2	19.8	20.4
31,32,33 (except 334)	86.7%	84.3%	61.9	63.0	60.6	59.6	58.6
42	78.0%	77.0%	43.5	48.2	52.1	56.2	60.3
44,45	82.0%	87.5%	83.0	88.4	94.6	96.5	100.3
22, 48,49	82.8%	70.6%	29.9	35.7	33.4	35.6	38.0
51	92.0%	86.4%	17.6	18.9	19.7	22.0	24.5
52	73.6%	86.4%	30.5	35.1	45.0	48.8	52.6
53	84.0%	85.8%	20.2	22.0	24.7	26.7	28.8
54	92.0%	85.8%	44.1	50.1	52.8	58.6	65.0
55	84.2%	83.9%	14.8	16.3	17.9	19.8	22.4
56	85.0%	82.1%	38.2	41.8	42.4	44.7	46.9
61	87.3%	82.1%	18.9	20.9	22.3	24.7	27.0
62	82.1%	83.9%	88.2	104.0	125.7	142.4	160.1
71	78.9%	77.0%	9.6	10.6	11.7	12.9	14.1
72	83.5%	83.9%	69.0	76.9	85.1	92.2	99.4
81	82.0%	74.4%	25.0	29.2	30.7	34.6	38.5
92	82.3%	79.8%	122.6	124.4	127.6	134.7	141.4
Total			767.5	838.0	898.3	961.7	1,028.8

Cluster forecast results

The UGB employment forecasts were allocated to clusters using the proportions in Table 4. These forecasts only represent the NAICS codes that comprise the identified clusters. There are additional jobs in other NAICS codes in the full forecast. The high growth employment forecast is shown by sector in Table 7 and by cluster in Table 8 and Figure 1.

Table 7: High growth cluster employment forecast for UGB by sector (thousands of employees)

				Number of employees (thousands)				
NAICS	Sector	Cluster	Share of Sector	2010	2015	2020	2025	2030
334	Mfg – High tech	Adv Mfg	100.0%	31.6	35.1	31.9	33.6	35.4
31,32,33 (except 334)	Mfg – non-high tech	Activewear	1.7%	1.5	1.6	1.6	1.6	1.6
		Adv Mfg	47.4%	40.4	43.5	42.4	43.0	43.4
		Bioscience	3.3%	2.9	3.1	3.0	3.0	3.1
42	Wholesale	Activewear	14.0%	6.7	7.4	7.7	8.4	9.0
		Bioscience	1.4%	0.7	0.8	0.8	0.9	0.9
		Cleantech	2.3%	1.1	1.2	1.3	1.4	1.5
51	Information	Software	43.7%	10.8	12.7	13.7	15.6	17.6
54	Professional Services	Activewear	2.8%	1.6	1.9	2.0	2.2	2.4
		Bioscience	4.2%	2.3	2.8	2.9	3.2	3.6
		Cleantech	15.1%	8.5	10.0	10.5	11.7	12.9
		Software	14.5%	8.1	9.6	10.1	11.2	12.3
55	Management	Activewear	5.5%	1.2	1.6	1.8	2.1	2.4
		Adv Mfg	0.3%	0.1	0.1	0.1	0.1	0.1
		Cleantech	1.2%	0.3	0.3	0.4	0.4	0.5
56	Admin, Waste	Cleantech	3.0%	1.9	2.4	2.6	2.9	3.2
62	Health & Social Services	Bioscience	1.2%	1.2	1.5	1.7	1.9	2.2
	Total			120.9	135.4	134.4	143.1	152.0

Table 8: High growth cluster employment forecast for UGB by cluster (thousands of employees)

Cluster	ES202 2006	2010	2015	2020	2025	2030
Activewear	10.4	11.0	12.4	13.0	14.2	15.3
Adv Mfg	64.9	72.0	78.7	74.4	76.7	78.9
Bioscience	5.8	7.1	8.1	8.4	9.1	9.8
Cleantech	9.6	11.8	13.9	14.8	16.4	18.0
Software	14.8	18.9	22.3	23.8	26.8	29.9
All Clusters	105.4	120.9	135.4	134.4	143.1	152.0
Cluster share of all employment	13%	13%	13%	12%	11%	11%

Under the high growth forecast, cluster employment represents a decreasing share of employment in the UGB between the years 2006 and 2030. The low growth employment forecast is shown by sector in Table 9 and by cluster in Table 10 and Figure 2.

Table 9: Low growth cluster employment forecast for UGB by sector (thousands of employees)

				Number of employees (thousands)				
NAICS	Sector	Cluster	Share of Sector	2010	2015	2020	2025	2030
334	Mfg – High tech	Adv Mfg	100.0%	20.1	21.2	19.2	19.8	20.4
31,32,33 (except 334)	Mfg – non-high tech	Activewear	1.7%	1.1	1.1	1.1	1.0	1.0
		Adv Mfg	47.4%	29.3	29.8	28.7	28.2	27.8
		Bioscience	3.3%	2.1	2.1	2.0	2.0	2.0
42	Wholesale	Activewear	14.0%	6.1	6.8	7.3	7.9	8.5
		Bioscience	1.4%	0.6	0.7	0.8	0.8	0.9
		Cleantech	2.3%	1.0	1.1	1.2	1.3	1.4
51	Information	Software	43.7%	7.7	8.3	8.6	9.6	10.7
54	Professional Services	Activewear	2.8%	1.2	1.4	1.5	1.7	1.8
		Bioscience	4.2%	1.8	2.1	2.2	2.5	2.7
		Cleantech	15.1%	6.7	7.6	8.0	8.9	9.8
		Software	14.5%	6.4	7.3	7.6	8.5	9.4
55	Management	Activewear	5.5%	0.8	0.9	1.0	1.1	1.2
		Adv Mfg	0.3%	0.0	0.0	0.0	0.1	0.1
		Cleantech	1.2%	0.2	0.2	0.2	0.2	0.3
56	Admin, Waste	Cleantech	3.0%	1.1	1.2	1.3	1.3	1.4
62	Health & Social Services	Bioscience	1.2%	1.1	1.3	1.6	1.8	2.0
	Total			87.4	93.1	92.3	96.6	101.3

Table 10: Low growth cluster employment forecast for UGB by cluster (thousands of employees)

Cluster	ES202 2006	2010	2015	2020	2025	2030
Activewear	10.4	9.2	10.2	10.8	11.7	12.5
Adv Mfg	64.9	49.4	51.1	48.0	48.1	48.2
Bioscience	5.8	5.6	6.2	6.5	7.0	7.5
Cleantech	9.6	9.0	10.1	10.7	11.7	12.9
Software	14.8	14.1	15.5	16.3	18.1	20.1
All Clusters	105.4	87.4	93.1	92.3	96.6	101.3
Cluster share of all employment	13%	11%	11%	10%	10%	10%

Under the low growth forecast, cluster employment represents a decreasing share of employment in the UGB between the years 2006 and 2030.

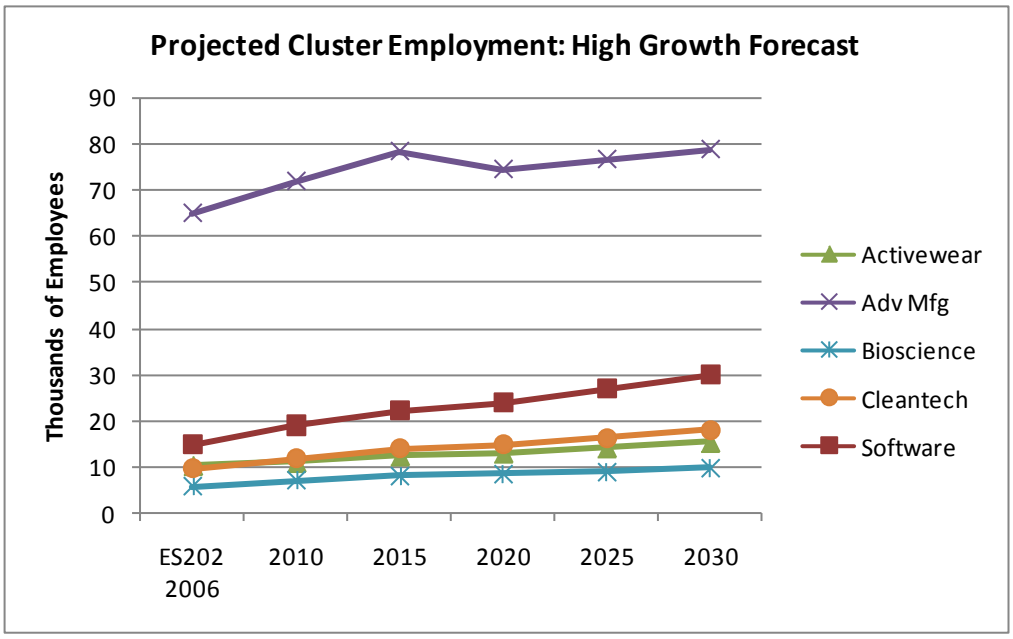


Figure 1: Projected cluster employment for UGB by cluster through 2030 (high and low growth forecasts)

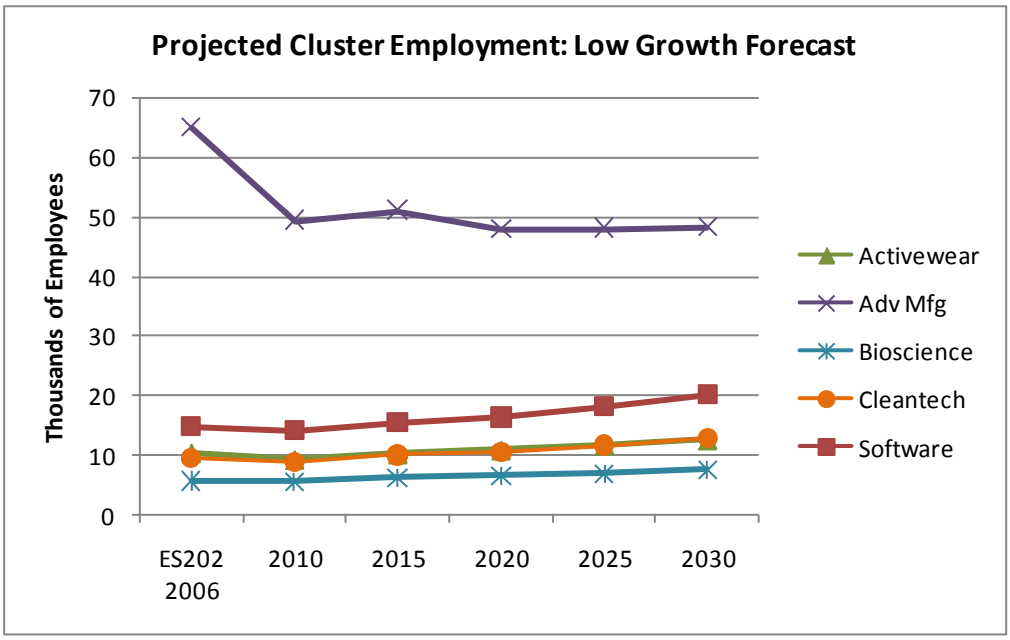


Figure 2: Projected cluster employment for UGB by cluster through 2030 (low growth forecast)

Under the high growth forecast, all five of the identified clusters would realize growth in employment by the year 2030. Under the low growth forecast, the Advanced Manufacturing cluster is forecasted to

suffer the most of the five clusters, with no recovery to 2010 employment levels by the year 2030. Under the low forecast, growth in the remaining four clusters is expected to occur, but at a slower rate than under the high growth forecast. By the year 2030, at both the high and low ends of the range, cluster employment is forecasted to comprise a smaller share of total employment in the Metro UGB than it did in 2006.

Appendix 4: Large employer / large lot analysis

Introduction

A strong regional economy that provides job choices and prosperity is an important part of quality of life. The economic position of the Portland metropolitan region is partially dependent upon global factors as the world shifts towards new market realities. However, local and regional choices can shape this region's place in the global economy. In addition to job capacity, factors that contribute to a strong regional economy include, an educated workforce, high value added businesses, wage levels, the mix of jobs, the success of economic development efforts, the transportation system, infrastructure investments and quality of life.

This appendix is intended to provide more detailed information than found in the urban growth report about how the relationship between demand for employment capacity and parcel formats and configurations may change over the next 20 years. The analysis approaches the topic from several angles to help inform growth management decisions.

This report includes the following contents. *Some of the reports contents are strictly informational and do not impact the demand analysis*:

- Inventory of existing large employers (by number of employees)
- Inventory of existing large parcel users (over 25 acres)
- Forecasted large lot demand (years 2010 to 2030)
- Reconciliation of large lot supply and demand
- Policy questions

Inventory of existing large employers[1]

This analysis provides information on both large lot users and the region's large employers. An inventory of existing large employers (in 2006) suggests that not all large employers use large parcels of land. This portion of the analysis also draws attention to the region's many Oregon-originated, large employers that have been in the region for decades. Existing employers play a critical role in supporting the region's economy, and their needs should not be forgotten amongst efforts to attract the next big employer.

[1] This large employer portion of the analysis uses United States Bureau of Labor Statistics data (ES-202) from 2006. This data includes only those employees that are covered by unemployment insurance (about 98 percent of all non-farm employees). This data set is deemed confidential by the federal government, requiring that it be presented in a generalized format that does not identify individual employers.

Methodology and results (large employers)

Different industries require different human resources. For instance, industrial uses typically require fewer employees per square foot than retail uses. This report's definition of a large employer recognizes these differences by varying employment minimums for each building type. To identify large employers, each North American Industry Classification System (NAICS) code[2] was first assigned to one of six building types.[3] A minimum employee number was applied to each building type, assuming that the building is on a 20-acre site (to control for parcel size). The large employer definitions are described in Table 1.

Table 1: definition of large employers by building type

Building type	NAICS codes	Number of equivalent jobs on 20 acres
Office	information finance real estate professional services management administration, waste	excluded from this large employer analysis because office uses would have too many employees on a 20-acre site to provide a means of identifying large employers
Flex	hi tech	600
General industrial	manufacturing (non high tech) transportation, warehouse, and utilities	400
Warehouse and distribution	wholesale	200
Retail	retail arts, entertainment, recreation accommodation and food service other services	700
Institution	education health and social services government	1,000

Using the definition of large employers found in Table 1 results in a list of 89 large employers inside the current urban growth boundary (UGB).

[2] NAICS codes are self-reported by firms and in a few cases do not appear to accurately represent the activities of the business on these particular sites. For instance one employer's NAICs code is in the wholesale category, placing them in the warehouse and distribution building type when most of their activities at this site appear to be office uses.

[3] This differs from the general methodology used in the urban growth report, which assigned each NAICS code to several building types. This difference in methodology does not appear to influence the results of this large lot/large employer analysis.

The original list of 89 large employers is described as follows:

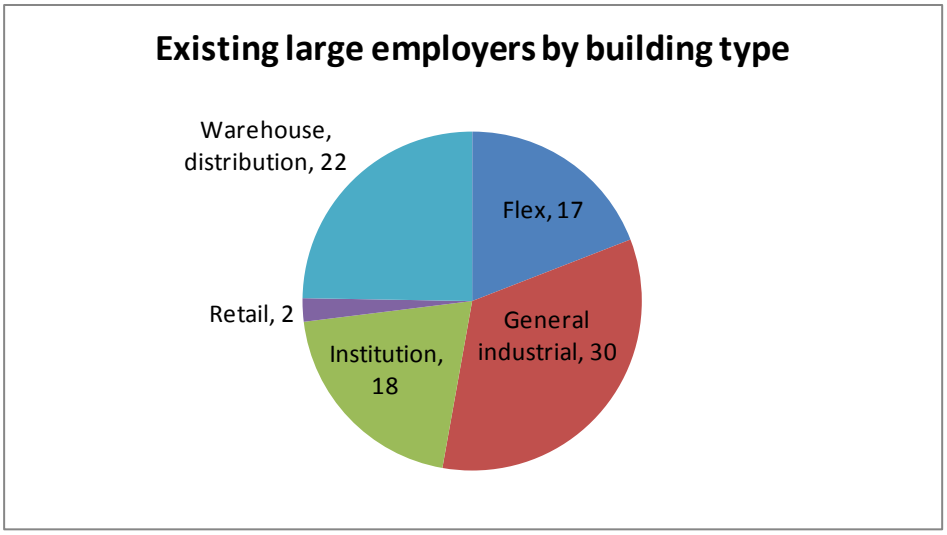


Figure 1: number of large employers inside the Metro UGB in 2006 by building type

- 16 percent of large employers are public sector
- 10 percent of large employers are in the central city
- 6 percent of large employers are in town centers or regional centers
- 9 percent of large employers are in corridors
- 61 percent of large employers are in Title 4 Employment, Industrial or Regionally Significant Industrial Areas (in some cases, these areas overlap with centers and corridors)

Nineteen of these 89 large employers are duplicates (same firm with multiple locations), leaving 70 unique large employers inside the UGB. Of these, 14 are public sector employers, leaving 56 large, unique, private-sector employers. Thirty-seven of these private firms (66 percent) originated in the Portland region. When public sector firms are included, 71 percent of the region's large employers originated in the Portland region (50 out of 70 employers).

As shown in Table 2, the 56 large, private employers have emerged in our region over the course of a century and a half. Many of them started as a small business that grew over time.[4]

This data is for information purposes only and does not impact the 2010 – 2030 large lot demand analysis.

Table 2: decade of origin of existing (year 2006) large, private employers in the Metro UGB

Decade	Number of existing (in 2006) large, private-sector employers by decade of origin in the Metro region	Number that are Oregon Originated
1850	1	1
1860	0	0
1870	2	2
1880	0	0
1890	1	1
1900	1	1
1910	4	4
1920	4	2
1930	4	4
1940	9	9
1950	3	2
1960	2	2
1970	8	5
1980	2	1
1990	6	4
2000-2006	3	0

[4] Additional information about these 56 firms as well as a description of methodology is available as Attachment 1 to this report.

Existing large parcel users

In addition to identifying existing large employers, this study identifies existing large parcel users in the region. This provides an idea of what attributes future users may be looking for in large parcels. Large parcels were defined as 25 acres or larger.

Methodology and results (existing large lot users)

To find existing large parcel users, taxlots larger than 25 acres that are being used for industrial or commercial purposes were identified. Other large employers (the 89 large employers as defined earlier in this report) that are located on an assemblage of more than 25 acres were added to this inventory. This survey finds a total of 60 existing firms inside the Metro UGB that are located on a parcel of land (or group of parcels) of at least 25 acres. Figure 2 shows the geographical distribution of these large parcels throughout the region. These large parcel users accounted for 8.1% of total employment in the region in 2006.

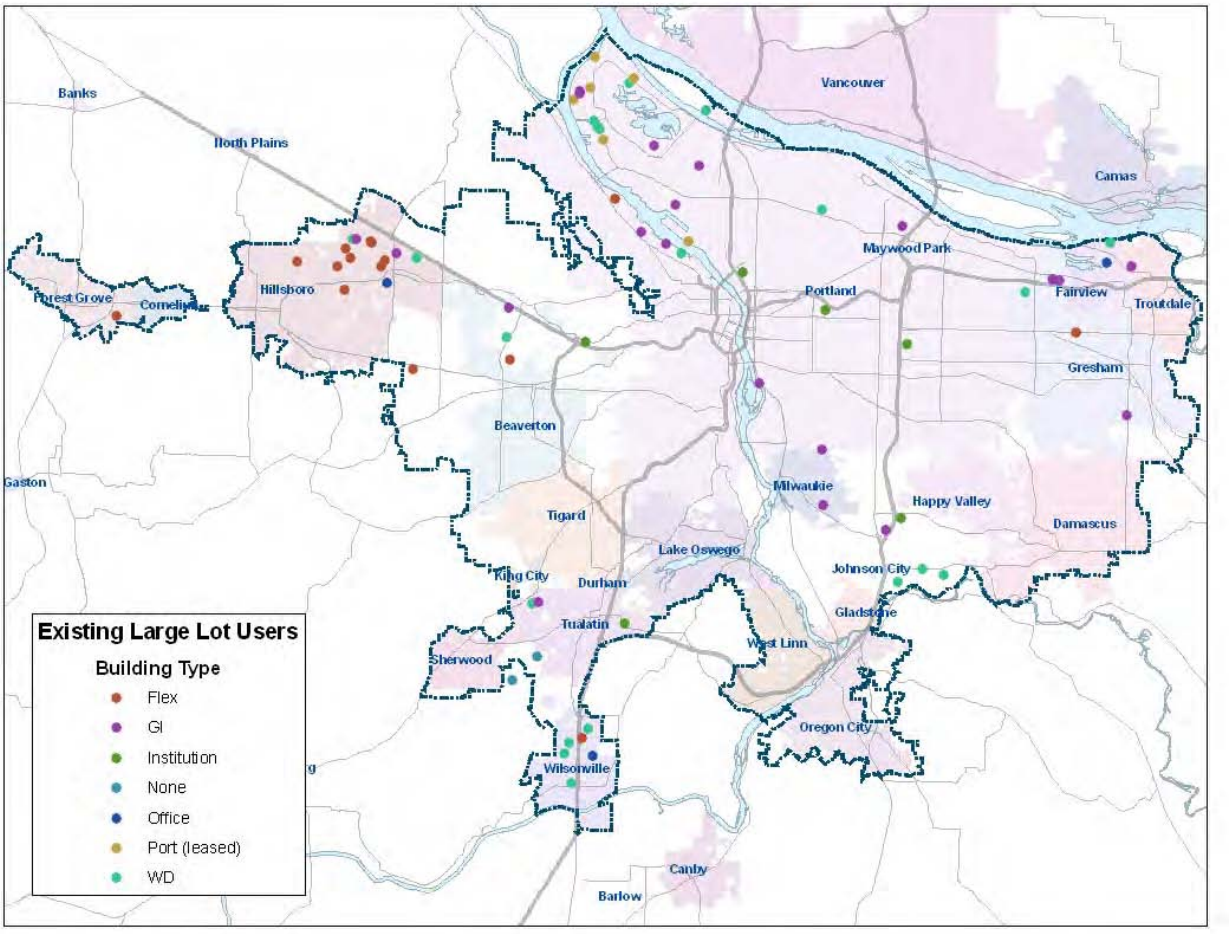


Figure 2: current large lot users by building type

GIS analysis indicates that these large parcels tend to be fairly flat. They may have some areas of slopes greater than 7% or even 15%, but these steep areas are usually small and scattered. Large parcel users with multiple buildings, like a hospital facility, are more likely to work around steeper slopes than a user

building a large warehouse or industrial building. There is evidence that all building types can work around small environmental limitations when necessary. Many of the parcels in the survey have areas that are protected by Title 3 or Title 13, usually in the form of a single stream corridor running through the property or protected areas along the edges of the parcel. Many large lot users have only developed a portion of their property, evidence of their preference for future expansion opportunities. Some basic attributes of these large parcels/users, organized by building type, are shown in Table 3. Additional information about employers on large parcels is included as Attachment 2.

Table 3: summary statistics for existing large lot users

Building type	Number of large employers	Total employees in building type	Proportion of regional employment	Average acreage per large employer	Average number of taxlots	Average employees per acre
Institutional	6	19,567	2.4 %	54.3	31.5	60.0
GI	21	10,475	1.3 %	53.2	3.0	9.4
WD	16	11,028	1.4 %	48.8	2.7	14.1
Flex	14	22,887	2.8 %	111.8	3.1	14.6
Office	3	1,635	0.2 %	82.2	5.0	6.6
Total	60	65,592	8.1 %			

Institutional large lot users

The six institutional employers inventoried here are all hospitals and related facilities. Together, they employed almost 20,000 people in 2006. There is strong evidence of taxlot assembly at these facilities, particularly those located in areas of higher density development. The total number of taxlots for each user ranges from 6 to 60 and total acreage ranges from 31 to 75 acres. For the large lot demand forecast section of this report, only medical uses are forecasted for the institutional building type. This is because other institutional large lot needs (e.g. schools) are better handled through the major UGB amendment process, which specifically addresses public facility needs.

General Industrial (GI) large lot users

There are 21 employers on large lots in the General Industrial category. The total lot sizes for these employers range from 25 to 164 acres, with an average of about 53 acres. There seems to be less taxlot assembly in this category. Eight of these employers are located on a single taxlot and the average number of taxlots for all GI large lot users is 3.0. GI buildings tend to be mostly one story, so coverage ratios provide a good indication of what the FARs might be on these lots. Coverage ratios were calculated for a sample of these employers and range anywhere from 0.16 to 0.67, with an average of 0.31. This is fairly consistent with the assumption in the preliminary employment urban growth report of an average FAR of 0.26 for the GI building type.

Warehouse and Distribution (WD) large lot users

There are 16 examples of WD employers located on large lots. Taxlot sizes range from 25 to 112 acres with an outlier (Nike[5]) at 452 acres on an assembly of 17 taxlots. Most of these companies own fewer than five taxlots. A sample of coverage ratios for these lots provides a range of 0.07 to 0.58 and an average of 0.29.

Flex large lot users

There are 14 examples of Flex employers located on large lots. Flex buildings tend to be located on the largest parcels, with an average of 112 acres per employer. However, there is evidence that these companies are holding land for future business expansion opportunities, as indicated by vacant taxlots and low coverage ratios where lots have been developed. Coverage ratios for a sample of developed lots range from 0.07 to 0.23 with an average of 0.13. Eight of these employers are located on a single taxlot while the rest are located on between two and 11 taxlots.

Office large lot users

Because office uses are well-suited to denser development, office building types are rare on large parcels. Counter intuitively, in this sampling of large parcel users, the office building type has the lowest average employee density per acre. There are three Office employers located on lots larger than 25 acres. Their total land area ranges from 44 to 123 acres on 3 to 6 taxlots.

Additional large lot users

There are some other examples of large lot users in the region that do not fit into our building type analysis. These include industrial users like sand and gravel mining as well as companies that are leasing large lots from the Port of Portland. The Port of Portland currently leases six large waterfront lots (or groups of taxlots) for warehouse and distribution use, one large lot for retail use and one for office use.

Correlation between past preferences for large lots and future employment demand

This analysis was conducted to examine the relationships between jobs capacity and the types of firms that use large parcels. This analysis, as with the general employment analysis found in the UGR, is based on employment projections for the period 2010 to 2030.Two different growth scenarios, high growth and low growth were examined.[6] These employment projections, by NAICS sector, are shown in Tables 4 and 5.

[5] Nike's self-reported wholesale NAICS code places them in the warehouse and distribution building type. They more correctly would be placed in the office building type. Because it is beyond the scope of this analysis to double-check each building type, Nike has been kept in the WD building type for consistency. This does not affect projected demand for future large lot office or WD uses.

[6] The 2010 to 2030 range forecast is available as a separate document.

Table 4: High growth employment projections by sector in thousands of jobs

NAICS codes	Sector	2010	2015	2020	2025	2030
11, 21	Ag, Mining	1.9	1.8	1.7	1.6	1.5
23	Construction	77.9	85.0	93.6	104.0	117.1
334	Manufacturing - Hi tech	39.2	43.6	46.5	48.9	51.6
31,32,33 (except 334)	Manufacturing - non-hi tech	98.5	105.9	108.9	110.5	111.4
42	Wholesale	61.4	67.9	74.1	80.0	85.9
44,45	Retail	120.6	132.3	136.3	142.1	149.4
22, 48,49	Transp, Warehouse & Utilities	40.8	48.3	53.0	56.7	60.7
51	Information	26.9	31.5	36.6	41.7	47.1
52	Finance	48.1	56.6	62.3	67.6	72.5
53	Real Estate	28.5	31.5	34.7	37.6	40.6
54	Professional Services	60.8	71.8	81.9	90.9	100.3
55	Management	26.8	33.6	39.7	46.0	52.7
56	Admin, Waste	77.0	95.3	108.9	121.2	132.8
61	Education	25.9	29.0	33.2	37.4	41.7
62	Health & Social Services	119.8	143.6	170.6	194.5	219.9
71	Arts, Entertain, Rec	15.2	16.8	19.0	21.0	22.9
72	Accomm & Food Service	88.1	98.1	108.1	117.2	126.5
81	Other Services	41.9	51.2	60.2	68.2	76.1
92	Government	161.9	165.5	175.6	185.7	195.4
	Total	1,160.9	1,309.3	1,444.8	1,572.6	1,706.1

Table 5: Low growth employment projections by sector in thousands of jobs

NAICS codes	Sector	2010	2015	2020	2025	2030
11, 21	Ag, Mining	1.5	1.4	1.3	1.2	1.2
23	Construction	43.9	45.6	44.7	43.3	41.3
334	Manufacturing - Hi tech	24.9	26.3	27.5	28.3	29.1
31,32,33 (except 334)	Manufacturing - non-hi tech	71.4	72.7	71.9	70.7	69.5
42	Wholesale	55.8	61.8	67.6	72.9	78.3
44,45	Retail	101.3	107.9	108.1	110.4	114.7
22, 48,49	Transp, Warehouse & Utilities	36.2	43.1	47.3	50.4	53.9
51	Information	19.2	20.6	22.9	25.5	28.3
52	Finance	41.4	47.7	52.0	56.5	60.9
53	Real Estate	24.1	26.1	28.7	31.2	33.6
54	Professional Services	48.0	54.5	61.6	68.3	75.8
55	Management	17.6	19.4	21.3	23.6	26.7
56	Admin, Waste	44.9	49.1	51.7	54.4	57.1
61	Education	21.7	24.0	27.1	30.1	32.9
62	Health & Social Services	107.5	126.7	149.8	169.7	190.8
71	Arts, Entertain, Rec	12.2	13.4	15.2	16.8	18.3
72	Accomm & Food Service	82.7	92.1	101.4	109.9	118.5
81	Other Services	30.5	35.6	41.3	46.5	51.7
92	Government	149.0	151.2	160.0	168.9	177.3
	Total	933.6	1,019.1	1,101.4	1,178.5	1,260.0

Employment was distributed by real estate type using a set of density assumptions about the relationship between land area and employment for each building type.

Table 6 shows the sectors (by NAICS codes) that are expected to occupy each of the six building types. These assumptions are slightly different than the methods used to assign sectors to building types in the UGR. For simplicity, each sector has been assigned to one building type as opposed to the proportional assignment used in the UGR. Assumptions about the average square foot per employee (SFE) and average floor to area ratio (FAR) were made for each building type, also shown in Table 6. These numbers allow for a calculation of the average number of jobs per acre for each building type. These values are the same as the Outer Ring density assumptions used in the broader UGR analysis, as most large lot development is expected to take place in Outer Ring subareas. As shown in the UGR's buildable land inventory, most of the existing large lot supply is located near the outer edges of the current urban growth area.

Table 6: Building type and density assumptions

Building Type	NIACS codes	Average SFE	Average FAR	Average Jobs per Acre
Warehouse/Distribution (WD)	22, 42, 48, 49	1,850	0.32	7.5
General Industrial (GI)	23, 31, 32, 33 (except 334)	600	0.26	18.9
Tech/Flex (TF)	334	990	0.31	13.6
Office	51, 52, 53, 54, 55, 56	375	0.75	87.1
Retail	44, 45, 71 ,72, 81	550	0.44	34.8
Medical	62	650	0.66	44.2

The next step is to determine how future job growth will be distributed among firm sizes. For this analysis, it is assumed that the proportional distribution of jobs by firm size will be the same as that observed in the 2006 employment data (for the Metro region). This distribution is shown in Table 7.

Table 7: Proportional distribution of employment by firm size for each building type

Firm size by jobs	WD	GI	TF	Office	Retail	Medical
less than 10	12%	15%	1%	17%	18%	13%
10 to 49	26%	30%	5%	26%	41%	24%
50 to 99	14%	17%	4%	14%	16%	13%
100 to 149	9%	9%	4%	7%	8%	6%
150 to 199	5%	6%	4%	5%	5%	4%
200 to 499	15%	14%	25%	14%	10%	9%
500 to 999	5%	5%	17%	9%	1%	5%
1,000 to 1,999	6%	5%	34%	5%	0%	7%
2,000 to 2,999	0%	0%	6%	2%	0%	6%
3,000 or more	7%	0%	0%	0%	0%	13%
Total	100%	100%	100%	100%	100%	100%

Finally, employment projections are run through this set of assumptions with the additional assumption of a 75% capture rate for the Metro UGB[7]. Tables 8 and 9 show the forecast of the number of new firms expected from 2010 to 2030 by firm size and building type. Note that in the low growth scenario, employment projections show a decline in employment in the General Industrial category, so the number of new firms and area of land for this building type have been set to zero.

Table 8: High growth forecast of new firms by firm size and building type, 2010 to 2030

Firm size by jobs	WD	GI	TF	Office	Retail	Medical	Total
less than 10	778	1,140	14	4,518	2,976	2,016	11,442
10 to 49	290	393	15	1,149	1,130	603	3,580
50 to 99	63	87	5	249	172	126	702
100 to 149	25	28	3	76	55	34	221
150 to 199	10	14	2	40	24	15	105
200 to 499	14	16	7	55	24	20	136
500 to 999	2	3	2	17	1	5	30
1,000 to 1,999	1	1	2	4	0	4	12
2,000 to 2,999	0	0	0	1	0	2	3
3,000 or more	1	0	0	0	0	3	4
Total	1,184	1,682	50	6,109	4,382	2,828	16,235

Table 9: Low growth forecast of new firms by firm size and building type, 2010 to 2030

Firm size by jobs	WD	GI	TF	Office	Retail	Medical	Total
less than 10	704	0	4	2,216	2,086	1,680	6,690
10 to 49	263	0	5	563	792	502	2,125
50 to 99	57	0	2	122	120	105	406
100 to 149	23	0	1	37	38	28	127
150 to 199	9	0	1	20	17	13	60
200 to 499	13	0	2	27	17	17	76
500 to 999	2	0	1	8	1	5	17
1,000 to 1,999	1	0	1	2	0	3	7
2,000 to 2,999	0	0	0	1	0	1	2
3,000 or more	1	0	0	0	0	2	3
Total	1,073	0	17	2,996	3,071	2,356	9,513

[7] The capture rate used in this UGR is applied to a larger 7-county area than past UGRs, which used a 4-county capture rate. This change is due to the U.S. Office of Management and Budget's changed definition of the primary metropolitan statistical area.

Using the assumptions about jobs per acre from Table 6, the forecast of firms is correlated to parcel size and building type, shown in Tables 10 and 11.

Table 101: High growth lot correlation by lot size and building type, 2010 to 2030

Lot size (acres)	WD	GI	TF	Office	Retail	Medical	Total
25 to 50	11	4	4	1	0	4	24
50 to 100	7	1	2	0	0	5	15
100 plus	3	0	1	0	0	0	4

Table 11: Low growth lot correlation by lot size and building type, 2010 to 2030

Lot size (acres)	WD	GI	TF	Office	Retail	Medical	Total
25 to 50	10	0	1	1	0	3	15
50 to 100	6	0	1	0	0	3	10
100 plus	3	0	1	0	0	0	4

Large lot demand for marine and rail terminal use is not included in this analysis. These types of facilities may have relatively few employees and little building square footage. Consequently, a job forecast may be an inadequate means of forecasting land demand for these uses. Furthermore, these uses are extremely location specific and cannot be accommodated through UGB expansions.

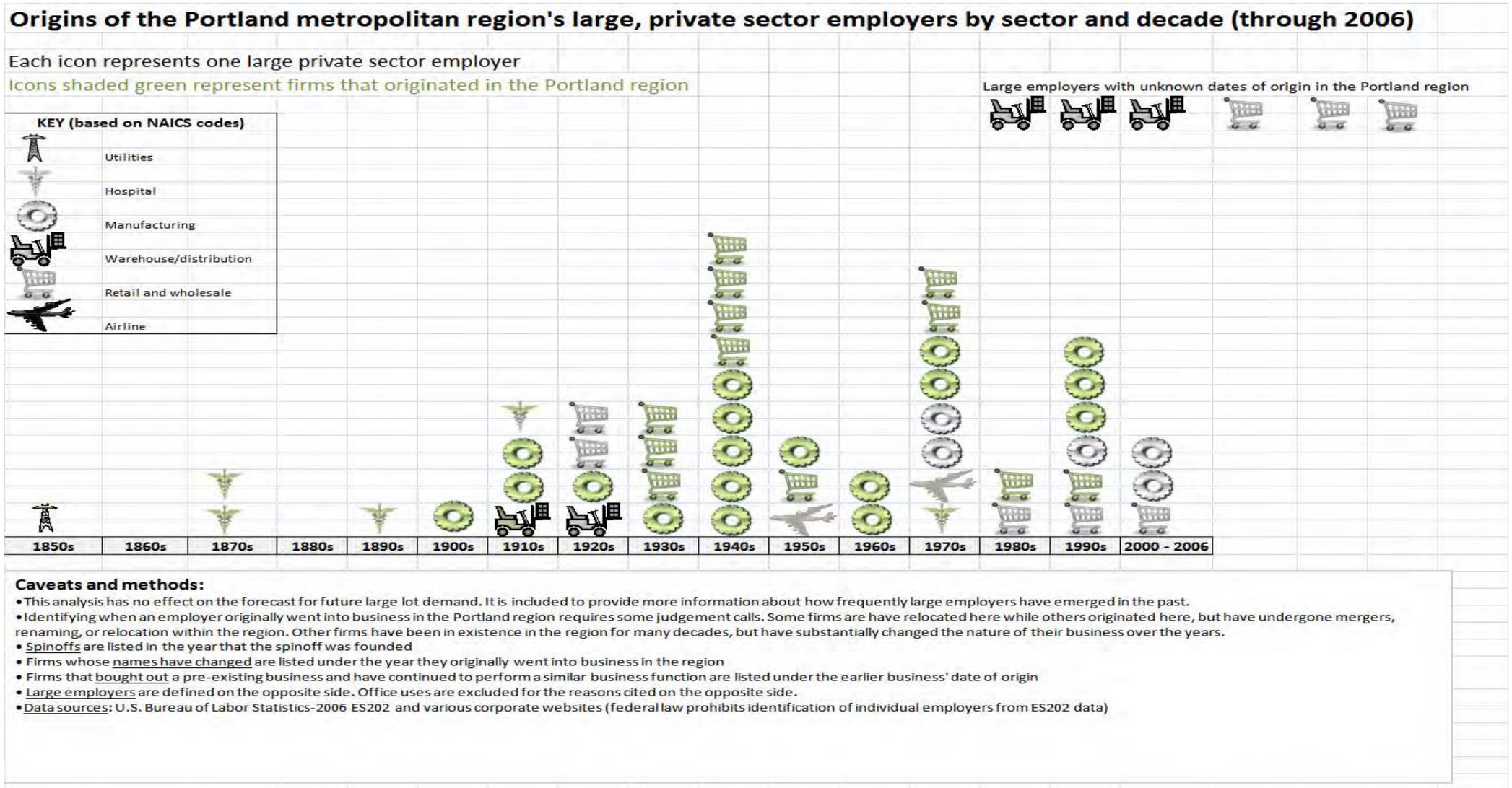
Policy questions

1. Some of the region's existing large lot employers appear to hold vacant land for future local expansion opportunities. Should it be a regional policy to provide capacity for future business expansions that may exceed the twenty-year need? What are the risks of not doing so?
2. Given the inherent uncertainty of the range forecast, what are the risks and opportunities of providing too much or too little large-lot employment capacity?
3. This analysis identifies potential demand for one 25-to-50-acre lot for office uses. Office uses are well-suited to multi-story buildings. Should it be regional policy to expand the UGB to provide large lots for office uses? What are the risks of not doing so?
4. Should the cyclical UGR capacity analysis include large lot institutional uses (medical, education, government) or should they be handled on an as-needed basis?
5. Since they need to be located close to where people live, should we expect that future institutional uses will occur in smaller building formats that don't require large lot UGB expansions?
6. Should we assume that potential land assembly can help address large lot demand?
7. What strategies can be put in place to ensure that industrial land is used for job generating industrial purposes in order to protect public investments made to support industrial uses (such as transportation investments and planning efforts) and enhance regional competitiveness?

Reconciliation of large lot supply and potential demand

It is likely that many future large parcel needs will need to be accommodated on vacant land rather than refill. Refill would appear to be a more likely source of capacity for smaller lot needs. The buildable land inventory for employment uses was amended by Metro's regional partners to incorporate local knowledge of available land. Details about the large lot buildable land inventory and a reconciliation of supply and potential demand are included in the urban growth report.

Attachment 1: Existing large employers (2006)



NAICS code	Building Type	Number of equivalent jobs on 20 acres
Ag, Mining		
Manufacturing - Hi tech	Flex	600
Manufacturing - non-hi tech	Gen. Industrial	400
Wholesale	Warehouse, distribution	200
Retail	Retail	700
Transportation, Warehouse & Utilities	Gen. Industrial	400
Information	Office	Not included
Finance	Office	Not included
Real Estate	Office	Not included
Professional Services	Office	Not included
Management	Office	Not included
Admin, Waste	Office	Not included
Education	Institutional	1000
Health & Social Services	Institutional	1000
Arts, Entertain, Rec	Retail	700
Accomm & Food Service	Retail	700
Other Services	Retail	700
Government	Institutional	1000

Method of defining "large employers"

- Each North American Industry Classification System (NAICS) code is assigned to one of six general building types.

- A minimum employee number is assigned to each building type, assuming a 20-acre site (to control for site size).

- Employers listed in the 2006 ES202 data are analyzed using the above filter to identify those that qualify as lare employers.

- Employers that emerged after 2006 are not included here

Attachment 2: existing large lot employers

This section is included for information purposes only

Existing large lot employers

This is a list of employers located on a taxlot or assemblage of taxlots of at least 25 acres. They were collected by looking at three different sources:

First, we looked at a set of "large employers" based on the 2006 ES-202 employment data to see if they were located on more than 25 acres of land. Different large employer criteria were established for each building type. We checked the area surrounding each employer to be sure to account for employers located on multiple taxlots. Next, we searched the current taxlot data for lots greater than 25 acres. Again, we checked the surrounding area for any additional taxlots being used by the employers associated with these large lots. We also checked the list of Industrial Cluster Employers from the City of Hillsboro (June 2009) for any additional large lot employers. Finally, this inventory includes additional large lot users on Port of Portland properties that were submitted by the Port.

* Note: Coverage ratios were calculated for a sample of employers from each building type by measuring building footprints from aerial photographs by hand. These building areas were then compared to total land area for the employer, regardless of whether the individual taxlots were developed or not. There may be some error in the building footprint measurements, and the coverage ratios will be skewed downward for employers that own a lot of vacant land. This is particularly a problem with Flex employers, so FARs have been provided where available (see # below.)

Note: Adjusted floor to area ratios (FARs) have been provided by the City of Hillsboro for selected employers. These data have been calculated based only on the developed parcels of land (excluding vacant parcels), so they should be more indicative of building density for these records than coverage ratios.

Institutional

NAICS (3 digit)	NAICS Description	Name	Market area	Acres	Number of Taxlots	Coverage ratio *	Adjusted FAR #
623	General Medical and Surgical Hospitals	Providence Portland Medical Center	inner north and east	31	45	-	-
622	General Medical and Surgical Hospitals	PROVIDENCE ST VINCENT MEDICAL CTR	inner westside	40	15	0.33	-
622	General Medical and Surgical Hospitals	LEGACY EMANUEL HOSPITAL & HLTH CNTR	central city	41	60	-	-
622	General Medical and Surgical Hospitals	Legacy Meridian Park Hospital	outer I-5 / I-205	68	10	-	-
622	General Medical and Surgical Hospitals	SUNNYSIDE HOSPITAL	outer clackamas	71	6	0.20	-
622	General Medical and Surgical Hospitals	PORTLAND ADVENTIST MEDICAL CENTER	inner north and east	75	53	-	-
			Total	**326**	**189**		
			Average	**54.3**	**31.5**	**0.27**	

General industrial

NAICS (3 digit)	NAICS Description	Name	Market area	Acres	Number of Taxlots	Coverage ratio *	Adjusted FAR #
331	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	NORTHWEST PIPE COMPANY	inner north and east	25	1	-	-
331	Steel Investment Foundries	PCC STRUCTURALS, INC.	outer clackamas	28	2	0.16	-
311	Coffee and Tea Manufacturing	BOYD COFFEE COMPANY	east multnomah co	28	1	-	-
332	Fabricated Pipe and Pipe Fitting Manufacturing	TUBE SPECIALTIES CO INC	east multnomah co	28	1	-	-
324	Asphalt Shingle and Coating Materials Manufacturing	HERBERT MALARKEY ROOFING COMPANY	inner north and east	28	2	-	-
327	Lime Manufacturing	ASH GROVE CEMENT COMPANY	inner north and east	29	1	-	-
333	Optical Instrument and Lens Manufacturing	LEUPOLD & STEVENS INC	inner westside	29	5	0.25	-
331	Steel Investment Foundries	PCC STRUCTURALS, INC.	inner north and east	29	11	0.38	-
336	Heavy Duty Truck Manufacturing	FREIGHTLINER OF PORTLAND LLC	inner north and east	33	3	0.67	-
332	Saw Blade and Handsaw Manufacturing	OREGON CUTTING SYSTEMS	inner clackamas	35	4	0.23	-
322	Paper (except Newsprint) Mills	GEORGIA PACIFIC	east multnomah co	36	1	-	-
325	All Other Basic Inorganic Chemical Manufacturing	TOKYO OHKA KOGYO AMERICA INC	outer westside	39	1	-	-
335	Current-Carrying Wiring Device Manufacturing	JAE OREGON INC	outer I-5 / I-205	40	1	-	-
324	Asphalt Paving Mixture and Block Manufacturing	PARAMOUNT OF OREGON INC	inner north and east	42	3	-	-
327	Glass Container Manufacturing	OWENS BROCKWAY GLASS CONTAINER INC	inner north and east	48	6	-	-
336	Railroad Rolling Stock Manufacturing	GUNDERSON, INC.	inner north and east	55	6	0.39	-
331	Steel Foundries (except Investment)	COLUMBIA STEEL CASTING CO., INC.	inner north and east	80	5	-	-
336	Other Aircraft Parts and Auxiliary Equipment Manufacturing	THE BOEING COMPANY	east multnomah co	86	3	0.27	-
327	Other Structural Clay Product Manufacturing	MUTUAL MATERIALS CO. - PORTLAND OR	east multnomah co	88	2	-	-
331	Iron and Steel Mills	EVRAZ OREGON STEEL MILLS INC	inner north and east	147	1	0.17	-
327	Ready-Mix Concrete Manufacturing	ROSS ISLAND SAND & GRAVEL CO.	inner north and east	164	2	-	-
			Total	**1,118**	**62**		
			Average	**53.2**	**3.0**	**0.31**	

Warehouse and distribution

NAICS (3 digit)	NAICS Description	Name	Market area	Acres	Number of Taxlots	Coverage ratio *	Adjusted FAR #
424	General Line Grocery Merchant Wholesalers	SYSCO FOOD SERVICE OF PORTLAND	outer I-5 / I-205	25	2	0.27	-
423	Metal Service Centers and Other Metal Merchant Wholesalers	LAMPROS STEEL	inner north and east	25	1	-	-
493	General Warehousing and Storage	G.I. JOES	outer I-5 / I-205	26	1	-	-
484	General Freight Trucking, Long-Distance, Less Than Truckload	USF REDDAWAY, INC.	outer clackamas	27	3	0.07	-
423	Construction and Mining (except Oil Well) Machinery and Equipment Merchant Wholesalers	THE HALTON COMPANY	inner north and east	29	2	0.19	-
493	Other Warehousing and Storage	G-P CONSUMER PROD NW LP	inner north and east	30	1	-	-
424	Men's and Boys' Clothing and Furnishings Merchant Wholesalers	COLUMBIA SPORTSWEAR USA CORPORATION	inner north and east	32	3	0.58	-
423	Other Professional Equipment and Supplies Merchant Wholesalers	VWR CORPORATION	outer I-5 / I-205	33	1	-	-
425	Wholesale Trade Agents and Brokers	PORTLAND AUTO AUCTION	inner north and east	38	2	-	-
493	General Warehousing and Storage	ALBERTONS	east multnomah co	54	2	-	-
493	General Warehousing and Storage	SAFEWAY STORES, INC.	outer clackamas	70	7	0.37	-
424	General Line Grocery Merchant Wholesalers	KROGER INC	outer clackamas	75	1	0.49	-
424	Drugs and Druggists' Sundries Merchant Wholesalers	GENENTECH INC	outer westside	75	5	-	0.19
488	Marine Cargo Handling	Oregon Paper Fiber		77	5	-	-
488	Other Support Activities for Road Transportation	SCHNITZER STEEL PRODUCTS	inner north and east	112	5	-	-
424	Footwear Merchant Wholesalers	NIKE, INC.	inner westside	452	17	0.06	-
			Total	**1,179**	**58**		
			Average	**73.7**	**3.6**	**0.29**	

Flex

NAICS (3 digit)	NAICS Description	Name	Market area	Acres	Number of Taxlots	Coverage ratio *	Adjusted FAR #
334	Semiconductor and Related Device Manufacturing	Integrated Device Technology Inc (IDT)	outer westside	25	1	-	0.37
334	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	FEI CO	outer westside	27	1	0.13	0.39
333	Semiconductor and Related Device Manufacturing	MAXIM INTEGRATED PRODUCTS	inner westside	33	1	0.23	0.22
334	Semiconductor and Related Device Manufacturing	Triquint	outer westside	47	4	0.08	0.15
334	Semiconductor and Related Device Manufacturing	INTEL CORPORATION (Hawthorn Farm)	outer westside	53	1	-	0.27
334	Semiconductor and Related Device Manufacturing	INTEL CORPORATION (Aloha)	outer westside	59	7	-	-
334	Printed Circuit Assembly (Electronic Assembly) Manufacturing	MERIX CORPORATION	outer westside	68	3	-	-
334	Semiconductor and Related Device Manufacturing	SILTRONIC CORPORATION	inner north and east	79	1	0.13	-
0		Solarworld	outer westside	94	1	-	0.32
334	Semiconductor and Related Device Manufacturing	INTEL CORPORATION (Jones Farm)	outer westside	116	1	-	0.18
334	Other Computer Peripheral Equipment Manufacturing	XEROX CORPORATION	outer I-5 / I-205	136	2	0.15	-
334	Semiconductor and Related Device Manufacturing	MICROCHIP TECHNOLOGY INC	east multnomah co	140	2	0.07	-
334	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	TEKTRONIX, INC.	inner westside	166	7	0.13	-
334	Semiconductor and Related Device Manufacturing	INTEL CORPORATION (Ronler Acres & vacant)	outer westside	522	11	-	0.27
			Total	**1,565**	**43**		
			Average	**111.8**	**3.1**	**0.13**	**0.27**

Office

NAICS (3 digit)	NAICS Description	Name	Market area	Acres	Number of Taxlots	Coverage ratio *	Adjusted FAR #
511	Software Publishers	Synopsys	outer westside	44	6	-	-
541		NMHG OREGON INC	east multnomah co	79	3	-	-
541	Computer Systems Design Services	MENTOR GRAPHICS CORP	outer I-5 / I-205	123	6	-	-
			Total	**246**	**15**		
			Average	**82.2**	**5.0**		

No building type

NAICS (3 digit)	NAICS Description	Name	Market area	Acres	Number of Taxlots	Coverage ratio *	Adjusted FAR #
212	Other Crushed and Broken Stone Mining and Quarrying	NORTHFORK EXCAVATING, INC	outer I-5 / I-206	67	1	-	-
212	Construction Sand and Gravel Mining	ROGERS NORTHWEST INC	outer I-5 / I-205	213	13	-	-

Large Hillsboro employers (from Industrial Cluster list) on smaller lots

NAICS (3dig)	NAICS Description	Employer (Notes)	MAname	Acres	Number of Taxlots	Btype	FAR
0		Should be Applied Materials?	outer westside	15	1	Flex	0.45
334	Other Computer Peripheral Equipment Manufacturing	Epson	outer westside	21	2	Flex	0.39
423	Industrial Supplies Merchant Wholesalers	Tokyo Electron America	outer westside	6	1	WD	0.31
334	Electronic Computer Manufacturing	Sun Microsystems	outer westside	12	2	Flex	0.29
334	Electronic Computer Manufacturing	Radisys	outer westside	11	2	Flex	0.43
334	Semiconductor and Related Device Manufacturing	Lattice Semiconductor Corporation	outer westside	16	5	Flex	0.41
333	Semiconductor Machinery Manufacturing	Novellus	outer westside	13	2	Flex	-

Port of Portland large lot users

493	Other Warehousing and Storage	G-P CONSUMER PROD NW LP	Port of Portland	55	2	WD	
494	Other Warehousing and Storage	GEORIA-PACIFIC CONSUMER PRODUCT LLC	Port of Portland	54	2	WD	
424	Grain and Field Bean Merchant Wholesalers	COLUMBIA GRAIN	Port of Portland	38	1	WD	
		CASCADE STATION RETAIL	Port of Portland	27	1	Retail	
811	Car Washes	TOYOTA MOTOR SALES USA	Port of Portland	74	2		
493	Other Warehousing and Storage	AUTO WAREHOUSING INC	Port of Portland	120	1	WD	
425	Wholesale Trade Agents and Brokers	HUNDAI MOTOR AMERICA	Port of Portland	49	1	WD	
551	Corporate, Subsidiary, and Regional Managing Offices	FREIGHTLINER LLC	Port of Portland	27	2	Office	
		PORTLAND BULK TERMINALS	Port of Portland	83	4		
		BNSF/Portland Terminal Willbridge/Lake Rail Yard		120			
		Union Pacific Albina Rail Yard		193			
		Union Pacific Brooklyn Rail Yard		98			
		Union Pacific Barnes Rail Yard		37			
		BNSF Ford lead		36			
		Portland Bulk Terminals/Canpotex @ Terminal 5		80			

Toyota @ Terminal 4	82
Freightliner Headquarters	27
Portland Shipyard on Swan Island	60
Shipyard Commerce Center on Swan Island	64
Knife River	48

Appendix 5: Multi-tenant (business park)/large lot analysis

Introduction

Large lot business parks with multiple tenants can play an important role in the region's economy. In general, business parks of all sizes serve a land demand segment that caters to start-up firms that do not have the financial wherewithal or desire to purchase or lease standalone buildings. Business parks also provide flexibility for small or large companies that have less tolerance for risk by allowing them to expand and contract by leasing more or fewer adjacent units within the same building or complex.

Business parks may also provide some benefits from the standpoint of land use efficiency. Some multi-tenant facilities may provide employment space more efficiently than individually owned and occupied buildings because tenants can share facilities that are used on an irregular basis (Yap and Circ). For example, small companies that need warehouse space can collocate in a multi-tenant building and share loading docks, or office type employers that deal with occasional outside clients can share parking for their customers. In addition, there are a few examples in Canada and elsewhere in the world of a movement towards "Eco-Industrial Parks" that go beyond just "green" building and landscaping (Braziller). These new industrial parks strive to create synergies among their tenants so that, for example, the by-products of one company (materials or energy) might become inputs for another (Innovista, TaigaNova). This new type of business park could play a role as the region moves toward new environmental goals such as reducing greenhouse gas emissions.

However, it should be noted that these benefits are not necessarily limited to very large business parks (greater than 25 acres) and can often be achieved through smaller or higher density multi-tenant developments as well. Firms can lease employment space in a wide range of multi-tenant facilities, from small office buildings to sprawling industrial parks, depending on their needs and preferences. The demand for land for smaller business parks (less than 25 acres) is addressed through the broader employment UGR analysis.

This study forecasts future preferences for employment space in large business parks based on the assumption that preferences for this building format will be the same in the future as they are now. For this analysis, firms that are currently located in large business parks are compared to total employment throughout the region to obtain the proportion of current employment in large business parks. This analysis assumes that this same proportion of projected employment growth from 2010 to 2030 will prefer to locate in large business parks. These preferences may, however, change over time.

The starting point for this study is the "Top 25 business parks" list produced by the Portland Business Journal (PBJ) in December 2008. This list provides the names and locations of the 26 largest business parks in the region, ranked by building square footage. After excluding business parks in Vancouver, WA, and those owned by the Port of Portland, there are 21 large business parks left for analysis. In

addition to these, two more business parks close to or over 25 acres were found while researching the site plans for the parks on the PBJ list so these have been included as well.

Mapping methods

These existing business parks were mapped by selecting the best matching taxlots using the following data:

(1) Taxlots – boundaries and ownership information
(2) Business park site maps and descriptions obtained from websites of owners, leasing agents and other sources

Employers located in these business parks were identified from geocoded 2006 ES202 data by first selecting points that fell inside any of the taxlots mapped as business parks in the previous step. Next, any employers that geocoded to the street near the business park that had an address that was similar to the business park taxlots or other employers located in the business park were also selected.

Large lot business parks: summary statistics

Using the business park taxlot and employer data compiled in the mapping stage, some summary statistics have been calculated in order to characterize large business parks and the employers that tend to occupy them.

Table 1 includes the list of the business parks that were examined and some figures that describe their land and buildings. Total acreage was derived from current taxlot data and building square footage measurements are reproduced from the Portland Business Journal and business park websites. The adjusted floor area ratio (FAR) values are based only on developed parcels, so any taxlots that appeared completely vacant in aerial photographs were excluded from these calculations. Table 2 presents employment statistics by business park.

Table 1: Land and building area statistics by business park

Business Park	Area		
	Total Acres	Building Square Feet	Adjusted FAR
AmberGlen Business Center	72.5	572,685	0.21
AmberGlen East and West	44.4	536,000	0.31
Beaverton Creek Business Park	55.9	512,852	0.26
Columbia Commerce Park	31.4	562,888	0.41
Columbia Pacific Airport Way Industrial Park	46.6	768,279	0.38
Cornell Oaks Corporate Center	106.8	684,000	0.18
Creekside Corporate Park	50.4	615,113	0.28
Kruse Woods Corporate Center	76.4	1,652,105	0.56
Lincoln Center	22.4	728,770	0.75
Nimbus Corporate Center	47.5	688,632	0.33
Northwest Corporate Park	30.0	678,028	0.52
Oregon Business Park 1**	36.4	782,294*	0.49
Oregon Business Park 2**	5.3	71,511*	0.31
Oregon Business Park 3	35.2	501,029	0.33
PacTrust Business Center	40.2	570,539	0.33
Pacific Business Park (South)	25.57	340,864*	0.31
Pacific Corporate Center	55.8	601,542	0.25
Parkside Business Center	51.9	687,829	0.30
Piedmont	24.4	#	#
Southshore Corporate Park	311.7	1,630,000	0.22
Tualatin Business Center I & II	33.40	385,305*	0.26
Wilsonville Business Center	30.1	710,000	0.54
Woodside Corporate Park	37.4	579,845	0.36
Total	1271.5	14,860,110	0.33
# Building square footage data unavailable	* Building square footage data from PacTrust		
**Oregon Business Parks 1 & 2 are reported together in the PBJ list because they are adjacent			
Source: Building square footage data from Portland Business Journal unless otherwise noted			

Table 2 – Employment statistics by business park

Business Park	Employment (ES202 2006)			
	Employer Count	Average employees per firm	Total Employment	Sq Ft per Employee
AmberGlen Business Center	33	41.4	1,366	419
AmberGlen East and West	24	33.9	813	659
Beaverton Creek Business Park	32	51.1	1,634	314
Columbia Commerce Park	22	18.1	398	1,414
Columbia Pacific Airport Way Industrial Park	45	10.5	471	1,631
Cornell Oaks Corporate Center	77	42.2	3,250	210
Creekside Corporate Park	59	33.1	1,952	315
Kruse Woods Corporate Center	252	14.5	3,662	451
Lincoln Center	204	12.9	2,627	277
Nimbus Corporate Center	51	23.5	1,197	575
Northwest Corporate Park	38	13.7	521	1,301
Oregon Business Park 1	49	23.2	1,138	687
Oregon Business Park 2	22	5.9	130	550
Oregon Business Park 3	36	20.7	744	673
PacTrust Business Center	50	29.0	1,448	394
Pacific Business Park (South)	30	15.23	457	746
Pacific Corporate Center	78	18.6	1,451	415
Parkside Business Center	164	9.7	1,588	433
Piedmont	7	133.3	933	#
Southshore Corporate Park	32	39.7	1,270	1,283
Tualatin Business Center I & II	19	40.42	768	502
Wilsonville Business Center	39	13.5	525	1,352
Woodside Corporate Park	39	17.6	687	844
Total	1,353	20.55	29,030	

Table 3 reorganizes the data to look at 2006 business park employment by sector. These employers represent a small fraction, about 3.6% in 2006, of total employment in the three county region. However, the fraction of employment in large business parks varies by sector. The business parks in this study are home to more than 10% of employment in the Information, Finance and Wholesale sectors, but less than 1% of employment in Health and Social services and several other sectors.

Table 3 – ES202 2006 employment by sector (large business parks and 3-county area)

Sector	Business park employment (jobs)	Total sector employment (3 county)	Proportion of jobs in large business parks
11, 12 (Ag, Mining)	5	9,811	0.1%
23 (Construction)	1,477	46,701	3.2%
334 (Mfg - High Tech)	3,144	33,539	9.4%
31, 32, 33, except 334 (Mfg - Non High Tech)	1,682	69,056	2.4%
42 (Wholesale)	4,996	49,178	10.2%
44, 45 (Retail)	1,041	84,111	1.2%
22, 48, 49 (TWU)	583	40,422	1.4%
51 (Information)	2,650	20,019	13.2%
52 (Finance)	4,050	37,524	10.8%
53 (Real Estate)	576	15,818	3.6%
54 (Professional Services)	3,185	43,273	7.4%
55 (Management)	840	20,745	4.0%
56 (Admin & Waste)	2,945	52,938	5.6%
61 (Education)	15	61,468	0.0%
62 (Health & Social Services)	468	84,801	0.6%
71 (Arts, Entertainment & Recreation)	110	12,042	0.9%
72 (Accommodation & Food Service)	516	63,756	0.8%
81 (Other Services)	579	31,551	1.8%
92 (Government)	151	31,398	0.5%
None	17	238	7.1%
Total	29,030	808,389	3.6%

The employment shown in Table 3 was aggregated into six building types using the same assumptions as the large lot analysis (Appendix 4 to the urban growth report (UGR)), which are included in Table 9 in this report.

Table 4 indicates that nearly half of the employment in large business parks was in sectors associated with the office building type.

Table 4 – Distribution of employment by building type in 2006 (large business parks and 3 county)

Building Type	Business Park Employment	Proportion of Business Park Employment by Building Type	Total Employment (3 county)	Proportion of Total Employment by Building Type
Warehouse/dist	5,579	19.2%	89,600	11.1%
Gen industrial	3,159	10.9%	115,757	14.3%
Tech/flex	3,144	10.8%	33,539	4.1%
Office	14,246	49.1%	190,317	23.5%
Retail	2,246	7.7%	191,460	23.7%
Institution	634	2.2%	177,667	22.0%

Distribution of existing (2006) business parks by firm size

In order to understand how smaller firms aggregate in business parks, the patterns of current (2006) employment in existing business parks were examined.

The firms located in these business parks are mostly small, in the range of 0 to 50 employees. As shown in Figure 1, almost 60% of employees located in large business parks work for firms with no more than 100 employees. Relatively small firm sizes provide some explanation of why these firms may prefer multi-tenant space. However, there is a wide range of firm sizes within each business park, with more than half of business parks in this study also home to at least one firm with more than 200 employees in 2006.

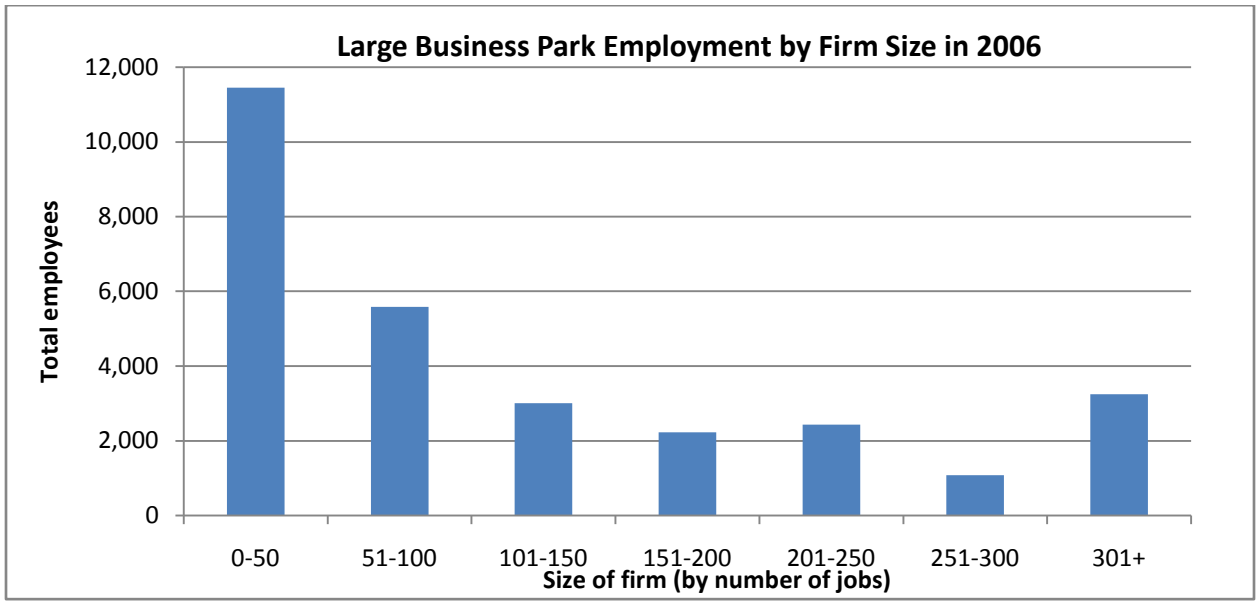


Figure 1 – Distribution of large business park employment by firm size in 2006

The distribution of business parks by employment is shown in Table 5. These data show, for example, that seven of the large business parks in this analysis housed between 500 and 1,000 employees.

Table 5 – Distribution of large business parks by employment (2006)

Business Park Size (employees)	Number of Business Parks	Proportion of Business Parks
< 500	4	17.4%
500 - 1000	7	30.4%
1000-2000	9	39.1%
2000-3000	1	4.3%
3000 +	2	8.7%
Total	23	100.0%

The 2006 distribution of business park employment by firm size and building type is shown in Table 6. For the purpose of forecasting potential business park preferences in the future, the proportions in Table 5 were used to convert the 2006 distribution of business park employment by firm size to an employment distribution by business park size (see Table 7). The overall total business park employment and employment by building type numbers have been maintained, however the firm sizes have been rearranged into business park-sized entities that would likely prefer larger parcels.

Table 6 – Distribution of business park employment by firm size (2006)

Firm size by jobs	W/D	Gen Ind	Tech/ Flex	Office	Retail	Inst	Total
less than 10	732	243	47	1,195	288	82	2,637
10 to 49	1,827	1,356	329	4,161	759	226	8,715
50 to 99	1,134	701	216	2,679	407	160	5,390
100 to 149	347	204	239	1,832	233	0	2,855
150 to 199	315	0	648	985	332	0	2,280
200 to 499	1,224	655	1,665	3,394	215	0	7,153
500 to 999	0	0	0	0	0	0	0
1,000 to 1,999	0	0	0	0	0	0	0
2,000 to 2,999	0	0	0	0	0	0	0
3,000 or more	0	0	0	0	0	0	0
Total	5,579	3,159	3,144	14,246	2,234	468	29,030
Columns will not add to Total since a small number of government and other jobs are not shown.							

Table 7 – Distribution of business park employment by business park size (2006)

Business park size by jobs	W/D	Gen Ind	Tech/ Flex	Office	Retail	Inst	Total
less than 10	0	0	0	0	0	0	0
10 to 49	0	0	0	0	0	0	0
50 to 99	0	0	0	0	0	0	0
100 to 149	0	0	0	0	0	0	0
150 to 199	0	0	0	0	0	0	0
200 to 499	970	549	547	2,478	389	81	5049
500 to 999	1,698	961	957	4,336	680	142	8,835
1,000 to 1,999	2,183	1,236	1,230	5,575	874	183	11,360
2,000 to 2,999	243	137	137	619	97	20	1,262
3,000 or more	485	275	273	1,239	194	41	2,524
Total	5,579	3,159	3,144	14,246	2,234	468	29,030
Columns will not add to Total since a small number of government and other jobs are not shown.							

Forecasted preference for large business parks

The next step is to forecast future employment in large business parks. The forecast assumes that fixed proportions of employment, by sector, will locate in large business parks in the future. The proportions observed for 2006, shown in Table 3, were used to scale the full employment forecast from 2010 to 2030 to large business park employment. Whether or not those preferences are "needs" remains for policy discussion. It also remains for debate whether these preferences will change over time.

The methodology used to forecast potential preferences for large business parks generally follows the steps of the large lot analysis for large individual employers (see Appendix 4). However, a few changes are made to account for the smaller employers involved in this analysis as well as the mixture of building types in a single business park.

Projected employment was aggregated from sector to building type, based on the relationships shown in Table 9 and then the forecasts were adjusted for infill and redevelopment using the refill rates also shown in Table 9. The Outer Ring market area average refill rates were chosen from the broader UGR analysis for this purpose, as most new business parks are likely to locate in the Outer Ring subareas. The use of a refill rate is a different approach than the large lot analysis, which did not assume any refill rate because the types of employers considered in the large lot analysis are assumed to have an inherent preference for large, vacant lots. Refill capacity is, however, assumed for this business park analysis because many of these types of employers do not necessarily need to locate on a large lot. Many are expected to locate on infill or redevelopment sites.

Projected changes in large business park employment from 2010 to 2030 under two different growth scenarios are shown in Table 8.

Table 8 – Projected employment changes in large business parks from 2010 to 2030, adjusted for refill

Growth Scenario	Change in Business Park Employment by Building Type, 2010 to 2030						Total Change
	W/D	Gen Ind	Tech/Flex	Office	Retail	Inst	
High	2,250	1,220	970	8,510	990	460	14,300
Low	2,060	-100	330	4,600	660	380	7,840

A second departure from the individual employer large lot analysis comes in the FAR assumptions that are used. Large business parks tend to have a mix of building types within the same property. Rather than use individual building type FAR assumptions to convert the employment forecast into land area, the weighted average FAR for the existing business parks examined in this study has been used across all building types. As previously shown in Table 1, this value is 0.33, so 0.33 has been used as the FAR for all building types. This may seem too high or too low for a particular building type, but it represents the mixture of building types typically found in large business parks.

The square foot per employee assumptions remain differentiated by building type, shown in Table 9. These SFE assumptions are the same as those used for the Outer Ring subareas in the broader employment UGR, again because most new business parks are expected to locate in the Outer Ring subareas.

Table 9 – Building type and density assumptions

Building Type	NAICS codes	Outer Ring SFE	Business Park FAR	Outer Ring Refill Rate
Warehouse/Distribution	22, 42, 48, 49	1,850	0.33	18%
General Industrial	23, 31, 32, 33 (except 334)	600	0.33	14%
Flex	334	990	0.33	16%
Office	51, 52, 53, 54, 55, 56	375	0.33	30%
Retail	44, 45, 71 ,72, 81	550	0.33	25%
Institution	61, 62, 92	650	0.33	36%

With these changes, the projected employment growth in large business parks was then run through the same set of calculations as the individual employer large lot analysis to determine the possible future preference for large business park land. The business park employment distribution (Table 7) was used for the current (and projected) employment distribution in place of the individual firm size distribution in order to forecast the land demand of aggregated business park-sized groups of employers. For a step-

by-step description, please see the large lot analysis. The resulting correlation of the forecast with historic preferences for large business parks is shown in Table 10. More details about the buildable land inventory and large lot inventory can be found in the UGR and in Appendix 4.

Table 10 – Correlation of forecast with historic preference for large business park lots (2010 to 2030, high and low growth)

High Growth							
Lot size (acres)	**WD**	**GI**	**TF**	**Office**	**Retail**	**Institution**	**Total Lots**
25 to 50	1	0	0	2	0	0	3
50 to 100	1	0	0	0	0	0	1
100 plus	1	0	0	0	0	0	1
Total Large Lots	3	0	0	2	0	0	5
Low Growth							
Lot size (acres)	**WD**	**GI**	**TF**	**Office**	**Retail**	**Institution**	**Total Lots**
25 to 50	1	0	0	1	0	0	2
50 to 100	1	0	0	0	0	0	1
100 plus	1	0	0	0	0	0	1
Total Large Lots	3	0	0	1	0	0	4

Assuming a continuation of historic preferences for large business parks, this analysis shows a forecasted preference for four to five large business parks (taxlots of at least 25 acres), depending on the amount of growth that is realized. Information about the region's large lot supply is included in the urban growth report.

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Appendix 6: Residential capacity methodology

DRAFT 2009-2030 Urban Growth Report

The Metro Council is expected to complete any capacity adjustments by the end of 2010 through regulations that bolster the amount of capacity in the existing UGB using urban investments and/or policy changes that increase densities or with possible Urban Growth Boundary (UGB) expansions. Dating forward 20 years yields a forecast horizon in year 2030. As interpreted from ORS 197.296 (20-year land supply statute), a 23 year time span is needed to synchronize limitations in lagged supply data from RLIS (i.e. housing capacity estimates are based on a July 2007 vacant land inventory) and state regulations that require a sufficient supply to meet a 20 year residential demand forecast.

This appendix includes a line by line annotation of the residential capacity methodology as well as additional information collected on parks SDCs and school district growth plans.

2009 to 2030 PRELIMINARY Urban Growth Report (UGR)

DRAFT Residential Dwelling Capacity Range Assessment

March 2009

Line No.			Residential DEMAND Assumption Low	Baseline	High	
	Residential Demand Estimates (in Dwelling Units)					
1a/		7-County Population Forecast (2007 to 2030)	728,200	875,000	1,024,400	
1b/		7-County Household Forecast (2007 to 2030)	348,600	408,300	469,100	
2/		**Capture 61.8% of 7-County Forecast in Metro UGB**	**215,400**	**252,300**	**289,900**	
3/		plus: 4% vacancy rate (source: 2000 Census)	8,600	10,100	11,600	
4/		**Dwelling Unit Demand in the Metro UGB:**	**224,000**	**262,400**	**301,500**	
			Residential SUPPLY Assumptions			
	July 2007 Vacant Land Inventory (Metro UGB):			**BASELINE**		
5/	**Gross Vacant Land in current Metro UGB**			**44,800**		
6/		less: Local Water Quality, floodways and Habitat Protection areas (ENV)		8,600		
7/	**Gross Vacant Buildable Acres in Metro UGB (GVBA)**			**36,200**		
8/		less: Fed., State, Municipal exempt land (actual count)		3,200		
9/		less: Acres of Platted Single Family Lots (actual count)		1,300		A
10/		less: Acres for Future Places of Worship and Social Org. (actual = 600 acres)		700		C
11/		less: Major Easements (Natural Gas, Electric & Petroleum) (actual count)		1,000		R
12/		less: Acres for Future Streets (0%, 10%, 18.5%)		4,900		E
13/		less: Acres for New Schools (H=45, M=55, E=70; actual = 1,000 acres)		1,000		S
14/		less: Acres for New Parks (based on SDC fees)		1,100		
15/		less: New Urban Areas (actual net of ENV, future streeets and dev. land)		7,900		
16/	**Net Vacant Buildable Acres (NVBA) - total**			**15,000**		
	Net Vacant Buildable Acres (NVBA) by Type (less-New Urban Areas):			**Metro UGB**		
17a/		Net Vacant Buildable Acres - Mixed Use Residential (MUR)		1,000		
17b/		Net Vacant Buildable Acres - Residential		6,400		
			Residential CAPACITY Assumption			
	Residential Housing Supply Assessment - Metro UGB		Low	Baseline	High	
18/	**Dwelling Unit Capacity of Vacant Land at Local Zoning (or Plan) - 2008**		**63,600**	**63,600**	**63,600**	
18a/		less: High-density MFR products not market feasible within next 20 years	(18,600)	(18,600)		
19/		add: Res. Development in vac. Mixed Use Districts (MUR)	29,100	29,100	29,100	
20/		less: Capacity Lost to SFR Underbuild @ 5%	(2,300)	(2,300)	(2,300)	
21a/		add: Res. Development Capacity on ENV land (no. taxlots wholly in Title 3	100	100	100	
21b/		add: Res. Development Capacity on Title 13 areas (80% of zoned capacity	19,300	19,300	19,300	U
22/		add: Units from Platted Single Family Lots under 3/8 acre (actual count)	8,800	8,800	8,800	N
23/		add: Units from Residential Refill @ 33%	73,900	86,600	99,500	I
23a/		add: Units from Residential Refill @ 40% (addition of 13% more)			39,200	T
23b/		add: Potential Units from *Subsidized* Residential Refill			71,100	S
24/		add: Estimated Capacity from New Urban Areas	48,000	48,000	48,000	
25/		less: New Urban Development not yet market feasible	(24,000)	(24,000)		
26/	**Subtotal: Dwelling Unit Capacity Supply Range**		**197,900**	**210,600**	**376,400**	
			Low Supply - High Demand		**Low Demand - High Supply**	
27/	**Net Need in Residential Dwelling Units (deficit):**		**(103,600)**	**(51,800)**	**152,400**	

Housing Demand Calculations:

Line 1a) 7-county PMSA Population Forecast: The regional population forecast is derived from Metro's Regional macro-economic forecast model. This model forecasts population growth 30 years into the future. The regional geography for the Portland-Beaverton-Vancouver, OR-WA Primary Metropolitan Statistical Area (PMSA) now comprises a total of 7-counties (i.e., Clackamas, Columbia, Multnomah, Washington and Yamhill counties in Oregon and Clark and Skamania counties in the State of Washington) – consistent with changes to federal data reporting standards. This is a change in geographic scope from an earlier 4-county SMSA (Standard Metropolitan Statistical Area) delineation to the present 7-county PMSA. The delineation is defined in the Federal Register by the Office of Management and Budget (OMB). "Re-drawing" PMSA delineations are required to be revised in order to reflect actual changes in the economic structure of regions as they grow and expand.

Line 1b) 7-county PMSA Household Forecast: The population forecast in line 1a is converted to a forecast of number of households using *age-adjusted headship rates* derived from Census information and Metro's regional macro-economic model. [source: Metro 2008-2040 Regional Forecast]

From Census estimates, the average household size for the PMSA is 2.57 persons per household in year 2000. The formation of future households and their composition is expected to change over time as family sizes decrease and the average age of the population increases making single-person households more prevalent in the future. By 2030, the average household size in the PMSA declines to 2.46 persons per household.

The assumption that future household sizes will decline has been vetted a number of times over the course of external peer review panels convened to analyze and review the veracity of the regional forecast and forecasting models and methods. Each time, demographers and professional forecasters have affirmed the assumption that the average household in the future will be smaller than today's household.

Line 2) Metro UGB Capture Rate (from a 7-county share): Capture rate is defined as the marginal share of future households expected to locate within the Metro UGB (with the remainder then locating elsewhere within the 7-county PMSA). The initial capture rate assumption (61.8%) is based on historical time series data obtained for 1979 to present. [source: Metro Research Center and Census data]

Table 1. Historical Capture Rate Series for the Metro UGB – 20-year Capture Rates

	2000	2001	2002	2003	2004	2005	2006	2007	Average
Rate:	62.2%	62.2%	62.2%	63.1%	62.2%	61.8%	60.4%	60.0%	61.8%

Source: Metro Data Research Center

Note: a forecast of Metro UGB capture rate can be derived from a discrete MetroScope scenario. This scenario would have the advantage of employing a capture rate that is economically consistent with a number of future policy implementations including the Regional Transportation Plan (RTP), urban renewal, other urban investment subsidy assumptions, zoning and comp plan changes, etc. Assuming an historical rate may be wrong if future policies diverge from current conditions.

However, starting with an initial UGR that assumes an historical average rate makes sense as policy makers can start from a common point and seek to redirect and bolster existing trends to align with future transportation and land use goals. As new policies emerge, they can be tested and new capture rates can be forecasted for future UGR assumptions.

Line 3) Vacancy Rate: Housing unit estimates are converted from households using a vacancy rate. Housing units are not the same as the number of households. [source: 2000 U.S. Census, Demographic Profile for the Portland-Vancouver, OR-WA PMSA]

The definition of housing units introduces differences in housing types, i.e., single family, multifamily, and manufactured housing as dwelling types that should be considered under existing housing need statues – ORS 197.296. Goal 10 also speaks to housing types which on a consistent basis will be addressed in the *Housing Needs Analysis Report*.

The initial assumption for the preliminary draft residential UGR assumes 4 percent, which is in keeping with the 2002 Residential UGR assumption.

Line 4) Dwelling Unit Demand Forecast: The resulting regional housing unit demand forecast is derived from Metro's Regional Forecast and vacancy rate assumption in line 3. [source: UGR calculation]

Housing Supply Calculations:

Line 5) Gross Vacant Land: Vacant land inside the current (as Jan 2009) Metro UGB is calculated based on exacting manual measurements of vacant land using photogrametric techniques and supplementary GIS data (including building permits and assessor tax lot information). [source: Actual RLIS measurement]

Line 6) ENV: *Environmental* constraints: Undeveloped land that should be protected from future development are subtracted from *gross vacant land*. The land that is deducted includes Metro's Title 3 (which includes floodplains) Title 13 (riparian areas), and floodways – as implemented by local jurisdictions. To the extent that areas with steep slopes intersect with the environmental constraints, they too are excluded from the 2007 buildable land inventory. Elsewhere, steep slopes are included in the buildable land inventory. For example, in jurisdictions located in Washington county, the deduction for environmental constraints is equal to the area delineated in maps provided by Clean Water Services. The map coverage from Clean Water Services are included in RLIS map/data layers. For further detailed explanations, please refer to the buildable land inventory GIS meta data description. [source: Actual RLIS measurement]

Line 7) GVBA: Gross Vacant Buildable Acres (GVBA) in the Metro UGB is defined as *gross vacant land* minus *environmental constraints*. [source: Actual RLIS measurement]

Gross-to-Net Calculations:

Line 8) Fed., State, Municipal Vacant Land: For purposes of measuring residential capacity per ORS 197.296, Federal, State and local municipal owned vacant land is removed from gross vacant buildable acres. [source: Actual RLIS measurement]

For calculating nonresidential land capacity, Federal, State and municipally owned land is added back into the estimation of employment land capacity.

Line 9) Platted SFR tax lots: An assumption that already platted tax lots under 3/8 of an acre in size will not subdivide into higher density housing products. [source: Actual GIS measurement] The capacity of existing SFR (single family residential) platted lots are not lost; they are returned to the calculation of residential capacity in line 22.

Line 10) Future Churches: (Only an additional 100 acres is set aside.) This is an assumption that sets aside future land supply in order to accommodate the development of future churches and social organizations. [source: Actual RLIS measurement and per capita forecast estimate]

The per capita estimate of future land need for this category is based on 1.4 acres per 1,000 future residents. [source: 1997 UGR church per capita rate assumption]

In the current baseline UGR, a total of 700 acres are needed to accommodate expected increase in church and social organization land needs. According to RLIS vacant land data, churches and social organizations already own 600 acres. The net amount that is deducted from other (i.e., residential or employment) future uses is thus calculated to be 100 acres for the 20-year forecast horizon. Per capita growth in population is derived from the 2008-2040 Regional Forecast.

Line 11) Major Utility Easements: Easements have been mapped for major utilities; this includes natural gas pipelines, petroleum pipelines and major electric lines (e.g., BPA powerlines). Pursuant to ORS 197.296, a consideration of easements is estimated to remove vacant land that is coincident with major easement lines identified in the Metro UGB as it has been deemed unsafe for future residential development in these areas. [source: Actual RLIS measurement]

Line 12) Future Streets ("skinny streets"): An assumption which sets aside a portion of the vacant land supply in order to accommodate future streets for undeveloped land inside the current Metro UGB. This assumption is calculated on a per tax lot basis:

- Tax lots under 3/8 acre assume 0% set aside for future streets
- Tax lots between 3/8 acre and 1 acre assume a 10% set aside for future streets
- Tax lots greater than an acre assume an 18.5% set aside for future streets

The basis for these net street deduction ratios derive from previous research completed by the Data Resource Center and local jurisdictions during the 2002 UGR. The current street set aside rates are based on "skinny street" assumptions for a total of 4,900 acres.

Line 13) Future Schools: (No additional lands are set aside.) This is the assumption that sets aside a portion of the future vacant land supply in order to accommodate a growth projection for land needed to build future schools in the Metro UGB. The school land demand forecast is based on a student per capita basis:

- High school – 45 students per acre
- Middle school – 55 students per acre
- Elementary school – 70 students per acre

The basis for these net school deduction ratios are compared with national school building standards and interviews with building officials at Tigard-Tualatin School District, Beaverton School District and Portland Public School District. The sets of assumptions student-acre ratios were vetted and finalized through MTAC. [source: for further details on national school standards, please refer to DLCD safe-harbor subcommittee reports].

According to the 2007 RLIS vacant land supply inventory database, school districts in the Metro UGB already own 1,000 acres of vacant land. The regional forecast includes a projection of student population and enrollment for residents inside the Metro UGB. [source: A land need forecast for future schools is calculated from the regional forecast and student-acre ratios. This forecast identified no additional land need other than what schools presently own; thus no additional set aside is assumed except for the 1,000 acres that schools have already land banked.] Review of the 16 school districts' plans shows that some anticipate growth, others see declining enrollment, and none look out over the 20-year timeframe that this capacity analysis considers. School districts are able to take advantage of special provisions under the Major UGB Amendment process to petition the Metro Council to bring land into the UGB to meet school needs that are not anticipated in five-year UGB review cycle. The Major Amendment Process may be a more appropriate means of addressing specific school district needs than can be accommodated through UGB expansions.

The present UGR approach does not analyze need by individual school district or regional subareas, so there may be some school districts that have a future surplus and others having a future gap. The table on the following pages describes what was learned by reviewing school district plans.

Table 2. Review of school district growth plans

School district	Information source	Time horizon	Overall growth	Plan to accommodate growth
Beaverton	Report of the long range facilities planning committee, September 2005[1]	2004-2020 for the facilities plan, 2009-2010 to 2025-2026 for the PSU enrollment forecasts	Growth expected at roughly 2.0% per year	Use portable classrooms, consider adjusting attendance boundaries as appropriate, consider expanding existing schools where possible to meet capacity, consider building new schools when neighboring schools can't accommodate the need. Annual increases in student enrollment equate to the need for at least one elementary school or middle school each year. The District also needs to plan for a new comprehensive high school within the next few years. In the meantime, as growth exceeds available space at some schools, the District continues to use a combination of attendance boundary adjustments and portable classrooms to address overcrowding.
Centennial	Centennial Long range planning committee final report, May 2005	2005-2015	Growth is expected over this time period	Two primary schools and one middle school will be required. A new alternative school should be built to accommodate 200 students and provide appropriate space and equipment for secondary level classes. Within the next 10-20 years the district will need: • Two elementary schools in Pleasant Valley area • One elementary in the Damascus/Boring area • One high school in the Damascus/Boring area
David Douglas	Facilities master plan from 2007-2012 and a report from the facilities and enrollment sutdy committee, March 2009	2007-2012	The district will serve an additional 1200 students by 2012, currently averaging 3 % per year	Identify land for future school sites, move classrooms to different school facilities, consider the use of modular classrooms, add capacity to existing schools, purchase or lease adjacent buildings to existing schools, cooperative agreements with other school districts to share facilities.
Forest Grove	Facilities task force report, April 2009, Enrollment projections	2008-2009 to 2012-2013	Yes	Replace existing elementary school, add additional classrooms to elementary schools.

[1] information on the website,http://www.beaverton.k12.or.us/home/departments/facilities/long-range-planning-and-development/, PSU population projections, November 2008

School district	Information source	Time horizon	Overall growth	Plan to accommodate growth
Gladstone	Average Daily Membership projections, 2009	through 2011-2012	The district is not experiencing growth-it is stagnant or losing kids	The district just completed upgrading and adding space where necessary to all school buildings. These facilities should be adequate for the next 15 to 20 years.
Hillsboro	Portland State University Enrollment forecasts, April 2006	2006-2015	Enrollment is projected to increase by: Elementary – 16%, Middle – 24%, High – 18%	The district has already done things to accommodate growth in the last two-three years including changing boundaries to accommodate the biggest school's areas. In recent years the school district has added four elementary schools and renovated an existing middle school to add extra capacity.
Lake Oswego	There is no formal facilities/growth plan		The district is experiencing flat or slightly declining enrollment	
North Clackamas				District is purchasing two tracts of land for new schools
Oregon City	Facilities Task Force Report, March 2008, PSU population forecasts, June 2009	Population projections look at 2009-2014 and Task Force Report looks out 10-20 years	While continued growth in the Oregon City area is expected, the timing of this growth is difficult to predict. According to PSU projection, from 2009-2014, K-12 enrollment is projected to decline by 1.5 %	The Task Force looked at different possibilities for future growth in enrollment through additional increments of 500 students. If this growth occurs, the task force recommends the following: adjust elementary school boundaries as needed, renovate old Main and use it for classrooms, alert community to the need for a new elementary school and second high school, renovate Jackson campus and use it to house students.
Parkrose		The district is not experiencing growth-it is stagnant or losing kids		

School district	Information source	Time horizon	Overall growth	Plan to accommodate growth
Portland Public Schools	The school district is working on a long range facilities plan called, 21st century schools, but it is not completed year	2005-2020	Enrollment is projected to level off from 2007 through 2011, but then is projected to start increasing again. In the long term, over the next 50 years, 30,000 additional students will be added to the district.	The school district is trying to figure this out as part of its current effort to develop its long range facilities plan.
Reynolds	Bond Measure Proposal, April 2008, Reynolds had planned to go out for a Bond measure June 2008, but didn't. The District needs far outweighed what the Board thought the public could or would pass.	2008-2013	Enrollment is expected to increase by: 7% (elementary), 4% (middle) and ½% (high).	Acquire new land for schools; replace Wilkes to add extra capacity for elementary school, construct east elementary, remodel Fairview; remodel middle school; remodel and expand Reynolds High School.
Riverdale	Website		Enrollment is currently growing	Renovate elementary school. The Grade School's capacity is 350 students with a current enrollment of 320 students. The High School, still a relatively new school, has grown its student body to the 200's, with a maximum of 300 students.
Sherwood	Sherwood District School Facilities Plan, 2008	From 2008 until 2015/2016, enrollment projections are from 2009-2020	Projected growth at 3% per year for the next fifteen years	In addition to building a new elementary and middle school and expanding the high school, the District purchased a number of portable classrooms now located at three elementary schools and at Sherwood Middle School. These portables have a capacity of 28 classrooms for future use. The district is also looking at ways to accommodate students with non-traditional classrooms like business locations or virtual settings.

School district	Information source	Time horizon	Overall growth	Plan to accommodate growth
Tigard-Tualatin	Tigard Tualatin School District Demographics Report, December 2008, Long Range Facilities Plan, December 2007	2009-2019	Enrollment is expected to increase by: 12% (elementary), 13% (middle) and 8% (high).	Pursue additional district owned facilities like Tigard-Tualatin school district admin center, Tigard-Tualatin school district bus yard, former elementary school-either use or sell these sites. Portable buildings, school expansions, boundary adjustments. Open a magnet school (Durham Center alternative school).
West-Linn/ Wilsonville	Long Range Facilities Plan, amended in 2005	20-year time horizon, 1996-2016	Total enrollment projected to increase by 27% over the 20-year time period	As enrollment exceeds capacity, the District constructs one or more facilities to increase capacity. Two new elementary schools and one new middle school are projected to be needed over the 20-year planning timeframe.

Line 14) Future Parks: (Based on SDC fees.) This is an assumption which sets aside a portion of vacant land supply in order to accommodate a growth projection for future neighborhood and community parks in the Metro UGB. The future park land demand forecast is based on an estimate of existing system development charges (SDC) which local jurisdictions levy on local residents. The land estimate for future parks is based on how much land SDC fees are likely able to purchase in the next 20 year period. This assumption is based on information provided by MTAC members and review of local SDC regulations to forecast future park acquisitions. MPAC endorsed this assumption for the 2002 UGR. [source: 2002 UGR assumption for new park acquisitions]

To inform the analysis in this report, current park SDC rates were inventoried for each city in the region. (Information may be found in Appendix 6.) Most of the local governments that levied parks SDCs in 2002 have increased their rates. In addition, two cities, King City and Rivergrove, have started levying parks SDCs since 2002. Also, a few local governments are currently employing a system whereby different fees are levied in different locations.

The 2002 urban growth report estimated that 1,100 acres of vacant land inside the UGB would be used for future parks. Like other possible approaches to estimating future park acreage inside the UGB, this SDC approach has its limitations and should be taken as a reasonable estimate rather than a precise accounting. Due to these limitations (summarized below), the updated inventory of park SDC rates does not provide a compelling reason to change this assumption:

Table 3. 2009 Park System Development Charges in the Portland metropolitan region

Jurisdiction	Single Family Residential	Multi-family Residential	Manufactured	Accessory dwelling unit	Single room occupancy	Average Multi-family and other
Beaverton	$6,888	$5,510	$2,521			$4,973
Cornelius	$2,143	$2,143	$2,143			
Durham	$1,320	$990				
Fairview	$1,252					
Forest Grove	$3,000	$3,000				
Gladstone	$-	$-				
Gresham:						
Gresham City	$3,837	$3,837				
Pleasant valley	$8,137	$8,137				
Springwater	$9,039	$9,039				
Happy Valley:						
zone 2	$6,760	$5,842				
zone 3	$6,075	$5,842				
Sunnyside village	$4,779	$4,425				
Hillsboro	$4,083	$4,083				
Johnson City	$-	$-				
King City	$1,664	$1,664				
Lake Oswego	$10,715	$5,959				

Jurisdiction	Single Family Residential	Multi-family Residential	Manufactured	Accessory dwelling unit	Single room occupancy	Average Multi-family and other
Maywood Park	$-	$-				
Milwaukie	$3,985	$3,608				
Oregon City	$3,422	$2,707	$2763			$2,964
Portland (central city)	$4,076	$2,621	$3,967	$2,297	$2,344	$3,061
Portland (non-central city)	$3,986	$2,616	$3,712	$2,172	$1,801	$2,857
Rivergrove	$500	$500				
Sherwood	$7,205	$5,407	$7,717			
Tigard	$5,370	$4,316	$4,257			$4,287
Troutdale	$7,137	$7,137				
Tualatin	$4,530	$4,530				
West Linn	$8,376	$5,923				
Wood Village	$-	$-				
Wilsonville	$4,602	$3,535	$2,962	$1,726		$3,206
Clackamas Co						
zone 2	$6,760	$5,842				
zone 3	$6,075	$5,290				
zone 3a	$4,779	$4,425				
Multnomah Co	$-	$-				
Washington Co	$6,888	$5,510				

Line 15) New Urban Areas: This is a new line added to the 2009 Residential Urban Growth Report. The purpose of this line item is to recognize that new urban areas which were amended to the Metro UGB have yet to receive urban zoning densities – zoning still retains rural residential zoning densities or other rural designation. Including new urban areas through the conventional land density calculation and assuming rural densities would provide an inaccurate assessment of future residential capacity of new urban areas. A more accurate means of forecasting residential capacity for the new urban areas is to rely on the initial concept plan density assumptions.

The future capacity of new urban areas is not lost, but is added back in line 24. Please see line 24a thru line 24o for individual capacity assumptions for the new urban areas.

Related: see explanation for line 25.

Line 16) Gross-to-Net total (Net Vacant Buildable Acres - NVBA): An internal UGR calculation step which is a subtotal amount that is the net vacant buildable acres inside the Metro UGB (less new urban areas) after subtracting for line items 8 thru 15.

Line 17 a-d) Detailed NVBA by Type: Line 17 verifies the subtotal shown on line 16. Lines 17 a-d show details of line 16 categorized by general zoning class in the amount of vacant buildable acres. The buildable acres in line 17b and 17c (part) will carry over to the Employment UGR. Lines 17a (part), 17c

(part) and 17d (all) carry into line 18 and line 19 for calculation of residential capacity (see below for additional details).

Also carrying over the employment UGR is the capacity found implicit in government owned land. The acreage amount totals up to an additional 3,200 gross buildable acres.

Line 18) Maximum Housing Capacity from SFR and MFR Zones: Maximum residential dwelling unit capacity is calculated from local zoning and comp plan designations (i.e., comp plans applied only to Portland and Wilsonville) and based on the net vacant buildable acres shown on line 17a (part), 17b (all), and 17c (part).

Dwelling unit density assumptions from various forms of net vacant buildable acres by type:

Capacity from Line 17a) Only half (50%) of the vacant acreage zoned for mixed use residential development (i.e., MUR) is assumed available for residential capacity. The remaining half is assumed not to be used for residential development owing to horizontal mixed use development in designated mixed use districts. Maximum densities vary from 8.9 DU/net acre up to 350 DU/net acre. Amounts vary based on vacant land in each mixed use zoning class. The residential capacity in mixed use residential districts is reported separately on line 19 and amounts to estimated capacity of 29,100 dwelling units.

Capacity from Line 17b) All 6,400 acres of residential land in line 17b are calculated into residential capacity and shown in total on line 18. This residential capacity is based on maximum zoning (or comp plan) density per local zoning ordinances as of the 3rd quarter 2008 RLIS database. Zoning capacity and densities vary for SFR1 (1 unit per acre) thru SFR16 (16 units per acre) and MFR1 (13.3 units per acre) thru MFR 7 (53.5 units per acre). [source: Metro Standardized Regional Zone Classification System (RLIS: zoneclass)]

Capacity from Line 17c) Farm and Forest designated land in UGB (not in new urban areas) = 10 units per net acre [source: 2002 UGR]. 65% of RRFU designated land is assumed to go towards future residential capacity. The rest will go towards employment uses. This assumption is based on a cross tabulation of vacant RRFU land and 2040 design types. 65% of RRFU vacant land is designated in design types that accommodate residential development. This residential capacity is reported in line 18 and the capacity amounts to approximately 17,300 dwelling unit.

Capacity from Line 17d) No residential capacity assumed on industrial, commercial, and mixed use employment (MUE) areas / zoning. (MUE zoning is defined as mix of commercial and industrial; not to be confused with MUR zoning that is a mix of commercial and residential – typically office/retail and multifamily development)

Based on the RLIS vacant land inventory, UGR gross to net reductions and zoning density assumptions, the maximum residential dwelling unit capacity derived from residential vacant land produces about 46,300 dwelling units. Average DU density from line 18 is about 7 units per net acre, which averages in RRFU, SFR and MFR vacant land and zoning assumptions.

Table 4. Summary Dwelling Unit Capacity from environmentally unconstrained vacant land:

RRFU	17,300 units	10 units per net acre
Single Family (SFR)	28,200 units	5 units per net acre
Multifamily (MFR)	18,100 units	26.5 units per net acre
SUBTOTAL (line 18)	63,600 units	7.9 units per net acre
Mixed Use Res. (line 19)	29,100 units	28.5 units per acre
TOTAL	92,700 units	10.8 units per net acre

Line 18a) High-Density MFR feasibility factor: Market feasibility is derived from a discrete MetroScope scenario. This factor is a capacity discount for high density multifamily (MFR7, MUR8 to MUR10) product that is forecasted not likely to fully develop in the course of the next 20 year growth horizon. This housing product is a non-performing capacity asset that cannot be utilized by the market because its zoning is far ahead of projected market demand. [source: MetroScope]

In the "high" supply capacity scenario assumption, the supply deduction of high density multifamily (and mixed use residential) housing units from the supply is removed. In order to achieve this assumption, it is assumed that policy actions implemented today will help close the gap between the demand for living in high rise apartments and the construction costs of high density development. In order for this outcome to materialize, MetroScope scenarios indicate that achievable rents necessarily must significantly rise in order to help close the gap between the supply and demand for this segment of housing product.

Line 19) MUR Zoned Capacity: Mixed use residential density and capacity are calculated from zoning (or comp plans) and reported on this line. Mixed use districts recognize vertical and horizontal forms of mixed use. There is evidence that mixed development to date include both forms of mixed use development. There is very little regionally representative data to base how much horizontal mixed use is actually occurring. Nevertheless, in order to recognize that horizontal mixed use does and will occur in the future, we assume a 50% ratio of the two forms of mixed use development. The result for purposes of calculating capacity in line 19 is to halve the vacant land capacity for future residential development. [source: UGR 2009 assumption]

The estimated residential unit capacity from 500 (derived from 1,000 acres X 50% MUR ratio = 500 acres) acres of MUR zoned vacant land represents 29,100 dwelling units. The average DU per acre is approximately 28.5 units per net acre.

The total dwelling unit capacity and density from unconstrained vacant land totals a maximum yield of 92,700 units for a DU/acre of approximately 10.8 units per net acre.

Line 20) Underbuild (physical development constraints): The underbuild is based on physical constraints that make practical development up to 100 percent of maximum zoned density to be impractical. Capacity lost to single family residential underbuild assumes a 5 percent loss from maximum capacity as calculated from the single family DU capacity embedded in the calculation of line 18. The 5

percent rate is an assumption synthesized from oral communication provided by MTAC members. [source: oral statements from MTAC members]

Line 21a) Title 3 Capacity "add back": Title 3 protects the water quality of the region by delineating development setback rules that prohibit development along streams, rivers, floodways and flood prone areas. This setback varies depending upon conditions along the waterway, such as steep slopes. The Title 3 "no build buffers" are defined by maps maintained by the Data Resource Center RLIS database.

Capacity for 1 dwelling unit is assumed for each tax lot wholly inside the Title 3 buffer and zoned for future residential development. This line adds back minimal capacity resulting from subtracting environmental (ENV) land from line 6.

Precedent from prior UGR studies determines this allowance on the assumption that land owners have the ability to exercise the right to build 1 dwelling unit on land that governments have designated for protection of an environmental resource. [source: 2002 UGR assumptions]

Line 21b) Title 13 Capacity "add back": Implementation of Title 13 differs significantly from Title 3 in that Title 13 is implemented as a voluntary set back requirement. Land owners may comply with Title 13 by mitigating the impact future development may have on the environment.

Delineation of exact Title 13 environmental areas for this UGR is based on individual analysis and tabulation of local ordinance and implementation of Metro's Title 13 code. Local jurisdictions that have adopted Title 13 code language have been precisely mapped into the tabulation. For local jurisdictions that have not yet adopted Title 13 code language into city ordinances, the environmental delineation is based on Metro's modeling of Title 13 implementation.

This line adds back 80% of the residential capacity from Title 13 that was deducted in line 6. Please note that line 6 combines Title 3 and 13 ENV as one deduction, but the more detailed GIS data distinguishes which tax lots are in (or intersect) Title 3 and which ones are in (or intersect) Title 13. For purposes of calculating the capacity added back for Title 13 delineated vacant land, the residential capacity is based on local zoning less 20% capacity to account for mitigation efforts. [source: local jurisdiction ordinances and information]

Line 22) Platted SFR "add back": The count of tax lots under 3/8 of an acre are tabulated and recorded on line 23. This line corresponds to the "add back" in dwelling units associated with the net acre deduction in line 9. [source: Actual RLIS measurement]

Line 23) Residential Refill Demand: Residential refill is the combination of expected amount of future redevelopment and infill (it is not the available capacity). It is a "demand" estimate. It is predicted estimate of what we anticipate will be the number of future dwelling units that will be accommodated on land that the RLIS database considers as developed land in the year 2007. A refill rate is derived from a discrete MetroScope scenario. This rate is then multiplied against future housing unit demand to arrive at a projection of residential refill. This refill is a forecast.

The amount of refill fluctuates between a low and high demand housing forecast. In this preliminary draft residential UGR, the refill rate may vary depending upon demand assumptions. Forecasting a future refill rate is part art and part science. Taking into consideration past refill rates, shifts in housing preferences, scenario results and the stated objectives of the region's citizens, it is estimated that current policy direction and investment trends will produce an average refill rate of approximately 33 percent through the year 2030 (shown in line 4).

Line 23a) Upper range of possible refill: This is redevelopment and infill that could materialize above what the refill rate based on current investment policies and trends would assume as possible refill capacity. Scenario tests with alternative land use capacity and growth forecast assumptions indicate the future refill rate could top 40%. We assume that this may be a realistic top-end of the refill rate range. This is a "high" capacity residential supply assumption. [source: MetroScope Scenarios (2008)] This tranche represents uncertainty in the supply capacity for dwelling units inside the existing UGB. In fact, it is more likely that the size and steepness of this tranche will be less. The table and chart represent what it is estimated to be the likely high-end of the refill range supply.

Line 23b) Potential Units from Subsidized Residential Refill: This represents potential redevelopment and infill IF local governments take additional actions today to bolster residential demand and supply in designated 2040 centers and corridors. This is a "high" capacity residential supply assumption that requires policy action in order to realize any capacity towards the UGR. At this point, the estimate of this subsidized refill amount is highly speculative and should not be counted as actual supply that the region can count on in order to meet future housing demands. The assumptions involved include investments in all of the regional and town centers in the region.

Line 24) Estimated Capacity from New Urban Areas: This is a subtotal of lines 24a to 24o.

Line 24 a-o) New Urban Area Capacity Assumptions: These group of line items detail the theoretical buildout capacity assumed for individual new urban area addition to the Metro UGB during previous periodic reviews. [source: Various Concept Plans]

Line 25) New Urban Area market feasibility factor: New urban areas are not expected to yield full development in the next 20 years due to infeasible market conditions, lack of infrastructure and/or financing ability to render urban development densities to occur. Market feasibility is derived from a discrete MetroScope scenario.

Line 26) Dwelling Capacity / Supply: Total Dwelling Unit Capacity tallied from lines 18 to 24

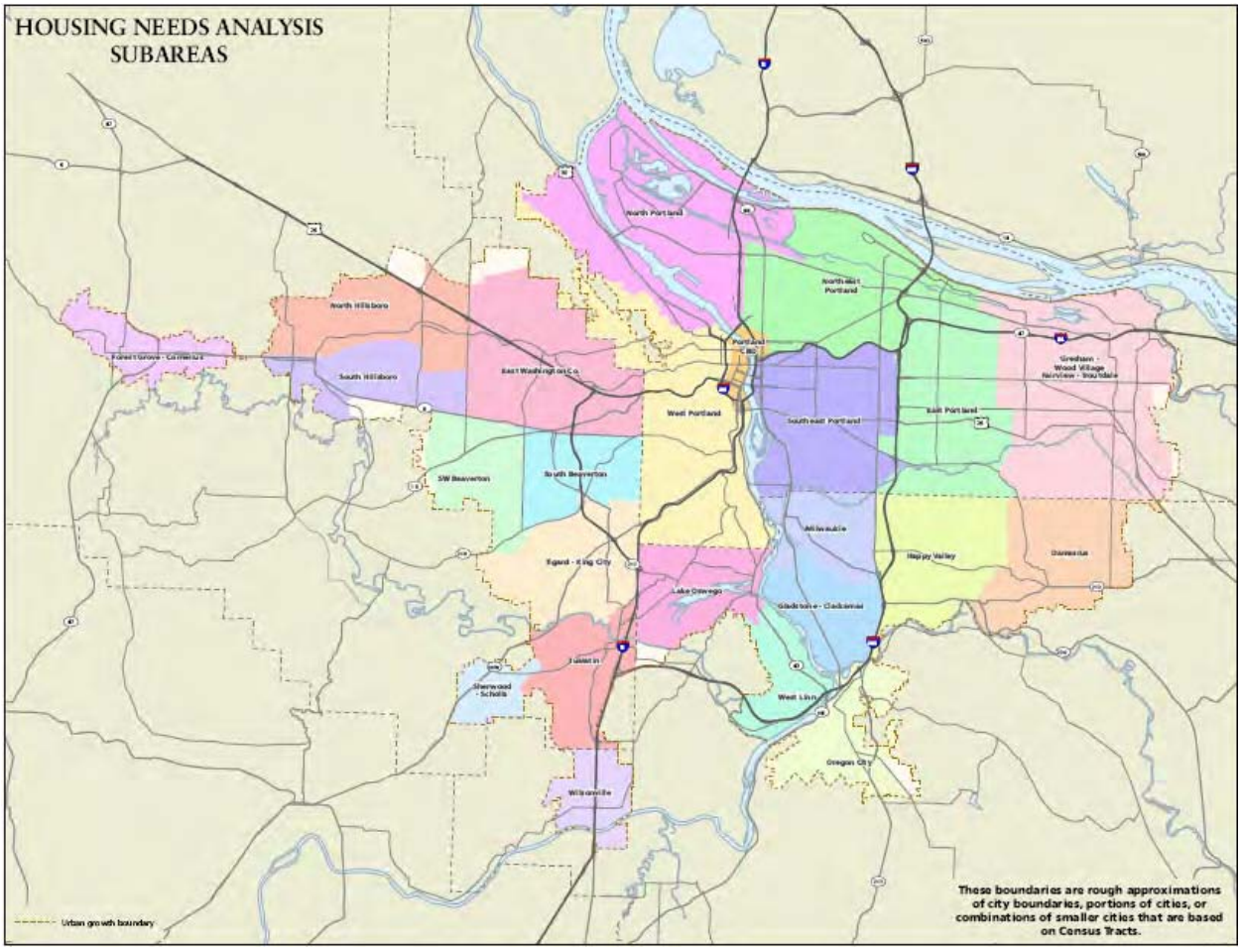
Line 27) Residential Gap Assessment: Deficit (or surplus) housing supply

Appendix 7: Portland metropolitan area housing choice forecasts; subarea profiles

Purpose

Historically, most residents of this region have been able to choose from a variety of housing types that match their preferences and budgets. However, there is work to be done to ensure that future generations have the same range of choices and that those choices support the region's vision of creating vibrant and walkable communities, protecting air and water quality, and reducing greenhouse gas emissions.

The following profiles describe forecasted housing dynamics for the 24 subareas pictured in the map below. Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.



These profile sheets are intended to describe the total number of households, unique housing mix, incomes, and housing and transportation expenses forecasted for subareas in the Portland metropolitan

region (within the Metro urban growth boundary (UGB)). Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends, but assume two different amounts of population growth for the 7-county area by the year 2030 (low and high growth).

The results of these scenarios should not be taken as foregone conclusions. Different assumptions would produce different results. Changes in policies and investments can change the outcomes for the region's communities.

Relationship of this analysis to the urban growth report

The scenario assumptions and results described in this analysis inform the urban growth report, but do not constitute the urban growth report. The urban growth report is an analysis of residential demand and capacity, while scenarios provide information about the possible performance of the region's residential capacity in light of forecasted demand. Performance is measured as housing mix, density, cost and affordability. If residential development of a particular type and tenure (rent/own) is reported as a scenario forecast, capacity for that household type is implicitly available. In this sense, scenarios do not identify a capacity gap. That determination is left to the urban growth report.

Three additional reasons that the results of these scenarios will differ somewhat from numbers reported in the urban growth report are:

Capture rate: The urban growth report assumes that 61.8 percent of future residential growth in the 7-county area will occur in the Metro UGB. This 61.8 percent capture rate is based on historic data. This UGR capture rate helps to establish the amount of residential demand (through the year 2030) that must be accommodated in the Metro UGB. Scenarios, on the other hand, produce a capture rate as an output of the scenario (i.e. it is not an assumption fed into the model). Consequently, the household numbers reported as scenario results, while similar, are not the same as the household demand numbers used in the urban growth report.

Refill rate: As with the capture rate, the urban growth report assumes a future refill rate. Scenarios, on the other hand, produce a refill rate as an output. Consequently scenario results will again differ somewhat from numbers used in the urban growth report's capacity analysis.

Timeframe: Scenario results are reported for the 2005 to 2030 timeframe. The UGR analysis covers the 2010 to 2030 timeframe. As a consequence, the results are somewhat different.

Household types

The MetroScope scenario model uses 400 types of households[1] that are determined by household size, income, household age and whether children are present. To make analysis and presentation feasible, the 400 types have been simplified to eight household types.

These eight household types are ranked roughly commensurate with income (income generally increases from household type one to household type eight). Differences in household characteristics translate into different choices of housing types and locations and transportation modes, as well as level of cost burden.

Household type	Characteristics
1	These are some of the lowest-income households. Among renters, these are exclusively single-person households—primarily the elderly. Owners have a more even age and household size distribution.
2	These households can be of any age, but their income is among the lowest. These households are primarily childless.
3	With a bit more income than household type two, these households are primarily in the 25 to 44 age bracket, mostly without children, although about a third of homeowners have children.
4	With a broad age distribution and approaching middle income, these households are usually childless, especially among renters.
5	These households are larger and wealthier. The majority of homeowners have children.
6	With more income than household type five. Almost half of these households are between 25 to 44 years of age. Although the majority do not have children, two- and three-person households are most common.
7	Mostly without children, these households include very high-income couples, especially among owners.
8	Most of the homeowners in this household type have children. They are high wage earners.

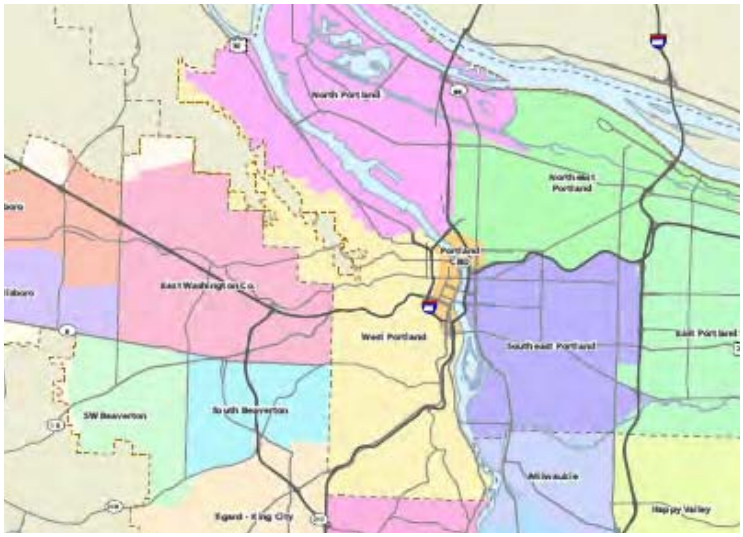
Housing and transportation costs

Traditionally, housing affordability analyses look at the cost of the residence itself without regard for transportation costs. In reality, people weigh a variety of factors when choosing where to live. One such factor is transportation costs. In many cases, highly desirable locations have high housing costs, but very low transportation costs (because of their central location and access to multiple modes of transportation), while other locations have lower housing costs, but very high transportation costs (because they are distant from jobs and services). In order to illustrate the tradeoffs of different housing choices, this analysis includes information about housing and transportation costs.

[1] Household refers to the residents, not the residence

Portland central business district, map reference number 11

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

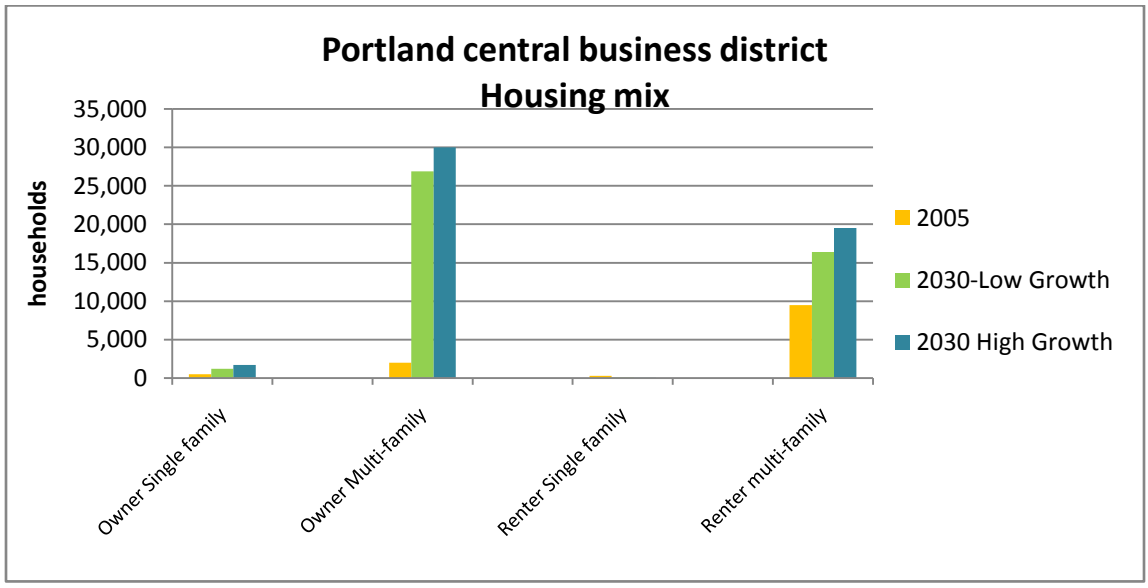
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Forecast summary:

The Portland central business district subarea includes areas such as downtown Portland, the Pearl District, the university district, old town/Chinatown, the Lloyd district, and Goose Hollow. A substantial share of the metro region's commercial core and jobs are centered in this area (around 15 percent) and fewer residential developments. The 2005 average income for households in this subarea is lower than the average income for the region, but it is projected to increase slightly by 2030. This subarea is characterized by high rates of owner occupied and rental multi-family households (16 and 77 percent, respectively), which are much higher than the average regional shares of multi-family households. This distinction is expected to increase in both growth scenarios for 2030.

While the average household spends a smaller share of its annual household income on transportation costs compared to households in other subareas, the share of annual income projected to be spent on housing in this subarea is much higher than other subareas, ranging from 66 to 84 percent in the 2030 growth scenarios. This is because this is a location that is likely to remain in high demand. Though the number of cost-burdened households is forecasted to increase, the share of households that is cost-burdened is forecasted to decrease from 53 percent in 2005 to 29 to 33 percent in 2030. This is higher than the forecasted regional average for cost-burdened households (projected to be between 17 to 23 percent of all households in the region by 2030).

Portland central business district	2005	2030 (low-growth)	2030 (high growth)
Total households	12,300	44,500	51,100
Subarea share of region's households	2%	6%	6%
Total jobs	123,900	174,400	208,800
Subarea share of region's jobs	15%	17%	15%
Percent of all households by household type			
Household type 1	30%	20%	21%
Household type 2	11%	9%	9%
Household type 3	12%	12%	13%
Household type 4	5%	11%	11%
Household type 5	11%	16%	16%
Household type 6	11%	18%	12%
Household type 7	9%	10%	25%
Household type 8	11%	3%	3%
Average annual cost information for all households			
Transportation costs	$2,300	$2,400	$2,400
Housing costs	$16,000	$33,300	$43,600
income	$38,000	$50,800	$51,900
% Income spent on transportation	6%	5%	5%
% Income spent on housing	42%	66%	84%
% Income spent on housing and transportation	48%	70%	89%
Average annual cost information for all renters			
Transportation costs	$1,900	$1,700	$1,800
Housing costs	$10,300	$11,900	$14,400
Income	$26,100	$24,000	$24,300
% Income spent on transportation	7%	7%	7%
% Income spent on housing	40%	50%	59%
% Income spent on housing and transportation	47%	57%	66%
Number of cost burdened households	6,400	12,900	16,800
Share of households that are cost burdened	53%	29%	33%



Northeast Portland, Map Reference Number 12

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.

Forecast summary:

This subarea includes the Northeast sections of Portland, roughly bounded by I-84, I-205, I-5 and the Columbia River. The average household income for this subarea is slightly lower than the average income level for the region. The shares of single family owner occupied households (62 percent) and rental multi-family households (21 percent) are fairly comparable to the regional average rate for these household types (60 and 29 percent respectively). The shares of these household types are projected to remain consistent with the regional average rates in 2030. The share of annual income spent on transportation is relatively low in 2005 and 2030 and is projected to decrease over time, but the share of annual income spent of housing is projected to increase slightly. Both the number and share of households that are cost-burdened are projected to increase by the year 2030, but the shares of households that are cost-burdened are forecasted to be similar to the average regional rates.

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

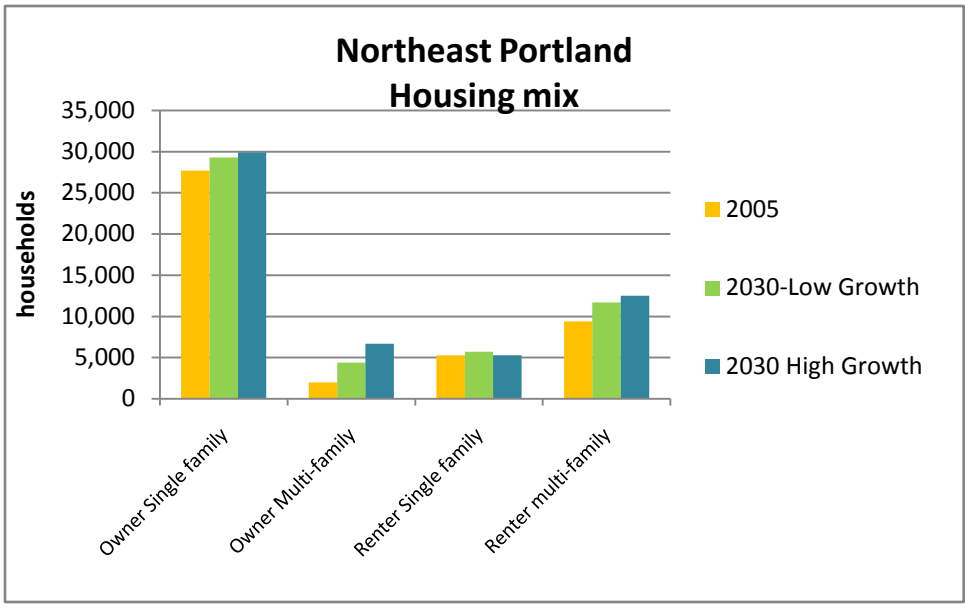
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

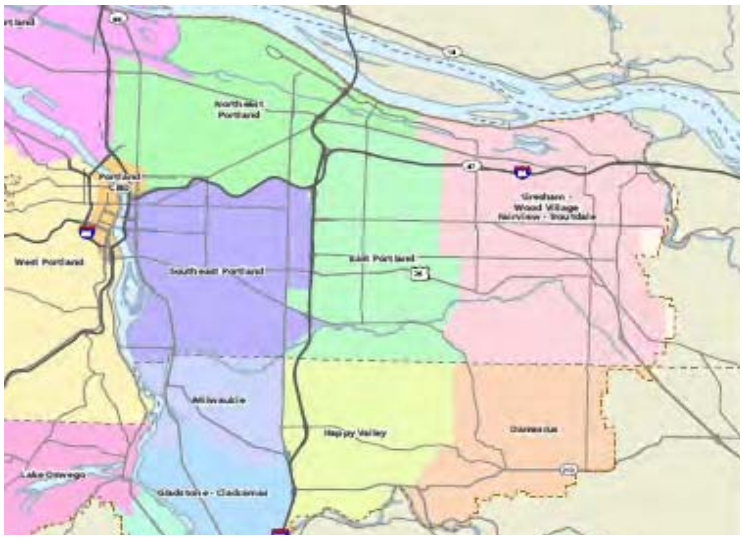
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Northeast Portland	2005	2030 (low-growth)	2030 (high growth)
Total households	44,400	51,100	54,300
Subarea share of region's households	8%	6%	6%
Total jobs	66,000	68,300	88,800
Subarea share of region's jobs	8%	7%	6%
Percent of all households by household type			
Household type 1	18%	19%	20%
Household type 2	16%	15%	15%
Household type 3	13%	13%	14%
Household type 4	12%	12%	12%
Household type 5	10%	9%	9%
Household type 6	10%	10%	8%
Household type 7	12%	13%	15%
Household type 8	9%	8%	8%
Average annual cost information for all households			
Transportation costs	$3,800	$3,700	$3,600
Housing costs	$21,600	$23,000	$28,100
Income	$50,000	$50,000	$49,900
% Income spent on transportation	8%	7%	7%
% Income spent on Housing	43%	46%	56%
% income spent on housing and transportation	51%	53%	63%
Average annual cost information for all renters			
Transportation costs	$2,500	$2,500	$2,500
Housing costs	$8,800	$9,900	$11,600
Income	$28,200	$28,200	$28,500
% Income spent on transportation	9%	9%	9%
% Income spent on Housing	31%	35%	40%
% Income spent on housing and transportation	40%	44%	49%
Number of cost burdened households	7,400	9,300	13,100
Share of households that are cost burdened	17%	18%	24%



Subarea: Gresham-Wood Village-Fairview-Troutdale, Map Reference Number: 13

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes Gresham, Wood Village, Troutdale and Fairview. The average income for this area is lower than the regional average for both 2005 and 2030. In 2005, the shares of single family owner occupied (61 percent) and multi-family rental houses (31 percent), which make up the majority of households in this subarea, are fairly comparable to regional average shares for these household types (60 percent and 29 percent respectively). While the shares of these household types remain consistent with the regional average rates in the two growth scenarios for 2030, the rate of owner occupied multi-family households is projected to increase from one percent in 2005 to five to ten percent in 2030. The share of annual income spent on transportation and housing remains consistent with the average for the region.

While the number and share of households that are cost-burdened remains relatively constant from 2005 to the low-growth 2030 scenario, the high-growth 2030 scenario projects increases in both these categories. These increases would make the share of households that is cost-burdened in this subarea higher than the forecasted regional rate (regional average rate is projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

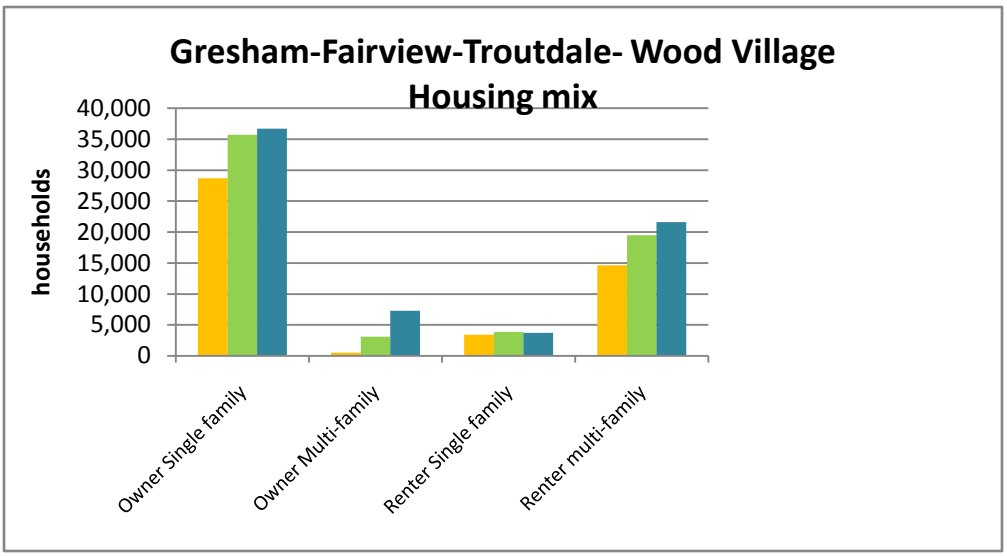
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

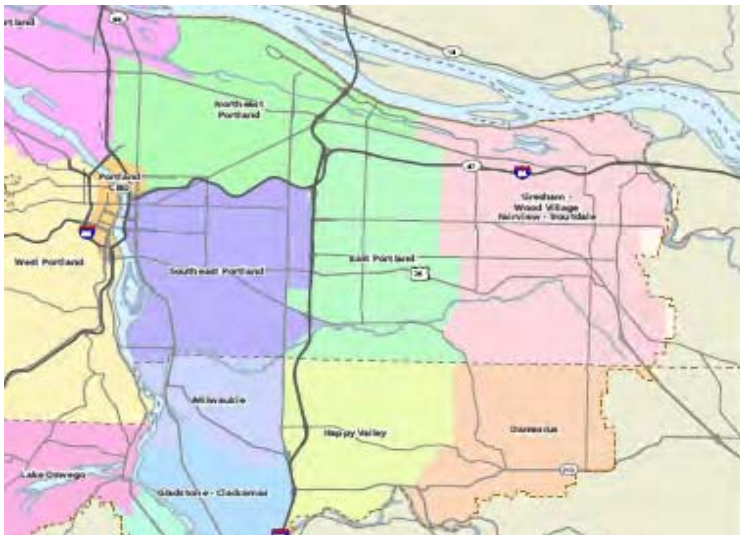
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Gresham-Wood Village-Fairview-Troutdale	2005	2030 (low-growth)	2030 (high growth)
Total households	47,300	62,300	69,300
Subarea share of region's households	8%	8%	8%
Total jobs	47,700	58,000	92,100
Subarea share of region's jobs	6%	6%	7%
Percent of all households by household type			
Household type 1	9.3%	10%	11%
Household type 2	14%	13%	14%
Household type 3	16%	15%	16%
Household type 4	17%	17%	16%
Household type 5	17%	16%	16%
Household type 6	12%	13%	12%
Household type 7	10%	8%	9%
Household type 8	6%	8%	7%
Average annual cost information for all households			
Transportation costs	$6,200	$6,200	$6,100
Housing costs	$15,800	$19,700	$23,200
Income	$49,500	$49,700	$49,100
% Income spent on transportation	13%	13%	12%
% Income spent on housing	32%	40%	47%
% Income spent on housing and transportation	45%	43%	59%
Average annual cost information for all renters			
Transportation costs	$4,400	$4,500	$4,500
Housing costs	$8,000	$9,200	$10,700
Income	$30,900	$32,100	$32,800
% Income spent on transportation	14%	14%	14%
% Income spent on housing	26%	29%	33%
% Income spent on housing and transportation	40%	43%	47%
Number of cost burdened households	7,400	9,800	17,900
Share of households that are cost burdened	16%	16%	26%



Subarea: East Portland, Map Reference Number: 14

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes Portland neighborhoods between I-205 and the border of Gresham. The average income for this subarea is lower than the regional average and is projected to decrease slightly relative to the regional average by 2030. The shares of owner occupied single family (62 percent) and rental multi-family rental households (26 percent) in 2005 are very comparable to regional average rates for these housing types (60 percent and 29 percent respectively). While the shares of these household types remain consistent with the regional average rates in 2030, the rate of owner occupied multi-family households is projected to increase from two percent in 2005 to seven to thirteen percent in 2030. The share of annual income spent on transportation and housing remains consistent with the average for the region. The number and share of households that are cost-burdened are projected to increase only slightly between 2005 and 2030 and remain similar to the forecasted regional rate (regional average is projected to be between 17 to 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

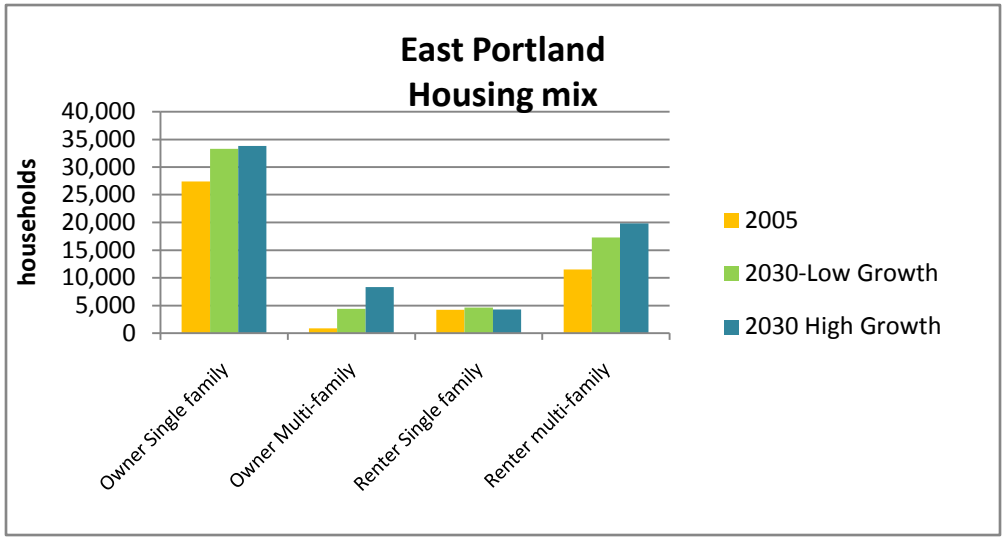
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

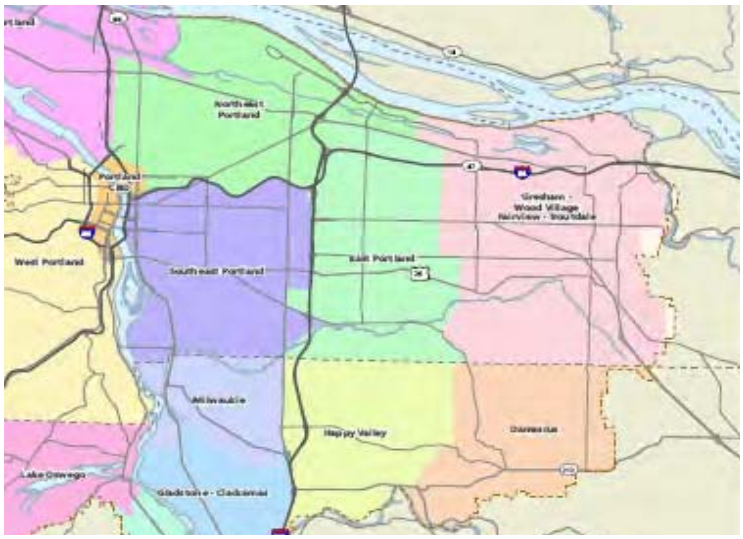
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

East Portland	2005	2030 (low-growth)	2030 (high growth)
Total households	44,000	59,700	66,200
Subarea share of region's households	8%	8%	8%
Total jobs	23,000	29,600	42,200
Subarea share of region's jobs	3%	3%	3%
Percent of all households by household type			
Household type 1	15.2%	18%	19%
Household type 2	20%	20%	20%
Household type 3	18%	17%	18%
Household type 4	15%	16%	15%
Household type 5	12%	11%	11%
Household type 6	9%	8%	7%
Household type 7	7%	7%	7%
Household type 8	5%	4%	4%
Average annual cost information for all households			
Transportation costs	$4,500	$4,300	$4,200
Housing costs	$14,500	$16,700	$19,200
Income	$42,400	$40,100	$39,400
% Income spent on transportation	11%	11%	11%
% Income spent on housing	34%	42%	49%
% Income spent on housing and transportation	45%	53%	60%
Average annual cost information for all renters			
Transportation costs	$3,400	$3,400	$3,400
Housing costs	$7,900	$8,900	$10,200
Income	$29,100	$29,200	$29,600
% Income spent on transportation	12%	12%	11%
% Income spent on housing	27%	30%	34%
% Income spent on housing and transportation	39%	42%	45%
Number of cost burdened households	7,800	11,000	12,400
Share of households that are cost burdened	18%	18%	19%



Subarea: Southeast Portland, Map Reference Number: 15

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes Portland neighborhoods south of I-84, east of the Willamette River, and west of I-205. The Southeast Portland subarea, home to the highest share of the region's households (12 percent) relative to other subareas in the region, is projected to see a slight decrease in its share of the region's households from 2005 to 2030. The average income for this subarea, lower than the regional average, is projected to remain constant through 2030. Southeast Portland's share of owner occupied single family households in 2005 (53 percent) is slightly lower than the regional average rate for that housing type (60 percent) and is projected to remain constant by 2030. In 2005, the shares of rental single family and rental multi-family households (13 and 30 percent respectively) were higher than the regional averages for these housing types (9 percent and 29 percent respectively) and are projected to decrease slightly by 2030.

While the share of annual income spent on transportation costs relative is fairly low relative to other subareas (eight percent of income), the number and share households that are cost-burdened are projected to increase slightly from 2005 to 2030. The share of households that are considered cost-burdened, at roughly 25 percent in 2005 and upwards of 30 percent in 2030, is higher than the forecasted average range for the region (the regional average rate is projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

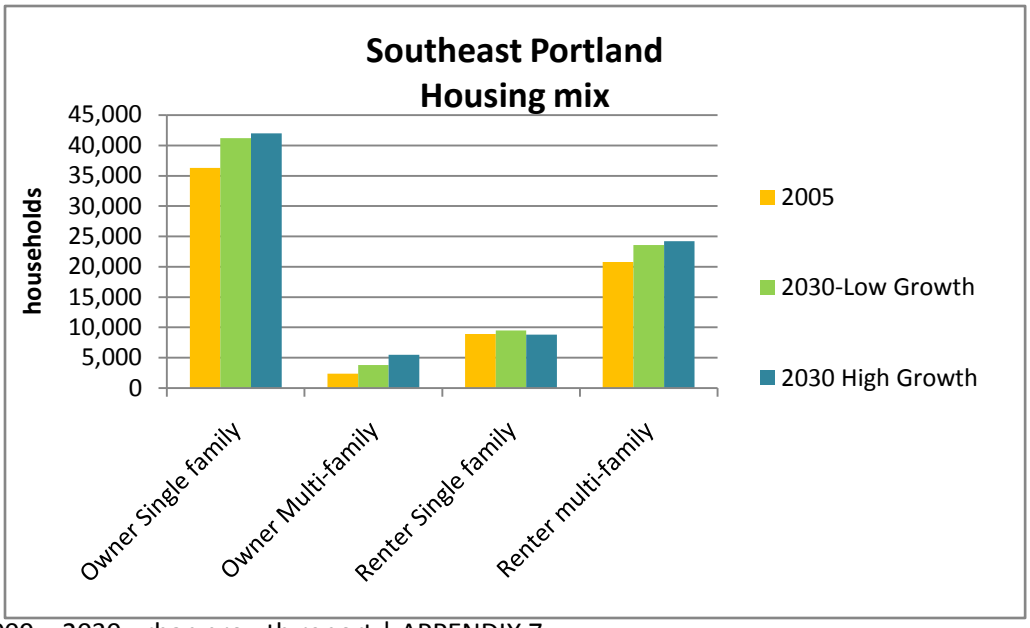
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

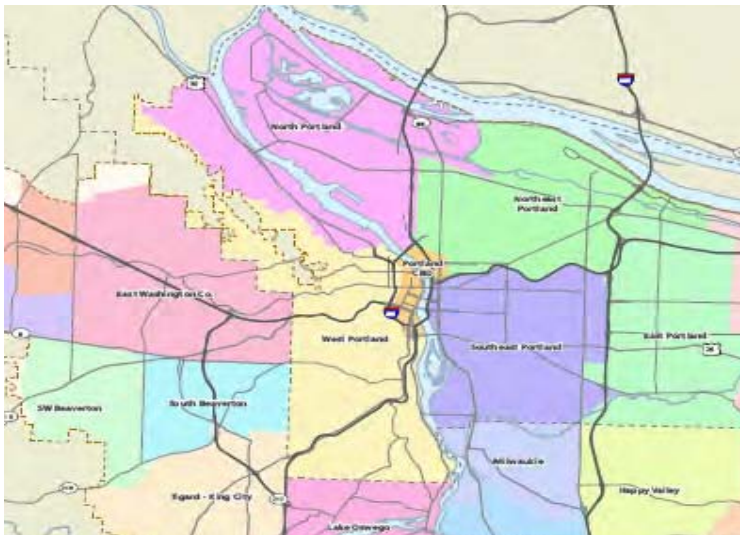
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Southeast Portland	2005	2030 (low-growth)	2030 (high growth)
Total households	68,300	78,100	80,500
Subarea share of region's households	12%	10%	9%
Total jobs	70,400	87,300	105,900
Subarea share of region's jobs	8%	8%	8%
Percent of all households by household type			
Household type 1	17%	18%	18%
Household type 2	19%	17%	17%
Household type 3	15%	16%	16%
Household type 4	13%	14%	14%
Household type 5	11%	10%	10%
Household type 6	9%	9%	8%
Household type 7	10%	11%	12%
Household type 8	7%	6%	6%
Average annual cost information for all households			
Transportation costs	$3,500	$3,500	$3,500
Housing costs	$18,400	$20,500	$25,100
Income	$43,900	$43,900	44,000
% Income spent on transportation	8%	8%	8%
% Income spent on housing	42%	47%	57%
% Income spent on housing and transportation	50%	55%	65%
Average annual cost information for all renters			
Transportation costs	$2,400	$2,400	$2,400
Housing costs	$8,400	$9,500	$11,100
Income	$26,400	$26,000	$26,400
% Income spent on transportation	9%	9%	9%
% Income spent on housing	32%	37%	42%
% Income spent on housing and transportation	41%	46%	51%
Number of cost burdened households	16,200	18,500	26,100
Share of households that are cost burdened	24%	24%	32%



Subarea: West Portland, Map Reference Number: 16

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes Portland neighborhoods west of the Willamette River (excluding Forest Park and the central business district). The average income for this subarea is higher than the regional average income level. In 2005, the share of owner occupied single family households (51 percent)was lower than the regional average rate (60 percent), while the share of rental multi-family households (36 percent) was higher than the regional average rate for that household type (29 percent). The share of owner occupied single family households is projected to decrease to 41 percent in 2030 and the share of owner occupied multi-family households is projected to increase from six percent in 2005 to in 25 percent in 2030.

While the share of annual income spent on transportation is low compared to other subareas in the region, the share of income spent on housing in this subarea is projected to increase to a range of 57 to 74 percent by 2030. This is because this is a location that is likely to remain in high demand. In addition, the share of households considered cost-burdened, projected to increase from 24 percent in 2005 to 26 to 29 percent in 2030, is slightly higher than the forecasted regional average for cost-burdened households (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

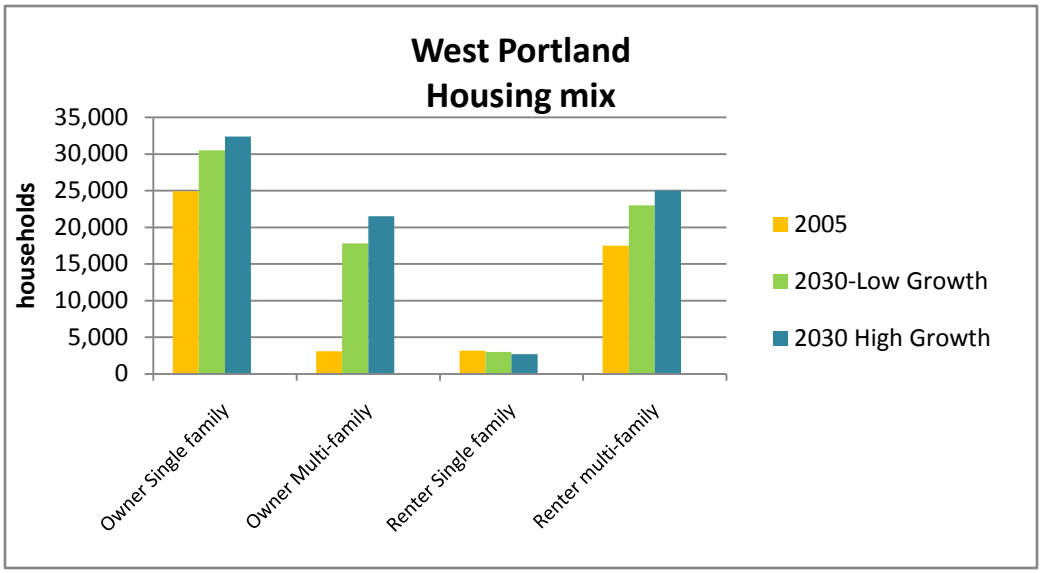
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

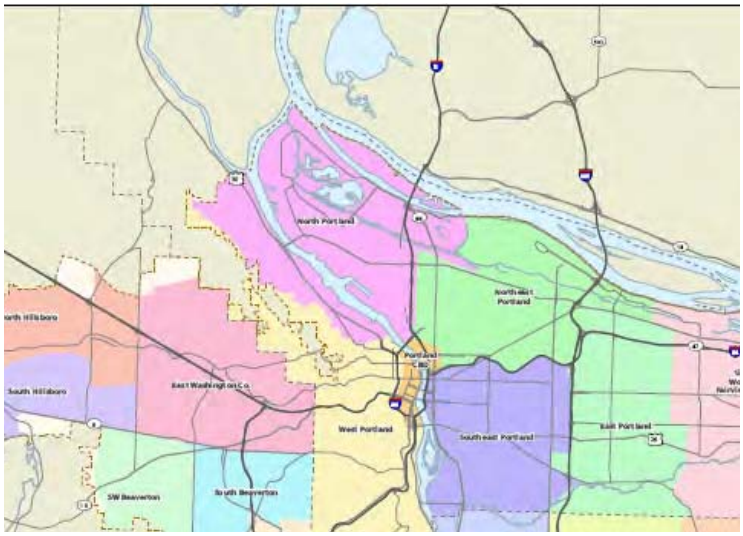
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

West Portland	2005	2030 (low-growth)	2030 (high growth)
Total households	48,800	74,200	81,500
Subarea share of region's households	9%	9%	9%
Total jobs	69,100	90,200	106,900
Subarea share of region's jobs	8%	9%	8%
Percent of all households by household type			
Household type 1	9%	10%	9%
Household type 2	11%	10%	9%
Household type 3	10%	11%	11%
Household type 4	9%	11%	10%
Household type 5	9%	8%	8%
Household type 6	11%	11%	8%
Household type 7	16%	17%	21%
Household type 8	26%	23%	23%
Average annual cost information for all households			
Transportation costs	$4,300	$4,100	$4,100
Housing costs	$31,900	$38,500	$52,100
income	$67,000	$67,800	$70,300
% Income spent on transportation	6%	6%	6%
% Income spent on housing	48%	57%	74%
% Income spent on housing and transportation	54%	63%	80%
Average annual cost information for all renters			
Transportation costs	$2,300	$2,200	$2,300
Housing costs	$10,600	412,300	$14,900
Income	$27,900	$27,900	$28,100
% Income spent on transportation	8%	8%	8%
% Income spent on housing	38%	44%	53%
% Income spent on housing and transportation	46%	52%	61%
Number of cost burdened households	11,700	19,100	23,800
Share of households that are cost burdened	24%	26%	29%



Subarea: North Portland, Map Reference Number: 17

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes Forest Park, neighborhoods in north Portland, and employment and industrial areas along the Willamette River and is home to a high share of the region's jobs. These scenarios indicate that the total number of jobs in this subarea is projected to increase by the year 2030. The average household income for residents of this subarea is significantly lower than the regional average income level. The shares of owner occupied and rental single family households in 2005 (63 percent and 15 percent respectively) are slightly higher than regional average rates for these housing types (60 percent and 9 percent respectively), but the share of owner occupied single family housing is projected to decrease to 53 to 49 percent in 2030. However, the shares of owner occupied and rental multi-family households are both projected to increase by 2030.

The share of annual income spent on housing and transportation is fairly consistent with the regional average. The number and share of households that are cost-burdened are projected to increase slightly by 2030 and remain fairly comparable to the forecasted regional average (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

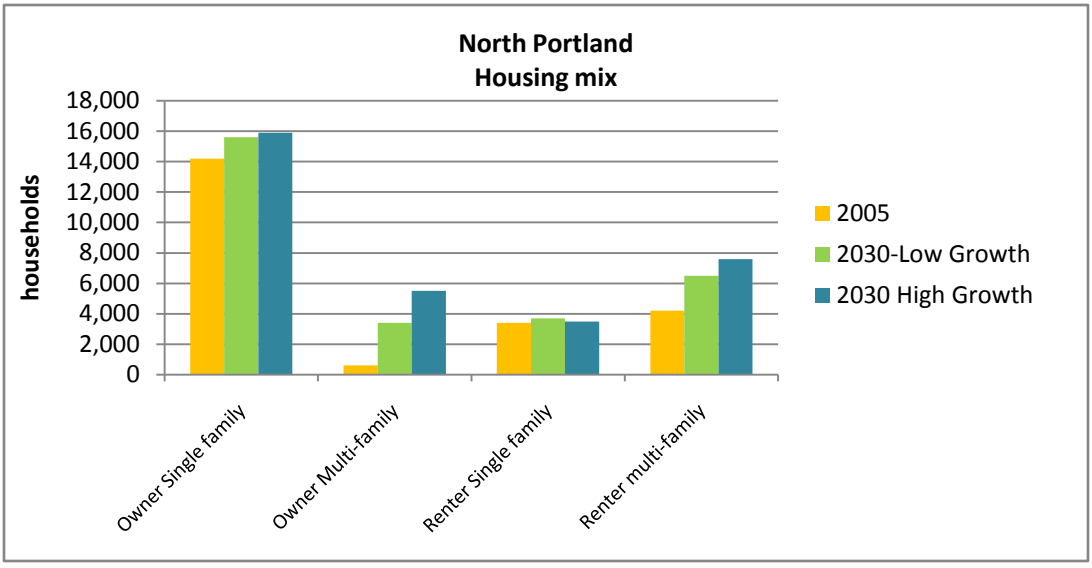
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

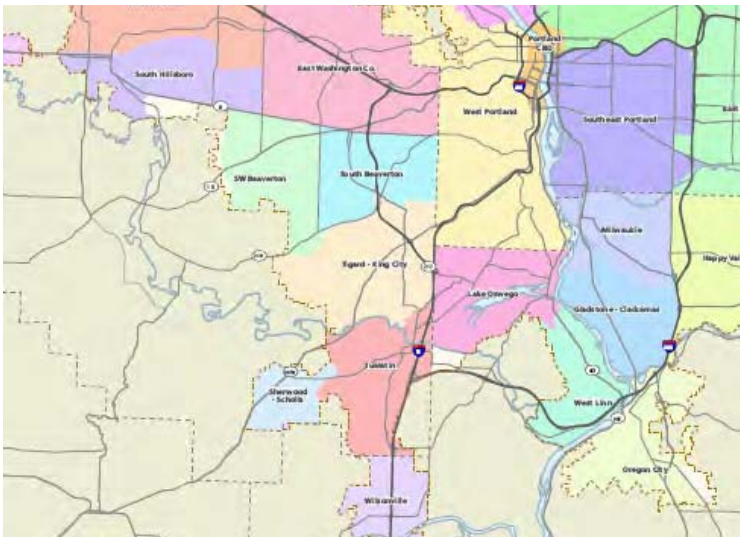
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

North Portland	2005	2030 (low-growth)	2030 (high growth)
Total households	22,400	29,200	32,500
Subarea share of region's households	4%	4%	4%
Total jobs	71,900	80,600	102,100
Subarea share of region's jobs	9%	8%	7%
Percent of all households by household type			
Household type 1	29%	32%	37%
Household type 2	22%	21%	21%
Household type 3	14%	13%	14%
Household type 4	9%	9%	9%
Household type 5	7%	6%	6%
Household type 6	7%	6%	6%
Household type 7	7%	7%	7%
Household type 8	6%	5%	5%
Average annual cost information for all households			
Transportation costs	$3,800	$3,600	$3,500
Housing costs	$14,000	$15,500	$17,800
Income	$37,100	$35,400	$34,800
% Income spent on transportation	10%	10%	10%
% Income spent on housing	38%	44%	51%
% Income spent on housing and transportation	48%	54%	61%
Average annual cost information for all renters			
Transportation costs	$3,000	$3,000	$3,000
Housing costs	$7,700	$8,700	$10,100
Income	$27,500	$28,200	$29,000
% Income spent on transportation	11%	10%	10%
% Income spent on housing	28%	31%	35%
% Income spent on housing and transportation	39%	41%	45%
Number of cost burdened households	4,000	5,700	6,600
Share of households that are cost burdened	18%	19%	20%



Subarea: Lake Oswego, Map Reference Number: 21

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea roughly approximates the boundaries of the City of Lake Oswego. The average income for residents of this subarea is much higher than the regional average, with only five percent of all households identified as cost burdened in 2005. The primary housing types in Lake Oswego are owner occupied single family and rental multi-family households. While the share of owner occupied single family households in Lake Oswego (68 percent) is higher than the regional average rate for this household type (60 percent), the share of rental multi-family households (20 percent) is slightly lower than the regional average rate (29 percent). There is relatively little household growth projected by the year 2030.

The share of annual income spent on transportation is slightly lower than rates for other subareas in the region, while the share of annual income that is spent on housing is comparable to other subareas in the region. While the share of households that are cost-burdened is projected to increase to 11 to 13 percent by 2030, the share of cost-burdened households is lower than the forecasted regional average rate (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

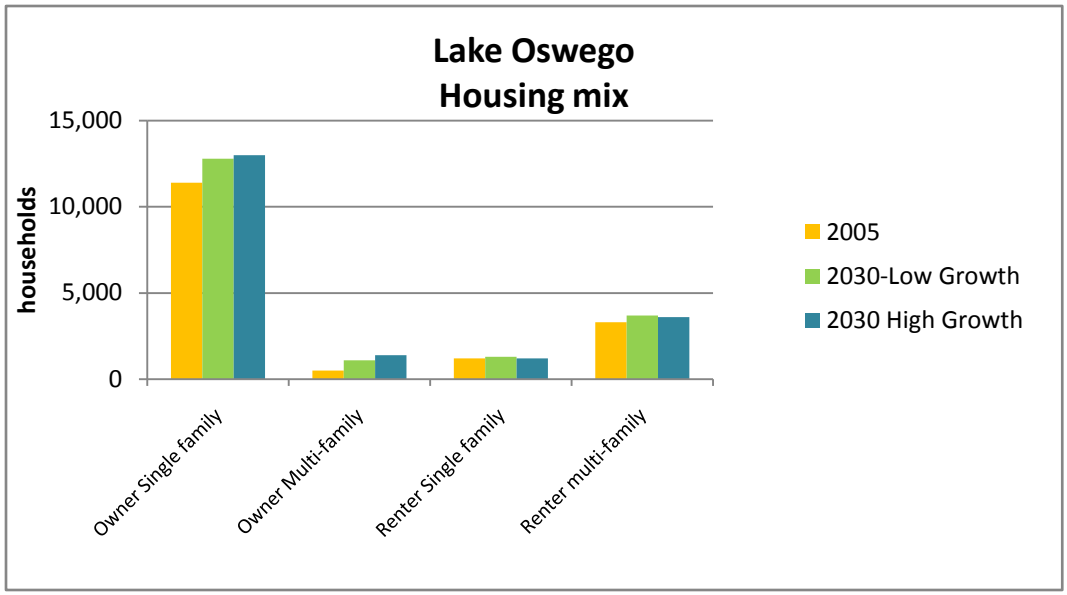
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Lake Oswego	2005	2030 (low-growth)	2030 (high growth)
Total households	16,400	18,900	19,200
Subarea share of region's households	3%	2%	2%
Total jobs	15,600	22,000	26,300
Subarea share of region's jobs	2%	2%	2%
Percent of all households by household type			
Household type 1	2%	2%	2%
Household type 2	3%	3%	3%
Household type 3	3%	3%	3%
Household type 4	6%	6%	6%
Household type 5	9%	9%	9%
Household type 6	14%	16%	13%
Household type 7	23%	22%	26%
Household type 8	41%	40%	38%
Average annual cost information for all households			
Transportation costs	$7,200	$7,200	$7,100
Housing costs	$35,100	$37,600	$47,900
Income	$89,000	$89,200	$90,000
% Income spent on transportation	8%	8%	8%
% Income spent on housing	39%	42%	53%
% Income spent on housing and transportation	47%	50%	61%
Average annual cost information for all renters			
Transportation costs	$4,900	$5,000	$5,000
Housing costs	$11,500	$13,500	$15,800
Income	$47,900	$48,600	$48,700
% Income spent on transportation	10%	10$	10%
% Income spent on housing	24%	28%	32%
% Income spent on housing and transportation	34%	38%	43%
Number of cost burdened households	900	2,000	2,500
Share of households that are cost burdened	5%	11%	13%



Subarea: Gladstone-Clackamas, Map Reference Number: 22

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.

Forecast summary:

This subarea includes the City of Gladstone and surrounding unincorporated areas of Clackamas County. In 2005, the average income level for residents of this subarea was less than the regional average, but is projected to increase slightly relative to the regional average by 2030. In 2005, the share of owner occupied single family households (71 percent), was higher than the average regional rate for this housing type (60 percent), but is projected to decrease slightly by the year 2030. The share of rental multi-family housing (20 percent in the year 2005), is slightly lower than the regional average rate for this housing type (29 percent), and is forecasted to remain fairly constant by 2030.

The shares of annual income spent on housing and transportation costs are fairly consistent with regional averages. The share of households that are cost-burdened is projected to increase from 13 percent in 2005 to 15 to 21 percent in 2030. Though this would represent an increase for this subarea, this rate is on the low end of the forecasted regional average (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

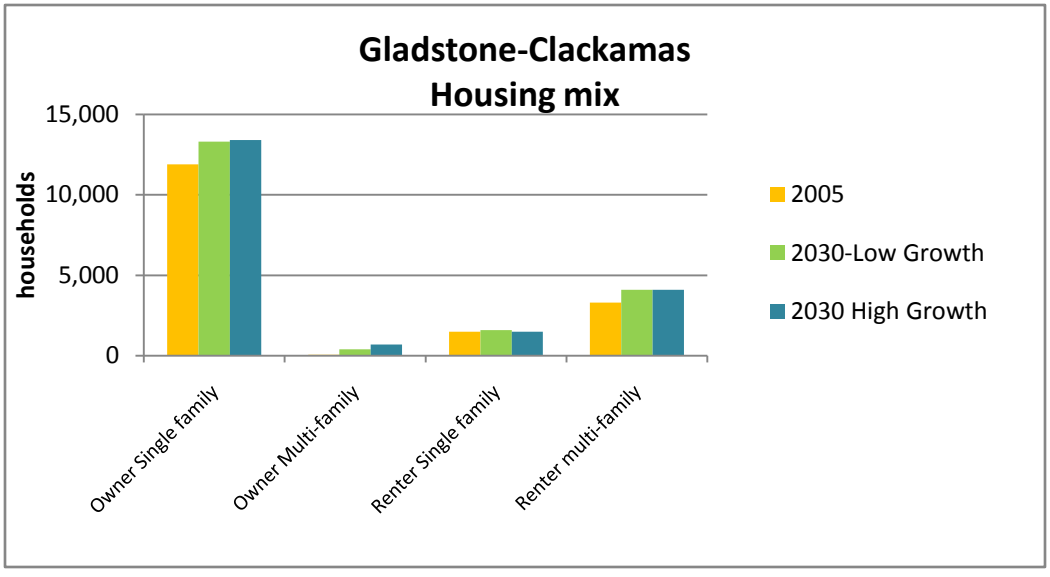
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Gladstone-Clackamas	2005	2030 (low-growth)	2030 (high growth)
Total households	16,800	19,400	19,700
Subarea share of region's households	3%	2%	2%
Total jobs	10,300	12,500	14,900
Subarea share of region's jobs	1%	1%	1%
Percent of all households by household type			
Household type 1	8%	11%	11%
Household type 2	13%	14%	14%
Household type 3	14%	16%	16%
Household type 4	17%	18%	18%
Household type 5	18%	16%	17%
Household type 6	14%	12%	10%
Household type 7	10%	8%	9%
Household type 8	7%	5%	5%
Average annual cost information for all households			
Transportation costs	$6,200	$6,000	$5,900
Housing costs	$17,100	$20,100	$24,100
Income	$54,400	$49,700	$49,400
% Income spent on transportation	11%	12%	12%
% Income spent on housing	31%	40%	49%
% Income spent on housing and transportation	43%	52%	61%
Average annual cost information for all renters			
Transportation costs	$4,400	$4,300	$4,400
Housing costs	$8,000	$8,900	$10,200
Income	$32,100	$30,600	$31,100
% Income spent on transportation	14%	14%	14%
% Income spent on housing	25%	29%	33%
% income spent on housing and transportation	39%	43%	47%
Number of cost burdened households	2,100	2,800	4,200
Share of households that are cost burdened	13%	15%	21%



Subarea: Milwaukie, Map Reference Number: 23

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.

Forecast summary:

This subarea includes the City of Milwaukie as well as unincorporated areas of Clackamas County. In 2005, the average income for residents of this subarea was lower than the regional average, but it is projected to increase by the year 2030 to be slightly higher than the regional average. In 2005, the shares of single family owner occupied (58 percent) and multi-family rental households (31 percent), the two primary housing types in this subarea, were fairly consistent with regional average rates for these housing types (60 percent and 29 percent respectively). The shares of single family owner occupied and multi-family rental households are forecasted to remain constant from 2005 to 2030.

The shares of annual income spent on housing and transportation are relatively consistent with regional averages. The share of cost-burdened households is projected to increase slightly from 18 percent 2005 to 19 percent 2030, but remains fairly comparable to the forecasted regional average rate (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

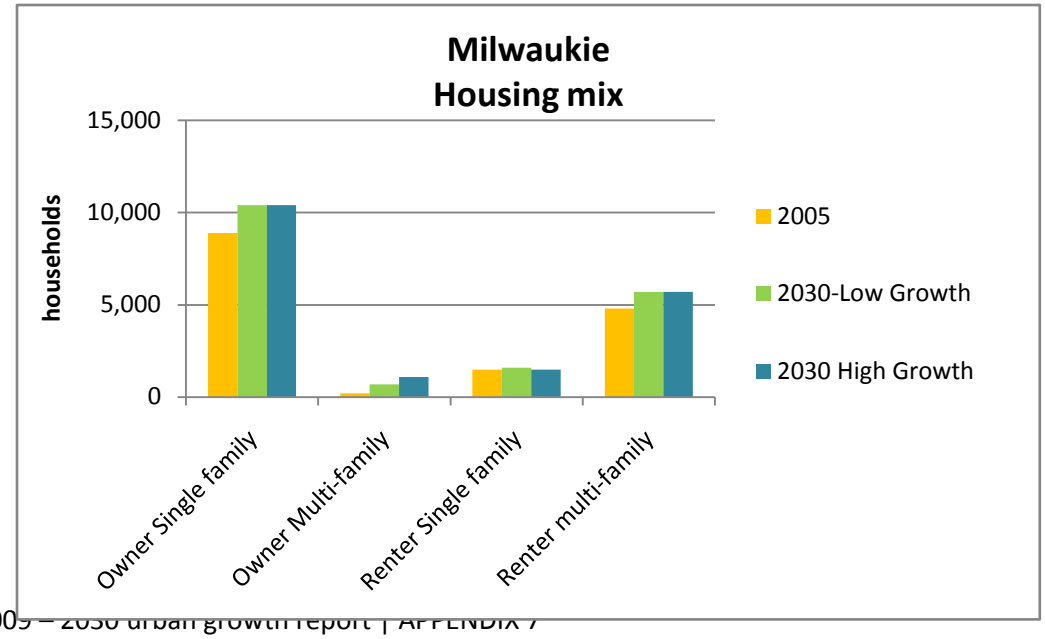
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

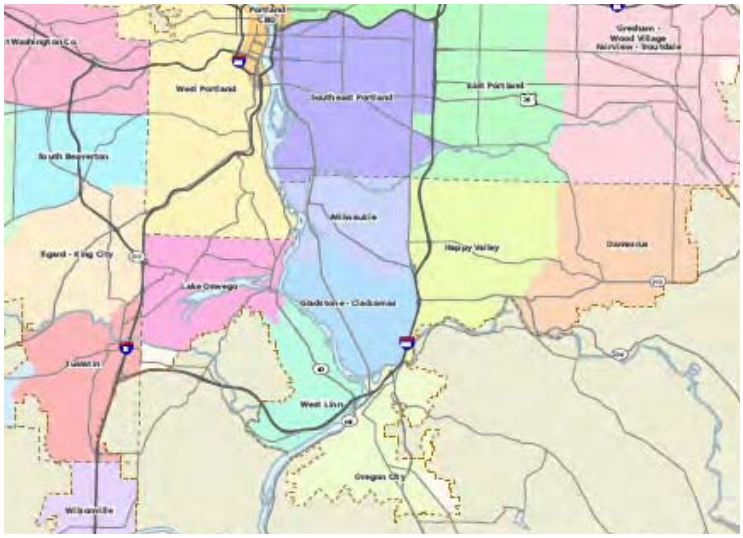
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Milwaukie	2005	2030 (low-growth)	2030 (high growth)
Total households	15,400	18,400	18,700
Subarea share of region's households	3%	2%	2%
Total jobs	22,200	24,100	29,700
Subarea share of region's jobs	3%	2%	2%
Percent of all households by household type			
Household type 1	13%	16%	16%
Household type 2	17%	17%	17%
Household type 3	17%	17%	18%
Household type 4	18%	19%	18%
Household type 5	14%	13%	13%
Household type 6	9%	8%	7%
Household type 7	7%	6%	7%
Household type 8	6%	4%	4%
Average annual cost information for all households			
Transportation costs	$4,700	$4,500	$4,500
Housing costs	$14,100	$16,500	$19,500
Income	$43,600	$40,500	$40,300
% Income spent on transportation	11%	11%	11%
% Income spent on housing	32%	41%	48%
% Income spent on housing and transportation	43%	52%	59%
Average annual cost information for all renters			
Transportation costs	$3,700	$3,600	$3,600
Housing costs	$7,900	$8,900	$10,100
Income	$30,700	$29,500	$29,700
% Income spent on transportation	12%	12%	12%
% Income spent on housing	26%	30%	34%
% Income spent on housing and transportation	38%	42%	46%
Number of cost burdened households	2,700	3,400	3,500
Share of households that are cost burdened	18%	19%	19%



Subarea: Happy Valley, Map Reference Number: 24

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes Happy Valley as well as unincorporated areas of Clackamas County. In 2005, the average income for residents of this subarea was higher than the regional average and is projected to increase slightly by the year 2030. The share of owner occupied single family households in Happy Valley (67 percent) is higher than the regional average rate for this housing type (60 percent), but is projected to decrease slightly by the year 2030. The shares of owner occupied multi-family and rental multi-family households are both projected to increase slightly by 2030, but are forecasted to remain consistent with or lower than the regional average rates for these housing types.

The share of annual income spent on housing and transportation is fairly consistent with other subareas across the region. The share of cost-burdened households is projected to increase slightly from 10 percent 2005 to 11 to 20 percent in 2030, but remains low compared to the forecasted regional rate (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

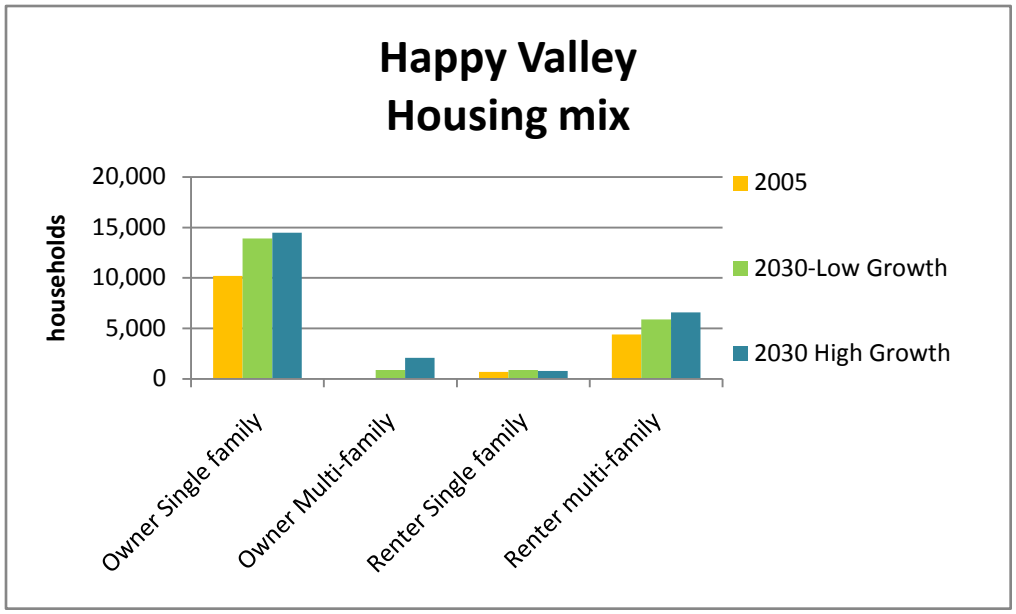
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Happy Valley	2005	2030 (low-growth)	2030 (high growth)
Total households	15,300	21,600	24,000
Subarea share of region's households	3%	3%	3%
Total jobs	32,300	36,100	50,400
Subarea share of region's jobs	4%	3%	4%
Percent of all households by household type			
Household type 1	4%	5%	6%
Household type 2	5%	5%	5%
Household type 3	8%	8%	9%
Household type 4	12%	13%	13%
Household type 5	16%	15%	15%
Household type 6	18%	19%	16%
Household type 7	17%	15%	17%
Household type 8	19%	20%	19%
Average annual cost information for all households			
Transportation costs	$7,100	$7,100	$6,900
Housing costs	$21,000	$26,900	$32,400
Income	$71,000	$70,100	$69,500
% Income spent on transportation	10%	10%	10%
% Income spent on housing	30%	38%	47%
% Income spent on housing and transportation	40%	48%	55%
Average annual cost information for all renters			
Transportation costs	$4,500	$4,600	$4,700
Housing costs	$8,500	$9,700	$11,200
Income	$33,500	$34,000	$35,300
% Income spent on transportation	14%	13%	13%
% Income spent on housing	25%	29%	32%
% Income spent on housing and transportation	39%	42%	45%
Number of cost burdened households	1,600	2,400	4,800
Share of households that are cost burdened	10%	11%	20%



Subarea: Damascus, Map Reference Number: 25

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.

Forecast summary:

This subarea includes the City of Damascus as well as scattered unincorporated areas of Clackamas County. As this area is newly developing, the subarea's share of the region's households and jobs is relatively low compared to other subareas, but is projected to grow by 2030. In 2005, the average income for residents of this subarea was higher than the regional average and is projected to increase proportionally relative to the regional average by the year 2030. With 92 percent of all households categorized as owner occupied single family in 2005, Damascus has a much higher rate of owner occupied single family households than the regional average rate for that housing type (60 percent). This share is projected to remain fairly constant from 2005 to 2030 as are the shares of other housing types. In 2005, the share of annual income spent on housing was 26 percent, lower than the regional average, but is projected to increase by the year 2030.

While the number and share of households that are cost-burdened are projected to increase in 2030, the share of households that are cost-burdened is still very small at 4 to 6 percent and is much lower than the forecasted regional average (projected to be between 17 and 23 percent of all the households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

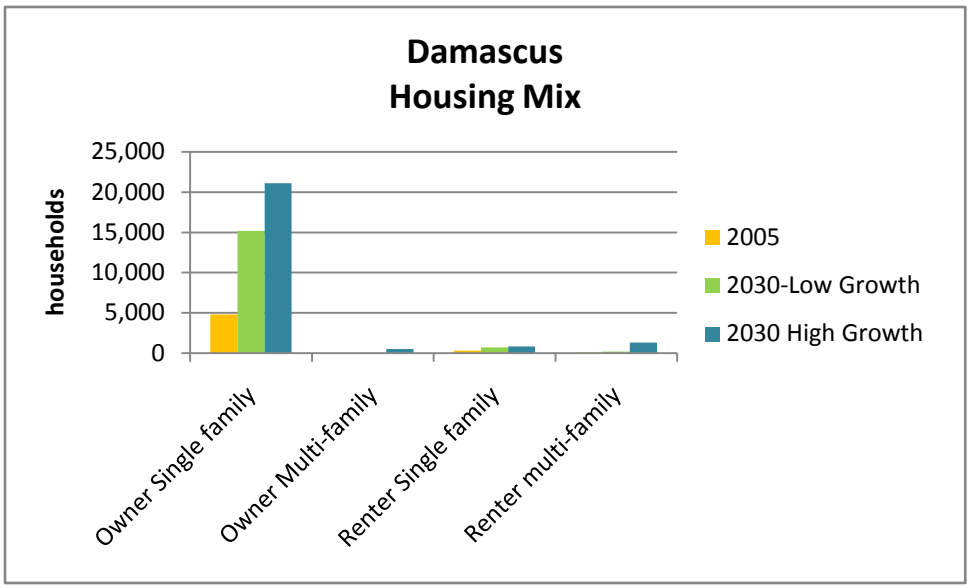
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

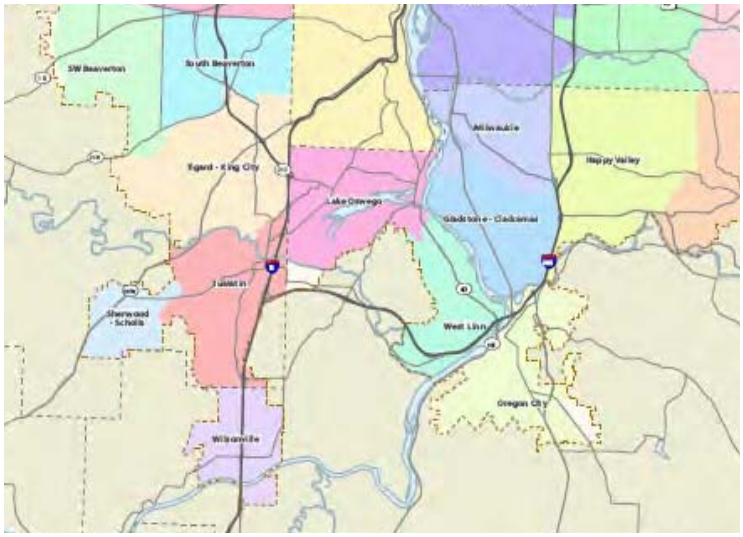
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Damascus	2005	2030 (low-growth)	2030 (high growth)
Total households	5,200	16,200	23,800
Subarea share of region's households	1%	2%	3%
Total jobs	3,300	4,100	10,600
Subarea share of region's jobs	0%	0%	1%
Percent of all households by household type			
Household type 1	4%	5%	6%
Household type 2	5%	4%	5%
Household type 3	3%	4%	4%
Household type 4	6%	6%	6%
Household type 5	12%	12%	13%
Household type 6	20%	23%	18%
Household type 7	26%	23%	27%
Household type 8	24%	24%	21%
Average annual cost information for all households			
Transportation costs	$10,800	$10,900	$10,600
Housing costs	$23,600	$34,900	$40,600
Income	$89,300	$88,000	$85,100
% Income spent on transportation	12%	12%	12%
% Income spent on housing	26%	40%	48%
% Income spent on housing and transportation	38%	52%	60%
Average annual cost information for all renters			
Transportation costs	$6,700	$7,000	$7,000
Housing costs	$8,200	$9,500	$9,900
Income	$36,400	$43,000	$41,400
% Income spent on transportation	18%	16%	17%
% Income spent on housing	23%	22%	24%
% Income spent on housing and transportation	41%	38%	41%
Number of cost burdened households	200	600	1,400
Share of households that are cost burdened	3%	4%	6%



Subarea: Oregon City, Map Reference Number: 26

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes the City of Oregon City as well as surrounding unincorporated areas of Clackamas County. In 2005, the average income for residents of this subarea was fairly consistent with the regional average in 2005, but is projected to slightly decrease from 2005 to 2030. While the share of single family owner occupied households in 2005 (71 percent) is higher than the regional average rate for that housing type (60 percent), it is projected to decrease slightly to 66 to 61 percent by the year 2030. The share of rental multi-family households in 2005 (21 percent), the other primary housing type in the subarea, was lower than the regional average rate (29 percent), but is projected to increase to 25 to 27 percent by 2030, which would make it consistent with the regional average rate.

The share of annual income spent on transportation costs (15 percent) is slightly higher than the regional average, while the share of annual income spent on housing is relatively similar to the regional average. The share of households that are considered cost-burdened is projected to nearly double from 11 percent in 2005 to 21 to 22 percent in 2030. However, this rate would be similar to the forecasted regional average rate for cost-burdened households (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

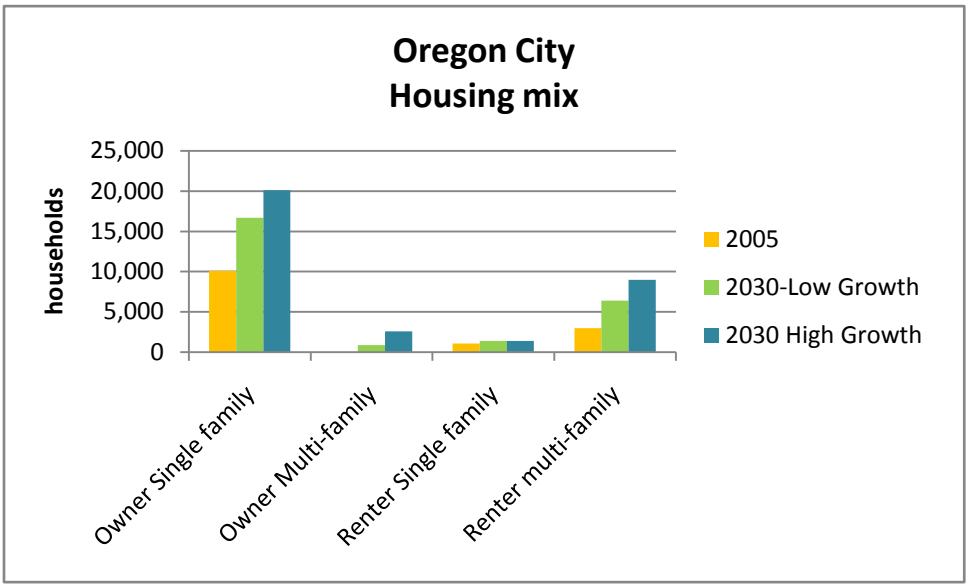
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

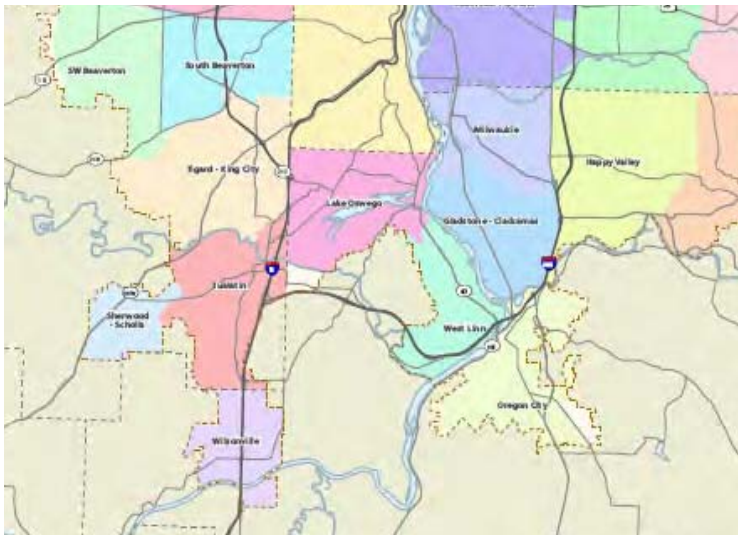
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Oregon City	2005	2030 (low-growth)	2030 (high growth)
Total households	14,300	25,300	33,100
Subarea share of region's households	3%	3%	4%
Total jobs	14,100	20,500	29,400
Subarea share of region's jobs	2%	2%	2%
Percent of all households by household type			
Household type 1	9%	11%	13%
Household type 2	11%	11%	12%
Household type 3	11%	11%	12%
Household type 4	15%	16%	15%
Household type 5	16%	15%	15%
Household type 6	16%	16%	13%
Household type 7	14%	13%	13%
Household type 8	9%	8%	7%
Average annual cost information for all households			
Transportation costs	$8,500	$8,300	$8,000
Housing costs	$17,200	$22,800	$26,400
Income	$58,700	$56,200	$54,500
% Income spent on transportation	15%	15%	15%
% Income spent on housing	29%	40%	48%
% Income spent on housing and transportation	44%	55%	63%
Average annual cost information for all renters			
Transportation costs	$6,200	$5,900	$5,700
Housing costs	$7,900	$9,200	$10,200
Income	$33,700	$32,500	$31,500
% Income spent on transportation	18%	18%	18%
% Income spent on housing	26%	28%	32%
% Income spent on housing and transportation	42%	46%	50%
Number of cost burdened households	1,600	5,300	7,100
Share of households that are cost burdened	11%	21%	22%



Subarea: West Linn, Map Reference Number: 27

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes the City of West Linn. It should also be noted that these scenarios assume future UGB expansions to the south of this subarea (based on the current state land hierarchy) and that some of the resulting new households and jobs are reported for this subarea. Those UGB expansions will not necessarily occur. In 2005, the average income for residents of this subarea was substantially higher than the regional average and is projected to increase by the year 2030. In 2005, the share of owner occupied single family households (80 percent) was much higher than the regional average (60 percent) and is projected to increase to 86 to 89 percent by 2030. There is little projected increase in the shares of other household types from 2005 to 2030.

The share of annual income spent on housing and transportation is fairly comparable to the regional average. However, the share of households that are cost-burdened in this area (five percent in 2005) is projected to remain relatively constant in 2030, much lower than the forecasted regional average rate (regional average is projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

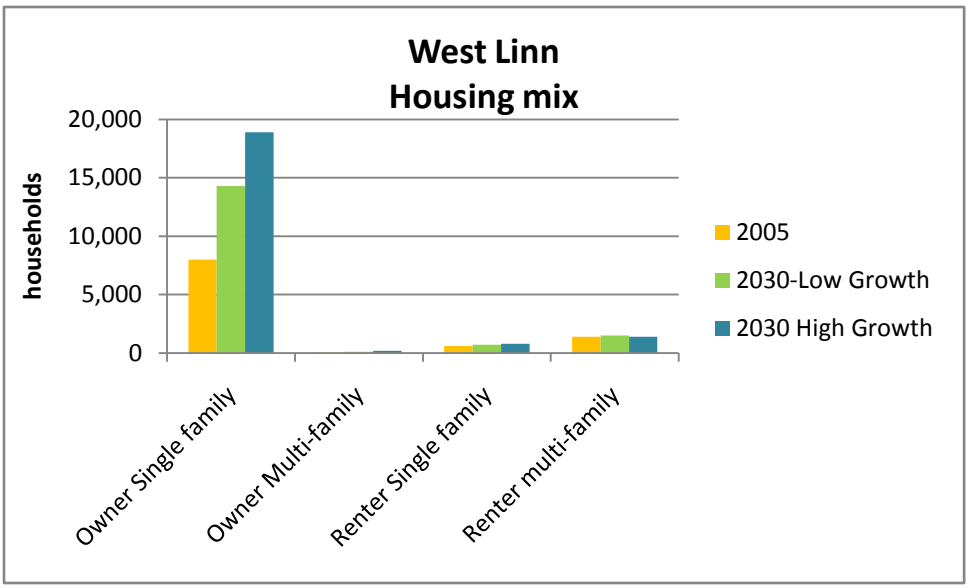
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

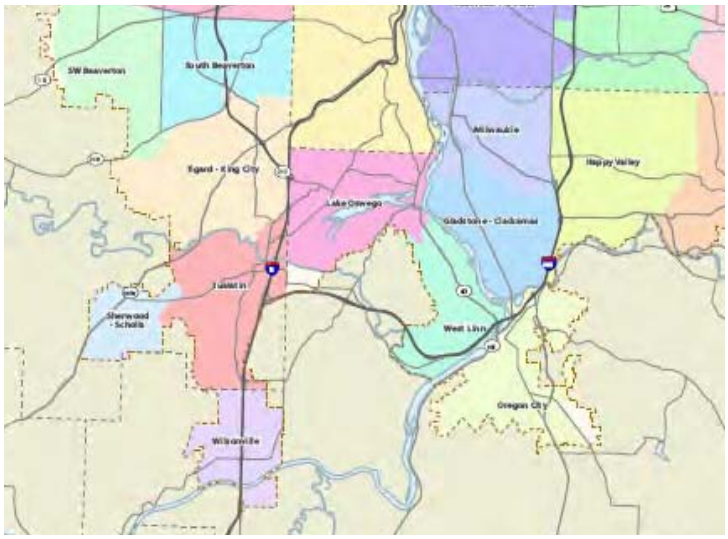
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

West Linn	2005	2030 (low-growth)	2030 (high growth)
Total households	10,000	16,600	21,200
Subarea share of region's households	2%	2%	2%
Total jobs	5,400	6,200	9,400
Subarea share of the region's jobs	1%	1%	1%
Percent of all households by household type			
Household type 1	2%	1%	1%
Household type 2	4%	2%	2%
Household type 3	4%	3%	3%
Household type 4	8%	6%	5%
Household type 5	8%	7%	7%
Household type 6	13%	15%	12%
Household type 7	20%	19%	25%
Household type 8	40%	47%	48%
Average cost information for all households			
Transportation costs	$8,900	$9,400	$9,400
Housing costs	$29,500	$38,200	$49,100
Income	$90,300	$97,900	$100,800
% Income spent on transportation	10%	10%	9%
% Income spent on housing	33%	39%	49%
% Income spent on housing and transportation	43%	49%	58%
Average cost information for all renters			
Transportation costs	$6,300	$6,700	$6,700
Housing costs	$10,700	$13,200	$15,300
Income	$51,000	$55,400	$55,600
% Income spent on transportation	12%	12%	12%
% Income spent on housing	21%	24%	28%
% Income spent on housing and transportation	33%	36%	40%
Number of cost burdened households	517	908	875
Share of households that are cost burdened	5%	6%	4%



Subarea: Wilsonville, Map Reference Number: 28

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes the City of Wilsonville as well as scattered unincorporated areas of Clackamas County. For the years 2005 and 2030, average incomes for residents of this subarea are slightly higher than the regional averages. In 2005, the share of single family owner occupied households (58 percent) was slightly lower than the regional average rate for this housing type (60 percent), but is projected to increase by 2030. In 2005, the share of rental multi-family households (34 percent), the other significant housing type in Wilsonville, was higher than the regional average rate for this housing type (29 percent).

The share of annual income spent on transportation costs (14 percent) is slightly high relative to the regional average, while the share of annual income spent on housing is fairly consistent with the regional average. The share of households that are cost-burdened is projected to increase from 17 percent in 2005 to 20 to 24 percent in 2030, which is consistent with the regional rate for households that are cost-burdened (the regional average is projected to be between 17 and 23 percent of all households by the year 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

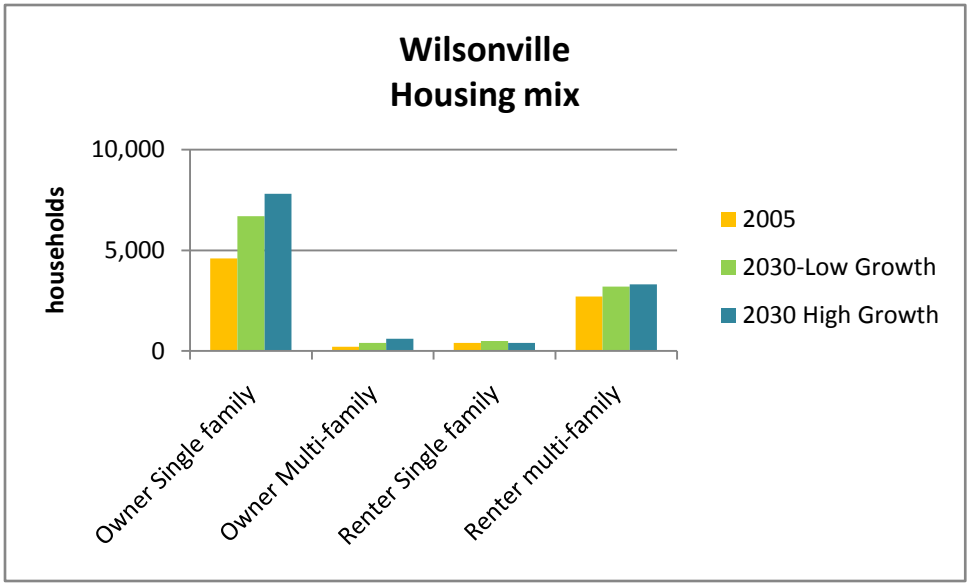
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

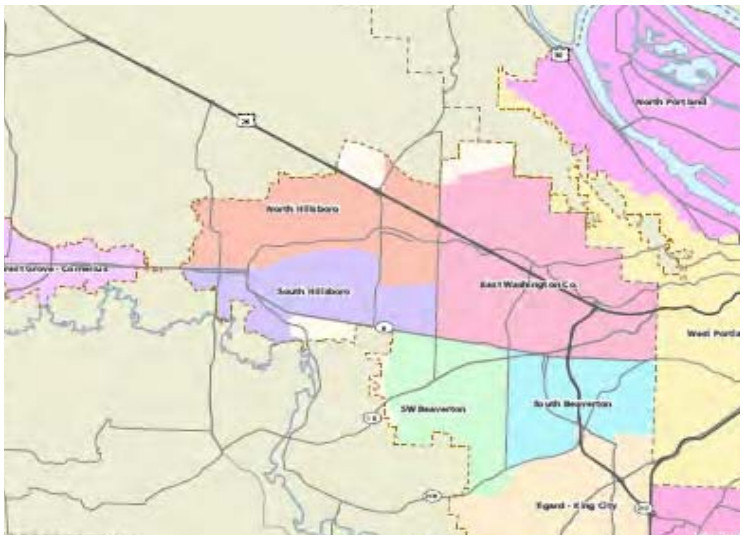
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Wilsonville	2005	2030 (low-growth)	2030 (high growth)
Total dwelling units	7,900	10,900	12,200
Subarea share of region's households	1%	1%	1%
Total jobs	15,200	19,400	28,400
Subarea share of region's jobs	2%	2%	2%
Percent of all households by household type			
Household type 1	4%	5%	5%
Household type 2	4%	5%	5%
Household type 3	7%	7%	8%
Household type 4	9%	10%	10%
Household type 5	12%	11%	12%
Household type 6	20%	21%	17%
Household type 7	23%	24%	27%
Household type 8	21%	16%	16%
Average annual cost information for all households			
Transportation costs	$10,100	$10,100	$10,100
Housing costs	$22,200	$27,800	$35,100
Income	$72,300	$72,200	$73,900
% Income spent on transportation	14%	14%	14%
% Income spent on housing	31%	38%	47%
% Income spent on housing and transportation	45%	52%	61%
Average annual cost information for all renters			
Transportation costs	$7,100	$6,900	$6,900
Housing costs	$9,400	$10,600	$12,100
Income	$39,300	$36,700	$36,300
% Income spent on transportation	18%	19%	19%
% Income spent on housing	24%	29%	33%
% Income spent on housing and transportation	42%	48%	52%
Number of cost burdened households	1,300	2,100	2,900
Share of households that are cost burdened	17%	20%	24%



Subarea: North Hillsboro, Map Reference Number: 31

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes sections of Hillsboro as well as some unincorporated areas of Washington County. The average historic and forecasted incomes for residents of this subarea are slightly lower than the regional average. The subarea's share of the region's housing remains constant from 2005 to 2030. This subarea is forecasted to see job growth by the year 2030. In 2005, the housing mix is almost split evenly between owner occupied single family and rental multi-family households (50 and 40 percent respectively). In 2005, the share of multi-family rental households was higher than the regional average for this housing type (regional average 29 percent). This rate is projected to increase slightly by 2030. However, the share of owner occupied single family households, slightly lower than the regional average rate in 2005 (regional average 60 percent), is projected to decrease by the year 2030.

While the share of annual income spent on transportation is higher than the regional average, the share of annual income spent on housing costs is slightly lower than the regional average. By the year 2030, the share of households that are cost-burdened is projected to increase from nine percent to 13 to 27 percent, a range that exceeds the forecasted regional rate for cost-burdened households (regional average is projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

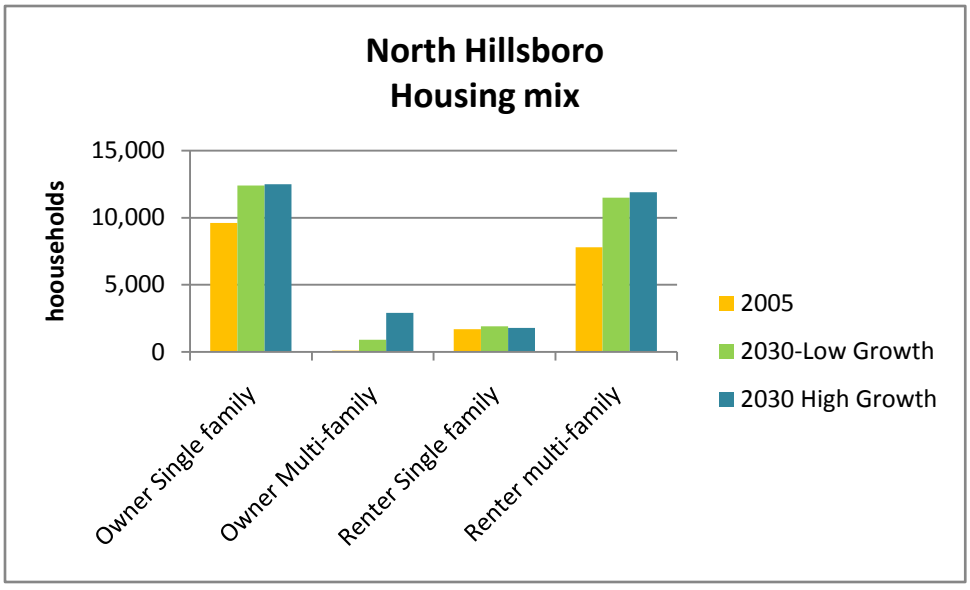
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

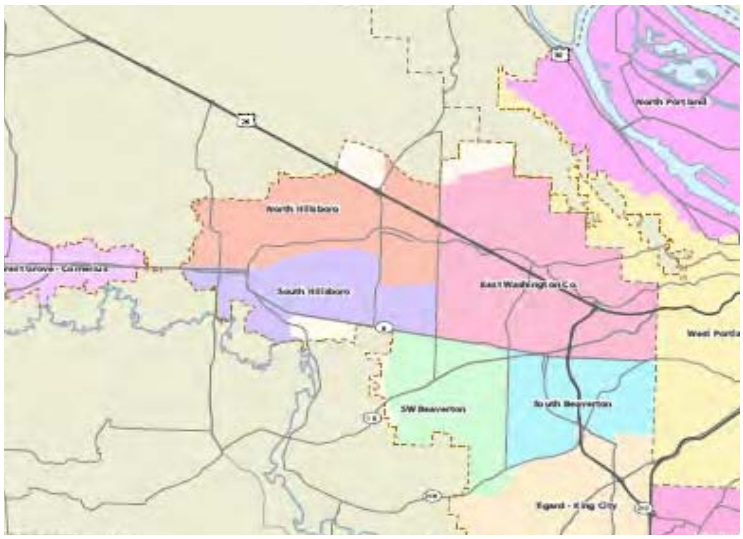
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

North Hillsboro	2005	2030 (low-growth)	2030 (high growth)
Total dwelling units	19,300	26,700	29,200
Subarea share of region's households	3%	3%	3%
Total jobs	19,300	29,900	56,300
Subarea share of region's jobs	2%	3%	4%
Percent of all households by household type			
Household type 1	5%	7%	9%
Household type 2	8%	10%	10%
Household type 3	9%	11%	12%
Household type 4	13%	15%	15%
Household type 5	16%	16%	16%
Household type 6	19%	19%	16%
Household type 7	20%	15%	15%
Household type 8	10%	8%	7%
Average annual cost information for all households			
Transportation costs	$7,100	$6,700	$6,400
Housing costs	$16,200	$19,000	$22,400
Income	$56,400	$51,100	$50,000
% Income spent on transportation	13%	13%	13%
% Income spent on housing	29%	37%	45%
% Income spent on housing and transportation	41%	50%	58%
Average annual cost information for all renters			
Transportation costs	$5,700	$5,200	$5,200
Housing costs	$9,300	$10,200	$11,800
Income	$42,500	$37,300	$37,200
% Income spent on transportation	14%	14%	14%
% Income spent on housing	22%	27%	32%
% Income spent on housing and transportation	36%	42%	46%
Number of cost burdened households	1,800	3,500	7,800
Share of households that are cost burdened	9%	13%	27%



Subarea: East Washington County, Map Reference Number: 32

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes sections of the City of Beaverton as well as unincorporated areas of Washington County. The average household income, while slightly higher than the regional average, is projected to decrease slightly from 2005 to 2030. In 2005, the share of owner occupied single family households (51 percent) was slightly lower than the regional average rate for this housing type (60 percent) and is projected to decrease by 2030. The share of multi-family households in 2005 (30 percent) is fairly consistent with the regional average rate for that housing type (29 percent) and remains fairly constant through 2030. Finally, the share of owner occupied multi-family households, consistent with the regional average rate in 2005 (regional average of two percent), is projected to increase by the year 2030.

The share of income spent on transportation and housing is fairly consistent with the regional average. While the number of cost-burdened households in this subarea is projected to increase from 2005 to 2030, the share of households that are cost-burdened could, depending on the growth scenario, remain constant at 12 percent or increase to 21 percent by the year 2030. The higher rate would be comparable to the forecasted regional rate for cost-burdened households (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

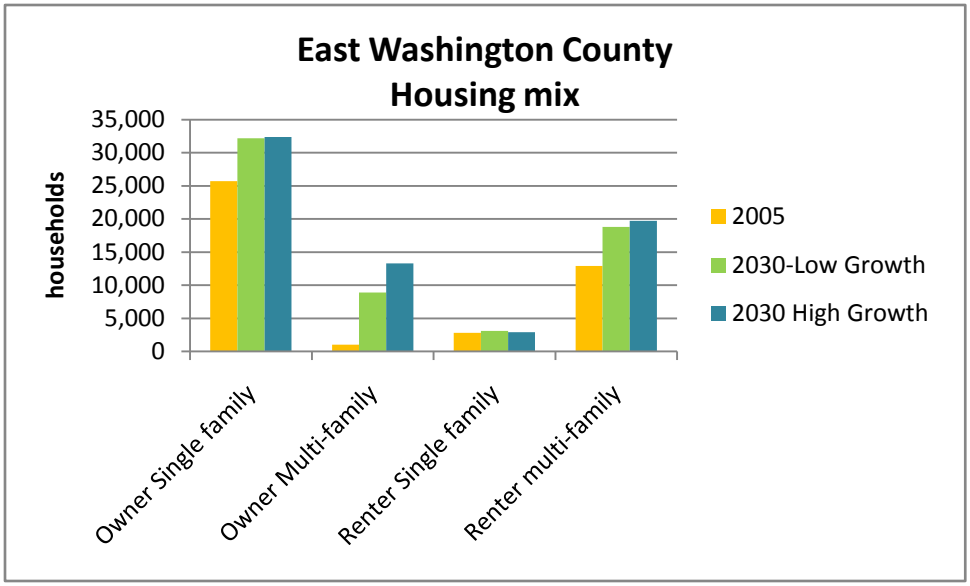
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

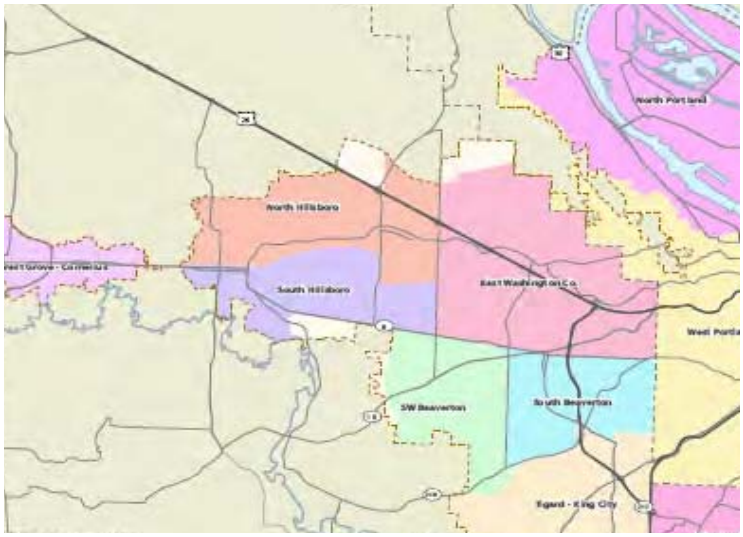
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

East Washington County	2005	2030 (low-growth)	2030 (high growth)
Total dwelling units	42,400	63,000	68,3000
Subarea share of region's households	7%	8%	8%
Total jobs	65,600	87,000	122,800
Subarea share of region's jobs	8%	8%	9%
Percent of all households by household type			
Household type 1	4%	7%	7%
Household type 2	7%	9%	10%
Household type 3	10%	10%	11%
Household type 4	13%	13%	12%
Household type 5	14%	12%	13%
Household type 6	16%	16%	13%
Household type 7	19%	17%	19%
Household type 8	19%	16%	14%
Average annual cost information for all households			
Transportation costs	$5,900	$5,500	$5,300
Housing costs	$22,400	$25,600	$30,900
Income	$67,800	$64,100	$63,400
% Income spent on transportation	9%	9%	8%
% Income spent on housing	33%	40%	49%
% Income spent on housing and transportation	42%	49%	57%
Average annual cost information for all renters			
Transportation costs	$3,900	$3,900	$3,900
Housing costs	$9,200	$10,600	$12,400
Income	$35,400	$35,900	$36,100
% Income spent on transportation	11%	11%	11%
% Income spent on housing	26%	30%	34%
% Income spent on housing and transportation	37%	41%	53%
Number of cost burdened households	5,100	7,300	14,300
Share of households that are cost burdened	12%	12%	21%



Subarea: South Beaverton, Map Reference Number: 33

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes parts of Beaverton as well as unincorporated areas of Washington County. The average income for residents of this subarea in 2005 and 2030 is slightly lower than the regional average. While the share of owner occupied single family (51 percent) is lower than the regional average rate for this housing type in 2005 (60 percent), the share of rental multi-family households in 2005 (38 percent) is higher than the regional average rate (29 percent). This housing mix is not projected to experience much change by the year 2030.

The share of income spent on housing and transportation in 2005 and 2030 is comparable to the regional average, but, for renters, the share of income spent on housing and transportation costs is slightly higher than the regional average. In addition, the share of households that are cost-burdened is higher than the regional average and is projected to increase to 19 percent to a third of all households in 2030. This is higher than the forecasted regional rate for cost-burdened households (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

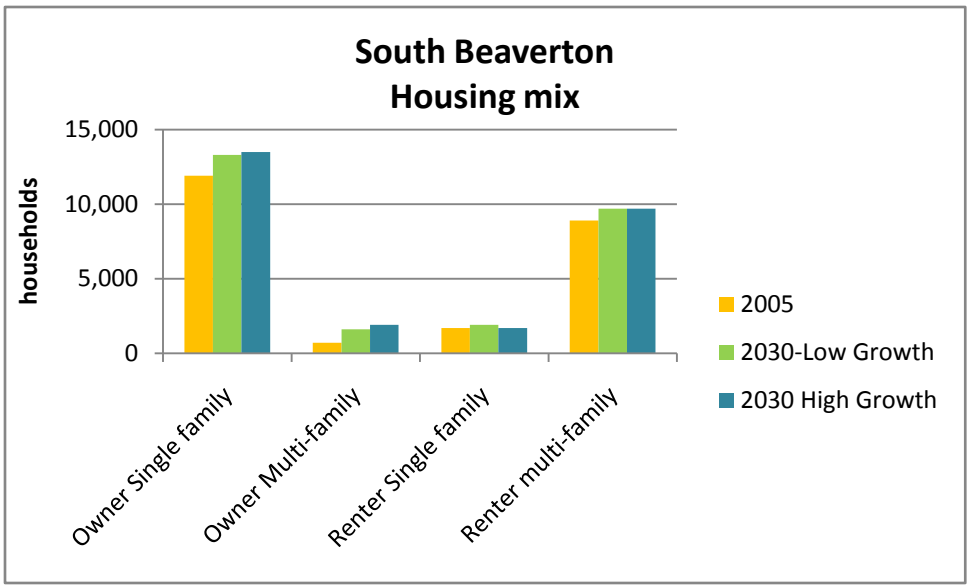
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

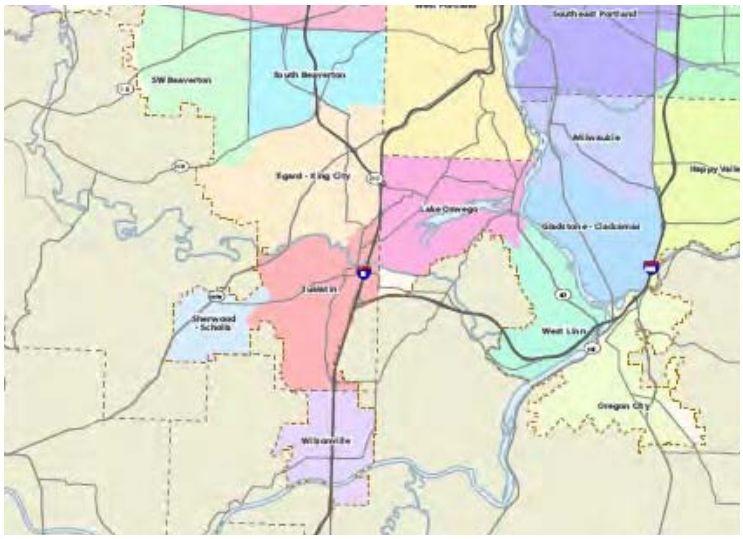
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

South Beaverton	2005	2030 (low-growth)	2030 (high growth)
Total dwelling units	23,200	26,600	26,800
Subarea share of region's households	4%	3%	3%
Total jobs	36,000	39,100	48,600
Subarea share of region's jobs	4%	4%	4%
Percent of all households by household type			
Household type 1	7%	9%	9%
Household type 2	12%	13%	13%
Household type 3	13%	13%	14%
Household type 4	17%	17%	17%
Household type 5	16%	15%	16%
Household type 6	14%	14%	12%
Household type 7	12%	12%	13%
Household type 8	9%	7%	7%
Average annual cost information for all households			
Transportation costs	$4,900	$4,700	$4,700
Housing costs	$17,300	$20,600	$25,300
Income	$52,300	$50,600	$50,700
% Income spent on transportation	9%	9%	9%
% Income spent on housing	33%	41%	50%
% Income spent on housing and transportation	42%	50%	59%
Average annual cost information for all renters			
Transportation costs	$3,600	$3,500	$3,500
Housing costs	$8,700	$9,800	$11,300
Income	$33,200	$32,500	$32,300
% Income spent on transportation	11%	12%	11%
% Income spent on housing	26%	30%	35%
% Income spent on housing and transportation	37%	42%	46%
Number of cost burdened households	4,200	$5,000	8,000
Share of households that are cost burdened	18%	19%	30%



Subarea: Tigard-King City, Map Reference Number: 34

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes Tigard, King City, and some unincorporated areas of Washington County. The average income for residents of this subarea is consistent with the regional average for both 2005 and 2030. While the share of owner occupied single family (64 percent percent) is lower than the regional average rate for this housing type in 2005 (60 percent), the share of rental multi-family households in 2005 (27 percent) is higher than the regional average rate (29 percent).

The share of annual income spent on transportation and housing is fairly comparable to the regional average. While the number of cost-burdened households in this subarea is projected to increase from the years 2005 to 2030, the share of households that are cost-burdened could either remain constant at 12 percent or increase to 21 percent, depending on the growth scenario. These rates would be lower than or comparable to the forecasted regional rate for cost-burdened households (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

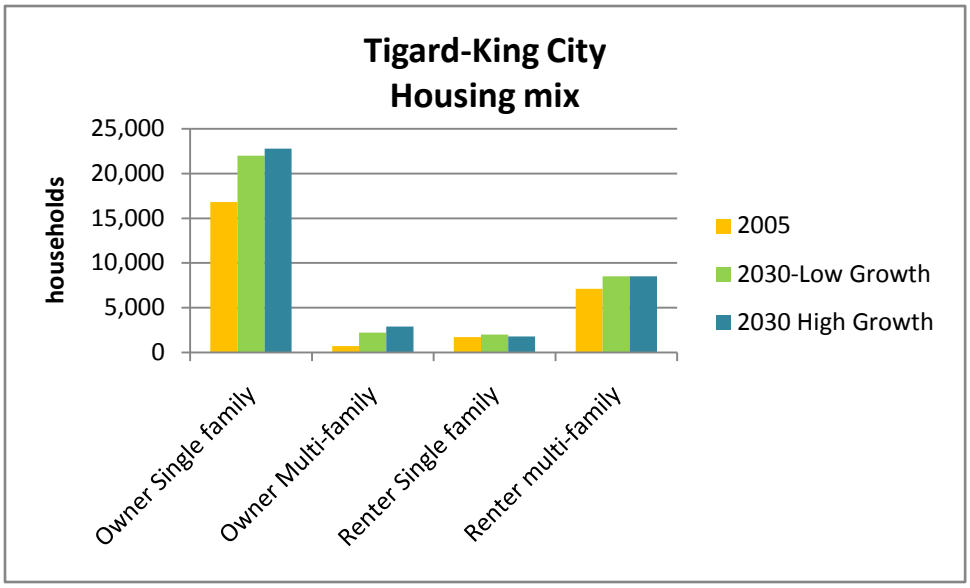
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

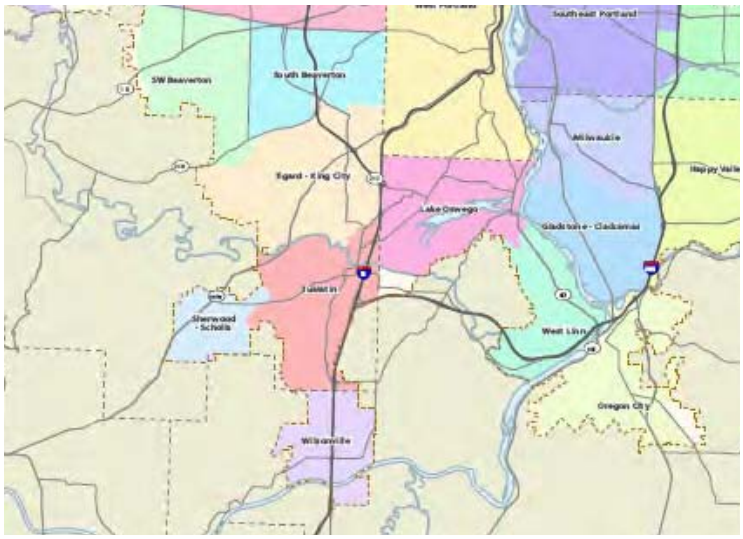
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Tigard, King City	2005	2030 (low-growth)	2030 (high growth)
Total dwelling units	26,400	34,600	36,100
Subarea share of region's households	5%	4%	4%
Total jobs	37,900	46,500	60,600
Subarea share of region's jobs	5%	4%	4%
Percent of all households by household type			
Household type 1	5%	7%	8%
Household type 2	9%	11%	12%
Household type 3	12%	14%	15%
Household type 4	15%	16%	16%
Household type 5	16%	15%	15%
Household type 6	15%	14%	11%
Household type 7	14%	13%	15%
Household type 8	13%	10%	9%
Average annual cost information for all households			
Transportation costs	$6,200	$5,900	$5,900
Housing costs	$20,100	$24,000	$29,300
Income	$61,900	$58,500	$58,100
% Income spent on transportation	10%	10%	10%
% Income spent on housing	32%	41%	50%
% Income spent on housing and transportation	42%	51%	60%
Average annual cost information for all renters			
Transportation costs	$4,100	$3,900	$3,500
Housing costs	$8,800	$9,800	$11,400
Income	$34,000	$32,500	$32,600
% Income spent on transportation	12%	12%	12%
% Income spent on housing	26%	30%	35%
% Income spent on housing and transportation	38%	42%	47%
Number of cost burdened households	3,300	4,300	7,500
Share of households that are cost burdened	12%	12%	21%



Subarea: Tualatin, Map Reference Number: 35

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes the City of Tualatin as well as unincorporated areas of Washington County. In 2005, the average income for residents of this subarea was slightly higher than the regional average and is projected to increase by 2030. In 2005, the share of owner occupied single family households (56 percent)was lower than the regional average rate for this housing type (60 percent) and the share of rental multi-family households (36 percent) was higher than the regional average rate (29 percent). However, the share of owner occupied single family households is projected to increase from 66 to 72 percent in the year 2030 and the share of rental multi-family households is projected to decrease to 21 to 26 percent in 2030.

The share of annual income spent on transportation and housing is comparable to the regional average rate. While the number of cost-burdened households in this subarea is projected to increase by the year 2030, the share of households that are cost burdened is projected either to decrease slightly or increase to 17 percent, depending on the growth scenario. This rate would be on the low end of the forecasted regional average range (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

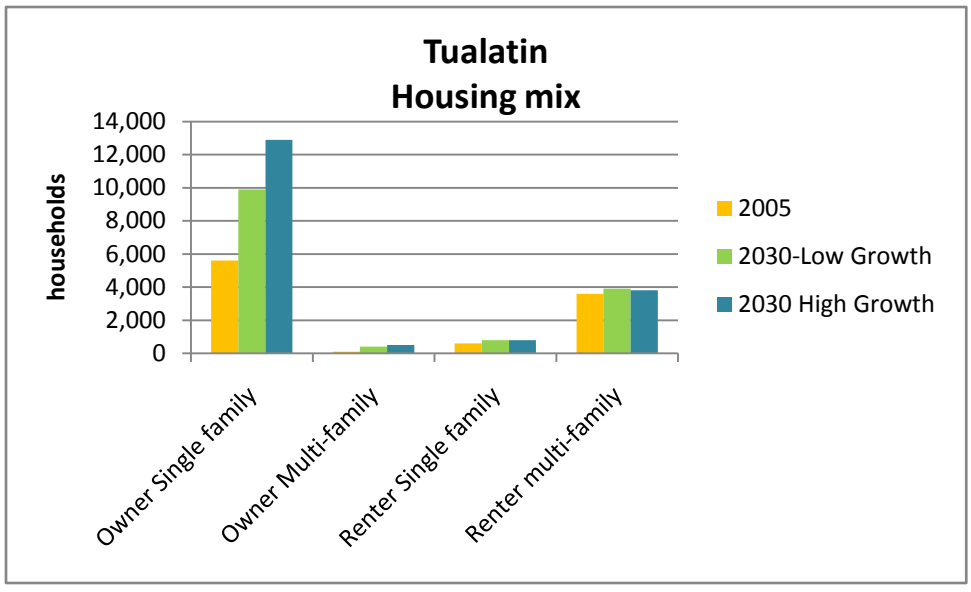
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

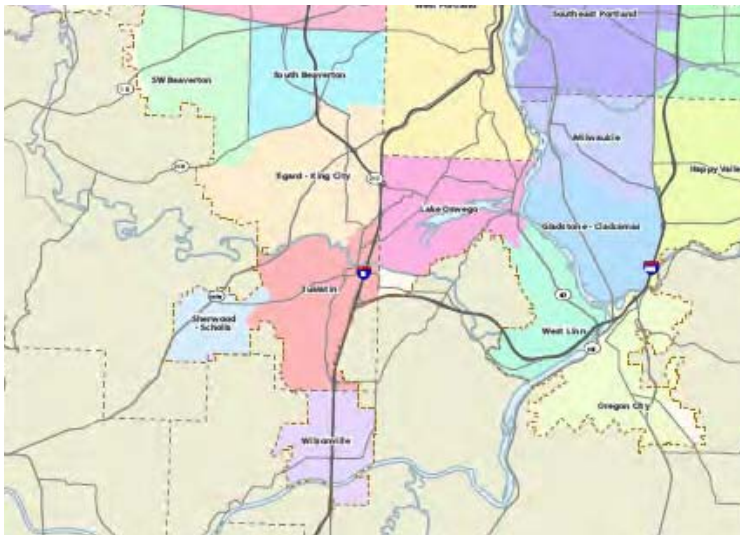
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Tualatin	2005	2030 (low-growth)	2030 (high growth)
Total dwelling units	9,900	15,000	18,000
Subarea share of region's households	2%	2%	2%
Total jobs	32,200	39,900	51,200
Subarea share of region's jobs	4%	4%	4%
Percent of all households by household type			
Household type 1	4%	4%	3%
Household type 2	8%	6%	5%
Household type 3	9%	8%	7%
Household type 4	13%	13%	12%
Household type 5	16%	15%	15%
Household type 6	17%	16%	14%
Household type 7	16%	11%	12%
Household type 8	19%	29%	32%
Average annual cost information for all households			
Transportation costs	$7,200	$8,300	$8,800
Housing costs	$19,300	$28,000	$37,000
Income	$64,100	$73,000	$77,800
% Income spent on transportation	11%	11%	11%
% Income spent on housing	30%	38%	48%
% Income spent on housing and transportation	41%	49%	59%
Average annual cost information for all renters			
Transportation costs	$4,600	$4,500	$4,600
Housing costs	$8,800	$10,100	$11,600
Income	$36,000	$35,300	$35,700
% Income spent on transportation	13%	13%	13%
% Income spent on housing	25%	29%	33%
% Income spent on housing and transportation	38%	42%	45%
Number of cost burdened households	1,300	1,700	3,000
Share of households that are cost burdened	13%	12%	17%



Subarea: Sherwood-Scholls, Map Reference Number: 36

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes the city of Sherwood and unincorporated areas of Washington County. In 2005, the average income for residents of this subarea was higher than the regional average. Average incomes are projected to decrease slightly by 2030. In 2005, the share of owner occupied single family owner households, the primary housing type in the Sherwood-Scholls area, is much higher (82 percent) than the regional average rate for this housing type (60 percent). While this share is projected to decrease by 2030, it will still be high compared to the regional average rate.

The share of income spent on transportation is slightly high relative the regional average, while the share of income spent on housing is fairly consistent with the regional average. The share of households that are cost-burdened, relatively low at five percent in 2005, is projected to increase to 10 to 14 percent by the year 2030. This would be a lower share than the regional average (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

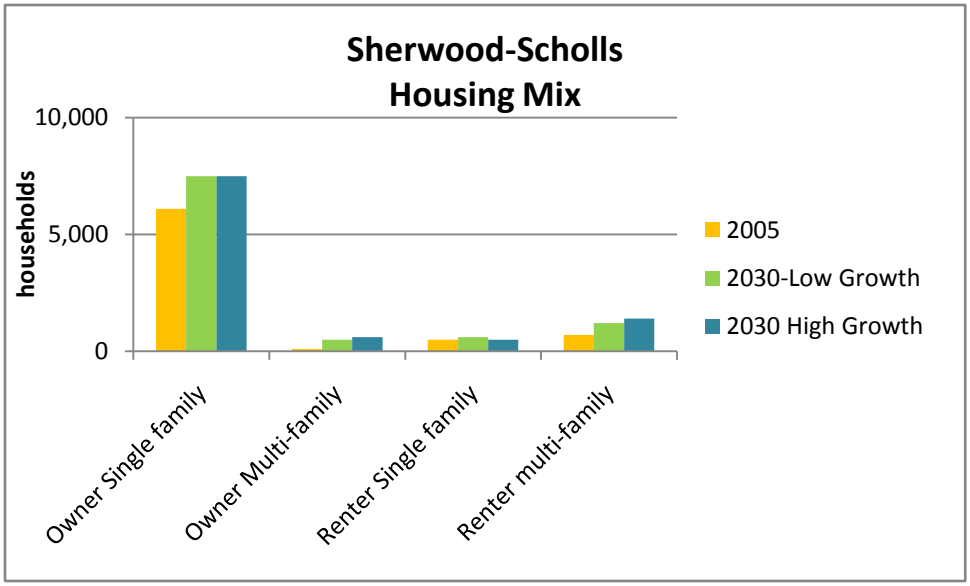
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

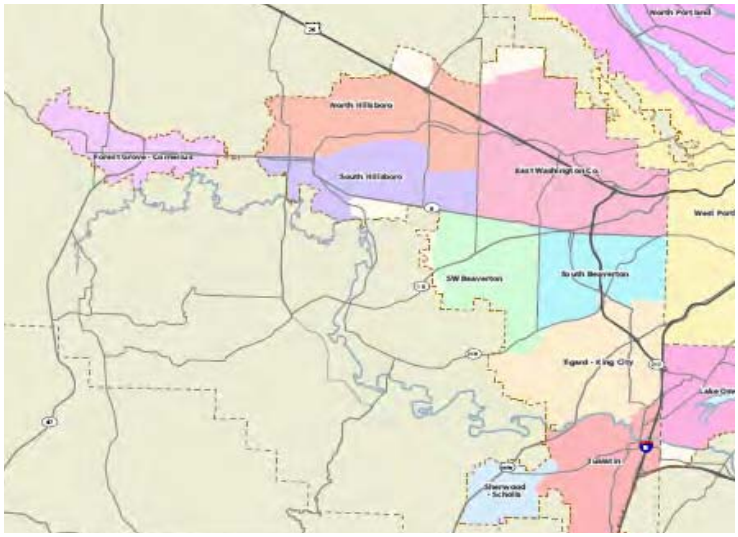
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Sherwood-Scholls	2005	2030 (low-growth)	2030 (high growth)
Total dwelling units	7,400	9,800	10,000
Subarea share of region's households	1%	1%	1%
Total jobs	28,000	34,700	45,000
Subarea share of region's jobs	3%	3%	3%
Percent of all households by household type			
Household type 1	4%	6%	6%
Household type 2	4%	5%	5%
Household type 3	7%	8%	9%
Household type 4	15%	17%	17%
Household type 5	18%	18%	19%
Household type 6	18%	18%	15%
Household type 7	19%	17%	18%
Household type 8	15%	12%	11%
Average annual cost information for all households			
Transportation costs	$10,200	$9,800	$9,700
Housing costs	$22,700	$28,100	$34,300
Income	$75,100	$69,700	$69,200
% Income spent on transportation	14%	14%	14%
% Income spent on housing	30%	40%	50%
% Income spent on housing and transportation	44%	54%	64%
Average annual cost information for all renters			
Transportation costs	$6,300	$6,400	$6,700
Housing costs	$8,800	$10,100	$11,800
Income	$38,500	$38,800	$40,300
% Income spent on transportation	16%	17%	17%
% Income spent on housing	23%	26%	29%
% Income spent on housing and transportation	39%	43%	46%
Number of cost burdened households	400	1,000	1,400
Share of households that are cost burdened	5%	10%	14%



Subarea: SW Beaverton, Map Reference Number: 37

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes the SW sections of Beaverton as well as large areas of unincorporated Washington County. In 2005, the average income for residents of this subarea was slightly higher than the regional average and is projected to increase by the year 2030. While, in 2005, the share of owner occupied single family (66 percent) is higher than the regional average rate (60 percent) for this housing type, the share of rental multi-family households (25 percent) is lower than the regional average rate (29 percent). By the year 2030, the share of owner occupied single family households is projected to increase slightly and the share of rental multi-family households is projected to decrease slightly.

The share of annual income spent on transportation and housing is fairly consistent with the regional average rate. The share of households that are cost-burdened is projected to increase from 8 percent in 2005 to 9 to 15 percent in 2030, which is lower than the forecasted regional average rate (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

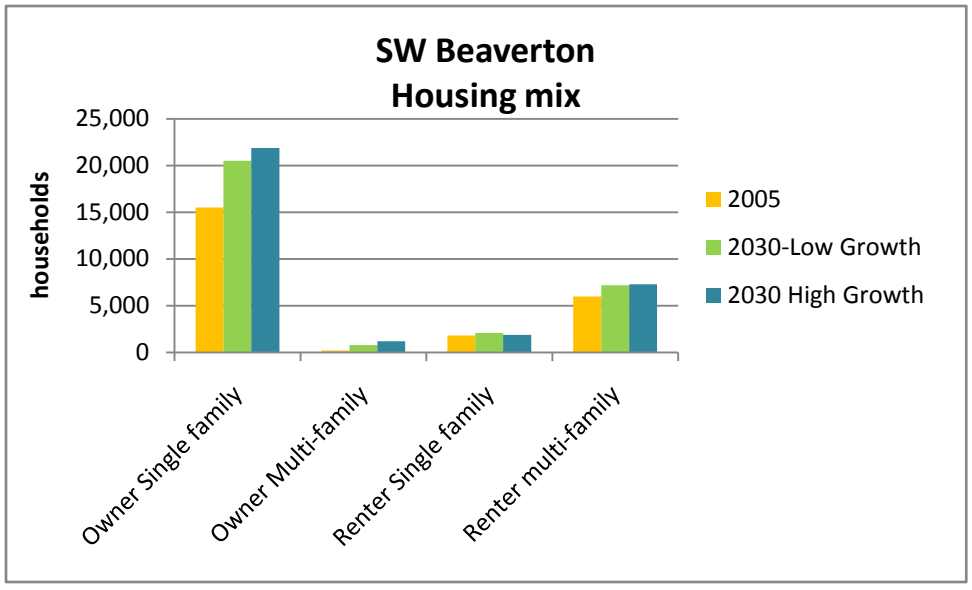
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

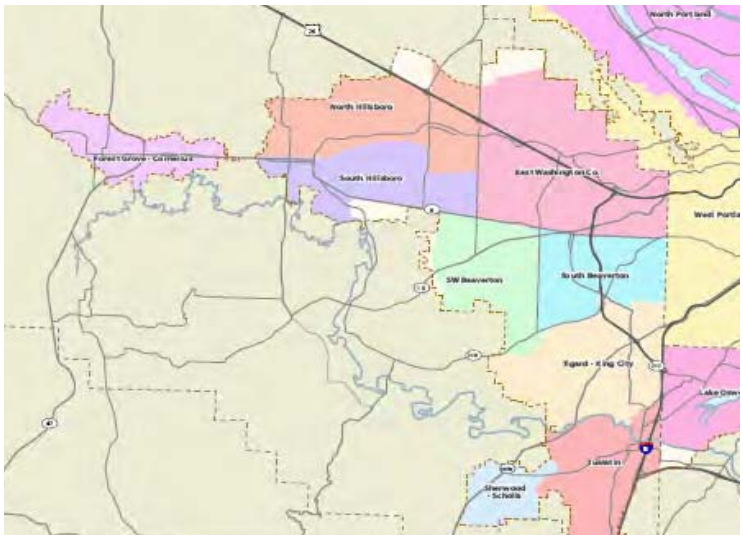
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

SW Beaverton	2005	2030 (low-growth)	2030 (high growth)
Total dwelling units	23,500	30,500	32,300
Subarea share of region's households	4%	4%	4%
Total jobs	4,300	5,300	6,800
Subarea share of region's jobs	1%	1%	0%
Percent of all households by household type			
Household type 1	5%	5%	5%
Household type 2	8%	8%	8%
Household type 3	10%	10%	11%
Household type 4	15%	15%	14%
Household type 5	15%	14%	15%
Household type 6	16%	17%	15%
Household type 7	16%	14%	17%
Household type 8	16%	16%	16%
Average annual cost information for all households			
Transportation costs	$6,700	$6,700	$6,700
Housing costs	$20,100	$25,700	$32,300
Income	$64,800	$65,200	$66,400
% Income spent on transportation	10%	10%	10%
% Income spent on housing	31%	39%	49%
% Income spent on housing and transportation	41%	49%	59%
Average annual cost information for all renters			
Transportation costs	$4,800	$4,800	$4,900
Housing costs	$9,100	$10,800	$12,500
Income	$36,600	$40,100	$40,400
% Income spent on transportation	12%	12%	12%
% Income spent on housing	23%	27%	31%
% Income spent on housing and transportation	35%	39%	43%
Number of cost burdened households	1,900	2,600	5,000
Share of households that are cost burdened	8%	9%	15%



Subarea: South Hillsboro, Map Reference Number: 38

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes the southern portion of the City of Hillsboro. In 2005, the average income for residents of this subarea was slightly lower than the regional average income and is projected to decrease slightly by the year 2030. Housing costs are projected to increase slightly by 2030. While the share of owner occupied single family (66 percent) was higher than the regional average rate for this housing type in 2005 (60 percent), the share of rental multi-family households (25 percent) was lower than the regional average rate (29 percent). The share of owner occupied single family households is projected to increase slightly in 2030 and the share of rental multi-family households is projected to decrease slightly by 2030. The share of rental single family households, at ten percent in 2005, was slightly higher than the regional average rate for that housing type (7 percent), a trend that continues through the year 2030.

While the share of annual income spent on transportation costs is slightly higher than the regional average, the share of annual income spent on housing costs is fairly consistent with the regional average. The share of households that are cost-burdened is projected to increase from 9 percent in 2005 to 10 to 16 percent in 2030, which is slightly lower than the forecasted regional average rate (projected to be between 17 and 23 percent of all households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

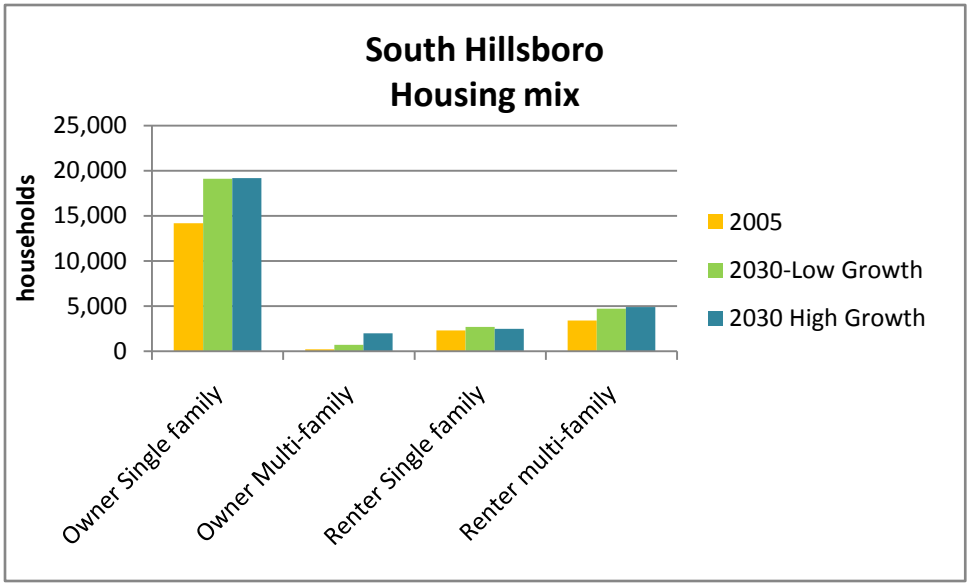
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

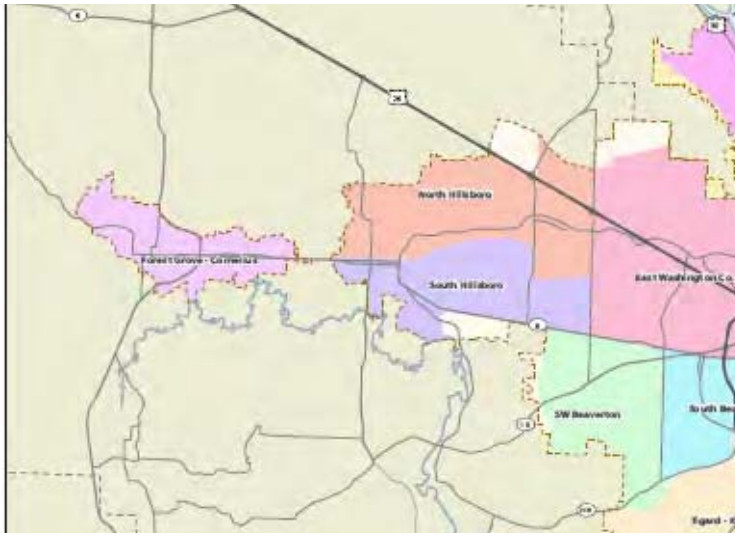
Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

South Hillsboro	2005	2030 (low-growth)	2030 (high growth)
Total dwelling units	20,100	27,100	28,600
Subarea share of region's households	4%	3%	3%
Total jobs	10,300	11,800	19,100
Subarea share of region's jobs	1%	1%	1%
Percent of all households by household type			
Household type 1	7%	8%	10%
Household type 2	14%	14%	15%
Household type 3	17%	18%	18%
Household type 4	19%	20%	19%
Household type 5	16%	15%	15%
Household type 6	11%	10%	8%
Household type 7	9%	8%	8%
Household type 8	8%	7%	6%
Average annual cost information for all households			
Transportation costs	$6,800	$6,700	$6,600
Housing costs	$16,500	$21,100	$25,100
Income	$52,400	$50,600	$49,400
% Income spent on transportation	13%	13%	13%
% Income spent on housing	31%	42%	51%
% Income spent on housing and transportation	44%	55%	64%
Average annual cost information for all renters			
Transportation costs	$5,200	$5,200	$5,200
Housing costs	$8,700	$10,200	$11,800
Income	$39,100	$39,300	$39,200
% Income spent on transportation	13%	13%	13%
% Income spent on housing	22%	26%	30%
% Income spent on housing and transportation	35%	39%	43%
Number of cost burdened households	1,900	2,800	4,600
Share of households that are cost burdened	9%	10%	16%



Subarea: Forest Grove-Cornelius, Map Reference Number: 39

Data is given for the year 2005 and as projections for high and low growth scenarios for 2030. These two scenarios both assume a continuation of current policies and investment trends. The scenarios examine the possible implications of two different population growth rates (low and high growth). Different policies and investments would produce different results.



Forecast summary:

This subarea includes the cities of Forest Grove and Cornelius. In 2005, the average income for residents of this subarea was significantly lower than the regional average and is also projected to be lower than the regional average in 2030. While the share of owner occupied single family (67 percent) is higher than the regional average rate for this housing type in 2005 (60 percent), the share of rental multi-family households in 2005 (23 percent) is lower than the regional average rate (29 percent). The share of owner occupied single family households is projected to increase slightly in 2030 and the share of rental multi-family households is projected to remain relatively constant through the year 2030.

The share of annual income spent on transportation costs, 22 percent in 2005, was much higher than the regional average. The share of annual income spent on housing is comparable to the regional average. In addition, the share of households that are cost burdened, at 21 percent in 2005, is projected to increase to 28 to 29 percent by the year 2030, which is higher than the forecasted regional average rate (projected to be between 17 and 23 percent of all the households in the region by 2030).

Subarea boundaries are based on groupings of Census Tracts that are intended to roughly approximate city boundaries, portions of cities, or groupings of smaller cities.

Definitions:

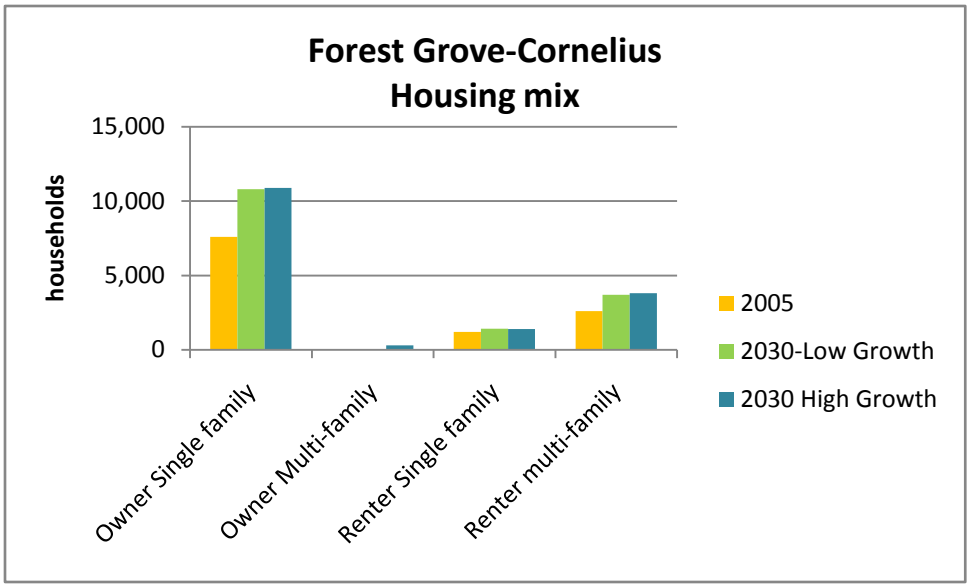
Cost-burdened household: Renters that spend more than half of their household income on transportation and housing.

Household types: Households have been grouped into eight categories according to household size, income, age of householder, and whether or not they have children. These household types are numbered one to eight, with progressively higher household incomes.

Housing costs: A comprehensive set of annual household expenditures including rent or mortgage payments, utilities, furnishings, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Transportation costs: A comprehensive set of annual transportation expenditures including gasoline, car payments, auto insurance, transit fares, etc. Costs vary, reflecting different demographic preferences and location choices. Costs are expressed in year 2005 dollars.

Forest Grove-Cornelius	2005	2030 (low-growth)	2030 (high growth)
Total dwelling units	11,500	15,900	16,400
Subarea share of region's households	2%	2%	2%
Total jobs	4,800	7,700	12,900
Subarea share of region's jobs	1%	1%	1%
Percent of all households by household type			
Household type 1	13%	15%	16%
Household type 2	20%	20%	20%
Household type 3	18%	18%	19%
Household type 4	16%	17%	16%
Household type 5	10%	11%	11%
Household type 6	9%	9%	7%
Household type 7	8%	6%	7%
Household type 8	7%	5%	5%
Average annual cost information for all households			
Transportation costs	$10,200	$10,300	$10,100
Housing costs	$14,500	$18,200	$21,700
Income	$46,300	$44,300	$43,500
% Income spent on transportation	22%	23%	23%
% Income spent on housing	31%	41%	50%
% Income spent on housing and transportation	53%	64%	73%
Average annual cost information for all renters			
Transportation costs	$6,700	$6,300	$6,300
Housing costs	$7,000	$7,900	$9,100
Income	$27,500	$24,900	$25,100
% Income spent on transportation	25%	25%	25%
% Income spent on housing	25%	32%	36%
% Income spent on housing and transportation	50%	57%	61%
Number of cost burdened households	2,400	4,400	4,700
Share of households that are cost burdened	21%	28%	29%



Appendix 8
"Needed housing" data tables

Report Purpose

The tables included in this report contain the information required to address "housing needs" requirements in Oregon Revised Statutes 197.296 and 197.303. This report provides a look at the region's historic and forecasted performance in housing mix, density, cost and affordability. Some elements of this appendix also appear in different formats throughout the urban growth report.

Use of scenarios

MetroScope scenarios are used to forecast future performance. Forecasted results are reported for two different MetroScope scenarios:

- Low Growth Scenario—assumes that population growth occurs at the low end of the forecasted range.
- High Growth Scenario—assumes that population growth occurs at the high end of the forecasted range.

All other assumptions are the same for the high and low growth scenarios. Those assumptions are intended to represent a continuation of current policies and investment trends. Different policy and investment choices or assumptions would produce different results.

Full documentation of the growth forecast is available in Appendix 12 and full documentation of the MetroScope scenario assumptions is available in Appendix 2.

Relationship of scenarios to the urban growth report

The scenario assumptions and results described in this analysis inform the urban growth report, but do not constitute the urban growth report. The urban growth report is an analysis of residential demand and capacity, while scenarios provide information about the possible performance of the region's residential capacity in light of forecasted demand. Performance is measured as housing mix, density, cost and affordability. If residential development of a particular type and tenure (rent/own) is reported as a scenario forecast, capacity for that household type is implicitly available. In this sense, scenarios do not identify a capacity gap. That determination is left to the urban growth report.

Three additional reasons that the results of these scenarios will differ somewhat from numbers reported in the urban growth report are:

Capture rate: The urban growth report assumes that 61.8 percent of future residential growth in the 7-county area will occur in the Metro UGB. This 61.8 percent capture rate is based on historic data. This UGR capture rate helps to establish the amount of residential demand (through the year 2030) that must be accommodated in the Metro UGB. Scenarios, on the other hand, produce a capture rate as an output of the scenario (i.e. it is not an assumption fed into the model). Consequently, the household numbers reported as scenario results, while similar, are not the same as the household demand numbers used in the urban growth report.

Refill rate: As with the capture rate, the urban growth report assumes a future refill rate. Scenarios, on the other hand, produce a refill rate as an output. Consequently scenario results will again differ somewhat from numbers used in the urban growth report's capacity analysis.

Timeframe: Scenario results are reported for the 2005 to 2030 timeframe. The UGR analysis covers the 2010 to 2030 timeframe. As a consequence, the results are somewhat different.

Formatting of report and relation to legal requirements

The tables included in this report contain the information required to address "housing needs" requirements in ORS 197.296 and 197.303. For ease of reference, the figures are numbered to correspond to the sections of those statutes:

- Figures 3.1 through 3.3 address the housing capacity and need requirements of ORS 197.296(3)(a) and (b)
- Figures 4.1 AB, C and D address the "buildable lands" inventory requirements of ORS 197.296(4)(a)(A), (B), (C) and (D)
- Figures 5.1 through 5.6 address the housing capacity and need requirements of ORS 197.296(5)(a)(A) and (B)
- Figures 5E.1 and 5E.2 address the housing trend requirements of ORS 197.296(5)(a) (E)
- Figure 6.1 reconciles the calculations of housing land need in this analysis and the UGR
- Figures 303.1 through 303.4 address the "needed housing" requirements of ORS 197.303.

ORS 197.296 suggests providing historic data for the previous five years, but allows for the presentation of a shorter or longer time series if doing so will provide more accurate and reliable data. Consequently the timeframe for the historic data reported in this analysis is sometimes longer than five years.

Analysis of data

Figure 3.1: forecasted housing demand by type and tenure

Figure 3.1 displays housing demand and supply by tenure (rent, own) and type (single-family, multi-family) for the years 2005 and 2030. Assuming a continuation of current policies and investment trends, the region is likely to see an increase in the total numbers of all housing types by the year 2030. However, the likely increase in multi-family residences (both owned and rented) is particularly noteworthy. The potential increase in multi-family units (123,000 to 176,000 more by 2030) is greater than the increase in single-family units (100,000 to 124,000 more by 2030).

Figure 3.1: Forecasted number and share of dwelling units by type and tenure (years 2005 and 2030)

Owner	Dwelling units (2005)	Percent of units (2005)	Dwelling units (2030 low growth)	Percent of units (2030 low growth)	Dwelling units (2030 high growth)	Percent of units (2030 high growth)	Difference 2005 to 2030 (low growth)	Differences 2005 to 2030 (high growth)
Single Family Detached	313,752	87.5%	401,395	76.9%	426,604	73.0%	87,644	112,853
Single Family Attached	15,000	4.2%	19,254	3.7%	20,463	3.5%	4,254	5,463
Townhouse Condominium	15,865	4.4%	84,424	16.2%	119,383	20.4%	68,558	103,518
Manufactured	14,000	3.9%	16,947	3.2%	17,995	3.1%	2,947	3,995
Subtotal	358,617	100.0%	522,020	100.0%	584,445	100.0%	163,403	225,828
Renter	**Dwelling units (2005)**	**Percent of units (2005)**	**Dwelling units (2030 low growth)**	**Percent of units (2030 low growth)**	**Dwelling units (2030 high growth)**	**Percent of units (2030 high growth)**	**Difference 2005 to 2030 (low growth)**	**Differences 2005 to 2030 (high growth)**
Single Family Detached	41,468	19.4%	46,111	16.8%	43,411	15.0%	4,643	1,943
Single Family Attached	7,200	3.4%	7,970	2.9%	7,474	2.6%	770	274
Apartment	163,375	76.5%	218,089	79.6%	236,285	81.9%	54,714	72,910
Manufactured	1,650	0.8%	1,652	0.6%	1,383	0.5%	2	(267)
Subtotal	213,693	100.0%	273,822	100.0%	288,554	100.0%	60,129	74,861
Combined owner, renter	**Dwelling units (2005)**	**Percent of units (2005)**	**Dwelling units (2030 low growth)**	**Percent of units (2030 low growth)**	**Dwelling units (2030 high growth)**	**Percent of units (2030 high growth)**	**Difference 2005 to 2030 (low growth)**	**Differences 2005 to 2030 (high growth)**
Single Family Detached	355,220	62.1%	447,506	56.2%	470,016	53.8%	92,287	114,796
Single Family Attached	22,200	3.9%	27,224	3.4%	27,937	3.2%	5,024	5,737
Townhouse Condominium Apartment	179,240	31.3%	302,513	38.0%	355,668	40.7%	123,273	176,428
Manufactured	15,650	2.7%	18,598	2.3%	19,378	2.2%	2,948	3,728
Total		100.0%		100.0%		100.0%		

	572,310		795,842		872,999		223,532	300,689

Figure 3.2: Proforma residential densities

Figure 3.2a (low proforma densities) and Figure 3.2b (high proforma densities) present the variables used to establish the residential density ranges used in this analysis. These proforma values are a blend of MetroScope scenario results and historic data and are used as a potential range of built residential densities. The high densities do not assume any zoning changes. The final column of Figure 3.2 displays forecasted densities per gross buildable acre for four housing types.

The number of gross buildable acres of residential consumption in a given year is divided by the number of total new units for that year, including housing built on vacant land and housing built through infill and redevelopment (refill), yielding the weighted average of 9.99 (low) to 19.93 (high) units per gross acre.

Figure 3.2a (Low proforma residential densities through the year 2030)

	Lot size range (square feet)	**Median lot size (sq. ft.)**	**Median number of units per net buildable acre**	**Average gross to net acres factor**	**Average refill rate**	**Average vacancy rate**	**Average underbuild factor**	**Density per gross buildable acre**
Single Family Detached	1,750 - 43,560	5,500	7.9	0.65	20%	4%	5%	6.4
Single Family Attached	1,500 - 3,500	3,500	12.4	0.6	22%	4%	5%	9.5
Townhouse Condo Apartment	250 - 2,500	1,750	24.9	0.5	30%	4%	5%	17.6
Manufactured	2,500 - 43,500	5,500	7.9	0.65	20%	4%	5%	6.4
Proforma average weighted density in units per net acre			13.41	Proforma average weighted density in units per gross acre				9.99

Figure 3.2b (High proforma residential densities through the year 2030)

	Lot size range (square feet)	Median lot size (sq. ft.) 2030	Median number of units per net buildable acre	Average gross to net acres factor	Average refill rate	Average vacancy rate	Average underbuild factor	Density per gross buildable acre
Single Family Detached	1,750 - 43,560	4,500	9.7	0.65	30%	4%	5%	8.9
Single Family Attached	1,500 - 3,500	2,500	17.4	0.55	40%	4%	5%	15.8
Townhouse Condo Apartment	250 - 2,500	900	48.4	0.5	45%	4%	5%	43.5
Manufactured	2,500 - 43,500	5,000	8.7	0.65	20%	4%	5%	7.0
Proforma average weighted density in units per net acre			22.08	Proforma average weighted density in units per gross acre				19.93

Figure 3.3: Proforma gross buildable acres

Based on the low and high proforma densities found in figure 3.2, figure 3.3a (low growth) and figure 3.3b (high growth) show the gross buildable acres demanded by new household growth under two different growth scenarios[1]: 223,532 (low growth) to 300,689 (high growth) new occupied units (232,473 to 312,716 units when adjusted for a four percent vacancy rate). In these scenarios, if households choose to locate in the Metro UGB, there is implicitly adequate capacity. It remains for policy discussion whether this potential future distribution of households would produce the region's desired outcomes.

After adjusting for the refill rate, vacancy rate and under-build factors, these proforma density and growth assumptions produce a total vacant land demand that amounts to 13,967 to 29,292 gross vacant acres. Under these assumptions, single family detached housing would consume about 72 to 74 percent of the acres.

Figure 3.3a (Low growth): regional housing land demand in gross buildable acres (2005 to 2030)

		Low proforma density		High proforma density	
	New dwelling units (low growth)	**Adjusted dwelling unit capacity per gross acre**	**Adjusted gross acres demanded**	**Adjusted dwelling unit capacity per gross acre**	**Adjusted gross acres demanded**
Single Family Detached	92,287	6.4	14,516	8.9	10,392
Single Family Attached	5,024	9.5	531	15.8	318
Townhouse Condominium Apartment	123,273	17.6	7,018	43.5	2,836
Manufactured	2,948	6.4	464	7.0	422
Totals	223,532		22,528		13,967

[1] This residential demand range is comprised of the number of households "captured" in the Metro UGB in two MetroScope scenarios (low and high growth) between the years 2005 and 2030. For the reasons mentioned in the introductory paragraphs to this analysis, this household demand range is somewhat different from the household demand range used in the UGR.

Figure 3.3b (High growth): regional housing land demand in gross buildable acres (2005 to 2030)

	New dwelling units (high growth)	Low proforma density		High proforma density	
		Adjusted dwelling unit capacity per gross acre	Adjusted gross acres demanded	Adjusted dwelling unit capacity per gross acre	Adjusted gross acres demanded
Single Family Detached	114,796	6.4	18,056	8.9	12,926
Single Family Attached	5,737	9.5	607	15.8	364
Townhouse Condominium Apartment	176,428	17.6	10,044	43.5	4,058
Manufactured	3,728	6.4	586	7.0	533
Totals	300,689		29,292		17,882

Figures 4.1AB and C: vacant and partially vacant acres

Figures 4.1AB and C show the region's residential capacity by generalized zoning. Figure 4.1AB depicts the gross buildable acres of residential land by "vacant" and "partially vacant" categories.

FIGURE 4.1AB DATA NOT YET AVAILABLE

Figure 4.1C shows the distribution of mixed-use land between vacant and partially vacant.

FIGURE 4.1C DATA NOT YET AVAILABLE

Figure 4.1.D: estimate of redevelopment and infill (refill) capacity

Figure 4.1D presents an estimate of the number of developed acres within the UGB with potential for additional residential development during the planning period through infill or redevelopment (refill). This estimate is made based on zoning, land values, improvement values, and tax lot sizes. The maximum refill capacities found in Figure 4.1.D are assumptions that are fed into the two MetroScope scenarios. These estimates do not assume any changes to zoning.

Figure 4.1.D: Estimate of possible refill capacity in UGB based on existing zoning (year 2005)

Zone class	Gross buildable acres	Refill capacity estimate (dwelling units)
MFR1	76	1,147
MFR2	238	4,761
MFR3	160	3,988
MFR4	212	6,353
MFR5	33	1,160
MFR6	3	114
MFR7	134	8,036
MUR1	12	119
MUR10	241	30,114
MUR2	162	2,428
MUR3	24	471
MUR4	235	5,879
MUR5	325	9,762
MUR6	47	1,657
MUR7	288	12,960
MUR8	214	13,878
MUR9	135	16,841
SFR10	38	383
SFR11	12	135
SFR12	140	1,682
SFR14	486	6,808
SFR15	160	2,403
SFR5	1,024	5,122
SFR6	994	5,966
SFR7	450	3,153
SFR8	31	251
SFR9	339	3,048
Grand Total	*6,215*	*148,621*

Though this refill capacity is available in the scenarios, it is not necessarily all consumed (developed) in the scenarios. The amount that gets consumed in the model is reported as a forecasted refill rate. The amount of refill that is actually realized in the future will depend on the decisions of individual owners, prices, regional growth and government policies and investments. As detailed in the UGR, it is anticipated that, during the 2010 to 2030 time period, 33 percent of all residential development will occur through refill.

Based on existing policies, Metro anticipates another 42,900 to 52,900 dwelling units to be produced within existing urban renewal districts during the same time frame. Urban renewal district land is not typically zoned residential and is not displayed in Figure 4.1D. However, experience and modeling indicate substantial residential capacity is created in mixed-use urban renewal districts.

Figures 5.1 through 5.6: historic land consumption in UGB

Figures 5.1 through 5.6 document historically observed development data for comparison with the projected data contained in Figures 3.1 through 3.3. The figures provide at least five years of data on the number, density and average mix of housing types and the trends in density and average mix of housing types that have occurred in the UGB.

FIGURE 5.1 DATA NOT YET AVAILABLE

Figure 5.2 shows that average densities for new residential construction have been increasing since the mid-1990s.

Figure 5.2: Average density of new residential construction inside the Metro UGB (1995 to 2006)

Year	Estimated dwelling unit permits	Average density per net acre	Average weighted lot size (single-family)	Average weighted lot size (multi-family)
1995	11,692	5.5	No Data	No Data
1996	13,105	8.4	No Data	No Data
1997	13,680	8.6	7,648	2,383
1998	12,449	7.7	8,386	2,027
1999	10,133	7.0	8,840	914
2000	8,710	8.6	6,476	1,268
2001	8,942	6.5	8,356	2,047
2002	7,967	9.0	7,610	1,580
2003	8,557	10.9	6,003	1,416
2004	7,136	9.7	6,190	1,053
2005	8,456	9.7	6,070	1,250
2006	9,104	10.7	5,441	2,586

The average, observed density for new residential construction during the 2002 to 2006 period was approximately 10 units per net acre. A comparison of the historic data with the forecast through year

2030 (see Figure 3.2) shows that residential densities are expected to increase during the period 2010 to 2030 to between 13.5 to 22 units per net buildable acre.

Figure 5.3 provides more explanation for the 1995 – 2006 density trends shown in Figure 5.2. Figure 5.3 presents the number of single family and multi-family units constructed within the UGB during the 1995 to 2006 period. Though lot size, gross to net ratio and refill rate also affect residential density, a change in the mix of dwelling unit types profoundly affects density and associated land consumption. Generally, multi-family housing production tends to increase during periods of economic growth. For example, during the 1995 - 1998 period of quickening economic growth, the multi-family share of the housing market grew to 48.3 percent and densities rose rapidly. Conversely, starting in 1999, regional economic growth slowed, single family market share climbed to over 71 percent and residential densities declined. During the entire eleven-year period from 1995 to 2006, multi-family units comprised about 36 percent of total production. By way of comparison, it is forecasted (see figure 3.1) that multi-family will comprise 38 to 41 percent of production for the 2005 to 2030 period.

Figure 5.3: New residential units inside the UGB by type (1995 to 2006)

Year	New multi-family units	New single-family units	Total units	Multi-family share
1995	5,399	6,293	11,692	46.2%
1996	6,324	6,781	13,105	48.3%
1997	4,675	9,005	13,680	34.2%
1998	3,018	9,431	12,449	24.2%
1999	2,912	7,221	10,133	28.7%
2000	1,461	7,249	8,710	16.8%
2001	2,229	6,713	8,942	24.9%
2002	3,647	4,320	7,967	45.8%
2003	3,772	4,785	8,557	44.1%
2004	2,381	4,755	7,136	33.4%
2005	2,766	5,690	8,456	32.7%
2006	4,374	4,730	9,104	48.0%
Totals	42,958	76,973	119,931	35.8%

Figure 5.4 shows sales price, median house size, lot size and imputed density trends for new single-family homes during the 1995 to 2006 time period. During this time, the trend was rising home prices and declining lot sizes. As prices rose, lot size decreased and number of units per gross acre increased. Building permit data indicate total single family construction was relatively steady, between 6,000 and 7,000 units per year, until 2002 when permit numbers dropped into the 4,000 to 5,000 per year range. Data in Figure 5.4 include single-family attached as well as detached housing.

Figure 5.4: Newly constructed single-family residence characteristics (1995 to 2006)

Year	Median sale price	Median house size	Median lot size	Dwelling units per gross acre	New permits (in UGB)
1995	$ 169,000	1,858	6,738	4.2	6,293
1996	$ 179,000	1,896	6,698	4.2	6,781
1997	$ 191,000	1,957	6,481	4.4	9,005
1998	$ 192,000	1,882	5,996	4.7	9,431
1999	$ 204,000	1,958	6,151	4.6	7,221
2000	$ 191,500	1,904	5,436	5.2	7,249
2001	$ 191,385	1,838	5,250	5.4	6,713
2002	$ 197,822	1,793	5,000	5.7	4,320
2003	$ 209,513	1,830	4,750	6.0	4,785
2004	$ 237,803	1,914	4,858	5.8	4,755
2005	$ 274,950	1,973	4,549	6.2	5,690
2006	$ 315,000	2,025	4,300	6.6	4,730

Figure 5.5 provides data similar to Figure 5.4, but for multi-family units. Here, median rent applies to all multi-family units rather than only newly constructed units. Multi-family housing production has varied year to year, generally increasing during periods of regional economic growth. During the 1995 to 2006 time period, the median rent has increased by approximately 26 percent.

Figure 5.5: Newly constructed multi-family residence characteristics (1995 to 2006)

Year	Median Rent	Units per Gross Acre	New Permits (in UGB)
1995	$ 572	No Data	5,399
1996	$ 599	No Data	6,324
1997	$ 616	14.6	4,675
1998	$ 634	17.2	3,018
1999	$ 658	38.1	2,912
2000	$ 702	27.5	1,461
2001	$ 730	17.0	2,229
2002	$ 747	22.1	3,647
2003	$ 771	24.6	3,772
2004	$ 795	33.1	2,381
2005	$ 717	27.9	2,766

2006	$ 723	13.5	4,374

Figure 5.6 lists attached and detached single-family units by year built. Data come from the home sales survey and make the assumption that all homes built on lots of less than 3,500 square feet are attached units. Figure 5.6 indicates that the attached share of single-family home construction has been steadily increasing over the period 1995 – 2006. (The year 2001 reflects an incomplete sample in the home sales record.) In 1995 small lot or attached dwelling units comprised about six percent of the newly built single-family stock. By the year 2006, small lot/attached units comprised almost 50 percent of the new single-family stock.

Figure 5.6: Newly constructed small lot (or attached single-family) and detached larger lot single family units 1995 - 2006

Year	Attached dwelling units	Detached dwelling units	Total dwelling units	Percent attached/small lot units
1995	144	2,187	2,331	6.2%
1996	225	4,840	5,065	4.4%
1997	265	3,373	3,638	7.3%
1998	324	2,533	2,857	11.3%
1999	751	3,671	4,422	17.0%
2000	807	3,314	4,121	19.6%
2001	233	464	697	33.4%
2002	1,335	2,950	4,285	31.2%
2003	1,975	2,780	4,755	41.5%
2004	1,990	2,765	4,755	41.9%
2005	2,510	3,230	5,740	43.7%
2006	2,305	2,410	4,715	48.9%

Figure 5E.1: number of new dwelling units by housing type and capacity source

Figure 5E.1.a provides the number of dwelling units that were permitted during the 2001 to 2006 period by housing type and capacity type (vacant land or refill). Further detail on how much development occurred on the partially vacant component of vacant land is included in figure 5E.2.

The refill rate indicates the percent of all new dwelling units that were built through redevelopment and infill. Generally, higher refill rates are achieved for multi-family housing than single-family housing. The bulk of this difference shows up in redevelopment (infill numbers for single-family and multi-family are similar).

Figure 5E.1.a: Number of new dwelling units by housing type and capacity source (2001 to 2006)

New single-family residences

Year	New units on vacant land	New units through refill	New units through infill	New units through redevelopment	Refill rate
2001 - 2002	3,640	675	365	310	15.6%
2002 - 2003	4,030	755	355	400	15.8%
2003 - 2004	3,755	1,000	445	555	21.0%
2004 - 2005	4,965	725	340	385	12.7%
2005 - 2006	3,645	1,085	400	685	22.9%
Totals	20,035	4,240	1,905	2,335	17.5%

New multi-family residences

Year	New units on vacant land	New units through refill	New units through infill	New units through redevelopment	Refill rate
2001 - 2002	3,126	521	90	431	14.3%
2002 - 2003	2,199	1,573	515	1,058	41.7%
2003 - 2004	1,329	1,052	297	755	44.2%
2004 - 2005	1,825	941	214	727	34.0%
2005 - 2006	2,976	1,398	25	1,373	32.0%
Totals	11,455	5,485	1,141	4,344	32.4%

New residences (single-family and multi-family combined)

Year	New units on vacant land	New units through refill	New units through infill	New units through redevelopment	Refill rate
2001 - 2002	6,766	1,196	455	741	15.0%
2002 - 2003	6,229	2,328	870	1,458	27.2%
2003 - 2004	5,084	2,052	742	1,310	28.8%
2004 - 2005	6,790	1,666	554	1,112	19.7%
2005 - 2006	6,621	2,483	425	2,058	27.3%

Totals	31,490	9,725	3,046	6,679	23.6%

Figure 5E.1.b: lot sizes of new construction by housing type and capacity source

Figure 5E.1.b provides the lot sizes of new dwelling units that were permitted during the 2001 to 2006 period by housing type and by capacity source (refill and vacant).

Figure 5E.1.b: Lot sizes (square feet) of new dwelling units by housing type and capacity source (2001 to 2006)

New single-family residences					
Year	Vacant	Refill	Infill	Redevelopment	Total average lot size
2001 - 2002	7,575	7,803	5,917	9,932	7,610
2002 - 2003	5,973	6,166	5,869	6,408	6,003
2003 - 2004	6,136	6,393	5,035	7,482	6,190
2004 - 2005	5,903	7,210	5,390	8,816	6,070
2005 - 2006	5,265	6,033	4,933	6,675	5,441
Totals	6,148	6,625	5,402	7,606	6,232
New multi-family residences					
Year	Vacant	Refill	Infill	Redevelopment	Total average lot size
2001 - 2002	564	1,675	3,259	1,344	1,580
2002 - 2003	1,457	1,359	676	1,691	1,416
2003 - 2004	1,062	1,042	1,211	976	1,053
2004 - 2005	1,236	1,278	1,456	1,225	1,250
2005 - 2006	3,224	1,228	2,828	1,199	2,586
Totals	1,864	1,281	1,212	1,299	1,675
New residences (single-family and multi-family combined)					
Year	Vacant	Refill	Infill	Redevelopment	Total average lot size
2001 - 2002	4,798	5,134	5,392	4,937	4,848
2002 - 2003	4,379	2,918	2,795	2,985	3,981
2003 - 2004	4,810	3,650	3,505	3,732	4,476
2004 - 2005	4,649	3,859	3,871	3,853	4,493

2005 - 2006	4,347	3,328	4,809	3,022	4,069
Totals	4,590	3,611	3,832	3,504	4,359

Figure 5E.2: New construction on partially vacant land

Figure 5E.2 provides the number of new dwelling units that were permitted on partially vacant land during the 2001 to 2006 time period. Average lot sizes are also indicated. The undeveloped portion of a developed taxlot may be included in the vacant land inventory as partially vacant land if it meets certain criteria:

- The entire taxlot is at least one acre
- Zoning would allow for the creation of a new lot
- There is at least ½ acre that is undeveloped[2]

Figure 5E.2: new dwelling units on partially vacant land by housing type (2001 to 2006)

New single-family residences					
Year	**Partially vacant (dwelling units)**	**Vacant (dwelling units)**	**Percent on partially vacant**	**Partially vacant (lot size in sq ft)**	**Vacant (lot size in sq ft)**
2001 - 2002	1,320	2,280	36.7%	15,077	3,264
2002 - 2003	1,230	2,295	34.9%	6,870	5,671
2003 - 2004	1,925	1,660	53.7%	5,704	6,952
2004 - 2005	2,545	1,685	60.2%	5,461	6,342
2005 - 2006	1,820	1,195	60.4%	5,389	6,123
Totals	8,840	9,115	49.2%		
New multi-family residences					
Year	**Partially vacant (dwelling units)**	**Vacant (dwelling units)**	**Percent on partially vacant**	**Partially vacant (lot size in sq ft)**	**Vacant (lot size in sq ft)**
2001 - 2002	675	2,338	22.4%	1,963	1,444
2002 - 2003	708	1,109	39.0%	2,265	1,246
2003 - 2004	384	414	48.1%	1,456	814
2004 - 2005	539	704	43.4%	1,337	1,337
2005 - 2006	1,132	1,167	49.2%	1,946	5,711
Totals	3,438	5,732	37.5%		
New residences (single-family and multi-family combined)					
Year	**Partially vacant (dwelling units)**	**Vacant (dwelling units)**	**Percent on partially vacant**	**Partially vacant (lot size in sq ft)**	**Vacant (lot size in sq ft)**

[2] If the undeveloped portion of the taxlot is less than ½ acre, it would not be considered vacant, but the taxlot could be eligible for infill.

2001 - 2002	1,995	4,618	30.2%	10,640	2,343
2002 - 2003	1,938	3,404	36.3%	5,188	4,229
2003 - 2004	2,309	2,074	52.7%	4,998	5,727
2004 - 2005	3,084	2,389	56.3%	4,740	4,867
2005 - 2006	2,952	2,362	55.6%	4,069	5,919
Totals	12,278	14,847	45.3%		

Figure 5E3(a): estimated capacity on lands zoned mixed use

Figure 5E3(a) provides an estimate of residential capacity on lands zoned mixed use. Capacity on vacant and refill land is included.

Figure 5E3(a): estimated residential capacity on lands zoned mixed use

Zoning class	Estimated dwelling unit capacity
MUR 1	776
MUR 2	4,488
MUR 3	927
MUR 4	9,757
MUR 5	9,437
MUR 6	3,067
MUR 7	19,452
MUR 8	19,804
MUR 9	39,737
MUR 10	24,754
Total	132,200

Figure 5E3: characteristics of new housing in mixed use zones

Figure 5E3: characteristics of new housing in mixed use zones (2002 to 2006)

	Multi-family dwellings		Single-family dwellings		All dwellings	
Year	New dwelling units	Average lot size (sq. ft.)	New dwelling units	Average lot size (sq. ft.)	New dwelling units	Average lot size (sq. ft.)
2002	753	1,345	370	2,749	1,123	1,807
2003	1,106	642	360	6,640	1,466	2,115
2004	1,003	611	430	2,206	1,433	1,090
2005	723	1,286	755	2,860	1,478	2,090
2006						

	2,293	3,575	635	1,813	2,928	3,193

Overview of figures 303.1 through 303.3

Figures 303.1 through 303.3 provide supporting documentation to determine the amount of land necessary to accommodate housing for a 20-year time span. "Housing need" must, under state law, be determined by type and rent/housing price ranges. Accordingly, Figure 303.1 presents total dwelling units within the UGB in 2005 and projections for 2030 by rent/price range and type. Figure 303.2 depicts details of housing type by tenure (rent vs. own) for 2005 and 2030. Figure 303.3 contains an "affordability analysis" for the years 2005 and 2030.

Data for the year 2005 and earlier years come primarily from the Year 2000 Census STF-3 files and data published for the Portland Metropolitan Area in the American Housing Survey. These data are supplemented by detailed data available from the year 2005 calibration of MetroScope. Year 2030 estimates are obtained from MetroScope scenarios that assume a continuation of current policies and investment trends.

The data presented in the accompanying figures and tables derive primarily from MetroScope modeling. In this sense "need" takes on an explicit economic definition where supply and demand are not static points, but respond to each other through price effects. Consequently, scenarios do not identify a capacity gap. Instead, they illustrate the possible price effects of a continuation of current policies and investment trends.

On the demand side of "need", the housing quantities - along with the accompanying prices/rents, tenure and housing type choices - represent what consumers are willing to pay given their income, age and household size and preferences for neighborhood, housing quantity and travel time to work. On the supply side of "need"—housing quantities and types—price represents the adjustment of the vintage housing stock to demand prices and suppliers' responses to housing prices throughout the region given land availability, land prices, zoning, economies of scale factors and development costs.

Figure 303.1: dwelling unit demand by price and housing type

Figure 303.1a and 303.1b show a possible shift in numbers by price/rent category. Compared to the year 2005, the 2030 distribution is more concentrated toward the higher end of the price/rent distribution. The result is that there are absolute decreases in dwelling units with lower rents and prices. The shift upward in the price/rent distribution reflects a combination of increasing real incomes between 2005 and 2030 and very limited supply in high demand areas within the UGB. The increase in price/rent reflects a relative lack of single-family detached capacity in high-demand central city areas and results in a shift toward higher density housing types.

Figure 303.1a: owner-occupied dwelling units by price and housing type (2005 and 2030)

Owner-occupied dwelling units

	Total dwelling units			Detached Housing		Attached Housing	
Approx. dwelling value	Year 2005	Year 2030	Difference in dwelling units 2005 to 2030)	Single-family and manufactured units	Manufactured units in parks	Single family units	Apartments, townhouses, condos
< $150,000	30,259	44,411	14,152	A	A	A	A
$150,000 - $200,000	27,191	26,954	(237)	MRKT	MRKT	MRKT	MRKT
$200,000 - $250,000	31,796	15,301	(16,495)	MRKT	MRKT	MRKT	MRKT
$250,000 - $300,000	21,442	30,657	9,215	MRKT	MRKT	MRKT	MRKT
$300,000 - $400,000	44,089	41,522	(2,566)	MRKT	MRKT	MRKT	MRKT
$400,000 - $500,000	49,363	52,167	2,804	MRKT	MRKT	MRKT	MRKT
$500,000 - $750,000	58,184	107,613	49,429	MRKT	MRKT	MRKT	MRKT
> $750,000	96,294	265,820	169,527	MRKT	MRKT	MRKT	MRKT
Total Units	358,617	584,445	225,828	116,848	*	*	108,980

Figure 303.1a notes:

- *Depending on jurisdiction practice, attached single-family houses (row houses) are included either as detached single-family or as multi-family owner.*
- *"A" denotes housing that would be partially assisted, given the dwelling value.*
- *MRKT denotes housing that would be market rate, given the dwelling value.*

- ** Because manufactured housing describes a construction technique rather than a housing type, it is not identified in MetroScope or in historic data.*

Figure 303.1b: renter-occupied dwelling units by price and housing type (2005 and 2030)

Renter-occupied dwelling units							
	Total dwelling units			**Detached Housing**		**Attached Housing**	
Approx. monthly rent	Year 2005	Year 2030	Difference in dwelling	Single-family and manufactured	Manufactured units in parks	Single family units	Apartments, townhouses, condos
< $400	43,167	19,195	(23,972)	A	A	A	A
$400 - $475	18,967	31,926	12,958	MRKT	MRKT	MRKT	MRKT
$475 - $550	25,514	25,812	298	MRKT	MRKT	MRKT	MRKT
$550 - $625	27,479	24,531	(2,948)	MRKT	MRKT	MRKT	MRKT
$625 - $750	24,854	38,485	13,630	MRKT	MRKT	MRKT	MRKT
$750 - $900	34,359	43,000	8,641	MRKT	MRKT	MRKT	MRKT
$900 - $1,100	13,315	40,881	27,566	MRKT	MRKT	MRKT	MRKT
> $1,100	26,038	64,724	38,686	MRKT	MRKT	MRKT	MRKT
Total Units	213,693	288,554	74,861	1,676	*	*	73,185

Figure 303.1b notes:

- *Depending on jurisdiction practice, attached single-family houses (row houses) are included either as detached single-family or as multi-family owner.*
- *"A" denotes housing that would be partially assisted, given the dwelling value.*
- *MRKT denotes housing that would be market rate, given the dwelling value.*
- ** Because manufactured housing describes a construction technique rather than a housing type, it is not identified in MetroScope or in historic data.*

Figure 303.2: housing and transportation affordability

Figures 303.2a (low growth) and 303.2b (high growth) summarize the regional affordability analysis. Cost-burdened households are defined as renters that spend more than 50 percent of their income on housing and transportation expenses. A more complete discussion of cost burden is included in the *Performance* section of the urban growth report. Data for owners and renters are presented here.

Figure 303.2a (Low growth scenario): Housing and transportation affordability

Owners			
	Households (year 2005)	**Households (year 2030)**	**Households (change 2005 – 2030)**
Spending less than 50% of income on housing and transportation	145,937	60,218	(85,718)
Spending more than 50% of income on housing and transportation	212,681	461,802	249,121
Total owners	358,617	522,020	163,403
Median percent of income spent on housing and transportation	53.5%	63%	9.5%
Renters			
	Households (year 2005)	**Households (year 2030)**	**Households (change 2005 – 2030)**
Spending less than 50% of income on housing and transportation	121,633	150,011	28,378
Spending more than 50% of income on housing and transportation	92,060	123,811	31,750
Total renters	213,693	273,822	60,129
Median percent of income spent on housing and transportation	49.5%	49%	-0.5%
Combined (owners and renters)			
	Households (year 2005)	**Households (year 2030)**	**Households (change 2005 – 2030)**
Spending less than 50% of income on housing and transportation	267,569	210,229	(57,340)
Spending more than 50% of income on housing and transportation	304,741	585,612	280,871
Total households	572,310	795,842	223,532
Median percent of income spent on housing and transportation	52.0%	58.5%	6.5%

Figure 303.2b (high growth scenario): Housing and transportation affordability

Owners			
	Households (year 2005)	**Households (year 2030)**	**Households (change 2005 – 2030)**
Spending less than 50% of income on housing and transportation	145,937	0	(145,937)
Spending more than 50% of income on housing and transportation	212,681	584,445	371,765
Total owners	358,617	584,445	225,828
Median percent of income spent on housing and transportation	53.5%	73.0%	19.5%
Renters			
	Households (year 2005)	**Households (year 2030)**	**Households (change 2005 – 2030)**
Spending less than 50% of income on housing and transportation	121,633	86,729	(34,904)
Spending more than 50% of income on housing and transportation	92,060	201,825	109,765
Total renters	213,693	288,554	74,861
Median percent of income spent on housing and transportation	49.5%	57.0%	7.5%
Combined (owners and renters)			
	Households (year 2005)	**Households (year 2030)**	**Households (change 2005 – 2030)**
Spending less than 50% of income on housing and transportation	267,569	86,729	(180,841)
Spending more than 50% of income on housing and transportation	304,741	786,271	481,529
Total households	572,310	872,999	300,689
Median percent of income spent on housing and transportation	52.0%	67.0%	15.0%

Appendix 9
Residential "economic refill" study: 2001 to 2006

(DRAFT: August 11, 2009)

Introduction

This report presents the fourth residential refill study conducted by Metro for the Portland metropolitan area. These studies are generally conducted every three to five years to examine the historical residential refill rate by looking at actual residential development in the recent past. The most recent prior refill study collected data from 1997 to 2001 and found an average residential refill rate of 30.4% for the period. The current study collected data from 2001 to 2006 and estimated an average residential refill rate of 33.0% over the five year period with wide variation from year to year.

Background

What is refill?

Refill is composed of two types of development: redevelopment and infill. Redevelopment means demolishing an existing structure to build a new dwelling. An example of redevelopment would be tearing down an old house to build four townhouses in its place. Infill means building on land that is classified as developed, but does not require tearing down an existing structure to build a new one. For example, a homeowner owns a half acre lot with one house built on it and the lot is classified as developed in RLIS. Zoning allows the lot to be split into two lots so the homeowner divides the property and builds a second house on the vacant land. This is infill because the original house is still standing.

What is the refill rate?

The "refill rate" is the percentage of new dwelling units that are built on land that is already considered to be developed, instead of on vacant land. It is important to note here that we are comparing the number of refill units to the total of all new units built over a particular time period. So the refill rate is a proportion of new development, not a proportion of some land base.

Why is the refill rate important?

Metro accounts for a "refill" factor when estimating the residential land supply available within the Urban Growth Boundary in the urban growth report (UGR). For instance, if the residential refill rate is estimated at 20% and Metro's 20-year growth is assumed to be 215,000 dwelling units, this means 20% of 215,000 units (43,000) will be built on land Metro considers previously developed. If the refill rate were 100%, all residential development would occur on developed land and Metro would require no

additional vacant land for housing. Conversely, if the refill rate were 0%, all future residential development would require vacant land. Clearly, estimates of the present residential refill rate and projections of its future value strongly influence calculations of how much residential land will need to be included within the Urban Growth Boundary.

How is the refill rate used?

The focus of this study is the historical residential refill rate over the period from 2001 to 2006. Building permit data, information about the regional land inventory, aerial photographs and site visits are used to identify where refill is actually happening on the ground. This historical information can help to inform assumptions about future refill rates. However, these historical rates may not be exactly the same as the refill rates that are assumed for projections of future housing needs. The ongoing documentation of historic refill rates provides a better understanding of the factors that may influence refill rates in the future.

Differences between the results of this study and refill rates reported in the UGR

Refill is defined differently in the UGR and in this "economic refill" study. It is important to note that these two different definitions produce different numeric results. The UGR refill rate is used in conjunction with the Regional Land Information System (RLIS), which returns land to the vacant land inventory if an existing structure is torn down and the land remains vacant for a period of time. The economic refill rate is used with a land inventory that classifies previously developed land to be developed, even if the land was scraped clean and remained vacant for several years before being redeveloped. This type of inventory will have a higher proportion of developed land than the UGR refill methodology, so the associated refill rate is usually slightly higher. Which refill rate is used depends on which land accounting system is being used, however the two systems are perfectly consistent and great care is always taken not to double count any type of land or development in either case. Both measures are still in use because the land use forecasting model Metroscope relies on the economic refill rate and the associated land inventory, while we must use a refill rate with a different definition in the context of the UGR.

UGR Refill:

Some prior refill studies, and the Urban Growth Report (UGR), have relied on a "UGR" definition of refill and the resulting refill rates. This definition was driven by the need for a technical definition of refill in terms of the Regional Land Information System (RLIS) that did not require any value judgments. UGR infill and redevelopment are defined as follows:

- Infill: Residential development (denominated in dwelling units) on a parcel without a pre-existing physical structure where Metro considers the parcel developed in the fiscal year (or years) prior to the fiscal year for which the building permit is issued. For instance a single family residential building permit issued between July 03 and June 04 for a parcel classed as developed in RLIS as of June 30, 2004 would be classified as infill provided no previous structure occupied it.

- Redevelopment: Same as above except that a structure or the identifiable remains of a structure were visible on the parcel in the fiscal year prior to the issuance of the residential building permit.

Economic Refill:

This appendix reports an "economic refill" rate. By virtue of reducing the classification exercise to a 99.9% mechanical operation in the context of the UGR, a limited number of building permits are classified in a somewhat counter-intuitive fashion. In order to address this issue, an "economic" classification system was developed. For example, in some fast growing suburban subdivisions on vacant land, a few building permits are assigned to parcels that Metro had classed as developed in the previous year. Since these parcels are no longer in the vacant land inventory, they are properly classed as infill in the UGR. While consistent with the Regional Land Information System (RLIS) accounting framework, this classification is somewhat misleading in an economic sense and would be classified as development occurring on vacant parcels according to the economic definition of refill. Conversely, in some instances on developed land, buildings are demolished and the land held vacant for a number of years. In many of those instances RLIS detects the vacant land and restores it to the vacant land inventory. Subsequently, when the land is redeveloped it is accounted for as development on vacant land according to the land accounting system. From an economic and historical perspective it is clearly redevelopment and would be classified as such under the economic definition of refill.

Economic refill definitions

Building permit data were used to identify new dwelling units built in the region over the period from 2001 to 2006. In order to identify each permit as being infill, redevelopment or occurring on vacant land, these classifications are defined as follows:

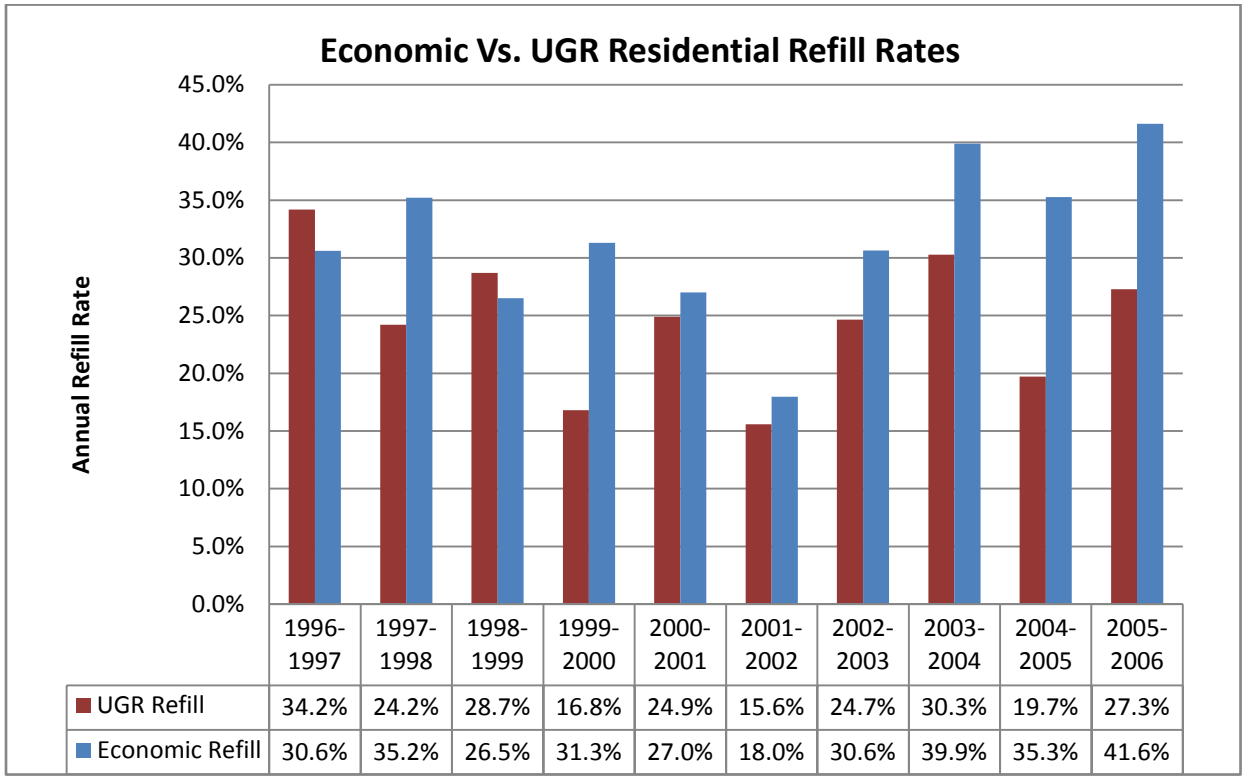
- Vacant: Residential development (denominated in dwelling units) on a taxlot, or portion of a taxlot, that is identified in the Regional Land Inventory System (RLIS) as vacant and has never had any development on it. This land is generally at least 90% vacant and the historical records show no evidence of any prior development.

- Infill: Residential development on land without a pre-existing physical structure where Metro considers the taxlot to be developed. For example, a homeowner owns a half acre taxlot with one house built on it and RLIS classifies the whole lot as developed. Zoning allows the property to be split into two smaller lots, so the homeowner divides the property and builds a second house on the vacant land. This is infill because the original house is still standing.

- Redevelopment: Same as above except that there was an existing structure at the site of the new development at some point in the past. An example of redevelopment would be tearing down an existing house to build four townhouses in its place. Another example would be building condos on a lot where the existing structure had been torn down years earlier and the land remained vacant for a period of time before being redeveloped.

Figure 1 compares historical UGR and economic refill rates and clearly indicates that the two measures have diverged in recent years. The five year average UGR refill rate for 1996 to 2001 was 26.5% and the average economic refill rate was 30.4%. For 2001 to 2006, the average UGR refill rate was 23.5% and the average economic refill rate was 33.0%. Between the two periods, the average UGR refill rate declined by 3 percentage points and the average economic refill rate increased by 2.6 percentage points.

Figure 1. Ten year comparison of economic and UGR refill rates



	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
UGR Refill	34.2%	24.2%	28.7%	16.8%	24.9%	15.6%	24.7%	30.3%	19.7%	27.3%
Economic Refill	30.6%	35.2%	26.5%	31.3%	27.0%	18.0%	30.6%	39.9%	35.3%	41.6%

This gap between the different measures of refill can largely be attributed to how redevelopment is identified under the two systems. From 2001 to 2006, redevelopment accounted for about 77% of observed refill. For 2005-2006, nearly half of the single-family dwelling (SFD) units identified as economic redevelopment were classified as UGR vacant and almost a third of multi-family dwelling (MFD) units classified as economic redevelopment were called UGR vacant. In most cases this is because the redevelopment took place on land where the prior existing development was torn down years before the site was redeveloped, and so it was returned to the vacant lands inventory in RLIS but not in Metroscope's land accounting system. The UGR definition of refill leads to sensitivity to the timing of observations. For example, if an existing house was torn down in January 2006, then an aerial photograph from July 2005 would show the lot as developed and an aerial photograph from July 2006 would show the lot as vacant. If a building permit for a new house were filed for the lot in June 2006, it

would be classified as UGR redevelopment. On the other hand, if the permit was filed in August 2006, it would likely be classified as occurring on vacant land according to RLIS.

Urban renewal areas are a significant driver of redevelopment, so increased urban renewal activity could contribute to this discrepancy between the UGR and economic refill rates. Currently, urban renewal areas account for about 8.3% of acreage within the UGB while nearly 36% of MFD units classified as redevelopment were built in urban renewal areas from 2001 to 2006. Almost 63% of these redevelopment MFD units were misidentified as occurring on vacant land using the UGR definition of refill. By contrast, about 23% of redevelopment MFD units outside of urban renewal areas were misidentified as vacant development.

Economic refill study procedures

The new dwelling units that were identified in the permit data were classified into one of the three definitions above (vacant, infill or redevelopment) using a series of procedures. First, the new dwelling unit permits were divided into SFD and MFD for analysis. In order to reduce the workload required by the classification process, the SFD permits were sampled at a rate of one in five using geographic weights to ensure a representative distribution across the region. The pool of SFD permits is fairly homogenous as most SFD permits represent a single dwelling on a single residential lot. By contrast, every MFD permit was evaluated, since there are fewer permits of this type and each multi-family development is unique in type, number of units and lot size. The SFD sample findings were then scaled by five so that the tables in this report represent the proper distribution of SFD to MFD units.

For both subsets, SFD and MFD, the following steps were taken:

1. Geo-code the permit based on address and find the taxlot that it falls on.
2. Check the Regional Land Information System (RLIS) database and aerial photos both before and after the date of the permit to classify the development as vacant, infill or redevelopment.
3. If these steps could not clearly identify the type of development, a site visit was conducted to try to classify the permit into the most appropriate category.

The following three figures show some examples of how these types of development were identified using the geo-coded permit location, tax lots from RLIS and aerial photographs before and after the development. More examples and descriptions can be found in Attachment 1.

Figure 2. Example of building permit identified as infill development

Predevelopment **Post development**

The predevelopment image on the left indicates that a large tax lot was likely divided into three smaller lots. (The pre-subdivision taxlot is not shown.) The building permit (indicated by a blue dot) is for a new house on the back lot, which was vacant prior to the permitted development. This is considered infill because the larger lot was previously developed but building the new house did not require tearing down any existing structures.

Figure 3. Example of building permit identified as redevelopment

2001 (predevelopment) **2003 (permit year)** **2006 (post development)**

The predevelopment images from 2001 and 2003 show that an existing structure was torn down at some point and the land remained vacant for a period of time before it was subdivided and redeveloped at a higher density, as shown in the 2006 image.

Figure 4. Example of vacant and redevelopment on the same lot

Predevelopment

Post development

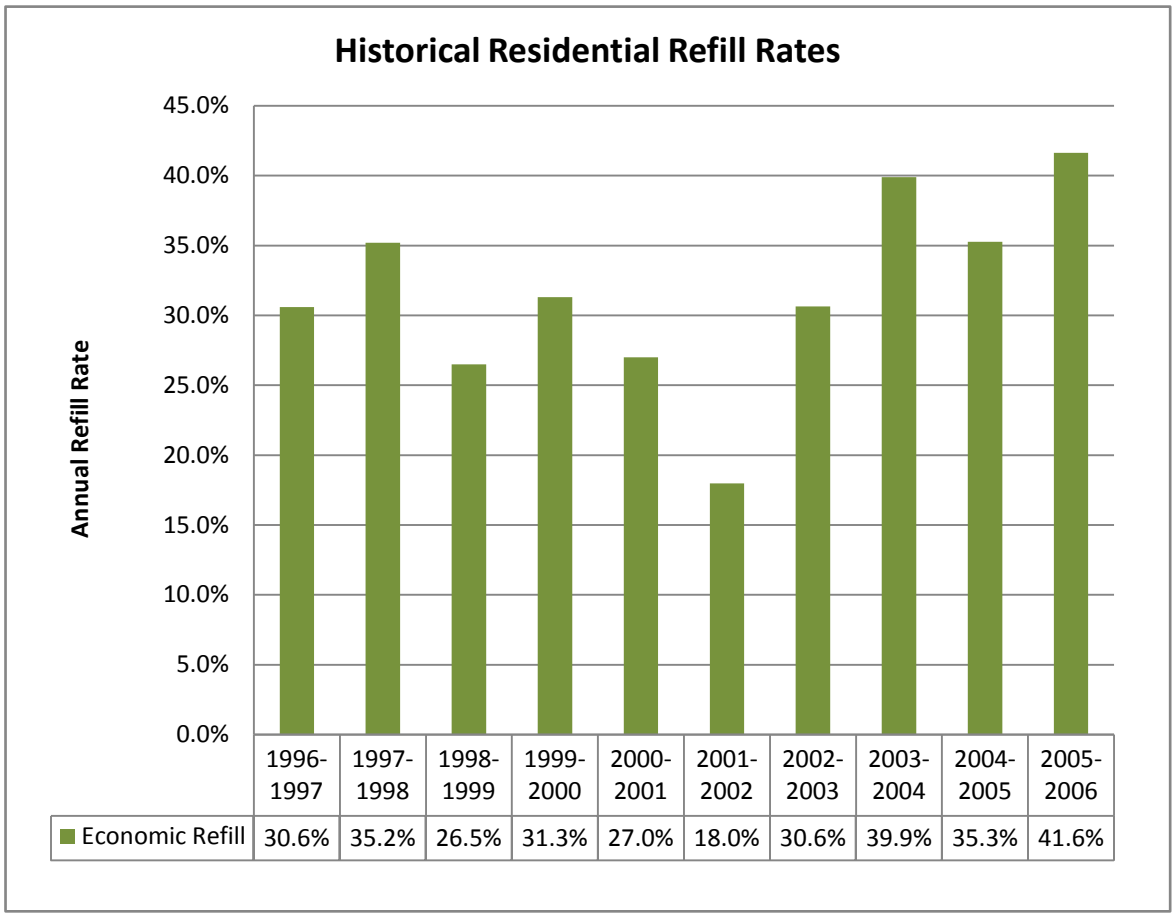
The predevelopment image shows that the left half of the lot was classified as vacant (indicated by the green overlay) while the right half was developed. The subdivision that occurred on the green area would be considered development on vacant land. The subdivision on the right side of the lot required the removal of the existing structure, and would be classified as redevelopment.

Economic refill study results

Regional Results

Results from the current study (2001-2002 to 2005-2006) and the most recent prior residential refill study (1996-1997 to 2000-2001) are shown in Figure 5. From 2001 to 2006, the annual residential refill rate ranged from a low of 18.0% in the first year to a high of 41.6% in the final year. The overall refill rate for the five year period was 33.0%, compared to 30.4 % for the previous five years.

Figure 5. Historical economic refill rate



	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Economic Refill	30.6%	35.2%	26.5%	31.3%	27.0%	18.0%	30.6%	39.9%	35.3%	41.6%

Multifamily developments accounted for about 39% of new dwelling units built from 2001 to 2006 while single family dwellings made up 61% of new residential units (Table 1). The refill rate for multifamily dwelling units was much higher than single family, at 46% compared to 25%. Accordingly, the overall residential refill rate is sensitive to the proportional distribution of MFD and SFD development. If the long term share of multifamily dwelling units compared to single family dwellings were higher in the future than that observed over the study period, we could expect a higher overall residential refill rate. If the multifamily share were lower, we would expect a lower overall residential refill rate over the long term. Table 2 shows the impact that various proportional allocations of multifamily and single family dwelling units might have on the residential refill rate in the future, given the current MFD and SFD refill rates.

Table 1. Distribution of new dwelling units by permit type

Dwelling Unit Type	Total Units	Proportion of Development	Vacant Units	Refill Units	Refill Rate
Multi Family	16,940	39%	9,170	7,770	45.9%
Single Family	26,515	61%	19,945	6,570	24.8%
Total	43,455	100%	29,115	14,340	33.0%

Table 2. Theoretical impact of shares of MFD and SFD development on the overall residential refill rate

Proportion multifamily	Proportion single family	Refill Rate
20%	80%	29%
30%	70%	31%
40%	60%	33%
50%	50%	35%
60%	40%	37%

Subarea Results

The subarea data for MFD permits in Table 3 show a wide range of refill rates throughout the region. The City of Portland accounted for nearly half of all new MFD units from 2001 to 2006 and 71.5% percent of those were refill units. The highest MFD refill rate occurred in Oregon City – Milwaukie, at 87.8%, however this subarea accounted for less than 1% of MFD development. The overall MFD refill rate of 45.9% was driven largely by the MFD development observed in Portland.

Table 3. New multi-family dwelling units from 2001-2006, by subarea

MFD combined jurisdictions (2001-2006)[1]	MFD Vacant Units	MFD Refill Units	MFD % Refill
Oregon City - Milwaukie	19	137	87.8%
Portland	2,287	5,740	71.5%
Gresham - Troutdale - Fairview - Wood Village	797	681	46.1%
Forest Grove - Cornelius	51	39	43.3%
Hillsboro	1,818	691	27.5%
Beaverton	931	282	23.2%
Lake Oswego - West Linn	57	16	21.9%
Clackamas Unincorp - Happy Valley - Wilsonville	432	62	12.6%
Washington County Unincorp	2,107	93	4.2%
Tualatin - Tigard - Sherwood - King City	671	29	4.1%
Totals	9,170	7,770	45.9%

Note: Jurisdictions with fewer than 500 new dwelling units will exhibit much more variability than jurisdictions with more than 1,000 units.

The City of Portland also exhibited a high refill rate for single family dwellings, as shown in Table 4. More than 21% of new SFD permits were issued in Portland and 53.2% of those were considered refill. The lowest SFD refill rate was observed in the Tualatin - Tigard - Sherwood - King City area. The area accounted for about 13% of new single family dwelling units with a refill rate of 10.4%.

[1] These subareas were defined based on the availability of the building permit data. The building permits are classified by the issuing jurisdiction, so these jurisdictions were collapsed down to larger subareas for this report.

Table 4. New single family dwelling units from 2001-2006, by subarea

SFD combined jurisdictions (2001-2006)	SFD Vacant Units	SFD Refill Units	SFD % Refill
Portland	2,625	2,980	53.2%
Lake Oswego - West Linn	550	235	29.9%
Hillsboro	3,435	1,010	22.7%
Clackamas Unincorp - Happy Valley - Wilsonville	1,755	400	18.6%
Washington County Unincorp	3,825	870	18.5%
Forest Grove - Cornelius	655	115	14.9%
Beaverton	1,200	200	14.3%
Oregon City - Milwaukie	875	135	13.4%
Gresham - Troutdale - Fairview - Wood Village	1,960	270	12.1%
Tualatin - Tigard - Sherwood - King City	3,065	355	10.4%
Totals	19,945	6,570	24.8%

Note: Jurisdictions with fewer than 500 new dwelling units will exhibit much more variability than jurisdictions with more than 1,000 units.

Figures 6 and 7 are illustrative examples of how refill rates vary across the region and how they might change in the future given a particular set of assumptions. These maps are based on a Metroscope scenario that uses the same assumptions that were used for the current UGR. However, in this case, only the results for the medium growth scenario are presented. A detailed description of the scenario assumptions can be found in Appendix 2.

Figure 6 compares the historical MFD refill rates observed from 2001 to 2006 with the Metroscope projected MFD refill rates for 2005 to 2030. Multifamily dwelling refill rates are generally expected to increase across the region, potentially reaching an overall MFD refill rate of nearly 70% for the region given current policies. This change is largely driven by a lack of infrastructure on newly urbanized land within the projected time period as well as increasing demand for dwelling units closer to the city center and other concentrations of jobs, retail and services. Changing demographics and preferences are increasing the housing demand in existing urban areas, where development is already fairly dense. Accordingly, new dwelling units in these areas must be created through refill development, and multifamily dwellings are particularly well suited for this purpose. Oregon City – Milwaukie is the only subarea where the future MFD refill rate is expected to fall in comparison to the historical data. However, since so little MFD development occurred for the subarea from 2001 to 2006 the estimated historical MFD refill rate of 87.8% should be interpreted with caution. The MFD refill rate is expected to increase dramatically in the Lake Oswego – West Linn area, from 21.9% to 79.9% since the model is anticipating no new vacant land for MFD development in this area by 2030.

Figure 6. Comparison of historical and projected (medium growth scenario) MFD refill rates by subarea

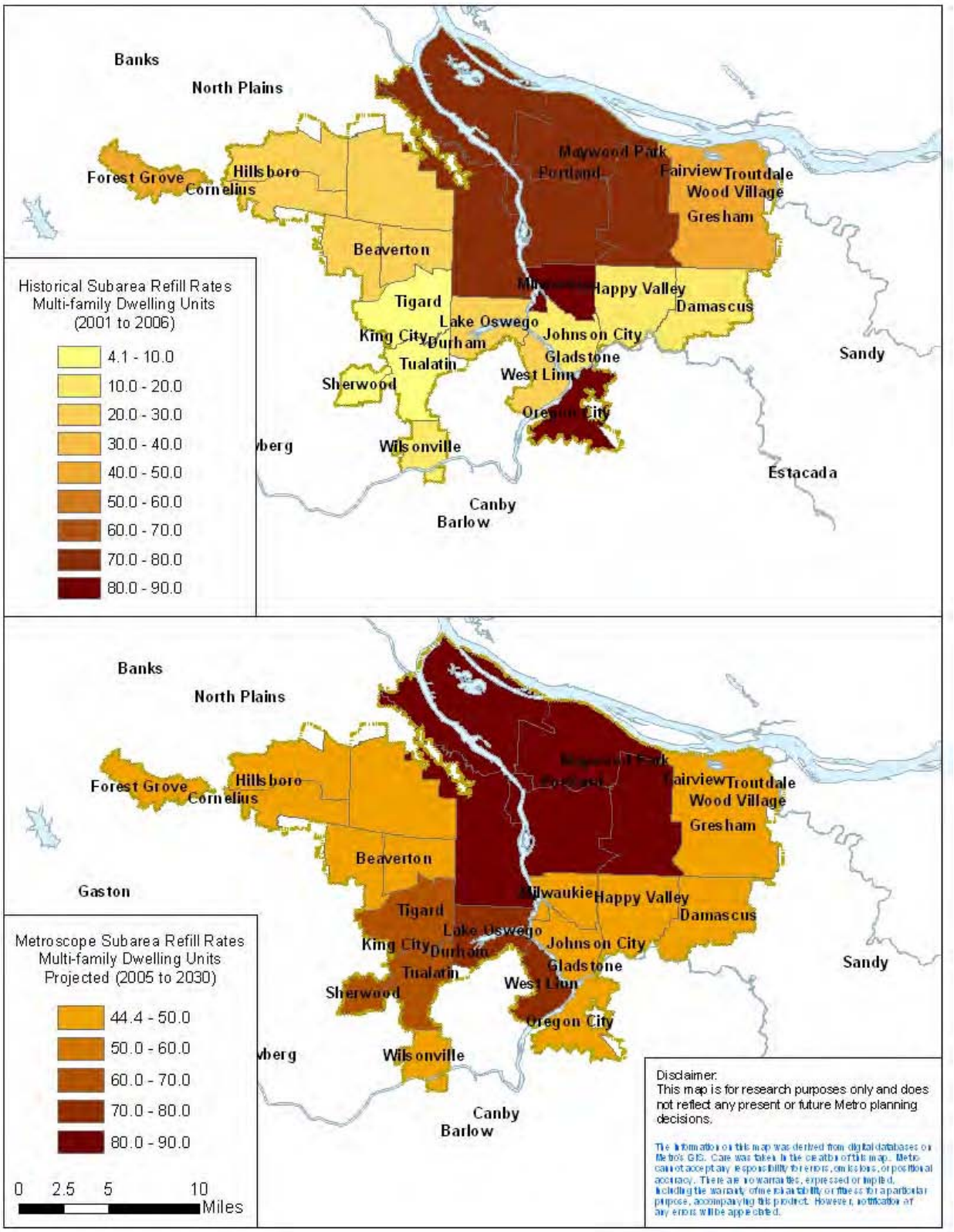
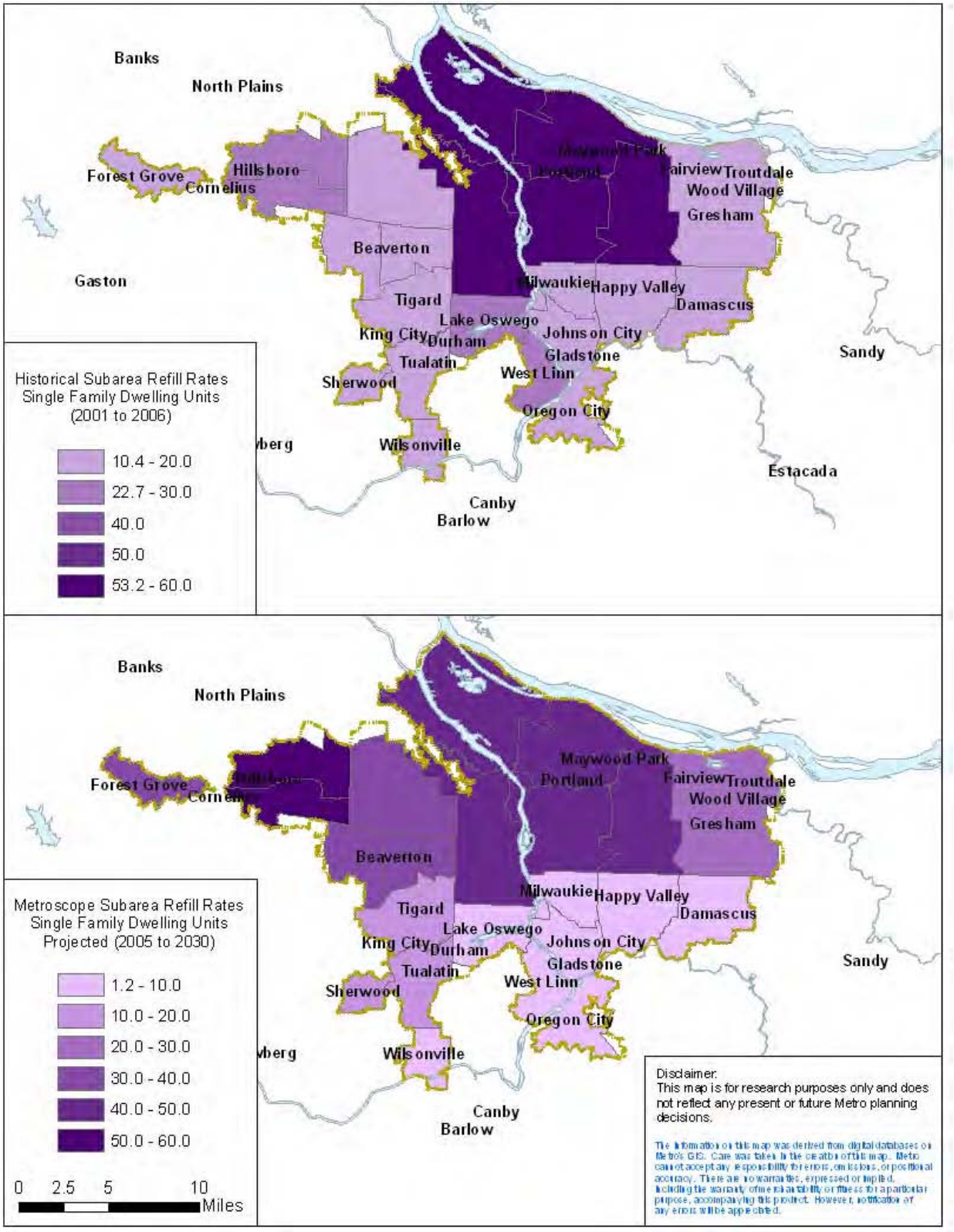


Figure 7 compares the historical SFD refill rates observed from 2001 to 2006 with the Metroscope projected refill rates for 2005 to 2030. The future expectations for SFD refill are more varied than for MFD, with both increases and decreases in the subarea SFD refill rates across the region. In five of the nine subareas the SFD refill rate is expected to increase, with the largest increases projected to occur in the Beaverton, Hillsboro and Forest Grove – Cornelius areas. In four subareas, (Portland, Lake Oswego - West Linn, Oregon City - Milwaukie and Clackamas Unincorporated – Happy Valley – Wilsonville), the SFD refill rate is expected to fall over the period 2005 to 2040. However, this decline is not so much an indication that refill is going to slow down significantly as it is an indication that refill in these areas is expected to shift more toward multifamily instead of single family development. In fact, in these four subareas, multifamily dwelling units are projected to account for between 82% and 92% of the refill residential development in terms of units.

The overall residential refill rate is expected to increase in most subareas in the region. The two exceptions are Clackamas Unincorporated – Happy Valley – Wilsonville, where refill is projected to decline from 17.4% to 11.6%, and Lake Oswego – West Linn, where refill is projected to decline from 29.3% to 9.4%. These results are consistent with the land supply situation in the region and the assumptions for land availability and UGB expansions used for this scenario. In places like the city of Portland, existing vacant supply is being used up and little additional vacant land is anticipated in the area over the forecast period. In contrast, vacant land within the current UGB and new UGB additions are assumed to become available in areas adjacent to the Clackamas Unincorporated – Happy Valley – Wilsonville and Lake Oswego – West Linn subareas. Therefore single family development is projected to take place on new vacant land in these areas, which reduces the residential refill rate. These UGB and land availability assumptions may change with the designation of urban and rural reserves, which would produce different scenario results.

Figure 7. Comparison of historical and projected single family dwelling refill rates by subarea



ATTACHMENT 1: Classifying development as vacant, infill or redevelopment

This section describes, in detail, the steps to classify building permit data into both an economic refill category and a UGR refill classification.

1. Review Taxlot, Vacant Land and Photo Layer for the year prior to the building permit. Use the following definitions to identify the permit as vacant, infill or redevelopment.

2. Definitions

    a. **UGR Vacant** is development on a taxlot that is designated as vacant in RLIS prior to the date the building permit is issued. A portion of a taxlot may also be considered vacant in RLIS if it meets the following criteria:

        i. The entire taxlot is at least one acre in size

        ii. Zoning would allow for the creation of a new lot

        iii. There is at least half an acre of undeveloped land on the taxlot

        If the land is considered vacant in RLIS, then new development would be considered UGR vacant regardless of whether it is located on a fully vacant taxlot or the vacant portion of a partially developed taxlot.

    b. **UGR Refill** is a term that includes UGR Infill and UGR Redevelopment, defined below:

        i. **UGR Infill** is the addition of dwelling units to a developed taxlot while preserving the existing structure. By definition, UGR infill should only occur on taxlots that are smaller than one acre since development on larger taxlots would properly be considered development on partially vacant land.

        ii. **UGR Redevelopment** is the removal of existing structures and replacement with a net increase in dwelling units. If existing structures are removed years prior to the redevelopment, the land may be returned to the RLIS vacant land inventory, in which case the new development would be classified as occurring on vacant land.

    c. **Economic Vacant** is development on a taxlot that has <u>never</u> been developed. Once developed, the taxlot (or developed portion, if the tax lot is large) is permanently removed from the economic vacant category, even if it is subsequently cleared of improvements.

    d. **Economic Refill** is a term that includes Economic Infill and Economic Redevelopment, defined below:

        i. **Economic Infill** is building additional dwelling units on a lot that is not considered vacant in RLIS, without the removal of an existing building. If the land where the permit is located is classified as vacant in RLIS (even if only a portion of the taxlot is vacant), the development is not considered Economic Infill.

ii. **Economic Redevelopment** is the removal of existing structures and replacement with a net increase in dwelling units. Economic redevelopment includes taxlots that were at one point developed but were cleared and held vacant for years prior to redevelopment (regardless of whether RLIS returns them to the vacant lands inventory.)

Using these definitions, each building permit receives an economic classification (vacant, infill or redevelopment) and a UGR classification (vacant, infill or redevelopment). There are two reasons that a building permit might receive different classifications under the two systems. The first reason is the conceptual difference between the definitions above, particularly in how redevelopment is identified. However, discrepancies between UGR and economic classifications may also arise from mistakes (or inconsistencies) in how land is classified in RLIS, as some of the examples in this section will show.

Other notes:

3. When recording lot sizes for building permits, the new lot size is used if the property was subdivided.

4. Parking lot conversion is considered redevelopment since something was there prior to the building permit being issued.

Examples

1. In the pictures below, the old lot is partially vacant (as identified by the green shading). The blue dot shows the location of a permit application on the vacant portion of the land. This is an example that shows development on vacant land on a partially vacant lot. The permit identified by the blue dot would be considered UGR Vacant and Economic Vacant.

Before

After

2. UGR Redevelopment/Infill and Economic Redevelopment/Infill – In regards to the tear down of a SFD and the rebuilding of skinny houses in its place, if the permit falls on the house itself it would be classified both UGR and Economic Redevelopment. However, if the permit falls on the vacant yard it would be classified UGR Infill and Economic Infill.

Before

After

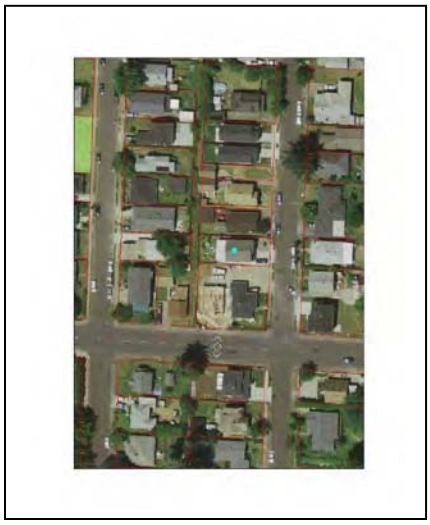
3. In this picture the blue dot falls on property that should have been classified as partially vacant in RLIS. Since it was not, the blue dot would be considered UGR Infill and Economic Vacant. This is an example of a discrepancy that arises due to an error in RLIS. The pink dots on the green space are on land that was properly identified as partially vacant and would be considered both UGR and Economic Vacant.

4. The blue dot below shows UGR Infill, because the taxlot was not considered vacant in RLIS but building a new house did not require the teardown of an existing structure. Since the lot is in a fully developed neighborhood, it may have been overlooked in the vacant lands inventory and never returned to UGR Vacant status. Since there are no existing buildings visible in previous year photos, it was classified as Economic Vacant for this study.

   This example is a judgment call that depends on the context of the lot and building permit under consideration. This lot looks like it might have been part of the developed lot next to it before it was sold off for a new house. In that case, it would be considered Economic Infill because it was part of a developed lot and there was less than half an acre of vacant land available for development. In the future, this type of example would more likely be classified as Economic Infill, however development of this type was consistently classified as Economic Vacant for this study.

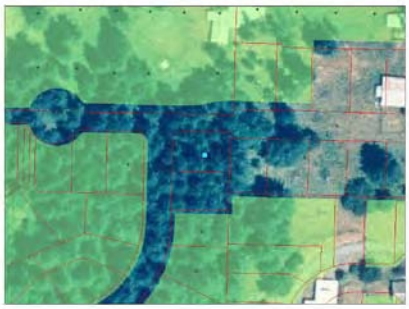
   Pre-Development

   Post-Development



5. Below is another example of how errors can influence the classification of a building permit. This is UGR Infill, Economic Vacant due most likely to surveyor error when checking new development status. The lot with the blue dot on it was probably deemed developed along with the surrounding developing lots before its individual permit was approved. Or it may have been missed in the vacant land layer update.

1996



Pre-Development

Post-Development

6. The following photos show a case where the existing lot is a partially vacant lot, with an existing house that also gets redeveloped. The blue dot on the left is UGR and Economic Vacant, on a partially vacant lot. The blue dot on the right side shows development that is both UGR and Economic Redevelopment. It is possible that another building permit not on the site of the original house, but not on the green vacant land area, could be considered both UGR and Economic Infill.

Pre-Development

Post-Development

7. This is an example of UGR Redevelopment (due to an error in RLIS) and Economic Redevelopment. The blue dot shows the address of the building permit. The year the building permit was issued, 2003, the lot was empty (but not considered vacant), however the 1996 photo shows that there was a house on the lot. This is considered Economic Redevelopment because there once was a building on the lot, even though a significant amount of time passed between the tear down and the replacement (approximately 7 years). More correctly the lot should have been assessed as a vacant lot on the green vacant lot layer in 2003. Then this building permit would correctly be considered UGR Vacant, Economic Redevelopment.

1996

2003 – Permit year

Post Development

8. With condos, the permit may not divulge how many units the application is for, and when geocoded, the permit address will not link to a specific address. General rules created for consistent evaluation are as follows:

When looking at the permit description for the pink dots, each states that the permit is for a five unit condo development. So it can be assumed that each permit is for an entire row of condos. If there is not a description like that, an educated guess can be made by checking the permit value (in these cases, between $400,000 & $500,000), and then checking Portland maps for sale price of an individual condo ($180,000). Because of the higher permit cost (which is based on estimated construction cost), one can assume the permit was for a row of condos.

For instances like the blue dot above, where there is no apparent connection to a specific condo or group of condos, the best reference is to look at surrounding examples. Several things to compare are

1. The permit value – Review the permit value for one of the pink dots. If the blue dot value is comparable, it is most likely the same situation.

2. Street names – Look to see if the street names changed. In the blue dot case, the permit was for the old street name before the development changed a street name. Once this was established, it was easier to find a corresponding house number, and thus the corresponding row of condos.

Data Sources

Regional Land Information System (RLIS) and other data collected and/or maintained by Metro:

- Current and historical taxlots
- Current and historical aerial photographs
- Vacant lands
- Streets

Construction Monitor (http://www.constructionmonitor.com/):

- Building permit data available by subscription service

Appendix 10: Report on the region's past performance

The region's historic performance in achieving its desired outcomes

Unlike past UGRs, this report is intended to assess not only residential capacity and need, but to provide some basic information about how the region has been performing in terms of its six desired outcomes. This appendix compiles information on past performance and relates it to the six desired outcomes that define the characteristics of a successful region.

Preservation of home values

Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity

For most families, a house is their single largest investment. In the Portland metro region, home values have remained relatively stable during a tumultuous two years when values have crashed in many other cities. Given the complexity of the dynamics that influence housing values, it is difficult to explain why some cities have fared better than others. However, it is likely that actions taken at the local and regional level to implement the 2040 Growth Concept, with its focus on reinforcing existing centers and corridors and restrained approach to outward growth, deserve some of the credit.

Costs of living (source: U.S. Bureau of Labor Statistics)

Two primary household budget items are housing and transportation. Operating on the assumption that transportation costs would always be minimal, a common tactic has been to "drive until you qualify for the mortgage." Now it has become clear that energy price increases are here to stay. We must account for the combined cost of housing and transportation when considering housing and transportation choices.

Compared with other cities in the western U.S., the Portland region offers housing and transportation at relatively low prices. When these costs are expressed as a percentage of income, the Portland region is about average in affordability (amongst cities in the western U.S.).

Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices
6. Equity

Average annual cost of housing[1] per household (2005)

Phoenix	$ 8,414
Portland	$ 9,862
Denver	$10,078
Seattle	$10,741
Honolulu	$10,887
Anchorage	$11,391
Los Angeles	$13,030
San Diego	$14,511
San Francisco	$15,947

Average annual cost of transportation per household (2005)

Denver	$8,646
Portland	$8,845
Seattle	$9,491
San Francisco	$9,518
Honolulu	$9,921
Phoenix	$10,549
Los Angeles	$10,972
San Diego	$11,301
Anchorage	$12,596

Average annual cost of housing and transportation per household (2005):

Portland	$18,707
Denver	$18,724
Phoenix	$18,963
Seattle	$20,232
Honolulu	$20,808
Anchorage	$23,987
Los Angeles	$24,002
San Francisco	$25,465
San Diego	$25,812

Average annual cost of housing and transportation as a percent of income (2005)

Denver	29%
San Francisco	29%
Honolulu	30%
Phoenix	31%
Seattle	32%
Portland	33%
Anchorage	34%
Los Angeles	36%
San Diego	37%

[1] "shelter" portion only of housing costs only

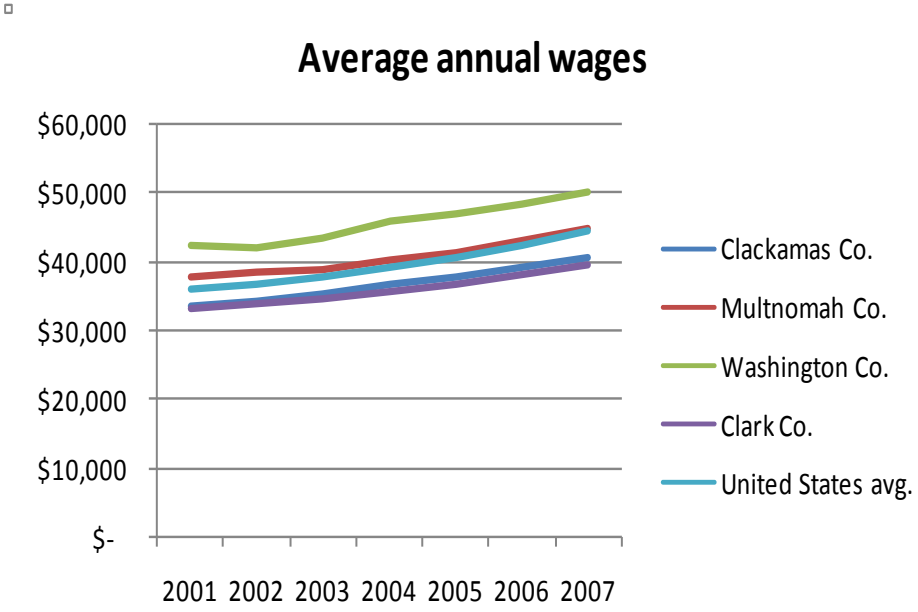
Average annual wages (U.S. Bureau of Labor Statistics)

Applies to desired outcome(s):

2. Economic competitiveness and prosperity

6. Equity

The ability to find gainful employment is an important measure of the economic and social well-being of the region. Average annual wages in both Multnomah and Washington counties have consistently exceeded the national average. A healthy economy is the product of many factors, including the preservation of the region's quality of life, which is an important attractor of employers and a skilled work force.



Water quality (source: Oregon Department of Environmental Quality)

Applies to desired outcome(s):

5. Clean air and water, healthy ecosystems

How we care for our watersheds now and in the future will be a critical means of preserving our region's environmental health and its identity as a leader in conservation and sustainability. The Oregon Water Quality Index (OWQI) is tracked by the Oregon Department of Environmental Quality. The index analyzes a defined set of water quality variables and produces a score describing general water quality. The water quality variables included in the OWQI are temperature, dissolved oxygen (percent saturation and concentration), biochemical oxygen demand, pH, total solids, ammonia and nitrate nitrogens, total phosphorus, and bacteria.

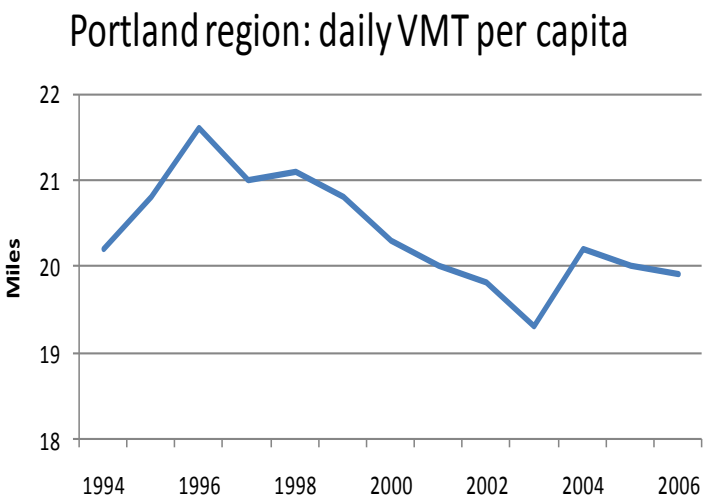
	2003	2004	2005	2006
Sandy River at Troutdale Bridge	91	91	91	90
Beaverton Creek at Cornelius Pass Rd. (Orenco)	53	55	56	54
Clackamas River at High Rocks	91	91	91	92
Clackamas River at McIver Park	95	95	95	95
Clackamas River at Memaloose Rd.	92	92	92	95
Columbia Slough at Landfill Rd.	37	39	43	44
Fanno Creek at Bonita Rd. (Tigard)	62	61	61	62
Johnson Creek at SE 17th Ave. (Portland)	29	29	31	30
Swan Island Channel midpoint (Willamette River)	80	81	81	81
Tualatin River at Boones Ferry Rd.	59	61	60	57
Tualatin River at Elsner Rd.	66	66	65	63
Tualatin River at Hwy 210 (Scholls)	65	65	63	62
Tualatin River at Rood Bridge	76	78	78	80
Willamette River at Hawthorne Bridge	82	83	84	85
Willamette River at SP&S railroad bridge (Portland)	79	80	84	82
Columbia River at Portland Marker 47	82	83	83	86

Very poor	Poor	Fair	Good	Excellent
Less than 60	60 – 79	80 - 84	85 - 89	90 - 100

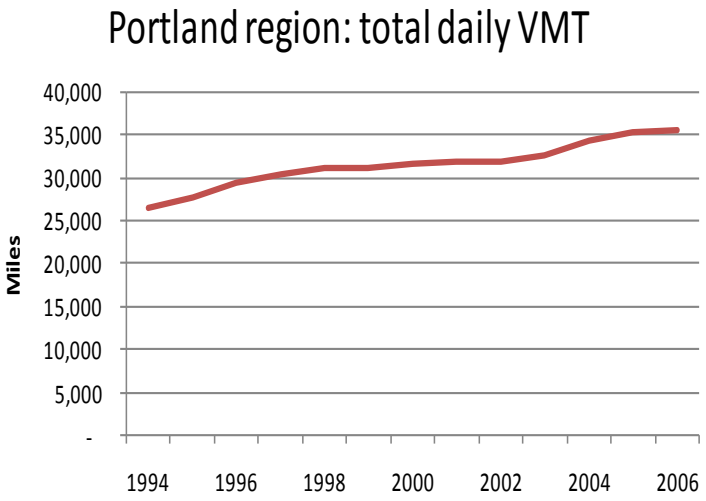
Vehicle miles travelled (VMT) (source: Federal Highway Administration)

Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices
4. Reduce greenhouse gas emissions
5. Clean air and water, healthy ecosystems



On average, each of us is driving less than we did in the mid 1990s. This is a trend that will need to continue in order to reduce greenhouse gas emissions.



However, we will need to see even greater reductions in per capita VMT. Because of population growth, total daily VMT for the region has increased. In order to reduce greenhouse gas emissions below 1990 levels[2], each of us (and future residents) will need to drive much less than we do today. The compact urban form envisioned in the 2040 Growth Concept is the surest way to make that reduction in total VMT.

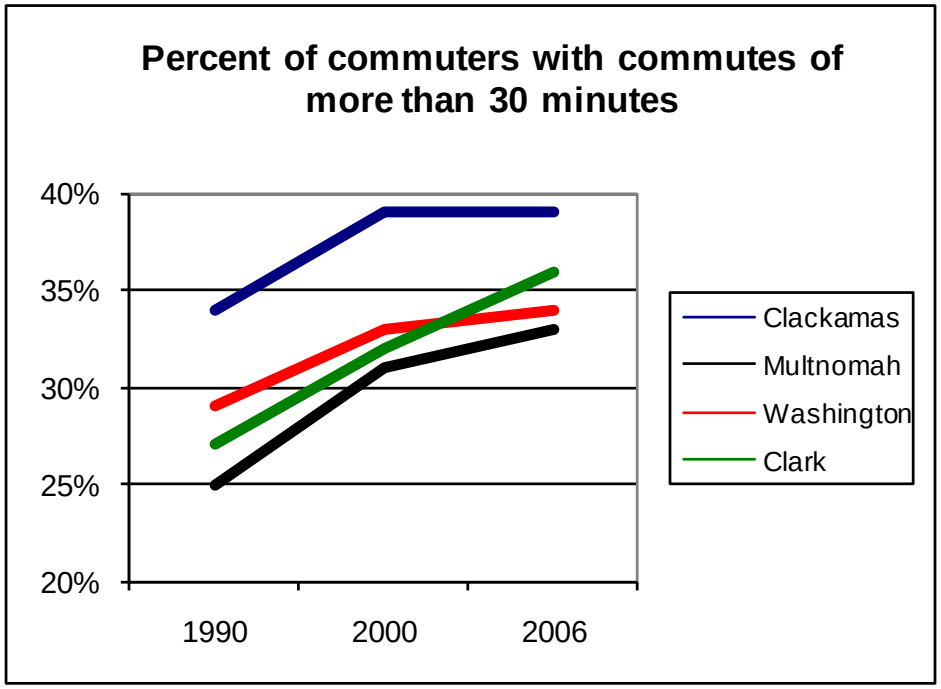
[2] Oregon state law requires that growth in greenhouse gas emissions be halted by 2010, that emissions be reduced to 10% below 1990 levels by 2020, and 75% below 1990 levels by 2050.

Commute time (source: U.S. Census Bureau)

Good growth management practices can help to reduce the distance between home and work. However, as the region has matured as a metropolitan area, commute times have increased. A steadfast commitment to good land use policy, reinforcement of centers and corridors, and smart transportation investments remain the most effective means of moderating commute times (and other trip times).

Applies to desired outcome(s):

2. Economic competitiveness and prosperity
3. Transportation choices
4. Reduce greenhouse gas emissions
5. Clean air and water, healthy ecosystems
6. Equity



Commute by bicycle

(source: U.S. Census)

In many communities throughout the United States, commuting by bicycle is all but impossible. Many cities in our region have been planned in ways that make bicycle commuting a viable and pleasant option. There's still much room for improvements, however.

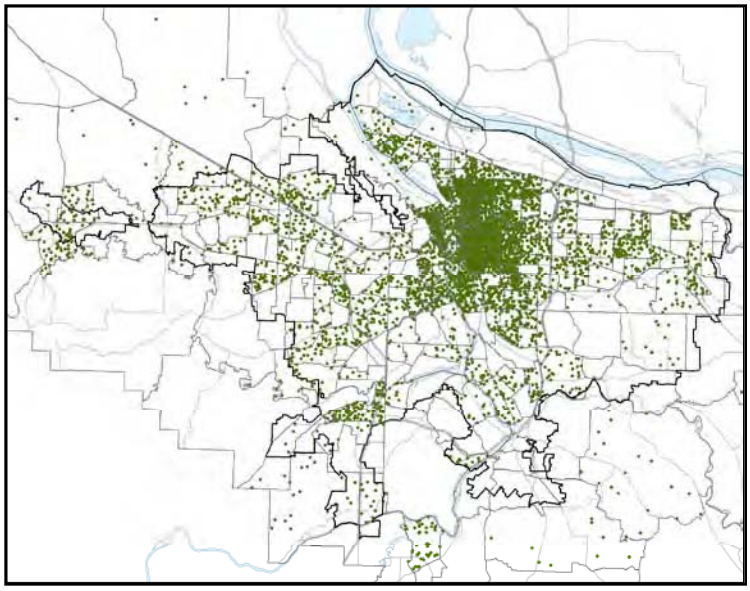
Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices
4. Reduce greenhouse gas emissions
5. Clean air and water, healthy ecosystems
6. Equity

1990	
Sacramento	1.9%
Seattle	1.5%
Portland	1.1%
Phoenix	1.1%
San Diego	1.1%
San Francisco	1.0%
Hillsboro	0.9%
Beaverton	0.7%
Los Angeles	0.6%
Gresham	0.3%
New York	0.3%
Atlanta	0.3%
Lake Oswego	0.0%

2000	
San Francisco	2.0%
Seattle	1.9%
Portland	1.8%
Sacramento	1.4%
Phoenix	0.9%
San Diego	0.7%
Los Angeles	0.6%
New York	0.5%
Gresham	0.4%
Hillsboro	0.4%
Beaverton	0.3%
Atlanta	0.3%
Lake Oswego	0.2%

2006	
New York	5.5%
Portland	4.2%
Seattle	2.3%
San Francisco	2.3%
Sacramento	1.3%
Hillsboro	1.1%
Beaverton	0.9%
San Diego	0.8%
Los Angeles	0.6%
Phoenix	0.6%
Atlanta	0.5%



Year 2000 (3-county area)
One dot = one bike commuter
.9% of commuters
6,425 bike commuters

Commute by transit (source: U.S. Census)

Our region has good reasons to be proud of the transit system that we continue to build. But, we should continue to strive for better. Several other cities in the U.S. provide examples of how much more we may be able to increase transit ridership.

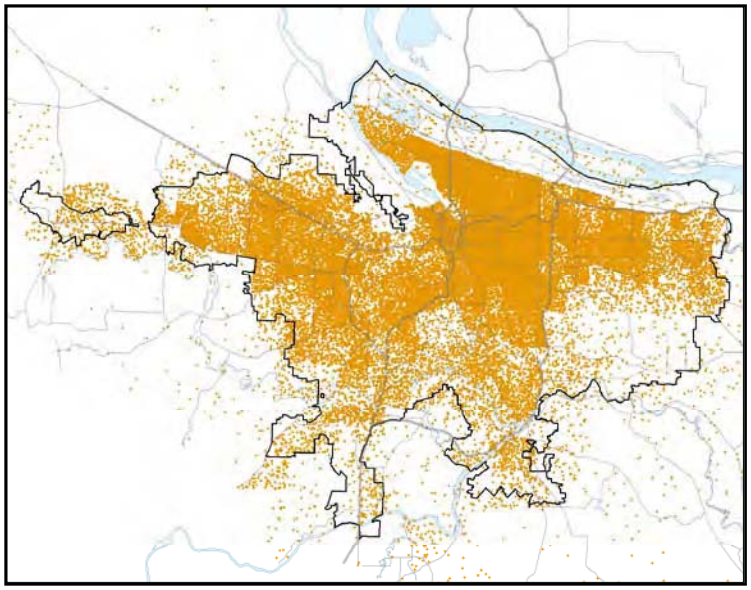
Applies to desired outcome(s):

7. Vibrant, walkable communities
8. Economic competitiveness and prosperity
9. Transportation choices
10. Reduce greenhouse gas emissions
11. Clean air and water, healthy ecosystems
12. Equity

1990	
New York	51.9%
San Francisco	33.2%
Atlanta	19.7%
Seattle	15.8%
Portland	11.0%
Los Angeles	10.5%
Gresham	5.5%
Beaverton	4.9%
San Diego	4.2%
Sacramento	4.0%
Hillsboro	3.5%
Phoenix	3.1%
Lake Oswego	2.9%

2000	
New York	52.8%
San Francisco	31.1%
Seattle	17.6%
Atlanta	15.0%
Portland	12.3%
Los Angeles	10.2%
Beaverton	8.3%
Gresham	7.6%
Hillsboro	6.5%
Sacramento	4.6%
San Diego	4.2%
Lake Oswego	3.7%
Phoenix	3.3%

2006	
New York	54.2%
San Francisco	30.3%
Seattle	17.8%
Atlanta	14.8%
Portland	12.6%
Los Angeles	10.9%
Beaverton	10.1%
Hillsboro	7.7%
Sacramento	4.6%
San Diego	4.1%
Phoenix	3.7%



Year 2000 (3-county area)
One dot = one transit commuter
7.6% of commuters
55,831 transit commuters

Commute by driving alone (source: U.S. Census)

Driving alone remains the predominant mode of commuting in our region. In order to make other modes viable choices for more people, we must continue taking an integrated approach to land use and transportation.

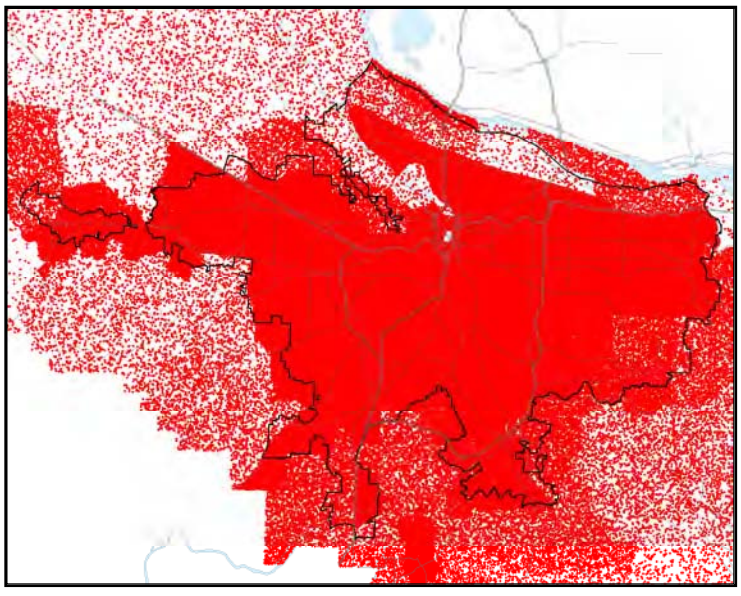
Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices
4. Reduce greenhouse gas emissions
5. Clean air and water, healthy ecosystems
6. Equity

1990	
New York	24.0%
San Francisco	38.5%
Seattle	58.7%
Atlanta	61.2%
Portland	65.0%
Los Angeles	65.2%
San Diego	70.7%
Sacramento	71.7%
Hillsboro	73.4%
Phoenix	73.7%
Gresham	75.7%
Beaverton	76.7%
Lake Oswego	81.9%

2000	
New York	24.9%
San Francisco	40.5%
Seattle	56.5%
Portland	63.7%
Atlanta	64.0%
Los Angeles	65.7%
Sacramento	71.0%
Phoenix	71.7%
Beaverton	72.5%
Gresham	72.5%
Hillsboro	73.4%
San Diego	74.0%
Lake Oswego	78.8%

2006	
New York	23.5%
San Francisco	40.5%
Seattle	55.2%
Portland	60.6%
Atlanta	64.9%
Los Angeles	67.2%
Hillsboro	68.3%
Sacramento	72.5%
Phoenix	72.7%
San Diego	74.7%
Beaverton	75.0%



Year 2000 (3-county area)
One dot = one drive alone commuter
71.5% of commuters
523,140 drive alone commuters

Commute by walking (source: U.S. Census)

The ability to walk to work is perhaps the most basic measure of how the region is faring in creating a compact urban form. By this measure, some of our region's communities are faring better than others.

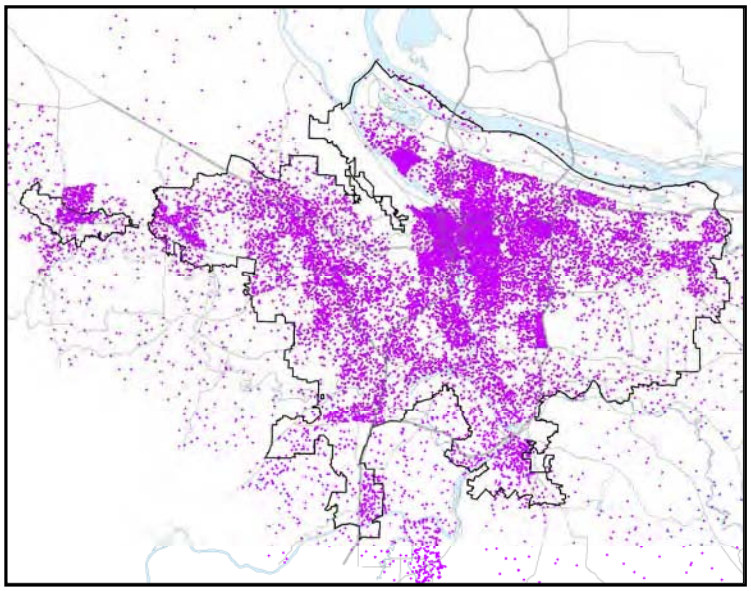
Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices
4. Reduce greenhouse gas emissions
5. Clean air and water, healthy ecosystems
6. Equity

1990	
New York	10.7%
San Francisco	9.8%
Seattle	7.2%
Portland	5.6%
San Diego	4.9%
Los Angeles	3.9%
Atlanta	3.8%
Sacramento	3.4%
Phoenix	2.7%
Hillsboro	2.6%
Beaverton	2.3%
Gresham	1.6%
Lake Oswego	1.6%

2000	
New York	10.4%
San Francisco	9.4%
Seattle	7.4%
Portland	5.2%
San Diego	3.6%
Los Angeles	3.6%
Atlanta	3.5%
Beaverton	3.1%
Sacramento	2.8%
Hillsboro	2.2%
Phoenix	2.2%
Lake Oswego	2.0%
Gresham	1.8%

2006	
New York	9.8%
San Francisco	9.6%
Seattle	8.4%
Portland	5.2%
Atlanta	4.6%
Hillsboro	4.2%
San Diego	3.6%
Los Angeles	3.4%
Sacramento	3.0%
Beaverton	2.4%
Phoenix	1.9%



Year 2000 (3-county area)
One dot = one walk commuter
3.2% of commuters
23,761 walk commuters

Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices

Active living (source: Centers for Disease Control)

Urban form plays an important role in either encouraging or discouraging physical activity. The opportunity to visit open spaces or incorporate biking or walking into everyday routines are a couple of ways that residents of the Metro region have benefited from a tradition of good planning.

Percent of metropolitan area population that gets recommended amount of physical activity (year 2005)

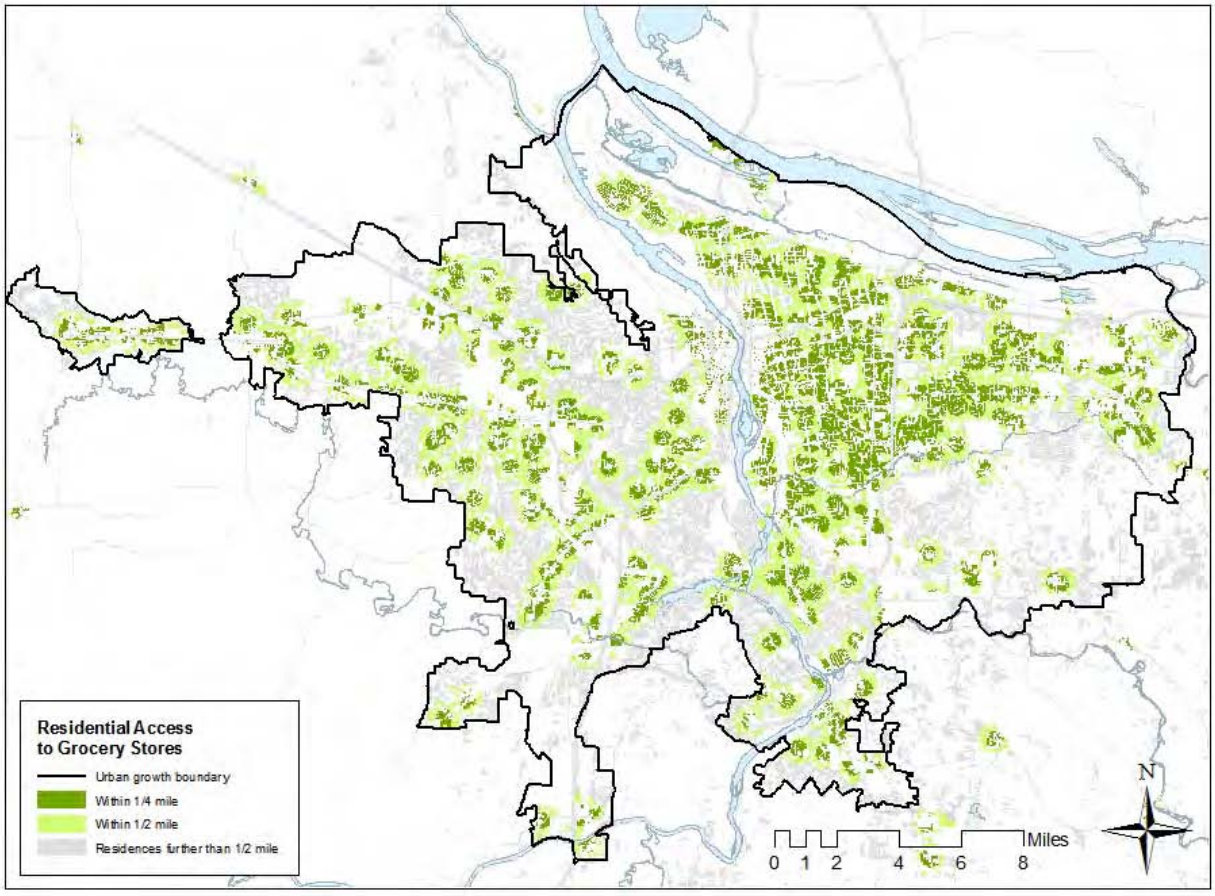
San Francisco	53%
Portland	52%
San Diego	52%
Seattle	51%
Phoenix	51%
Denver	50%
Albuquerque	48%
Los Angeles	45%
Austin	44%
Atlanta	41%

Grocery store[3] within walking distance

Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Transportation choices
6. Equity

Many communities in our region have mixed-use developments that give people the option of walking to take care of everyday tasks such as grocery shopping. These communities are vibrant places to live and work and will be key to reducing the region's auto dependence.



[3] Includes convenience stores

Jobs-to-housing balance

Ideally, people would live close to where they work, thereby saving money and time spent commuting. However, for a number of reasons, achieving a jobs-to-housing balance at the local jurisdiction level (i.e. city) does not appear to have the intended effect of shortening commutes:

- Many households have two or more employees, thereby reducing the likelihood that all members of a household will find employment in their city of residence.
- Employees have specific qualifications and wage requirements that will not necessarily be met by jobs that are nearby.
- Employers have specific worker requirements that will not necessarily be fulfilled by the local labor pool.
- Workers may change jobs with some frequency, but each job change will not necessarily result in a residential move.
- Wages and rents may be mismatched for an employee in a given city.

Data from the U.S. Census Bureau (Longitudinal Employer-Household Dynamics) indicate that many Metro region residents make commutes[4] not only to other cities, but to other counties. However, most trips are for non-commute purposes. Creating a local mix of uses is an important means of reducing non-commute trip frequency and distance.

Year 2006 data on commute behavior are summarized on the following pages for Clackamas, Clark, Washington and Multnomah counties.

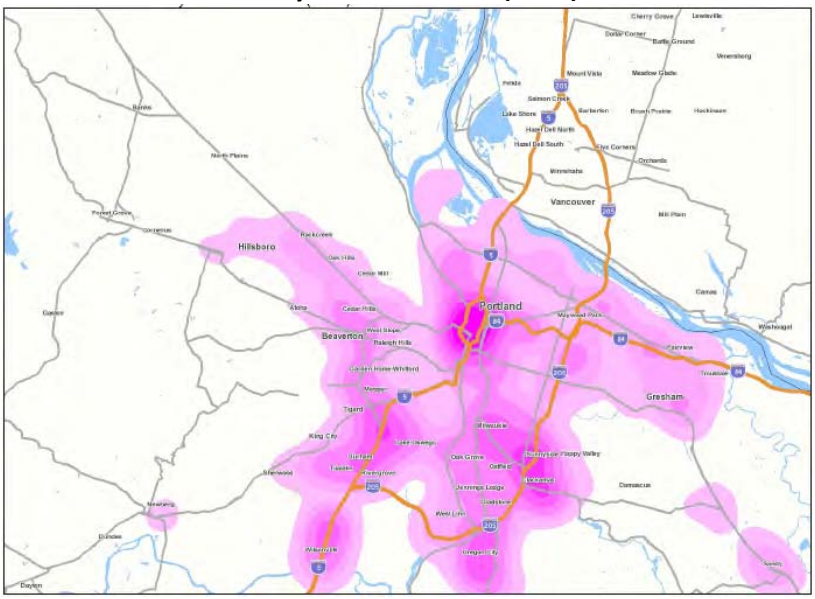
[4] Data on following pages is for primary job only

Jobs-to-housing balance: Clackamas County

Source: U.S. Census Bureau (Longitudinal Employer-Household Dynamics)

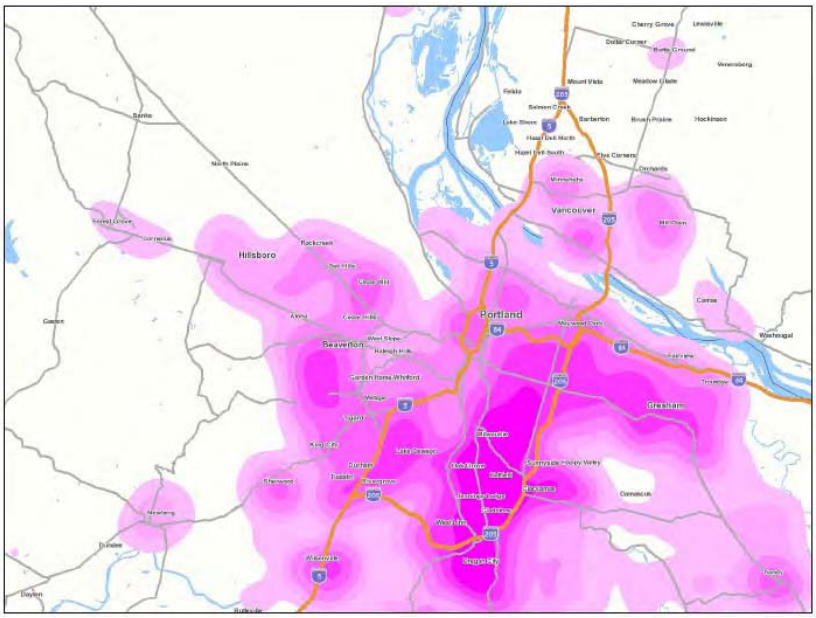
Clackamas County is sending workers to and attracting workers from locations throughout the region.

Where Clackamas County residents work (2006)



Portland	29.6%
Oregon City	5.3%
Beaverton	4.0%
Lake Oswego	3.8%
Tigard	3.7%
Milwaukie	3.6%
Wilsonville	3.4%
Gresham	3.3%
Tualatin	2.9%
Hillsboro	2.0%
All Other Locations	38.6%

Where Clackamas County workers reside (2006)



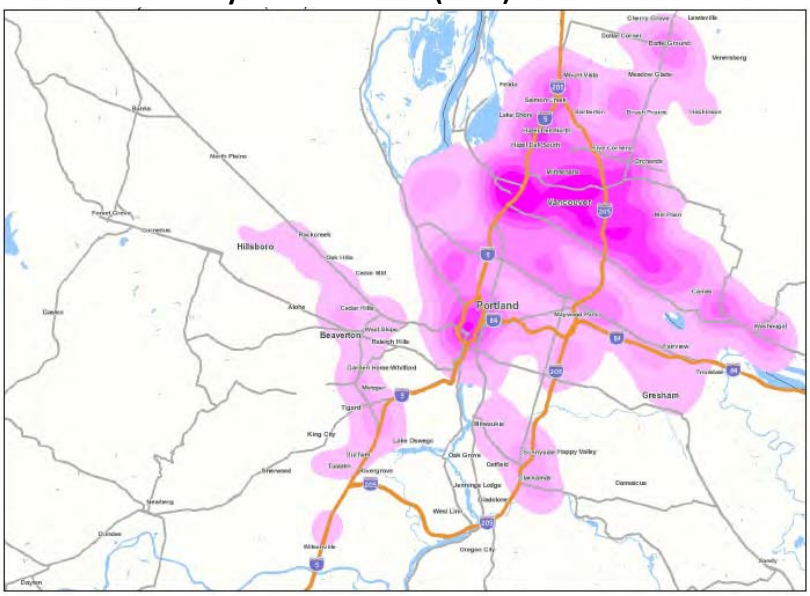
Portland	19.4%
Gresham	4.6%
Oregon City	4.5%
Lake Oswego	3.0%
Beaverton	3.0%
West Linn	2.8%
Milwaukie	2.6%
Salem	2.5%
Oatfield	2.3%
Canby	2.2%
All Other Locations	53.0%

Jobs-to-housing balance: Clark County

Source: U.S. Census Bureau (Longitudinal Employer-Household Dynamics)

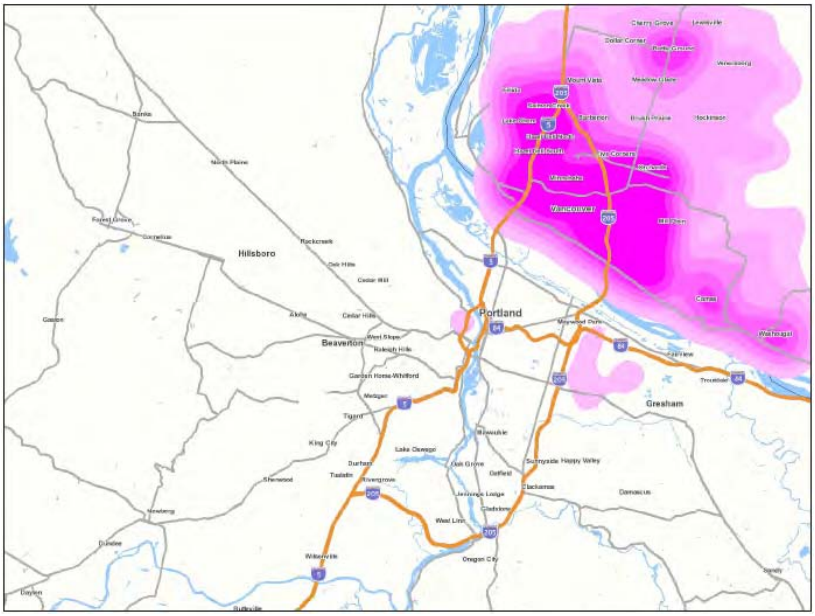
Many Clark County residents commute to jobs in the Metro region, particularly in Portland. However, most of Clark County's jobs are filled by those who live north of the Columbia River.

Where Clark County residents work (2006)



Vancouver	31.4%
Portland	21.9%
Camas	3.1%
Orchards	1.9%
Salmon Creek	1.9%
Walnut Grove	1.7%
Battle Ground	1.6%
Seattle	1.6%
Five Corners	1.5%
Gresham	1.5%
All Other Locations	31.9%

Where Clark County workers reside (2006)



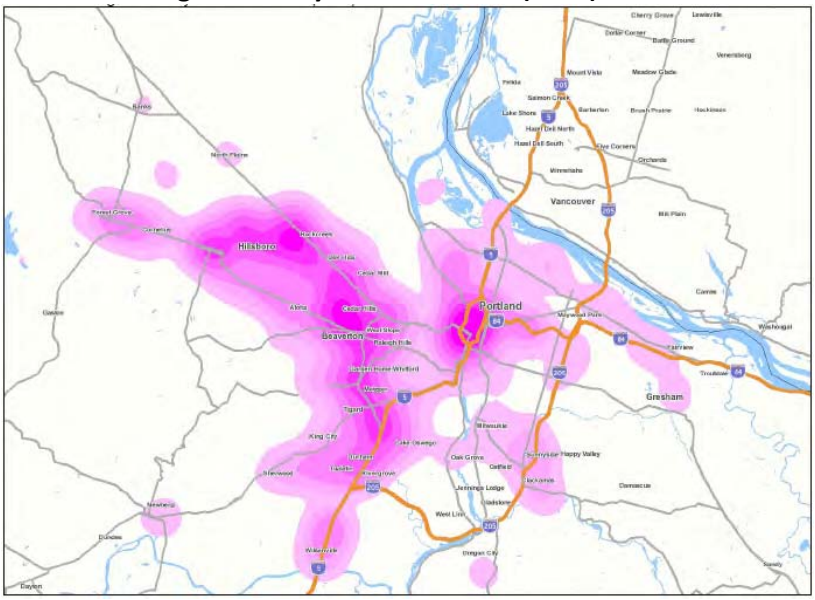
Vancouver	29.3%
Portland	5.0%
Orchards	4.3%
Salmon Creek	3.8%
Camas	3.2%
Five Corners	3.0%
Battle Ground	2.9%
Washougal	2.4%
Hazel Dell North	2.2%
Mill Plain	2.1%
All Other Locations	41.8%

Jobs-to-housing balance: Washington County

Source: U.S. Census Bureau (Longitudinal Employer-Household Dynamics)

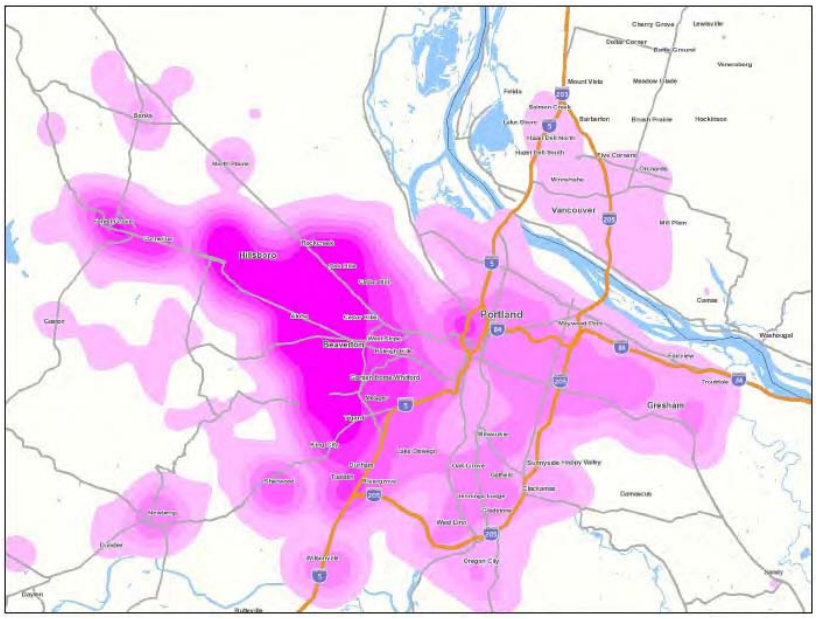
Washington County is sending workers to and attracting workers from locations throughout the region.

Where Washington County residents work (2006)



Portland	25.1%
Hillsboro	16.7%
Beaverton	15.6%
Tigard	6.1%
Tualatin	3.2%
Forest Grove	2.2%
Lake Oswego	2.1%
Wilsonville	2.0%
Aloha	1.8%
Salem	1.4%
All Other Locations	23.8%

Where Washington County workers reside (2006)



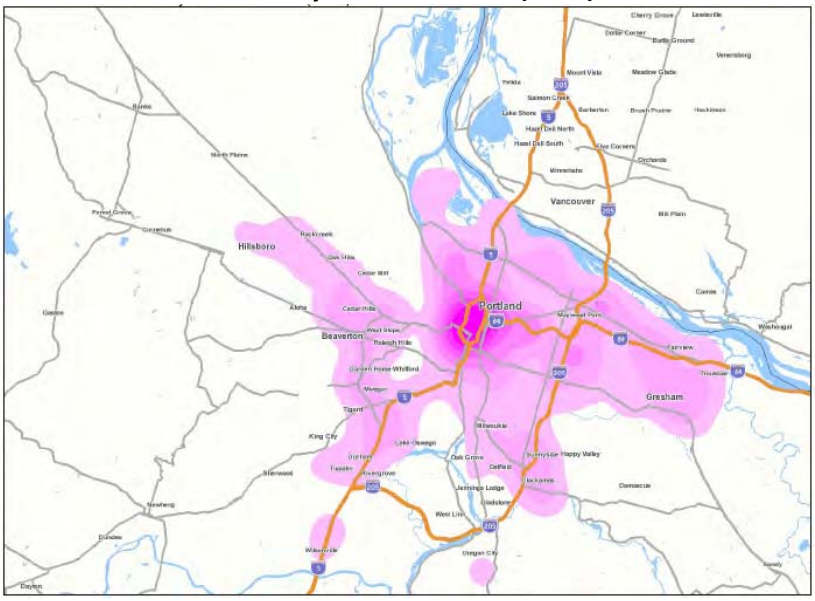
Portland	17.0%
Hillsboro	10.6%
Beaverton	9.9%
Aloha	5.2%
Tigard	3.9%
Forest Grove	2.5%
Tualatin	2.0%
Gresham	1.9%
Lake Oswego	1.7%
Vancouver	1.5%
All Other Locations	43.8%

Jobs-to-housing balance: Multnomah County

Source: U.S. Census Bureau (Longitudinal Employer-Household Dynamics)

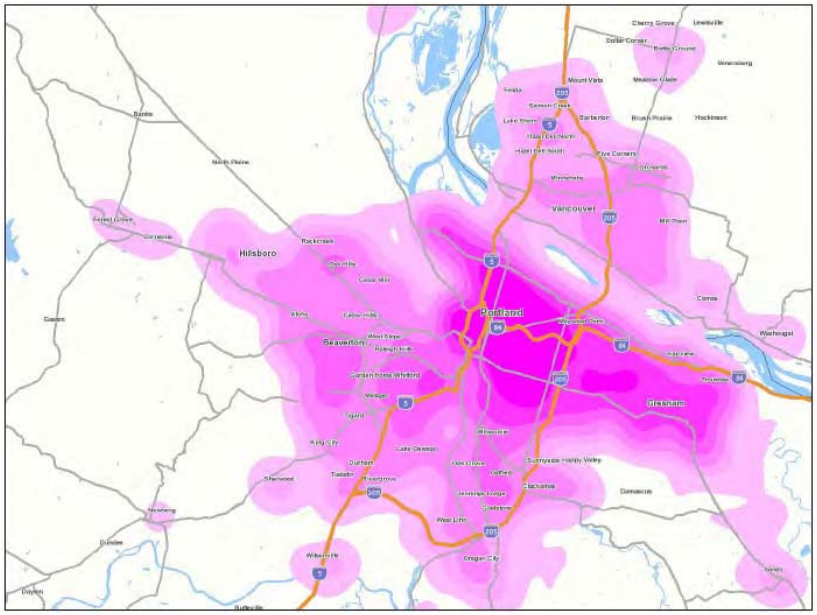
Multnomah County is sending workers to and attracting workers from locations throughout the region.

Where Multnomah County residents work (2006)



Portland	58.2%
Gresham	5.9%
Beaverton	4.7%
Hillsboro	2.6%
Tigard	2.6%
Vancouver	1.5%
Lake Oswego	1.4%
Milwaukie	1.4%
Tualatin	1.3%
Salem	1.2%
All Other Locations	19.2%

Where Multnomah County workers reside (2006)



Portland	42.6%
Gresham	7.2%
Vancouver	4.2%
Beaverton	3.5%
Hillsboro	1.8%
Lake Oswego	1.6%
Tigard	1.5%
Troutdale	1.3%
Aloha	1.3%
Milwaukie	1.2%
All Other Locations	33.8%

Employment Demand Factors & Trends

Task 1 Report - Metro Employment & Economic Trends Analysis

Final Draft

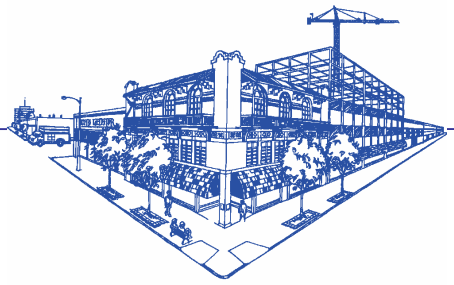
Prepared for:

Metro

March 2009

E. D. Hovee
& Company, LLC

Economic and Development Services



Employment Demand Factors & Trends

Task 1 Report - Metro Employment & Economic Trends Analysis

Final Draft

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March 2009

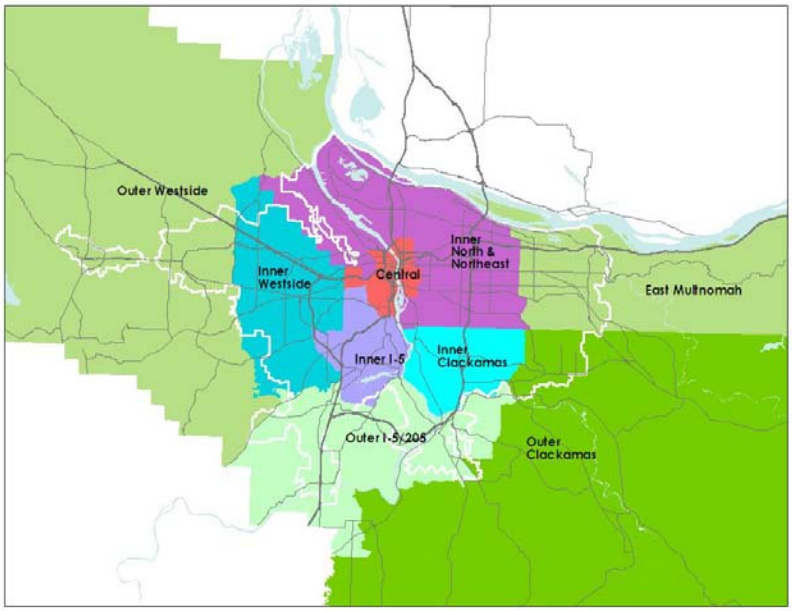
EMPLOYMENT DEMAND ANALYSIS OVERVIEW

Metro is engaged in conducting an employment and economic trends analysis for the Portland metropolitan region. This report covers *Task 1,* describing employment trends and demand factors and focused on the region's documented experience over the 2000-2006 time period.

For this analysis, the three-county Metro region has been divided into nine geographic subareas, which can be further aggregated to three overall *ring geographies:*

- Central (also a subarea of its own)
- Inner ring (Inner North & East, Inner Westside, Inner I-5 an Inner Clackamas)
- Outer ring (Outer Westside, East Multnomah County, Outer Clackamas and Outer I-5/205).

Market Area Geographies



This overview highlights major observations and findings from this Task 1 *Employment Demand Factors and Trends* analysis report, including a summary of implications for shaping a new employment land demand paradigm. Employment is one of many approaches to measuring economic activity. Because the focus of this report is how business uses land, employment and building development are emphasized. Other factors – such as wage levels, technology and capital intensiveness, monetary output and comparative regional advantage (or location quotients) – are not considered. This report also does not evaluate which industries and jobs the region should endeavor to encourage, but rather reports past trends as illustrated via employment data.

EMPLOYMENT TRENDS SUMMARIZED

Employment trends have been evaluated by market subarea geography, 2040 Design Types and by NAICS industry sector. Consistent with the forecast allocation approach being recommended, primary emphasis and confidence is placed on summary data for the subarea and design type geographies.

Employment by Industry Sector. As of 2006, the tri-county region (both inside and outside the Urban Growth Boundary) had total non-agricultural covered employment estimated at 842,000 jobs. This represents an increase of roughly 22,500 jobs since 2000, a relatively slow

0.5% annual job growth over a period marked by an economic downturn and subsequent recovery.

This is the longest time period for which subregional data is available and encompasses close to a full economic cycle. However, growth within this time period was far weaker than the 2.9% annual average growth experienced during the previous decade (see Figure 1, Chapter 1).

In 2006, the tri-county area captured 83% of jobs within the larger seven-county region, with the bulk of remaining jobs located in Clark County, Washington. This was a slight reduction from its year 2000 capture rate of 84%.

Sectoral shifts in the region's employment reflect the evolution of business job classification, as well as actual job losses and gains. When viewed by industry sector, the following key region-wide trends are noted:

- The service sector is associated with by far the largest recent growth and in 2006 accounted for 56% of the tri-county's covered employment.
- Health care and social assistance dominated service sector job growth, with a net gain of 17,000 jobs. Other growth service industries included accommodation and food service, management of companies and public administration.
- The industrial sector includes construction, utilities, manufacturing and wholesale and distribution. In 2006 30% of tri-county jobs were within the industrial sector, a decline from this sector's 32% share in 2000. Regional employment shifted away from this sector at an average annual rate of 0.6% and a reported total decline of 8,800 jobs.
- Manufacturing, a subset of the industrial sector, reported a net loss of 6,700 jobs. This is associated both with businesses retracting and moving outside of the tri-county area (including to Clark County), and a shifting in businesses' self-description of their employment away from industrial SIC/NAICS job classifications. A countervailing trend of note over this time period is manufacturing output, which the Bureau of Economic Analysis reports increased by more than $9 billion for the seven-county region between 2001 and 2006. Within the manufacturing sector, business growth (or profit) appears to contradict job growth, due in part to high commodity pricing and strong export markets. Equivalent data for other industrial sectors such as transportation and warehousing is suppressed due to confidentiality.
- Retail jobs also declined over this time period. Ten percent of tri-county employment is within the retail sector, which contracted at a reported rate of -1.2% annually for a net loss of 6,300 jobs between 200 and 2006. This contrasts with the 2.3% annual job growth rate retail experienced during the 90s. *Note:* prior to 2000, retail included dining (with SIC job classification). Post-2000, NAICS places dining within the service sector.

Employment by Market Subarea. Based on the subareas defined for this analysis:

- About one-half of the tri-county region's 2006 employment was located within the largely developed inner ring geography; the remainder was divided between the central ring and the outer ring.

- This distribution of regional employment is shifting, as central and inner ring geographies lost jobs by between 0.2% and 0.5% annually during the first half of this decade, and outer ring geographies added jobs at a pace above 3% per year. While outside of the purview of this report, Clark County also reported rapid job growth during this time period of 2.2% annually. This growth rate is below the tri-county outer ring subareas and significantly above the over-all tri-country growth rate of 0.5%.
- Service sector jobs increased throughout the region, in all but one subarea. The Central subarea and Outer Westside subareas report especially strong service sector gains at 10,400 and 7,000 net new jobs respectively. This likely reflects both job growth and some job reclassifications.
- Within the inner ring, the Central and North & Northeast subareas show the largest job loss, particularly for industrial jobs. Together, these two submarkets report a decline of 24,000 industrial jobs, resulting in a net job loss across all sectors of 16,800. Most inner ring geographies also experienced retail job losses, for a combined central/inner ring loss of 7,800 retail jobs.
- In contrast, outer ring subareas added industrial jobs, enough to off-set about 65% of inner/central ring losses (but still resulting in a regional industrial employment decline). Retail job growth was also widespread across outer ring subarea (+3,200), enough to off-set about 50% of inner/central ring employment decline.

Employment by Design Type. Job growth also has been analyzed for 2040 Design Types:

- All of the *urban-focused* 2040 Design Types (centers and corridors) reported job growth occurring at rates below the 0.5% annual growth rate experienced region-wide with the exception of Town Centers, which grew at an equivalent pace. City Center and Corridors reported half as rapid growth (0.2% annually) and Regional Centers reported an extremely low 0.03% annual growth rate. This did vary by subarea, as discussed in the body of the report. Service and public sector jobs fueled what growth did occur within these most urban of the 2040 Design Types, with the exception of Town Centers which also reported retail growth.
- *Title 4* Industrial Areas are associated with the strongest growth rate at 4.3% annually, primarily via industrial jobs. However, approximately 30% of net new jobs locating in Industrial Areas were non-industrial (primarily service sector) jobs. The bulk of Industrial Areas (85%) are located within the region's outer ring. Employment Areas (58% of which are in the outer ring) grew more slowly at 2.4%, primarily through service sector jobs that offset a significant shift away from industrial employment. Regionally Significant Industrial Areas (RSIAs) reported a job base erosion of close to 1% annually. RSIAs are predominantly located within the central and inner ring geographies; about 70% are within the Portland harbor/Columbia Corridor.

DEVELOPMENT TRENDS SUMMARIZED

Development of industrial, commercial and mixed use building space for employment use has also been evaluated at a subregional level using the proprietary CoStar real estate inventory. This analysis addresses questions of how job growth corresponds to real estate development, the form

of recent development throughout the region and to the extent to which these patterns have changed in recent years.

Industrial & Commercial Development Trends. The commercial real estate industry typically distinguishes between industrial (including flex space), office and retail building types, a classification scheme far more generalized than job sectors. Key trends are summarized by building type and highlight the differences between subarea and design type geographies.

Overview Notes:

- Despite a regional shift away from *industrial* sectors jobs between 2000 and 2006, the CoStar commercial real estate inventory indicates that over 17 million square feet of industrial space has been completed since 2000 (although 'recent development' covers a longer time frame, through January 2009 rather than through 2006). This partly reflects a dispersal of service sector jobs into lower cost industrial and retail building formats, but also indicates a disconnect between job trends and development trends.
- While reported *retail* jobs declined, CoStar data indicates that 9.3 million square feet of new retail space was developed throughout the region. Some of this space outside of regional retail centers undoubtedly accommodates service sector (including dining related) employment.
- The region's service sector driven job gains of close to 40,000 (including public sector) have served as a major impetus for the more than 9.5 million square feet of net added *office* space.
- Some discrepancies between building space and job numbers may exist as the result of mixing different data sources. However, this analysis clearly suggests that the development of industrial and commercial *real estate product* has out-paced job gains since 2000, throughout the region.

Industrial Development:

- Aligning with reported industrial job trends, a substantial portion of new industrial building product appears to be concentrated in the tri-county region's outer ring (61%). Clark County also developed significant industrial product over this time period. Virtually no net new product classified as industrial has been built in the Central subarea since 2000.
- Post-2000 industrial development has concentrated in the subareas of Inner North and Northeast (inner ring), and East Multnomah and Outer I-5/205 (outer ring).
- The vast majority of both historic and recently developed industrial space is classified as distribution or warehouse throughout the region.
- Most industrial product remains 1-2 story in height, with a few notable exceptions such as Intel's Ronler Acres (half office, 4 stories) and two-story buildings that house clean rooms, warehouse and food processing in other outer ring subareas.
- Flex space (typically with 50%+ office use) remains a small component of the over-all industrial market. It is heavily concentrated in the Inner Westside, with recent development also favoring outer Westside subareas. About 30% of post-2000 flex space

is two stories, mostly in conjunction 30,000-40,000 square foot structures in campus-oriented business or office parks.

Office Space Development:

- The outer ring's share of commercial buildings (both office and retail) close to doubled for post-2000 development.
- The Central subarea continues to support a slight majority of the region's office inventory (52%). Since 2000, however, the Central subarea has captured only 26% of the 9.5 million square feet of new office space developed in the tri-county region. In contrast, 41% of new development has located within the inner-ring (and 33% in the outer ring).
- The Central subarea retains its Class A office space dominance with 58% of the region's inventory, but Class A space developed since 2000 has been fairly evenly distributed between the Central subarea and the inner and outer ring.

Retail Development:

- New retail development has favored outer ring subareas, which have captured close to 50% of all post-2000 retail development (and virtually 100% of net retail job gains). In comparison, Portland's Central subarea has captured just 10% of new retail building development.
- As might be expected, with recent retail development larger retail centers have favored the outer ring subareas whereas smaller centers and main street development have dominated Central subarea and inner ring development patterns.

Structured Parking:

- While not generally considered a real estate development product of its own, structured parking is critical to achieving the higher urban densities associated with the 2040 design concept. To date, structured parking development remains limited to narrow geographies and uses within the region.
- Outside of the Central City, office buildings within Washington Square regional center Kruse Way (Inner I-5 subarea) have developed some structured parking without public subsidy.
- Within the Central subarea, a substantial portion of structured parking for retail customer use is provided as part of the City of Portland's *Smart Park* system. Outside of Central subarea mixed-use products, structured parking is confined to regional malls within the inner ring and Outer Westside subareas.
- Medical institutions and smaller medical office buildings are a prime sponsor of structured parking, especially in the Inner Ring and the Outer Westside subareas. Major corporate campuses – such as Nike, Adidas and Intel – have also developed structured parking over the last 10 years.
- Other identified examples of structured parking are municipal sponsored, either serving city offices (Hillsboro) or a private development supported by public funding support (for instance, the Beaverton Round). The region's office, business and industrial parks still generally rely primarily upon surface parking lots.

Intensity of Employment Development. This analysis operationalizes development density via the metric of floor area ratios (FARs), which are calculated by dividing building square footage by land square footage. Key observations are noted as follows:

- Commercial sector building development – office and retail – has become denser post-2000 across the region, although at present only the Central subarea is associated with FARs averaging above 1.0.
- All subareas for which data is available report substantial post-2000 commercial FAR increases ranging between 80% and 170% compared to development on the ground pre-2000.
- On average, even inner ring subareas continue to build commercial and industrial at single-level, surface-parking densities (FARs below 0.5). An important caveat for this analysis is that square footage data appears to be extremely limited for development within Washington and Clackamas Counties.
- Within the region's urban-focused 2040 Design Types, employment-related FARs are much higher, approaching 1.0 within regional centers and exceeding 0.40 within town centers and corridors. These areas clearly appear to have densified in recent years (post-2000).
- Title 4 areas – RSIAs, Employment and Industrial Areas – report typical industrial and office FARs of 0.30, with little variation over time (except for RSIAs where FARs have increased for development occurring post-2000).

DEMAND FACTORS

The final chapter of this Task 1 report covers several topics of special interest in allocating job growth to the region's land supply.

Employment on Vacant vs. Redeveloped Land. A major factor in estimating the land needs associated with future employment growth is the extent to which building development locates on vacant (greenfield) parcels versus parcels on which some existing – likely low valued – development is located, so that the new building represents land redevelopment.

Historic use data was available for a limited portion of parcels for which post-2000 development is reported. For the 450 taxlots region-wide for which data was available, more than one-half (53%) were properties on which some amount of development was located prior to the current building. Forty-seven percent of these taxlots were vacant prior to their post-2000 development.

When broken down by ring geographies, redevelopment rates appear to be far higher for the central and inner ring market geographies. Redevelopment rates appear to correlate with both land values and the extent of prior development within a subarea.

The Central subarea is associated with the highest redevelopment rate of 65%. The inner ring reported a high redevelopment rate of 59%. Predictably, the redevelopment rate was lowest in the outer ring at 36%. *Note:* An important caveat associated with these results is that necessary taxlot detail was missing for most taxlots within Washington and Clackamas Counties; results are most reliable for Multnomah County subareas.

Consumer Expenditures as Retail Driver. By and large, retail potential and actual spending appear to be roughly in balance in the 4-county Portland metro area (including Clark County) – with locally generated retail demand exceeding supply by about 4%. While there are potential imbalances within specific merchandise categories, these may be more the result of different consumer spending priorities and development patterns in the Portland metro area, rather than indications of actual sales leakage.

Consequently, further retail development over the longer term is expected to be dependent primarily on some combination of population growth and destination tourism activity (aided by Oregon's lack of retail sales tax). While the geographic distribution of retail sales could change between subareas within the region, in the absence of population and/or tourism growth, this shifting would be a zero-sum game, with some subareas gaining at the expense of others.

Institutional Utilization. Institutional uses warrant special consideration, because of their growing importance to the region's employment and land use patterns that are distinct from those of many other employers. Institutions such as medical, education and other public agency functions often tend to cluster employment, 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).

Metro's 2035 employment forecast projects that a significant 20% of net new employment is expected to be within the health and education sectors, accounting for 98,000 and 24,000 net added jobs respectively between 2008 and 2035. A portion of these jobs will be within institutional settings. A review of 2006 employment indicates that, within these sectors, 60% - 80% of employment occurs at sites with more than 50 employees.

In focus groups being conducted as a part of Task 6 for this employment and economic trends analysis work program, institutional land users report somewhat conflicting priorities:

- Dense (multi-story) development appears to work well for administrative and non-patient functions. On the other hand, lower profile mid-rise development often better maintains accessibility, reduces development costs and avoids neighborhood conflicts.
- Especially given the challenges of building in an often residential environment, institutional preference is to expand on-site (where existing agreements are in place) rather than to acquire new land on which to expand.
- Institutions value both easy auto accessibility (as most clients access institutions via cars) and good transit service, especially to serve the needs of a diverse workforce.
- Space needs are impacted in somewhat divergent direction via both an aging population (with greater health care needs and thus space needs) versus reduced on-site visits and fewer over-night stays (which may reduce medical institution space needs).

With the exception of major research functions, institutions increasingly appear oriented to decentralize and bring services closer to where people live. Given that the bulk of the region's population growth is projected for the outer ring, institutional employment growth is expected to follow suit and favor outer ring and other locations anticipated for substantial household growth.

Industrial Building & Site Utilization. A key topic of special interest affecting regional land demand is how land utilization has changed and will change within the industrial sectors. To what extent have or will industrial uses densify and thus reduce land needs? How do industrial trends influence this?

There are few clear trends on industrial land use and building development. As noted, a substantial portion of the region's flex space and a few notable industrial buildings have been developed since 2000 at 2+ stories within the region, primarily in outer ring geographies.

Despite these developments (and some increase in FARs for RSIAs), over-all average industrial FARs appear to have changed very little, and if anything are decreasing. This decrease is likely related to the historic stock of multi-story warehouse space; such space is largely considered dysfunctional for modern warehouse uses and is not being replicated as businesses relocated to newer, lower profile buildings.

Metro's 2035 employment projections call for wholesale trade, warehousing and distributing to comprise approximately 45% of net new industrial sector job growth (58,000 new jobs between 2008 and 2035). Data indicates that warehouse buildings typically support fewer jobs per square feet than other types of industrial uses.

Of the remaining industrial sector jobs projected, high tech accounts for 45% and construction accounts for 39%; neither of which can be considered as 'traditional' industrial sector land users. Other manufacturing jobs are projected to account for only 4% of non-distribution related industrial job growth – a total of just 3,000 net added jobs between 2008 and 2035.

Based on preliminary Task 6 focus group results, the best opportunities for increased density of distribution related development may relate more to opportunities for high-cube space (with higher ceilings for more rack storage) than to multi-story development. Most manufacturing space is also expected to remain at one and in some cases two stories, albeit with high ceiling space requirements for some processes and with 2+ stories more possible for office, administrative and some R&D components of a firm's operations. For existing land constrained industrial uses, transition from at-grade to structured parking also may be considered in some cases.

Building Square Feet per Employee. Land needs forecasting (Task 3) will also incorporate standard assumptions on square requirement per employee, varied by sector. Generally, these values have been considered as relatively stable although there is speculation about changing densities in the years ahead with higher overall cost of real estate. A range of values from various sources are reported in the body of this report and will be more fully considered as input variables within the Task 3 analysis to come.

Implications for New Demand Paradigm. The results of this Task 1 analysis (together with Task 2 location variables trends research) will inform subregional employment forecasting within Task 3. Regional employment totals are expected to be consistent with Metro's already completed *2005-2060 Regional Population and Employment Forecast for the Portland-Beaverton-Vancouver OR-WA Primary Metropolitan Statistical Area (PMSA).*

The New Demand Paradigm associated with Task 3 will allocate this employment to the tri-county portion of the larger metro area by industry sector, subarea geography and design types using a range rather than point estimate approach. Based on research being completed with Tasks 1, 2 and 6 of this Employment and Economic Trends research, the following implications are noted for the Task 3 demand allocation process.

1. The 2002 *Urban Growth Report* projected that the tri-county UGB would capture 75% of future job growth; this employment analysis indicates that the tri-county area captured 83% of 2006 employment. Task 3 forecast allocation scenarios may be varied to reflect this more recent experience and/or land capacity constraints within certain job sector or land use design types.

2. The Metro 2060 forecast provides a range rather than point estimate of future total employment but without detailed employment sector (or industry-specific) projections. This approach reflects the increasingly dynamic nature of the national and metro area economy and is proposed to be continued with the forecast allocation process – placing primary emphasis on subarea geography and design type categories rather than sector specific projections.

3. A baseline forecast allocation is expected to reflect the continued trend of job movement towards the outer rings of the metro region – especially for job sectors seeking Title 4 land and population-driven components of retail and institutional (service) growth. An alternative scenario may reflect growth patterns possible if urban-focused design types (centers and corridors) successfully compete for higher shares of regional employment growth.

4. Prior forecast allocations have translated employment growth to land demand with use of employment density factors (measured in terms of *jobs per acre*). In contrast, this planned allocation modeling process will pursue a two-step approach:

    - Application of *employment per square foot of building area* standards based on Metro and other research which generally are not expected to change materially over the forecast periods (of 5, 20 and 50 years) – at least in base case scenario.
    - Variation of *building to site area (or FAR)* standards reflecting both recent experience and regional policy objectives. FAR variations are seen as the primary means of influencing the future land footprint associated with regional employment growth.

5. Commercial office, retail and institutional uses have begun to transition to higher FARs, a trend that is forecast to continue albeit with higher FARs expected for the central and inner ring than the outer ring of the tri-county region. At FARs in the range of 0.50+/- (depending on use), transition from at-grade to structured parking and lowered parking ratios with active transit access would also be anticipated.

6. With the exception of RSIAs, industrial FARs do not yet appear to be increasing within the tri-county region but are maxing out at about 0.30. A baseline forecast scenario can

be expected to maintain this cap for the foreseeable future. Alternative scenarios may reflect other industrial development patterns with reduced development footprint – including transition to higher cube distribution, structured parking for some major employers at site constrained facilities, and/or reduced tri-county capture for uses with lower ratios of employment per square foot of building area.

7. Information from this analysis suggests consideration of adjusting refill rates (currently assumed at 50% for commercial use and industrial at 35%) by location as well as by land use. Higher refill rates would be indicated for central and inner ring than for outer ring subareas. More information is needed – likely anecdotal – to support varying these rates by land use.

As Metro and local jurisdictions explore this new demand paradigm, additional data resources may be needed above and beyond what is currently available across the region. Important data-related tools to maintain and improve upon our ability to track the relationship between job and development trends include accurately geocoded ES-202 job data (potentially to the taxlot level of accuracy) and better populated tax assessor's databases for current land use, building square footage and year built (with best coverage currently available for Multnomah County).

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EMPLOYMENT DEMAND FACTORS & TRENDS INTRODUCTION

Metro is engaged in conducting an employment and economic trends analysis for the Portland metropolitan region. This project will outline a *new paradigm* for evaluating the building and land demands associated with regional job growth over 5-, 20-, and 50-year time horizons.

The employment and economic trends analysis is intended to be serve as background for the *Urban Growth Report* Metro will complete in 2009. Other uses include land use and transportation modeling (including the MetroScope model), local jurisdiction information for Goal 9 comprehensive plan updates, and general information for business and economic development organizations throughout the region.

Six tasks have been outlined with this employment and economic trends analysis work program:

Task 1 – Employment Demand Factors and Trends (this report)
Task 2 – Variables Affecting Location Decisions
Task 3 – New Demand Assessment Paradigm
Task 4 – New Capacity/Inventory Approach
Task 5 – Frame Choices for Job Needs
Task 6 – Focus Groups

PURPOSE OF TASK 1 ANALYSIS

This Task 1 report provides quantitative benchmarking to inform the rest of the assessment process, particularly the subsequent demand paradigm modeling of Task 3. The analysis encompasses a review of subregional job growth by sector since 2000, commercial development trends in location and form by 2040 Design Types and market subarea geographies, and a number of 'special topics' that impact land demand: redevelopment/infill versus greenfield development, consumer demand as a retail driver, and institutional and industrial development trends and average building space used per employee.

This is a draft report intended for review with Metro, the Employment Coordination and Advisory Committee (CAC) and Metro Council.[1]

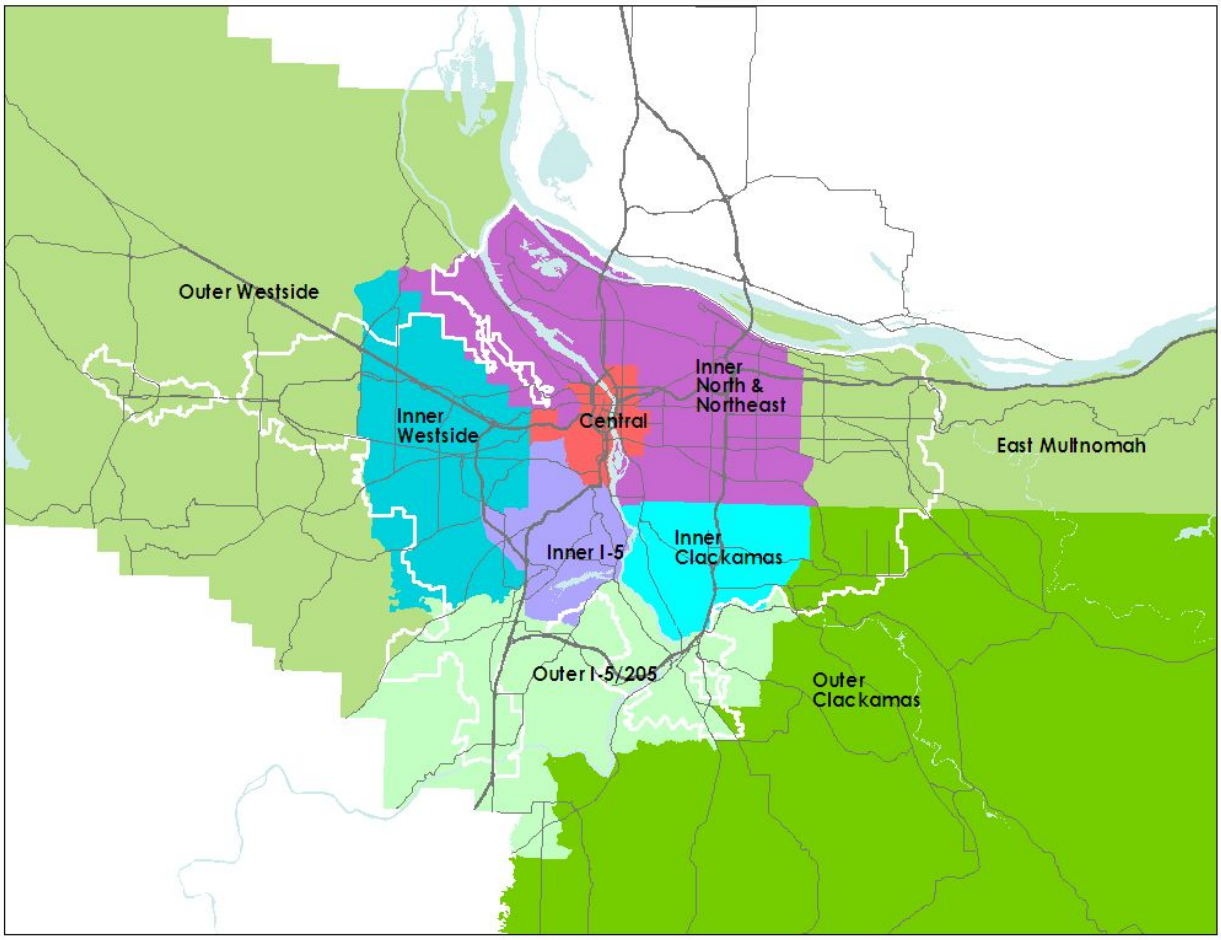
GEOGRAPHIC MARKET SUBAREAS

To review subregional trends in employment and development, the three-county Metro region has been divided into nine geographic subareas, mapped below. These subareas are intended to reflect major market distinctions; they vary by size and current density of employment activity. Subareas were designed to be compatible with Metroscope Census Tract geographies. The nine subareas can be aggregated to three overall *ring geographies:*

[1] Information for this report has been compiled from sources generally deemed to be reliable. The accuracy of data obtained from third-party sources is not guaranteed, is subject to change, and accompanied by limitations as noted in this report. Observations and findings in this report are those of the authors. They should not be construed as representing the opinion of other parties prior to their express approval, whether in whole or part.

- Central (also a Subarea of its own)
- Inner ring (Inner North & East, Inner Westside, Inner I-5 an Inner Clackamas)
- Outer ring (Outer Westside, East Multnomah County, Outer Clackamas and Outer I-5/205).

Market Area Geographies



The remainder of the report is organized by three primary topic areas:

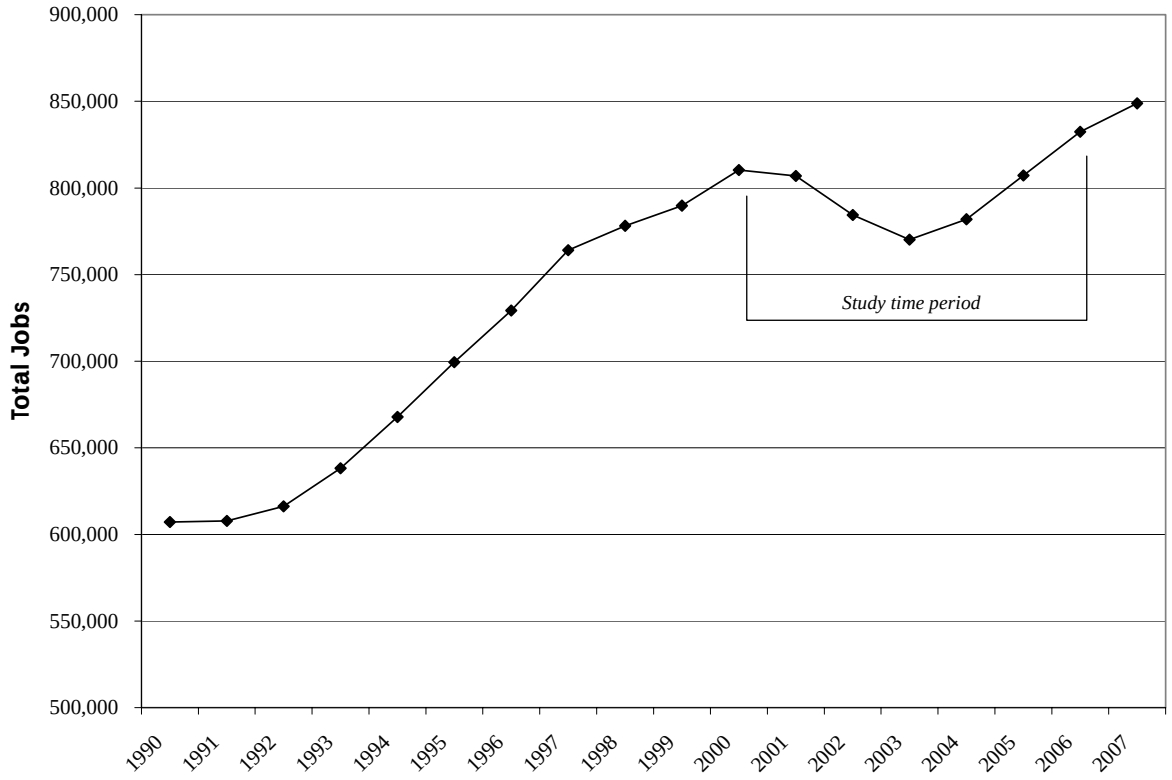
I. Employment Trends
II. Development Trends
III. Demand Factors

I. EMPLOYMENT TRENDS

The employment trends analysis reviews tri-county regional job growth through the *dual lenses* of regional subareas and land use designations. This review is intended to inform the allocation of projected future regional employment between subareas and land use designations, together with longer-term, regional-level job trends. Past trends are considered to be one, but not the only, indicator of future growth potentials.[2]

Subregional employment trends have been analyzed using geocoded Employment Security 202 (ES 202) data for the years 2000 and 2006. Geocoding allows for sub-regional analysis of employment trends, and as a relatively recent data innovation, this is the longest time period for which data is available. This period covers close to a full economic cycle; however, tri-county job growth during this recent period of recover and expansion was relatively weak compared with regional job gains experienced during the previous decade, averaging only 0.5% annually.

Figure 1. Tri-County Covered Employment Trends (1990-2007)



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

[2] This discussion of employment trends updates and revises an initial draft memo dated November 11, 2008, and incorporates newly geocoded (mapped) employment data for improved accuracy. 2006 is the latest year for which detailed geocoded employment information is currently available.

Data Limitations. ES 202 data is the most comprehensive and timely source available, compiled from employees covered by unemployment insurance and generally covering about 85% of all employment.[3] Other than firms expanding or declining and opening or closing, there are two primary issues associated with this data that impact its portrayal of job growth:

1) Employment has been parceled out to sites for employees with multiple sites, and this process may be more or less accurate in one of the two years (with a tendency towards greater accuracy in later years).
2) Employers self-report NAICS, which can vary over time (even for some larger firms).

The second set of issues related to changing employment classification is of greater concern, for several reasons including:

- National changeover from the Standard Industrial Classification (SIC) to North American Industry Classification System (NAICS) occurred post-2000, leading to new classifications and some confusion for many employers.
- There appears to be some trend toward companies reporting more than one NAICS, with a separate NAICS assigned to groups of employees as appropriate. For instance, in 2000 one major Portland area firm described its employment sites as concerned with retail and wholesale. In 2006, it described various employment sites as concerned with retail, wholesale, warehousing, and the management of companies. This greater detail in and of itself has shifted some employment away from the industrial sectors, as employment appears to be increasingly split between a company's former 'primary' industry classification (e.g. warehousing, manufacturing) and other classifications (such as management, which falls within the service sectors).
- If a company buys another company, the acquired company often will take on the NAICS of the parent company.
- The nature of a business may change, or a business may change its understanding of its core function.
- Companies self-report NAICS, and sometimes are inconsistent over time.[4]

Because of these issues, sectoral-level changes (for instance, the reported decline in manufacturing jobs and increase in service jobs) are best understood as shifts in the nature of the region's employment rather than necessarily as job growth or decline within a firm.

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[3] Alternative data sources include the Covered Employment Statistics, a sample survey-based time series that is adjusted to match ES 202 data, and the Economic Census, completed once every five years (with a several year lag before data release and not available at a sub-regional level). Total firm employment has been allocated to employment sites when appropriate; however, geocoding error remains one risk associated with the data and the conclusions drawn from the geocoded data base.

[4] Metro staff and EDH reassigned year 2000 NAICS for approximately 1,300 out of 59,000 records with consistent names and addresses in both years but inconsistent NAICS codes.

Employment data should also be viewed as most reliable when summed on a geographic subarea or design type level, rather than when sectoral-level data is compared over time. This approach is consistent with anticipated forecast allocations, which may place equal or greater reliance on patterns of subregional and design type rather than sectoral allocations.

This chapter reviews employment trends within the time period for which subregional data is available are reviewed by:

- Employment sector
- Subarea geographies
- 2040 Design Types

EMPLOYMENT BY INDUSTRY SECTOR

As of 2006 there were just over 842,000 non-farm jobs in the tri-county region (excluding the largely non-urban agriculture, fish and forestry sector). [5] This figure represents a modest 0.5% annual increase over 2000 tri-county employment, or 22,500 new non-farm jobs over a six-year period. Reported post-2000 job growth is signifianctly lower than the 2.9% annual average reported for 1990 through 2000.

For context, the tri-county's weak job growth post-2000 was not unique. It was well above the national average job growth rate (of only 0.3%), indicating that in fact the Portland region fared better than many areas. Statewide growth job growth also fell after 2000, but remained about twice the annual average reported for the tri-county area over the entire 2000-2006 period.

In 2006, the tri-county region captured 83% of jobs within the larger seven-county geography (including Clark and Skamania Counties, Washington, and Oregon's Columbia and Yamhill Counties). Clark County captured the bulk of the remainder. The tri-county's capture of the seven-county PMSA fell slightly in 2006 from 84% in 2000. The share of seven-county employment within the Urban Growth Boundary was nearly as high, and also declining: 79% in 2006 and 81% in 2000.

Job change is reported in the following table by two-digit NAICS (North American Industrial Classification System), as well as by the four major NAICS groupings used throughout this report:

- Industrial (of which manufacturing is a subset)
- Retail
- Services
- Public sector

  Note: 'Other' is a final remnant category of unclassified jobs.

[5] This sector reports wide fluctuations; reporting requirements vary by firm size, which tends to vary annually.

Region-wide, net employment gains are indicated only for the services and public sectors over the six-year study period considered. Services now comprise 56% of the tri-county non-farm economy. This aggregated sector increased by just fewer than 44,000 jobs, a 1.3% average annual growth rate (compared with roughly a 3.5% growth rate during the 90s).

Figure 2. Three-County Job Change by Two-Digit NAICS (2000-2006)

EDH Sector	NAICS		2000	2006	2006 Distribution	Change Net	AAGR
Industrial	21	Mining	490	430	0%	(60)	-2.2%
	22	Utilities	7,030	4,000	0%	(3,030)	-9.0%
	23	Construction	44,900	48,980	6%	4,080	1.5%
	31	Man: food, textile, apparel	10,090	9,370	1%	(720)	-1.2%
	32	Man: wood, petrol, chemicals	21,680	19,170	2%	(2,510)	-2.0%
	33	Man: metal, machine, computer	81,670	78,170	9%	(3,500)	-0.7%
		Manufacturing subtotal	*113,440*	*106,710*	*13%*	*(6,730)*	*-1.0%*
	42	Wholesale Trade	53,490	51,390	6%	(2,100)	-0.7%
	48	Transportation	27,190	25,040	3%	(2,150)	-1.4%
	49	Transport & Warehousing	12,540	13,720	2%	1,180	1.5%
		Industrial subtotal	***259,080***	***250,270***	***30%***	***(8,810)***	***-0.6%***
Retail	44	Retail	57,360	58,510	7%	1,150	0.3%
	45	Retail: Dept, misc.	33,710	28,460	3%	(5,250)	-2.8%
		Retail subtotal	***91,070***	***86,970***	***10%***	***(4,100)***	***-0.8%***
Services	51	Information	26,600	20,440	2%	(6,160)	-4.3%
	52	Finance & Insurance	41,370	45,450	5%	4,080	1.6%
	53	Real Estate	21,400	18,980	2%	(2,420)	-2.0%
	54	Prof., Scientific, Tech Services	42,220	43,930	5%	1,710	0.7%
	55	Management*	9,130	21,010	2%	11,880	14.9%
	56	Admin Support, Waste	48,420	53,660	6%	5,240	1.7%
	61	Education	67,800	65,590	8%	(2,210)	-0.6%
	62	Health & Social Asst.	73,200	90,120	11%	16,920	3.5%
	71	Arts, Enter., Recreation	12,830	12,440	1%	(390)	-0.5%
	72	Accommodation & Food	58,650	65,670	8%	7,020	1.9%
	81	Other Services	33,280	31,560	4%	(1,720)	-0.9%
		Service subtotal	***434,900***	***468,850***	***56%***	***33,950***	***1.3%***
Public	92	**Public Administration**	**30,470**	**35,690**	**4%**	**5,220**	**2.7%**
Other	99	Unclassified	650	240	0%	(410)	-15.3%
	0	Unclassified	3,380	-			
		Total	819,550	842,020	100%	22,470	0.5%

*Note: Between 2000 and 2006, the industrial classification system changed from the Standard Industrial Classification System to the North American Industrial Classification System. 2000 NAICS data was converted to SIC codes, but some reported job change is the result of incompatibility between these two systems, particularly within the management sector.

Source: ES 202, Metro, E.D. Hovee & Company, LLC.

Health care and social assistance lead the service sector's job growth, with a net gain of close to 17,000 jobs, equal to 75% of the region's total net job growth. Other areas of service sector

growth were experienced with accommodation and food service, public administration, administrative support and wasted management, finance and insurance and construction.[6]

The employment growth reported for the new management sector appears due in large part to reclassification of jobs (moving to the NAICS from the Standard Industrial Classification system) as much as actual growth in corporate headquarters jobs. Information is also a newly added sector and therefore also subject to error in trends reporting, but its loss of 6,000+ is in line with sustained job losses following the technology (dot-com) bust of 2001-2.

The industrial sector includes construction, manufacturing and wholesale and distribution. This sector contracted at an average of -0.6% annually during the study period, despite gains in both construction and transport and warehousing. This is a sharp contrast to the 2.6% annual growth during the 90s.[7]

In 2006 industrial jobs comprised about 30% of the tri-county job base, with manufacturing about 40% of that total (or 13% of regional jobs). Over the 2000-2006 time period the manufacturing subsector contracted even more rapidly than the larger industrial sector, at a rate of about -1.0% annually. At least a portion of this job loss may be associated with businesses retracting and moving outside of the tri-county area (for instance, to Vancouver Washington), as well as the administrative changes reported above (e.g. businesses re-coding themselves). A countervailing trend of note over this time period is manufacturing output, which the Bureau of Economic Analysis reports increased by more than $9 billion for the seven-county region between 2001 and 2006. Within the manufacturing sector, business growth (or profit) appears to contradict job growth, due in part to high commodity pricing and strong export markets. Equivalent data for other industrial sectors such as transportation and warehousing is suppressed due to confidentiality.

Retail employment also contracted over this time period. Ten percent of tri-county employment is within the retail sector, which contracted at -0.8% annually (vs. 2.3% growth during the 90s).

EMPLOYMENT BY SUBAREA GEOGRAPHY

A second way of considering employment trends is by geographic subarea. For purposes of subregional analysis, the Portland tri-county region has been divided into nine market subarea geographies as illustrated on the following map. Subareas are intended to reflect major market distinctions, and vary in geographic size and current job density. Subareas also represent aggregations of Metroscope Census Tract geographies.[8]

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[6] As of 2008, widely reported construction job loss still did not appear within OED employment numbers.

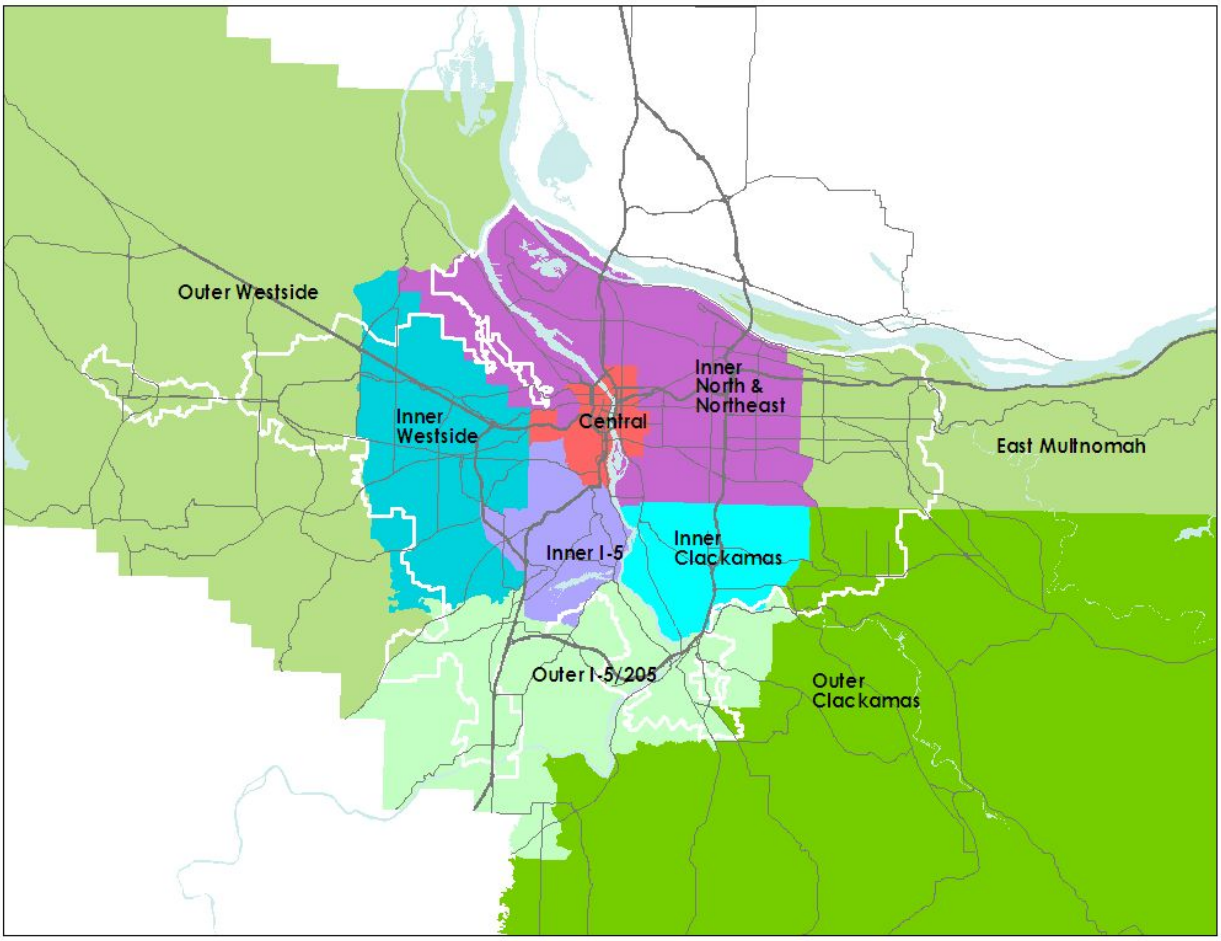
[7] Job gains have been noted for some portions of manufacturing during the post-2001 period of economic recovery, especially in leading edge firms that also benefited from devaluation of the dollar. However, it remains to be seen whether the overall shift away from industrial employment continues or can be arrested within portions of the region's economy for which sustainable competitive advantage can be demonstrated.

[8] Some notable and unavoidable anomalies derive from this need to conform Metroscope census tract boundaries. An example is the inclusion of Hillsdale and Providence St. Vincent within the Central subarea.

The nine subareas can be further aggregated to three overall *ring geographies*:

- Central (also a subarea)
- Inner ring (Inner North & East, Inner Westside, Inner I-5 an Inner Clackamas)
- Outer ring (Outer Westside, East Multnomah County, Outer Clackamas and Outer I-5/205).

Figure 3. Market Subarea Geographies



Note: Subareas are compatible with E-zone geography (aggregations of Census Tracts) to allow for comparison with Metroscope outputs.

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

As noted, there is a greater degree of confidence in employment trends reported by subarea geography (not broken down by jobs sector) as an indication of total job changes within the region.

Of the nine tri-county subareas, the Central subarea comprises the largest number of jobs with approximately 24% of the region's employment as of 2006. Inner North & East Portland represents the subarea with the 2nd largest employment base at 22%; the Inner Westside encompasses about 14%. The remaining subareas contain less than 10% of the region's employment each.

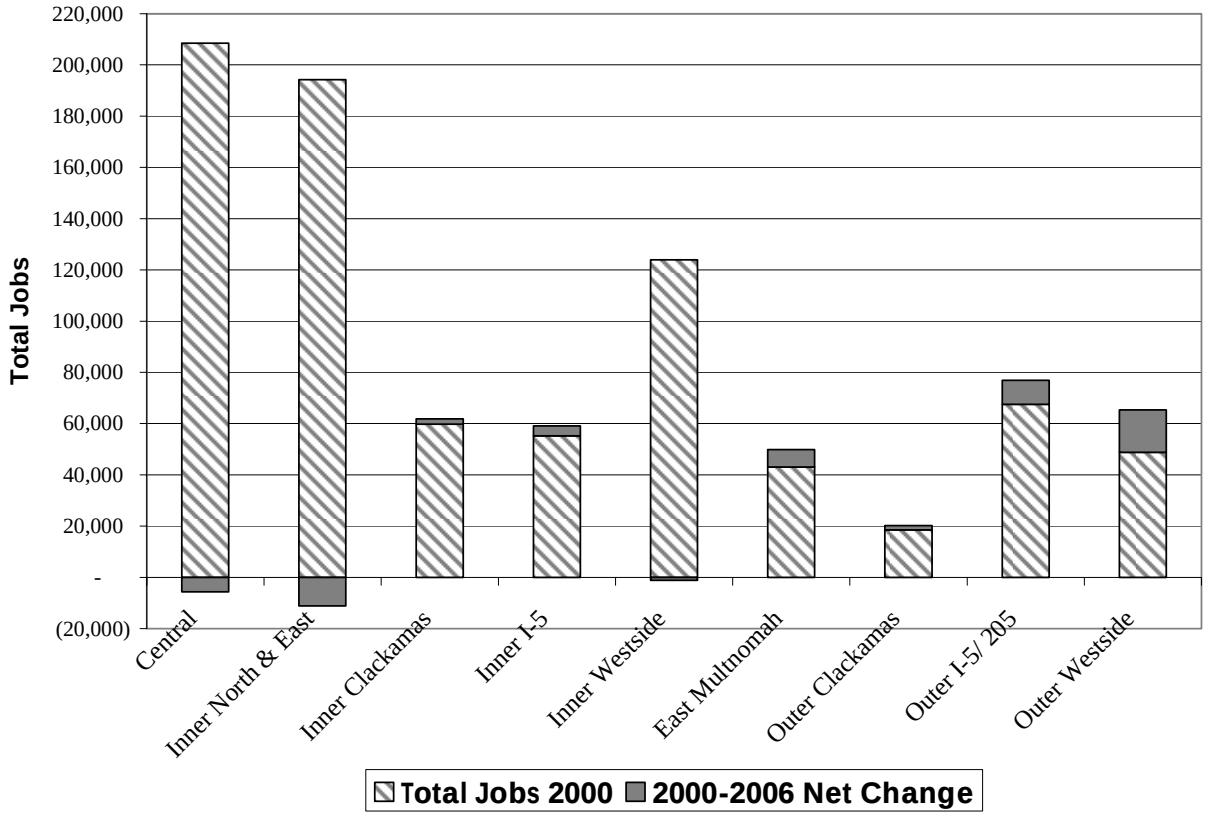
When the nine market subarea geographies are aggregated into central, inner and outer rings, their respective shares of total employment are as follows:

- Central: 25% (declining 0.5% annually)
- Inner ring: 50% (declining 0.2% annually)
- Outer ring: 26% (growing 3.2% annually)

Despite the region's significantly reduced growth post-2000, some subareas and design types were more successful in attracting new jobs.

Subarea Overview. Subarea job totals and net growth between 2000 and 2006 are illustrated by the following chart. While the Central and Inner North & East subareas account for the largest shares of the region's employment base, both have experienced job losses over the last 6 years (losses of 5,700 and 11,100 respectively). The Inner Westside also reports job losses of 1,100.

Figure 4. 2006 Subarea Job Totals and Net Growth (2000-2006)



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

Outer ring subareas reported much stronger growth trends, increasing its share of regional employment from 22% to 25% over these six years. Annual gains in each of the four subareas averaged 1.6% - 5.6% annually. The single fastest growing subarea is the Outer Westside

(adding 16,500 jobs in 6 years at more than twice the growth rate of any other subarea). Outer I-5/205 and East Multnomah County also both reported annual growth above 2%.

The following table portrays the same information in numerical format.

Figure 5. Subarea Growth Trends (2000-2006)

	Inner Ring					Outer Ring			
	Central	Inner North & East	Inner Clack.	Inner I-5	Inner Westside	East Mult.	Outer Clack.	Outer I-5/ 205	Outer Westside
Total Jobs 2006	202,800	183,300	61,900	59,100	122,900	49,900	20,167	76,900	65,300
2006 Share	24%	22%	7%	7%	15%	6%	2%	9%	8%
2000-2006 Net Change	(5,700)	(11,100)	2,000	3,900	(1,100)	6,900	1,717	9,400	16,500
Annualized Growth	-0.5%	-1.0%	0.6%	1.2%	-0.1%	2.7%	1.6%	2.3%	5.6%

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

While outside of the analysis scope of this report, Clark County functions as part of the Portland economy and labor shed. Non-agricultural job growth within Clark County appears to have followed outer ring trends, growing at an average annual rate of 2.2% – well above the tri-county average. At 130,000 jobs in 2006, Clark County represents about half as many jobs as the tri-county outer ring subareas combined, and added 16,000 additional jobs between 2000 and 2006.

Subarea Trends by Job Sector. Job growth between 2000 and 2006 can be further described in terms of shift between employment sectors. As discussed above, sectoral changes should be understood as shifts in the nature of employment as well as actual job losses or gains.

This review indicates substantial shifting of employment activity both between subareas and by industry sector:

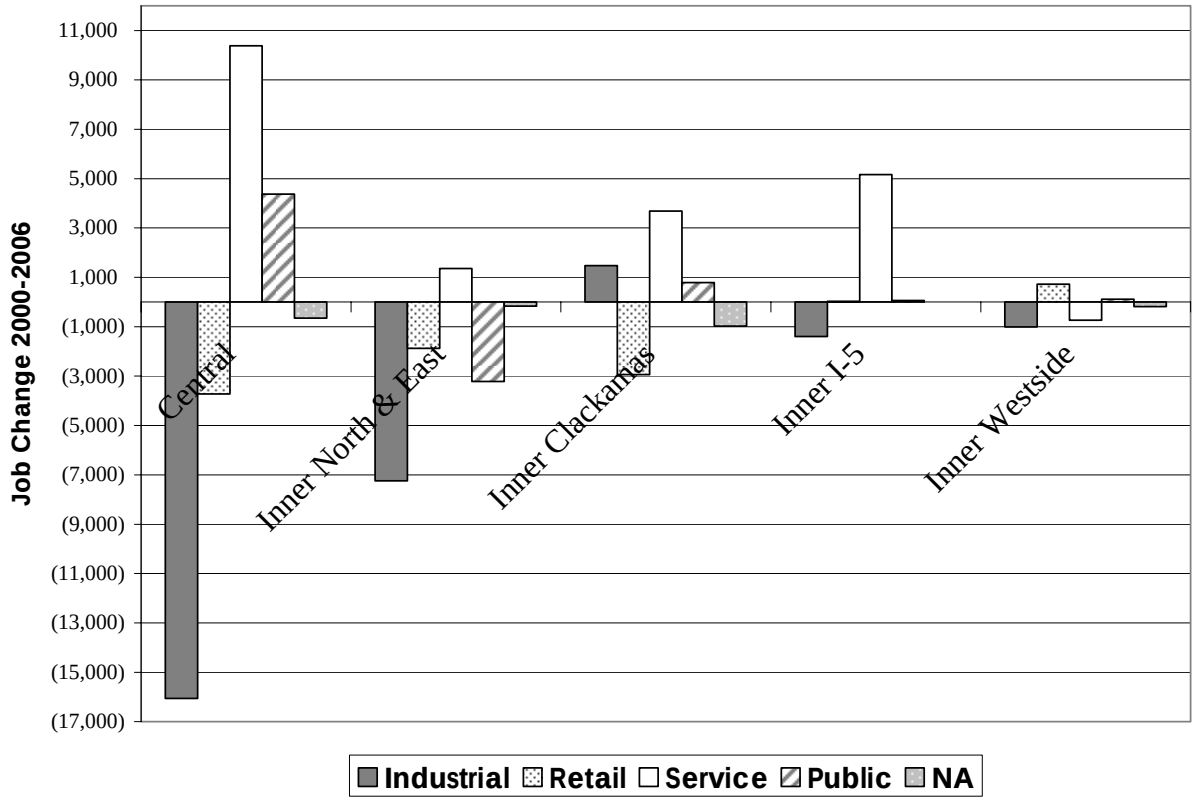
- When grouped together, the *outer ring* subareas gained jobs across all of the four broad job sector aggregations of industrial, retail, service sector and public sector.[9]
- Within the *Central* and aggregated *inner ring* subareas, in contrast, employment shifted away from the industrial and retail sectors, and the inner ring subareas report public sector job declines as well.
- Only service sector jobs increased across *all three* of the ring geographies.

Industrial: Over the study timeframe, the Central and most inner ring subareas report lower numbers of jobs identified with the industrial sectors: utilities, manufacturing, wholesale trade, and transportation & warehousing. Inner Westside subareas report declines of 1,000 to 1,400

[9] NAICS 2-digit sectors aggregated into these groupings are as follows. Industrial: 11,21,22,23,31,32,33,42,48,49. Retail: 44,45. Service Sector: 51,52,53,54,55,56,61,62,71,72,81. Public Administration: 99.

jobs within these sectors; Inner North & East of 7,000, and the Central subarea of over 16,000 industrial jobs.

Figure 6. Job Sector Trends within Central and Inner Ring Subareas (2000-2006)



Note: NA indicates jobs without a NAICS classification

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

Re-classifying portions of industrial companies as 'management' (a service sector classification), likely accounts for a portion of this jobs shift, although data checking attempted to correct for this.

Inner Clackamas was the one exception to the close-in shift away from industrial jobs; this subarea gained close to 1,500 industrial sector jobs, with gains in both durable manufacturing and transportation and warehousing.

Despite the widespread shift away from industrial employment, as of 2006 the central and inner rings still retained more than 75% of the region's jobs in utilities, wholesale trade, transportation and warehousing.

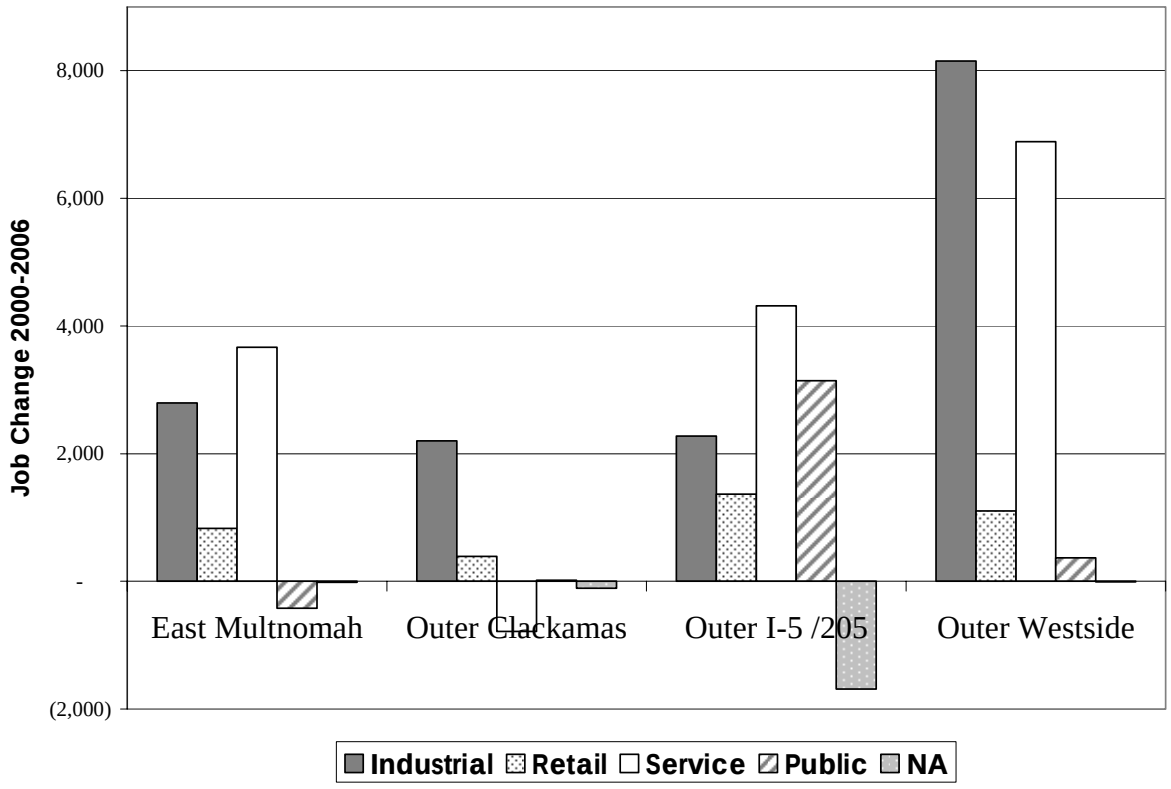
In contrast to the inner shift away from the industrial sectors, these sectors grew in all outer ring subareas: by approximately 8,200 jobs in the Outer Westside and more modest gains ranging from 2,200 to 2,800 in the remaining subareas.

Of the industrial sectors, manufacturing especially favored the outer ring, largely due to the Outer Westside manufacturing job gains of over 5,400. By 2006, the outer ring subareas represented 47% of the region's manufacturing jobs (up from 41% just six years earlier).

Construction employment (a part of the industrial sector aggregation) declined within the Central City and added twice as many jobs in the outer ring as in the inner ring (4,200 and 1,900 jobs, respectively).

Retail: Retail appears to be following the over-all trend of the region's jobs in moving outward. Within the Central subarea, jobs identified as retail declined by 3,700. Inner North & East and Inner Clackamas subareas also reported declines of 1,900 and 3,000 respectively. In contrast, retail employment increased in all outer ring subareas by a range of 400 to 1,400 net added jobs.

Figure 7. Sectoral Trends within Outer Ring Subareas (2000-2006)



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

Services: Services represent the one sector with growing numbers across almost all of the region's market subarea geographies. Over the six-year time frame, a substantial number of jobs were added in each ring:

- Central: +10,400
- Inner ring: +9,500 (with the Inner Westside reporting a loss, largely due to declines within the information and finance sectors)

- Outer ring: +14,100 (with the greatest gains in the Outer Westside – 7,000 – and a decrease of 800 reported for the Outer Clackamas subarea)

Health care and social assistance, administrative and waste management and finance and insurance were the greatest contributors to inner ring subarea service job gains. In the outer ring, growth in these sectors was matched in accommodation and food service. Management, public administration and education stand out as service growth drivers in the Central subarea.

EMPLOYMENT BY DESIGN TYPE

The 2040 Growth Concept defines design types intended to guide growth and implement the 2040 regional vision:[10]

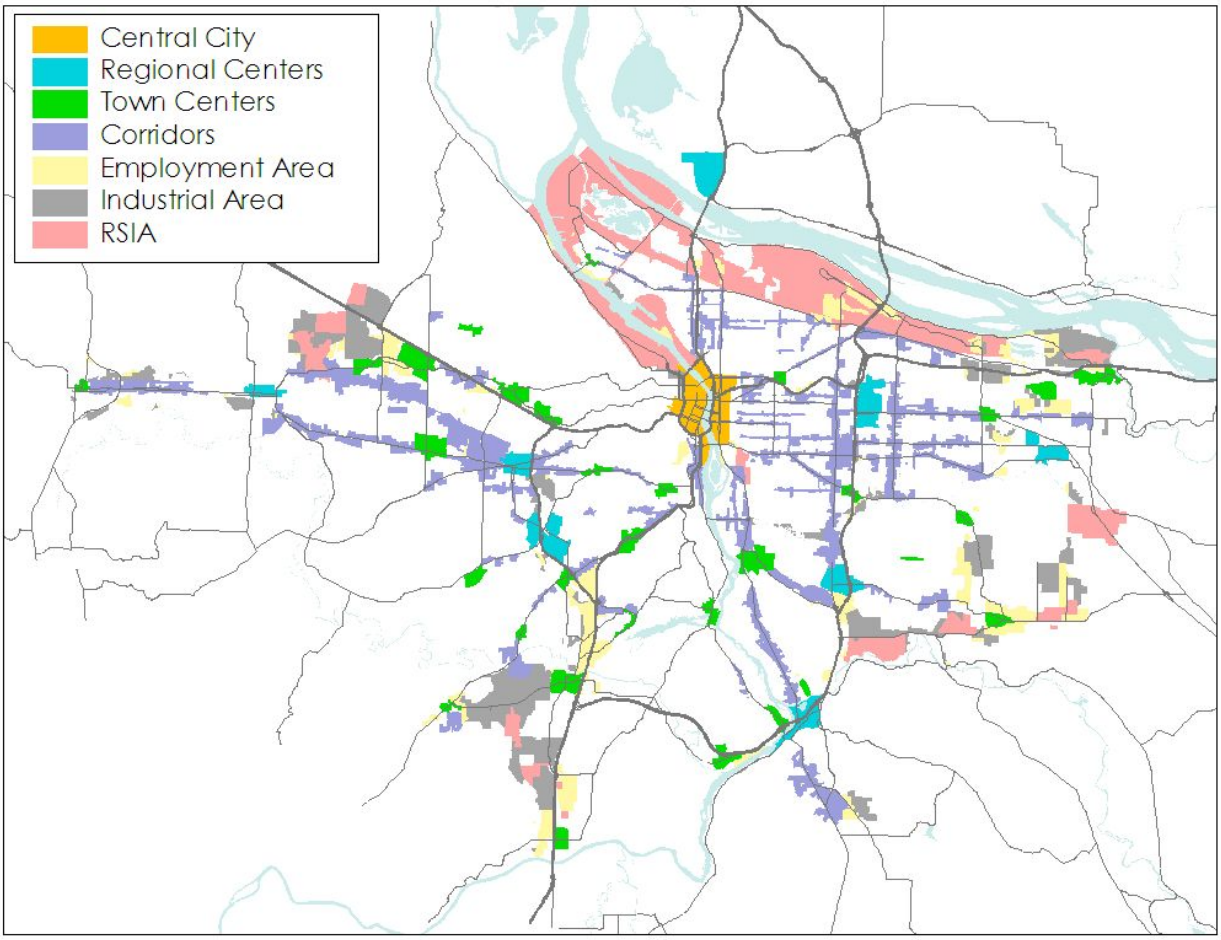
- Urban focused design types include the Central City, Regional Center, Town Center, and Corridor designations.
- Three Title 4 designations are also analyzed: Regionally Significant Industrial Areas (RSIAs), Industrial Areas and Employment Areas. These are intended to preserve land for industrial and employment uses by limiting non-industrial uses (particularly retail).

When these seven Design Type (including Title 4) designations are combined, they contain approximately 75% of all tri-county employment. The remaining 25% of the tri-county non-farm job base is located along streets not designated as corridors and within residential zones (e.g. as with a number of school, medical and other institutional uses). Jobs located in areas not designated with any of the Design/Title 4 types are classified as 'Other.'

The analysis areas that correspond to the four urban design types and three Title 4 areas are illustrated by the following map.

[10] Station areas have not been analyzed due to their frequent overlap with other 2040 Design Types. Title 4 land is here defined as land not within a 2040 center or corridor Design Type, some of which overlap. This methodology enables all of the Design Types indicated to be summed to equal total regional jobs – as a control total.

Figure 8. 2040 Growth Concept Employment Design Type Geographies



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

Design Type Overview. To give context to this design type discussion, the following table reports total acreage within parcels within the seven design types. This illustrates that parcels within Title 4 lands account for more than 40,000 acres region-wide, approaching four times the acreage identified with the urban design type designations. Design types are also not evenly distributed among the subareas: Inner North and Northeast contains almost 70% of the region's RSIA land, for example, whereas the majority of both Industrial and Employment Areas are located within the region's outer ring.

In general, Title 4 areas were intended to preserve land for employment uses. However, the character of these areas varies across the region, as they were fairly recently identified by local jurisdictions (by Metro's action in 2002) with varying land use and economic development objectives. For instance, some jurisdictions classified rail-served land as an Industrial Area; others classified rail-served land as Employment Area. In many cases designations were applied to land already developed with significant employers or public uses (corporate headquarters, airports, prisons). There are no lands indicated as having the RSIA designation with the Inner I-5 and Inner Westside market subarea.

Figure 9. Parcel Land Area within Design Types (in acres)

Subarea	Central City	Corridors	Regional Center	Town Center	RSIA	Industrial	Employ-ment	Total
Central	420	2		90	120	80	210	920
Inner N/NE	2	250	640	270	13,060	410	1,180	15,810
Inner Clackamas		420	500	480	820	870	630	3,720
Inner I-5		170	370	680		70	690	1,980
Inner Westside		380	770	1,920		530	920	4,520
East Multnomah		30	410	800	2,050	2,300	1,440	7,030
Outer Clackamas				210	950	2,080	1,500	4,740
Outer I-5/205		690	540	940	570	3,600	1,660	8,000
Outer Westside		380	210	300	1,260	2,800	410	5,360
Total	400	2,300	3,440	5,690	18,830	12,740	8,640	52,080
Percent	1%	4%	7%	11%	36%	24%	17%	100%
Central	*100%*	*0%*	*0%*	*2%*	*1%*	*1%*	*2%*	
Inner Rings	*0%*	*53%*	*66%*	*59%*	*74%*	*15%*	*40%*	
Outer Rings	*0%*	*47%*	*34%*	*40%*	*26%*	*85%*	*58%*	

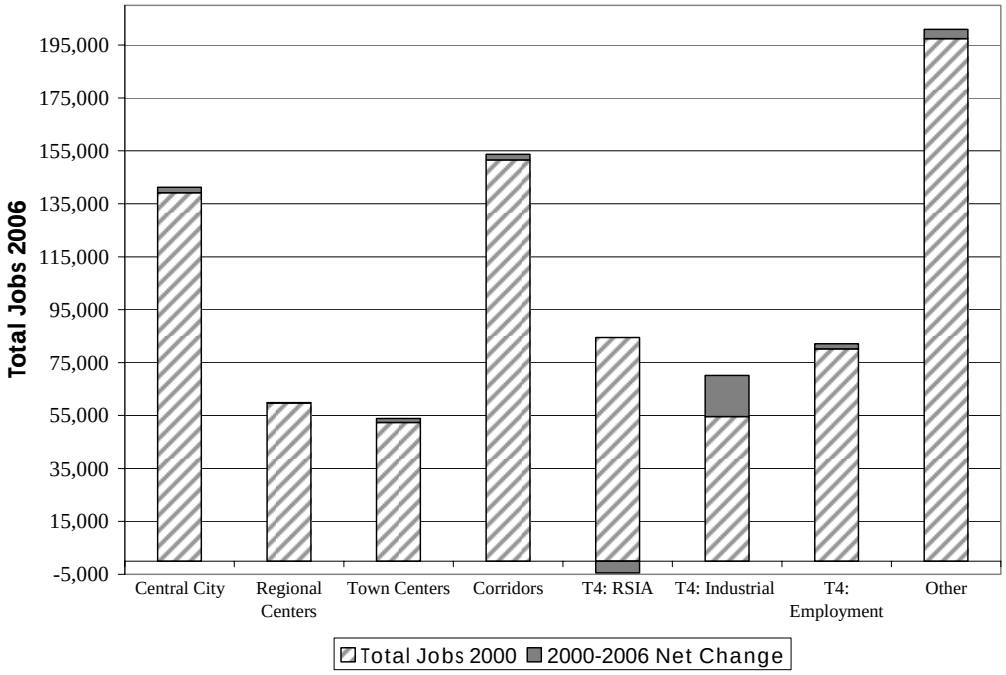
Source: Metro, RLIS, E.D. Hovee & Company, LLC.

The category of 'Other Areas' is not reflected within the above acreage chart; this residual category includes all tri-county land not within a designated design type (hundreds of thousands of acres).

Of Metro's identified Design Types, Corridors and Central City accommodate the largest number of jobs at about 154,000 and 141,000 2006 jobs respectively. Taken together, these two design types account for 35% of the tri-county region's job base but only 5% of the acres within the seven design types analyzed in this report.

However, more jobs (nearly 209,000 or 25% of the regional total) are accounted for by 'Other' employment than by any one of the design types. Job growth on land not captured within a Design Type was below the tri-county average.

Figure 10. 2006 Employment & 2000-2006 Growth by 2040 Design Type



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

The most significant job gains by far are reported for industrial areas (+ 15,600 jobs). All other Design Types gained between 100 and 2,200 jobs over this time period. 'Other' land (not classified as a Design Type) gained 3,500 jobs.

Of the urban design types, Town Centers appear to fare the best with a modest 0.5% annualized growth rate, equal to the regional growth average. The Inner Westside added 3,150 jobs within its nine Town Centers, which together represent 30% of the region's Town Center acreage. Outer Westside, Inner North & Northeast and Inner Clackamas also reported Town Center gains. It is important to note that trends within the relatively smaller geographies of Town Centers, Regional Centers and Corridors can be more susceptible to substantial job changes from actions of single prominent employers rather than broad economic trends.

The Central City experienced slower growth of about 0.2% per year. It is important to note that the Central City design type is distinct from the Central subarea, which has about 30% more jobs with a larger geographic boundary, and which reported job losses during the study time frame.[11]

Job growth within Corridors (including Main Streets) occurred at a modest rate about equivalent to that of the Central City at 0.2% per year. Corridor job growth varied widely by subarea: an average loss of about 2,100 jobs was reported for the Central and Inner Clackamas subareas, IN

[11] The primary geographic difference is that the Central subarea encompasses more land on the Westside than does the Central City design type, suggesting that the *subarea's* job declines occurred west of I-405.

contrast, the Outer Westside, Outer I-5/205 and Inner Westside subareas reported an equivalent average gain.

Regional Centers fared least well with negligible job growth (0.03%), primarily due to losses significant losses indicated for the Inner Westside (Beaverton and part of Washington Square) that off-set gains in other subareas, primarily the outer subareas of East Multnomah and Outer Westside.

Figure 11. 2006 Employment & 2000-2006 Growth by 2040 Design Type

	Urban Design Types				Title 4 Areas*				
	Central City	Corridors	Regional Centers	Town Centers	RSIA	Industrial	Employ-ment	Other	Total
Total Jobs 2006	141,280	153,740	59,870	53,900	80,040	70,170	82,080	200,950	842,040
2006 Share	17%	18%	7%	6%	10%	8%	10%	24%	100%
2000-2006 Net Change	2,060	2,200	110	1,480	(4,460)	15,600	1,930	3,550	22,480
2000-2006 Annualized Growth	0.2%	0.2%	0.0%	0.5%	-0.9%	4.3%	0.4%	0.3%	0.5%

Note: Title 4 jobs reflect those jobs *within* Title 4 areas but *outside* of centers and corridors (some of which overlap with Title 4 areas).
Source: Metro, E.D. Hovee & Company, LLC.

Title 4 areas report some of the strongest growth trends, particularly Industrial Areas (at an annualized growth of 4.3%). Again, these areas are disproportionately located in the outer subareas, where 85% of the tri-county's Industrial Areas acreage is located. The Central subarea reported losses (corresponding to the Central Eastside and portions of Lower Albina); all other subareas reported a gain. Significant gains include the Outer Westside (+8,250), East Multnomah (+4,330) and Outer I-5/205 (+2,540). Inner Clackamas and Inner Westside also each added over 1,000 jobs within Industrial Areas.

In contrast, RSIAs report job *losses* averaging 0.9% annually. Seventy percent of RSIA land is within the Inner North and Northeast subarea, along the Willamette and Columbia Rivers, the Columbia Corridor, and surrounding the airport. This designation includes all of the Port of Portland's properties, and the region's land with the longest industrial tradition. Known issues impacting some vacant and underutilized parcels within the harbor area include unresolved contamination, older facilities that require retooling, and some pricing pressure for land that interfaces with urban development. At sites with substantial remediation costs, redevelopment for industrial use may be more financially challenging than for commercial uses (as industrial is typically associated with lower average per acre pricing. It is unknown the extent to which these issues have impacted the reported job losses within North & Northeast RSIAs (-2,500 jobs).

RSIA losses were in fact the largest within the Central subarea, however, at close to -3,000. This RSIA covers the Fred Meyer and Tri-met headquarters sites (between SE Powell and SE Holgate) and surrounding uses. Two thirds of the reported job loss is attributed to Tri-Met,

potentially changes of employment location. The remainder is dispersed among smaller employers.

Design Type Job Sector Trends. Reviewing Design Type job changes at a finer level of detail – by job sector – is less stable and more subject to data 'noise' than reviewing job totals. Keeping this in mind, design type job trends have been reviewed via four broad job sector aggregations: industrial, service, retail and public sector.

The *first chart* displays trends within the 2040 Design Types of Centers and Corridors. Employment shifted away from the industrial sectors within all of these urban design type categories. The greatest industrial sector job losses were within:

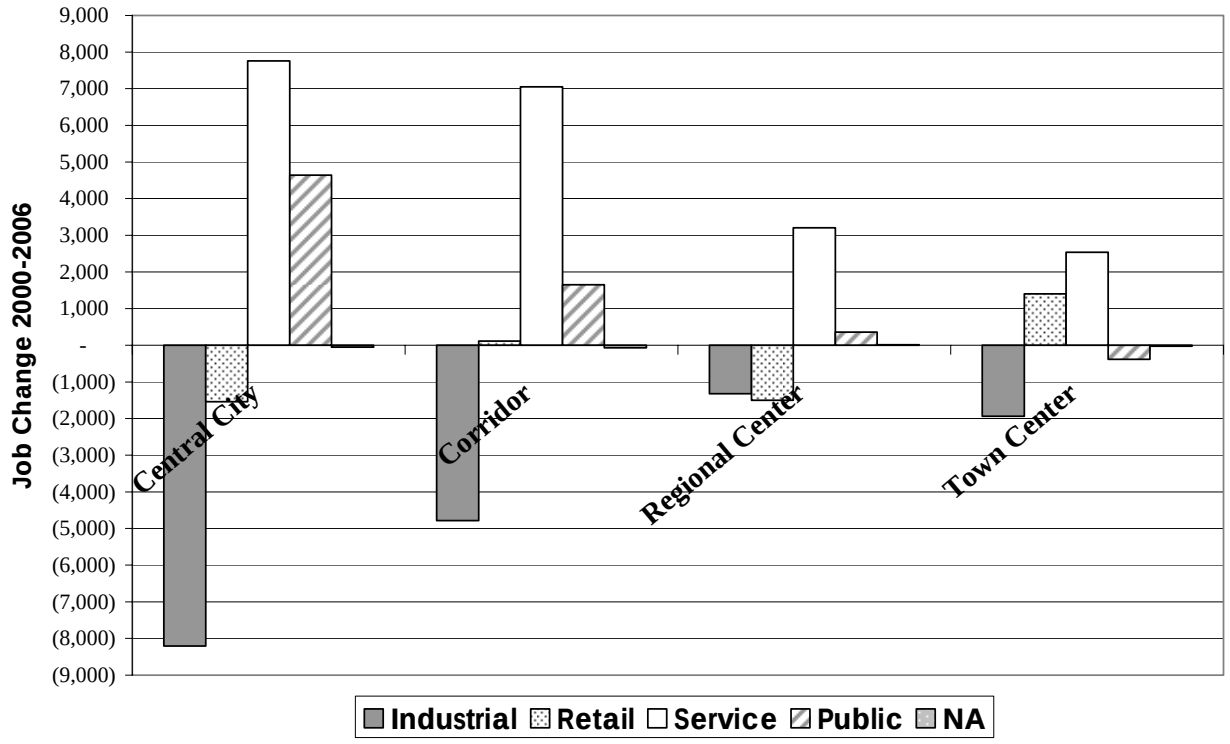
- The Central City (-8,300)
- Outer I-5/205 (-1,600)
- Inner Westside Regional Centers (-1,300)
- Inner I-5 Town Centers (-600)
- Inner North and Northeast Regional and Town Centers (-250 each)

Inner Westside Town Centers were the only Design Type to add more than 50 jobs over this time period.

Retail also is indicated as a declining job sector the Central City and within Regional Centers, with widespread losses in all subareas but Outer I-5/205 (+300) and East Multnomah County (+200).

Service jobs exhibited the greatest growth, increasing at average annualized rates between 1% and 2% across all the urban Design Types (2-3 times the regional total job growth rate). Public sector employment increased for all Design Types but Town Centers, but most significantly in the Central City (+4,650 jobs).

Figure 12. Sectoral Trends within Urban Design Types



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

Job growth with Title 4 Areas has been more varied, as depicted by the above chart. Within the Regionally Significant Industrial Areas (RSIAs), net job losses are primarily attributed to industrial job loss within the Central subarea (-3,100) and Inner North and Northeast (-5,700). Jobs classified as retail also declined within RSIAs, in every subarea by East Multnomah. The Central and Inner Clackamas RSIAs report a loss of more than 1,000 retail jobs each.

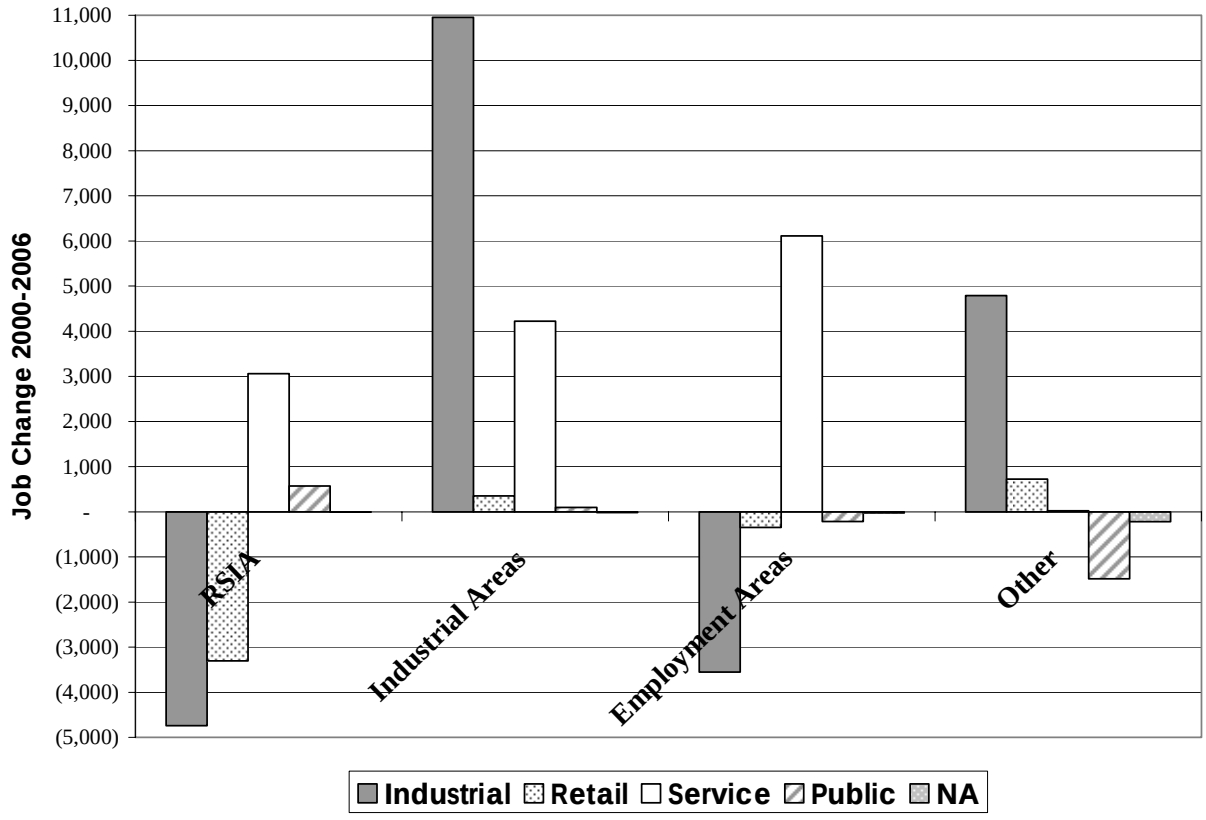
RSIA industrial and retail losses were partially offset by service sector gains, or shifts towards service sector functions: the Central City RSIA reported an increase of 2,000 service sector jobs, and Inner North and Northeast RSIAs reported +500 service jobs. Region-wide, RSIAs added 3,600 service jobs. Again, this in part reflects the changing description of employment: in 2000, Tri-met described its 2,900 Central subarea RSIA jobs as within the transportation sector; in the year 2006 at the same location it reported a decline of jobs – to 900 – now classified within various service sectors.

Employment Areas reported an over-all annual growth just below the regional average. This was despite a reported net decline in industrial sector jobs of -3,500 (all associated with Central and Inner Ring subareas). Service sector growth outweighed this loss: a net regional gain of 5,900 jobs was fueled by growth within the Central subarea (+2,000), Inner I-5 (+3,800), Outer I-5/205 (+1,000) and the Outer Westside (+850). Retail jobs gains and losses were less pronounced and displayed no clear trends.

In contrast to RISA and Employment Areas, Title 4 Industrial Areas report significant net industrial job gains of close to 11,000. Again, the Central subarea Industrial Areas (primarily the Central Eastside and Lower Albina) sustained significant industrial losses of close to 1,900, and Inner North and Northeast reported minor Industrial Area industrial job losses, but all other subareas reported Industrial Area industrial job gains. The outer ring subareas host 85% of the region's Industrial Areas and also dominated Industrial Area job gains, with the Outer Westside reporting growth of 7,700 Industrial Area industrial jobs, and East Multnomah and Outer I-5/205 reporting a gain of more than 2,000 Industrial Area industrial jobs each.

Service employment also grew within Industrial Areas, but far less dramatically: the Central, Inner Clackamas, Each Multnomah, Inner Westside and Outer Westside each added more than 500 Industrial Area service jobs for a regional gain of 4,300 Industrial Area service jobs (28% of total Industrial Area job gain).

Figure 13. Sectoral Trends within Title 4 Areas



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

'Other Areas" (not labeled as Title 4 or Design Type) also reported a strong shift towards industrial employment (+4,800 jobs, primarily within wholesale trade and construction). Manufacturing jobs declined within 'Other Areas' by close to 800 jobs.

In summary, both the Employment Areas and RSIAs appear to be experiencing a significant shift in the composition of their employment bases, away from industrial and toward service sector

employment. Both areas are well represented within the Central and Inner Ring subareas (42% and 76% of all acreage, respectively). In contrast, strong industrial job growth is associated with Industrial Areas and within land not designated by a Design Type ('Other Areas'). Further research is required to inform whether this divergence in the employment mix of Title 4 lands reflects shared characteristics of land within these designations (such as simply its location within the region's inner or outer ring), or the particular characteristics of diverse businesses located on land that was largely designated after its initial development and utilization.

II. DEVELOPMENT TRENDS

Employment growth typically affects land use in the form of industrial and commercial real estate development, the buildings in which jobs are housed. However, the relationship is not necessarily 1:1 as there are a number of factors beyond job growth that influence how jobs are translated in building form and associated land needs.

This chapter provides a review of real estate development trends, reporting sectors and metrics as typically tracked within the industrial and commercial real estate industry. Real estate sectors differ from job sectors in that they are far more generalized. The primary commercial real estate classifications used within the commercial real estate industry are:

- Office (Class A, B, C)
- Retail (by center type or 'other'; roughly defined by size)
- Industrial (distributing/warehouse/general manufacturing)
- Flex (typically with a mix of at least 50% office space and the remainder as industrial/distribution).

To complicate matters, there is little uniformity within real estate professionals as to how product is categorized (for instance, are business parks an industrial, office or flex product?). This report at times compares growth within job sectors to growth within commercial real estate sectors, but acknowledges there is not necessarily a one to one relationship between how jobs and buildings are described or between the kinds of buildings in which a certain job sector is housed. For instance, a service sector job may be housed in an office structure, retail center or industrial building.

In the chapter following this review of development trends, additional demand factors and trends of note are explored that affect the ways in which building development and land needs respond to and influence tri-county employment.

This chapter provides additional context to inform assumptions regarding the extent and form of future employment-related development and how this will vary across the region. Primary sources of data are tax assessment data as packaged via Metro's RLIS geocoded data set, and CoStar, a proprietary commercial real estate data base increasingly used by real estate professionals throughout this and other metro regions of the U.S. *Each data set is subject to limitations, as discussed below, but provides insight into both broad trends and subregional variations.*

Thos built environment analysis consists of two primary components, covering:

- Industrial & Commercial Broad Development Trends
- Intensity of Employment-Related Development

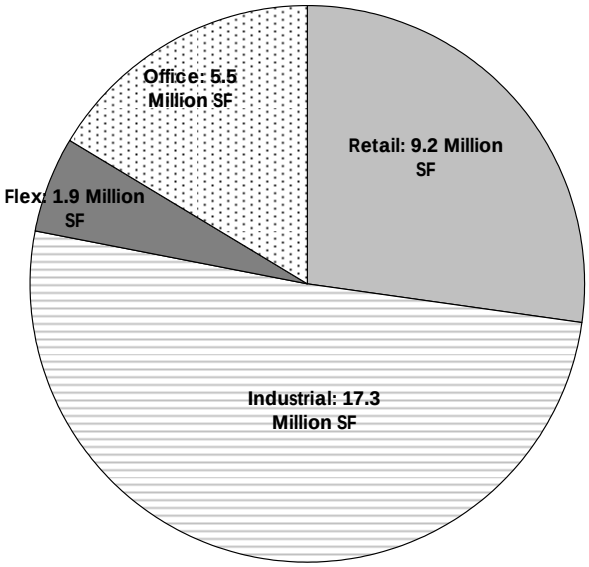
INDUSTRIAL & COMMERCIAL BROAD DEVELOPMENT TRENDS

Development trend data is derived from Costar, a proprietary database primarily used by commercial brokers that has been inventorying Portland real estate (new and existing) over approximately the past five years. This is the most comprehensive industry database on the region's building stock currently available, but has been focused on multi-tenant properties. While the data base is becoming increasingly inclusive, it tends to under-represent free-standing, smaller, and older properties, including some owner-occupied industrial and neighborhood retail properties.

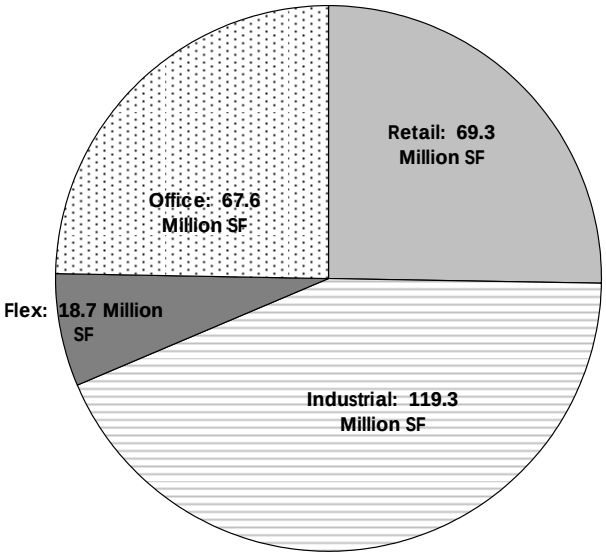
Data tables are provided as an appendix to this report. The tables summarize development characteristics between and within subareas. The following is summary observations for each of the four employment real estate product types considered.

Figure 14. 2009 and Post-2000 Commercial Real Estate Inventory

Tri-County Employment-Related Real Estate Inventory, January 2009



Post-2000 Additions to the CoStar Employment-Related Real Estate Inventory



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

Industrial Development

- The Costar inventory includes 120 million square feet of industrial space in the tri-county region (excluding flex space, discussed separately below). Over 17 million square feet of this inventory is reported to have been developed since 2000, contrasting strongly with the net regional industrial job loss reported.
- The inner ring still contains the largest share of the region's industrial space (54%), but the outer ring has captured over 60% of the tri-county's post-2000 industrial development (10.5 million square feet). If the relative growth rates of the inner and outer rings

continue, the outer ring would account for the majority of the region's industrial space by 2028.

- The vast majority of both historic and recently developed industrial space is classified as distribution or warehouse**.** While Costar's classification system is not fully populated, it does indicate a bent, both historic and current.
- Inner North and Northeast (which houses three times the acreage of Title 4 land of any other subarea) reported the greatest volume of recent industrial construction with over 5 million new square feet. The vast majority of this space is described as distribution/warehousing.
- Other high growth subareas are in the outer ring: East Multnomah (5 million, about 10% manufacturing) and Outer I-5/205 (2.7 million square feet, close to 20% manufacturing). Virtually no industrial space has been built in the Central subarea since 2000.
- Clark County, while beyond the purview of this analysis, is an important geography within the region's economy. Clark County added 3 million square feet of industrial space since 2000; as a subarea this would be third in total square footage inventory after Inner North and Northeast and Outer I-5/205. The bulk of Clark County product was within a business park environment in 'outlying' portions of the County.
- The Outer Westside is the one market subarea with a significant amount of recent industrial product developed more than one story in height. This is largely due to the Intel Ronler Acres site on NW 229th, close to one million square feet in four stories. Ronler Acres is also the only known recent industrial development with structured parking, and is roughly half office space and half microprocessor fabrication.
- Other subareas also have examples of multi-story industrial development: Outer Clackamas reports two recent two-story warehouse and distributing buildings, about 20,000 square feet each. Outer I-5/205 most significantly reports an I-5 industrial park with 165,000 square feet of newly developed two-story space that includes clean rooms. East Multnomah reports a recently developed 181,000 square feet paper warehouse and a 56,000 square feet food processing plant. The remaining subareas report extremely limited two-story industrial square footage outside of older industrial building stock, which is primarily located in the Central and Inner Ring subareas.
- Industrial parking ratios vary widely between 1.8 and 3.8 per 1,000 square feet of building space region-wide, although parking ratio is a poorly populated field within the industrial inventory. There were no clear trends relating parking densities to types of industrial uses or subareas.

Flex Development

- Flex space differs from industrial in its higher office component (defined by Costar as comprising at least 50% of building space). The Costar inventory includes 19 million square feet of flex space, equal to only 16% of the square footage within the total industrial market.
- Close to 2 million square feet of flex space is reported to have developed since 2000. This represents a slower growth than was reported for traditional industrial space, in large part due to continuing high flex space vacancies within the Inner and Outer Westside subareas of the metro region.

- Close to half of the region's flex inventory is located within the Inner Westside subarea and continues to locate in this subarea. More recent development has also favored the Outer I-5/205 and Outer Westside subareas. No other subarea has developed more than about 100,000 square feet of flex space since 2000.
- Clark County has developed close to 300,000 square feet of flex space since 2000, mostly in the Cascade Park area east of I-205. As a subarea, this would rank 4th behind all Westside subareas except Inner I-5.
- Flex space tends to be in business or related campus park settings: in the Inner Westside subarea, about 81% of flex space is within a corporate park, versus 65% of industrial square footage.
- Recent development has been spread evenly across buildings, with buildings averaging 35,000 – 40,000 square feet in the three subareas in which this product type clusters.
- A greater share of flex product has been constructed in a multi-level format than is true for other industrial: about 30% of post-2000 development in the Inner Westside and Outer I-5/205 subareas. In the three subareas in which this product type clusters, however, the share of multi-story product actually decreased for buildings constructed after 2000 (pre-2000, the share of multi-story buildings was closer to 40%). This decrease in density may correspond to continuing high vacancies and resulting targeting of other more rate-sensitive sectors other than high-tech following the 2002 recession.
- In the subareas with the most flex product, flex parking ratios are above 3.0 per 1,000 square feet of building area but still slightly below office parking ratios.

Office Development

- There is 68 million square feet of competitive office product within the Costar inventory, with over 9 million reported as developed since 2000. Growth within the office inventory was in line with industrial and retail growth trends.
- The Central subarea continues to support a slight majority of the region's office inventory (52%). Since 2000, however, the Central subarea has captured only 26% of the 9.5 million square feet of new office space developed in the tri-county region. In contrast, 41% of new development has located within the inner-ring (and 33% in the outer ring).
- Clark County added a significant 2.2 million square feet of office space since 2000, more than any single tri-county outer ring subarea (despite a job growth rate below that of the East Multnomah, OuterI-5/205 and Outer Westside subareas). The bulk of Clark County's new office space is considered Class B. For contrast, within the three Metro jurisdiction counties, outer ring subareas added 3.1 million square feet combined, with the bulk within the Outer Westside (2.0 million square feet of primarily Class A space).
- For Class A buildings, the Central subarea has better retained its advantage, with 58% of total Class A product. Since 2000, however, new Class A office development (totaling 5.5 million square feet) has been fairly evenly distributed, ranging from 31%-35% capture in each of the Central, Inner and Outer rings of the region.
- Subareas with the greatest proportions of Class A (as a % of all subarea office space) are Outer Westside (63%), Inner Westside (47%), Inner I-5 (42%), and Central (40%). In terms of square feet of Class A space, however, Central dwarfs all other subareas with

more than twice the square footage of the entire inner ring and seven times the square footage of the outer ring.

- Very little new office product is being developed anywhere in the region at just one story, with the exception of Outer Clackamas. In all other subareas, at least 85% of office square footage development after 2000 has been higher than one story. Region-wide, the percentage of office square footage within one-story buildings was 13% pre-2000 and decreased to 6% for post-2000 development. Lower cost and lower density office space is in part moving to the retail inventory (e.g. within neighborhood and community retail centers, where services also locate).
- After 2000, buildings of four or more stories increased from 51% to 56% of total office square footage. Seven of the region's nine subareas report post-2000 office development over four stories: Central (81%), Outer Westside (60%), Inner Westside (54%), Inner North & Northeast (48%), Inner I-5 (46%), Inner Clackamas (39%) and Outer I-5/205 (36%). However, only four of these subareas developed more than one million square feet of office space in this time period (Central, Inner I-5, Inner Westside and Outer Westside).
- Only the Central subareas reported office parking ratios below 3.0 for recent development; other subareas range between 3.0 and 4.0. This reflects properties only that report dedicated parking spaces; some historic office product may have no associated parking and thus are not reflected within this average.
- Structured parking for office product remains limited to a few specific geographies within the region. Outside of the Central City, office buildings within Washington Square regional center (mostly within the Inner I-5 submarket) and Kruse Way (also Inner I-5) have developed some structured parking without public subsidy. Medical institutions and smaller medical office buildings are another example; this user type is perhaps the dominant sponsor of structured parking in Inner Ring and the Outer Westside subareas.
- The region's corporate campuses have also moved towards structured parking in the last ten years, with garages on the Nike and Adidas campuses (Inner Ring) and Intel's Ronler Acres (Outer Westside). Other identified examples of structured parking are municipal sponsored, either serving city offices (Hillsboro) or a private development supported by public subsidy (for instance, the Beaverton Round).

Retail Development

- There are 69 million square feet of retail product within the Costar inventory. Over 9 million square feet has been developed since 2000, despite a net reduction regionally in retail jobs. One (of many possible) disconnects between these data sources is that dining often falls within a retail building product but is now considered a service sector job (with the NAICS classification system). Of the product types covered by brokerage data such as Costar, retail may be the least well documented – particularly smaller, freestanding storefront and urban street retail within older properties.
- The majority of the tri-county region's retail space lies within the inner ring subareas. The Central subarea represents 18%; the outer rings represent 26% of the region's inventory. Inner North & East is the largest single subarea accounting for 25% of the region's inventory.

- Within the tri counties, stand alone, large format retail represents a fairly even share of each rings' building inventory (ranging from 11-15%).
- Small centers and main street retail dominate the Central and inner ring subareas, whereas centers of more than 35,000 square feet (and ranging up to 1+ million square feet) dominate the outer ring retail inventory.
- Region-wide, development since 2000 has favored larger format stores, which increased from 15% of the pre-2000 building stock to 21% of the post-2000 building stock. Centers have maintained a constant share of the region's retail inventory, while 'other' or main street retail has declined as a share of the reported regional total.
- Clark County developed a remarkable 3.8 million square feet of retail space since 2000, about 40% of the post-2000 development inventoried for Oregon counties. This represents very rapid growth for a county that has historically experienced substantial retail sales leakage to the Oregon side of the Columbia River. Post-2000 Clark County retail development has favored large retail centers (45%) and smaller format stores (32%).
- Predictably, the Central submarket reports the highest share of recently developed retail buildings more than one story (84%, including both all-commercial and mixed-use buildings). The Inner North & Northeast and Inner I-5 submarkets also report denser trends, with 46% and 44% respectively of post-2000 retail development in buildings with more than one story. The Inner Westside reports 25%. All other subareas report 11% or less. Outer Clackamas and Outer Westside report especially low density in recent retail development.
- In most subareas, the proportion of retail being developed within multi-story structures increased after 2000. The exceptions are Inner and Outer Clackamas and Outer Westside. Region-wide, the percentage of retail more than one story decreased from 27% in the pre-2000 inventory to 26% in the post-2000 inventory. When the three outlier subareas are removed, the percentage within the remaining six subareas increases from 23% to 25%.
- Parking ratios are the lowest within the Central subarea (below 2.0 spaces per 1,000 square feet in post-2000 development) and in East Multnomah County (2.85). A standard range of between 3.0 and 4.0 is reported for all other subareas both pre- and post-2000. Again, this average only reflects properties that report dedicated parking spaces; historic and urban streetfront retail very often have limited or no associated parking and do not report parking ratios.
- Structured parking is associated with retail development in numerous subareas beyond the Central subarea via regional malls: Lloyd District (Inner North & Northeast), Clackamas Town Center (Inner Clackamas), Washington Square (Inner I-5), Street of Tanasbourne (Outer Westside) and Bridgeport Village (Inner Westside). Beyond Outer Westside, the outer ring subareas have yet to development retail-associated structured parking or with other center types.

INTENSITY OF EMPLOYMENT-RELATED DEVELOPMENT

Considerable attention has been to the density of residential development across the tri-county region. Less attention has been given to density (or intensity) of employment development, with most analyses focusing on employment per unit of land area.[12] In contrast, this trends analysis focuses on the relationship between industrial/commercial buildings and land area as measured by floor area ratios (FARs).

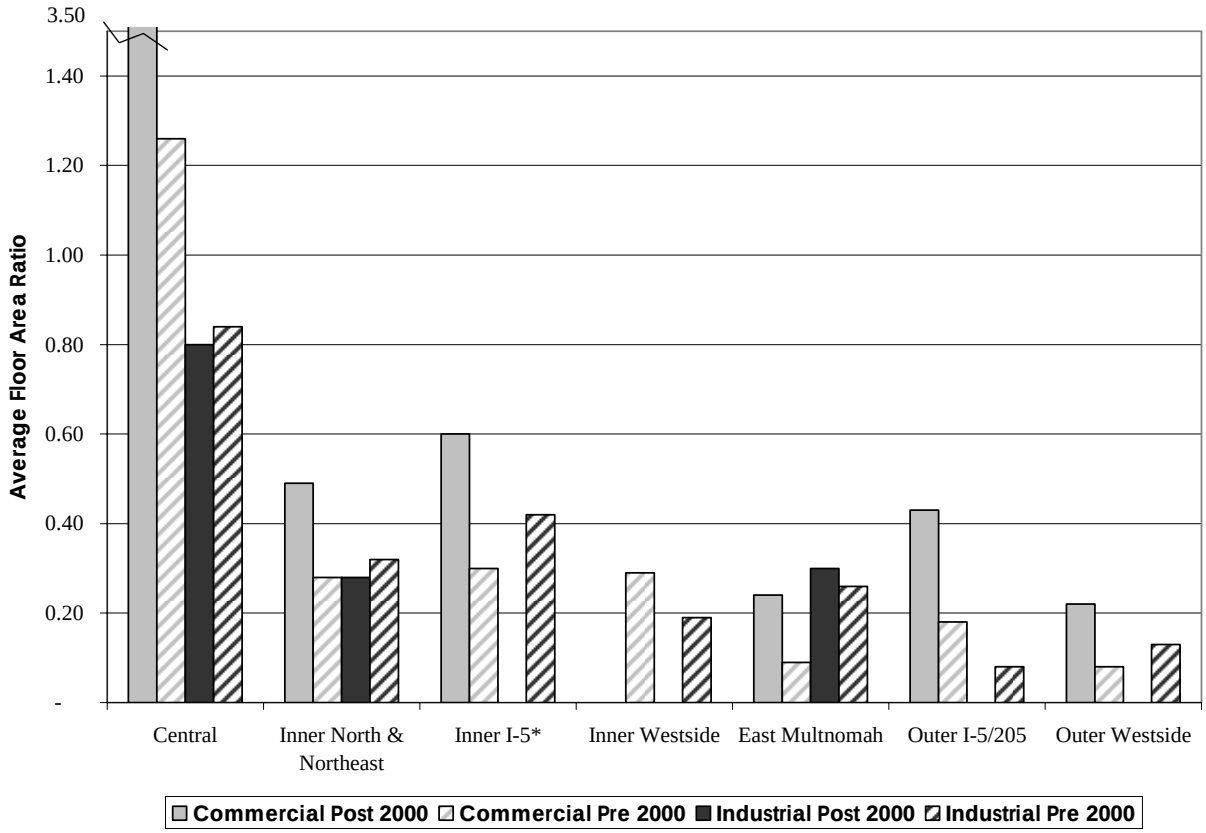
Floor area ratios describe the density of building development by comparing total building square feet to land square feet. An FAR of 0.5 indicates that total building square feet is equal to 50% of land area (for instance, a single story building with 50% lot coverage). An FAR above this often – although not always – indicates a multi-story building with some form of structured parking or below average parking ratios, as a substantial portion of site area is typically also required for on-site parking, landscaping, setbacks, etc.

Methodology. FARs have been calculated for each subarea and design type for development occurring both before and after 2000. For subareas, reported FAR describes land developed in commercial or industrial use (according to tax assessor data). Vacant lots and lots not developed in commercial or industrial use were excluded from the FAR calculations. *This approach describes existing employment-related development, rather than the landscape as a whole.*

FARs by Subarea. Density of commercial development appears to be substantially greater post-2000 than what was on the ground pre-2000. This is the case for the six subareas for which comparable pre/post-2000 data is available.

[12] Employment densities vary by product type (for instance, new industrial space may be warehouse space with relatively low densities of employment). It is noted that real estate product types do not neatly correspond to job classifications. For instance, an undetermined portion of service sector jobs are likely located in buildings classified as industrial.

Figure 15. Subarea Floor Area Ratios (pre & post 2000)



*Note: Excludes Clackamas County lots.

Source: Metro RLIS (Nov 08), E.D. Hovee & Company, LLC. [13]

Pre and post-2000 data is available for industrial development in only the three Multnomah County subareas. In two of these areas (Central and Inner North and Northeast), average FAR fell for post-2000 development. This is likely related to older, two-story industrial stock that is no longer being built for modern industrial uses but rather slowly converting to office uses.

A strong caveat to the above data is that limited square footage data is available for lots in Washington County, and no data is available for Clackamas County lots. The following table lists the total building square footage from which the above chart derives. It illustrates the uneven nature of the data: far more data is available for Multnomah County development.

[13] In addition to limited parcels with reported square footage data, an added limitation of assessors data is that it relies upon tax data to identify current property use, which is not always accurate. There is a risk of over-stating FARs for larger development that may encompass more than one parcel (For instance, regional malls or developments that may involve parking on one taxlot and a building on an adjacent lot. In this case, a parcel in surface parking use would be described as vacant and not included in the FAR tally). However, this is an issue that would affect both pre- and post-2000 conditions and so should not affect the relative changes between these time periods.

Figure 16. Building Square Footage Data Available by Subarea

Building Square Feet	Central	Inner North & Northeast	Inner I-5*	Inner Westside	East Multnomah	Outer I-5/205	Outer Westside
Post 2000	5,028,000	9,407,000	372,000		6,740,000	92,000	84,000
Pre 2000	77,774,000	110,592,000	9,390,000	9,814,000	24,027,000	2,088,000	5,486,000

Source: Metro RLIS (Nov 08), E.D. Hovee & Company, LLC.

As would be expected, the Central subarea reports the highest FARs for employment land and the only FARs in the region averaging more than 1.0. Post 2000 development is associated with a substantial FAR jump, from 1.26 to 3.51 for commercial uses (office and retail) within Portland's Central subarea. All other subareas for which data is available also report substantial post-2000 commercial FAR increases ranging between 80% and 170% compared to development on the ground pre-2000.

For the two Inner ring subareas with sufficient data, post -2000 commercial FARs range from 0.50 to 0.60, increases from pre-2000 development.[14] Industrial FARs, on the other hand, indicate slightly declining FARs for the two subareas with sufficiently populated tax data. Inner North and Northeast reports post-2000 industrial FARs about 70% below commercial FARs.[15]

Outer ring subareas report a substantially less dense pre-2000 building stock for employment lands, but post-2000 commercial FARs that appears to approach those of the inner ring subareas (ranging from 0.22 to 0.43). Increases in density of commercial development have been particularly dramatic for outer ring subareas for which data is available – with the Outer I-5/205 subarea indicating a more than three-fold increase in commercial FAR.[16]

FARs by Design Type. A similar exercise has been undertaken to evaluate FAR by Design Type including Title 4 land. For each of six Design Types (excluding Central City), FAR was calculated for the following

1. Parcels exclusively in commercial or industrial use, and
2. All mixed use center development within the design type (including residential use).[17]

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[14] Square footage data is substantially more complete for Multnomah County development than for Clackamas and Washington County, rendering FAR calculations more reliable for the Central, Inner North and East and East Multnomah subareas. No square footage data was available for Clackamas County (within Metro's geocoded taxlot data set); this impacts the Inner I-5 and Outer I-5/205 subareas as well as the two Clackamas County subareas. FARs for these subareas reflect non-Clackamas County lots only.

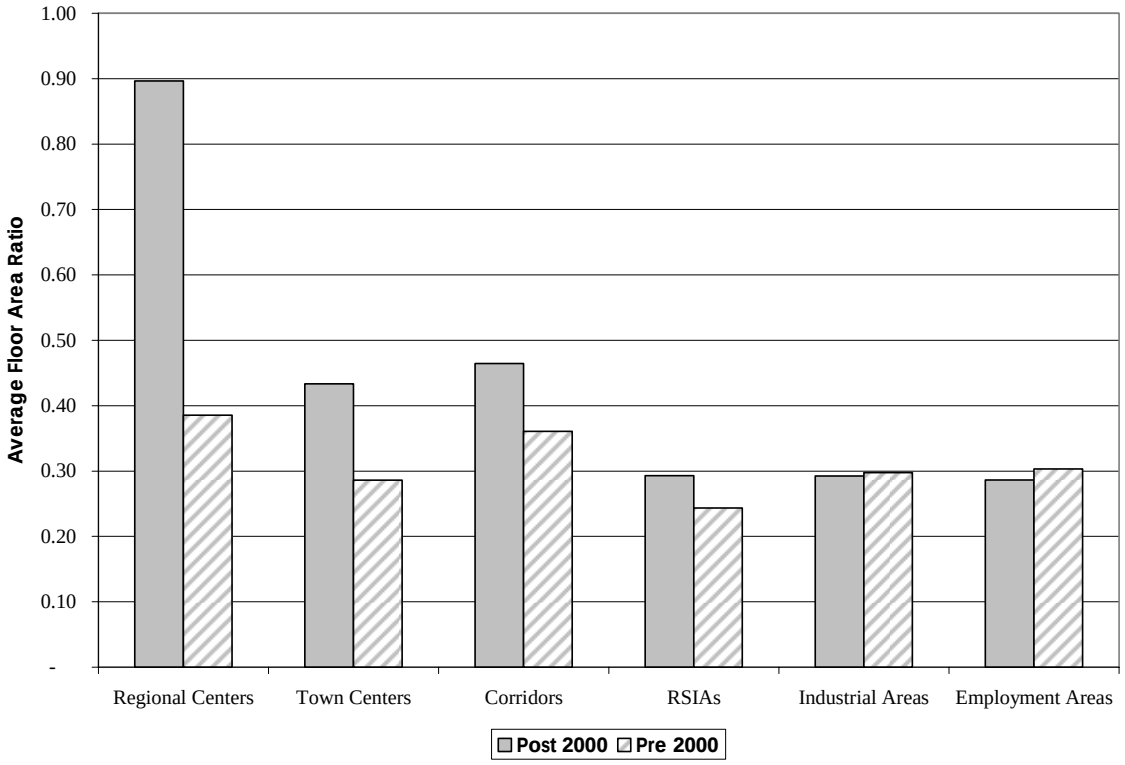
[15] With less than 12,000 square feet reported in the tax assessor data, Inner Westside post-2000 data was deemed insufficient from which to draw FAR conclusions.

[16] Square footage data is extremely limited for Washington County subareas and FAR calculations reflect only those parcels with reported building square footage.

[17] Lots identified as resource, agricultural, open space, vacant or public facilities or other were excluded from the analysis. Also noted is that the FARs reported for employment land likely miss the commercial component within mixed-use buildings.

An increase in FAR is indicated across all of the urban (non-Title 4) design types with post-2000 development compared with pre-2000 conditions.

Figure 17. Design Type Floor Area Ratios (Employment-related Development)



Source: Metro RLIS (Nov 08), E.D. Hovee & Company, LLC.

It is important to note that the Design Type FAR conclusions reflect primarily Multnomah County and some Washington County taxlots, and exclude Clackamas County entirely (due to the limited tax assessor data available for those counties).

Regional centers reported the highest average FAR at 0.90, increasing to 1.07 when residential properties are included. Regional centers are also associated with greater increases in FAR than Town Centers or Corridors.

Across all the urban design types, post-2000 FARs increased when residential development was included. This indicates that recent residential development is on average now denser than recent commercial development. Just the opposite conditions prevailed for development on the ground pre-2000 development; data indicates that residential buildings were less dense than commercial development within the design types before 2000.

Title 4 industrial areas report less variation in pre-2000 and post-2000 FARs: FARs tend to cluster around 0.3. Regionally Significant Industrial Areas are the exception; pre-2000 FARs are somewhat lower pre-2000 (0.24), whereas post-2000 FARs are in line with other Industrial and Employment Areas at 0.29. While there is residential development within these areas, a 'with

residential' FAR was not calculated because residential generally represents a non-conforming use within Title 4 that is now discouraged by regional land use policies.

The following table reports building square feet from which FARs were derived, and reports urban Design Type FARs both including and excluding residential buildings.

Figure 18. FARs by Design Type Detail

	Land SF	Building SF	FAR
Regional Centers			
Post 2000			
Commercial/industrial	1,975,000	1,771,000	0.90
With MFR/SFR	3,425,395	3,665,000	1.07
Pre 2000			
Commercial/industrial	24,815,000	9,564,000	0.39
With MFR/SFR	48,630,000	15,295,000	0.31
Town Centers			
Post 2000			
Commercial/industrial	2,011,000	871,000	0.43
With MFR/SFR	9,452,000	6,856,000	0.73
Pre 2000			
Commercial/industrial	27,581,000	7,895,000	0.29
With MFR/SFR	85,053,000	21,648,000	0.25
Corridors			
Post 2000			
Commercial/industrial	6,278,000	2,916,000	0.46
With MFR/SFR	27,750,000	18,504,000	0.67
Pre 2000			
Commercial/industrial	108,843,000	39,268,000	0.36
With MFR/SFR	346,639,000	103,207,000	0.30
Employment Areas			
Post 2000			
Commercial/industrial	6,116,000	1,751,000	0.29
Pre 2000			
Commercial/industrial	57,330,000	17,397,000	0.30
Industrial Areas			
Post 2000			
Commercial/industrial	10,153,000	2,968,000	0.29
Pre 2000			
Commercial/industrial	70,066,000	20,851,000	0.30
Regional Significant Industrial Areas			
Post 2000			
Commercial/industrial	23,402,000	6,855,000	0.29
Pre 2000			
Commercial/industrial	208,984,000	50,938,000	0.24

Note: The Central City design type has been excluded from this table due to data errors associated with residential condominiums and the prevalence of this building type within the Central City.

Source: Metro RLIS (Nov 08), E.D. Hovee & Company, LLC.

III. DEMAND FACTORS

This chapter considers four topics of special interest in allocating expected job growth to the region's land supply. These include:

- *Redevelopment rates:* to what extent is development occurring on vacant land versus land that is already in (potentially low value) use?
- *Consumer demand as a retail driver:* to what extent is the tri-county sufficiently served by retailers, and will retail continue to cluster in certain higher income subareas rather than evenly distribute throughout the region?
- *Institutional growth:* how much job growth will occur within institutional settings? How do institution's land use patterns vary from other users?
- *Land use within industrial sectors:* to what extent have industrial users intensified, as has been observed within the office sectors? To what extent might this occur in the future?
- *Employees per square foot:* assumptions are reported that will serve as a starting point to be combined with FAR inputs – translating job growth to site/land consumption.

EMPLOYMENT ON VACANT VS. REDEVELOPED LANDS

A major factor in estimating the land needs associated with future employment growth is the extent to which building development locates on vacant (greenfield) parcels versus parcels on which some existing – likely low valued – development is located, so that the new building represents land redevelopment.

To quantify this issue, parcels that tax data indicated had developed post-2000 were matched with the same property tax ID numbers from a 1999 taxlot database. The characteristics of the taxlot in 1999 were then noted, including whether the parcel had any improvements (indicated by improvement value and/or building square footage).[18]

The required data was available for about 450 taxlots region-wide, a very limited sample of the taxlots on which post-2000 development occurred and again disproportionately weighted towards Multnomah County taxlots. Within this sample, 53% were properties on which some amount of development was located prior to the current building (with at least 200 square feet and a value of at least $5,000). Forty-seven percent of these taxlots were vacant prior to their post-2000 development.

[18] This query relied upon year built and square footage data, which again were poorly populated for Clackamas and Washington County taxlots. It also only captures those taxlots that remained consistent within this timeframe, as opposed to taxlots that were split or aggregated in the redevelopment process.

Figure 19. Former Use of Parcels that Developed Post-2000 for Employment Uses

	Number of Parcels by Improvement: Land Value Ratio*						1999 Status	
Geography	Total	< 0.5	0.5 - 1	>1	No data	Vacant	Improved	Vacant
Central	52	20	5	7	2	18	65%	35%
Inner Ring	265	59	29	51	17	109	59%	41%
Outer Ring	129	18	6	17	5	83	36%	64%

*Note: Improvement to land value ratio describes the relationship between the value of land improvement (building) to the value of land.

Source: RLIS (November 2008), E.D. Hovee & Company, LLC.

Taxlots were also analyzed by subarea and by ring. Predictably, given the greater building stock and developed parcels with the central and inner ring – and the longer time period over which they have developed – redevelopment rates were higher for these two geographies.

The Central subarea reported the highest redevelopment rate among the ring geographies at 65%, which corresponds to its relatively high land values. The inner ring reported a similarly high redevelopment rate at 59%.The outer ring, which supports the bulk of the region's vacant parcels, reported a redevelopment rate of just 36%.

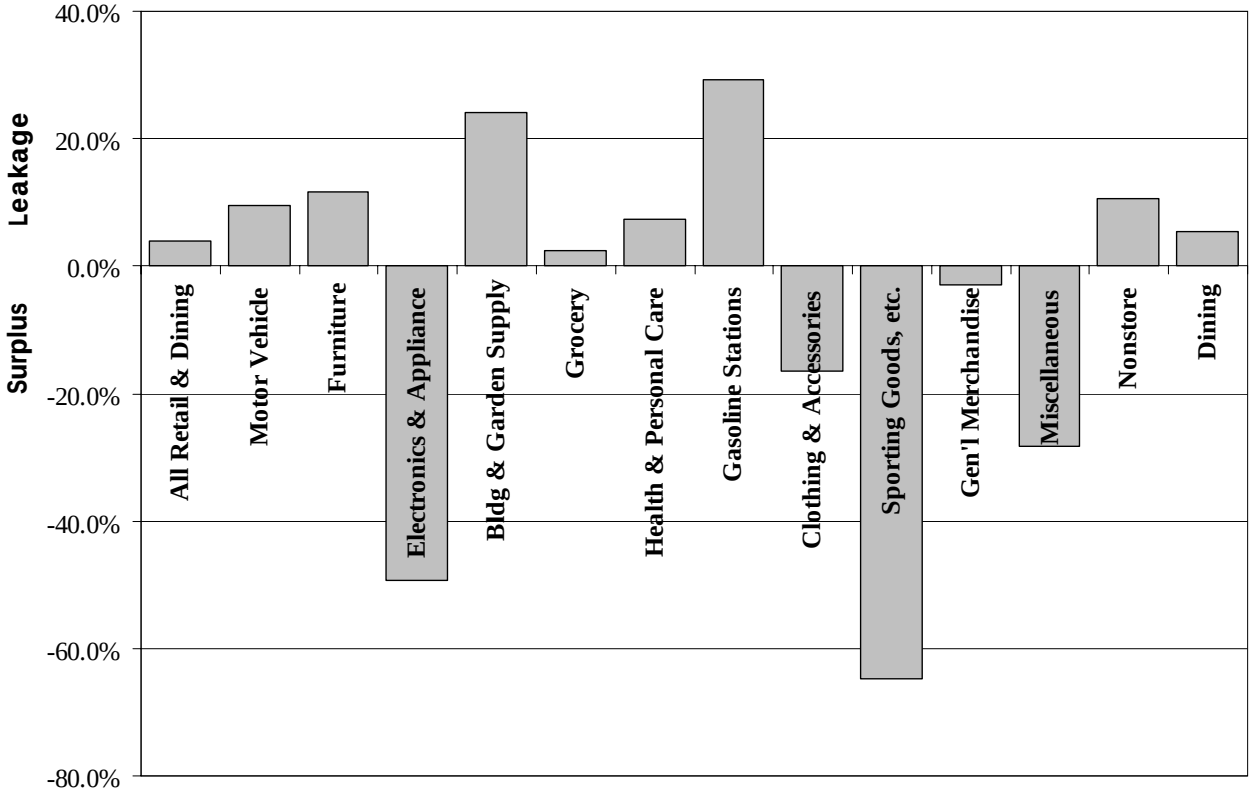
CONSUMER EXPENDITURES AS RETAIL DRIVER

As a real estate product, retail development is unique in its responsiveness to household consumer demand, primarily measured through housing densities and incomes. For this discussion, consumer retail expenditures are considered at the macro (regional) level of the Portland tri-county area plus Clark County, given Clark County's major influence on regional retail activity (its historic propensity to shop in retail tax-free Oregon).

As of 2008, an estimated $24+ billion in consumer spending potential is estimated for the four-county metropolitan area. This estimate is based on household disposable income for the region and typical buying patterns exhibited throughout the U.S. In 2008, metro area retailers collected an estimated $23 billion in sales, meaning that the remaining $1 billion could be viewed as retail leakage, with consumers traveling elsewhere to shop (or shopping online). However, this relatively minor leakage (4%) could also simply indicate different consumer spending priorities in the Portland metro area.

As a percentage of total demand, the leakage is relatively modest – only 4% of total spending potential (retail demand). It also appears to be influenced by lifestyle and planning choices that, to some degree, set this metro area apart from the rest of the country. This becomes more evident with the following graphic depicting levels of sales leakage (or surplus) by major merchandise category.

Figure 20. Retail Sales Leakage as % of Demand – By Merchandise Type (2008)



Source: ESRI Business Information Solutions, E. D. Hovee & Company, LLC.

While total sales are very close to total estimated spending, sales within each retail category diverge (sometimes significantly) from the national norms. According to U.S. averages, the Portland region appears to spend less on motor vehicle sales, furniture and home furnishings, building materials and garden supply, grocery, health and personal care, gasoline stations, non-store retailers and dining. In contrast, retail sales are higher than would be expected in electronics/appliance stores, apparel, general merchandise, and a variety of specialty merchandise categories. These variances from the national norms could indicate tourism/destination spending (in 'over supplied' categories), shifts between categories (for instance, residents appear to be under-served with furniture stores but are more than amply served by home furnishings stores), and also retailers and their merchandise not neatly falling within the categories created by industry analysts.

This overview suggests four summary observations:

1. By and large, retail potential and actual spending appear to be roughly in balance in the Portland metro area (including Clark County). While there are potential imbalances within specific merchandise categories, these may be more the result of different consumer spending priorities and development patterns in the Portland metro area, rather than indications of actual sales leakage.

2. Consequently, further retail development over the longer term is dependent primarily on some combination of population growth and destination tourism activity (aided by Oregon's lack of retail sales tax).
3. The geographic distribution of retail sales could change between subareas within the region. However, in the absence of population and/or tourism growth, this shifting would be a zero-sum game, with some subareas gaining at the expense of others.
4. As the region grows, an appropriate planning and market question is whether the distribution of retail will or should continue to be strongly focused on the Central and Inner Ring areas or more dispersed to Outer Ring subareas to better serve local residents closer to home.

INSTITUTIONAL UTILIZATION

Institutional uses warrant special consideration as an employment generator and land consumer because their land use patterns are distinct from other employers. Institutions including health care, education and public agencies often tend to cluster employment, 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 (such as residential).

Metro's 2035 employment forecast (created in 2000) projects that a significant 20% of net new employment will be within the health and education sectors: a total of 126,000 new health care jobs and 31,300 new education jobs. Pro-rated, assuming constant annual growth, this equates to 97,600 health care jobs and 24,100 education jobs that might be expected between 2008 and 2035. Many of these jobs will locate outside of land designated for employment uses.

A review of 2006 health care and education employment sectors indicates that the bulk of employment sites (rather than employers, which may maintain more than one site) supports more than 50 employees: within education, more than 80% of employment is at sites with more than 50 employees; within health care, more than 60% of employment is at sites with more than 50 employees.

Figure 21. 2006 Education and Health Care Employment by Employees per Site

	Education		Health Care	
Employees per Site	Total	Percent	Total	Percent
Less than 10	1,500	2%	13,200	15%
10-50	11,400	17%	19,700	22%
50-100	12,100	18%	10,500	12%
101-500	15,300	23%	17,600	20%
500+	25,200	38%	29,000	32%
Total	65,500	100%	90,000	100%

Source: ES 202, Metro, E.D. Hovee & Company, LLC.

If these trends continue in the future, employment growth 2008- 2035 within these sectors would be distributed approximately as follows:

Figure 22. Projected Employment Growth 2008 – 2035 by Employees per Site

Employees per Site	Education	Health Care
Less than 10	600	14,300
10-50	4,200	21,400
50-100	4,500	11,400
101-500	5,600	19,100
500+	9,300	31,500
Total	24,200	97,700

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

In focus groups conducted as a part of Task 6 for this employment and economic trends analysis work program, institutional land users report somewhat conflicting priorities:

- Dense (multi-story) development fits well for administrative and non-patient functions. On the other hand, mid-rise development best maintains accessibility, keeps cost low and avoids neighborhood conflicts.
- Especially given the challenges of building in an often residential environment, institutional preference is to expand on-site (where existing agreements are in place) rather than to acquire new land on which to expand.
- Institutions value both easy auto accessibility (as most clients access institutions via cars) and good transit service, primarily to serve their workforce.
- Space needs are impacted by both an aging population (with greater health care needs and thus space needs) and reduced on-site visits and fewer over-night stays (which reduce space needs).

With the exception of major research and administrative functions, institutions generally appear oriented to decentralize and bring services closer to where people live. Given that the bulk of the region's population growth is projected for the outer ring, institutional employment growth is expected to follow suit and favor outer ring and other locations anticipated for substantial household growth.

INDUSTRIAL BUILDING & SITE UTILIZATION

A final topic of special interest that impacts regional land demand is how land utilization has changed and will change within the industrial sectors. Office uses are generally understood to increase in density as land prices increase, adding both building stories and structured parking. Given their emphasis on housing machinery and goods (rather than employees and clients), industrial uses have historically lacked the financial incentive to build at higher densities. To what extent have industrial uses densified in this region? How do broader industrial trends influence this – for instance, continued or accelerated growth in land-intensive warehousing and distributing uses?

To date, this analysis reveals relatively few clear trends indicating substantial changes with industrial land use and building development. Summary comments are listed below.

- Close to 30% of post-2000 flex space development in the Inner Westside and Outer I-5/205 subareas (where the bulk of new flex has located) has comprised 2+ story development since 2000. While reportedly a small component of new industrial sector development, flex is generally willing to develop at higher densities given its heavier emphasis on office.
- In two of nine subareas, 2+ level industrial development accounted for the majority of new space constructed – the Inner I-5 at 52% and Outer Westside at 61%. For the other seven market subareas, multi-level industrial accounted for at most 15% of new development.
- A few notable industrial buildings comprise much of the 2+ level industrial structures constructed since 2000. Examples include recent two-story warehouse and distributing buildings (of about 20,000 square feet each within Outer Clackamas) and an Outer I-5/205 industrial park with 165,000 square feet of newly developed flex two-story space that includes clean rooms). East Multnomah reports one recently developed 181,000 square feet paper warehouse and a 56,000 square feet food processing plant.
- The region's prime example of higher density developed industrial space is Intel's Ronler Acres site in the Outer Westside subarea. At four stories and with about 50% office use, this building fits within the traditional definition of flex (vs. industrial) space. The building is associated with structured parking, but retains a campus-style environment with significant green space surrounding the building. Due to this green space, the development's ultimate FAR may be low despite the multi-story and structured parking elements.
- With the exception of RSIAs, over-all average industrial FARs appear to have changed very little, and if anything are decreasing. Decreasing FARs are likely related to the historic stock of multi-story warehouse space; such space is largely considered dysfunctional for modern warehouse uses and is not being replicated in newer buildings. For the most part, multi-story warehouse space is gradually leaving the industrial building inventory with industrial users migrating to new and lower profile construction. This is happening, for example, with office conversions in Portland's Central Eastside district (initially developed pre-1950).
- Metro's 2035 employment projections call for wholesale trade, warehousing and distributing to comprise 45% of net new industrial sector job growth, or a pro-rated 58,000 new jobs by 2035. Data indicates that warehouse buildings support fewer jobs per square feet than other types of industrial uses. Of the remaining industrial sector jobs projected, high tech accounts for 45% and construction accounts for 39%; neither of these are 'traditional' industrial sector land users (high tech tends to have a higher office component and construction requires more land for equipment storage than building square feet). Manufacturing jobs are projected to account for only 4% of non-distributing industrial job growth – a total of just 3,000 new jobs between 2008 and 2035. Again, it should be noted that job sectors locate in various types of commercial space, which are only broadly classified as industrial, flex, office or retail.

Based on focus group results, the best opportunities for increased density of distribution related development may relate more to opportunities for high-cube space (with higher ceilings for more rack storage) than to multi-story development. Most manufacturing space is also expected to

remain at one and in some cases two stories, albeit with high ceiling space requirements for some processes and with 2+ stories more possible for office, administrative and some R&D components of the structure.

Opportunities for multi-level development may also be greater for flex buildings with a higher component of office space, especially within high demand market subareas. For existing land constrained industrial uses, transition from at-grade to structured parking also may be considered in some cases.

BUILDING SQUARE FEET PER EMPLOYEE

Beyond building type and density, the final piece of data required to translate jobs into land needs is the number of building square feet required per employee. The following table lists a range of inputs that will be considered within Task 3 modeling for this Employment Demand Analysis project.

Figure 23. Square Feet per Employee

Employment Type	1999 Metro Study	2008 Metroscope Range
Manufacturing		500 – 1,100
Chemicals, petroleum, rubber, leather	720	
Primary & fabricated metals	320	
Machinery equipment	300	
Electrical machinery, equipment	400	
Transportation and Warehousing	3,290	
Communications and Public Utilities	460	
Wholesale Trade	1,390	
Retail	470	320-450
Services		320-450
Finance, Insurance	370	
Health services	350	500 – 1,100
Education, social, membership services	530	500 – 1,100

Source: 1999 Employment Density Study, Metro; E.D. Hovee & Company, LLC.

Obtaining updated real-world information requires a survey of employers. This was last completed in 1999 for Metro's Employment Density Study. Results available by job sector are reported in the second column. The third column reports simulated employment densities generated from the MetroScope employment model (which vary by Census Tract) that will also be considered with the Task 3 demand paradigm and employment allocations.

Few studies have been conducted that can provide *apples to apples* comparisons of employment density in a consistent manner across a multi-year time frame. Analysis that has been reviewed

does not always indicate a clear trend over time, nor does it reflect prospects for changing patterns that could yet emerge over the next 20-50 years.[19]

Examples of changes that could influence job densities in ways not experienced to date include increased property costs, business cost reductions, increased part-time and shared job positions, office hoteling (or space sharing), and automation. These or other variations may be modeled within a Task 3 demand scenario, as outlined in the following section.

[19] As an example, data compiled by the national Building Owners and Managers Association for office space indicates that employment per square foot of office space generally declined for *private* downtown and suburban uses from 1985 to 1990, then increased somewhat from 1995-2003 (but not back to 1985 levels. With *government* office space, the reverse pattern is noted. Workers square feet increased from 1985-1995, then declined from 1995-2003. As cited by the Urban Land Institute (ULI) publication, *Shared Parking,*, 2005.

IMPLICATIONS FOR NEW EMPLOYMENT DEMAND PARADIGM

As noted at the outset of this report, the results of this Task 1 analysis (together with Task 2 location variables trends research) will inform subregional employment forecasting within Task 3. Regional employment totals are expected to be consistent with Metro's already completed *2005-2060 Regional Population and Employment Forecast for the Portland-Beaverton-Vancouver OR-WA Primary Metropolitan Statistical Area (PMSA).*

The New Demand Paradigm associated with Task 3 will allocate this employment to the tri-county portion of the larger metro area by industry sector, subarea geography and design types using a range rather than point estimate approach. Based on research completed with Tasks 1 and 2 of this Employment and Economic Trends research, the following implications are noted for the Task 3 demand allocation process.

8. The 2002 *Urban Growth Report* projected that the tri-county UGB would capture 75% of future job growth; this employment analysis indicates that the tri-county area captured 83% of 2006 employment. Task 3 forecast allocation scenarios may be varied to reflect this more recent experience and/or land capacity constraints within certain job sector or land use design types.

9. The Metro 2060 forecast provides a range rather than point estimate of future total employment but without detailed employment sector (or industry-specific) projections. This approach reflects the increasingly dynamic nature of the national and metro area economy and is proposed to be continued with the forecast allocation process – placing primary emphasis on subarea geography and design type categories rather than sector specific projections.

10. A baseline forecast allocation is expected to reflect the continued trend of job movement towards the outer rings of the metro region – especially for job sectors seeking Title 4 land and population-driven components of retail and institutional (service) growth. An alternative scenario may reflect growth patterns possible if urban-focused design types (centers and corridors) successfully compete for higher shares of regional employment growth.

11. Prior forecast allocations have translated employment growth to land demand with use of employment density factors (measured in terms of *jobs per acre*). In contrast, this planned allocation modeling process will pursue a two-step approach, similar to the prior Regional Industrial Land Study (RILS) approach:

    - Application of *employment per square foot of building area* standards based on Metro and other research which generally are not expected to change materially over the forecast periods (of 5, 20 and 50 years) – at least in base case scenario.
    - Variation of *building to site area (or FAR)* standards reflecting both recent experience and regional policy objectives. FAR variations are seen as the primary means of influencing the future land footprint associated with regional employment growth.

12. Commercial office, retail and institutional uses have begun to transition to higher FARs, a trend that is forecast to continue albeit with higher FARs expected for the central and inner ring than the outer ring of the tri-county region. At FARs in the range of 0.50+/- (depending on use), transition from at-grade to structured parking and lowered parking ratios with active transit access would also be anticipated.

13. With the exception of RSIAs, industrial FARs do not yet appear to be increasing within the tri-county region but are maxing out at about 0.30. A baseline forecast scenario can be expected to maintain this cap for the foreseeable future. Alternative scenarios may reflect other industrial development patterns with reduced development footprint – including transition to higher cube distribution, structured parking for some major employers at site constrained facilities, and/or reduced tri-county capture for uses with lower ratios of employment per square foot of building area.

14. Information from this analysis suggests consideration of adjusting refill rates (currently assumed at 50% for commercial use and industrial at 35%) by location as well as by land use. Higher refill rates would be indicated for central and inner ring than for outer ring subareas. More information is needed – likely anecdotal – to support varying these rates by land use.

As Metro and local jurisdictions explore this new demand paradigm, additional data resources may be needed above and beyond what is currently available across the region. Important data-related tools to maintain and improve upon our ability to track the relationship between job and development trends include accurately geocoded ES-202 job data (potentially to the taxlot level of accuracy) and better populated tax assessor's databases for current land use, building square footage and year built (with best coverage currently available for Multnomah County).[20]

[20] Also noted as a related data need will be GIS algorithms to better associate vacant and unimproved lots (particularly parking areas) with adjoining employment uses and buildings under common ownerships.

APPENDIX. DETAILED DEVELOPMENT DATA TABLES

Tables included in this appendix describe the region's (non-residential) built environment, as reflected in the CoStar commercial real estate inventory. Tables included are:

Summary Tables:

- Industrial, Flex, Office Trends by Subarea
- Summary table: Retail Trends by Subarea

Detailed Subarea Tables:

- Central Subarea
- Inner North & East
- Inner Clackamas
- Inner I-5
- Inner Westside
- Outer Multnomah County
- Outer Clackamas
- Outer I-5/205
- Outer Westside

Industrial, Flex, Office Trends by Subarea

	Central	Inner Ring	Outer Ring	Inner N/NE	Inner Clackamas	Inner I-5	Inner Westside	East Multnumah	Outer Clackamas	Outer I-5/205	Outer Westside	Total
Industrial												
Pre 2000	9,735,000	57,902,000	34,398,000	37,152,000	11,559,000	2,564,000	6,627,000	9,465,000	1,068,000	13,477,000	10,388,000	102,035,000
Post 2000	14,000	6,794,000	10,455,000	5,055,000	1,356,000	114,000	269,000	4,919,000	317,000	3,653,000	1,566,000	17,263,000
Total Industrial	9,749,000	64,696,000	44,853,000	42,207,000	12,915,000	2,678,000	6,896,000	14,384,000	1,385,000	17,130,000	11,954,000	119,298,000
% of Total	8%	54%	38%	35%	11%	2%	6%	12%	1%	14%	10%	100%
% of Post 2000	0%	39%	61%	29%	8%	1%	2%	28%	2%	21%	9%	100%
Flex (50% office)												
Pre 2000	911,000	12,349,000	3,578,000	1,204,000	495,000	2,564,000	8,086,000	231,000	104,000	1,523,000	1,720,000	16,838,000
Post 2000	-	1,010,000	879,000	18,000	-	114,000	878,000	103,000	12,000	447,000	317,000	1,889,000
Total Flex	911,000	13,359,000	4,457,000	1,222,000	495,000	2,678,000	8,964,000	334,000	116,000	1,970,000	2,037,000	18,727,000
% of Total	5%	71%	24%	7%	3%	14%	48%	2%	1%	11%	11%	100%
% of Post 2000	0%	53%	47%	1%	0%	6%	46%	5%	1%	24%	17%	100%
All Office												
Pre 2000	32,934,000	18,239,000	6,953,000	6,836,000	1,479,000	6,054,000	3,870,000	1,224,000	272,000	2,764,000	2,693,000	58,126,000
Post 2000	2,486,000	3,911,000	3,125,000	659,000	702,000	1,428,000	1,122,000	303,000	27,000	826,000	1,969,000	9,522,000
Total Office	35,420,000	22,150,000	10,078,000	7,495,000	2,181,000	7,482,000	4,992,000	1,527,000	299,000	3,590,000	4,662,000	67,648,000
% of Total	52%	33%	15%	11%	3%	11%	7%	2%	0%	5%	7%	100%
% of Post 2000	26%	41%	33%	7%	7%	15%	12%	3%	0%	9%	21%	100%
Class A Office												
Pre 2000	12,134,000	4,953,000	1,635,000	342,000	289,000	2,499,000	1,823,000	-	-	164,000	1,471,000	18,722,000
Post 2000	1,890,000	1,703,000	1,930,000	195,000	341,000	662,000	505,000	-	-	457,000	1,473,000	5,523,000
Total Class A	14,024,000	6,656,000	3,565,000	537,000	630,000	3,161,000	2,328,000	-	-	621,000	2,944,000	24,245,000
% of Total	58%	27%	15%	2%	3%	13%	10%	0%	0%	3%	12%	100%
% of Post 2000	34%	31%	35%	4%	6%	12%	9%	0%	0%	8%	27%	100%
Office Distribution												
Class A	40%	30%	35%	7%	29%	42%	47%	0%	0%	17%	63%	36%
Class B	37%	44%	47%	45%	48%	43%	44%	67%	45%	62%	29%	41%
Class C - F	23%	26%	18%	48%	23%	15%	10%	33%	55%	20%	8%	23%

Source: Costar (January 2009), E.D. Hovee & Company, LLC.

Retail Trends by Subarea

All Retail	Central	Inner Ring	Outer Ring	Inner N/NE	Inner Clackamas	Inner I-5	Inner Westside	East Multnumah	Outer Clackamas	Outer I-5/205	Outer Westside	Total
Pre 2000	11,716,000	34,813,000	13,526,000	15,305,000	5,906,000	5731000	7,871,000	4,418,000	1,614,000	4,147,000	3,347,000	60,055,000
Post 2000	909,000	3,815,000	4,525,000	1,732,000	500,000	265000	1,318,000	1,337,000	172,000	1,524,000	1,492,000	9,249,000
Total Retail	12,625,000	38,628,000	18,051,000	17,037,000	6,406,000	5996000	9,189,000	5,755,000	1,786,000	5,671,000	4,839,000	69,304,000
% of Total	18%	56%	26%	25%	9%	9%	13%	8%	3%	8%	7%	100%
% of Post 2000	10%	41%	49%	19%	5%	3%	14%	14%	2%	16%	16%	100%
Large Format												
Pre 2000	1,911,000	5,267,000	1,615,000	2,026,000	1,246,000	1,177,000	818,000	706,000	136,000	475,000	298,000	8,793,000
Post 2000	-	1,062,000	871,000	587,000	171,000	-	304,000	192,000	-	198,000	481,000	1,933,000
All Large Format	1,911,000	6,329,000	2,486,000	2,613,000	1,417,000	1,177,000	1,122,000	898,000	136,000	673,000	779,000	10,726,000
% of Total	18%	59%	23%	24%	13%	11%	10%	8%	1%	6%	7%	100%
% of Post 2000	0%	55%	45%	30%	9%	0%	16%	10%	0%	10%	25%	100%
Centers >35,000 SF												
Pre 2000	3,669,000	15,266,000	7,150,000	4,371,000	3,110,000	3,031,000	4,754,000	2,292,000	851,000	2,391,000	1,616,000	26,085,000
Post 2000	335,000	1,135,000	2,467,000	467,000	83,000	125,000	460,000	763,000	50,000	938,000	716,000	3,937,000
All Centers	4,004,000	16,401,000	9,617,000	4,838,000	3,193,000	3,156,000	5,214,000	3,055,000	901,000	3,329,000	2,332,000	30,022,000
% of Total	13%	55%	32%	16%	11%	11%	17%	10%	3%	11%	8%	100%
% of Post 2000	9%	29%	63%	12%	2%	3%	12%	19%	1%	24%	18%	100%
Other												
Pre 2000	6,136,000	14,280,000	4,761,000	8,908,000	1,550,000	1,523,000	2,299,000	1,420,000	627,000	1,281,000	1,433,000	25,177,000
Post 2000	574,000	1,618,000	1,187,000	678,000	246,000	140,000	554,000	382,000	122,000	388,000	295,000	3,379,000
All Other	6,710,000	15,898,000	5,948,000	9,586,000	1,796,000	1,663,000	2,853,000	1,802,000	749,000	1,669,000	1,728,000	28,556,000
% of Total	23%	56%	21%	34%	6%	6%	10%	6%	3%	6%	6%	100%
% of Post 2000	17%	48%	35%	20%	7%	4%	16%	11%	4%	11%	9%	100%
Distribution												
Large Format	15%	16%	14%	15%	22%	20%	12%	16%	8%	12%	16%	15%
Centers	32%	42%	53%	28%	50%	53%	57%	53%	50%	59%	48%	43%
Other	53%	41%	33%	56%	28%	28%	31%	31%	42%	29%	36%	41%

Source: Costar (January 2009), E.D. Hovee & Company, LLC.

Central Subarea

DEMOGRAPHICS

2008 Households	47,630	Median Income	$44,300	Median Age	37.1
2008 Population	83,100	Average Income	$70,700	Percent Non-White	20%
Average Household Size	1.65			Percent Hispanic	6%

RETAIL

	Retail Types				Built Environment		Rents	
		Centers				Parking		
Year Built	Large Format	>35,000 SF	Other	Total SF	>1 Story	Ratio	Range	Average
Pre 2000	1,911,000	3,669,000	6,136,000	11,716,000	66%	2.76	$4-$40	$19.09
Post 2000	-	335,000	574,000	909,000	84%	1.73	$19-$35	$26.37
All Years	1,911,000	4,004,000	6,710,000	12,625,000	68%	2.67	$4-$40	$19.93
Avg Rent/SF	*$11.00*	*$19.78*	*$20.06*	*$19.93*		(blank)		

OFFICE

	Square Feet by Building Class				Built Environment			Rents	
Year Built	A	B	C	Total	2-3 Stories	4+ Stories	Parking	Range	Average
Pre 2000	12,134,000	12,500,000	8,300,000	32,933,000	24%	72%	2.17	$8-$54	$18.93
Post 2000	1,890,000	595,000	1,000	2,485,000	17%	81%	2.46	$17-$29	$22.63
All Years	14,024,000	13,095,000	8,301,000	35,418,000	23%	73%	2.18	$8-$54	$19.20
Avg Rent/SF	*$23.58*	*$19.36*	*$17.04*	*$19.20*		(blank)			

FLEX (50% office)

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	911,000	29%	3.04	$5-$14	$10.07
Post 2000	-	0%	-	-	-
All Years	911,000	29%	3.04	$5-$14	$10.07

INDUSTRIAL

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	9,735,000	31%	1.23	$3-$20	$9.83
Post 2000	14,000	0%	-	-	-
All Years	9,749,000	30%	1.23	$3-$20	$9.83

Inner North & Northeast

DEMOGRAPHICS

2008 Households	169,810	Median Income	$74,600	Median Age	40.5
2008 Population	424,720	Average Income	$106,800	Percent Non-White	13%
Average Household Size	2.37			Percent Hispanic	7%

RETAIL

	Retail Types				Built Environment		Rents	
		Centers				Parking		
Year Built	Large Format	>35,000 SF	Other	Total SF	>1 Story	Ratio	Range	Average
Pre 2000	2,026,000	4,371,000	8,908,000	15,305,000	19%	3.42	$2-$54	$15.88
Post 2000	587,000	467,000	678,000	1,732,000	46%	3.26	$11-$34	$20.42
All Years	2,613,000	4,838,000	9,586,000	17,037,000	21%	3.41	$2-$54	$16.81
Avg Rent/SF	*$14.56*	*$17.86*	*$16.79*	*$16.81*		(blank)		

OFFICE

	Square Feet by Building Class				Built Environment		Rents		
Year Built	A	B	C	Total	2-3 Stories	4+ Stories	Parking	Range	Average
Pre 2000	342,000	2,931,000	3,563,000	6,836,000	56%	17%	3.40	$7-$53	$16.95
Post 2000	195,000	417,000	47,000	659,000	37%	48%	3.22	$13-$26	$18.84
All Years	537,000	3,348,000	3,610,000	7,495,000	55%	19%	3.39	$7-$53	$17.12
Avg Rent/SF	*$36.76*	*$17.19*	*$16.34*	*$17.12*		(blank)			

FLEX (50% office)

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	1,204,000	18%	2.22	$11-$12	$11.91
Post 2000	18,000	0%	-	-	-
All Years	1,222,000	18%	2.22	$11-$12	$11.91

INDUSTRIAL

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	37,152,000	6%	1.66	$3-$23	$7.03
Post 2000	5,055,000	0%	1.24	$4-$8	7.03
All Years	42,207,000	5%	1.65	$3-$23	$6.89

Inner Clackamas

DEMOGRAPHICS

2008 Households	48,700	Median Income	$61,600	Median Age	38
2008 Population	125,500	Average Income	$77,400	Percent Non-White	14%
Average Household Size	2.56			Percent Hispanic	8%

RETAIL

	Retail Types				Built Environment		Rents	
		Centers				Parking		
Year Built	Large Format	>35,000 SF	Other	Total SF	> 1 Story	Ratio	Range	Average
Pre 2000	1,246,000	3,110,000	1,550,000	5,906,000	23%	4.29	$7-$38	$17.46
Post 2000	171,000	83,000	246,000	500,000	8%	3.84	$15-$33	$19.92
All Years	1,417,000	3,193,000	1,796,000	6,406,000	21%	4.22	$7-$38	$17.81
Avg Rent/SF	*$30.48*	*$18.32*	*$16.99*	*$17.81*		(blank)		

OFFICE

	Square Feet by Building Class				Built Environment			Rents	
Year Built	A	B	C	Total	2-3 Stories	4+ Stories	Parking	Range	Average
Pre 2000	289,000	717,000	473,000	1,479,000	61%	15%	4.09	$1-$24	$16.33
Post 2000	341,000	340,000	21,000	702,000	57%	39%	3.95	$15-$30	$22.90
All Years	630,000	1,057,000	494,000	2,181,000	60%	23%	4.07	$1-$30	$17.34
Avg Rent/SF	*$24.36*	*$19.18*	*$12.54*	*$17.34*		(blank)			

FLEX (50% office)

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	495,000	23%	2.88	$5-$31	$12.18
Post 2000	-	0%	-	-	-
All Years	495,000	23%	2.88	$5-$31	$12.18

INDUSTRIAL

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	11,559,000	7%	2.03	$3-$20	$7.16
Post 2000	1,356,000	4%	1.36	$5-$7	5.26
All Years	12,915,000	7%	1.92	$3-$20	$6.89

Inner I-5

DEMOGRAPHICS

2008 Households	41,490	Median Income	$74,600	Median Age	40.5
2008 Population	99,700	Average Income	$106,800	Percent Non-White	13%
Average Household Size	2.37			Percent Hispanic	7%

RETAIL

	Retail Types				Built Environment		Rents	
		Centers				Parking		
Year Built	Large Format	>35,000 SF	Other	Total SF	> 1 Story	Ratio	Range	Average
Pre 2000	1,177,000	3,031,000	1,523,000	5,731,000	38%	5.6	$26-$32	$17.26
Post 2000	-	125,000	140,000	265,000	44%	4.4	$10-$32	$28.07
All Years	1,177,000	3,156,000	1,663,000	5,996,000	38%	5.5	$10-$32	$18.09
Avg Rent/SF	*17.33*	*17.00*	*18.39*	*18.09*		(blank)		

OFFICE

	Square Feet by Building Class				Built Environment		Rents		
Year Built	A	B	C	Total	2-3 Stories	4+ Stories	Parking	Range	Average
Pre 2000	2,499,000	2,474,000	1,081,000	6,054,000	47%	43%	3.57	$7-$49	$20.46
Post 2000	662,000	758,000	8,000	1,428,000	45%	46%	3.64	$14-$35	$23.71
All Years	3,161,000	3,232,000	1,089,000	7,482,000	47%	44%	3.58	$7-$49	$21.07
Avg Rent/SF	*$25.50*	*$21.51*	*$15.25*	*$21.07*		(blank)			

FLEX (50% office)

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	2,564,000	5%	3.15	$10-$15	$12.39
Post 2000	114,000	0%	-	-	-
All Years	2,678,000	5%	3.15	$10-$15	$12.39

INDUSTRIAL

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	2,564,000	2%	1.81	$4-$9	$5.82
Post 2000	114,000	52%	3.00	-	-
All Years	2,678,000	4%	1.87	$4-$9	$5.82

Inner Westside

DEMOGRAPHICS

2008 Households	129,140	Median Income	$67,200	Median Age	34.9
2008 Population	332,140	Average Income	$88,100	Percent Non-White	22%
Average Household Size	2.56			Percent Hispanic	12%

RETAIL

	Retail Types				Built Environment		Rents	
Year Built	Large Format	Centers >35,000 SF	Other	Total SF	> 1 Story	Parking Ratio	Range	Average
Pre 2000	818,000	4,754,000	2,299,000	7,871,000	9%	4.07	$10-$38	$19.47
Post 2000	304,000	460,000	554,000	1,318,000	25%	4.07	$18-$43	$27.97
All Years	1,122,000	5,214,000	2,853,000	9,189,000	11%	4.07	$10-$43	$21.28
Avg Rent/SF	*$25.18*	*$20.63*	*$21.41*	*$21.28*		(blank)		

OFFICE

	Square Feet by Building Class				Built Environment		Rents		
Year Built	A	B	C	Total	2-3 Stories	4+ Stories	Parking	Range	Average
Pre 2000	1,822,863	1,566,429	480,296	3,869,588	64%	25%	4.10	$10-$108	$20.91
Post 2000	505,266	607,174	10,000	1,122,440	42%	54%	3.87	$16-$31	$23.46
All Years	2,328,129	2,173,603	490,296	4,992,028	59%	32%	4.06	$10-$108	$21.56
Avg Rent/SF	*$23.23*	*$24.89*	*$15.44*	*$21.56*		(blank)			

FLEX (50% office)

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	8,086,000	48%	3.76	$5-$22	$11.29
Post 2000	878,000	29%	3.68	$7-$11	9.86
All Years	8,964,000	46%	3.75	$5-$22	$11.13

INDUSTRIAL

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	6,627,000	6%	2.44	$4-$26	$8.30
Post 2000	269,000	0%	2.57	$5-$16	10.68
All Years	6,896,000	6%	2.45	$4-$26	$8.42

Outer Multnomah County

DEMOGRAPHICS

2008 Households	53,080	Median Income	$60,300	Median Age	34
2008 Population	145,210	Average Income	$69,800	Percent Non-White	20%
Average Household Size	2.70			Percent Hispanic	14%

RETAIL

	Retail Types			Built Environment			Rents	
Year Built	Large Format	Centers >35,000 SF	Other	Total SF	>1 Story	Parking Ratio	Range	Average
Pre 2000	706,000	2,292,000	1,420,000	4,418,000	6%	4.09	$8-$34	$14.35
Post 2000	192,000	763,000	382,000	1,337,000	10%	3.86	$11-$28	$21.23
All Years	898,000	3,055,000	1,802,000	5,755,000	7%	4.05	$8-$34	$16.41
Avg Rent/SF	*$9.90*	*$17.09*	*$16.50*	*$16.41*		(blank)		

OFFICE

	Square Feet by Building Class					Built Environment			Rents	
Year Built	A	B	C	F	Total	2-3 Stories	4+ Stories	Parking	Range	Average
Pre 2000	-	737,000	484,000	3,000	1,224,000	81%	0%	4.28	$6-$28	$14.60
Post 2000	-	290,000	13,000	-	303,000	87%	0%	2.85	$16-$26	$21.69
All Years	-	1,027,000	497,000	3,000	1,527,000	82%	0%	4.21	$6-$28	$15.42
Avg Rent/SF	*$0.00*	*$16.67*	*$14.16*	*$0.00*	*$0.00*		(blank)			

FLEX (50% office)

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	231,000	0%	3.00	$8-$9	$8.33
Post 2000	103,000	0%	2.56	$10-$11	$10.90
All Years	334,000	0%	2.75	$8-$11	$9.19

INDUSTRIAL

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	9,465,000	2%	1.81	$4-$10	$6.94
Post 2000	4,919,000	6%	1.23	$5-$8	$5.71
All Years	14,384,000	3%	1.63	$4-$10	$6.27

Outer Clackamas

DEMOGRAPHICS

2008 Households	41,880	Median Income	$65,800	Median Age	40.3
2008 Population	119,600	Average Income	$79,400	Percent Non-White	9%
Average Household Size	2.84			Percent Hispanic	8%

RETAIL

	Retail Types			Built Environment			Rents	
Year Built	Large Format	Centers >35,000 SF	Other	Total SF	> 1 Story	Parking Ratio	Range	Average
Pre 2000	136,000	851,000	627,000	1,614,000	11%	3.53	$7-$22	$14.30
Post 2000	-	50,000	122,000	172,000	0%	4.93	$14-$25	$20.60
All Years	136,000	901,000	749,000	1,786,000	10%	3.79	$7-$25	$16.29
Avg Rent/SF	*$0.00*	*$17.91*	*$15.86*	*$16.29*		(blank)		

OFFICE

	Square Feet by Building Class				Built Environment			Rents	
Year Built	A	B	C	Total	2-3 Stories	4+ Stories	Parking	Range	Average
Pre 2000	-	108,000	164,000	272,000	0	0%	314%	$12-$21	15.75
Post 2000	-	27,000	-	27,000	0	0%	425%	$11-$28	25.75
All Years	-	135,000	164,000	299,000	0	0%	326%	$12-$26	17.75
Avg Rent/SF	*$0.00*	*$20.49*	*$15.93*	*$17.75*	*(blank)*				

FLEX (50% office)

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	104,000	11%	1.82	$11-$12	$11.16
Post 2000	12,000	0%	2.32	0	$0.00
All Years	116,000	9%	2.15	$11-$12	$11.16

INDUSTRIAL

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	1,068,000	6%	2.19	$1-$20	$12.28
Post 2000	317,000	13%	2.08	$5-$7	$6.43
All Years	1,385,000	7%	2.17	$1-$20	$10.98

Outer I-5/205

DEMOGRAPHICS

2008 Households	52,110	Median Income	$73,100	Median Age	37.2
2008 Population	140,690	Average Income	$98,800	Percent Non-White	10%
Average Household Size	2.67			Percent Hispanic	8%

RETAIL

	Retail Types				Built Environment		Rents	
Year Built	Large Format	Centers >35,000 SF	Other	Total SF	>1 Story	Avg Parking Ratio	Range	Average
Pre 2000	475,000	2,391,000	1,281,000	4,147,000	9%	3.72	$8-$32	$19.04
Post 2000	198,000	938,000	388,000	1,524,000	11%	4.37	$19-$32	$27.28
All Years	673,000	3,329,000	1,669,000	5,671,000	10%	3.93	$8-$32	$21.03
Avg Rent/SF	*$28.39*	*$22.70*	*$20.31*	*$21.03*		(blank)		

OFFICE

	Square Feet by Building Class					Built Environment			Rents	
Year Built	A	B	C	F	Total	2-3 Stories	4+ Stories	Parking	Range	Average
Pre 2000	164,000	1,890,000	707,000	3,000	2,764,000	44%	20%	3.91	$4-$63	$18.54
Post 2000	457,000	351,000	18,000	-	826,000	58%	36%	3.91	$11-$32	$23.99
All Years	621,000	2,241,000	725,000	3,000	3,590,000	47%	24%	3.91	$4-$63	$19.78
Avg Rent/SF	*$27.59*	*$20.90*	*$16.67*	*$0.00*	*$19.78*		(blank)			

FLEX (50% office)

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	1,523,000	40%	2.90	$5-$15	$8.82
Post 2000	447,000	28%	2.75	$5-$11	$8.72
All Years	1,970,000	37%	2.89	$5-$15	$8.80

INDUSTRIAL

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Rents	Average
Pre 2000	13,477,000	2%	1.79	$5-$20	$7.09
Post 2000	3,653,000	6%	2.31	$5-$8	$6.13
All Years	17,130,000	3%	1.89	$5-$20	$6.86

Outer Westside

DEMOGRAPHICS

2008 Households	52,110	Median Income	$73,100	Median Age	37.2
2008 Population	140,690	Average Income	$98,800	Percent Non-White	10%
Average Household Size	2.67			Percent Hispanic	8%

RETAIL

	Retail Types			Built Environment			Rents	
Year Built	Large Format	Centers >35,000 SF	Other	Total SF	>1 Story	Parking Ratio	Range	Average
Pre 2000	298,000	1,616,000	1,433,000	3,347,000	12%	3.75	$8-$25	$18.94
Post 2000	481,000	716,000	295,000	1,492,000	2%	4.48	$18-$34	$23.52
All Years	779,000	2,332,000	1,728,000	4,839,000	9%	3.88	$8-$34	$20.27
Avg Rent/SF	*$14.35*	*$18.66*	*$20.73*	*$20.27*		(blank)		

OFFICE

	Square Feet by Building Class				Built Environment		Rents		
Year Built	A	B	C	Total	2-3 Stories	4+ Stories	Parking	Range	Average
Pre 2000	1,471,000	842,000	380,000	2,693,000	24%	4%	4.06	$17-$21	$14.73
Post 2000	1,473,000	490,000	6,000	1,969,000	35%	60%	3.70	$11-$20	$18.80
All Years	2,944,000	1,332,000	386,000	4,662,000	29%	55%	3.97	$11-$21	$15.74
Avg Rent/SF	*$20.50*	*$16.74*	*$14.10*	*$15.74*			(blank)		

FLEX (50% office)

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	1,720,000	29%	3.66	$9-$12	$10.61
Post 2000	317,000	2%	3.66	$5-$6	$5.40
All Years	2,037,000	25%	3.46	$5-$12	$10.03

INDUSTRIAL

			Parking	Rents	
Year Built	SF	2+ Stories	Ratio	Range	Average
Pre 2000	10,388,279	3%	2.24	$4-$17	$7.39
Post 2000	1,565,828	61%	2.20	$7-$11	$8.20
All Years	11,954,107	11%	2.41	$4-$17	$7.48

Bonnie Gee Yosick llc
Economic and Policy Analysis

FINAL DRAFT

MEMORANDUM

TO: Malu Wilkinson

FROM: Bonnie Gee Yosick

DATE: January 23, 2009

SUBJECT: Task 2 Variables Affecting Location Decisions (Final Draft)

Metro has contracted with a consultant team headed by E.D. Hovee & Company, LLC to define a new paradigm for evaluating job needs and associated employment land demand for the urban area of the tri-county region. This paradigm is to respond not only to global drivers of what appear to be increasingly diverse if not unprecedented economic cycles, but also support the continued integrity of the region's unique land use structure and its goal of integrating economic, environmental and social objectives.

The employment and economic trends analysis is intended to be serve as background for the *Urban Growth Report* Metro will complete in 2009. Other uses include land use and transportation modeling (including the MetroScope model), local jurisdiction information for Goal 9 comprehensive plan updates, and general information for business and economic development organizations throughout the region.

Six tasks have been outlined with this employment and economic trends analysis work program:

Task 1 – Employment Demand Factors and Trends
Task 2 – Variables Affecting Location Decisions (this memo)
Task 3 – New Demand Assessment Paradigm
Task 4 – New Capacity/Inventory Approach
Task 5 – Frame Choices for Job Needs
Task 6 – Focus Groups

As part of this analysis, the goal of Task 2 is to provide a qualitative assessment of regional, national, and global economic development perspectives. This research is aimed to identify existing and emerging factors that affect location decisions by type of business, both between and within metro areas comparable to the Portland-Metropolitan region. The focus of this memo is a targeted national literature survey, using prior results of RILS and GMELS research as a starting point.

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While presented as a stand-alone memo for the purpose of discussion, this document supports and is supported by the other documents being produced by the consulting team. In particular, Task 1 sets the stage by providing the quantitative benchmark that serves to drive the analysis. Task 3 crafts the demand-assessment paradigm, Task 4 evaluates the land and building capacity of the region, Task 5 frames the choices, allowing testing of various policy decisions' impact upon the region's land and development patterns, and finally, Task 6 presents the findings of the focus groups described above.

The focus of this literature survey is to identify *emerging drivers* affecting the relationship between changing employment patterns and associated building and site characteristics, including such attributes as parcel size and density of development by type of use and market area location preference. This memo presents findings of the literature survey, organized as follows:

- An overview of key global risks and opportunities to the Portland Metro regional economy,
- Followed by an overview of the commercial and industrial real estate environment for the Portland Metro region, reviewing the commercial and industrial land markets each in turn:
  - Industrial,
  - Office,
  - Retail,
  - Institutional, and
  - Mixed-Use;
- Concluding with an exploration of how these drivers might affect the regional economy and its resulting land use in the short, medium, and long term.

As noted earlier, the quantitative benchmark for the analysis is presented in the Task 1 work product. Data to specific sub-regions is presented in more detail in that memo. As the research presented in this Task-2 product is qualitative in nature, the findings are presented as they apply to the Portland Metropolitan region, referred to generally as the Metro region. Where it may support the findings, some region-wide empirical information is presented where it is available.

SUMMARY OF FINDINGS

Consumers are being cautious, companies are laying off employees, and businesses are keeping inventories lean. At the same time, baby-boomers are nearing retirement age, distinctions between traditional land uses are blurring, and technology for everything from telecommunications systems, inventory management, and on-line shopping is improving.

This sampling of existing and emerging trends will serve to influence decisions about the capacity of the Metro region to meeting employment needs and support a strong regional economy. This memo explores how these and other observations may affect the outlook for land use and development in the region—over 5-, 20- and even 50-year time horizons.

In the short term (of the next 5 years), lean, slow-moving inventories are resulting in weak demand for warehousing/distribution space. However, despite increasing availability, rents are holding steady and the Portland Metro region's industrial market is continuing to perform well. For the industrial market, the region has a price advantage over other west coast cities and is priced comparably to other similarly-sized cities inland, making it attractive to companies seeking industrial space with good access and a regional location with high-quality amenities and attractions for staff.

As job losses and other cost-cutting measures force employers to re-evaluate space needs, a steady increase in vacancy rates is putting downward pressure on rents, which will slow short-term development activity. As with industrial, the region's office market is faring this recession better than the rest of the nation, with vacancy rates just above those of the best-performing office markets. Though substantial new construction is now underway in Portland's Central Business District (CBD), with increasing vacancies, a slowdown in development is expected.

With relatively little retail space per-capita, the region's retail market is also expected to perform well relative to other regions. Retailers will be well-served to invest in both their physical space and their web presence, developing well-integrated, multichannel (web and stores) operating strategies.

With the exception of Research and Development (R&D) and administrative functions, services—particularly medical-office, education, and workforce training programs—are moving toward more stand-alone locations proximate to population and employment centers. Distinctions among traditional land uses are becoming increasingly blurred.

Over the longer term (of the next 20 years and beyond), employers may have difficulty filling positions as baby boomers retire and leave the already slow-growing labor market. Increased globalization and offshoring of some activities will continue as the wage differential between the domestic and international labor markets is expected to persist. Increasing levels of automation and highly effective supply-chain management enables this trend in industrial and manufacturing, while advanced telecommunications systems threaten traditional office jobs.

However, there may be opportunities to bolster employment growth by encouraging in-migration and strengthening the region's existing comparative advantages. The region has attracted recent attention as a leader in sustainable and renewable energy technologies, with significant industry clusters in apparel, creative services, biosciences, and metals as well. The extent to which the region can leverage its competitive position to augment key industry clusters will help determine its mid- to long-term industrial opportunities. To realize these opportunities, the region's economic potential is increasingly dependent on investing in a solid infrastructure system, securing a world-class presence in higher education linked to R&D, and attracting capital to convert promising new technologies to commercial applications.

GLOBAL RISKS AND OPPORTUNITIES TO THE PORTLAND METRO ECONOMY

After a surprisingly robust recovery after 9/11, it appears the inevitable economic slowdown has begun. Corrections in the housing and financial markets, combined with high volatility in energy prices, are causing widespread slowing across industries. These global and national factors have taken their toll regionally as well. The slowdown became undeniable midyear when the State of Oregon posted its first job losses in the 2nd quarter of 2008 after nearly 20 consecutive quarters of rising employment. The region's economy has also slowed as national and global concerns over credit availability and high energy prices have taken hold.

These and other macroeconomic issues represent risks to the regional economy, and—with it—regional employment and development patterns. Some of the key risks and opportunities are reviewed and discussed below.

Financial market instability is affecting business and consumer confidence, which will affect businesses' capital spending plans. In an attempt to bolster confidence and stimulate the economy, Congress has passed a massive "bailout" plan and the Fed has lowered interest rates. Continued access to credit is vital to putting a "floor" under the downturn and subsequent economic recovery.

Though the immediate credit crunch is currently perceived as primarily a short-term issue, the ramifications (i.e. the industrial makeup of the economy) will also play out through the mid-term of the next 10 to 20 years and possibly beyond. This may occur both as an intergenerational shifting of "repayment" responsibility of the current and continuing bailout into the next generation and to the extent that intensified global competition combines with demographic and geopolitical pressures creating a continually shifting playing field of global winners and losers.

Housing market: While not directly an economic development factor, housing values and credit availability affect household wealth and resulting decisions ranging from consumer purchases to job choices. Lax lending standards and low interest rates resulted in rampant overleveraging in the mortgage market. Home price declines and mortgage equity withdrawal declines have slowed consumer spending and impacted consumer net worth (including retirement funding). Oregon is particularly susceptible to a major housing correction in California and the rest of the nation due to dependence on forest products (more so for the rest of the state than the Portland Metro area).

Growth in employment and personal income will be needed to stabilize consumer spending. Oregon's relative advantage in housing cost is narrowing as prices in California fall faster than in Oregon. Additionally, weak residential building has resulted in a loss of construction employment. With economic recovery, a potential mid-term question is whether pricing will come back to levels needed to support development of urban-scale residential and mixed use projects, or—as experienced in the land-constrained economies in Asia—multi-story industrial development.

The current ***fiscal environment*** is forcing government to find more cost-effective ways to deliver services. On the revenue side, the economic slowdown, tax limitations, and the political challenge of increasing revenue streams are constraining local government revenues, while expenses related to provision of service—such as health benefits, energy and commodity costs, and pension benefit costs—are growing faster than the tax bases which support them.

Oregon's tax structure, with its initiative "reforms" of the 1990s (Measures 5 and 50), relies particularly heavily on the personal income tax. This system seemed to work during the high-tech boom and its resulting prosperity, but that algorithm proved problematic in the dot-com bust several years ago and appears even less sustainable today. Declining employment and personal income will result in declining tax revenues, and state and local governments will need to cut services and infrastructure investment which will affect business and consumer location decisions. For Oregon, this situation is exacerbated by the increasing disparity between economic health of the Portland metro/Willamette Valley area and other traditional resource-dependent regions of the state.

The ***decline of the resource-based economy*** most directly affects rural Oregon—but with it, the Portland Metro region. Rural parts of the state have experienced a decline as their resource-based economies have shrunk. As a result, downsized employees have—in some cases—retrained and moved to urban areas. Some have adjusted to a longer commute to the urban area, rather than moving outright, and still others have simply dropped out of the workforce altogether. These choices affect the Portland Metro region's labor and housing markets.

Global Positioning

Key manufacturing sectors of the Pacific Northwest economy are increasingly dependent on international markets—as exemplified by high tech, aerospace and machinery. This dependence presents risks as well as opportunities:

- ***Volatility of the dollar:*** The recent decline of the U.S. dollar has helped the region's economy by making exports more competitive on the international market, while at the same time making imported goods more expensive for consumers. A resurgent dollar lessens the manufacturing competitive advantage. Longer term, continued instability of exchange rates will increase risk to Portland-area companies dependent on staying globally competitive.

- ***Global pathway cities:*** The Urban Land Institute's (ULI) *Emerging Trends in Real Estate 2009* report concludes that U.S. pathway cities "which have become investor favorites and global business magnets, reinforce their premier standings in the looming market correction." The report highlights the coastal cities of Seattle, San Francisco, and Los Angeles along the pacific and New York, Boston, and Washington DC to the east, also noting Chicago, Dallas, and Atlanta as "three key metros in the middle of the country." Portland is situated between what are currently the two top-ranked U.S. gateways of Seattle and San Francisco. However, without clear economic drivers, the ULI report notes that "Portland prospers in Seattle's shadow, but increasingly plays second fiddle."

- ***China & emerging economies:*** In recent years, the rapid growth of China and then India created incredible inflationary pressure, especially on basic commodity prices. While perhaps not sustainable as exemplified by the current economic downturn, global recovery could mean a return to increased competition for products ranging from steel and cement to food to oil—all with effects on the Portland metro economy. As India and other countries (including the African continent) become more significant on the global stage, competition for resources becomes more severe—as do potential climate and carbon effects. At the same time, increasing incomes in developing nations increase demand for Oregon's exports. Short term, global economic downturn can be expected to dampen demand for Oregon's manufacturing exports. Longer term, the reality of an increasingly global economy amidst constrained resources places increasing emphasis on sustainability as good business practice—and as perhaps a key source of competitive advantage for years to come.

- ***Outsourcing of manufacturing operations and professional services:*** Recently, the availability of advanced telecommunications networks has allowed the outsourcing of certain manufacturing operations and professional and technical jobs to regions of the world with lower labor costs. With the U.S. as a current leader in design and development, the need for rapid turnaround in terms of development of new product seems to support domestic labor, but the mid- to long-term impact of globalization remains unclear, especially as other countries move quickly up the education and technology curve.

Going green: Beginning as a response to the Great Depression, Portland and the Pacific Northwest have benefited from low-cost hydropower. However, as demand surpasses the available capacity of hydro generation, electric generation has moved to higher-cost sources such as coal and natural gas, resulting in higher energy prices and adverse carbon-footprint impacts, which put the region's transportation sector at risk. On the other hand, higher energy costs may encourage development of smaller and more disparate distribution centers, and the Portland Metro region may be well positioned for this role. On the development side, increasing energy costs and the vogue of green buildings has increased use of technology to control costs. Portland may benefit from its current position as a leader in green building with a concentration of Leadership in Energy and Environmental Design (LEED)-certified buildings and LEED-accredited professionals, allowing a concentration of a green-building niche. The region also has opportunity to focus on alternative energy with associated business investments in technologies such as wind and solar power. It will be critical that the region take advantage of this position, as other regions develop expertise to close this gap in the mid- and long-term. Urban core markets appear to be a potential beneficiary of increased energy costs.

Development Costs*:* Increased capitalization (cap) rates indicate higher levels of property income are needed to support new real estate development. From a real estate perspective, required income levels make it harder for industrial uses to compete for sites with commercial. In the short-term, construction materials become more affordable as commodity prices have eased, but the fear is that they will rise again as the global economy rebounds in the mid-term. This combination places more pressure on finding more cost effective ways of delivering higher-

cost urban than suburban development, but may also keep conditions ripe for redevelopment and renovation of existing buildings in developed areas.

Demographics: Aging baby boomers, smaller household sizes, flattened levels of labor force participation. These demographic trends have short-, medium-, and long-term implications to the labor market and levels of consumer spending, which will likely outlast the immediate financial situation.

According to an analysis by the Oregon Employment Department, Oregon's public-sector workforce has a higher proportion of older workers than the private sector, with about one in five workers in state and local government and education estimated to be 55 or older. State agencies are trying to accommodate older workers by allowing more flexible work options and allowing retirement-eligible employees to retain part-time work. Among private industries, the transportation sector has the highest proportion of older workers, with over one-third of the total workforce in transit and ground transportation 55 or older. Other industry sectors with a relatively higher proportion of older workers include other services, natural resources and mining, and health care and social assistance. Industry groups with moderate numbers of older workers include financial activities, professional and business services, wholesale trade, and manufacturing. Industry groups with the lowest proportion of older workers include retail trade; arts, entertainment, and recreation; administrative and waste services; construction; information; and accommodation and food services.

The potential economic and financial burdens posed by an aging population are offset, at least in part, to the extent that the U.S. remains attractive and facilitates continued in-migration. For example, a ULI analysis of a United Nations (UN) report indicates that North America—including the U.S.—has been the dominant recipient of the world's immigrants who intend to settle permanently. The UN further estimates that the U.S. population contains about six times as many foreign-born persons as Canada. Though the U.S. has a somewhat ambivalent view of immigration, Canada faces serious immediate labor shortages and anticipates a worsening of the situation, so therefore is actively recruiting immigrants, with an emphasis on skilled trades and professions. Expatriate professionals demand international-quality real estate product, including industrial, office, laboratories, and warehouses. All migrants generate housing and retail demand and generally contribute to the regional labor force (retirees excepted).

COMMERCIAL/INDUSTRIAL REAL ESTATE MARKET

Global economic conditions affect regional development patterns through changes in employment patterns which, in turn, affect commercial and industrial real estate development.

The slowdown in the economy has been evident in the real estate market through most of 2008. In the United States, property sales of significant office, industrial, retail, apartment, and hotel assets total just $46.5 billion in the first quarter of 2008, down from over $135.0 billion the previous year. And even more striking, the number of investors is down from over 150 different buyers last year to less than 50 this year.

Most of these commercial property investors are watching on the sidelines with their capital, waiting for the economic cycle to recover. With no better opportunities in stocks or other asset classes, equity capital flows into commercial property investments remains strong. Foreign buyers of U.S. property are also growing, facilitated by the relatively weak dollar. Availability of capital will facilitate the stabilization of financial markets.

Unemployment in the metro area increased to 7.2 percent for November 2008, up nearly 2 percent from 5.4 percent a year ago. The Oregon average was slightly higher, at 9.0 percent for December, up from 5.4 percent. The national average increased 2.2 percent to 7.2 percent for the same time period. Job gains continue to be led by healthcare, education, and other services, while losses occurred in construction, trade and transportation, financial, and manufacturing.

For the *short-term*, the financial crisis will add another drag to the weakened economy. Job cuts are expected in industries serving the financial sector, and the economy is expected to remain weak with low consumer confidence and elevated unemployment. To date, the Portland region has not suffered to the same degree as many other regions, with relatively low vacancy rates holding lease rates steady.

In the *mid-term*, the region's opportunities for growth are tied to its current competitive position and key decisions by major employers in concert with state and local governments. Investments in infrastructure will allow both established and emerging niche industries to develop sustainably. For the *long-term*, the region is remains dependent on its historic attractiveness for young creatives, global-pathway connections, and an emphasis on environmental and economic sustainability. Education—both in terms of a world-class higher-education system and workforce training—remains critical.

INDUSTRIAL TRENDS AND OUTLOOK

Previous multi-story buildings were abandoned with the advent of the assembly line in Henry Ford's era to accommodate horizontally-organized factories. Industrial development in the 1920s and 1930s clustered in areas well-served by rail, and the evidence of these development patterns are still evident in the region today. In the 1950s and 1960s, business parks introduced a mix of office, R&D and warehouse/distribution in suburban areas with good freeway and airport access. More recently, a hybrid of traditional industrial and office has evolved, responding to industry's need for a greater range of amenities and higher-quality finishes than traditional industrial, with corresponding higher rental rates as well. Though still a small portion of the total industrial market, this tech-flex segment is generally higher density than traditional industrial in suburban areas and serves an important function in high-tech areas, offering an appealing alternative to traditional office space.

Industrial development includes a broad range of product types and settings.

Warehouse/Distribution buildings generally provide storage and distribution of goods. These require large, flat sites with space for maneuvering trucks and access to transportation. They typically have low employee-to-area ratios so parking requirements are typically small. Some buildings may have 10 to 20 percent of their floor area allotted to office uses, to support the

administrative staff of a distribution or manufacturing company. Ceiling heights can be as high as 36 feet to provide for higher stacking, and buildings can be as large as 750,000 to 1 million square feet, though most buildings in the Portland Metro area are generally less than 250,000 square feet.

Manufacturing structures are large buildings designed to house manufacturing processes and can be more than 1 million square feet. Like warehouse/distribution space, ceiling heights are high and ample room for truck maneuverability is a necessity. Parking ratios are usually low, so the FAR is usually relatively high, despite the single-floor format.

Tech-flex space might be one- or two-story buildings ranging from 20,000 to 1 million square feet with internal space a combination of office and warehouse. The pattern of internal uses varies, though the CoStar data cited in the Task 1 Report defines it as 50 percent or more office space with the balance as warehouse space. This class includes buildings devoted exclusively to research and buildings which serve multiple uses, often with office and administration functions in the front of the building and R&D other high-tech uses in the rear. Offices in R&D buildings typically have open floor plans to promote teamwork and collaboration, and activities range from the creation and development of new technologies and products to the development, testing, and manufacture of products from existing technology. The design of tenant improvements is more important for R&D uses than for other industrial uses and is usually tailored to the needs of specific tenants.

National outlook

Employment in manufacturing, distribution, and related sectors drives the market for industrial space. Cautious consumers and inventory management practices are driving businesses to keep inventories lean, resulting in weak demand for warehousing/distribution space. However, despite increasing availability, rents are holding steady.

Historically, there has been a significant spread between regions in the vacancy rates of industrial properties. The national commercial/industrial real estate brokerage firm C. B. Richard Ellis (CBRE) compares the availability rates across metropolitan areas, which it refers to as "market areas."[1] For the Portland market area—which includes Multnomah, Washington, Clackamas, Yamhill, and Columbia counties in Oregon, and Clark County in Washington—availability rates are one to two percent higher than the vacancy rates. According to CBRE, the five best performing cities have availability rates under 10 percent and the five worst experiencing much higher availability rates over 17.5 percent, as shown in Table 1.

[1] While conceptually similar to vacancy rates, availability rates include properties which may still be under construction or occupied, but which are expected to become available in the near future, and—as such—are being actively marketed.

Table 1
Industrial Market Availability Rates, 3rd Quarter 2008

Markets with Lowest Availability Rates		Markets with Highest Availability Rates	
Tucson	4.4%	Austin	23.8%
Las Vegas	6.5%	Stamford	19.9%
Houston	7.0%	Boston	19.8%
Salt Lake City	7.6%	Columbus	18.9%
Long Island	7.6%	Baltimore	17.4%
Portland	8.2%		

Source: C.B. Richard Ellis, United States National Industrial Availability Index, 3rd Quarter 2008.

Ranked 24th in size among the 44 market areas reported by CBRE, Portland has been experiencing vacancy rates just above those of the strongest industrial markets.

Until the more recent economic slowdown, the U.S. and Portland Metro region experienced a somewhat unexpected resurgence in some manufacturing sectors following 9/11. The manufacturing sectors enjoying this renaissance seemed to be technologically sophisticated, niche-oriented, leading edge (for their industry) and market responsive (i.e. with rapid turnaround to changing customer requirements). It is not clear whether this was an anomaly (brought about, for example, by the weak U.S. dollar) or represents a path for selectively reinventing our industrial base—as tech-savvy and market-focused.

Portland Metro Region Outlook

Regional job losses have occurred in the construction and financial sectors, and—notably for the industrial real estate market—manufacturing, and trade and transportation. Gains were seen in healthcare, education, government, and professional services—industry groups driving office and institutional space, but not typically industrial space users.

As of the second quarter of 2008, the region's industrial real estate market was continuing to perform well, despite economic uneasiness. With relatively low vacancies and with only about 500,000 square feet under construction, the industrial market is expected to continue to perform well, given the limited choice and room for movement in the market. And as noted in the national outlook, rental rates have been holding steady, between $0.33 to $0.41 per square foot in the region. In some cases, new construction is asking rates as high as $0.45 per square foot. Flex space is renting in the $0.85 to $0.95 per-square-foot range.

These rates compare favorably to the Puget Sound area, our global-pathway neighbor to north, whose market area average lease rates are $0.54 per square foot, with warehouse/manufacturing/business park space leasing at an average of $0.45 per square foot while flex/tech space commands $1.20 per square foot. Portland also maintains this price advantage over other portal cities on the west coast, with asking rates (for warehouse only) averaging $0.69 per square foot in the Los Angeles market area, $0.91 in San Francisco, and $0.71 in San Diego.

Pricing in Portland's six-county market area is also comparable to Sacramento's market area which has asking rates of $0.36 per square foot for warehouse, $0.58 per square foot for light A&B, and $0.84 per square foot for R&D space. Pricing for other similarly-sized metro areas is also comparable, with Austin's lease rates at $0.54 for warehousing, $0.51 manufacturing, and $0.81 for flex/R&D.

Within the region, there is significant variability in vacancy rates in the markets subareas. According to Commercial Real Estate Brokerage Cushman & Wakefield, the vacancy rates varied across the region as of the 3rd quarter, 2008 from a low of 4.2 percent in the Southeast sector including Southeast Portland and Clackamas to a high of 8.4 percent in the Southwest sector, with the Hillsboro/Sunset Corridor subarea 12.7 percent vacant. However, one limitation with broker data is its omission of owner-developed or owner-occupied space.

Emerging Trends

Employment in manufacturing, distribution, and related sectors drives the market for industrial space. Though job gains are expected in the transportation/warehousing and wholesale trade sectors, the Bureau of Labor Statistics has forecast a loss of over 1.5 million U.S. manufacturing jobs between 2006 and 2016. Some job losses are the natural result of automation as employers substitute capital for labor. But job losses coupled with the turmoil of the financial markets will not bode well for businesses making capital investments. Key trends affecting the Portland region's industrial land uses are described below:

Offshoring: Continued movement of industrial operations overseas, including more high-tech manufacturing and R&D functions previously maintained in the U.S. The wage differential which drove the offshoring of certain manufacturing functions may be reaching the exhaustion point, according to some observers. Consulting firm McKinsey & Co. notes that other factors are changing global economics, including the high cost of oil, the falling dollar, rising overseas wages, and quality issues. According to a workshop summary of the Committee on the Offshoring of Engineering from the National Academy of Engineering, the overall business cycle and technological changes have a larger impact on the short-term engineering workforce. In addition, some foreign-based companies are now "onshoring" by increasing their engineering operations in the U.S. As globalization continues, an increasing number of workers likely will be vulnerable to the impacts—both negative and positive—of offshoring and other labor market shifts.

Globalization has also changed and ***consolidated industrial space across the U.S***.—with the areas of dominance the portal cities along the coasts and a few key inland nodes for distribution to the rest of the country.

Supply-Chain Management: Continued consolidation of corporate America and resulting consolidation of distribution facilities have fueled the trend in supply-chain management such as just-in-time inventory management, direct distributing (shipping goods directly from manufacturers to retailers, or—in some cases—consumers), and electronic inventory control. All of these developments in supply-chain logistics have undergone an evolution over the past

decade, and several key parts of the supply chain—warehousing and distribution—have been incorporated into the changes.

Success with ***Radio Frequency Identification (RFID)*** in today's retail supply chain has been mixed. Wal-Mart started its push for adoption of RFID technology in 2004 when it annouced its goal to have 12 of its approximately 120 distribution centers outfitted for RFID by 2006; as of September 2008, only five were. Research released in August 2008 by the RFID Research Center at the University of Arkansas showed promise for the use of RFID tags on individual retail items, though there were several disconcerting challenges noted in the study. Of particular concern was the limited success rate of readers when scanning varying quantities of items; the more items the reader had to scan in one instance, the less successful it was—a serious impediment to a technology intended to streamline large quantities of merchandise in the supply chain. As a compromise to item-level tagging, Walgreens has recently deployed an approach which places its control tags on plastic tubs and cages that carry cases of products to shipping dock doors. Information on the contents of the containers is synched with Walgreens' warehouse system to ensure that product quantities and items are destined for the intended store.

The impact of RFID technology on land needs will depend on the ***physical layout of the distribution centers***. Distribution centers may now use multiple gates and trailers to minimize downtime for drivers and trucks. Empty trailers are then towed temporarily to the parking area until they are needed for preloading. Higher ceilings now observed allow increased stacking heights so more goods can be stored at one facility before they are shipped out. As at cross-dock trucking facilities, which allow loading and unloading at two or more sides of the terminal, many facilities run with bays on more than one side of the building.

Shortened Product Life Cycles—an indicator of a manufacturer's cost sensitivity—are speeding up. This phenomenon is most prevalent in semiconductors, other electronics, and apparel. Though development has traditionally occurred in the U.S., items are becoming commodified, and then manufactured elsewhere with lower costs of production. This change in production timing and location focuses on the need to accommodate these international supply chains. Similarly, recent volatility in fuel prices increases the dependence on well-integrated transportation networks.

Geographic concentration, specialization, and differential growth by industrial sectors: From real estate economics, the concept of the regional "anchor"—a large firm providing both stability and volume of ideas—helps to fuel start-ups and support their growth. As such, the capabilities of companies to coordinate will drive the degree of commercial success enjoyed within the region. Though a university is a critical component, research suggests that the existence of a world-class university is not, by itself, sufficient to promote an industrial cluster. To support the geographic concentration effort, the Oregon Business Plan has launched the **Oregon Cluster Network** to identify Oregon's mature, emerging, and potential industry clusters and assist cluster participants to accelerate innovation and growth of their industries. The clusters currently identified by this effort include the following:

Aerospace & Aviation
Agriculture & Food
Apparel & Sporting Goods
Creative Services & Arts
Defense & Security
Distribution & Logistics
Financial Services
Fisheries
Forestry Cluster
Green Development
Healthcare & Biosciences
High Tech
Metals & Transport Equipment
Outdoor & Recreation
Professional & Business Services
Renewable Energy
Software
Telecommunications
Tourism & Hospitality

Mass Customization: One opportunity to revive a timber resource-based economy is through the concept of mass customization, which typically involves high levels of mechanization and design and order-processing over the internet, with the goal of yielding higher quality than standard mechanized products. A number of ideas surface from the previous interviews and other research conducted for a previous forest cluster study conducted by E.H. Hovee & Company – suggesting how mass customization might be applied to a largely softwood-oriented industry in Oregon, including:

- Ability of Oregon producers to apply up to 200-300 veneers or different finishes to a commodity plywood or MDF core product – on a *made to order* basis. Some companies are able to alter production daily – maximizing wood value based on market prices the day before.
- Manufacture of extensive door and window products – using a range of wood, composite and non-wood materials.
- Milling of large logs – for a variety of customized, high-end architectural and engineering applications.
- Greater involvement of primary producers in retail packing and displays – ranging from displays at major "big box" retailers to customized customer graphics.
- Ability to mesh concepts of mass customization at the factory with *just in time* inventory control desired by the end-user or retailer.
- Prospective ability to mill certified lumber to market specifications – with *chain of custody* tracking letting the customer know the precise source and management practices of the forest from which the lumber originated.
- Future potential for development of forest bio-refineries that use a common pulp digester with ability to rapidly switch between different outputs – from traditional pulp/paper to bio-fuels and other bio-products – thereby optimizing market demand and pricing.

All of these concepts for mass customization will be predicated on the ability to bring large quantities of raw resources together with virtual market information and high technology capabilities – enabling an ever increasing array of customer choice and value opportunities. In addition to this example of wood products, this concept may be applied to other similar manufacturing opportunities. The opportunities which might easily be adapted would be those sectors that seem to involve some combination of higher-value niche products, customer-driven ordering capabilities, technological sophistication (even for small to medium size companies),

links to high quality or green design, and building from existing core strengths of the regional economy.

Table 2
Industrial Business Trends by Use Type

Industrial Segment	Trends	Land Use Implications	High Performing Regions
Heavy Industrial/ Manufacturing	Increasing off-shore production and decreasing U.S. employment share, especially in non-durable goods. Cost sensitivity varies with life cycle of the product, which is speeding up (e.g. semiconductors).	Requires larger sites (possibly with industrial sanctuary) and good transportation and utility systems, such as redundant power. Fast and certain permitting a more important factor in location decisions.	U.S. industrial space is clustered in key hub distribution markets, rather than in manufacturing centers within each town. These hubs are Los Angeles, Chicago, Northern New Jersey, Dallas/Fort Worth, San Francisco Bay Area, and Atlanta. Preference for large markets, access to suppliers.
Warehouse/ Distribution	Globalization, RFID and other forms of electronic warehousing, direct distribution, just-in-time inventory management, third party distribution. Merging functions with storefronts and siting in shopping centers (Costco). Low inventory/high turnover businesses will remain the most cost sensitive.	Regional/local trade markets (Portland) anticipated to need well located, affordable (vs. state of art) space. Adequate transportation infrastructure is critical. Less supply-chain real estate may be required in some industries. As business functions evolve, retailers may seek less expensive industrial space, rather than retail designated commercial space.	Key gateway cities for air transport distribution: Miami, New York/New Jersey, Los Angeles, Chicago, San Francisco, and—with the location of FedEx's DC—Memphis. Key gateway cities for maritime distribution: Seattle/Tacoma, Los Angeles, New York/New Jersey, San Francisco/Oakland, Miami, and—most comparably to Portland—Savannah and Charleston.
Tech-Flex	Provides campus-type setting desirable to some office users, and allows close siting of business functions (office, R&D, assembly). Encompassing increasingly diverse land uses as services for employees.	Pressure to provide more outlying greenfields along adequate major transportation corridors.	Centers viewed as competitive with Portland include San Diego, San Jose, Seattle, Phoenix, Salt Lake City, Denver, Austin. Other established regions include Boston, Research Triangle Park (NC), and Los Angeles.

Summary Portland Metro Region Outlook:

Short-Term (5-Year): Though still low relative to other regions, vacancies in the six-county Portland Metro area are rising—putting downward pressure on rental rates, especially over the time period that regional / statewide unemployment rates continue to trend upward. The Portland region has a price advantage over other west coast cities and is priced competitively to other similarly-sized cities inland, making it attractive to companies seeking industrial space

with good access and a location with high-quality amenities and attractions for staff. To the extent that the dollar remains comparatively weak over this time period, exports may continue as an important source of stability for the regional economy.

The region has attracted significant attention as a leader in sustainable and renewable energy technologies. Two recent developments include Denmark's Vestas Wind Systems—the world's largest windmill manufacturer—with its North American headquarters in Portland's Central Business District (CBD)—and SolarWorld—one of the largest producers of solar cells in the world—recently opening a 480,000-square-foot manufacturing facility in the former Komatsu plant in Hillsboro. Such developments are key to utilizing large campus industrial sites.

Mid-Term (20-Year): For the 20-year time horizon, the region's prospects are highly dependent on its current competitive position and decisions by major high-tech and Port-related industries within the Portland metro area relative to other U.S. and global alternatives.

The opportunity for the region to attract new growth lies with the region's existing industry clusters. Particular emphasis has been on the recent surge in sustainable and renewable energy, with the City of Portland and the State of Oregon negotiating with Vestas to expand its local operations, hoping to add another 850 jobs to its current employment of about 350 local jobs. The ability of one company—such as Vestas or SolarWorld—to "anchor" the region's sustainable industry cluster could pave the way for spinoff industries.

Other opportunities include building off the region's other industry groupings, including established and emerging industries such as apparel, metals, high-tech, biosciences, and others. Linkages to Oregon's historic natural-resource activities should also not be overlooked, as these resource-based activities may also shift with a nod to the region's current emphasis on sustainability, such as green forest products, and local and organic agriculture, with a preference to agricultural products from Oregon and Southwest Washington.

If RFID technology improves and delivers on its promise to provide critical logistical data to supply-chain and merchandising functions, it is likely that inventories will continue to fall, making distribution centers more highly-automated activity hubs and less passive warehousing space. Volatility in the energy market and fuel prices may encourage development of second-tier distribution locations, and Portland may be well-positioned to satisfy this role.

Long-Term (50-Year): For the long-term, the region is increasingly dependent on securing an internationally recognized higher-ed research presence coupled with venture capital for leading edge technology and commercial applications. Likely shift from large footprint industrial park and campus orientations to higher-density industrial (including for some wholesale-distribution functions both close-in and on the I-5 corridor). Multi-story industrial applications may be possible. Public investments in infrastructure will be crucial.

OFFICE COMMERCIAL TRENDS AND OUTLOOK

Office development is a highly segmented, highly diverse, and highly competitive segment of the development industry. They are categorized by class, building type, use, ownership, and location.

The three main classes are A, B, and C. *Class A* office spaces are investment-grade buildings with top-notch location, design, building systems, amenities, and management. They typically but are not always mid-high rise structures and command the market's highest rents and most credit-worthy tenants. *Class B* buildings also have good location, management, and construction with a little functional obsolescence or deterioration. This class is generally found in well-located buildings that have been well maintained. *Class C* buildings are typically substantially older and have not been modernized.

The office market can also be also categorized as high- (15 or more stories), mid- (four to 15 stories), or low-rise (one to three stories), and garden office (one to five stories with extensive landscaping). Related building product types (often classified by brokers as industrial space) include R&D (typically one or two stories with up to 50 percent office/dry laboratory space and the workshops, storage, and perhaps some light manufacturing), and tech-flex space (one- or two-story buildings often with a mix of warehouse and light industrial and offices).

Most urban areas classify office space by the location and the physical characteristics of the offices and their typical users. The CBD usually contains the largest concentration of major office buildings, though the CBD's share of metropolitan office space is declining in most cities. (More later) Typical tenants in downtown offices include law firms, insurance companies, and financial institutions that require high-quality space. Creative firms and even software are an increasing part of the tenant mix in some metro areas including Portland. Suburban areas have experienced office nodes clustering near freeway interchanges or major suburban shopping centers and executive housing areas.

Historically, suburban rents have been lower than those in the CBD and tenants have typically included regional headquarters offices and smaller companies and service organizations, but suburban locations have been attracting more major law firms, accounting firms and some corporate entities from the CBD, with construction quality, range of amenities, and rents increasing correspondingly. Neighborhood offices are typically oriented to serve the needs of local residents by providing space for service and professional business along arterial streets near residential areas. Business parks might include several buildings with a range of uses from light industrial to office and are typically in suburban locations.

National Outlook

Prospects for the office market are generally tied to financial-, technical-, and professional-services sector employment. The hit to the financial sector directly affects commercial real estate markets serving global financial markets (most particularly New York and London), as job losses and other cost-cutting measures force employers to re-evaluate their space needs. A

steady increase in vacancy rates is putting downward pressure on rents, which will result in less short-term development activity.

Compared to other metropolitan areas, the Portland region was still faring well as of the third quarter of 2008, as shown in the table below.[2] As in many other metro areas of the U.S., Central City office product appears to be holding its own better than suburban office product.[3] This phenomenon reflects some back-to-the-City movement that is also being echoed in housing markets across the nation—driven, in part, by the appeal of urban amenities and efforts to reduce the cost of commuting.

Table 3
Best Performing Office Markets
3rd Quarter, 2008

Metropolitan	Vacancy Rate	Downtown	Vacancy Rate	Suburban	Vacancy Rate
Manhattan	5.9%	Charlotte	0.9%	Honolulu	8.8%
Honolulu	9.3%	Manhattan, Midtown	5.4%	Los Angeles & Miami	9.7%
Miami	9.9%	Boston	6.6%	Nashville	11.2%
Los Angeles	10.2%	Manhattan, Downtown	7.4%	Orlando	11.2%
Portland	10.7%	Washington, DC	7.8%	St. Louis & Ft. Lauderdale	11.6%
		Portland	8.0%	Portland	12.2%

Source: C.B. Richard Ellis, United States National Office Vacancy Index, 3rd Quarter 2008.

Table 4
Worst Performing Office Markets
3rd Quarter, 2008

Metropolitan	Vacancy Rate	Downtown	Vacancy Rate	Suburban	Vacancy Rate
Detroit	24.7%	Detroit	26.1%	Detroit	24.4%
Dallas/Ft. Worth	21.2%	Toledo	23.1%	Phoenix	21.4%
Phoenix	19.8%	Dallas/Ft. Worth	22.2%	Cincinnati	21.2%
Palm Beach County	19.6%	St. Louis	20.1%	Dallas/Ft. Worth	21.0%
Atlanta	19.3%	Wilmington	20.0%	Austin	19.7%
Portland	**10.7%**	**Portland**	**8.0%**	**Portland**	**12.2%**

Source: C.B. Richard Ellis, United States National Office Vacancy Index, 3rd Quarter 2008.

[2] As described earlier, CBRE defines the Portland market area as Multnomah, Washington, Clackamas, Yamhill, and Columbia counties in Oregon, and Clark County in Washington.

[3] CBRE defines the downtown market as the office buildings in the central core of the largest city within the metropolitan area.

Portland Metro Region Outlook

As noted earlier, unemployment in the metro area increased to 6.4 percent for October 2008, comparable to the Oregon average of 6.8 percent, and the national average of 6.1 percent. Though losses were observed in construction, these losses were suffered mostly in residential building activity, as commercial activity is relatively strong with over 1.3 million square feet of office space under construction in the CBD, including MachineWorks, Ziba Design Headquarters, and Meier & Frank building in the Pearl and the ZGF Building, First & Main Equity Office, and Park Avenue West development downtown. The largest of these developments, First & Main and Park Avenue West, are not due for completion until 2010 and 2011. It is unclear whether the demand for these new buildings will be from net new demand or current CBD tenants looking to trade up into more efficient space—which helps justify the higher rents for new construction. If so, these new developments may have little impact on total market absorption, leading to increased vacancies, particularly of older Class B and C properties. Also of concern is the impending availability of some 106,000 square feet when the Port of Portland moves its headquarters to the airport. Suburban development activity was not indicated in available brokerage reports.

The vacancy rate in the CBD dropped to 8.5 percent for the 3rd Quarter 2008, from 9.1 percent from the 2nd Quarter and 9.2 percent one year ago. This contrasts with the suburban vacancy rate, which at 15.3 percent for the 3rd Quarter 2008, is the highest in the region, suffering from over 84,000 square feet in the Tektronix campus and nearly 94,000 square feet in the newly completed Pacific Highway Center.

Emerging Trends

Influence of technology: As tenants require more extensive and sophisticated telephone and computer network systems integrated into the design of buildings, "Smart Buildings" are the norm, with advanced telecommunications cabling and services including phone systems, computer networks, data transmission, voice- and videoconferences and other communication technologies. Energy technology is becoming more sophisticated as well with energy management systems that control heating and ventilation and cogeneration and off-peak cooling systems, remote monitoring and control of HVAC systems is common for lower operating costs and more efficient billing of tenants.

Green Building: Buildings account for nearly three-fourths of electricity consumption, and over one-third of all energy use, carbon dioxide emissions, and raw material use in the U.S. In response, the United States Green Building Council developed its Leadership in Energy and Evironmental Design (LEED) building rating system to conserve natural resources, reduce operating costs, and provide a range of social and community benefits. Established in 2000, there are now 2,150 LEED certified projects nationwide, in all 50 states and 69 countries. By 2010, McGraw-Hill estimates 10 percent of new commercial construction will be green. Portland is seen as a leader in green building, with more buildings LEED-certified per capita than any other region. The City of Portland requires all new and major renovations of city

buildings meet LEED Gold green building standards. This year, ***Popular Science*** magazine rated Portland as America's greenest city with a population over 100,000, and Sustainlane.com, a San Francisco–based environmental group, last year ranked it as the greenest among the 50 largest U.S. cities.

Corporate Campuses: During the 1990s, Sears vacated its namesake tower in Chicago and relocated to a suburban campus. In southern California, the Disney Company continued to add to its corporate collection of buildings designed by renowned architects in suburban Burbank, with buildings designed by Robert Stern, Michael Graves, and Aldo Rossi. Sprint created a 240-acre headquarters campus in the suburb of Overland Park, near Kansas City. Though most market surveys of office space specifically exclude owner-occupied buildings from the inventory of commercial office space, these decisions obviously affect the local office market dramatically.

The past decade has revealed an overall ***trend toward office decentralization*** in urban areas—albeit with Central City cores also still experiencing strong office occupancies. Though downtowns across the United States are enjoying a renaissance with new sports and cultural facilities, restaurants and entertainment districts, old buildings are being converted into lofts and condominiums, and thousands of new residents moving in, one component of downtown's traditional livelihood has not generally enjoyed a similar surge: the office market. A review of central business district (CBD) inventories in 30 major U.S. cities by Integra Realty Services shows that nearly three-quarters of them experienced a net increase in office space between 2001 and 2007, but still continued to lose market share in their metropolitan areas to suburban office locations. According to Integra figures, the average metropolitan market share of these 30 CBDs dropped from 31.8 percent in 2001 to 28.4 percent in 2007. With an estimated 28.7 million square feet of office space outside the CBD, Portland's CBD share fell from 42 percent to 37 percent. However, with strong building activity noted in the CBD, the total impact of this trend is unclear.

Mergers and acquisitions: The trend toward business consolidation results in property surpluses as newly merged companies seek to realize the efficiencies that the merger intended. While efficient use of land is desirable, the resulting downsizing may result in adjustments in the real estate market, just as workforce downsizing often results in short-term labor market adjustments. The decline of the financial services industry and the collapse of Washington Mutual in Seattle will likely result in further consolidation, as evidenced by job losses in financial services.

Globalization: As with the movement of industrial operations overseas, professional services are being outsourced as well. The ***Wall Street Journal*** recently published an article highlighting the practice of offshoring legal services to India. Though such face-to-face tasks as appearing in court or handling witness depositions cannot currently be outsourced, routine legal research, due diligence and document review is being done in India at roughly half the cost as in the U.S. Though Indian lawyers often lack U.S. licenses, they are typically closely supervised by U.S. lawyers to comply with ethical concerns. Similar transitions are occurring in industries ranging from technology support centers to title insurance firms. As globalization continues, an increasing number of U.S. workers will be vulnerable to the negative impacts of offshoring and other labor market shifts.

Office-Space "Hoteling": Improved technology and cost-cutting pressure is leading more companies to consider telecommuting and other strategies to reduce the amount they spend on office space. Besides increasing productivity and collaboration among their workers, companies are able to squeeze their operations into less space by adopting policies such as hoteling, in which a worker has no assigned desk but checks in when in the office and is assigned one. That helps mitigate the problem of "dark space" -- desks sitting empty when workers are on the road, working from home or on vacation. According to a 2005 survey, reported in the ***Wall Street Journal***, Chicago real-estate office Jones Lang LaSalle Inc. asked the real-estate directors of 50 major corporations, who together control more than two billion square feet of office space, to rate their best options for cutting their real-estate costs. The top choice for 37 percent of the executives was telecommuting and hoteling. One potential drawback of this approach is that companies are running the risk that they may have more limited expansion opportunities when or if business picks up.

Businesses look for ***strong education systems*** that produce an educated workforce, a user-friendly development and regulatory bureaucracy, affordable workforce housing, and proximity to desirable amenities, including executive housing and recreational opportunities for employees.

Ownership in small businesses may continue to rise due to a variety of factors, including low interest rates, the conversion of leasable property to for-sale units motivated by high vacancy rates, the availability of below-market loans from the US Small Business Administration, retirement planning for small business owners, the tax benefits of property ownership, increasing numbers of professional women working part-time while caring for children, all of which might also point to opportunities for condominium- office development.

Following the trend to save time and commuting costs, the prevalence of ***live-work space*** seems to be increasing. For example, according to the ***LA Times***, if all applications for mixed-use home-office types are approved, it would bring the total number of such units to over 10,000 in the LA region. An Urban Land Institute study indicated that local governments are attracted to the home-office model because it allows for higher levels of energy efficiency and potential for increased tax revenue.

Office Serving Non-Local Markets: Nationally, these *traded sector* office segments—including corporate headquarters, research and development, and back-office functions—have received the most attention, since they can readily move if the company perceives advantages to one location over another. Over the past two decades much of this corporate activity has gravitated to suburban office park and business park locations. Except in high profile corporate urban centers such as Manhattan, these can be difficult clients to attract into City Center locations.

An analysis by the Public Policy Institute of California concluded that net job loss from relocation is very small, and that in-migration largely offsets out-migration. For jobs in California in the 1992-2004 time period, out-migration accounted for 1.6 percent of all "job destruction", and in-migration accounted for 1.0 percent of all job creation. Overall, jobs lost from net relocation accounted for an annualized rate of 0.06 percent of employment; in other

words, job loss from net relocation in California was only six out of every 10,000 jobs annually for the period 1992-2004.

Table 5
Summary of Trends of Office Serving Non-Local Markets

Office Segment	Trends	Land Use Implications	High Performing Regions
Headquarters	Central cities or strong first tier suburbs with good educational systems and air connections.	Requires good choice of office space or availability of land for build-to-suit. Often a stated preference for suburban campuses.	Washington DC, Atlanta, Charlotte, Dallas, Raleigh-Durham.
R&D	Proximity to universities, good K-12 and higher educational system, lifestyle amenities attractive to educated workforce.	Some preference for campus environment as buffer from neighboring uses and privacy. Sited in both traditional office and tech-flex space.	Route 1 in northern New Jersey, large metropolitan areas.
Back Office	Sensitivity to cost with respect to real estate, housing, telecommunications, taxes, wages.	Requires state of the art telecommunications and proximity to affordable workforce housing.	Domestically, medium & small sized cities – Tampa, Tucson, suburban areas. Globally, Bangadore, India.

Office Serving Local Markets: Outside of the traded-sector is another segment of the office market, more captive to the local community. This segment is generally comprised of law firms, Certified Public Accountants (CPAs), medical office, financial institutions, insurance providers, real estate professionals, architectural/engineering firms and others which serve the local business and consumer base of a particular region. As with retail commercial, this segment is driven by population growth and the general economic conditions in the region, but can vary by subarea, based on submarket population and incomes.

Table 6
Summary of Trends of Office Serving Local Markets

Office Segment	Trends	Land Use Implications	High Performing Regions
Central City	Despite a strong inner-city rebound, decentralization of office continues. Firm re-engineering generally favors suburban, exurban, second & third tier cities for back office functions. The central city is favored for high profile and client-oriented service firms.	National trend towards decentralization although 'urban recommit' relocations are documented nationwide.	Boston, New York City, Albuquerque, Las Vegas, Fresno, San Antonia, San Jose, Jersey City, Little Rock, Omaha, Portland.
Suburban	Campus offices can be part of supply chain cluster of an industrial firm and allow for greater integration between land uses and office functions.	Continued pressure for greenfield sites with adequate infrastructure. Need for regulatory accommodation of integration of functions for high-tech sector and other rapidly changing business sectors.	Ventura County, San Diego, Honolulu, Sacramento, Tucson.
Neighborhood	Typically Class B & C space, service-oriented, including medical-office.	Often occurs in retail strip commercial and Main Street locations. Customer-oriented firms such as insurance and real estate often prefer ground floor locations.	Oriented to serve local population, no major differences across major metro areas.

Office Segment	Trends	Land Use Implications	High Performing Regions
Home Office	More people with traditional jobs are working from home a portion of their week, requiring greater communications infrastructure.	Reduces demand for office space to extent that individuals telecommute full-time. Live-work space also seems to be growing.	Limited empirical research; may be correlated with metro areas having a high share of *creative class* individuals.

Summary Portland Metro Region Outlook:

Short-Term (5-Year): With relatively lower vacancy rates than comparable metro areas, the Portland region is expected to perform better than the national average. Even with uncertain economic conditions, building is continuing with over 1.3 million square feet under construction in the CBD, including the Pearl. Additionally, Vestas is considering investing about $250 million to build 500,000 to 600,000 square feet of LEED-Platinum downtown space in the South Waterfront not yet on the books.

However, with increasing vacancies, a slowing of development is expected after projects in pipeline are completed. The duration of the slowdown depends on the extent of the global financial-sector consolidation now in process and statewide employment stagnation. Unlike many metro areas, there currently appears to be some opportunity for Central City (downtown plus Lloyd and Pearl) to recapture market share with more diverse products, attractive lease rates (in down market), increased transit premium, and LEED certifications. The greatest challenges are for much of the suburban market, including business/tech-flex parks with substantial office tenancies.

Mid-Term (20-Year): The future of the office market remains highly uncertain in the mid-term. The labor market—already growing slowly—is expected to further decelerate as baby boomers retire. An additional challenge is the Portland metro region's perceived lack of "global-pathway" status, though increasing energy costs may represent an opportunity for the region even as a second-tier center. There are continued opportunities to build on the region's appeal to young creatives and an entrepreneurial strengthening of business, tech-related and creative service sectors. Best opportunities are for transit-rich, higher density and increasingly urban locales marketed for green development. Portland's position as a leader in sustainable and renewable energy in industry and manufacturing may be expanded to include professional services. With high numbers of LEED-accredited professionals currently in the marketplace, there may be opportunity for spinoff firms and other specialized professional services.

Long-Term (50-Year): For the long term, public investments in education and infrastructure will become even more important. Increased density and increased use of live-work options may affect the region's need for traditional office environments, even in the face of uncertain job growth**.** Advanced telecommunications systems and globalization will make the prospects for office development even more uncertain. As a result, the region's office development becomes increasingly reliant on the historical attractiveness of Portland metro area (extending well beyond the Central City) for migrants—particularly young creatives, and both environmental and economic sustainability. In addition to committed support of workforce training, achieving

world-class higher education and research status would be integral for sustained competitive advantage and improved incomes region-wide.

RETAIL TRENDS AND OUTLOOK

Retail developments are typically categorized by the commercial real estate brokerage and development communities based on market served and tenant characteristics. The following definitions reflect typical real estate nomenclature, and the language may or may not match local planning definitions. For example, what the industry defines as neighborhood centers are often viewed by zoning as community centers.

Convenience and Neighborhood Centers provide the convenience (food, drugs, and sundries) and personal services (laundry and dry cleaning, barbershop, etc.) for the needs for the immediate neighborhood. These centers are usually anchored by a supermarket or drug store, and contain up to 100,000 square feet of leasable area. The site is usually 3 to 10 acres in size and typically serves a population of between 3,000 and 40,000 people.

Community Centers provide many of the convenience and personal services by neighborhood center with a wider array of soft lines (apparel) and hard lines (hardware and appliances). Most of these centers are anchored by a junior department store or variety store in addition to a grocery store and ranges in size from 100,000 to 500,000 square feet. The site area is usually 10 to 30 acres and typically serves a population of between 40,000 and 150,000 people.

Regional and super regional centers provide the general merchandise, apparel, furniture, and home furnishings in depth and variety as well as a range of service and recreational facilities. Typically built around two or more full-service department stores (50,000 square feet each), they typically contain between 500,000 to 1 million square feet or more. The site area required ranges from 10 to 100 acres or more and serves a population of 150,000 to 300,000 or more.

In addition, there are several variations of the major types of shopping centers, including Power Centers, Lifestyle Centers, and Downtown or Urban (Street) Retailing. Specialization of shopping centers started in the 1970s, though the trend accelerated through the 1990s. The affects of these and other trends are explored in the Retail Trends section of this document.

National Outlook

With consumers tapped out on credit and unemployment numbers rise, retail has been hit hard. Large malls, typically owned by REITs, and high-income-area neighborhood shopping centers are generally expected to perform best, though even they will suffer through the unsettling jobs picture and housing woes. This ownership structure typically means remote decision-making and fiduciary responsibilities.

Decline in consumer spending prompted several regional mall stores to either file for bankruptcy protection or close some stores, including Circuit City, Sharper Image, Foot Locker, Pacific Sunwear of CA, and Zales. Retailers have been posting some of the largest year-over-year

declines in retail sales throughout 2008 including Dillard's, Kohl's, Limited Brands, American Eagle Outfitters, and Macy's. Stores that survive will still likely shelve expansion plans for the near term. The uncertainty has led to a flight to quality, with the newer or substantially upgraded regional malls with strong management faring the best.

Weakened consumer demand and inability to borrow to finance the purchase of merchandise are hitting some stores hard than others. Linens 'n Things filed for Chapter 11 bankruptcy protection and is set to close 120 of its 589 stores, including 27 closings in California. The Home Depot is also planning to close 15 stores (less than 1 percent of the company's store portfolio) scattered across ten states (none in Oregon or Washington), and cut its U.S. development pipeline by approximately 50 stores. Yet to be seen is whether this retail contraction is merely a short-term cyclical phenomenon or the start of a longer term transition in the national retail environment.

Portland Metro Region Outlook

A recent survey by Cushman & Wakefield's (C&W) Retail Specialty Group revealed that the Portland region has the second lowest amount of retail space per capita among the 25 largest U.S. metropolitan areas.[4] Only New York City has less retail space per capita. As a result, the Portland region is expected to weather the national slowdown better than most major markets. It is also likely that the region experiences higher overall sales per square foot, which may enable retailers to provide higher-quality store design and amenities.

C&W noted that furniture stores seem to be particularly hard hit by the economic downtown, with Wicks, Levitz, and Linens 'n Things vacating space, enabling some updating and remodeling where the historically tight market may support a higher lease rate for higher quality space.

Despite the cautious economic conditions globally, many retailers are still conducting due diligence for future openings in the Portland region, including national clothier Rue 21 planning to open several Oregon locations in 2009, and Toys R Us planning to introduce a new hybrid concept in 2010. Much of the proposed retail development seems to be following anticipated "new rooftops"—as with over 900,000 square feet of development in four large projects in Clark County. Also planned is The Rivers near Oregon City, a lifestyle-type center of nearly 700,000 square feet.

Emerging Trends:

Some of the trends involve variations of the major types of shopping centers. Specialization of shopping centers started in the 1970s, though the trend accelerated through the 1990s.

[4] Cushman & Wakefield includes Clark County in Washington in its retail analyses.

The ***Power Center*** is a specialized type of super community center which emerged in the 1980s. It usually contains at least four category-specific anchors of 20,000 square feet or more. These anchors typically emphasize hard goods, such as consumer electronics, sporting goods, office supplies, home furnishings, home improvement goods, specialty foods, toys, and personal computer hardware/software. They tend to be narrowly focused but deeply merchandised "category killers" together with the more broadly merchandised price-oriented warehouse clubs and discount department stores. Anchors in power center typically occupy 85 percent or more of the total leasable space.

Convenience-craving American consumers have driven even traditional department store chains to experiment with elements of the big-box format. Shopping carts—once exclusively in the realm of supermarkets and big-box discounters are now seen in midtier department stores as well. The Kohl's chain set the pace, offering customers a virtual "racetrack" floor plan and other time-saving features such as centralized checkout. Sears and JCPenney have started developing and converting off-mall, big-box stores, emulating many of the speed-oriented elements that have helped Kohl's expand so quickly. Despite these efforts, Sears and JCPenney were among many retailers reporting double-digit decline in same-store sales in November 2008. (Other stores reporting declines include Costco, Target, Macy's Nordstrom, Gap, and Abercrombie & Fitch). Wal-Mart is the only national retailer to report a gain, raising the question of whether its good fortune is a result of the current economic condition (as shoppers trade down during a period of austerity) or an intensification of the long-term competitive of its low-cost, high-volume format.

Further boosting the strength of power centers is the addition of amenities and square footage. This new genre, sometimes referred to as a "***power town***" may contain 600,000 to 1 million square feet or more and feature expanded components beyond big-box retail anchors, such as lifestyle wings, mix of uses such as residential or office, or a entertainment or hospitality element. Examples in place now include the Alliance Town Center—a 300-acre center which will ultimately house a 1.35 million-square-foot power center/town center, plus an additional retail component anchored by Belk and J.C. Penney, the Village at Stone Oak—a 635,000 square-foot development that uses power-center tenants and lifestyle retailers in San Antonio, and Prairie Center—which will house up to 3 million square feet, including a 950,000 square-foot power center in Brighton, Denver.

Lifestyle centers are another specialized type of super community center. International Council of Shopping Centers (ICSC) in 2002 as defined a lifestyle center: a location near affluent residential neighborhoods, an upscale orientation, 150,000 to 500,000 square feet of gross leasable area (GLA), an open-air format, and at least 50,000 square feet of national specialty chain stores. The success of these centers, including the region's BridgePort Village, appears to correspond with a downtown renaissance, with the lifestyle center emulating a man-made "town square." With limited property available for retail development, it is likely that this trend will be beneficial to increased downtown and urban retailing.

Convenience-craving consumers' quest for one-stop shopping has driven developers to acknowledge that today's customer shops at both big-boxes and in-line boutiques, providing them together in a ***Hybrid Center***. A pioneer of this combination of power and lifestyle is

Developers Diversified with the 1999 Phase 1 opening of Riverdale Village in Coon Rapids (Minneapolis), MN, which featured a Costco, Best Buy, and a Main Street with small shops in an 875,000-square-foot open-air center which includes a man-made lake and pavilion for outdoor events.

Downtown or Urban Retailing: While the postwar suburban shopping centers grew, downtown retailing declined. The late 1970s and early 1980s saw the introduction of festival marketplaces in a few cities, such as the Faneuil Hall Marketplace in Boston, Harborplace in Baltimore, and South Street Seaport in New York. Regional shopping centers were built in a few downtown locations, such as Glendale Galleria in Glendale, CA and Hawthorne Plaza in Hawthorne, CA, and the Gallery at Market East in Philadelphia, and Eaton Centre in Toronto, continuing into the 1990s with the development of Circle Center in Indianapolis and San Francisco Centre. These new-generation centers form anchors within the downtown retail environment and encourage spillover of retail growth throughout the surrounding neighborhood.

Urban street retail is more difficult to track on a consistent basis as commercial brokerage firms do not typically include independent stand-alone retailers outside of larger shopping centers such as NW 23rd Avenue or SE Hawthorne Street. This type of "Main Street" retail is sometimes configured as neotraditional developments, with ground floor retail and residential and office uses on the upper floors. Local, independent shops are usually the first to "discover" a new urban street ripe for retail. As business builds, chains start to take notice, and move in, often building larger stores overshadowing their precursors. Unfortunately, as the economy slows, the pacesetting independents are typically the ones to close first, as has been observed on NW 23rd. According to Shelley Poticha and Gloria Ohland of Reconnecting America, "Portland is modeling a new kind of downtown neighborhood that appeals to the demographic groups (smaller, older neighborhoods) that are becoming the new majority in the United States."

Retailers are being challenged to adapt successful suburban retail formulas to fit urban spaces, leading to the ***Vertical Stacking of Tenants***. In addition to being more expensive to build than a conventional horizontal center, these projects need to draw shoppers from floor to floor and create the visual connections that allow circulation. Escalator and checkout placement can affect aisle width and loading areas may need to be adaptable to accommodate multiple retail users. There are numerous examples of vertically stacked retail, including Pioneer Place in downtown Portland.

Transportation-Integrated Retailing: Following the restoration of Union Station in Washington DC in the late 1980s demonstrated the potential for shopping centers in major transit stations. The restoration of Grand Central Terminal in New York has created the opportunity for high-end specialty shopping to serve commuters, tourists, and office workers in the Midtown area. Transit-oriented development along light-rail stations is Portland's answer to this type of transportation-integrated retailing. As ridership continues to increase, station areas can expect to become increasingly visible and desirable retail locations. Despite suffering the incredibly poor timing of opening on September 10, 2001, CascadeStation has since re-tooled and en route to success with new specialty furniture anchor IKEA. Another example of transportation-integrated retailing is the Oregon Market, featuring local shops and restaurants in the Portland Airport

(PDX). PDX was reportedly the first major airport to adopt "fair retail pricing"—a requirement that airport retailers and restaurants sell at the same price as their off-airport outlets.

The popularity of ***on-line shopping*** has raised questions about the impact of internet sales on bricks-and-mortar stores. More than half of U.S. households regularly shop on the Web, but online purchases still make up only 7 percent of total retail sales, according to Forrester Research. This market share varies, based on consumers' shopping patterns for different product types. For bigger-ticket items, consumers tend to reseach options online, and then go offline to buy (some who return to make the ultimate purchase online after satisfying their desire to see the product in-person, only if cost savings are present)—a practice found in just over half the customers purchasing consumer electronics. These ***cross-channel shoppers*** do make purchases online, with 5 out of 6 reporting online purchases within three months of the survey, likely on items like books—whose ubiquity, wide availability, and relatively low price helped amazon.com usher in the genre of on-line shopping. According to a survey of consumer book-buying habits conducted by Fairfield Research, chain stores accounted for just over one-third of book purchases (in units) in 2007; that figure, based on consumers' buying plans for 2008, is projected to fall to just marginally percent this year. In contrast, the percentage of books purchased online jumped from 23 percent in 2006 to 30 percent in 2007 and is projected to inch up to 30.5 percent in 2008. The increased integration between on-line and in-person shopping will heighten the demand for integrated transportation networks.

Summary Portland Metro Region Outlook:

Short-Term (5-Year): With relatively less square footage of retail space than other comparable metropolitan areas, the Portland Metro region should outperform the national average. However, global deleveraging will certainly affect this region with increasing retail vacancies, the likely exit of national retailers from the market, and dramatically slowed retail development (especially in outer suburban areas). The seeming potential for more center-related development may also be offset in this region by urban-growth-boundary management combined with opportunity for well-capitalized independents as with urban street corridors. Overall, the best investment opportunities are expected to be with major regional centers and grocery-anchored neighborhood centers, while older strip centers will face challenges and likely higher vacancy rates as the economic downturn results in a flight to quality. New developments will continue to employ the more population and lower-cost open-air format, in contrast to the former enclosed mall format.

Possible increase of on-line purchases, particularly for smaller, more ubiquitous products such as computer hardware and software, books, pet supplies, cosmetics and fragrances, and as price-sensitivite consumers are exposed to more direct-market channels. Continued price competition on bigger-ticket and widely-available items such as applicances, autos, and electronics.

Mid-Term (20-Year): As the economy recovers, development will be renewed but at a slower pace with the aging of the prime baby-boomer market. As a result, there may be increased emphasis on redevelopment or reuse of dated centers. Increasing consumer desire for open-air formats and limited real estate for new lifestyle developments may benefit urban street retail with mixed use, possibly including scaled-back infill grocery concepts.

Transit-oriented development is likely to benefit from increased ridership and lack of development sites. More vertical stacking of retail is also likely. As distribution becomes more centralized and automated, it will become increasingly dependent on public investments in transportation infrastructure.

There is opportunity for retailers with both websites and brick-and-mortar stores to respond to web-savvy consumers with well-integrated, multichannel operating strategies, including consistent pricing, ability to purchase and redeem gift cards online or in stores, and ability to accrue loyalty points across channels. Some retailers may invest in their web presence not only to sell merchandise directly, but to position their site as a research tool to increase sales at their stores.

Long-Term (50-Year): As large sites for traditional shopping center formats becomes more scarce and regional malls continue to age, there is an increased risk of physical and market obsolescence, yielding possible opportunities for the reconfiguration of outer ring retail to more urban, mixed-use, street and transit orientations. An important question mark is the long-term competitive position of large format national retailers – both in terms of community acceptance, adaptation to more urban footprints and potential trends toward shopping closer to home (as exemplified by Portland interests in achieving 20-minute neighborhoods).

In the long term, the overall impact of online shopping on traditional retail is unclear, though the main influencing factors seem to be consumer preference for handling merchandise versus value of time and the sophistication of retailer distribution technologies.

INSTITUTIONAL TRENDS AND OUTLOOK

National real estate literature is not oriented towards institutional users. More than any other employment related real estate product type, institutional users such as medical centers and universities tend to respond more to unique considerations associated with project funding and market demand.

However, universities and hospitals have increasingly become strong economic development drivers of their communities. In many cities they are major employers, bringing high-wage jobs to the communities in which they locate. Not only have these jobs been viewed as largely recession-proof, enrollment in higher education is often counter-cyclical, with residents returning to school when the jobs are scarce.

For outerlying areas without existing infrastructure or well-developed land use networks, a potential role for institutions might be as drivers of infrastructure or as "anchors" to other developing commercial or residential nodes.

Educational Institutions: As reviewed by Professor Heike Mayer, Margaret Pugh O'Mara chronicles the efforts of the Silicon Valley, Philadelphia, and Atlanta to create what she calls "cities of knowledge." As she describes it, Stanford University played an active and largely successful role in real estate development and its entrepreneurial efforts in connecting with

industry. In contrast, O'Mara considers the University of Pennsylvania effort to create a critical mass of academia and industry a failure which she attributes to obstacles in the existing urban neighborhood, including an unfriendly business climate, urban problems, and a lack of support for entrepreneurial ventures. Efforts to utilize the Georgia Institute of Technology as a catalyst for high-tech development also failed, because 1) Georgia Tech failed to become involved in real estate development, 2) developers established technology parks not adjacent to Georgia Tech, and 3) government officials were focused not on a concentration of knowledge in Atlanta, but on building scientific industries statewide.

O'Mara concludes that key ingredients to the recipe for high-tech success include investments in science and technology, a world-class and politically-powerful university, control over land development in the right location, and the will to use high-tech economic development as an end, not as a means to solve other urban problems.

Health Care Institutions: Healthcare expenditures by those 65 and over represent the majority of healthcare spending in the U.S. And with the baby boomers reaching that threshold, the increased need for health care will be significant in the short, mid, and long term. However, though the demographics support growth, there will likely be significant challenges posed by increased funding uncertainty particularly related to Medicare and Medicaid (pending substantial health care reform), given that increasing costs for health care require an ever-increasing share of GDP.

The nature of the health care institution itself has changed from a one-stop shop for inpatient services to a collection of many organizations following the trend of specialization in medicine, with more procedures conducted on an outpatient basis. As a result, the medical office sector is expected to be a growth business for the foreseeable future. Medical office buildings are often developed on the campuses of existing hospitals, but can also be stand-alone buildings in downtowns or even suburban environments. From an investment perspective, analysts say they have historically been overlooked not only because they lack the pizazz of gleaming skyscrapers, but also because their complex operating structures can scare off traditional office investors.

Corrections Institutions: The Office of Economic Analysis produces a semi-annual Corrections Population Forecast which provides projections of the offender populations supervised by the Department of Corrections (DOC). The forecast uses a model which simulates the flow of inmates from intake to the prison through their sentence, and final departure as prisoners are released. Although criminal activity (measured by arrests) has generally decreased in Oregon over the past decade, the prison population has gradually increased, primarily due to increasing lengths of stay. The future rates will be influenced by changes in the Alternative Incarceration Program (AIP). The prison population at the beginning of July 2008 was approximately 13,550, or 0.5 percent higher than one year before. By mid 2018, the prison inmate population is expected to grow to just over 15,800. Unlike the historical NIMBY (Not-in-My-Backyard) image, modern correctional institutions are often viewed as a potential economic development strategy, bringing family-wage jobs with benefits. With existing capacity, however, observers do not expect development of significant additional correctional institutions in the immediate-term.

Other Public/Private Institutions: Many universities have embarked on large-scale redevelopment projects, often in partnership with real estate development firms, presenting opportunities for the private sector. These university-related projects are frequently extensive mixed-use developments that will serve both daily and visiting populations. For example, a new 345-acre development at Western Carolina University (WCU) in Cullowhee, North Carolina, will include not only academic buildings, but also private sector and government facilities, as well as multi-family housing. The projects, 40 percent of which will comprise the actual buildings, will be funded in part by a $2.89 million investment by the state as part of series of projects costing about $400 million. The catalyst for this development is WCU's Millennial Initiative, facilitated by state legislation that allows universities to enter into public/private partnerships with businesses that support both university development and economic development.

Emerging Trends:

Demographics: As the population continues to age, health-care institutions will continue to flourish. The first baby boomers will turn 65 in 2012, and their healthcare needs will be significant. From 2005 to 2020, the under-65 population is expected to grow by nine percent, while the 65-and-over population is expected to grow by 50 percent. This age shift is amplified by the fact that the 65-and-over population utilizes greater levels of physician services than those under 65 (about 4:1 for populations 65 to 74 and about 6:1 for populations 75 and older).

Inner-city school districts—which have faced declining enrollment for years—are now seeing their student populations stabilize and may even experience a bit of recovery in coming years. Though these declines are largely offset by gains in suburban school districts (for example, the Beaverton School District has been experienced gains which roughly offset losses in the Portland Public Schools), the flattening of the region's population pyramid is undeniable, resulting in impacts on institutional planning as students move through the K-12 system to higher education or workforce training programs.

Private redevelopment partnerships: As shown by Western Carolina University and the Stanford/Silicon Valley examples, universities can work in partnership with businesses that support both university development and economic development. These neighborhoods will allow students to attend class, then walk next door to apply their learning in related workplaces. Conventional models focused on research and began with incubators and research/technology parks sponsored by the largest research universities. The Silicon Valley example shows that adjacencies and integration have synergistic qualities.

Unconventional Sites: At a time when universities are running out of room to expand on their existing campuses, some are thinking beyond their ivy-covered walls and finding ways to use unconventional sites to their advantage. In the process, they are helping to revitalize neighborhoods and creating synergies with other uses. San Francisco State University's College of Extended Learning, MBA and Executive MBA programs joined the retail and office tenants at the Westfield San Francisco Centre, the largest urban shopping center west of the Mississippi River. Locally, University of Oregon's Portland satellite campus in the White Stag block of Old Town is an institutional example benefiting the urban area's revitalization efforts. And Oregon

Health and Science University's (OHSU) development of South Waterfront allowed much-needed expansion, despite severe land-capacity constraints.

Summary Portland Metro Region Outlook:

Short-Term (5-Year): Though the prospects are good for increased need for health care and education, the economic downturn will likely provide challenges of constrained funding for education, Medicare/Medicaid reimbursements, and public and nonprofit agencies. In the short term, there could be an emphasis on planning for mid-term development, and the opportunity to accommodate adults returning for added education.

Mid-Term (20-Year): In the mid term, substantially increased health care demand is anticipated with aging of baby boomers. There may be challenges posed by increased funding uncertainties for Medicare and Medicaid (pending substantial health care reform). Medical office buildings—traditionally located on hospital campuses—will likely need to expand to more stand-alone locations proximate to growing populations. Educational facilities may also be likely to focus development on satellite campuses, closer to the populations they serve. Workforce training programs will also need to be distributed with population. A South Portland expansion and strengthened linkage of OHSU/PSU campus development is anticipated. Inmate population and capacity of correctional institutions will need to be revisited.

Long-Term (50-Year): The institutional share of regional employment base (and resulting space needs) is expected to continue to increase. This growth may include greater ancillary opportunities ranging from R&D to supportive residential community options. There will be greater pressure for increased density of institutional development, including reconfiguration of existing facilities. Decentralized operations of institutional users are expected to follow population growth.

MIXED USE

Mixed-use design has advanced from the traditional main street approach—with residential above retail space—to a diverse mix of property types, users, and strategies to create true urban environments. The relative resurgence of many city cores and the desire of some metro areas to better manage or limit sprawl and increase sustainability have seen mixed use emerge as a major component of contemporary real estate strategy. This resurgence takes the traditional main-street-residential-over-retail approach to the next level by introducing other uses and forms to the urban—and even suburban—environment.

A key challenge with mixed use is to successfully conquer the conflicts sometimes inherent between uses. One designer sees mixed-use development being conceived of as 'insertions' into gaps in existing downtowns as opposed to greenfield sites. In most cases, a limited number of large new anchors are introduced to attract new customers to the edge of an existing retail area. The anchors then are surrounded by smaller retailers, and some office space that can be placed above retail. Housing is placed around these attractions in locations less central and in most cases is used as a buffer to surrounding residential districts.

Emerging Trends:

Some land use combinations which appeared in the literature included the following:

Suburban Office/Housing/Retail: The transformation of suburban business districts from poorly linked, auto-dependent, segregated-use projects into well-connected, pedestrian-friendly, mixed-use environments is a development trend gaining momentum in urban areas nationwide, with plans for suburban office parks transitioning to mixed-use developments, sometimes with nearly equal parts of office space, housing, and retail. Many of the same factors that influenced the resurgence of central business districts in the 1990s apply to the revival of suburban business districts. Such factors include: development density, improved spatial connection between buildings, pedestrian interconnections, street layout, opportunities for shared parking, and choice in mode of transit. However, because the building form and layout of suburban business districts have an independence and separation not found in downtown business districts, they can prove a major challenge to public transit, which is sometimes unable to serve lower density and fragmented development in a cost-effective manner.

Retail/Medical Office: As described in the office and institutional sections of this report, health care services were historically provided on hospital campuses, but began to move into freestanding medical office buildings—sometimes still in or near medical complexes, but increasingly in freestanding office buildings conveniently located near population and employment centers. Health care services moved from institutional to office—and now—to retail. Typically located inside drug store chains and staffed by nurse practitioners, ***retail clinics*** fulfill patients' demand for convenient routine medical care. The first retail clinic opened in August 2000, morphing a medical office use with a neighborhood retail use. In most cases, retail clinics operate under existing retail zoning, making them not a mixed-use per se, but a trend toward new combinations of retail and service uses that will affect land use needs for institutional, medical office, and retail.

Redevelopment of Obsolete Public Buildings: Obsolete facilities of all kinds can result in newly available parcels of prime land. These facilities might include public uses—decommissioned military bases, surplus school sites, hospitals closed due to demographic shifts and changes in health-care standards and delivery systems—or private uses—industrial sites and buildings intended for development which never occurred. The resulting sites—proximate to transportation infrastructure—are often ideal candidates for redevelopment. Hospital redevelopment in particular favors a combination of uses, as shown by the former Boston, Forborough, and Metropolitan State Hospitals in Massachusetts. Locally, the former Dammasch Hospital site in Wilsonville is an example now being developed by Costa Pacific Communities as Villebois. Smaller scale examples in this region include the McMenamins restaurant/brewpub redevelopments and the identification of two sites in Portland under the Department of Defense's Base Realignment and Closure (BRAC) process—the Lt. Alfred Sharff US Army Reserve Center located in the Portsmouth Neighborhood in North Portland at 8801 N. Chautauqua Boulevard and the Sgt. Jerome Sears US Army Reserve Center located in the Multnomah Neighborhood in Southwest Portland at 2730 SW Multnomah Boulevard. Disposition of these surplus military properties presents potential opportunities for creative re-use of these sites.

Summary Portland Metro Region Outlook:

Short-Term (5-Year): Likely slowdown in mixed use (beyond existing pipeline projects) due to overall economic contraction, greater financial feasibility challenges with urban density projects, and lender caution with what is often viewed as more challenging mixed use project finance. Maybe offset, at least in part, by public-private development programs (as with urban renewal where available).

Mid-Term (20-Year): Major rebound opportunity as core urban markets solidify emerging advantages over car-dependent outer ring alternatives. Substantially increased market share depends on extension of mixed use beyond the Central City, as with station area development and streetcar extension, and greater diversity of mixed use application, e.g. work-live, office/retail condos, and use diversification of ground floor space beyond retail.

Provision of health-care services will likely become increasingly specialized and geographically segmented as the bulk of baby-boomers reach retirement age. As the sector continues to grow and adapt to these needs, its growth will have implications across multiple land uses.

Long-Term (50-Year): Could emerge as the hallmark of the Portland Metro region as a legitimate but distinctive global pathway community, with substantial mixed-use throughout the region – focused on regional and town centers, corridors, and possibly selected high demand employment areas.

SUMMARY CONCLUSIONS

In addition to the industrial makeup of the economy—reviewed in the Task 1 report, existing and emerging trends will influence the capacity of the Portland Metro region to meet employment needs and support its regional economy. This memo reviews those emerging trends, and explores how they might affect the outlook for land use and development in the region—over 5-, 20- and 50-year time horizons.

In the short term, demand for warehousing/distribution space is expected to remain weak, due to lackluster retail sales. In the industrial real estate market, the Portland Metro region currently has a price advantage over other west coast cities which makes it attractive to companies seeking industrial space with good access and a regional location with high-quality amenities and attractions for staff. As job losses and other cost-cutting measures force employers to re-evaluate space needs, a steady increase in vacancy rates is putting downward pressure on rents, which will slow short-term development activity. But as with industrial real estate, the region's office market is faring this recession better than the rest of the nation.

With relatively little retail space per-capita, the region's retail market is also expected to perform well relative to other regions. Retailers expected to perform well are those who have well-integrated, multichannel (web and stores) operating strategies. Services—particularly medical-office, education, and workforce training programs—are moving toward more stand-alone locations proximate to population and employment centers. Distinctions among traditional land uses are becoming increasingly blurred.

Over the longer term (of the next 20 years and beyond), employers may have difficulty filling positions as baby boomers retire and leave the already slow-growing labor market. The public sector and certain transportation and health care sectors in particular will need to ensure adequate workforce training and flexible work options to allow older workers to remain in the workforce.

Increased globalization and offshoring of some activities will continue as the wage differential between the domestic and international labor markets is expected to persist. Increasing levels of automation and highly effective supply-chain management enables this trend in industrial and manufacturing, while advanced telecommunications systems threaten traditional office jobs. However, volatility in energy prices may slow this phenomenon somewhat, and may even create an opportunity for the region with its well-integrated and multi-modal transportation network. These and other implications are summarized in Table 7 on the following page.

There may also be opportunities to bolster employment growth by encouraging in-migration and building off the region's recent attention as a leader in sustainable and renewable energy technologies. Industry clusters in apparel, creative services, biosciences, and metals and others also continue to offer key opportunities. To realize these opportunities, the region's economic potential is increasingly dependent on investing in a solid infrastructure system, securing a world-class presence in higher education, and attracting the capital required to convert promising new technologies to commercial applications.

IMPLICATIONS FOR FUTURE TASKS

As noted at the beginning of this memo, the results of the Task 1 employment demand factors and trends analysis and this Task 2 survey will inform employment forecasting of Task 3 and the job choices of Task 5. The New Demand Paradigm associated with Task 3 will allocate employment forecast to the tri-county portion of the larger metro area by industry sector, subarea geography and design types using a range rather than point estimate approach. From there, Task 4 will evaluate the land and building capacity of the region, while Task 5 frames those choices in a policy context.

Questions raised in this memo about the region's role in supporting and cultivating certain emerging drivers may be explored in those future tasks. For example:

- How does the region compare to other parts of the country / world with respect to employer incentives (including the Oregon Department of Energy's Business Energy Tax Credits, known as BETCs)?
- How might the region support building re-use for new emerging industries?
- What types of infrastructure improvements will be most beneficial to employers?
- How might the region explore the role of institutions as drivers of infrastructure or as "anchors" to other developing commercial or residential nodes.
- How might the region further support workforce training and higher education to achieve world-class status?
- How might the region cultivate the development or redevelopment of unconventional sites?

- To what degree should the region consider or encourage development concepts for which there is no clearly demonstrated market at least in the Portland region to-date?

These are some of the questions which might be further explored as the new demand paradigm is development and Metro and its partner jurisdictions explore implications of various policy decisions.

Table 7
Summary of Implications

Commercial-Industrial Land Use Segment	Short-Term (5-Year)	Mid-Term (20-Year)	Long-Term (50-Year)
Industrial	The Portland Metro region's price advantage over other west coast cities continues to make it attractive to companies seeking industrial space with good access and a location with high-quality amenities and attractions for staff. To the extent that the dollar remains comparatively weak over this time period, exports may continue as an important source of stability for the regional economy. Attracting large industrial users is key to utilizing large campus industrial sites.	The opportunity for the region to attract new growth lies with the region's existing industry clusters including emerging applications (as with solar). Particular emphasis has been on the recent surge in sustainable and renewable energy. The ability of one company to "anchor" the region's sustainable industry cluster could pave the way for spinoff industries. Other opportunities to build off the region's other industry groupings, including established and emerging industries such as apparel, metals, high-tech, biosciences, and others. Volatility in the energy market and fuel prices may encourage development of second-tier distribution locations, and the region may be well-positioned to satisfy this role.	For the long-term, the region is increasingly dependent on securing an internationally recognized higher-ed research presence coupled with venture capital for leading edge technology and commercial applications. Likely shift from large footprint industrial park and campus orientations to higher-density industrial (including for some wholesale-distribution functions both close-in and on the I-5 corridor). Multi-story industrial applications may become more possible.
Office-Commercial	With relatively lower vacancy rates than comparable metro areas, Portland can be expected to perform better than the national average. However, with increasing vacancies, a slowing of development is expected after projects in pipeline are completed. There appears to be some opportunity for Central City (downtown plus Lloyd and Pearl) to recapture market share with more diverse products, attractive lease rates (in down market), increased transit premium, and LEED certifications.	The future of the office market remains highly uncertain in the mid-term. The labor market—already growing slowly—is expected to further decelerate as baby boomers retire. Continued opportunities are to build on the region's appeal to young creatives and an entrepreneurial strengthening of business, tech-related and creative service sectors. Best opportunities are for transit-rich, higher density and increasingly urban locales marketed for green development. Portland's position as a leader in sustainable and renewable energy in industry and manufacturing may be expanded to include professional services. With high numbers of LEED-accredited professionals in the marketplace, there may be opportunity for spinoff firms and other specialized professional services.	For the long term, public investments in education and infrastructure will become even more important. Increased density and greater use of live-work options may affect the region's need for traditional office environments, even in the face of uncertain job growth. Advanced telecommunications systems and globalization will make the prospects for office development even more uncertain. In addition to committed support of workforce training, achieving world-class higher education and research status will be integral for sustained competitive advantage and increased incomes region-wide.

Commercial-Industrial Land Use Segment	Short-Term (5-Year)	Mid-Term (20-Year)	Long-Term (50-Year)
Retail-Commercial	With relatively less square footage of retail space than other comparable metropolitan areas, the Portland Metro region should outperform the national average. The economic downturn will likely result in a flight to quality. Possible increase of on-line purchases, particularly for smaller, more ubiquitous products. Continued price competition on bigger-ticket and widely-available items such as applicances, autos, and electronics.	There may be increased emphasis on redevelopment or reuse of dated centers. Increasing consumer desire for open-air formats and limited real estate for new lifestyle developments may benefit urban street retail with mixed use, possibly including scaled-back infill grocery concepts. Transit-oriented development is likely to benefit from increased ridership and lack of development sites. More vertical stacking of retail is also likely. As distribution becomes more automated, it will become increasingly dependent on public investments in transportation infrastructure. Opportunity for retailers with both websites and brick-and-mortar stores to respond to web-savvy consumers with well-integrated, multichannel operating strategies.	Increased risk of physical and market obsolescence, yielding possible opportunities for the reconfiguration of outer ring retail to more urban, mixed-use, street and transit orientations. Overall impact of online shopping on traditional retail is unclear, though the main influencing factors seem to be consumer preferences for handling merchandise versus perceived value of time, desire for convenience, and the sophistication of retailer distribution technologies.
Institutional	Though the prospects are good for increased need for health care and education, the economic downturn will likely provide challenges of constrained funding for education, Medicare/Medicaid reimbursements, and public and nonprofit agencies. In the short term, there could be an emphasis on planning for mid-term development, and the opportunity to accommodate adults returning for added education.	Substantially increased health care demand is anticipated with aging of baby boomers. There may be challenges posed by increased funding uncertainties for Medicare and Medicaid (pending substantial health care reform). Medical office buildings—traditionally located on hospital campuses—will likely need to expand to more stand-alone locations proximate to growing populations. Educational facilities may also be likely to focus development on satellite campuses, closer to the populations they serve. Workforce training programs will also need to be distributed with population. A South Portland expansion and strengthened linkage of OHSU/PSU campus development is anticipated.	The institutional share of regional employment base (and resulting space needs) is expected to continue to increase. This growth may include greater ancillary opportunities ranging from R&D to supportive residential community options. There will be greater pressure for increased density of institutional development, including reconfiguration of existing facilities. Decentralized operations of institutional users are expected to follow population growth.

Commercial-Industrial Land Use Segment	Short-Term (5-Year)	Mid-Term (20-Year)	Long-Term (50-Year)
Mixed-Use	Likely slowdown in mixed use (beyond existing pipeline projects) due to overall economic contraction, greater financial feasibility challenges with urban density projects, and lender caution with what is often viewed as more challenging mixed use project finance. May be offset, at least in part, by public-private development programs (as with urban renewal where available).	Major rebound opportunity as core urban markets solidify already emerging advantages over car-dependent outer ring alternatives. Substantially increased market share depends on extension of mixed use beyond the Central City, as with station area development and streetcar extension, and greater diversity of mixed use application, e.g. work-live, office/retail condos, and use diversification of ground floor space beyond retail. Provision of health-care services will likely become increasingly specialized and geographically segmented as the bulk of baby-boomers reach retirement age. Growth will have implications across multiple land uses.	Could emerge as the hallmark of Portland for a legitimate but distinctive global pathway community, with substantial mixed-use throughout the region – increasingly focused on regional and town centers, corridors, and possibly selected high demand employment areas.

APPENDIX 1

Industry Case Studies

The following are case studies of specific industry sectors with significant employment that could affect the Portland Metro employment and commercial/industrial development patterns over a 20- to 50-year period.

Oregon's Transportation and Warehousing Sector Case Study: The transportation and warehousing industry is an integral part of Oregon's economy. A comprehensive and efficient passenger and freight transportation system is essential to economic activity and contributes to the health and growth of Oregon businesses. This sector provides the state's manufacturers, wholesalers, retailers, farmers, tourists, and residents with air, road, rail, and water transportation, and storage services. As estimated by the Oregon Employment Department, Oregon's transportation and warehousing industry is expected to grow by 13 percent by 2016, or by 44,000 jobs to nearly 380,000 jobs. The state and structure of the regional economy will influence future growth in the sector. In addition to its role in supporting the efficient movement of passengers and freight, technological advancements will also propel growth as more firms use transportation and warehousing companies for logistical services such as inventory management and just-in-time shipping. According to a 2007 analysis commissioned by the Port of Portland, regional maritime and aviation activity supported nearly 78,000 jobs in the local economy, including approximately 45,500 jobs created directly by marine cargo and airport activity.

Oregon's Traditional Metals Sector Case Study: Though considered a mature industry, Oregon's metals manufacturing industry employs more than 25,000 workers, with about 17,000 in fabricated metals industries and over 8,000 in primary metals, according to the Oregon Employment Department. Although employment levels have declined from their recent peak in the late 1990s, the industry continues to provide many workers with stable high-wage jobs with benefits and considerable hiring has taken place in metals manufacturing since the recession of 2002-2003. Because the industry has a relatively large fraction of older workers, according to data from the U.S. Census Bureau's Local Employment Dynamics (LED) program, employers will soon lose many skilled workers as baby boomers retire. These retirements will create further job opportunities for workers with the appropriate skills. Primary metals had an average wage of more than $5,000 per month while jobs in fabricated metals paid a little more than $3,300 per month during the first quarter of 2006. The comparable wage for all private employers in Oregon was roughly $3,200 per month. The 2006 to 2016 industry employment forecasts suggest the state's metals industry will see modest job increases between 2006 and 2016, adding over 1,900 jobs and growing by roughly 8 percent.

APPENDIX 2

Potential Emerging Trends: Specific Examples

The following are more specific examples of less tested but potentially emerging trends that could affect the Portland Metro employment and commercial/industrial development patterns over a 20- to 50-year period.

Supply-Chain Management and Logistics Analysis Example: Logistics analysis uses distribution network modeling to simulate the requirements of retail distribution centers. For example, Deloitte Consulting has developed a model for a prototypical national network of stores which suggests that 95 to 99 percent of the population can be served within one to two days with five distribution centers, located in Atlanta, Chicago, Dallas, Reno, and Scranton-Allentown, PA. Further consolidation may result in secondary hubs, presenting a possible opportunity for the Portland region.

Multi-Story Industrial Buildings Examples: The physical land constraints in the industrial hubs of Asia have precluded the U.S. trend of pushing industrial development to the perimeter. The need to maximize land use in island economies with high populations reveals that a multistory industrial development will pencil out when land values increase to more than half the value of the building. This is when it becomes reasonable to incur the extra construction complexities and costs associated with going vertical. The major Asian industrial hubs of Tokyo, Osaka, Singapore, and Hong Kong contain numerous examples of multistory distribution facilities. For example, AMB Kasugai Distribution Center in the city of Nagoya, Japan is a 1,298,000-square-foot distribution center comprised of six stories and two corkscrew truck ramps. The infill distribution facility is centrally located and building tenants are now closer to their customers, minimizing transportation-related impacts.

In Japan, where vertical development has long been common, zoning ordinances reflect the realities of scarce land. The typical FAR for distribution facilities is around 200 percent (meaning two square feet of building area for every square foot of land area), which enables developers to build vertically and still have ample room for trucks to maneuver around the facility. The seven-story AMB Ohta Distribution Center at the Port of Tokyo, for example, has a floor/area ratio in excess of 398 percent, unheard of in the U.S. Western urban planners have often argued that higher FARs simply allow too many warehouses in densely populated areas, when in fact multistory developments encouraged under higher FAR allowances are proving to be more eco-friendly and less costly to their communities.

Early adopters of multistory industrial facilities in the U.S. will likely be global shippers already operating in multistory facilities in Asia. Assuming that a combination of rising land prices, environmental pressures, and more enlightened urban planning will accelerate this trend, multistory industrial development may be on the mid- to long-term horizon in the U.S., despite its engineering and operational challenges. Fortunately, existing engineering and design best practices from Asia are available to be emulated and adapted to U.S. conditions.

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Employment & Economic Trends Analysis
Focus Group Research – February 2009

In cooperation with the business community, focus group research has been conducted to obtain business and industry perspectives on emerging trends in building space needs and changing regional competitive advantage. The following eight focus groups were conducted:

- Biotech/medical
- Distribution/logistics
- Food/beverage
- High tech
- Metals/machinery
- Business locators
- Regional services
- Retail

Photos courtesy of Davis, Hibbitts & Midghall.

There were 47 participants with these eight groups. A list of participants is provided in the Appendix at the end of this research report.

Focus Group Research Purpose

Focus groups were conducted over the time period of December 2008 to February 2009 as part of an employment and economic trends analysis for the Portland tri-county region on behalf of Metro. The primary purpose of this trends analysis is to outline a *new paradigm* for evaluating job needs and associated capacity demand within the region over 5-, 20- and 40-50-year time horizons.

Participants

Funding support for this focus group research was provided by Metro in cooperation with City of Portland, Port of Portland and private funders through the auspices of an informal group of business groups and trade associations (as detailed in the Appendix). Seven of the eight groups were led by Adam Davis and John Horvick of the opinion research and consultation firm Davis, Hibbitts & Midghall.

The retail group was led by economic and development consultant E. D. Hovee & Company, LLC in conjunction with Bonnie Gee Yosick LLC. Logistical support including invitations and space arrangements were provided by The Bookin Group on behalf of the Commercial Real Estate Economic Coalition (CREEC). Capacity Commercial Group, Greater Hillsboro Area Chamber of Commerce, and Commercial Realty Advisors hosted the groups.

While not designed to measure with statistical reliability the attitudes of a particular group, focus group research is valuable in providing the perspectives of the population from which the sample was drawn. In the interest of encouraging candid discussion, comments made are not attributed to specific individuals. This report provides an overview summary of findings, followed by more detailed results from each of the individual focus groups.

SUMMARY OF FINDINGS

Findings of the eight focus group discussions are organized to cover discussion of building and space needs, emerging trends, development patterns, advantages and disadvantages of doing business in the Portland metro area, and on-going competitive advantage for the region.

This summary is intended to cover major themes emerging from the eight groups collectively. Subsequent sections of this report provide results by focus group.

BUILDING & SPACE NEEDS

Focus group participants were asked separately about changes in building space and then location/site needs over the next 1-20 years. Key themes from discussion across the eight focus groups are noted as follows.

Building Space:

- Rapid industrial change – as land and building space becomes increasingly expensive
- Hi-cube distribution – on the horizon for mid-large firms
- "New-age shop" for manufacturing – as companies of all sizes invest in technology
- Diversity of office needs – but with common themes of more collaboration, space-sharing and conferencing
- Retail shift to smaller store concepts – especially grocery and for the near-term

Location/Site:

- Regional competition for industrial sites – extending at least from Woodland to Salem
- For sites of 20+ acres, increasing need to look outside the metro region
- Distribution requirement for freeway access (I-5 +)
- Clustering for competitive advantage – exemplified by clusters including high-tech, metals and professional services
- Labor force a growing driver of facility siting
- Customer / client businesses driven for closer proximity to population
- Little eagerness for brownfield redevelopment – due to liability issues
- Greater impetus for businesses to say in the same site footprint – to mitigate neighborhood and cost issues

EMERGING TRENDS

As a follow-up question, participants were asked to identify other emerging trends that could impact building space and location/site needs 20 to perhaps even 50 years into the future. Major response themes:

- Transit now important across all business groupings – especially for employees

- Transit-oriented development (TOD) interest – but a source of frustration for at least some commercial/industrial firms in this region
- Auto orientation still critical for customer and patient access – with parking needed but a major cost and with recognition that auto reliance varies widely across the region
- Work force accessibility a critical concern – key to attracting young talent which is easier due to this region's quality of life draw.
- Going green of broad interest – especially when supported by customers, clients, workers and/or investors

DEVELOPMENT PATTERNS

A question framed for focus group participants was as follows:

> *A recent Metro 2060 forecast is that the region's employment base could essentially double from less than 1 million jobs in 2000 to about 2 million by 2060. About 70% of this job growth can be expected by 2035.*
>
> *The Portland metro area has already shifted toward greater density of residential development. To accommodate the anticipate job growth at the lowest possible environmental cost to the Willamette Valley, similar approaches may be needed to encourage a "smaller footprint" of land need with each new job created. Over the next 20 years – what options could you see your business taking advantage of ...*

This question evoked considerable and wide-ranging discussion among participants. Major themes resulting include the following key observations:

- Multi-story development works best for office / administrative functions
- Mixed opinions on retail suitability for 2+ stories – but most likely at higher value and urban or constrained sites
- Manufacturing typically holding at 1-2 floors – more for admin / R&D functions
- Multi-level economics are not workable for distribution yet (despite some global experience) – but hi-cube distribution accomplishes similar results of reduced land footprint
- Great impetus for more and more efficient building on site, adaptive reuse, and multi-level parking on constrained sites
- Continued strong and growing orientation to sites offering transit accessibility together with exploration of opportunities for improved site efficiency (including less land devoted to parking where supported by project economics and other transportation modes)

ADVANTAGES & DISADVANTAGES

Participants also were asked to identify advantages and disadvantages of conducting business in the Portland metro area. Items mentioned most frequently (across most or all focus groups) are distinguished from those less frequently mentioned – as outlined by the following chart.

Advantages	Disadvantages
Most frequently mentioned	
• Talented work force ('the cutting edge is out of Oregon' • Multi-modal access • Quality of life (urban, recreation) • Relationships (business-to-business & customer)	• Poor market proximity (no critical mass) • Shallow labor pool (skill positions) • Limited, high cost sites • Transportation congestion (freight, passenger) • Public policy issues (taxes, fees, permitting, infrastructure)
Less frequently mentioned	
• Sustainability commitment (business, environmental, land use) • Reasonable cost of doing business • Population growth (good demographics) • Gateway location	• Cost of doing business (cost of living) • Limited investment capital (with need for incentives) • Industrial encroachment & gentrification

COMPETITIVE ADVANTAGE

The last question raised in the focus group discussions was:

> *What message do you have for Metro and local jurisdictions about what to do in a changing world to assure that the Portland metro area remains competitive as a place for businesses in your industry group to expand or locate?*

Key themes heard in both written responses and ensuing discussion are summarized to include:

- More land in the right place(s) – with in-place infrastructure
- Increased focus on sustainability – as a necessary cost of doing business
- Economic stability of Portland – a plus compared to the rest of the west coast
- Addressing issues of congestion – on local streets as well as the freeway system
- Taxes, fees, permitting – consider streamlining
- Value capture as a mechanism for infrastructure funding – for new employment land brought into the UGB
- Encouragement of high-end jobs
- Flexibility in policy application
- Paying attention to the short as well as long-term – take incremental steps to achieve the long-range vision

The remainder of this report provides a more detailed listing of results for each individual focus group.

BIOTECH / MEDICAL

Four people participated in the biotech/medical focus group. Three were leaders of small start-up businesses and one was a representative of a local university actively involved in bio-med research and university-commercial technology transfer (or commercialization).

SUMMARY OF FINDINGS

Building and location site needs are expected to change in next 10-20 years. All the participants expected their organizations to grow and need more space for offices, laboratories, and, perhaps, manufacturing.

Low-cost facilities important to startup companies. The participants felt that affordable space is critical for startup companies. Because they are not yet making profits and operate on investor money, they need to be especially careful with their funds. The OHSU Marquam 2 building and PSU Business Accelerator are viewed as important facilities because of their relatively low rents. One participant said that his company would not locate to Portland or Multnomah County because of high local taxes.

Proximity to other biotechnology companies, OHSU and PSU was essential. The participants wanted to be close to one another for collaboration, and near universities for access to researchers and facilities. Also, creating a cluster of biotechnology companies would help build a culture that is attractive to investors and perspective employees. Transit from downtown and the PSU campus to the South Waterfront and OHSU is critical to collaboration.

A "green" culture is valuable to recruit talent. The participants did not embrace green development for its own sake. If it lowered their costs, great. Otherwise they did not think their clients would judge them based on the commitment to sustainable practices. However, there was a belief that Portland's reputation as a green community helps attract qualified employees to the region.

BUILDING SPACE NEEDS

a. Anticipated Changes in the Next 10-20 Years

"I think it will. We hope to take on more projects."

"Definitely. The evaluation of the business plan is to establish a diagnostic laboratory and to expand that component of the business automatically requires more space."

"All of this is hypothetical because we could be gone in a year. What I envision is that our company will continue to be involved in discovery research. To the extent we can get funding to carry that out is a big part of the ball game."

"Don't foresee qualitative changes, but quantitative changes (i.e., we will need more office space and more lab space). We will continue to have need for specialized space (BSL-3 lab at OHSU)."

"Increase in office space, with increase in patenting and industry collaboration."

All four participants said they anticipated their building space would change in the next 10-20 years. They believed their companies would grow and need more office space for administration

and more specialized laboratory space. As the firms grow from Research & Development to production they may need space for manufacturing, but only if it is cost effective to do it themselves. Also, some of the companies operate in different locations throughout the region and consolidating was a long-term goal.

b. Building Space Needs for Biotechnology Companies

"At an earlier stage when you're trying to develop the technology that's where the public/private collaboration is ongoing and you need space that can be leased."

"If you're doing diagnostic service you need a couple of things. You need access. You have to be able to back in trucks…The space you need – part of it is manufacturing – but part of it is packaging. As well as the R&D laboratory."

"For a therapeutic company you really need to have a CGMP [Current Good Manufacturing Practices] or access to that to develop pilot scale processes to have enough therapeutic compounds to conduct animal trials."

"It's doesn't always make sense to set up your own manufacturing facility. When large pharma has extra capacity you partner with them."

The participants said within the biotechnology sector, different companies have different building site needs. Medical devise and diagnostic companies need space for manufacturing, packaging, and access for trucks to deliver supplies and pick up finished products. Companies involved with Research & Development for pharmaceuticals and vaccines need access to specialized laboratories. Cost was also a concern, especially for start-up companies. Without capital to build specialized facilities, startups need affordable space to lease.

LOCATION/SITE NEEDS

a. Anticipated Changes in the Next 10-20 Years

"Currently occupying the Portland State University Business Accelerator, which is an incubator and by definition short-term. Perhaps be in better proximity to customers, i.e., Portland or Hillsboro."

"Need to be closer to university faculty."

"Will likely stay in leased space outside Portland and Multnomah County. Not likely to move office into Portland due to tax policy. As a money sink, we do not like to pay taxes on venture capital investments."

"Don't see need for major move but modest move to improve accessibility and/or consolidate operations might be attractive."

Two participants thought their location needs would change in the next 10-20 years. One participant's location is temporary by design and the other would like to move closer to OHSU and PSU. A third participant did not anticipate moving. Their present location was desirable because of low local taxes. The fourth participant thought his office might move to improve accessibility, but would stay in the same general area.

b. Location/Site Needs for Biotechnology Companies

"Marquam 2 is not a particularly presentable space but were not brining in clients there. We do work."

"Staying in the vicinity of PSU and OHSU makes sense because it's new technology. The stuff that's going to need that space is most likely to come out of those institutions."

"And it comes down to ease of access. If the collaborators have to drive an hour to be with each other, it's not going to work."

"You've got to build that culture. You can feel it starting to happen here. And I think bringing people together, providing services that are affordable, that can be centralized is part of that."

"One of the most important things to us is being adjacent to other companies. There are so many rules and regulations that the university has, that NIH has, that the FDA has, that it's really helpful to be able to walk next door to someone from another company who happens to have been through x, y, or z.

"If you take a look at what's happening around OHSU and PSU there is not a lot of space that is available. It's all built. How do you locate a business that needs proximity to an academic institution? You start going up and down the river saying, 'Where is there space?'"

"There is land out in North Portland by the race track. But the problem with that is ease of access."

"Looking 10 years down the road if the Life Science Collaboration building goes in [at OHSU], if the light rail tracks are built and extended to Clackamas County and linked to PSU and OHSU, that is integrated to allow this flow of people, you could easily see manufacturing in all the land that Clackamas County has available. If you link that up to Swan Island you've got the trucking as part of that."

Three of the four participants had experience with the Marquam 2 building, which OHSU leases out. It is desirable because of its affordability and proximity to both OHSU and PSU. In fact, all the participants agreed that being close to other biotechnology firms and universities is advantageous. Trimet buses (and future MAX extension at the South Waterfront), the Portland Streetcar, and the OHSU Aerial Tram help facilitate collaboration. Collaboration was more important for Research & Development than manufacturing.

There was discussion about whether OHSU plans for a new "Life Science Collaboration" building would have space for startup biotechnology companies. One participant said it depended on how much tax-exempt bond money paid for the facility because IRS rules limit the amount of space that can be used for commercial enterprises when tax-exempt bonds fund development.

ADVANTAGES OF THE PORTLAND METRO AREA

"Close to the money in the Bay Area."

"Quality of life makes it easier to recruit young talented people. People want to move here."

"Portland is an easy place to recruit people."

"OHSU/PSU"

"Proximity to OHSU."

The main advantages to doing business in the Portland metro area are the quality of life and higher education institutes, particularly OHSU and PSU.

DISADVANTAGES OF THE PORTLAND METRO AREA

"Dearth of venture capital."
"Not a prominent biotech/venture capital location."
"The tax structure could be more flexible to start up companies. You feel different about paying taxes when you're making a lot of money."
"Lack of existent biotech culture."
"Lack of seasoned, experienced, executive biotech management."
"Lack of open space for building infrastructure for labs."
"Culture. This is the first place that I've been where there are so many agencies trying to do the same thing without talking to each other."

The participants said disadvantages to doing business in the region were a lack of venture capital for startup companies and high taxes. They suggested that this could be overcome with more grant and loan programs that encourage investment, and reducing taxes on startups that have not turned a profit. One participant's said, "investments are not profits; research supplies are not product inventory."

The participants also said that the local "culture" hindered the industry. They felt hopeful that the region is coming closer to having a "critical mass" of biotechnology firms, but they didn't think it is there yet. Without that culture it is harder to collaborate, attract employees, and develop experienced management.

A final disadvantage was a lack of laboratory space – particularly affordable space. The participants recommended more efforts to facilitate the construction of laboratory space and providing rental subsidies to startup companies.

HOW TO BUILD A BIOTECHNOLOGY SECTOR

Two different perspectives on how to build a biotechnology sector in the Portland region.

"I think the way you build a biotech industry – and there are a lot of states trying to do this – it's to look at the North Carolina model. First you got the universities united and mandated to be business friendly and all these constraints relaxed. And then they tried to recruit a big drug company. Once they got the big drug company and the university was there to support them, there was a biotech industry born."

"We're not going to be a North Carolina. We're not going to be a San Diego, San Francisco, or Boston. But when I take a look at where we are today, we're easily 15 years behind where Utah is, 15 years behind Colorado, and 20 years behind Washington in terms of development of the bioscience sector. When you take a look at Utah and Colorado it was growth within the state. The industry grew within the state. When I was in Utah we never recruited a large pharmaceutical company. We

just made it easy for companies to grow and locate next to each other. Once you have a co-location of companies good things happen. You share ideas, you get to know one everyone else, and you get spin-offs."

CLIMATE CHANGE & GREEN DEVELOPMENT

"If it makes a more cost effective space, great. If makes it a more presentable space, great. But not a big concern. We're not going to be judged by the space we rent. We'll be judged by the quality of our science."

"Climate change is of no consequence. Green development in Portland makes us attractive to creative, well-educated, bright people. So the more that Portland is perceived as the green capital of the world, the better it is for recruiting."

"Climate change is going to make Portland more attractive than other parts of the country."

"We've made a conscientious effort to go with LEED Platinum ratings for any new construction we do."

For most of the participants, climate change and green development were not important values in and of themselves. One participant said that his company would not be judged on its commitment to sustainability or what type of facility they leased. On the other hand, he said if green development helps to lower costs that would be beneficial.

At least one person felt that green development and a commitment to slowing climate change are values particularly important to "creative, well-educated, and bright people," and that Portland's reputation as a "green" city makes the region more attractive to the type of employees that biotechnology companies desire.

SMALLER FOOTPRINT

"I'm not sure I subscribe to a smaller footprint. I'm not totally in favor of it because it hasn't been adequately defined. Does it mean just selectively? Is it an overarching plan? At what expense? For what gain? You need to be careful."

"If there is substantial difference in cost it is hard to accommodate."

"The issue for more, when you construct an office building, you have about 1-1/2 feet of HVAC space per floor. In a wet lab you have about 3 feet of space – at least. That adds substantially to the cost if you're thinking about density."

The participants were asked if they would locate in taller buildings with greater urban density. Three participants said that they would consider 2- to 4- story building. One participant said he would consider a 3- to 5-story building. None would consider an 8-story or higher building.

The primary concern was cost. They were skeptical that their laboratory and manufacturing needs could be meet in taller buildings without increasing construction or leasing costs. One participant questioned whether it was even possible to put specialized wet laboratories in high rise buildings.

DISTRIBUTION / LOGISTICS

Four people participated in the focus group. Three were representatives of trucking and logistic companies. One was a representative from the Port of Portland. Of the three trucking and logistic companies, one was a large "asset-based" company headquartered in Portland. It had five sites in the region, approximately 160 employees, and a fleet of trucks. The other two were national companies with operations in the region. One described his company as "asset light." It had some administrative offices in Vancouver, two staging areas at the Port of Portland, but otherwise operated out of their vendors' warehouses. The other was a large property owner in northwest Portland, where their finance and IT workforce are located. Additionally, it owned truck yards in Wilsonville and north Portland.

SUMMARY OF FINDINGS

Expect to need larger facilities and more land in the next 10-20 years. The participants expect the region's population and demand for their services to grow in the next two decades. To accommodate growth, and in addition to an expanded marine and rail service, they believe they will need larger facilities for administrative staff, larger warehouses, and more land for truck yards. Furthermore, they said there is an inadequate land supply in the region partly due to land use restrictions and a social culture that doesn't understand their industry.

Congestion along the I-5 corridor is a serious impediment to the distribution sector. All the participants said traffic congestion is a major problem. While they believed that solving the Columbia River Crossing is important, it is only one of several choke points through the metropolitan area. Congestion and access to I-5 are key to their location and site decisions.

Climate change and green development are relevant in so far as it affects profitability. The participants were not antagonistic to environmental policies, but they saw them through the lens of profitability. Most said their businesses have taken steps to reduce their energy and fuel costs, and that they support mass transit. They do worry, however, about environmental restrictions that are insensitive to their industry.

BUILDING SPACE NEEDS

"Logistics needs are changing. Constant reevaluation of modes."

"Tied to growth of partners (i.e., increased freight will demand larger facilities)."

"Our needs are really dependent on what the Port is going to do and how that will increase."

"The dramatic change we've seen in our business is we need more and more yard space. Our new model is to make the building slightly smaller, maybe taller. But we are operating drop carriers 24 hours a day and need that yard space."

All four participants said their building site needs would change in the next 10-20 years. They said that as the Portland metro area grows demand for their services will increase, and to meet demand they will need larger facilities.

The participants had difficulty distinguishing their building space needs from their land space needs, which were paramount. To the extent that they did, however, they felt that their building space needs would grow to accommodate more administrative staff and larger warehouses.

LOCATION/SITE NEEDS

"Because congestion over the Columbia Crossing is so problematic we needed another facility to manage stuff going north."

"The key component is the I-5 corridor. For distribution to happen you have to have access to I-5."

"Fundamentally on the marine side we see continued growth. We'll continue to look for waterfront land, for which there is a huge limitation--there is not much of it."

"Since we're asset-based, industrial land is critical to what we do. Unfortunately, there is a lack of it in the Portland metro area. We need fairly good sized parcels."

"We've developed an expertise in brownfield redevelopment. We recognized that because of Oregon land use laws, land is constrained. And that reuse of existing land that is adjacent to key transportation corridors is opportune. To the extent that we can develop brownfields that is attractive. And we see that as an opportunity."

The participants described their location and site needs for the next 10-20 years. Again, they foresaw a need for more land. As the region's populations grows, demand for their services will grow, which in turn will mean more demand for trucks, ships, and rail to move goods. As one participant said, "You can't stack tractors on top of one another."

However, the participants were of the opinion that available industrial land is running out. They attributed part of this to the Urban Growth Boundary and other land use restrictions. At least one participant also felt the social and political culture of the region looked down on the distribution sector as "dirty work" and didn't take its interests into account when developing public policy.

A bright spot was the Port of Portland's development of the Rivergate Industrial District. They praised it as having access for trucks, rail, and marine. One participant said, "It's got everything located there. It's a gem in terms of rich infrastructure."

It was critically important to the participants to be both physically close to Interstate 5 and have easy access to it. They said the Portland metro region alone isn't a large enough market to support them. They all had a regional approach to business. And because the vast majority of the region's population is along the I-5 corridor, that's where they need to be. Additionally, access to the north and south is more important that access to the east.

The participants all said that I-5 choke points including the Interstate Bridge hampered their businesses. One participant said his company had to open a second truck yard in north Portland because it took too much time to get products into Washington from their yard in Wilsonville. Another said his company would consider relocating to Clark County if I-5 traffic didn't improve through Portland.

ADVANTAGES OF THE PORTLAND METRO AREA

"Great place to live from an employee standpoint."
"Quality of life."
"Alternative to the Seattle/Tacoma choke point."
"Potential for growth large because of excess capacity at Port of Portland. Their growth means our growth."

The participants said the region's quality of life is an advantage to doing business here because it attracts and retains employees. One participant said it is particularly important to recruiting IT and logistic workers.

As much as the participants complained about congestion in Portland, they said it is significantly better than Seattle and Tacoma.

The participants also believed that Portland's population would grow over the coming decades and that this is an opportunity to expand their businesses.

DISADVANTAGES OF THE PORTLAND METRO AREA

"Small consumer base relative to other markets (e.g., Los Angeles/Long Beach and Seattle/Tacoma)."
"Transportation congestion."
"We lack a vision and plan. We've been trying to get trucks off the street, which is not good for job creation."
"Taxes, fees, and attitude of the city to industrial growth and business growth. Needs major work."

The participants said a significant disadvantage to the region is that it is not large enough to support a completely local operation. Also, traffic congestion along the I-5 corridor is a serious problem.

At least one participant didn't think the local political culture is friendly to or understands the needs of the distribution industry. He said, "The idea of freight needs to be expanded in the community. It is not just the trucks going from here to Fred Meyer."

A participant suggested that changing when businesses receive products from trucks would go a long way to solving distribution and congestion problems. From his perspective, businesses in the Portland metro area expect and demand deliveries between 10:00 AM and 3:00 PM, which results in trucks being on the road during peak traffic hours. He said truckers and distribution companies would rather make deliveries between 10:00 PM and 8:00 AM. He admitted that many businesses don't have the scale to accept deliveries during these hours – and that it would take a change of business culture among those who do – but he pointed to the downtown

Nordstrom's as an example of a business that does accept deliveries during off-peak hours. For him, the demand for peak-hour deliveries harms both commuters and distribution companies and changing this should be part of the overall transportation plans for the region.

CLIMATE CHANGE & GREEN DEVELOPMENT

"We are concerned about reducing the cost of building operations and energy."
"Sustainability important. Cost and availability of energy. It's the right thing to do."
"Green building requirements are hard to understand or implement. Very expensive with no return."
"To the extent that there are tax credits and tax benefits are going to be huge."
"We want to see things done for the right reasons and be economically effective. We use it as a way not only to be socially responsible but to increase our level of profitability."
"One of my concerns is that we don't have a cookie-cutter approach."

All the participants were concerned about climate change and green development to a degree, but their concern was largely borne out of economic considerations. They saw "greening" their businesses largely as reducing their fuel and energy costs.

They were not antagonistic to green practices – a new Port of Portland building will be LEED certified and another company has a sustainability committee – but they were leery of how environmental regulations affected their businesses. One participant in particular was concerned that clean air requirements in California may be replicated in Oregon. He said this would "radically change" their business model, which relies on partnerships with independent operators who could not afford to upgrade their trucks. He felt that California-like regulations would drastically increase the price of trucks making his company less competitive. Another participant warned against environmental policy having a "cookie-cutter approach."

SMALLER FOOTPRINT

"Multistory warehouses don't work. Everything has to go up and down an elevator. It would create a choke point. We need more of a footprint, not less."
"People aren't going to move here, there's not going to be jobs here if we don't have the appropriate infrastructure."
"We're going to need more footprint not less. You can't stack tractors."
"People don't want to live near industrial jobs. You're going to have to go someplace for an industrial job."
"This might work for commercial and residential, but it doesn't really work for distribution functions that this city relies on."
"We're a big believer in high density and live/work environments."

We asked the participants if they would locate to taller buildings with greater urban density. Only one participant said his business would consider locating in a 2- to 4-, 5- to 8-, or more than 8-story building. They didn't believe that warehouses and other facilities that distribution companies need could be scaled upwards though one participant mentioned seeing such a facility in Singapore. Moreover, they anticipated that as the region's population grows – and with it demand for their services – they will need more land not less.

However, most were open to the idea that office and other administrative workers could be in taller buildings. One of the participants, said that his business is actively trying to develop a high-density, mixed-use development on land they own in northwest Portland.

All four participants said that they would consider locating to sites that emphasize transit accessibility. They have a self-interest in this because they believe their businesses will be more successful if mass transit can help reduce traffic congestion. One participant stressed that from his perspective the freight community and transportation community share the same values. He said, "Every car that comes off the street is a good one. We like bicycles, we like transit because it gets cars off the street and cars are what cause congestion."

FOOD / BEVERAGE

Four people participated in the focus group. Two were owners of small craft distilleries. One opened in 2005 in inner southeast Portland. The other is located in northwest Portland and has been in business for over twenty years. Between them they have three to eight employees and operate out of 5,000 to 18,000 square feet. The third participant is the president of a medium-sized maraschino cherry processer with production facilities in Forest Grove. It has approximately 70 employees that work in a 130,000-square foot building. The final participant was a representative of the Kraft food processing company in north Portland.

SUMMARY OF FINDINGS

Most expect to need more building space. Three of the four participants believed business growth will require more space. One participant, however, believed that improved manufacturing technology and equipment may allow them to decrease their space and increase output.

Residential encroachment affecting location site needs. Residential development is nearing the industrial space of some of the participants. This will impact their decision about how long to stay in their present locations.

Transportation costs and traffic congestion are a problem.

The region lacks skilled labor. It is difficult to find skilled mechanics, electricians, and other skilled employees. The participants recommended more programs to support the industrial arts in high schools and community colleges.

Regulations are costly, contradictory, and often poorly implemented. The participants were frustrated by local regulations and regulators. Their experience made them leery of additional regulations for green development.

Climate change not as important as green development. The participants were not motivated by concerns about climate change but they were supportive of practices that would lower their energy costs. They are, however, worried about administrative burdens.

BUILDING SPACE NEEDS

"We could have more building space needs but it would depend on consumer demand and population growth in the area."

"There are two issues. One is simple growth. It is already beginning to look like we are running out of room. New product lines will require all our space fairly soon. The second issue is the impending gentrification."

"So the question is how do we move to a smaller, more efficient space? Something we can maintain at a lower cost."

"But for our natural growth and expansion we will need to have more room for equipment and barrels. Coming into this year we have an expansion plan, which will probably get us out of that building in 2010."

All four participants said that their building space needs would change in the next 10-20 years. Three thought they would need more space and one believed that more efficient operations and improved technology would allow his company to reduce their space demands.

Distilleries have moved into their current locations in the last few years, but strong growth has already pushed them to maximize their space. Demand for their products is growing and they are expanding their product lines. A particular need for both of them is barrel storage. One said that his company is considering offsite storage. Another concern was appearance. Because the craft distilling business attracts tourists, there is a need for a more attractive space for walk-in customers.

One participant thought that eventually more space would be needed, but there are no immediate plans. When consumer demand and population growth push them to expand, the biggest issues will be more space for handling incoming materials and shipping finished product.

A processor said they currently occupy a building that is much too big for their operations – and that they will need even less space in the future. While he expects his company to grow, he believed that technology improvements would lead to more efficient processing with smaller or less machinery. The company has started to look for new locations, but one hindrance is the depreciating real estate market. He would like to sell the building they currently occupy but anticipates it taking a long time to find a buyer.

LOCATION/SITE NEEDS

"I would be a fool to reinvest in that space because I have an encroaching neighborhood around us."

"We face a number of competitive pressures but at the end of the day our costs are lower at the Michigan facility. So we continue to push production to Michigan."

"We're right (close-in) so we have great access to transportation. We choose it for that fact. It has easy access for deliveries and pick-ups. Also it's very inexpensive in that area. Right now it's a great deal for us."

"As long as I've good rail and good transportation it'd be okay [to move to Clackamas or Clark County]."

"From a workforce point of view, quality of life is a significant competitive advantage. The fact of the matter is that if we were going to build another (plant) it wouldn't be here."

"A major reason we are looking in the Portland region is that as a private business we get to make certain lifestyle decisions and I want to live in Portland."

The participants were mixed on whether they expected their location site needs to change in the next 10-20 years. One reason for this is uncertainty about changes happening in the neighborhoods that surround their facilities – a significant concern for these businesses. Two of the businesses occupy land in areas that in recent years has become more residential. One participant said local political forces will continue to push for more housing near his facility. And yet another is concerned that a nearby firm may sell their property for residential development.

Whatever decisions these companies make about location in the future, easy access to transportation will be key factor. Each said that highway access, especially I-5, is critical. It was also important to be close to crops that supply them, particularly if it is fruit. Proximity to the Port was also important for grain supply and access to international markets.

In one way or another, the participants each indicated that they had options to do business in another region or even another country, but would like to stay here because of the quality of life. This is a desirable place to be for them personally and attractive to employees. Moreover, the local community is very supportive of local agriculture and specialty foods.

ADVANTAGES OF THE PORTLAND METRO AREA

"Recruiting talent. Desirable location to live."
"Willing demographic. Excited and interested in local products."
"Good employment pool."
"Good access to raw materials."

Quality of life was the most mentioned benefit of the Portland metro region. As one participant said, "as a private business we get to make certain lifestyle decisions and I want to live in Portland." They each said they personally want to stay in the region and said that it is attractive to employees – especially high-paid, skilled employees.

A second significant benefit to being in this region is access to local crops. Three of the participants rely heavily on local agriculture to make their products. Being near the supply lowers transportation costs, makes maintaining relationships with suppliers easier, and is a way to support local farmers. For the distillers, a benefit of the region is that the community is interested in gourmet food and supportive of local products.

DISADVANTAGES OF THE PORTLAND METRO AREA

"Distance from larger population and cost of transportation."
"Transit. Proximity to United States population base."
"Contradictory regulatory and bureaucratic hoops."
"What you have now is expensive regulatory efforts done by poor quality employees, badly managed, that produce mediocre results."
"This workforce issue is big. My joke right now is I'll kill you for an electrician; I'll just maim you for a mechanic."

Access to good transportation was important to all the participants, but especially important to those whose customer base is national and international. It is an issue of both distance from raw materials and customers. One participant said,

> "We could do business elsewhere, and that has to do with population centers not being on the west coast. You could theoretically harvest here and ship to Kansas City. If you just want to do low-cost manufacturing and centralize to be close to key customers, it would not be in the Portland metro area."

Also noted is that congestion on I-5 and delays at the Port of Portland increase their shipping costs.

The participants said that they are burdened by regulations that are costly, contradictory, and often poorly implemented by government employees. A participant complained that too often regulators do more to stop projects than working with business owners to help them work within the system. He said, "You can be signed off by everybody then some other agency comes in and puts it to a stop. And there is very little recourse. There is not a lot of innovation on the part of regulators. There seems to be a dogged motivation to say no rather than figure a problem out."

To ease this problem, some participants would like state regulatory agencies, Metro and other regional governments to help businesses navigate the permitting process. They suggested "streamlining" regulations with less paperwork and less overlap among government agencies. They also recommended the governments work together to create some type of "one-stop permitting."

The participants report different experiences with the region's workforce. The two largest employers said that there is a dearth of skilled blue-collar workers in the region. They would like Metro and the region's other governmental bodies to do more to support industrial education in the schools. "What we should do is invest in education and workforce training, but keep in mind not everyone is going to go to college. There is no shame in taking that electrical position or mechanical position. We should have specific programs for blue-collar positions."

One participant, however, reports the opposite experience. He said because his company produces an artisanal product he is able to easily attract employees. "I have a lot of people doing blue-collar work who are not blue-collar people. That is my strategy. I've been lucky to hire very bright, very energetic, easily-trainable, highly-educated youngsters to work for me. They are the creative class." For him the challenge hasn't been hiring skilled workers, but retaining them.

Climate Change & Green Development

"I worry more about the administrative hassle. If I've got to understand the carbon footprint of my building and have a tax or trade expense against that, how am I going to figure it out?"

"I'm all for sustainability. But it is more what the consumer is asking."

"I would say that in terms of really well thought out green issues for sourcing, production, distribution, and sales, we are not much. We haven't brought a lot to the conversation. We're keeping our heads down."

"We have a very extensive recycling program. When we go to a new location, I'm very concerned about water, heating, and cooling. I'm worried about cost, but I also don't like things to go to waste."

We asked the participants how big a concern is climate change and green development relative to their building space and location/site needs in the future? For the most part they weren't overly concerned about climate change per se but they were interested in how green development might help them lower their energy costs. "I don't see climate change affecting my business directly

but green building is highly desirable to save on water, heat, natural gas, etc. Conservation and a subsequent decrease in cost are very important to our business."

There were concerns, however, about the administrative and regulatory burdens of green initiatives. They worried that governmental policies would be costly and time consuming, which would make them less competitive in the national and international markets. One participant said, "If it gets to a point where the cost – whether if carbon trading or green energy – impacts our electrical or natural gas expense…if that pushes us to an uncompetitive position, then we're off to Turkey or we're out of business."

One participant had a unique perspective. He said he started his business in part to help local farm growers. By using their crop locally, he was helping small, family growers.

SMALLER FOOTPRINT

"In our production facility gravity flow might work. A high-rise wouldn't work, but I could definitely see a 2- to 3-story building maybe working. Might work like a brewery."

"The best model to look at are the wineries. Some of what they do is very creative with gravity."

"I'd say going up would require the same sort of engineering challenges and creativity as it would be to increase your output with a smaller footprint by changing your processes. In fact that would be an easier goal."

"In our industry it would be difficult. There would have to be a paradigm shift in over technology. Our (production equipment) is 300-350 foot long and 40-50 inches wide. You don't put those in a high rise."

We asked the participants if they would locate to taller buildings with greater urban density. One participant said he would consider locating in a 2- to 4-story building and none said they would go taller. Interestingly, distillers indicate there might be some possibilities to go taller by taking advantage of gravity flows to move product. They thought that the breweries and wineries provide some examples of how it could work for them.

One participant thought the goal of reducing their footprint would be easier to accomplish with technological advancements (e.g., smaller more efficient boilers) that lessen their overall need for space. He added that he could imagine being on the first floor of an industrial space with upper floors leased to other tenants.

Another business representative said that they currently reside in a tiered facility with a maximum height of six stories. Product moves higher to lower levels during the (production) and packaging process. He said it would take a "paradigm shift in…technology" to be able to operate in a single high rise facility.

HIGH TECH

Six people participated in the technology focus group. Three were associated with the solar industry, either directly with a company or as a leader of a business association that represents the industry. Two were from multi-national semiconductor and computer technology businesses with a large presence in the region. One participant was from a software business association. The businesses owned several hundreds of acres of land and employed 500 to 15,000 people in the region. The focus group was held in Hillsboro and the participants came from businesses in Washington County.

SUMMARY OF FINDINGS

Building space needs will grow with time and technology changes, but some participants now have excess capacity. The participants in the solar industry are expanding, and have plans to build additional facilities to support their manufacturing. The participants from the semiconductor sector said their businesses have been contracting and they have excess capacity in the facilities they own. Technology changes quickly in the industry, and facilities with good access to move equipment in and out is important.

All the participants have side they own enough land for future expansion but there is not enough shovel ready industrial land in the region to attract new businesses. Because of prior planning, the businesses represented at the focus group had purchased enough land to meet their long-term expansion goals. However, they said the west side of the Portland metro region has run out of industrial land for new high-tech manufacturing businesses.

Congestion and public transportation's "last mile" are serious problems. The participants said that Shute Road and the intersections at Evergreen Street and Highway 26 are at the "cusp of failure." They were broadly supportive of public transportation, but complained that there is not enough bus service in Washington County. The MAX provides good east/west service but there is poor or non-existent bus service from the MAX station to the large employers. They described this as the "last mile" problem.

Multi-story facilities are not applicable to manufacturing, but some participants were open to more creative use of industrial land. There was agreement that multi-story buildings will not work for manufacturing, but lower-level buildings may be acceptable for office space, corporate housing, and other amenities at industrial sites. The participants, however, were concerned that building regulations will make the region less competitive when recruiting new businesses.

BUILDING SPACE NEEDS

"We'll add to existing facility and bring in more types of manufacturing (modeling)."

"Our (another state) facility is currently a third occupied. If there was going to be expansion it would probably not be in the Oregon facility – subject to incentive programs we could work out with local and state governments."

"What you want is a large straight building that has easy access on both sides so you do the equipment move ins. Because the technology changes very rapidly."

"The fact is that this is our largest operation. We don't want to put all our eggs in one basket."

Over the long-term, the participants expected their building space needs to expand as their businesses grow and technology changes. The participants on the solar manufacturing side said they are now in a "ramp-up" phase. One plans to add space to their present building to handle "ancillary and logistic activity."

Overall, the participants had a mix of building space needs, including large manufacturing facilities for solar panels and semiconductors, laboratories for research, and office space for administration. A couple of the participants also stressed that some of their work is highly confidential and that secure campuses are necessary.

For high-tech manufacturing, the participants said it is important to have a long, straight facility for manufacturing. Ideally, it would have access on both sides of the facility to ease the movement of equipment. Technology in the industry changes rapidly and they frequently update their equipment. Having a building with good access facilitates this.

One of the participants said they have seen a decline in business with the recession. Where just a few months ago their major manufacturing facility was running at capacity, now they have more capacity then they need. One representative indicated said that the company has a manufacturing facility at another location that is only at one-third capacity and when business picks up again it is most likely that they will increase production at this site rather than expand in the Portland region.

One high tech participant said that when they bought their land, they developed a master plan that included future construction. Although new construction isn't planned for the near term, this person expected at some point in the future new manufacturing, R&D, office, or other buildings would be built.

Software firms indicated that they cared less about the overall size or shape of their buildings than about access to band-width and transportation. A priority need is community space for meetings. Something with open spaces, meeting rooms, Internet access, and video conferencing. One participant suggested creating a collaborative space on the second floor of the Hillsboro Library.

LOCATION/SITE NEEDS

"Yes. Due to the expansion of the company industry."

"Solar being the only industry that is going to be adding jobs to the Oregon economy over the next two to three years, we have three to five manufacturers that are kicking tires in the region."

"The backend is the labor-intensive part. We would like to source, and have been sourcing where our customer base is."

"One of the things that is interesting about the solar industry is the manufacturing side has a lot in alignment with the semiconductor side as far as needs in terms of industrial sites."

"Probably the most pressing issue is congestion we expect at the intersection of Highway 26 and Shute Road."

"There is no land on the corridor where light rail is. There is no bus service north of Highway 26."

All the participants said they have adequate room on land they currently own for expansion. Some of the business are experiencing a decline in business because of the recession and have enough capacity to expand when the economy recovers.

All the participants said that transportation and congestion are significant problems for their businesses. They said that Shute Road and the intersections at Evergreen Street and Highway 26 are particularly problematic. They said it would only get worse as two existing firms in ramp up phase move into full operation.

Concern is also expressed with inadequate public transportation in Washington County. They described it as the "last mile" problem. They said with MAX there is relatively good east/west movement, but that employees cannot get from the MAX station to the work site because the plant facilities are a mile or two away and there are no buses serving them. One firm has a private shuttle service to pick employees up at MAX stations and transport them between campuses. Also noted is that there are conversations going on now between some of Washington County's large employers about sharing shuttle services.

One participant cautioned about the limits of public transportation. A high-tech company has won national awards for its transit program – which include shuttle services, subsidized Trimet passes, carpool programs, and onsite showers for bike riders – but only 3-5% of employees take transit. For many employees public transportation, it still takes significantly more time than driving and there are too few routes serving the area.

At least one participant believed that the west side of the metro region needs a logistics facility of the scale what exists at PDX. Moving goods and materials across the region to PDX is costly and time consuming. The company represented has explored relocating some operations to (another state) where a new logistics facility was recently built.

Despite the fact that these participants said their companies had room to expand, there was agreement that the western side of the region does not have enough shovel ready industrial land to attract new businesses. One participant said, "There is no shovel ready land in the UGB. We've just used the last one. We're maxed out. We don't have one industrial, shovel ready site."

ADVANTAGES OF THE PORTLAND METRO AREA

"Skilled silicon workforce."

"The biggest thing we have going for us is our employee RD"

"Cost-effective energy."

"Utilities. One of the reasons we're here is the power is very good because of the groundbreaking work the semiconductor business has done."

"Local tax incentives."

"Support of state and city."

The participants said a principle advantage to the Portland metro area is the workforce. The cluster of high-tech companies has been able to "beg, borrow, and steal" the best intellectual talent from around the world. Other frequently mentioned benefits were the tax incentives provided by state and local government and cost effective energy.

DISADVANTAGES OF THE PORTLAND METRO AREA

"Distance from primary transportation hubs."
"Transportation gridlock."
"Portland-centric policies."
"Metro had their urban agriculture program and there wasn't the addressing of industrial needs and job needs."
"It doesn't seem like folks appreciate the natural and necessary difference we have out here."

Traffic congestion, especially on Shute Road and Highway 26, is a major disadvantage to the Portland metro area. As mentioned above, the participants said that there is a "last mile" problem with public transportation in Washington County. Another significant problem is that there is a lack of available shovel ready industrial land. The participants thought that part of the reason for this is that regional policy makers don't understand the needs of high-tech manufacturing.

In various ways during the conversation, the participants expressed frustration about regulatory burdens. They said that they are discouraging companies from locating here. One participant put it this way:

> "Flexibility is the word. I don't want a situation with a rigid set of rules and we end up losing the solar industry. Because we can't be flexible enough to adapt to get these industrial sites shovel-ready, sited, and built. There are more to come if we make it possible. And they're not choosing between Hillsboro and Gresham. They're choosing between Hillsboro, Albuquerque, Germany, Austin, and Korea. Governments are actively pursuing and competing for this investment. If Oregon becomes known as the place as 'Yeah we'd love to have you, but this is our list of ten demands', it's going to a real problem for us."

CLIMATE CHANGE & GREEN DEVELOPMENT

"We are a green company and believe in influencing climate change."
"Enterprise funded partly on climate change concerns, so huge"
"Due to chemicals used and substrate, concerned with regulatory controls."

Three of the participants represented the solar power industry. Not surprisingly, the group gave a high importance to green energy and climate change. Most of the participants also stressed the importance of public transportation to reduce their employees' carbon footprint. They would like there to be more done to improve public transportation in Washington County and asked for more bus transportation to major employment sites. One participant said, "If we look out five to ten years, and this region wants do to more than market the lexicon of sustainability then they do have to look at how people get around and where people live and make policies that are relevant not to the world they would like to see but the what actually exists."

SMALLER FOOTPRINT

"I see the ambition in this and where you'd ideally go, but it's not applicable out here."
"I appreciate their vision. But when you look at manufacturing you got ugly buildings. You can't build out onto the street."
"Administrative and financial stuff could be on more than one floor."

We asked the participants if they would locate to taller buildings. For manufacturing, the participants did not think multi-story facilities could ever work. Some participants did say that for office and other administrative buildings multi-story buildings are viable.

And one participant encouraged the others in the focus group to think more creatively about how to use space. This person elaborated: "Could we go to the street and have a parking garage, child care facility, a restaurant. Yes. Then I'm thinking of the second story we could have four or five corporate apartments? Could there be housing? I think the answer is yes. Let's take a different approach. Let's kick some ideas around."

On the other hand, a couple of participants reacted strongly to being asked about higher density and multi-story buildings. They were concerned about regulations that didn't account for the realities of their operations. When asked if their businesses would consider multi-story buildings, one participant objected. "I don't read this and think you've got manufacturing in mind. It's not applicable. I see the ambition in this and where you'd ideally go, but it's not applicable out here."

Software companies may have a different perspective. Businesses care less about the physical structure of their building space than the available bandwidth, access to amenities, and good transportation.

METALS / MACHINERY

Six people participated in the focus group. They ranged from local family-owned businesses to multi-national corporations with major operations in the region. The smallest company employed about 50 people locally and the largest employed 3,000 in Oregon. Several of the businesses had multiple facilities in the region, including northwest Portland, Clackamas, the Port of Vancouver, Swan Island, and Johnson Creek.

SUMMARY OF FINDINGS

Business growth and larger equipment will require larger facilities. Most of the participants said they will need more building space. They all expected demand for their services to grow. They will need more space to handle more business and, with that, bigger, heavier, and taller equipment.

Current sites/locations are too small for expected growth. The participants who said they will need larger facilities said their current sites will not suffice. They are more likely to locate in outlaying communities than the City of Portland.

Green development is important to control energy costs. The participants were not concerned about climate change, but did aspire to lower their energy costs. They supported green development to the extent that it helped them become more efficient.

Multi-story facilities are not an option for metals manufacturing. The participants said the size and weight of their equipment makes multi-story facilities impossible.

BUILDING SPACE NEEDS

" Need more space. Definitely expanding."

"New markets have always been sought. Current markets come and go, but those that stay grow."

"Your components become larger physically, they become heavier. So it's more height and more crane."

"We're in an inefficient set up with three different small shops and it would be nice to combine into one area. To one nice, new facility."

We asked the participants if their building space needs would change in the next 10-20 years. Five said yes and that they all will need more space and larger facilities. First, they expect demand for their services to grow and their businesses to expand. Second, growth will require them to purchase larger and heavier equipment, which will require more building space and height. They said they will need larger cranes, advanced conveyor systems, computer servers, furnaces, and more.

For some, in addition to growth, they would like to be in newer buildings. Older buildings are serviceable but lacking. One participant would like to be in a more modern building with better heat, lighting, and ventilation.

A participant who did not expect building space needs to change indicated that, in the last several decades, facilities have been underutilized and that they will be able to absorb growth for the foreseeable future.

LOCATION/SITE NEEDS

"No. Or minor incremental change."

"The types of businesses that we move into will need more industrial area. The area we currently do business in is too expensive for the land that we need."

"We've been there fifty years and now we're surrounded by residential and other industrial businesses."

"I need property now. But where is it?"

"The big thing for us is acreage. For example,…we'll need a test track. So we'll need maybe ten to twenty acres of space in the metro area."

"Reasonable proximity to major highways is the important transport issue for us."

Again, five of six participants said they expect their location or site needs to change in the next couple of decades. A primary reason for this was expected businesses growth. Several believed that they will outgrow their current locations and that they don't have room left at their sites for expansion.

Several participants said they are "land-locked" or that the property around them is not developable. Two said that over the years residential neighborhoods have encroached upon them. One has land near the firm's property that is protected by a water district. These are examples of situations indicated by participants who indicate they are currently looking or will have to look for new land to develop.

Transportation will be key to their location decisions. Some factors that they are considering are proximity to major highways and the Port of Portland, and also the ability to bring in a rail spur. Two of the larger businesses have facilities scattered throughout the metro area and they would like to either consolidate operations or least keep future facilities reasonably close to their present locations.

Looking forward, some said government support and incentives will drive their location decisions. There was a sense that the City of Portland was an unfriendly place for them to do business and that outlaying communities are doing more to attract metal manufacturers. For example, speaking of Portland one participant said, "It's tough to be convinced that anyone wants you here." Another said, "We'll look anywhere. Whatever happens, it's going to be a huge investment so if someone comes to us and says here's $50 million to come out to the boonies, it's possible we'll do that… It'll be what incentives and the full package when it comes together."

To help make their location decisions, the participants suggested that Metro and regional governments create a database of shovel ready sites. They said the State of Oregon is already doing this and it would be helpful if it existed locally too.

The participants discussed the possibility of locating on brownfield sites, but they were not enthusiastic. More than one business representative indicated they would not consider brownfields because of public relation and liability problems.

One person commented, "We're not eager to take on the problems associated with brownfields. We have enough issues with our own manufacturing processes and trying to keep those clean. We don't need the complications of land that is already questionable." Another said, "Our business is a little bit different with having a target painted on our back. So we're probably a little bit more sensitive. I agree about brownfields. I can't imagine doing that here. We're very cautious."

On the other hand, at least one participant would consider brownfields if several criteria are met. "We're not anti-brownfields per se. It's all bottom line cost effectiveness. If someone is going to pay for it, if it's indemnified, if the city takes it, if the permitting process is expedited…I don't really care where it is if all those bottom line costs are taken care of."

ADVANTAGES OF THE PORTLAND METRO AREA

"Technical talent."
"Highway access (trucking is main transportation)."
"Near the Port of Portland"
"Good political support."

The participants named a range of advantages to doing business in the Portland metro area. Some of the most mentioned were the stock of talented employees and access to the Port of Portland. Other advantages included community services, political support, and personal history doing business in the region.

One participant made the point that manufacturing companies will have more long-term benefits to the region than industries associated with the "creative class." The point made was that because of the equipment and capital investments that manufacturing companies make, they are unlikely to move. Or in this person's words, "Everything we do is so big and so heavy we are not the type of companies that are going to pick up and move. I love the creative class, but all these people that are coming to work in office buildings and high-rises, they can move tomorrow."

DISADVANTAGES OF THE PORTLAND METRO AREA

"Very few large, undeveloped land areas close to highways."
"Not central to the United States—shipping costs to Midwest."
"City interference with day-to-day operations."
"Other industries get more attention"

More than anything else, the participants said that the lack of available industrial land is a disadvantage to doing business in the region. They said that what exists often is of poor quality, has limited access to transportation, or is expensive.

A few participants also said their industry isn't supported by local governments. They thought land supply was overly regulated and biased against manufacturing.

Climate Change & Green Development

"Climate change is more of a general community concern to us than a business concern. Green development is something we see as economic advantage to us."

"Climate change and global warming built off models slanted to build case. Green concepts are fine."

"There is a lot of potential in our industry. We use a lot of electricity and we have a lot of big flat roofs. If there were programs in place that help offset electric on a leases basis for solar. There is great potential there."

As a group, climate change was not a factor in their decision-making. Those who expressed an opinion about it were skeptical or identified it as a "community concern" more than a "business concern." But they were interested and supportive of green development as a means to lower their energy costs. As one participant said, "Just specifically about the facility it's really about energy efficiency. It's the cost of doing business."

Being near a residential neighborhood has motivated one participant to be more concerned about their manufacturing emissions. One comment:

> "In terms of emissions and environmental controls, we are very sensitive to the fact that a number of our manufacturing facilities are located in residential neighborhoods. So we really measure ourselves not just against regulator standards but the perception of the neighborhoods. It's not just altruism. Complaints take up time, effort, and energy."

At least one participant was concerned about environmental regulations interfering with plant operations. The sentiment was expressed most clearly by a participant who said, "I could go from yellow to red real easily depending upon how DEQ responds to political pressure…"

Smaller Footprint

"We deal with molten steel and molten titanium. Multi-story manufacturing is not feasible."

"Everything we have to do is with bulk steel. So I can't imagine multi-stories for manufacturing."

"In our current location we do have a second floor and we don't use it. It doesn't work for our industry. It just doesn't."

"How are you ever going to do anything with cranes on multiple stories? It's never going to happen."

We asked the participants if they would locate to taller buildings. They all agreed that multi-story buildings would not work for their businesses. They said the size and weight of their equipment made multi-story buildings impossible.

The only options they saw for multi-story were office space and structured parking. One participant said the business would consider a 2- to 4-story office building for engineering and R&D employees. Another participant said the business was considering building a multi-story parking structure because their current parking lot is threatened by a planned highway expansion.

Four participants said they would consider locating to sites that emphasize transit accessibility. One firm's representative noted: "We like to be on a transit line because ideally if someone is going to work for the streetcar it would be nice if they never had to take a car."

A business representative said that the December 2008 snowstorms made public transportation – especially light rail – more important. During the week of storms only 30-40% of employees were able to get to work. But public transportation was less important to others. Two people said that they already subsidize Trimet passes but few employees use them.

BUSINESS LOCATORS

Nine people participated in the focus group. Seven were from private firms that help industrial and distribution clients locate and purchase property in the Portland metro region. They represented local and national companies, and ranged in experience from 6 to 39 years. The other two participants came from the State of Oregon and the Port of Portland.

SUMMARY OF FINDINGS

Manufacturers and distributors will need larger single-story buildings in the future. Tends in technology, competitiveness, and fuel prices will result in businesses seeking larger facilities in the region.

Larger facilities will require more land. The participants said multi-story facilities could not work for distribution and manufacturing. Therefore, as building sizes increase there will be a corresponding demand for larger plots of industrial land. Factors that make industrial land useable are infrastructure (water, sewer, electricity, etc.), proximity to transportation, and the employment pool.

Current land inventory not adequate to meet needs. The participants said there are not enough large and contiguous pieces of industrial land in the region. They said the region needs new industrial parks with over 1,000 acres. They believed that the land is available if there is the political will to expand the Urban Growth Boundary.

Green development is increasingly important. The participants were mixed about whether businesses are willing to pay more for green development today, but they expect it to become more important in the future. They distinguished between a desire for reducing energy costs and concern about climate change.

BUILDING SPACE NEEDS

> *"I think the economies of scale drive larger and larger warehouse. But with fuel prices I think you'll see the reverse of that. There'll be smaller regional facilities servicing smaller areas."*
>
> *"Vertical growth works at a very large scale. It doesn't work well for a 20,000 - 40,000 square foot user. It doesn't have the economy of scale when you're that small."*
>
> *"The other thing is technology is replacing humans in distribution. And so to take advantage of vertical growth it is customize picking and conveyor systems that are replacing 20 guys on a fork lift."*
>
> *"Even distribution users are getting into that very specific building type with technology and automatic picking because of the price of labor as a component of their overall budget is continuing to go up."*
>
> *"Greater design focus on efficient logistics and energy efficiency."*

The focus group began by asking the participants if they expected the building space needs of their clients to change in the next 10-20 years. Everyone said yes. They expected larger facilities with higher ceilings to accommodate modern equipment.

Some of the participants expected distributors to change their business models from very large centralized facilities to smaller regional facilities because of fuel costs. They said that as fuel costs increase, it will become more profitable to operate multiple facilities in smaller population centers than to truck goods from one central location. If this comes to be, then distributors will want to build or purchase facilities in Portland. However, they said that while these would be smaller facilities relative to some of the "mega" facilities that exist elsewhere, they would be large for this region – 150,000 square feet of more.

Some participants noted manufacturers and distributors are replacing people with machines – such as cranes, pickers, and conveyors – and that they expect this to continue. As the cost of labor increases and machines become more efficient, it is more cost effective for businesses to automate.

Moreover, tax laws incentivize equipment over labor because equipment depreciation is a tax deduction. In terms of building space needs, this means that companies will need more space with taller ceilings to have room for cranes and other equipment.

There were mixed feelings about environmental design and whether businesses are willing to pay extra for sustainable features in the current market. But a number of participants said in the written comments that they expected green building practices to become more important in the next couple decades.

LOCATION/SITE NEEDS

"Limited supply will push development out and to smaller communities. Not driven by users' needs to be farther from city center."

"Warehouses are getting bigger. The need for larger flat sites will increase."

"We're short of useable land and the economics of the less useable land is so far out of whack. It's one of the reasons that it's hard to get companies to expand and move here."

"I agree that I-84 is important. But not in my lifetime the UGB is not going beyond the Sandy River. So for our discussion today it's I-5."

"I think east/west traffic in the metro area is a fundamental problem. It's very difficult to go east/west."

In the written comments, all the participants said their clients' location site needs will change in the next two decades. They expected to need more land to accommodate larger facilities and bigger truck staging areas. But the participants felt that the region lacks the inventory to accommodate these needs. They expect businesses to look farther out for land to build their facilities – if they decide to locate in the region at all.

Business locators indicate that the importance of access to transportation differed by business and industry sector. For some sectors, particularly distribution, access to the I-5 is critical. But I-5 access was less important to manufacturers, as long as they could reach another major road, such as I-205 or US 26.

A couple of participants said that access to labor is important to a business's location and site needs. Companies that need a large labor pool will select sites near population centers. One participant said, "The problem with Damascus or being on either side of Estacada or Canby is they don't have a population base to support. That is the big disconnect." Another said, "What I tried to explain to people is yes you need transportation for trucks, but if you're looking for companies that hire knowledge based people, their employees have to get to it."

ADVANTAGES OF THE PORTLAND METRO AREA

"Livability"
"Gateway to Asia."
"Strong land use laws."
"Educated and good workforce."

We asked the participants to write what they considered the biggest advantages of the Portland metro area for their clients' businesses to grow. The top two responses were quality of life and a talented workforce. They said the region's recreational activities and "socially-aware culture" make this a desirable place to live and attractive to employees.

Some of the other advantages to the region included access to Asian markets, being a regional hub, relatively good transportation, the Port of Portland, and the low cost of power.

DISADVANTAGES OF THE PORTLAND METRO AREA

"Limited industrial land."
"Government entities that don't care about business."
"Cumbersome jurisdictional approvals."
"Liberal attitude."

The participants said a limited land supply and the difficulties doing business were the biggest disadvantages to their clients. They said that taxes are too high, that permitting takes too long, and that government is unfriendly to business.

Other disadvantages cited include not having a major university, expensive construction, and a small regional population base.

LAND INVENTORY

"Our inventory at the Port has decreased quite a bit. So people are actually shocked when they learn the Port doesn't have a 35-acre site or a 50-acre site."
"And it's not just fifty acres here seventy five acres there. What you need is fifteen hundred acres in a large industrial park. Because then there is synergy."
"There are 'A,' 'B,' 'C,' and 'D' [grade] sites. 'A' sites are gone. 'B' sites are really tough to find. What you have are 'C' and 'D' sites with slopes and wetlands."
"One example is industrial land brought into Damascus where it has not been served, and is not where anybody wants to be. People want to be on I-5."
"There is plenty of available land, but there is a lack of political will."

Throughout the focus group nearly all the participants stressed that the region is land constrained, in part, because of the Urban Growth Boundary (UGB). They said within the UGB it is very difficult to find large enough parcels for their clients. And if their clients need smaller parcels, what is available often doesn't meet their needs. For example, it is too far from the interstate, on sloped land, near environmentally-sensitive habitat, or not the right size.

Some participants said that what is needed are large – 1,000 to 1,500 contiguous acre – industrial parks with infrastructure and access to multiple modes of transportation. One participant said, "If I can make one point today it is that it can't be 100 acres here and 150 acres there. It's got to be a big move." At least one participant believed that there are a couple hundred acres zoned for industrial in Wilsonville that aren't utilized because of a lack of infrastructure. Another participant said that industrial land in Damascus isn't ideal because it is too far from I-5.

The participants felt that the politics of the Urban Growth Boundary and local zoning are unfavorable to industrial users. They felt that there has been a lack of political will and a NIMBY-ism attitude. As one participant put it, "The government put a big 'no' around the city. And there is a political responsibility that comes with that. It means having the nerve to say 'yes' for the things you need. Otherwise you bring everything to a stop."

We asked the participants where they would like to open more land for industrial uses. Some specific suggestions were Colwood National Golf Course (7313 NE Columbia Blvd.) and Broadmoor Golf Club (3509 NE Columbia Blvd.). More general suggestions were land north of I-205 merge near Ridgefield, Washington, and land between Wilsonville and Woodburn.

Suggested was a tax on windfall profits to help pay for infrastructure developments on industrial land. One person elaborated as follows:

> "I don't think a farmer today, who has enjoyed the advantages of low taxes outside of the Urban Growth Boundary, ought to be entitled to the total windfall profit of being brought inside. In terms of how you fund some of that infrastructure, I think when you come in the UGB and sell your property you owe a tax to pay for the infrastructure that is brought in."

Not every comment about the UGB was negative. A couple participants said the UGB has helped support the region's quality of life, which makes it attractive to companies and employees.

Climate Change & Green Development

"It's important to people and their investors. It's the practical thing to incorporate into your site selection."

"I'd say we've had one client that acted like they cared. I would be surprised if he thinks he kept any money in his pocket because of it."

"I don't think it's worth anything on the lease rate. I think it is a tie breaker."

"Green is good. LEED is bad."

The participants had mixed feelings about the importance of climate change and green development. In the written comments some said that green is becoming more of an issue for their clients. Some examples were: "It's getting more and more play." "Historically most companies have not prioritized sustainability, but this is changing."

There was a sense that green development is more important for commercial clients than those in manufacturing or distribution. One participant said, “In an office I don't think you can play unless it's LEED sliver or better. But on industrial I think it's just nice to have.” Also, they distinguished between a concern for climate change per se and development practices that reduce energy costs. Only the latter drives development decisions.

Others were more critical of green development. One called it “marketing” and didn’t think that businesses are willing to pay extra for it. Another complained that LEED certification is far too expensive. An anecdote is cited of the case where it cost a building owner $2,500 to remodel a building to meet LEED standards but the certification process cost $44,000.

SMALLER FOOTPRINT

As with the other groups, participants were asked if their clients would locate to taller buildings in areas with greater urban density. Two said they would consider 2- to 4-story buildings and 5- to 8-story buildings. Three said they would consider buildings eight or more stories. However, they qualified their answers by saying only their commercial clients would consider taller buildings.

The participants generally agreed that multi-story facilities for manufacturing and distribution are not feasible. Multi-story buildings are inefficient and cannot accommodate modern industrial equipment, such as cranes, pickers, and conveyor systems. In fact, they saw the trend working the other direction, with businesses moving out of multi-story facilities into larger single story units. One participant went so far as to say, “That these questions would be posed to a group like this scares me. You’d have to be somewhat removed.”

Five participants said their clients would consider reducing land site needs for parking by encouraging transit, shared parking, and/or structured parking. They cautioned, however, that this would not be popular and that expansions of transit infrastructure shouldn’t come at the expense of industrial land. The participants who said no commented that trucking is dependent on freeways and that the “hub-and-spoke” model of transit clashes with the “satellite” model of manufacturing and distribution.

REGIONAL SERVICE PROVIDERS

Five people participated in the focus group. (A sixth person started and completed some written exercises but did not stay for any of the group discussions.) One of the participants represented a regional law firm with headquarters in downtown Portland that employs about 250 people. A second participant was from an international consulting firm with offices in downtown Portland with about 1,000 local employees.

Three participants represented the health care sector. Two were from large health care providers that have multiple clinics, hospitals, and administrative offices in the metro region. The other was an executive from a health insurer that leases three office spaces in downtown Portland. Each of their companies has several thousand workers in the area.

SUMMARY OF FINDINGS

For office settings, space per employee is decreasing. Professional workers are using smaller offices or cubicles. This will mitigate future space needs even as business expands. However, needs for conference and collaborative work space are increasing.

Health care providers expect to build more facilities as the population ages. As the population ages it will require more care. Health care providers expect to need more facilities to accommodate them.

Public transportation critical to service sector. It is important downtown businesses where parking is limited and to bringing patients to health care facilities.

Green development embraced. All the participants valued green development. Several are located in LEED buildings or will only consider LEED building for the future. The region's focus on sustainability draws young, creative talent to the region.

BUILDING SPACE NEEDS

> *"One thing a lot of law firms are looking at is single-sized offices regardless if you are a partner or associate. With the idea that you meet with your clients in a conference room."*
>
> *"Your own personal workspace is getting smaller and smaller. One reason is employees are spending a lot less time there. They're in and out."*
>
> *"If you look at health care financing, the role of government as we move into health care reform, you may see some of those functions taken over by the government and our sand box shrinking."*
>
> *"Well the doctor patient nexus remains relatively unchanged. Patients are still going to come in. The change we see is with day surgery and ambulatory services. Overnight stays are not increasing."*

There was a mix of expectations about future business space needs among the participants. In general, for office and administrative work they anticipated needing less space per employee. Individual offices have become smaller or disappeared all together. The representative from the

law firm said that it is becoming more common for partners and associates to have the same size offices and to use conference rooms for client meetings.

Several participants said that the majority of their employees work in cubicles and open spaces. This was true for low-level workers, such as claims processors, and becoming more common among professional staff.

One participant said, "The perfect space would be office, highly open, highly interactive, and accommodating for communication. A big part of our business is sharing communications, sharing ideas. Technically we do not have any offices. It's all open cubes. That's very important."

A couple of participants commented that it is becoming more difficult to manage space because employees spend more time out of the office telecommuting, traveling, or at client meetings. One person estimated that on any given day 20-30% of employees are not at their desks. To better manage office space use in the future, employees may lose their permanent space altogether. Instead, the office would have fewer cubicles and employees would store their materials in cabinets and share common workspace on a first come first served basis. Not everyone agreed with this specific suggestion, but did agree that they will need creative solutions to manage space as more employees work outside the office.

Additionally, increased electronic filing was seen as further reducing space needs. This has already happened, for example, with a law firm where the library shrunk as more legal text became available online.

Among these participants, the health service providers had unique space needs. In particular, they said the aging population will require more health care services – both acute and chronic – and that this impacted how they thought about their expansion plans. They will need more facilities to care for the elderly, and they will have to consider where to locate and how to build them to accommodate a population with diminished mobility. For example, they were leery of taller facilities because they are less accessible to people with wheelchairs and walkers.

LOCATION/SITE NEEDS

> *"They've changed a little bit, but we're still committed to the central city. We went through the process of looking at the suburbs, but we felt more connected to downtown. More connected to the relationships, the cultural issues. And the rates were not significantly different."*
>
> *"Transit and the transit modes drive what we can do. It means you can drive your parking down and your land needs down, and your floor to area ratio goes up."*
>
> *"Consolidation of employee functions in regional claims and customer services."*

Three participants said they anticipated their location site needs to change in the next 10-20 years. Two thought growth and expansion will require them to add more facilities. But one participant expected the size of his company to decrease because of consolidation and government involvement in health care financing taking some functions out of the private sector.

The most mentioned issue in regards to location was access to public transportation. In one way or another all the participants said that this was important. One participant said that "it's a huge

issue for our front-line employees. Getting in and out of the downtown area and parking is a very costly thing. So to the extent that we can get them to use public transportation helps." Another said that light rail is more important than buses. "Light rail is particularly important. We operate shuttles and are able to pick people up at light rail stops. That's what sends our mode split so high."

The health care providers expressed different experiences with patients using public transportation. One said it was critical to their patients and to decisions about where to build new facilities. The other said that in their experience most patients don't use public transportation and that it was more important to employees.

Most of the participants had seen increases in the number of employees commuting by bicycle. One mentioned that the company expanded its onsite bike parking and it is full most days. However, they also agreed that public transportation and bicycles will never be able to fully replace the need for automobiles and parking. Employees that need to be out and about during the day don't have the time for public transportation.

A few participants said their companies have experimented with car-share programs. The purpose of the programs has been to encourage employees to take public transportation to the office, but have access to company cars of Zip Cars during the day. One person said their program is little more than a "novelty." Another said that their program hasn't gained much traction because it's cumbersome. Two more said they were aware their business has a program but didn't know how many employees use it.

ADVANTAGES OF THE PORTLAND METRO AREA

"Availability of workforce and clients."
"Positive demographic and employment trends."
"Sustainability focus. Most important now and will be in the future. It points a picture that is important to our employees and actually important to our business. We're doing a lot of work in that area."

Advantages to the Portland metro area include a skilled and educated workforce, relatively stable population, and economic growth.

The region's focus on sustainability is important to maintaining the region's quality of life. It also makes it easier to recruit young, creative employees who place a high value on environmental sustainability.

DISADVANTAGES OF THE PORTLAND METRO AREA

"Expensive for front-line employees to park and commute."
"Congestion limits access to our facilities."
"Congestion around emergency rooms is an increasing concern for us. That is a situation where people have to get to us in a hurry."
"Delays with the I-5 bridge are silly. Companies are not locating here because of traffic. It will probably be a bigger issue in the future."
"Erosion of employment segments valuable to our growth."

In the written comments, the participant named a variety of disadvantages to Portland including the cost of land and facilities, the decline of the manufacturing sector, and the relatively small population base. In the group discussion, the most mentioned disadvantage was traffic congestion.

One participant said that traffic congestion and the delay of reaching a solution to the I-5 bridge has caused businesses not to locate to the region. Another said that congestion near hospital emergency rooms is becoming a concern because the vast majority of emergency room patients drive their own cars. And another said that cost of commuting to downtown is expensive for frontline employees.

We asked the participants what Metro and local governments can do to assist their business and others in their industry sector. Five of six participants said improving transportation infrastructure and accessibility.

Climate Change & Green Development

"Part of our organizational mission is community health. So environmentally-sensitive building is a contributor to that."

"We're looking at space to lease in Seattle now and it's got to be LEED-certified."

"The public service nature of what we do guides action. Our new hospital was the first LEED gold hospital in the country."

"To get the best and brightest engineers and professionals we have to be in that area. It's a recruiting issue."

The participants were strongly supportive of green development and their individual companies have already taken steps to reduce energy use. One participant said his firm will only consider LEED-rated buildings for future leases. Others presently rent or built LEED-certified facilities.

The two health care providers said that community health is part of their organizations' mission and therefore it's important to have green buildings. And in addition to health benefits, they valued lower energy costs.

One participant said that his company works in the environmental field and that it was vital his company embrace those values. Customers and employees demand it.

Smaller Footprint

"I think as a company as we get our technology issues sorted out, these mid-rise buildings will be more attractive. It would be less expensive office space in a geographic region where our employees can come and go more easily."

"Two to four stories is just not big enough."

"What we're building now in the town centers are all 2-, 3-, and 4-story offices. They could be higher but the ambulatory issue is important to us. We try to keep the number of stories down."

We asked the participants if they would locate to taller buildings in areas with greater urban density. Three said they would consider 2- to 4-story buildings, four said they would consider a 5- to 8-story buildings, and two said they would consider buildings eight or more stories.

Two of the three participants who have a large presence in downtown Portland desired taller buildings. These businesses have a relatively high ratio of professional employees. However, one participant, who currently has offices in a high-rise building, thought in the future the organization might prefer to relocate to a mid-rise building in the suburbs. In part, this is because of a labor profile with more low-wage workers for whom the cost of commuting and parking downtown are higher than it would be outside of the city center.

Health care providers indicated that mid-rise buildings tend to work better for their clinical space. They didn't rule out being in taller buildings and acknowledged that the OHSU Center for Health and Healing is an example of clinical space in a tall building. But they said that for standard care their patients do not want to travel far and therefore they need clinics in neighborhoods and town centers. They did agree that administrative operations could be in taller buildings.

RETAIL

Summarized are key points made during the retail focus group hosted by Bob LeFeber of Commercial Realty Advisors and facilitated by Eric Hovee and Bonne Gee Yosick. There were eight participants in this focus group including four representatives of grocery store operators, a specialty retailer, dining establishment, lending institution and personal services provider. "Facility reach" ranges from just one operation to 34 stores in the Portland metro area. Store size ranges from a few thousand to over 200,000 square feet.

SUMMARY OF FINDINGS

After a period of increasing store size, retailers are now looking to smaller and more infill store sites. The recent trend has been toward smaller-scale developments with a thinning of in-line stores (a combination of the economic situation and weeding out of weaker competitors). Also noted is that the backroom is shrinking; less storage is required since deliveries are more frequent, daily in some cases.

The Portland metro market may be slightly underserved, but this is a benefit as there is not excess store square footage with greater resiliency as retail spending slows. Because this region is perceived as generally a bit under-served, participants don't expect the region to be as adversely affected as others in the U.S. will during the current economic downturn.

Multi-level stores work, but primarily in urban environments. Where they have been attempted in suburban environments; shoppers don't go upstairs and those departments suffer. Larger footprint uses prefer free-standing versus in-line uses when possible but will accept in-line sites with urban development when supported by potential sales volume.

Retailer financial capacity varies depending on the customer market segment served. Opportunities are much different for 1st- versus 2nd- and 3rd-generation store formats. Reuse of existing space is more critical for lower rent in-line and 2nd-/3rd-generation stores.

Zoning and development regulations need to be manageable to allow for site use and redevelopment. Issues related to setbacks, street orientation, multiple entrances, corner versus mid-block appeal, and design review can make or break retail success. Also cited are zone change requirements affecting the way that new grocery stores to replace previous grocery operations.

Multi-channel uses continue to increase; customers are using a combination of on-line and in-person shopping and banking. However, people still want a place to go where they can shop and sample merchandise in favorite departments or talk to their own personal service representative as in a financial institution.

Customers and employees expect retailers to be green. For retailers, sustainability includes greater emphasis on recycling, reduced energy use, more efficient lighting and HVAC systems. Energy savings are important and can be significant. However, green measures also need to pencil, a reason for concern with application of LEED standards to retail development.

BUILDING SPACE NEEDS

"It was initially thought that on-line banking would take over, but people seem to want a place to go to, people to talk to, and drive-through facilities."
"Seems to be a trend toward the smaller (store) concept"
"The backroom is shrinking with less storage required since deliveries are more frequent, daily in some cases."
"Suspect a trend toward smaller shopping centers in general."
"Rehab of in-line space if a playground can be accommodated."

There is general agreement that the Portland metro region is likely to see less suburban shopping center development than in the past. When development does occur, it may be on smaller sites than previously. More development of infill sites is also expected.

A firm that previously targeted 10- to 30-acre sites is now seeking more 9- to 12-acre sites. In their words, the "shopping centers are shrinking; in-line tenants are gone." This trend is partly but not solely a cyclical phenomenon of the economy and reflects a "weeding out of weaker players."

The trend toward smaller store sites is exemplified by the grocery industry. Examples of smaller grocery prototypes include Wal-Mart's MarketSite (more of a convenience-type concept), Tesco's Fresh and Easy store (being introduced first in the Southwest US), and similar Safeway smaller format stores.

For one retailer, a key to successful innovation is a full-scale emphasis on trying to get customers through transactions faster. The focus is on keeping labor low with self-bagging and other self-service functions.

LOCATION/SITE NEEDS

"Grocers generally need parking. Planners talk about pedestrian and bike accessibility, but grocers need people buying 8 bags of groceries, not 1 or 2 bags of groceries."
"It was initially thought that on-line banking would take over, but people seem to want a place to go to, people to talk to, and drive-through facilities."
"Anytime we can do a free-standing building, it is preferred."
"… a second or third-generation space user, so need to look for the redevelopment opportunities."
"When people drink alcohol, they want to be closer to home."
"Other urban locations like NW 23rd will be sought out but probably not in the Portland metro area."

As one participant, noted, the retail objective today is to create the "nodes of activity" such as a grocery store or bank around which other retailers will then also be attracted.

Parking remains a pivotal consideration for retailers. But retail parking needs can vary widely across the region. One retailer conducted a mode split study and found that only 2% of shoppers

arrived by non-car modes at a Beaverton store while 50% of shoppers came by means other than auto at a Hawthorne store site.

Secondary urban areas can perform well for retail but should not necessarily be expected to perform at urban levels. Areas ranging from Gateway to Orenco are cited as "well performing, but they are not urban." This means that retail site and building planning can expect to differentiate between very intense central city, close-in urban street and more recently emerging suburban shopping areas throughout the metro area.

ADVANTAGES OF THE PORTLAND METRO AREA

"The region seems slightly underserved (with retail) but that is generally positive. Less choice is better than too much choice."

"We are close to the customer and each store responds to its unique environment."

"We are continuing to look for sites."

The region's population growth is viewed as a plus by area retailers. As one retailer commented, the Portland area continues to experience unmet market demand which is why they are continuing to expand.

Another retailer expressed optimism about market demographics more in the sense of being better able to survive the current economic downturn: "We won't be hit the way others in the U.S. will be because we are generally a bit underserved."

DISADVANTAGES OF THE PORTLAND METRO AREA

"Compared to the other metro areas, this is a tough place to go shopping."

"Issue of jurisdictions working with developers collaborative versus antagonistically"

"Development regulations are a disincentive to move walls. It does not allow evolution of the space."

"California has the worst state regulations to deal with, but Oregon is 2nd."

"It would be helpful if approvals were more administrative (by the Planning Director) instead of requiring several levels of hearings by Planning Commission and/or City Council."

"Site design requirements are not responsive to current economic conditions."

"… urban level requirements are difficult in suburban environments."

"There is a need to accommodate cars."

"Somewhere in recent history, we went from vision-driven planning to regulation-driven planning, and we need a return to the vision."

Many of the perceived disadvantages of doing business in this metro area focus on aspects of the regulatory environment. These are perceived as being onerous from a variety of standpoints – including impact on development feasibility, store profitability, and comparison with other metro areas of the U.S.

A grocer gave an example of prior grocery store sites that had to be rezoned to allow redevelopment for a new grocery store. Another store operator cited an example of requirements

for pedestrian entrances in non-pedestrian environments, creating inefficiencies in design and problems with added shoplifting.

One retailer gave the example that "in the Albina plan, all stations were zoned high-density residential, but the HD residential won't go in without the services to support it." Also cited was an example of a competitor filing a LUBA appeal for only $250 – after the project had already gone through an extensive public review process. The requirements need to be "clear and predictable."

A store developer expresses concerns with the nexus between SDC charges and where the improvements are made, noting that "the improvements need to be made in the vicinity of the project." Another commented that improvements made by the retailer need to be offset in fees.

As one successful retail operator noted: "Despite all the grousing, there is a recognition that it is this highly-regulated environment that has created the conditions that allow the company to be successful."

A final suggestion: "There needs to be a phasing-in of the long-term vision which is not economically feasible yet." When asked about the "single most important thing that Metro and local jurisdictions could (or should) do to best assure that this region remains competitive", suggestions received include the following:

- Keep approvals process clear and predictable.
- SDC nexus needs to be clear; keep public improvements in the vicinity of the development.
- Don't demonize the automobile. It's part of our culture and society. People require it.
- Urban development standards don't work in suburban environments.
- Ensure development requirements respond to existing market conditions. (For example, poorly planned pedestrian accesses can result in less efficient use of space within the establishment and/or end up being used nearly exclusively by shoplifters.)

CLIMATE CHANGE & GREEN DEVELOPMENT

"Customers and employees expect it (going green)"
"It's ingrained and expected."
"Energy savings are important and can be significant."
"All our meals used to be on disposable serveware, now it's down to about 25% disposable."
"Access to transit is important for the staff"
"Energy-efficiency needs to pencil."

One participant commented on the emphasis on green and sustainable development this way: "As a resident, it's wonderful; but it shouldn't be in conflict with industry." A retailer looking at added sites noted that "new buildings apply LEED principles, but are not certified" due to high costs of certification, especially for smaller footprint buildings. Another retail business

comments that solar panels on light fixtures save money but were "harder to permit than the standard approval process."

A food retailer comments that they "use no Styrofoam and are seeking energy savings." And a service business representative observes that "better light and HVAC systems make for a better environment, which makes the experience better for the customer."

A business that values transit access not only for those who work at store sites but in preparatory facilities. In addition to transit, walking and biking (including bike route access) are important.

SMALLER FOOTPRINT

"Allow master planning of sites to respond to market conditions."
When the environment demands it, there is no problem putting parking underneath."
"The marriage of LRT and economic activity seems questionable. Dallas seems more successful, developed as public-private partnerships."
"Recognize that we have a pro forma that we're bound by."

As with the other focus groups, participants were asked if they would locate to taller buildings with greater urban density. Opinions were mixed.

Among retail representatives, the general consensus seemed to be that multi-level retail and participation with mixed-use development makes most sense in higher demand urban and mixed use settings. One business representative noted that "development patterns have been established; it's about redevelopment."

However, in other less urban settings, an urban format with multi-level stores and reduced parking ratios may not work. With retail, one size does not fit all situations.

What is clear is that retail and service business patterns and customer demands are continually changing. A store that uses multi-channel marketing finds that its customers "still want to shop the deli, produce and other departments."

Even functions like an ATM take on greater importance in a retail site. As one participant noted, the "ATM is becoming more of a multi-convenience center" where people can also make purchases – as for stamps, travelers' checks, and gift cards.

In summary, the trends most favorable toward smaller footprints include a more conservative development environment favoring smaller store sites, growing emphasis on urban infill sites, and willingness to adjust parking requirements to the mode mix of traffic in a particular portion of the metro region. However, clear limits are also noted – a suburban setting may not immediately adjust to or support an overly urban retail development concept.

APPENDIX. FOCUS GROUP FUNDERS & PARTICIPANTS

This appendix provides a list of focus group funding partners and participants (by group).

PROJECT FUNDING

This focus group research has involved funding support from both public and private sector organizations including:

Clackamas County Business Alliance (CCBA)
Commercial Association of REALTORS® (CAR)
Commercial Real Estate Economic Coalition (CREEC)
East Metro Economic Alliance (EMEA)
Metro
Oregon Association of REALTORS® (OAR)
National Association of Industrial and Office Properties (NAIOP)
Port of Portland
Portland Bureau of Planning
Portland Business Alliance (PBA)
Providence Health & Services (PH&S)
Society of Industrial and Office REALTORS® (SIOR)
Westside Economic Alliance (WEA)

FOCUS GROUP PARTICIPANTS

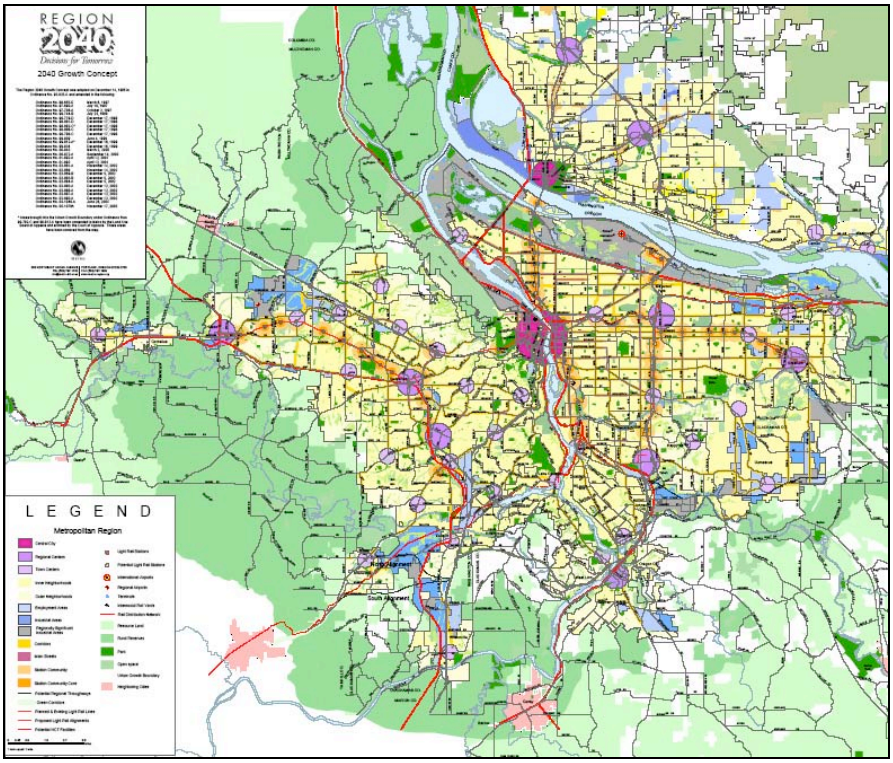
Listed below are names and business/organizational affiliations represented within the eight focus groups. This contribution of time and ideas by focus group participants is gratefully acknowledged.

Name	Position	Focus Group	Firm / Organization
Mike Becker	Director of Legislative and Regulatory Affairs	Regional Service Providers	Regence BlueCross/BlueShield
Bob Beisner	Board of Directors	High Tech	SolarWorld
Steve Benight	CEO	Biotech/Medical	Portland Bioscience, Inc.
Craig Boretz	Vice President of Corporate Development	Distribution/Logistics	Con-way
Paul Breuer	Senior Vice President	Business Locators	Colliers International
Chandra Brown	Vice President	Metals/Machinery	Oregon Iron Works, Inc.
Erin Carlson	---	Retail	Save-A-Lot Foods
Mark Childs	Principal	Business Locators	Integrated Corporate Property Services
Bob Currey-Wilson	---	Retail	Fred Meyer

Name	Position	Focus Group	Firm / Organization
Tom Dechenne	Senior Real Estate Broker	Business Locators	Norris, Beggs & Simpson
Eileen Drake	Vice President	Metals/Machinery	Precision Cast Parts/PCC Structurals, Inc.
Gary Eichman	President	Distribution/Logistics	Oregon Transfer Company
Patrick Flanagan	---	Retail	Key Bank
Glenda Hollenbeck	---	Retail	Kindercare
Dan Hossley	---	Retail	Moonstruck Chocolate
Wray Hutchinson	---	Retail	Buffalo Wild Wings
J. Isaac	Senior Vice President Business Affairs	Regional Service Providers	Portland Trailblazers
Jeff King	Director	Biotech/Medical	Virogenomic, Inc.
Susie Lahsene	Senior Manager Transportation and Land Use Policy	Distribution/Logistics	Port of Portland
Tim Leahy	President	Metals/Machinery	Calbag Metals
Dave Marks	President	Metals/Machinery	Marks Metal
Harvey Matthews	Executive Director	High Tech	Software Association of Oregon
Stephen McCarthy	Owner	Food/Beverage	Clear Creek Distillery
Doug MacGowan	Vice President Foundry Operations	Metals/Machinery	Esco Corporation
Lee Medoeff	Owner	Food/Beverage	House Spirits Distillery
Jill Miles	National Business Development	Business Locators	State of Oregon – Economic Development Department
Joe Mollusky	Real Estate Marketing Manager	Business Locators	Port of Portland
Clark Nelson	Human Resources Manager	Food/Beverage	Kraft Foods
Don Ossey	Principal	Business Locators	Capacity Commercial Group
Drew Park	---	Metals/Machinery	Columbia Wire & Iron
Arundeep Pradhan	Director – Technology & Research	Biotech/Medical	Oregon Health & Science University
Donna Ragan	Director – Taxes and Economic Development	High Tech	TriQuint Semiconductor, Inc.
Morgan Randis	---	Retail	WinCo Foods
Josh Reynolds	President	Food/Beverage	Gray & Company
Brian Rohter	---	Retail	New Seasons Market
Ben Santarris	Public Affairs Manager	High Tech	SolarWorld
John Siemsen	Director of Planning and Strategy	Regional Service Providers	Kaiser Permanente
Stuart Skaug	Associate	Business Locators	CBRE
Greg Smith	Transportation Solutions	Distribution/Logistics	Road Link
Desari Strader	Executive Director	High Tech	Oregon Solar Energy Industries Association

Name	Position	Focus Group	Firm / Organization
Irfan Tahir	Broker	Business Locators	Grubb and Ellis
John Titteninton	Director of Research & Development	Biotech/Medical	Najit Techonologies, Inc.
Steve Wells	Principal, Development and Investment Group	Business Locators	Trammel Crow
Donald Williams	COO	Regional Service Providers	Schwabe, Williamson & Wyatt
Jonathan Williams	Government Affairs Manager	High Tech	Intel Corporation
John Willis	Area Vice President	Regional Service Providers	CH2M Hill
Ty Wyman	Attorney; Representative PH&S	Regional Service Providers	Providence Health & Services/Oregon

EMPLOYMENT & ECONOMIC TRENDS ANALYSIS



Interim Status Report

Prepared for:
Metro

March 2009

E. D. Hovee & Company, LLC – Economic & Development Services

Bonnie Gee Yosick llc FCS Group Davis, Hibbitts & Midghall, Inc.

INTRODUCTION

This is the interim report for an employment and economic trends analysis being conducted for the Portland metro region. The primary purpose of the analysis is to outline a *new paradigm* for evaluating job needs and associated capacity within the tri-county portion of the metro region.

Report Context. In 1995, the region endorsed the 2040 Growth Concept, an innovative blueprint that seeks to direct future population and employment growth into urban centers, transportation corridors and employment areas in a manner that uses land more efficiently and enhances the character and economic vitality of urban communities. In 2008 the Metro Council adopted six characteristics of a successful region that describe outcomes to guide the region's efforts to accommodate population and employment growth while enhancing quality of life for current and future residents. One outcome focuses specifically on the economy: *Current and future residents benefit from the region's sustained economic competitiveness and prosperity.*

State land use laws require Metro to produce an analysis of the region's capacity to meet the forecasted 20-year demand for jobs and housing by the end of 2009. Metro, in partnership with Clackamas, Multnomah and Washington counties, is also working to identify urban and rural reserves, which will define the shape of the region for the next 40 to 50 years.

Economic & Employment Trends Work. To support efforts to analyze demand and capacity and identify urban reserves, Metro is undertaking a fresh look at an employment methodology with the assistance of a consultant team led by Eric Hovee, E. D. Hovee and Company, LLC. The employment and economic trends work will provide the Metro Council with a new paradigm for evaluating job demand and associated employment land demand for the 5-, 20- and 50-year time horizons. The work will include:

- Economic trends focused on location decisions and development practices,
- An updated inventory of employment land across the region, and
- Policy options for assessing employment capacity needs.

Summary Overview. Work that has been completed to date includes:

- Employment Demand Factors & Trends (Eric Hovee & Tess Jordan)
- Variables Affecting Location Decisions (Bonnie Gee Yosick, LLC)
- Focus Group Research (Adam Davis – Davis, Hibbitts & Midghall, Inc.)

The purpose of this status report is to provide a *summary overview* of work completed to date and implications for next steps – notably the formulation of a new demand assessment paradigm, capacity inventory, and framing choices for regional job needs. More detailed draft technical reports are available for each of the topics described above.

This report begins with a brief overview of key findings from analysis completed to date. This is followed by discussion of research results from each individual project task – leading to implications for a new demand paradigm and resulting choices for regional job needs.

OVERVIEW FINDINGS

Drawing from research completed on employment trends, a literature search of factors affecting location decisions and industry focus groups, the following overall findings are outlined as being of particular importance to shaping a new employment paradigm for the tri-county region:

1. *Post-2000, the Portland region has experienced an economic recovery with modest job growth accompanied by migration of net added employment to outer ring suburban areas of the metro area.* Non-farm job gains were at much lower rates (averaging 0.5% annually) than were experienced in the 1990s. This post-2000 experience of more moderate job growth also appears consistent with expectations of slower labor force and employment changes over upcoming 5-, 20- and 50-year time horizons. While 75% of existing jobs remain concentrated in the region's center and inner rings, the outer rings experienced job growth at rates of approximately 3% per year – accounting for virtually all of the region's net added jobs.

2. *Increased intensity of development and employment activity has occurred for the central city, centers and corridors (urban 2040 design types) but with surprisingly weak job gains.* Floor area ratios (FARs) as an indicator of building intensity (measuring building square feet divided by site area) have increased substantially for regional centers, town centers and corridors. However, urban design type employment growth has increased at below region-wide rates for all but town centers.

3. *Conversely, industrial and employment areas have experienced strong jobs gains but at largely unchanged levels of development intensity.* While a substantial source of this job growth has occurred with industrial-related uses (especially in industrial areas), the majority of the employment gain realized across all employment land has come from service sector jobs. Development intensity as measured by FAR continues at just under 30% of site area.

4. *Building intensity (FAR) rather than job intensiveness of building space utilization can be expected to serve as the major driver of changing employment 'footprint' in the years ahead.* The standard measure of employment intensiveness – jobs per acre – is the mathematical product of jobs per square foot of building area *multiplied by* FAR of building development on-site. National literature, combined with experience of the Portland metro area, suggests that while there may be some shifts in employee use of building space, the major determinant of job density on site will come from increased FAR. This can occur via means such as greater building coverage of the site, more multi-level buildings, and improved utilization of higher ceiling (high-cube) buildings for industrial applications.

5. *Business community commitment is evident for realization of the region's 2040 vision accompanied by incremental change.* Focus group participation demonstrates a Portland metro area business culture that thinks long-term – more so than many business counterparts across the U.S. or globally. This commitment is evidenced by rapid adoption of green business and development practices and by support for maintaining the region's

livability to attract and retain labor force. Caution is also exemplified by the statement: "Don't require the full-build now." Rather, make incremental changes creating new market opportunities while staying the course toward achievement of the longer term 40-50 year vision.

6. *While a major focus of Metro's urban growth report will be on assuring adequacy of development capacity for job growth, there are issues beyond land supply that will affect regional job outcomes.* Job characteristics of interest that have been identified but are beyond the direct scope of this research process include such metrics as wage levels, value of regional output, technological and capital intensiveness of the region's industrial base, education levels, infrastructure readiness and ability to respond to as yet unforeseen opportunities.

   Local jurisdictions may appropriately address many of these factors including jurisdiction specific aspirations through Goal 9 Economic Opportunity Analyses. Metro is charged with taking a broader regional view to assure that the full range of current and future job needs can be adequately addressed in a manner that also meets the adopted Region 2040 vision.

7. *Looking to the future, there appears to be no single economic driver of job growth for the Portland metro region.* While the Portland metro area experienced substantial high-technology growth in the 1990s, there is no similar readily discernable sector-driven source of job growth post-2000. However, some metro areas of the country can point to major traded sector activities or employers serving as engines for economic prosperity.

   For example, Seattle has experienced substantial job growth driven with recognized employers in aerospace, software and internet retail, biotechnology, and national / international consumer retailing – and has an in-place public/private economic development strategy through the region-wide *Prosperity Partnership.* By contrast, the Portland metro area does not yet have in place a comprehensive economic development strategy with accompanying regional business cluster priorities.

Consistent with this overview, the remainder of this interim report now turns to more detailed discussion of employment demand factors and trends, variables affecting location decisions, focus group research, summary implications and next steps.

EMPLOYMENT DEMAND FACTORS & TRENDS

The first work task in the trends analysis was to review employment trends and associated site demand factors – by industry sector, market subareas and design types. This review covers much of the most recent cycle of the national and regional economy – over the 2000-2006 time period.

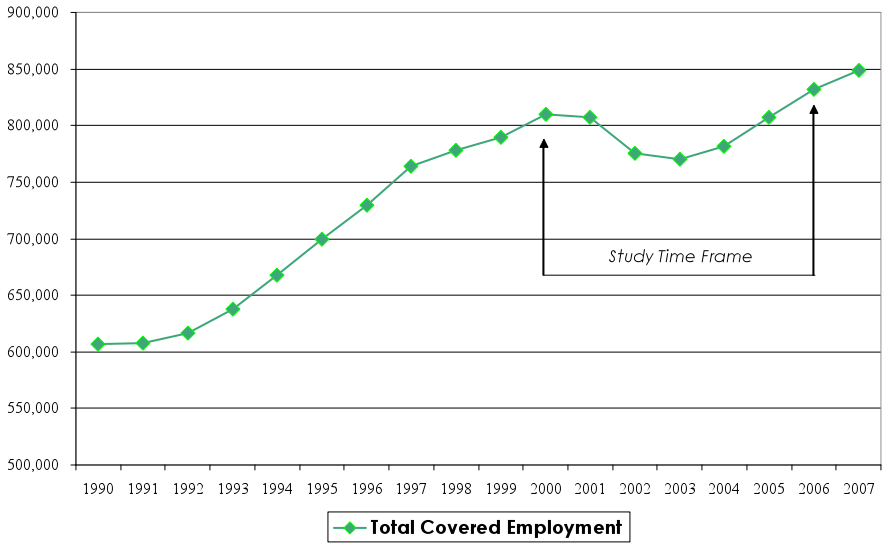
Results of this trends analysis are intended to serve as background considerations for a new demand assessment paradigm. This demand paradigm involves allocation of regional forecasts over 5-, 20- and 50-year time periods by market subarea and design types.

The trends analysis is conducted both from employment and development perspectives. While agricultural employment and land remains important to areas outside of the region's urban growth boundary (UGB), the focus of this analysis is on job sectors requiring urban land. Principal findings from this analysis are summarized as follows.

Employment Trends

As of 2006, the tri-county region had an estimated 842,000 non-agricultural jobs. Employment in the tri-county area represents 83% of the job base for the seven-county Primary Metropolitan Statistical Area (PMSA), with the bulk of remaining jobs located in Clark County, Washington.

Tri-County Total Employment Trends 1990-2007



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

Between 2000 and 2006, the region added approximately 22,500 jobs – representing a 0.5% annual job growth over a period marked by an economic downturn and subsequent recovery. Employment growth was far weaker in this most recent cycle than the 2.9% annual job growth experienced during the previous decade of the 1990s. Job gains in the 1990s were also relatively high by comparative standards – about one-third higher than the rate of growth in the preceding decade of the 1980s.

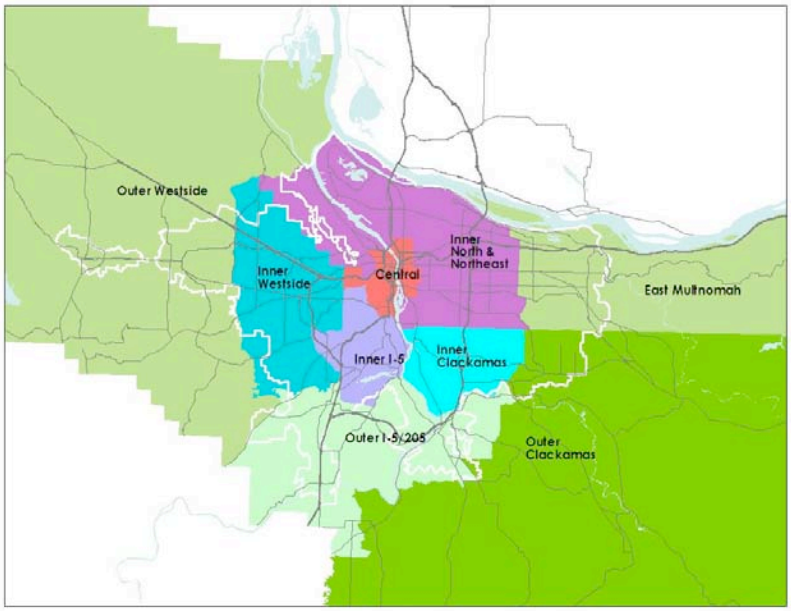
Trends by Industry Sector. Industry shifts in the region's employment reflect the evolution of business job classification, as well as actual job losses and gains. Several key trends are noted:

- The service sector is associated with by far the largest growth and in 2006 accounted for 56% of the tri-county's covered employment.
- Health care and social assistance has dominated service sector job growth, with a net gain of 17,000 jobs.
- The industrial sector comprises 30% of tri-county jobs, a decline from this sector's 32% share in 2000. Manufacturing, a subset of the industrial sector, is indicated with a net loss of 6,700 jobs over the 2000-2006 time period.
- Jobs associated with retail (excluding dining) also declined – a reversal of prior experience in the 1990s.

Market Subareas. For this analysis, the three-county Metro region has been divided into nine geographic subareas and further aggregated to three overall *ring geographies:*

- ✓ *Central* (also a Subarea of its own)
- ✓ *Inner ring* (Inner North & East, Inner Westside, Inner I-5 and Inner Clackamas)
- ✓ *Outer ring* (Outer Westside, East Multnomah County, Outer Clackamas and Outer I-5/205).

Tri-County Market Area Geographies



Legend: With the above map, tri-county *inner ring* geographies are indicated by purple/blue shades with *outer ring* geographies shown in green shades. The urban growth boundary (UGB) is indicated with the white line.

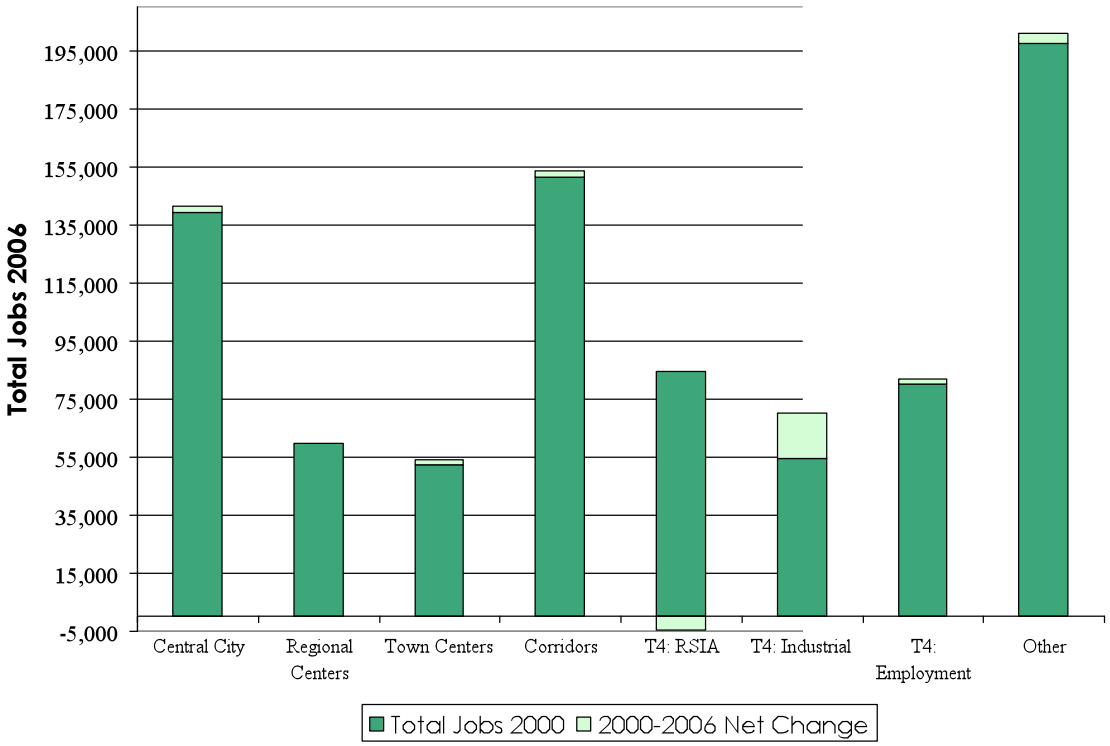
Key trends for these market subarea geographies are noted as follows:

- About one-half of the tri-county region's 2006 employment is located within the largely developed inner ring geography, with the remainder divided between the central and outer rings.
- The central and inner ring geographies are losing jobs while outer ring geographies have added jobs at a pace above 3% per year.
- Within the inner ring, the Central and Inner North & Northeast subareas show the largest job loss, especially for industrial jobs.
- In contrast, outer ring subareas added industrial jobs – enough to off-set about 65% of inner/central ring losses (but still resulting in a Portland tri-county region industrial employment decline).
- Retail job growth also appears to be migrating to the outer ring subareas (+3,200 jobs), enough to off-set about 50% of inner/central ring employment decline.
- While outside of the direct purview of this report, Clark County also reported rapid job growth during this time period of 2.2% annually, well above the overall job growth rate indicated for the Oregon side of the tri-county region.

Employment by Design Type. The region's 2040 Growth Concept calls for development to be focused in centers and corridors and with employment and industrial lands. To better understand how successful current policies have been and to develop a basis for further policy discussion we analyzed job growth by 2040 Design Types:

- *Urban-focused* 2040 Design Types report job growth, but at rates below the 0.5% annual growth rate experienced region-wide. An exception is noted for Town Centers which grew at an equivalent pace. Service and public sector jobs fueled the job growth occurring in the other 2040 Design Types (city center, regional centers and corridors).
- Industrial Areas are associated with the strongest growth rates, averaging 4.5% per year. The largest share of the growth has occurred for industrial jobs. About 30% of net new jobs locating in Industrial Areas were non-industrial (primarily service sector) jobs. Employment Areas experienced slower job growth and Regionally Significant Industrial Areas (RSIAs) reported some job base erosion from 2000-2006.
- *Other areas* (not covered by 2040 design types) currently account for about one-quarter of all metro area employment but very little of the job growth experienced post-2000.

Jobs by Design Type (2000-2006)



Note: The central city, regional centers, town centers and corridors represent adopted 2040 urban design types. Regionally significant industrial areas (RSIAs), industrial areas and employment areas are part of the Title 4 industrial and employment lands process.

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

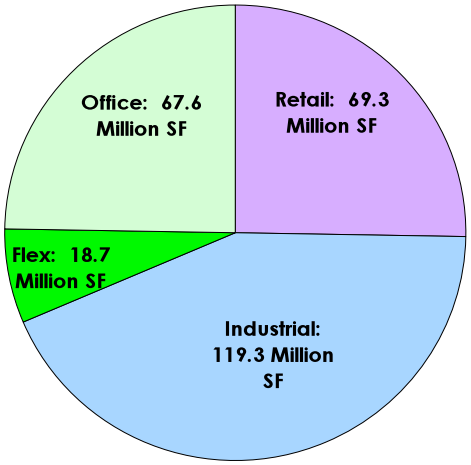
Development Trends

Development of industrial, commercial and mixed use building space for employment use has been evaluated at a subregional level using proprietary CoStar real estate industry data.

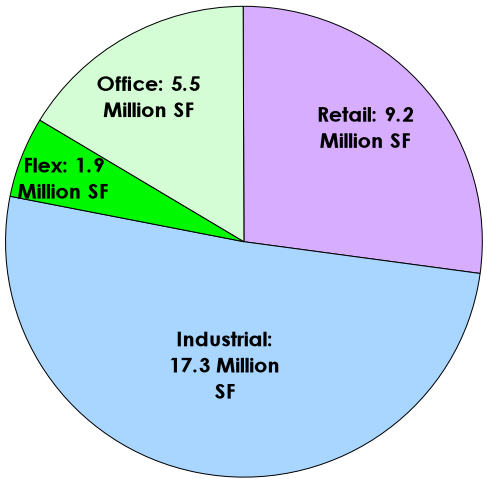
Industrial & Commercial Development Trends. As of January 2009, the Portland metro region has an estimated 275 million square feet of industrial and commercial building space (as tracked by the national/regional real estate data organization CoStar):

- An estimated 34 million square feet has been added post-2000 – with industrial and retail sectors increasing their respective shares of the total identified space inventory.
- Industrial space represents 43% of the region's total employment space inventory and 51% of new construction. Flex space (typically with 50%+ office use) remains a small component of the over-all industrial market, with about 16% of the overall industrial inventory.
- The single largest share of new office product – 41% of all recent development – has located within the inner ring.
- Retail space has also become an increased share of the region's employment building inventory. New retail development has favored outer ring subareas, which have captured close to 50% of post-2000 retail development
- Overall, this analysis suggests that the development of industrial and commercial *real estate product* has out-paced job gains since 2000 throughout the region.

Employment Real Estate Inventory (January 2009)



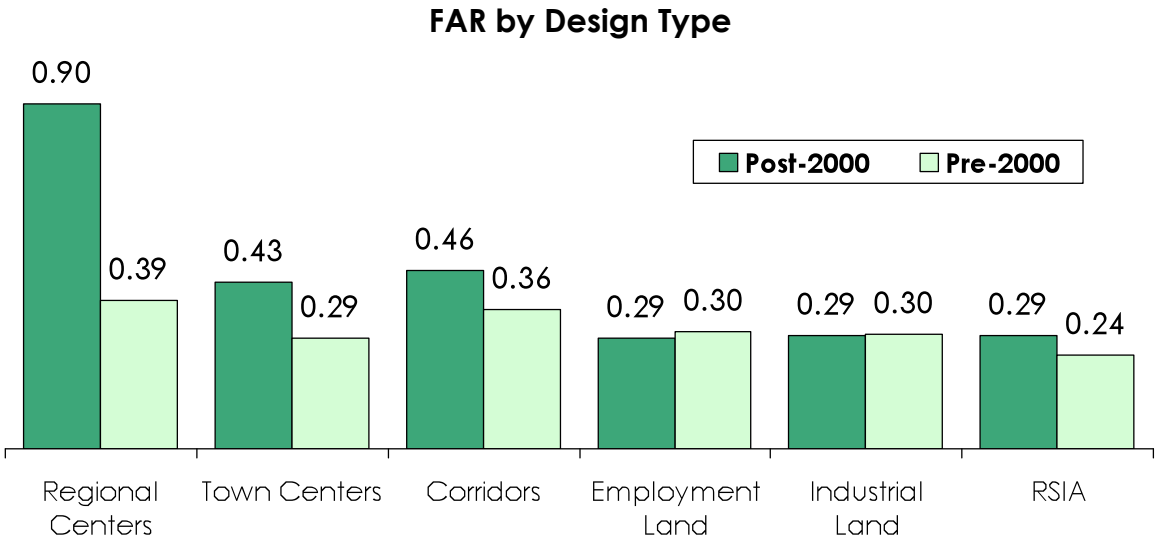
Inventory Additions (Post-2000)



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

Intensity of Employment Development. An important focus of this analysis has been on floor area ratios (FARs) as a measure of industrial/commercial development density. FARs are calculated by dividing building square footage by land square footage:

- Densities for urban focused design types have increased since 2000 across the region. However, only the Central area of the region currently achieves FARs averaging above 1.0.
- Industrial and employment area densities have experienced little overall FAR change since 2000 – but remain relatively stable at close to 0.30.



Source: Metro Data Resource Center RLIS and E. D. Hovee & Company, LLC.

Demand Factors

Several added and related demand factors have been considered with this trends analysis:

- Based on a partial sampling of tax lots developed since 2000, more than one-half (53%) occurred on previously developed sites (with 47% on vacant sites). *Redevelopment rates* appear to be greatest for central and inner ring geographies.
- Within the larger four county metropolitan region (including Clark County*), retail demand and supply* appear to be in near balance – with the region about 4% below national retail standards as of 2008. Of specific note is that this metro region deviates from national norms with respect to spending patterns by specific retail category.
- The Metro 2035 forecast indicates that about 20% of net new jobs can be expected in institutional categories of *health care and education*. Between 60-80% of this demand is expected to be accommodated by larger employers of 50+ jobs. Substantial growth is anticipated for outer ring geographies in response to patterns of population growth.
- *Industrial building and site utilization* appears to be increasingly oriented to warehouse and distribution – accounting for an estimated 45% of industrial job growth. High tech uses are currently expected to account for another 45%, construction 39% and other manufacturing 4% of net job increases to 2035.

VARIABLES AFFECTING LOCATION DECISIONS

A key component of this research has been to identify existing and emerging factors that affect business location decisions. This has been a primarily qualitative assessment conducted as a literature review – from regional, national and global perspectives. The analysis includes risks and opportunities to the Portland metro area economy, followed by real estate product specific assessments and then looks out over 5-, 20- and 50-year time horizons.

Global Risks & Opportunities

As the events of the last two years demonstrate, there are new and increasingly global risks as well as opportunities that can be expected to shape the metro area economy in the years ahead. While the current severity of the challenge is viewed as short-term, it is increasingly clear that longer term prospects are altered as well.

Key risks and opportunities are summarized as including:

- Financial market instability (including the risk of on-going global instability beyond the current economic downturn)
- Housing market recovery (likely affecting consumer wealth, spending and job choices over at least the next five years)
- Fiscal environment (including issues related to federal and state tax structure and a state that is still highly resource dependent)
- Global positioning (including issues related to dollar volatility, the growing importance of global pathway cities, changing role of China and emerging economies, and outsourcing)
- Going green (addressing issues including climate change, energy and water conservation)
- Development costs (relative to supportable market values both short and longer term)
- Demographics (related both to an aging population and effects of migration)

Industrial & Commercial Real Estate

Trends and outlook for industrial, commercial office and retail development have been assessed in the context of these global risks and opportunities.

Industrial. Key real estate products encompassed by industrial development include warehouse/distribution, manufacturing and tech-flex space. The Portland metro area has the advantage of being positioned at close to the top tier of the strongest industrial markets in the U.S. (with moderate levels of vacancy as of 2008). A competitive advantage is that the Portland metro area remains price competitive with other major west coast and other comparable communities – less so with central/southeast U.S. and offshore alternatives.

Emerging trends that can be expected to affect industrial development globally and in this metro area include:

- Continued off-shoring of commodity production, less so for high value niche products (including some indications that off-shoring may be reversed)
- Supply-chain management to further reduce inventory costs
- Radio frequency identification (RFID) as a means to better track inventory supporting more high-cube distribution and cross-dock freight handling
- Shortened product life cycles with more rapid transition from R&D to prototype testing and commodity production with increasingly international supply chains
- Geographic concentration and specialization of industry sectors with regional anchors

- Mass customization that is reliant on virtual market information and high technology applications even for small lot, niche product manufacturers
- Early global interest in opportunities for vertical manufacturing and distribution, especially in high cost international locales of Asia and Europe

Office Commercial. Office space has traditionally been characterized as comprising Class A (investment grade), Class B (smaller/older) and Class C (including historic) properties. Compared to the rest of the U.S., the Portland metro area has maintained relatively strong occupancy. As in other metro markets, central business district (CBD) properties are generally faring better than suburban counterparts.

Emerging trends of potential importance for office space in the years ahead include:

- Continuing emphasis of technology (with smart buildings, now green design)
- Impetus for corporate campuses and office decentralization
- Business mergers and acquisitions coupled with globalization
- More aggressive consideration of techniques to reduce square footage per employee such as office "hoteling"
- Link to education for a well-trained, creative class workforce
- Small business space including growth of alternative concepts such as work/live

Retail Commercial. For more than a generation, the real estate industry has classified retail centers by size and market area served, including convenience/neighborhood, community and regional centers. Different variations of these center types have also developed. Until recently there has been less attention on urban street retailing which is of growing importance in the Portland metro area.

While the Portland region has the second smallest amount of retail space per capita among the 25 largest metro areas in the U.S., total retail sales are roughly in balance with demand. Over at least the short term, store closings currently being experienced may well be accompanied by longer term consolidation of national chains. There is a flight to stores offering value (by customers) and to retail spaces offering quality with value (by store tenants).

The literature review suggests several broader trends of continuing importance longer-term:

- Continued morphing of retail centers into power, lifestyle, hybrid center and transportation-integrated retail concepts
- Greater acceptance of downtown and urban retailing, including more vertical stacking
- Growing importance of cross-channel shopping and continued impact of on-line shopping, which currently account for about 7% of retail sales

Institutional. Education, health care, corrections, and other public/private (including non-profit) institutional activity represents a form of real estate development that is often overlooked and not well-tracked with no readily definable market activity. While much of the national literature takes on more of a case study approach, overall trends of importance to watch include:

- Changing demographics – notably the aging of the population and extent to which growth continues in suburban fashion or is re-directed to existing urbanized areas
- Private redevelopment partnerships – including potential for broader economic development roles by major metro area institutions
- Redevelopment of unconventional sites – especially as many education and health care facilities are in quasi-residential settings or near major employment nodes

Mixed Use. As with institutional use, mixed use is not yet well-tracked as a separate market or investment product. Product types include residential with retail, office with retail and unconventional/niche opportunities including:

- Growing acceptance of suburban mixed use at high-demand locations – especially combinations of office, retail and/or housing
- Retail and medical office mixed use – as when more medical activities move into a pharmacy or multi-shop setting as retail clinics
- Redevelopment of obsolete public (as well as private) property – ranging from decommissioned military bases to surplus school sites and hospital facilities

Summary Outlook (5-, 20-, 50-Year Horizons)

A summary of the 5-, 20- and 50-year outlook for these product types is provided by the following matrix chart. As is becoming increasingly apparent, the next five years can be expected to be largely about economic recovery, setting the stage for a longer term path of more sustainable growth and development.

Mid-term (20-year) prospects take advantage of significant pending demographic changes and required public-private implementation (as with infrastructure reinvestment). Long-term (40-50 year) prospects, while least certain, offer the widest set of opportunities for reinvention of the jobs/land paradigm necessary to accommodate substantially greater regional job base but with less development and land "footprint" per job.

Reaching to 2040 and beyond represents an appropriate time frame for full realization of the region's growth concept vision. This is also the time frame over which an intentional strategy could serve to solidify a Portland metro sustained advantage as a distinctive, sustainable global pathway for jobs meeting shared region-wide needs and aspirations.

Summary Outlook (5-, 20-, and 40-50 Year Horizons)

Real Estate Type	5-Year	20-Year	40-50 Year
Industrial	• Price advantage • Export driven • Large sites a bonus?	• Build from existing clusters (green) • 2nd tier distribution	• World class higher ed • Multi-level industrial?
Office	• Slowed development • Urban market recapture • LEED bonus	• Depends on young creatives • More mixed use / TOD	• Flexible live-work • Education link for income growth
Retail	• More stability than nation? • Flight to quality & value	• Reuse of dated centers • TOD opportunity	• Outer ring urban formats • Online & multi-channel integration
Institutional	• Constrained funding • Plan for mid-term	• Aging boomers • Satellite facilities	• Increased share of job base • Densification of use
Mixed Use	• Slowed development • Public-private stimulus?	• Rebound opportunity • Extension beyond Central City	• Portland's global pathway opportunity

FOCUS GROUP RESEARCH

Metro, in cooperation with the business community, commissioned focus group research to obtain business and industry perspectives on emerging trends in building space needs and changing regional competitive advantage. The following eight focus groups were conducted and led primarily by Adam Davis of Davis, Hibbitts & Midghall:

- Biotech/medical
- Distribution/logistics
- Food/beverage
- High tech
- Metals/machinery
- Business locators
- Retail
- Regional service providers

There were 47 participants with these eight groups. While not designed to measure with statistical reliability the attitudes of a particular group, focus group research is valuable in providing the perspectives of the population from which the sample was drawn.

Photos courtesy of Davis, Hibbitts & Midghall.

Findings are organized to cover discussion of building and space needs, emerging trends, development patterns, advantages and disadvantages of doing business in the Portland metro area, and on-going competitive advantage for the region.

Building & Space Needs

Participants noted the following needs, first for building space, then location and site needs:

Building Space:

- Rapid industrial change – as land and building space is increasingly expensive
- Hi-cube distribution – on the horizon for mid-large firms
- "New age shop" for manufacturing – as companies of all sizes invest in technology
- Diversity of office needs – but with common themes of more collaboration and conferencing
- Retail shift to smaller store concepts – especially grocery and for the near-term

Location/Site:

- Regional competition for industrial sites – extending at least from Longview to Salem
- For sites of 20+ acres, increasing need to look outside the Portland tri-county region
- Distribution requirement for freeway access (with I-5 as the preferred corridor)
- Clustering for competitive advantage – exemplified by clusters including high tech, metals and professional services
- Labor force as a growing driver of facility siting decisions
- Customer/client businesses driven for closer proximity to population
- Little eagerness for brownfield redevelopment, due to liability issues
- Greater impetus for businesses to say in the same site footprint in order to mitigate neighborhood and cost issues

Emerging Trends

- Transit now important across all business groupings, especially for employees
- Transit-oriented development (TOD) interest – but a source of frustration for at least some commercial/industrial firms in this region
- Auto orientation still critical for customer and patient access, with parking needed but a major cost and with recognition that auto reliance varies widely across the region
- Work force accessibility a critical concern – key to attracting young talent which is easier due to this region's quality of life draw
- Going green of broad interest – especially when supported by customers, clients, workers and/or investors

Development Patterns

- Multi-story development works best for office and administrative functions
- Diverse opinions on retail suitability for 2+ stories – but most likely at higher value and urban or constrained sites
- Manufacturing typically holding at 1-2 floors – more for admin / R&D functions
- Multi-level economics are not workable for distribution yet (despite global experience), but hi-cube distribution accomplishes similar results of reduced land footprint
- Great impetus for more and more efficient building on site, adaptive reuse, and multi-level parking on constrained sites

Advantages & Disadvantages

Focus group participants were asked a two-part question: *What are the primary advantages (and disadvantages) of the Portland metro area as a place for your business to grow?*

Responses are organized in terms of comments most frequently heard across most or all of the focus groups. Also identified are less frequently mentioned items that are nonetheless of great importance in at least some of the focus group discussions.

Advantages	Disadvantages
Most frequently mentioned	
• Talented work force ('the cutting edge is from Oregon') • Multi-modal access • Quality of life (urban, recreation) • Relationships (business-to-business & customer)	• Poor market proximity (no critical mass) • Shallow labor pool (skill positions) • Limited, high cost sites • Transportation congestion (freight, passenger) • Public policy issues (taxes, fees, permitting, infrastructure)
Less frequently mentioned	
• Sustainability commitment (business, environmental, land use) • Reasonable cost of doing business • Population growth (good demographics) • Gateway location (especially Port-related)	• Cost of doing business (cost of living) • Limited investment capital (and need for incentives for some industries) • Industrial encroachment & gentrification

Competitive Advantage

The last question raised in the focus group discussions was: *What message do you have for Metro and local jurisdictions about what to do in a changing world to assure that the Portland metro area remains competitive as a place for businesses in your industry group to expand or locate?*

Key themes heard in both written responses and ensuing discussion are summarized to include:

- More land in the right place(s) – with in-place infrastructure
- Increased focus on sustainability – as a necessary cost of doing business
- Economic stability of Portland – a plus compared to the rest of the west coast
- Addressing issues of congestion – on local streets as well as the freeway system
- Taxes, fees, permitting – consider streamlining
- Value capture as a mechanism for infrastructure funding – as for new employment land brought into the UGB
- Encouragement of high end jobs – with greater focus on wage levels
- Flexibility in policy application
- Paying attention to the short as well as long-term – taking incremental steps to achieve the long-range vision

SUMMARY IMPLICATIONS & NEXT STEPS

While the results of the employment trends analysis, national literature on factors affecting location, and focus groups can be viewed separately, the real value lies in looking for broad themes and implications suggested from multiple avenues of research. Of special importance to the work ahead are implications for a new employment paradigm, intensity of employment land use, and resulting next steps.

Implications for a Regional Employment Paradigm

Key implications of work completed to date for the remainder of this employment and economic trends analysis are summarized by the following chart. These implications are particularly relevant for the formulation of a new demand paradigm: to address needs for substantial job growth in the years ahead but with less *footprint* impact for each job created on the metro region's urban landscape.

Each of the three research paths taken with this trends analysis project suggests both opportunities and challenges ahead for improved intensity of employment use. The data analysis helps to identify trends that are most distinct to the Portland metro region while the literature review draws on emerging national and global themes that can be expected to serve as external forces shaping local and regional opportunities. Business outreach exemplified by the focus groups and business roundtable can yield results in suggesting options for refining and achieving the 2040 vision on the ground, one step at a time.

Drawn From	Implication
Employment Demand Factors & Trends	• Less NAICS/sector focus – more on market subareas & design types • Capacity *feedback* loop – affecting tri-county/UGB capture • Job to site demand driven by FAR • Good opportunity for urban/commercial FAR increase; not proven for industrial • Stronger refill opportunity for central & inner ring geographies
Variables Affecting Location Decisions	• Building reuse and unconventional site use for emerging industries • Role of incentives and infrastructure investment • Institutions as *anchor* for outer ring development • Role of *world class* work force training and higher education
Focus Groups	• Multiple ways to less site footprint (including industry) • Reserving capacity for major planned industrial campus • *Green* as a distinct competitive edge (transportation, design, operating efficiencies, a way of doing business)

Intensity of Employment Land Use

The data, literature and focus group research for this employment and economic trends analysis has identified multiple factors that affect employment land use. While some factors are of perhaps greater importance to the Portland metro region, most are being played out in other metro regions across the U.S. or globally, albeit in varying ways.

Some factors point toward opportunities for increased density of employment while others may provide impetus to reduced on-site density. Examples include opportunities for more multi-level development and improved jobs capture for 2040 urban design types.

Also noted is that some factors are common across all industrial, commercial and mixed-use real estate while others are specific to individual project types. For example, employment intensity of industrial use is specifically linked to factors such as the proportion of manufacturing, warehouse/distribution, administrative and R&D jobs at a particular plant site.

A preliminary review of factors identified to date is provided by the matrix chart on the following page. Added discussion of these or other detailed factors will be important to achieve a new demand paradigm as the next step of an updated jobs forecast allocation process for the metro region. While some features can be built into a scenario encouraging greater intensity of employment activity than has been the case in recent years, further research and policy discussion can be expected beyond the completion of this trends analysis.

Factors Affecting Density of Employment Land Use

Increased Density	Reduced Density
Across all Real Estate Product Types	
• Attract an increased percentage of jobs to urban design types (especially office / institutional) • Multi-story development • Change from surface lot to structured parking • Reduction in auto dependence (with more transit, bike, pedestrian options) • Reduced landscaping / open space buffer • Higher land cost or existing site constraints • Green design goal for reduced carbon footprint • UGB triggers (large served sites for employers otherwise not accommodated in metro region)	• Increased per square foot cost of construction for multi-story development (especially when construction type changes) • Employer substitution of capital / equipment for labor • Campus-oriented development • Environmental / open space set asides
Industrial Development	
• Increase in proportion of administrative versus production and/or warehouse space • Multi-story business park / flex space • Going vertical (even within one story – for distribution &or manufacturing) • Process re-engineering for increased efficiency per square foot of building area • Just-in-time inventory management • Supportive mixed use on or near site (e.g. child-care, dining, fitness)	• Vintage relocation from older multi-story to modern single level industrial facilities • Process automation with more production output per worker & per square foot of floor area • Land-banking (to protect future expansion options) • Security issues (for separation from other uses) • Buffering needs (with nearby incompatible uses as with residential)
Office Development	
• Transition from private office to open space layout (reduced office space per employee) • Telecommuting / shared office space (hoteling)	• Increased allocation of conference & collaborative work space • Ground floor use for customer visibility & access • Office uses moving to lower density, less costly building types (e.g. retail, business park space)
Retail Development	
• Reduction in back of house storage requirements (e.g. just in time inventory) • Transportation-integrated & cross-channel retail	• Warehouse style store formats • Automated checkout
Institutional Use	
• Improved profile / customer appeal of more urban multi-story facilities • Greater use of unconventional & adaptive reuse sites	• Required auto accessibility for substantial ground floor customer uses (as with reception/ emergency areas in medical institutions)
Mixed Use	
• Encouragement of customer-oriented service / office uses to locate above ground floor retail • Shared parking opportunity • Live-work options	• Residential displacement of zoned job capacity • Primary or exclusive focus on residential mixed use options (with less emphasis on job development)

Findings & Policy Questions

Substantive work steps remaining with this employment and economic trends analysis will assess options covering the following regional priorities:

- New Employment Paradigm
- New Development Capacity & Inventory Approach
- Framing Choices for Job Needs

Based on the work completed to date, a major challenge with a changing jobs paradigm is to determine market and policy mechanisms that can be effective with improved jobs performance for 2040 urban design types while concurrently achieving better site utilization with industrial and employment lands. This discussion can be expected to engage multiple groups and constituencies. Policy discussion may be focused on two main questions:

1. ***What is the vision for the region's economy?*** Key aspects of this question useful to frame this region-wide discussion include:

   - Recognition that issues extending beyond regional and local jurisdiction land supply also affect job outcomes – in terms both of the number and characteristics of future regional employment. These issues range from questions of appropriate job metrics (such as wage levels) to priority business clusters important for regional economic vitality.
   - Appropriateness of global/national benchmarking for the Portland tri-county region. More specifically, the question posed is whether and how this region aims to conform to standards of other comparable regions or forge ahead to create and sustain its own unique market niche in the U.S. and internationally.

2. ***How are economic opportunities best realized in the context of the 2040 regional vision?*** Findings pertinent to this second question include observations of:

   - No clear economic driver for long-term job demand. In a period of slower short and long-term growth, an important question is whether the region would benefit from a more intentional strategy that targets characteristics of desired jobs – reaching beyond current Metro metrics of job numbers and industry (or sectoral) mix.
   - Continued if not enhanced opportunity to focus on strategies for achieving better job performance in the central city, centers and corridors while focusing on more efficient site use in employment and industrial areas. These strategies not only coincide with the adopted Region 2040 vision but also offer prospects for a more carefully articulated regional advantage. Playing to the metro area's strengths is important for the task of economic recovery over the next five years and for sustained vitality extending toward longer term 20- and even 40-50 year time horizons.

FCS GROUP
Solutions-Oriented Consulting

Memorandum

To: Malu Wilkinson, Metro and Eric Hovee **Date:** April 3, 2009

From: Todd Chase, AICP, LEED

CC: Justin Healy, Real Urban Geographics

RE Revised Draft Employment Areas Vacant Land Supply Findings, revised

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Introduction

This memorandum provides revised draft preliminary land supply findings and current land inventory estimates for land that has been considered by Metro to be available for potential employment growth. The preliminary land supply findings are intended to provide a draft estimate of the gross buildable land area for areas within the Urban Growth Boundary (UGB) area (tri-county area) that are planned for industrial, employment, commercial, public facilities, or mixed-use developments (per the 2040 Regional Framework Plan and local zoning codes).

This land inventory includes an analysis of tax lots that were characterized as vacant or partially vacant by Metro Regional Land Information System While this land supply tabulation is intended to be an approximate indicator of vacant and partially vacant employment lands within the existing UGB, it is not intended to reflect vacant land absorption over a fixed time period. Comparisons with prior UGB land supply estimates and studies are difficult to make due to changes in tax lot boundaries (i.e., tax lot line boundary adjustments), zoning changes, and corrections made to prior vacant land mapping assumptions. This analysis includes adjustments to the prior 2007 Metro Vacant land inventory database, with current assumptions as of December 2008. Attempts have been made to remove tax lots from the vacant buildable land inventory if construction has been completed (as of December 2008), but not for tax lots with construction underway or development applications approved or pending approval.

The steps used to conduct this analysis are generally laid out as follows.

Step 1 Meet with Metro staff to confirm current GIS data assumptions, and available GIS analysis layers that should be used in this analysis.

Step 2 Prepare draft buildable lands maps for the tri-county UGB region that depict prior 2007 vacant and part vacant land inventory assumptions for industrial, employment, commercial, public facilities, and or mixed-use areas.

Step 3 Distribute draft buildable land maps to local jurisdictions and the Port of Portland for review and comment. Reviewers were asked to provide comments on specific tax lots, and to define any areas that are deemed to be "special planning areas" with expected levels of future development and employment growth. Please refer to separate Memorandum from Miranda Bateschell of Metro to local jurisdictions dated November 26, 2008.

Step 4 Compile comments from local jurisdictions for each tax lot, and incorporate comments into the GIS data base. Note, 22 of 23 jurisdictions along with the Port of Portland did provide some level of review and comment on the draft employment land inventory assumptions. This effort resulted in comments that helped to verify new development projects with buildings that have been constructed as of December 2008. Map reviewers also provided comments regarding current zoning, and ownership considerations (such as whether the tax lot is owned a school or parks district), and noted whether tax lots should be "added" or removed" from the vacant land inventory.

Step 5 Estimate the buildable land area for each tax lot by analyzing GIS data pertaining to environmental features that would constrain the amount of potential site development on vacant and part vacant areas. For purposes of this analysis, the City of Portland and Washington County identified vacant tax lots to be included in this analysis. The City of Portland and Washington County also identified environmental constraints, which is used for this work to calculate net buildable land area. For areas, outside Washington County and the City of Portland, the environmental constraints were calculated for each site using estimates for land area that is constrained by the following: Metro Title 3 designation (waterways, wetlands, riparian buffers) or applicable local significant resource overlay zone (applicable to Wilsonville); slopes over 10% for tax lots with industrial land use classifications, or 25% for tax lots with other employment and mixed use land use classifications.

Step 6 Remove "developed" tax lots and tax lots that no longer have an "employment land use" classification inventory (based on comments). Also, remove tax lots with less than 0.2 buildable acres after accounting for environmental constraints[1]. This step resulted in a total of 649 tax lots with 1,127 net buildable acres being removed from the draft land supply inventory. The primary reason for removing vacant lands in tax lots with less than one acre in size was most often attributed to adjustments needed to be made to delete "slivers" of vacant lands that resulted after accounting for environmental constraints. For tax lots over one acre in size, the land being removed from the inventory primarily reflects recent construction of public, private and non-profit developments, and some local zone changes (noted and recorded as of December 2008). Additional analysis of the tax lots over one acre, reveals that approximately 20% of the land removed is attributed to public and non-profit development activity (churches, schools, etc.) and 80% to private development activity. The

[1] Unlike the prior Regional Industrial Land Study for the Portland-Vancouver Region (1999-2003) reports, and subsequent vacant industrial land supply updates (2007), this analysis has been expanded to include all types of employment land (industrial, commercial, mixed-use, public facilities, etc.) and includes tax lots of less than 1.0 acre in size.

amount of land removed or added due to changes in land use zoning is not known at this time because of the methodology used to assimilate the data.[2]

As indicated in **Table 1**, after accounting for the inventory being removed, the amount of remaining vacant employment land inventory includes approximately 3,286 tax lots with a total of 12,151 net buildable acres inside the existing Metro UGB area.

Table 1
Portland Metropolitan Region (tri-county) Urban Growth Boundary
Estimated Employment Land Supply, December 2008
(net buildable acres including land within flood plains)

	Less than 1 ac.		More than 1 ac.		Total	
	tax lots	acres	Tax lots	acres	Tax lots	acres
Estimated Inventory Before Analysis	1,327	691	2,608	12,587	3,935	13,278
Inventory Removed*	386	83	263	1,044	649	1,127
Remaining Inventory After Analysis	**941**	**608**	**2,345**	**11,543**	**3,286**	**12,151**

** represents tax lots removed from Metro's draft vacant and part vacant land supply inventory based on jurisdiction input, or size thresholds (removes tax lots with less than 8,712 square feet of buildable land area). Compiled by FCS GROUP based on Metro GIS data and jurisdiction/Port input.*

Step 7 Sort tax lots into Tiers based on an analysis of tax lot location**,** existing building and land value, environmental development constraints, infrastructure availability, transportation access, local land use designation and "land banking" issues. For purpose of this analysis, a transportation deficiency was noted for tax lots within 1/4 mile of major arterial roadway with a peak-hour volume-capacity ratio greater than 1.0 (V/C>1.0 as defined by the current Metro Regional Transportation Plan traffic model). Land use policy constraints were identified for tax lots that have not been annexed or zoned by local jurisdictions, and for sites with identified restrictions (based on map review comments reflecting brownfields, aviation flight protection overlay zone, or marine-use restrictions). The current assessed market value for building improvements helped determine if a site is considered as vacant or part vacant. For purposes of this analysis, tax lots with less than $25,000 in building valuation are assumed to be vacant, and tax lots with more than $25,000 are assumed to be part vacant.

The general land use classifications included in this vacant employment land analysis include tax lots that have the following local land use classifications, which are defined within the Metro Regional Land Information System, GIS database as "GEN ZONE CLASS" or 2040 Design Type "DESGNTYP" if no local urban zoning has been established.

[2] It should be noted that jurisdictions did not provide a consistent set of comments for all tax lot that were to be removed from the land supply inventory nor provided a consistent means to measure the amount of land removed due to re-zoning vs. new development. However, based on the comments that we did receive, the vast majority (over 90% of the land area of all removals) were attributed to new developments, not land banking nor re-zoning.

A summary of the relevant 2040 Design classifications considered in this vacant land inventory are provided in **Table 2**.

Table 2
2040 Design Types Evaluated in this Vacant Land Analysis

2040 Design Type	Expected/Planned Uses
Central City	Includes Downtown Portland and portions of the South Waterfront and Lloyd District, which function as the major regional center. Expected uses include a broad mix of high-rise development for employment, housing, and institutional uses; with urban amenities and public open spaces.
Regional Centers	There are 7 regional centers outside the Central City, including: Hillsboro; Gresham; Gateway (east Portland); Downtown Beaverton; downtown Oregon City; Washington County Town Center; and Clackamas Town Center. Expected uses include a broad mix of low and mid-rise developments with employment, housing, and institutional uses; and urban amenities and public open spaces.
Town Centers	Town Centers are located in small to mid-size cities, and provide local shopping, employment, cultural and recreational opportunities. Expected uses include low- to mid-rise developments for retail, employment, housing and institutional uses, and public open spaces. Examples include: downtown Lake Oswego, Forest Grove, Hillsdale and Gladstone.
Corridors	Located along transit routes, Corridors are less dense than centers, but can include nodes of relatively higher density developments. Expected developments include row-houses, duplexes and low- to mid-rise office buildings, along with neighborhood retail/services.
Station Communities	Generally located within 1/2 mile from light-rail, commuter rail or high capacity transit, these areas include nodal developments with excellent pedestrian and transit access. Expected uses include a mix of mid- to high rise developments, with retail, employment and housing.
Main Streets and Neighborhood Centers	Traditional "main streets" served by transit with a strong business and civic community that generally serves local neighborhoods and travelers. Expected uses include a mix of low- to mid-rise developments, with a mix of retail, services, employment, and housing. Examples are found in Hillsboro, Milwaukie, Oregon City, and Gresham.
Employment Areas	Areas set aside or planned for a mix of light industrial and office developments, with good transportation access. Expected uses include light industrial and "flex" developments, campus office, and medical office, with ancillary retail/services.
Industrial and Regionally Significant Industrial Areas (RSIA)	Areas set aside or planned primarily for industrial uses and activities. Located near existing/planned highways, rail corridors, and marine/air freight handling areas, these industrial areas are critical for regional commodity flows and access to national and international markets. Expected uses include low- to mid-rise industrial developments (warehousing distribution, manufacturing, processing, etc.), corporate headquarters, and ancillary retail/services. RSIA has more restrictive limitations on non-industrial activities than found in Industrial Areas.
Inner and Outer Neighborhoods	Primarily includes low-rise residential neighborhoods with public parks and open spaces. May include neighborhood retail/services and institutional uses (ie., schools and churches) in low-rise environment.

Relevant local general zoning classifications considered in this vacant employment land inventory are listed in **Table 3**.

Table 3
General Local Zoning Classifications Evaluated in this Vacant Land Analysis

Land Use Classification		Expected/Planned Uses
CC	Central Commercial	Range of mid to high-rise commercial uses; typically associated with CBD's and downtowns, including retail, service and/or office uses.
CO	Office Commercial	Range of low-rise offices and businesses, such as professional and medical offices, often in "campus" settings.
COM	Commercial	Retail, service and/or office uses.
IH	Heavy Industrial	Light and heavy industrial uses with intensive activity, such as chemical and food processing, heavy manufacturing, assembly, and intermodal shipping; uses may have noxious externalities.
IL	Light Industrial	Light industrial uses, such as warehousing distribution, light manufacturing, processing, fabrication and assembly. May allow corporate headquarters and ancillary commercial services.
IND	Industrial	Light and/or heavy industrial uses, such as manufacturing, fabrication, processing, assembly and warehouse distribution.
MUE	Multiple Use Employment	Broad range of uses, including office, retail, warehouse distribution, and light industrial activities.
MUR	Mixed Use Residential	Low to high-rise residential housing, with ancillary retail, service and office uses
PF	Public Facilities	Broad range of government buildings, public facilities and institutions, such as public works yards, treatment plants, and schools.

Step 8: In addition to deducting selected environmental constraints from the gross buildable land supply (please refer to Step 7), this vacant land analysis also deducted land for future public right-of-way (streets and pedestrian corridors). The analysis utilized current Metro Urban Growth Report assumptions for planned future right of ways to be: 18.5% of gross buildable area for tax lots larger than one acre; 10% of gross buildable area for tax lots between 3/8 acre and one acre; and 0% for tax lots under 3/8 acre.

The current 2009 Employment Land Supply Tier classifications and applicable constraints are summarized in **Table 4.**

Table 4
2009 Vacant Employment Land Supply Classifications

Tier	Title	Applicable Constraints	Development Readiness
A	Vacant, Unconstrained	Must be over 1 net buildable acre with no known constraints*	Great
B	Vacant, Constrained	Must be over 1 buildable acre, and have one or more constraints listed in Note 1.	Good
C	Infill, with 0.2 to 1 acre in size (Vacant or Part Vacant)	Tax Lots with 0.2 to 1 acre, and already annexed.	
D	Part Vacant, with constraints	Portion of existing tax lot that is (net of existing building and parking), over 1 acre, and be already annexed**	
E	Vacant, but lacks urban services, infrastructure and current zoning	Vacant, over 1 acre, but lacks needed infrastructure, and requires annexation and current zoning before development can commence*	Fair
F	Part Vacant or Redevelopable, but lacks urban services, infrastructure and current zoning	Part vacant land, over 1 acre, but lacks needed infrastructure, and requires annexation and current zoning before development can commence**	Poor
G	Infill, with 0.2 to 1 acre in size, but lacks urban services and infrastructure and current zoning (Vacant or Part Vacant)	Small areas of vacant or part vacant land outside existing service district, lacks needed infrastructure, and requires annexation and current zoning before development can commence.	

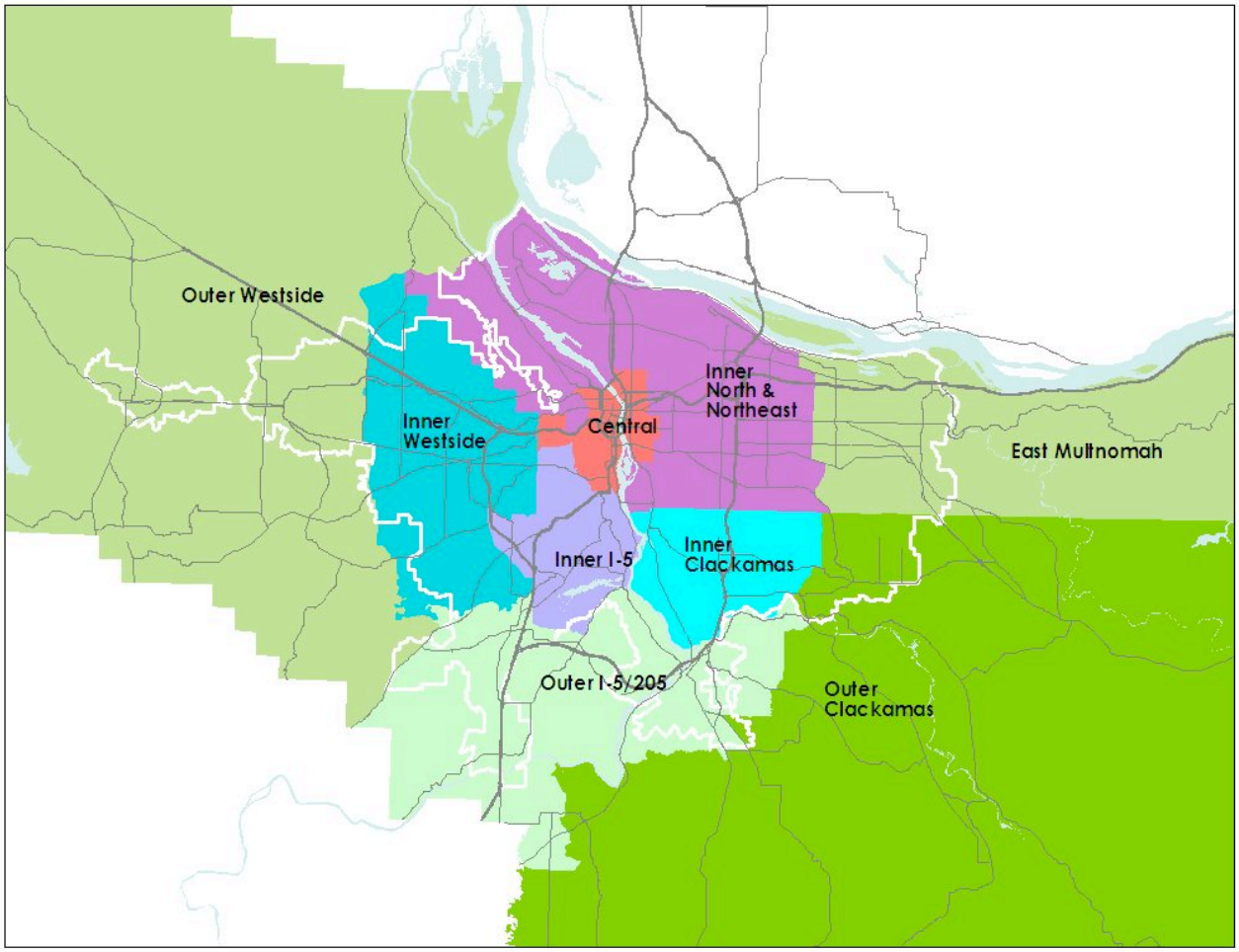
Notes:
1) applicable constraints include one or more of the following: Title 3 Environmental designation (waterways, wetlands, riparian buffers, etc.) or applicable local significant resource overlay zone; slopes over 10% for industrial lands or 25% for other employment and mixed use lands; transportation deficiency (within 1/4 mile of major arterial roadway with V/C>1.0 (defined by Metro RTP); lack of adequate sewer or water infrastructure, lack of local zoning consistent with urban employment-related development, or known land use/policy constraints (such as sites designated as "brownfields", aviation flight protection overlay zone, or marine-use restrictions); or tax exempt tax lot status.
** Tax lot building market value is less than $25,000, according to County Assessor records, 2008.*

*** Tax lot building market value is more than $25,000, according to County Assessor records, 2008.*

Preliminary Findings

In addition to the work undertaken to derive Tier designations, this vacant employment land supply analysis groups vacant lands by generalized land use classification, parcel size, and market geography. This approach provides a useful means for understanding the amount of land supply as well as its ability to accommodate near-term and long-term employment growth throughout the region. The vacant land supply is reported for nine tri-county market geographies. These areas are depicted in **Figure 1.**

Figure 1 Tri-County Market Geographies



The draft land supply findings are reported in the following tables:

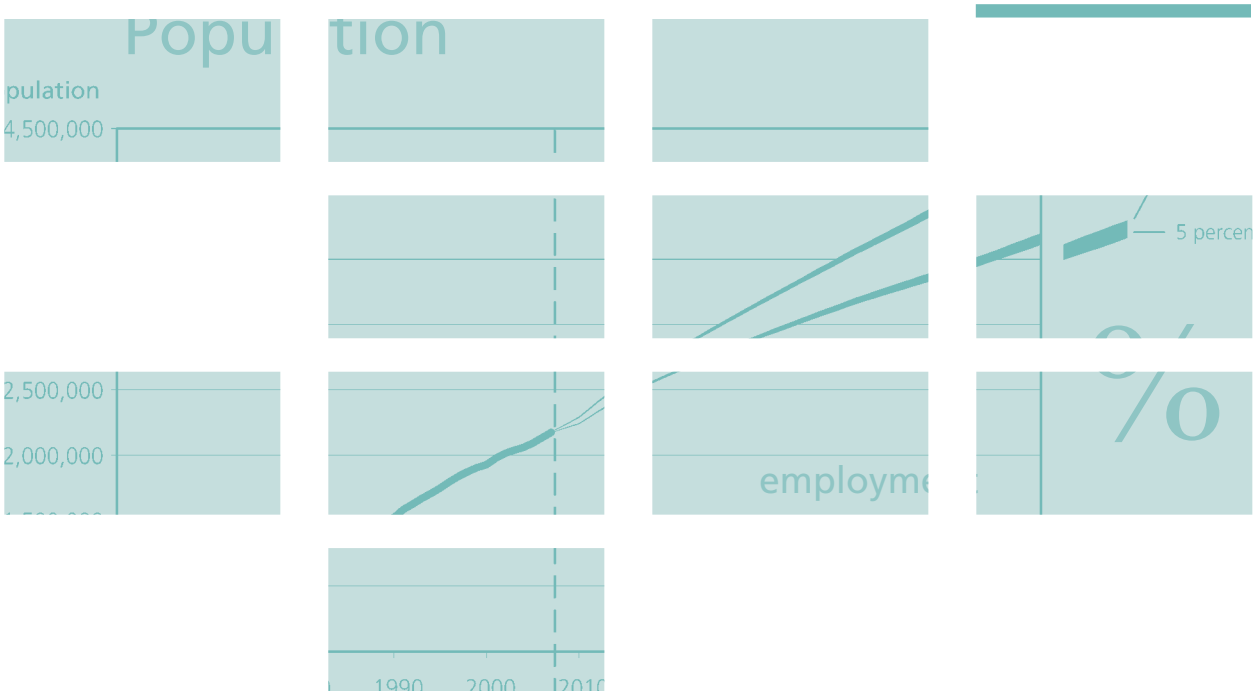
Table 5: Regional UGB Area Total Vacant Land Supply by Tier
Table 6: Tier A Vacant Land Supply by Market Geography
Table 7: Tier B Vacant Land Supply by Market Geography

This document provides more emphasis on the Tier A and Tier B land supply because that is the vacant land supply that is deemed to be ready for new development in the short-term. The other land supply Tiers (C-G) may also be developed, but offer additional challenges or impediments to development relative to the Tier A and Tier B land. Hence, the majority of the Tier C-G tax lots are most likely to develop after the short-term period (after year 5). Please refer to **Appendix A** for a more detailed breakdown of estimated net buildable land area for each of the market areas shown in Figure 1.

It should be noted that the vacant employment land supply estimates contained in this memorandum and Appendix A are limited to the land use classifications listed in Table 1 and Table 2. In addition to these employment land use classifications, we have also identified approximately 238 net acres of "Rural" land use classifications within the Inner North & East Market Geography. These lands are primarily concentrated in West Hayden Island, and were previously classified as "Regionally Significant Industrial Area 2040 Design Type" in 2002, but that designation was subsequently amended to a "Rural Design Type." Planning decisions regarding the future use of West Hayden Island are still pending local and regional review and approvals.

Next Steps

The next steps in the vacant employment land analysis includes estimating the near-term development capacity potential that could be accommodated on vacant Tier A and Tier B lands within the existing tri-county UGB.



20 and 50 year

Regional population and employment range forecasts

September 2009

Metro | *People places. Open spaces.*

PURPOSE OF THE 2030 FORECASTS

Oregon land use laws require that Metro maintain a supply of buildable land inside the urban growth boundary to accommodate estimated housing needs for twenty years. Metro fulfills a similar role in determining whether or not there is adequate capacity for employment. This draft 2030 forecast is a necessary step towards Metro's compliance with these requirements and is the determination of how much growth is expected. A separate analysis of the region's capacity to accommodate growth is included in the urban growth report.

PURPOSE OF THE 2060 FORECASTS

The 2060 forecast is intended to inform the urban and rural reserves process. Metro and Clackamas, Multnomah and Washington counties are jointly leading this innovative regional effort to study and designate areas outside of the current urban growth boundary that are suitable for accommodating future population and job growth over the next 40 to 50 years (urban reserves) as well as areas that should be preserved for agriculture, forestry and natural resources (rural reserves).

A draft 2060 forecast was released by Metro in May 2008; the current forecast updates that release by starting with an updated 2030 forecast and responding to public comments and questions on the 2030 to 2060 component.

DISCLAIMER

These forecasts illustrate a range of possible population and employment outcomes and trends for the greater Portland metropolitan area over a 50-year period. These forecasts are intended to inform local and regional public policy discussions and do not represent any policy agenda or policy decision of the Metro Council.

EXECUTIVE SUMMARY

To inform the regional discussion of growth management choices and the possible implications of those choices, Metro has developed a range population and employment forecast. This forecast is derived from national economic and demographic information and is adjusted by Metro based on regional growth factors.

The forecasts cover the seven-county Portland-Beaverton-Vancouver Primary Metropolitan Statistical Area (PMSA), as defined by the U.S. Office of Management and Budget. It does not predict where within the statistical area future population and jobs may locate nor does it determine what portion may locate within the Metro urban growth boundary.

The region must make a number of choices about how it will accommodate forecast growth and what the possible implications of those choices may be.

Regional choices: Is the region willing and able to provide the necessary public facilities and services, governance and investments to accommodate population and employment growth and support the creation of sustainable, vibrant communities?

Local choices: How willing and able are the region's cities, counties and public service providers to make targeted investments and public improvements in their urban centers, transportation corridors and employment areas in order to support long-term population and employment growth?

Map 1: Portland-Beaverton-Vancouver OR-WA PMSA

Geographic extent of the regional forecast encompasses seven counties. The Metro urban growth boundary comprises a fraction of the land area of the region.

SUMMARY FORECAST RESULTS

Population and employment forecast ranges are provided for the years 2030 and 2060 for the entire seven-county Portland-Beaverton-Vancouver Primary Metropolitan Statistical Area, which consists of Clackamas, Columbia, Multnomah, Washington and Yamhill counties in Oregon as well as Clark and Skamania counties in Washington. Though this forecast does not predict where growth will occur within the seven-county statistical area, it is safe to say that not all of it will be within Metro's boundary.

The forecast indicates a 90 percent chance that the population of the seven-county statistical area in 2030 will be between 2.9 and 3.2 million people. For 2060, the forecast projects a 90 percent probability that the population of the same area will be between 3.6 and 4.4 million people. In 2000, the population was 1.9 million people.

On the employment side, the forecast indicates a 90 percent chance that there will be between 1.3 and 1.7 million jobs in the statistical area in 2030 and a 90 percent chance that there will be between 1.7 million and 2.4 million jobs in the same area in 2060. In 2000, there were approximately 973,000 jobs.

Where the region's population and employment numbers ultimately land will be affected by several factors. They include varying conditions in the local and global economies, changing population and workforce demographics, and policy decisions and investments made in local communities that may attract particular types of population and employment growth to certain areas of the region.

Next steps

Fall 2009: Metro has released a draft urban growth report with analyses of the region's capacity to accommodate the next twenty years of residential and employment growth within the existing urban growth boundary. The 2030 forecast informs these capacity analyses. The urban growth report discusses what share of the forecast growth may happen within the urban growth boundary.

December 2009: The Metro Council will, with Clackamas, Multnomah and Washington counties, adopt urban and rural reserves. Urban reserves will be informed by the 40-50 year population and employment range forecast.

The Metro Council will accept a 2030 population and employment range forecast and the final urban growth report, which describes any capacity gap to be addressed in 2010.

2010: Local and regional governments will continue to implement policies and investments to create and enhance great communities while accommodating anticipated growth. Metro Council will submit plans to accommodate at least 50 percent of any 20-year capacity need to the Oregon Land Conservation and Development Commission.

2011: If any additional 20-year capacity need remains, the Metro Council will consider urban growth boundary expansions into designated urban reserves.

ABOUT THE RANGE

Why use a range instead of a point forecast?

To plan for the future, it is important to have an idea what the future might look like. In making any prediction, it is necessary to acknowledge uncertainty. Predictions that declare absolute certainty can be regarded with skepticism.

Weather forecasting is an example. Which forecast is more trustworthy and provides more useful information for planning?

Five days from today, it will be sunny.
or…
Five days from today, there is a 65 percent chance of sunny weather.

If you rely on the first forecast, you may end up stuck in the rain without an umbrella. If you rely on the second forecast, you have the opportunity to consider whether or not it is worth taking an umbrella along.

Forecasting population and employment growth and subsequently making land use, transportation, and investment decisions is a similar exercise, though with higher stakes. The use of a range forecast allows for the consideration of a number of possible outcomes, rather than only planning for one future. Using a range forecast is more likely to result in growth management decisions that result in adaptable, resilient communities that are able to adjust course when conditions change. This ability to be adaptable is more critical than ever considering today's volatile fuel prices, an economic crisis of historic proportions, and the need to take significant and immediate actions to reduce greenhouse gas emissions.

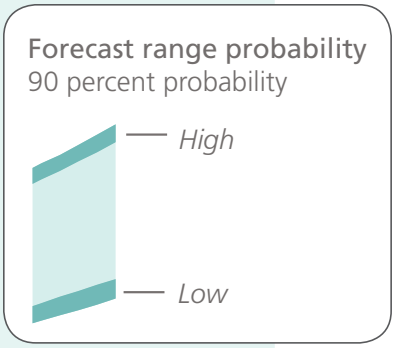
What does the range mean?

As with a weather forecast, this population and employment range forecast is expressed in terms of probability. The methodology for producing the range forecast is described in more detail later in this document.

Low end of range: There is a five percent chance that actual growth will be less than or equal to the low end of the range.

High end of range: There is a 95 percent chance that actual growth will be less than or equal to the high end of the range.

Stated differently, there is a 90 percent chance that growth will occur within the outer bounds of the forecast range.



What kinds of questions should we consider in light of the range forecast?

The range forecast prompts questions for policy makers to consider such as:

- What are the risks of planning for the high or low end of the forecast? Are there different risks associated with planning for land use, transportation investments or other infrastructure system investments?
- How might the success or failure of efforts to preserve the region's livability push population and employment growth higher or lower within the forecast range?
- How might particularly effective or ineffective economic development strategies push population and employment growth higher or lower within the forecast range?
- The range forecast does not account for a number of unknowns such as the possibility of climate change refugees – people who may be displaced by climate change. Future climate conditions could result in additional people entering or leaving the region. How might this additional uncertainty influence how we make decisions?

What are some of the variables that affect the forecast?

Some of the basic variables that inform this forecast are birth, death and immigration rates and anticipated economic conditions. The regional economy is increasingly subject to global and national forces that are beyond the region's influence and are not easily quantifiable through standard economic tools. Economic globalization affects the flow of trade, foreign exchange rates, and the cost and availability of foreign and domestic skilled and unskilled labor. Population growth in the region continues to reflect the region's status as one of the nation's more desirable metropolitan areas; in the early part of this decade, our region's population continued to grow even as employment stagnated during the recession.

These are but a few examples of the many factors that will ultimately affect both population and employment trends in the region.

How has recent global economic turmoil influenced the forecast?

Our region is not immune to the recent recession and other economic distress. In the short term, it is expected that job growth will slow in our region. Employment sectors that tend to be most sensitive to downturns in business cycles include construction, manufacturing and professional business services. However, by the year 2020, growth is expected to have returned to the average long-term trend (compared to older forecasts).

Managing in the fog

A recent article in *The Economist* refers to forward-thinking companies like Lego that use range forecasts instead of point forecasts. The article states that scenario planning, which considers a range of possible outcomes, is all the more important during uncertain times since it allows for contingency planning and adaptability.

The Economist (February 26, 2009) Managing in the Fog. Accessed online on March 5, 2009 at http://www.economist.com/business/displaystory.cfm?story_id=13184837

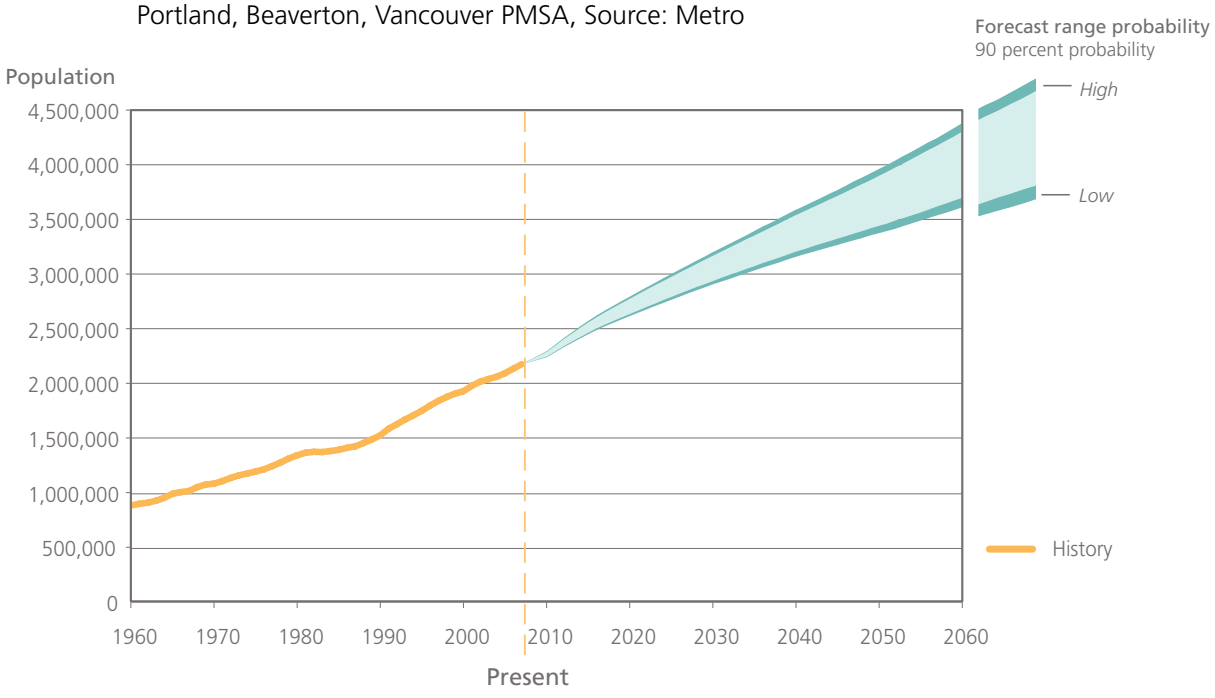
POPULATION RANGE FORECAST RESULTS

In the year 2000, the population of the seven-county statistical area was about 1.9 million people. This forecast estimates that, by the year 2030, the population could grow to a total of 2.9 to 3.2 million people. By the year 2060, the population could grow to a total of 3.6 to 4.4 million people.

Table 1: Population range forecast and annual percentage rate change from year 2000
Portland, Beaverton, Vancouver PMSA, Source: Metro

Year		Low end of range	High end of range
2000	*1,927,881 Actual*		
2030		2,903,300 1.37% APR	3,199,500 1.70% APR
2060		3,609,300 1.05% APR	4,376,100 1.38% APR

Figure 1: 2007 – 2060 Population forecast
Portland, Beaverton, Vancouver PMSA, Source: Metro



HOUSEHOLD RANGE FORECAST RESULTS

Using forecast household sizes, the population forecast is translated into a household range forecast.

In the year 2000, there were approximately 742,300 households in the seven-county statistical area. This forecast estimates that, by the year 2030, there could be between 1.2 to 1.3 million households. By the year 2060, there could be between 1.5 to 1.8 million households.

Table 2: Household forecast and annual percentage rate change from year 2000
Portland, Beaverton, Vancouver PMSA, Source: Metro

Year	Low end of range	High end of range
2000 *742,300 Actual*		
2030	1,181,300 1.56% APR	1,301,800 1.89% APR
2060	1,478,400 1.15% APR	1,792,500 1.48% APR

Figure 2: 2007 – 2060 Household forecast
Portland, Beaverton, Vancouver PMSA, Source: Metro

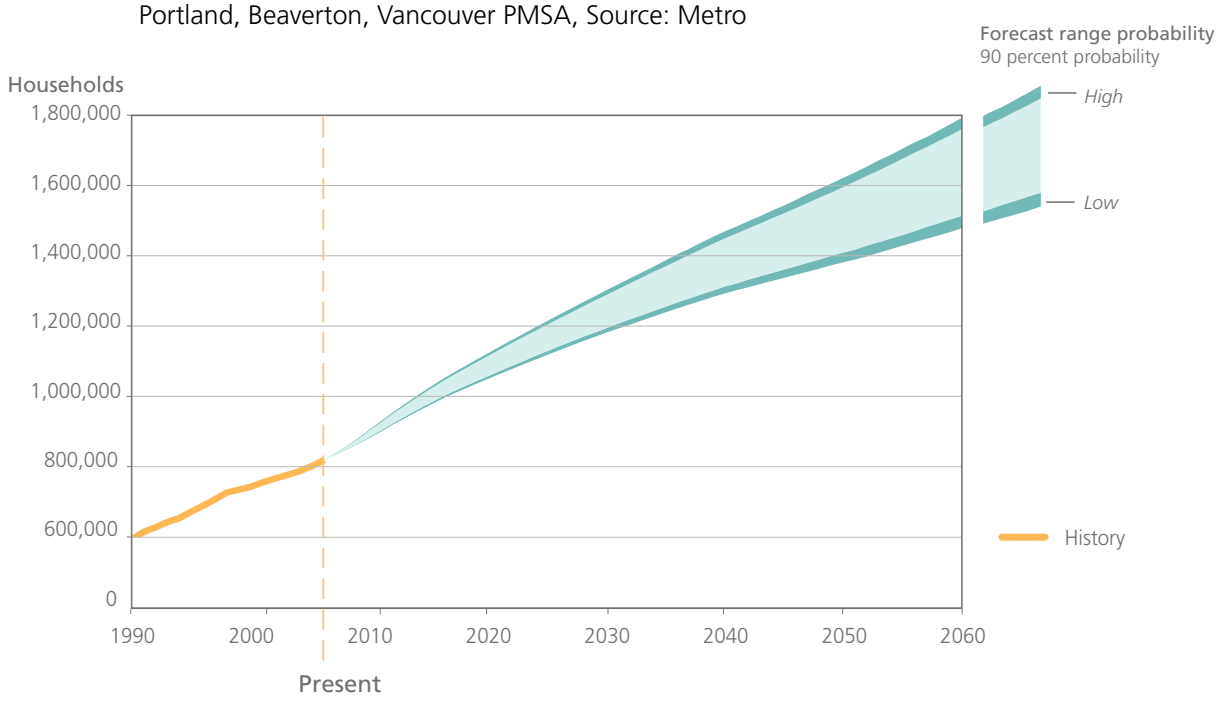
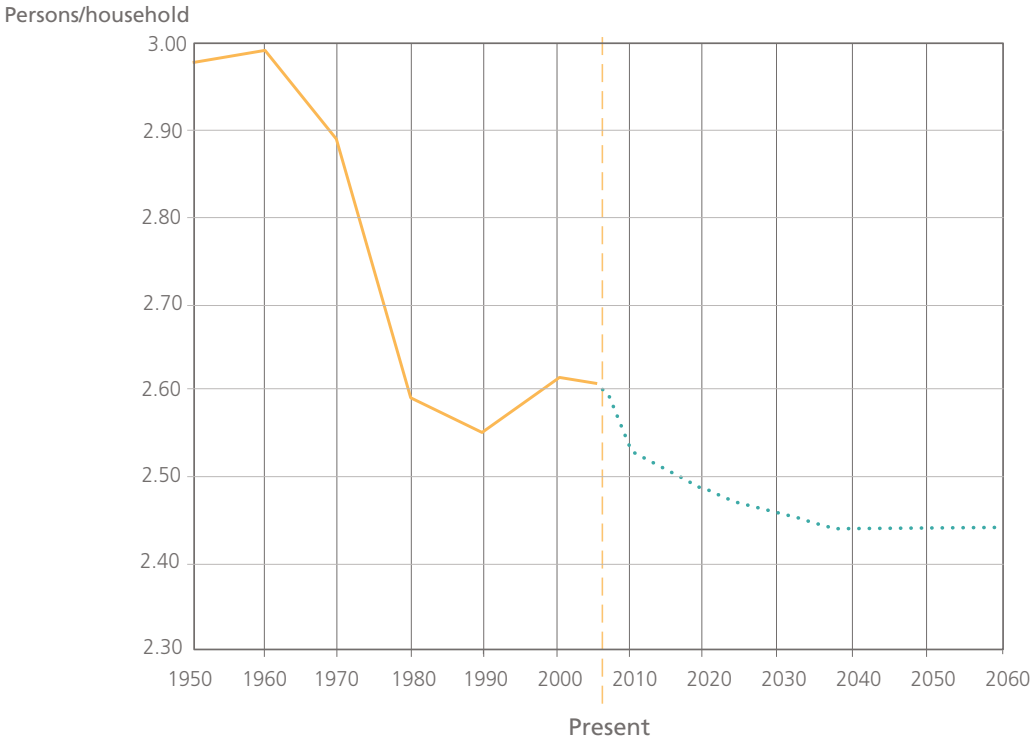


Figure 3: 2007 – 2060 Average household size forecast
Portland, Beaverton, Vancouver PMSA, Source: Metro



What are some expected demographic changes?

The region's population is forecast to be distributed fairly evenly among different age groups – a trend that is also predicted for the United States as a whole. This is a change from the past when there were progressively fewer people at more advanced ages. One implication of this anticipated change is that a greater percentage of households will be older and without children, resulting in a lower average household size. More demographic detail is presented in the full forecast report.

EMPLOYMENT RANGE FORECAST

This forecast also predicts how many jobs will be in the seven-county statistical area in the future. As with the population and household forecasts, this forecast does not predict where these jobs will be within the seven-county statistical area. Not all forecast jobs will be within Metro's jurisdiction.

In the year 2000, the number of jobs in the seven-county statistical area was 973,230. This forecast estimates that, by the year 2030, jobs could grow to a total of 1.3 to 1.7 million. By the year 2060, jobs could grow to a total of 1.6 to 2.4 million.

Economic lows and highs are to be expected at times throughout the course of the analysis period; this forecast focuses on the cumulative, long-term trends.

Table 3: Employment range forecast and annual percentage rate change from year 2000
Portland, Beaverton, Vancouver PMSA, Source: Metro

Year		Low end of range	High end of range
2000	*973,230 Actual*		
2030		1,252,200 0.84% APR	1,695,300 1.87% APR
2060		1,648,400 0.88% APR	2,422,900 1.53% APR

Figure 4: 2007 – 2060 Employment forecast (nonfarm)
Portland, Beaverton, Vancouver PMSA, Source: Metro

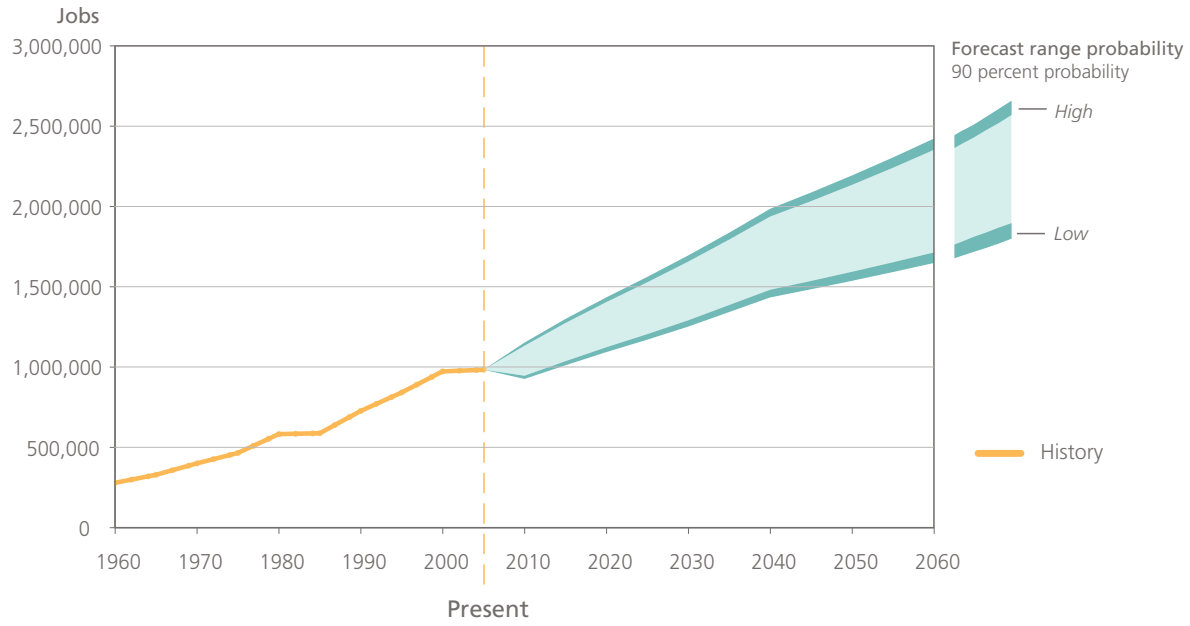
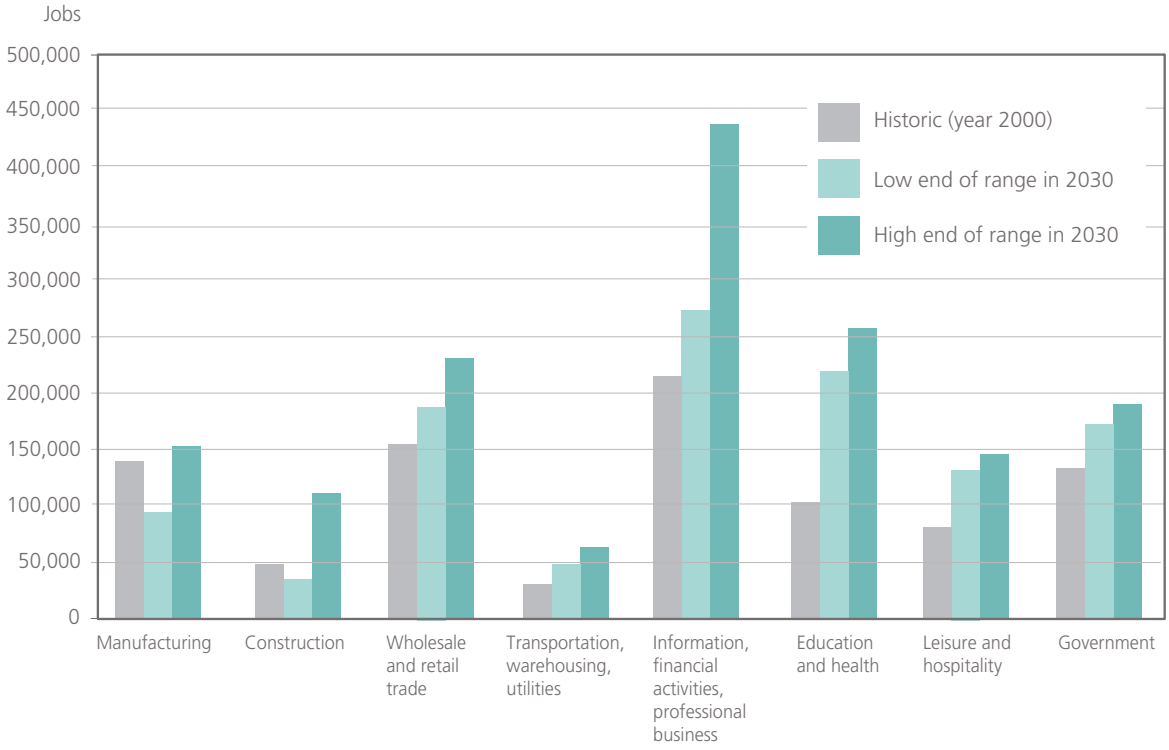


Figure 5: 2007– 2030 Employment forecast by sector
Portland, Beaverton, Vancouver PMSA, Source: Metro



How might the mix of employment in 2030 compare with 2000?

As in the past, the information, financial activities and professional business sectors are forecast to make up a substantial share of total future employment (about one-quarter of all jobs) in the seven-county statistical area.

Employment sectors that serve the resident population (e.g. the health and education and construction sectors) tend to show growth that is commensurate with overall population growth. From the years 2000 to 2030, employment in the education and health sectors is predicted to increase by 117 percent (low end of forecast range) to 154 percent (high end of forecast range).

The manufacturing sector is forecast to see relatively little growth as many of these jobs move overseas. It is likely that the manufacturing jobs that do remain will be those that require specialized training and command competitive wages.

ABOUT THE PROJECTIONS

How Metro produced the projections

Economic trend forecast: Metro first produces the "econometric trend" forecast through 2040 using its own state-of-the-art regional econometric model. This model has been thoroughly vetted by an independent panel of economic and demographic experts from across the U.S. It relies on national growth factors obtained from the economic forecasting firm Global Insight, Inc., as well as birth and death rates derived from the U.S. Census Bureau's most current "middle series" fertility and survival rates. Both the national economic data and national demographic forecast data are then regionalized based on regional growth factors; net migration into the region pegged to relative differences between regional and national economic growth factors; and actual birth and death rates derived from local vital statistics. Population and migration trends are directly linked to specific economic sectors modeled in the regional econometric model, so employment trends and population growth are dependent upon one another.

Range forecast: The economic trend forecast assumes certain trends for birth rates, death rates and migration rates. Yet there is a degree of uncertainty surrounding those trends. To account for that uncertainty, 10,000 scenarios (*Monte Carlo simulations*) were conducted to determine possible population and employment outcomes if these rates were to differ to a greater or lesser degree from the assumed trends. Using this method, the probability that actual population and employment growth in 2030 and 2060 will be less than or equal to a certain projected or forecast value was calculated. There is a 95 percent chance that actual growth will be less than or equal to the upper end of the range and a five percent chance that actual growth will be less than or equal to the bottom end of the range.

Extrapolating the forecast beyond the year 2040

Global Insight does not produce a U.S. macroeconomic outlook that extends more than 30 years into the future. Consequently, to complete the "econometric trend" forecast to the full 2060 horizon, the post-2040 population trend from the regional econometric forecast has simply been extrapolated forward to converge with the trend growth rate predicted for U.S. population.

The projected employment trend to 2040 is also derived from Metro's regional econometric model and driven by the Global Insight U.S. macroeconomic outlook. Post-2040 employment projections are extrapolated based on a stable employment-population ratio.

How do these projections compare with other projected growth rates?

To put Metro's forecast into context, Table 4 summarizes forecast annual percentage rates of population growth from several different sources for the entire United States, Oregon, and the Portland metro region. The annual percentage rates of growth are for the 2000 to 2030 time period. This table shows forecast growth rates increasing as the geography moves from nation to state to region. Of these three geographic scales, forecast growth rates for the entire United States are the lowest since the large geography includes a variety of urban and rural areas, many of which are forecast to grow slowly. Forecast growth rates for Oregon are higher than rates for the United States since the historic trend of coastal states growing faster than interior states is expected to continue. Finally, given that a substantial portion of the Portland metro region is urban, its forecast growth rates are even higher. Metro's regional forecasts (Table 4) are in keeping with regional forecasts conducted by the Oregon Office of Economic Analysis and Global Insight.

Table 4: Forecast comparisons

Population growth **Annual percentage rate 2000 – 2030**	**Geography of forecast**	**Forecast source**	
0.85%	United States	U.S. Census middle series (2004)	
0.95%	United States	Global Insight (4th quarter, 2008)	
1.14%	Oregon	Global Insight (2008)	
1.16%	Oregon	U.S. Census middle series (2005)	
1.18%	Oregon	OR Office of Economic Analysis (2004)	
1.28%	Portland metro region (3 counties)	OR Office of Economic Analysis (2004)	
1.40%	Portland metro region (7 counties)	Global Insight Regional Service (2008)	
1.37%	Portland metro region (7 counties)	Metro – low end of range (2009)	Current forecast
1.70%	Portland metro region (7 counties)	Metro – high end of range (2009)	

Source: US Census as compiled by Metro (for purposes of calculation consistency, the geographic extent of the PMSA used here is the same seven counties even though the PMSA's boundaries have changed over time)

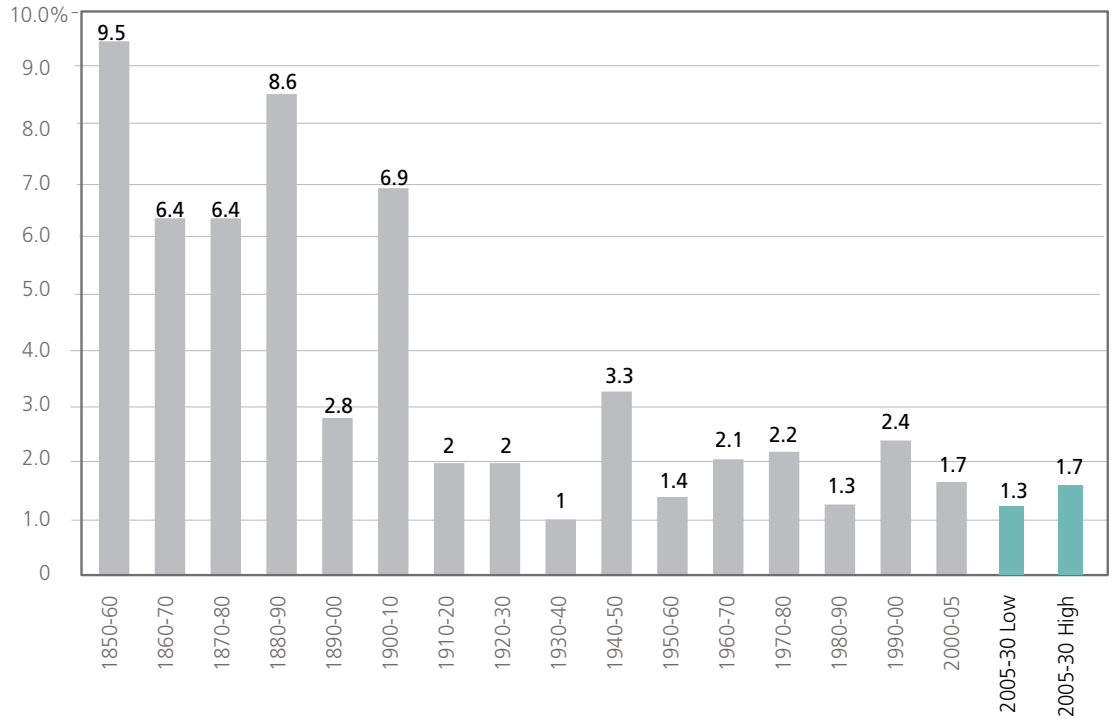
How do the projections compare to historical growth rates?

Figure 6 helps put the population range forecast in perspective with historical population trends. This forecast indicates slower population growth in the region for the next 50 years than has historically been experienced since the inception of the state.

Population trends have varied widely since 1850. At a glance, the historical data show two distinct periods of growth: first, a hyper-expansion phase that carried through the early pioneer days and ensuing decades through 1910, when the base population of the region was small, and second, a slower pace over the last century, reflecting the maturation of Portland as a metropolitan area.

Population growth in the region averaged 2.44 percent per year during the 20th century. At that rate, it took over 100 years before the region's population reached one million residents in 1966. More recently, the population doubled to about two million people in only 36 years. This doubling of the population occurred at the relatively modest growth rate of 1.9 percent per year. The more recent lower growth rate can be explained both by declining birth rates and the mathematics of compounding growth on a large population base (in absolute terms, the population increase is substantial despite a lower growth rate). Likewise, when forecasting population growth, we start with a large population base and even modest growth rates amount to big increases in population numbers.

Figure 6: Historical and forecast population growth rates



For more information on the forecasts, contact Ken Ray, Metro senior public affairs coordinator, at 503-797-1508 or ken.ray@oregonmetro.gov.

Visit www.oregonmetro.gov/forecasts

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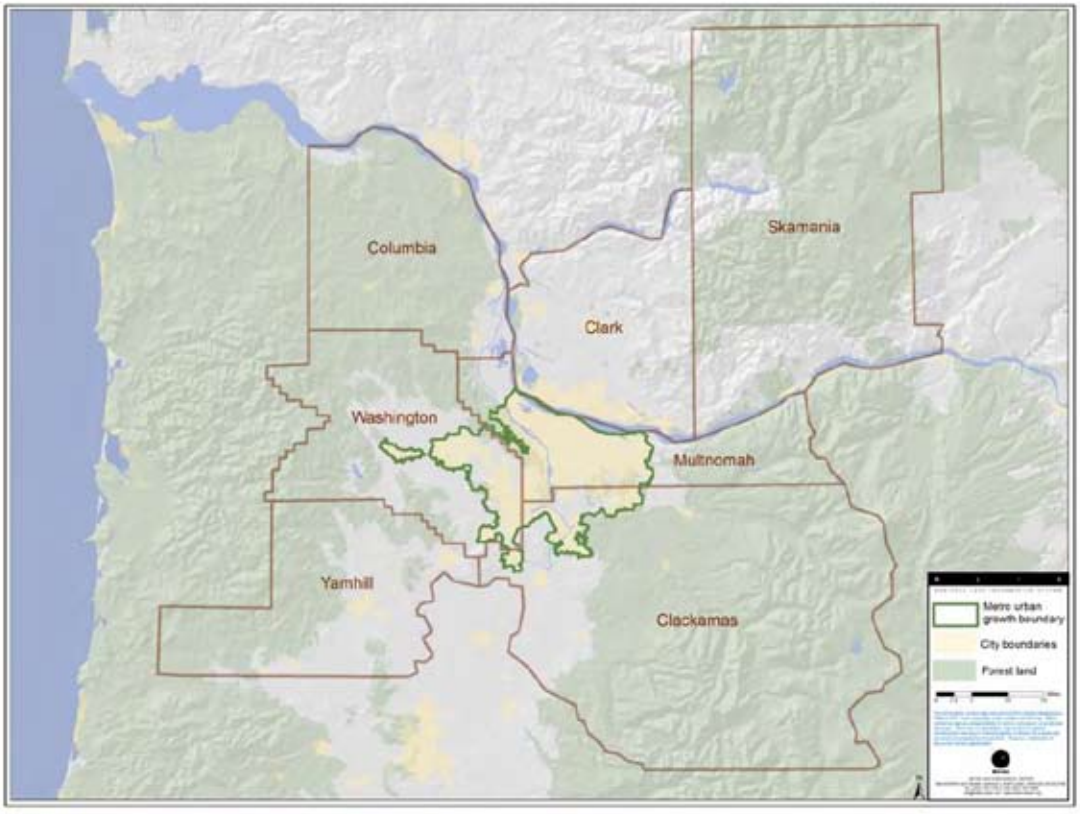
Preface

To inform the regional discussion of growth management choices and the possible implications of those choices, Metro has developed a range population and employment forecast. This forecast is derived from national economic and demographic information and adjusted by Metro based on regional growth factors. The forecast has two end dates (2030 and 2060) to serve two purposes, described below.

Forecast geography

These forecasts are for the seven-county Portland-Beaverton-Vancouver Primary Metropolitan Statistical area (PMSA), as defined by the U.S. Office of Management and Budget. The area includes Clackamas, Columbia, Multnomah, Washington and Yamhill counties in Oregon as well as Clark and Skamania counties in Washington (shown in Map 1 below). This forecast does not predict where within the PMSA future population and jobs may locate nor does it determine what portion may locate within the Metro urban growth boundary (UGB). These possible trends are discussed in the September 2009 Urban Growth Report (UGR).

Map 1. Portland-Beaverton-Vancouver OR\-WA Primary Metropolitan Statistical Area (PMSA)



The PMSA has changed during the years and has added additional counties as the region has grown in population and economic linkages. As defined in the Federal Register, the Portland-Beaverton-Vancouver OR-WA PMSA was expanded to 7-counties in 2004. This latest expansion added Skamania

County in Washington State. As commuter flows from adjacent counties increase and as the population and employment base of the greater metropolitan area expands, federal statisticians will occasionally revisit and revise the composition of the PMSA to reflect the closer integration of counties and define a new metropolitan area definition.

The Metro regional macro-econometric model produces detailed population and employment growth projections based on this new 7-county metropolitan PMSA definition. Regional growth factors are in part determined by international and national macro-economic factors. The assumptions for future macro-economic forces are inputs taken from IHS Global Insight's U.S. long-term forecast outlook. The U.S. outlook embodies economic, demographic as well as fiscal and monetary policies that impact regional growth trends.

Regional growth is partly influenced by national macro-economic trends which affect components of the regional economy and its production factors. These factors include wage and income trends, traded sector competitiveness, overall final demand measures like GDP, interest rates and cost of capital which impact regional growth trends. One factor of production that is extremely germane to the topic of the urban growth report is land supply. However, the regional forecast is implicitly silent on the question of land supply and its implication on future regional growth. The regional forecast is silent on this as it implicitly assumes that future land supplies will be present in the quantity and locations necessary to support regional growth trends that were present during the region's past. To get sub-county level population and employment estimates, MetroScope will be used to distribute growth based on land use and transportation implications and other growth allocation factors. At the point with MetroScope, future land supply assumptions become important. We will need to more explicitly account for land supplies, expansions, zoning, investments in infrastructure, and location efficiencies, but for the forecast we assume land supplies are available and unconstrained.

Purpose of 2030 forecast

This report highlights the major economic and demographic forecast results that underpin the capacity and demand projections contained in the 2009 Urban Growth Report (UGR). The regional forecast describes future employment, income, wage, population and household trends that make up the demand forecasts (including a range forecast) for deriving a 20-year demand for both residential and employment capacity[1]. The regional forecast includes three scenarios: high-growth, medium-growth (or sometimes referred to as the "baseline" forecast), and low-growth. These three economic scenarios convert to high and low demand ranges for housing and employment in the 2009 UGR.

1 Additional high and low growth scenarios for the region will accompany this baseline forecast to cover a range of uncertainty in the regional forecast. A probabilistic population methodology, which has been peer reviewed, has been developed to generate the regional range population forecast. The long-run employment forecast is derived from the population ranges. The short-run and midterm portion of the employment forecast is derived from the sample standard errors of the forecast which are generated from industry-sector based regression equations. A low-end supply range has also been estimated based on continuing existing policy and density assumptions, and a high-end supply range has been estimated based on potential new policies, public investments and housing subsidies that might increase the housing supply in the future.

The purpose of this document is to primarily describe the economic and demographic inputs that derive the regional medium-growth forecast scenario. The high- and low-growth scenarios are generated as statistical confidence intervals from the medium-growth (baseline) forecast. The population and demographic details of the regional forecast drive the derivation of housing demand in the Residential UGR and Metro's Housing Needs Analysis (HNA); while the details of the employment portion of the regional forecast drive the derivation of industrial and commercial employment capacity demand for the Nonresidential (employment-portion) UGR.

Purpose of 2060 forecast

The UGR and periodic review decision making process focus on the regional forecast through year 2030. However, there are a number of on-going planning studies and future transportation studies that also rely on discrete pieces of the 2060 regional economic and population projections[2]. The regional forecast must serve other planning purposes, for example, on-going land use and transportation studies may use truncated portions of the regional forecast for individual project planning needs. Corridor and regional transportation planning studies may require a 2035, 2040 or 2045 forecast horizon. The timing for the land use assumptions on many transportation projects depends on a 20-year horizon from when the project construction is expected to finish. Typically, transportation studies require a 35-year forecast horizon. They also require the regional forecast to be disaggregated to Transportation Analysis Zones (TAZ).

The 2060 forecast is intended to inform the urban and rural reserves process. Metro and Clackamas, Multnomah and Washington counties are jointly leading this innovative regional effort to study and designate areas outside of the current urban growth boundary that are suitable for accommodating future population and job growth over the next 40 to 50 years (urban reserves) as well as areas that should be preserved for agriculture, forestry and natural resources (rural reserves).

A draft 2060 forecast was released by Metro in May 2008; the current forecast updates that release by starting with an updated 2030 forecast and responding to public comments and questions received on the 2030 to 2060 component. The primary difference between the May 2008 forecast and the forecast described here is that this forecast takes into account worsening global economic conditions. The current economic downturn is anticipated to slow growth over the short term. However, in the longer term, it is expected that the region's population and employment growth will return to long-term trends which are similar (not necessarily the same) to past performances.

For any other uses, the 2060 Regional Forecast may be truncated to the appropriate planning horizons as needed.

2 Additional information is needed from other tasks under periodic review to make a final determination of UGB capacity need, e.g., urban/rural reserves and alternatives analyses, employment and economic trends analysis, MetroScope scenario operations and data regarding capture rates and refill rates, and other policy inputs with respect to matters of urban form and regional transportation plan (RTP) assumptions.

Does the regional forecast provide county-level or subarea details?

No. At this point, the regional forecast does **not** get disaggregated to smaller geographies like transportation analysis zones (TAZ). That step is left for MetroScope to complete. However, Metro will not generate a TAZ-level disaggregation of the regional forecast until the Metro Council and local governments have made decisions on urban reserves, UGB amendments, final regional transportation investment decisions, implementation of new land use regulations, and sundry land use real estate investment assumptions. These assumptions are critical, and without a clearer understanding from policy makers about where the region can reasonably anticipate the location of future capacity, valid steps to forecast where growth goes in the region will be subject to significant conjecture. The TAZ allocation process likely will not start until 2011.

However, there are plans to produce preliminary MetroScope growth distributions during the course of finalizing the UGR in 2009. These MetroScope scenarios will focus on refining various land use assumptions that could be utilized to fill the gap between housing or employment demand and capacity (as documented in the UGR that was released in September 2009). A key input to these MetroScope-based scenarios are the prospective land supply assumptions embedded into these analytical scenarios. These UGB expansion assumptions are based on the soil type and land hierarchy system established by state laws prior to recent legislation that now allows Metro (and counties) to establish urban reserves (and rural reserves). These scenarios would represent planning research that may inform decision makers on what policy actions may be needed to address regional needs. These scenarios were completed in mid-year 2009 to help inform the UGR to be adopted by Metro Council resolution at the end of 2009.

Methods Overview – how did Metro generate the regional forecast?

The Metro regional forecast provides the technical foundations for estimates of future employment and future residential land demand. A key implicit assumption in these regional growth projections are land supply conditions that do not constrain regional growth trends. Slower growth derives not from land shortages, but instead changes in demographic factors and economic conditions in the future outlook.

The regional forecast is created in two distinct time segments using two forecasting methods. The pre-2040 forecast period derives from Metro's regional econometric model. The period of the post-2040 regional forecast is prepared based on a Delphic method. A baseline forecast is prepared for the region employing the econometric method through the year 2040 and a Delphi[3] method that extends it to the year 2060.

Projected ranges are produced in conjunction with the baseline forecast. These ranges represent a 90% confidence interval or roughly +/- 2 standard deviations from the baseline trend forecast. These range

[3] The Delphi method refers to a forecasting approach which relies on a panel of independent experts. It is based on the assumption that group judgments are more valid than individual judgment. In our case, the independent experts included the review of U.S., Oregon and PMSA population growth forecasts prepared by the U.S. Census, Global Insight, Pew Research Center, United Nations, World Bank, and the Oregon Office of Economic Analysis. A range of national, state and regional population forecasts were analyzed and heuristic population growth estimates for the Portland region were derived from the projections of the experts.

projections accompany the baseline forecast for population and employment totals in order to give policy makers flexibility in managing future land use and transportation growth decisions. Growth ranges help to explicitly recognize the extent of our current understanding of future trends and the degree of uncertainty and possible risk inherent with extremely long-run regional growth projections. The use of a range forecast allows for the consideration of a number of possible outcomes, rather than only planning for one future. Using a range forecast is more likely to result in growth management decisions that result in adaptable, resilient communities that are able to adjust course when conditions change.

Econometric Method

An economic model based on econometric theories is employed to generate an employment forecast for the Portland PMSA. Detailed national economic assumptions are used to derive the regional growth forecast through to year 2040. Typical national variables used in the modeling of the regional economic forecast include the following items: components of GDP – such as consumption, investment, government spending and net exports; interest rates, foreign exchange variables, employment-productivity assumptions, U.S. employment trends, income and wage terms, inflation variables, population and demographics, etc. These details are empirically estimated into the economic coefficients of the Metro regional econometric model. The forecast of these detailed variables and assumptions feed into the growth projections for regional population and employment. The geographic extent of the regional econometric model is a 7-county region (i.e., Portland-Beaverton-Vancouver, OR-WA PMSA) delineated by federal authorities[4].

Regional totals are generated from aggregating the demand projections for employment on an industry sector-by-sector basis. Since forecast ranges are also needed, we go back to the regression analysis and utilize the forecast standard errors from employment equations and derive ranges that are +/- 2 standard deviations from the expected trend forecast. These details are available through year 2040.

Embedded into the econometric model is a standard cohort-component population module that simultaneously works with the economic modules. As the economy grows, both income / wages and employment in the region expands and begins to attract more in-migration which in turn bolsters regional population trends. Meanwhile, traded-sector portions of the economy derive the majority of its growth through the national growth factors supplied by the Global Insight national macro-economic forecast. Population serving industry sector draw their growth factor from the population forecast and through indirect and induced feedback from traded sector economic growth trends. As each major sector changes, its impact ripples across all other industry sectors. The dynamic nature of population, migration, employment, wages and income play itself out through the regional forecast. The econometric model simulates these interactions and the forecast for the region presents itself as a

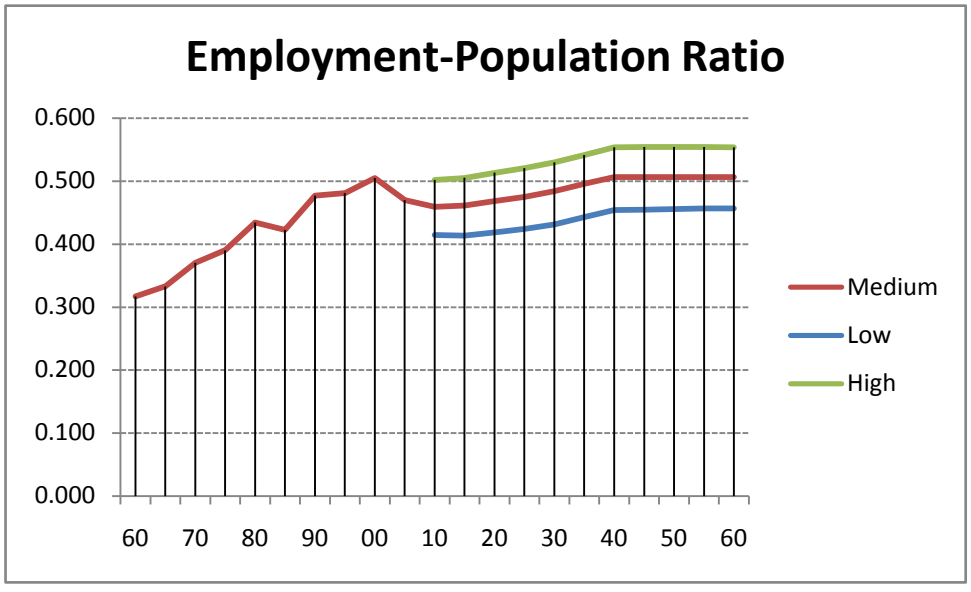
4 The PMSA designation is delineated by the federal government to describe a group of counties in a metropolitan area that possess a strong social and economic affinity with one another. The Portland area PMSA includes the following Oregon counties: Clackamas, Columbia, Multnomah, Washington and Yamhill, plus Clark and Skamania counties in Washington State.

consequence of these feedbacks in production, employment and population as well as through the assumptions of the national macro-economic forecast.

Employment-Population Ratio Method

After 2040, we switch to a fixed-factor extrapolation to calculate the range values for regional employment through year 2060. The rate of future employment growth between 2040 and 2060 is pegged to population trends projected for the same time span. This fixed factor is based on the employment-to-population (e-p) ratio evident in year 2040 and carried forward through 2060. This approach ensures that future population and employment trends are consistent for each range projection.

A chart nearby shows the e-p ratio used to translate the population range projections during the post-2040 time period into employment projections. Shown in the chart are historical e-p experiences for the Portland PMSA region and the e-p ratio assumptions for the low, medium, and high growth regional forecast scenario ranges. E-p ratios in the near term dip due to the downturn in the regional business cycle, but are expected to gradually rebound. In the high growth scenario, e-p ratios in the future rise above late-90's levels and level out after 2040. In the medium scenario, projected e-p ratios are assumed to more slowly recover to pre-recession levels by about 2040 and level off from that point forward in time. The low-growth e-p ratio alternative assumes much more muted rebound in the e-p ratio and the ratio never returning to pre-recession levels of the ratio. The e-p ratio is not likely to see much greater appreciation in value in the long-term due to long-term expectations of the labor force participation rates having already reached or soon to reach its zenith. The fact is, the proportion of women entering the labor force is nearly topped out and male labor force participation rates overall are expected to slide as the aging baby boom population saunters into its retirement years. Thus, expected labor force participation rates and employment-population ratios are made to be consistent.



Employment growth from year-to-year in the short-run may temporarily outpace population growth rates in the region, especially due to cyclical business activity. However, employment growth in the long-run is not expected to significantly outpace or differ from expected population growth. Accordingly, the extreme long-run portion of the regional employment forecast is thus pegged closely to expected population growth rates for the Portland PMSA. This is of course shown in the e-p ratios (see chart above).

Population totals are generated by building-up the regional population forecast on an age-specific cohort basis. A standard cohort component population model is embedded with the regional econometric model in order to capture feedbacks that exist between population growth and economic growth considerations. The econometric part of the forecast is from present to year 2040.

Post-2040, the population forecast for the region is extended using only the cohort-component population model and independent of the econometric model. We do this simply by decoupling the direct feedback that the economy / econometric model has with regional migration. Instead, we trend out the regional migration parameter without running the regional econometric model and replace the migration parameter with a fixed-value migration parameter that keeps the share of migration constant. Natural growth (from births and deaths) are aged and carried forward in typical cohort-fashion based on age-specific growth assumptions derived from the US Census Bureau. High and low growth population projections are generated for the 2060 forecast using Monte Carlo simulation routines in the same fashion that the 2030 population projections had been generated. There is consistency between methods and assumptions between preparing the range forecast for 2030 or 2060 as forecast endpoints. The 2060 population forecast is merely a statistical continuation of the Monte Carlo range forecast for year 2030; with the only difference being how regional migration is treated in the two time spans.

Of course there is good amount of distinction between how pre-2040 employment ranges were developed and post-2040 employment ranges were generated. This had partly to do with the fact that the Global Insight Forecast went out only to 2040 and we had to use a different approach to forecast the remaining years out to 2060 (hence use of the e-p ratio). But there is also theoretical merit in using the e-p ratio in the distant out years in order to maintain better consistency between population formation and employment. The linkage in the long-term has to consider that employment growth rates cannot continually exceed population growth without economic dislocations and inefficiencies. Thus, the extreme long-term has to consider labor force participation and be constrained in some fashion to available population and inevitable labor force growth.

Typically, commercial and industrial capacity demand (need) is derived from sector level employment forecasts and by projections of employment density and floor-to-area-ratios (FAR) for each building type[5]. Therefore, the regional forecast pays careful attention in generating the detailed employment

5 FAR projections and employment density assumptions are derived by Metro's other economic model – MetroScope. In fact, MetroScope is a comprehensive land use allocation model that interacts with Metro's regional transportation model as well as the regional economic model.

forecasts for the nonresidential UGR. (The endpoint for the UGR is 2030. The econometric model forecast period is extends well past 2030 and up to year 2040.)

How is the regional population range calculated?

Ranges for the regional population forecast are generated from a peer reviewed probabilistic population forecast model. This model builds on the standard cohort component population model previously described as embedded in the econometric model. The cohort component population model is exported to risk/uncertainty generation software that allows us to estimate probability distributions and create Monte Carlo simulations of future population scenarios. Ten thousand simulations were completed and their probabilities were compiled together in a way that we could statistically enumerate a 90 percent confidence interval or a likely range for future population growth, that is a high and low growth range.

How is the regional population converted into projections of households?

Future residential capacity demand (need) is determined from household forecasts generated from the Metro regional forecast. Future regional population is estimated using an age-cohort survival model with the final result a forecast of population by age. U.S. Census "middle-series" age-specific birth and age-specific mortality rates form the baseline assumptions for projecting natural population growth in the region. These age-specific rates are calibrated to regional vital statistics data to create composite regional age-specific birth and death rates used in estimating natural increases in regional population[6]. The migration component is estimated net of in- and outflows and is linked to the economic forecast and regional econometric model through wage rates and employment change.

The completed population forecast is then converted to an estimate of the number of households and dwelling units. Age-specific headship rates[7] derived from the U.S. decennial Census and projected over time (based on extrapolations from Global Insight national trend assumptions) are used to derive age-specific household projections for the regional household forecast. Headship rates are calculated by dividing the number of householders by the population in each age cohort. The household cohorts are summed together to generate the total household forecast. Finally, an average regional vacancy rate[8] is applied to the total household projections to convert the future household outlook into dwellings or housing units.

The regional household forecast truncated to year 2030 is the basis for estimating the statutorily required 20-year housing demand forecast that is found in the residential UGR demand/capacity analysis. The regional employment forecast by industry provides the economic trends to forecast the non-residential capacity demand projections for the non-residential UGR demand analysis.

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6 Regional birth and death rates fluctuate a tad from year-to-year. We chose as initial rates a set of composite rates that minimized the difference between actual and model fitted births and deaths between 1990 and 2000. We adjusted the national fertility and mortality assumptions to correspond to regional differences in these rates. These differences were not large, but we felt it was reasonable to make the adjustments in order to better replicate regional trends.

7 Headship rates are the number of people counted as heads of households.

8 The vacancy rate according to the US Census for the Portland-Vancouver OR-WA PMSA was 5.8% for all units; 2.3% for single-family / owned units; and 6.7% for multi-family rental units (source: U.S. Census, Demographic Profiles).

Perhaps the best means of examining the changes in headship rates is to see the resulting household size changes between population and household formation projections / results. Historically, the region has seen household sizes fall much more rapidly than what is being projected for the future. Going back even further in time, the U.S. (like many other industrialized nations) has seen its average household sizes in its metropolitan areas decline drastically. Portland has shared in this overall declining household size trend. A table nearby shows the historical rates and compares them to the current regional forecast.

	Household Size (Portland PMSA)
1950	2.97
1960	2.99
1970	2.89
1980	2.59
1990	2.57
2000	2.60
2010	2.54
2020	2.49
2030	2.46
2040	2.44
2050	2.44
2060	2.44

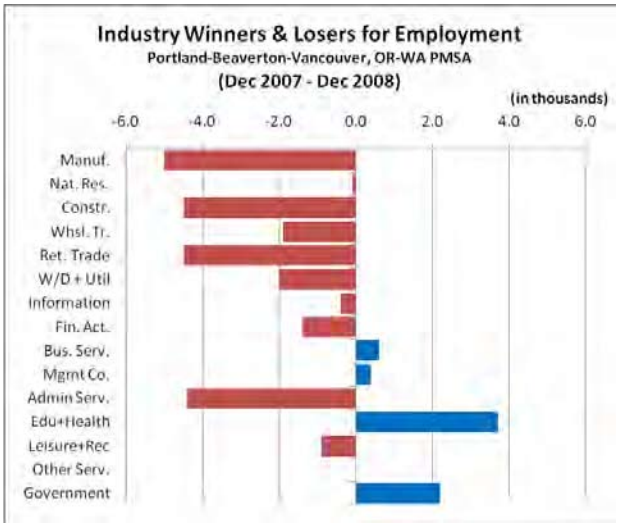
Demographers believe that the limits for the decline in household size may be coming to an end, but there is room for declines but at much slower rates. For example, between 1960 and 2000, the household sizes fell 0.37 points as compared to our projection period from 2000 to 2060 of average household size declining a mere 0.16 points. Demographic trends such as with aging baby boomers, increases in teen pregnancies, surge in divorce rates, and growing welfare rolls (until recent welfare reforms) were cited as possible reasons why average household sizes nationwide (and the region too) would experience further declining sizes. Consequently, the regional forecast for households in the region anticipates the impact of these long-term demographic trends.

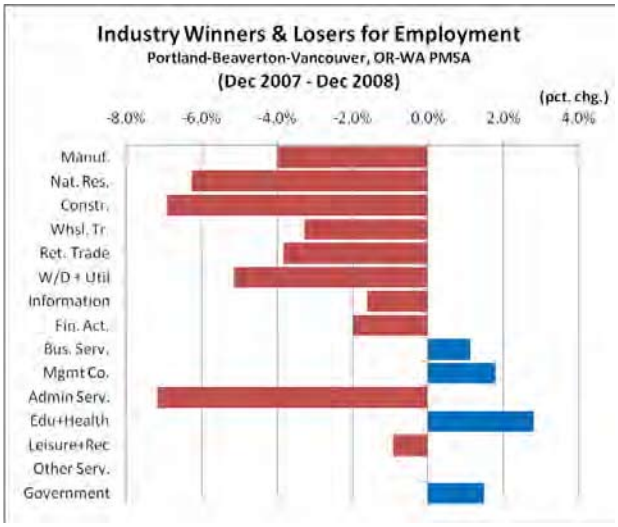
Summary of recent trends

Recent economic trends

- Majority of economists believe the economy is still shrinking. (Recent expectations of US GDP predict a decline of -4.6 percent in 2009Q1 followed by a dip of -1.5% in the 2nd quarter.)
- Portland area unemployment rate is up to 8.1% in December 2008 and now 9.8 percent in January 2009.
- Nonfarm wage and salary employment is down -1.7% from a year ago December.
- Job losses are mounting – 18,200 Portlanders have lost their jobs since last year.
- Losses are distributed unevenly with losses heaviest in manufacturing, construction and retail trade sectors. . .indications suggest the recession contagion has spread to other sectors and will worsen if the economic slide is not halted soon.
- U.S. housing crunch has infected the regional housing market – sharp declines in residential construction activity, region-wide permits numbers are in recession levels, home prices are down -12 to -14 percent. . .construction activity has yet to hit bottom.
- Fed Chairman Bernanke said that even if financial markets stabilize today, he doubts the recession will end until later this year.

Although a recession officially had been declared in December 2007 for the U.S. economy, the region's economic landscape remained relatively unscathed through the first three quarters of 2008. On a year-over-year basis, the regional economy managed to keep itself afloat over the summer despite mounting losses in the national housing and construction industries and worrisome signs emerging on Wall Street. Regional conditions deteriorated rapidly after the economic meltdown on Wall Street. By the time the financial crisis erupted in September 2008, regional employment had fallen to no growth and in the 4th quarter began posting increasingly negative job readings.



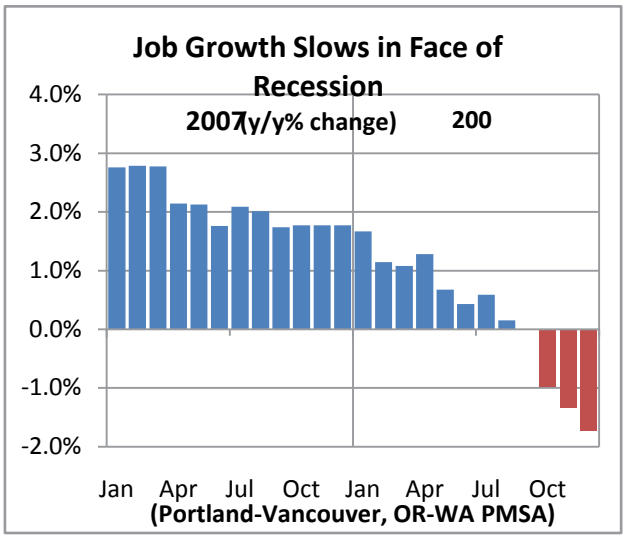


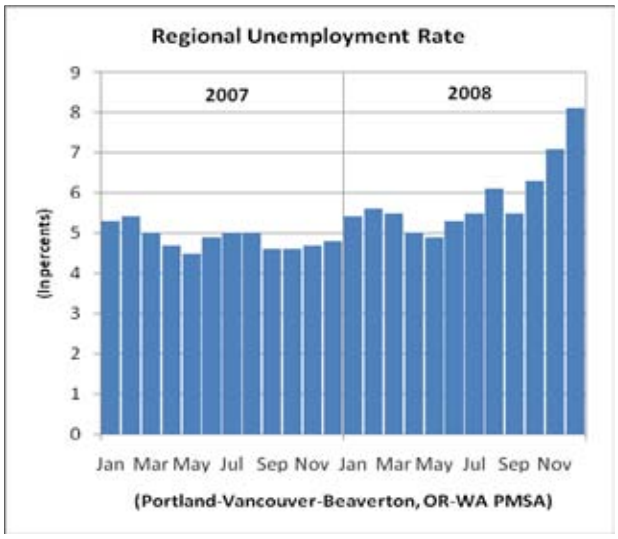
At the same time that job growth began sliding lower, the Portland area unemployment rate began its steep increase. The region's unemployment rate has ratcheted up almost a whole percentage point each month since September. As of December 2008, the regional rate stood at 8.1 percent unemployment

(not seasonally adjusted) as compared to Oregon State of 8.8 percent, and nationally the rate is 7.1 percent. Only a year ago, employment levels stood at 1,056,100 jobs – since then there has been a loss of over 18,200 Portland area jobs. Region-wide total nonfarm wage and salary employment now stands near 1,037,900 jobs.

Job losses across metropolitan area industries have been uneven. Durable manufacturing, construction, temporary help agencies and retail establishments have so far during this recession shed the largest number of jobs from the workforce. On a percentage basis, the administrative services sector (which includes firms specializing in providing temporary help to manufacturers and businesses) has had the sharpest decline, followed by the construction industry. The region's manufacturing industry has suffered the largest total losses, but on a percentage basis is only fifth in percentage decline in employment.

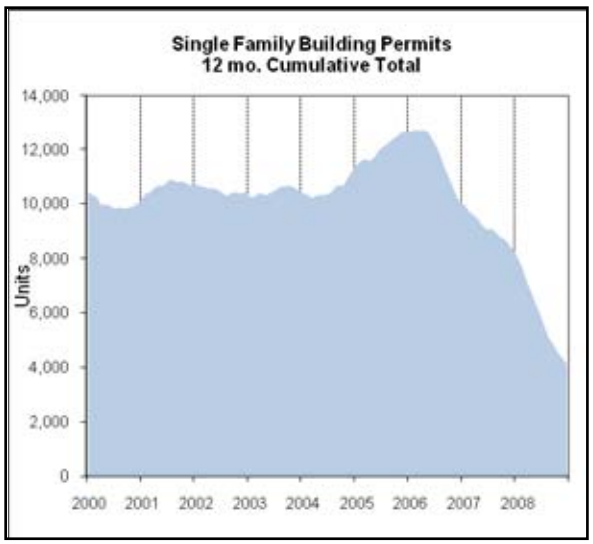
At this stage of the recession, the logistics industries – including the wholesale trade sector and the warehousing and distribution subsector – are exhibiting sharper declines that may presage a broader and deepening recession for the region. The sector comprising warehousing and distribution recorded the fourth steepest decline on a percentage basis followed closely by the wholesale trade sector. Combined the industry losses of these two sectors almost add up to the losses in the construction industry.

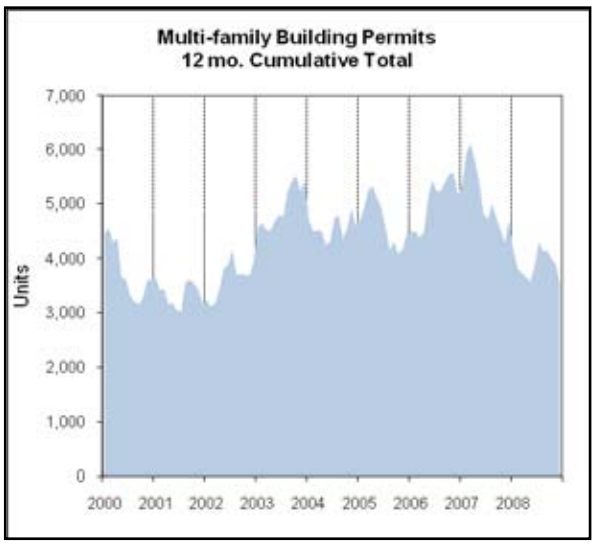




Construction and Housing Markets

The housing market continues to exert downward pressure on the regional real estate market and construction industry. National housing markets remain severely depressed. Standard & Poor's Case-Shiller price indices report a -25.3 percent annual decline in the composite home prices of the top-20 metropolitan U.S. cities. Portland shows a decline of -11.9% as of December 2008. The data indicate home prices continue to spiral lower at an accelerating pace.

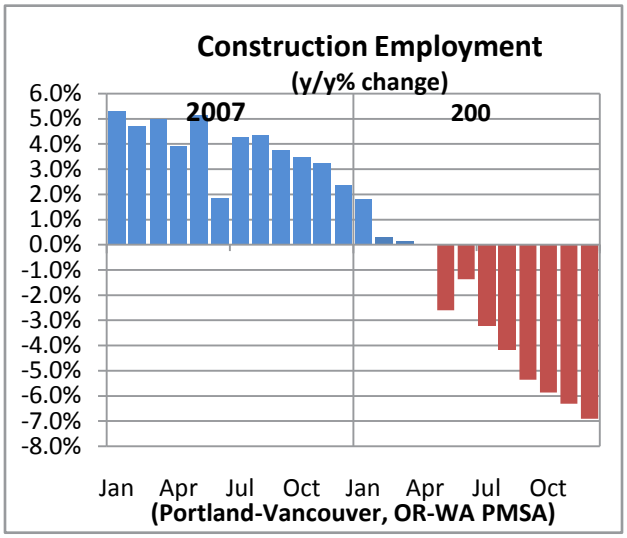




Phoenix AZ (-43.2%), Las Vegas NV (-42.8%), and Miami FL (-40.9%) lead the pack in terms of racing to the bottom. The California housing markets, particularly, San Francisco (-38.3%), Los Angeles (-35.7%) and San Diego (-35.4%) report home price declines nearly as bad as Arizona, Nevada and Florida.

Residential development activity in the Portland metropolitan area has like for the rest of the nation been a harbinger of ill economic news for some time. According to Census reports, building permit issues for single family and multifamily development have seen fairly sharp decreases since early 2007. In fact, single family residential permit reached an annualized peak of over 12,700 issued permits as recent as 2006 Q1. Single family permits remained above 10,000 units for all of 2006 and still remained fairly strong in the early half of 2007. Permit activity began falling sharply in late-2007, coinciding with the brewing turmoil in the home construction industry at the national level.

Multi-family construction in the Portland area has remained aloft longer, but has also come down to recession levels as well. This lag may have more to do with commercial development practices. Multifamily development projects typically take longer to plan and to complete than for single family. This lag may have little correlation with the recession.



The prices for median single family homes continue to see significant downward pressures. According to the Portland-Beaverton-Vancouver PMSA regional RMLS data, the median sale price for existing and new homes sold in December 2008 is $252,900 and the average is $300,800. Both figures are down -8.5 percent and -14.5 percent from the same month a year ago. These values are the lowest since the first quarter of 2006, thus all of the real estate gains since the last economic recovery in the region have been given back during this current recession.

In the same RMLS database, new listings and pending sales for December 2008 fell to 1,880 homes and 810 sold, respectively. These are the lowest December readings in over a decade. One may have to reach all the way back to the 1980-82 recession in order to identify such low levels for both these statistics.

Construction employment is -6.9 percent lower than a year ago December. Almost 5,000 construction workers have lost their jobs since the recession began a year ago. The subsector – residential building construction – has been hardest hit during the recent downturn, which has been confirmed by the negative news in home sales and home prices. The nonresidential building construction and specialty trade construction subsectors have maintained employment levels to a greater degree than residential employment construction, but as this recession lingers there will be mounting pressures to shed employment even in these construction subsectors.

This forecast anticipates further deterioration in the construction industry for the rest of 2009. Home price values will have to improve and prospects for renewed residential construction activity will need to rebound before the region will see construction employment levels begin to recover. Expect the construction industry to be an early indicator of an economic turnaround for the regional economy.

Manufacturing Sector

Manufacturers have decreased their employment levels -4 percent since December 2007. Heavy industrial goods manufacturers have been racing to the bottom at a faster pace than other manufacturers. Durable goods dropped -4.8 percent while nondurable goods fell -1.3 percent.

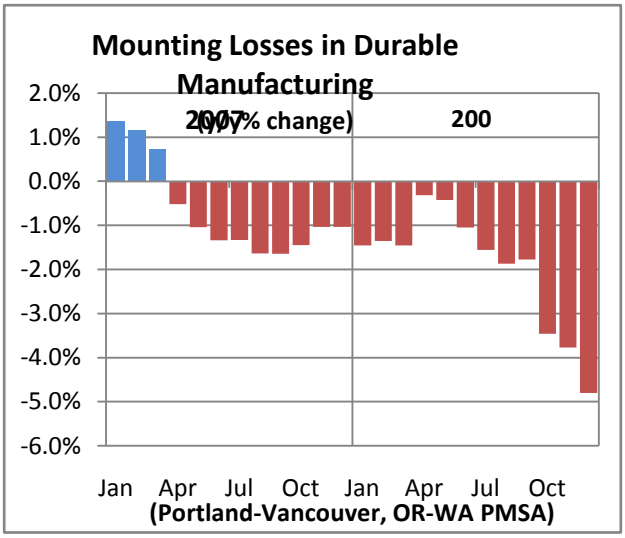
Manufacturing Subsector (NAICS)	%change Dec. 2007-08
Wood Products (321)	-17.0%
Primary Metals (331)	1.5%
Fabricated Metals (332)	-3.0%
Machinery (333)	-4.6%
Computer & Electronics Machines (334)	-5.4%
Transportation Equipment (336)	-7.8%
Other Durable Goods	-1.9%
Food Processers (311)	1.1%
Paper (322)	-6.5%
Other Nondurable Goods	-1.2%

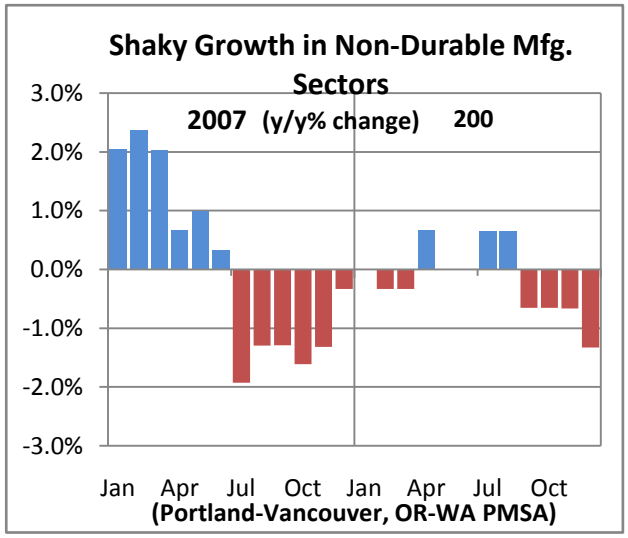
Gains (as of December 2008, year-over-year change in jobs):

- The Primary Metals and Food Processing industries report small gains in employment of 100 jobs each since December 2007.

Losses (as of December 2008, year-over-year change in jobs):

- The wood products industry has trimmed over 900 jobs .
- Fabricated metals shed 400 employees.
- Machinery declined by 400 employees.
- The computer/electronics and electrical industry eliminated 2,000 workers.
- Transportation equipment manufacturers cut 700 jobs.
- The paper and pulp producers trimmed 300 employees.

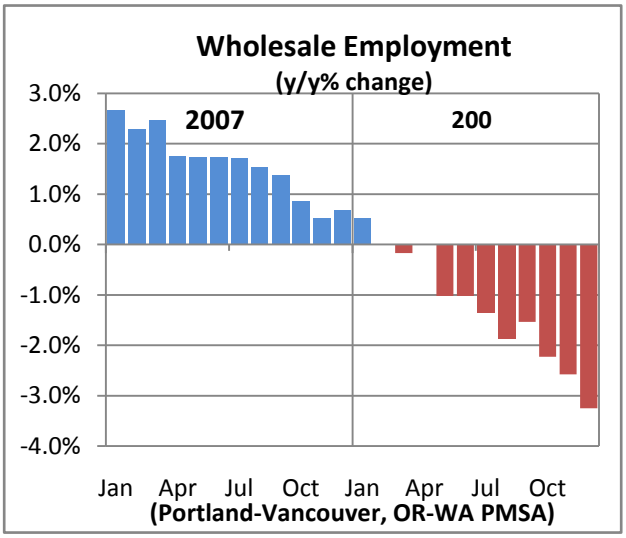




Logistics Industries: Wholesale Trade, Warehousing, Distribution and Utilities[9]

Wholesale trade, which comprises establishments engaged in wholesaling merchandise, generally without transformation, and providing services related to the intermediate step of distributing merchandise to retailers and other businesses. The wholesale sector has seen a drop of -3.3 percent of employment since December of year ago. These losses have been dominated by losses in durable wholesale goods.

Employment in wholesale trade is a cornerstone of this region's economic base. Thus the warehousing and transport of goods is a vital economic indicator of the region's health. Recent figures for the transport of goods by air and ground indicate substantial weaknesses. Employment levels are -10 percent lower in air transportation jobs and -6.3 percent lower in the truck transportation subsector. Other subsectors in transportation and warehousing show signs of weakening, but not to the degree seen in air and truck transportation.



This forecast anticipates further weakness in wholesale employment through the remainder of 2009.

Retail Trade Sector

The retail trade sector serves as a barometer for population serving industries and a gauge for how consumers are reacting to economic stimulus. Over the last 14 months, the U.S. economy has served up very little rosy news for consumers. As a result, the region has seen retail employment slip -3.8 percent on a regional basis. Substantial employment declines have occurred in the sales of motor vehicles (-11.1

[9] NAICS coding protocols include Utilities with the subsector warehousing and distribution.

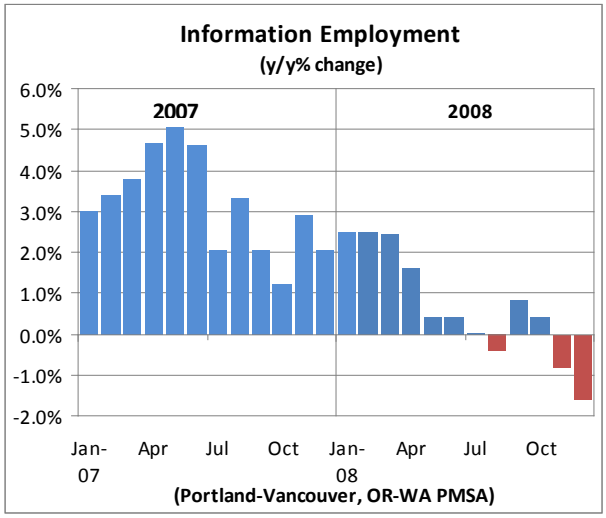
percent) and clothing retailers (-15.7 percent). The remaining larger subsector retailers have experienced modest declines in food stores (-1 percent) and general mechandisers (-4.4 percent). In a somewhat surprising development, these year-over-year declines have been partially offset by a 1.1 percent increase in all other categories of retail establishments.

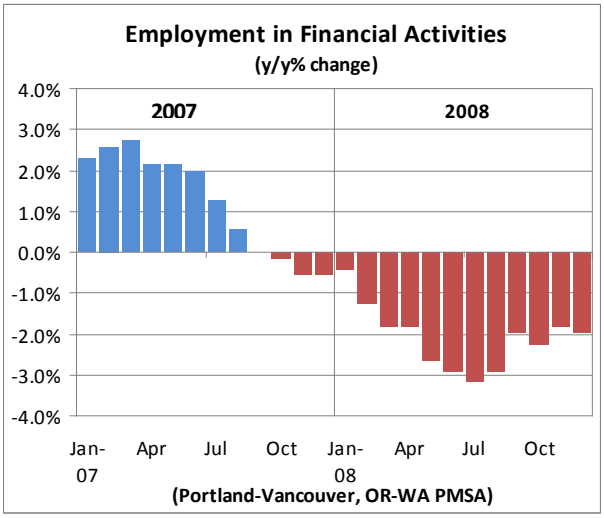
Information Sector

A moderate decrease of -1.6 percent in information service employment occurred over the last year. This compares almost equally with an overall decrease in total nonfarm employment of -1.7 percent in the same time span. Information services is predominately divided into two major subsectors: conventional printing and publishing and data processing which includes internet publishing.

Financial Activities Sector

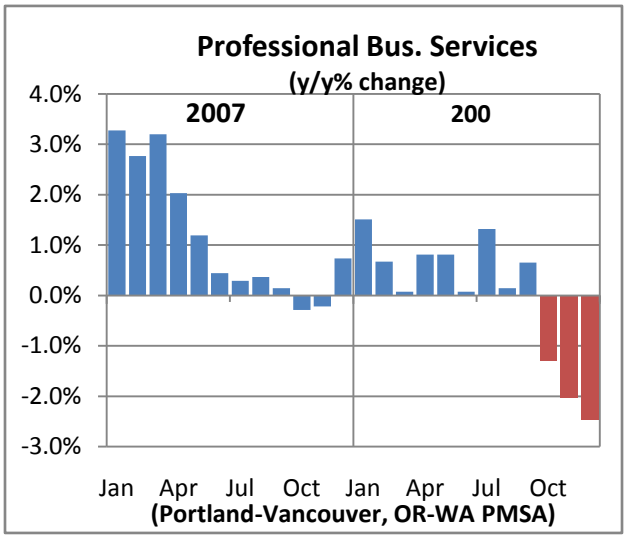
The region's financial activities sector has recently experienced a moderate employment decline in the order of -2 percent on a year-over-year basis as of December 2008. The declines in finance, insurance and the real estate subsectors seem to have stabilized since the onset of the U.S. recession over 14 months ago and from the fallout from Wall Street last September.





Professional Business Services

The professional business services sector is the largest and most diverse industry sector in the region. It encompasses a wide range of occupations including professional, technical and scientific employment; top-management employees of companies; adminstrative technicians and temporary help workers; and finally occupations in waste management and recovery. Weakness in this sector has been focused primarily in a subsector comprised of adminstrative services and temporary workers. Year-over-year



decreases in the "admin and temp" employment market continue to erode with losses now reaching 9.2 percent lower as of December 2008. Up until the financial meltdown on Wall Street, the professional business services sector has been a source of job growth in the region.

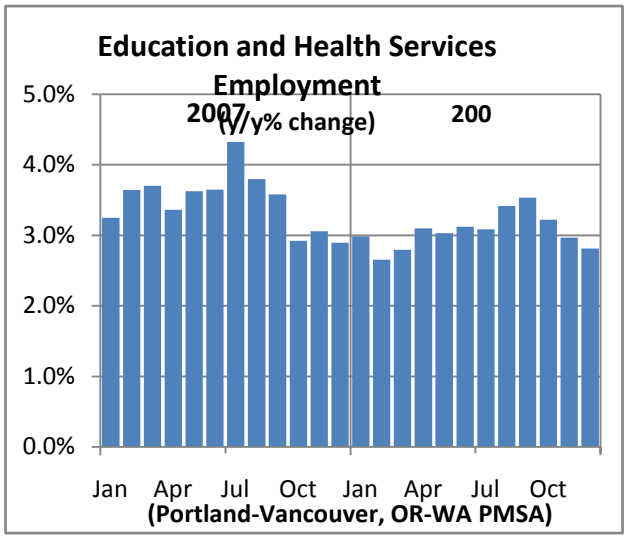
This was the last sector to register negative growth, but with the recession now fully underway, it seems more likely that job declines in professional services will accellerate as the region sinks to lower economic levels of distress. We anticipate further decreases as the other subsectors of this broad services category succumb to the overall regional malaise – this will be especially true for the professional, scientific and technical service jobs.

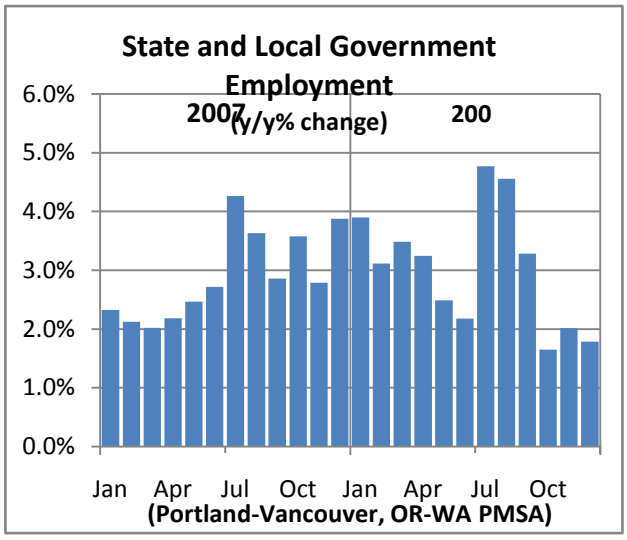
Leisure and Hospitality Services

Weakness in the regional economy also spread across to the hospitality service industry which saw a modest decrease in fourth quarter 2008 employment on a year-over-year basis. Food services and a range of accommodation establishments are included in hospitality services. As the economic downturn spread to the broader economy outside of construction and finance, the number of business travelers decreased while consumer spending on eating out were curtailed.

The arts, entertainment and recreation subsector posted surprising resiliency in the face of deteriorating economic conditions. Losses in this subsector seem to be stabilizing.

We anticipate losses in this sector to mount as the recession drags on into the summer and perhaps beyond if government bailouts fail to arrest the freefall in the national economy. Tourism and business travel will likely retrench as the recession eats away consumer confidence and businesses cut back on discretionary travel arrangements. The overall tourist markets in the region will consequently suffer from fewer consumers willing to spend and to travel to conventions and local events in the Portland area.





Education and Health Services

The education and health service subsectors both report relatively strong year-over-year employment growth in December 2008. Education advanced 1.7 percent and Health Care rose 3.1 percent on an annualized basis. These industries do not normally show drastic changes in employment levels because each industry caters to specific population-serving demand segments. The recession has so far done little to impact educational or medical needs, especially since people tend to postpone medical treatment / services in only the most dire of economic circumstances. However, next year's school budgets may tell a different story. Already, the state legislature is wrestling with potential forecasted funding gaps to pay for K-12 education. This may necessitate cuts in teacher employment.

Growth rates slowed since September 2008 but remain high relative to total growth rates in the region. This forecast projects industry growth to slide lower, but remain positive at year-end. Growth is not likely to turn negative, but if U.S. conditions worsen and the recession deepens in the state, education and health care employment may not be able to sustain positive growth in 2009 – albeit at much reduced rates.

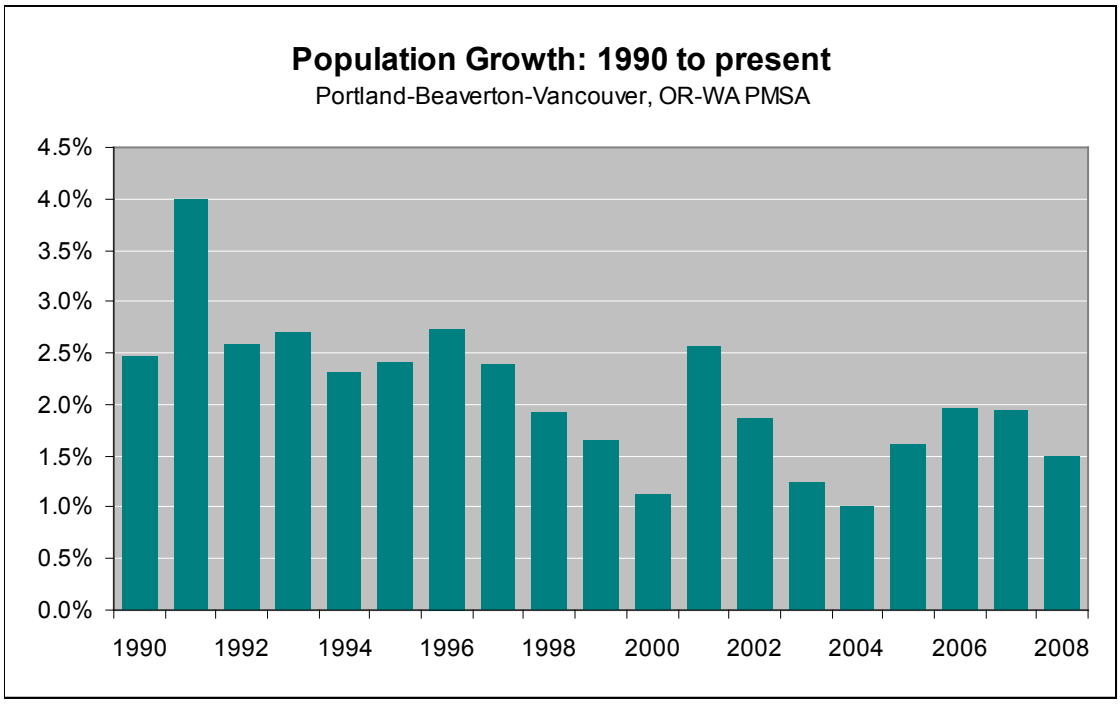
State and Local Government

State and local government is one of two industry sectors in the region still showing positive employment growth from a year ago. Although state and local budgets are being squeezed by the recession, revenues appropriated for this fiscal year are already in government coffers. The risk to state and local government employment will be in the next year or two as revenues and budgets for next year are being prepared now. If the recession continues to persist, employment levels will have to be cut to balance projected budgets. This is the last resort for local governments, but they may have no choice over the next few years.

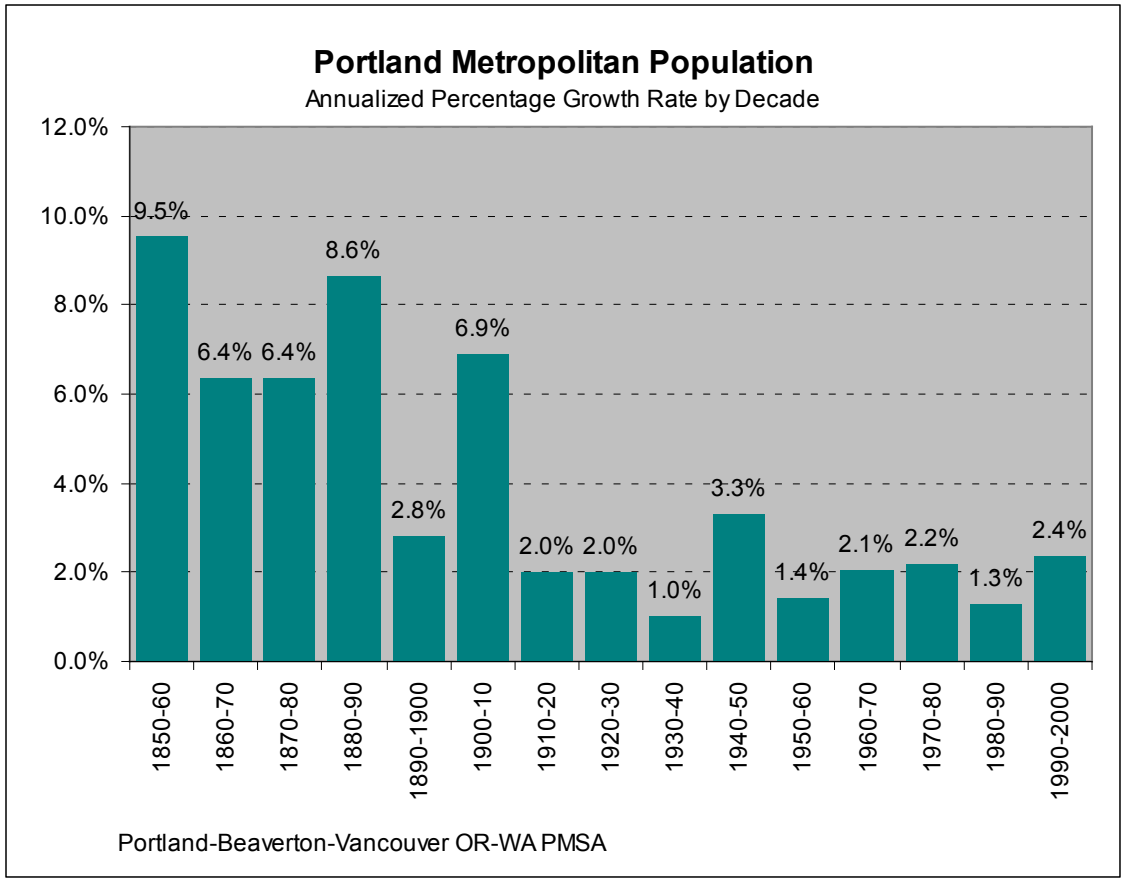
This forecast includes an expectation that job growth in 2009 will stagnate and will actually begin to see modest cuts in government employment levels through 2012 and not return to pre-recession levels until 2014.

Population trends

Population growth, particularly in-migration, in the region has been susceptible to shifting economic growth trends. The region's annual average population growth has slowed considerably in the current decade as two recessions have chipped away at regional economic vitality. A recession at the turn of the century sapped away much of the economic momentum gained during the 1990's. Population growth in the decade of the 90's was estimated to be 2.4 percent average per year. Recent annual population growth from the Census estimates 1.5 percent growth in 2008. And just as the regional economy began to recover from the 2001 recession, the latest recession hit the region in 2008 and has caused population growth to again taper off.



Population trends for the Portland region tend not to swing as wildly as employment trends, and in fact, have been fairly stable since 1910. Based on Census data collected since 1850, the region has experienced two distinct growth periods. During the pioneer exploration and discovery period prior to 1910, the region experienced decades of growth that ranged between 6.4 to 9.5 percent annual growth per year (except the recession between 1890-1900 that swept across America). After 1910, decade-by-decade estimates of population growth for the region stabilized in a tight band between 2.0 to 2.4 percent annual average growth (except for World War II and the subsequent baby boom generation). The growth rate for regional population since 2000 has been 1.7 percent per year. This tighter growth band occurs when regions mature and its population base becomes fairly large. Mature metropolitan areas normally do not experience large swings in population growth without large unforeseen economic or demographic causes such as plagues, other natural disasters or human spawned technological innovation that re-orders human behaviors.



Regional population growth is expected to trend up during the next business cycle up-turn. In the long-term, we anticipate future population growth to taper off – consistent with national and state trends. Births and deaths are expected to converge towards national averages over the long-run. Life expectancies and female fertility rates in the region are expected to trend toward national rates as the regional forecast incorporates the growth trends of the Census middle series population and demographic assumptions[10].

Why does regional population growth slow in the forecast?

- Birth rates are expected to slowly decrease in the long-run and stabilize towards the national average.

- Life expectancies are expected to rise a little more but not as sharply as the U.S. and the region has experienced during the last half of the 20th century – as medical care and geriatric services have dramatically improved life spans.

- Migration trends in the past century have generally favored states on the west coast, gulf coast and eastern seaboard. However, the mass exodus from rural states to more metropolitan areas around the country has slowed considerably, and in some corners of the country we see the tide

[10] For an abstract and detailed discussion of the Census Bureau's population projections of the U.S., please see: http://www.census.gov/population/www/documentation/twps0038/twps0038.html

of migration flowing back towards rural communities as population densities have made it more desirable for some population segments to reach back to a quieter life style.

- The regional forecast has been made consistent with national and statewide population trends, which show population growth tapering off in the long-term.

Population Forecast Comparison Table: U.S., Oregon and Portland PMSA

	U.S. Population Global Insight, 2008		Oregon Population Oregon Office of Economic Analysis, 2004		Portland PMSA Population Metro, 2008	
1990-00	282,810,000	1.24%	3,437,000	1.9%	1,927,900	2.4%
2000-10	311,370,000	0.97%	3,844,000	1.1%	2,265,500	1.6%
2010-20	342,610,000	0.96%	4,359,000	1.3%	2,703,600	1.8%
2020-30	375,120,000	0.91%	4,891,000	1.2%	3,050,100	1.2%
2030-40	407,870,000	0.84%	5,425,000	1.0%	3,371,500	1.0%

Table Notes:
Global Insight, 2008 "The US Economy 30-Year Focus"
Oregon Office of Economic is from their 2000-2040 county population forecast
Portland PMSA = Portland-Beaverton-Vancouver, OR-WA PMSA (7 counties)

Portland regional population growth is anticipated to rebound after the current recession and thus is expected to rise to 1.8 percent annually in keeping with the acceleration expected in regional economic growth.

The Appendix of this report will provide further forecast details for regional population growth.

Population Forecast trends and ranges

The Portland-Beaverton-Vancouver, OR-WA PMSA population forecast and probabilistic range

	Low	Base	High		Low	Base	High
2010	2,235,600	2,265,500	2,295,800		1.33%	1.60%	1.87%
2015	2,445,900	2,509,600	2,572,200		1.81%	2.07%	2.30%
2020	2,612,600	2,703,600	2,793,900		1.33%	1.50%	1.67%
2025	2,762,000	2,881,800	2,999,900		1.12%	1.28%	1.43%
2030	2,903,300	3,050,100	3,199,500		1.00%	1.14%	1.30%
2035	3,031,300	3,210,700	3,392,900		0.87%	1.03%	1.18%
2040	3,155,700	3,371,500	3,587,200		0.81%	0.98%	1.12%
2045	3,263,900	3,517,200	3,766,500		0.68%	0.85%	0.98%
2050	3,372,200	3,669,300	3,959,000		0.65%	0.85%	1.00%
2055	3,487,500	3,827,900	4,161,400		0.67%	0.85%	1.00%
2060	3,609,300	3,993,400	4,376,100		0.69%	0.85%	1.01%

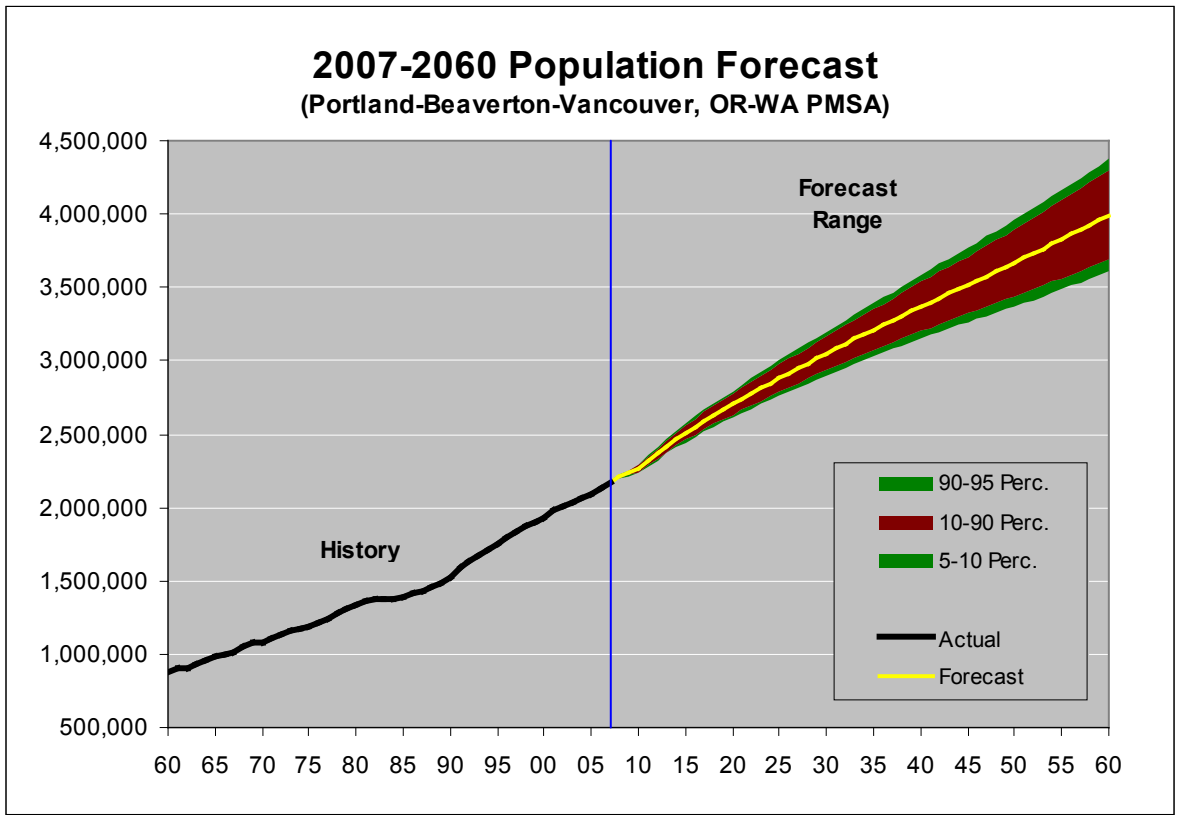


Chart Notes:

The chart above depicts the forecast range for total population in the region. The yellow line represents the "forecast mean". The red and green wedges represents the forecast uncertainty. The green wedges represent the 5% forecast uncertainty at the "part of the tail ends of the forecast distribution".

Statewide Economic Conditions

Oftentimes, the regional forecast is compared to what's expected for the state as a whole. Following is a short passage from the state economist's latest economic and revenue forecast. Although the statewide forecast is not explicitly an input into the regional forecast, it is important to pay attention to statewide trends because some of these trends impact the regional outlook. For the majority, statewide conditions are mirrored in the local and regional economy.

Excerpts from Oregon Economic and Revenue Forecast, March 2009:

The fourth quarter of 2008 posted the fourth consecutive quarter of job losses. The preliminary estimate of fourth quarter job loss in Oregon is negative 6.8 percent at an annualized rate. Under the newer North American Industrial Classification System which goes back to 1990, this is the largest single quarterly job decline. On a year-over-year (Y/Y) basis, jobs decreased by 2.5 percent in the fourth quarter.

Most sectors were hit hard in the fourth quarter. Manufacturing and construction continued to lose jobs at a high rate. Joining in heavy job losses were retail and wholesale trades, transportation services, warehousing and utilities, professional and business services, financial activities, and local government education. The only sectors not experiencing declines were food processors, private education and health services, and state government.

The recession in Oregon took a sharp turn downward in the fourth quarter of 2008. The financial crisis and steep drops in consumer spending has spread this recession to all corners of the economy. From December 2007 to December 2008, around two-thirds of all the jobs losses occurred in the last quarter of 2008.

The total private employment sector declined 7.5 percent in the fourth quarter with a Y/Y decline of 3.5 percent. This is considerably larger than the drop of 1.4 percent in the third quarter of last year. Manufacturing lost 5,064 during the quarter, accounting for 18.4 percent of the job drop in total private employment. The manufacturing employment sector is down 10.1 percent in the fourth quarter with a Y/Y decline of 7.2 percent. Private nonmanufacturing employment was down 7.1 percent in the fourth quarter. The government sector lost jobs at a rate of 3.6 percent in the fourth quarter due mainly to local government job losses.

Most manufacturing sectors declined by double-digit amounts. Within manufacturing, transportation equipment decreased 37.9 percent, with a loss of 1,610 jobs. Wood products continued to slide with job losses at 17.6 percent. Since the first quarter of 2006, wood products have lost 7,300 jobs for a decline of 20.0 percent over this period. Metal and machinery, which had been holding up, lost jobs at a rate of 9.8 percent. Computer and electronic products also felt the recession impacts of slower consumer and business spending with job losses of 16.0 percent. The "Other" category for durable goods, which includes electrical equipment, appliance, and furniture products, lost 1,000 jobs, for a decline of 17.5 percent.

In the nondurables manufacturing sectors, food processing increased 42.4 percent in this highly seasonal employment sector. The other nondurable manufacturing sector, which includes paper and allied products, had job declines of 8.1 percent.

The collapse of the housing market and the broadening recession continued to impact construction. Employment in construction decreased 18.1 percent with job losses of 4,500. From the first quarter of 2007 to the fourth quarter of 2008, construction has lost 15,700 jobs or 15.0 percent.

The dismal holiday season shopping is evident in retail job losses of 10.8 percent as this seasonally adjusted number dramatically declined due to low seasonal hiring. Wholesale trade jobs are down 7.9 percent.

The information sector, which includes software publishers, had job losses of 5.1 percent. Newspapers are also feeling the effect of lower advertising dollars from retailers.

Financial Activities continue to feel pressure from the broadening financial system problems with jobs down 8.2 percent.

Professional and business services jobs declined 12.9 percent, a dramatic change which caused the Y/Y jobs to decline 3.7 percent. Other than a slight Y/Y job loss in the third quarter of 2008, this is the first Y/Y decline since the fourth quarter of 2003.

Educational and Health Services continued to show positive job gains with 2.4 percent. The Y/Y job growth continues at a high rate of 3.9 percent.

Discretionary spending by households sharply declined in the fourth quarter as customer traffic slowed at sit-down eating establishments. Leisure and Hospitality job losses were at 1.2 percent. The Y/Y job losses of 0.6 percent are the first since the second quarter of 2002.

Overall government decreased jobs 3.6 percent. The sector within government that is mainly responsible for the decline is local government education with a job loss of 8.3 percent. Federal government was essentially flat while state government jobs were up 4.0 percent, partly a reflection of the upcoming legislative session.

2030 / 2060 Regional Range Forecast Results

Employment

The recession is a heavy burden on the region's economy. As of March 2009, the recession is 15 months old and shows very little sign of abatement. There is little evidence that the recession is anywhere near its trough. In fact, most mainstream economic forecasters and pundits believe the recession will stretch out through the third quarter of this year. This would mean a recession that would be at least 22 months in length – making it the longest since 1980-82.

How deep the economy falls and how long it will continue sliding is a subject of endless debate. Putting it into perspective as a range, an optimistic outlook might have a rebound begin this summer or a pessimistic outlook might anticipate a rebound beginning in the first quarter of 2010. In other words the recession could last another 3 to 12 months – maybe even longer if global conditions worsen to exacerbate the domestic situation. The longer the recession persists the deeper the job losses and the longer it will take for the region to climb back to pre-recession levels.

Current conditions remain pretty gloomy and this is reflected in the near term estimates depicted in the regional forecast and range growth rates – particularly the "low growth" scenario and to a lesser degree the "medium" baseline econometric trend model projection. The details of the regional forecast are mainly focused on the baseline trend model projections, while the range forecast values represent statistical confidence intervals that are plus/minus approximately 2 standard deviations from the baselines. Both near term and long-term economic conditions are directly modeled into the baseline while the ranges merely depict probable outcomes based on statistical forecast errors (i.e., standard deviations).

Annual Employment Change: 2009 to 2015
(Portland-Beaverton-Vancouver, OR-WA PMSA – 7 county total)

	2008	2009	2010	2011	2012	2013	2014	2015
High		0.3%	1.0%	2.1%	2.6%	2.5%	2.4%	2.3%
Medium	0.5%	-0.6%	0.4%	1.7%	2.3%	2.2%	2.3%	2.3%
Low		-1.8%	-0.5%	1.1%	1.9%	1.8%	2.0%	1.9%

Nonfarm wage and salary employment in the 7-county PMSA is expected to decline into negative growth territory in 2009 in the medium or baseline scenario (-0.6 percent). This forecast is based on economic conditions and futures assumptions from December 2008. In comparison, the statewide forecast predicted a decline in total employment of -1.5 percent for 2009. The statewide forecast is from the December 2008 (Vol. XXVIII, No. 4) Oregon Economic Forecast.

Current conditions have worsened in the first quarter of 2009 which makes the regional forecast a bit outdated for predicting near term economic growth trends. A recently updated Oregon Economic Forecast (March 2009, Vol. XXIX, No. 1) predicts much steeper job declines for 2009 of -4.3 percent for total nonfarm wage and salary employment in the state.

It is an expectation of the current regional forecast that the Portland regional economy will not see as sharp an economic / employment decline as the state as a whole. The Portland metropolitan economy represents nearly half of the economic growth of the state and is oftentimes the engine that drives statewide growth. The state forecast has to consider and include rural economies which generally fare worse than urban areas during a recession. Consequently, the Portland region, comprising mostly urban attributes, will see fewer job declines.

Moreover, the near term conditions do not necessarily invalidate the long-term projections of the regional forecast. Indeed, past experience indicates that economic growth will rebound and for a period grow faster. This fortuitous cyclic behavior should smooth out near term fluctuations to make the long-term portion of the forecast more plausible. In fact, this will eventually repeat itself in the current recession. After playing out the short-term business cycle effects of the recession and incorporating subsequent recovery assumptions, the regional forecast begins playing to its strength in its ability to forecast the innate long-term economic trends in the region.

In this long-term trend scenario, the forecast anticipates growth in the near term to play out the current business cycle and resulting in initially negative growth, transitioning into a short duration of faster growth to reflect a business recovery. Afterwards, the long-term trend begins to speak for itself. Employment growth in the long-run is dependent on population growth, which influences the economic sectors that are predominately population serving, such as services and retail trade. In traded sector industries, growth projections more heavily factor in national and global trends. Regional sectors such as warehousing and distribution and manufacturing subsectors such as high-tech electronics, metals, timber and transportation equipment producers are influenced by productivity trends and domestic investment expenditures and global trade factors.

The range forecast for both jobs and population reflects these economic influences except that the high growth forecast will accentuate the factors that push growth in the region faster while the low growth scenario will accentuate factors that pull the region towards slower growth. However, in order to produce statistical confidence intervals, we rely on statistical measures to generate the high and low growth forecasts. There are alternative means of creating high and low growth forecasts which are scenario based. We have opted not to use the scenario approach[11].

As the recession fades from memory, long-term growth factors that include population growth, productivity, GDP and consumption spending and domestic investment assumptions begin to exert greater influence on the regional forecast. On a global scale, exchange rates, interest rates, and relative growth potentials between the U.S. and its chief competitors also begin to play a larger role in influencing long-term employment growth of the region.

[11] The Metro Council directed staff to develop a probabilistic population model and forecast. The Council, on its own, deemed that a forecast that utilizes a statistical inference approach for generating valid confidence intervals for population would better serve their needs in the deliberation of UGB management decisions. It was stated by a panel of forecasting experts that a range forecast approach would help provide the Metro Council with flexibility in recognizing the inherent forecast risks and uncertainties in UGB planning.

The following table illustrates the range of employment growth rates for key industries in the Portland region. Although the forecast counts on certain long-term trends to be major drivers of regional employment growth, there still remains some uncertainty of the actual growth trends of these global and national economic variables. Thus the annualized percentage growth rates that approximate a 90 percent confidence interval for individual sector-by-sector growth for the high and low growth forecasts are shown.

Annualized Wage & Salary Employment Growth Range (%APR): 2008 to 2040

Industry Sector (NAICS)	High Growth Rate	Low Growth Rate
Nonfarm total employment	1.8%	0.7%
Manufacturing, total	0.6%	-1.1%
Durable Goods, total	0.6%	-1.2%
Wood Products (321)	0.2%	-1.8%
Primary Metals (331)	-0.8%	-3.7%
Fabricated Metals (332)	-0.1%	-0.9%
Machinery	-0.5%	-1.0%
Electronics	1.0%	-0.9%
Transportation Equipment	0.7%	-1.5%
Nondurable Goods, total	0.4%	-0.8%
Nonmanufacturing, total	2.0%	-0.9%
Construction	2.0%	-2.5%
Wholesale Trade	1.5%	1.2%
Retail Trade	1.0%	0.2%
Transport., Warehousing, Utilities	1.7%	1.4%
Information Services	2.2%	0.5%
Financial Activities	1.8%	1.2%
Business Services	2.4%	0.6%
Education & Health Services	2.7%	2.2%
Leisure & Hospitality	1.6%	1.3%
Other & Personal Services	2.4%	1.1%
Government, civilian total	1.1%	0.8%
Federal	0.0%	-0.2%
State & Local	1.3%	1.0%

In the medium baseline forecast, total nonfarm wage and salary employment is expected to have an annual average growth rate between 2008 and 2040 of about 1.3 percent; total manufacturing of -0.2 percent; private non-manufacturing of 1.5 percent; and state & local government of 1.1 percent. More and more of the region's job base is expected to switch to population serving growth sectors. This translates into relatively faster employment growth in nonmanufacturing sectors and government. This economic trend is exhibited in the forecast ranges.

In the medium baseline forecast, the share of manufacturing jobs in 2008 is about 12 percent of all nonfarm employment in the region. By 2040, this share drops to eight percent. Manufacturing has a total in 2008 of about 142,000 employees. Manufacturing employment levels are expected to decline in the medium scenario to almost 134,000 jobs. A steeper decline in regional manufacturing jobs is offset by growth projected in the region's high tech electronics industries. This differs from national assumptions which call for a decrease in high tech employment levels in the future.

Most manufacturing subsectors in the region are expected to see little growth or expansion through 2040. This trend mimics the general tone of the U.S. manufacturing sector, except that the Portland region's overall decline is less steep than anticipated at the overall national level. Close to 4 million American manufacturing jobs are projected to disappear over the next three decades as the nation continues to transition towards fewer domestic manufacturing activities. The average rate of employment deceleration for the U.S. is -0.6 percent according to the national forecaster – Global Insight.

The regional forecast analyzes and projects the baseline regional forecast for both population and employment. The reason for this is that the ranges which we define to be 90 percent confidence intervals are spawned from the baseline trends projections. The baseline employment forecast and the baseline population forecast determine the projected midpoint of the range and represent the value that is statistically the most likely representation of future trends. In a statistical sense of a "bell-shaped" distribution, the baseline regional forecast values provide the "mean" for the bell shaped range forecast distribution.

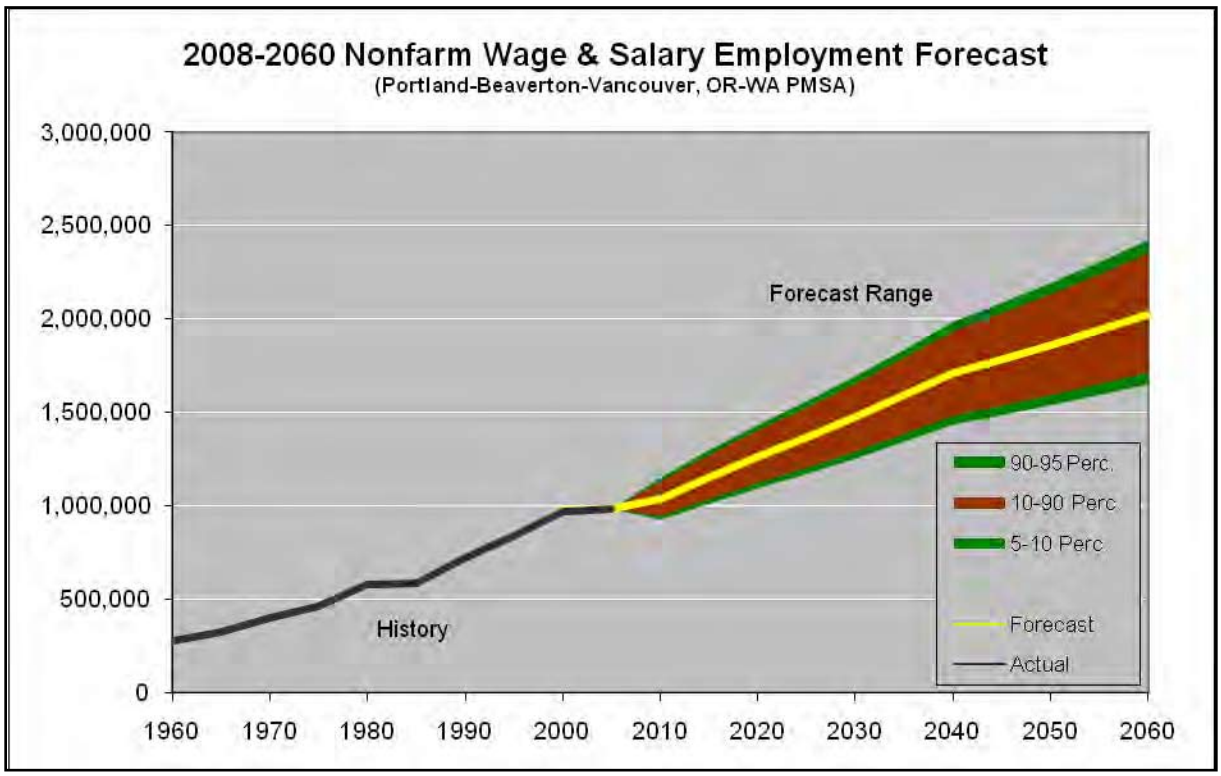
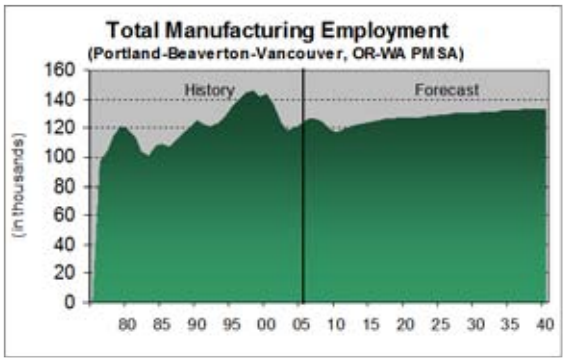
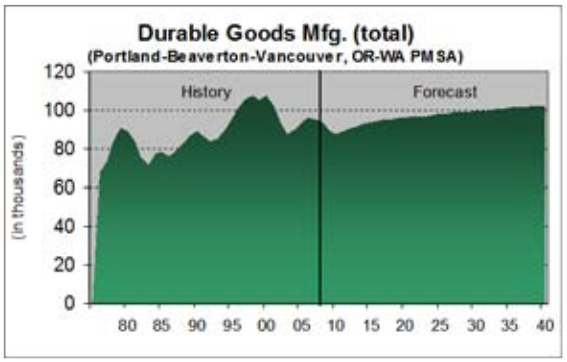


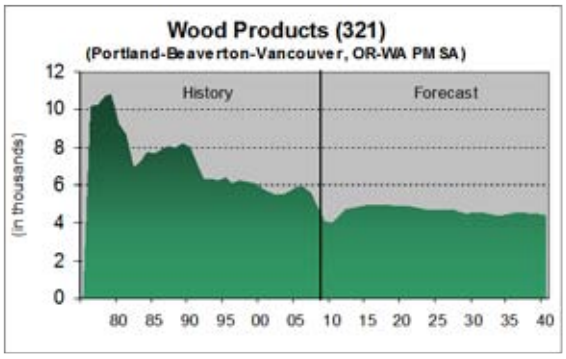
Chart Notes:

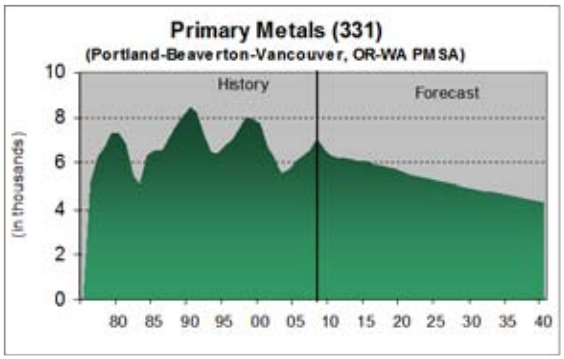
The chart above depicts the forecast range for total nonfarm employment. The yellow line represents the "forecast mean". The red and green wedges represents the forecast uncertainty. The green wedges represent the 5% forecast uncertainty at the "part of the tail ends of the forecast distribution".

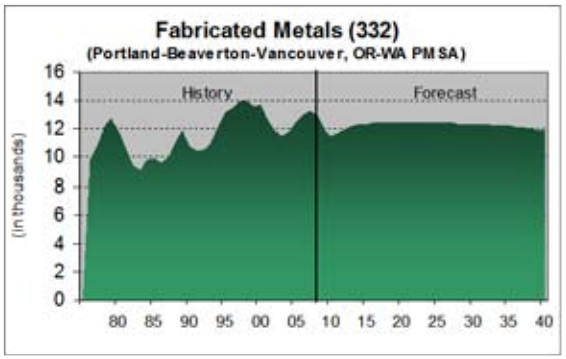
Durable Manufacturing Industry Trends

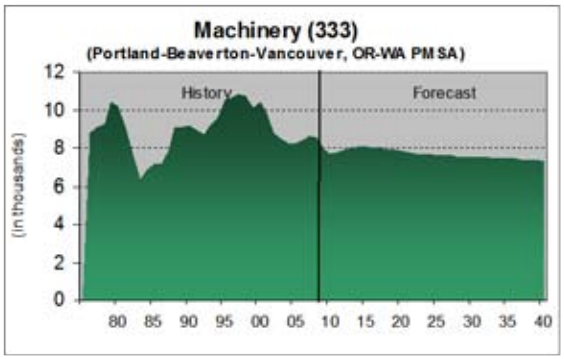


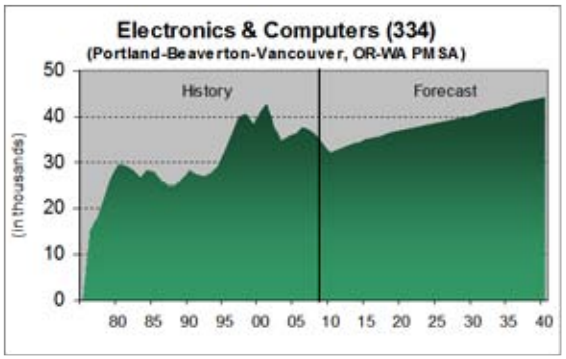


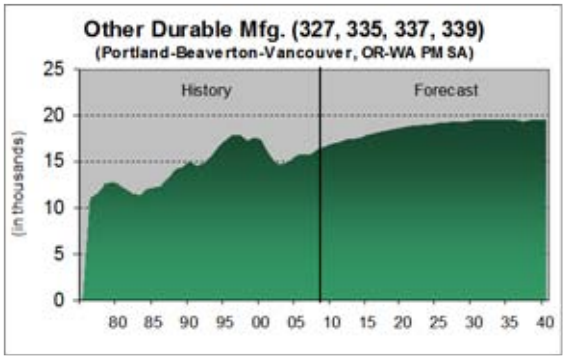




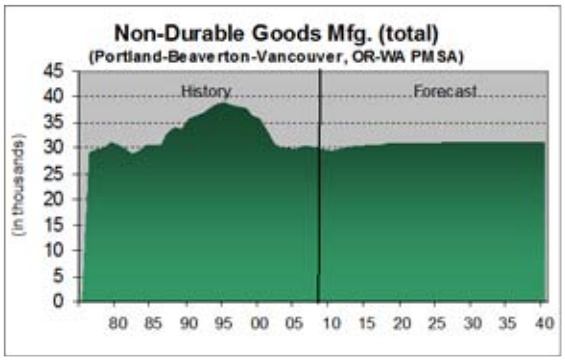


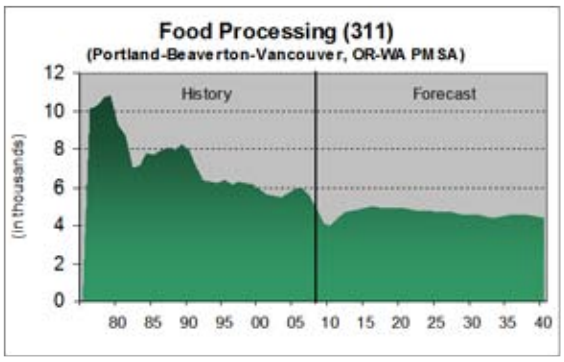


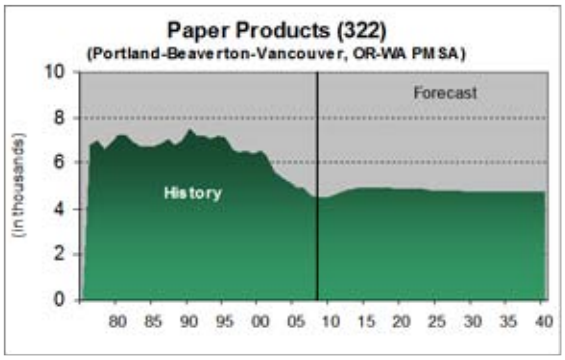


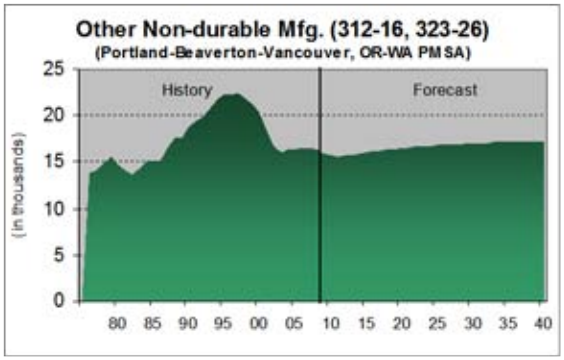


Non-durable Manufacturing Industry Trends









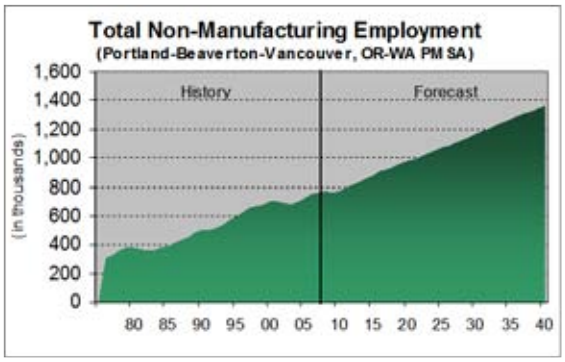
Manufacturing employment is expected to modestly rebound from today's recession battered levels. The sector will be slow to recover to its pre-recession employment levels nor is the sector expected to return to job levels last seen during the mid-1990's. Any anticipated expansion will be muted during the recovery and few strong employment prospects are expected during the long-term.

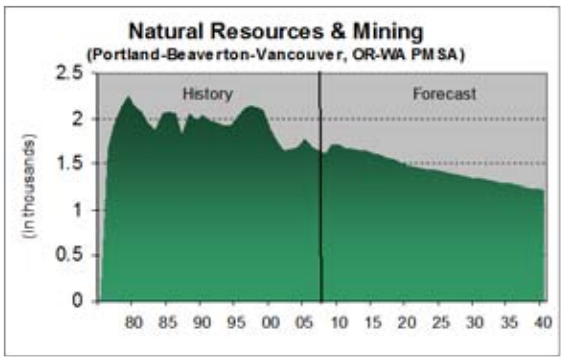
Job growth across the majority of the industry sectors in manufacturing will be constrained by overseas competition, higher productivity (which means employers won't need to hire as many people to produce the same or more output / revenue), and overall migration of jobs from manufacturing to office related occupations.

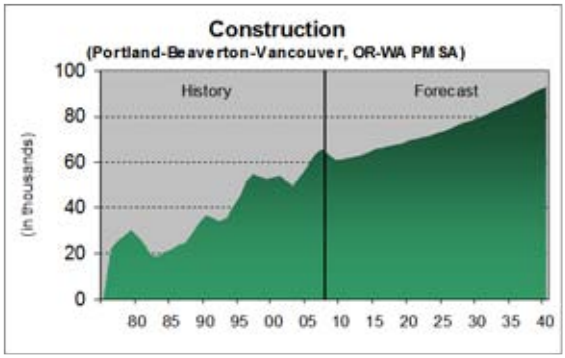
In particular, conservation concerns and resource constraints will likely continue to limit further employment prospects in resource-related sectors. Industry subsectors such as mining, paper, metals, and timber products are expected to see long-term declines as productivity levels rise and competition from foreign sources drives these jobs overseas. Higher wages in the U.S. and lower real wages abroad are market forces commonly cited as reasons for the migration of manufacturing activities to overseas locales. Also, more emphasis on environmental issues will likely push more domestic manufacturers to seek more hospitable economic conditions elsewhere.

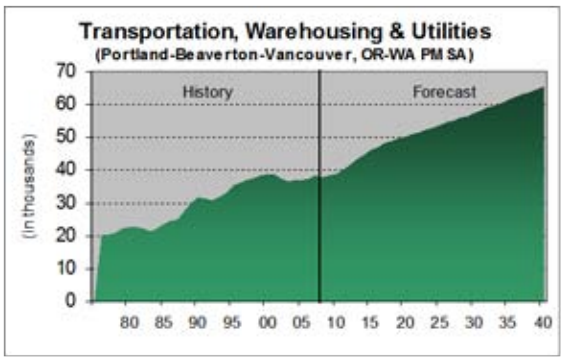
Based on current assumptions, the electronics and computer sector is expected to see modest growth rates, but even this growth is tempered by the same global economic forces that erode the employment outlook of national and other regional manufacturing sector outlooks.

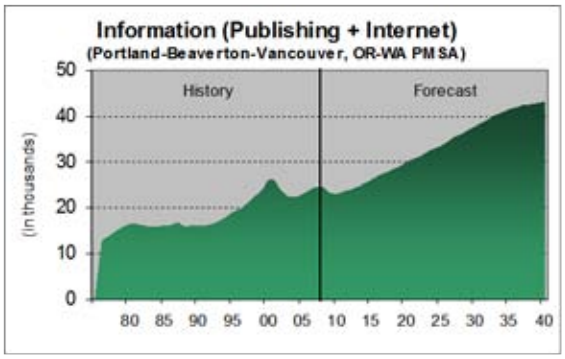
Private non-manufacturing industry trends

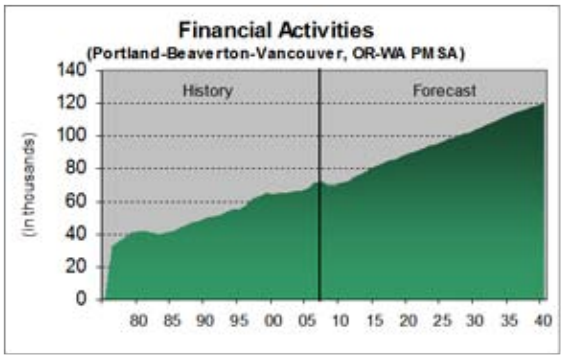


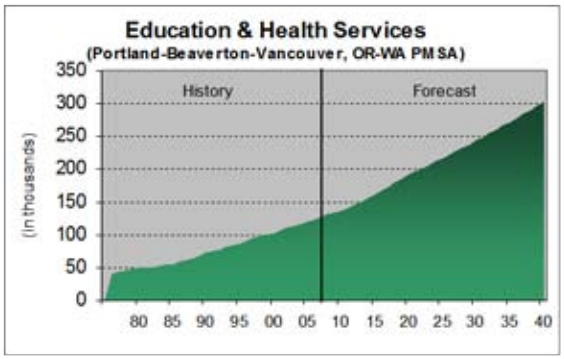


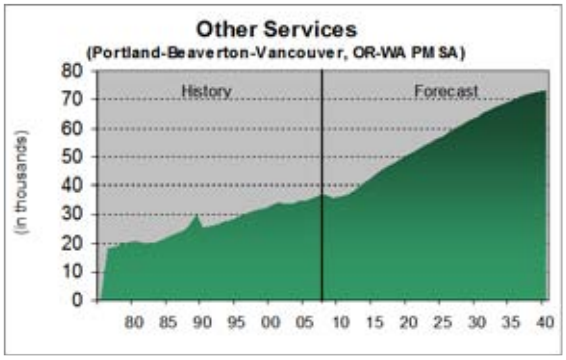










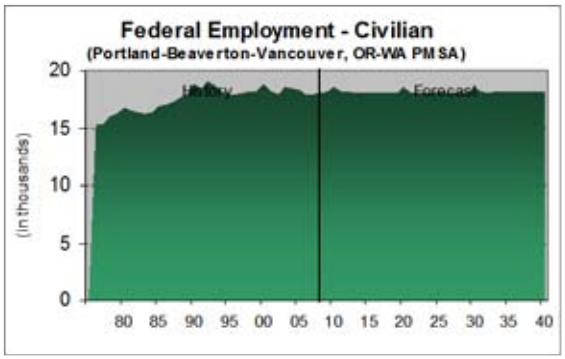


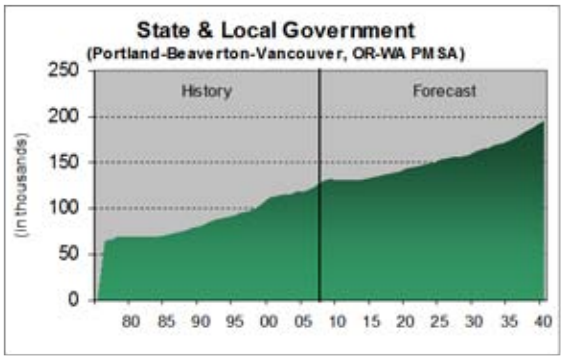
The non-manufacturing sector will see moderate job growth over the next several decades as the U.S. and regional economies transition from a manufacturing-driven economy to one focused more on service sector growth. Non-manufacturing sectors will employ over 85 percent of workers in the future. Some sectors, such as warehousing & distribution, wholesale trade may diversify even more so than today to become “traded sector” industries. In the future, more goods are expected to be produced overseas. If the Port of Portland can emerge from global competition to become a primary point of entry for international trade, the regional economy may be poised to see even more job growth in logistics related industry sectors.

Population serving sectors will see employment levels rise as the resident population of the region naturally matures. Education and health services will rise relatively faster than other industry sectors due to an aging population base and relatively faster population growth in the younger age cohorts as compared to the working age population. Finance activities, retail trade and other personal and household services will generally be expected to trend with population growth.

The region will see relatively faster job growth in professional, technical and business services as jobs that were formerly employed in manufacturing industrial sectors transition to service-related jobs that oversee technical aspects of production, research and development. Also, there will be growing demand of people to directly “broker” and oversee administrative tasks that relate to the movement and transport of goods to and from overseas manufacturing plants.

Government employment trends

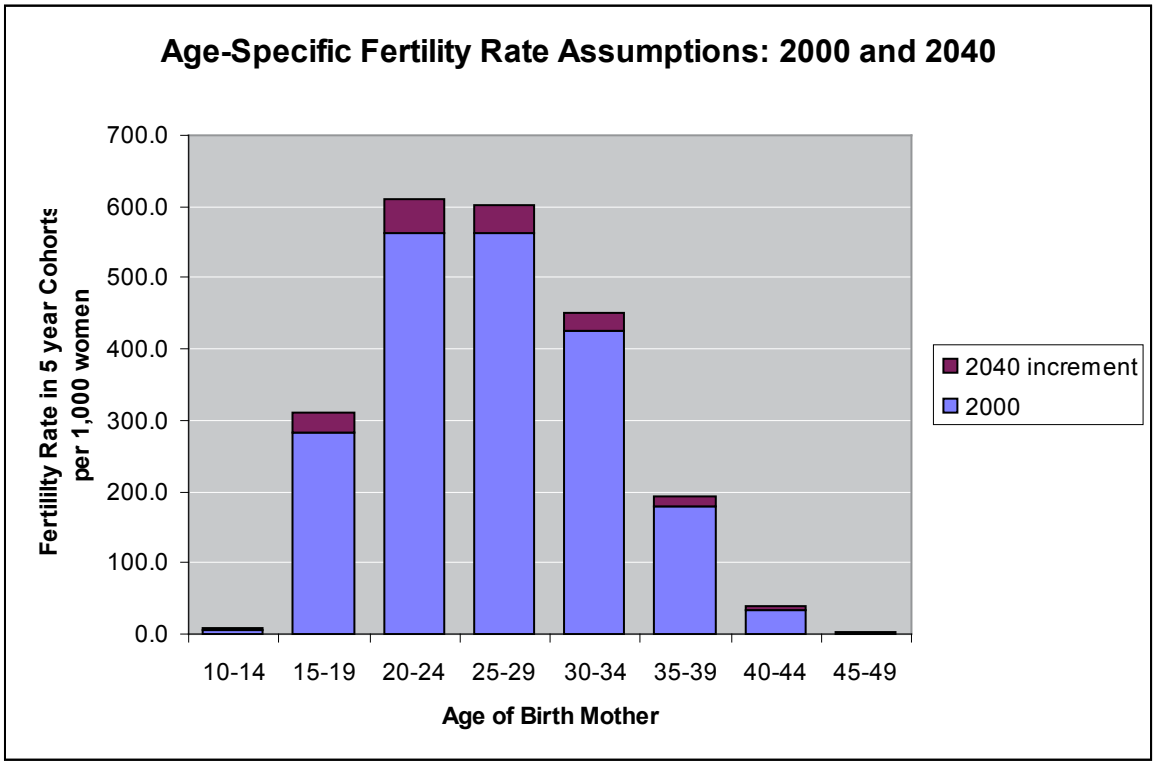




The government sector is anticipated to see relatively modest job growth that is in keeping with the population trends projected overall for the region. State and local government spending and consequently employment growth will be limited by general population growth and revenue collections. The region has never been a focal point for federal employment and that condition is not expected to change in the future. The number of federal jobs nationwide and regionally are expected remain unchanged.

Population and demographics

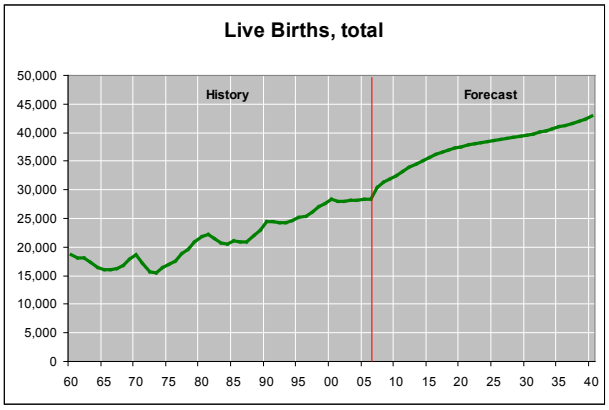
This section describes the demographic components that go into the population and growth projections.

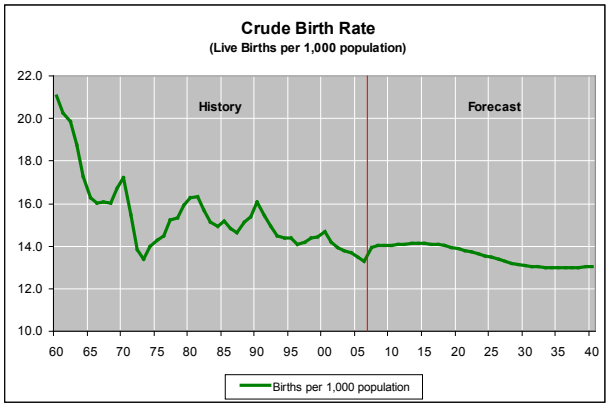


Age-specific fertility rates are calculated by dividing the number of live births in each age five-year cohort by the total female population (in thousands) in each age group. Age-specific fertility rate

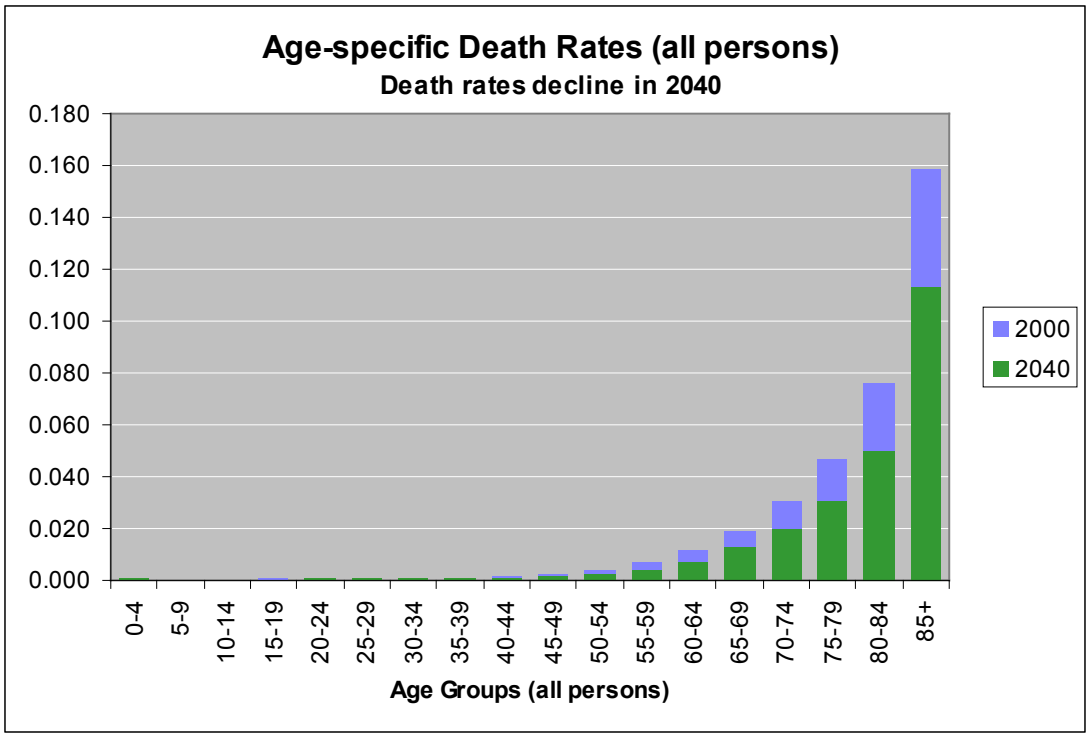
projections for the region are derived from the Census middle series assumptions and calibrated to recent regional live birth information. Female fertility rates are highest for women of childbearing ages between 20 to 29 years old and begin to taper off rapidly after age 34. The blue bars indicate the fertility rate measured for women in year 2000, while the 2040 increment represents the change by 2040 (i.e., the incremental difference between 2000 and 2040.) Summing together the age-specific fertility rates equals the total fertility rate for the average female.

The total fertility rate is the average number of children born to an average woman over the course of an average lifespan. This rate increases slightly over the forecast period. However, because of the structure of the US population and aging of it, there will be proportionally fewer women of childbearing age in the future and thus the birth rate is expected to decrease during the forecast period. The birth rate is the ratio of live births to total population. In other words, each woman is expected to have incrementally more children than compared to women today, but the total number of these births relative to total population is expected to taper off compared to historical rates.



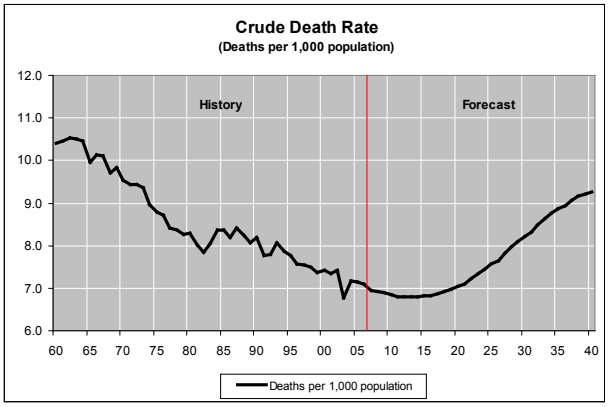


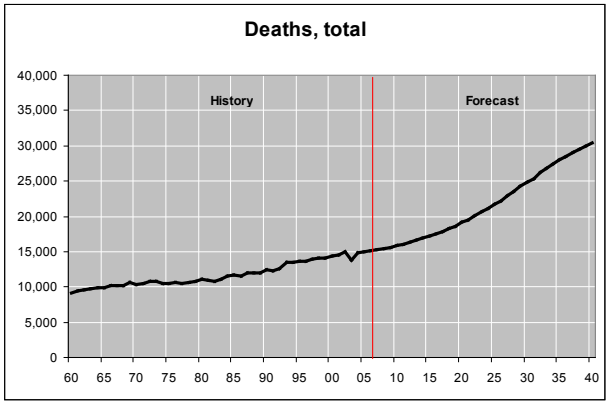
In a similar fashion, age-specific death rates are derived from Census life expectancy tables and calibrated to recent regional mortality rates. These rates are shown as age-specific death rates for all persons (regardless of race and sex – although we recognize that there are differences, we have taken a composite of these differences to create an average of death rates by age).



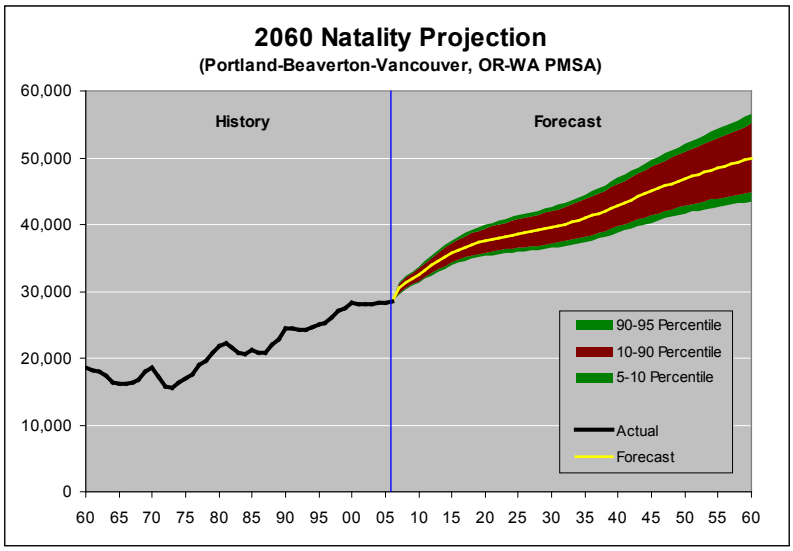
The height of each bar represents the proportion of persons in each age group who pass away each year. Life expectancies are expected to improve in the future and thus the 2040 age-specific death rates (shown as green bars) for all the age groups are lower than the year 2000 bars. For example, by the time a person reaches 85 years old in year 2000, he/she will see 16 out of 100 of his/her cohorts pass away before reaching the next birthday. As life expectancies increase, by 2040 this rate decreases to about 11 out of 100 of his/her cohorts passing away before reaching the next birthday.

However, because the average age of the population is expected to rise in the future (i.e., the graying of America), the crude death rate in the region is also expected to rise over time. Total deaths rise with increasing number of people residing in the region and as the baby boom generation grows increasingly older.

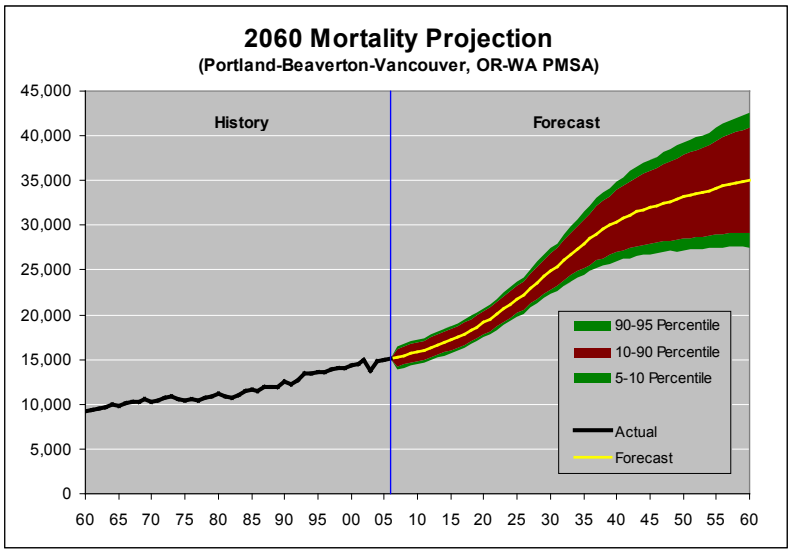




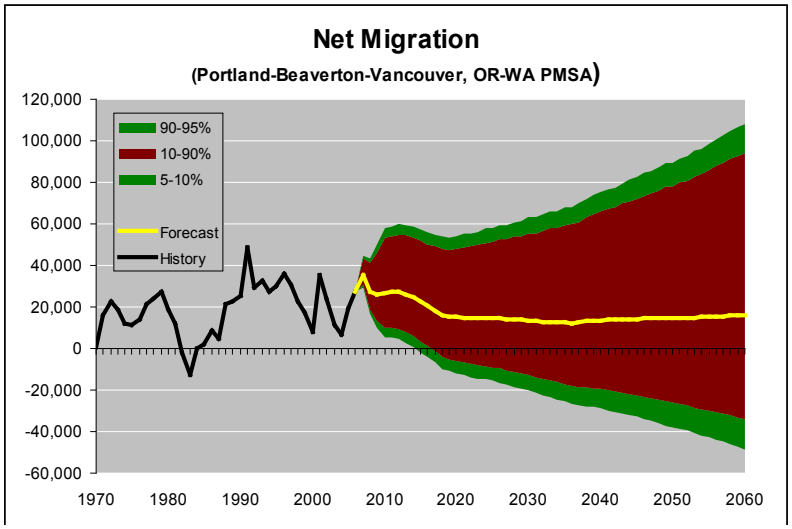
Range Forecast Projections for each Demographic Component



Resident live births for the Portland region are expected to increase as the population base rises. Age-specific fertility rates increase slightly during the forecast, but overall birth rates (i.e., live births divided by total population) is expected to decline slightly.



Resident deaths for the Portland region are expected to increase as the population base rises. Age-specific death rates are expected decline as life expectancies improve during the forecast. Overall number of deaths will grow because of the rising size of the region's population and the march of time takes its toll on the baby-boom generation.



Migration levels fluctuate wildly with changes in economic growth in the region. Future migration rates tend to duplicate the historical average level due to moderating economic trends forecasted both nationally and regionally. Large migration swings are not apparent because business this is a trend forecast devoid of cyclic fluctuations.

Putting it all together, births minus deaths plus net migration yields the population forecast. There is little cyclical swings projected in the population (and employment) forecast for the Portland region because the forecast follows the expected trend laid out in the Global Insight national macroeconomic forecast. The national forecast from Global Insight "plays out" the current recession and subsequent uptick. These fluctuations show up in the regional forecast, but in the long-term, the trends smooth out. This trend attempts to get at the underlying economic and demographic trends – leaving out only the economic up-swings and recessions that may arise in the future. For long-term planning, the base trends are what is important. Attempting to forecast business cycles is likely impossible to predict with any certainty, but the trends without peaks and dips provide useful economic planning insight for planners and decision makers.

2060 Population Forecast Revisions

Of significant note, the population projections from Global Insight are higher as compared to forecasts of a year ago. On August 14, the Census Bureau released new population projections going out to 2050. Global Insight incorporated these updated revisions into the U.S. forecast over 2018-38. As a result, the population in 2038 is 397.6 million, compared with 389.4 million in a prior forecast almost year earlier. These projections are based on new demographic assumptions from the Census for birth rates, death rates, and immigration rates.

The difference in the current U.S. population demographics is carried into the regional population forecast. The population components have been updated with new long-term Census assumptions. Also, the current regional population forecast includes near term adjustments due to the on-going recession effects on regional population growth. The result is near term population is slightly lower in the current forecast as compared to the May 2008 2060 Population Forecast, but by 2020, the technical adjustments proposed by the Census Bureau's release of new population projections bumps up the growth trend for the region's population projection. By 2040, for example, the region's total population reaches 3.372 million residents in the current forecast as compared to 3.254 million residents in the May 2008 forecast. This is for the baseline. The forecast ranges have also been adjusted accordingly to maintain consistency with the long-term range of uncertainty.

Forecast methods

This regional forecast range for the 7-county PMSA was developed using multiple methods. The forecast has two distinct future years as endpoints – 2030 for the Urban Growth Report analysis and 2060 for setting the stage for analyzing urban and rural reserves. This forecast by itself does not distribute the regional employment and population forecast to counties or subareas. Different methods are employed to forecast regional population trends and regional employment trends. However, the methods are not independent. They recognize the inherent interaction and feedback between population and employment growth and thus the regional forecast for employment and population are prepared jointly. This section briefly describes how each piece of the regional forecast and range were prepared.

Summary of forecast methods

	2030 Forecast "base case"	**2060 Forecast "base case"**	**High/Low Range Forecast**
Population Forecast	1) Regional econometric model – embedded with a cohort component population model	2) Extrapolation of the base case regional population forecast using national population growth rates	3) Probabilistic model using Monte Carlo simulation technique
Employment Forecast	4) Regional econometric model – assumes Global Insight 30-year US projections to drive regional growth trends to year 2040	5) Assumes fixed employment-population ratio trends that converts the 2040 to 2060 population forecast into employment	6.1) High and low range values that correspond to roughly a 90% confidence interval are calculated from the econometrically derived standard deviations at the industry-level. This pertains to the forecast through 2040. 6.2) For 2040 to 2060, assumes fixed employment-population ratio trends that converts the population forecast into employment

Table Notes:

1. The March 2009 regional population forecast - described as a "medium or baseline" scenario – was produced jointly with Metro's regional macro-economic model projections which include forecasts for regional employment and income. The "baseline" population forecast was developed using traditional cohort component modeling methods. This approach ages the population base sequentially for each age group and across future years. This forecast approach required detailed estimates of future birth rates and death rates for regional residents. These demographic forecast assumptions (e.g., birth rates and life expectancies – by age) were derived from the latest U.S. demographic projections and adjusted to reflect inherent differences between regional and national rates using vital statistics provided by the state health departments in Washington and Oregon. The birth rates indicate how many newborns to expect from residents of the region while life expectancy assumptions anticipate the survival rate of existing and newly arrived residents to the region (the region being 7-counties). Migration is the 3rd component to the cohort modeling approach. Migration provides the joint linkage between economic growth and population growth in the region. Hence, the regional population projections were done jointly with the econometric forecast to explicitly account for growth feedbacks between expected employment trends and population growth trends. The principal mechanism for the feedback from employment / economics to population growth is regional migration. The forecast structure anticipates population growth to grow faster when migration rates increase. Migration increases in the econometric model are relatively stronger growth rates between regional economic vs. national economic trends. We are able to forecast population growth out to year 2040 using the joint econometric model and cohort component model. For purposes of the UGR, this forecast may be truncated to 2030 to conform to the 20 year land need as stipulated under Oregon statutes.

2. The region's population total is extrapolated out to year 2060 using as its starting value the 2040 population forecast as derived from the econometric model and cohort component method. This extrapolation is based on a compounded fixed annual growth rate from the latest national population forecast trend from the U.S. Census and Global Insight. The U.S. population growth rate from 2000 to 2040 is 0.92 percent average per year. The annualized rate projected for the Portland 7-county PMSA region for the period 2000 to 2060 is 1.2 percent per year overall, but for the period 2040 to 2060, the extrapolated rate assumed was 0.85 percent – a bit slower to reflect how population growth nationwide is expected to taper off farther into the future[12]. The region, as a part of the U.S., is expected to see its population growth rate taper down along with the U.S. overall population trend.

3. A population range with a statistically generated confidence interval (i.e., a 90 percent confidence range) was developed around the base case econometric population forecast and the extrapolated population extension that goes out to year 2060. A Monte Carlo approach

[12] The appendix of this report lists several alternative U.S. population forecasts including the Census, Global Insight, Pew Research Center, United Nations and World Bank. For latest Census U.S. population estimates, see: http://www.census.gov/population/www/documentation/twps0038/tabA.txt .

using statistical simulation software that generated a sample draw of 10,000 alternative future population scenarios was used to generate high and low regional population ranges. The 5 percent samples on the high and low-end of the normally distributed population forecasts were discarded leaving a 90 percent confidence interval or range that we assume represents a credible population range that describes probable region growth. How this simulation works is that each age-adjusted birth rate is assigned a probable sample distribution – as there are "40 age groups" assumed to be of childbearing age (ages 10 to 49) and over 50-plus years we forecast into the future, the matrix for these sampling distribution sums to over 2,000 probabilistic random variables that are used in each of the 10,000 sample draws. Similarly, there are "85 age groups" that have age-adjusted death rates arrayed over the forecast period as survival rate functions (i.e., life expectancy); that is each of these 85 ages has a unique survival rate through the entire 50-plus forecast years. The matrix for the sampling distribution totals to over 4,250 separate survival rate distribution for each of the 10,000 Monte Carlo simulations. The matrix for predicting migration by age also totals to over 4,250 probabilistic distributions and also is subject to the 10,000 sample draws that create the population range forecast. Each of the sample distributions for births, deaths and migration culminate together to generate 10,000 separate population projections that form the basis for the population range and confidence interval.

4. The regional economic (employment) forecast – "medium" or "baseline" scenario – was produced using Metro's regional macro-economic model. The baseline regional forecast begins in year 2008 and extends out to 2040. For purposes of the UGR, the employment forecast can be truncated to year 2030. The national and global assumptions behind this forecast were based on the U.S. macro-economic outlook from Global Insight's 30-year national forecast. (The assumptions behind the U.S. forecast are detailed in a subsequent section of this report.) The econometric model forecasts region-wide employment growth by industry sector. These sectors are defined by the U.S. Bureau of Labor Statistics (BLS). Industry details are arrayed by the North American Industrial Classification System (NAICS) and the industry details are limited in the regional econometric model to the degree that industry disaggregation is permitted under federal privacy / disclosure regulations. (For a list of industries, please see the data appendix for the employment forecast.)

5. A "base case" employment forecast that extends from 2040 to 2060 is generated using a fixed employment-to-population ratio (e-p). An implicit ratio calculated from the econometric-based population and employment forecast for year 2040 is assumed for later years. In the base case, the 2040 e-p ratio is 0.51. What this translates to in the future is that one-half of the population is expected to hold down a job.

6. The regional employment forecast for the "base case" is extrapolated from the econometric model out to the year 2060. The beginning year of this extrapolation is 2040. In the extreme long-term, we anticipate employment changes to mirror closely the growth trends of population growth. In order to be consistent, the approach we opt for forecasting future employment trends to year 2060 is to utilize a ratio of employment-to-population (e-p ratio). The e-p ratio is

fixed at the 2040 level for each scenario for each subsequent year post-2040. The e-p ratio that converts the 2040 to 2060 population numbers for the low, medium and high growth scenarios are 0.46, 0.51, and 0.55, respectively.

Historical e-p ratio from 1960 to 2000

	1960	1965	1970	1975	1980	1985	1990	1995	2000
Empl.	882,231	989,200	1,081,978	1,192,500	1,341,542	1,391,424	1,523,741	1,749,224	1,927,881
Pop.	279,315	329,203	400,366	465,268	582,663	587,977	726,818	841,682	973,230
e-p ratio	0.317	0.333	0.370	0.390	0.434	0.423	0.477	0.481	0.505

Long-term Population and Household Trend Projection Details

The population range forecast is the basis for estimating household change in the region. The high-growth population forecast translates into a high-growth household forecast, and so on.

The population forecast by virtue of using a Monte Carlo simulation approach to the cohort-component method of population projections provides a population forecast by individual ages. This "population pyramid" affords us the ability to apply age-specific headship rates that converts the population forecasts by age into future household estimates by age. The table below illustrates the population to household conversion factors.

Age-Specific Headship Rate Assumptions

	2010	2020	2030	2040
15 to 24 year olds	0.184	0.184	0.184	0.184
25 to 34 year olds	0.471	0.471	0.471	0.471
35 to 44 year olds	0.550	0.550	0.550	0.550
45 to 54 year olds	0.575	0.575	0.575	0.575
55 to 64 year olds	0.584	0.584	0.584	0.584
65 to 74 year olds	0.623	0.623	0.623	0.623
75 to 84 year olds	0.660	0.660	0.660	0.661

Source: Metro Research Center, adapted from U.S. Census and Global Insight

Each age group is expected to have different rates of household formation. As people age, a greater proportion of them are expected to form families and non-traditional households. Although these rates may change over time, we have little econometric evidence to support changing these values at this point. There may be evidence in the future that these rates should be changed subjectively, we prefer to stay with what we know today.

The end result of this conversion and summing together and dividing total households into total population provides a quick summary of how the composition of households are expected to change. The U.S. Census reported that the average household size of Portland area residents was about 2.59 persons per household. The arithmetic of an aging population – one that has proportionally fewer people being added to the young working age population cohort – begins to slowly reduce household sizes. Older households tend to have or add fewer children. Older households eventually become single-

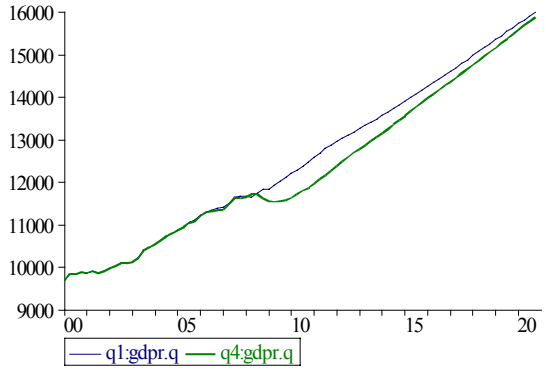
person households as one of the spouses or partners becomes deceased. As a result by 2030, the regional forecast has average household sizes decreasing to 2.46 persons in each household.

Impact of recession on the forecast

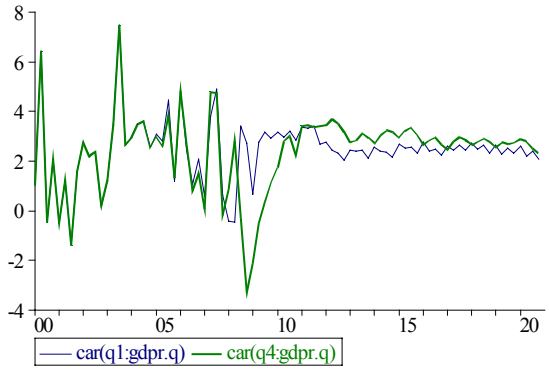
This overview compares the first and fourth quarter U.S. Outlook prepared by Global Insight. For our purposes, we assume that the Q1 2008 Global Insight U.S. forecast is a "pre-recession" trend projection while the Q4 2008 Global Insight U.S. forecast fully anticipates the extent of today's economic downturn. The Global Insight (GI) forecasts have a direct impact on the baseline Metro regional economic and population projections. The following charts outline the change to a recession growth profile for the U.S.

Note: 1st Quarter trends are marked in blue and 4th Quarter trend projections are in green.

Gross Domestic Product – Inflation adjusted

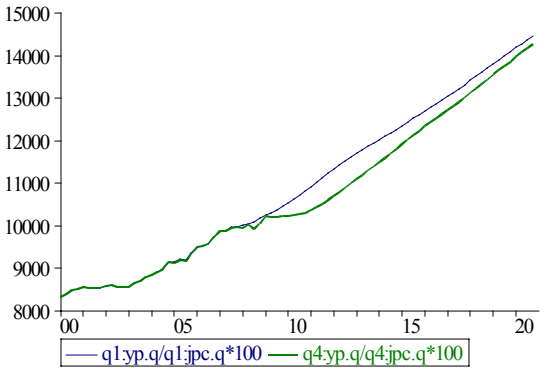


GDP – Annualized Growth Rates (in %)



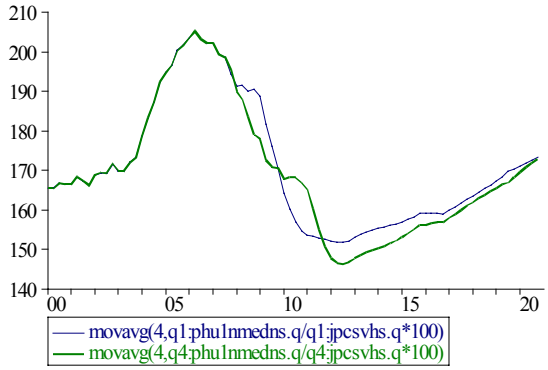
- GDP growth (in left chart– in $millions) takes a severe hit in 2008 and 2009 due to a collapsing housing market, financial meltdown on Wall Street and ensuing credit crunch that is spreading the contagion throughout the industrial, service and retail sectors.
- This recession will be the deepest in 20 years, but GI anticipates a stronger rebound than the jobless and joyless recoveries experienced after the last two mild recessions (1990-91, 2001-03).
- GDP growth begins to rebound in 2010, but growth still lags behind the pre-recession growth trend until after 2020. Real GDP will average 2.5% per year in 2008-38 (History: 3.1% [76-07]).

Personal Income also slowed by the recession (chart in $ millions).



- Consumers are expected to take a pretty strong beating in the latest GI forecast – reflected by much lower GDP and personal income growth projections.
- Retail sales, wholesaler and distribution activity, and service sector employment demand in the Portland region is expected to see substantially lower employment trends and growth rates due to a national forecast that reflects the malaise and lingering after effects of a recession that continues to worsen.

U.S. Housing Prices – Inflation adjusted median single-family housing prices take a sharp plunge



- The recession started with the piercing of the housing asset bubble which had been created by over exuberant lending and loose mortgage standards.

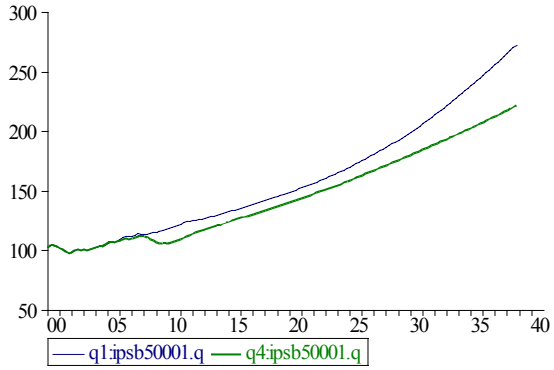
- The latest GI forecast foresees housing prices still having a ways to fall before reaching bottom.

- The Portland region has yet to suffer the full brunt of the recession, and in terms of the Portland economy, the worst is still to come. Portland has so far skirted the worst of the asset deflation and subprime mortgage debacle, but a worsening U.S. economy has spread into manufacturing and the retail and services sectors. Tight credit is hurting Main Street businesses and consumer spending. Slow sales are causing Portland area businesses to slash payroll in hopes of limiting operating losses.

- Demographic transition (older average population) will dictate slower growth of the housing stock and also produce less upward nominal price pressures (history: 5.8% vs. forecast: 2.5%)

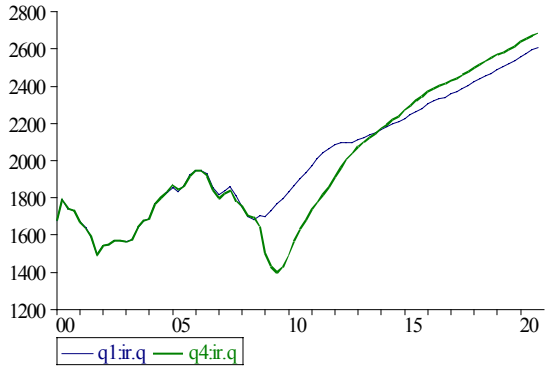
Industrial Production – index of U.S. activity

Chart Index: 2000=100



Investment - inflation adjusted is sharply reduced

Chart in $ millions



- Banks aren't lending in the current credit crisis. Stifled by a lack of available credit to finance ongoing operations, production levels are being slashed across all major sectors.

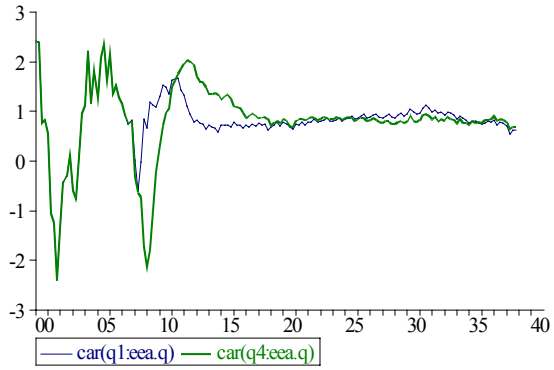
- Lack of credit is also expected to sharply reduce investment in the short-run until bank lending thaws.

- Manufacturing output in the latest national forecast calls for a dip in real activity and for lower production levels; this is expected to persist due in part to lower investment expenditures that reduce productivity over the long run.

- Domestic investment in plants and equipment are lower in the latest forecast, but investment levels are eventually expected to return to trend by 2014.

- Productivity, a key to long-term GDP growth potential – is expected to rise an average of 2% annually as compared to historical experience of 1.8% (1977-2007) per year.

U.S. Employment across all sectors are impacted by lower growth expectations – chart measures annualized growth rates for nonfarm wage & salary payroll employment



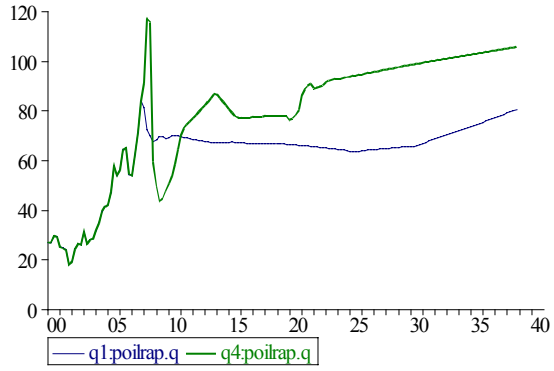
- Unemployment continues to rise as employers slash payroll expenses and trim other operating costs.

- Recession is expected worsen – driving employment lower for the remainder of 2008 and into 2009. Job growth in 2010 will turn positive, but remain sluggishly slow.

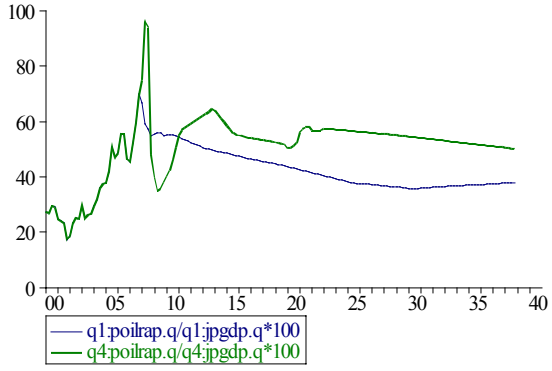
- Employment levels won't recover to pre-recession levels until 2011 and won't rebound to the long-term pre-recession growth expectations until 2020.

- In so far as the region is concerned, construction, manufacturing (particularly lumber and wood products), and temporary service employment –in this order – have been the hardest hit up to this point in the downturn.

Nominal Petroleum Prices ($ bbl)



Inflation Adjusted Prices ($ bbl)



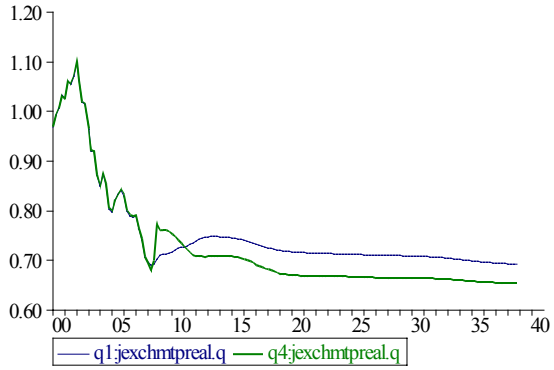
Global Insight has substantially revised its trend projections for future oil prices …

- Predicting more price volatility in the short run to emulate the U.S. recession and falling worldwide demand for crude.

- GI anticipates more mid-term fluctuations before settling into steady nominal price appreciation over the long term.

- Overall, real oil prices decline slightly, but remain high by current historical standards – this recognizes the greater supply and demand uncertainties extending into the future and that have roiled oil markets particularly last July when the price rose above $147 / bbl.

US Exchange currency rate index with major international trading partners (2000=1.00)

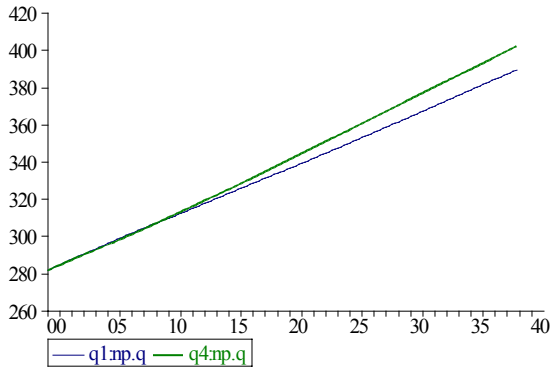


- Recent corrections in the exchange rate have helped U.S. imports (making goods we buy from abroad cheaper), but over the long term, GI predicts the exchange rate to weaken and settle back to a pattern of exchange rates prior to 2008.

- Lower U.S. exchange rates when they finally arrive will again help U.S. exports.

- However, too low of an exchange rate may make foreign investments in the U.S. riskier and less attractive.

U.S. Population forecast revised higher by Census



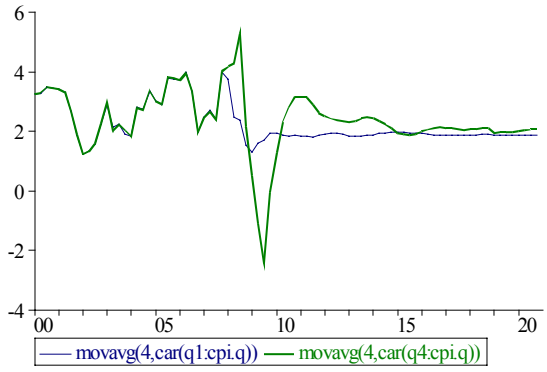
- Census expects more people, older average age, and higher proportion of non-white residents.

- Latest U.S. population projection is consistent with Census Bureau middle-growth forecast which assumes:
    1. Fertility rate of 2.1 births
    2. Life expectancy of 79 years for men and 84.8 years for women
    3. Immigration trend growing to 1.338 million in 2010, 1.473 million in 2020 and 1.664 in 2030

- Revised annual average population growth is now up to 0.9% APR from 0.8% APR found in the Q1 2008 U.S. forecast.

- By 2040, Census predicts that more than half of U.S. residents will be non-white. U.S. population will exceed 400 million residents by 2040. Share of 65-and-older population will rise above 20% from 12.6% in 2007.

Long-term inflation expectations are virtually unchanged between 1st and 4th Quarter U.S. Forecasts



- Don't expect any fundamental changes in inflationary expectations.

- After playing out the latest business cycle, GI anticipates a return to stable price changes in the neighborhood of 2 percent annual inflation rate.

- Monetary policy is anticipated to reinforce a steady-state rate of inflation by neither being overly accommodative in boosting economic output at the expense of risking an acceleration of inflation or overly restrictive in attempting to stabilize future prices.

- Hence in the long-run, real interest rates (long-term treasury yield) will rebound from current lows to a steady-state between 5.5% to 6%.

The U.S. and Global Macro-economic Perspective & Outlook

by

The following section contains reports prepared by IHS Global Insight.

- U.S. Forecast Flash by Nigel Gault (February 2009)
- Financial Weekly by Brian Bethune (March 2009)
- U.S. Long-term Macro-economic Capsule Summary by *Macro Staff* (November 2008)
- The U.S. Economy 30-Year Focus, The Trend Projection by Patrick Newport (December 2008)

Global Insight U.S. Perspective – February 2009

By Nigel Gault, Chief U.S. Economist and Group Managing Director of North American Macroeconomic Services

Current Economic Situation: The Obama Inheritance

President Obama has inherited an economy contracting more sharply than at any time since the winter of 1981-82. Real GDP declined 3.8% in the fourth quarter of 2008 (a decline likely to be magnified after revisions), and we expect further steep declines in the first half of 2009. The fourth-quarter contractions in much of the rest of the world—the Eurozone, the United Kingdom, and Japan—appear to have been even steeper than in the United States. President Obama's task is to try to interrupt the private sector's downward spiral by injecting demand through the fiscal-stimulus package, and by expanding efforts to shore up the financial sector and revive lending to consumers and businesses. But these measures are battling against extreme headwinds, and will take time to become effective. Their impact will grow as the year proceeds, but we still expect real GDP to fall 2.7% during 2009 and the unemployment rate to reach 9.3% by year-end.

Fourth Quarter "Flattered" by Inventory Buildup. The GDP decline was "only" 3.8%, because a 5.1% drop in final sales was partially offset by a surely undesired increase in inventories. Firms have cut production steeply, but not fast enough to prevent the inventory-to-sales ratio from rising. We expect final sales to decline less sharply in the first quarter than in the fourth, but firms will need to trim inventories more aggressively. As a result, we anticipate a 6.0% drop in the first-quarter GDP, followed by a 3.4% decline in the second quarter. We see the various stimulus efforts flattening out GDP in the third quarter and promoting modest growth in the fourth, with consumer spending picking up.

Private Spending in Headlong Retreat. For now, consumer spending is falling sharply, dropping 3.5% in the fourth quarter; we expect a 3.0% decline in the first. The decline in the labor market has accelerated; the United States lost 598,000 jobs in January, and 1.8 million over the last three months. By early indications, February looks just as bad as January. Housing starts and prices continue to retreat, although starts have now fallen so low that the bottom is probably near. Private investment in equipment and software retreated at a 27.8% annualized rate in the fourth quarter, with further, albeit less steep, declines on the way for first-half 2009. And nonresidential construction is poised to plunge this year. Exports are tumbling as world trade contracts, and we expect a 9.4% drop in volumes this year. Imports are falling even faster (down 11.8%, we
project), but while cutting imports faster than exports may dampen the U.S. downturn a little, it is not a route to recovery.

Deflation a Real Threat. There have been some signs of stabilization in commodity prices, but deflation remains a real threat. By the third quarter of 2009, we expect headline CPI inflation to be as low as minus 3.7% year-on-year, largely on lower energy costs. Core inflation has essentially disappeared in the last three months, and we see the core consumption price index rising just 0.5% year-on-year as of the third quarter, well below the Federal Reserve's 1-2% comfort zone.

Fiscal Stimulus on the Way. With private demand declining, the government is trying to fill the gap. We have assumed that the House and the Senate come to a compromise agreement on a fiscal-stimulus package valued around $800 billion. However, do not expect the package to change the picture quickly. Tax cuts can be implemented faster than spending, but will be partially saved. Spending has a bigger bang-for-the-buck, but takes longer to organize. The economy's path for the first half of this year has largely been set already. Still, a combination of fiscal stimulus and the Fed's and Treasury's efforts should revive the financial sector enough to at least stabilize the economy in the second half of 2009 and promote some recovery during 2010.

Fed Focus Shifts Away from Rates. We expect the Fed to hold the federal funds rate in its new target range of 0-25 basis points through the third quarter of 2010. Its main focus now will be on efforts to kick-start lending by bypassing the banks and providing financing directly into the mortgage, consumer, and business credit markets. These programs, which are still not fully operative, will be expanded under the latest initiative announced by the Treasury.

A Quick Look at the Numbers
(Annual rates)

	Quarterly				Annual				
	08:4	09:1	09:2	09:3	2008	2009	2010	2011	2012
Real GDP (Percent change)	-3.8	-6.0	-3.4	0.0	1.3	-2.7	2.0	3.5	3.3
Federal Funds Rate (Percent)	0.51	0.14	0.13	0.13	1.93	0.13	0.40	2.20	3.45
Ten-Year Treasury Yield (Percent)	3.25	2.60	2.62	2.64	3.67	2.65	3.10	4.35	4.58
Oil Prices, WTI (Dollars/barrel)	59	39	33	37	100	37	51	61	74
Consumer Price Index (% change y/y)	1.5	-0.4	-2.3	-3.7	3.8	-1.9	1.7	2.2	2.3
Housing Starts (Millions)	0.66	0.51	0.50	0.55	0.90	0.55	0.96	1.39	1.59
Consumer Sentiment (Univ. of Michigan)	58	58	55	57	64	57	66	71	72
Unemployment Rate (Percent)	6.9	7.9	8.5	9.0	5.8	8.7	9.4	8.7	7.9

source: U.S. Forecast Flash, Feb. 2009

Details of the Current U.S. Economy & Financial Condition by Brian Bethune, Chief U.S. Financial Economist

Current Conditions as of March 2, 2009

U.S. equities markets continued to deflate over the past week, as recent indicators on January new and existing home sales, durable goods orders, shipments and inventories, and weekly unemployment claims in late February suggested that the growth picture in the first quarter of 2009 will not be much better than the downwardly revised estimate of minus 6.2% in the fourth quarter of 2008.

Long-term bond yields spiked higher, with the 10-year yield moving up by more than 15 basis point to over the 3.00% threshold on Friday. The LIBOR Treasury-eurodollar (TED) spread remained steady near the 1% level.

The Treasury announced a program to convert up to $25 billion in preferred Citigroup shares to common stock, based on matching conversions from other private holders of preferred shares. This program could potentially bump the federal government's share ownership to 36%, but fears of further dilution of common stock by further Treasury equity injections sent the value of Citigroup stock down by about a dollar a share to close to $1.50.

President Obama outlined his long-term budget priorities for 2009–19 in a keynote speech to Congress resembling a state of the union address. Bottom-line, the budget incorporates much higher taxes for upper-income brackets, less spending on defense, and more outlays for financial system stabilization. The budget, while sweeping in terms of its scope, did not contain any major surprises. His bold goal is to reduce the deficit significantly by the end of his first term, from a projected $1.7 trillion in fiscal 2009 to $581.3 billion in fiscal 2012.

The president accomplishes this primarily by raising taxes on higher-income households and individuals, while reducing spending on defense contingency operations and certain healthcare programs.

The 2001 and 2003 tax cuts would be grandfathered for households earning less than $250,000, but the president re-institutes the higher tax brackets of 36.0% and 39.6% for households with incomes above $250,000. Also, with respect to the personal tax code, the president proposes to make the "Making Work Pay" tax credit permanent and expand the earned income tax credit over the long term.

With respect to business taxes, the budget makes upward adjustments to the net operating loss carry-back provision, which was substantially scaled back in the fiscal-stimulus legislation; makes permanent the R&D tax credit; and extends incentives for clean power generation.

With respect to defense spending, the president adjusts the budget baseline to include the real full-year costs of emergency spending (i.e., to reflect current overall overseas contingency commitments), and then makes proposals for reducing this higher baseline for defense spending, primarily by accelerating the withdrawal of troops from Iraq.

The president proposes comprehensive long-term reforms to the healthcare system. The concept he is floating is a "healthcare reserve fund." The reserve is funded about 50% by new revenues, and 50% by

savings in efficiency and accountability. Revenues are funded by limiting itemized deductions that reduce the marginal tax rate below the 28% threshold for households with over $250,000 in income. Cost savings come from reducing drug prices and containing Medicare overpayments, inter alia. However, the healthcare reform proposals leave open the question of broadening access to health insurance.

Finally, the budget proposes an additional $250 billion (on a net present value of expected losses basis) for stabilizing the financial system. This is in addition to the funds already provided under TARP, and recognizes that further large commitments of public capital, including further injections to the GSEs, are necessary to restore the normal functioning of the credit markets.

The main Achilles' heel of the president's budget in the short term is the assumption that the U.S. economy will suffer a decline of only 1.2% in 2009, and see a strong rebound of 3.2% in 2010. A more realistic forecast range would be a decline of 2.0–2.5% this year, with perhaps a rebound of 2.0–2.5% next year.

Indeed, IHS Global Insight expects the economy to contract 2.7% in calendar 2009 and then rebound a modest 2.0% in 2010. With further injections of public capital to the financial system along the lines of what the president is proposing, we would expect the deficit to approach $1.8 trillion in 2009, and likely be around $1.2 trillion in 2010.

With the substantial long-term tax increases that the president has in his budget on households and independent businesses with incomes above $250,000, it could be extremely difficult to muster the votes from moderate Republicans to support such a tax plan. Thus, while the plan is bold in terms of its proposed redistribution of the tax burden to higher income earners, it will be very tough uphill sledding to get the required votes in the Senate to pass this type of overhaul of the tax system.

Fed Chairman Ben Bernanke provided semi-annual testimony to the House financial committee last week, and his central message was that the key to stabilizing the economy is stabilizing the financial system. If this is done soon, the recession will end in 2009 and the economy will grow in 2010. According to the chairman, the economic downturn intensified late last year and the severity of the downturn is continuing—the economic outlook has worsened. Growth will resume in the second half of this year, provided financial markets stabilize. The federal funds rate is likely to stay where it is "for some time."

Bernanke noted that financial conditions have improved recently—LIBOR rates, mortgage rates, and corporate risk spreads have declined. However, "securitization markets remain shut…and some financial institutions remain under pressure." The near-term outlook is grim, with some light at the end of the tunnel. According to the FOMC's central tendency forecast, output will drop sharply in the first half of this year, but growth will resume in the second half. The unemployment rate should rise to 8.50–8.75% this year, and remain above 8.0% during 2010. Both overall and core inflation should remain low for the next two years. Policymakers expect a full recovery to take more than "two or three years." Over the long run, a term that economists refer to as the "steady state," growth should settle at 2.50–2.75%, the unemployment rate at 4.75–5.00%, and inflation at 1.75–2.00%. According to Bernanke, "This outlook for economic activity is subject to considerable uncertainty, and I believe that, overall, the downside risks probably outweigh those on the upside."

Chairman Bernanke's central message is that the key to stabilizing the economy is stabilizing the financial system. If this is done soon, the recession will end in 2009 and the economy will grow in 2010.

However, if the financial system remains gridlocked, the economy could be hit by the "destructive power of the so-called adverse feedback loop, in which weakening economic and financial conditions become mutually reinforcing."

Energy prices were mixed. Crude oil nearby futures (April) bumped up by $5.74/barrel to $45.22/barrel on Thursday as OPEC made noises about lowering output. Wholesale gasoline futures popped by 20 cents to $1.30/gallon. Natural gas spot prices dropped further, by 35 cents to $4.07/million Btu on Thursday, as weather remained temperate. Retail gas prices dropped by 5 cents to steady near $1.96, but retail diesel prices declined by a further 6 cents to $2.13.

Private petroleum inventories fell by 2.9-million barrels, less of a drop than the week before, but a second consecutive fall. Crude stocks climbed by a token 0.7-million barrels; gasoline stocks fell 3.4-million barrels, but distillate stocks climbed. The 0.8-million-barrel rise in distillate inventories is not normal in winter; in fact, a 2.0- million barrel drop would have been normal. Distillate stocks are very high. Gasoline inventories fell by 3.4-million barrels when just half of that would have been normal. Gasoline stocks are just under the midpoint of normal. Crude stocks, already high, climbed 0.7-million barrels to score a third consecutive week over the 350-million barrel mark; it has only bested that mark briefly since about 1990. Crude stocks are well above their normal high for the year and are more than 25-million barrels above the top of normal. Refineries' operating rates drifted lower to 81.4% of capacity for more slow fading in the face of weak demand. Inventories are flush, but imports have fallen and have remained low for two consecutive weeks.

Gold prices fell sharply in what appears to be a technical correction—prices dropped $44 per ounce to $947 per ounce on Thursday. Copper prices rebounded by 6%, and nickel prices edged up by 2%.

With respect to consumer demand, housing, and household financial indicators, indicators were mixed, as the latest weekly indicators on store sales and consumer sentiment improved, but confidence measures for February as a whole declined, mortgage applications fell, and new/existing home sales fell sharply in January.

- The ICSC-GS weekly retail report showed that samestore sales rose 0.6% during the week ended February 21. A few weeks back, the index was down 2.5% yearover- year, but recent gains have narrowed that loss to just 0.8%. Helping deliver this week's improvement was a modest decline in gasoline prices. ICSC Research expects another drop of 1–2% in retail sales in February. The tough economic climate will force the shuttering of underperforming stores and the disappearance of some chains altogether, transforming the retail landscape.

- The Conference Board's Consumer Confidence Index tumbled 12.4 points in February, to 25.0—the lowest level in its 42-year history. Assessments of both current and future conditions deteriorated, reflecting heightened anxiety over business conditions and job security. The present situation index dropped 8.5 points, to a 26- year low of 21.2, pulled down by worsening business and labor market conditions. The expectations index plummeted 15.0 points, to a record low of 27.5, as outlooks for the economy, jobs, and incomes turned more pessimistic.

- The ABC News/*Washington Post* consumer comfort index, a four-week moving average, inched up one point, to -48 for the week ended February 22, as President Obama signed the $787-billion fiscal stimulus package into law in the preceding week, leading to optimism about a potential improvement in personal finances. The index is down 11 points from a year ago.

Opinions on personal finances jumped again this week, climbing 4 points, to -2, as news of the substantial tax cuts included in the stimulus package worked its way down to consumers. Views on the state of the economy continued to hover 2 points above its record low of -90, and views on the buying climate climbed also held steady, at -52.

- The Mortgage Bankers Association's seasonally adjusted Market Composite Index, which measures mortgage applications volume, fell 15.1% for the week ended February 20 (after rebounding 45.7% in the prior week). The index was up 11.8% from a year earlier. The refinancing index decreased 19.1%, after jumping 64.3% in the previous week. It was up 47.1% year-over-year. The purchases index (which excludes refinancing) slipped 2.6% this week, after rising 9.1% in the prior week. The index was down 30.1% yearover- year. The average contract rate for 30-year fixedrate mortgages rose 8 basis points, to 5.07%.

- Existing home sales tumbled 5.3% in January, to a 4.49-million-unit annual rate, a record low (data start in January 1999). Single-family home sales were down 4.7%, falling to a 4.05-million-unit rate, the lowest since August 1997. Condo/co-op sales plummeted 10.2%, to 440,000 units, another record low (data start in January 1999). Sales were down 14.7% in the Northeast, 5.7% in both the South and Midwest, and flat out West. The median price of a single-family home was down 14.8% year-on-year (y/y), while the average price was off 13.3% y/y. The months' supply of existing homes increased 0.2, to 9.6 months.

- New home sales tumbled 10.2% in January, to a 309,000-unit seasonally adjusted annual rate. This was a record monthly low (data start in 1963). Sales were up in the Northeast, but down in the other three regions. The number of unsold new homes fell to 342,000—the 21st-straight monthly decline. Still, the inventory yardstick—the months' supply of new homes at current sales rates—rose from 12.2 months to a record-high 13.3 months. The median months for sale rose 0.1, to 9.3, its highest reading since August 1982. The number of completed new homes for sale, which had set a record high of 199,000 units in January 2008, fell to 167,000 units. Normally, this number would average less than 100,000.

- The University of Michigan consumer sentiment index fell 4.9 points in February, to 56.3, giving back nearly all the gains made in the prior two months. The index of current economic conditions edged down 1.0 point, to 65.5. The slight decline followed from consumers' heightened anxiety about deteriorating conditions in the labor market. The index of consumer expectations plunged 7.3 points, to its lowest level since June, as respondents expressed a nearly universal sentiment that the current downturn would last at least a year. With the economy unwinding, consumers expected an inflation rate of 1.9% over the next 12 months, down from 3.6% a year earlier. With respect to output, production, and employment, indicators were generally negative, as durable goods orders fell further in January, and claims for unemployment insurance jumped towards the end of February.

- New orders for durable goods fell 5.2% (down $9.0 billion) in January, with defense orders plunging $5.3 billion; defense orders had been unusually high in December. Excluding defense, orders fell 2.3%. The previous estimate for December was revised down by 1.6 percentage points. Shipments fell 3.7%, with nondefense deliveries off 4.2%. Orders for civilian aircraft and parts rebounded 43.6%, but it was in the parts, rather than in capital goods; the implied aircraft capital goods orders totaled a whopping $3 million. Orders for nondefense capital goods (excluding aircraft) fell 5.4%, deepening the drop since July to 20.7%. Motor vehicles and parts

orders fell 6.4%, and will remain weak. Inventories fell by 0.8%, but have a very long way to go to catch up to the collapse in orders and production from last summer.

- Initial claims for unemployment insurance on a seasonally adjusted basis ballooned to 667,000. Claims soared by 36,000 in the week ended February 21, despite an upward revision to the previous week's figure. The worsening picture suggests that the pace of layoffs will not slow any time soon. Continuing claims (reported for the week ended February 14) rose 114,000, to 5,112,000, after climbing 178,000 in the previous week. The record-high stock of insured unemployed underscores not only the suffering of job seekers, but also of the businesses that would otherwise be employing them. The four-week moving average, a more stable measure of unemployment claims, followed suit with the other indicators, climbing to 639,000—the highest level since October 1982. In next Friday's employment report, IHS Global Insight expects job losses of 750,000 during February, with the unemployment rate climbing to 8.0%.

- The Chicago Purchasing Managers' Business Barometer firmed by almost a point, from 33.3 to 34.2, but it was only one point off the lowest level since early 1982. The production reading firmed to 34.7 for a pickup of five points, but that level is still severely depressed. Orders were weaker than the month before, but have been so bad that it would have been hard for them to be worse. Backlogs are shrinking across most businesses and employment prospects went from very bad to even worse; the employment reading sank to 26.2 and was a scant three points away from setting a new all-time low going back to 1948. Supplier deliveries (vendor performance or complaints about slow delivery of supplies) remains the only thing holding the Chicago index up. Prices paid slipped a bit, to 37.8, but prices paid are falling and no longer seen as a major threat. General reports on financial markets, prices, and policy were generally negative, as home prices remained under general downward pressure at the end of 2008, and real GDP growth in the fourth quarter of 2008 was revised down substantially.

- The downward trend in prices continued during December: the 10-City Case-Shiller Composite Index dropped 19.2% year-on-year (a record decline), while the 20-City Composite was down 18.5% (also a record). Year-on-year, prices retreated in all 20 cities covered. House prices were back to their third-quarter 2003 levels. The downward trend in prices In eight cities, the drop was 20% y/y or more; 14 cities had double-digit declines; and in two cities (Denver and Dallas), the drop was less than 5%. Phoenix (down 34.0%), Las Vegas (down 33.0%), San Francisco (down 31.2%), and Miami (down 28.8%) reported the steepest declines. The national index was down 18.2% y/y in the fourth quarter, the largest decline in its 21- year history. The 10-city composite is down 28% from its June 2006 peak. House prices were back to their third-quarter 2003 levels.

- For December, the seasonally adjusted monthly FHFA/OFHEO purchase-only House Price Index increased 0.1%, after a 2.2% November drop, but fell 8.7% y/y. The monthly index was up in five of nine Census divisions, but all nine were down versus October. The December reading was down around its February–March 2005 levels. From the third to the fourth quarter, prices fell 3.4%; they were down 8.2% from a year earlier.

- The fourth-quarter GDP decline was revised from 3.8% to 6.2%, an even bigger downward revision than had been anticipated. A similarly steep decline is likely in the first quarter. The revised estimate of fourthquarter GDP growth came in at minus 6.2%, down from the initial estimate of minus 3.8%. The revision is bigger than expected—we had anticipated minus 5.3%. The GDP decline is the largest since the first quarter of 1982 (6.4%). Final sales fell 6.4%, worse

than the initially estimated 5.1% drop, accounting for about half the revision. Consumer spending, business fixed investment, exports, and state and local spending all fell more sharply than first estimated. Lower inventories accounted for the other half of the revision, and less of an inventory overhang is good news, but the steep decline in private spending is very bad news. We expect GDP to fall at roughly the same pace in the first quarter as in the fourth, around 6%. Most major categories of private spending were revised down. Consumption fell 4.3% (instead of 3.5%), business fixed investment fell 21.3% (instead of 20.1%), and exports fell 23.6% (instead of 19.7%). Also, state and local government spending fell 1.4% (instead of 0.5%). These revisions imply that the economy entered the first quarter on a steeper downward trajectory than previously thought. The only part of the revision that could remotely be described as good news was that inventory accumulation was lowered. Instead of adding to inventories, the business sector shed inventories— although not as rapidly as in the third quarter. This suggests less of an inventory overhang, and perhaps less need for steep production cutbacks. The problem here is that firms are chasing a moving target. As sales go even lower, so do desired inventories. In January, for example, durable goods producers cut their inventories, but their inventory/sales ratio still climbed because shipments fell even faster. There is still a major inventory correction to come. The new GDP statistics are now much more in line with the evidence on hours worked and industrial production. They suggest that the productivity increase initially announced for the fourth quarter simply did not happen. Our initial reaction to these figures is to anticipate a similar-sized GDP decline in the first quarter. Our February forecast shows a 6.0% drop. It is likely that final sales will decline more steeply than we thought (we had expected a 2.6% drop), but that the inventory correction will be less severe. But the overall GDP contraction will probably still come out around 6%. And the lower starting point for 2009 implies that the overall decline in GDP for the year will be in excess of 3.0%, rather than the 2.7% in our February forecast.

Source: U.S. Financial Weekly, March 2, 2009

Global Insight U.S. Long-term Macro-economic Outlook –2008 year-end Capsule Summary

by Patrick Newport, Director of Long-term Forecasting

This issue of *The U.S. Economy, 30-Year Focus* presents Global Insight's most recent set of long-range projections. Given the detail available in the current Global Insight model, the projections for the next 30 years cover not just the macro concepts such as output, inflation, and unemployment, but also the more disaggregated variables such as production and employment by industry. This disaggregation provides a variety of concepts for analysts to use in their planning models. Many of these variables serve as inputs to Global Insight's Regional and Energy models.

While the long-range outlooks have been of particular interest to utilities and state and local governments, which have relatively long planning horizons, they can be equally relevant to analysts dealing with shorter intervals. This is especially true of the trend scenario, the principal long-range projection. The trend is completely consistent with Global Insight's August short-term baseline (Control) solution (detailed in the August 2008 issue of *The U.S. Economic Outlook*), which represents our forecast through 2018. Thereafter, the economy is expected to make a transition to full employment (4.5–5.5% unemployment), and then evolve gradually along this full-employment growth path. Hence, the transition between the short- and long-term forecasts is smooth, making the trend projection an excellent base for ten-year planning purposes and policy simulations.

A Comparison of the Past and Future
(Percent)

	History 1977-2007	Trend 2008-2038	Cycle 2008-2038	Optim 2008-2038	Pesim 2008-2038
Average Annual Real Growth					
Potential Output	3.1	2.4	2.2	2.9	1.8
GDP	3.0	2.5	2.3	3.2	1.9
Consumption	3.3	2.1	2.1	3.0	1.4
Business Fixed Investment	4.9	4.2	4.2	5.0	3.3
Government	2.2	0.9	0.9	1.5	0.5
Exports	6.0	6.5	6.1	7.3	6.0
Imports	6.6	4.5	4.6	5.7	3.7
Average Annual Growth					
Labor Force	1.5	0.7	0.7	1.3	0.4
Productivity	1.8	2.0	1.8	2.1	1.6
Industrial Production	2.7	2.7	2.2	4.3	1.1
Average Level					
Inflation (Chain-wt. Implcit GDP deflator)	3.6	1.9	2.6	1.3	3.1
Unemployment	6.1	4.8	5.6	3.6	5.1
Average Percent of GDP					
Fuel Import Bill	1.4	2.1	2.3	2.3	1.9
Trade Balance	-2.3	-0.3	-0.5	-1.7	2.5
Federal Deficit	-2.3	-4.4	-5.2	-3.2	-5.5
Fixed Investment	11.4	10.8	10.9	11.1	10.2

Note: Growth rates for the projection period are compound annual growth rates calculated between the years 2007 and 2038.
Level Variables are averages for the years 2008 to 2038. Interpretation of the historical figures is similar.

Long-Term Projections

The Global Insight *30-Year U.S. Forecast* includes four projections: baseline, cyclical, optimistic, and pessimistic. The **trend projection** is the baseline scenario. It assumes that the economy suffers no major mishaps between now and 2038. It grows smoothly, in the sense that actual output follows potential output relatively closely. This projection is best described as depicting the mean of all possible paths that the economy could follow in the absence of major disruptions. Such disruptions include large oil price shocks, untoward swings in macroeconomic policy, or a financial meltdown.

[The cyclical, optimistic and pessimistic projections are not used by Metro. Global Insight's complete forecast description is provided in its unedited form for the reader. Metro only uses the Global Insight trend projection for generating the baseline trend regional forecast. Population and employment growth ranges are derived from Metro's own probabilistic population model and employment growth ranges are derived from the probabilistic population forecast using static employment-population ratios.]

The **cyclical projection** is the primary alternative scenario. It superimposes business-cycle behavior on the trend scenario. Economic growth proceeds in a series of starts and stops, with periods of rapid expansion, followed by externally, or policy-induced recessions. The timing of the recessions is merely suggestive. Because it is impossible to predict the exact timing of business cycles much in advance, it is unwise to focus on specific years. It is also inappropriate to calculate average growth rates between different points in the business cycle.

Mortality Assumptions
(Ultimate levels by 2050)

	Trend/Cycle	Optim	Pessim
Life Expectancy at Birth (Years)			
Male	80.9	80.9	80.9
Female	85.3	85.3	85.3

The **optimistic projection** is the upside scenario, in which economic growth proceeds smoothly but more rapidly than in the baseline, while prices rise more slowly. In this projection, population, labor force, and capital stock growth, as well as exogenous technological changes, occur more quickly than in the trend. Potential output thus climbs more rapidly, and because output is primarily supply-determined in the long run, real GDP grows 0.8 percentage point quicker per year.

Contributions to Real Potential GDP Growth
(Average annual percent change)

	History	Trend		Cycle		Optim		Pessim	
	1992-2007	2008-22	2023-38	2008-22	2023-38	2008-22	2023-38	2008-22	2023-38
Factors of Production: Private Nonresidential									
Labor Force (0.646)	0.9	0.3	0.5	0.3	0.5	0.5	0.9	0.3	0.3
Capital Stock (0.259)	1.2	0.7	0.9	0.7	0.9	0.9	1.0	0.6	0.8
Energy (0.07)	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0
Govt. Infrastructure (0.025)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	2.2	1.2	1.5	1.1	1.6	1.5	2.1	0.9	1.1
Contributions to Factor Productivity									
Research and Development	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other	0.7	0.8	0.9	0.7	0.6	0.9	1.0	0.6	0.5
Total	1.0	1.0	1.1	0.9	0.9	1.1	1.2	0.7	0.8
Real Potential Growth	2.5	2.2	2.6	2.1	2.4	2.6	3.2	1.7	1.9

Note: Figures in parentheses are production function weights. All real data are in chained 2000 dollars. Labor and capital exclude labor and capital used to produce energy.

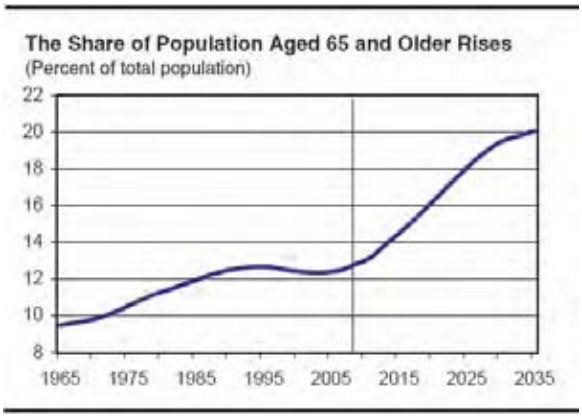
The **pessimistic projection** is the downside scenario. Here, growth proceeds smoothly, but more slowly than in the baseline, and productivity growth is weaker. In this projection, population, labor force, and capital stock growth, together with exogenous technological changes, occur less rapidly than in the trend. Output thus climbs 0.6 percentage point more slowly per year.

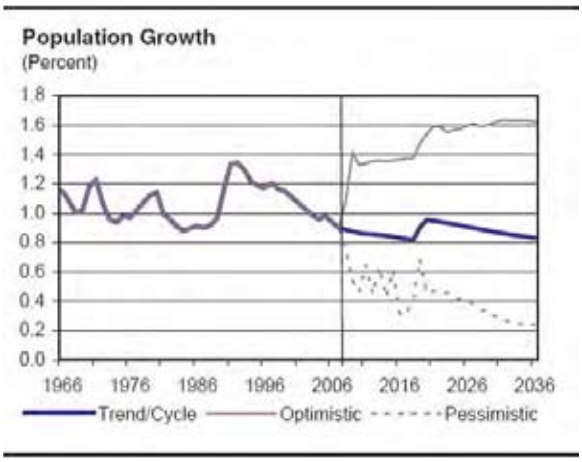
Probabilities

The underlying rate of growth in "*TREND30YR0808*" is consistent with history, as well as with conjecture about the economy's unfolding structure. It can be regarded as the best-unbiased projection of the economy. Although any probabilities attached to long-run projections must be highly subjective, Global Insight believes there is only a 10% chance that the economy's underlying path will be outside the bandwidth encompassed by the optimistic and pessimistic projections.

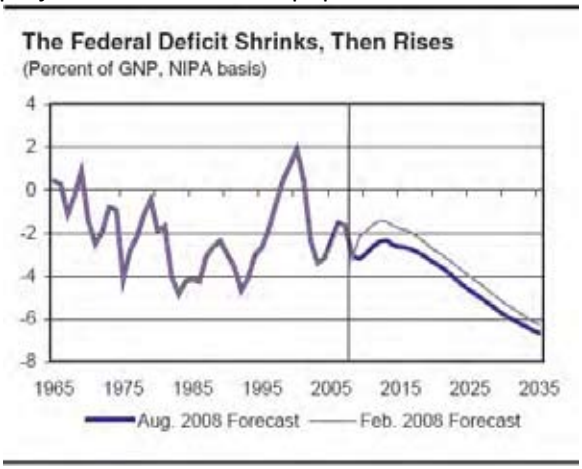
Key Long-term Assumptions

Demographics. Demographic factors are a primary driving force in any long-term economic projection. The population's growth rate and changes in its composition have considerable impacts on the labor force, the full-employment unemployment rate, housing demand, and other spending categories-most notably, consumption of health services and purchases by state and local governments.





The population projections in Global Insight's trend and cyclical scenarios are built on the Census Bureau's latest projections, which were released in August 2008. These projections replace the Census 2004 "interim" projections, and incorporate new basic fertility, mortality, and migration assumptions. Since the Census's projections for 2001–07 are not the same as its latest population estimates, we have spliced the projections to the latest population estimates.



The "middle" projection is based on specific assumptions about immigration, fertility, and mortality rates. According to the Census, the fertility rate (the average number of births per woman upon completion of childbearing) will rise from 2.02 in 2001 to 2.06 in 2025 and then slip to 2.03 in 2050, while the mortality rate should continue to improve, with life expectancy for men and women rising steadily from 75.7 and 80.8 years, respectively, in 2010 to 79.6 and 84.2 years in 2040. Meanwhile, net

immigration (including undocumented immigration) is estimated to rise from 1.173,000 persons in 2001 to 1,569,000 in 2040. Based on these assumptions, the U.S. population will average 0.9% growth per year through 2030, down from the 1.1% pace during the last 30 years. Thus, total population will rise from 282.8 million in 2000 to 396.4 million in 2038.

The age distribution of the population is also an important factor in the long-term outlook. As baby boomers begin to retire, the share of the U.S. population aged 65 years and over will jump from 13% in 2010 to 20% by 2038, pushing up outlays for Social Security, Medicare, and Medicaid. In addition, the growth rate of the working-age population will slow more than that of the overall population. After increasing 1.2% annually over the past 30 years, the population aged 16–64 years will grow only 0.5% over the forecast period. The optimistic and pessimistic alternatives embody population projections different from those in the trend. The optimistic outlook assumes the U.S. population will increase more quickly because of higher net immigration. Conversely, the pessimistic alternative constricts growth in the labor force because of lower-assumed net immigration from the start of the forecast period. As a result, annual population growth averages 1.5% in the optimistic scenario and just 0.4% in the pessimistic scenario. By 2038, the current population increases to 481 million in the optimistic projection, but to only 344 million in the pessimistic scenario, compared with 388 million in the baseline.

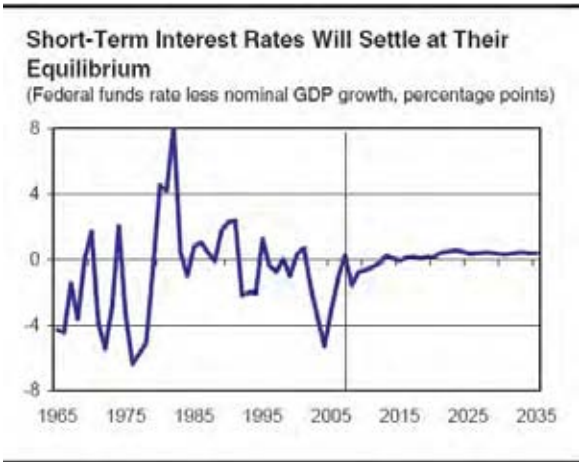
Fiscal Policy. We expect federal spending on defense, transfer payments, and federal aid to state and local governments to consume a good share of GDP. As a result, the federal government should post deficits in the unified budget over the forecast period. In the forecast, the deficit averages 4.4% of GDP in 2008–38. In the longer run, the baby boomers' retirement will cause deficits to grow, despite some increases in the Social Security tax rate.

Monetary Policy and Inflation. Monetary policy remains important in the long-term projections, not so much in determining the level of output, but rather in determining the rate of inflation. Ultimately, the Federal Reserve decides on the steady-state rate of inflation. Monetary policy can cause inflation to accelerate by being overly accommodative and pushing the unemployment rate temporarily below the rate at which inflation is stable. Alternatively, it can cause inflation to decelerate by being restrictive and pushing the unemployment rate temporarily above the rate at which inflation is stable.

In this forecast, we assume that the Fed's ultimate goal is a stable inflation rate. The CPI inflation rate spikes in the early years of the forecast because of spiking oil prices, and eventually settles to about 2.0%

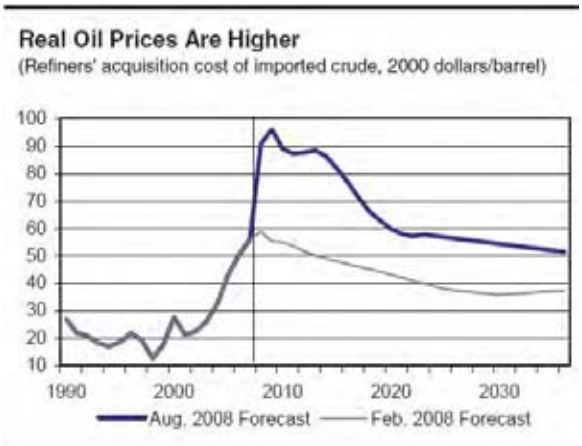
Bond yields will generally move parallel to the funds rate over the forecast interval, but run somewhat higher. The yield on ten-year treasuries rises slowly, and eventually converges to about 5.4%. The forecast implies a real federal funds rate of about 2.6% and a real long-term bond rate of 3.4%.

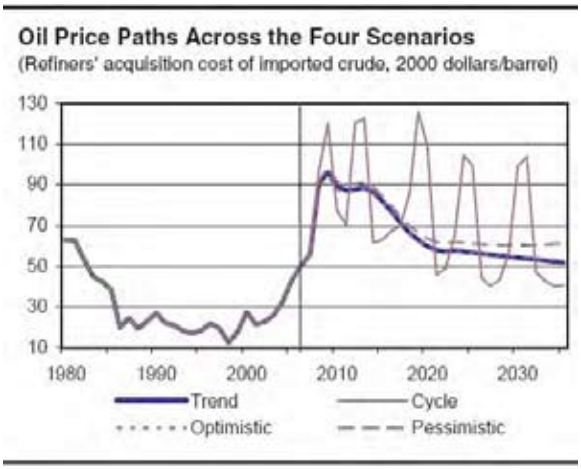
In the cyclical scenario, periods of overly expansive monetary policy are followed by intervals of overly restrictive policy, which



translates into the periodic acceleration and deceleration of inflation. In the optimistic scenario, the Fed is assumed to keep a tight rein on the money supply, permitting little acceleration of inflation. Conversely, in the pessimistic scenario, the central bank is assumed to be reluctant to put the economy through the pain necessary to bring inflation back to baseline levels, choosing instead to tolerate an inflation rate that is higher than in the baseline.

Energy. Global Insight's Energy Service expects the average acquisition price of foreign oil to remain above $90 per barrel over the forecast period. With worldwide demand steadily increasing, the OPEC cartel will maintain some pricing power. Although it is impossible to predict the precise timing of price changes, the trend projection assumes that oil prices will drop from current high levels and hover over $100 per barrel through the end of the forecast period. The West Texas Intermediate price for





oil is projected to reach $114 per barrel by 2038, compared with the average price of $26 in 2001.

In the long run, scarcity tends to bid energy prices up, while new technologies tend to hold them down. In the end, we project that scarcity will win out, with the real price of imported oil rising from about $21.50 per barrel in 2001 to $50.50 in 2038.

The oil price path in the cyclical scenario several oil spikes, where oil producers are assumed to mimic their behavior of the 1970s, raising oil prices substantially when the world economy is close to a cyclical peak. In the pessimistic scenario, nominal and real oil prices are higher than in the trend. In the optimistic scenario, nominal and real oil prices are below what they are in the trend.

Price projections are a trend. It is likely that there will be periods, possibly of several years at a time, when prices are either above or below the trend. A price outcome higher than the projected trend could result from stronger demand growth (perhaps notably in China) and/or weaker supply (more disappointments in non-OPEC and loss of productive capacity in OPEC due to political upsets). A price outcome lower than the projected trend could arise from recession, enforcement of higher efficiency standards, or better than expected supply prospects.

International. In the trend projection, the major U.S. trading partners are assumed to follow a growth pattern similar to that in the United States, with the pace of growth averaging 1.8% over the forecast period, down from an average 2.6% over the past 30 years. This slowdown reflects demographic forces similar to those operating in the United States, as well as the maturation of many developing economies. Owing to steady pressure from the current account deficit, the dollar will fluctuate, but on average, depreciate throughout our long-term forecast.

Variations in the international environment help explain some of the differences among the alternative scenarios. A faster (slower) rate of growth abroad partially explains the higher (lower) level of exports in the optimistic (pessimistic) scenario. Meanwhile, a cycle in the real exchange rate due to swings in domestic interest rates helps explain the trade pattern in the cyclical scenario.

Demand Mix. Although the overall level of output is determined by supply conditions, many mixes of aggregate demand are consistent with that level of output. Over the forecast period, the demand mix will be dominated by the need to boost exports to balance the current account. Over the forecast period, the share of GDP going to exports rises from 12% in 2007 to 28% in 2038.

The sum of the remaining shares of GDP must decline to make room for the rising share devoted to exports. Government spending will bear some of the burden in 2010–38; the government's share of GDP will decline 5.8 percentage points.

Methodology Over the Short-Term Forecasting Horizon

The trend remains consistent with the August Control forecast through 2018. The two bandwidth scenarios-optimistic and pessimistic-take the trend solution as their starting point and immediately diverge from it-according to their own underlying assumptions-at the beginning of the solution interval. This ensures that growth is always higher in the optimistic alternative, and lower in the pessimistic alternative. However, while average GDP growth, inflation, unemployment, and interest rates may be higher or lower than in the trend, depending on which is appropriate, these relationships will not necessarily hold for every individual quarter of the forecast period.

Capsule Summary of the Long-Term Trend Forecast & Assumptions

		Trend Projection
	General Outlook	The economy exhibits mild variations in growth and approaches its balanced-growth path. CPI inflation rises slowly, averaging 2.0%.
I.	**Principal Exogenous Assumptions**	
	Demographic	Projections consistent with the Census Bureau's latest middle-growth forecast, which assumes a leveling off of the fertility rate at 2.1 births, an ultimate mortality rate of 79.0 years for men and 84.8 years for women, and net immigration grows to 1.338 million in 2010, 1.473 million in 2020, to 1.664 in 2030.
	Energy imports	Real oil prices fall, but remain high by current historical standards. No embargoes are assumed.
	Food prices	Wholesale farm prices average 1.2% annual increases.
II.	**Principal Policy Dimensions**	
	Tax changes	Marginal personal tax rates inch up. Corporate tax stays at 35.0%.
	Growth of federal spending	Real, +3.0% per year.
	Federal Transfers	Real growth of 3.7% per year.
	Budget deficit	Deficit averages 4.4% of GDP.
	Average federal government share of GDP	23.5%
	Monetary policy	Sufficient funds made available to promote stable credit growth. Money (M2) growth averages 4.6%.
	Federal funds rate	Rises gradually, eventually settling at 4.75%.
	Nonborrowed reserves	Steadily rises over forecast period.

III.	**Behavior of Economic Agents**	
	Consumers	Consumer confidence relatively constant.
	Average annual real consumption growth	2.1%
	Business	Decisions made in relatively stable environment.
	Average fixed investment share in GDP	10.8%
	Average share of corporate cash flow in GNP	9.6%
	State and local government	Real expenditures dictated by demographics and ability to raise taxes. Average real growth in purchases of 0.9% per year.
	Federal budget position (Fiscal years)	Deficits.
	International Average annual wholesale price inflation for major trading partners	1.6% (OECD countries) 3.6% (Developing countries)
	Real U.S. exchange rate	Declines over forecast period.
IV.	**Other Parameters**	
	Average annual productivity growth	2.0%
	Average annual potential output growth	2.4%
	Consumer price inflation	Eventually stabilized at 2.0%
	Consumer price index Average annual increase Peak annual	2.0% 4.8% (2008)
	Hourly earnings	3.5%

	Average annual rise	4.2% (2008)
	Housing market	Demographics dictate slower growth of the housing stock.
	Median new home price in 2038 Average annual rise	$554,800 2.7%
	Unemployment	Settles at about 4.6%.
	Average unemployment rate	4.8%

Source: http://myinsight.globalinsight.com/servlet/cats?filterID=876&serviceID=1784&typeID=4410&pageContent=report

U.S. Long-term Trend Forecast Details –

Slowing Growth and Federal Deficits: The Trend Projection

by Patrick J. Newport, Global Insight Economist

Highlights

- Real GDP growth will average 2.5% per year in 2008–38.
- The outlook for inflation remains moderate. Consumer price index (CPI) inflation will average 1.9% per year over the forecast period. Core inflation will average 2.0%.
- Nonfarm business productivity growth averages 2.0% over the forecast period, compared with the 2.1% average experienced since 1953.
- The current-account deficit is negative through 2032. Afterward, the current-account surpluses grow.
- Real oil prices fall over the forecast period, but remain high by historical standards.
- The labor market improves over the forecast period, with the unemployment rate eventually settling at 4.6%.
- The federal budget deficit remains in deficit throughout the forecast period.

Introduction

Economists focus on the short run. Will the Federal Reserve raise interest rates? Is the stock market overvalued? Will we have a recession next year? This focus is understandable. We care more about what will happen tomorrow than what will happen three years from today. The focus, though, is misplaced. When historians look back on the 20th century, the most striking economic fact that will distinguish it from previous centuries will not be the 21 recessions, but rather the steady, inexorable rise in per capita income.

The driving force behind rising per capita income is one that economists still do not quite understand: productivity growth. While they agree that new technologies eventually make workers more productive, many questions remain under debate. What determines the pace of technological progress? How long does it take for new technologies to catch on? As a growth accelerant, how does an innovation such as the Internet compare with the invention of the transistor, the airplane, or the electric bulb? Not knowing these answers makes productivity-and the course of the economy-extremely tricky to forecast.

A further complication made this forecast even trickier. Productivity surged between 1994 and 2004, possibly because of what Alan Greenspan called a revolution in information technologies. Although productivity growth eased as the economy slowed in 2001, it surged—for reasons that remain unclear—in 2002, 2003, and 2004. Since then, however, productivity growth has slowed. Over 2004–07, productivity growth averaged just 1.5%.

Going forward, where is productivity heading? Some academics, such as Dale Jorgenson of Harvard, Mun S. Ho, of resources for the Future Inc, and Kevin Stiroh of the Federal Reserve Board, believe that the productivity boom has years to go before it runs out of steam. In a paper published earlier this year, Jorgenson Ho, and Stiroh projected a base-case productivity growth rate of 2.4% over the next 10 years.

Robert Gordon of Northwestern University, however, believes that corporate cost-cutting accounts for the strong productivity numbers during 2001–04, and that what we are seeing today is a return to normalcy. In a paper written in October 2006, he projected that productivity gains over the next 25 years would average around 2.1%, about the same as over the previous 25 years. This is just a tick below the 2.3% pace that the Congressional Budget Office assumed in its latest 10-year budget projections.

Our view is closer to Gordon's than Jorgenson's (though we hope we are wrong!). For 2008,and 2009 we project it will increase 1.7%, about the same as in 2006. The slowdown from the torrid rates registered earlier this decade is partly cyclical. We believe, however, that trend productivity growth has slowed.

Changes to the 30-Year Forecast

We have made two significant changes to the forecast. First, the price of oil is much higher. The average price of West Texas Intermediate crude, for example, is $104.8 /barrel in 2018, compared with $71.0/barrel in our February 2008 forecast. Adjusted for inflation, oil prices after 2020 are about 40% higher than in our February forecast. This change reflects our view that most of the recent runup in oil prices is mostly permanent. In the forecast, the real price of oil still declines over time from current

Contributions to New Jobs
(Payroll employment, cumulative percent change)

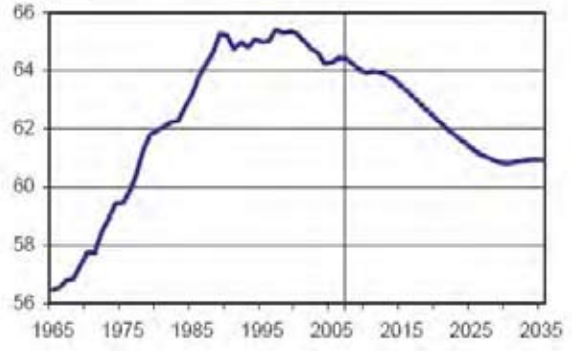
	History		Trend		
	1980 -1990	1991 -2007	2008 -2018	2019 -2028	2029 -2038
Manufacturing	-8.9	-21.5	-6.8	-6.6	-3.7
Mining and Construction	8.3	38.3	2.3	12.6	24.5
Government	14.6	20.6	8.4	4.2	3.7
Private Services	23.3	26.7	9.5	9.1	10.4
Total New Jobs (Millions)	19.6	28.1	12.8	12.5	15.3

levels because of technological improvements—they just do not decline as much as in previous forecasts.

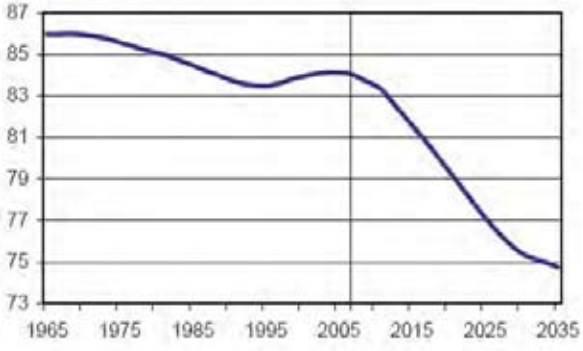
Second, our population projections are higher. On August 14, the Census Bureau released new population projections going out to 2050. We incorporated these projections into the forecast over 2018-38. As a result, the population in 2038 is 397.6 million, compared with 389.4 million in our February forecast. These projections are based on new demographic assumptions from the Census for birth rates, death rates, and immigration rates. We have not made corresponding revisions for GDP or labor-force growth because we had been anticipating these upward population revisions, and had held off lowering our GDP growth assumption.

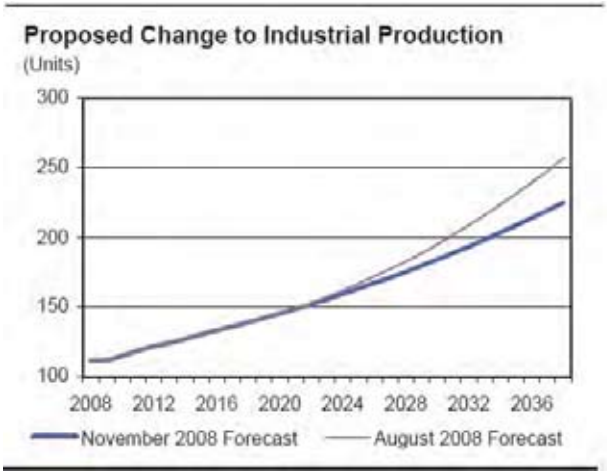
The big picture is similar to that portrayed in our previous long-term forecast publication (February 2008). Real GDP growth (2.5%), labor productivity growth (2.0%), CPI

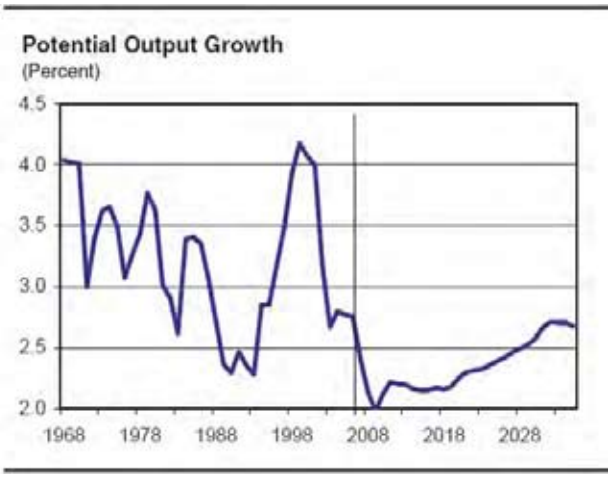
The Labor-Force Participation Rate Eases
(Percent)



Share of Population Aged 16-65 Falls
(Percent of total adult population)

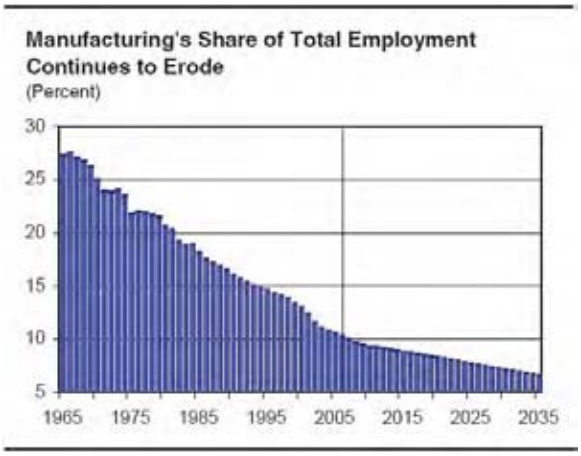






inflation (2.1%), the core PCE deflator growth (2.1%) are all the same. The level of interest rates, the long-run level of housing starts, and the unemployment rate also are about the same. The fiscal deficit is a little larger, mainly because of weakness in the short term. After releasing the forecast, internal users of our long-term forecast persuaded us that the forecast for exports, and therefore industrial production, over the last 15 years of the projection period was too strong.

In the forecast, industrial production grows 2.1% over the first 15 years and 3.3% over the last 15 years. Although export growth should or will likely pick up in the last 15 years of the projection period, if the United States is to address its trade imbalances, export growth will be somewhat slower when we next update the forecast. As a result, industrial production will grow 2.5% annually during 2022-38, down from 3.3% in the current forecast. The chart below shows the current forecast, and the forecast we propose to make in the November update.



Long-Term Forecast Assumptions

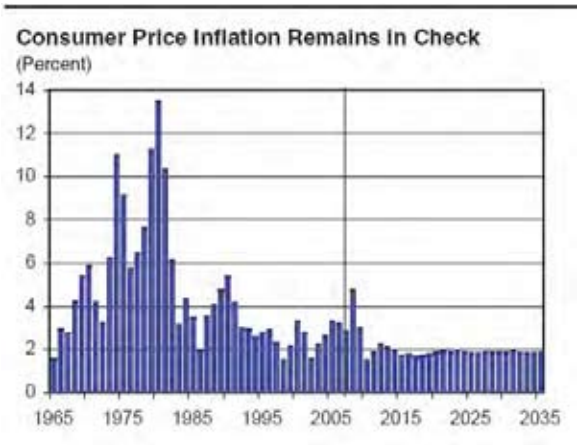
In the trend scenario, after the first five years of the forecast, we assume an environment free of exogenous shocks. Economic output will converge towards its potential level, with all resources fully utilized. As a result, the growth rates of output, real incomes, real expenditures, and the general standard of living of the population are determined by the growth rate of potential GDP. The long-range outlook is dominated by supply factors, such as population growth and demographics, labor force participation rates, average weekly hours worked, national saving and capital stock accumulation, and productivity growth.

Population and Demographics

The population projections are built on the Census Bureau's latest projections, which were released in August 2008. These projections have the U.S. population expanding at an annual rate of 0.9% in 2008-38, when the population reaches 398 million. Growth in the older-age cohorts will be stronger as the baby boomers age. The 65-yearsand- over population share rises from 12.6% in 2007 to 20.2% in 2038.

Productivity and Aggregate Supply

It is the economy's ability to increase supply in the long run that determines its potential



growth path. Growth in aggregate supply depends on the increase in the labor force, the growth of the capital stock, and improvements in productivity.

Global Insight believes that productivity growth will average 2.0% per year in 2008–38. This is lower than the stellar 2.9% average annual growth achieved during the 1960s, but above the 1.8% annual growth rate for 1976–2006. The real effective capital stock will grow 3.0% annually, compared with 4.0% in 1976–2006. The declining price of capital goods relative to other inputs accounts for the robust capital stock growth rates.

Government Policy

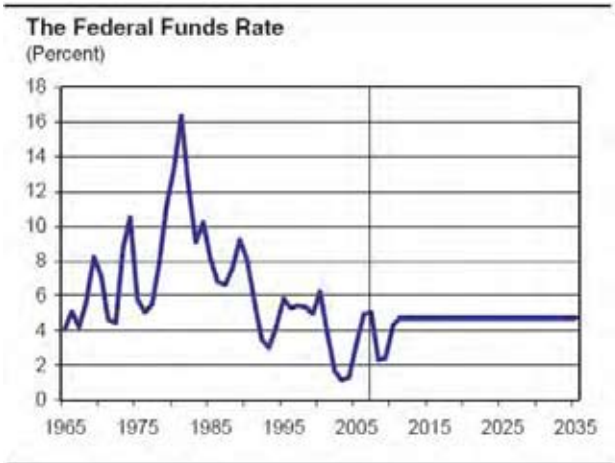
The federal budget deficit approached $400 billion in 2004, as the 2003 tax act reduced receipts and the war on terrorism boosts spending. In 2008-15 the fiscal year budget deficit hovers between $237 billion and $561 billion. An easy way for Congress to increase tax revenues is to let the tax cuts sunset as scheduled; however, this seems unlikely regardless of who may be in the White House or in control of Congress. One way or another, the well-off will be forced to pay more, perhaps by applying the Social Security tax to all incomes, as well as by raising marginal rates.

With the economy growing faster than the pace of government spending, the government sector's share of GDP will decline over the forecast period. The state and local government maintains the dominant share of total government purchases, growing from 63% in 2007 to 65% in 2038. At the federal level, the military accounted for 68% of federal purchases in 2007, and slowly drops to 59% in 2038.

Monetary Policy and Financial Markets

The Federal Reserve decides on the steady-state rate of inflation. Monetary policy can cause inflation to accelerate by being overly accommodative. Alternatively, it can cause inflation to decelerate by being restrictive. In the forecast, the monetary authorities opt to maintain core inflation at about 2.1%.

Bond yields will generally move parallel to the funds rate over the forecast interval, but run somewhat higher. The yield on 10-year Treasuries remains low by historical standards, hovering around 5.4% after 2014. The forecast implies a real federal funds rate of about 2.6%



Personal Consumption Slows in Trend Scenario
(Average annual percent change)

	History		Trend		
	1980 -1990	1991 -2007	2008 -2018	2019 -2028	2029 -2038
Total Expenditures	3.2	3.3	2.3	2.1	2.0
Total less New Light Vehicles	N/A	3.3	2.4	2.1	2.0
Durable Goods	4.5	6.1	3.7	3.6	3.9
Motor Vehicles & Parts	4.0	3.3	1.5	1.1	1.5
Furniture & Household Equip.	5.6	9.9	6.2	6.1	7.1
Computers	N/A	44.5	19.7	18.1	18.2
Software	N/A	N/A	9.4	8.0	8.6
Other Equipment	4.6	6.4	4.0	3.3	3.4
Other Durables	3.7	5.4	3.3	3.8	3.8
Nondurable Goods	2.3	2.8	1.9	2.0	2.0
Clothing & Shoes	4.5	4.7	3.1	2.2	2.3
Food & Beverages	2.0	2.1	1.6	1.5	1.4
Gasoline & Oil	1.4	1.6	0.9	0.5	0.7
Fuel Oil & Coal	-5.1	-1.2	-1.5	-0.4	-0.5
Other Nondurables	2.5	3.9	2.5	3.0	2.8
Tobacco	-2.0	-1.6	-4.0	-4.2	-5.9
Drugs & Pharmaceuticals	4.0	5.9	5.3	4.7	3.7
Services	3.4	2.9	2.3	2.0	1.8
Housing	2.8	2.3	1.4	1.3	0.8
Household Operation	2.6	2.7	1.7	2.2	1.8
Transportation	2.7	2.5	1.9	2.2	2.4
Medical Care	3.9	3.0	3.1	2.4	2.2
Recreation	6.3	4.0	2.4	0.8	0.7
Personal Business	4.1	3.8	2.9	2.0	1.7
Other Services	3.9	2.8	2.3	2.5	2.4

and a real long-term bond rate of 3.3%.

Oil Prices
Global Insight's Energy Service expects the average acquisition price of foreign oil to remain above $90 per barrel over the forecast period. With worldwide demand steadily increasing, the OPEC cartel will maintain some pricing power. Although it is impossible to predict the precise timing of price changes, the trend projection assumes that imported oil prices will average $110/barrel in 2010–20. The West Texas Intermediate price for oil is projected to reach $114 per barrel in 2038, compared with the price of $41.50 in 2004.

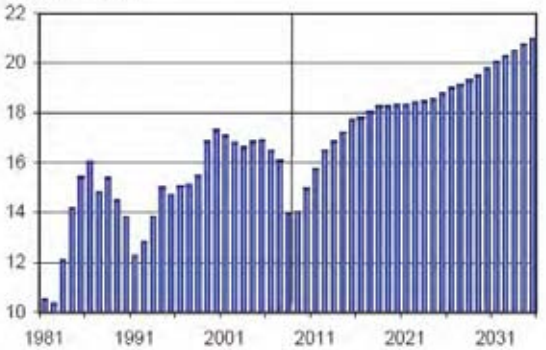
In the end, scarcity tends to bid energy prices up, while new technologies tend to hold them down. In the end, we project that new technologies will win out—and that the real price of oil will steadily fall from current levels. Real oil prices, nonetheless, will remain high by historical standards.

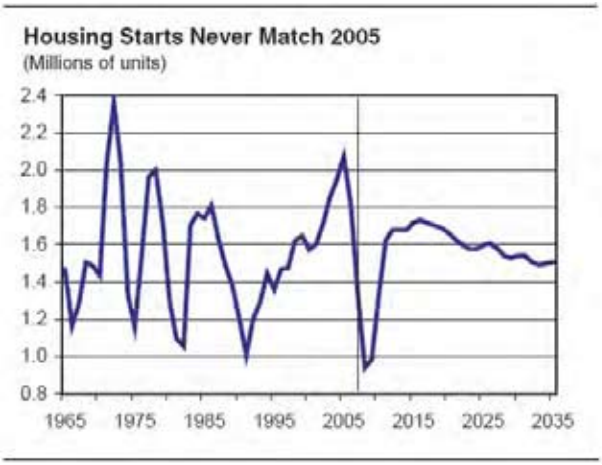
Foreign Assumptions
The major U.S. industrialized trading partners are assumed to follow a growth pattern similar to that in the United States, with the pace of growth averaging 1.8% over the forecast period, down from an average 2.7% over the past 30 years. This slowdown reflects demographic forces similar to those operating in the United States. The developing countries that trade with the United States will grow 4.0%, down 0.8 percentage point from the past 30 years.

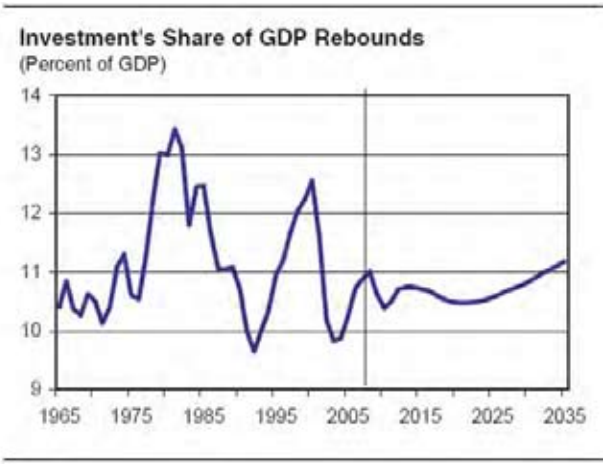
The dollar will have to depreciate steadily against foreign currencies throughout the forecast period in order to keep the U.S. current account deficit from growing too fast. Over the forecast period, the real U.S. trade-weighted dollar relative to industrialized country currencies depreciates 0.5% annually.

Long-Term Forecast Highlights
Real GDP. The trend projection assumes that the U.S. economy experiences no major mishaps between now and 2038. The projection is identical with our February 2008 baseline forecast through 2018, and represents Global Insight's best estimate of the economy's path over that period. Beyond 2018, the projection should be interpreted as the mean of all possible near-full-employment paths the economy could follow. The smooth-growth characteristics of the trend projection make it most useful for tasks largely impervious to short-term cyclical fluctuations, such as planning capacity additions and evaluating new markets. This projection is also the best base from which to evaluate the effects of various

Light-Vehicle Sales
(Millions of units)







assumptions about key exogenous elements, such as fiscal policy or energy prices, on the overall economic outlook.

Annual real GDP growth averages 2.5% in 2008–38, compared with 3.0% for the past 25 years. The economy's underlying growth will slow after 2011, as baby boomers begin to retire, slowing labor force growth. Potential output growth should hold up fairly well in the future, with greater business fixed investment and R&D spending offsetting the slowdown in labor force growth. Eventually, though, the effects of weaker labor force growth become dominant and, in a sense, self-perpetuating. As output growth drops off, business fixed investment rises more slowly, limiting capital stock growth and thus future output gains.

Employment. Slower long-run increases in the labor force indicate more moderate long-run employment growth in the future. Total civilian employment will rise at an average annual rate of 0.8% from 2007 to 2038. Total establishment employment will rise from 137.6 million in 2007 to 178.2 million in 2038, an increase of 29%. Manufacturing's share of total employment will continue to decline over the forecast period, falling to 6.5% in 2038, from 10.1% in 2007.

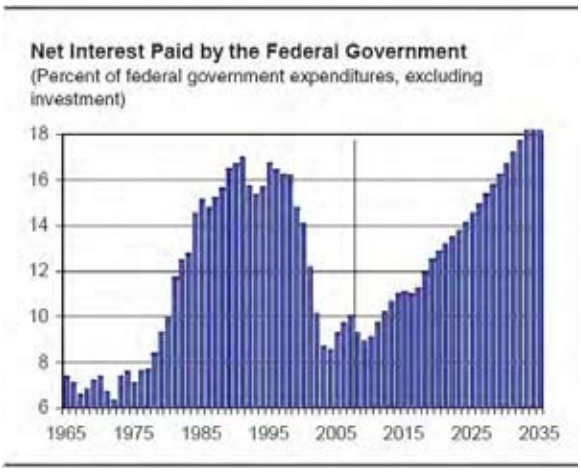
The broad service sector will generate an increasing share of employment growth in the forecast period, although the federal government's share of employment will decline during the forecast period.

Inflation. Over the long run, inflation is a monetary phenomenon. Its future course will be determined by policies implemented by Ben Bernanke and his successors. Since we do not know who these successors will be, we assumed the Fed will try to contain inflation over the forecast period. The CPI is expected to average 2.0% annual increases in 2008–38, somewhat less than the 4.3% average in 1975–2005. The broader-based GDP deflator will also rise 1.9% per year.

Consumption. Expenditures, in the long term, are primarily determined by the growth of real permanent income, demographic influences, and changes in relative prices. The share of personal consumption expenditures in GDP hovers between 67% and 71% of GDP over the

Saving and Investment Shares of GNP
(Percent)

	History	Trend	
	1992-2007	2008-22	2023-38
Household	5.3	5.4	10.9
Business	9.6	9.1	10.3
Government	-2.3	-3.9	-6.5
Total Saving	12.6	10.5	14.7
Total Investment	12.8	10.8	14.9
Gross Private Investment	16.0	14.6	14.8
Nonresidential Fixed Investment	10.9	10.6	11.1
Residential	4.7	3.8	3.4
Change in Inventories	0.4	0.2	0.3
Net Foreign Investment	-3.3	-3.9	0.1
Statistical Discrepancy	0.2	0.2	0.1



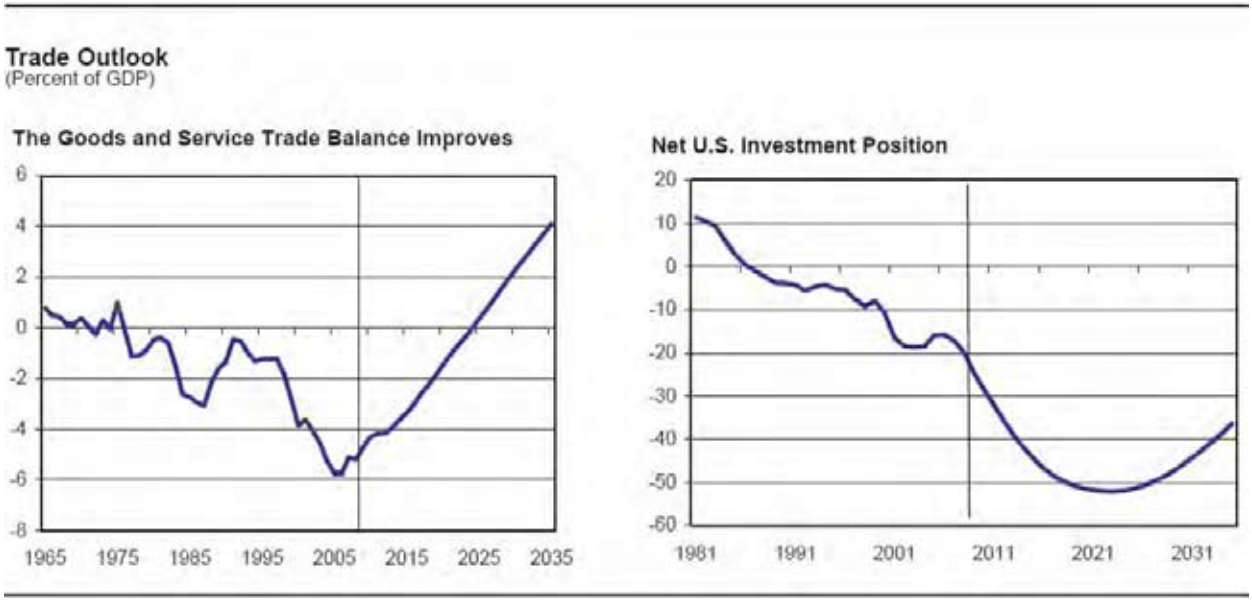
forecast period.

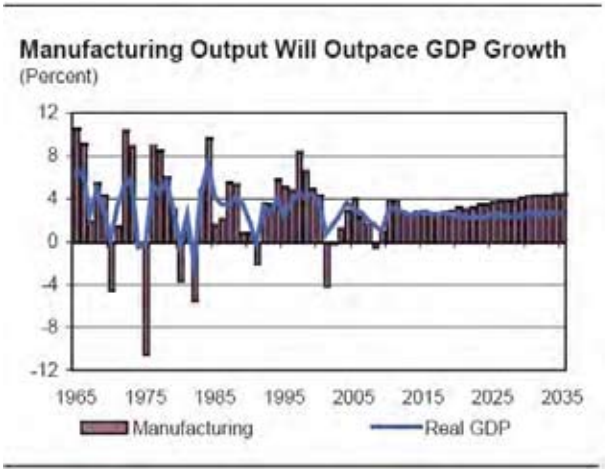
Real consumption growth will average 2.1% per year over the forecast period. In per capita terms, growth will advance about 1.3% per year, down 0.8 percentage point from the 1977–2007 rate. The share of consumption devoted to services will rise, mainly because of rising health expenditures, while that for goods will fall over the forecast period.

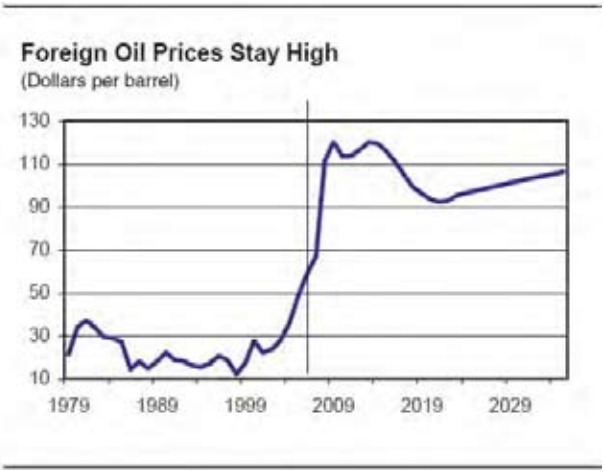
The long-term outlook for auto and light truck sales calls for a slowdown in the rate of increase relative to past performances. Vehicle sales growth will average close to 1.0% over the next 30 years. Light-vehicle sales are forecasted to reach 22.7 million units by 2038. Although the number of vehicles per person has increased significantly in the past 20 years, the United States is approaching a saturation point in the rate of vehicle ownership. Future growth in vehicle sales will be primarily driven by growth in population and demand for replacement vehicles. Automobile sales should be relatively strong throughout the projection period, averaging 10.4 million units per year.

Energy conservation efforts will continue. This stems partly from a stock/flow phenomenon: despite the trend toward minivans and sport/utility vehicles, for example, the average new vehicle is still more fuel-efficient than the existing stock. Gasoline usage per vehicle should fall for several more years, even if relative energy prices remain flat. Similar considerations apply to business capital and housing stocks. The ongoing employment shift from manufacturing to services also implies lower energy usage per unit of output. Real personal disposable income, which climbed 3.0% in 1976-2005, will again rise 2.6% annually over the next 30 years. This does not take into account the rising volume of withdrawals from existing retirement plans.

Housing. Household growth clearly depends on population growth, but real incomes, employment, the age distribution of the







population, and societal values also influence it. Net additions to the housing stock are closely linked to household growth, which is the primary driver of housing starts. Many analysts tend to overlook another key factor for housing starts: the geographic location of the demand for net additions.

The 25–34 year-old cohort is key for the demand for new housing. This is the age group where individuals typically purchase their first home. The demand for new housing was boosted by the large gains in this age group in the late 1960s and 1970s, as the baby-boom generation entered the housing market. Unfortunately for the housing sector, the baby-boom generation began to pass through this age bracket in the mid-1980s, limiting the demand for additions to the housing stock. The number of households in this cohort will begin a modest increase after 2005. The overall headship rate will gradually increase toward older segments due to the shift in the age composition.

The demographic demand for housing will be a bit stronger over the next 30 years than over the past 30 years. Thus, housing starts are projected to average 1.55 million units annually in 2008–38, compared with 1.56 million for 1976–2005. Meanwhile, the housing stock (excluding mobile homes) will climb from 115.0 million units in 2007 to 148.3 million units in 2038 [annualized increase of 0.85% per year].

Business Fixed Investment. Good profitability and solid demand growth should keep investment healthy over the next 30 years. The share of GDP devoted to business fixed investment will hover around 10.0–11.5% of GDP through most of the forecast period. The effective capital stock (in 2000 dollar terms) is projected to increase 3.0% annually, below the 4.0% average growth rate recorded for 1976–2005. Inventory investment will remain a small percentage of GDP. Although inventories have played significant roles during past business cycles, inventory investment represents an average in the stable growth scenario and is thus artificially smooth. Capital inflow will contribute to net domestic investment throughout the forecast period, although the federal debt clearly hurt it in the later years of the forecast. The government saving projection assumes that state and local governments continue to run modest operating surpluses.

International Trade. A decline in the dollar relative to industrialized-country-currencies, combined with modest unit labor cost growth, will stimulate U.S. exports abroad and result in an eventual improvement in the U.S. current-account balance. Global Insight projects that real exports will expand at an average annual rate of 6.5% over the entire forecast period. Real imports, meanwhile, will grow at an average annual rate of 4.5%.

Industrial Production
(Average annual percent change)

	History		Trend			
	1980-1990	1991-2007	2008-2038	2008-2018	2019-2028	2029-2038
Mining	-0.7	-0.4	-0.3	-0.3	-0.4	-0.3
Utilities	2.0	2.0	0.9	0.9	0.9	0.7
Manufacturing - SIC Basis	1.9	3.1	3.5	2.5	3.5	4.5
Food	1.8	1.7	1.6	1.9	1.4	1.3
Textile Mills	0.6	-2.2	-2.4	-2.6	-1.4	-3.2
Apparel	-0.2	-4.5	-4.8	-5.4	-4.1	-4.8
Logging*	2.0	-0.3	0.0	-0.8	0.1	0.6
Furniture & Related Products	1.9	1.8	1.2	0.9	1.5	1.2
Paper & Products	1.9	-0.1	1.1	1.3	1.1	0.8
Newspapers, Periodicals, Books*	2.1	-0.5	1.7	0.5	1.9	2.9
Petroleum & Coal Products	-1.2	1.3	1.4	2.2	1.6	0.4
Chemicals	1.8	2.2	2.9	3.1	3.0	2.4
Rubber & Plastics Products	3.8	2.6	2.1	1.6	2.2	2.4
Leather & Allied Products	-2.6	-4.5	-3.3	-3.3	-2.4	-4.1
Nonmetallic Mineral Products	0.1	1.5	1.0	1.2	1.6	0.3
Primary Metals	-2.7	0.8	0.7	1.4	1.4	-0.9
Fabricated Metal Products	-0.1	2.0	1.3	1.1	1.7	1.3
Machinery	-0.4	1.7	2.4	1.5	2.5	3.2
Computers & Electronic Products	11.4	16.4	12.8	11.8	13.4	13.4
Elec. Eq., Appliances, & Components	0.2	1.1	2.5	2.0	2.9	2.5
Transportation Equipment	1.6	2.0	3.4	2.4	2.0	6.0
Miscellaneous	2.6	3.2	4.6	4.2	4.6	5.0
All Manufacturing - NAICS	2.0	3.3	3.6	2.7	3.6	4.5
Durable Goods	2.2	5.0	5.3	3.9	5.3	6.9
Nondurable Goods	1.6	1.2	1.8	1.7	1.9	1.8
All Less Comp., Commun., & Chips	1.2	1.4	2.2	1.8	2.1	2.7

Source: The U.S. Economy-The 30-Year Focus Trend Projection

Population and Demographics

	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
Portland-Beaverton-Vancouver, OR-WA, PMSA - Components of Population (in thousands)											
Population (7 counties)	1,523.7	1,749.2	1,927.9	2,092.9	2,265.5	2,509.6	2,703.6	2,881.8	3,050.1	3,210.7	3,371.5
Pct. Chg. (5-year avg.)	1.8	2.8	2	1.7	1.6	2.1	1.5	1.3	1.1	1	1
Annual Avg. Change	26.5	45.1	35.7	33	34.5	48.8	38.8	35.6	33.7	32.1	160.84
Births, total	24.5	25.1	28.3	28.3	32.7	36.4	38.5	40.4	42	43.6	45.6
Crude Birth Rate	16.1	14.4	14.7	13.5	14.4	14.5	14.3	14	13.8	13.6	13.5
Deaths, total	12.5	13.6	14.2	15	16.3	18.1	20.3	22.9	25.6	28	30.0
Crude Death Rate	8.2	7.8	7.3	7.2	7.2	7.2	7.5	8	8.4	8.7	8.9
Natural Increase	12	11.6	14.1	13.3	16.4	18.2	18.2	17.5	16.4	15.5	15.6
Net Migration	25.1	29.7	7.8	19.7	35.6	29.1	19.8	18.9	18	17.9	17.8
%Migration Growth Share	68.66	72.36	36.06	59.47	116.54	63.32	54.37	54.38	54.85	56.29	56.5
Regional Population Cohorts											
under 4 years old	112	136.2	134.9	142.2	150.6	166.9	181.2	192.4	201.7	210.2	218.77
5 to 9 years old	112.6	136.3	138.2	144.4	152.7	165.7	177.4	188.8	199.2	208.3	217.21
10 to 14 years old	106.7	126	136.2	144.5	153.7	165	174.3	184.6	195	204.8	214.22
15 to 19 years old	98.4	112.5	130.6	140.2	152.8	164.8	172.9	181.6	191.2	201	210.76
20 to 24 years old	101.1	104.7	127.4	138.5	157.6	173.9	180.7	187.3	195	203.8	213.39
25 to 29 years old	123.4	116.9	147.1	150.4	162.5	180.1	187.9	193.7	199.9	207.3	215.87
30 to 34 years old	138.7	141.8	151	157.5	166	180.9	190.1	196.6	202.4	208.8	216.18
35 to 39 years old	142	156.2	157.3	162	169.6	181.5	190.2	197.4	203.5	209.5	216.04
40 to 44 years old	126	154.2	160	166.6	171.6	180.8	188.3	195.4	202	208.1	214.30
45 to 49 years old	92	134.1	153.3	163.7	170.3	178.2	184.6	191.3	197.9	204.2	210.57
50 to 54 years old	67.3	96.2	130.1	145.2	160.9	171.6	178.8	185.3	191.8	198.3	204.67
55 to 59 years old	56.8	69.1	90.8	110.6	138.6	156.8	167.8	175.8	182.9	189.6	196.31
60 to 64 years old	56.9	57.2	62.8	77.4	107.7	132.3	149	160.6	169.4	177	184.22
65 to 69 years old	56.2	55.4	49.9	57	78.3	102.6	122.9	138.2	149.7	158.9	166.98
70 to 74 years old	46.1	51.9	47.5	48.9	57.5	75	94.1	111	124.6	135.6	145.23
75 to 79 years old	34.7	40.1	43.2	43.3	44.1	53.2	67.2	82.3	96.2	108.1	118.63
80 to 84 years old	23.7	27.4	30.7	32.5	32.5	36.2	44.3	55.2	66.8	77.7	87.96
85 years or older	20.8	23.9	26.9	31.8	38.6	44	52	64.4	80.8	99.6	120.21
Total	1,523.7	1,749.2	1,927.9	2,092.9	2,265.5	2,509.6	2,703.6	2,881.8	3,050.1	3,210.7	3,371.5
Population Share by Age (in percents)											
under 4 years old	7.35	7.79	7	6.8	6.65	6.65	6.7	6.67	6.61	6.55	6.49
5 to 9 years old	7.39	7.79	7.17	6.9	6.74	6.6	6.56	6.55	6.53	6.49	6.44
10 to 14 years old	7	7.2	7.07	6.91	6.78	6.57	6.45	6.41	6.39	6.38	6.35
15 to 19 years old	6.46	6.43	6.77	6.7	6.74	6.57	6.4	6.3	6.27	6.26	6.25
20 to 24 years old	6.64	5.99	6.61	6.62	6.96	6.93	6.68	6.5	6.39	6.35	6.33
25 to 29 years old	8.1	6.69	7.63	7.19	7.17	7.18	6.95	6.72	6.56	6.46	6.40
30 to 34 years old	9.1	8.1	7.83	7.53	7.33	7.21	7.03	6.82	6.64	6.5	6.41
35 to 39 years old	9.32	8.93	8.16	7.74	7.48	7.23	7.03	6.85	6.67	6.52	6.41
40 to 44 years old	8.27	8.81	8.3	7.96	7.58	7.21	6.96	6.78	6.62	6.48	6.36
45 to 49 years old	6.04	7.67	7.95	7.82	7.52	7.1	6.83	6.64	6.49	6.36	6.25
50 to 54 years old	4.41	5.5	6.75	6.94	7.1	6.84	6.61	6.43	6.29	6.18	6.07
55 to 59 years old	3.73	3.95	4.71	5.28	6.12	6.25	6.21	6.1	6	5.91	5.82
60 to 64 years old	3.73	3.27	3.26	3.7	4.75	5.27	5.51	5.57	5.55	5.51	5.46
65 to 69 years old	3.69	3.17	2.59	2.72	3.46	4.09	4.55	4.8	4.91	4.95	4.95
70 to 74 years old	3.03	2.97	2.46	2.34	2.54	2.99	3.48	3.85	4.09	4.22	4.31
75 to 79 years old	2.28	2.29	2.24	2.07	1.95	2.12	2.48	2.86	3.15	3.37	3.52
80 to 84 years old	1.56	1.57	1.59	1.55	1.44	1.44	1.64	1.92	2.19	2.42	2.61
85 years or older	1.36	1.37	1.4	1.52	1.7	1.75	1.92	2.24	2.65	3.1	3.57

Population and Demographics

	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
Population Groups (in thousands)											
Children under 18 years old	418.4	497.6	523.7	579.4	579.2	629.4	671.2	711	748.8	784.1	819.3
Pct. of Children	27.5	28.4	27.2	27.7	25.6	25.1	24.8	24.7	24.6	24.4	24.3
16 years or older (both sex)	1,164.4	1,319.2	1,482.6	1,597.6	1,778.0	1,979.0	2,136.2	2,279.7	2,416.0	2,547.2	2,677.0
Pct. Working-Age Pop.	76.4	75.4	76.9	76.3	78.5	78.9	79	79.1	79.2	79.3	79.4
65 years and older (both sex)	181.5	198.7	198.3	213.6	251	311.1	380.4	451.1	518.1	579.8	627.1
Pct. Retirement Age	11.9	11.4	10.3	10.2	11.1	12.4	14.1	15.7	17	18.1	18.6
Percent of Women of Child-bearing Age											
Women, 15 to 44 years old	24.1	22.6	22.8	22	21.8	21.3	20.7	20.1	19.7	19.4	19.3
Total Fertility Rate (per 1,000)	66.6	63.5	64.4	61.4	66.4	68	69	69.7	69.8	69.9	70
Women, 10 to 49 years old	30.7	30.1	30.4	29.4	29	28.2	27.3	26.7	26.2	25.8	25.7
Total Fertility Rate (per 1,000)	52.4	47.7	48.4	46	49.9	51.4	52.1	52.5	52.5	52.6	52.6
Households by Age of Head Person (in thousands)											
Households, total	593.1	671.8	742.3	798.8	892.4	998.1	1,085.6	1,165.9	1,241.0	1,312.2	1,381.0
(Percent shares)											
15 to 24 years old	5.3	5.7	6	6.4	6.4	6.2	6	5.8	5.7	5.7	5.7
25 to 34 years old	21.7	18.8	19.4	18.2	17.3	17	16.4	15.8	15.3	14.9	14.8
35 to 44 years old	25.7	25.6	23.3	22.9	21	20	19.2	18.5	18	17.5	17.3
45 to 54 years old	15.9	19.8	22	21.9	21.3	20.1	19.2	18.6	18	17.6	17.4
55 to 64 years old	11.4	11	12.4	13.9	16.1	16.9	17.1	16.9	16.6	16.3	16.2
65 to 74 years old	11.2	10	8.2	8.2	9.5	11.1	12.5	13.3	13.8	14	14
75 to 84 years old	6.7	6.8	6.6	6.2	5.7	5.9	6.8	7.8	8.7	9.4	9.7
85 years or older	2.2	2.2	2.2	2.4	2.6	2.7	2.9	3.3	3.9	4.6	5
State-level Forecasts (annualized percent change)											
CA Population	2.43	1.23	1.34	1.31	0.14	-0.09	1.38	2.14	1.94	1.43	1.22
CA Employment	3.02	-0.12	3.13	0.43	0	1.39	1.22	0.97	0.95	0.95	0.99
WA Population	2.04	2.41	1.46	1.31	1.46	1.59	1.52	1.43	1.36	1.3	1.29
WA Employment	4.61	1.84	2.93	0.48	1.35	1.68	1.49	1.35	1.34	1.34	1.37
OR Population	1.24	2.3	1.45	1.24	1.46	1.64	1.15	0.79	0.79	0.91	0.97
OR Employment	4.04	2.61	2.53	0.45	0.88	2	1.65	1.43	1.41	1.41	1.41
(annualized percent change)											
U.S. Population, all ages	0.97	1.27	1.16	0.96	0.97	0.97	0.96	0.93	0.89	0.85	0.83
16 years and older	1.02	1.2	1.3	1.18	1.14	0.98	0.99	0.98	0.95	0.9	0.87

Population and Household Range Projections through Year 2060

Probabilistic Population Forecast Range

	POPULATION			POPULATION - annual pct. chg.		
	Low - 5%	Pop. Base	High - 95%	Low - 5%	Pop. Base	High - 95%
1960		882,231			1.42%	
1965		989,200			2.32%	
1970		1,081,978			1.81%	
1975		1,192,500			1.96%	
1980		1,341,542			2.38%	
1985		1,391,424			0.73%	
1990		1,523,741			1.83%	
1995		1,749,224			2.80%	
2000		1,927,881			1.96%	
2005		2,092,910			1.66%	
2010	2,235,600	2,265,500	2,295,800	1.33%	1.60%	1.87%
2015	2,445,900	2,509,600	2,572,200	1.81%	2.07%	2.30%
2020	2,612,600	2,703,600	2,793,900	1.33%	1.50%	1.67%
2025	2,762,000	2,881,800	2,999,900	1.12%	1.28%	1.43%
2030	2,903,300	3,050,100	3,199,500	1.00%	1.14%	1.30%
2035	3,031,300	3,210,700	3,392,900	0.87%	1.03%	1.18%
2040	3,155,700	3,371,500	3,587,200	0.81%	0.98%	1.12%
2045	3,263,900	3,517,200	3,766,500	0.68%	0.85%	0.98%
2050	3,372,200	3,669,300	3,959,000	0.65%	0.85%	1.00%
2055	3,487,500	3,827,900	4,161,400	0.67%	0.85%	1.00%
2060	3,609,300	3,993,400	4,376,100	0.69%	0.85%	1.01%

Annual Percentage Rate:

1960-80		2.12%	
1980-00		1.83%	
2000-20	1.53%	1.71%	1.87%
2020-40	0.95%	1.11%	1.26%
2040-60	0.67%	0.85%	1.00%

The Metro econometric model embeds a standard regional cohort-component model to forecast population growth by age through year 2040.
After 2040, a fixed growth rate is assumed for regional population that trends future growth towards the U.S. population trend.

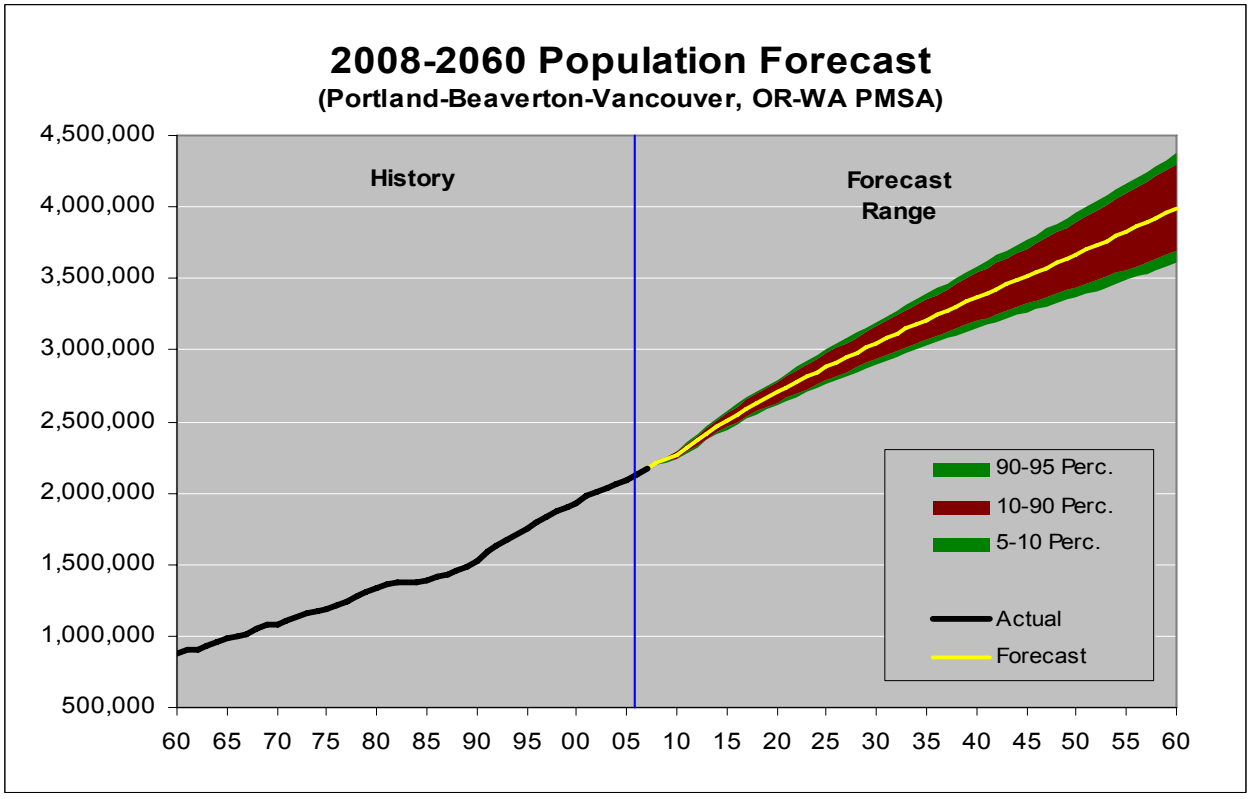
Household Forecast Range

	HOUSEHOLDS				HOUSEHOLD - annual pct. chg.		
	Low	HH Base	High	HH Size	Low	HH Base	High
1990		593,100		2.57		1.50%	
1995		671,800		2.60		2.52%	
2000		742,300		2.60		2.02%	
2005		798,800		2.62		1.48%	
2010	880,600	892,400	904,300	2.54	1.97%	2.24%	2.51%
2015	972,800	998,100	1,023,000	2.51	2.01%	2.26%	2.50%
2020	1,049,100	1,085,600	1,121,900	2.49	1.52%	1.69%	1.86%
2025	1,117,500	1,165,900	1,213,700	2.47	1.27%	1.44%	1.59%
2030	1,181,300	1,241,000	1,301,800	2.46	1.12%	1.26%	1.41%
2035	1,238,900	1,312,200	1,386,700	2.45	0.96%	1.12%	1.27%
2040	1,292,600	1,381,000	1,469,400	2.44	0.85%	1.03%	1.17%
2045	1,336,900	1,440,699	1,542,800	2.44	0.68%	0.85%	0.98%
2050	1,381,300	1,502,978	1,621,700	2.44	0.66%	0.85%	1.00%
2055	1,428,500	1,567,950	1,704,600	2.44	0.67%	0.85%	1.00%
2060	1,478,400	1,635,730	1,792,500	2.44	0.69%	0.85%	1.01%

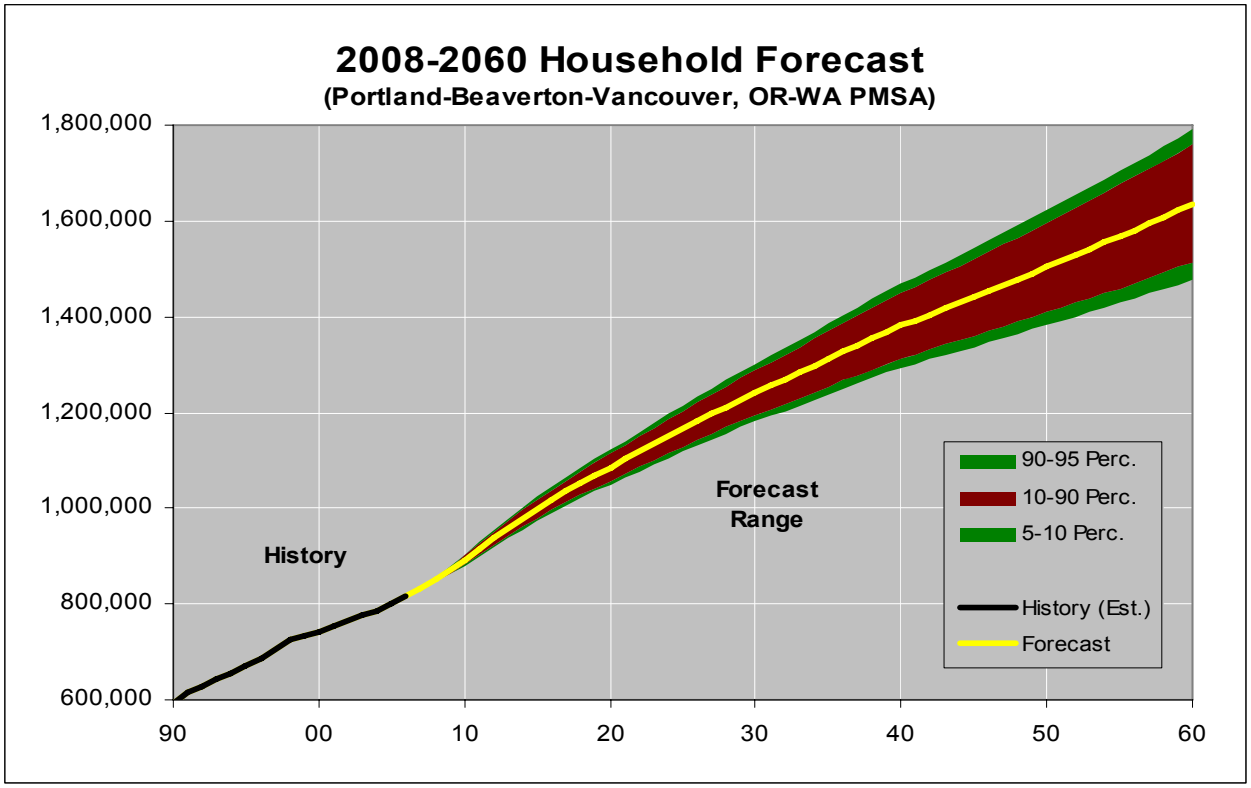
Annual Percentage Rate:

1990-00		2.27%	
2000-20	1.87%	2.00%	2.12%
2020-40	1.22%	1.38%	1.53%
2040-60	0.71%	0.89%	1.04%

Population and Household Range Projections through Year 2060



The household range projections are derived from the population forecast using age-adjusted headship rates which have been derived from census data.



Oregon State Population Forecasts (in millions)

Source: Census						Source: Oregon Office of Economic Analysis				Source: Metro		Source: Global Insight	
	(8)		(9)			(10)		(11)		(12)		(13)	
	released 1996		released 2005			released 1997		released 2004		circa 2008		released 2008	
Scenario:	Middle Series		Middle Series							Trend Base Case		Trend Control	
2000	3.397	1.30%	2000	3.421		2000	3.406	2000	3.437	2000	3.421	2000	3.43635
2005	3.613	1.24%	2005	3.596	1.00%	2005	3.631	1.29%	2005	3.618	1.03%	2005	3.639	1.24%	2005	3.63842	1.15%
2010	3.803	1.03%	2010	3.791	1.06%	2010	3.857	1.21%	2010	3.844	1.22%	2010	3.924	1.52%	2010	3.92034	1.50%
2015	3.992	0.97%	2015	4.013	1.14%	2015	4.091	1.18%	2015	4.096	1.28%	2015	4.237	1.54%	2015	4.17835	1.28%
2020	4.177	0.91%	2020	4.260	1.20%	2020	4.326	1.12%	2020	4.359	1.26%	2020	4.448	0.98%	2020	4.40874	1.08%
2025	4.349	0.81%	2025	4.536	1.26%	2025	4.556	1.04%	2025	4.626	1.19%	2025	4.602	0.68%	2025	4.62402	0.96%
			2030	4.834	1.28%	2030	4.776	0.95%	2030	4.891	1.12%	2030	4.771	0.73%	2030	4.82645	0.86%
						2035	4.988	0.87%	2035	5.155	1.06%	2035	4.987	0.89%	2035	5.01698	0.78%
						2040	5.193	0.81%	2040	5.425	1.03%	2040	5.228	0.95%	2040	5.20041	0.72%
%APR	0.99%		1.16%			1.06%		1.15%		1.07%		1.04%	

(8) http://www.census.gov/prod/2/pop/p25/p25-1131.pdf (Census Population Projections)
(9) http://www.census.gov/population/projections/SummaryTabA1.xls (Census Population Projections)
(10) Office of Economic Analysis, Department of Administrative Services, State of Oregon, January 1997
(11) Office of Economic Analysis, Department of Administrative Services, State of Oregon, April 2004
(12) Metro, Economic and Land Use Forecasting, unpublished data (derived from stochastic model equation)
(13) Doug Laube, Global Insigt emailed the GI regional service population forecast figures, 2008 (Global Insight)

U.S. Population Forecasts (in millions)

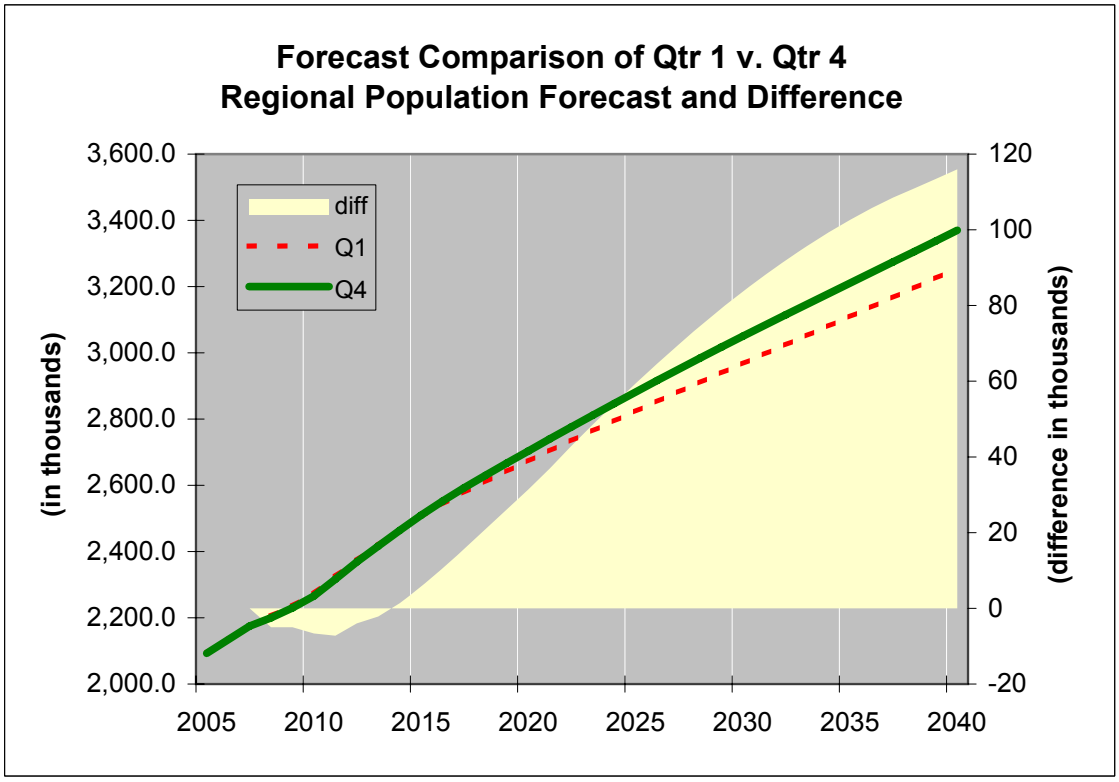
	Source: Census				Source: Global Insight				Source: Pew Research Center		Source: United Nations		Source: World Bank	
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
	released 2000		released 2004		released 2008Q1		released 2008Q4		released 2008		released 2008		circa 2005	
Scenario:	Middle Series		Middle Series		Trend Control		Trend Control		Main Projection		Medium Variant		(Base Case Trend)	
2000	275.03	0.93%	**2000** 282.13		**2000** 282.81		**2000** 282.81		**2000** 281.646		**2000** 284.857		**2000** 282.193	
2010	299.60	0.86%	**2010** 308.94	0.91%	**2010** 310.85	0.95%	**2010** 311.37	0.97%	**2010** 309.653	0.95%	**2005** 299.846	1.03%	**2005** 296.507	0.99%
2020	324.65	0.81%	**2020** 335.81	0.84%	**2020** 337.73	0.83%	**2020** 342.61	0.96%	**2020** 340.219	0.95%	**2010** 314.692	0.97%	**2010** 310.206	0.91%
2030	350.78	0.78%	**2030** 363.58	0.80%	**2030** 365.58	0.80%	**2030** 375.12	0.91%	**2030** 371.822	0.89%	**2015** 329.010	0.89%	**2015** 323.890	0.87%
2040	377.07	0.73%	**2040** 391.95	0.75%	**2040** 394.05	0.75%	**2040** 407.87	0.84%	**2040** 403.648	0.82%	**2020** 342.547	0.81%	**2020** 336.844	0.79%
2050	403.40	0.68%	**2050** 419.85	0.69%					**2050** 438.153	0.82%	**2025** 354.930	0.71%	**2025** 348.335	0.67%
2060	431.70	0.68%									**2030** 366.187	0.63%	**2030** 358.263	0.56%
2070	463.29	0.71%									**2035** 376.492	0.56%	**2035** 367.134	0.49%
2080	497.46	0.71%									**2040** 385.868	0.49%	**2040** 375.206	0.44%
2090	533.22	0.70%									**2045** 394.426	0.44%	**2045** 382.823	0.40%
2100	570.55	0.68%									**2050** 402.415	0.40%	**2050** 390.368	0.39%
%APR	0.73%		0.80%		0.83%		0.92%		0.89%		0.69%		0.65%	

(1) http://www.census.gov/population/projections/nation/summary/np-t2.txt (Census Population Projections)
(2) http://www.census.gov/ipc/www/usinterimproj/natprojtab01a.xls (Census Population Projections)
(3) AREMOS data bank UQCLS02 (Global Insight, 2008 Quarter 4, US Economy 30-Year Outlook)
(4) AREMOS data bank UQCLS11 (Global Insight, 2008 Quarter 1, US Economy 30-Year Outlook)
(5) http://pewhispanic.org/files/reports/85.pdf (Pew Research Center)
(6) http://esa.un.org/unpp/index.asp (United Nations, World Population Prospects: 2006 Revision Population Database)
(7) http://go.worldbank.org/072F5QBOC0 (World Bank Population Projections: HNP Stats)

2040 Q1 vs. 2040 Q4 Population Forecast Comparison

Total Population

	Q1	Q4	diff	%diff
2008	2,205.0	2,200.0	(5.00)	-0.2%
2009	2,235.0	2,230.0	(5.00)	-0.2%
2010	2,272.2	2,265.5	(6.63)	-0.3%
2011	2,323.6	2,316.3	(7.24)	-0.3%
2012	2,372.5	2,368.5	(4.00)	-0.2%
2013	2,418.5	2,416.3	(2.15)	-0.1%
2014	2,462.2	2,463.5	1.36	0.1%
2015	2,503.8	2,509.6	5.76	0.2%
2020	2,672.2	2,703.6	31.42	1.2%
2025	2,822.4	2,881.8	59.41	2.1%
2030	2,966.4	3,050.1	83.70	2.7%
2035	3,108.0	3,210.7	102.65	3.2%
2040	3,254.0	3,370.0	115.98	3.4%



Portland-Beaverton-Vancouver, OR-WA PMSA

Q1 Forecast represents a "pre-recession" projection and set of macro-economic assumptions
Q4 Forecast represents a recognition in the forecast that embeds the most recent recession outlook and assumptions

However, between Q1 and Q4, the U.S. Census adjusted its future forecast assumptions for immigration, native birth rates and death rates. The result is a Q4 forecast for population growth that is an average of one-tenth of a percentage point faster by 2040 as compared to the previous Q1 population foreast.

Portland Metro Area Population (geographies differ) - in millions

Source: Global Insight Regional Service						Source: Oregon Office of Economic Analysis				Source: Metro								
	(14)		(15)			(16)		(17)		(18)			(19)			(20)		
	released 2001		releasd 2008			released 1997		released 2004		released @ May 2008 Forum			pre-recession draft			post-recession draft		
Scenario:	Trend Control		Trend Control							Trend Base Case			Trend Control			Trend Control		
	(5 counties)		(7 counties)			(3 counties)		(3 counties)		(7 counties)			(7 counties)			(7 counties)		
2000	1.875		2000	1.942		2000	1.420	2000	1.452	2000	1.9279	1.96%	2000	1.928	1.96%	2000	1.928	1.96%
2005	2.019	1.49%	2005	2.098	1.56%	2005	1.514	1.29%	2005	1.540	1.19%	2005	2.0966	1.69%	2005	2.093	1.66%	2005	2.0929	1.66%
2010	2.155	1.31%	2010	2.297	1.83%	2010	1.609	1.23%	2010	1.646	1.34%	2010	2.3141	1.99%	2010	2.272	1.66%	2010	2.2655	1.60%
2015	2.284	1.17%	2015	2.474	1.50%	2015	1.710	1.22%	2015	1.759	1.34%	2015	2.5291	1.79%	2015	2.504	1.96%	2015	2.5096	2.07%
2020	2.419	1.15%	2020	2.637	1.29%	2020	1.812	1.17%	2020	1.877	1.30%	2020	2.7077	1.37%	2020	2.672	1.31%	2020	2.7036	1.50%
2025	2.558	1.13%	2025	2.794	1.16%	2025	1.912	1.09%	2025	2.000	1.27%	2025	2.8711	1.18%	2025	2.822	1.10%	2025	2.8818	1.28%
			2030	2.947	1.07%	2030	2.009	0.99%	2030	2.125	1.22%	2030	3.0217	1.03%	2030	2.966	1.00%	2030	3.0501	1.14%
			2035	3.096	0.99%	2035	2.101	0.90%	2035	2.252	1.17%	2035	3.1813	1.03%	2035	3.108	0.94%	2035	3.2107	1.03%
			2040	3.245	0.94%	2040	2.189	0.83%	2040	2.384	1.14%	2040	3.2843	0.64%	2040	3.254	0.92%	2040	3.3715	0.98%
												2045	3.4178	0.80%						
												2050	3.5567	0.80%						
												2055	3.7013	0.80%						
												2060	3.8517	0.80%						
%APR	1.25%		1.29%			1.09%		1.25%		1.16%			1.32%			1.41%		
(2000-2035)			1.40%			1.16%		1.28%		1.51%			1.45%			1.54%		

(14) Global Insight
(15) Doug Laube, Global Insigt emailed the GI regional service population forecast figures, 2008
(16) Office of Economic Analysis, Department of Administrative Services, State of Oregon, January 1997
(17) Office of Economic Analysis, Department of Administrative Services, State of Oregon, April 2004
(18) Metro, Economic and Land Use Forecasting, published for the May 2008 Forecast Forum
(19) Metro, Economic and Land Use Forecasting, unpublished data (derived from econometric regional macro model) - 2008 Q1 US Macro Assumptions
(20) Metro, Economic and Land Use Forecasting, unpublished data (derived from econometric regional macro model) - 2008 Q4 US Macro Assumptions

Employment by Industry (Portland-Beaverton-Vancouver, OR-WA PMSA)

Moderate Growth Scenario (Baseline Series)

(in thousands)	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
Nonfarm Employment, Civ.	582.7	588.0	726.8	841.7	973.2	983.7	1,040.1	1,157.0	1,265.9	1,368.4	1,475.9	1,592.1	1,707.4
Private nonfarm emp.	496.0	499.9	626.1	730.7	842.7	846.0	891.8	1,005.7	1,105.3	1,198.2	1,296.6	1,399.7	1,496.7
Manufacturing, total	119.7	108.7	124.9	135.3	143.3	123.8	117.0	124.2	127.4	129.2	130.8	132.7	133.8
Durable Goods	89.1	78.1	89.0	96.3	107.5	94.0	87.3	93.6	96.5	98.1	99.7	101.4	102.5
Wood Products	9.3	7.7	7.9	6.4	5.9	6.0	4.0	5.0	4.9	4.7	4.5	4.5	4.4
Primary Metals	7.3	6.6	8.5	6.8	7.7	6.1	6.3	6.1	5.6	5.2	4.9	4.6	4.3
Fab. Metals	11.9	9.9	10.8	13.2	13.7	12.5	11.5	12.4	12.5	12.4	12.3	12.2	11.9
Machinery	10.2	7.1	9.2	10.5	10.4	8.3	7.7	8.0	7.8	7.6	7.5	7.4	7.3
Electronics	29.4	27.9	28.1	32.7	41.2	36.5	32.0	34.9	37.0	38.6	40.4	42.4	44.2
Computers	7.4	9.2	12.2	18.1	28.0	26.9	24.2	27.9	30.6	32.8	35.0	37.2	39.3
Oth. Elect.	22.0	18.6	16.0	14.6	13.2	9.5	7.9	7.0	6.4	5.8	5.4	5.1	4.9
Transport. Eq.	8.4	6.7	9.5	9.6	11.2	9.0	8.8	9.4	10.0	10.3	10.5	10.7	10.9
Oth. Durables	12.5	12.2	15.0	17.2	17.4	15.7	16.9	17.9	18.7	19.2	19.5	19.5	19.5
Non-Durable Goods	30.6	30.6	35.9	39.1	35.8	29.8	29.6	30.6	30.9	31.1	31.2	31.3	31.3
Food Proc.	8.6	8.8	9.5	9.6	8.9	8.6	9.4	9.6	9.6	9.5	9.4	9.4	9.4
Paper	7.3	6.7	7.5	7.1	6.5	5.0	4.6	4.9	4.9	4.9	4.8	4.8	4.8
Other Non-Dur.	14.8	15.1	18.8	22.3	20.4	16.3	15.7	16.0	16.5	16.8	17.0	17.1	17.2
Non-Mfg. (private)	380.4	395.8	501.2	595.4	699.4	722.2	774.9	881.6	977.9	1,069.1	1,165.9	1,267.1	1,362.9
Natural Resources	2.2	2.1	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2
Construction	28.1	22.3	36.9	45.3	53.2	58.5	60.9	65.3	69.2	73.7	79.2	85.6	93.0
Trade, Transport & Utilities	124.4	126.9	155.9	176.5	201.0	197.7	208.0	230.6	243.2	256.2	271.5	287.4	302.0
Wholesale Trade	36.1	35.5	41.6	49.1	55.6	56.3	58.6	64.8	70.9	76.4	82.1	87.7	92.0
Retail Trade	65.5	67.7	82.6	92.5	106.8	104.5	110.9	120.1	122.2	126.2	132.1	138.3	144.6
Auto parts	8.7	9.1	10.8	12.2	14.2	14.2	13.7	15.2	15.9	16.5	17.2	17.8	18.4
Food & Bev.	9.0	11.6	15.2	16.6	18.8	18.6	20.0	21.3	21.9	22.5	23.3	24.3	25.4
Other Retail	47.8	47.0	56.6	63.7	73.8	71.8	77.2	83.6	84.4	87.2	91.5	96.2	100.8
TWU	22.8	23.7	31.7	35.0	38.6	36.9	38.5	45.7	50.2	53.6	57.3	61.4	65.4
Information	16.6	16.1	16.1	19.0	26.0	22.9	23.0	26.1	29.7	33.6	37.7	41.5	43.1
Printing	3.3	4.7	4.5	6.5	9.7	9.1	10.1	12.0	14.8	17.4	19.9	21.7	21.7
Internet, etc.	13.4	11.5	11.6	12.5	16.2	13.8	12.9	14.0	14.9	16.2	17.8	19.8	21.4
Financial Activities	42.2	42.0	50.0	55.4	64.9	68.2	71.0	81.0	88.9	96.4	103.8	112.5	119.8
Finance & Ins.	28.3	27.9	30.0	33.1	41.6	43.9	44.8	52.2	57.2	62.0	66.7	72.5	77.1
Real Estate	13.9	14.1	20.0	22.3	23.3	24.4	26.3	28.8	31.7	34.4	37.1	39.9	42.7
Pro. Business	47.3	57.1	77.5	104.6	130.5	128.5	137.6	161.9	182.5	202.2	222.7	244.2	265.0
Pro., Sci., Tech.	19.7	22.7	36.3	43.9	48.5	49.1	54.4	63.2	71.7	79.6	88.1	97.1	106.2
Mgmt. of Companies	7.7	8.6	10.2	14.9	20.2	20.3	22.2	26.5	30.5	34.8	39.7	45.3	50.8
Admin & Waste	19.9	25.8	31.0	45.8	61.7	59.2	61.0	72.2	80.3	87.8	95.0	101.9	108.0
Edu. & Health	49.8	55.7	73.5	87.4	102.9	119.8	137.4	161.6	190.4	215.9	242.7	271.1	301.2
Education	7.0	8.2	11.7	14.1	18.0	21.0	23.8	26.5	30.2	33.8	37.3	41.2	44.6
Health Care	42.8	47.4	61.8	73.3	84.9	98.9	113.6	135.1	160.2	182.1	205.4	229.9	256.6
Leisure & Hospitality	49.3	51.5	63.6	76.0	85.8	90.1	99.0	110.2	121.8	132.5	143.1	153.9	164.2
Arts, Entertain. & Rec.	6.6	6.9	9.9	11.8	13.1	13.2	13.7	15.1	17.1	18.9	20.6	22.2	23.4
Accomm. & Food Ser.	42.7	44.6	53.7	64.2	72.7	76.9	85.4	95.1	104.8	113.6	122.5	131.7	140.8
Other Services	20.7	22.2	25.7	29.1	33.4	34.6	36.2	43.4	50.7	57.4	63.9	69.9	73.4
Social Orgs.	6.6	6.6	12.0	13.2	15.3	15.1	15.9	20.5	25.2	29.4	33.3	36.4	37.0
Other	9.9	10.9	13.7	15.9	18.1	19.5	20.3	22.9	25.5	28.0	30.6	33.4	36.4
Government, total	93.5	96.0	109.2	118.3	137.7	144.8	155.5	158.4	167.8	177.3	186.3	199.4	217.8
Military	6.8	8.0	8.5	7.3	7.2	7.2	7.2	7.1	7.1	7.1	7.1	7.1	7.1
Civilian Govt., total	86.7	88.1	100.8	111.0	130.5	137.7	148.3	151.2	160.6	170.1	179.2	192.3	210.7
Civilian Fed	16.7	16.9	18.8	18.0	18.9	18.4	18.5	18.1	18.6	18.1	18.6	18.1	18.1
State & Local	70.0	71.1	81.9	93.0	111.6	119.3	129.8	133.1	142.1	152.0	160.6	174.2	192.5

Employment by Industry (Portland-Beaverton-Vancouver, OR-WA PMSA)

(annualized percent change)

	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
Nonfarm Employment, Civ.	4.82	0.18	4.33	2.98	2.95	0.21	1.12	2.15	1.82	1.57	1.52	1.53	1.41
Private nonfarm emp.	5.32	0.16	4.60	3.14	2.89	0.08	1.06	2.43	1.91	1.63	1.59	1.54	1.35
Manufacturing, total	5.46	(1.91)	2.82	1.62	1.15	(2.88)	(1.14)	1.21	0.51	0.28	0.25	0.28	0.18
Durable Goods	7.18	(2.59)	2.65	1.58	2.23	(2.65)	(1.46)	1.41	0.60	0.34	0.32	0.34	0.22
Wood Products	(2.27)	(3.77)	0.75	(4.34)	(1.46)	0.17	(7.53)	4.24	(0.20)	(0.70)	(0.86)	(0.13)	(0.38)
Primary Metals	9.28	(2.23)	5.35	(4.48)	2.72	(4.69)	0.81	(0.87)	(1.50)	(1.43)	(1.25)	(1.17)	(1.41)
Fab. Metals	5.06	(3.66)	1.66	4.17	0.70	(1.73)	(1.68)	1.47	0.11	(0.08)	(0.13)	(0.20)	(0.48)
Machinery	3.90	(6.96)	5.26	2.64	(0.08)	(4.60)	(1.40)	0.89	(0.53)	(0.49)	(0.34)	(0.19)	(0.32)
Electronics	17.65	(1.05)	0.17	3.06	4.73	(2.40)	(2.57)	1.74	1.17	0.84	0.91	0.97	0.84
Computers	29.09	4.65	5.65	8.24	9.16	(0.78)	(2.15)	2.90	1.88	1.37	1.31	1.26	1.07
Oth. Elect.	14.79	(3.29)	(3.06)	(1.73)	(2.04)	(6.29)	(3.78)	(2.23)	(1.89)	(1.85)	(1.45)	(1.02)	(0.85)
Transport. Eq.	3.82	(4.31)	7.13	0.10	3.14	(4.17)	(0.45)	1.32	1.14	0.69	0.42	0.36	0.23
Oth. Durables	3.13	(0.45)	4.15	2.81	0.20	(2.06)	1.51	1.11	0.92	0.51	0.29	0.00	0.01
Non-Durable Goods	1.13	(0.01)	3.24	1.71	(1.74)	(3.58)	(0.13)	0.63	0.23	0.10	0.06	0.08	0.02
Food Proc.	(0.49)	0.46	1.70	0.21	(1.63)	(0.71)	1.91	0.46	(0.15)	(0.19)	(0.11)	(0.04)	(0.04)
Paper	1.61	(1.51)	2.28	(1.09)	(1.75)	(5.21)	(1.83)	1.66	(0.12)	(0.25)	(0.25)	(0.08)	(0.07)
Other Non-Dur.	1.88	0.43	4.49	3.45	(1.78)	(4.40)	(0.76)	0.43	0.57	0.36	0.25	0.19	0.07
Non-Mfg. (private)	5.24	0.80	4.83	3.51	3.27	0.64	1.42	2.61	2.10	1.80	1.75	1.68	1.47
Natural Resources	6.52	(0.76)	(0.19)	(0.39)	(1.33)	(1.09)	(0.80)	(1.08)	(1.66)	(1.10)	(1.01)	(0.91)	(0.88)
Construction	5.95	(4.52)	10.62	4.22	3.24	1.92	0.81	1.41	1.16	1.26	1.46	1.56	1.67
Trade, Transport & Utilities	3.52	0.40	4.21	2.52	2.63	(0.33)	1.02	2.09	1.07	1.04	1.17	1.14	1.00
Wholesale Trade	5.46	(0.32)	3.20	3.35	2.52	0.27	0.80	2.03	1.79	1.52	1.45	1.32	0.96
Retail Trade	2.81	0.66	4.06	2.29	2.92	(0.43)	1.20	1.60	0.35	0.65	0.91	0.93	0.89
Auto parts	0.65	1.04	3.52	2.38	3.17	(0.11)	(0.63)	2.07	0.89	0.79	0.77	0.75	0.59
Food & Bev.	5.16	5.19	5.55	1.83	2.47	(0.25)	1.54	1.27	0.51	0.55	0.75	0.84	0.88
Other Retail	2.80	(0.36)	3.78	2.40	2.99	(0.54)	1.46	1.60	0.21	0.65	0.97	0.99	0.94
TWU	2.67	0.77	6.05	1.99	1.99	(0.92)	0.85	3.50	1.88	1.32	1.36	1.38	1.30
Information	6.16	(0.57)	0.00	3.35	6.41	(2.44)	0.08	2.50	2.67	2.48	2.32	1.94	0.77
Printing	5.74	7.52	(0.78)	7.65	8.44	(1.26)	2.12	3.49	4.20	3.28	2.77	1.69	0.06
Internet, etc.	6.26	(3.00)	0.29	1.50	5.29	(3.16)	(1.38)	1.68	1.28	1.66	1.85	2.21	1.52
Financial Activities	6.65	(0.09)	3.52	2.10	3.19	1.02	0.80	2.65	1.88	1.64	1.49	1.62	1.27
Finance & Ins.	6.20	(0.28)	1.44	2.00	4.65	1.07	0.41	3.11	1.85	1.65	1.46	1.69	1.22
Real Estate	7.59	0.32	7.20	2.24	0.86	0.93	1.50	1.86	1.94	1.63	1.54	1.48	1.37
Pro. Business	6.83	3.86	6.31	6.18	4.51	(0.30)	1.37	3.31	2.43	2.07	1.95	1.86	1.65
Pro., Sci., Tech.	7.89	2.95	9.83	3.85	2.03	0.23	2.06	3.04	2.58	2.11	2.04	1.97	1.81
Mgmt. of Companies	5.01	2.28	3.40	7.90	6.24	0.06	1.87	3.57	2.89	2.63	2.69	2.64	2.34
Admin & Waste	6.53	5.29	3.78	8.13	6.14	(0.84)	0.59	3.44	2.13	1.81	1.58	1.42	1.17
Edu. & Health	5.71	2.25	5.72	3.51	3.33	3.09	2.77	3.30	3.33	2.54	2.37	2.24	2.13
Education	7.97	3.12	7.32	3.78	5.08	3.05	2.56	2.18	2.65	2.27	2.01	2.02	1.60
Health Care	5.36	2.09	5.43	3.47	2.98	3.10	2.82	3.53	3.46	2.59	2.44	2.28	2.22
Leisure & Hospitality	6.93	0.87	4.32	3.62	2.46	0.99	1.91	2.15	2.03	1.69	1.56	1.46	1.31
Arts, Entertain. & Rec.	3.28	0.86	7.51	3.52	2.07	0.26	0.66	2.02	2.47	2.06	1.75	1.46	1.10
Accomm. & Food Ser.	7.56	0.87	3.79	3.64	2.53	1.11	2.12	2.18	1.96	1.63	1.52	1.46	1.35
Other Services	3.16	1.43	2.93	2.55	2.81	0.70	0.90	3.69	3.17	2.49	2.19	1.80	1.00
Social Orgs.	4.25	(0.09)	12.76	1.93	3.10	(0.28)	1.00	5.22	4.21	3.11	2.55	1.82	0.32
Other	2.81	2.00	4.59	3.08	2.58	1.49	0.84	2.44	2.20	1.86	1.80	1.77	1.72
Government, total	1.81	0.54	2.61	1.61	3.08	1.02	1.42	0.37	1.16	1.11	1.00	1.37	1.78
Military	(2.19)	3.26	1.25	(2.85)	(0.50)	0.11	(0.14)	(0.03)	(0.03)	0.00	0.00	0.00	0.00
Civilian Govt., total	2.16	0.32	2.73	1.95	3.30	1.07	1.50	0.39	1.21	1.15	1.04	1.42	1.84
Civilian Fed	2.21	0.26	2.11	(0.91)	1.01	(0.57)	0.20	(0.49)	0.55	(0.53)	0.49	(0.47)	0.00
State & Local	2.14	0.33	2.87	2.56	3.72	1.34	1.70	0.52	1.30	1.37	1.11	1.63	2.03

Employment by Industry (Portland-Beaverton-Vancouver, OR-WA PMSA)

HIGH Growth Scenario

	2010	2015	2020	2025	2030	2035	2040
(in thousands)							
Nonfarm Employment, Civ.	1,152.4	1,299.4	1,434.2	1,561.8	1,695.3	1,836.8	1,985.7
Private nonfarm emp.	998.7	1,142.0	1,266.8	1,384.4	1,508.1	1,635.9	1,764.3
Manufacturing, total	137.6	149.5	155.4	159.4	163.0	166.3	169.1
Durable Goods	104.9	115.2	120.3	123.6	126.8	129.7	132.2
Wood Products	5.0	6.2	6.3	6.2	6.0	6.0	6.0
Primary Metals	7.6	7.7	7.4	7.1	6.9	6.6	6.3
Fab. Metals	12.4	13.5	13.7	13.7	13.7	13.7	13.6
Machinery	8.6	9.0	8.8	8.6	8.4	8.2	8.0
Electronics	39.2	43.6	46.5	48.9	51.6	54.5	57.3
Computers	30.5	35.8	39.4	42.4	45.6	48.7	51.8
Oth. Elect.	8.7	7.8	7.1	6.5	6.1	5.8	5.5
Transport. Eq.	12.2	13.0	13.5	13.9	14.2	14.4	14.6
Oth. Durables	20.0	22.3	24.0	25.2	26.1	26.4	26.5
Non-Durable Goods	32.7	34.3	35.2	35.8	36.2	36.6	36.9
Food Proc.	10.0	10.3	10.2	10.1	10.1	10.0	10.0
Paper	5.2	5.5	5.4	5.4	5.3	5.2	5.2
Other Non-Dur.	17.5	18.6	19.6	20.3	20.9	21.4	21.7
Non-Mfg. (private)	861.1	992.6	1111.4	1,225.0	1,345.1	1,469.6	1,595.2
Natural Resources	1.9	1.8	1.7	1.6	1.5	1.4	1.4
Construction	77.9	85.0	93.6	104.0	117.1	132.3	150.6
Trade, Transport & Utilities	221.5	246.7	261.7	277.0	294.4	311.9	328.5
Wholesale Trade	61.4	67.9	74.1	80.0	85.9	91.8	96.6
Retail Trade	120.6	132.3	136.3	142.1	149.4	156.9	164.4
Auto parts	15.4	17.0	17.7	18.5	19.2	20.0	20.7
Food & Bev.	22.0	23.5	24.3	25.1	26.2	27.5	28.8
Other Retail	83.2	91.8	94.3	98.5	104.0	109.5	114.9
TWU	40.8	48.3	53.0	56.7	60.7	65.0	69.4
Information	27.9	31.7	35.9	40.8	46.2	51.0	55.3
Printing	13.4	16.7	20.6	24.3	27.9	30.6	31.7
Internet, etc.	13.6	14.9	16.0	17.4	19.2	21.4	23.6
Financial Activities	76.5	88.1	97.0	105.2	113.1	122.2	130.3
Finance & Ins.	48.1	56.6	62.3	67.6	72.5	78.5	83.5
Real Estate	28.5	31.5	34.7	37.6	40.6	43.7	46.8
Pro. Business	164.6	200.7	230.5	258.0	285.9	313.7	341.7
Pro., Sci., Tech.	60.8	71.8	81.9	90.9	100.3	110.2	120.1
Mgmt. of Companies	26.8	33.6	39.7	46.0	52.7	60.0	67.8
Admin & Waste	77.0	95.3	108.9	121.2	132.8	143.6	153.7
Edu. & Health	145.7	172.6	203.8	231.9	261.6	293.1	327.2
Education	25.9	29.0	33.2	37.4	41.7	46.3	50.9
Health Care	119.8	143.6	170.6	194.5	219.9	246.8	276.3
Leisure & Hospitality	103.2	114.9	127.1	138.2	149.4	160.7	171.9
Arts, Entertain. & Rec.	15.2	16.8	19.0	21.0	22.9	24.6	26.3
Accomm. & Food Ser.	88.1	98.1	108.1	117.2	126.5	136.1	145.6
Other Services	41.9	51.2	60.2	68.2	76.1	83.2	88.4
Social Orgs.	20.4	26.9	33.1	38.5	43.5	47.6	49.5
Other	21.5	24.3	27.1	29.7	32.6	35.6	38.9
Government, total	161.9	165.5	175.6	185.7	195.4	209.1	229.5
Military	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Civilian Govt., total	153.7	157.4	167.4	177.5	187.2	200.9	221.4
Civilian Fed	19.1	18.7	19.2	18.7	19.2	18.8	18.8
State & Local	134.6	138.7	148.2	158.8	168.0	182.1	202.6

Employment by Industry (Portland-Beaverton-Vancouver, OR-WA PMSA)

LOW Growth Scenario

	2010	2015	2020	2025	2030	2035	2040
(in thousands)							
Nonfarm Employment, Civ.	926.2	1,011.1	1,093.5	1,170.7	1,252.2	1,342.9	1,433.7
Private nonfarm emp.	783.3	866.0	939.7	1,007.9	1,081.0	1,159.2	1,231.5
Manufacturing, total	96.3	99.0	99.4	99.0	98.7	99.0	98.9
Durable Goods	69.7	72.1	72.7	72.6	72.5	73.0	73.1
Wood Products	3.1	3.7	3.5	3.3	3.1	3.1	3.1
Primary Metals	5.1	4.4	3.8	3.3	2.9	2.7	2.3
Fab. Metals	10.6	11.3	11.2	11.1	10.9	10.7	10.3
Machinery	6.8	7.1	6.9	6.7	6.7	6.7	6.7
Electronics	24.9	26.3	27.5	28.3	29.1	30.3	31.2
Computers	17.9	20.0	21.8	23.1	24.4	25.7	26.8
Oth. Elect.	7.1	6.3	5.7	5.1	4.8	4.5	4.3
Transport. Eq.	5.5	5.9	6.4	6.7	6.9	7.1	7.1
Oth. Durables	13.8	13.5	13.4	13.1	12.9	12.6	12.4
Non-Durable Goods	26.6	26.8	26.7	26.4	26.2	26.0	25.8
Food Proc.	8.8	9.0	8.9	8.8	8.8	8.8	8.7
Paper	3.9	4.4	4.4	4.4	4.3	4.3	4.4
Other Non-Dur.	13.9	13.5	13.4	13.2	13.1	12.9	12.7
Non-Mfg. (private)	687.0	767.0	840.3	908.9	982.3	1,060.2	1,132.6
Natural Resources	1.5	1.4	1.3	1.2	1.2	1.1	1.1
Construction	43.9	45.6	44.7	43.3	41.3	38.8	35.7
Trade, Transport & Utilities	191.9	210.9	221.2	232.0	245.2	259.3	272.4
Wholesale Trade	55.8	61.8	67.6	72.9	78.3	83.6	87.9
Retail Trade	101.3	107.9	108.1	110.4	114.7	119.8	124.9
Auto parts	12.0	13.5	14.1	14.6	15.1	15.7	16.2
Food & Bev.	18.1	19.1	19.5	19.9	20.5	21.2	22.0
Other Retail	71.2	75.3	74.6	75.9	79.1	82.9	86.7
TWU	36.2	43.1	47.3	50.4	53.9	57.7	61.6
Information	19.2	20.6	22.9	25.5	28.3	31.0	31.8
Printing	6.9	7.4	9.0	10.5	12.0	12.7	11.8
Internet, etc.	12.2	13.2	13.9	15.0	16.4	18.2	20.0
Financial Activities	65.5	73.8	80.8	87.6	94.5	102.8	110.1
Finance & Ins.	41.4	47.7	52.0	56.5	60.9	66.6	71.4
Real Estate	24.1	26.1	28.7	31.2	33.6	36.2	38.7
Pro. Business	110.5	123.0	134.6	146.4	159.6	174.7	189.3
Pro., Sci., Tech.	48.0	54.5	61.6	68.3	75.8	84.0	92.2
Mgmt. of Companies	17.6	19.4	21.3	23.6	26.7	30.6	34.8
Admin & Waste	44.9	49.1	51.7	54.4	57.1	60.2	62.2
Edu. & Health	129.1	150.6	176.9	199.8	223.7	249.1	275.9
Education	21.7	24.0	27.1	30.1	32.9	36.1	38.9
Health Care	107.5	126.7	149.8	169.7	190.8	213.0	237.0
Leisure & Hospitality	94.9	105.5	116.6	126.7	136.8	147.0	157.0
Arts, Entertain. & Rec.	12.2	13.4	15.2	16.8	18.3	19.7	20.9
Accomm. & Food Ser.	82.7	92.1	101.4	109.9	118.5	127.3	136.1
Other Services	30.5	35.6	41.3	46.5	51.7	56.5	59.3
Social Orgs.	11.4	14.1	17.3	20.2	23.1	25.3	25.4
Other	19.1	21.6	24.0	26.3	28.7	31.2	33.9
Government, total	149.0	151.2	160.0	168.9	177.3	189.8	208.3
Military	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Civilian Govt., total	142.9	145.1	153.9	162.8	171.2	183.7	202.2
Civilian Fed	18.0	17.5	18.0	17.5	17.9	17.5	17.5
State & Local	125.0	128.0	136.0	145.0	153.0	166.0	184.7

Employment by Industry (Portland-Beaverton-Vancouver, OR-WA PMSA)

Range: difference between HI and Lo Scenarios

	2010	2015	2020	2025	2030	2035	2040
(in thousands)							
Nonfarm Employment, Civ	226.3	288.3	340.7	391.2	443.2	493.9	552.0
Private nonfarm emp.	215.4	276.0	327.1	376.4	427.1	476.7	532.8
Manufacturing, total	41.3	50.5	56.0	60.4	64.3	67.3	70.2
Durable Goods	35.2	43.0	47.6	51.1	54.3	56.7	59.1
Wood Products	1.9	2.5	2.7	2.8	2.9	2.9	2.9
Primary Metals	2.6	3.3	3.6	3.8	3.9	4.0	3.9
Fab. Metals	1.8	2.2	2.4	2.6	2.8	3.0	3.3
Machinery	1.7	2.0	2.0	1.8	1.7	1.5	1.3
Electronics	14.2	17.3	19.0	20.7	22.5	24.2	26.1
Computers	12.6	15.7	17.6	19.3	21.2	23.0	25.0
Oth. Elect.	1.6	1.5	1.4	1.4	1.3	1.2	1.2
Transport. Eq.	6.7	7.1	7.1	7.2	7.3	7.3	7.4
Oth. Durables	6.2	8.8	10.7	12.1	13.2	13.8	14.1
Non-Durable Goods	6.1	7.5	8.5	9.3	10.1	10.6	11.1
Food Proc.	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Paper	1.2	1.1	1.1	1.0	0.9	0.9	0.8
Other Non-Dur.	3.6	5.1	6.2	7.1	7.9	8.4	9.0
Non-Mfg. (private)	174.1	225.5	271.1	316.0	362.8	409.4	462.6
Natural Resources	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Construction	34.0	39.3	48.9	60.8	75.8	93.5	114.9
Trade, Transport & Utilitie	29.6	35.8	40.5	45.1	49.2	52.6	56.1
Wholesale Trade	5.6	6.1	6.5	7.1	7.6	8.2	8.7
Retail Trade	19.3	24.4	28.2	31.7	34.7	37.1	39.5
Auto parts	3.4	3.5	3.7	3.9	4.1	4.3	4.5
Food & Bev.	3.9	4.4	4.8	5.3	5.8	6.3	6.8
Other Retail	12.0	16.6	19.8	22.6	24.9	26.6	28.2
TWU	4.7	5.3	5.8	6.3	6.8	7.3	7.8
Information	8.8	11.1	13.1	15.3	17.9	20.1	23.5
Printing	6.4	9.3	11.7	13.8	15.9	17.9	19.9
Internet, etc.	1.3	1.7	2.1	2.4	2.8	3.2	3.6
Financial Activities	11.0	14.3	16.2	17.5	18.6	19.4	20.2
Finance & Ins.	6.6	8.9	10.2	11.1	11.6	11.9	12.1
Real Estate	4.4	5.4	5.9	6.4	7.0	7.5	8.1
Pro. Business	54.1	77.7	95.9	111.7	126.3	139.0	152.4
Pro., Sci., Tech.	12.8	17.3	20.3	22.6	24.5	26.2	27.9
Mgmt. of Companies	9.2	14.2	18.4	22.4	26.0	29.4	33.0
Admin & Waste	32.1	46.2	57.2	66.8	75.7	83.4	91.5
Edu. & Health	16.6	22.0	26.9	32.1	37.8	44.1	51.3
Education	4.2	5.1	6.1	7.3	8.7	10.3	12.0
Health Care	12.4	16.9	20.8	24.8	29.1	33.8	39.3
Leisure & Hospitality	8.4	9.4	10.5	11.5	12.7	13.7	14.9
Arts, Entertain. & Rec.	3.0	3.4	3.8	4.2	4.6	5.0	5.4
Accomm. & Food Ser.	5.4	6.0	6.7	7.3	8.1	8.8	9.5
Other Services	11.4	15.6	18.9	21.7	24.3	26.7	29.0
Social Orgs.	8.9	12.9	15.8	18.3	20.4	22.3	24.1
Other	2.4	2.7	3.1	3.5	3.9	4.4	4.9
Government, total	12.9	14.3	15.6	16.8	18.1	19.3	21.2
Military	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Civilian Govt., total	10.8	12.3	13.6	14.7	16.0	17.2	19.1
Civilian Fed	1.2	1.2	1.3	1.2	1.3	1.3	1.3
State & Local	9.6	10.7	12.2	13.8	15.0	16.1	17.9

Employment

(PMSA in 1,000's)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total Nonfarm W&S Jobs									
Portland PMSA	973.23	965.84	944.03	934.30	954.01	983.68	1,015.28	1,036.98	1,042.41
%ch	2.80	(0.76)	(2.26)	(1.03)	2.11	3.11	3.21	2.14	0.52
U.S. (in millions)	111.00	110.71	108.83	108.42	109.80	111.89	114.12	115.42	115.02
%ch	2.14	(0.26)	(1.70)	(0.38)	1.28	1.90	1.99	1.14	(0.35)
Total Manufacturing									
Portland PMSA	143.30	135.87	123.82	118.12	120.21	123.82	126.62	126.01	124.28
%ch	1.08	(5.19)	(8.87)	(4.60)	1.77	3.00	2.26	(0.48)	(1.37)
U.S. (in millions)	17.27	16.44	15.26	14.51	14.32	14.23	14.16	13.88	13.48
%ch	(0.33)	(4.78)	(7.20)	(4.90)	(1.33)	(0.62)	(0.48)	(1.94)	(2.91)
Durable Goods, total									
Portland PMSA	107.52	102.27	92.80	87.93	90.04	94.00	96.38	95.76	94.05
%ch	2.07	(4.89)	(9.26)	(5.25)	2.39	4.40	2.53	(0.64)	(1.78)
U.S. (in millions)	10.88	10.34	9.48	8.96	8.92	8.96	8.98	8.82	8.53
%ch	0.43	(4.99)	(8.24)	(5.49)	(0.43)	0.34	0.31	(1.87)	(3.29)
Wood Products									
Portland PMSA	5.91	5.68	5.54	5.53	5.69	5.96	5.95	5.58	4.86
%ch	(3.15)	(3.80)	(2.51)	(0.26)	2.98	4.72	(0.15)	(6.14)	(12.93)
U.S. (in millions)	0.61	0.57	0.55	0.54	0.55	0.56	0.56	0.52	0.48
%ch	(1.20)	(6.41)	(3.26)	(3.15)	2.27	1.73	(0.04)	(6.99)	(7.97)
Primary Metals									
Portland PMSA	7.73	6.69	6.26	5.58	5.72	6.08	6.29	6.57	7.08
%ch	(2.94)	(13.45)	(6.47)	(10.78)	2.37	6.42	3.41	4.51	7.68
U.S. (in millions)	0.62	0.57	0.51	0.48	0.47	0.47	0.46	0.46	0.45
%ch	(0.51)	(8.26)	(10.79)	(6.26)	(2.16)	(0.16)	(0.48)	(1.79)	(2.16)
Fabricated Metals									
Portland PMSA	13.67	12.71	11.97	11.51	11.87	12.53	12.93	13.25	13.00
%ch	0.73	(7.06)	(5.79)	(3.89)	3.11	5.56	3.25	2.46	(1.89)
U.S. (in millions)	1.75	1.68	1.55	1.48	1.50	1.52	1.55	1.56	1.54
%ch	1.44	(4.35)	(7.64)	(4.51)	1.22	1.69	2.06	0.64	(1.55)
Machinery Mfg.									
Portland PMSA	10.44	9.90	8.78	8.43	8.26	8.25	8.38	8.61	8.54
%ch	2.97	(5.19)	(11.28)	(3.99)	(2.07)	(0.09)	1.60	2.70	(0.80)
U.S. (in millions)	1.46	1.37	1.23	1.15	1.15	1.17	1.18	1.19	1.19
%ch	(0.78)	(5.95)	(10.13)	(6.48)	(0.58)	1.73	1.56	0.41	0.07
Computer & Electr.									
Portland PMSA	41.21	42.72	37.68	34.69	35.62	36.49	37.70	36.89	35.53
%ch	7.30	3.66	(11.80)	(7.93)	2.70	2.42	3.32	(2.13)	(3.68)
U.S. (in millions)	1.82	1.75	1.51	1.36	1.32	1.32	1.31	1.27	1.25
%ch	2.22	(3.93)	(13.81)	(10.10)	(2.40)	(0.49)	(0.64)	(2.73)	(1.80)
Transport. Equip.									
Portland PMSA	11.16	8.54	7.70	7.58	7.96	9.02	9.32	9.11	8.70
%ch	(3.79)	(23.46)	(9.83)	(1.60)	4.96	13.33	3.31	(2.22)	(4.44)
U.S. (in millions)	2.06	1.94	1.83	1.78	1.77	1.77	1.77	1.71	1.61
%ch	(1.51)	(5.73)	(5.62)	(2.99)	(0.47)	0.32	(0.19)	(3.29)	(6.12)
Other Durable Goods									
Portland PMSA	17.40	16.03	14.87	14.62	14.93	15.68	15.81	15.74	16.33
%ch	(0.91)	(7.89)	(7.23)	(1.69)	2.15	5.02	0.84	(0.46)	3.78
U.S. (in millions)	4.01	3.83	3.53	3.34	3.32	3.32	3.33	3.29	3.21
%ch	0.61	(4.65)	(7.65)	(5.50)	(0.52)	(0.08)	0.32	(1.09)	(2.64)
Non-Durable Goods									
Portland PMSA	35.78	33.60	31.01	30.19	30.18	29.82	30.24	30.25	30.23
%ch	(1.77)	(6.10)	(7.69)	(2.67)	(0.04)	(1.17)	1.39	0.05	(0.09)
U.S. (in millions)	6.39	6.11	5.77	5.55	5.39	5.27	5.17	5.07	4.95
%ch	(1.60)	(4.41)	(5.44)	(3.95)	(2.79)	(2.22)	(1.83)	(2.07)	(2.24)

Employment

(PMSA in 1,000's)

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Nonfarm W&S									
Portland PMSA	1,036.07	1,040.11	1,058.01	1,082.34	1,105.92	1,131.15	1,156.99	1,182.11	1,203.77
%ch	(0.61)	0.39	1.72	2.30	2.18	2.28	2.28	2.17	1.83
U.S. (in millions)	113.04	113.24	115.11	117.56	119.76	121.58	123.29	124.86	126.13
%ch	(1.72)	0.18	1.65	2.13	1.87	1.52	1.41	1.27	1.02
Total Manufacturing									
Portland PMSA	118.85	116.95	119.00	121.16	122.11	123.18	124.22	125.13	125.88
%ch	(4.37)	(1.60)	1.75	1.82	0.78	0.88	0.85	0.73	0.60
U.S. (in millions)	12.57	11.99	12.19	12.50	12.71	12.81	12.78	12.79	12.80
%ch	(6.73)	(4.61)	1.64	2.51	1.70	0.79	(0.20)	0.07	0.07
Durable Goods, tota									
Portland PMSA	89.18	87.32	89.11	90.98	91.78	92.72	93.64	94.41	95.08
%ch	(5.18)	(2.09)	2.06	2.10	0.87	1.03	0.99	0.83	0.70
U.S. (in millions)	7.87	7.46	7.69	7.99	8.16	8.23	8.20	8.20	8.19
%ch	(7.68)	(5.19)	3.11	3.78	2.17	0.91	(0.41)	(0.04)	(0.07)
Wood Products									
Portland PMSA	4.09	4.03	4.43	4.70	4.82	4.90	4.96	4.99	4.98
%ch	(15.79)	(1.69)	10.04	6.05	2.53	1.74	1.13	0.67	(0.25)
U.S. (in millions)	0.43	0.43	0.48	0.52	0.53	0.54	0.55	0.55	0.54
%ch	(11.00)	0.82	12.76	7.00	2.99	1.97	0.44	0.54	(0.80)
Primary Metals									
Portland PMSA	6.64	6.33	6.25	6.21	6.13	6.11	6.06	5.99	5.92
%ch	(6.26)	(4.63)	(1.17)	(0.76)	(1.25)	(0.35)	(0.78)	(1.12)	(1.17)
U.S. (in millions)	0.41	0.37	0.37	0.37	0.38	0.38	0.38	0.38	0.37
%ch	(7.45)	(9.99)	(1.46)	1.06	2.26	1.02	(0.97)	(0.80)	(0.21)
Fabricated Metals									
Portland PMSA	11.89	11.51	11.73	12.02	12.22	12.33	12.38	12.45	12.49
%ch	(8.54)	(3.17)	1.85	2.53	1.66	0.87	0.47	0.50	0.34
U.S. (in millions)	1.43	1.29	1.29	1.34	1.41	1.45	1.47	1.50	1.51
%ch	(6.93)	(9.88)	0.16	3.76	4.80	3.25	1.29	1.87	0.75
Machinery Mfg.									
Portland PMSA	7.94	7.69	7.74	7.92	8.02	8.05	8.04	8.03	8.00
%ch	(6.98)	(3.17)	0.63	2.33	1.24	0.32	(0.02)	(0.12)	(0.39)
U.S. (in millions)	1.11	1.05	1.07	1.13	1.17	1.20	1.20	1.20	1.20
%ch	(6.84)	(5.34)	2.43	5.06	4.06	1.83	0.02	0.13	(0.07)
Computer & Electr.									
Portland PMSA	33.37	32.03	32.67	33.46	34.01	34.43	34.91	35.36	35.81
%ch	(6.09)	(4.00)	1.99	2.43	1.64	1.23	1.40	1.27	1.28
U.S. (in millions)	1.23	1.15	1.18	1.18	1.10	1.05	1.01	0.99	0.98
%ch	(1.30)	(6.74)	2.37	0.59	(6.71)	(5.27)	(3.53)	(2.29)	(0.97)
Transport. Equip.									
Portland PMSA	8.65	8.82	9.13	9.22	9.15	9.29	9.42	9.53	9.65
%ch	(0.59)	1.96	3.47	1.01	(0.81)	1.63	1.34	1.22	1.16
U.S. (in millions)	1.42	1.39	1.47	1.55	1.61	1.63	1.61	1.59	1.58
%ch	(11.87)	(2.00)	6.03	5.61	3.70	0.94	(1.06)	(0.97)	(1.12)
Other Durable Good									
Portland PMSA	16.59	16.90	17.16	17.45	17.43	17.61	17.86	18.06	18.24
%ch	1.59	1.87	1.56	1.68	(0.12)	1.05	1.39	1.13	0.96
U.S. (in millions)	2.95	2.83	2.90	3.02	3.13	3.18	3.19	3.19	3.21
%ch	(7.97)	(3.98)	2.47	3.97	3.56	1.82	0.08	0.25	0.49
Non-Durable Goods									
Portland PMSA	29.67	29.63	29.88	30.18	30.33	30.46	30.58	30.71	30.80
%ch	(1.83)	(0.14)	0.85	0.98	0.50	0.42	0.42	0.42	0.29
U.S. (in millions)	4.70	4.53	4.49	4.51	4.55	4.57	4.58	4.60	4.61
%ch	(5.09)	(3.65)	(0.79)	0.33	0.87	0.57	0.19	0.28	0.32

Employment

(PMSA in 1,000's)

	2018	2019	2020	2021	2022	2023	2024	2025	2026
Total Nonfarm W&S									
Portland PMSA	1,223.86	1,244.16	1,265.92	1,285.56	1,304.70	1,325.23	1,346.43	1,368.37	1,390.31
%ch	1.67	1.66	1.75	1.55	1.49	1.57	1.60	1.63	1.60
U.S. (in millions)	127.32	128.36	129.36	130.52	131.73	132.95	134.17	135.40	136.62
%ch	0.94	0.82	0.78	0.90	0.93	0.93	0.92	0.91	0.90
Total Manufacturing									
Portland PMSA	126.50	126.99	127.41	127.60	127.82	128.19	128.65	129.19	129.68
%ch	0.50	0.39	0.33	0.15	0.17	0.29	0.35	0.42	0.38
U.S. (in millions)	12.80	12.76	12.63	12.55	12.40	12.25	12.12	12.00	11.91
%ch	0.03	(0.34)	(1.05)	(0.64)	(1.17)	(1.19)	(1.06)	(1.01)	(0.76)
Durable Goods, tota									
Portland PMSA	95.64	96.08	96.47	96.62	96.82	97.17	97.59	98.10	98.55
%ch	0.59	0.46	0.41	0.15	0.21	0.35	0.44	0.52	0.46
U.S. (in millions)	8.18	8.14	8.04	7.96	7.84	7.73	7.65	7.57	7.52
%ch	(0.17)	(0.44)	(1.28)	(0.93)	(1.49)	(1.38)	(1.15)	(1.00)	(0.64)
Wood Products									
Portland PMSA	4.96	4.93	4.91	4.86	4.81	4.78	4.75	4.74	4.74
%ch	(0.43)	(0.44)	(0.55)	(0.92)	(1.09)	(0.66)	(0.59)	(0.10)	0.03
U.S. (in millions)	0.54	0.54	0.53	0.52	0.51	0.50	0.49	0.49	0.49
%ch	(0.71)	(0.76)	(1.48)	(1.49)	(2.49)	(2.52)	(1.52)	(0.29)	0.15
Primary Metals									
Portland PMSA	5.83	5.73	5.62	5.52	5.43	5.36	5.30	5.23	5.17
%ch	(1.53)	(1.71)	(1.87)	(1.90)	(1.54)	(1.33)	(1.17)	(1.21)	(1.27)
U.S. (in millions)	0.37	0.37	0.37	0.38	0.37	0.37	0.37	0.37	0.36
%ch	(0.08)	0.03	(0.08)	0.37	(0.58)	(0.54)	(0.56)	(0.90)	(1.06)
Fabricated Metals									
Portland PMSA	12.49	12.48	12.45	12.42	12.39	12.40	12.40	12.40	12.40
%ch	0.01	(0.08)	(0.26)	(0.26)	(0.19)	0.02	0.02	(0.01)	0.06
U.S. (in millions)	1.50	1.51	1.50	1.50	1.49	1.47	1.46	1.45	1.44
%ch	(0.30)	0.11	(0.41)	0.07	(0.98)	(0.81)	(0.69)	(0.92)	(0.65)
Machinery Mfg.									
Portland PMSA	7.94	7.89	7.83	7.77	7.72	7.69	7.66	7.64	7.62
%ch	(0.73)	(0.71)	(0.78)	(0.67)	(0.70)	(0.40)	(0.33)	(0.32)	(0.26)
U.S. (in millions)	1.19	1.19	1.18	1.16	1.15	1.13	1.12	1.11	1.10
%ch	(0.34)	(0.25)	(0.94)	(1.10)	(1.48)	(1.16)	(0.94)	(1.00)	(0.89)
Computer & Electr.									
Portland PMSA	36.25	36.62	37.00	37.27	37.55	37.85	38.19	38.58	38.95
%ch	1.23	1.04	1.02	0.74	0.76	0.78	0.90	1.02	0.96
U.S. (in millions)	0.97	0.96	0.94	0.93	0.92	0.91	0.90	0.90	0.91
%ch	(0.28)	(1.18)	(2.86)	(0.69)	(1.05)	(1.21)	(0.86)	(0.07)	1.11
Transport. Equip.									
Portland PMSA	9.77	9.86	9.97	9.95	10.00	10.09	10.20	10.32	10.41
%ch	1.33	0.93	1.05	(0.17)	0.44	0.90	1.10	1.25	0.81
U.S. (in millions)	1.56	1.52	1.47	1.42	1.37	1.32	1.28	1.24	1.21
%ch	(1.22)	(2.22)	(3.29)	(3.50)	(3.81)	(3.45)	(3.17)	(2.89)	(2.66)
Other Durable Good									
Portland PMSA	18.40	18.56	18.70	18.83	18.92	19.01	19.10	19.18	19.26
%ch	0.89	0.89	0.76	0.67	0.49	0.48	0.46	0.43	0.42
U.S. (in millions)	3.23	3.24	3.23	3.22	3.19	3.17	3.15	3.13	3.11
%ch	0.52	0.39	(0.39)	(0.34)	(0.79)	(0.73)	(0.62)	(0.65)	(0.41)
Non-Durable Goods									
Portland PMSA	30.86	30.91	30.93	30.98	31.00	31.02	31.05	31.09	31.13
%ch	0.20	0.14	0.09	0.15	0.05	0.09	0.10	0.11	0.13
U.S. (in millions)	4.63	4.62	4.59	4.59	4.56	4.52	4.48	4.43	4.39
%ch	0.37	(0.16)	(0.63)	(0.13)	(0.61)	(0.86)	(0.90)	(1.02)	(0.98)

Employment

(PMSA in 1,000's)

	2027	2028	2029	2030	2031	2032	2033	2034	2035
Total Nonfarm W&S									
Portland PMSA	1,411.64	1,432.22	1,452.77	1,475.85	1,499.06	1,521.51	1,544.30	1,567.99	1,592.06
%ch	1.53	1.46	1.43	1.59	1.57	1.50	1.50	1.53	1.54
U.S. (in millions)	137.83	138.99	140.12	141.28	142.69	144.06	145.37	146.66	147.88
%ch	0.89	0.84	0.82	0.83	1.00	0.96	0.91	0.89	0.83
Total Manufacturing									
Portland PMSA	130.03	130.24	130.43	130.84	131.26	131.58	131.87	132.28	132.65
%ch	0.27	0.16	0.15	0.31	0.33	0.24	0.22	0.31	0.29
U.S. (in millions)	11.82	11.72	11.62	11.52	11.46	11.38	11.30	11.22	11.14
%ch	(0.76)	(0.80)	(0.89)	(0.84)	(0.57)	(0.64)	(0.78)	(0.71)	(0.65)
Durable Goods, tota									
Portland PMSA	98.87	99.08	99.28	99.66	100.03	100.33	100.62	101.00	101.35
%ch	0.32	0.21	0.20	0.38	0.38	0.30	0.29	0.38	0.34
U.S. (in millions)	7.47	7.41	7.33	7.28	7.25	7.20	7.15	7.12	7.10
%ch	(0.72)	(0.82)	(0.96)	(0.79)	(0.42)	(0.57)	(0.69)	(0.47)	(0.29)
Wood Products									
Portland PMSA	4.70	4.61	4.53	4.54	4.56	4.47	4.41	4.45	4.51
%ch	(0.92)	(1.95)	(1.75)	0.35	0.36	(1.88)	(1.41)	0.89	1.42
U.S. (in millions)	0.48	0.47	0.46	0.46	0.46	0.45	0.45	0.45	0.47
%ch	(1.15)	(2.77)	(2.79)	0.62	1.35	(2.08)	(2.06)	1.99	2.84
Primary Metals									
Portland PMSA	5.10	5.04	4.97	4.91	4.85	4.80	4.75	4.69	4.63
%ch	(1.23)	(1.28)	(1.33)	(1.31)	(1.21)	(0.95)	(1.08)	(1.23)	(1.35)
U.S. (in millions)	0.36	0.35	0.34	0.33	0.33	0.32	0.31	0.30	0.29
%ch	(1.76)	(1.96)	(2.18)	(2.40)	(2.32)	(2.30)	(2.53)	(2.74)	(2.87)
Fabricated Metals									
Portland PMSA	12.40	12.38	12.35	12.32	12.32	12.31	12.28	12.25	12.20
%ch	(0.02)	(0.16)	(0.26)	(0.21)	(0.05)	(0.07)	(0.22)	(0.28)	(0.39)
U.S. (in millions)	1.44	1.43	1.41	1.39	1.38	1.37	1.35	1.33	1.30
%ch	(0.42)	(0.69)	(1.04)	(1.16)	(0.71)	(0.99)	(1.48)	(1.74)	(1.76)
Machinery Mfg.									
Portland PMSA	7.59	7.56	7.53	7.51	7.50	7.49	7.48	7.46	7.44
%ch	(0.31)	(0.40)	(0.42)	(0.31)	(0.10)	(0.12)	(0.18)	(0.20)	(0.29)
U.S. (in millions)	1.09	1.08	1.07	1.05	1.04	1.03	1.02	1.01	1.00
%ch	(0.80)	(0.90)	(1.40)	(1.50)	(1.21)	(0.94)	(0.88)	(0.88)	(0.95)
Computer & Electr.									
Portland PMSA	39.31	39.66	40.00	40.37	40.76	41.15	41.55	41.96	42.37
%ch	0.92	0.90	0.86	0.92	0.95	0.97	0.98	0.98	0.97
U.S. (in millions)	0.91	0.92	0.93	0.94	0.95	0.96	0.98	1.00	1.01
%ch	0.23	0.87	0.95	1.01	1.36	1.53	1.54	1.75	1.71
Transport. Equip.									
Portland PMSA	10.43	10.43	10.46	10.54	10.56	10.60	10.64	10.70	10.73
%ch	0.23	0.04	0.28	0.72	0.22	0.37	0.41	0.49	0.35
U.S. (in millions)	1.18	1.15	1.13	1.11	1.10	1.09	1.09	1.10	1.10
%ch	(2.46)	(2.28)	(2.02)	(1.57)	(0.94)	(0.44)	(0.21)	0.28	0.82
Other Durable Good									
Portland PMSA	19.33	19.39	19.43	19.46	19.49	19.50	19.50	19.49	19.46
%ch	0.36	0.29	0.21	0.17	0.15	0.06	0.01	(0.07)	(0.14)
U.S. (in millions)	3.11	3.09	3.07	3.04	3.02	3.00	2.98	2.95	2.92
%ch	(0.27)	(0.38)	(0.69)	(0.91)	(0.70)	(0.68)	(0.82)	(1.02)	(0.95)
Non-Durable Goods									
Portland PMSA	31.15	31.16	31.15	31.18	31.23	31.25	31.24	31.27	31.30
%ch	0.08	0.01	(0.01)	0.09	0.15	0.05	0.00	0.09	0.10
U.S. (in millions)	4.35	4.32	4.29	4.25	4.21	4.18	4.14	4.09	4.04
%ch	(0.83)	(0.76)	(0.78)	(0.91)	(0.82)	(0.76)	(0.93)	(1.13)	(1.27)

Employment

(PMSA in 1,000's)

	2036	2037	2038	2039	2040	Annualized Percentage Rates 1978-2008	2008-20	2020-40
Total Nonfarm W&S								
Portland PMSA	1,616.12	1,639.81	1,662.61	1,684.85	1,707.41	2.15%	2.2%	1.5%
%ch	1.51	1.47	1.39	1.34	1.34			
U.S. (in millions)	149.15	150.52	151.76	153.00	154.26	1.62%	1.3%	0.9%
%ch	0.86	0.92	0.82	0.82	0.82			
Total Manufacturing								
Portland PMSA	132.99	133.26	133.44	133.63	133.82	0.28%	-1.0%	0.2%
%ch	0.25	0.20	0.13	0.14	0.14			
U.S. (in millions)	11.08	11.05	11.04	11.03	11.02	-1.13%	-2.6%	-0.7%
%ch	(0.55)	(0.33)	(0.08)	(0.08)	(0.08)			
Durable Goods, tota								
Portland PMSA	101.66	101.90	102.09	102.28	102.48	0.38%	-0.9%	0.3%
%ch	0.30	0.24	0.19	0.19	0.19			
U.S. (in millions)	7.09	7.09	7.12	7.15	7.18	-1.07%	-2.5%	-0.6%
%ch	(0.15)	0.06	0.39	0.39	0.39			
Wood Products								
Portland PMSA	4.58	4.59	4.53	4.48	4.43	-2.60%	-1.5%	-0.5%
%ch	1.41	0.20	(1.16)	(1.16)	(1.16)			
U.S. (in millions)	0.48	0.49	0.48	0.48	0.47		-1.2%	-0.6%
%ch	2.97	1.32	(1.01)	(1.01)	(1.01)			
Primary Metals								
Portland PMSA	4.56	4.49	4.43	4.37	4.31	0.15%	-2.6%	-1.3%
%ch	(1.52)	(1.45)	(1.33)	(1.33)	(1.33)			
U.S. (in millions)	0.28	0.27	0.26	0.25	0.24		-4.2%	-2.1%
%ch	(3.75)	(3.80)	(3.81)	(3.81)	(3.81)			
Fabricated Metals								
Portland PMSA	12.15	12.10	12.04	11.98	11.91	0.19%	-0.8%	-0.2%
%ch	(0.45)	(0.36)	(0.53)	(0.53)	(0.53)			
U.S. (in millions)	1.28	1.26	1.25	1.24	1.22		-1.3%	-1.0%
%ch	(1.72)	(1.38)	(1.11)	(1.11)	(1.11)			
Machinery Mfg.								
Portland PMSA	7.42	7.40	7.37	7.35	7.32	-0.27%	-2.4%	-0.3%
%ch	(0.36)	(0.28)	(0.32)	(0.32)	(0.32)			
U.S. (in millions)	0.99	0.98	0.98	0.98	0.97		-1.8%	-1.0%
%ch	(1.02)	(0.81)	(0.44)	(0.44)	(0.44)			
Computer & Electr.								
Portland PMSA	42.76	43.12	43.47	43.82	44.18	1.46%	-0.9%	0.9%
%ch	0.94	0.83	0.81	0.81	0.81			
U.S. (in millions)	1.03	1.05	1.07	1.09	1.11		-5.4%	0.8%
%ch	1.85	1.97	1.99	1.99	1.99			
Transport. Equip.								
Portland PMSA	10.76	10.77	10.80	10.83	10.86	-0.27%	-0.9%	0.4%
%ch	0.25	0.11	0.26	0.26	0.26			
U.S. (in millions)	1.12	1.14	1.18	1.22	1.26		-2.8%	-0.8%
%ch	1.32	2.16	3.45	3.45	3.45			
Other Durable Good								
Portland PMSA	19.44	19.44	19.45	19.46	19.47	0.87%	0.6%	0.2%
%ch	(0.13)	(0.01)	0.06	0.06	0.06			
U.S. (in millions)	2.90	2.88	2.87	2.87	2.86		-1.8%	-0.6%
%ch	(0.83)	(0.63)	(0.12)	(0.12)	(0.12)			
Non-Durable Goods								
Portland PMSA	31.33	31.36	31.35	31.35	31.34	0.01%	-1.2%	0.1%
%ch	0.09	0.09	(0.04)	(0.01)	(0.01)			
U.S. (in millions)	3.99	3.95	3.91	3.87	3.84	-1.22%	-2.7%	-0.9%
%ch	(1.26)	(1.02)	(0.92)	(0.92)	(0.92)			

Employment

(PMSA in 1,000's)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Food Processing									
Portland PMSA	8.87	8.79	8.73	8.72	8.65	8.56	8.80	9.07	9.32
%ch	(0.82)	(0.93)	(0.68)	(0.12)	(0.87)	(0.97)	2.75	3.15	2.73
U.S. (in millions)	1.55	1.55	1.52	1.52	1.49	1.48	1.48	1.48	1.47
%ch	0.19	(0.19)	(1.64)	(0.49)	(1.53)	(1.10)	0.10	0.10	(0.41)
Paper									
Portland PMSA	6.52	6.30	5.60	5.38	5.15	4.99	4.94	4.67	4.53
%ch	1.84	(3.31)	(11.10)	(4.01)	(4.18)	(3.23)	(0.85)	(5.56)	(2.85)
U.S. (in millions)	0.60	0.58	0.55	0.52	0.50	0.48	0.47	0.46	0.45
%ch	(1.77)	(4.47)	(5.38)	(5.55)	(4.02)	(2.28)	(2.82)	(2.08)	(1.48)
Other Non-Durable Goods									
Portland PMSA	20.39	18.51	16.68	16.09	16.38	16.28	16.50	16.51	16.37
%ch	(3.26)	(9.23)	(9.86)	(3.55)	1.79	(0.62)	1.37	0.08	(0.85)
U.S. (in millions)	4.23	3.98	3.70	3.51	3.40	3.31	3.22	3.13	3.03
%ch	(2.22)	(5.95)	(6.94)	(5.13)	(3.15)	(2.70)	(2.55)	(3.07)	(3.21)
Total Non-Manuf.									
Portland PMSA	699.43	698.53	686.49	682.69	697.53	722.21	749.73	768.52	770.91
%ch	2.57	(0.13)	(1.72)	(0.55)	2.17	3.54	3.81	2.51	0.31
U.S. (millions)	93.74	94.27	93.57	93.91	95.48	97.66	99.96	101.54	101.54
%ch	2.61	0.57	(0.74)	0.36	1.68	2.28	2.36	1.57	0.00
Natural Resources									
Portland PMSA	1.88	1.74	1.66	1.67	1.68	1.78	1.68	1.64	1.62
%ch	(9.92)	(7.50)	(4.54)	0.74	0.83	5.58	(5.28)	(2.41)	(1.46)
U.S. (millions)	0.60	0.61	0.58	0.57	0.59	0.63	0.68	0.72	0.77
%ch	0.10	1.14	(3.85)	(1.82)	3.26	6.17	9.09	5.63	7.08
Construction									
Portland PMSA	53.17	54.03	51.62	50.10	53.87	58.48	63.18	65.67	63.89
%ch	1.46	1.61	(4.46)	(2.95)	7.53	8.55	8.04	3.94	(2.71)
U.S. (millions)	6.79	6.83	6.72	6.74	6.97	7.33	7.69	7.62	7.21
%ch	3.72	0.57	(1.63)	0.30	3.52	5.17	4.90	(1.00)	(5.29)
Wholesale Trade									
Portland PMSA	55.58	56.29	54.63	54.79	55.12	56.34	57.47	58.40	57.95
%ch	3.60	1.28	(2.95)	0.29	0.59	2.21	2.01	1.62	(0.78)
U.S. (millions)	5.93	5.77	5.65	5.61	5.66	5.76	5.90	6.03	6.02
%ch	0.68	(2.69)	(2.08)	(0.80)	0.96	1.77	2.45	2.11	(0.19)
Retail Trade									
Portland PMSA	106.78	103.42	100.52	99.60	101.16	104.49	107.56	110.22	110.23
%ch	1.76	(3.14)	(2.81)	(0.91)	1.57	3.30	2.94	2.47	0.01
U.S. (millions)	15.28	15.24	15.03	14.92	15.06	15.28	15.36	15.49	15.29
%ch	2.06	(0.26)	(1.40)	(0.73)	0.95	1.48	0.49	0.86	(1.26)
TWU (Transportation, Warehousing, Utilities)									
Portland PMSA	38.63	38.43	37.30	36.52	37.03	36.88	37.48	37.99	37.74
%ch	0.60	(0.53)	(2.94)	(2.10)	1.40	(0.39)	1.61	1.37	(0.65)
U.S. (millions)	5.01	4.97	4.82	4.76	4.81	4.92	5.02	5.09	5.07
%ch	2.18	(0.80)	(3.08)	(1.22)	1.06	2.18	2.08	1.42	(0.36)
Information									
Portland PMSA	25.96	25.92	23.83	22.52	22.49	22.94	23.98	24.74	24.80
%ch	8.88	(0.18)	(8.04)	(5.50)	(0.11)	2.00	4.52	3.17	0.25
U.S. (millions)	2.59	2.61	2.43	2.26	2.21	2.16	2.14	2.13	2.11
%ch	7.52	0.51	(6.83)	(6.84)	(2.46)	(2.30)	(1.03)	(0.20)	(0.89)
Financial Activities									
Portland PMSA	64.85	65.05	65.58	66.43	66.07	68.23	70.63	71.48	70.08
%ch	(0.51)	0.31	0.81	1.30	(0.55)	3.27	3.51	1.21	(1.96)
U.S. (millions)	7.69	7.81	7.85	7.98	8.03	8.15	8.33	8.31	8.20
%ch	0.54	1.57	0.50	1.63	0.68	1.53	2.16	(0.23)	(1.30)

Employment

(PMSA in 1,000's)

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Food Processing									
Portland PMSA	9.26	9.41	9.56	9.64	9.65	9.64	9.63	9.61	9.60
%ch	(0.64)	1.59	1.56	0.88	0.08	(0.05)	(0.12)	(0.19)	(0.15)
U.S. (in millions)	1.46	1.45	1.46	1.48	1.51	1.53	1.55	1.57	1.59
%ch	(1.11)	(0.72)	0.84	1.36	1.81	1.46	1.17	1.40	1.33
Paper									
Portland PMSA	4.50	4.55	4.71	4.84	4.91	4.94	4.94	4.96	4.95
%ch	(0.87)	1.26	3.45	2.84	1.41	0.57	0.11	0.23	(0.11)
U.S. (in millions)	0.43	0.41	0.41	0.41	0.42	0.42	0.42	0.43	0.43
%ch	(5.90)	(4.12)	(0.56)	1.16	1.58	1.10	0.35	0.26	0.45
Other Non-Durable									
Portland PMSA	15.92	15.67	15.62	15.69	15.77	15.88	16.01	16.14	16.25
%ch	(2.77)	(1.55)	(0.33)	0.49	0.48	0.67	0.83	0.84	0.67
U.S. (in millions)	2.82	2.67	2.63	2.62	2.62	2.62	2.61	2.60	2.59
%ch	(6.91)	(5.10)	(1.70)	(0.37)	0.23	(0.02)	(0.41)	(0.39)	(0.31)
Total Non-Manuf.									
Portland PMSA	768.07	774.87	791.58	813.87	835.81	858.63	881.56	903.87	923.20
%ch	(0.37)	0.89	2.16	2.82	2.70	2.73	2.67	2.53	2.14
U.S. (millions)	100.47	101.25	102.92	105.06	107.05	108.77	110.51	112.06	113.33
%ch	(1.05)	0.78	1.65	2.08	1.89	1.61	1.60	1.41	1.13
Natural Resources									
Portland PMSA	1.72	1.71	1.67	1.66	1.66	1.65	1.62	1.60	1.58
%ch	6.33	(0.44)	(2.35)	(0.72)	(0.27)	(0.59)	(1.41)	(1.52)	(1.45)
U.S. (millions)	0.76	0.72	0.74	0.72	0.70	0.68	0.66	0.63	0.61
%ch	(2.28)	(4.93)	2.28	(2.06)	(2.62)	(2.37)	(4.17)	(3.73)	(3.56)
Construction									
Portland PMSA	60.84	60.89	61.96	62.37	63.05	64.26	65.29	66.25	66.96
%ch	(4.77)	0.08	1.75	0.67	1.09	1.91	1.61	1.47	1.08
U.S. (millions)	6.74	6.52	6.59	6.89	7.17	7.41	7.61	7.78	7.89
%ch	(6.51)	(3.27)	0.97	4.63	4.09	3.25	2.78	2.20	1.40
Wholesale Trade									
Portland PMSA	58.18	58.64	59.49	60.88	62.18	63.45	64.84	66.15	67.39
%ch	0.40	0.79	1.45	2.35	2.14	2.04	2.18	2.03	1.88
U.S. (millions)	5.81	5.76	5.84	5.99	6.12	6.23	6.35	6.47	6.59
%ch	(3.39)	(0.86)	1.37	2.51	2.12	1.95	1.90	1.87	1.83
Retail Trade									
Portland PMSA	109.72	110.91	112.79	114.86	116.53	118.32	120.08	121.24	121.49
%ch	(0.46)	1.08	1.70	1.84	1.45	1.53	1.49	0.97	0.20
U.S. (millions)	15.11	15.40	15.22	15.36	15.46	15.52	15.59	15.56	15.52
%ch	(1.22)	1.94	(1.16)	0.90	0.67	0.36	0.45	(0.17)	(0.23)
TWU (Transportatio									
Portland PMSA	38.06	38.48	39.79	41.50	43.04	44.40	45.71	46.94	47.96
%ch	0.84	1.11	3.41	4.29	3.69	3.16	2.96	2.69	2.16
U.S. (millions)	4.95	4.95	5.09	5.28	5.46	5.61	5.76	5.92	6.07
%ch	(2.41)	0.05	2.74	3.85	3.40	2.75	2.72	2.69	2.48
Information									
Portland PMSA	23.49	23.03	23.60	24.07	24.69	25.37	26.05	26.82	27.57
%ch	(5.29)	(1.95)	2.47	1.99	2.57	2.73	2.70	2.95	2.81
U.S. (millions)	2.02	1.98	2.07	2.08	2.09	2.12	2.14	2.18	2.22
%ch	(4.31)	(1.87)	4.17	0.60	0.61	1.30	1.14	1.66	1.86
Financial Activities									
Portland PMSA	70.19	71.02	72.25	74.21	76.60	78.89	80.95	83.03	84.52
%ch	0.15	1.19	1.72	2.71	3.22	2.99	2.62	2.56	1.79
U.S. (millions)	8.16	8.24	8.29	8.43	8.55	8.57	8.57	8.56	8.51
%ch	(0.57)	1.00	0.62	1.74	1.36	0.24	0.06	(0.16)	(0.62)

Employment

(PMSA in 1,000's)

	2018	2019	2020	2021	2022	2023	2024	2025	2026
Food Processing									
Portland PMSA	9.59	9.58	9.56	9.53	9.52	9.50	9.48	9.47	9.46
%ch	(0.09)	(0.14)	(0.18)	(0.27)	(0.18)	(0.18)	(0.15)	(0.12)	(0.15)
U.S. (in millions)	1.61	1.62	1.62	1.63	1.63	1.63	1.63	1.62	1.62
%ch	1.29	0.48	(0.03)	0.56	0.19	(0.11)	(0.08)	(0.17)	(0.15)
Paper									
Portland PMSA	4.93	4.92	4.91	4.90	4.89	4.87	4.86	4.85	4.85
%ch	(0.33)	(0.28)	(0.32)	(0.08)	(0.32)	(0.23)	(0.28)	(0.28)	(0.03)
U.S. (in millions)	0.43	0.43	0.43	0.43	0.43	0.42	0.42	0.42	0.41
%ch	0.54	0.05	(0.29)	0.12	(0.41)	(0.69)	(0.74)	(0.83)	(0.88)
Other Non-Durable									
Portland PMSA	16.34	16.41	16.47	16.54	16.59	16.65	16.71	16.77	16.82
%ch	0.53	0.44	0.36	0.46	0.30	0.33	0.35	0.36	0.32
U.S. (in millions)	2.59	2.57	2.55	2.53	2.50	2.47	2.43	2.39	2.35
%ch	(0.22)	(0.59)	(1.05)	(0.61)	(1.16)	(1.38)	(1.46)	(1.62)	(1.56)
Total Non-Manuf.									
Portland PMSA	941.21	959.54	977.90	995.53	1,012.78	1,031.05	1,049.68	1,069.07	1,088.92
%ch	1.95	1.95	1.91	1.80	1.73	1.80	1.81	1.85	1.86
U.S. (millions)	114.51	115.60	116.73	117.98	119.33	120.70	122.05	123.40	124.71
%ch	1.05	0.95	0.98	1.07	1.15	1.15	1.12	1.11	1.06
Natural Resources									
Portland PMSA	1.55	1.52	1.49	1.48	1.46	1.45	1.43	1.41	1.40
%ch	(1.85)	(1.78)	(1.63)	(1.17)	(0.99)	(1.13)	(1.08)	(1.08)	(1.00)
U.S. (millions)	0.59	0.57	0.56	0.56	0.55	0.55	0.55	0.55	0.54
%ch	(3.93)	(2.36)	(1.69)	(0.67)	(0.54)	(0.75)	(0.75)	(0.21)	(0.39)
Construction									
Portland PMSA	67.70	68.45	69.18	69.95	70.77	71.72	72.61	73.65	74.79
%ch	1.11	1.10	1.07	1.11	1.18	1.33	1.24	1.43	1.55
U.S. (millions)	7.98	8.05	8.11	8.18	8.27	8.40	8.55	8.74	8.93
%ch	1.23	0.78	0.76	0.91	1.15	1.54	1.76	2.17	2.28
Wholesale Trade									
Portland PMSA	68.55	69.70	70.87	72.01	73.05	74.13	75.26	76.42	77.61
%ch	1.72	1.68	1.68	1.60	1.45	1.48	1.52	1.54	1.56
U.S. (millions)	6.71	6.84	6.98	7.17	7.31	7.43	7.55	7.66	7.77
%ch	1.80	1.97	2.09	2.67	1.88	1.69	1.56	1.51	1.41
Retail Trade									
Portland PMSA	121.54	121.77	122.19	122.66	123.30	124.15	125.12	126.21	127.39
%ch	0.04	0.19	0.35	0.38	0.52	0.70	0.78	0.87	0.93
U.S. (millions)	15.47	15.41	15.38	15.38	15.40	15.41	15.41	15.38	15.34
%ch	(0.33)	(0.42)	(0.20)	0.01	0.12	0.11	0.00	(0.21)	(0.27)
TWU (Transportatio									
Portland PMSA	48.75	49.45	50.16	50.83	51.44	52.11	52.82	53.56	54.32
%ch	1.65	1.44	1.42	1.34	1.22	1.29	1.36	1.40	1.43
U.S. (millions)	6.21	6.33	6.38	6.46	6.55	6.66	6.77	6.88	6.99
%ch	2.44	1.87	0.77	1.20	1.46	1.68	1.63	1.66	1.62
Information									
Portland PMSA	28.27	28.98	29.72	30.52	31.27	32.04	32.81	33.59	34.41
%ch	2.53	2.50	2.57	2.68	2.47	2.45	2.42	2.37	2.45
U.S. (millions)	2.25	2.28	2.32	2.37	2.42	2.47	2.53	2.58	2.63
%ch	1.43	1.28	1.59	2.32	2.22	2.15	2.15	2.01	2.11
Financial Activities									
Portland PMSA	85.82	87.23	88.86	90.38	91.81	93.29	94.78	96.40	97.99
%ch	1.55	1.64	1.87	1.71	1.58	1.61	1.60	1.71	1.65
U.S. (millions)	8.44	8.41	8.42	8.41	8.42	8.42	8.42	8.44	8.44
%ch	(0.77)	(0.34)	0.08	(0.07)	0.08	0.01	0.00	0.21	0.05

Employment

(PMSA in 1,000's)

	2027	2028	2029	2030	2031	2032	2033	2034	2035
Food Processing									
Portland PMSA	9.44	9.43	9.42	9.42	9.41	9.40	9.40	9.40	9.40
%ch	(0.15)	(0.13)	(0.11)	(0.06)	(0.09)	(0.06)	(0.03)	(0.01)	(0.02)
U.S. (in millions)	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.61
%ch	(0.02)	0.03	0.08	0.03	0.08	0.06	(0.11)	(0.30)	(0.37)
Paper									
Portland PMSA	4.84	4.82	4.80	4.79	4.80	4.79	4.76	4.76	4.77
%ch	(0.14)	(0.41)	(0.51)	(0.14)	0.20	(0.26)	(0.53)	(0.04)	0.16
U.S. (in millions)	0.41	0.41	0.40	0.40	0.40	0.39	0.39	0.38	0.38
%ch	(0.85)	(0.92)	(0.90)	(0.94)	(0.93)	(0.92)	(1.08)	(1.17)	(1.24)
Other Non-Durable									
Portland PMSA	16.87	16.90	16.94	16.98	17.02	17.06	17.08	17.12	17.14
%ch	0.28	0.20	0.19	0.24	0.27	0.20	0.16	0.18	0.15
U.S. (in millions)	2.32	2.29	2.26	2.22	2.19	2.16	2.13	2.09	2.05
%ch	(1.39)	(1.28)	(1.36)	(1.59)	(1.46)	(1.34)	(1.52)	(1.74)	(1.97)
Total Non-Manuf.									
Portland PMSA	1,108.43	1,127.32	1,146.07	1,165.85	1,186.26	1,206.18	1,226.17	1,246.62	1,267.14
%ch	1.79	1.70	1.66	1.73	1.75	1.68	1.66	1.67	1.65
U.S. (millions)	126.01	127.26	128.50	129.76	131.23	132.67	134.07	135.44	136.74
%ch	1.04	0.99	0.98	0.98	1.13	1.10	1.05	1.02	0.96
Natural Resources									
Portland PMSA	1.39	1.37	1.36	1.34	1.33	1.32	1.31	1.30	1.28
%ch	(0.94)	(1.00)	(1.07)	(1.13)	(0.83)	(0.76)	(0.95)	(0.99)	(0.93)
U.S. (millions)	0.54	0.54	0.53	0.53	0.53	0.53	0.53	0.53	0.53
%ch	(0.42)	(0.61)	(0.65)	(0.50)	(0.15)	(0.28)	(0.48)	(0.18)	0.00
Construction									
Portland PMSA	75.95	77.03	78.07	79.20	80.38	81.61	82.92	84.21	85.58
%ch	1.54	1.42	1.35	1.45	1.48	1.53	1.61	1.56	1.62
U.S. (millions)	9.12	9.26	9.39	9.57	9.77	9.98	10.17	10.33	10.47
%ch	2.06	1.61	1.39	1.83	2.16	2.11	1.93	1.57	1.40
Wholesale Trade									
Portland PMSA	78.79	79.92	81.01	82.12	83.31	84.44	85.53	86.61	87.67
%ch	1.52	1.44	1.36	1.37	1.45	1.36	1.29	1.26	1.22
U.S. (millions)	7.82	7.87	7.88	7.87	7.87	7.86	7.82	7.77	7.69
%ch	0.64	0.74	0.04	(0.05)	(0.07)	(0.12)	(0.51)	(0.70)	(0.98)
Retail Trade									
Portland PMSA	128.58	129.72	130.84	132.05	133.29	134.52	135.77	137.04	138.33
%ch	0.93	0.89	0.86	0.92	0.94	0.92	0.93	0.94	0.94
U.S. (millions)	15.33	15.32	15.33	15.32	15.35	15.38	15.42	15.43	15.44
%ch	(0.07)	(0.05)	0.08	(0.08)	0.18	0.18	0.27	0.10	0.07
TWU (Transportatio									
Portland PMSA	55.08	55.82	56.54	57.30	58.11	58.90	59.69	60.51	61.35
%ch	1.40	1.34	1.29	1.33	1.41	1.36	1.35	1.38	1.39
U.S. (millions)	7.06	7.11	7.15	7.19	7.25	7.29	7.27	7.26	7.23
%ch	0.91	0.82	0.49	0.60	0.82	0.49	(0.18)	(0.22)	(0.45)
Information									
Portland PMSA	35.25	36.07	36.87	37.68	38.53	39.34	40.11	40.83	41.48
%ch	2.44	2.30	2.23	2.20	2.24	2.12	1.93	1.80	1.61
U.S. (millions)	2.70	2.76	2.83	2.91	2.99	3.09	3.18	3.27	3.37
%ch	2.41	2.45	2.59	2.65	2.95	3.10	3.00	2.97	2.86
Financial Activities									
Portland PMSA	99.43	100.77	102.17	103.80	105.58	107.25	108.91	110.69	112.48
%ch	1.47	1.34	1.39	1.60	1.71	1.58	1.55	1.63	1.62
U.S. (millions)	8.43	8.41	8.41	8.44	8.48	8.51	8.54	8.58	8.61
%ch	(0.15)	(0.22)	0.01	0.33	0.46	0.35	0.36	0.47	0.40

Employment

(PMSA in 1,000's)

	2036	2037	2038	2039	2040	Annualized Percentage Rates 1978-2008	2008-20	2020-40
Food Processing								
Portland PMSA	9.39	9.39	9.39	9.39	9.38	0.25%	0.6%	-0.1%
%ch	(0.02)	(0.05)	(0.04)	(0.04)	(0.04)			
U.S. (in millions)	1.60	1.60	1.59	1.58	1.58		0.4%	-0.1%
%ch	(0.48)	(0.45)	(0.37)	(0.37)	(0.37)			
Paper								
Portland PMSA	4.78	4.79	4.78	4.77	4.75	-1.25%	-2.3%	-0.2%
%ch	0.25	0.24	(0.29)	(0.29)	(0.29)			
U.S. (in millions)	0.37	0.37	0.36	0.36	0.35		-2.7%	-1.0%
%ch	(1.30)	(1.26)	(1.26)	(1.26)	(1.26)			
Other Non-Durable								
Portland PMSA	17.16	17.18	17.19	17.20	17.20	0.32%	-1.8%	0.2%
%ch	0.10	0.12	0.03	0.03	0.03			
U.S. (in millions)	2.01	1.98	1.96	1.93	1.91		-4.1%	-1.4%
%ch	(1.86)	(1.43)	(1.30)	(1.30)	(1.30)			
Total Non-Manuf.								
Portland PMSA	1,287.35	1,306.89	1,325.27	1,343.95	1,362.93	2.61%	2.8%	1.7%
%ch	1.59	1.52	1.41	1.41	1.41			
U.S. (millions)	138.07	139.48	140.72	141.97	143.24	2.25%	1.8%	1.0%
%ch	0.97	1.02	0.89	0.89	0.89			
Natural Resources								
Portland PMSA	1.27	1.26	1.25	1.24	1.22	-0.91%	-1.9%	-1.0%
%ch	(0.95)	(0.90)	(1.02)	(1.02)	(1.02)			
U.S. (millions)	0.53	0.52	0.52	0.52	0.51	-0.51%	-0.6%	-0.4%
%ch	(0.05)	(0.21)	(0.61)	(0.61)	(0.61)			
Construction								
Portland PMSA	87.01	88.49	89.96	91.46	92.99	2.80%	2.2%	1.5%
%ch	1.67	1.70	1.67	1.67	1.67			
U.S. (millions)	10.64	10.79	10.90	11.02	11.13	1.72%	1.5%	1.6%
%ch	1.58	1.38	1.07	1.07	1.07			
Wholesale Trade								
Portland PMSA	88.68	89.60	90.38	91.18	91.98	1.84%	2.0%	1.3%
%ch	1.15	1.03	0.88	0.88	0.88			
U.S. (millions)	7.62	7.54	7.45	7.36	7.27	1.14%	1.4%	0.2%
%ch	(0.92)	(0.97)	(1.22)	(1.22)	(1.22)			
Retail Trade								
Portland PMSA	139.62	140.87	142.10	143.34	144.58	1.80%	1.1%	0.8%
%ch	0.93	0.90	0.87	0.87	0.87			
U.S. (millions)	15.43	15.42	15.39	15.36	15.33	1.47%	0.1%	0.0%
%ch	(0.09)	(0.05)	(0.20)	(0.20)	(0.20)			
TWU (Transportatio								
Portland PMSA	62.19	63.02	63.81	64.61	65.43	1.96%	2.2%	1.3%
%ch	1.37	1.33	1.26	1.26	1.26			
U.S. (millions)	7.20	7.18	7.12	7.07	7.02	1.24%	2.0%	0.5%
%ch	(0.33)	(0.35)	(0.72)	(0.72)	(0.72)			
Information								
Portland PMSA	42.05	42.49	42.69	42.89	43.10	1.71%	1.1%	1.9%
%ch	1.36	1.05	0.48	0.48	0.48			
U.S. (millions)	3.46	3.56	3.65	3.74	3.83		-0.9%	2.5%
%ch	2.81	2.80	2.45	2.45	2.45			
Financial Activities								
Portland PMSA	114.17	115.72	117.07	118.44	119.83	2.01%	2.7%	1.5%
%ch	1.50	1.35	1.17	1.17	1.17			
U.S. (millions)	8.64	8.65	8.64	8.63	8.62	1.95%	0.8%	0.1%
%ch	0.29	0.14	(0.13)	(0.13)	(0.13)			

Employment

(PMSA in 1,000's)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Pro. Bus.Services									
Portland PMSA	130.45	127.48	121.67	117.89	122.08	128.53	134.79	136.38	136.95
%ch	5.36	(2.28)	(4.56)	(3.11)	3.56	5.28	4.88	1.18	0.42
U.S. (millions)	16.67	16.48	15.97	15.98	16.39	16.95	17.57	17.97	17.91
%ch	4.49	(1.15)	(3.07)	0.06	2.51	3.43	3.68	2.24	(0.30)
Edu. & Health Serv.									
Portland PMSA	102.92	106.53	110.98	113.61	115.65	119.84	123.22	127.52	131.50
%ch	2.27	3.50	4.18	2.37	1.79	3.62	2.82	3.49	3.12
U.S. (millions)	15.11	15.64	16.20	16.59	16.95	17.37	17.83	18.33	18.89
%ch	2.13	3.53	3.57	2.39	2.19	2.48	2.61	2.81	3.06
Leisure & Hospitality									
Portland PMSA	85.78	85.47	84.82	85.59	87.64	90.09	94.09	97.82	99.42
%ch	1.50	(0.36)	(0.76)	0.90	2.40	2.80	4.43	3.97	1.63
U.S. (millions)	11.86	12.03	11.99	12.18	12.49	12.81	13.11	13.47	13.65
%ch	2.74	1.46	(0.39)	1.58	2.62	2.55	2.30	2.77	1.32
Other Services									
Portland PMSA	33.42	34.18	33.89	33.98	34.74	34.61	35.65	36.64	36.73
%ch	3.13	2.29	(0.86)	0.26	2.23	(0.37)	3.00	2.80	0.24
U.S. (millions)	5.17	5.26	5.37	5.40	5.41	5.39	5.44	5.49	5.53
%ch	1.60	1.73	2.17	0.53	0.16	(0.26)	0.80	0.97	0.76
Fed. Gov. - Civilian									
Portland PMSA	18.89	18.13	17.97	18.56	18.41	18.36	17.96	17.97	18.08
%ch	4.00	(4.05)	(0.89)	3.29	(0.79)	(0.31)	(2.15)	0.02	0.62
U.S. (millions)	2.87	2.76	2.77	2.76	2.73	2.73	2.73	2.73	2.74
%ch	3.44	(3.55)	0.08	(0.19)	(1.06)	0.04	0.00	(0.20)	0.49
State & Local Gov.									
Portland PMSA	111.61	113.31	115.76	114.93	117.86	119.29	120.97	124.49	129.15
%ch	6.38	1.53	2.16	(0.71)	2.54	1.21	1.41	2.91	3.75
U.S. (millions)	17.93	18.36	18.74	18.82	18.89	19.07	19.24	19.47	19.72
%ch	2.18	2.41	2.11	0.41	0.37	0.98	0.87	1.22	1.29
Emp - Pop ratio									
Portland PMSA	0.50	0.49	0.47	0.46	0.46	0.47	0.48	0.48	0.47
U.S.	0.39	0.39	0.38	0.37	0.37	0.38	0.38	0.38	0.38

Employment

(PMSA in 1,000's)

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Pro. Bus.Services									
Portland PMSA	135.71	137.56	142.37	148.12	152.55	157.15	161.86	166.51	170.64
%ch	(0.91)	1.36	3.50	4.04	2.99	3.02	2.99	2.87	2.48
U.S. (millions)	17.41	17.73	18.84	19.74	20.48	21.17	21.96	22.72	23.34
%ch	(2.81)	1.86	6.26	4.77	3.75	3.35	3.76	3.42	2.75
Edu. & Health Serv.									
Portland PMSA	135.17	137.40	140.18	144.92	150.27	155.81	161.60	167.55	173.39
%ch	2.79	1.65	2.02	3.38	3.69	3.69	3.71	3.68	3.49
U.S. (millions)	19.38	19.90	20.36	20.64	20.96	21.29	21.61	21.91	22.20
%ch	2.62	2.68	2.29	1.40	1.56	1.55	1.50	1.42	1.32
Leisure & Hospitalit									
Portland PMSA	98.96	99.03	100.37	102.72	105.12	107.60	110.17	112.77	115.17
%ch	(0.46)	0.07	1.35	2.34	2.34	2.36	2.39	2.36	2.13
U.S. (millions)	13.60	13.53	13.49	13.67	13.88	14.02	14.12	14.21	14.25
%ch	(0.34)	(0.55)	(0.26)	1.32	1.54	1.03	0.71	0.61	0.30
Other Services									
Portland PMSA	36.03	36.20	37.12	38.56	40.14	41.76	43.40	45.02	46.54
%ch	(1.89)	0.45	2.56	3.86	4.09	4.05	3.92	3.75	3.36
U.S. (millions)	5.69	5.72	5.61	5.46	5.37	5.34	5.31	5.30	5.30
%ch	2.79	0.52	(1.89)	(2.59)	(1.71)	(0.60)	(0.54)	(0.15)	0.06
Fed. Gov. - Civilian									
Portland PMSA	18.24	18.54	18.18	18.12	18.10	18.09	18.09	18.08	18.08
%ch	0.93	1.65	(1.97)	(0.31)	(0.15)	(0.02)	(0.02)	(0.02)	(0.02)
U.S. (millions)	2.75	2.79	2.73	2.72	2.71	2.71	2.71	2.71	2.70
%ch	0.36	1.54	(2.39)	(0.36)	(0.21)	(0.05)	(0.04)	(0.04)	(0.04)
State & Local Gov.									
Portland PMSA	130.91	129.76	129.27	129.21	129.92	131.26	133.14	135.05	136.64
%ch	1.36	(0.88)	(0.38)	(0.04)	0.55	1.03	1.43	1.43	1.18
U.S. (millions)	19.68	19.59	19.66	19.85	20.11	20.32	20.50	20.63	20.77
%ch	(0.25)	(0.43)	0.34	0.96	1.36	1.04	0.87	0.64	0.65
Emp - Pop ratio									
Portland PMSA	0.47	0.48	0.47	0.47	0.47	0.47	0.47	0.47	0.46
U.S.	0.38	0.38	0.38	0.39	0.39	0.38	0.38	0.38	0.38

Employment

(PMSA in 1,000's)

	2018	2019	2020	2021	2022	2023	2024	2025	2026
Pro. Bus.Services									
Portland PMSA	174.52	178.54	182.53	186.27	189.89	193.88	197.96	202.20	206.50
%ch	2.27	2.30	2.23	2.05	1.95	2.10	2.10	2.14	2.13
U.S. (millions)	24.01	24.59	25.16	25.68	26.31	26.98	27.68	28.42	29.18
%ch	2.87	2.44	2.28	2.09	2.46	2.53	2.57	2.69	2.67
Edu. & Health Serv.									
Portland PMSA	179.18	184.97	190.37	195.36	200.37	205.47	210.62	215.85	221.15
%ch	3.34	3.23	2.92	2.62	2.56	2.55	2.50	2.48	2.46
U.S. (millions)	22.47	22.68	22.87	23.06	23.24	23.40	23.55	23.64	23.70
%ch	1.21	0.91	0.85	0.82	0.81	0.68	0.62	0.41	0.25
Leisure & Hospitalit									
Portland PMSA	117.38	119.60	121.82	123.99	126.04	128.15	130.28	132.45	134.66
%ch	1.92	1.89	1.86	1.78	1.65	1.67	1.67	1.67	1.66
U.S. (millions)	14.25	14.30	14.39	14.48	14.57	14.64	14.70	14.73	14.76
%ch	0.01	0.35	0.59	0.67	0.62	0.47	0.37	0.24	0.18
Other Services									
Portland PMSA	47.95	49.34	50.72	52.10	53.38	54.68	56.00	57.35	58.71
%ch	3.04	2.88	2.80	2.72	2.46	2.44	2.42	2.41	2.37
U.S. (millions)	5.29	5.31	5.34	5.39	5.43	5.47	5.50	5.52	5.55
%ch	(0.21)	0.24	0.67	0.87	0.79	0.77	0.54	0.35	0.54
Fed. Gov. - Civilian									
Portland PMSA	18.08	18.11	18.59	18.10	18.09	18.10	18.10	18.10	18.10
%ch	(0.02)	0.19	2.63	(2.59)	(0.05)	0.01	0.01	0.01	0.01
U.S. (millions)	2.70	2.71	2.78	2.71	2.71	2.71	2.71	2.71	2.71
%ch	(0.04)	0.21	2.71	(2.78)	0.00	0.00	0.00	0.00	0.00
State & Local Gov.									
Portland PMSA	138.09	139.54	142.05	144.34	146.02	147.91	150.03	152.02	153.63
%ch	1.06	1.05	1.80	1.62	1.16	1.29	1.44	1.33	1.06
U.S. (millions)	20.91	21.06	21.19	21.30	21.41	21.53	21.66	21.79	21.93
%ch	0.71	0.73	0.60	0.54	0.51	0.56	0.59	0.63	0.62
Emp - Pop ratio									
Portland PMSA	0.47	0.47	0.47	0.47	0.47	0.47	0.48	0.48	0.48
U.S.	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.39

Employment

(PMSA in 1,000's)

	2027	2028	2029	2030	2031	2032	2033	2034	2035
Pro. Bus.Services									
Portland PMSA	210.62	214.57	218.49	222.72	227.10	231.23	235.41	239.79	244.19
%ch	2.00	1.88	1.82	1.94	1.97	1.82	1.81	1.86	1.83
U.S. (millions)	29.96	30.75	31.54	32.30	33.05	33.80	34.59	35.46	36.37
%ch	2.67	2.64	2.57	2.42	2.32	2.25	2.34	2.52	2.56
Edu. & Health Serv.									
Portland PMSA	226.48	231.79	237.15	242.66	248.15	253.70	259.36	265.20	271.09
%ch	2.41	2.35	2.31	2.32	2.27	2.24	2.23	2.25	2.22
U.S. (millions)	23.80	23.89	23.98	24.09	24.24	24.41	24.57	24.71	24.81
%ch	0.41	0.35	0.41	0.43	0.62	0.71	0.66	0.58	0.42
Leisure & Hospitalit									
Portland PMSA	136.82	138.92	140.97	143.09	145.30	147.44	149.54	151.68	153.85
%ch	1.61	1.53	1.48	1.50	1.55	1.47	1.43	1.43	1.43
U.S. (millions)	14.80	14.84	14.90	14.95	15.05	15.12	15.21	15.27	15.33
%ch	0.29	0.25	0.44	0.32	0.65	0.49	0.59	0.38	0.40
Other Services									
Portland PMSA	60.05	61.35	62.61	63.90	65.20	66.45	67.64	68.78	69.85
%ch	2.29	2.16	2.06	2.05	2.04	1.92	1.79	1.68	1.56
U.S. (millions)	5.59	5.62	5.66	5.69	5.74	5.80	5.85	5.89	5.93
%ch	0.73	0.60	0.58	0.61	0.92	1.00	0.77	0.78	0.64
Fed. Gov. - Civilian									
Portland PMSA	18.10	18.10	18.10	18.55	18.14	18.12	18.12	18.12	18.12
%ch	0.01	0.01	0.01	2.48	(2.25)	(0.11)	0.00	0.00	0.00
U.S. (millions)	2.71	2.71	2.71	2.78	2.71	2.71	2.71	2.71	2.71
%ch	0.00	0.00	0.00	2.66	(2.53)	0.00	0.00	0.00	0.00
State & Local Gov.									
Portland PMSA	155.10	156.58	158.18	160.63	163.42	165.66	168.17	171.00	174.17
%ch	0.96	0.96	1.02	1.55	1.74	1.37	1.52	1.68	1.85
U.S. (millions)	22.06	22.19	22.31	22.43	22.53	22.64	22.75	22.85	22.95
%ch	0.60	0.60	0.55	0.51	0.45	0.49	0.50	0.41	0.46
Emp - Pop ratio									
Portland PMSA	0.48	0.49	0.49	0.49	0.50	0.50	0.50	0.50	0.51
U.S.	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39

Employment

(PMSA in 1,000's)

	2036	2037	2038	2039	2040	Annualized Percentage Rates 1978-2008	2008-20	2020-40
Pro. Bus.Services								
Portland PMSA	248.52	252.73	256.74	260.82	264.97	3.96%	2.8%	1.9%
%ch	1.77	1.69	1.59	1.59	1.59			
U.S. (millions)	37.37	38.44	39.59	40.77	41.98		3.5%	2.6%
%ch	2.75	2.89	2.98	2.98	2.98			
Edu. & Health Serv.								
Portland PMSA	277.06	283.02	288.96	295.03	301.22	3.55%	5.3%	2.3%
%ch	2.20	2.15	2.10	2.10	2.10			
U.S. (millions)	24.88	24.95	24.95	24.95	24.96	3.66%	3.5%	0.4%
%ch	0.28	0.25	0.02	0.02	0.02			
Leisure & Hospitalit								
Portland PMSA	155.99	158.10	160.11	162.14	164.20	2.68%	3.0%	1.5%
%ch	1.39	1.35	1.27	1.27	1.27			
U.S. (millions)	15.37	15.43	15.46	15.49	15.53	2.55%	1.6%	0.4%
%ch	0.24	0.40	0.21	0.21	0.21			
Other Services								
Portland PMSA	70.81	71.61	72.20	72.80	73.40	2.11%	3.5%	1.9%
%ch	1.37	1.13	0.83	0.83	0.83			
U.S. (millions)	5.97	6.01	6.05	6.08	6.11	1.42%	0.3%	0.7%
%ch	0.64	0.80	0.53	0.53	0.53			
Fed. Gov. - Civilian								
Portland PMSA	18.12	18.12	18.12	18.12	18.12	0.41%	-0.1%	-0.1%
%ch	0.00	0.00	0.00	0.00	0.00			
U.S. (millions)	2.71	2.71	2.71	2.71	2.71	2.74%	-0.3%	-0.1%
%ch	0.00	0.00	0.00	0.00	0.00			
State & Local Gov.								
Portland PMSA	177.68	181.56	185.80	189.14	192.55	2.11%	2.0%	1.5%
%ch	2.02	2.18	2.34	1.80	1.80			
U.S. (millions)	23.07	23.18	23.27	23.36	23.46	1.42%	1.4%	0.5%
%ch	0.50	0.48	0.40	0.40	0.40			
Emp - Pop ratio								
Portland PMSA	0.51	0.51	0.51	0.51	0.51			
U.S.	0.39	0.40	0.40	0.40	0.40			

Total Nonfarm Wage & Salary Employment Range Projections through Year 2060

Probabilistic Population Forecast Range

	EMPLOYMENT			EMPLOYMENT - annual pct. chg.		
	Low - 5%	Pop. Base	High - 95%	Low - 5%	Pop. Base	High - 95%
1960		279,315			1.42%	
1965		329,203			3.34%	
1970		400,366			3.99%	
1975		465,268			3.05%	
1980		582,663			4.60%	
1985		587,977			0.18%	
1990		726,818			4.33%	
1995		841,682			2.98%	
2000		973,230			2.95%	
2005		983,680			0.21%	
2010	926,200	1,040,100	1,152,400	-1.20%	1.12%	3.22%
2015	1,011,100	1,157,000	1,299,400	1.77%	2.15%	2.43%
2020	1,093,500	1,265,900	1,434,200	1.58%	1.82%	1.99%
2025	1,170,700	1,368,400	1,561,800	1.37%	1.57%	1.72%
2030	1,252,200	1,475,900	1,695,300	1.36%	1.52%	1.65%
2035	1,342,900	1,592,100	1,836,800	1.41%	1.53%	1.62%
2040	1,433,700	1,707,400	1,985,700	1.32%	1.41%	1.57%
2045	1,484,600	1,781,200	2,087,000	0.70%	0.85%	1.00%
2050	1,537,300	1,858,200	2,193,400	0.70%	0.85%	1.00%
2055	1,591,900	1,938,600	2,305,300	0.70%	0.85%	1.00%
2060	1,648,400	2,022,400	2,422,900	0.70%	0.85%	1.00%

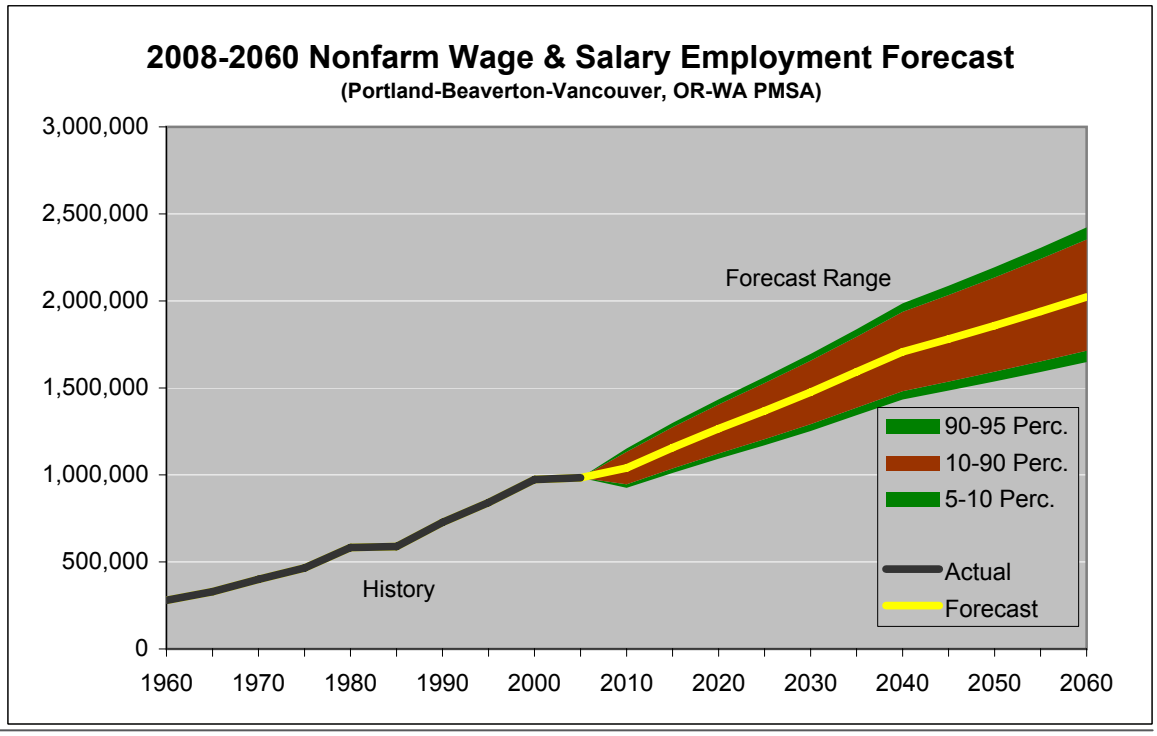
Annual Percentage Rate:

1960-80		3.74%	
1980-00		2.60%	
2000-20	0.58%	1.32%	1.96%
2020-40	1.36%	1.51%	1.64%
2040-60	0.70%	0.85%	1.00%

The Metro econometric model drives the forecast estimation for employment through 2040.

After 2040, the methodology for projecting future jobs is based on a fixed factor employment-population ratio.

Total Nonfarm Wage & Salary Employment Range Projections through Year 2060



Q1 vs. Q4 - 2040 Regional Employment Forecast Comparison

Total Nonfarm Wage & Salary Employment

	Q1	Q4	diff	%diff
2008	1,045.8	1,042.4	(3.36)	-0.3%
2009	1,058.4	1,036.1	(22.37)	-2.2%
2010	1,080.2	1,040.1	(40.06)	-3.9%
2011	1,093.7	1,058.0	(35.72)	-3.4%
2012	1,110.3	1,082.3	(28.00)	-2.6%
2013	1,128.9	1,105.9	(22.95)	-2.1%
2014	1,146.6	1,131.1	(15.46)	-1.4%
2015	1,164.3	1,157.0	(7.29)	-0.6%
2020	1,250.6	1,265.9	15.30	1.2%
2025	1,349.6	1,368.4	18.72	1.4%
2030	1,463.6	1,475.9	12.21	0.8%
2035	1,571.9	1,592.1	20.14	1.3%
2040	1,688.2	1,707.4	19.21	1.1%

Total Manufacturing Employment

	Q1	Q4	diff	%diff
2008	125.0	124.3	(0.71)	-0.6%
2009	125.1	118.9	(6.27)	-5.3%
2010	126.8	116.9	(9.83)	-8.4%
2011	127.0	119.0	(7.99)	-6.7%
2012	126.9	121.2	(5.75)	-4.7%
2013	127.1	122.1	(5.04)	-4.1%
2014	127.4	123.2	(4.24)	-3.4%
2015	127.7	124.2	(3.46)	-2.8%
2020	128.4	127.4	(0.95)	-0.7%
2025	129.9	129.2	(0.70)	-0.5%
2030	132.1	130.8	(1.23)	-0.9%
2035	133.6	132.7	(0.94)	-0.7%
2040	135.1	133.8	(1.32)	-1.0%

Total Non-Manufacturing Employment

	Q1	Q4	diff	%diff
2008	775.9	770.9	(5.00)	-0.6%
2009	788.3	768.1	(20.20)	-2.6%
2010	807.1	774.9	(32.20)	-4.2%
2011	820.5	791.6	(28.97)	-3.7%
2012	837.6	813.9	(23.73)	-2.9%
2013	856.0	835.8	(20.17)	-2.4%
2014	873.2	858.6	(14.61)	-1.7%
2015	890.1	881.6	(8.57)	-1.0%
2020	968.8	977.9	9.15	0.9%
2025	1,057.4	1,069.1	11.68	1.1%
2030	1,157.3	1,165.9	8.54	0.7%
2035	1,256.4	1,267.1	10.77	0.8%
2040	1,363.9	1,362.9	(0.98)	-0.1%

Total Civilian Government Employment

	Q1	Q4	diff	%diff
2008	144.9	147.2	2.35	1.6%
2009	145.1	149.2	4.09	2.7%
2010	146.3	148.3	1.96	1.3%
2011	146.2	147.4	1.24	0.8%
2012	145.9	147.3	1.48	1.0%
2013	145.8	148.0	2.26	1.5%
2014	146.0	149.4	3.39	2.3%
2015	146.5	151.2	4.75	3.1%
2020	153.5	160.6	7.10	4.4%
2025	162.4	170.1	7.73	4.5%
2030	174.3	179.2	4.90	2.7%
2035	182.0	192.3	10.32	5.4%
2040	190.0	210.7	20.67	9.8%

Portland-Beaverton-Vancouver, OR-WA PMSA

Q1 Forecast represents a "pre-recession" projection and set of macro-economic assumptions
Q4 Forecast represents a recognition in the forecast that embeds the most recent recession outlook and assumptions

Personal Income (includes nominal and inflation adjusted figures)

	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
Portland-Beaverton-Vancouver, OR-WA PMSA Components of Personal Income - Nominal Levels (annualized percent change)											
Personal Income	6.49	7.25	7.35	3.08	5.31	6.35	5.97	5.04	4.88	4.67	4.66
+ Wage Disbursement	8.63	7.28	8.57	2.43	2.52	5.53	5.59	4.76	4.64	4.48	4.53
- Social Ins. Contribution	9.16	8.03	7.37	3.13	1.91	5.09	5.29	4.09	3.93	3.88	3.98
+ Transfer Payments	5.88	8.44	5.77	6.53	7.71	5.70	5.68	5.45	5.24	4.76	4.59
+ Other Labor Income	7.82	7.80	6.80	4.71	7.01	6.96	6.21	5.54	5.39	5.26	5.10
+ Farm Proprietors Inc.	19.74	(9.11)	6.54	10.14	8.06	2.94	4.55	0.09	2.18	2.42	2.12
+ Bus. Proprietors Inc.	10.21	4.87	7.50	5.90	1.62	0.65	0.73	0.66	0.65	0.65	0.68
+ Div., Interest, & Rent	7.99	7.23	5.27	1.61	0.99	10.67	8.08	5.59	5.10	4.81	4.85
+ Res. Adjustment	0.38	(45.73)	(319.35)	151.38	(193.03)	(5.44)	(5.40)	(4.77)	(4.72)	(4.60)	(4.60)
Personal Income (in millions)	$28,582	$40,561	$57,823	$67,302	$87,186	$118,638	$158,515	$202,719	$257,198	$323,114	$405,751
% change	6.49	7.25	7.35	3.08	5.31	6.35	5.97	5.04	4.88	4.67	4.66
inflation adjusted (2000$)	$43,001	$50,430	$61,916	$67,160	$71,147	$83,940	$100,393	$115,940	$133,217	$151,670	$172,523
% change	4.37	3.24	4.19	1.64	1.16	3.36	3.64	2.92	2.82	2.63	2.61
Per Capita Income	$18,756	$23,186	$29,993	$32,156	$38,483	$47,272	$58,628	$70,343	$84,322	$100,635	$120,275
% change	4.57	4.33	5.28	1.4	3.66	4.2	4.4	3.71	3.69	3.6	3.63
inflation adjusted (2000$)	$26,098	$26,812	$29,863	$29,068	$31,405	$33,447	$37,132	$40,232	$43,676	$47,239	$51,166
% change	0.83	0.54	2.18	-0.54	1.56	1.27	2.11	1.62	1.66	1.58	1.61
Average Household Inc.	$48,191	$60,378	$77,894	$84,254	$97,697	$118,869	$146,011	$173,874	$207,246	$246,240	$293,163
% change	N/A	4.61	5.23	1.58	3	4	4.2	3.55	3.57	3.51	3.55
inflation adjusted (2000$)	$67,339	$70,132	$77,894	$76,495	$80,706	$85,143	$93,616	$100,671	$108,668	$117,011	$126,240
% change	N/A	0.82	2.12	-0.36	1.08	1.08	1.92	1.46	1.54	1.49	1.53
U.S. Personal Income Components - Nominal Levels (annualized percent change)											
Personal Income	6.71	4.75	6.50	4.03	4.36	5.50	5.14	4.60	4.53	4.38	4.38
+ Wage Disbursement	6.65	4.42	7.15	3.27	3.79	4.91	4.50	4.07	4.02	3.93	3.96
- Social Ins. Contribution	7.83	5.37	5.69	4.47	3.48	5.52	5.31	4.31	4.01	3.92	3.95
+ Transfer Payments	6.98	8.07	4.32	7.00	6.21	5.99	6.43	6.02	5.70	5.17	4.98
+ Other Labor Income	6.06	5.50	4.32	8.71	4.07	4.67	4.08	3.74	3.63	3.64	3.54
+ Farm Proprietors Inc.	8.91	(6.58)	0.00	8.49	(3.05)	2.94	4.55	0.09	2.18	2.42	2.12
+ Bus. Proprietors Inc.	7.63	6.13	8.49	5.58	3.81	5.48	5.89	5.42	4.94	4.72	4.70
+ Div., Interest, & Rent	6.94	3.15	6.18	1.43	4.80	7.39	5.95	4.64	4.76	4.75	4.87
U.S. Personal Income (in billions)	$4,879	$6,152	$8,430	$10,270	$12,710	$16,609	$21,341	$26,728	$33,359	$41,340	$51,222
% change	6.71	4.75	6.5	4.03	4.36	5.5	5.14	4.6	4.53	4.38	4.38
inflation adjusted (2000$)	$6,429	$6,952	$8,430	$9,055	$10,006	$11,623	$13,494	$15,252	$17,176	$19,199	$21,437
% change	2.64	1.58	3.93	1.44	2.02	3.04	3.03	2.48	2.4	2.25	2.23
U.S. Per Capita Income	$19,468	$23,044	$29,807	$34,611	$40,818	$50,839	$62,287	$74,477	$88,929	$105,638	$125,586
% change	5.68	3.43	5.28	3.03	3.35	4.49	4.15	3.64	3.61	3.5	3.52
inflation adjusted (2000$)	$25,656	$26,039	$29,807	$30,518	$32,135	$35,577	$39,385	$42,499	$45,787	$49,061	$52,567
% change	1.65	0.3	2.74	0.47	1.04	2.06	2.05	1.53	1.5	1.39	1.39
U.S. Avg. Household Inc.	$52,027	$61,459	$78,755	$90,295	$106,243	$130,708	$158,710	$189,760	$226,934	$270,984	$324,339
% change	5.22	3.39	5.08	2.77	3.31	4.23	3.96	3.64	3.64	3.61	3.66
inflation adjusted (2000$)	$68,565	$69,448	$78,755	$79,618	$83,644	$91,470	$100,355	$108,284	$116,842	$125,851	$135,711
% change	1.21	0.26	2.55	0.22	0.99	1.8	1.87	1.53	1.53	1.5	1.52
U.S. Consumer Price Index	130.66	152.38	172.19	195.28	218.72	246.06	272.32	301.75	334.44	370.76	410.83

Industry Wage Rates and Projections - Nominal Levels

	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
Portland-Beaverton-Vancouver, OR-WA PMSA Industry Hourly Wage Rates (annualized percent change)												
Ag., Forestry & Fisheries	2.4	2.3	5	3.1	0.9	1.7	1.9	2	1.7	1.7	1.6	1.6
Lumber & Wood Products	2.3	3.1	5.6	2.6	2.9	1.6	1.8	2.8	1.9	1.9	1.5	2.1
Primary Metal Mfg.	3.4	4.2	3	4	1.4	3.1	2.7	2.7	2.2	2.1	1.8	1.9
Fabricated Metal Mfg.	2.9	3.3	3	4	2.7	1.2	1.5	2.2	1.9	1.9	1.7	1.8
Machinery Mfg.	4.5	4.2	3.7	6.3	1	2.5	3.2	3.3	2.7	2.8	2.7	2.7
Computer & Electronics	6.9	5.6	9	12.5	-2.4	1.8	4.8	4.3	3.5	3.4	3.2	3.2
Transportation Equipment	5	3.1	2.2	5.3	4	1.5	1.7	2.3	2.1	2.3	2.4	2.6
Other Durables	4.2	3.3	3.8	3.9	2.2	2.3	2.4	2.5	2.1	2.1	2	2
Food Manufacturing	2.6	1.5	3.9	4	-2.3	0.5	3.3	3.8	3.1	2.7	2.3	2.2
Paper Manufacturing	6.3	1.8	4.1	1.8	2.3	1.2	2.7	2.7	2.2	2.1	1.9	2
Other Nondurables	3.2	3.9	3.7	4.3	2.6	2.9	2.5	2.5	2	2	1.9	1.9
Wholesale Trade	3.5	4.1	4.7	6.3	-5.9	2.5	6.1	5	3.4	2.7	2.3	2.3
Retail Trade	3.1	2.7	4.1	4.1	2.3	3.2	2.3	2.2	1.8	1.7	1.7	1.7
Transport., Warehousing & Ut	2.2	3.6	2.4	5.2	1.6	1	1.7	2	1.8	1.7	1.6	1.7
Information	6.2	3.5	5.6	7.8	1.2	1.2	3.3	3.6	3.3	3.4	3.5	3.5
Finance & Insurance	6.1	6	5.5	5.3	7.1	2.7	4.2	5	4.3	4.3	4	4.2
Real Estate Rental & Leasing	3.9	4.7	3.6	5.5	3.9	2.9	3.5	2.9	2.7	2.5	2.4	2.4
Pro., Sci., & Tech. Services	6.8	7.8	4.2	5.7	1.1	2	3.2	4.1	3.7	3.7	3.5	3.5
Management of Co.	3.8	7.3	4.2	12.7	-1.6	5.3	3.9	4.2	3.5	3.5	3.2	3.3
Admin. & Waste Support	4.1	1.1	3.7	6.3	-1.1	0.5	3.2	4.2	3.6	3.3	2.8	2.8
Educational Services	4.5	3.7	3.9	3.5	3.4	2.5	2.8	3.1	2.7	2.7	2.5	2.6
Health Services	6.2	5	4.5	3.6	4.1	3.1	3.2	3.6	3	3	2.8	2.9
Federal Govt., Civilian	6.9	4.8	4.9	2.7	4.4	2.9	3	3.1	2.7	2.6	2.4	2.4
State & Local Govt.	7.8	3.5	4.1	3.3	3.9	2.8	2.9	3.3	2.8	2.8	2.6	2.7
Portland-Beaverton-Vancouver, OR-WA PMSA Industry Hourly Wage Rates (nominal dollars)												
Ag., Forestry & Fisheries	5.56	6.23	7.96	9.25	9.67	10.54	11.58	12.81	13.95	15.18	16.42	17.78
Lumber & Wood Products	7.87	9.15	12.05	13.66	15.75	17.08	18.72	21.46	23.6	25.98	27.98	31.04
Primary Metal Mfg.	12.44	15.25	17.69	21.56	23.12	26.94	30.8	35.25	39.34	43.63	47.79	52.51
Fabricated Metal Mfg.	10.37	12.22	14.19	17.29	19.77	20.93	22.58	25.22	27.72	30.44	33.15	36.24
Machinery Mfg.	11.24	13.81	16.59	22.57	23.68	26.77	31.4	36.85	42.13	48.3	55.1	62.95
Computer & Electronics	12.32	16.15	24.8	44.7	39.67	43.42	55.02	67.97	80.74	95.38	111.51	130.53
Transportation Equipment	13.65	15.86	17.71	22.96	27.89	30	32.66	36.57	40.49	45.43	51.18	58.19
Other Durables	9.26	10.9	13.11	15.84	17.64	19.78	22.22	25.19	28.02	31.1	34.29	37.86
Food Manufacturing	9.74	10.49	12.73	15.45	13.74	14.07	16.53	19.93	23.23	26.56	29.77	33.19
Paper Manufacturing	15.35	16.76	20.45	22.41	25.17	26.74	30.62	34.92	38.91	43.08	47.34	52.27
Other Nondurables	9.62	11.64	13.94	17.21	19.55	22.55	25.51	28.86	31.91	35.2	38.59	42.40
Wholesale Trade	11.97	14.64	18.38	24.9	18.37	20.77	27.86	35.52	41.88	47.81	53.57	60.02
Retail Trade	6.6	7.55	9.23	11.31	12.65	14.8	16.57	18.51	20.25	22.06	23.95	26.06
Transport., Warehousing & Ut	11.55	13.75	15.51	19.96	21.63	22.75	24.71	27.32	29.8	32.47	35.18	38.27
Information	11.01	13.07	17.18	25.03	26.51	28.16	33.08	39.42	46.41	54.82	64.97	77.16
Finance & Insurance	9.43	12.61	16.51	21.39	30.1	34.31	42.17	53.82	66.57	82.05	99.9	122.72
Real Estate Rental & Leasing	6.36	8.01	9.55	12.5	15.1	17.43	20.67	23.81	27.21	30.8	34.68	39.05
Pro., Sci., & Tech. Services	10.34	15.09	18.57	24.54	25.87	28.54	33.34	40.68	48.83	58.6	69.48	82.52
Management of Co.	13.54	19.3	23.66	43.08	39.81	51.47	62.34	76.44	90.87	107.7	126.24	148.49
Admin. & Waste Support	6.61	6.98	8.38	11.34	10.72	11.02	12.91	15.85	18.95	22.27	25.62	29.41
Educational Services	6.91	8.28	10.01	11.9	14.08	15.94	18.27	21.3	24.34	27.74	31.38	35.68
Health Services	9.59	12.21	15.22	18.16	22.17	25.82	30.27	36.06	41.89	48.54	55.72	64.28
Federal Govt., Civilian	18.53	23.4	29.69	33.95	42.12	48.67	56.31	65.63	74.84	85.01	95.74	107.79
State & Local Govt.	12.08	14.35	17.58	20.64	24.96	28.68	33.16	38.97	44.77	51.4	58.4	66.72

Industry Wage Rates and Projections - Inflation Adjusted (Year 2000 Levels)

	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
Portland-Beaverton-Vancouver, OR-WA PMSA Industry Hourly Wage Rates (annualized percent change, inflation adjusted)												
Ag., Forestry & Fisheries	2.4	2.3	5.0	3.0	0.9	1.7	1.9	2.0	1.7	1.7	1.6	1.6
Lumber & Wood Products	2.3	3.1	5.7	2.5	2.9	1.6	1.9	2.8	1.9	1.9	1.5	2.1
Primary Metal Mfg.	3.4	4.2	3.0	4.0	1.4	3.1	2.7	2.7	2.2	2.1	1.8	1.9
Fabricated Metal Mfg.	2.9	3.3	3.0	4.0	2.7	1.1	1.5	2.2	1.9	1.9	1.7	1.8
Machinery Mfg.	4.5	4.2	3.7	6.3	1.0	2.5	3.2	3.3	2.7	2.8	2.7	2.7
Computer & Electronics	6.9	5.6	9.0	12.5	-2.4	1.8	4.8	4.3	3.5	3.4	3.2	3.2
Transportation Equipment	5.0	3.0	2.2	5.3	4.0	1.5	1.7	2.3	2.1	2.3	2.4	2.6
Other Durables	4.2	3.3	3.8	3.9	2.2	2.3	2.4	2.5	2.2	2.1	2.0	2.0
Food Manufacturing	2.6	1.5	3.9	3.9	-2.3	0.5	3.3	3.8	3.1	2.7	2.3	2.2
Paper Manufacturing	6.3	1.8	4.1	1.8	2.4	1.2	2.7	2.7	2.2	2.1	1.9	2.0
Other Nondurables	3.2	3.9	3.7	4.3	2.6	2.9	2.5	2.5	2.0	2.0	1.9	1.9
Wholesale Trade	3.5	4.1	4.7	6.3	-5.9	2.5	6.0	5.0	3.3	2.7	2.3	2.3
Retail Trade	3.1	2.7	4.1	4.1	2.3	3.2	2.3	2.2	1.8	1.7	1.7	1.7
Transport., Warehousing & Ut	2.2	3.5	2.4	5.2	1.6	1.0	1.7	2.0	1.8	1.7	1.6	1.7
Information	6.1	3.5	5.6	7.8	1.2	1.2	3.3	3.6	3.3	3.4	3.5	3.5
Finance & Insurance	6.1	6.0	5.5	5.3	7.1	2.7	4.2	5.0	4.3	4.3	4.0	4.2
Real Estate Rental & Leasing	3.9	4.7	3.6	5.5	3.9	2.9	3.5	2.9	2.7	2.5	2.4	2.4
Pro., Sci., & Tech. Services	6.8	7.9	4.2	5.7	1.1	2.0	3.2	4.1	3.7	3.7	3.5	3.5
Management of Co.	3.8	7.3	4.2	12.7	-1.6	5.3	3.9	4.2	3.5	3.5	3.2	3.3
Admin. & Waste Support	4.1	1.1	3.7	6.2	-1.1	0.6	3.2	4.2	3.6	3.3	2.8	2.8
Educational Services	4.4	3.7	3.9	3.5	3.4	2.5	2.8	3.1	2.7	2.6	2.5	2.6
Health Services	6.2	4.9	4.5	3.6	4.1	3.1	3.2	3.6	3.0	3.0	2.8	2.9
Federal Govt., Civilian	6.9	4.8	4.9	2.7	4.4	2.9	3.0	3.1	2.7	2.6	2.4	2.4
State & Local Govt.	7.8	3.5	4.1	3.3	3.9	2.8	2.9	3.3	2.8	2.8	2.6	2.7
Portland-Beaverton-Vancouver, OR-WA PMSA Industry Hourly Wage Rates (inflation adjusted to year 2000 dollars)												
Ag., Forestry & Fisheries	8.90	9.97	12.74	14.80	15.47	16.87	18.53	20.50	22.32	24.29	26.28	28.45
Lumber & Wood Products	12.59	14.64	19.28	21.86	25.20	27.33	29.96	34.34	37.77	41.58	44.78	49.68
Primary Metal Mfg.	19.91	24.40	28.31	34.50	37.00	43.11	49.29	56.41	62.95	69.82	76.48	84.02
Fabricated Metal Mfg.	16.59	19.56	22.71	27.67	31.64	33.49	36.13	40.36	44.36	48.71	53.05	58.00
Machinery Mfg.	17.99	22.10	26.55	36.12	37.89	42.84	50.25	58.97	67.42	77.29	88.18	100.74
Computer & Electronics	19.72	25.84	39.69	71.53	63.48	69.48	88.05	108.77	129.21	152.63	178.45	208.89
Transportation Equipment	21.84	25.38	28.34	36.74	44.63	48.01	52.27	58.52	64.80	72.70	81.90	93.12
Other Durables	14.82	17.44	20.98	25.35	28.23	31.65	35.56	40.31	44.84	49.77	54.87	60.58
Food Manufacturing	15.59	16.79	20.37	24.72	21.99	22.52	26.45	31.89	37.17	42.50	47.64	53.12
Paper Manufacturing	24.56	26.82	32.73	35.86	40.28	42.79	49.00	55.88	62.27	68.94	75.76	83.64
Other Nondurables	15.39	18.63	22.31	27.54	31.29	36.09	40.82	46.18	51.06	56.33	61.75	67.85
Wholesale Trade	19.16	23.43	29.41	39.85	29.40	33.24	44.58	56.84	67.02	76.51	85.73	96.05
Retail Trade	10.56	12.08	14.77	18.10	20.24	23.68	26.52	29.62	32.41	35.30	38.33	41.70
Transport., Warehousing & Ut	18.48	22.00	24.82	31.94	34.61	36.41	39.54	43.72	47.69	51.96	56.30	61.25
Information	17.62	20.92	27.49	40.05	42.42	45.06	52.94	63.08	74.27	87.73	103.97	123.48
Finance & Insurance	15.09	20.18	26.42	34.23	48.17	54.91	67.48	86.13	106.53	131.30	159.87	196.38
Real Estate Rental & Leasing	10.18	12.82	15.28	20.00	24.16	27.89	33.08	38.10	43.54	49.29	55.50	62.48
Pro., Sci., & Tech. Services	16.55	24.15	29.72	39.27	41.40	45.67	53.35	65.10	78.14	93.78	111.19	132.06
Management of Co.	21.67	30.89	37.86	68.94	63.71	82.37	99.76	122.33	145.42	172.35	202.02	237.63
Admin. & Waste Support	10.58	11.17	13.41	18.15	17.15	17.64	20.66	25.36	30.33	35.64	41.00	47.07
Educational Services	11.06	13.25	16.02	19.04	22.53	25.51	29.24	34.09	38.95	44.39	50.22	57.09
Health Services	15.35	19.54	24.36	29.06	35.48	41.32	48.44	57.71	67.04	77.68	89.17	102.87
Federal Govt., Civilian	29.65	37.45	47.51	54.33	67.40	77.89	90.11	105.03	119.76	136.04	153.21	172.50
State & Local Govt.	19.33	22.96	28.13	33.03	39.94	45.90	53.07	62.36	71.64	82.25	93.46	106.77

Headship Rates by County

2000 Census Headship Rates by Age of Head Householder

	Clackamas	Columbia	Marion	Multnomah	Polk	Washington	Yamhill	Clark	PMSA
Households 15 to 24 years	0.135	0.114	0.155	0.200	0.175	0.181	0.120	0.155	0.169
Households 25 to 34 years	0.458	0.467	0.440	0.492	0.462	0.491	0.422	0.478	0.477
Households 35 to 44 years	0.526	0.536	0.512	0.557	0.519	0.551	0.495	0.544	0.541
Households 45 to 54 years	0.562	0.548	0.552	0.595	0.555	0.579	0.532	0.568	0.573
Households 55 to 64 years	0.587	0.573	0.579	0.617	0.577	0.599	0.563	0.595	0.596
Households 65 to 74 years	0.617	0.618	0.609	0.635	0.604	0.615	0.589	0.618	0.620
Households 75 to 84 years	0.663	0.684	0.653	0.669	0.633	0.648	0.632	0.656	0.658
Households 85 years and over	0.626	0.639	0.608	0.609	0.449	0.604	0.557	0.581	0.598
Total	0.483	0.484	0.462	0.507	0.467	0.491	0.434	0.485	0.487
Average Household Size:	**2.64**	**2.66**	**2.80**	**2.43**	**2.71**	**2.63**	**2.96**	**2.71**	**2.61**

1990 Census Headship Rates by Age of Head Householder

	Clackamas	Columbia	Marion	Multnomah	Polk	Washington	Yamhill	Clark	PMSA
Households 15 to 24 years	0.116	0.116	0.154	0.204	0.177	0.165	0.125	0.148	0.165
Households 25 to 34 years	0.454	0.473	0.445	0.502	0.455	0.495	0.440	0.487	0.482
Households 35 to 44 years	0.537	0.541	0.522	0.579	0.541	0.565	0.512	0.554	0.556
Households 45 to 54 years	0.573	0.568	0.560	0.599	0.561	0.590	0.548	0.582	0.582
Households 55 to 64 years	0.581	0.567	0.571	0.603	0.564	0.588	0.551	0.590	0.587
Households 65 to 74 years	0.623	0.641	0.620	0.650	0.611	0.630	0.608	0.629	0.633
Households 75 to 84 years	0.645	0.687	0.638	0.671	0.616	0.636	0.621	0.667	0.653
Households 85 years and over	0.645	0.688	0.638	0.671	0.617	0.636	0.621	0.667	0.653
Total	0.478	0.487	0.470	0.517	0.473	0.495	0.451	0.489	0.494
Average Household Size:	**2.69**	**2.70**	**2.74**	**2.41**	**2.73**	**2.62**	**2.92**	**2.69**	**2.60**

Change in Headship Rates: 1990 to 2000

	Clackamas	Columbia	Marion	Multnomah	Polk	Washington	Yamhill	Clark	PMSA
Households 15 to 24 years	0.019	-0.002	0.001	-0.004	-0.002	0.016	-0.005	0.007	0.004
Households 25 to 34 years	0.004	-0.006	-0.005	-0.010	0.007	-0.004	-0.017	-0.010	-0.005
Households 35 to 44 years	-0.011	-0.005	-0.009	-0.022	-0.022	-0.013	-0.017	-0.010	-0.015
Households 45 to 54 years	-0.011	-0.019	-0.008	-0.003	-0.006	-0.011	-0.016	-0.014	-0.009
Households 55 to 64 years	0.006	0.007	0.007	0.014	0.012	0.011	0.012	0.004	0.009
Households 65 to 74 years	-0.005	-0.023	-0.011	-0.014	-0.007	-0.015	-0.019	-0.011	-0.013
Households 75 to 84 years	0.019	-0.004	0.015	-0.001	0.017	0.011	0.011	-0.011	0.005
Households 85 years and over	-0.019	-0.048	-0.030	-0.062	-0.168	-0.032	-0.065	-0.085	-0.055
Total	**0.005**	**-0.003**	**-0.009**	**-0.011**	**-0.006**	**-0.004**	**-0.016**	**-0.004**	**-0.006**

Headship rates are calculated by dividing the number of householders by the population in each age group.
Headship rates are used to project the number of future households from a population forecast. Headship rates change over time as demographic and economic factors fluctate.

Source: 1990 U.S. Census, 2000 U.S. Census as compiled by Metro DRC

Location Quotients

Portland-Beaverton-Vanouver, OR-WA PMSA

	1990	1995	2000	2005	2008	2010	2015	2020	2025	2030	2035	2040
Manufacturing, total	1.06	1.09	1.12	1.18	1.22	1.27	1.23	1.22	1.26	1.28	1.3	1.29
Durable Goods, total	1.25	1.29	1.34	1.43	1.45	1.53	1.45	1.45	1.51	1.54	1.56	1.53
Wood Products	2.21	1.54	1.31	1.45	1.34	1.22	1.15	1.12	1.14	1.12	1.05	1
Primary Metal	1.86	1.47	1.68	1.77	2.09	2.22	2.03	1.82	1.67	1.66	1.72	1.82
Fabricated Metal	1.01	1.13	1.06	1.12	1.11	1.16	1.07	1.01	1	1	1.02	1.03
Machinery	0.98	1.01	0.97	0.96	0.95	0.96	0.85	0.8	0.8	0.8	0.81	0.8
Electrical Machinery	2.23	2.7	3.07	3.77	3.75	3.63	4.38	4.79	5.01	4.86	4.56	4.33
Transportation Equipment	0.67	0.67	0.73	0.69	0.71	0.83	0.74	0.82	0.97	1.07	1.06	0.98
Non-durable Goods, total	0.78	0.79	0.76	0.77	0.8	0.85	0.84	0.82	0.82	0.83	0.84	0.86
Food Processing	0.95	0.86	0.77	0.79	0.83	0.85	0.79	0.72	0.68	0.65	0.64	0.63
Paper	1.75	1.55	1.46	1.4	1.32	1.45	1.47	1.39	1.36	1.35	1.37	1.4
Non-manufacturing, total	1.03	1.03	1.01	1.01	1	1	1.01	1.01	1.01	1.01	1.01	1.01
Natural Resources	0.4	0.44	0.42	0.39	0.28	0.31	0.31	0.32	0.3	0.29	0.27	0.26
Construction	1.05	1.2	1.06	1.08	1.17	1.22	1.09	1.03	0.99	0.93	0.89	0.88
Retail Trade	0.94	0.93	0.95	0.93	0.95	0.94	0.98	0.96	0.96	0.97	0.98	0.99
Motor Vehicle & Parts	1.09	1.04	1.04	1	0.97	0.92	1.01	1.07	1.08	1.09	1.08	1.08
Food & Beverage Stores	0.82	0.8	0.85	0.89	0.93	0.89	0.97	1.01	1.01	1.03	1.05	1.08
Other Retail	0.96	0.95	0.96	0.93	0.95	0.96	0.97	0.93	0.93	0.94	0.94	0.95
Transp., Warehouse, & Utilities	1.13	1.08	1.04	1.02	0.98	1.01	1	0.95	0.91	0.9	0.93	0.96
Information, total	0.9	0.93	0.97	1.02	1.09	1.08	1.11	1.14	1.14	1.12	1.05	0.98
Publishing	0.78	0.99	1.27	1.37	1.56	1.66	1.86	2.14	2.36	2.51	2.48	2.34
Internet & Other	0.97	0.9	0.85	0.87	0.9	0.85	0.83	0.78	0.74	0.69	0.64	0.62
Finance Activities	1.14	1.13	1.14	1.14	1.13	1.12	1.2	1.28	1.34	1.39	1.42	1.45
Finance & Insurance	0.91	0.91	0.99	0.99	0.95	0.96	1.04	1.11	1.17	1.21	1.24	1.25
Real Estate	1.84	1.77	1.57	1.55	1.62	1.61	1.63	1.74	1.8	1.89	1.96	2.03
Pro. Business Services	1.08	1.14	1.06	1.03	1.01	1.01	0.93	0.88	0.83	0.78	0.73	0.69
Pro., Sci., & Tech.	1.21	1.2	0.98	0.95	0.91	0.9	0.89	0.85	0.76	0.67	0.59	0.54
Mgmt. of Companies	0.92	1.23	1.52	1.56	1.62	1.61	1.95	2.32	2.66	3.1	3.56	3.89
Admin. Support	1.01	1.05	1.02	0.99	0.96	0.99	0.81	0.73	0.7	0.67	0.65	0.63
Edu. & Health Care	1.01	0.92	0.92	0.94	0.92	0.9	0.95	1.01	1.07	1.14	1.19	1.24
Educational	1.04	0.98	1.02	1	0.96	0.96	1.09	1.21	1.29	1.38	1.45	1.52
Health Care	1	0.91	0.9	0.92	0.91	0.89	0.92	0.98	1.03	1.1	1.15	1.2
Leisure & Hospitality	1.03	1.01	0.98	0.96	0.96	0.95	0.99	1.03	1.05	1.08	1.09	1.11
Arts, Entertainment & Rec.	1.32	1.13	0.99	0.95	0.92	0.91	0.98	0.99	0.96	0.96	0.95	0.96
Accommodation & Food	0.99	0.99	0.98	0.96	0.97	0.96	0.99	1.03	1.07	1.1	1.12	1.14
Other Services	0.91	0.89	0.88	0.87	0.88	0.83	1.04	1.15	1.21	1.27	1.28	1.28
Government, Civilian total	0.89	0.85	0.9	0.9	0.91	0.91	0.86	0.85	0.85	0.83	0.85	0.87
Federal, Civilian	0.89	0.85	0.89	0.91	0.87	0.87	0.85	0.81	0.78	0.75	0.73	0.72
State & Local	0.81	0.79	0.84	0.85	0.86	0.86	0.82	0.81	0.82	0.81	0.83	0.85

U.S. Population and Labor Force Productivity Measures

	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
Components of Population (in millions)															
Population (U.S.)	205.4	216.2	228	238.7	250.6	267	282.8	296.7	311.4	326.7	342.6	358.9	375.1	391.3	407.8
Pct. Chg. (5-year avg.)	1.09	1.03	1.06	0.93	0.97	1.27	1.16	0.96	0.97	0.97	0.96	0.93	0.89	0.85	0.83
Annual Avg. Change	2.2	2.2	2.4	2.2	2.4	3.3	3.2	2.8	2.9	3.1	3.2	3.3	3.2	3.2	3.3
Population by Age (in millions)															
0 to 4 years old	17.2	16.1	16.5	17.9	18.9	19.6	19.2	20.3	21.2	22.2	23	23.6	24.3	25.2	26.4
5 to 15 years old	44.8	42.5	38.8	37.4	38.7	42.6	45.2	44.7	44.9	47	49.2	51.4	53.2	54.8	56.6
16 to 21 years old	22.6	25.2	25.9	23.4	22.4	21.7	24.3	25	26.3	25.5	26.6	28.1	29.5	30.8	32.0
22 to 54 years old	82	89.6	99.3	109.4	118.2	127.9	134.5	139.3	142.2	144.3	145.7	149.7	155.6	162.1	168.0
55 to 64 years old	18.7	20.1	21.8	22.1	21.1	21.4	24.5	30.5	36.4	40.6	43	41.9	40.2	40.7	43.1
65 to 84 years old	18.7	20.9	23.5	25.8	28.2	30.1	30.8	31.7	34.4	40.5	48.2	56.7	63.4	66.3	68.0
85 years and older	1.4	1.8	2.3	2.7	3.1	3.7	4.3	5.1	6	6.5	6.8	7.4	8.9	11.5	14.1
Population Share by Age (in percent)															
0 to 4 years old	0.08	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06
5 to 16 years old	0.22	0.2	0.17	0.16	0.15	0.16	0.16	0.15	0.14	0.14	0.14	0.14	0.14	0.14	0.14
17 to 21 years old	0.11	0.12	0.11	0.1	0.09	0.08	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
22 to 54 years old	0.4	0.41	0.44	0.46	0.47	0.48	0.48	0.47	0.46	0.44	0.43	0.42	0.41	0.41	0.41
55 to 64 years old	0.09	0.09	0.1	0.09	0.08	0.08	0.09	0.1	0.12	0.12	0.13	0.12	0.11	0.1	0.11
65 to 84 years old	0.09	0.1	0.1	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.14	0.16	0.17	0.17	0.17
85 years and older	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03
Population A.P.R. (in percent)															
0 to 4 years old	-2.71	-1.37	0.57	1.58	1.14	0.73	-0.4	1.12	0.91	0.9	0.68	0.55	0.57	0.74	0.92
5 to 16 years old	0.79	-1.06	-1.81	-0.69	0.67	1.93	1.18	-0.19	0.07	0.93	0.92	0.85	0.69	0.61	0.66
17 to 21 years old	3.2	2.27	0.51	-1.97	-0.9	-0.61	2.24	0.62	0.97	-0.59	0.86	1.04	1.01	0.87	0.75
22 to 54 years old	1.28	1.8	2.07	1.96	1.55	1.59	1.02	0.69	0.41	0.29	0.2	0.54	0.78	0.82	0.71
55 to 64 years old	1.8	1.42	1.62	0.31	-0.93	0.24	2.79	4.49	3.61	2.21	1.13	-0.5	-0.82	0.22	1.13
65 to 84 years old	1.49	2.25	2.32	1.91	1.82	1.3	0.45	0.59	1.6	3.35	3.55	3.3	2.25	0.89	0.50
85 years and older	5.66	4.99	4.53	3.24	2.84	3.73	3.11	3.39	3.29	1.73	0.9	1.76	3.61	5.24	4.17
Labor Force (in millions)															
Population 16 years and old	143.4	157.7	172.7	183.4	193	204.8	218.4	231.7	245.2	257.4	270.4	283.9	297.6	311.3	324.9
Labor Force, total	82.8	93.8	107	115.9	125.9	133.1	142.6	149.3	156	163	168.4	172.9	178.6	186.1	194.3
16 to 64 years old	79.6	90.8	103.9	113	122.4	129.2	138.3	144	149.3	155	158.4	161	165.4	172.6	180.7
65 years and older	3.2	3	3.1	2.9	3.5	3.9	4.3	5.3	6.7	8.1	10	11.9	13.2	13.5	13.7
Participation Rate (in percent)															
Labor Force, total	57.7	59.5	61.9	63.2	65.2	65	65.3	64.4	63.6	63.3	62.3	60.9	60	59.8	59.8
16 to 64 years old	64.6	67.3	70.7	72.9	75.7	75.6	75.4	73.9	72.9	73.7	73.6	73.3	73.4	73.9	74.2
65 years and older	16	13	11.9	10.2	11	11.5	12.4	14.3	16.6	17.2	18.2	18.5	18.2	17.3	16.9
Employment and Manhour															
Total Nonfarm Employment	71	77.1	90.5	97.5	109.5	117.3	131.8	133.7	135.6	146.5	153.3	159.9	166.5	173.5	180.6
Unemployment Rate (percer	5	8.5	7.2	7.2	5.6	5.6	4	5.1	8.2	5.7	4.9	4.9	4.9	4.9	4.9
Average Weekly Hours	35.9	34.6	33.7	33.9	33.3	33.4	33.4	32.6	32.3	32.5	32.5	32.5	32.5	32.5	32.5
Manufacturing Workweek	39.8	39.4	39.7	40.5	40.5	41.3	41.2	40.6	40.6	40.9	40.7	40.8	40.8	40.7	40.6
Durable Mfg.	40.5	40	40.3	41.3	41.2	42.2	41.8	41.1	40.8	41.1	40.8	40.8	40.9	40.8	40.7
Nondurable Mfg.	39	38.6	38.8	39.4	39.6	40.1	40.3	39.9	40.2	40.5	40.6	40.7	40.7	40.6	40.5
Productivity Measures (annual pct. change)															
GDP / Employment	0.27	1.04	0.38	1.72	0.91	1.06	1.7	1.99	1.07	1.56	1.84	1.64	1.6	1.6	1.71
FRB Ind. Production, total	3.23	1.78	4.54	2.24	2.96	3.22	5.87	0.77	-0.17	3.89	3.2	3.17	3.28	3.22	3.12
FRB Ind.Production, Mfg.	3.5	1.79	4.21	1.71	2.63	2.89	5.21	0.67	0.05	3.15	2.51	2.52	2.49	2.42	2.39
Employment Cost Index (annual pct. change)															
Pvt. Sector wages & salarie	N/A	N/A	7.88	6.01	3.72	3.07	3.67	3	2.54	2.57	2.76	2.34	2.3	2.14	2.21

Key U.S. Economic Indicators & Forecast Variables

	1975	1980	1985	1990	1995	2000	2005	2010
Components of GDP (in pct. change)								
Gross Domesitc Product	2.7	3.7	3.2	3.3	2.5	4.1	2.3	1.4
Consumption	3.2	3.2	3.8	3.3	2.6	4.4	2.9	1.6
Durables	4.9	3.6	7.9	3.8	4	9.3	5.6	1.7
Computers	N/A	N/A	105.9	43.8	51.4	61.3	32.2	18.2
Software	N/A	N/A	N/A	N/A	51.9	40.4	13.5	8.7
Medical Devices	3.1	1.4	7.8	12.4	-1.2	6.2	0.2	3.6
Nondurables	1.8	2.7	2.4	2.7	2	3.5	3	1.5
Food	1.1	2.2	1.8	2.4	1.1	2.3	2.5	1.7
Medical Services	5.7	4.4	3.6	4.6	2.6	3.4	4.3	2.6
Prescription Drugs	5.4	5.4	3.3	4.6	3.2	9.9	5.7	2.8
Gross Domestic Investments	1.2	7.3	5.7	1	4.8	8.9	1.5	-3.2
Nonresidential Fixed Investments	2.6	8.1	4.7	1.6	5.1	10.1	-0.1	0.5
Industrial Equipment	1.3	4	-0.2	0.5	4.3	3.4	-1.8	-1.8
Computer Equipment	24.6	61.9	42.7	14.6	29.2	38.8	9.4	13.1
Software	14.2	14.5	18.9	18.2	12.4	19.7	3.3	4.3
Transportation Equip.	3.3	5	3.7	-2.9	8.3	5.9	-1.4	-9.8
Structures	-0.8	7.8	2.9	-2	-2.1	4.8	-4.4	0.4
Residential Fixed Investments	0.6	3.9	4.4	0.1	3.4	4.8	5.9	-9.9
Equipment	N/A	N/A	N/A	N/A	0.6	3.5	4.8	-0.5
Structures	0.4	3.9	4.4	0	3.5	4.9	5.9	-10.1
Exports	6.9	7.5	0.3	11	7.1	7.1	1.9	5.5
Goods	7.4	8.1	-0.4	11	7.8	8	1.5	5.7
Services	5.6	5.4	3.1	10.9	5.4	4.9	2.9	5
Imports	1.3	6.5	8.6	5.3	6.9	11.7	4.3	1.2
Federal Spending	-3	2.4	5.2	2.2	-2.5	-0.1	4.6	1.9
State & Local Spending	3.1	1.2	1.7	3.8	2.2	3.4	1.2	0.9
Inflation Measures (in pct. change)								
GDP Deflator	6.7	7.3	5.2	3.2	2.5	1.7	2.5	2.3
Consumer Price Index	6.7	8.9	5.5	4	3.1	2.5	2.5	2.3
excluding Food & Energy	5.7	8.4	6.2	4.4	3.5	2.4	2.1	2.1
Producer Price Index	9.6	9	2.8	2.4	1.4	1.3	3.5	2.5
Employment Cost Index	N/A	7.9	6	3.7	3.1	3.7	3	2.5
Interest Rates (in percents)								
Fed Funds	5.8	13.4	8.1	8.1	5.8	6.2	3.2	1.2
3-month Treasury Bill	5.8	11.4	7.5	7.5	5.5	5.8	3.1	1.8
30-Year Treasury Bond	N/A	11.3	10.8	8.6	6.9	5.9	4.6	4.3
30-Year Fixed Mortgage	9	13.8	12.4	10.1	8	8.1	5.9	5.6
Personal Income (in pct. change)								
Nominal	9.7	11.6	8.9	6.7	4.7	6.5	4	4.4
Inflation adjusted	2.8	2.5	3.2	2.6	1.6	3.9	1.4	2
Other Key U.S. Economic Measure								
Oil Prices ($ / barrel) - nominal								
W. Texas Intermediate	N/A	N/A	27.9	24.5	18.4	30.4	56.6	63.3
Refiners Acquistion Cost	10.4	28.2	26.7	22.3	17.2	28.2	50.3	56.9
Domestic Crude	8.4	24.2	26.7	22.4	17.3	29	53	58.5
Imported Crude	13.9	34	27	22.2	17.1	27.7	48.9	56.1
Exchange Rate Indexes 2000=1.0 (weighted, inflation-adjusted)								
Major Trading Partners	0.942	0.836	1.13	0.832	0.8	1	0.825	0.744
Other Important Partners	N/A	0.799	1.16	1.094	0.986	1	0.919	0.683
Housing Starts (in millions)	1.16	1.3	1.741	1.203	1.361	1.573	2.073	1.082
Single-family	0.891	0.855	1.071	0.901	1.082	1.232	1.719	0.912
Multi-family	0.269	0.445	0.671	0.303	0.279	0.341	0.354	0.171
Consumer Sentiment	70.4	64.4	93.2	81.6	92.2	107.6	88.6	67.1

Key U.S. Economic Indicat

	2015	2020	2025	2030	2035	2040
Components of GDP (in pct. chang						
Gross Domesitc Product	3.1	2.8	2.5	2.4	2.4	2.5
Consumption	2.7	2.9	2.5	2.4	2.4	2.4
Durables	5.2	4.6	4.5	4.8	5.1	5.2
Computers	21.2	20	19	18.7	18.5	18.4
Software	11	9.6	8.8	8.9	8.8	8.9
Medical Devices	4.8	3.6	2.8	2.7	2.5	2.3
Nondurables	2.1	2.6	2.5	2.4	2.4	2.3
Food	1.8	1.8	1.7	1.5	1.4	1.4
Medical Services	3.9	3.7	2.9	2.7	2.6	2.5
Prescription Drugs	6.5	6.3	4.5	4.1	3.6	3.3
Gross Domestic Investments	7.7	2.9	3	3.1	3.4	3.5
Nonresidential Fixed Investments	7.2	3.9	4.2	4.2	4.4	4.4
Industrial Equipment	4.2	3	2.4	2.8	3	2.8
Computer Equipment	20	19.2	18.6	14.6	14.7	14.7
Software	4.7	3.1	3.3	3.5	3.4	3.3
Transportation Equip.	13.6	4.3	4	4.6	5.4	5.4
Structures	6	1	1.1	1.2	1.3	1.5
Residential Fixed Investments	8.2	0.7	-0.4	-0.2	0.3	0.6
Equipment	4.1	4.6	5	6	6.8	7.2
Structures	8.3	0.6	-0.5	-0.3	0.2	0.5
Exports	7.6	6.4	5.4	5.2	5.3	5.4
Goods	8.2	6.9	5.7	5.4	5.6	5.9
Services	6.3	5.4	4.8	4.7	4.6	4.5
Imports	5.4	4.7	4.5	4.6	4.8	4.7
Federal Spending	0	0.9	0.8	1.1	0.9	1
State & Local Spending	0.4	1	1.1	1.1	1	1
Inflation Measures (in pct. change)						
GDP Deflator	1.9	1.9	1.7	1.8	1.8	1.8
Consumer Price Index	2.4	2	2.1	2.1	2.1	2.1
excluding Food & Energy	2.2	2.1	2	2	2.1	2.1
Producer Price Index	2	0.7	0.9	0.7	0.7	0.7
Employment Cost Index	2.6	2.8	2.3	2.3	2.1	2.2
Interest Rates (in percents)						
Fed Funds	4.8	4.8	4.8	4.8	4.7	4.7
3-month Treasury Bill	4.6	4.6	4.6	4.6	4.6	4.6
30-Year Treasury Bond	5.8	5.8	5.8	5.8	5.8	5.8
30-Year Fixed Mortgage	7.1	7.1	7.1	7.1	7.1	7.1
Personal Income (in pct. change)						
Nominal	5.5	5.1	4.6	4.5	4.4	4.4
Inflation adjusted	3	3	2.5	2.4	2.3	2.2
Other Key U.S. Economic Measure						
Oil Prices ($ / barrel) - nominal						
W. Texas Intermediate	86.5	85	101.1	105.8	110	112.5
Refiners Acquistion Cost	78.9	78.1	94.2	98.9	103.1	105.5
Domestic Crude	80.6	79.6	95.7	100.4	104.6	107
Imported Crude	78.2	77.5	93.7	98.4	102.6	105
Exchange Rate Indexes 2000=1.0 (						
Major Trading Partners	0.706	0.669	0.666	0.664	0.657	0.654
Other Important Partners	0.594	0.561	0.542	0.523	0.509	0.5
Housing Starts (in millions)	1.834	1.793	1.685	1.592	1.544	1.512
Single-family	1.443	1.379	1.287	1.183	1.128	1.106
Multi-family	0.391	0.414	0.398	0.409	0.416	0.406
Consumer Sentiment	84	86.6	86.6	86.4	86.2	85.9

U.S. Employment and Industry Detail (NAICS)

	1980	1985	1990	1995	2000	2005	2010	2015
Employment, nonfarm	90.53	97.51	109.49	117.31	131.79	133.69	135.62	146.5
pct. chg. (annual)	3.27	1.5	2.35	1.39	2.36	0.29	0.29	1.55
Private Employment	74.15	80.98	91.08	97.87	111	111.89	113.24	123.29
pct. chg. (annual)	3.56	1.78	2.38	1.45	2.55	0.16	0.24	1.72
Manufacturing	18.73	17.82	17.7	17.24	17.27	14.23	11.99	12.78
pct. chg. (annual)	2.06	-1	-0.14	-0.52	0.02	-3.8	-3.36	1.29
Durable Goods	11.68	11.03	10.74	10.37	10.88	8.96	7.46	8.2
Lumber	N/A	N/A	0.54	0.57	0.61	0.56	0.43	0.55
Primary Metals	N/A	N/A	0.69	0.64	0.62	0.47	0.37	0.38
Fab. Metals	N/A	N/A	1.61	1.62	1.75	1.52	1.29	1.47
Machinery	N/A	N/A	1.41	1.44	1.46	1.17	1.05	1.2
Electronics	N/A	N/A	1.9	1.69	1.82	1.32	1.15	1.01
Transport. Eq.	N/A	N/A	2.13	1.98	2.06	1.77	1.39	1.61
Oth. Durables	N/A	N/A	2.45	2.43	2.56	2.15	1.79	1.99
Non-Durables	7.05	6.78	6.96	6.87	6.39	5.27	4.53	4.58
Food Proc.	N/A	N/A	1.51	1.56	1.55	1.48	1.45	1.55
Paper	N/A	N/A	0.65	0.64	0.6	0.48	0.41	0.42
Other Non-Dur.	N/A	N/A	4.8	4.67	4.23	3.31	2.67	2.61
Non-Mfg.	71.79	79.69	91.79	100.07	114.53	119.45	123.63	133.71
pct. chg. (annual)	4.1	2.65	3.05	1.9	3.06	0.82	0.72	1.77
Nat. Resources	1.08	0.97	0.76	0.64	0.6	0.63	0.72	0.66
Construction	4.45	4.79	5.27	5.28	6.79	7.33	6.52	7.61
Wholesale Trade	4.56	4.91	5.27	5.43	5.93	5.76	5.76	6.35
Retail Trade	10.24	11.73	13.18	13.9	15.28	15.28	15.4	15.59
Auto parts	N/A	N/A	1.49	1.63	1.85	1.92	1.95	1.91
Food & Bev.	N/A	N/A	2.78	2.88	2.99	2.82	2.94	2.78
Other Retail	N/A	N/A	8.91	9.39	10.44	10.54	10.51	10.89
TWU	3.61	3.73	4.22	4.51	5.01	4.92	4.95	5.76
Information	2.36	2.44	2.69	2.84	3.63	3.06	2.78	2.96
Printing	N/A	N/A	0.87	0.91	1.03	0.9	0.8	0.82
Internet, etc.	N/A	N/A	1.82	1.93	2.59	2.16	1.98	2.14
Financial Activities	5.02	5.81	6.61	6.83	7.69	8.15	8.24	8.57
Finance & Ins.	N/A	N/A	4.98	5.07	5.68	6.02	6.11	6.33
Real Estate	N/A	N/A	1.64	1.76	2.01	2.13	2.13	2.24
Pro. Business	N/A	N/A	10.85	12.85	16.67	16.94	17.73	21.96
Pro., Sci., Tech.	N/A	N/A	4.54	5.08	6.7	7.02	7.88	8.98
Mgmt. of Co.	N/A	N/A	1.67	1.69	1.8	1.76	1.8	1.72
Admin & Waste	N/A	N/A	4.64	6.08	8.17	8.16	8.05	11.26
Edu. & Health	7.07	8.66	10.98	13.29	15.11	17.37	19.9	21.61
Education	N/A	N/A	1.69	2.01	2.39	2.83	3.24	3.06
Health Care	N/A	N/A	9.3	11.28	12.72	14.54	16.66	18.55
Leisure & Hospitality	6.72	7.87	9.29	10.5	11.86	12.81	13.53	14.12
Arts & Entertain.	N/A	N/A	1.13	1.46	1.79	1.89	1.97	1.95
Accomm. & Food Ser.	N/A	N/A	8.15	9.04	10.07	10.92	11.56	12.17
Other Services	2.75	3.37	4.26	4.57	5.17	5.39	5.72	5.31
Govt., Civilian, total	16.38	16.53	18.41	19.43	20.79	21.81	22.38	23.21
Civilian Fed	3	3.01	3.2	2.95	2.87	2.73	2.79	2.71
State & Local	13.38	13.52	15.22	16.49	17.93	19.07	19.59	20.5

U.S. Employment

	2020	2025	2030	2035	2040	1990-05	2005-40
Employment, nonfarm	153.33	159.9	166.49	173.54	180.58	1.3%	0.9%
pct. chg. (annual)	0.92	0.84	0.81	0.83	0.8		
Private Employment	129.36	135.4	141.28	147.88	154.40	1.4%	0.9%
pct. chg. (annual)	0.97	0.92	0.85	0.92	0.87		
Manufacturing	12.63	12	11.52	11.14	10.97	-1.4%	-0.7%
pct. chg. (annual)	-0.24	-1.01	-0.81	-0.67	-0.30		
Durable Goods	8.04	7.57	7.28	7.1	7.13	-1.2%	-0.6%
Lumber	0.53	0.49	0.46	0.47	0.49	0.2%	-0.4%
Primary Metals	0.37	0.37	0.33	0.29	0.24	-2.5%	-1.9%
Fab. Metals	1.5	1.45	1.39	1.3	1.22	-0.4%	-0.6%
Machinery	1.18	1.11	1.05	1	0.97	-1.2%	-0.5%
Electronics	0.94	0.9	0.94	1.01	1.11	-2.4%	-0.5%
Transport. Eq.	1.47	1.24	1.11	1.1	1.24	-1.2%	-1.0%
Oth. Durables	2.05	2.01	1.99	1.92	1.87	-0.9%	-0.4%
Non-Durables	4.59	4.43	4.25	4.04	3.83	-1.8%	-0.9%
Food Proc.	1.62	1.62	1.62	1.61	1.58	-0.1%	0.2%
Paper	0.43	0.42	0.4	0.38	0.35	-2.0%	-0.9%
Other Non-Dur.	2.55	2.39	2.22	2.05	1.90	-2.4%	-1.6%
Non-Mfg.	140.71	147.9	154.95	162.39	169.75	1.8%	1.0%
pct. chg. (annual)	1.1	1.12	1.01	1.05	0.89	-8.4%	0.2%
Nat. Resources	0.56	0.55	0.53	0.53	0.51	-1.2%	-0.6%
Construction	8.11	8.74	9.57	10.47	11.20	2.2%	1.2%
Wholesale Trade	6.98	7.66	7.87	7.69	7.29	0.6%	0.7%
Retail Trade	15.38	15.38	15.32	15.44	15.36	1.0%	0.0%
Auto parts	1.81	1.79	1.78	1.8	1.82	1.7%	-0.2%
Food & Bev.	2.61	2.6	2.55	2.52	2.44	0.1%	-0.4%
Other Retail	10.96	11	10.99	11.12	11.10	1.1%	0.1%
TWU	6.38	6.88	7.19	7.23	7.05	1.0%	1.0%
Information	3.15	3.44	3.8	4.32	4.87	0.9%	1.3%
Printing	0.84	0.86	0.89	0.95	1.02	0.2%	0.4%
Internet, etc.	2.32	2.58	2.91	3.37	3.85	1.1%	1.7%
Financial Activities	8.42	8.44	8.44	8.61	8.66	1.4%	0.2%
Finance & Ins.	6.22	6.21	6.22	6.39	6.49	1.3%	0.2%
Real Estate	2.2	2.23	2.22	2.22	2.17	1.8%	0.1%
Pro. Business	25.16	28.42	32.3	36.37	41.89	3.0%	2.6%
Pro., Sci., Tech.	10.2	12.29	14.79	17.96	21.92	2.9%	3.3%
Mgmt. of Co.	1.6	1.53	1.45	1.39	1.31	0.4%	-0.8%
Admin & Waste	13.36	14.6	16.06	17.02	18.70	3.8%	2.4%
Edu. & Health	22.87	23.64	24.09	24.81	25.04	3.1%	1.1%
Education	3.01	3.05	3.06	3.09	3.04	3.5%	0.2%
Health Care	19.86	20.6	21.03	21.73	22.01	3.0%	1.2%
Leisure & Hospitality	14.39	14.73	14.95	15.33	15.55	2.2%	0.6%
Arts & Entertain.	2.09	2.29	2.42	2.54	2.59	3.5%	0.9%
Accomm. & Food Ser.	12.3	12.44	12.53	12.79	12.96	2.0%	0.5%
Other Services	5.34	5.52	5.69	5.93	6.13	1.6%	0.4%
Govt., Civilian, total	23.97	24.5	25.2	25.66	26.20	1.1%	0.5%
Civilian Fed	2.78	2.71	2.78	2.71	2.71	-1.1%	0.0%
State & Local	21.19	21.79	22.43	22.95	23.49	1.5%	0.6%

U.S. National Income

	1975	1980	1985	1990	1995	2000	2005	2010	2015
(Nominal billions of dollars unless othewise noted)									
Total Personal Income	1,335.1	2,307.9	3,526.7	4,878.6	6,152.3	8,429.7	10,269.8	12,709.5	16,608.9
pct. chg. (annual)	9.70	11.60	8.90	6.70	4.70	6.50	4.00	4.40	5.50
Inflation-adjusted	3,712.4	4,430.8	5,268.5	6,060.5	6,718.0	8,429.3	9,203.1	10,262.5	12,078.6
pct. chg. (annual)	3.20	3.60	3.50	2.80	2.10	4.60	1.80	2.20	3.30
Wage & Salary Disbursements	814.8	1,377.7	1,995.7	2,754.0	3,419.3	4,829.2	5,671.7	6,829.7	8,677.8
Social Security Contributions	89.3	166.2	281.4	410.1	532.8	702.7	874.3	1,037.2	1,356.9
Transfer Payments to Persons	170.0	279.5	424.9	595.3	877.4	1,084.1	1,520.7	2,054.9	2,749.2
Other Labor Income	87.6	185.2	281.5	377.8	493.6	609.9	926.0	1,130.3	1,420.2
Proprietors, total	119.5	174.1	262.3	380.6	492.1	728.4	959.8	1,145.2	1,490.6
Farm	21.7	11.4	20.8	31.9	22.7	22.7	34.1	29.2	33.7
Businesses (nonfarm)	97.8	162.8	241.5	348.7	469.5	705.7	925.7	1,116.0	1,456.9
Dividends, Interest and Rent	188.1	373.5	702.1	982.1	1,147.1	1,547.8	1,661.7	2,100.6	3,000.7
(annualized percent change)									
Wage & Salary Disbursements	8.10	11.10	7.70	6.70	4.40	7.10	3.30	3.80	4.90
Social Security Contributions	14.00	13.20	11.10	7.80	5.40	5.70	4.50	3.50	5.50
Transfer Payments to Persons	17.90	10.50	8.70	7.00	8.10	4.30	7.00	6.20	6.00
Other Labor Income	15.90	16.20	8.70	6.10	5.50	4.30	8.70	4.10	4.70
Proprietors, total	8.80	7.80	8.50	7.70	5.30	8.20	5.70	3.60	5.40
Farm	11.30	-12.20	12.90	8.90	-6.60	0.00	8.50	-3.10	2.90
Businesses (nonfarm)	8.30	10.70	8.20	7.60	6.10	8.50	5.60	3.80	5.50
Dividends, Interest and Rent	10.20	14.70	13.50	6.90	3.20	6.20	1.40	4.80	7.40

U.S. National Income

	2020	2025	2030	2035	2040	1975-05	2005-40
(Nominal billions of dollars unl							
Total Personal Income	21,340.6	26,727.8	33,358.9	41,340.2	51,233.2	7.0%	4.7%
pct. chg. (annual)	5.10	4.60	4.50	4.40	4.40		
Inflation-adjusted	14,128.4	16,135.7	18,328.9	20,684.4	23,325.1	3.1%	2.7%
pct. chg. (annual)	3.20	2.70	2.60	2.40	2.40		
Wage & Salary Disbursements	10,812.3	13,200.8	16,073.5	19,490.4	23,701.8	6.7%	4.2%
Social Security Contributions	1,757.7	2,170.3	2,641.9	3,202.5	3,893.1	7.9%	4.4%
Transfer Payments to Persons	3,753.7	5,026.9	6,633.2	8,535.3	10,843.7	7.6%	5.8%
Other Labor Income	1,734.4	2,084.3	2,491.1	2,978.4	3,533.8	8.2%	3.9%
Proprietors, total	1,982.1	2,568.3	3,261.5	4,101.5	5,152.6	7.2%	4.9%
Farm	42.1	42.3	47.2	53.2	59.0	1.5%	1.6%
Businesses (nonfarm)	1,940.0	2,526.0	3,214.4	4,048.4	5,093.7	7.8%	5.0%
Dividends, Interest and Rent	4,005.9	5,025.8	6,342.0	7,999.6	10,168.5	7.5%	5.3%
(annualized percent change)							
Wage & Salary Disbursements	4.50	4.10	4.00	3.90	4.00		
Social Security Contributions	5.30	4.30	4.00	3.90	3.90		
Transfer Payments to Persons	6.40	6.00	5.70	5.20	5.00		
Other Labor Income	4.10	3.70	3.60	3.60	3.50		
Proprietors, total	5.90	5.30	4.90	4.70	4.70		
Farm	4.50	0.10	2.20	2.40	2.10		
Businesses (nonfarm)	5.90	5.40	4.90	4.70	4.70		
Dividends, Interest and Rent	5.90	4.60	4.80	4.80	4.90		

U.S. Manufacturing Productivity Measures

	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
U.S. Manufacturing Productivity Measures (Federal Reserve Board) (annualized percent change)													
Total Industrial Production	4.21	1.71	2.63	2.89	5.21	0.67	0.05	3.15	2.51	2.52	2.49	2.42	2.39
Manufacturing, total	4.55	2.22	3.06	3.46	6.00	0.97	-0.05	4.24	3.42	3.43	3.53	3.44	3.40
Nondurable Goods	3.32	1.82	2.74	1.76	1.33	0.49	-0.79	2.78	2.56	1.99	1.85	1.56	1.31
Food Processing	2.70	2.39	1.89	1.90	1.55	1.31	1.35	2.51	1.99	1.80	1.78	1.73	1.71
Paper	4.05	1.81	2.47	1.91	-0.32	-1.54	-2.01	2.79	1.85	1.30	0.99	0.93	0.96
Durable Goods	5.39	2.51	3.30	4.82	9.49	1.39	0.49	6.06	4.55	5.36	5.55	5.72	6.00
Wood Products	1.96	1.95	2.88	1.59	2.66	1.26	-7.17	4.89	0.38	0.04	-0.52	0.85	2.19
Primary Metals	0.54	-6.00	2.56	1.86	1.00	-0.63	-1.42	3.11	1.73	0.61	-0.27	-1.33	-1.79
Fabricated Metals	3.73	-0.22	0.85	3.33	3.19	-1.34	-0.93	3.01	1.60	1.35	1.19	0.99	0.85
Machinery	4.27	-2.64	2.29	3.35	2.86	-1.30	-2.54	5.18	2.06	1.95	2.23	2.47	2.37
Computer & Electronics	22.48	14.55	8.32	14.04	30.58	7.21	10.56	12.43	12.02	13.88	11.91	11.44	11.54
Transport Equipment	3.02	3.15	2.16	1.44	3.97	0.95	-2.40	5.47	1.76	2.54	4.02	5.69	6.69
U.S. Manufacturing Productivity Measures (Federal Reserve Board) (index 2002=100)													
Total Industrial Production	56.3	61.3	69.7	80.4	103.7	107.2	107.5	125.5	142	160.8	181.9	205	219.9
Manufacturing, total	50.5	56.3	65.5	77.6	103.9	109	108.8	133.8	158.3	187.4	222.9	264	291.6
Nondurable Goods	70	76.6	87.7	95.7	102.2	104.8	100.7	115.5	131	144.6	158.5	171.3	177.7
Food Processing	66.6	74.9	82.3	90.4	97.7	104.2	111.4	126.2	139.2	152.2	166.2	181.1	190.5
Paper	78.8	86.2	97.4	107	105.3	97.5	88.1	101.1	110.8	118.1	124.1	129.9	133.7
Durable Goods	39.7	44.9	52.8	66.9	105.2	112.7	115.5	155	193.6	251.3	329.2	434.8	518.9
Wood Products	66.2	72.9	84	91	103.7	110.4	76.1	96.6	98.5	98.7	96.2	100.3	104.5
Primary Metals	116.1	85.2	96.7	106	111.4	108	100.5	117.1	127.6	131.6	129.8	121.4	114.6
Fabricated Metals	77.8	77	80.3	94.6	110.7	103.5	98.7	114.5	124	132.6	140.7	147.8	151.3
Machinery	88.5	77.4	86.7	102.2	117.7	110.2	96.9	124.8	138.2	152.2	169.9	192	205.4
Computer & Electronics	4.7	9.3	13.8	26.7	101.3	143.5	237.1	425.9	751.2	1438.7	2525.2	4339.6	6022.7
Transport Equipment	58.8	68.7	76.5	82.1	99.7	104.6	92.6	120.9	131.9	149.5	182	240	293.8

Appendix 13: Capacity definitions

Introduction

The urban growth report (UGR) uses a complex accounting system to track the urban growth boundary's (UGB) capacity for growth. Capacity falls into several categories:

- Vacant land
- Developed land
- Partially vacant land
- Infill capacity
- Redevelopment capacity

These terms, as used in the UGR, have meanings that are somewhat different from their common usage. These differences in definitions can lead to misunderstandings. This glossary is intended to provide policy makers with a shared understanding of how these words are used in the context of the UGR and in growth management decisions.

When calculating the UGB's capacity, the UGR assumes that current zoning remains unchanged. No changes to zoning are assumed even though a number of cities will be updating their comprehensive plans to reflect changing local aspirations and to support vibrant communities.

Vacant land

The vacant land inventory consists of taxlots that have negligible or no improvement value or building(s). Aerial photos, building permit data, and tax assessor data are used to identify vacant land. The vacant land designation does not, however, necessarily indicate that the land is buildable (because of environmental constraints or lack of infrastructure) or that there is a market for its development. There is no minimum lot size for vacant lands. Examples of vacant lots are shown outlined in the photo below.

Developed taxlots

Many taxlots inside the UGB are already developed. Depending on their size, zoning, and the value of structures, they may or may not be available for additional development as partially vacant, infill, or redevelopment capacity (described below).

Partially vacant land

The undeveloped portion of a developed taxlot may be included in the vacant land inventory if it meets certain criteria:

- The entire taxlot is at least one acre
- Zoning would allow for the creation of a new lot
- There is at least ½ acre that is undeveloped

If the undeveloped portion of the taxlot is less than ½ acre, it would not be considered vacant, but the taxlot could be eligible for infill (defined below).

Infill development

Infill occurs when more units (residential or employment) are added to an already-developed taxlot that is smaller than one acre (the vacant portion of larger developed taxlots would be included in the partially vacant category). Infill can only occur if existing structures are built below maximum zoned density.

In the UGR, infill capacity is not calculated on a taxlot-by-taxlot basis since infill development depends on economic conditions and the decisions of individual land owners. Instead, the UGR accounts for infill as a part of the refill rate (defined below).

Infill occurs in many locations, including centers, corridors and neighborhoods. The 2040 Growth Concept's focus is on encouraging infill in centers and along corridors, not in existing neighborhoods.

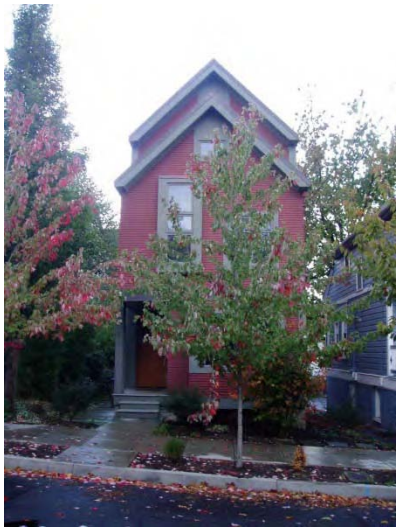
What it's not: In the context of the UGR, infill is not development on a vacant lot in an existing neighborhood. This would be categorized as development on vacant land.

An example of mixed-use infill

before

after (addition of units to existing development)

Examples of residential infill



Redevelopment

Redevelopment occurs when a structure is removed and a new structure (or structures) is built in its place. Redevelopment tends to occur when an existing building has a low value compared to the value of the land. Redevelopment can only occur to the degree that it is allowed by local zoning. The 2040 Growth Concept's focus is on encouraging redevelopment in centers and along corridors, not in existing neighborhoods.

What it's not: In the context of the UGR, the rehabilitation of a building is not considered redevelopment. While rehabilitation of buildings improves communities, it does not necessarily add capacity. Consequently, rehabilitation is not monitored for the UGR. If the rehabilitation of a building includes the addition of units, it would be considered infill.

An example of redevelopment

Before redevelopment

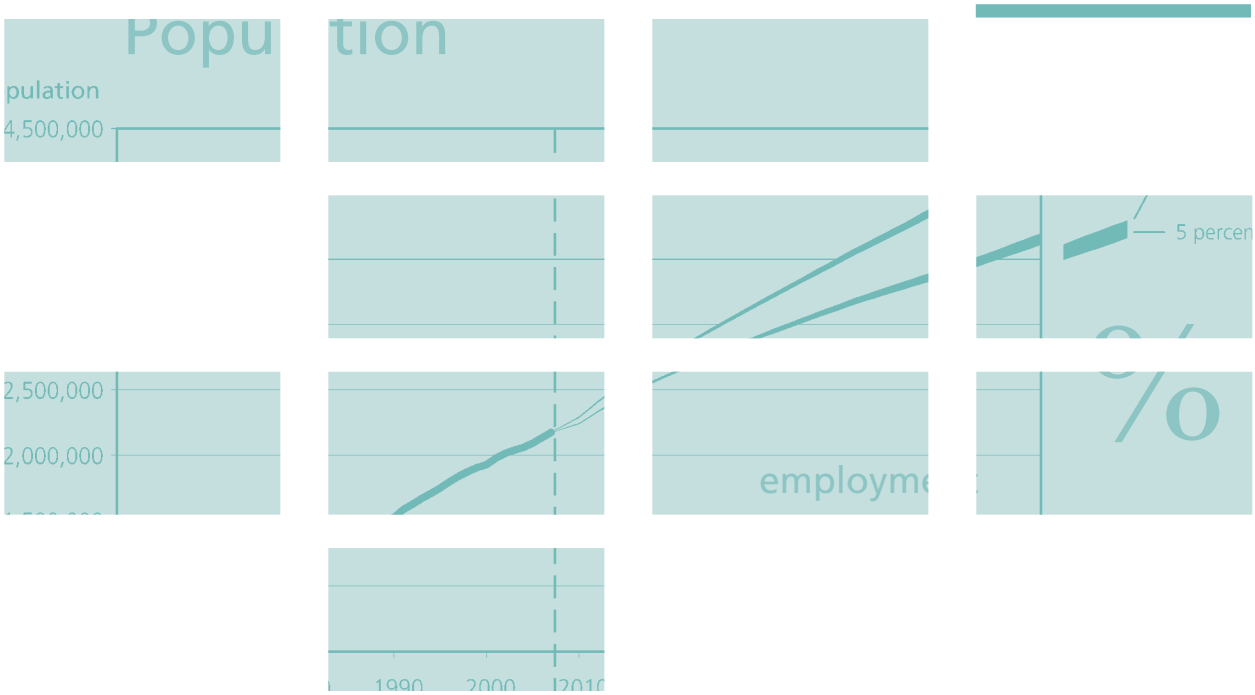
After redevelopment

Refill rate

The refill rate measures the share of new development (either residential or employment) that occurs through both infill and redevelopment (i.e. not on vacant land), net of any existing development. For example, if four new residences are built in a year and one of them occurs through infill or redevelopment (refill), the refill rate would be 25 percent.

Refill development tends to occur in areas with high market demand and during periods of economic growth. Refill capacity is not finite; it is continually renewed as buildings become obsolete and as land values increase. Potential refill is, however, limited by current zoning. In estimating future refill rates, the UGR does not assume any changes to current zoning.

The 2040 Growth Concept's focus is on encouraging refill in centers and along corridors, not in existing neighborhoods.



20 and 50 year

Regional population and employment range forecasts

September 2009

Metro | *People places. Open spaces.*

PURPOSE OF THE 2030 FORECASTS

Oregon land use laws require that Metro maintain a supply of buildable land inside the urban growth boundary to accommodate estimated housing needs for twenty years. Metro fulfills a similar role in determining whether or not there is adequate capacity for employment. This draft 2030 forecast is a necessary step towards Metro's compliance with these requirements and is the determination of how much growth is expected. A separate analysis of the region's capacity to accommodate growth is included in the urban growth report.

PURPOSE OF THE 2060 FORECASTS

The 2060 forecast is intended to inform the urban and rural reserves process. Metro and Clackamas, Multnomah and Washington counties are jointly leading this innovative regional effort to study and designate areas outside of the current urban growth boundary that are suitable for accommodating future population and job growth over the next 40 to 50 years (urban reserves) as well as areas that should be preserved for agriculture, forestry and natural resources (rural reserves).

A draft 2060 forecast was released by Metro in May 2008; the current forecast updates that release by starting with an updated 2030 forecast and responding to public comments and questions on the 2030 to 2060 component.

DISCLAIMER

These forecasts illustrate a range of possible population and employment outcomes and trends for the greater Portland metropolitan area over a 50-year period. These forecasts are intended to inform local and regional public policy discussions and do not represent any policy agenda or policy decision of the Metro Council.

EXECUTIVE SUMMARY

To inform the regional discussion of growth management choices and the possible implications of those choices, Metro has developed a range population and employment forecast. This forecast is derived from national economic and demographic information and is adjusted by Metro based on regional growth factors.

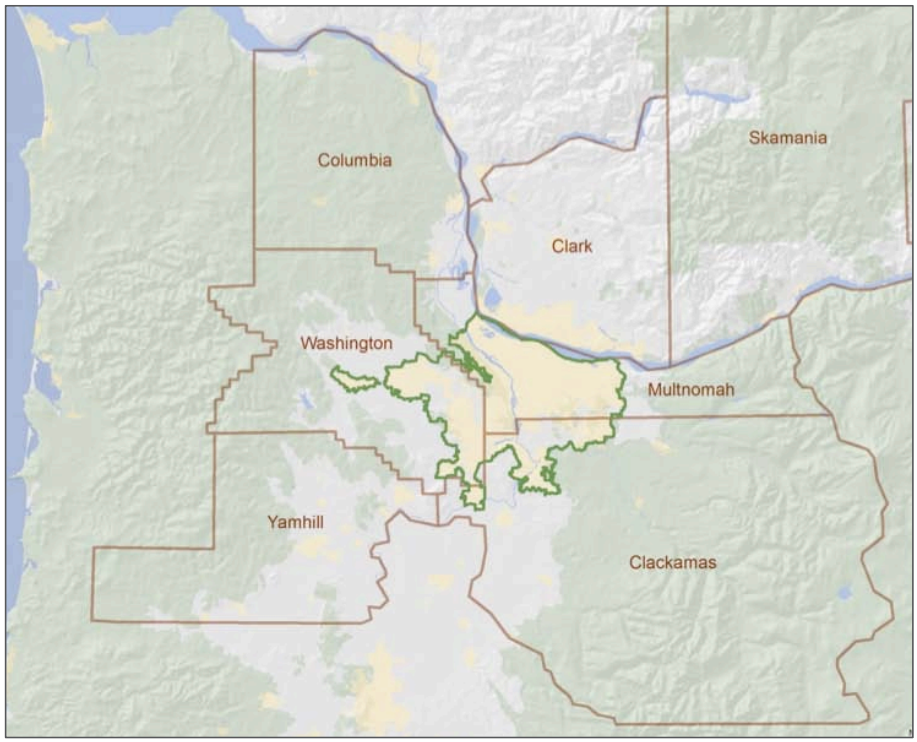
The forecasts cover the seven-county Portland-Beaverton-Vancouver Primary Metropolitan Statistical Area (PMSA), as defined by the U.S. Office of Management and Budget. It does not predict where within the statistical area future population and jobs may locate nor does it determine what portion may locate within the Metro urban growth boundary.

The region must make a number of choices about how it will accommodate forecast growth and what the possible implications of those choices may be.

Regional choices: Is the region willing and able to provide the necessary public facilities and services, governance and investments to accommodate population and employment growth and support the creation of sustainable, vibrant communities?

Local choices: How willing and able are the region's cities, counties and public service providers to make targeted investments and public improvements in their urban centers, transportation corridors and employment areas in order to support long-term population and employment growth?

Map 1: Portland-Beaverton-Vancouver OR-WA PMSA



Geographic extent of the regional forecast encompasses seven counties. The Metro urban growth boundary comprises a fraction of the land area of the region.

SUMMARY FORECAST RESULTS

Population and employment forecast ranges are provided for the years 2030 and 2060 for the entire seven-county Portland-Beaverton-Vancouver Primary Metropolitan Statistical Area, which consists of Clackamas, Columbia, Multnomah, Washington and Yamhill counties in Oregon as well as Clark and Skamania counties in Washington. Though this forecast does not predict where growth will occur within the seven-county statistical area, it is safe to say that not all of it will be within Metro's boundary.

The forecast indicates a 90 percent chance that the population of the seven-county statistical area in 2030 will be between 2.9 and 3.2 million people. For 2060, the forecast projects a 90 percent probability that the population of the same area will be between 3.6 and 4.4 million people. In 2000, the population was 1.9 million people.

On the employment side, the forecast indicates a 90 percent chance that there will be between 1.3 and 1.7 million jobs in the statistical area in 2030 and a 90 percent chance that there will be between 1.7 million and 2.4 million jobs in the same area in 2060. In 2000, there were approximately 973,000 jobs.

Where the region's population and employment numbers ultimately land will be affected by several factors. They include varying conditions in the local and global economies, changing population and workforce demographics, and policy decisions and investments made in local communities that may attract particular types of population and employment growth to certain areas of the region.

Next steps

Fall 2009: Metro has released a draft urban growth report with analyses of the region's capacity to accommodate the next twenty years of residential and employment growth within the existing urban growth boundary. The 2030 forecast informs these capacity analyses. The urban growth report discusses what share of the forecast growth may happen within the urban growth boundary.

December 2009: The Metro Council will, with Clackamas, Multnomah and Washington counties, adopt urban and rural reserves. Urban reserves will be informed by the 40-50 year population and employment range forecast.

The Metro Council will accept a 2030 population and employment range forecast and the final urban growth report, which describes any capacity gap to be addressed in 2010.

2010: Local and regional governments will continue to implement policies and investments to create and enhance great communities while accommodating anticipated growth. Metro Council will submit plans to accommodate at least 50 percent of any 20-year capacity need to the Oregon Land Conservation and Development Commission.

2011: If any additional 20-year capacity need remains, the Metro Council will consider urban growth boundary expansions into designated urban reserves.

ABOUT THE RANGE

Why use a range instead of a point forecast?

To plan for the future, it is important to have an idea what the future might look like. In making any prediction, it is necessary to acknowledge uncertainty. Predictions that declare absolute certainty can be regarded with skepticism.

Weather forecasting is an example. Which forecast is more trustworthy and provides more useful information for planning?

Five days from today, it will be sunny.
or…
Five days from today, there is a 65 percent chance of sunny weather.

If you rely on the first forecast, you may end up stuck in the rain without an umbrella. If you rely on the second forecast, you have the opportunity to consider whether or not it is worth taking an umbrella along.

Forecasting population and employment growth and subsequently making land use, transportation, and investment decisions is a similar exercise, though with higher stakes. The use of a range forecast allows for the consideration of a number of possible outcomes, rather than only planning for one future. Using a range forecast is more likely to result in growth management decisions that result in adaptable, resilient communities that are able to adjust course when conditions change. This ability to be adaptable is more critical than ever considering today's volatile fuel prices, an economic crisis of historic proportions, and the need to take significant and immediate actions to reduce greenhouse gas emissions.

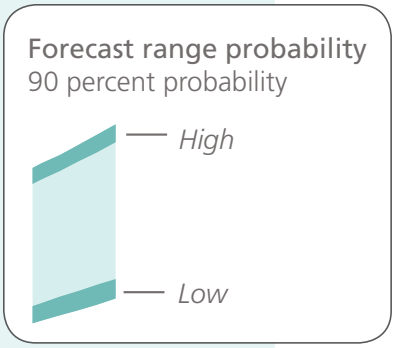
What does the range mean?

As with a weather forecast, this population and employment range forecast is expressed in terms of probability. The methodology for producing the range forecast is described in more detail later in this document.

Low end of range: There is a five percent chance that actual growth will be less than or equal to the low end of the range.

High end of range: There is a 95 percent chance that actual growth will be less than or equal to the high end of the range.

Stated differently, there is a 90 percent chance that growth will occur within the outer bounds of the forecast range.



What kinds of questions should we consider in light of the range forecast?

The range forecast prompts questions for policy makers to consider such as:

- What are the risks of planning for the high or low end of the forecast? Are there different risks associated with planning for land use, transportation investments or other infrastructure system investments?
- How might the success or failure of efforts to preserve the region's livability push population and employment growth higher or lower within the forecast range?
- How might particularly effective or ineffective economic development strategies push population and employment growth higher or lower within the forecast range?
- The range forecast does not account for a number of unknowns such as the possibility of climate change refugees – people who may be displaced by climate change. Future climate conditions could result in additional people entering or leaving the region. How might this additional uncertainty influence how we make decisions?

What are some of the variables that affect the forecast?

Some of the basic variables that inform this forecast are birth, death and immigration rates and anticipated economic conditions. The regional economy is increasingly subject to global and national forces that are beyond the region's influence and are not easily quantifiable through standard economic tools. Economic globalization affects the flow of trade, foreign exchange rates, and the cost and availability of foreign and domestic skilled and unskilled labor. Population growth in the region continues to reflect the region's status as one of the nation's more desirable metropolitan areas; in the early part of this decade, our region's population continued to grow even as employment stagnated during the recession.

These are but a few examples of the many factors that will ultimately affect both population and employment trends in the region.

How has recent global economic turmoil influenced the forecast?

Our region is not immune to the recent recession and other economic distress. In the short term, it is expected that job growth will slow in our region. Employment sectors that tend to be most sensitive to downturns in business cycles include construction, manufacturing and professional business services. However, by the year 2020, growth is expected to have returned to the average long-term trend (compared to older forecasts).

Managing in the fog

A recent article in *The Economist* refers to forward-thinking companies like Lego that use range forecasts instead of point forecasts. The article states that scenario planning, which considers a range of possible outcomes, is all the more important during uncertain times since it allows for contingency planning and adaptability.

The Economist (February 26, 2009) Managing in the Fog. Accessed online on March 5, 2009 at http://www.economist.com/business/displaystory.cfm?story_id=13184837

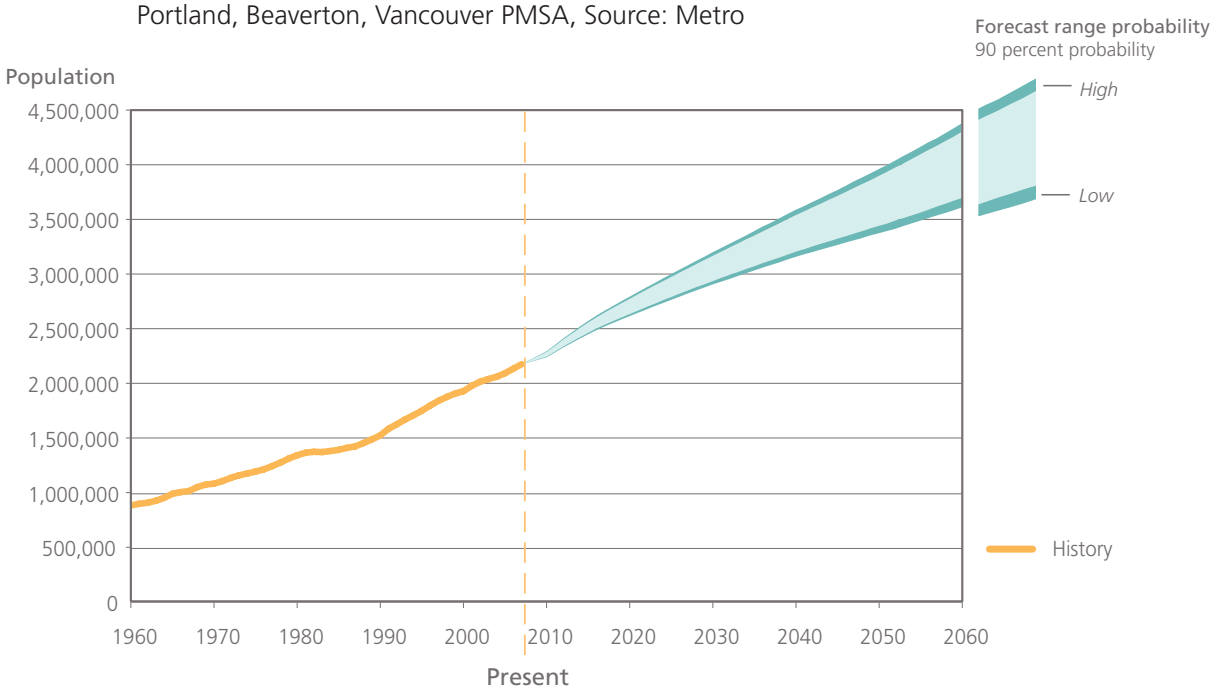
POPULATION RANGE FORECAST RESULTS

In the year 2000, the population of the seven-county statistical area was about 1.9 million people. This forecast estimates that, by the year 2030, the population could grow to a total of 2.9 to 3.2 million people. By the year 2060, the population could grow to a total of 3.6 to 4.4 million people.

Table 1: Population range forecast and annual percentage rate change from year 2000
Portland, Beaverton, Vancouver PMSA, Source: Metro

Year	Low end of range	High end of range
2000 *1,927,881 Actual*		
2030	2,903,300 1.37% APR	3,199,500 1.70% APR
2060	3,609,300 1.05% APR	4,376,100 1.38% APR

Figure 1: 2007 – 2060 Population forecast
Portland, Beaverton, Vancouver PMSA, Source: Metro



HOUSEHOLD RANGE FORECAST RESULTS

Using forecast household sizes, the population forecast is translated into a household range forecast.

In the year 2000, there were approximately 742,300 households in the seven-county statistical area. This forecast estimates that, by the year 2030, there could be between 1.2 to 1.3 million households. By the year 2060, there could be between 1.5 to 1.8 million households.

Table 2: Household forecast and annual percentage rate change from year 2000
Portland, Beaverton, Vancouver PMSA, Source: Metro

Year	Low end of range	High end of range
2000 *742,300 Actual*		
2030	1,181,300 1.56% APR	1,301,800 1.89% APR
2060	1,478,400 1.15% APR	1,792,500 1.48% APR

Figure 2: 2007 – 2060 Household forecast
Portland, Beaverton, Vancouver PMSA, Source: Metro

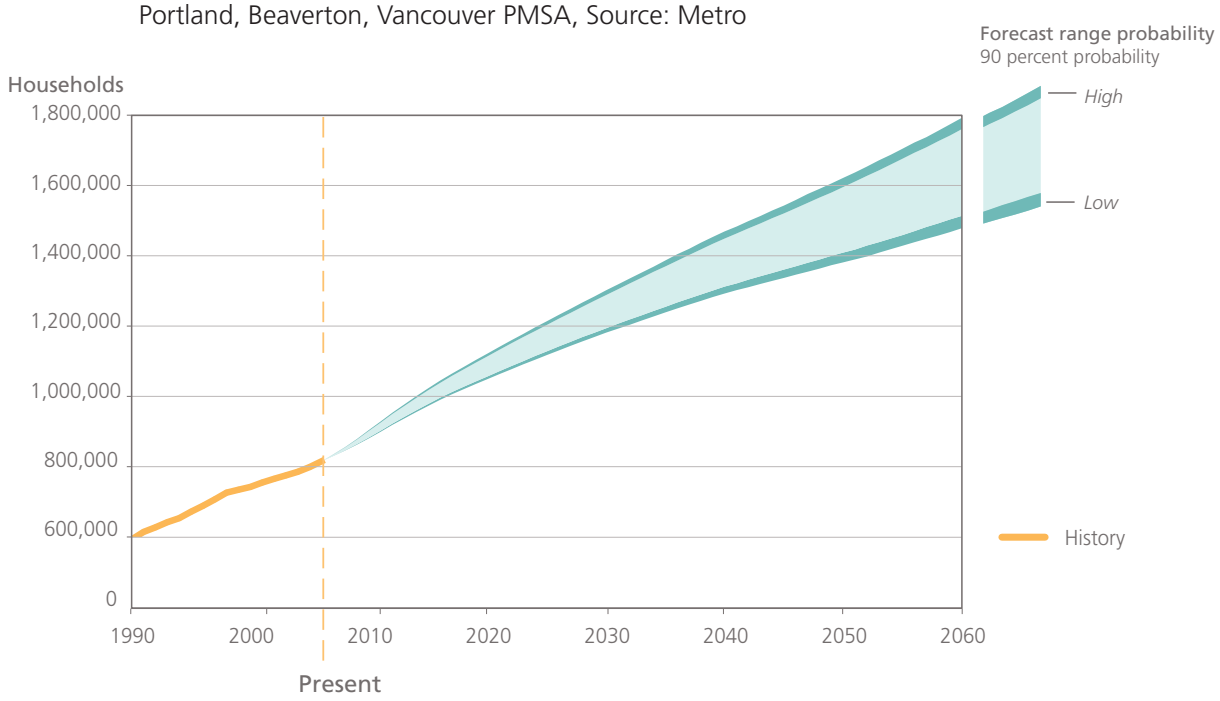
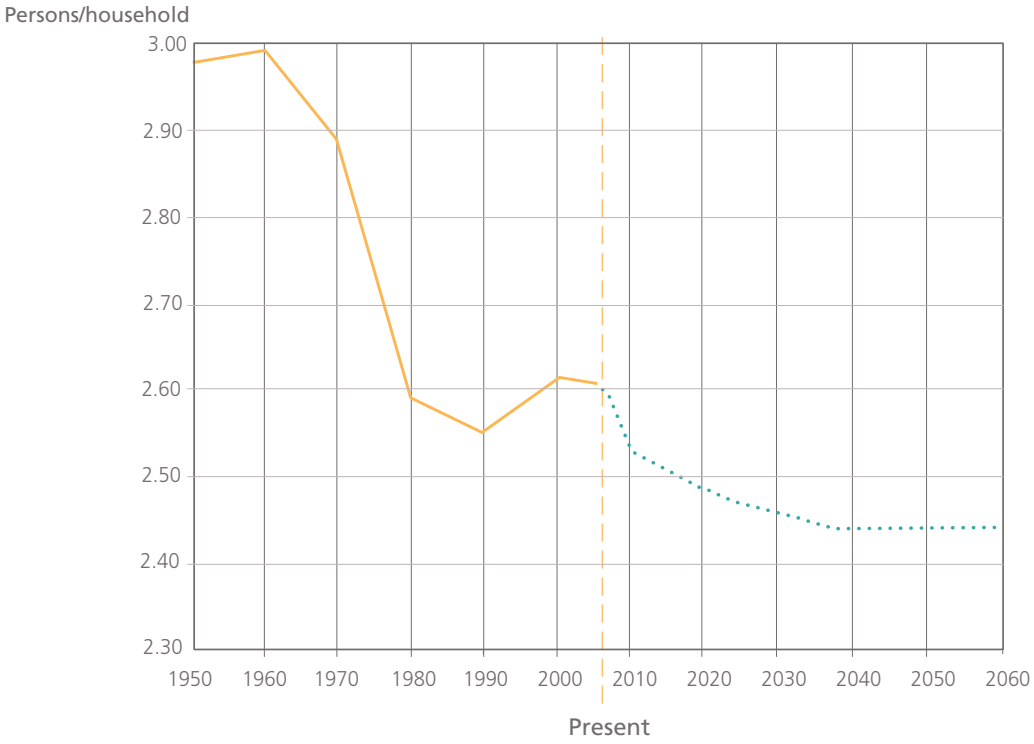


Figure 3: 2007 – 2060 Average household size forecast
Portland, Beaverton, Vancouver PMSA, Source: Metro



What are some expected demographic changes?

The region's population is forecast to be distributed fairly evenly among different age groups – a trend that is also predicted for the United States as a whole. This is a change from the past when there were progressively fewer people at more advanced ages. One implication of this anticipated change is that a greater percentage of households will be older and without children, resulting in a lower average household size. More demographic detail is presented in the full forecast report.

EMPLOYMENT RANGE FORECAST

This forecast also predicts how many jobs will be in the seven-county statistical area in the future. As with the population and household forecasts, this forecast does not predict where these jobs will be within the seven-county statistical area. Not all forecast jobs will be within Metro's jurisdiction.

In the year 2000, the number of jobs in the seven-county statistical area was 973,230. This forecast estimates that, by the year 2030, jobs could grow to a total of 1.3 to 1.7 million. By the year 2060, jobs could grow to a total of 1.6 to 2.4 million.

Economic lows and highs are to be expected at times throughout the course of the analysis period; this forecast focuses on the cumulative, long-term trends.

Table 3: Employment range forecast and annual percentage rate change from year 2000
Portland, Beaverton, Vancouver PMSA, Source: Metro

Year		Low end of range	High end of range
2000	*973,230 Actual*		
2030		1,252,200 0.84% APR	1,695,300 1.87% APR
2060		1,648,400 0.88% APR	2,422,900 1.53% APR

Figure 4: 2007 – 2060 Employment forecast (nonfarm)
Portland, Beaverton, Vancouver PMSA, Source: Metro

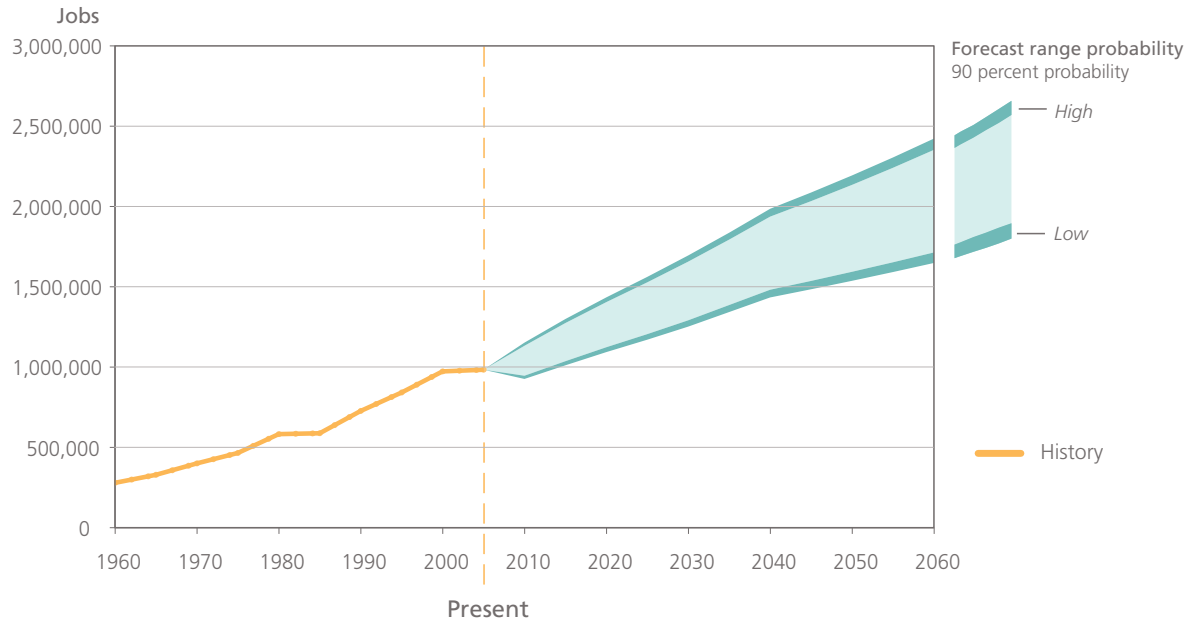
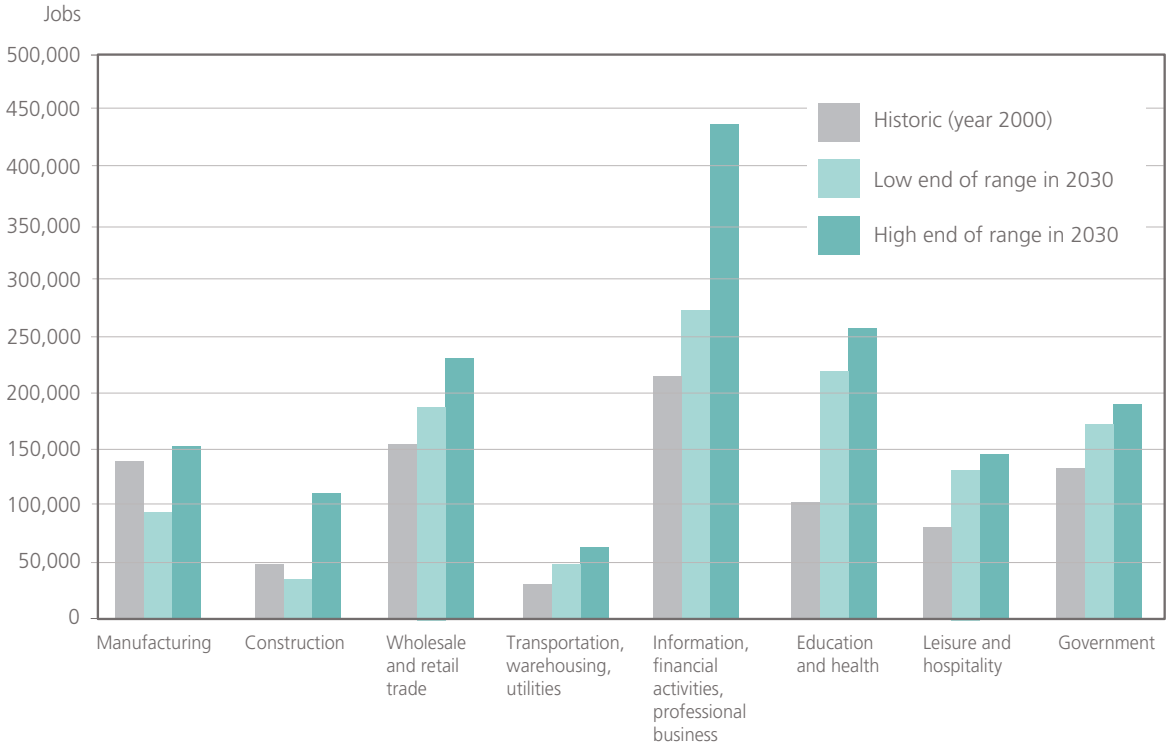


Figure 5: 2007– 2030 Employment forecast by sector
Portland, Beaverton, Vancouver PMSA, Source: Metro



How might the mix of employment in 2030 compare with 2000?

As in the past, the information, financial activities and professional business sectors are forecast to make up a substantial share of total future employment (about one-quarter of all jobs) in the seven-county statistical area.

Employment sectors that serve the resident population (e.g. the health and education and construction sectors) tend to show growth that is commensurate with overall population growth. From the years 2000 to 2030, employment in the education and health sectors is predicted to increase by 117 percent (low end of forecast range) to 154 percent (high end of forecast range).

The manufacturing sector is forecast to see relatively little growth as many of these jobs move overseas. It is likely that the manufacturing jobs that do remain will be those that require specialized training and command competitive wages.

ABOUT THE PROJECTIONS

How Metro produced the projections

Economic trend forecast: Metro first produces the "econometric trend" forecast through 2040 using its own state-of-the-art regional econometric model. This model has been thoroughly vetted by an independent panel of economic and demographic experts from across the U.S. It relies on national growth factors obtained from the economic forecasting firm Global Insight, Inc., as well as birth and death rates derived from the U.S. Census Bureau's most current "middle series" fertility and survival rates. Both the national economic data and national demographic forecast data are then regionalized based on regional growth factors; net migration into the region pegged to relative differences between regional and national economic growth factors; and actual birth and death rates derived from local vital statistics. Population and migration trends are directly linked to specific economic sectors modeled in the regional econometric model, so employment trends and population growth are dependent upon one another.

Range forecast: The economic trend forecast assumes certain trends for birth rates, death rates and migration rates. Yet there is a degree of uncertainty surrounding those trends. To account for that uncertainty, 10,000 scenarios (*Monte Carlo simulations*) were conducted to determine possible population and employment outcomes if these rates were to differ to a greater or lesser degree from the assumed trends. Using this method, the probability that actual population and employment growth in 2030 and 2060 will be less than or equal to a certain projected or forecast value was calculated. There is a 95 percent chance that actual growth will be less than or equal to the upper end of the range and a five percent chance that actual growth will be less than or equal to the bottom end of the range.

Extrapolating the forecast beyond the year 2040

Global Insight does not produce a U.S. macroeconomic outlook that extends more than 30 years into the future. Consequently, to complete the "econometric trend" forecast to the full 2060 horizon, the post-2040 population trend from the regional econometric forecast has simply been extrapolated forward to converge with the trend growth rate predicted for U.S. population.

The projected employment trend to 2040 is also derived from Metro's regional econometric model and driven by the Global Insight U.S. macroeconomic outlook. Post-2040 employment projections are extrapolated based on a stable employment-population ratio.

How do these projections compare with other projected growth rates?

To put Metro's forecast into context, Table 4 summarizes forecast annual percentage rates of population growth from several different sources for the entire United States, Oregon, and the Portland metro region. The annual percentage rates of growth are for the 2000 to 2030 time period. This table shows forecast growth rates increasing as the geography moves from nation to state to region. Of these three geographic scales, forecast growth rates for the entire United States are the lowest since the large geography includes a variety of urban and rural areas, many of which are forecast to grow slowly. Forecast growth rates for Oregon are higher than rates for the United States since the historic trend of coastal states growing faster than interior states is expected to continue. Finally, given that a substantial portion of the Portland metro region is urban, its forecast growth rates are even higher. Metro's regional forecasts (Table 4) are in keeping with regional forecasts conducted by the Oregon Office of Economic Analysis and Global Insight.

Table 4: Forecast comparisons

Population growth Annual percentage rate 2000 – 2030	**Geography of forecast**	**Forecast source**	
0.85%	United States	U.S. Census middle series (2004)	
0.95%	United States	Global Insight (4th quarter, 2008)	
1.14%	Oregon	Global Insight (2008)	
1.16%	Oregon	U.S. Census middle series (2005)	
1.18%	Oregon	OR Office of Economic Analysis (2004)	
1.28%	Portland metro region (3 counties)	OR Office of Economic Analysis (2004)	
1.40%	Portland metro region (7 counties)	Global Insight Regional Service (2008)	
1.37%	Portland metro region (7 counties)	Metro – low end of range (2009)	Current forecast
1.70%	Portland metro region (7 counties)	Metro – high end of range (2009)	

Source: US Census as compiled by Metro (for purposes of calculation consistency, the geographic extent of the PMSA used here is the same seven counties even though the PMSA's boundaries have changed over time)

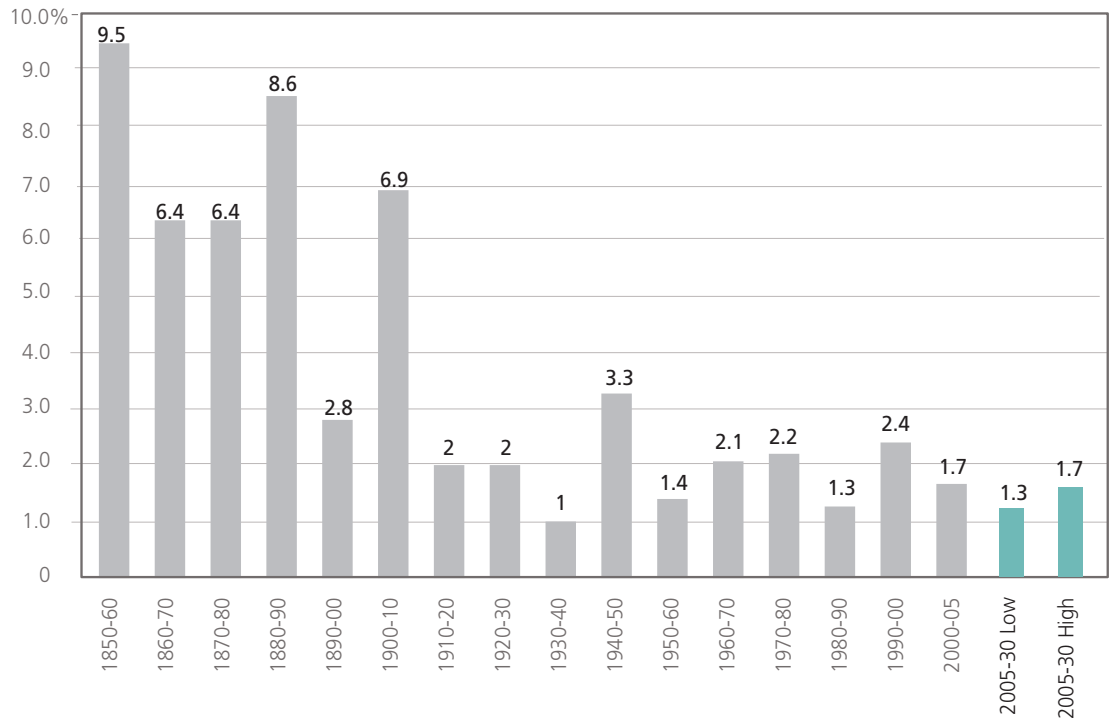
How do the projections compare to historical growth rates?

Figure 6 helps put the population range forecast in perspective with historical population trends. This forecast indicates slower population growth in the region for the next 50 years than has historically been experienced since the inception of the state.

Population trends have varied widely since 1850. At a glance, the historical data show two distinct periods of growth: first, a hyper-expansion phase that carried through the early pioneer days and ensuing decades through 1910, when the base population of the region was small, and second, a slower pace over the last century, reflecting the maturation of Portland as a metropolitan area.

Population growth in the region averaged 2.44 percent per year during the 20th century. At that rate, it took over 100 years before the region's population reached one million residents in 1966. More recently, the population doubled to about two million people in only 36 years. This doubling of the population occurred at the relatively modest growth rate of 1.9 percent per year. The more recent lower growth rate can be explained both by declining birth rates and the mathematics of compounding growth on a large population base (in absolute terms, the population increase is substantial despite a lower growth rate). Likewise, when forecasting population growth, we start with a large population base and even modest growth rates amount to big increases in population numbers.

Figure 6: Historical and forecast population growth rates



For more information on the forecasts, contact Ken Ray, Metro senior public affairs coordinator, at 503-797-1508 or ken.ray@oregonmetro.gov.

Visit www.oregonmetro.gov/forecasts

Metro | *People places. Open spaces.*

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and good transportation choices for people and businesses in our region. Voters have asked Metro to help with the challenges that cross those lines and affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to protecting open space, caring for parks, planning for the best use of land, managing garbage disposal and increasing recycling. Metro oversees world-class facilities such as the Oregon Zoo, which contributes to conservation and education, and the Oregon Convention Center, which benefits the region's economy.

Metro representatives

Metro Council President – David Bragdon

Metro Councilors

Rod Park, District 1
Carlotta Collette, District 2
Carl Hosticka, District 3
Kathryn Harrington, District 4
Rex Burkholder, District 5
Robert Liberty, District 6

Auditor – Suzanne Flynn

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UGB Capacity Ordinance (adopt in 2010)

The Capacity Ordinance will adopt all the policies, strategies and actions the Metro Council chooses to ensure the region has room ("capacity") for the next 20 years' worth of growth. The Chief Operating Officer recommends the following overarching strategy: take advantage of existing capacity in the urban growth boundary (UGB) - not fully realized under today's policies - by integrating public and private investments, financial incentives, growth management tools and focusing them in Centers, Corridors and employment areas. The strategies, policies and actions that are part of this overarching strategy and will comprise the Capacity Ordinance are more fully described below.

Establishing the Baseline
The Chief Operating Officer proposes a Forecast of Population and Employment Growth expected over the next 20 years [attach?]. We can think of the forecast as the region's "demand" or "need" to the year 2030. The forecast is presented as a range to reflect the uncertainty involved in predicting the long-term future.

The Chief Operating Office also proposes an estimate of the capacity of the existing UGB to accommodate that growth, based upon existing policies (local zoning and current spending on public works, for example). This estimate in contained in the Urban Growth Report [attach?]. We can think of this estimate as the region's "supply" or "capacity" to accommodate the "demand" or "need" identified in the forecast.

These two documents establish the starting point, or "baseline", for this Recommendation. The Forecast and the Urban Growth Report present the region with a gap: our growth "demand" exceeds our capacity.

New Strategies

Strategy 1: Measure Performance of Investments and Tools and Use Lessons Learned from Performance

The Chief Operating Officer recommends that the Council:

- Make the Outcomes the ultimate goals of its growth management strategies (incorporate the Outcomes into the Regional Framework Plan)
- Adopt performance indicators that will tell the region how well the new strategies move us from the "baseline" toward the Outcomes (add the performance indicators to the Regional Framework Plan as an appendix)
- Set performance targets associated with each indicator to help define the Outcomes we want (add the performance indicators to the Regional Framework Plan as an appendix)
- Establish a system to check progress on a periodic basis, report progress to the region, and respond to the report by adjusting strategies and actions as necessary to achieve the Outcomes
- Adopt policies to commit Metro to this program of performance measurement (incorporate policies into the Regional Framework Plan) [attach?].

Strategy 2: Invest in Our Centers, Corridors and Employment Areas

The Chief Operating Officer recommends that the Council:

- Adopt an Investment Strategy that:
  Focuses on Centers, Corridors and Employment Areas
  Links regional plans and local aspirations and regional and local investments
  Uses urban renewal and other existing investment tools in more Centers, Corridors and Employment Areas
  Contains a new source of funding for public works and community assets throughout the region
  Contains a new source of funding for transportation improvements as match to attract federal dollars to the region

- Develop a mechanism to link regional investments with supportive and complementary investments and other actions by cities and counties to maximize the impact of the investments in Centers, Corridors and Employment Areas (include mechanism in Title 6 of the Urban Growth Management Functional Plan and adopt a map of Centers and Corridors)

Strategy 3: Use Tools to Direct Growth to Centers, Corridors and Employment Areas

The Chief Operating Officer recommends that the Council:

- Keep the urban growth boundary tight to support city and county aspirations for revitalization of their Centers and Corridors and to achieve regional objectives to protect farm and forest land
- Minimize expansion of the UGB and use any expansion to achieve the desired Outcomes
- Develop methods, such as land assembly and a "fast-track" UGB expansion process, to prepare the region to respond quickly to new employment opportunities (add to Urban Growth Management Functional Plan)
- Protect existing residential and employment capacity in city and county plans and simplify the methods for doing so (revise Titles 1 and 4 of the Urban Growth Management Functional Plan)
- Protect the region's most important industrial lands from conflicting uses and protect routes for movement of goods in and out of those lands (revise Title 4 of the Urban Growth Management Functional Plan and the associated map of employment lands)
- Encourage cities and counties to use financial incentives – such as the state's Vertical Housing Program, impact-based systems development charges and transit-oriented tax exemptions – for development in Centers and Corridors by linking regional investments with the use of such incentives and offering a program of technical assistance (revise Title 6 of the Urban Growth Management Functional Plan)
- Amend the 2040 Growth Concept Map to show new Centers that reflect city and county aspirations and regional strategies
- Use Metro's responsibility for city and service district boundary changes to link boundary changes to desired Outcomes, particularly to address governance issues (provision of services, for example) associated with urban development (revise Metro Code Chapter 3.09 on boundary changes).

Aspirations and investments

Section 3D

Investments the public makes – in roads and light rail, parks and schools, water and sewer pipes, and in setting aside areas for both industry and for natural spaces – create the foundation of our communities.

Cities, counties, school and water districts, regional, state and federal government bodies all make investments in these critical community assets. These public investments, in turn, spur private investment in real estate and development. Our region has a history of successfully collaborating to make investments in the "built environment" in order to create the type of vibrant, economically healthy communities we desire.

Our region's communities have significant aspirations for growth and improvement of existing commercial centers, downtowns and mainstreets which further the goals of the 2040 Growth Concept. However, the region faces a significant challenge to making the investments and enacting the policy changes required to achieve these aspirations. A gap of at least $10 billion exists between our current public revenue sources and the investments required to maintain and improve our roads, parks, schools, and other infrastructure.

The next stage of the region's work should lead to the adoption of an integrated regional investment strategy focusing on our downtowns, main streets and employment areas consistent with the 2040 Growth Concept. This strategy should be focused on improving and building upon our existing communities, capitalizing on the value and capacity of existing infrastructure, and making targeted investments linked to local investments and leveraging private investment.

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Aspirations and Investments: Executive Summary

INTRODUCTION

Investments the public makes – in roads and light rail, parks and schools, water and sewer pipes, and in setting aside areas for both industry and for natural spaces – create the foundation of our communities. Cities, counties, school and water districts, regional, state and federal government bodies all make investments in these critical community assets. These public investments, in turn, spur private investment in real estate and development. Our region has a history of successfully collaborating to make investments in the "built environment" in order to create the type of vibrant, economically healthy communities we desire.

However, in recent years, it has become increasingly clear that our regional vision for growth and development faces a significant threat: a serious shortage of funding for needed infrastructure. A lack of finance for roads, sewers, and water pipes has stalled development in new expansion areas, development of the region's designated centers and corridors has not occurred at the expected pace, and the list of deferred repairs continues to grow. Nonetheless, increasing numbers of people continue to settle in our region and forecasts predict strong continued growth in population and employment.

In October 2006, our region's leaders gathered to discuss the challenge of meeting existing community investment needs while planning investments for the future. They received a stern warning about the results of failing to invest in critical infrastructure – less than a year later, the collapse of the Interstate-35 bridge in Minneapolis brought into stark relief the increasingly fragile state of our nation's infrastructure and brought a high level of public attention to the issue.

SUMMARY OF THE CHALLENGES

What Investments Do We Need?

Elected leaders, local government staff, and private sector representatives have worked since then to document the nature and extent of our investment needs over the next 20 to 30 years. What we have found is that:

- Locally and regionally, we have great aspirations to improve and develop our existing communities – we desire vibrant mainstreets and commercial districts, the ability to walk or bike, take transit or drive to work and to play, as well as access to parks and natural areas to enjoy the outdoors.
- The foundations of our communities – from roads and water pipes, to parks and schools – require additional investment, both to maintain and repair existing systems and to accommodate future growth.

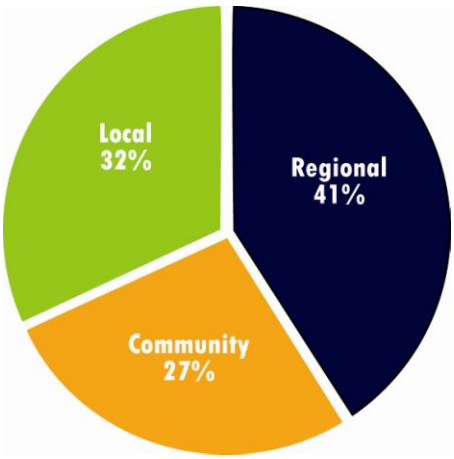
- Every community requires greater investment in infrastructure, but the needs vary widely throughout the region – redeveloping areas require investments in high capacity transit, school facilities, and upgrading antiquated roads and pipes; newer developments require upfront investments for sewer treatment facilities, road and sidewalk construction, and parks and schools.

The region has largely completed the work of identifying the types of investments we must make to maintain our community livability, the investments we aspire to make to enhance quality of life and create new jobs, and the investments we should make to accommodate future growth. The next stage of our work will be the development and implementation of a strategy to finance these investments.

The Infrastructure Advisory Committee's *Regional Infrastructure Analysis* (*Analysis*) found that vibrant communities are supported by a wide range of public investments, including:

- **Pipes, Pavement and Wires**: transportation, transit, sewer, water, stormwater and energy
- **Spaces and Structures**: urban parks and greenspaces, parking, schools, civic buildings and facilities (including police and fire stations, libraries, and plazas)

Levels of Public Investment Needs

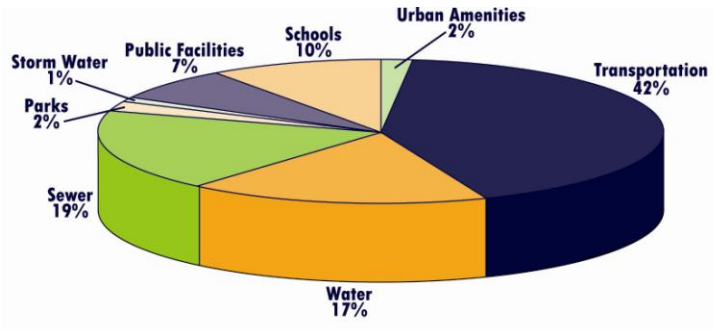


The *Analysis* also reported that the combined public costs of deferred maintenance and new infrastructure to accommodate growth are estimated at between $27 billion and $41 billion over the next 30 years. Only half of this cost estimate can be met with existing revenue sources, leaving a funding gap of between $10 and $20 billion. These costs include local infrastructure (streets, neighborhood parks, elementary schools, household water distribution), community infrastructure (minor arterial streets, parks and fields, high schools, civic buildings, sewer trunks and treatment facilities), and regional infrastructure (major arterial streets, highways and bridges, light rail transit, regional parks, cultural facilities, community colleges).

Funding needs differ greatly by type of infrastructure:

- **Transportation** represents the largest single expense, but also has the most numerous funding mechanisms.
- Rate-based **water and sewer** systems provide stable funding, but lack up-

Local Infrastructure Expenditures by Type



front capital to build and repair treatment and transmission facilities.

- **School** construction funding has been dependent on local property tax measures. Up to 150 new school facilities will be required by 2035.
- The region will need over 5,000 acres of new **urban parks** and over 8,000 acres of **natural areas**.
- Urban amenities such as **plazas** and **mainstreet improvements** and **development incentives** support redevelopment, but are hard to fund with existing finances.

Why The Funding Gap?

This gap between needed investments and existing public finance has grown because the traditional sources of funding for infrastructure and community investments are failing at the same time that costs are increasing:

- Existing funding mechanisms are insufficient:
    - Federal spending on infrastructure has been in decline for three decades.
    - State investments have also declined and most grant programs have evaporated.
    - Some traditional fees and taxes are now raising fewer dollars per person – for example, gas taxes raise less revenue as cars become more fuel efficient.
    - Local revenues, severely limited by property tax initiatives, have been largely directed to maintenance and operations of core programs.
    - System Development Charges (SDCs) are generally limited to local and community improvements, and are not available to fund most regional infrastructure.
- While traditional funding sources are in general decline, the cost of providing critical community investments has been increasing:
    - Construction and material costs – for example, for road repairs or steel and concrete for bridges and buildings – have increased much faster than inflation over the past decade.
    - The value of land has risen sharply, increasing the challenge of finding sites for parks, schools, or industrial sites as communities grow.

How We Grow

Both the *Analysis* and the *Infrastructure Case Studies* report document that more compact urban development supports more cost effective use of transportation, water/sewer, and other civic infrastructure. Infrastructure that incorporates pricing, incentives for conservation, and more efficient technologies can also reduce the need to expand road, water pipe, and other capacity, by reducing demand. However, our region will still face billions of dollars to repair and maintain our existing roads,

pipes, and buildings, and we will need to make improvements and add new pipes, parks, and plazas to maintain and build great communities.

Where we grow

The *Infrastructure Case Studies* tell us that serving development is generally less expensive where infrastructure is already in place, even if the existing infrastructure needs maintenance work or capacity upgrades. In comparing redevelopment and new urban development projects, the differences in cost per unit is highly dependent upon the individual circumstances. On the margin, redevelopment of underutilized lands and vacant lots, using the existing transit, road, sewer, water, and other infrastructure capacity provides the best return on public investment. However, public infrastructure is extremely expensive wherever development occurs, and successful develop is dependent upon significant private investments. Even in locations where existing infrastructure has adequate capacity and can be extended to serve redevelopments or newly developing properties, building and upgrading the roads, pipes, parks and schools is not cheap.

High Costs Wherever We Grow

The **North Bethany** area, 680 acres added to the UGB in 2002, is envisioned as a "community of distinction", with parks, open spaces, three new schools, and transportation connections to existing neighborhoods and employment areas. However, development has been stalled due to the lack of up-front funding for public infrastructure, estimated at more than $400 million. Many of these costs will be repaid by development impact fees, but not until development occurs.

The **Brewery Blocks**, a 4.6 acre redevelopment project in NW Portland, enjoyed plenty of transportation access, water and sewer capacity, but required a $40 million public investment for a parking structure to be viable. Being located in an urban renewal area made funding this project possible.

Aspirations

In order to understand how the region can work together to achieve the goals of the 2040 Growth concept, Metro collected and summarized cities' and counties' aspirations for how their communities will develop and function in the future. The *Investing and Great Places Matrix* presents the goals and priorities that each community has for the development of their downtowns, commercial districts, and main transportation corridors, as well as some of the barriers they face in achieving their aspirations.

What the *Matrix* tells us is:

- Our region's communities have significant aspirations for growth and improvement of existing commercial centers, downtowns and mainstreets which further the goals of the Region 2040 Growth Concept.

- There is significant capacity to accommodate new people and jobs within existing communities.

- Much of the planning work required for successful development is complete. Financial resources to make targeted investments remains the most significant obstacle cities and counties face.
- Many communities are working on increasing local finances to help achieve their aspirations, including using financial incentives and local urban renewal programs.
- Most community development aspirations are directly linked to regional investments and policies, in particular transportation-related investments such as high-capacity transit.

ACTION PLANS: Part I

Regional Investments: From Strategy to Action

For more than twenty years this region has made well-planned investments in transportation infrastructure that have led to increased travel choices, reduced pollution, and more efficient development patterns. The region has also been successful in establishing a parks and natural areas investment program, using regional bond measure funds to protect water quality, wildlife habitat, and publicly identified lands of special concern, which has become a model of local and regional collaboration. In addition to purchasing regional natural areas, this program provides a per-capita local share to invest in neighborhood parks, and competitive capital grants to restore nature in urban neighborhoods. Our track record of success in financing these regional infrastructure needs followed the development of regional strategy and concerted collaborative action by regional partners.

To place our past successes in context, however, since the early 1990s the region has only received about half of the state revenue that we assumed in our past transportation plans, and federal funding has actually diminished by nearly half over the past three decades. In developing the draft 2035 Regional Transportation Plan, the region's transportation leaders have put forward an ambitious transportation finance strategy to continue to pursue increased state and federal funding, while relying more on local sources of funding to meet the region's needs. In the realm of parks and natural areas, the places protected by voters have increased by thousands of acres, however, funding for long-term maintenance and increased public access has yet to be identified. At our current rate of investment, the region's trail system will take over 200 years to build.

The RTP financing strategy still depends upon concerted action by city, county, and regional governments to adopt envisioned revenue increases. Fully implementing the region's network of parks, trail and natural areas will require concerted action by local and regional partners to identify strategies to connect and fund the whole network. A new and evolving collaborative effort of business, non-profit and government entities is working together to implement this network, known as The Intertwine.

ACTION PLANS: Part II
Community Investments: From Aspirations to Strategy

Moving beyond roads, bridges, and transit to the lengthy list of the other investments required to create and support vibrant communities, the region has a well developed vision and significant aspirations, but lacks an integrated regional investment strategy to achieve those aspirations. The *Regional Infrastructure Analysis*, the *Case Studies*, and the *Investment Matrix* detail the numerous investment aspirations and challenges for upgraded water and sewer systems, new and improved parks, sidewalks and plazas, and for the public/private collaboration required to make residential, commercial and mixed-use development successful.

The next stage of the region's work should lead to the adoption of an integrated regional investment strategy focusing on our downtowns, main streets and employment areas consistent with the Region 2040 Growth Concept. To leverage limited resources, this strategy should focus on improving and building upon our existing communities, capitalizing on the value and capacity of existing infrastructure, and making targeted investments linked to local investments and leveraging private investment. Elements of the strategy should include:

1. **Maintain** the roads, sidewalks, water and sewer lines, parks, and other public assets we already have as our highest priority.
2. **Reuse and revitalize** dilapidated buildings, vacant and underused lots, and decaying infrastructure in already developed areas, accommodating growth efficiently and bringing increased activity to those areas.
3. **Get more from our regional investments by linking them to each other and to the aspirations and investments of local communities.**
4. **Leverage private investment** through strategic coordination of public investments with the private sector.
5. **Identify local and regional actions needed to pursue new sources of funding.**

An integrated regional investment strategy will become the basis for realizing our aspirations and enabling us to accommodate growth in our existing communities. This action plan should include two major elements:

- **<u>Transportation investment</u>: Implement the transportation investment strategy identified in the Regional Transportation Plan (RTP).**
  The RTP identifies existing revenues as well as aspirational revenue targets to fund a prioritized list of planned transportation projects. Local and regional follow-up actions are required to enact new revenue sources. The region's transportation leaders should create a "road map" identifying the local and regional action steps to generate the levels of revenue envisioned in the RTP.

- **<u>Other community investments</u>: Develop a regional action plan to make focused investments in the region's downtowns, main streets and employment areas.**
  In order to maintain our existing infrastructure and community assets, and to meet the region's collective aspirations for population and employment growth, regional leaders should develop a strategy for closing the finance gap between our aspirations for development and our current means. This strategy should:

  - Refine the investment needs identified in the "Regional Infrastructure Analysis" and "Investing in Great Places Matrix" to begin serving as a "project list" for targeting regional and local resources.

  - Identify and recommend local and regional revenue actions to increase the resources available to make the public investments required to implement Strategy 1.

Making the Greatest Place

Investing in Great Places matrix | September 15, 2009

Achieving local aspirations through strategic regional and local investments

Investing in Great Places matrix | August 2009

Achieving local aspirations through strategic regional and local investments to support them

Translating a vision into a reality is not a simple task. Often when people are asked to describe what they want their communities to be like in the future they use descriptions of how it should look and function. They describe the vibrant environment of people coming and going on the street, the inviting streetscapes of established neighborhoods and prosperous businesses that would anchor the community.

In 1995, with the support of the public and elected officials of the region, Metro adopted the 2040 Growth Concept as a vision to guide growth and development throughout the region over the coming decades. Since then, local governments have updated their zoning, targeted their investments and taken other steps to implement this vision. Though Metro works closely with cities and counties to track employment, zoning, household size and other data that indicate the potential for growth, it is a local government's investment in time, leadership and incentives that make a difference in how that community grows.

Through its comprehensive Making the Greatest Place effort, Metro has embarked on an integrated policy and investment program aimed at implementing the 2040 Growth Concept by focusing more growth and investment in the central city, town and regional centers, transportation corridors and employment areas while protecting valuable farm and forest land. This effort seeks to integrate long-term land use plans with public investments to achieve six outcomes that define a successful region:

1. People live and work in vibrant communities where they can choose to walk for pleasure and to meet their everyday needs.
2. Current and future residents benefit from the region's sustained economic competitiveness and prosperity.
3. People have safe and reliable transportation choices that enhance their quality of life.
4. The region is a leader in minimizing contributions to global warming.
5. Current and future generations enjoy clean air, clean water and healthy ecosystems.
6. The benefits and burdens of growth and change are distributed equitably.

Local aspirations and the Investment Matrix

In an effort to better understand how and where local communities intend to grow and how the region can support them, Metro recently asked officials from local cities and counties to summarize their aspirations for how their communities will develop and function over the next few decades. The aspirations reflect the communities' priorities for redevelopment, the values that guide their decisions and the challenges and barriers they anticipate to achieving these aspirations.

Achieving these aspirations require different types and amounts of investments by local governments, Metro and the private sector in order to achieve on-the-ground results. To better understand what is needed to fulfill these aspirations, Metro summarized the needs identified by local governments for 16 different types of investments in five community design types described in the 2040 Growth Concept: central city (Downtown Portland), corridors, employment areas (including industrial areas), town centers and regional centers in an Investment Matrix. This Investment Matrix, will inform local and regional policy and investment decisions and longer term efforts to refine tools that assist with the achievement of these aspirations.

The Investment Matrix allows the region to look at its proposed investments that leverage private development in centers, corridors, and employment areas. Having a clear picture of the connection between public investments and local development allows the region to make best use of limited dollars. These public funds can then be used to leverage necessary private investments that support the creation and enhancement of vibrant urban communities.

Information presented on the matrix reflects the stated aspirations of local cities and counties for where and how they desire to grow. In cases where a local government specified goals of certain numbers of new households or jobs desired, those numbers are indicated. In most cases, the local aspirations were described in more qualitative terms, often referring to the level of activity desired – active 18 hours per day, for example, or the look of a place, similar to Sellwood or Hillsdale. These references were included in the matrix when the information was available.

Local governments identified investments needed to achieve their aspirations.

The Investment Matrix highlights areas in the region that are the focus of future employment and residential development. The matrix includes four distinct sections: regional investments, local investments, shared responsibilities and private actions.

Each icon represents some form of investment.

Solid icons representing existing investments

Hollow icons represent investments that are proposed, committed or under consideration.

Half solid icons reflect that some investments have been completed and more are needed.

How the Investment Matrix informs policy decisions

The Urban Growth Boundary. By the end of 2009, the Metro Council is required by Oregon law to complete an analysis of the capacity of the existing urban growth boundary (UGB) to accommodate the population and employment growth projected over the next 20 years. If the analysis indicates that additional capacity is needed to accommodate projected growth, the Metro Council and local governments have until the end of 2010 to determine how best to add capacity to the boundary either through additional investments in centers , corridors and employment areas or by expanding the boundary.

Local and regional policy and investment commitments will largely determine the future capacity of the existing boundary. The Metro Council will be working with local governments throughout 2010 to achieve the most efficient use of existing resources to meet forecasted demands. The aspirations of local governments for centers, corridors and employment areas will affect regional policies and investment priorities.

If local and regional investments are insufficient to meet forecasted demand for new housing and employment capacity, then Metro Council will consider boundary expansion to meet additional demands.

Urban Reserves. By the end of 2009, the Metro Council and the boards of commissioners of Clackamas, Multnomah and Washington counties will reach agreements to designate areas outside the boundary as urban and rural reserves. Urban reserves will be areas that are suitable for accommodating urban development over the next 40 to 50 years. Rural reserves will include areas with high-value working farms and forests or important natural features that will be excluded from urban development. Land use actions to formally designate urban and rural reserves are scheduled to occur in 2010.

Per state law, urban reserves will be designated in a manner that supports development in existing centers, corridors and employment centers already inside the boundary. Urban reserves, once brought into the boundary, will need investments to support vibrant new centers, corridors and employment that sustain a diverse mix of housing and jobs while reducing global warming, protecting clean air and water and supporting healthy ecosystems. The Investment Matrix will inform the policy discussions around the designation of urban reserves in order to achieve these objectives.

The Regional Transportation Plan. As part of the solicitation for projects in the Regional Transportation Plan, Metro requested that local governments consider local aspirations for their community. The matrix reflects the transportation projects that local governments identified and illustrates their role in achieving the broader outcomes defined in the Regional Transportation Plan.

Investing in Great Places matrix | Definitions

Local aspiration profile

The Matrix includes only those areas that local governments identified as areas with aspirations in the profile

2040 Design: Existing design type defined in the 2040 Growth Concept (central city, corridor, employment area, regional center, town center).

Activity level goal: The level of activity identified by a local government in its local aspiration submission, using the activity spectrum included in Metro's State of the Centers Report. This level of activity indicates the hours of activity desired or the type of community that a local government seeks to emulate. The Matrix includes numerical targets if identified by the local aspiration.

Current development: This is defined in the State of the Centers Report using 2007 data from Environmental Systems Research Institute (ESRI) and InfoUSA.

Regional investment actions

Existing or proposed investments largely using regional funds

Bus Transit: Bus and frequent bus services.

High-capacity transit: Light rail, rapid bus service, streetcar or other high capacity service, or other related facilities including park and ride lots and transit centers.

Highways and arterials: New road capacity or new access points to existing roads, including interchange access and safety improvements. In freight areas, these investments also include multi-modal freight, rail and air.

Transportation system management and operations: Technological enhancements such as traffic signal optimization, access management, or other efforts that serve to increase the capacity of the existing transportation system. Also includes Transportation Management Associations, targeted marketing and other efforts that serve to reduce demand for trips made by single-occupant vehicles.

Transit-oriented Development: Investments by Metro in mixed-use development projects (commercial and residential) near light rail and frequent bus service.

Grants: Grant funds administered by Metro to encourage redevelopment of existing communities, including brownfield assessment grants, Nature in Neighborhood grants, planning grants funded through the regional Construction Excise Tax, and other regional grant programs.

Regional Greenspaces: Regional parks, natural areas and trails funded through regional bond measures or other regional funds.

Shared responsibilities

Those investments that require funding from local and regional sources and other partnerships

Enhanced pedestrian, bicycle and trail environment: Landscaping, median or curb extensions, sidewalks, bikeways, boulevard retrofits, trails.

Utilities and civic infrastructure: Includes sewer, water and stormwater pipes and facilities as well as civic infrastructure including schools, libraries and other public buildings.

Local actions

Existing or proposed actions largely requiring investments by local governments

Local streets and connectors: New street connections, new local road capacity, realignments of existing residential streets and arterials.

Supportive code: Mixed-use zoning or multi-family development zoning in centers, streamlined processes or other efficiencies in development permitting and inspections, bonuses or incentives that are included in code.

Parking strategies: Shared parking, changing minimum (or maximum) parking requirements for certain developments, providing structured or metered parking.

Financial incentives: Urban renewal, local improvement districts, business improvement districts, enterprise zones, main street programs, system development charge credits, variable system development charges, tax credits to support vertical housing development, other incentives financed by local general funds set in policy.

Direct project incentives: Land acquisition, joint development agreements, storefront improvement grants, marketing directed toward specific projects.

Local greenspaces: Local parks, trails and natural areas.

Private actions

Collaboration: Active partnerships between property owners and the public sector, establishment of public/private partnerships to engage development.

Source: 2007 Environmental Systems Research Institute and InfoUSA

Investing in Great Places matrix | Central City

Achieving local aspirations through strategic regional and local investments

Proposed | Existing | In progress

Local aspiration profile [1,2]	Regional investment actions							Shared responsibilities		Local actions						Private actions
Current: 17,800 DU (2005), 150,500 jobs (2005) **Goal:** 50,000 to 60,000 additional DU; 75,000 additional jobs	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
South Waterfront High density, mixed use, future OHSU campus expansion	●	●	●	●		●	●	●	●	◔	◔	◔	●	◔	●	●
University District PSU expansion; ECO District	●	●	●	●		●		◔	●	◔	◔	◔	◔	◔	●	◔
Goose Hollow Mixed-use community	●	●	●	●	●	●		●	●	●	◔	◔	◔	◔	●	●
River District Mixed-use community	●	●	●	●		●		◔	●	◔	◔	◔	◔	◔	◔	◔
Downtown Financial and regional retail center	●	●	●	●				◔	●	◔	◔	◔	◔	◔	◔	◔
Lower Albina Industrial district	●	●	●	●				◔	●	◔	◔	◔	●	◔	●	●
Lloyd District Mixed use with emphasis on regional attractions; eco district	●	●	●	●	●			◔	●	●	◔	◔	●	◔	●	◔
Central Eastside Industrial with incubator and emerging creative sector emphasis	●	●	●	●	●	●	●	◔	●	◔	◔	◔	◔	◔	●	◔

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Investing in Great Places matrix | Regional Centers

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Beaverton Downtown	**Current:** 1,170 DU / 7,420 EMP	●	●	●	●	●		●	●	●	●	Z	●	$	$		●
Washington Square Tigard	**Current:** 1,270 DU / 13,770 EMP **Goal:** 50 DU/acre 2.0 FAR or greater	●	●	●	●	$	●	●	●		●	Z	P	$	$		●
Washington Square Beaverton		●	●	●	●			●	●	●	●	Z				●	
Hillsboro Downtown 18 hour activity	**Current:** 3,600 DU / 12,850 EMP 3,000 DU / 3,000 EMP	●	●		●	$		●	●	●		Z	P	$	$		●
Clackamas Town Center	**Current:** 2,680 DU / 4,140 EMP	●	●	●	●	$	●	●	●	●	●	●	●	●	●	●	●
Oregon City Downtown	**Current:** 150 DU / 3,260 EMP	●	●	●	●			●	●	●	●	Z	P	$	●	●	●
Gresham Civic neighborhood,	**Current:** 440 DU / 1,070 EMP **Goal:** Total of 2,000 DU / 2,000 EMP	●	●			$	●		●	●	●	Z	P		●	●	
Gresham Downtown	**Current:** 440 DU / 1,070 EMP **Goal:** Total of 2,000 DU / 2,000 EMP	●	●			$			●	●	●	Z	P	$	$	●	●
Gateway (Portland)	**Current:** 3,500 DU / 7,190 EMP	●	●			$		●	●		●	Z	P	$	$	●	●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Investing in Great Places matrix | Town Centers

Achieving local aspirations through strategic regional and local investments

Proposed
Existing
In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Aloha	**Current:** 2,150 DU / 1,130 EMP	No information available															
Bethany	**Current:** 950 DU / 510 EMP	No information available															
Cedar Mill	**Current:**1,530 DU / 1,710 EMP	No information available															
Cornelius Aspiration to be a complete Town Center	**Current:** 3,240 DU / 2,270 jobs **Goal:** 2,800 DU and 7,100 jobs on an additional 640 acres by 2030	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●
Damascus	**Current:** 90 DU / 550 EMP	No information available															
Forest Grove	**Current:** 180 DU / 800 EMP **Goal:** Double residential density (20 DU / acre to 40 DU / acre)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Gladstone	**Current:** 270 DU / 310 EMP	No information available															
Happy Valley Existing Town Center 14 hour activity		●						●	●	●	●	●	●	●	●	●	●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Investing in Great Places matrix | Town Centers

Achieving local aspirations through strategic regional and local investments

Proposed | Existing | In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Hillsdale-Portland 18 hour activity	**Current:** 980 DU / 1,050 EMP	●				$			●	●		Z		$	$	●	●
Hollywood-Portland	**Current:** 800 DU / 4,200 EMP	◔	●			$			●	●		Z	P	$	$	●	●
King City	**Current:** 410 DU / 720 EMP	No information available															
Lake Grove	**Current:** 300 DU / 2,840 EMP	●	●	●	●				●	●	●	Z	P	$	$	●	●
Lake Oswego	**Current:** 1,500 DU / 2,830 EMP	◔	●	●	●			●	●	◔	●	◔	P	$	$	●	●
Lents-Portland	**Current:** 590 DU / 320 EMP	●							●		●	Z		$	$	●	●
Milwaukie	**Current:** 1,950 DU / 3,750 EMP	●	◔	●	●	$	●	◔	◔	●	●	Z	P	$		◔	●
Murray/ Scholls	**Current:** 1,980 DU / 10 EMP	●		●	●			◔		●	●	Z				●	

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Investing in Great Places matrix | Town Centers

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Orenco	**Current:** 1,590 DU / 790 EMP	No information available															
Pleasant Valley	**Current:** 20 DU / 10 EMP																
Raleigh Hills	**Current:** 870 DU / 1,600 EMP	No information available															
Rockwood	**Current:** 4,360 DU / 1,990 EMP **Goal:** 7,000 DU / 3,500 EMP total																
Sherwood	**Current:** 110 DU / 570 EMP																
St. Johns-Portland	**Current:** 290 DU / 1,009 EMP																
Sunset Transit Center	**Current:** 160 DU / 1,760 EMP																
Tanasbourne/ AmberGlen 18 hour activity	**Current:** 3,820 DU / 4,680 EMP **Goal:** Additional 6,800 DU / 6,580 jobs total																

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Investing in Great Places matrix | Town Centers

Achieving local aspirations through strategic regional and local investments

Proposed
Existing
In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions							Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Tigard Downtown	**Current:** 560 DU / 2,310 EMP **Goal:** 2,500 DU; 1.9 million sq. ft. employment/office/ commercial	●	●		●	●	●		●		●	Z	P	●	●	●	●
Troutdale 18 hour activity	**Current:** 970 DU **Goal:** Additional 530 DU	●		●			●	●			●	●	P	$			●
Tualatin 18 hour activity	**Current:** 2,390 residents / 3,860 jobs **Goal:** 2,500-3,400 residents / 6,700-8,400 jobs	●	●	●	●				●	●	●	Z	P	$		●	●
West Linn Bolton	**Current:** 1,820 EMP	●		●	●				●	●		Z					
West Linn Willamette		●							●	●	●	Z		$		●	●
West Portland HIllsdale typology	**Current:** 1,530 DU/1,670 EMP		●	●					●		●	Z					
Wilsonville	**Current:** 400 DU / 1,850 EMP	●	●	●	●		●	●	●	●	●	Z	●	$	$	●	●
Wood Village/ Fairview Fairview Village	**Current:** 760 DU / 960 EMP	●		●		$	●	●	●	●	●	Z		$		●	●
Wood Village/ Fairview Wood Village		●	●	●								Z	P	$			

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Beaverton Walker and 158th	**Goal:** Wish to explore options, current zoning: 750 DU / 3,080 EMP by 2020	●		●	●				●	●	●	Z				●	
Beaverton Beaverton Hillsdale Hwy	**Goal:** Wish to explore options, current zoning: 290 DU / 3,390 EMP by 2020	●			●		●		●	●	●	Z					
Fairview Sandy Blvd.	**Current:** 91 acres of vacant and redevelopable land	◢		●			●	●	●	●		Z				●	
Forest Grove Hwy 8, Commercial		●	●	●		$	●		●	●	◢	◢			$	$	
Milwaukie King Rd. to Harrison		●					●		●		●	Z					
Sherwood Pacific Highway							●	●							$	$	
Sherwood Sherwood Blvd							●	●							$	$	
Sherwood Oregon St.							●	●							$	$	

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed
Existing
In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Sunnyside Happy Valley		●		●		●	●				●	Z	P	●		●	●
Sunnyside Clackamas Co.		◔		◔				◔	◔	◔	◔	◔		◔	◔	◔	◔
Tigard Hwy 99	**Goal:** 40 - 50 DU / acre, 20 - 40 EMP / acre; 2.0 FAR	●	●	●	●	●	●	●	●	●	●	Z	P	●		●	●
Wood Village Sandy Blvd		●			●				●			Z	P	●		●	
Wood Village Halsey St		●			●				●			Z	P	●		●	
Gresham 162nd		●		●					●			◔					
Gresham 181st		●		●	●				●			◔					
Gresham Eastman/223rd		●		●					●			◔					

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Gresham 257th/Kane		●		●	●				●		●	◔					
Gresham Sandy		●		●								◔					
Gresham Halsey		●		●					●			◔					
Gresham Glisan		●		●					●			◔					
Gresham Stark		●		●					◔			◔					
Gresham Burnside		●		●					●			◔					
Gresham Division		●		●					●			◔					
Gresham Powell		●	●	●					●			◔					

1. *Current development source: 2007 Environmental Systems Research Institute and InfoUSA*

2. *Development goal source: Local aspirations submitted to Metro*

Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Portland Interstate Avenue	**Goal:** 3,250 DU / 1,220 jobs from 2005-2030		●			●			●	●	●	Z		●	●		
Portland 82nd Avenue			●		●	●			●	●		Z		●	●		●
Portland Sandy Boulevard		●	●						●			Z	P	●			●
Portland Martin Luther King Jr. Boulevard			●			●			●			Z	P	●	●		
Portland Cully Boulevard		●							●		●	Z		●	●	●	
Portland Barbur Boulevard		●	●		●	●			●	●	●	Z	P	●			●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions							Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Portland NE Killingsworth Street		●							●			Z	P	$	$		●
Portland Powell Boulevard		●	●						●			Z	P	$			
Portland 102 Ave.			●						●		●	Z		$	$	●	●
Portland Foster Road			●						●		●	Z		$			
Portland SE Belmont			●						●			Z		$	$		
Portland SE Hawthorne			●						●			Z	P	$	$		
Portland SE Division									●	●		Z		$	$		●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Investing in Great Places matrix | Corridors

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile (1,2)		Regional investment actions							Shared responsibilities		Local actions							Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Portland Kenton/Denver			●						●		●	Z		$			
Portland Milwaukie Avenue			●						●			Z		$			
Portland Tacoma Street									●			Z					
Portland 122nd Avenue			●						●		●	Z					●

1. *Current development source: 2007 Environmental Systems Research Institute and InfoUSA*

2. *Development goal source: Local aspirations submitted to Metro*

Investing in Great Places matrix | Employment

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Beaverton 217 East	**Goal:** Wish to explore options, current zoning: 3,7540 jobs projected by 2020	●		●	●				●	●	●	Z		$			
Beaverton 217 West	**Goal:** Wish to explore options, current zoning: 1,510 jobs projected by 2020	●		●					●	●	●	Z					
Beaverton Arctic and Western	**Goal:** Wish to explore options, current zoning: 270 jobs projected by 2020	●							●	●	●	Z					
Beaverton Millikan	**Goal:** Wish to explore options, current zoning: 1,410 jobs projected 2020		●						●	●	●	Z				●	
Beaverton Cornell Corridor	**Goal:** Wish to explore options, current zoning: 3,690 jobs projected by 2020	●							●	●	●	Z				●	
Beaverton Cornell Oaks	**Goal:** Wish to explore options, current zoning: 4,400 jobs projected by 2020	●							●	●	●	Z				●	
Forest Grove	**Goal:** Additional 6,000 jobs	●	●	●			●	●	◔	◔	●	◔	P	◔	$	●	●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

Investing in Great Places matrix | Employment

Achieving local aspirations through strategic regional and local investments

Local aspiration profile [1,2]		Regional investment actions						Shared responsibilities		Local actions						Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Gresham General																	
Gresham Springwater																	
Gresham Southshore																	
Happy Valley Rock Creek Employment Center																	
Hillsboro Evergreen Employment area	**Goal:** 20,000 jobs																
Lake Oswego Kruseway																	

1. *Current development source: 2007 Environmental Systems Research Institute and InfoUSA*

2. *Development goal source: Local aspirations submitted to Metro*

Investing in Great Places matrix | Employment

Achieving local aspirations through strategic regional and local investments

Proposed Existing In progress

Local aspiration profile [1,2]		Regional investment actions							Shared responsibilities		Local actions							Private actions
	Development Current/Goal	Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Collaboration
Milwaukie North Industrial Area		●	●	●		$		●				Z					
Milwaukie Johnson Creek Blvd.		●		●				●	●			Z					
Milwaukie International Way		●		●	⋮				●			Z					
Oregon City Beavercreek Rd	**Goal:** 3,600 jobs	◔		●				●	●		$	Z				●	●
Portland Columbia Corridor Swan Island NW Industrial	**Current:** 81,000 jobs **Goal:** 25,000 jobs	●	⋮		💵	●	●	🚰		$	Z		$	$	●	●	

1. *Current development source: 2007 Environmental Systems Research Institute and InfoUSA*

2. *Development goal source: Local aspirations submitted to Metro*

Investing in Great Places matrix | Employment

Achieving local aspirations through strategic regional and local investments

Proposed · Existing · In progress

Local aspiration profile [1,2]	Development Current/Goal	Regional investment actions: Bus	High capacity transit	Highways and arterials	Transportation system management and operations	Transit oriented development	Grants	Regional greenspaces	Shared responsibilities: Enhanced pedestrian, bike and trail environment	Utilities and civic infrastructure	Local actions: Local streets and connectors	Supportive code	Parking strategies	Financial incentives	Direct project incentives	Local greenspaces	Private actions: Collaboration
Sherwood Pacific Highway and Tualatin-Sherwood Rd		●		●				●	●		●	Z		$	$		
Tigard Employment lands 14 hour	**Goal:** 30-40 Employees/acre	●	●	●	●		●		●		●	Z		$			
Tigard Tigard Triangle	**Goal:** 30-40 DU / 2.0 FAR or greater	●	●	●	●		●		●			◢		$		●	●
Tualatin *areas outside of existing city* Southwest Concept Plan South Tualatin	**Goal:** 5,970-12,470 jobs	●		●			●		●	●	●	Z				●	●
Tualatin Existing Industrial/ Employment Lands	**Goal:** 7,710 jobs	●		●						●	●	Z					
Wilsonville Coffee Creek Industrial Area	**Goal:** 1,500 jobs	●	◢	◢	●		●	●	●	◢	◢	Z	P	◢		●	●
Columbia Cascade River District Troutdale Wood Village Gresham Fairview	**Goal:** 32,500 jobs	●		◢			●	●	◢	●	◢	Z		$		●	●

1. Current development source: 2007 Environmental Systems Research Institute and InfoUSA

2. Development goal source: Local aspirations submitted to Metro

METRO

REGIONAL INFRASTRUCTURE ANALYSIS

JULY 2008

COGAN OWENS COGAN

FCS GROUP
Solutions-Oriented Consulting

otak

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

As a number of recent incidents have graphically illustrated, the United States faces an infrastructure crisis of epic proportions. Congressman Earl Blumenauer has observed that the nation has no plan for building the roads, bridges, water and sewer lines, energy facilities, and other physical projects that support our communities.

"We're losing this battle," says Blumenauer. "We're investing less in infrastructure than in any time in our history."

The Portland region is not immune to this serious problem. Past plans that guided investments are outdated. The lack of adequate financing mechanisms has led to maintenance being postponed and neglected. Despite widespread recognition that sound infrastructure is critical to maintaining and enhancing regional economic growth, competitiveness, productivity and quality of life, current approaches to the planning, development and financing of critical community support systems are not working.

To make matters worse, approximately one million more people are expected to live in the seven-county Portland metropolitan area within thirty years. The estimated cost of building the public and private facilities needed to accommodate growth in jobs and housing in the three-county Portland region through 2035 is $27-41 billion. Traditional funding sources are expected to cover only about half that amount. Even if the region does not experience this projected growth, $10 billion is needed just to repair and rebuild our existing infrastructure.

Systems development charges, gas taxes and other revenue sources are not keeping pace with rising infrastructure costs, while voter-approved tax limitations and other ballot initiatives have crippled the ability of communities to fund these services. Rate-funded services tend to enjoy more stable and predictable funding, but can face significant difficulties in obtaining large amounts of up-front capital needed to make major improvements or expand capacity.

All of this leads to one unavoidable conclusion: we cannot continue to do things as we have in the past. New and creative solutions are essential.

Expenditures to improve public infrastructure are investments. As with other types of investments, the public should expect a return on its investments in public infrastructure.

That return can take many different forms, including quantitative measures such as higher tax revenues, improved housing or more jobs. Other "returns" could include more qualitative benefits, such as strong and livable communities. Although investing in infrastructure is expensive, the return on that investment directly improves the lives of the people who live and work here. Public investment is also necessary to make private investment possible and profitable, and private investment is what ultimately builds great communities.

In 1995, the Portland region adopted the 2040 Growth Concept, a long-range plan to guide future growth and development. This innovative blueprint for the future is based on a set of shared values that continue to resonate with residents of the region: thriving neighborhoods and communities, abundant economic opportunity, clean air and water, choices in housing and transportation, access to nature, and a sense of place that, taken together, are the reason people love to live here.

However, this vision will not become a reality unless we can provide the infrastructure to support it. Local and regional leaders have identified the lack of adequate infrastructure funding as a key barrier to successfully realizing the aspirations embodied in the 2040 Growth Concept.

To address this issue, Metro initiated a process to identify infrastructure needs, assess the funding gap, and explore financing and other policy options. The analysis focuses on eight infrastructure types needed to make and sustain great communities:

- Civic buildings, parking structures, public plazas
- Energy
- Schools
- Roads, transit, bike lanes and sidewalks (transportation)
- Stormwater
- Urban parks and open spaces
- Wastewater (sewers)
- Water

It is important that the region continue its legacy of coordination among local jurisdictions and the general public to identify and address the highest priorities for providing infrastructure to serve both existing and future residents. Political leadership and public engagement efforts will be needed to raise awareness of infrastructure needs and issues and garner support for agreed-upon solutions. Metro, along with its local government partners, plays a key role in leading this regional dialogue and building consensus.

Infrastructure planning, development and finance strategies are organized into the following four approaches:

Efficient Service Delivery

Fragmented delivery systems often result in reduced efficiencies. Better coordination among service providers can lead to cost

savings through sharing facilities and service delivery, adjusting service areas, merging service districts, and reallocating funding responsibilities for community and regional facilities. Improved maintenance of existing infrastructure systems ensures a maximum return on past investments. Potential strategies include:

- Shared public facilities
- Regional coordination and planning
- Systems maintenance

Demand Management

Reducing the demand for services can help prevent or delay the need for major capacity investments. Components of demand management include focusing growth to use existing capacity first, using pricing and other incentive-based strategies to reduce demand and shift it to off-peak times, and educating the public on conservation strategies. Potential strategies include:

- Compact development patterns
- Peak-use pricing
- Public education and resource conservation

Innovative Planning and Design

Emerging technologies provide opportunities to increase efficiencies and conserve resources over the long term. Investments in research and development of innovative approaches to infrastructure planning, design and construction can make infrastructure systems more sustainable and build community support. Preparing for the impacts of new technologies will result in long-term cost savings. Potential strategies include:

- Infrastructure recycling and reuse
- Sustainable infrastructure (e.g., natural systems, co-generation facilities)
- Emerging technologies (e.g., electric cars and water reuse systems)

New Funding

New funding sources are needed to enable the region to upgrade and replace deteriorating infrastructure systems and provide services to newly urbanizing areas. The region also needs to identify and remove barriers to public and private investments in infrastructure. Communities in the region can work together to secure funds at the local, community and regional levels and to leverage federal and state investments. A regional approach to financing basic infrastructure could help achieve the region's long-term vision. Potential strategies include:

- Pursuit of new state and regional revenue sources
- Public-private partnerships
- Strategic land acquisition

CONSIDERATIONS FOR MOVING FORWARD

Changing times require new approaches to infrastructure provision and finance. This analysis describes the region's infrastructure challenges and begins to quantify the problem and lay out some options to address the region's infrastructure needs. However, tough questions remain as the region moves forward:

- There will never be enough money for everything – how can we most efficiently guide public investment decisions to strategically target limited resources?
- Can managing demand reduce the need to expand the capacity of infrastructure?
- Are we providing infrastructure services at the most efficient level (geographical or jurisdictional), or are there opportunities to achieve economies of scale or efficiencies?
- How can we best address competing fiscal demands for new infrastructure, maintenance needs, and upgrades of existing facilities?
- Do service providers currently have the capacity to research and share information with counterparts nationally and globally to facilitate the adoption of innovations in service delivery?
- Will incorporating global climate change and sustainability into public messages help manage consumption?
- How can government deepen public understanding of the infrastructure challenges and increase public support for infrastructure finance?

RECOMMENDATIONS FOR ACTION

The time is right for decisive action by elected and appointed leaders across the region to address our infrastructure needs. Recommended actions:

- Coordinate regional partners to identify state legislative changes that would increase our capability to finance regional infrastructure needs.
- Convene regional partners to explore opportunities to implement solutions that increase efficiency and better manage demand.
- Increase public awareness of infrastructure needs and the importance of setting priorities with limited resources.
- Recognize return on investment when making public investment decisions in both urban and newly urbanizing areas.
- Encourage and facilitate implementation of new technologies that increase the efficiency and sustainability of infrastructure systems.

INTRODUCTION

The Portland region is facing a significant challenge to maintain, preserve and provide adequate infrastructure to meet the needs of current and future populations. Public investments made today will shape the region for years to come. The region is projected to grow more rapidly than expected since the region endorsed the 2040 Growth Concept in 1995. More people and the accompanying need for land, jobs and housing are best served when urban lands are used and redeveloped efficiently. Rising costs for building and maintaining public facilities in existing communities further highlight this need. Geographic areas recently added to the region's urban growth boundary are still largely undeveloped and may remain so for some time due to a lack of necessary infrastructure.

Local and regional leaders have identified the need for additional funding for infrastructure as a key to successful implementation of the 2040 Growth Concept vision and accommodating expected population growth. Metro's Making the Greatest Place Initiative is an effort to identify what the region has been doing well to achieve the 2040 vision, capitalize on successes and increase efforts where needed. Metro Council and other leaders throughout the region are seeking better information to aid them in important policy decisions. To that end, Metro initiated this process to identify infrastructure needs, assess the funding/financing gap, and explore financing and other policy options in partnership with leaders throughout the region. The analysis focuses on eight types of infrastructure that make and sustain great communities:

- Civic buildings, parking structures, public plazas
- Energy
- Schools
- Roads, transit, bike lanes and sidewalks (transportation)
- Stormwater
- Urban parks and open spaces
- Wastewater (sewer)
- Water

The study explores the following:

- What infrastructure is needed to serve existing residents and accommodate future growth? What issues need to be addressed?
- What will it cost to provide needed infrastructure? Where do we experience the greatest cost efficiencies?
- What infrastructure is planned? What is the funding/financing gap?

The vision of the 2040 Growth Concept is to establish complete communities that include:

- safe and stable neighborhoods for families
- compact development that uses both land and money more efficiently
- a healthy economy that generates jobs and business opportunities
- protection of farms, forests, rivers, streams and natural areas
- a balanced transportation system to move people and goods
- housing for people of all incomes in every community

- What are potential planning, development and financing policy options? How can we target infrastructure investments to get the greatest return?

NEEDS AND ISSUES

NATIONAL TRENDS

National population growth and increasing maintenance needs have resulted in a demand for additional infrastructure funds. The United States population is expected to grow 33 percent by 2035. Approximately 94 million more people will live here than in 2000. In addition to the need for new infrastructure to accommodate this growth, existing infrastructure systems are aging and overburdened and require substantial maintenance and upgrades. Moreover, current designs cannot support projected population and economic growth. Deteriorating infrastructure threatens the economy, environment and quality of life. The American Society of Civil Engineers (ASCE) rates the nation's water, sewer and transportation systems a grade of D-minus. More than 72,000 miles of municipal water and sewer pipelines are more than 80 years old.

According to the ASCE, an estimated $1.6 trillion is needed over the next five years to repair the existing infrastructure in the U.S. Any delayed investment increases this cost by 12-20 percent annually. It will cost $250 billion annually over the next 50 years to ensure "good" infrastructure. The United States currently spends 40 percent of that each year.

The federal share of infrastructure funding has been declining since 1975 and many funds once available through state governments for capital improvements no longer exist. Financial tools such as the federal highway trust fund are being depleted.

Global climate change, increasing energy and fuel prices, an aging population and an increasing disparity in income and wealth will have significant effects on regional development. Drought in southern states due to climate change could accelerate population growth in the Portland region. In addition, climate change may reduce the water available from glaciers, increase winter storm events and decrease summer flows. This means greater demands on existing sources and the possibility of water being treated as a commodity and traded from wet to dry areas. Another likely result of climate change is a national greenhouse gas cap-and-trade system.

The Report of the City of Portland Peak Oil Task Force states that the availability of oil may have peaked and prices will continue to rise with demand. According to some, the expected outcome of increasing fuel prices will be more dense development patterns, increased use of alternative forms of transportation, an emphasis on efficiency and a diminished role for the automobile-dependent land use pattern. As baby boomers age, housing demand for older

people will grow while lower and middle-class families may increase their preference for smaller, centrally located and easier to maintain units.

Another trend that may affect infrastructure is sustainable development. Portland and Oregon are considered national leaders in this field. Sustainability could serve as a framework for considering infrastructure investments and their impact on the region. Furthermore, increases in the prices of commodities, such as metals, heightens the need to promote the reuse and recycling of resources throughout the region.

Finally, there is an urgent need to ensure the provision of services and protection of critical physical infrastructure through emergency preparedness. Comprehensive emergency plans are needed to address infrastructure planning, engineering design, construction, and operation and maintenance activities for the purposes of homeland security and in response to natural disasters.

LOCAL TRENDS

People moving to the Portland region cite a strong and diverse economy, high quality of life, abundant public amenities and superior environmental quality as reasons for choosing the region. Metro forecasts show that within the next 30 years, one million more people will live in the seven-county Portland metropolitan area.[1] About 70 percent of that growth is expected in the tri-county Portland region (region).[2] A population increase of approximately 680,000 people by 2035 is expected, bringing about 590,000 new jobs and 310,000 new households.

Policies in the 2040 Growth Concept encourage the efficient use of land by directing growth inward rather than outside the urban growth boundary (UGB). Growth is encouraged in centers and corridors with increased emphasis on infill and redevelopment and higher density development in areas where it is appropriate. The 2040 Growth Concept is designed to help communities find more efficient and less expensive ways to deliver services.

However, as communities in the region strive to create vibrant places to live, work and play, they have experienced slower than expected growth in designated centers and corridors and little to no development in areas recently added to the urban growth boundary. Infrastructure costs have been cited as major obstacles in both cases. The region faces significant challenges regarding how it can effectively maintain, preserve and expand public infrastructure.

Although the function and livability of our communities depend on reliable public services, infrastructure systems are fraught with investment and maintenance shortfalls, uneven funding systems and multi-layered

[1] The seven-county Portland metropolitan area includes Clackamas, Columbia, Multnomah, Washington and Yamhill counties in Oregon, as well as Clark and Skamania counties in Washington.

[2] The Portland region includes the existing and potentially urbanizing portions of the metro region within Clackamas, Multnomah and Washington counties.

jurisdictional patterns. In addition to the need to address aging infrastructure conditions and upgrades needed to meet new environmental and emergency preparedness standards, the increasing population and employment base noted previously will put additional demands on roadway, transit, water, sewer, parks, schools and energy systems. This is accompanied by a common issue of concern for all service providers, how to raise and maintain sufficient funds.

Estimates of infrastructure capital costs needed to accommodate growth in the region over the next 30 years range from $27 to 41 billion. Traditional funding sources are expected to cover only about half that amount. State initiatives such as Measures 5 and 50 have limited local revenue streams. Infrastructure provided through user fees or rate-payment systems benefit from more stable funding, but struggle to secure funding for large capital improvements. Non-rate-based infrastructure types are subject to the inconsistencies of voter-approved bonds. Systems development charges have not kept pace with rising infrastructure costs.

During the course of this analysis, Metro collected data from infrastructure service providers throughout the region. Sixty-four service providers completed questionnaires regarding local infrastructure planning and funding efforts. In addition, more than 125 service providers attended two workshops to discuss infrastructure needs and opportunities. A summary of needs and issues identified through this outreach process follows.

Civic Buildings and Facilities

Capital funds for civic structures such as police and fire stations are often subject to voter approval and must compete with other interests for scarce resources. Urban amenities such as plazas, streetscapes and some civic buildings – critical components of downtown redevelopment efforts – are often supported through urban renewal programs and public/private development agreements. There are no dedicated funding sources for operations and maintenance. Libraries are relatively well-supported with local bond levies for capital costs, but they also often lack adequate operations and maintenance funds. Land supply and price also are issues when jurisdictions consider sites for civic facilities.

Energy

Electric and gas utilities have a legal obligation to provide their chartered services, with rates established and monitored by the state Public Utilities Commission. Based on current trends, the region requires the equivalent of two to three new 400 megawatt power plants to supply adequate power by 2035. Siting of energy infrastructure in communities is an ongoing challenge for utility companies. Energy conservation efforts reduce revenues while also reducing demand for electricity, helping to defer the need to build expensive new facilities.

Technological advances not yet known are likely to change the region's energy supply and infrastructure needs. Another challenge will be integration of district energy production and distribution systems into developing and redeveloped areas.

The most prominent challenge for energy providers is coordination with other service providers, transportation in particular. Better coordination in the planning and installation of infrastructure could result in cost savings for developers and rate payers. For instance, there are opportunities to place new energy and utility transmission systems within existing and planned transportation corridors. However, increasing demand for access to rights-of-way and denser development patterns make it difficult and more expensive to locate and relocate facilities. Local development code requirements often aggravate these problems.

Emerging energy sources also face difficulties in regards to location. Solar panels are often subject to development and design codes that restrict their application. There are a number of concerns about the siting of liquefied natural gas (LNG) transmission lines, including the potential for spills due to accidents or attacks and their effect on wildlife habitat and the environment.

Schools

While some areas of the region have underutilized school facilities, population growth will bring new school-aged residents to newly urbanizing areas, creating a geographical mismatch between existing school capacity and new school capacity needs. Future legislative mandates, such as full-day kindergarten, may require additional classrooms. As land values increase, siting schools near population centers becomes increasingly expensive. Better coordination with local jurisdictions and developers in regards to new development could provide cost efficiencies. School districts benefit when new neighborhoods are built around schools and when planning for roads considers school access and bus routes. Funding for capital improvements, dependent on local voter approval, is inconsistent across the region and often restricted, as some jurisdictions do not allow new revenues to pay for operations and maintenance. The recently-approved construction excise tax will provide a new funding source, but only for land acquisition and planning.

Transportation

Transportation costs represent the largest portion of unmet infrastructure needs. Current state and local transportation resources for operations, maintenance and expansion of the system are limited. Oregon ranks last compared with other western states in total auto taxes collected. The Oregon Department of Transportation (ODOT) , cities and counties devote nearly all existing state and federal gas tax revenues to operation and maintenance of the existing road system. Generally, about three quarters of local annual transportation

and public utility capital improvement budgets are spent on maintenance, preservation and operation of existing transportation infrastructure. The result is little available funding to address new capital facility needs. Local roads are funded through development fees, local improvement districts (LIDs) and other mechanisms, which leverage additional private and public investments.

Payroll taxes have provided the primary source of revenue for transit operations and for routine expenditures such as fleet upgrades, vehicle purchases and replacements. Unlike the gas tax, payroll tax revenues expand as the region's economy grows and wages rise, allowing revenues to better keep pace with inflation. However, under its present statutory limitation, the payroll tax may be insufficient to support the system expansions needed to serve a rapidly growing ridership. Another challenge for transit providers like TriMet is developing partnerships with local governments and developers to provide complementary access to transit, such as sidewalks and transit-oriented development. Currently, sidewalks connect to only 69 percent of the transit stops in the region.

There is no dedicated source of revenue for development of new regional transportation systems such as bridges and highways, which are essential for the efficient movement of freight and, therefore, the region's economy. Additionally, insufficient funds for operations is a continuing challenge for all. Fuel costs continue to increase and gas tax revenues are expected to decrease as automobiles become more fuel-efficient. The state gas tax has not increased since 1993 and gas tax revenues have lost significant purchasing power due to inflation and dramatic increases in material costs. It appears likely that electric vehicles will become more prominent in the next decade, requiring a new type of electrical energy charging station. Fuel cost increases already are stimulating transit ridership and could impact regional development patterns and the travel mode mix.

Stormwater/Wastewater

Stormwater and wastewater systems are aging throughout the region. Many are more than 100 years old. Increasing permitting requirements for treatment and discharge result in significant additional compliance costs. Sewer providers often can issue bonds secured by existing and future rate increases, providing stable revenue for incremental construction. However, communities face a significant challenge in securing up-front capital as major construction projects, such as new sewer plants or major trunk lines, cannot be added incrementally in a cost-effective manner. Collaboration and consolidation among providers may provide service and cost efficiencies, but are challenging to realize. Siting new sewer facilities is increasingly difficult in light of community compatibility issues and local, state and federal environmental regulations.

Although stormwater facilities are most effective at the local (watershed) level, solutions to these systems have little to no excess capacity. There are, however, site-specific opportunities for stormwater management solutions such as green streets and open space/stormwater management facilities. These providers share many of the same challenges to implementing capital improvements faced by sewer providers, especially securing reliable funding for long-term maintenance.

Urban parks and open spaces

The availability and cost of land represent the most significant challenges for ensuring adequate parks and open spaces for a growing population. As urban communities increase in density, this becomes both more necessary and more expensive. Given population projections, the region likely will need 5,000 acres of new urban park space and 8,000 acres of open space by 2035. While voters have been generous in approving funding for new acquisitions for parks and open space, funds for maintenance and operations are scarce.

Water

While our region appears to have an existing adequate source of water supply, projected population growth will increase demand. Source development and transmission of water to new users are challenges. Water conservation, reuse and non-potable use are becoming increasingly important to reduce demand and delay the need to upgrade systems. Securing up-front capital represents the largest hurdle to meeting new capacity demands.

Many water providers use intergovernmental agreements (IGAs) to provide service across jurisdictions, but coordination continues to be a challenge. Water providers will need to work with non-potable water supplier to effectively build and manage a viable system to reuse water when feasible.

SUMMARY OF LOCAL TRENDS

As evidenced by this summary of infrastructure needs and issues, the Portland region lacks a coordinated system for planning, construction and maintenance of the infrastructure required to create great communities. Some challenges, such as the lack of a stable funding source, are common among all service providers and require solutions at the regional level. Other challenges are unique to each provider and may be more appropriately addressed locally.

COSTS AND INVESTMENTS

COSTS

Given current levels of service delivery, the capital needed to accommodate population and job growth in the region through 2035 could run as high as $41 billion. Total costs include approximately $10 billion for repairs and reconstruction that would likely be needed even if the region did not experience its projected population growth.

Figure 1. Local Infrastructure Expenditures by Type

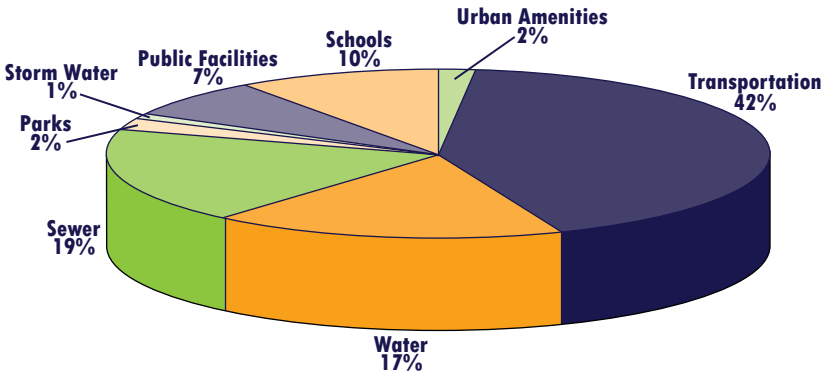


Figure 1 illustrates the allocation of local expenditures by infrastructure type in the Portland region. Transportation is by far the largest expenditure, accounting for 42 percent of local capital improvement plans. Sewer (19%) and water (17%) are the next highest cost items.

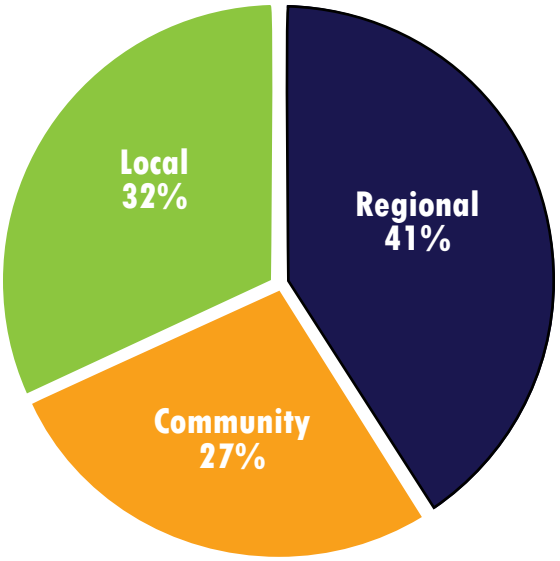
For the purposes of this cost analysis, infrastructure is separated into three levels of public investment: local, community and regional. The demand on local infrastructure is directly related to specific dwelling units. Though not necessarily on-site, community infrastructure may still be attributed to specific dwelling units. Regional infrastructure benefits the entire regional, though it is difficult to establish a nexus between the collective need for regional infrastructure and individual use. Table 1 provides examples of infrastructure at each level.

Regional infrastructure costs comprise 41 percent of total costs, followed by local infrastructure, 32 percent, and community infrastructure, 27 percent. Regional facilities are not usually funded by individual jurisdictions or developers.

Table 1. Levels of Infrastructure Investment

Local	Community	Regional
Local streets and sidewalks	Collectors and minor arterials	Major arterials and bridges; transit
Neighborhood parks	Community parks and fields; civic buildings (police, fire, libraries); parking garages	Regional parks, arts and cultural facilities
Household sewer and water collection and distribution pipes	Sewer trunk and treatment; water distribution, treatment and storage	Regional water and sewer facilities
Elementary and middle schools	High schools	Community colleges

According to an analysis of the 2035 Regional Transportation Plan (RTP) and local transportation system and public facility plans, the 2035 transportation system will cost approximately $23.7 billion, including approximately $4.7 billion for preservation/ reconstruction and $19 billion for capacity improvements. Of the $23.7 billion in transportation investment needed in the region, $14.2 billion will be needed for local/ community facilities and $9.5 billion for regional facilities.



COST INVESTMENTS

National research demonstrates that public infrastructure in urban settings and compact new development at the edge of existing systems is generally less expensive per unit than in areas with more land-extensive development patterns. Moreover, fragmented development patterns lead to loss of open space and agricultural lands, auto dependence, urban blight and disinvestment, and higher resource consumption.

Furthermore, compact regional development is shown to increase regional economic activity. A study by Joe Cortright, Vice President, Impresa Consulting, asserts that reduced transportation costs of $1.1 billion to $1.5 billion per year are tangible benefits of the Portland region's current transportation/land use system. The reduced transportation costs result in $800 million of additional economic activity in the region that would have benefited oil and auto companies outside the region.[3]

Case studies examining the cost of redevelopment in five existing urban centers and new development in twelve urbanizing areas in the Portland region found that while public infrastructure capital costs vary depending on specific location and access to existing infrastructure, they generally reflect this national pattern. Some urban case studies had lower costs than urbanizing case studies and vice versa. However, while local and community infrastructure costs per land area is generally higher in urban areas, the cost per job/dwelling unit is lower due to higher development densities. In fact, certain small scale infill development projects may have little or no infrastructure costs.

Urban and urbanizing areas usually have different public infrastructure requirements that vary by location, type, mix and scale of the development. Most urban developments occur where existing public facilities are already in place, but may require upgrading to accommodate increased demand. Projects often have no or little surplus vacant land to utilize for development phasing, and attempt

[3] Joe Cortright, Portland's Green Dividend. CEOs for Cities, 2007.

to optimize the available land with buildings, open space and parking. Parking usually is provided in above- or below-grade structures that are built early in the project and cannot be phased in over time. Many sites available for development in urban areas are "brownfields." While brownfield sites offer an excellent opportunity for redevelopment and cost savings due to their proximity to existing infrastructure, the potential cost of environmental remediation may make these sites impractical.

In contrast to urban area developments, urbanizing areas often require new public infrastructure or the expansion of existing systems. This often occurs on vacant or "greenfield" land with few constraints. Transportation infrastructure is the most critical investment needed to accommodate growth in these areas, comprising approximately fifty percent of the needed capital costs. Urban areas are generally more readily able to provide transportation, sewer and water services than newly urbanizing areas.

With respect to development density/design and resulting infrastructure demand, a key difference between the urban and urbanizing case studies is the timing of investment. Urban developments tend to require the majority of their infrastructure up-front (usually by year 15) while urbanizing developments can finance this in phases over many years. Therefore, while initial infrastructure costs tend to be the same or slightly higher in urban than in urbanizing areas, development in urban areas is often less expensive over time.

FUNDING AND FUNDING GAPS

To accommodate growth over the next 30 years, the Portland region will require infill utilities and upgrades to existing systems in urban areas and new systems to serve urbanizing areas. Demands are projected to be relatively consistent across the region, regardless of location. No one area within the region appears to be better prepared to accommodate future growth than another.

Traditional funding sources are expected to cover only about half the estimated $27 to 41 billion needed to accommodate growth by 2035. Compounding the decrease in federal funding for infrastructure are state initiatives which constrain the ability of local jurisdictions to raise revenue. Measures 5 and 50 place restrictions on property tax rates and increases in assessed property values. Thus, it is highly unlikely that local revenue can keep up with the cost of providing public services over the long term.

Some types of infrastructure, such as water, sewer, electricity and natural gas, are provided through rate-based funding systems. These tend to be stable and predictable because rates can be increased to cover additional costs. However, obtaining large amounts of up-front capital to make major improvements or expand capacity still are significant challenges.

Non-rate-based infrastructure, such as parks, school facilities, civic structures and transportation, generally do not have significant and stable sources for maintenance and operations and are subject to local budgetary constraints.

Parks and libraries tend to be fairly well supported with local bond levies for capital costs, but usually lack adequate operations and maintenance funding. Public investment in urban parking facilities and amenities such as landscaping, art and lighting are often funded through urban renewal programs or public-private development agreements. The current RTP identifies a $7 billion finance gap, which would be even higher if the full range of transportation costs to support great communities were identified.

Expanded or new local and community transportation facilities are often funded in part through system development charge (SDC) revenues, which leverage additional private and public investments. Metro's report, *Promoting Vibrant Communities with System Development Charges*, found that assessing differential SDCs in urban versus urbanizing areas can promote greater financial equity and the 2040 Growth Concept by reducing up-front costs of targeted developments. However, most local SDCs cover only 30-50 percent of the capital costs of local/community roadways or transit facilities. Moreover, they are subject to fluctuations based on the pace of new development, limited to certain types of infrastructure and can fund only capital improvements.

Among the other causes of funding gaps identified by service providers throughout the region are the following:

- Declining state and federal allocations.
- Lack of ongoing, reliable sources.
- Capital investment funds diverted to operating and/or maintenance.
- Funds diverted to unanticipated and/or emergency repairs.
- Rising construction costs.
- Small scale and fragmented development not allowing economies of scale.
- Low tax bases due to limited population size or low household incomes and/or voter reluctance to approve higher taxes.
- Funding adjustments that require political action.
- Lack of public support and/or political will.
- Competitive nature of funding sources based on geography.

PLANNING, DEVELOPMENT AND FINANCE

With a common understanding of the challenges facing the Portland region, the next step is to identify potential solutions to regional infrastructure needs and determine at what level of public investment each solution will be pursued. It is important that the region leverage its successful history of coordination among

local jurisdictions and the general public to effectively identify and address the highest priorities for providing infrastructure to serve both existing and future residents. Metro, along with other collaborative political bodies, plays a key role in leading a regional dialogue and building consensus. Leadership from elected officials and the private sector, as well as community engagement efforts will be needed to raise public awareness of infrastructure needs and issues and garner support for agreed-upon solutions.

Potential infrastructure planning, development and finance strategies are divided into the following four approaches:

Efficient Service Delivery – Explore ways to provide services more efficiently, decrease costs, conserve resources, and maximize current infrastructure investments.

Demand Management – Examining the need for infrastructure from conservation and land development perspectives can help prevent or delay the need for major capacity investments. Components of demand management include focusing growth to use existing capacity first; pricing usage to reduce and manage demand; educating the public on conservation strategies; and providing incentives to reduce demand.

Innovative Planning and Design – Research and implement innovative approaches to infrastructure planning and design to create vibrant communities. Plan for emerging technologies with potential to improve service delivery.

New Funding – Evaluate and pursue new local and regional funding sources to leverage state and federal investments. Identify and remove existing barriers to public and private investment.

The following pages outline strategies to address infrastructure needs and issues. A description of each strategy is accompanied by case studies for further clarification when applicable.

EFFICIENT SERVICE DELIVERY

Fragmented delivery systems often result in reduced efficiencies. For service providers, jurisdictional issues and daily operations can be barriers to working with adjacent service providers. Focused coordination among service providers can lead to shared facilities and service delivery, adjusting service areas, merging service districts, and allocating funding responsibilities for community and regional facilities.

Shared Public Facilities

Multiple goals can be met by coordinating public facility needs. Public facilities that serve more than one purpose make efficient use of public money. One way to accomplish this is to combine elements that serve two or more areas of public need. The groups served need not be mutually exclusive. Examples include combining a water reservoir with active park use and building library space inside a City Hall

building. Underutilized public space can be used for other activities. For example, utility corridors can be opened to public access for recreational use and public parking lots can be used for community gatherings and activities. Creating and developing public facilities that serve exclusive needs at opposite times of the year can be cost-effective. For example, a series of ball fields can double as a regional stormwater facility in the rainy season.

Case Studies

City of Sherwood Snyder Park

The City of Sherwood is in the process of constructing a new four million gallon covered reservoir in Snyder Park. To add to the amenities of this hill-top community park, the reservoir will be built partially underground, with two tennis courts constructed on top.

City of Sherwood Civic Building

The Sherwood Urban Renewal Plan Advisory Commission (SURPAC) recommended co-locating the new library inside the proposed City Hall building. In 2007, Sherwood opened the doors of the new 10,000 SF building to serve a growing population of approximately 16,000. The new facility was built with urban renewal dollars and general fund dollars (proceeds from sale of the Old Library and City Hall buildings). The City Hall includes a public plaza and a courtroom, which also function as a city council room and a community room.

Tualatin Hills Parks and Recreation District

Utilizing existing Bonneville Power Administration (BPA) right-of-way, the Tualatin Hills Parks and Recreation District operates several parks and trails throughout west Beaverton. Plans are underway to complete the 16-mile trail which runs underneath a BPA line from the Tualatin River north to Portland's Forest Park.

Sunnyside Village Green Park

A collaborative effort between North Clackamas Parks and Recreation and Clackamas County Water and Environment Services, this park is a multiuse facility integrating regional stormwater management with park facilities. The park includes a stormwater detention pond to reduce the rate of runoff in the basin and water quality treatment to stormwater flows. During summer months the dry depression zone serves as an open grass play area and amphitheater. During extreme storm events, water slowly fills the depression providing needed storage with overflows into a tributary to Sieben Creek.

City of Wilsonville

The City of Wilsonville is maximizing the use of open space within Villebois Village. Palermo Park is two acres of active park area including a basketball court and play areas with open lawn spaces and trails. This park also functions as a stormwater treatment facility during the winter months.

Shared Public Service Delivery

Efficiencies can be realized by streamlining fragmented service delivery and infrastructure

maintenance. Intergovernmental agreements are the most common form of coordination found in the Portland region. However, focused collaboration could lead to redistricting service areas, merging service districts, and allocating financing responsibilities for community and regional facilities. For example, the cities of Wood Village and Fairview have IGAs with Gresham for wastewater treatment and work closely to keep the cost of treatment down and prepare for future system demands. These efforts could lead to strategies that allow service providers to be more efficient with the resources and infrastructure systems that currently exist.

Case Studies

Portland Region

- The City of Portland sells wholesale water to 19 other service providers.
- The cities of Hillsboro, Gresham, Tigard and Portland use intergovernmental agreements (IGAs) for park facilities and services.
- The Tualatin Valley Water District is a partner in water resources and transmission in a venture with the Joint Water Commission, the Willamette River Water Coalition and the City of Portland. In addition, it provides contract water services to the cities of Beaverton and Sherwood, as well as Clean Water Services, Valley View Water District and Southwood Park Water District. The District works with the Regional Water Providers Consortium on regional planning, conservation and emergency preparation plans.
- The North Clackamas Water Commission has IGAs with Sunrise Water Authority, South Fork Water Bureau, and the cities of Gladstone and Lake Oswego for a variety of services.
- Gresham has intergovernmental agreements (IGAs) with Multnomah County to maintain County-owned Vance Park and with Metro Parks & Greenspaces for maintenance of co-owned parcels.
- Clean Water Services has IGAs with seven large cities in Washington County to implement local sewer and stormwater operations and maintenance.
- Gresham has maintenance IGAs with Multnomah County and the Multnomah County Drainage District to provide services for specific stormwater infrastructure.
- Washington County employs IGAs with its cities for roadway maintenance and project funding through both the county-wide Traffic Impact Fee and the Major Streets Transportation Improvement Program. The County works closely with its municipal partners through the County Coordination Committee.
- The City of Milwaukie contracts with Clackamas County to provide traffic signal operations and maintenance.
- During snow and ice events, the effort of clearing roadways across the region is shared among ODOT, PDOT, counties, and smaller cities via a coordinated agreement.

Equipment Sharing

Large equipment for infrastructure maintenance and construction can be shared among cities and counties to accomplish large projects or provide secondary relief in emergency situations. A regional approach could be taken and be justified on a cost-benefit basis.

Case Study

Portland Region

The cities of Troutdale, Fairview and Wood Village share stormwater equipment.

Regional Coordination

There are many issues that are most effectively addressed at a scale larger than the local level. State/interstate, regional, sub-regional, and local infrastructure needs, costs, and benefits should be clearly defined. Potential collaborators can be identified and solutions developed that are appropriate for the type and size of the need. For example, the need for bridge planning and financing can be addressed regionally if it is agreed that this is a regional priority.

Participating in local advocacy groups or nonprofit organizations offers opportunities to build support for large projects to attain long-term goals. For example, participating in regional meetings can provide smaller agencies or jurisdictions opportunities to spread the word regarding proposed utility changes.

Case Study

Regional Water Providers Consortium

The Regional Water Providers Consortium is a group of 23 water providers that serve Clackamas, Multnomah and Washington counties and Metro. The Consortium provides a forum for collaboration on water supply issues and conducts activities that provide service to customers in and around the Portland metropolitan area. This includes coordinating implementation of the Regional Water Supply Plan, studying and discussing water supply issues, and promoting cost-efficient use and stewardship of water resources.

Capital Improvement Coordination

Public agencies can benefit from the knowledge of proposed capital improvement plans of various infrastructure entities. Where projects overlap, they can link the construction schedules to eliminate mobilization and clean-up efforts as well as lower the overall costs and public impacts. This strategy can be problematic when services are provided by multiple agencies and funds are available at different times. Case studies are similar to some of those identified under “Shared Public Service Delivery.”

Alternative Standards for Public Construction

Where funds are limited, the public can benefit from specific infrastructure elements that meet health and safety standards, but are of a lesser standard than what is typical for new construction. For example, interim pedestrian trails could be built instead of formal sidewalks on urban streets.

The increasing cost of energy and the impact it will have on both personal mobility and utility operations will likely lead to changed standards for public construction. For instance, smaller cars will use less space on roads and in parking areas.

Case Study

City of Portland Pedestrian Design Guide

The City of Portland Department of Transportation's (PDOT) Pedestrian Design Guide supplies several alternative designs for constructing pedestrian facilities where the conventional city standards are not feasible. The design guide allows for alternate surfacing materials, widths, and locations for sidewalks that often cost less to design and install. Many have been applied to local improvement district (LID) projects.

Franchise Agreement Consistency

Clear, consistent agreements among private utility providers and similarly sized jurisdictions can save time and money when coordinating public improvements and upgrades. Included in this should be an attempt to treat each utility consistently when participating in large urban projects. A regional governing agency could develop a model franchise agreement. The model franchise agreement could state common conditions, requirements and obligations as well as exceptions where they are appropriate due to the nature of the infrastructure type or a particular utility provider. The desired result is to realize common expectations among public agencies and utility providers in the region. The benefits may also be a consistent and fair treatment of utility providers, as well as more timely response, better cooperation and less litigation among parties. For instance, clear management of the limited space in the right-of-way can minimize future relocations as improvements and upgrades are performed on existing infrastructure. Furthermore, coordination between energy and other infrastructure providers in advance of development could minimize future relocations and identify alternatives to the right-of-way when limited space will not accommodate multiple utilities, resulting in cost savings for developers and ratepayers.

Oregon Department of Transportation/American Public Works Association Specifications

In 1996, the Governor's Task Force on Transportation Efficiency was assigned the mission of finding new ways to use Oregon's gas tax money more efficiently. Representatives from the infrastructure and construction trades voted to create joint standards. In 2002, the Oregon Standard Specifications for Construction were completed and were updated in early 2008. This document allows construction work to occur across the state under a standardized method and payment system, ensuring that projects receive a consistent quality of construction. The effort also provides cost savings by allowing contractors to use consistent materials and machinery across various jurisdictional boundaries.

Annexation Planning

Efficiencies can be realized by planning annexation areas along growth corridors and growth centers, including the infrastructure to support this sequencing. Funding mechanisms should be put in place to support growth as it happens, responding to cycles in the economy and housing markets.

Systems Maintenance

Techniques used to assess maintenance needs that can prolong the life of facilities should be expanded.

Case Study

Portland Region

- PDOT's Pavement Management System.
- The City of Portland maintains a software system to conduct asset management.
- Street cleaning frequencies can be adjusted to prolong the life of stormwater piping systems, reducing the maintenance costs caused by debris entering pipes.

Life-Cycle Costing

Considering whole-life costs when making infrastructure investment decisions can reduce long-term costs. One method of implementation is to require life-cycle costing as a criterion for project approval and/or permitting fees.

DEMAND MANAGEMENT

The Portland region needs to examine infrastructure conservation measures to help prevent or delay the need for major capacity investments. Components of demand management include: focusing growth to use existing capacity first; pricing usage to reduce and manage demand; educating the public on conservation strategies and travel options; and providing incentives to reduce demand.

Compact Development Patterns

Compact urban land form (smaller lots and multi-family vs. single family) is a key factor in reducing demands on infrastructure and on water in particular. Continue to promote compact development as a key factor in efficiency for all infrastructure types. Focus on infill and redevelopment in existing urban areas as well as newly urbanizing with close proximity to existing systems targeted for compact, mixed-use and industrial development.

Peak-use Pricing

Infrastructure system capacity or sizing for capacity often is a function of peak demand versus usage. Peak events dramatically increase the demand on infrastructure systems. For example, peak rain events in Lake Oswego can increase the demand for wastewater service up to six times more than the average demand. Most services where peak demand is an issue do not charge for the time of day the resource is used. Conservation is necessary, but pricing measures that reduce overall demand as well as peak demand should be implemented. There are many opportunities to change behavior by reducing or minimizing peak use of a variety

of services. Leveling out peak demand can be an effective way to reduce infrastructure cost. Peak-use pricing uses real time monitoring systems that charge for the actual amount of the resource used or capacity consumed. This technique could be used for many types of infrastructure, including roadway and water usage. One example is implementing or increasing toll charges during the rush hour (congestion pricing). Another is implementing peak seasonal pricing for water use, including wastewater. The cost of technology used to implement daily peak pricing for water is prohibitive at this time.

Case Studies

Portland General Electric (PGE)

PGE's Critical Peak Pricing (CPP) program provides lower energy rates on non-CPP event days. Businesses can reduce energy bills by shifting energy usage away from peak days and hours.

Singapore

Singapore introduced the world's first congestion pricing program in 1975 and implemented electronic road pricing in 1998. New technology is used to predict prevailing and emerging traffic conditions and adjust pricing accordingly. Congestion charges are part of a comprehensive traffic management effort that includes an annual road tax, fuel taxes, custom duties and vehicle registration fees and investment in public transportation.

Public Education and Resource Conservation

Invest in public outreach efforts to inform the public of the current state of infrastructure in the region. Help people understand the real costs and benefits of their actions. Provide detailed information on strategies to reduce impacts on infrastructure, including conservation measures to help prevent or delay the need for major capacity investments. In particular, efforts to conserve water and energy and reduce driving could have a significant impact on the need to upgrade existing infrastructure systems. When possible, incentives should be used to encourage conservation efforts, such as lower use of utilities.

Case Studies

Portland Bureau of Environmental Services

The City of Portland provides a discount on sewer charges for properties that disconnect downspouts from the combined sewer system.

Regional Water Providers Consortium

The Regional Water Providers Consortium develops and implements water conservation programs that educate the public about water-related issues. The programs include a summer marketing campaign, website, schools programs, community events and partnerships, and public education and outreach.

Drive Less/Save More Campaign

The Drive Less/Save More Campaign is sponsored by Metro's Regional Travel Options Program, TriMet, ODOT and other public/

private partners. The campaign seeks to reduce single-person car trips by promoting travel options like public transit, car pooling, biking and walking and encouraging drivers to trip chain or combine multiple errands into single trips. The campaign website provides access to a number of resources at http://drivelesssavemore.com/.

INNOVATIVE PLANNING AND DESIGN

Traditional infrastructure facilities may be designed and provided in innovative ways that address sustainability and increase community support. Emerging technologies provide opportunities to increase efficiencies and lead to best practices.

Infrastructure Recycling and Reuse

Promote innovative ways to reuse or recycle existing infrastructure. For example, schools or unused transportation or utility corridors that are insufficient to serve one purpose can be used for other purposes to help reduce the need for new facilities to meet expanding demand.

Case Studies

Springwater Corridor

The Springwater Corridor is a former rail corridor; the Springwater Division Line was developed for rail service in 1903. Much of Springwater Corridor was acquired by the City of Portland in 1990, with additional acquisitions by Metro in the following years. Master planning for the Corridor began in 1991, and involved input from citizens, agencies, organizations, and municipalities, including Portland Department of Transportation; Oregon Department of Transportation; the cities of Gresham and Milwaukie; Metro; Clackamas and Multnomah counties; the 40-Mile Loop Land Trust; and the Johnson Creek Corridor Committee.

Banks–Vernonia State Trail

Recently completed, this is the first "rails-to-trails" state park built in Oregon. It is built on an abandoned railroad bed that stretches 21 miles from the town of Banks to the city of Vernonia. The railway line dates back to the 1920s, when it was used for moving logs and lumber from the Oregon-American lumber mill in Vernonia, and freight and passengers from Keasey to Portland. The line was abandoned and the rails salvaged in 1973. The right-of-way was then purchased by the state in 1974, and transferred to Oregon Parks and Recreation Department in 1990.

Green Infrastructure

Infrastructure innovation is evolving rapidly due to regional planning initiatives, market acceptance of the green building movement and interest in sustainable development. It may be possible to foster regional collaboration and leadership in various fields of green planning, design, engineering and development. An excellent example of this is Metro's work to foster green street designs to address storm water, urban design and other multiple benefits.

Examples of regional "green" infrastructure that might be developed include:

- Solid waste management and zero waste and economic development related to recycling industry
- Water conservation and reuse strategies
- Green buildings
- Eco-roofs for open space and storm water management
- Distributed renewable energy
- Waste water treatment systems as sources of bio-nutrients
- Metropolitan food transportation and distribution strategies

Case Studies

Metro Green Street Handbook

Metro's Green Street Handbook is an example of a green infrastructure initiative that documents the state of the art of stormwater management in the streetscape.

Sustainable Infrastructure Research and Development

Support the evolution of Portland State University (PSU) as a research and development and application center for innovative sustainable infrastructure. PSU currently houses significant assets that can help the region develop and apply innovative research, development, technological transfer, finance and operation techniques. These resources could potentially be organized into a regional infrastructure innovation center or network. This center could draw on the rich academic resources in civil engineering, transportation, biology, chemistry, energy and mechanical engineering, electrical engineering, nanoscience, urban and regional planning, public administration, business administration, finance and other disciplines to improve the capacity of the region to accommodate future growth.

Case Studies

Canada

The National Research Council of Canada, Center for Sustainable Infrastructure Research (http://irc.nrc-cnrc.gc.ca/csir/index_e.html) is a collaboration of universities, municipal governments and industrial partners in Regina, the Province of Saskatchewan and elsewhere. The collaboration is pursuing a multi-disciplinary research and development program to develop innovative technologies and decision support tools that address the economic, social, and environmental aspects of infrastructure sustainability. This effort will help develop a technology base that will give Saskatchewan a competitive advantage in sustainable infrastructure technologies.

Virginia

The Green Infrastructure Center (www.gicinc.org), in Charlottesville, VA, is a nonprofit organization founded in December 2006 to assist communities in developing strategies for protecting and conserving

their ecological and cultural assets through environmentally-sensitive decisions, lifestyles and planning. Green infrastructure includes the interconnected natural systems and ecological processes that provide clean water, air quality and wildlife habitat. Green infrastructure sustains a community's social, economic, and environmental health. The Center provides tools to help communities identify the services provided by natural systems, such as enhanced quality of life and economic benefits, and develop strategies to protect and sustain these resources.

Australia

The Natural Edge Project (TNEP) is an independent and highly developed Sustainability Think-Tank based in Australia. TNEP operates as a partnership for education, research and policy development on innovation for sustainable development. TNEP's mission is to contribute to and succinctly communicate leading research, case studies, tools and strategies for achieving sustainable development across government, business and civil society. See: http://www.naturaledgeproject.net/

Sustainable Infrastructure Standards

Long-term cost savings can be realized through sustainable infrastructure development. Sustainable infrastructure standards are evolving based on the strong market recognition of the U. S. Green Building Council's LEED rating system and related developments. Both the American Society of Civil Engineers (ASCE) and American Public Works Association (APWA) have infrastructure programs to support sustainability.

Case Studies

United States Green Building Council (USGBC)

According to the USGBC, LEED for Neighborhood Development integrates the principles of smart growth, urbanism and green building into the first national system for neighborhood design. LEED certification provides independent, third-party verification that the location and design of a project meet accepted high levels of environmentally responsible, sustainable development. The post-pilot version of the LEED ND rating system is expected to launch in 2009.

American Society of Civil Engineers

ASCE and the Canadian Society of Civil Engineers are formulating a joint sustainable development action plan for the profession.

See: http://content.coprinstitute.org/files/pdf/ASCESustainableDevelopmentActionPlan.pdf

Emerging Technologies

Plan for and utilize emerging technologies that can reduce costs and increase infrastructure services. Strategies include:

- Planning infrastructure to support the use of electric and other alternative-fuel cars.
- Integrating solar generation infrastructure into the urban form.

- Constructing facilities designed to generate power, such as systems to capture methane in wastewater treatment plants.
- Use advanced street lighting technology such as LEDs or super-conducting cables.
- Designing water reuse systems that include the use of bio-reactors.
- Utilizing GPS equipment to redistribute peak auto use on congested traffic ways.
- Smart meter technology to allow peak pricing.
- Smart signal systems to manage congestion.

NEW FUNDING

New funding sources are needed to upgrade and replace existing infrastructure systems as well as provide infrastructure to newly urbanizing areas. Communities in the region can support new investment by working together to pay for the infrastructure needed at the local, community and regional levels, and to leverage federal and state investments. This analysis should include identifying and removing barriers to public and private investments in infrastructure. A regional look at financing possibilities for basic infrastructure could help support implementation of the region's 2040 vision. Financing devices need to be put in place upfront by the responsible governments.

Support Federal Legislation

Support development of a national infrastructure plan proposed by Congressman Earl Blumenauer. Work with the regional congressional delegation to develop support for this plan and targeted federal funding. "The legislation calls for a new National Plan to define and finance the infrastructure required to support a sustainable economy, improve the livability of our cities and rural communities, provide jobs for Americans, and strengthen national security." The bill would create a Commission on Rebuilding America for the 21st Century and a national vision for infrastructure including specific recommendations and a set of model principles to inform future infrastructure investments.

Potential New State Revenue Sources for Oregon

Opportunities for funding community and regional infrastructure facilities, such as roads, bridges, transit systems, and water/sewer facilities should start at the state level, with new funding sources for strategic infrastructure investments identified during the 2009 legislative session. Examples from this region and other jurisdictions follow. Each of these tools has been used in other places, but implementation of any tool has inherent benefits and risks.

- Additional funds for the Oregon Infrastructure Bank to be dedicated to metropolitan areas.
- An expanded role for the Oregon Infrastructure Bank to provide credit-enhancement to local governments and service districts.

- Funding from the Oregon Strategic Transportation Initiative dedicated to strategic projects in metropolitan areas.
- State transportation project mitigation (traffic impact) fees for strategic regional projects.
- A real estate transfer fee with revenues dedicated to infrastructure.
- An increased Oregon fuel tax and additional revenues dedicated to strategic infrastructure.
- A lodging accommodations tax and dedicated revenues to infrastructure.
- Revenues from the Oregon weight-mile tax and dedicated revenues to regional freight mobility projects.
- An increased Oregon motor vehicle fee with revenues dedicated to strategic regional projects.
- Oregon income tax deductions for businesses and residents located within a designated Center, Corridor, Employment or Industrial area per the 2040 Growth Concept.
- State provisions to allow establishment of Special Benefit Assessment Districts with local taxing authority.

Case Studies

Oregon Special Public Works Fund

The Special Public Works Fund administered by the Oregon Community Development Division is primarily a loan program that provides funding for municipally-owned facilities that support economic and community development. Established in 1985 by the Oregon Legislature, the fund has grown to $160 million. Loans range in size from less than $100,000 to $15 million. Loan terms can be offered at tax-exempt rates for up to 25 years. Grants are limited to $500,000 or 85 percent of the project cost, or up to $5,000 per eligible job created or retained.

Oregon Water/Wastewater Fund

This is a loan and grant program administered by the Oregon Community Development Division to provide for the design and construction of public infrastructure needed to ensure compliance with the U.S. Safe Drinking Water Act or the Clean Water Act. Public entities, municipalities, ports and special districts may apply for funding improvement of drinking water, wastewater, or storm water systems. Loans range in size from less than $100,000 to $15 million. Loan terms can be offered at tax-exempt rates for up to 25 years. Grants are limited to $10,000 per hookup, with a maximum of $750,000 per project. An applicant is not eligible for grant funds if the annual median household income in the applicant's service area is more than the state average median household income level.

Oregon Transportation Infrastructure Bank (OTIB)

OTIB offers direct loans for eligible projects funded from available resources or through the sale of revenue bonds. Borrowers include cities, counties, transit districts, ports, tribal

governments, state agencies and private for-profit and non-profit entities. Uses of funding include various transportation and transit projects. Loan terms can include tax-exempt financing with repayment beginning within five years of project completion and must be repaid within 30 years or at the end of the useful life of the project. Projects are selected on a competitive basis with preference given to projects with quick loan repayment. Projects that receive OTIB funds may include federal money which requires the applicants to abide by applicable state and federal laws, rules and regulations including NEPA, Davis-Bacon Act, Buy America, etc. As of January 2005, the Oregon Transportation Commission had approved a $30 million non-revolving line of credit from the State Highway Fund for the OTIB.

State Transportation Mitigation Fees

Washington State Department of Transportation (WSDOT) allows local jurisdictions (cities and counties) to charge developers for their impacts on state transportation facilities. The WSDOT mitigation fee program has been used to fund the local share for capacity improvements to roadways in Pierce and Snohomish Counties in the greater Seattle Metropolitan Region. The mitigation fee is based on the capital cost of projects identified in the State Transportation Improvement Program and calculated annually by WSDOT staff. Each jurisdiction has the flexibility to charge the mitigation fee or waive it on a case by case basis. CALTRANS is also now considering a similar approach for funding the local share of strategic state transportation improvements.

Oregon Senate Bill 772, Public-Private Partnerships

In 2003, the Oregon Legislature approved a new bill that provides ODOT with tools to develop public-private partnerships for transportation projects, and raised the limit of funding for this program to $50 million. While no such partnerships have materialized, this program has the potential for creating opportunities to build large, badly-needed transportation projects.

Oregon House Bill 2278, expansion of ConnectOregon

This bill funds another $100 million of ConnectOregon through lottery bond sales and authorizes a statewide multimodal transportation study.

Washington Economic Development Finance Authority (WEDFA)

WEDFA can act as the issuing authority on tax exempt Industrial Revenue Bonds to finance eligible infrastructure investments by qualifying public or private entities. WEDFA issues bonds for up to $10 million on a single project, but does not provide any credit enhancement for borrowers. Washington state securities law requires that each borrower obtain a direct pay letter of credit from a lending institution equal to the principal plus 125 days interest. An alternative to the letter of credit provision is for

the borrower to work with a lender to arrange a "private placement" of the bond with an institutional investor or banking firm. WEDFA staff can assist with private placement efforts.

California Infrastructure and Economic Development Bank (I-Bank)

State financing authority provides tax exempt financing to public agencies and qualifying private and non-profit entities. Since 1999, the I-Bank has financed more than $6.5 billion in bonds and loans for economic development and public infrastructure projects. I-Bank also provided more than $300 million in loans from the Infrastructure State Revolving Fund Program since 2000. I-Bank leverages about $2.50 in added public and private investment for each $1.00 it lends. Public infrastructure projects financed by I-Bank include flood control, water, wastewater, public safety facilities, and public streets.

California Proposition 1B

Approved by voters in November 2006, Prop. 1B enacts the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 and authorizes $19.925 billion of state general obligation bonds for specific purposes. Focus of this program is on high-priority transportation corridor improvements, trade infrastructure and port security projects, school bus replacement, passenger rail improvements, state/local transportation projects, bridge retrofits, railroad grade separation projects, and traffic safety.

California Proposition 1C

Approved by voters in November 2006, Prop. 1C enacts the Housing and Emergency Shelter Trust Fund Act. Funds are used for providing shelters for battered women and children, low income housing, homeownership assistance, and development programs targeted in urban areas near public transportation. The measure authorizes $2.85 billion in GO bonds to fund 13 new and existing housing and development programs. Funds are awarded on a competitive basis.

Potential New Regional Revenue Source or Authority

Particularly if federal or state funding efforts do not appear viable, a regional referendum should be considered to seek voter support for new or expanded fees that can be used to leverage state or federal funding to complete strategic infrastructure projects such as bridge construction or preservation, and new roadway, transit, multimodal, and urban amenity projects. If regional funds were to be collected by Metro, it is likely that the Legislature would need to increase Metro's spending cap. Examples of regional tools used in local and other jurisdictions follow. Each tool has inherent benefits and risks.

- Transportation project mitigation fees or system development charges for strategic regional projects.
- Real estate transfer fee dedicated to strategic regional infrastructure projects (this would be an increase in Washington County).

- Fuel tax, with dedicated funding for strategic regional projects.
- Lodging accommodations tax, with dedicated funding for infrastructure.
- Motor vehicle fee increase, with dedicated funding for strategic regional projects.
- Expansion and extension of the construction excise tax, with dedicated funding for strategic community or regional infrastructure projects.
- Expanded role for Metro to educate and inform citizens and businesses regarding the benefits of conservation.
- Expanded role for Metro to help coordinate utility district roles and responsibilities in conjunction with service providers.
- Revolving Loan Fund for location efficient mortgages for low and moderate income homebuyers.
- Carbon Impact Offset fee for new buildings that do not meet energy efficiency guidelines.

Case Studies

San Diego

The San Diego Association of Governments (SANDAG) is using innovative techniques to plan and fund their transportation system. A 5 percent sales tax dedicated to transportation improvements has been particularly successful.

Virginia

With the passage of a new transportation act, Virginia is pursuing what appears to be regional financing of transportation that locks together state and local financing of improvements and more regional control of land use. The overall approach allows the regional transportation authority to levy certain taxes and require that localities do likewise for transportation support. State funds will be tied to regional actions. As part of the transportation plan, Virginia is building "hot lanes" on the interstates that will toll individual drivers that use HOV lanes.

State or Regional Bond Bank

Bond banks are a financial intermediary that provides low cost funds through the sale of tax exempt bonds. Capital financing through bond banks allows borrowers to take advantage of the bank's high investment grade rating, low interest rates and reduced issuance and post issuance costs. Local governments are shareholders that participate in bank governance and in some cases make minimal stock subscription payments. For more information see the Appendix.

Case Studies

States of Alaska, Indiana, Maine, New Hampshire, Vermont

Alberta Province, Canada

Value-capture finance

Public improvements made today can lead to future increases in economic value. By capturing a share of future increases, these improvements can be made self-financing. Value-capture finance leverages future tax

receipts to pay for public infrastructure needed to support development for projected growth. In other words, private land value increases generated by new public investment are all or in part "captured" through a land related tax to pay for that investment.

Public and private sectors are constituent elements in the development process. Local government's role evolves as provider of infrastructure and promoter of development. New applications are possible as governments and private developers find it necessary and desirable to work together. Value-capturing finance shares the benefits and costs among partners so that private benefits are partially invested in public services. Those that benefit from new public investment in infrastructure and services pay for them. Examples include urban renewal districts.

Assessment and Taxation Districts

Special districts assess properties with added charges to recover the cost of special improvements made to them. They are not a burden on the general tax base and do not constitute general indebtedness. Moreover, this technique allows landowners to amortize payments over time. Special districts are a viable source of funding at the local or community level. It can be a challenge to explain this technique to the public. A common type of special district is the local improvement district (LID) where a public amenity is needed. Public agencies can encourage and/or aid the use of an LID to fund specific projects. With this source of private (often via property-owners) funding, many elements can be completed at little cost to the public agency.

The following are other types of assessment and taxation districts:

- Regional Improvement Districts
- Special Benefit Assessment Districts
- Business Improvement District
- Supplemental SDCs
- Reimbursement Districts
- Urban Renewal Districts

Case Studies

Washington State Local Infrastructure Financing Tool (LIFT)

Established during the 2006 legislative session, the LIFT program provides a new way to support public infrastructure, with focus on job creation and increasing local economic activity. LIFT is a competitive program that allows selected local governments to take advantage of tax revenue generated by new private developments in Revenue Development Areas (RDAs). Much like Oregon's urban renewal program, LIFT supports RDA's use of state and local tax increment revenues to repay bonds. Jurisdictions may apply for up to $2.5 million in annual LIFT authority, and in most cases only one RDA is allowed per county.

Community Facilities District Act ("Mello-Roos")

Mello-Roos enabled Community Facility Districts (CFD) to be established by local government agencies in California as a means of obtaining community funding. CFDs are areas where a special tax is imposed on property owners. The CFD has chosen to seek public financing through the sale of bonds for the purpose of financing certain public improvements and services.

Tax Revenues and Fees

Tax revenues and fees could be used to fund new infrastructure. Most taxes require voter approval and would likely be subject to a cap. Tax revenues and fees include:

- Impact Fees, Systems Development Charges
- Utility Charges/Fees (user charges)
- Motor Vehicle Registration Fees
- Fuel Tax (maximum allowed under state laws)
- Utility Franchise Fees
- Developer Connection Charges
- Real Estate Transfer Fee
- Construction Excise Tax
- Lodging Tax
- Toll Revenues
- Mitigation Fees
- Property Tax Levy
- Payroll Tax
- Road User Fee (establish a user fee paid by households, businesses, and industries to fund transportation system improvements and upgrades; similar to Portland Mayor-elect Sam Adams' Safe, Sound and Green Plan and the street utility fee in Hillsboro).
- Tax Increment Financing (establish a tax increment district to raise the funding for necessary public infrastructure improvements).

Public-Private Partnerships

Public-private partnerships (PPPs) are an effective means to develop infrastructure projects. A PPP is a contractual agreement between a public agency (federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for use by the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility. PPPs can create wide opportunities for deeper funding and sources of creativity.

Successful PPPs have strong political leadership, shared burdens and rewards, commitment to plans, project timetables and clear, realistic funding sources. PPPs can be focused at various scales and structured in different ways (See the Appendix). Some are more applicable to infrastructure needs than others, and some more applicable to particular types of infrastructure. For instance, utilities such as water or sewer that have a user-paid revenue stream are better implemented

under some models, and road or highway infrastructure that may combine user fees with local, state, and federal capital contributions are better constructed under other models. They are used extensively in Europe, but with mixed success. Metro could develop a "toolkit" to define the range of PPPs and the criteria for success in developing and managing PPPs.

Case Studies

South Waterfront; Portland, OR

The South Waterfront project is a PPP among the City of Portland, the Portland Development Commission, and Oregon Health and Science University. Tax increment revenues and local private cost-sharing was used to provide needed improvements and desired amenities. Development agreements between the city and individual property owners provided a tool for negotiating public and private commitments to meet plan goals on a site-specific basis. PPPs were used to finance some improvements and long-term maintenance of public facilities. For example, local improvement districts assisted with streetcar, tram, parks and greenway installation and maintenance.

Metro

A transit-oriented development (TOD) Program aims to provide built examples of transit-oriented development projects and to demonstrate the potential of public-private partnerships for making great communities. The TOD program provides financial incentives and uses PPPs to enhance the economic feasibility of higher density mixed-use projects served by transit. The program has contributed to many of the successful TOD developments in the region and has acquired key opportunity sites at transit stations.

Cascade Station, Airport Light Rail Transit; Portland, OR

Bechtel, Trammel Crow, Port of Portland, PDOT, TriMet and PDC partnered to build light rail transit and retail / commercial infrastructure near the Portland Airport. Bechtel provided the private partner's contribution by constructing the infrastructure in exchange for the right to enter into 99-year leases that would allow private development of the Port's land. The Portland Development Commission was an intermediary and provided about $30 million in financing.

Land Acquisition

Investigate new approaches to land acquisition. Land acquisition is a major challenge preventing large scale development projects in the region. A handful of corporations now control the building of large residential housing developments in the United States. There is a need to plan for areas to be annexed by talking to these corporations to understand what large-scale development would look like and how to prepare for it. New approaches to land acquisition include:

- Planning for public transit and development patterns that support it is of particular importance. Obtain rights-of-way before

development occurs to dictate where linear infrastructure will go.

- Various landowners form a private limited liability corporation to spread costs and benefits and consolidate land for a single developer.
- Public sector uses a tool similar to urban renewal, but to purchase land in urbanizing areas for development purposes.
- Work with developers to get control of parcels with highest value to leverage process.

Patient Equity[4]

Patient equity is the capital committed to a development budget that does not have a defined payback schedule. Patient capital is not a substitute for other financing that sunsets in seven to ten years. Rather, it is additive, layered on top of a conventional development budget such that the overall cost of the project increases. Patient equity pays the increased costs and mitigates the risks of new development. Ultimately, it can facilitate a project's success and over time yield substantial return to its investors.

Patient equity is ideal for financing walkable, mixed-use projects. It allows conventional equity to take on a proportionally smaller piece of the total development budget. Investors of patient equity in walkable projects are likely to see substantial financial returns as the project matures and critical mass is achieved (ten or more years). However, current methodologies for evaluating equity investments are often biased toward short-term (one to seven years) investment decisions. Many of these methodologies are unable to evaluate cash flows beyond year five, which is when walkable, urban developments see their strongest financial performance. A similar method could be to establish a patient equity fund for long-term investments to be used in public-private partnerships.

Case Studies

Reston Town Center

Mobil Land owned the master planned community of Reston, Virginia, located in the Washington, D.C. metropolitan area. The 200-acre site includes more than one million square feet of office, hotel and retail space, and thousands of condominium and rental apartments. Current rental rates and sales prices demonstrate the premium that Reston Town Center's walkable urbanism commands. There is no direct evidence of how much patient equity was in the project but estimates of patient equity for the first phase of the Town Center are upwards of 50 percent of the development budget.

Century Theatre Block, Albuquerque

The Historic District Improvement Company (HDIC) developed the Century Theatre Block in Albuquerque as the catalytic project starting the revitalization of the downtown. The project consists of a 47,000 square foot, 14-screen

[4] Source: Leinberger, Christopher B. *The Need for Patient Equity in Creating Great Places.*

movie theater, 25,000 square feet of retail and 25,000 square feet of office space in a mixed-use, walkable form. The HDIC project had a 40% higher construction and tenant improvement budget than the conventional budget. The development budget became 5% conventional equity, 67% debt and 27% patient equity. The cash flows have recently surpassed the conventional projections and seem set to significantly surpass the conventional projections in the future.

AvalonBay Communities, Inc.

AvalonBay REIT concentrates on building and owning rental apartment projects in markets with high barriers to entry. As a result, over half of their portfolio is in walkable, urbane locations. This portfolio has earned AvalonBay a reputation as one of the premier rental apartment REITs in the United States. It has consistently been the most profitable apartment REIT and has provided the highest shareholder return for apartment REITs.

Remove Barriers to Investment

Identify and remove existing legal, regulatory and other barriers to public and private investment in new development and infrastructure. For instance, liability issues associated with superfund sites prevent redevelopment of brownfields due to fear of lawsuit. Unfunded mandates from federal and state governments also serve as obstacles to investments in infrastructure. Likewise, cities should revisit development codes to encourage investments, removing codes that prevent compact urban development.

Carbon and Ecosystem Service Markets

Due to the impact of climate change, there is a rapidly evolving set of markets in green house gas reduction or sequestration. The United States Congress is considering a national cap-and-trade system that could result in up to $1 trillion in capital exchange. It is likely that national legislation will pass within the next few years. The Western Governors' Climate Initiative also is developing a regional cap-and-trade system to reduce greenhouse gas emissions and several Oregon leaders are developing a similar concept designed to quantify and monetize the value of services provided by ecosystems and develop the market mechanisms where they can be sold, purchased, or traded. These opportunities are detailed in several presentations at: www.nebc.org/content.aspx?pageid=34

Case Studies

Climate Action Plan Tax, Boulder, Colorado

Boulder voters approved Initiative 202 in 2007, making this the first time in the nation that a municipal government will impose an energy tax on its residents to directly combat global warming. The energy tax is also referred to as a carbon tax since it is based on electricity consumed through the burning of coal which is directly related to carbon or greenhouse gas emissions. The average household will pay $1.33 per month and the average business will pay $3.80 per month. The tax will generate

about $1 million annually through 2012 when the tax is set to expire. Estimated energy cost savings from this measure are $63 million over the long term.

Oregon

There are significant efforts in Oregon to develop an ecosystem services market for the Willamette Valley and elsewhere to value and capitalize on ecosystem services provided by nature. Taken together with the emerging cap and trade carbon markets there are and will be major opportunities for funding for energy-efficient infrastructure, compact development and open space "greenfrastructure" needs of the region. Regional collaboration will be essential to fully participate in both markets.

CRITERIA FOR TARGETING REGIONAL FUNDS

While it is important to pursue strategies in all four categories, the reality is that new funding sources are crucial to providing needed infrastructure. The following matrix outlines a set of regional funding program eligibility criteria. These funding criteria could be applied to ascertain the relative advantages and disadvantages for the aforementioned funding programs, using a relative scoring method for each criterion ranging from 1 (least effective) to 5 (most effective). The highest scoring funding programs should be advanced for consideration by the appropriate legislative body and/or public-at-large.

Criteria	Evaluation Question to be Addressed	Comments
Legal precedence in Oregon	Is this technique allowed under Oregon law?	
Current use in Portland region	How many jurisdictions or districts use it today? Has it been successful?	
Overall simplicity (easy to understand/convey)	Can it be explained in 20 words or a simple graphic?	Important for public support
Implements 2040 policy objectives	Can funding be focused on centers, corridors, and employment and industrial areas?	
Equity among affected stakeholders	Who pays the cost? Are they the beneficiaries?	
Ease of integration with existing governments	How many inter-agency agreements/ modifications will be required?	Important to local agencies
Potential revenue generation	What is revenue generation potential: high, med., low?	Forecast over 30 years
Stability of annual revenues	How much does the revenue stream rely on variable factors, such as construction cycles?	Historical review of revenue system
Ability to be used for annual operations & maintenance	Can the revenue be used for annual operations & maintenance?	Important to local agencies
Flexibility of the revenues	Can the revenue address multiple infra needs?	Flexibility of technique
Annual implementation/ administrative costs	What will be the cost of administering this to local governments?	Forecast over 30 years
Ability to leverage federal or state funds	Can this revenue source leverage non-local grants?	Potential for all levels of government
Ability to leverage local public/ private funds	Can this revenue source leverage private investment?	Potential for all levels of government
Likely to receive voter approval	Is this the type of program voters generally support?	Important to elected officials
Consistency with other financing techniques used by local governments	How well does it fit in with contemporary patterns?	Helps sell program to citizens

* It is recommended that regional funding techniques be ranked according to these criteria on a scale of 1 to 5, with 1 being least effective and 5 being most effective, and use this as a basis for prioritizing funding programs.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Changing times require new approaches to infrastructure provision and finance. This analysis describes the region's infrastructure challenges and begins to quantify the problem and lay out some options to address the region's infrastructure needs. However, tough questions remain as the region moves forward:

- There will never be enough money for everything – how can we most efficiently guide public investment decisions to strategically target limited resources?
- Can managing demand reduce the need to expand the capacity of infrastructure?
- Are we providing infrastructure services at the most efficient level (geographical or jurisdictional), or are there opportunities to achieve economies of scale or efficiencies?
- How can we best address competing fiscal demands for new infrastructure, maintenance needs, and upgrades of existing facilities?
- Do service providers currently have the capacity to research and share information with counterparts nationally and globally to facilitate the adoption of innovations in service delivery?
- Will incorporating global climate change and sustainability into public messages help manage consumption?
- How can government deepen public understanding of the infrastructure challenges and increase public support for infrastructure finance?

RECOMMENDATIONS

The time is right for decisive action by elected and appointed leaders across the region to address our infrastructure needs. Recommended actions:

- Coordinate regional partners to identify state legislative changes that would increase our capability to finance regional infrastructure needs.
- Convene regional partners to explore opportunities to implement solutions that increase efficiency and better manage demand.

- Increase public awareness of infrastructure needs and the importance of setting priorities with limited resources.
- Recognize return on investment when making public investment decisions in both urban and newly urbanizing areas.
- Encourage and facilitate implementation of new technologies that increase the efficiency and sustainability of infrastructure systems.

Public Infrastructure Costs

Case Studies

July 2009

Introduction

Purpose

The region is in the process of deciding where and how to grow. These decisions will have long-term financial costs and benefits for current and future residents. An understanding of the factors that contribute to infrastructure costs will be essential to making those decisions.

To assist in the region's discussions about growth management, this report focuses on the capital costs and capacity of public infrastructure provision for new and infill developments throughout the region. This report uses a variety of analyses and information to provide a beginning framework for future conversations on infrastructure investment. Local case studies analyzing residential and employment areas throughout the region help illustrate the distinct factors that influence infrastructure costs.

Report Findings and Conclusions

A few things are readily apparent from the information gained in this report:

- Public infrastructure is extremely expensive. Even in locations where existing infrastructure has adequate capacity and can be extended to serve newly developing properties, it is not cheap.

- There is so much variation from one site to the next that it is difficult to make meaningful comparisons. One site already has available infrastructure and the next does not. One has steep slopes and the next does not. One has good connectivity and the next does not. The list goes on.

- Infrastructure to serve development is generally less expensive where infrastructure is already in place, even if the existing infrastructure needs maintenance work or capacity upgrades.

- Only the developments that have been fully built-out can claim to have accurate information on infrastructure cost. All the rest are estimates. Even where sites have been fully developed, it is not possible to accurately identify all of the regional infrastructure costs that result.

- Public infrastructure is an essential part of our quality of life for both existing and future residents. Given that this region is attracting more people and jobs (current projections assume one million more residents in the next 20 to 30 years), enhancing the public's understanding of the costs of building and maintaining that infrastructure is critical. The

public will be asked to invest even more in infrastructure in the future and should demand a meaningful return on that investment.

- This report provides only a general estimate of the demands created by local development on regional infrastructure. Each case study includes data on average commute distances, but does not include specific cost estimates for regional infrastructure. Unlike local and community infrastructure costs, there is no mechanism in place to collect revenues from developments to pay for regional infrastructure.

Summary of Cost Findings

Some of the developments studied here have already been built, others are still at the concept planning stage. Some are intended exclusively for housing development, while others are intended to create new jobs. Most include both jobs and housing. The following list shows the range of cost estimates for local infrastructure that have been found. All of these cost estimates are for local and community infrastructure only, and do not include added regional infrastructure costs.

A review of the summary numbers that follow makes it obvious how varied these case studies are. Comparing the first four cases listed below (Shute Road, Coffee Creek, S.W. Tualatin and Lake View Village) shows how different they are – in spite of the fact that they are all planned for non-residential development. Additional to the infrastructure costs per job created, the following differences are noted:

Lake View Village is a commercial development within a downtown redevelopment area. While it created more than 200 jobs, its primary function was to support and stimulate redevelopment of the surrounding downtown properties. Most of its costs went for the development of a public parking structure; something not anticipated in the other three areas. The other three areas are primarily planned for industrial uses.

Shute Road has the lowest anticipated local infrastructure cost per job. That is primarily because of the existing infrastructure and road network in the area.

S. W. Tualatin will require major upgrades to its surrounding streets to be viable. On a per-job basis, these local transportation costs are expected to be more than four times as high as those of the Shute Road area.

The Coffee Creek area is expected to have local infrastructure costs that are almost as high as the Shute Road area, while resulting in less than half as much job creation.

Project status (as of April 2009):

*	Planning not complete
**	Plan complete (not necessarily adopted)
***	Development underway
****	Development complete

Job Creation Only

West Coast Paper site (Portland)****
276 jobs $60,000 local infrastructure cost: +/-$200/job

Tualatin Business Center (Tualatin)****
124 jobs $298,000 local infrastructure cost: +/-$2400/job

Shute Road area (Hillsboro)***
3,660 jobs $9,136,000 local infrastructure cost: +/-$2,500/job

Coffee Creek area (Wilsonville)**
1,474 jobs $8,058,000 local infrastructure cost: +/-$5,500/job

S.W. Tualatin*
5,760 jobs $60,627,000 local infrastructure cost: +/- $10,500/job

Lake View Village (Lake Oswego)****
207 jobs $5,116,000 local infrastructure cost: +/-$24,500/job

Housing Only

Witch Hazel area (Hillsboro)***
2,000 units $39,560,000 local infrastructure cost: +/- $20,000/unit

Park Place area (Oregon City)**
1,458 units $71,760,000 local infrastructure cost: +/-$49,000/unit

In other areas studied, which have been planned primarily (but not exclusively) for housing or for job creation, per unit and per job costs are somewhat more generalized and should be considered only as "order of magnitude" estimates. These include:

Primarily Job Creation

Brewery Blocks (Portland)****
2,440 jobs (113 units) $40,647,000 local infrastructure cost: +/- $13,500 to $15,000/job

Springwater (Gresham)**
15,330 jobs (1,456 units) $375,791,000 local infrastructure cost: +/- $16,500 to $24,000/job

Primarily Housing

Rock Creek (Happy Valley)***
2,932 units (619 jobs) $48,796,000 local infrastructure cost: +/- $14,000 to $16,000/unit

South Hillsboro**
10,182 units (879 jobs) $295,517,000 local infrastructure cost: +/- $26,000 to $28,500/unit

North Bethany (Washington County)**
5,000 units (276 jobs) $416,633,000 local infrastructure cost: +/- $79,000 to $82,500/unit

Job/Housing Mix

N. Main (Milwaukie)****
95 units (40 jobs) $919,000 local infrastructure cost

Civic (Gresham)****
636 units (2,433 jobs) $11,606,000 local infrastructure cost

Beavercreek Road (Oregon City)**
1,450 units (3.652 jobs) $115,900,000 local infrastructure cost

Pleasant Valley (Gresham and Portland)**
4,926 units (4,935 jobs) $304,073,000 local infrastructure cost

S. Waterfront (Portland)***
10,000 units (3,600 jobs) $323,457,000 local infrastructure cost

Damascus/East Happy Valley* (Planning complete for Happy Valley portion.)
21,934 units (45,000 jobs) $3,119,295,000 local infrastructure cost

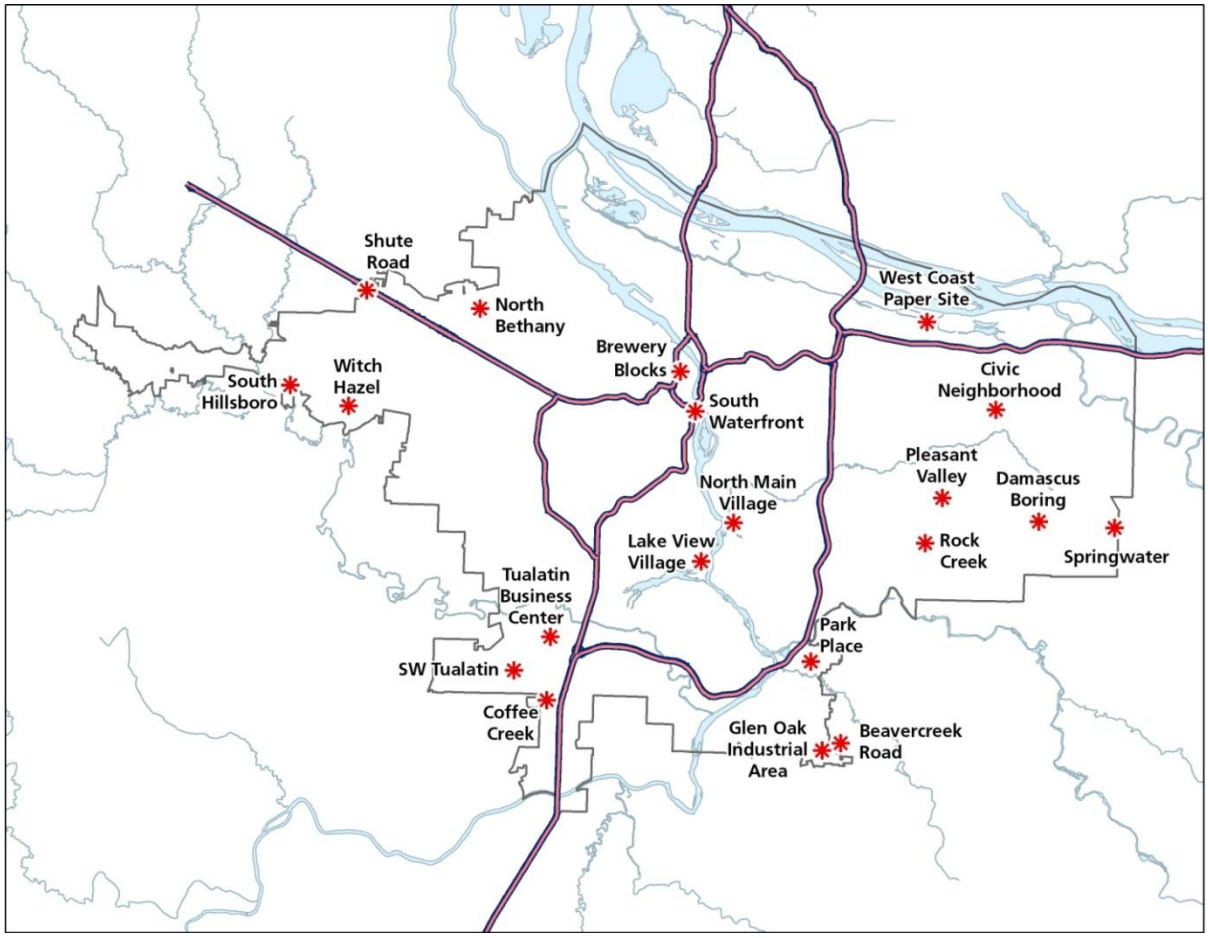
Local Case Study Analysis

The developments used in the local case study analysis are each unique, having different benefits, proposed uses, levels of service, surrounding uses, and topography. Since each case study is distinct, the analysis clearly shows factors that differ between case study areas. So, as a whole, the case studies help to illustrate the general lessons that can be learned from current infrastructure investments and provide one useful means of understanding what factors can influence infrastructure costs.

Although these case studies focus on specific geographic areas, each location exists as part of a larger community. Because of this, it is not possible to isolate every cost or benefit of the study areas relative to those larger communities. For instance, a study area may include amenities (e.g., a public park or a parking structure) that serve surrounding properties. In

another instance, properties near the study area may be providing amenities that benefit the study area. No effort has been made to attempt to quantify these characteristics.

Case study locations



Methods

Types of infrastructure considered

The focus of this analysis is on the following categories of infrastructure:

- Civic buildings, parking structures, public plazas
- Regional facilities such as marine and air ports
- Parks
- Sanitary Sewers
- Schools
- Stormwater
- Transportation
    - Roads, bridges, highways

    - Transit, bike, pedestrian
- Water

Reconciling differences between case studies

Generally speaking, one job will place fewer demands on infrastructure than will one household. However, different kinds of employment can place very different demands on infrastructure. It is also not possible to be exact in comparing costs from one unique geographic area to another.

Because the developments included in this analysis span several years, all costs have been shown in first quarter 2008 dollars.

Return on public investment

In an era of insufficient infrastructure funding, a primary concern for policy makers needs to be the cost effectiveness of different public infrastructure investments. This report is intended to allow for some discussion of the return on public investments in infrastructure. This report documents how much it costs to provide infrastructure to serve new households and employees in each study area. This analysis, however, does not incorporate all of the costs faced by the private sector in building out any given development.

The number of households and jobs created as a result of public infrastructure investment is by no means the only return that should be considered. The quality of the communities that are created through these investments and their possible contributions to local and regional goals are also essential considerations. This report does not attempt to judge the relative benefits of investments in different developments as each area is different.

Infill and Redevelopment

In addition to collecting information on the infrastructure costs of new developments, a survey of over 8,600 residential building permits issued in recent years was conducted in selected jurisdictions in an effort to understand the infrastructure costs of local infill development. These jurisdictions were also asked to report the on- and off-site improvements required for each type of development. The results of this survey, however, did not provide clear and consistent data from which to draw conclusions, due to differences in local jurisdiction's definitions of "infill/minor partitions" and "subdivisions/PUDs", and policies on when off-site infrastructure improvements are required. While there is significant infill and redevelopment activity, and low infrastructure costs associated with that activity, significant variations in policies at the local level made the inclusion of a clear analysis of regional infill costs for this report unfeasible

Types of costs

This analysis used case studies to evaluate and identify factors that can influence infrastructure costs, but it is limited in its scope. Specifically, this report only documents the capital costs of providing new local infrastructure. Nor does it include the cost of ongoing maintenance and operations of public facilities. It should be emphasized that those ongoing costs can be more significant than the initial costs of infrastructure. (A good example would be sewer service to a specific site. It might be initially less expensive to serve the area with pumps than with gravity, but the long-term costs of operating and maintaining a pump system could easily exceed the initial savings.) Finally, this report does not capture the infrastructure costs and savings to individual homeowners and employers in the region.

Different scales of infrastructure

This report divides infrastructure into two categories, depending on the infrastructure's user base:

- Local / community infrastructure
- Regional infrastructure

These two categories are described below.

Local / Community Infrastructure

Local / community facilities are those that are most directly necessitated by a particular development. The costs of these facilities are typically well documented and case studies are a useful way to understand them.

- Costs for newly urbanizing areas were taken from concept plans. These costs are early estimates that will, no doubt, change as plans are refined.

- Costs for urban redevelopment projects were provided by the responsible urban renewal and planning agencies and are for completed projects.

- Costs that were included in concept plans, but that can be categorized as regional costs (e.g., state highway improvements), were deducted from local/community costs.

- Local planning and urban renewal departments had the opportunity to review, comment on and correct case studies within their jurisdictions.

Regional Infrastructure

Regional infrastructure includes facilities such as highways, light rail, bridges, and marine and air terminals. Unlike local and community level facilities, it is difficult to link any particular development with the need for a regional facility. Instead, the need for regional facilities is cumulative in nature and their costs are rarely included in estimates for a particular development. It is also hard to separate the need to replace obsolete regional infrastructure from the need to replace regional infrastructure in order to increase capacity for increased population growth. However, local development does place certain demands on regional facilities and no direct method exists to pay for these regional costs to roads and bridges. Due to these factors, regional infrastructure costs can be difficult to completely isolate and understand, but still need to be considered in this analysis. Therefore, this report includes a general statement of the costs that these case study areas will place on regional infrastructure.

Past studies have focused on the costs of regional infrastructure. The cost assumptions listed below were based on these secondary sources: (Balboni, 2006) (Cogan, Sharpe, Cogan, 1990) (Sonny Conder Fiscal and Economic Consulting, 1991) (Speir & Stephenson, 2002) (United States Bureau of Economic Analysis, 1960-2005) (Waier, 2007).

Given that the trip generation patterns of different non-residential land uses vary so widely (e.g., from retail to warehousing) no effort has been made in this study to quantify the regional infrastructure costs that are attributable to each new job. Instead, each case study lists the projected commute distance in 2035 relative to the regional average, and the reader is encouraged to consider the regional cost implications of new jobs that result in different commute distances.

The estimated average cost of regional infrastructure per dwelling unit in the 7-county area (Clackamas, Multnomah, Washington, Clark, Yamhill, Marion, and Columbia counties) is approximately:

Transportation – transit (variable cost)	$ 3,000
Transportation – roads, bridges (variable cost)	$20,000
Transportation – marine, air (flat cost)	$ 1,500
Public facilities –civic buildings, regional open space, arts and cultural facilities	$ 5,500
Average cost per dwelling unit of regional infrastructure	**$ 30,000**

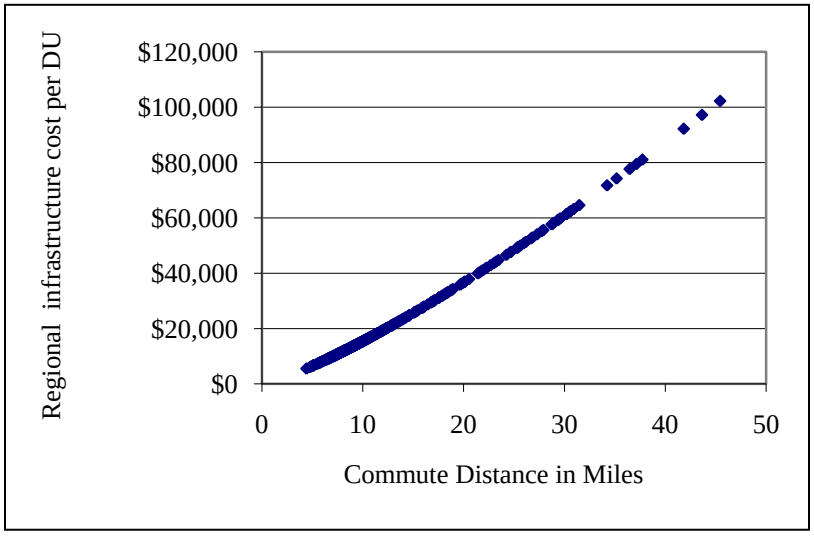
Flat regional infrastructure costs

Using the above-cited sources of cost estimates, flat costs can be applied to each new household (with a somewhat lower assumption for each new job) for marine, air, and other non-transportation regional facilities. These costs are not for specific facilities, but are, instead, intended to represent the typical regional infrastructure demands that new households and jobs create. The use of a flat cost for these facilities is based on the assumption that, generally speaking, most households in the study areas will place similar demands on these types of facilities[1].

Variable regional infrastructure costs

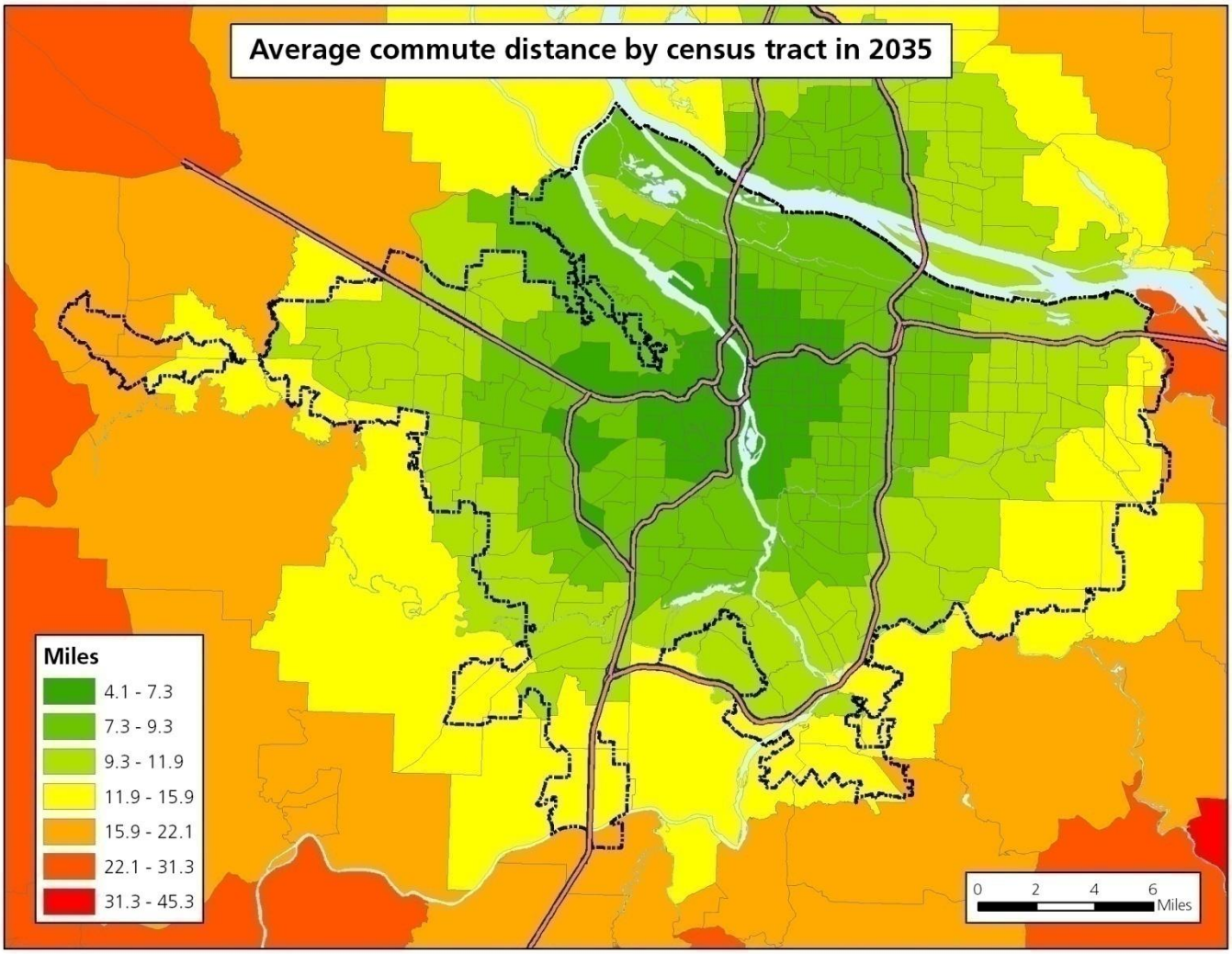
To more accurately represent the differences in demand that different case study locations may place on regional transportation facilities (such as highways, transit and bridges), variable costs can be attributed.

A household that makes longer distance trips places greater demands on transportation facilities than a household that makes shorter trips. A household's demand for regional transportation facilities was assumed to vary according to forecast commute distances[2].



[1] Though this is clearly not the case, a flat cost is used in the absence of a more accurate means of estimating how frequently a particular household may, for instance, use the airport or purchase goods that were received in our region's marine ports.

[2] Though commute travel is a relatively small portion of a household's total travel, it serves as a reasonable proxy for overall travel behavior. Households with relatively short commutes also tend to be relatively close to retail and other services, thereby reducing the length of other trips.



Using MetroScope[3], an integrated land use and transportation forecasting model, commute distances were estimated for new households and jobs in the region by the year 2035[4]. Commute distances that are reported in this analysis are one-way and calculated based on the job and household distributions that result from the modeled scenario.

The MetroScope model does not assume that all workers commute to the central city. Instead, the model measures commute distances from census tracts to a variety of employment centers throughout the region. As a result, proximity to any employment center in the region reduces the commute distance of a census tract.

[3] Because MetroScope cannot predict future policy changes made by cities or actions taken by firms or individuals, these forecasted commute distances are not a foregone conclusion. Policy changes and other dynamics (e.g. new regulations or changes in fuel costs) can serve to shorten or lengthen forecasted commutes. Generally, however, MetroScope scenarios can give reliable estimates of the likely outcomes of a given set of policy choices. The set of assumptions used in this scenario represents an extrapolation of past and current policy direction.

[4] Average commute distances are calculated at the census tract level.

Primary findings

Factors that can influence infrastructure costs

This case study analysis is not a statistical analysis that can definitively determine the effects of any particular factor on infrastructure costs. However, some general lessons can be gleaned. Some factors that can influence the costs of serving new development include:

- Site topography
- Environmental features
- Land ownership patterns
- Distance from existing infrastructure
- Presence or absence of existing infrastructure capacity
- Development density
- Proposed use
- Level of service or quality of amenities
- Travel behavior (of residents or employees)

Site topography

Flat sites tend to be less expensive to serve than sloped sites. For instance, sloped sites can either benefit or complicate the use of gravity systems for water or wastewater or can require the use of a non-grid street network. Sites with steep slopes are also typically built at lower densities, which can also have the effect of increasing the cost of infrastructure.

Environmental features

Though site features such as riparian areas or wetlands can be viewed as green infrastructure (for instance, as open space or as stormwater facilities), their presence can make an area more expensive to serve by reducing the potential development density of a site or by increasing actual construction costs.

Land ownership patterns

Fragmented land ownership patterns can require coordination with numerous land owners and can add time and cost to the development of an area. Having to cross multiple ownerships with streets, trails, or pipelines can add significantly to costs.

Distance from existing infrastructure

Increased distance from existing facilities can raise infrastructure costs. For instance, a new development that is further from existing facilities could require additional lengths of sewer pipe to connect to existing facilities or, an even more expensive proposition, the construction of a new sewage treatment plant.

Presence or absence of existing infrastructure capacity

In most cases, using existing infrastructure capacity before constructing new capacity makes sound financial sense. There is, however, a tipping point at which existing capacity will be fully utilized. This tipping point is inherently captured in these case studies. If additional capacity is necessitated by a particular development, the costs of those facilities have been included, where known.

Development density

Higher density developments tend to be less expensive to serve (on a per unit basis) than lower density developments. The relationship between residential density and infrastructure demand is fairly intuitive – larger lots require more lineal feet of pipes and pavement per household. These increased lengths generally

translate into higher infrastructure costs for both initial construction and long-term maintenance (Speir & Stephenson, 2002).

Despite this general rule, however, the lower density case study areas reveal a great deal of variation in the costs per job or per household. This variation is attributable to the many other factors that can influence costs. These factors may include level of service or the provision of amenities such as parks and sidewalks and other facilities such as schools.

Proposed uses

The case studies include both employment and residential uses and do not indicate that one type of use is inherently more expensive than the other. When considered on a cost-per-job basis, there are examples of both relatively inexpensive (e.g., Shute Road) and relatively expensive (e.g., Lake View Village) employment uses. This small sampling of case studies appears to indicate that variations in costs are contingent upon factors other than land use.

Level of service / quality of amenities

Two of the more important determinants of infrastructure cost are level of service and the presence of community amenities. Different case study areas need different facilities to support their intended use. Some of the case study developments require the entire gamut of new infrastructure facilities while others require little more than the addition of structured parking. This variation in the mix of facilities shows up in the information below. These facilities are all elements of creating great communities and it should be recognized that providing them is desirable.

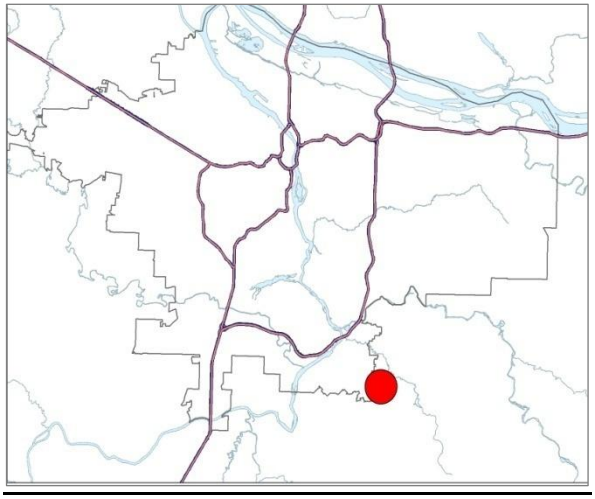
Redevelopment projects that make use of existing facilities can provide a high level of service/amenity, while also controlling costs. This is not to suggest that there are no costs associated with using existing infrastructure capacity, but merely that a large portion of those costs are already sunk and that it makes more sense to use that available capacity where possible.

Travel behavior

The relationship between travel behavior and infrastructure demand is intuitive. More frequent and longer trips place greater demands on the transportation system, resulting in a collective need for more highway, bridge and transit capacity. Residents of areas near employment centers tend to have shorter trips by all modes.

Beavercreek Road concept planning area

Oregon City



Estimated local infrastructure capital costs:
$115,900,000

Total acres:	453
Gross buildable acres:	292
Net new households:	1,450
Net new jobs:	3,652
Avg. commute miles in the year 2035:	17.09

Proposed Use

The plan for this newly urbanizing area envisions a diverse mix of uses (an employment campus north of Loder Road, mixed use districts along Beavercreek Road, and two mixed use neighborhoods). One purpose of the plan is to improve the jobs-housing balance in Clackamas County. Transit-oriented land uses are planned to increase the feasibility of transit service in the future. The concept area is adjacent to Clackamas Community College, providing workforce-training opportunities for future area residents and employees.

Existing Conditions and planned improvements – Beavercreek Road

Transportation

The site is adjacent to Beavercreek Road and south of the intersection of Highways 213 and 205. Traffic on Highway 213 is congested during peak hours. Beavercreek Road is a major local connector. There is very limited bike and pedestrian infrastructure. Of the projected infrastructure costs, 57% 0f the local share is for transportation improvements. It should also be noted that regional infrastructure costs will be affected

by average commute distances from the Beavercreek area that are nearly 5 miles longer than the regional average.

Commute Distances
Longer travel distances translate into a need for more regional infrastructure per household. Residents of the census tract that comprises the Beavercreek Road area are forecasted to have an average commute distance of 17.09 miles in the year 2035, significantly higher than the 7-county average (12.32 miles).

Water
Water is sourced from the Clackamas River. While there is sufficient water supply, the study area currently lacks an onsite distribution system.

Wastewater
An existing treatment plant has the capacity to serve the study area. There is a 12-inch sewer trunk that runs the length of Beavercreek Road, but this line lacks the capacity to serve the projected development.

Stormwater
The concept plan area drains into two basins, Abernethy Creek and Caufield Creek, both of which drain into the Willamette River, south of downtown Oregon City. Stormwater systems are largely undeveloped. This is one reason why stormwater infrastructure costs are expected to be significantly above the regional average at 22% of the total local infrastructure costs. The Beavercreek Road concept plan calls for green streets and onsite stormwater management. The plan also includes public open space in areas designated for natural stormwater treatment, which is intended to serve a dual function as both park and stormwater conveyance.

Parks, plazas, public places
There are no existing public parks within the plan area. There is an existing golf course on a portion of the site.

How do Beavercreek Road's infrastructure costs add up?

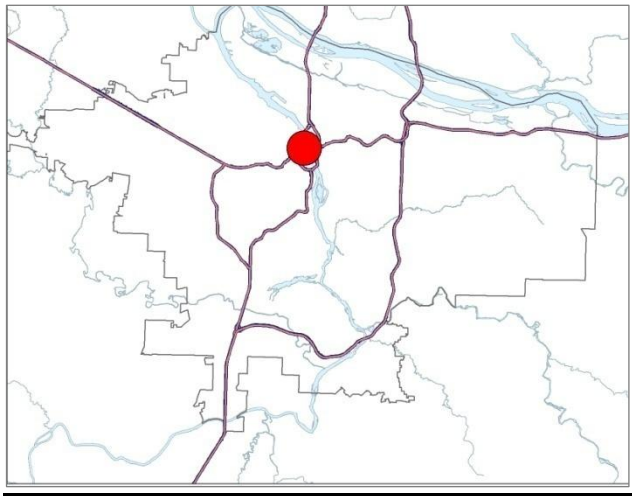
Estimated local infrastructure capital costs:

	Beavercreek Rd.
Transportation	$66,300,000
Transit, Bike, Pedestrian	-
Sewer	$8,500,000
Water	$15,900,000
Stormwater	$25,200,000
Parks	-
Other	-
Total	$115,900,000

Note that costs are related to both housing and job creation. Approximately 57% of costs are attributed to transportation infrastructure and approximately 22% are attributed to stormwater systems, including natural stormwater areas. The concept plan for the Beavercreek Road area does not project the need for any additional schools as a result of this development. Costs for regional transportation improvements (not included above) are significantly higher than average, due to commute distances projected to 2035.

Brewery Blocks

Portland



Estimated local infrastructure capital costs
$40,647,000

Total acres:	4.6
Gross buildable acres:	4.6
Net new households:	113
Net new jobs:	2,440
Avg. commute miles in the year 2035:	4.99

Proposed Use (completed project)

The Brewery Blocks redevelopment consists of a mix of high-density residential and commercial uses. The primary focus has been on job creation, with roughly 20 times as many new jobs as new housing units. It should be noted that the Brewery Blocks are located within a thriving redevelopment area of Portland, with the activities within this area completely interconnected with surrounding land uses. The Brewery Blocks have been able to take advantage of existing facilities, including transit, sewer, water, parks, and streets.

Existing Conditions – Brewery Blocks

Transportation

An urban street grid exists and the area is accessible by multiple modes. The streetcar system was developed as a part of the larger River District redevelopment. Many of the residents and employees within the Brewery Blocks are able to meet their transportation needs without their own motor vehicles.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include the Brewery Blocks are forecasted to have an average commute distance of 4.99 miles in the year 2035, considerably shorter than the 7-county average of 12.32 miles. This is expected to significantly reduce regional infrastructure costs over time.

Water
Sufficient water facilities already existed within the area in advance of development.

Wastewater
Sufficient wastewater facilities already existed within the area in advance of development.

Stormwater
Sufficient stormwater facilities already existed within the area in advance of development.

Parks, plazas, public places
Though there are no public parks within the Brewery Blocks, the development is able to take advantage of an existing park system that includes the North and South Park Blocks, Jamison Square, and Tanner Springs.

Structured parking and other improvements: The public costs associated with the redevelopment of the Brewery Blocks were attributed to the construction of structured parking, provision of street furnishings, and sidewalk improvements.

How do the Brewery Blocks' infrastructure costs add up?

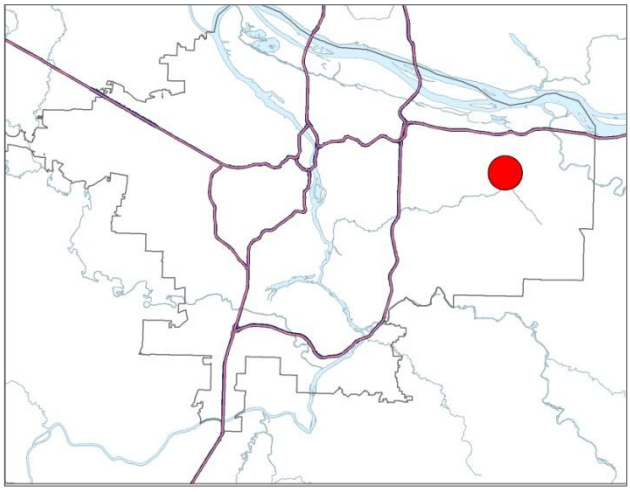
Estimated local infrastructure capital costs:

	Brewery Blocks
Transportation	-
Transit, Bike, Pedestrian	-
Sewer	-
Water	-
Stormwater	-
Parks	-
Other (See structured parking and other improvements, noted above)	$40,647,000
Total	$40,647,000

Note that, if all costs were related to job creation, the local infrastructure costs would average less than $17,000 per new job. Costs for regional transportation improvements attributed to the Brewery Blocks (not included above) are significantly lower than average, due to commute distances projected to 2035.

Civic Neighborhood

Gresham



Estimated local infrastructure capital costs: $11,606,000

Total acres:	5
Gross buildable acres:	5
Net new households:	636
Net new jobs:	2,433
Avg. commute miles in the year 2035:	11.13

Proposed Use

The City of Gresham intends the Civic Neighborhood, a redevelopment project, as an extension of its downtown. The area consists of a mix of residential, retail, and office uses served by transit. This case study area represents a 5 acre portion of the larger 130 acre Civic Neighborhood.

Existing Conditions and Planned Improvements – Civic Neighborhood

Transportation

The site is bisected by a light rail line and is served by four-lane major arterials and one local connector: Burnside Road, Division St., Eastman Parkway and the two-lane Wallula Road. Division St. was recently improved.

The bulk of projected Civic Neighborhood infrastructure costs are attributable to transit ($6,194,000) and transportation ($3,413,000) improvements.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that includes Civic Neighborhood are forecasted to have an average commute distance of 11.13 miles in the year 2035, more than a mile less than the 7-county average of 12.32 miles.

Water
The site is integrated into Gresham's existing water infrastructure.

Wastewater
The site is integrated into Gresham's existing sewer infrastructure.

Stormwater
Stormwater is handled by existing City of Gresham infrastructure.

Parks, plazas, public places
Though there are no parks within the Civic Neighborhood area, it is being developed with a pedestrian orientation.

Existing facilities: Civic Neighborhood is able to take advantage of existing facilities, including streets, sewer and water.

How do Civic Neighborhood's infrastructure costs add up?

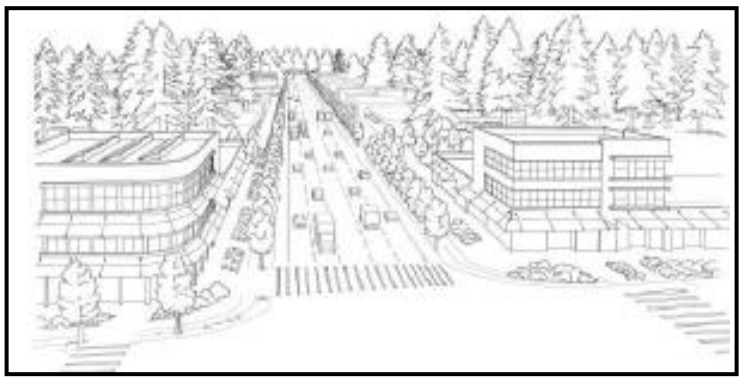
Estimated local infrastructure capital costs:

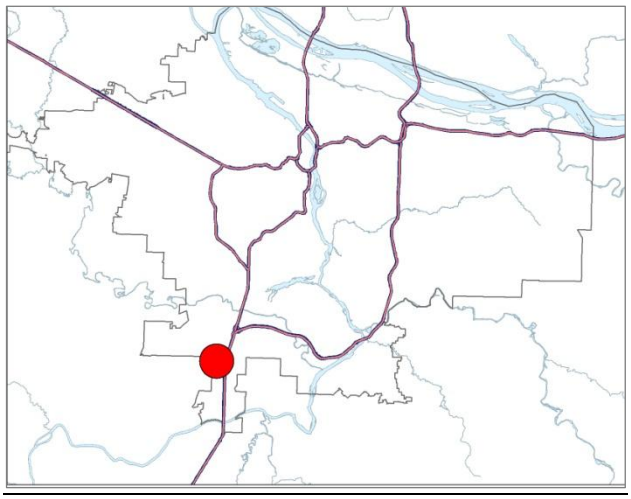
	Civic Neighborhood
Transportation	$3,413,000
Transit, Bike, Pedestrian	$6,194,000
Sewer	$366,000
Water	$266,000
Stormwater	$1,365,000
Parks	-
Other	-
Total	$11,606,000

Note that, even if all costs were related to job creation, the local infrastructure costs would average less than $5,000 per new job. More than 50% of all local infrastructure costs in the Civic Neighborhood are attributed to transit, bicycle, and pedestrian improvements. Costs for regional transportation improvements (not included above) are lower than average, due to commute distances projected to 2035.

Coffee Creek (1) master plan area

Wilsonville





Estimated local infrastructure capital costs:
$ 8,058,000

Total acres:	216
Gross buildable acres:	196
Net decrease in households:	10
Net new jobs:	1,474
Jobs per gross buildable acre:	7.5
Avg. commute miles in the year 2035:	12.82

Proposed Use

The Coffee Creek area is being planned as an employment area and is mapped as a Regionally Significant Industrial Area. Note that the area is planned to have no net increase in residential uses.

Existing Conditions and planned improvements – Coffee Creek

Transportation

The area is within 1/2 mile of the Wilsonville I-5 north interchange, with vehicle access via SW Lower Boones Ferry Road, Day Road and SW Grahams Ferry Road. There are few existing bicycle and pedestrian facilities and no transit service within the Coffee Creek Master Plan area. The closest transit stop is located nearby with a SMART bus line that provides stops along 95th Avenue and Commerce Circle (within ½ mile of the Master Plan area). West side commuter rail also provides service to the area. Over half of Coffee Creek's projected local infrastructure costs are attributable to transportation improvements ($4,518,000).

Commute distance

Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that includes Coffee Creek are forecasted to have an average commute distance of 12.82 miles in the year 2035. This distance is ½ mile longer than the average for the 7-county region (12.32 miles).

Water
Water main transmission supply lines exist through the central and southern portions of the Master Plan area. An additional reservoir will be needed at some point to provide adequate peak capacity prior to build out of the Master Plan area.

Wastewater
Sewer main trunk links are located within the central portion of the Coffee Creek Master Plan area. Site survey work will need to occur and the City will need to update its sewer system model to determine on and offsite sewer system improvements and trunk line size/location, pump station requirements, and more detailed cost estimates.

Stormwater
The north tributary to Basalt Creek is located south of Day Road. Basalt Creek drains into Coffee Creek Lake and extends north of Day Road into the City of Tualatin UGB. The master plan area is relatively flat with topography that varies only a few feet in elevation, and gently slopes from north to south. The City requires each new development within the Coffee Creek Industrial Master Plan area to detain and treat run off.

Parks, plazas, public places
There are no existing park facilities within the Master Plan area.

How do Coffee Creek's infrastructure costs add up?

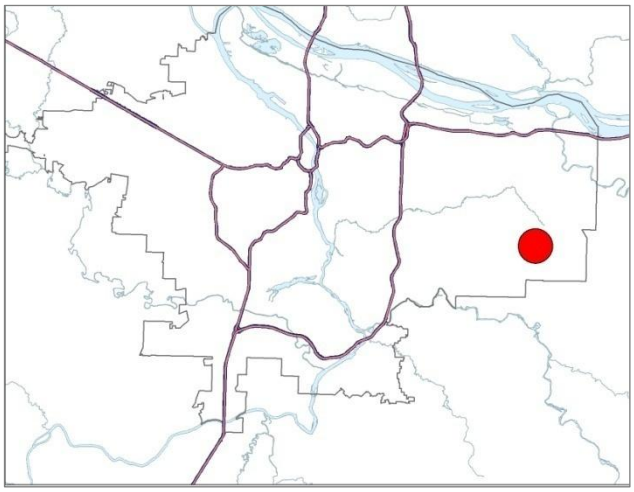
Estimated local infrastructure capital costs:

	Cost per job	Totals
Transportation	$3,065	$4,518,000
Transit, Bike, Pedestrian	-	-
Sewer	$1,038	$1,530,000
Water	$773	$1,140,000
Storm	$204	$300,000
Parks	$387	$570,000
Other	-	-
Total	$5,467	$8,058,000

Note that all costs are related to job creation. The local infrastructure costs are projected to average less than $5,500 per new job. More than 55% of all local infrastructure costs in the Coffee Creek area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly higher than average, due to commute distances projected to 2035.

Damascus / East Happy Valley Concept Plan

Damascus and Happy Valley



Estimated local infrastructure capital costs: $3,119,295,000

Total acres:	12,200
Gross buildable acres:	5,739
Net new households:	21,934
Net new jobs:	45,000
Avg. commute miles in the year 2035:	13.5

Proposed Use

The Damascus area is a newly urbanizing area, and is being planned as a new community that will include a variety of housing densities, mixed-use areas, and employment zones. The study area includes both the City of Damascus and some land in eastern Happy Valley. The concept plan has not yet been adopted. With estimated local infrastructure capital costs totaling more than $3 billion, it is easy to see why creating a new city is so difficult.

Existing Conditions and planned improvements -- Damascus

Transportation

The area is served by a transportation system that was designed for farm-to-market travel purposes. The street system is primarily made up of narrow, two-lane roads that carry urban levels of traffic. Highway 212, 172nd Avenue, Foster Road, 242nd Avenue, 222nd Avenue and Sunnyside Road are the primary routes that connect the communities of Damascus and Boring to other parts of the region. Some roads perform adequately during rush hour, but significant congestion and safety issues exist in the current Damascus city center (where Sunnyside, Highway 212, and Foster Road converge). Streets do not have bicycle and pedestrian facilities, except for sidewalks along limited sections of Highway 212 in the Damascus and Boring rural centers. Transit service is limited to two bus lines; a park-and-ride lot is located in Carver. The majority of the study area is located outside of the TriMet service boundary. $1,731,623,000 of the

projected local infrastructure costs for Damascus are for transportation improvements. Regional transportation facilities (Sunrise Hwy) have not been included in the cost estimates.

Commute distance: Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tracts that comprise the Damascus area are forecasted to have an average commute distance of 13.5 miles in the year 2035. This distance is more than a mile longer than the average for the 7-county region (12.32 miles).

Water
Two water districts, the Boring Water District and the Sunrise Water Authority, serve portions of the study area. Substantial portions of the area have no public water service.

Wastewater
Most of the primary study area has no sanitary sewer service. Only the far eastern edge of Damascus (Rock Creek corridor) has sanitary service. There are no sanitary sewage treatment facilities within the primary study area. There is a small, publicly-owned sanitary sewage treatment facility in the Boring rural center, but it is not available for additional hook-ups.

Stormwater: There is no existing public stormwater service in the study area.

Parks, plazas, public places
North Clackamas County contains a wide range of regional, state and county parks and recreation facilities. Metro owns a parcel in the Damascus Buttes area. Clackamas County, the City of Portland, and the state own the right-of -way for the Cazadero and Springwater trails, which are currently undeveloped. Clackamas County provides parks near the study area, including Barton Park, a 116-acre county recreation facility located along the Clackamas River.

Topography / natural features: Buttes and transition areas (15-25% slopes) cover large portions of the Damascus area. Riparian areas are also found throughout the concept plan area. These features reduce average densities, making each unit more expensive to serve. The topography is expected to split the wastewater system to the east and to the west, resulting in increased cost of collection and conveyance. Existing treatment facilities are located some distance from the urban centers.

How do Damascus' infrastructure costs add up?

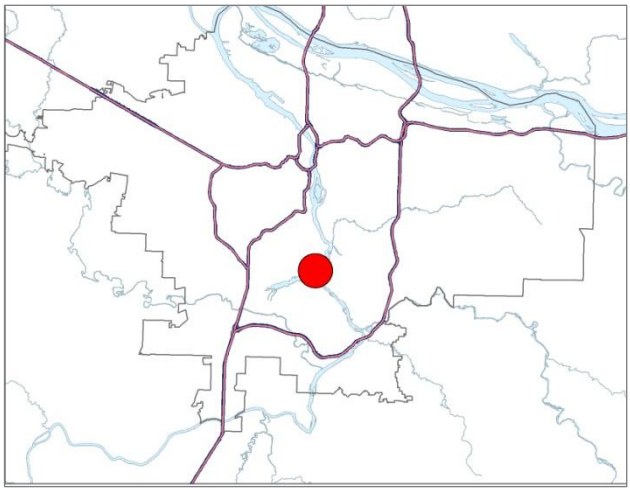
Estimated local infrastructure capital costs:

	Damascus
Transportation	$1,731,623,000
Transit, Bike, Pedestrian	-
Sewer	$162,200,000
Water	$282,843,000
Stormwater	$75,712,000
Parks	$390,203,000
Other	$476,674,000
Total	$3,119,295,000

Note that costs are related to both new housing and job creation. More than 55% of all local infrastructure costs in the Damascus area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly higher than average, due to commute distances projected to 2035.

Lake View Village Center

Lake Oswego



Estimated local infrastructure capital costs:
$5,116,000

Total acres:	2.39
Gross buildable acres:	2.39
Net new households:	0
Net new jobs:	207
New jobs per gross buildable acre:	86.6
Avg. commute miles in the year 2035:	8.83

Proposed Use (project completed)

Lake View Village Center is a redevelopment project that includes mixed uses (restaurant, retail, office) with structured parking. Although the Lake View Village Center development included no housing units, this commercial development has stimulated the construction of numerous housing units on surrounding blocks. The focus has been on job creation, and on stimulating new development in the rest of downtown Lake Oswego. The land uses resulting from redevelopment of this area are completely interconnected with surrounding land uses. This area has been able to take advantage of existing facilities, including sewer, water, parks, and streets.

Existing Conditions – Lake View Village Center

Transportation
An existing street network serves the area.

Commute distance: Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include Lake View Village are forecasted to have an average commute distance of about 8.83 miles in the year 2035, approximately 3 ½ miles less than the 7-county average of 12.32 miles

Water
Adequate water supply exists for the plan area.

Wastewater
Adequate sewer capacity exists in the plan area.

Stormwater
Adequate capacity to handle stormwater exists in the plan area.

Parks, plazas, public places
Millennium Plaza Park is adjacent to the project area.

Structured parking: Most of the local infrastructure costs are attributable to the construction of a structured parking garage which provides service to the subject area and to surrounding businesses.

How do Lake View Village's infrastructure costs add up?

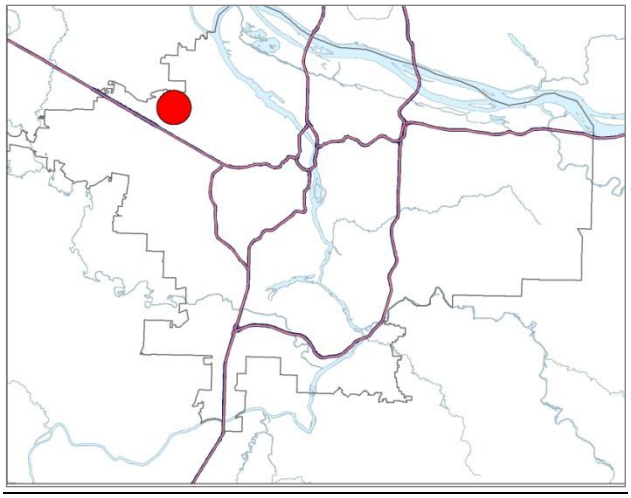
Estimated local infrastructure capital costs:

	Cost per job	Totals
Transportation	$3,850	$797,000
Transit, Bike, Pedestrian	-	-
Sewer	-	-
Water	-	-
Storm	-	-
Parks	-	-
Other	$20,865	$4,319,000
Total	$24,715	$5,116,000

Note that all costs are related to job creation. The local infrastructure costs averaged almost $25,000 per new job. More than 80% of all local infrastructure costs in the Lake View Village development are attributed to the construction of a public parking structure. Costs for regional transportation improvements (not included above) are considerably lower than average, due to average commute distances projected to 2035.

North Bethany concept planning area

Washington County



Estimated local infrastructure capital costs:
$416,633,000

Total acres:	800
Gross buildable acres:	680
Net new households:	5,000
Net new jobs:	276
Avg. commute miles in the year 2035:	11.92

Proposed Use

The North Bethany area is a newly urbanizing area that is being planned as a primarily residential community with ancillary commercial and institutional uses.

Existing Conditions and planned improvements – North Bethany

Transportation

Major transportation facilities in the vicinity of the plan area include Springville Rd., Kaiser, 185th, and Germantown Rd. There is bus service on Springville, 185th, and Kaiser. The Concept Plan includes costs for off-site improvements (Bethany Blvd. / US 26 overpass). Those costs have not been included in North Bethany's local infrastructure costs since they are regional facilities.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that comprises North Bethany are forecasted to have an average commute distance of 11.92 miles in the year 2035, slightly lower than the 7-county average (12.32 miles).

Water
The current source of water in the concept area is private wells. When developed, the area will be served by Tualatin Valley Water District.

Wastewater
Wastewater is currently handled on-site through the use of septic systems.

Stormwater
Stormwater runoff from the project site follows the natural topography, and is generally managed by several stream channels and culverts. The western end of the project site drains directly to Rock Creek. The remainder of the site is the headwaters of small drainages that are tributaries to Abbey Creek and Bethany Creek.

Topography and natural areas
The North Bethany area is relatively flat with the exception of the northern portion, which is sloped. A number of riparian zones cross the area.

Parks, plazas, public places
Though there are a number of open spaces, trails, and parks in the vicinity, there are no such areas that currently exist within the concept plan area. Envisioned as a "Community of Distinction," the North Bethany Concept Plan projects significant amounts of parkland ($38,700,000 estimated cost). These parks would match the level-of-service standards of the Tualatin Hills Park and Recreation District.

Schools: North Bethany's local infrastructure costs include the construction of 3 schools ($90 -$111 million). These projected costs include both land purchase and school construction.

How do North Bethany's infrastructure costs add up?

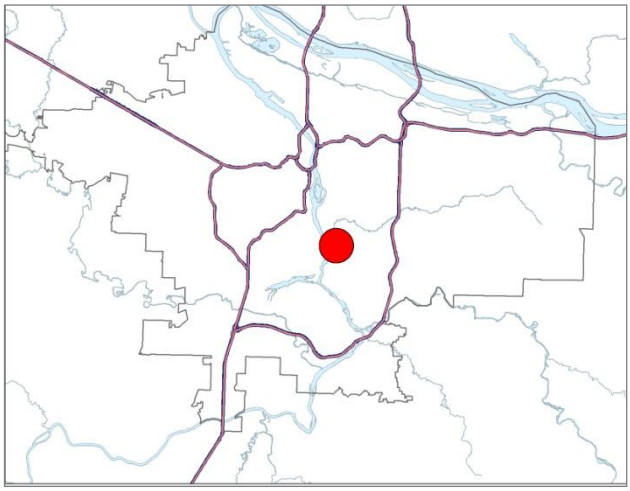
Estimated local infrastructure capital costs:

	North Bethany
Transportation (including Transit, Bike, Pedestrian)	$170,460,000
Sewer	$14,602,000
Water	$16,873,000
Stormwater	$14,926,000
Parks	$41,858,000
Other (schools, fire station and civic building)	$157,914,000
Total	$416,633,000

Note that, if all costs were related to housing, the local infrastructure costs would average about $83,500 per housing unit. More than 40% of all local infrastructure costs in the North Bethany area are attributed to transportation improvements. Washington County also calculated an additional $23,000,000 cost in providing affordable housing and another $131,300,000 in off-site transportation improvements (not included above). Costs for regional transportation improvements (not included above) are slightly lower than average, due to commute distances projected to 2035.

North Main Village

Milwaukie



Estimated local infrastructure capital costs
$ 919,000

Total acres:	1.9
Gross buildable acres:	1.9
Net new households:	95
Net new jobs:	40
Avg. commute miles in the year 2035:	7.99

Proposed Use (completed)

North Main Village is a redevelopment project located in downtown Milwaukie that consists of three-story townhomes, each with a garage and ground floor commercial element with two stories of living space above. The project also includes twenty condominium units.

Existing Conditions – North Main Village

Transportation

North Main Village's location in an already urbanized setting affords it access to existing transportation facilities including the Milwaukie Transit Center. However, transportation improvements are necessary to serve the area's growth.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that includes North Main Village are forecasted to have an average commute distance of 7.99 miles in the year 2035, considerably lower than the 7-county average of 12.32 miles. This is expected to reduce regional infrastructure costs over time.

Water
Existing water facilities are sufficient to serve North Main Village.

Wastewater
Existing wastewater facilities are sufficient to serve North Main Village.

Stormwater
Existing stormwater facilities are sufficient to serve North Main Village.

Parks, plazas, public places
North Main Village has no on-site parks, but a number of parks are nearby: Milwaukie Riverfront Park, Scott Park, and Dogwood Park.

Land write-downs
About $108,000 is attributable to land write-downs (included in "other" costs).

How do North Main Village's infrastructure costs add up?

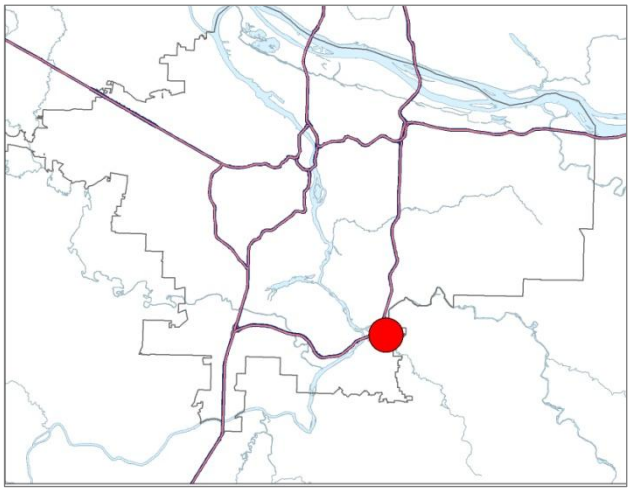
Estimated local infrastructure capital costs:

	North Main Village
Transportation	$811,000
Transit, Bike, Pedestrian	-
Sewer	-
Water	-
Stormwater	-
Parks	-
Other	$108,000
Total	$919,000

More than 88% of all local infrastructure costs in the North Main Village area are related to transportation improvements. Costs for regional transportation improvements (not included above) are significantly lower than average, when compared to commute distances projected to 2035.

Park Place concept planning area

Oregon City



Estimated local infrastructure capital costs:
$ 71,760,000

Total acres:	480
Gross buildable acres:	266
Net new households:	1,458
Net new jobs:	0
New households per gross buildable acre:	5.48
Avg. commute miles in the year 2035:	12.27

Proposed Use

Park Place is a newly urbanizing area, planned as a residential community with neighborhood retail and service uses. A developer has been consolidating ownership of over half of the plan area. It is hoped that ownership consolidation will simplify the provision of public facilities.

Existing Conditions and planned improvements – Park Place

Transportation

Isolated portions of the roadway system experience congestion and delays. The Highway 213 corridor is approaching capacity, particularly on the segment between Redland Road and the I-205 interchange. The public transit system provides limited service to this low-density, suburban location. The bicycle and pedestrian systems are incomplete, but plans exist to make incremental improvements. Park Place's transportation costs are projected to be $58,400,000, and make up the bulk of its local / community level infrastructure costs.

Commute distance

Travel distances correlate to more regional infrastructure needed per household. Park Place residents are forecasted to have an average commute distance of 12.27 miles in the year 2035. This distance is about average for the 7-county region (12.32 miles).

Water
Water conveyance facilities are limited within the study area. The Oregon City water system has sufficient water supply to serve the study area.

Wastewater
Limited wastewater collection facilities exist within the study area. Most properties are on septic systems. Two trunk interceptor lines, owned by the Tri-City Sewer District, pass through the study area. These interceptors connect with the Highway 213/ Newell interceptor, which conveys their flows to the wastewater treatment plant. These interceptors and the treatment plant have capacity to serve future development within the study area.

Stormwater
Stormwater is currently managed with roadside ditches and natural drainage channels. No other major stormwater facilities exist on site. All stormwater within the study area is conveyed to Abernethy Creek, Newell Creek, and Livesay Creek. Abernethy Creek and Newell Creek are subject to occasional flooding.

Topography / natural features
Large portions of the Park Place concept area have limited development potential because of constraints such as steep slopes and wetlands. These natural features provide valuable site amenities.

Parks, plazas, public places
Clackamas County and Metro own open spaces within the concept plan area.

How do Park Place's infrastructure costs add up?

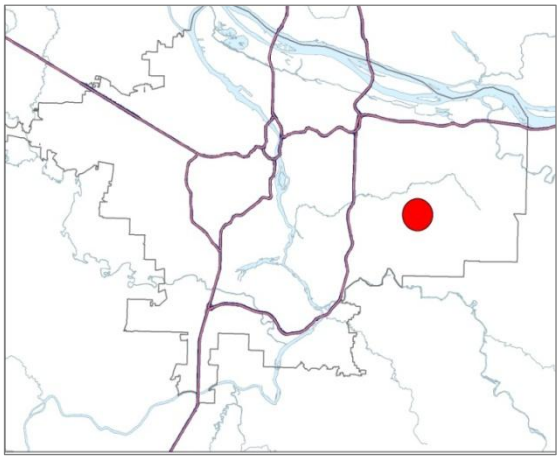
Estimated local infrastructure capital costs:

	Cost per housing unit	Totals
Transportation	$40,055	$58,400,000
Transit, Bike, Pedestrian	-	-
Sewer	$3,780	$5,520,000
Water	$2,606	$3,800,000
Storm	$562	$820,000
Parks	$2,209	$3,220,000
Other	-	-
Total	$49,218	$71,760,000

Note that all costs are related to new housing. The local infrastructure costs are projected to average more than $49,000 per housing unit. More than 80% of all local infrastructure costs in the Park Place area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are about average, due to commute distances projected to 2035.

Pleasant Valley concept planning area

Gresham and Portland



Estimated local infrastructure capital costs:
$304,073,000

	Phase I	Total Area
Total acres:	243	1,530
Gross buildable acres:	120	1,071
Net new households:	656	4,926
Net new jobs:	0	4,935
Avg. commute miles in the year 2035:	10.8	10.8

Proposed Use

Pleasant Valley is a newly urbanizing area that is planned with a town center, residential neighborhoods, and employment zones. Of the total planning area, approximately 290 acres are within the City of Portland and the remainder (1,140 acres) is in the City of Gresham. To date, Gresham has completed the sewer improvements for Phase I of the development of Pleasant Valley. The information for the Gresham Phase I land, households, and jobs is displayed in the table above, compared with the total concept plan area. Estimated costs for both the Gresham Phase I and the long range cost estimates over a 30-year time period that will be shared by Portland and Gresham are displayed in the table below.

Existing Conditions and Planned Improvements – Pleasant Valley

Transportation

Most new residents will access the development from 190th/Pleasant View Drive. This facility is currently a two-lane rural road, but under the plan will become a 4-5 lane, multi-modal roadway.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that comprise the Pleasant Valley area are forecasted to have an average commute distance of about 10.8 miles in the year 2035, lower than the 7-county average (12.32 miles).

Water

The area is primarily served by private wells. Upon development, water will be served by the City of Gresham and the City of Portland.

Wastewater

Wastewater is handled with private septic systems. Upon development, water will be served by the City of Gresham and the City of Portland.

Stormwater
Stormwater is currently directed to ditches along local roads. Following development, the area will be served by a regional detention system, maintained by the City of Gresham.

Parks, plazas, public places
An open space and parks master plan has been developed for Pleasant Valley. Following development, the area will be served by an open space and parks system that meets current City of Gresham standards.

Topography
The Pleasant Valley area is mostly rolling, but has a number of riparian areas.

Green practices
Most of the streets will be green streets. All stream crossings will use bridges (no culverts).

How do Pleasant Valley's infrastructure costs add up?

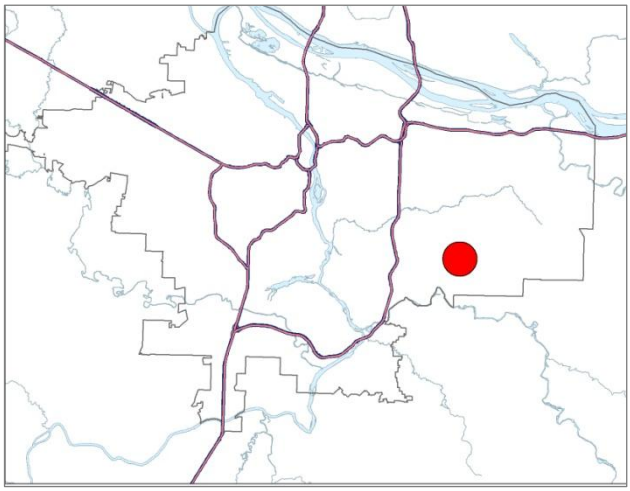
Estimated local infrastructure capital costs:

	Pleasant Valley	
	Phase I	**Total Area**
Transportation	$15,000,000	$103,823,000
Transit, Bike, Pedestrian	-	-
Sewer	$9,000,000 (completed)	$22,686,000
Water	$6,000,000	$21,172,000
Stormwater	-	$32,213,000
Parks	-	$70,186,000
Other	-	$53,993,000
Total	30,000,000	$304,073,000

Note that costs are related to a mix of new housing and new jobs. Approximately 34% of all local infrastructure costs in the Pleasant Valley area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly lower than average, when compared to commute distances projected to 2035.

Rock Creek concept planning area

Happy Valley



Estimated local infrastructure capital costs
$ 48,796,000

Total acres:	670
Gross buildable acres:	357
Net new households:	2,815
Net new jobs:	619
Avg. commute miles in the year 2035:	10.72

Proposed Use

Rock Creek is a newly urbanizing area that is planned for residential, mixed-use, and employment uses.

Existing Conditions and Planned Improvements – Rock Creek

Transportation
Two-lane rural roads with soft shoulders and roadside drainage ditches are typical in the plan area. Approximately 2/3 of Rock Creek's local infrastructure costs are attributable to transportation improvements ($33,576,000). Roads, including Sunnyside Road, and 147th Avenue, have been improved to urban standards to provide multimodal access.

Commute distance
Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include the Rock Creek area are forecasted to have an average commute distance of 10.72 miles in the year 2035, less than the 7-county average (12.32 miles).

Water
Two wells and water from the Clackamas River supply the area. According to the Mt. Scott Water District, all necessary facilities are in place for any new developments in the planning area with the exception of a 12" water line for the higher areas.

Wastewater
There are three points of connection to the existing sewer system. There will need to be additional pumps installed in order to get the effluent to a point where a gravity flow system will work.

Stormwater
Storm drainage in the area is mostly over land, with some culverts under existing roads and ditches running alongside these roads. The area is split into two drainage areas that flow into Rock Creek and Sieben Creek.

Parks, plazas, public places
The area does not have any existing parks.

Topography
The Rock Creek area has slopes to the north (over 30% slopes) and Rock Creek and its tributaries flow through the area. South of Sunnyside Road, the area is relatively flat.

How do Rock Creek's infrastructure costs add up?

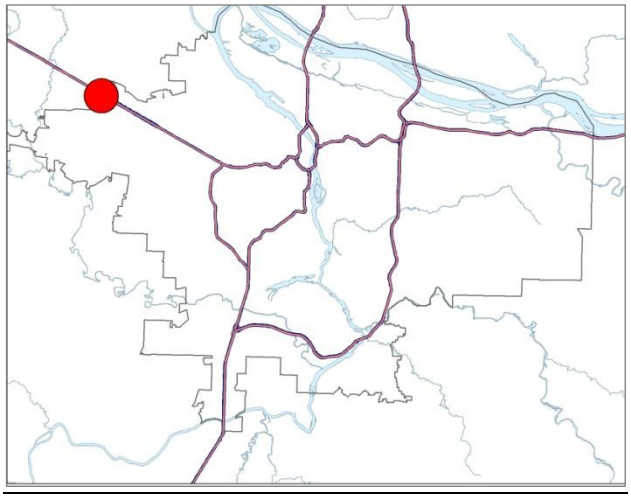
Estimated local infrastructure capital costs:

	Rock Creek
Transportation	$33,576,000
Transit, Bike, Pedestrian	-
Sewer	$1,076,000
Water	$3,185,000
Stormwater	$4,664,000
Parks	$6,295,000
Other	-
Total	$48,796,000

Note that most costs are related to housing. Almost 70% of all local infrastructure costs in the Rock Creek area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly lower than average, when compared to commute distances projected to 2035.

Shute Road concept planning area

Washington County



Estimated local infrastructure capital costs:
$ 9,136,000

Total acres:	215
Gross buildable acres:	175
Net new households:	0
Net new jobs:	3,660
New jobs per gross buildable acre:	20.91
Avg. commute miles in the year 2035:	13.99

Proposed Use

The Shute Road concept area is a newly urbanizing area that is being planned to provide large lots for industrial uses. Genentech, an international biomedical manufacturer, has acquired nearly half of this site (85 acres). Genentech has developed phase 1 facilities and will provide 300-400 jobs in the first phase. Genentech has developed approximately 15% of the total planning area.

Existing Conditions and Planned Improvements – Shute Rd.

Transportation

The site is adjacent to the Shute Road exit of the Sunset Highway. Shute Road and Evergreen Road, both five-lane local connectors, intersect at the southwest corner of the site. Approximately 2/3 of local infrastructure cost for the Shute Road area is attributable to transportation improvements ($6,350,000).

Commute distance

Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that comprises the Shute Rd. area are forecasted to have an average commute distance of 13.99 miles in the year 2035, longer than the 7-county average (12.32 miles).

Water

Water mains run along Shute Road and Evergreen Road, adjacent to the site.

Wastewater

There are currently no sanitary lines running though the site. One trunk line runs up Evergreen Road to the corner of the site and another line dead-ends into Shute Road near the center of the site.

Stormwater

Storm lines parallel water lines along Shute Road and Evergreen Road.

Parks, plazas, public places
There are no existing public parks or green spaces within the site.

Topography
The Shute Rd. concept area is relatively flat with a small riparian area associated with Waibel Creek. The area around the creek is not considered to be wetland.

How do Shute Road's infrastructure costs add up?

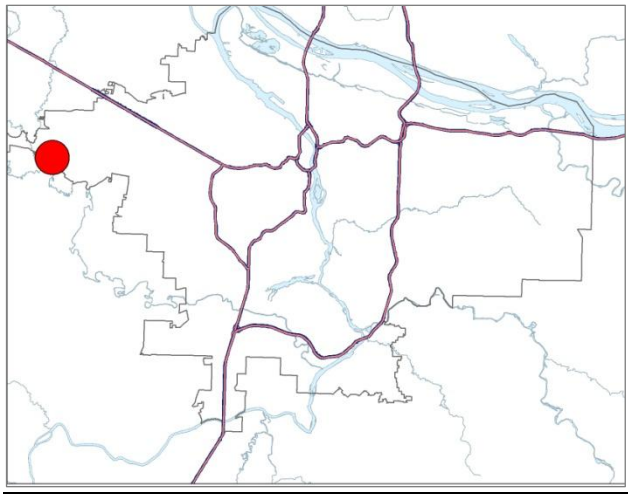
Estimated local infrastructure capital costs per new job:

	Cost per job	Totals
Transportation	$1,735	$6,350,000
Transit, Bike, Pedestrian	-	-
Sewer	$264	$967,000
Water	$169	$619,000
Stormwater	$328	$1,200,000
Parks	$387	$570,000
Other	-	-
Total	$2,496	$9,136,000

Note that all costs are related to new job creation. Approximately 70% of all local infrastructure costs in the Shute Road area are attributed to transportation improvements. Roughly 13% of costs are for stormwater conveyance. Costs for regional transportation improvements (not included above) are slightly higher than average, when compared to commute distances projected to 2035.

South Hillsboro concept planning area

Hillsboro



Estimated local infrastructure capital costs:
$295,517,000

Total acres:	1,565
Gross buildable acres:	1,030
Net new households:	10,182
Net new jobs:	879
Avg. commute miles in the year 2035:	12.2

Proposed Use

South Hillsboro is an area that includes land both inside and adjacent to the Urban Growth Boundary. The concept plan for the area includes residential, retail, and office uses. Note that the area is planned to include roughly 11 ½ housing units for each new job.

Existing Conditions and Planned Improvements – South Hillsboro

Transportation

Current transportation facilities generally consist of two lane sections without curbs. Drainage crossings are primarily culverts with some minor retaining / transition structures. At-grade railroad crossings connect the study area to Tualatin Valley Highway.

Commute distance

Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that comprises the South Hillsboro area are forecasted to have an average commute distance of 12.2 miles in the year 2035, slightly less than the 7-county average.

Water
Existing 8" and 10" waterlines to the northwest of the study area provide distribution to current development in that area and will eventually be connected to the grid for the South Hillsboro planning area. An existing 42" transmission line is located at the south side of the railroad tracks along the north edge of the South Hillsboro planning area. Connection to this line will be made to serve south into the planning area.

Wastewater
A 24" trunk sewer in Davis Road extending from the River Road Pump Station to SW 234th Avenue is currently being constructed. The trunk sewer is designed to serve 525 acres, including a significant portion of the South Hillsboro planning area. Area 71 is within this service area. The Clean Water Services "Aloha Pump Station" on SW 209th Avenue near SW Stoddard Drive and the Cross Creek Pump Station further south on 209th Avenue near SW Murphy Lane can serve Area 69 of the South Hillsboro planning area.

Stormwater
Development to the west and north of the study area includes storm drainage conveyance, storage and treatment of the areas consistent with standards in place at the time of the respective land use action. Outfall from these systems is to natural drainage tributaries of the Tualatin River. Throughout the South Hillsboro planning area, ditches provide storm water management along roadways. Large agricultural tracts have surface ditches that direct flow to natural conveyances, including a number of creeks. No stormwater facility costs have been identified for the area.

Topography
The South Hillsboro area is relatively flat.

Parks, plazas, public places
The City of Hillsboro currently has no park or recreation facilities located within the South Hillsboro Community Plan Study Area. The Bonneville Power Administration right-of-way north of Tualatin Highway extends south into the study area and could accommodate a trail.

How do South Hillsboro's infrastructure costs add up?

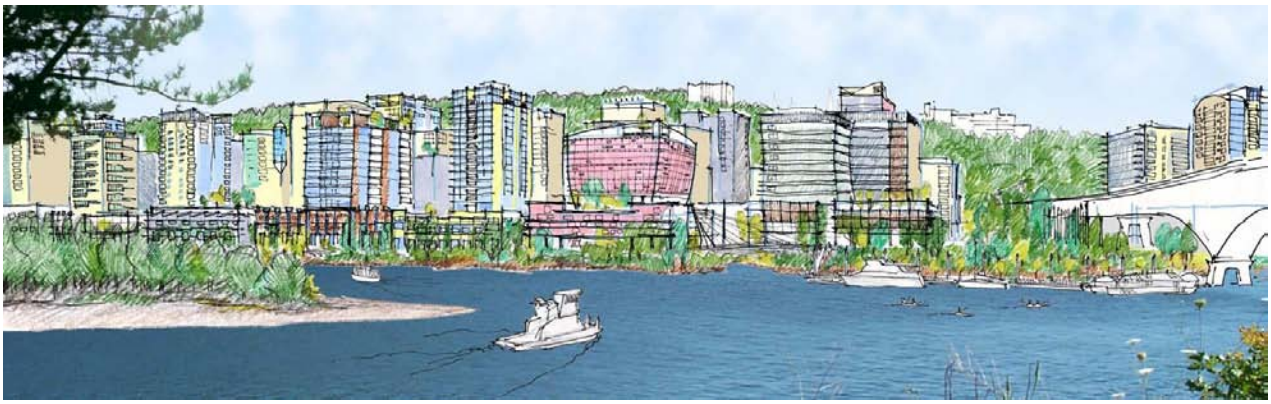
Estimated local infrastructure capital costs:

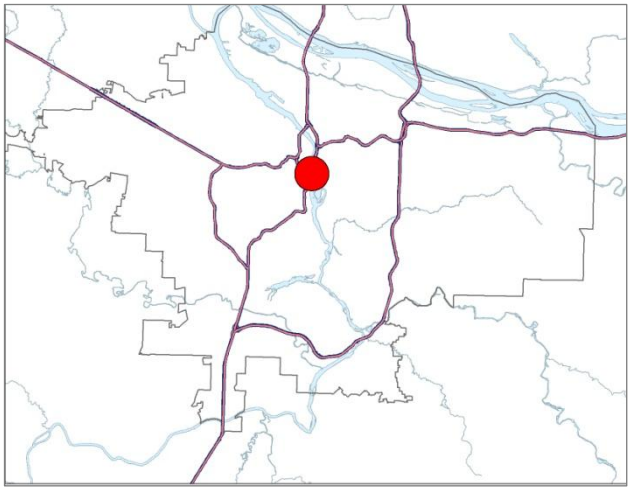
	South Hillsboro
Transportation	$203,057,000
Transit, Bike, Pedestrian	-
Sewer	$7,550,000
Water	$11,316,000
Stormwater	-
Parks	$56,894,000
Other	$16,700,000
Total	$295,517,000

Note that costs are related to both new housing and job creation. Approximately 69% of all local infrastructure costs in the South Hillsboro area are attributed to transportation improvements. No costs were projected for either schools or stormwater facilities. Costs for regional transportation improvements (not included above) are slightly lower than average, when compared to commute distances projected to 2035.

South Waterfront

Portland





Estimated local infrastructure capital costs:
$323,457,000

Total acres:	130
Gross buildable acres:	100
Net new households:	3,600
Net new jobs:	10,000
Avg. commute miles in the year 2035:	5.33

Proposed Use

The South Waterfront District offered a unique opportunity for redevelopment as it provided the largest block of vacant or underutilized land within the city's core. The district is being redeveloped with a mix of urban-scale offices, housing, hotels, parks and retail uses – with substantially more new jobs than housing units. The area is served by a multimodal transportation system and may serve as a transit hub for south downtown. Redevelopment in the district is meant to serve as a catalyst for the creation of a larger science and technology-based economy in the Central City.

Existing Conditions – South Waterfront

Existing facilities

South Waterfront is able to take advantage of existing streets, sewer, and water facilities. Most local / community costs are attributable to transportation ($148,445,000), transit / bike / pedestrian ($29,900,000), park ($92,553,000), and affordable housing requirements.

Transportation
Though the South Waterfront's central Portland location affords it extensive transportation connections, a substantial amount of redevelopment is contemplated.

Commute distance
Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tracts that include South Waterfront are forecasted to have an average commute distance of 5.33 miles in the year 2035, almost 7 miles shorter than the 7-county average of 12.32 miles. This is expected to significantly reduce regional infrastructure costs over time.

Water
Existing water facilities are sufficient to serve South Waterfront.

Wastewater
Existing sewer facilities are sufficient to serve South Waterfront.

Stormwater
Upgrades to the areas stormwater system will be necessary to serve the planned development.

Parks, plazas, public places
There is a park within the plan area. The plan also includes the restoration of the Willamette River Greenway through the site. Given the area's central location, numerous parks and trails are in the vicinity.

How do South Waterfront's infrastructure costs add up?

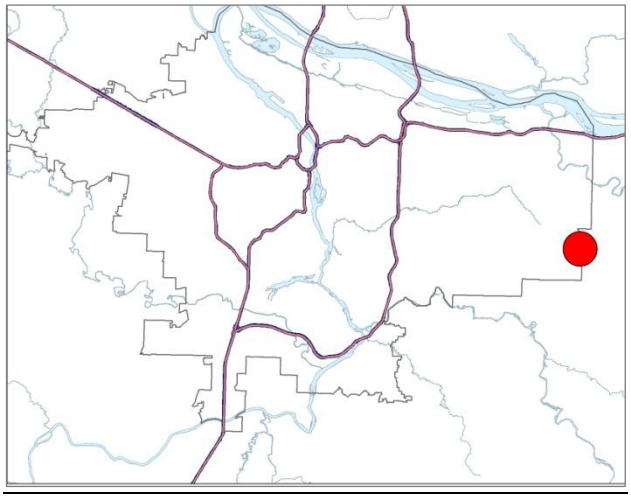
Estimated local infrastructure capital costs:

	South Waterfront
Transportation	$148,445,000
Transit, Bike, Pedestrian	$29,900,000
Sewer	-
Water	-
Stormwater	$710,000
Parks	$92,553,000
Other	$51,850,000
Total	$353,457,000

Note that costs are related to both new housing and job creation. Approximately 46% of all local infrastructure costs in the South Waterfront area are attributed to transportation improvements, with 29% for parks and open spaces. Costs for regional transportation improvements (not included above) are significantly lower than average, when compared to commute distances projected to 2035.

Springwater Community Plan

Gresham



Estimated local infrastructure capital costs
$375,791,000

Total acres:	1,272
Gross buildable acres:	762
Net new households:	1,609
Net new jobs:	15,330
Avg. commute miles in the year 2035:	12.82

Proposed Use

The Springwater area is a newly urbanizing area that is planned for industrial/high-tech campuses. To augment the mixed-use theme of the City as a whole, a village center with mixed retail and housing, and low-density residential development are also planned for areas too sloped for industrial use.

Existing Conditions and Planned Improvements -- Springwater

Transportation

The existing transportation system was designed primarily to serve rural residential and farm-to-market uses. The arterials are generally fast moving with most intersections either having no traffic control or only stop signs. Highway 26 is the major thoroughfare that traverses the study area, connecting Gresham with both Portland (to the west) and Sandy (to the southeast). Hogan Road/242nd Avenue also provides a north/south connection through the western portion of Springwater. Almost 2/3 of the projected local infrastructure costs ($237,231,000) for the Springwater area are attributable to transportation improvements.

Commute distance
Longer travel distances translate into more regional infrastructure needed per household. Residents of the census tract that includes the Springwater area are forecasted to have an average commute distance of 12.82 miles in the year 2035. This distance is ½ mile longer than the average for the 7-county region (12.32 miles).

Water
The area has no public water system. Private wells currently serve the area.

Wastewater
The area has no public sewer system. Waste is directed to private septic systems.

Stormwater
The area has no public stormwater system. Stormwater is directed to creeks and to drainage ditches along roads.

Parks, plazas, public places
The area has no public parks, but is bisected by the Springwater Corridor, a regional trail that connects Portland to Boring.

Topography / natural features
With the exception of its western portion, the Springwater area is relatively flat. The sloped, western portion of the area is planned for low-density residential development. The concept area also has a number of riparian areas. These features reduce average densities, making the area more expensive to serve, but may enhance property values.

How do Springwater's infrastructure costs add up?

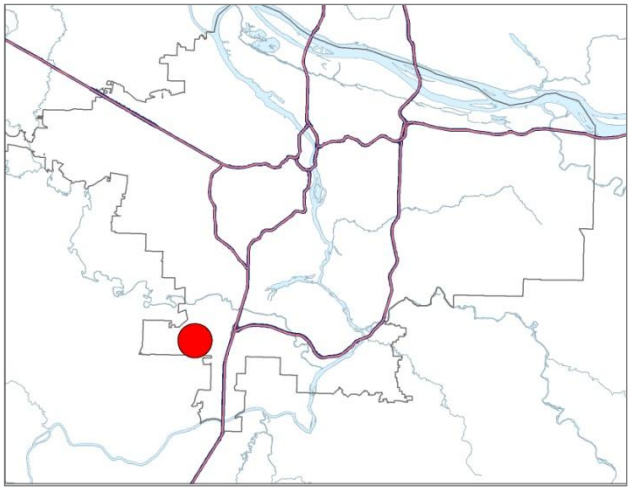
Estimated local infrastructure capital costs:

	Springwater
Transportation	$237,231,000
Transit, Bike, Pedestrian	-
Sewer	$28,894
Water	$35,032
Stormwater	$29,993
Parks	$44,642
Other	-
Total	$375,791,000

Note that costs are related primarily to job creation. Approximately 68% of all local infrastructure costs in the Springwater area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are slightly higher than average, when compared to average commute distances projected to 2035.

SW Tualatin Concept Plan

Tualatin



Estimated local infrastructure capital costs
$ 60,628,000

Total acres:	431
Gross buildable acres:	352
Net new households:	0
Net new jobs:	5,760
New jobs per gross buildable acre:	16.36
Avg. commute miles in the year 2035:	12.36

Proposed Use

SW Tualatin is a newly urbanizing area that is planned for industrial uses. Note that no residential uses are planned in this area.

Existing Conditions and Planned Improvements – SW Tualatin

Transportation

SW Tualatin-Sherwood Road, SW 115th Avenue and SW 120th Ave to the north and SW Tonquin Road and SW Waldo Way to the south serve the SW Tualatin concept area. A future SW 124th Avenue arterial connection is planned to connect Tualatin-Sherwood Road with SW Tonquin Road, and is expected to become a primary point of vehicle access in the future. This connection would be regarded as a community level facility as it would serve both Tualatin and Sherwood. SW 115th Avenue will serve as a secondary north-south access between SW Tualatin-Sherwood Road and SW Tonquin Road. A railroad line boarders the east boundary of the study area.

A substantial portion of the projected local infrastructure costs for SW Tualatin are attributable to transportation improvements. Since the writing of the concept plan, estimated costs for 124th Avenue have gone up significantly. Other transportation projects have also increased in cost since 2005, including SW 115 Avenue, SW Blake Street, SW 120 Avenue, Tonquin Road and Waldo Way. Tualatin now anticipates dividing a portion of those transportation costs with the county and state.

Commute distance

The SW Tualatin area is forecasted to have an average commute distance of 12.36 miles in the year 2035, roughly the same as the 7-county average (12.32 miles).

Water

No public water lines currently serve the study area.

Wastewater
No sanitary sewer system of adequate size to serve the proposed development exists on or near the study area.

Stormwater
No storm water system exists within the study area. The plan area rises gradually in elevation. Drainage is imperfect, but generally toward the north and toward the south, with a break point at approximately the middle of the Concept Plan area. Drainage in the northern portion around and in the quarry infiltrates through the fragmented basalt. Drainage to the south flows toward Coffee Lake Creek/Seely Ditch, which flows to the Willamette River.

Parks, plazas, public places
There are no existing parks within the concept area. However, there are long-term plans for a regional trail that would follow the Bonneville Power Administration easement through the area. Additionally, a forested area is envisioned west of a railroad line located in the eastern boundary of the study area to create a transition from residential to industrial uses.

How do S.W. Tualatin's infrastructure costs add up?

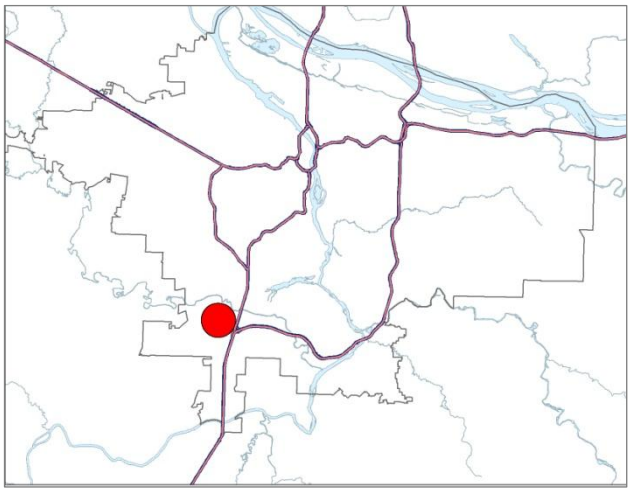
Estimated local infrastructure capital costs:

	Cost per job	Totals
Transportation	$7,147	$41,168,000
Transit, Bike, Pedestrian	-	-
Sewer	$1,680	$9,674,000
Water	$1,601	$9,224,000
Stormwater	$98	$562,000
Parks	-	-
Other	-	-
Total	$10,526	$60,628,000

Note that all costs are related to job creation. Approximately 68% of all local infrastructure costs in the S.W. Tualatin area are attributed to transportation improvements. Costs for regional transportation improvements (not included above) are about average, when compared to commute distances projected to 2035.

Tualatin Business Center

Tualatin



Estimated local infrastructure capital costs:
$298,000

Total acres:	12.5
Gross buildable acres:	7
Net new households:	0
Net new jobs:	124
Avg. commute miles in the year 2035:	12.2

Proposed Use

This area, along the Tualatin-Sherwood Highway, was planned and developed in 2001 by a private developer into 65,000 square feet of light industrial buildings. The site also houses motor vehicle fuel station and a car rental facility. The combined elements of the site are estimated to provide for 136 jobs.

Stormwater

This area was constrained by extremely high stormwater costs for mitigating off-site stormwater runoff. The developer faced a public requirement to mitigate on-site and off-site stormwater as a condition of approval for the project. As a result, costs for stormwater infrastructure were extra-ordinarily high at $298,000.

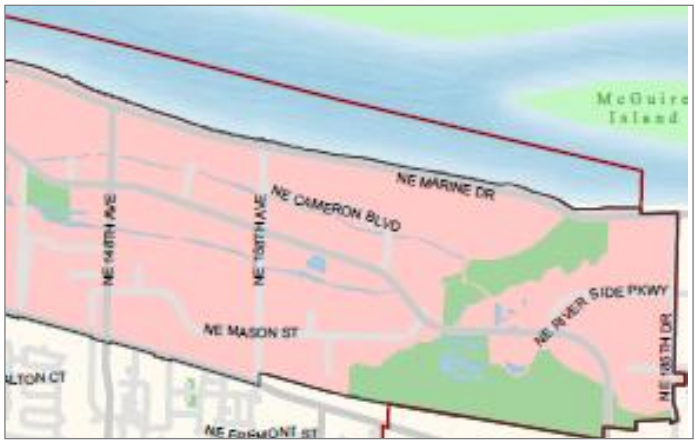
How do Tualatin Business Center's infrastructure costs add up?

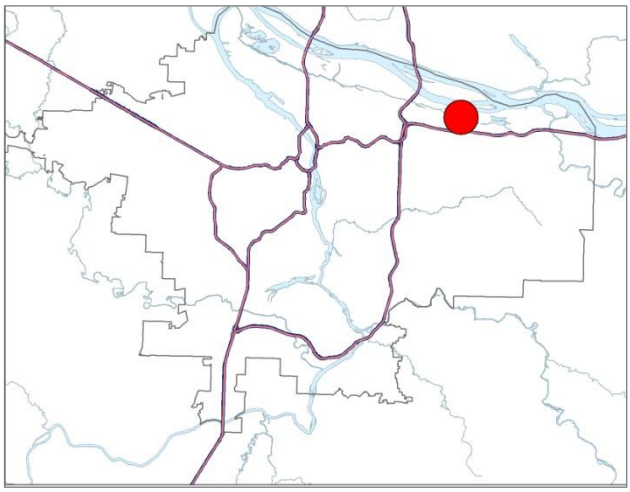
Estimated local infrastructure capital costs:

	Cost Per Job	Totals
Transportation	-	-
Transit, Bike, Pedestrian	-	-
Sewer	-	-
Water	-	-
Stormwater	$2,403	$298,000
Parks	-	-
Other	-	-
Total	$2,403	$298,000

West Coast Paper Site

Portland





Estimated local infrastructure capital costs:
$60,000

Total acres:	24.0
Gross buildable acres:	18.4
Net new households:	0
Net new jobs:	276
Avg. commute miles in the year 2035:	12.2

Proposed Use

This industrial site located near Marine Drive in Portland was completed in 2002 with the potential to accommodate 293,500 square feet of light industrial in two buildings and a total of 276 jobs.

Stormwater

Part of this site is constrained by environmental/water quality protection areas (5.6 acres) and the only local/community infrastructure costs identified for this development were environmental mitigation impacts. The developer also paid system development charges to offset additional infrastructure capacity improvements.

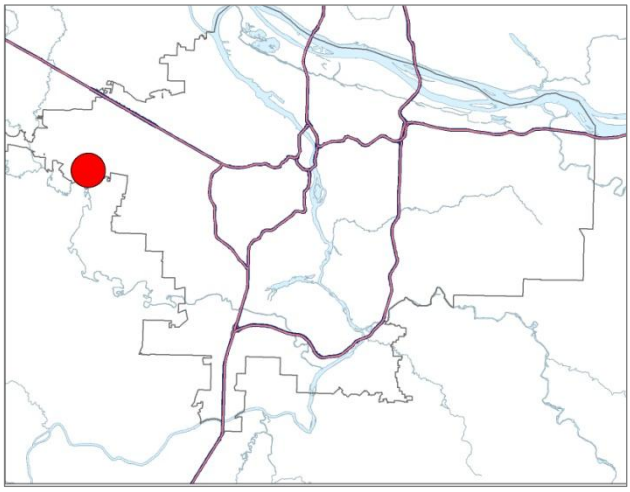
How do West Coast Paper site's infrastructure costs add up?

Estimated local infrastructure capital costs:

	Cost Per Job	Totals
Transportation	-	-
Transit, Bike, Pedestrian	-	-
Sewer	-	-
Water	-	-
Stormwater	$217	$60,000
Parks	-	-
Other	-	-
Total	$217	$60,000

Witch Hazel concept planning area

Hillsboro



Estimated local infrastructure capital costs:
$39,559,000

Total acres:	318
Gross buildable acres:	270
Net new households:	2,000
Net new jobs:	0
New households per gross buildable acre:	7.41
Avg. commute miles in the year 2035:	12.20

Proposed Use

Witch Hazel is a newly urbanizing area that is planned as a residential community with eventual mixed-use zones. At this time, however, the concept plan lists only new residential units in the area.

Existing Conditions and Planned Improvements – Witch Hazel

Transportation

Direct north-south access to the Witch Hazel Village plan area is provided by three county roadways: SW River Road (along the western edge), SW 247th / Brookwood Avenue (at the center), and SW 234th/Century Boulevard (along the eastern edge); and east-west access is provided by one city roadway, SE Alexander Street (along the northern edge). Except for River Road, which has a bike lane, the roads are without sidewalks, curbs and bike/pedestrian infrastructure.

Commute distance

Shorter travel distances translate into less regional infrastructure needed per household. Residents of the census tract that comprises the Witch Hazel area are forecasted to have an average commute distance of 12.2 miles in the year 2035, slightly less than the 7-county average (12.32 miles).

Water

Current residents are on private well systems. Water service exists to the north of the area. When the plan area is annexed to the City and is urbanized, water will be supplied by the City of Hillsboro.

Wastewater

With the exception of the new Witch Hazel Elementary School (which has sewer service), all developed properties within the plan area are currently served by private septic systems. Sanitary sewer service exists to the north of the area.

Stormwater
The existing stormwater system within the plan area includes pipes/culverts, subsurface tiling, overland flow, natural swales, irrigation and roadway drainage ditches, all of which flow to Witch Hazel Creek or Gordon Creek, eventually draining to the Tualatin River.

Parks, plazas, public places
There are no existing public parks within the Witch Hazel Village plan area. However, Clean Water Services owns a wetland area in the northwest portion of the concept area.

Schools
There is an existing public school in the area. Note that no capital costs for new school construction have been included in these estimates.

How do Witch Hazel's infrastructure costs compare to the regional average?

Estimated local infrastructure capital costs:

	Cost per housing unit	Totals
Transportation	$3,431	$6,862,000
Transit, Bike, Pedestrian	-	-
Sewer	$4,638	$9,275,000
Water	$4,288	$8,575,000
Stormwater	$5,118	$10,236,000
Parks	$2,306	$4,612,000
Other	-	-
Total	$19,780	$35,559,000

Note that all costs are related to new housing. Approximately 71% of all local infrastructure costs in the Witch Hazel area are attributed to a combination of sewer, water and stormwater improvements. Costs for regional transportation improvements (not included above) are about average, when compared to commute distances projected to 2035.

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Urban and rural reserves

Section 3E

In 2007 at the request of Metro and its regional partners, the Oregon Legislature passed Senate Bill 1011, establishing a new framework for planning for urban growth in the Portland metropolitan region. Under this new system, Clackamas, Multnomah and Washington counties and Metro must determine together which lands outside the current urban growth boundary are best suited to accommodate urban development over the next 40 to 50 years and which lands should be off limits to development in order to protect their values as farms, forests and natural areas during that same period. Across the region, civic leaders are engaged in this unique process, considering the relationship of urban and rural lands and the desired shape of the Portland metropolitan region over the next several decades.

The three counties and Metro expect to reach agreements on a map of urban and rural reserves by the end of 2009. The counties will each designate rural reserves within their respective boundaries by amending their county land use plans. The Metro Council will designate urban reserves in spring 2010 by adopting the Urban and Rural Reserves ordinance which will amend the Regional Framework Plan and Metro's Urban Growth Management Functional Plan.

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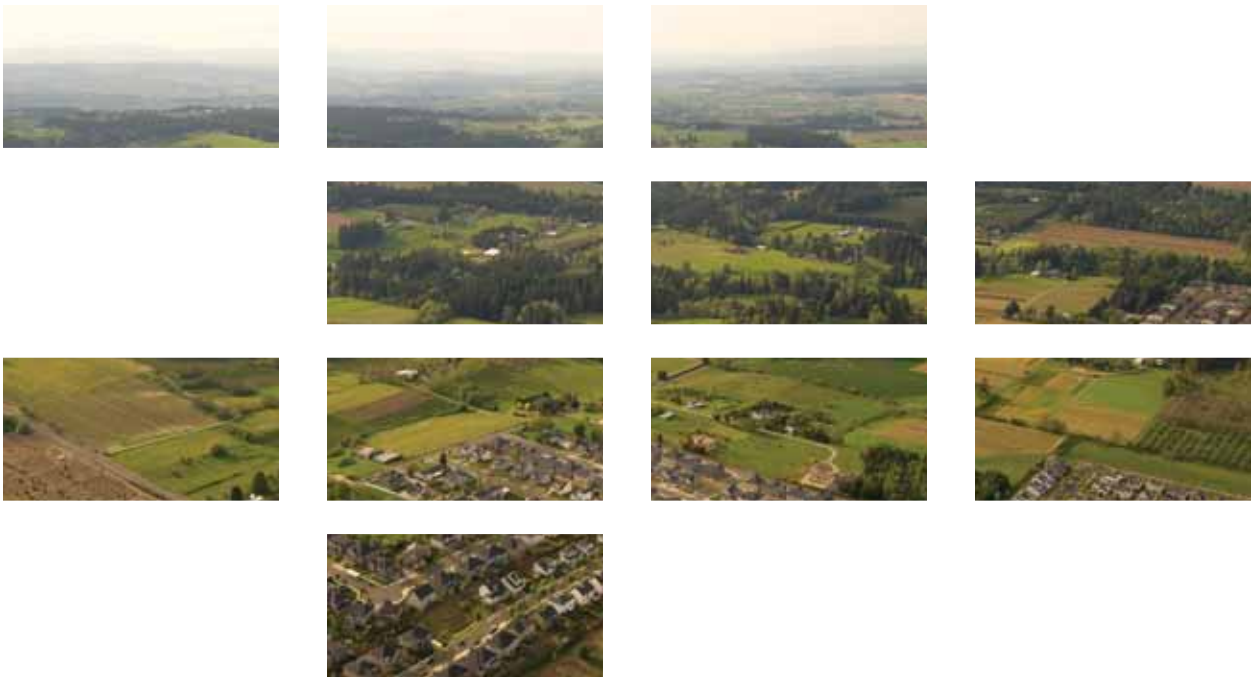


URBAN RURAL RESERVES

2009 – 2050/60

Chief Operating Officer Recommendation

September 15, 2009

Metro | *People places. Open spaces.*

Making the Greatest Place

Strategies for a Sustainable and Prosperous Region

A report from Metro's Chief Operating Officer

Section 3E – Urban and Rural Reserves

Table of Contents:

Introduction

One of the best-loved features of the Portland metropolitan region is its remarkable interplay of wild places, urban spaces and fertile furrows. The rich soils and abundant rainfall of this region made it the destination of one of the greatest human migrations in history. Like those early settlers, residents and leaders over time have recognized our immense good fortune in living in this abundant setting, and they developed processes to protect and maintain our most treasured assets--our farms, forests and natural areas. Unlike so many growing urban areas across the country, we've honored our heritage by keeping our developed footprint relatively compact. Today, distinctive communities, spectacular natural areas and productive cultivated landscapes comprise the physical, social and economic fabric of our region. They are interwoven and give this place its unique character.

In addition to protecting lands from urbanization, over the years we've developed a deeper understanding of our relationship to the land. Forty or fifty years ago, few Oregonians were familiar with the natural history or ecological mosaic of their region or thought a great deal about the origin of products on their grocery store shelves. Today terms like "riparian" and "restoration" are part of our urban lexicon. The region's residents pooled their resources to purchase a network of publicly owned natural areas, securing for generations their access to outdoor romps, clean water, wildlife habitat and a bit of solace within a bustling metro area. And our commitment to locally harvested food is now a powerful and colorful icon of the culture of contemporary Portland area communities.

At the same time, our cities and towns have blossomed in ways we couldn't have imagined 40 to 50 years ago, in great part due to the context in which they reside. Communities across the region have recaptured the charm of their historic downtown shopping and dining districts. From First Tuesday in Hillsboro to First Thursday in the Pearl District, art exhibits, community fairs and farmers markets that are sprouting across the region display the exuberance of contemporary metro area urban life. Today we're a creative hot spot with a reputation for indie music, award winning wines and gourmet presentation of locally grown food. With the newly opened Green Line, MAX light rail links communities in a growing network of transit options that span the region. Our region attracts up-and-coming entrepreneurs who find kindred creative spirits here, sparking new businesses, new designs and new approaches to green building and development.

As our relationship to the land and our communities has evolved over time, so must our tools for maintaining those relationships. Oregon's land use system provides a process for incrementally accommodating an expanding population while protecting farms and forests. The system requires communities to do what they can to accommodate growth in their existing footprint before expanding out. In contrast to urban areas across the country, much of our success in maintaining livability and advancing sustainability can be traced to this system of compact urban centers nested in protected rural landscapes. Yet it has become clear that the system for considering the land needs of the region needs a bit of remodeling.

A central tenet of that system is the urban growth boundary surrounding the Portland metropolitan area, separating urban communities from rural lands. Metro is responsible for monitoring the growth boundary and every five years calculates how much acreage is needed to maintain a 20-year supply of land to accommodate projected urban growth. The boundary is expanded only when necessary to respond to that need.

Under this longstanding system, every five years the citizens of the region grapple with identifying areas for urban expansion. This five year timeframe keeps landowners at the edge of the boundary in limbo, never knowing whether or when their lands might be destined for urbanization. Farmland owners and farmers who lease land near the boundary have difficulty taking longer term actions such as investing in irrigation systems or drainage tile, converting to organic agricultural practices or planting vineyards or orchards. This pushes viable agricultural activities, many that sell to urban customers, farther and farther away from the urban area. At the same time the uncertainties inherent in this system make it difficult for cities to make smart investments in publicly owned and shared systems like streets, drinking water pipes, parks and sewage disposal facilities.

After Metro's last urban growth boundary decision, the region's leaders proposed a solution. As a result, in 2007, the Oregon Legislature approved Senate Bill 1011. This legislation enables the region to identify and designate areas outside the current urban growth boundary that are best suited for housing and employment over the next 40 to 50 years as urban reserves. SB 1011 also provides a new opportunity to identify areas that should remain working farms and forests or natural areas for at least the next 40 to 50 years.

What makes this system better?

In the past, when considering expanding the boundary, Metro was required by state land use laws to consider the quality of the soil above everything else. Protecting high quality farm soils is important and that system provided a way to decide where *not* to develop. But it didn't provide a method for determining where development might make sense—which attributes of the landscape are most conducive to supporting a flourishing urban community. For the first time the region has a formal method for considering what makes a good site for a city.

Factors for urban reserve designation identified in Senate Bill 1011 include:

- Can the land be developed at urban densities that make efficient use of existing and future infrastructure?
- Does the land have enough development capacity to support a healthy economy?
- Can water, sewer, schools, parks and other urban-level services be provided efficiently?
- Can the land accommodate a well-designed system of streets, trails and transit?
- Can the area be designed to preserve and enhance natural ecological systems?
- Is there enough land to accommodate a range of housing types?
- Can the area be developed while preserving natural landscape features?
- Can the area be designed to minimize conflicts with farms, forests and important natural features on nearby land, including adjacent rural reserves?

At the same time, the designation of rural reserves provides a means for protecting the region's most valuable, productive and financially viable farms and commercial forests from urban development. The rural reserves designation is also designed to prevent urbanization of the region's most significant natural features like wetlands, rivers and their floodplains, buttes and savannas and to use some of these features as natural boundaries to urban expansion.

Factors for rural reserve designation identified in Senate Bill 1011 include:

- Is the land in an area that is potentially subject to urbanization?
- Is the area capable of sustaining long-term agriculture or forestry operations?
- Does the area include:
  - natural landscape features such as natural hazards?
  - important fish, plant or wildlife habitat?
  - lands that protect water supply and quality?
  - features that provide a sense of place such as rivers or buttes?
  - lands that separate cities?
  - lands that provide access to recreational opportunities?

The full text of the urban and rural reserve designation factors contained in Oregon Administrative Rules is provided in Appendix 3E-B.

Instead of starting from scratch every five years to consider whether and how to expand the urban footprint, the reserves process provides a common sense approach and greater certainty for local governments, businesses and rural landowners. Metro will still consider the residential and employment needs of its citizens every five years and make sure there is a 20 year supply of buildable land, but in the future the lands considered for expansion will be those within urban reserves.

In addition to considering the land's attributes, the reserves process provides the means for taking a longer term view in determining the scale and location of urban expansion or conversely, of rural land protection. It provides the means for residents of the region to collectively agree to the desired scale of urban expansion over time, establishing a more deliberate focus on the future of existing communities.

What are urban and rural reserves?

Urban reserves will be designated by Metro on lands currently outside the urban growth boundary that are suitable for accommodating urban development over the next 40 to 50 years. Rural reserves will be designated by each county on lands outside the current urban growth boundary that are high value working farms and forests or have important natural features like rivers, wetlands, buttes and floodplains. These areas will be protected from urbanization for the next 40 to 50 years.

Urban and rural reserve designations will not change current zoning or restrict landowners' currently allowed use of their lands. They will provide greater clarity regarding the long term expected use of the land and allow both public and private landowners to make long term investments with greater assurance.

Some lands currently outside the urban growth boundary will remain without either rural or urban designation. These lands are likely to be areas where there is limited potential for urbanization or areas that are neither high quality farmland nor the highest priority for urban expansion.

How is the public involved?

The reserves planning process was designed to provide stakeholders with a variety of ways to express their desires for the region's future and influence the outcome of the reserves decisions. Every citizen of the region has representation at several levels of the process and many opportunities to review maps and reports, consult with staff and elected officials and share their views. Metro and the three counties are following a state-approved coordinated public involvement plan throughout the course of the entire reserves project.

When the process was launched in 2008, a regional Reserves Steering Committee was formed comprising representatives of the many land use interests in the region including officials from local cities, counties, state agencies and Metro, as well as representatives from a variety of businesses, the agriculture industry, and environmental and social advocacy organizations. The Reserves Steering Committee advises the three counties and Metro—the four jurisdictions that will make the reserves designations—and is co-chaired by their representatives, known as the Core 4. They are:

- Clackamas County Commissioner Charlotte Lehan
- Multnomah County Commissioner Jeff Cogen
- Washington County Chair Tom Brian
- Metro Councilor Kathryn Harrington

The steering committee has met monthly, reviewing work in progress, raising process questions, requesting information, providing insights and guidance and providing outreach to and feedback from their respective constituents. Each of the three counties has also established advisory committees to inform their respective county commissions of local concerns and priorities.

Additionally, at key points in the process, Metro and the three counties have jointly sponsored open houses across the region, inviting residents to learn how the process is progressing and express their desires to officials. The counties have each held public hearings to gain insights from citizens. Metro is holding public hearings as part of the release of this strategy and will hold additional hearings at stages in the decision process. Metro and the counties also have web sites that include opportunities for residents to provide comments electronically. The lines of communication are essentially open throughout the process. Email and letters are welcome at any time.

Timeline

Phase 1 November 2007-March 2008	**Phase 2** April 2008 – August 2008	**Phase 3** September 2008 – October 2009	**Phase 4** November 2009 – December 2009	**Phase 5** January 2010 – May 2010
Establish committees, project approach and public involvement process	Identify reserves study area	Analyze reserves study area	Recommend urban and rural reserves	Adopt urban and rural reserves
Milestones				
Agree on factors and process	Select reserves study area	Recommend preliminary reserves	Create intergovernmental agreements on reserves designations	Counties designate rural reserves; Metro designates urban reserves

What's been done so far?

In September 2008, after consulting with residents of the region, the counties and Metro established a study area for the reserves project — roughly a five-mile-wide ring around the current urban growth boundary. The boundaries of the study area were adjusted to exclude lands outside the three metro-area counties (to reflect Metro's limited authority under state law); the City of Sandy's existing urban reserves; the Columbia Gorge National Scenic Area (which is already protected from urbanization under federal law); and to include areas extending out to neighbor cities such as Canby, Banks and Estacada. The study area is shown on page 6.

From autumn 2008 to spring 2009, the planning staff of the three counties and Metro analyzed these lands using the factors identified in Senate Bill 1011 to determine their suitability for either long term urban or rural uses. The three counties worked with their respective advisory committees and consulted with a variety of other stakeholders to create rough draft maps of urban and rural reserve candidate areas which they shared with the Regional Reserves Steering Committee and the public in April 2009. The Core 4 approved the candidate areas in May.

From May through September 2009, the counties continued to fine tune their recommendations for land suitability. Following public hearings, the three counties will make recommendations on land suitability in September. These recommendations will be presented to the regional Reserves Steering Committee on September 23.

A hallmark of the reserves process is its iterative nature. A multi-step screening process has been used to evaluate suitability, and more refined analysis is applied to lands at every step of the way. While the reserves designation process dwells in the arena of a broad regional system of land use, as lands are brought into the urban growth boundary there will be opportunity and necessity for more detailed local visions, plans and implementation.

Urban and Rural Reserve Study Areas
DRAFT
METRO
PEOPLE PLACES • OPEN SPACES

How will decisions be made?

The regional Reserves Steering Committee will review the suitability analyses from each of the counties as a basis for crafting a recommendation for a regional reserves system. They will make their recommendation to the Core 4 in mid October. Their recommendation will be shared with the public at open houses across the region in late October and November where there will be opportunities for residents to express their views.

The Core 4 will use all of this information—the county suitability analyses and advisory committee recommendations, the regional Reserves Steering Committee recommendation and public comment—in their discussions with each other and with their colleagues. The Core 4 members will each act as an emissary from their respective commission or council as they work together to negotiate a final reserves map of the region. The counties and Metro anticipate reaching formal intergovernmental agreements in late 2009 that define the agreed-upon urban and rural reserves. A sample intergovernmental agreement is attached as exhibit 3E-E.

In spring 2010, the Metro Council will formally adopt urban reserves with a reserves ordinance that will amend the Regional Framework Plan and make changes to Metro's Urban Growth Management Functional Plan to implement new policy on reserves, including a requirement that concept plans be in place before any urban reserve is brought into the urban growth boundary. A draft of the key elements of this ordinance is attached as exhibit 3E-F. Likewise, the counties will each adopt rural reserves in spring 2010 by amending their respective county comprehensive plans.

Strategies for a Sustainable and Prosperous Region is intended to assist with this process by proposing a comprehensive strategy for this region's future. The next section outlines how the comprehensive strategy informs the reserves process and provides specific recommendations on the reserves policy decisions ahead.

Recommendations

This treasured place and the planet we inhabit face formidable challenges. Locally and globally, pressing issues require changing our thinking and planning for a future that will be significantly different from the past. How we respond to these challenges today will set the course for generations to come.

Local and Global Challenges Ahead

- *Climate Change*
- *Volatile Energy Costs*
- *Economic globalization*
- *Deteriorating infrastructure*
- *Population growth*
- *Shifting demographics*

The urban and rural reserve process is our region's longest-range planning effort so the size, form and location of the chosen reserves will speak volumes about our aspirations for the future and our commitment to tackling the challenges ahead.

The region already has a long-range plan, the 2040 Growth Concept, which lays out our overall roadmap for the future. The 2040 Growth Concept acknowledges population growth as a fact of life and states the region's intention to incorporate that growth as much as possible into city and town centers, along transportation corridors and in employment areas. This approach protects existing single family neighborhoods, enhances community centers and main streets, increases the efficiency of public investments and avoids unnecessary development of farms, forests and natural areas. Our strategy represents the safest approach to an uncertain future because it is more sustainable, more livable and more fiscally responsible than urban sprawl and can reduce the region's carbon footprint. Therefore, reserves designations should above all reflect and support successful implementation of the 2040 Growth Concept.

In keeping with that goal these urban and rural reserve recommendations assume:

- The majority of our region's future growth will occur in existing centers, corridors and employment areas. This will be facilitated by an integrated set of investments and policy actions summarized in Chapters 1 and 2 of the Metro Chief Operating Officer's *Strategies for a Sustainable and Prosperous Region*. Land supply is only one tool to manage growth and develop communities; common sense and state law require other approaches to be exhausted before we resort to urbanization of farms, forests and natural areas.
- Development patterns will be different in the future as our economy responds to the global and local challenges listed above. Existing centers, corridors and employment areas will become more compact and vibrant, and new urban areas must be located, planned and developed to ensure they will stand the test of time.
- Farms, forests and natural areas will continue to be a cornerstone of this region's identity and economy for the next 50 years and beyond.

These assumptions assist in selecting both urban and rural reserves and in defining the appropriate scale of urban reserves. Recommendations on each topic are included in this section.

Regional Reserves Designation Principles

To assist in the designation of urban and rural reserves, regional reserves designation principles are proposed, designed to focus consideration on the suitability of lands to accommodate future urban or rural uses. The desired outcome is quality reserves in the right places that have the highest potential for success. The following principles are recommended:

- Urban reserve designations should prioritize lands that have the potential to complement and strengthen *existing* communities. Examples could include the creation of new centers to provide existing residents with more accessible services and shopping or the addition of residential capacity to assist with successful development of existing downtowns or corridors.
- Urban reserves designations should support job creation and economic opportunity by providing for future urban growth boundary expansions onto suitable employment lands when economic need is demonstrated. This recommendation goes hand-in-hand with strategies recommended elsewhere in the *Strategies for a Sustainable and Prosperous Region* that prime industrial and employment lands must be protected and preserved for industrial development and that a "fast-track" UGB expansion process should be established to address important economic opportunities.
- Urban reserve designations should prioritize lands that can accommodate a compact urban form. Considering the major challenges facing us – from climate change to lack of infrastructure funding to demographic changes – areas added to the growth boundary in the future must be more efficient and high-performing. Communities that are ultimately built in reserves added to the urban growth boundary should provide a more complete array of services near where people live and make it easier for people to choose walking, transit and biking for everyday travel. The technical suitability analysis completed by the counties and Metro will inform each area's potential for this.
- Reserve designations should provide for separation between the metropolitan region and neighbor cities (particularly Sandy, Estacada, Molalla, Canby, Newberg, Gaston, Banks, North Plains and Scappoose). This will ensure that these communities retain their distinct identity and the potential to grow in keeping with their own aspirations and state law.
- Not all land will be urban or rural reserve; some lands will have no designation. Reserve locations should be relevant to urbanization pressures. Lands with no designation will continue to operate under their current zoning regulations with no changes.
- Natural and man-made features will provide "hard edges" defining permanent boundaries between urban and rural landscapes. Conflicts between rural and urban

uses – ranging from traffic to dust to noise – frequently arise at the urban fringe and a logical, thoughtful consideration of ultimate urban form has the potential to minimize such problems in the future.

- Rural reserves should be chosen to protect the agriculture and forestry industries and important natural landscape features from future urbanization.

Defining the Scale of Reserves

The reserves process has purposefully focused on studying the suitability of lands outside the growth boundary for future urban and rural uses rather than on identification of an exact number of acres required for each. Our ability to forecast growth and development trends for the far future is limited and no mathematical formula or methodology is provided in state law or administrative rule for determining the scale of urban reserves. Thus, rather than debating decimal points the region has properly focused on the discussion of desired outcomes and policy and investment choices available to us.

However, once a set of suitable lands is identified, we must ensure that, together with lands inside the existing urban growth boundary, the urban reserves can be planned to accommodate estimated urban population and employment growth for 40 to 50 years beyond 2010. When designating urban reserves, Metro will specify the number of years for which the urban reserves are intended to provide a supply of land. Narrowing the range of "sufficiency" for urban reserves will provide focus to the regional reserves discussion and lead to final decisions. The range is defined by the answers to three questions:

- How many people and jobs should we plan for?
- How many of these people and jobs should we plan to accommodate within the existing urban growth boundary?
- How efficient will development be within urban reserves?

This analysis proposes answers to these questions based on the comprehensive roadmap laid out in the Chief Operating Officer's *Strategies for a Sustainable and Prosperous Region*, the Regional Reserves Guiding Principles listed above and the technical methodologies used to analyze demand and capacity in the draft urban growth report (UGR). Technical memoranda detailing the application of the regional reserves guiding principles to the urban growth report's methodology, extended over a 40/50 year timescale are attached to this report as Appendices 3E-C and 3E-D. The UGR (Section 3A of the *Strategies for a Sustainable and Prosperous Region)* contains much more information and discussion on many of the topics covered here.

An overview of the process to answer the questions above is presented in this section, beginning with population and employment growth forecasts. Metro released a Draft 2005-2060 Regional Population and Employment Forecast in May 2008 and updated it in April 2009. The current forecasts are included in the Chief Operating Officer's *Strategies for a Sustainable and Prosperous Region* as an Appendix to the Draft Urban Growth Report. The forecast is based on national economic and demographic information, and is adjusted by Metro to account for regional growth factors. The forecast has been available for public comment for more than a

year and has been peer-reviewed to ensure all appropriate technical factors are considered. The forecast is presented as a range to encourage discussion of the factors influencing growth rates and the risks and opportunities of planning for various points within the range.

The base forecast covers the seven-county Portland-Beaverton-Vancouver Metropolitan Statistical Area. Table 1 lists the total growth in population and jobs expected for the entire seven-county area.

Table 1
7-County Population and Employment Forecast

	2050		2060	
	Low	High	Low	High
New residents	1,107,800	1,693,700	1,344,000	2,110,700
New jobs	497,200	1,153,300	608,300	1,382,800

It is estimated that there is a 90 percent chance that the rate of growth will fall within this forecasted range, but high confidence comes at the price of larger variability. The full scope of the range is important to consider in our planning work, but the large variability may make it more difficult to arrive at a reserves conclusion. Therefore, this report recommends that the range be further narrowed by focusing on the middle one-third of the forecast range (illustrated in Appendices 3E-C and 3E-D). This retains a range to work with but eliminates the more unlikely very low and very high growth forecasts. Table 2 lists the narrowed forecast range.

Table 2
7-County Forecast, 2007-2060, Narrowed to Middle One-Third

	2050		2060	
	Mid ⅓ low	Mid ⅓ high	Mid ⅓ low	Mid ⅓ high
New residents	1,428,300	1,563,700	1,729,800	1,907,400
New jobs	696,300	945,000	843,700	1,127,200

The next step is determining how many of these residents and jobs will be located within the Metro area and the capacity of the current urban growth boundary to accommodate that growth over the reserves timeframe. As noted above, the assessment used here is based on the methodologies identified in Metro's Draft UGR. Approximately 62 percent of regional residential growth and 70 percent of regional employment growth is expected to be accommodated within the Portland metro area urban growth boundary.

Table 3 summarizes the residential and employment projections for the metro urban growth boundary over the reserves timeframe.

Table 3
New Dwelling Units and Jobs Within Portland metro area UGB, 2007 - 2050/2060

	2050		2060	
	Mid ⅓ low	Mid ⅓ high	Mid ⅓ low	Mid ⅓ high
New dwelling units	405,400	441,000	484,800	531,600
New jobs	515,300	699,300	624,300	834,100

The urban growth report contains a detailed assessment of the capacity of the urban growth boundary to accommodate growth over the next 20 years. A key finding is that city and county plans and zoning ordinances allow the creation of enough dwelling units and employment locations to accommodate the region's forecasted growth. However, the analysis concludes that under current market conditions and the policies and financial structures in place today, the region is not likely to realize all of this capacity by the year 2030. We face a gap between the aspirations of local communities and market realities under current conditions. This gap has been confirmed by computer analysis using Metro's market-based economic and land use model, *MetroScope.*

Our own experience – validated by computer modeling – tells us that we have tools that can close the gap. The region and local governments can turn potential capacity into actual development by focusing investments in existing communities and by taking complementary policy steps to ensure maximum utilization of the investments that are made.

All of the issues identified in the urban growth report apply to the reserves timeframe as well, although computer models are of little use when we look 40 to 50 years out in the future. Significant zoned capacity exists to accommodate regional growth but it is likely that not all of it will be realized. Therefore, assumptions must be made about what strategies will be used and what impact they will have on growth patterns in the future.

The Chief Operating Officer's *Strategies for a Sustainable and Prosperous Region* calls for a coordinated investment and policy strategy to make regional and community goals a reality. If we use land inside the existing urban growth boundary efficiently before expanding, we can build great communities, proactively address the economic, environmental and demographic challenges ahead of us and protect valued farms, forests and natural areas. Therefore, this report assumes that we will increasingly focus our investments and growth inside the existing urban growth boundary over the 40 to 50 year reserves timeframe and increasingly use the zoning that cities and counties have put in place.

These strategies are expected to result in 70 percent to 80 percent of forecasted residential growth being accommodated within the existing urban growth boundary, and an even higher percentage of employment growth. The rest will need to be accommodated within future growth boundary expansions into urban reserves.

The final step in the process is to predict the efficiency of future growth outside today's growth boundary. The reserves process was established to find lands suitable for development as "great communities" – areas that are, among other things, compact, walkable and cost-effective

to develop and maintain. Therefore, suitability findings should be directly related to an area's ability to accommodate compact, efficient development patterns. These areas should demonstrate the potential to develop effective and efficient internal transportation grids, connections to regional roads and highways, and other public works systems. In addition, these areas should include or be closely connected to downtowns, main streets and employment areas that residents can access conveniently and safely by walking, bicycling and transit.

Thus, just as our existing downtowns and main streets must accommodate more growth to achieve community aspirations, we must assume that development outside the existing urban growth boundary will be more compact and efficient in the future. This is the only reasonable tradeoff justifying expansions of urban development into farm and forest land. Technical analysis of the urban reserve candidate areas by county and Metro staff and policy discussions by citizens, stakeholders and elected officials has provided a great deal of information on this, discussed in detail in each county's suitability assessment.

While we want to use land as efficiently as possible, it's also of critical importance that we support job creation and economic opportunity and plan for sufficient employment land capacity for the long term. Some desirable employers may not choose to locate on redeveloped sites or to significantly adapt their facility designs to make use of a more compact site even over the reserves timeframe. The Draft Urban Growth Report contains a sophisticated new methodology for evaluating employment demand and capacity that was developed by E.D. Hovee & Company's consultant team. This work can be extended to the reserves timeframe to ensure we do provide sufficient land for employment opportunities in the future. The employment analysis concludes that sufficient capacity exists within the metro urban growth boundary to accommodate most forecasted employment growth, but that a long-range need for large lot industrial parcels should be accommodated within urban reserves.

In sum, this report recommends an increased focus on investment and growth within existing downtowns and main streets. This financially prudent approach will protect valuable farms, forests and natural areas while enhancing the livability of existing communities. The addition of land to existing communities via urban growth boundary expansions will be a key part of the region's long-term growth strategy as well, accommodating between 19 percent and 29 percent of future residential growth and key employment opportunities. Targeted urban reserves should be designated to accommodate healthy employment growth and to complement existing communities.

All of these goals can best be achieved by the adoption of urban reserves between 15,700 acres and 29,100 acres, depending on the chosen timeframe and growth rate assumptions. The suitability assessment and a discussion of the risks and opportunities of planning for different timeframes will inform the final decision on size of urban reserves.

Table 3: Recommended Regional Scale of Urban Reserves

11,300 acres	Residential	22,400 acres
4,400 acres	Employment	6,700 acres
15,700 acres	Total	29,100 acres

Although no numeric targets were created in the administrative rules for this, the region will also have to decide the scale of rural reserves. Rural reserve sizing and form should be guided by the proposed Regional Reserves Designation Principles outlined above and by the factors established in state statute and administrative rules.

Urban and Rural Reserve Designation Recommendations

With a sense of the appropriate scale of urban reserves in mind, the guiding principles defined above can be applied to the urban and rural reserve suitability maps to produce recommendations on the designation of urban and rural reserves. These Chief Operating Officer recommendations are designed to support regional decision-making and will inform discussions of the Regional Steering Committee, the county advisory committees and county commissions, the Metropolitan Policy Advisory Committee and the Metro Council.

The Metro Chief Operating Officer's recommendations on reserves are divided into 14 geographic areas for simplicity and readability. In reality, of course, no such "hard lines" exist; it is important to consider urban and rural reserve designations as an entire regional system. The assessments and related maps, found in Appendix 3E-A, are based on the final recommendations from the three county advisory committees. Final suitability recommendations from each county were not available in time for use in this document. The dates of the latest information available for use in these assessments are shown on the index map.

These recommendations are made with respect for the work that has already been done by the many public officials and other parties who have been working for over a year to assess and designate reserves, and with the expectation that many, if not most, of these comments are generally consistent with the direction of that process.

The next half century

Reserve designations, in concert with the other aspects of Making the Greatest Place, will shape the Portland Metropolitan Region in profound ways, determining where we work, how we travel, where we shop, where we play and how we interact with neighbors. In particular, the reserves decision will convey to the next several generations how today's residents and their leaders envision the relationship between civilized, cultivated and natural landscapes of our region. Getting this right is no small feat but it is essential.

At this juncture, the process shifts from a county by county assessment of land suitability to a broader context that extends across the greater metropolitan region from the Coast Range to the Cascades and from Wilsonville to the Columbia. As we consider the interconnected physical, ecological and human activities across this vast area and across time we need to contemplate the following:

Scale: Senate Bill 1011 stipulates that urban reserves must include sufficient land to support a healthy economy and a range of housing types. It has not yet been determined what constitutes a sufficient system of reserves across the metropolitan area. Additionally, each reserve must be scaled to achieve these goals in relation to its adjacent existing urban community. This is strongly tied to their form and location.

Form and location: The arrangement of urban reserves in relation to existing communities and adjacent rural reserves is a critical aspect of establishing a system that will evolve as an efficient, pleasing and functioning land use pattern. The public has strongly expressed a desire to maintain a linkage between cities and the lands that produce their food and offer recreational opportunities. What shape and pattern of urban and rural reserves will best meet the needs of future citizens of the region?

Regional balance: The three metropolitan counties have proposed very different configurations of both urban and rural lands within their boundaries. The region's leaders must consider whether there is a greater likelihood of achieving regional goals by balancing lands for jobs and housing between the east and west sides of the urban area. Additionally, they must determine what scale and configuration of rural reserves provides the greatest certainty and best protection for farmers, forest land owners and for natural features around the region.

Alternatives to urban and rural designations: Some lands don't fit neatly into a category of urban or rural. This process has highlighted a number of communities where full scale urban development is inappropriate or impractical and where it is more appropriate to plan for a different scale of human habitation, be it the rural community, hamlet, village or town. It is conceivable that some future population growth can be accommodated within communities that do not desire and will not achieve full scale urbanization within the 40 to 50 year timeframe but would likely grow organically and serve as smaller scale rural centers during that period.

These are just a few of the important issues that will be tackled by stakeholders and policy makers in the coming months. We have an opportunity to set the course of this region for decades to come. This is the time for residents and leaders across the region to add your voices,

your insights, your passion and your knowledge to this dramatic process of shaping the future of this place we call home.

APPENDIX 3E-A

RESERVE AREA ASSESSMENTS AND RECOMMENDATIONS

The Metro Chief Operating Officer's recommendations on reserves are divided into 14 geographic areas for simplicity and readability. In reality, of course, no such "hard lines" exist; it is important to consider urban and rural reserve designations as an entire regional system. The assessments and related maps are based on the final recommendations from the three county advisory committees. Final suitability recommendations from each county were not available in time for use in this document. The dates of the latest information available for use in these assessments are shown on the index map on page 2. Individual area maps are provided at the end of this appendix.

Reference is made in these recommendations to the several key background studies:

- *Identification of Metro Region Agricultural Lands and Assessing their Long-Term Commercial Viability,* produced by the Oregon Department of Agriculture. This report divided lands outside the Metro urban growth boundary into three categories (Foundation, Important and Conflicted) based on their ability to sustain commercial agricultural operations over the long term.
- *Natural Landscape Features Inventory*, produced by Metro. This study was intended to identify those natural landscape features that influence the sense of place in this region and can define future urban form.
- *Criteria for Consideration of Forestlands within Rural Reserves*, produced by the Oregon Department of Forestry. This report provided mapping and criteria to assist in the determination of what forestlands and natural resources should be included within rural reserves.

These studies, the suitability assessments completed by each county, and a wide variety of other information submitted as part of the reserves process to date to assist with suitability assessments are available through Metro's Urban and Rural Reserves website: www.oregonmetro.gov/reserves.

Clackanomah Area

Context/Rural Status

This area east of the cities of Damascus and Gresham in Clackamas and Multnomah Counties is defined by SE Lusted Road on the north, SE Orient Drive/SE 312 Avenue on the east, the community of Boring on the south and the UGB on the west. According to the Agricultural Lands Inventory, the area is split between Conflicted agricultural land west of SE 282nd Ave and south of Highway 26 and Foundation agricultural land in the remaining portion of the area. The area includes the East Buttes natural landscape feature and is adjacent to Deep Creek Canyon.

County Reserves Study Status

The Multnomah County Citizen Advisory Committee (CAC) has recommended that there be no urban reserves in this area. The CAC also recommended that the following areas be designated as rural reserves: North of Sandy River from the existing UGB out 3 miles; and all the land south and west of the Sandy River.

The Clackamas County Policy Advisory Committee (PAC) has recommended 2,203 acres of this area for urban reserve designation under the state factors. The recommended area is defined by the UGB on the west and north, SE 282nd Avenue on the east, and Highway 212 on the south. This area is characterized by the forested steep buttes adjacent to the UGB in the west and a flatter area west of SE 282nd Avenue that contains rural residences dispersed throughout the area, the Boring Middle School, and small scale agriculture activities. The center portion of the area is currently within the Damascus city limits. Based on the PAC discussions, this land would be suitable for both residential and employment uses. The PAC has recommended that the majority of the land to the south and east be designated as a rural reserve with exception of some land along Highway 224.

Suitability Notes

a) Some northwest and southwest portions of the study area north of the county line are suitable for future urbanization based on topography, future availability of urban services and the potential for residential or employment uses.
b) Large portions of the study area below the county line are also suitable for future urbanization based on the same factors as (a) above plus good access to Highway 26.
c) Some of the areas referred to in (a) and (b) above could be urbanized to make efficient use of public and private investments in Gresham's Springwater industrial area to support a healthy economy in East Multnomah County.
d) The northern portion of Clackamas County could be designed with a well-connected system of streets, bikeway and trails that link to transportation options in Gresham.
e) The areas referred to above for consideration of future urban uses must be carefully balanced with the designated Foundation agricultural land.
f) The East Buttes are a defining landscape feature for the area.

Metro Chief Operating Officer Recommendation

Some selected acreage north of the county line and additional acreage south of the county line should be considered for inclusion within urban reserves to provide long-term housing and employment opportunities. Most of the land recommended by the CAC and a substantial portion of the land recommended by the PAC should be considered for rural reserves. The

specific amount and location of these reserves should be guided by the following considerations:

- While portions of the area north of SE Lusted Road are suitable for urbanization between creek areas, their location and surrounding land would isolate them from the existing UGB urban areas. There are relatively flat areas for development and roadways between Beaver Creek and the Sandy River area. These landforms, however, along with river tributaries would preclude a well-connected transportation system. Access to the area would be limited to a narrow corridor on the northwest side. This situation would result in limited opportunities for urban densities as well as mixed use and employment uses. For this reason, this area should not be considered as an urban reserve.
- Multnomah County staff has identified areas south of SE Lusted Road as suitable for urbanization. Some of the more close-in portions, west of 302nd, should be considered for urban reserves in order to complement the potential urban reserves along Hwy 26 south of the county line. Careful consideration must be given to the fact that there is no clear natural or man-made feature to define a reserve boundary line to the east.
- While recognizing that the south of SE Lusted area is designated as Foundation agricultural land, portions of it are also situated to take advantage of and enhance the existing Springwater employment area as well as optimizing the Hwy 26 corridor.
- South of the county line there is appropriate land for both residential and employment uses, the latter to complement the future build out of the Springwater industrial area and optimize transportation investments on Highway 26 and light rail in Gresham. There are few urban reserve study areas around the region that appear to be suitable for concentrated economic development and the region should seriously consider reserving such lands for future urbanization.
- Hwy 26 could serve as an urban edge or boundary to separate urban and rural lands. While recognizing that portions of the area west of Hwy 26 are designated as Foundation agricultural land, it is important to consider some of this area for urban reserves to both take advantage of the Hwy 26 corridor and support a future Boring center.
- The village of Boring could serve as a commercial center for an urban area.
- The significant natural landscape features, including the east buttes and Deep Creek, should be protected from urbanization.
- Recognize the guiding principle of separation of neighbor cities from the Metro, in this case the city of Sandy.

Damascus Area

Context/Rural Status

This area is defined generally by Hwy 212 on the north, N. Deep Creek on the east, the Clackamas River on the south and Hwy 224 on the west. This area is characterized by low density rural residential land, some forested parcels, a flat bench area near Deep Creek Elementary School that is in agricultural production and rolling hills that generally slope south to the Clackamas River that are composed of small-scale agricultural activities. A substantial portion of the area is currently within the Damascus city limits, including approximately 500 acres that is outside the UGB. According to the Agricultural Lands Inventory, almost the entire area is designated as Conflicted agricultural land, with a small portion in the southwest corner designated as Important agricultural land. The area includes the Clackamas River Bluffs and Deep Creek Canyon natural landscape features. According to the Forestry Lands Inventory, a significant portion in the central portion of the area is designated as Mixed Forest Agriculture.

County Reserves Study Status

The Clackamas County Policy Advisory Committee (PAC) has recommended 1,718 acres of this area for urban reserve designation under the state factors. Based on the PAC discussions, this land would be suitable for both residential and employment uses. The PAC has recommended that the majority of the land to the south and east be designated as a rural reserve with exception of some land along Highway 224.

Suitability Notes

a) The eastern portion of the PAC-recommended area is very suitable for future urbanization based on topography, future availability of urban services and the potential for residential, mixed use or employment uses. Most of this area was identified in the Damascus Boring Concept Plan effort as an extension of the proposed town center to the north of Hwy 212.
b) Inclusion of the portion of this area that is currently within the Damascus city limits would help promote the implementation of the city's initial comprehensive planning by optimizing the regional planning efforts in the process, providing a governance structure for urban services and meeting future housing and economic needs of the community.

Metro Chief Operating Officer Recommendation

The PAC-recommended acreage in this area should be considered for inclusion within urban reserves to provide long-term housing and employment opportunities. The land to the south and east should be considered for rural reserves consistent with the PAC recommendation. The specific amount and location of these reserves should be guided by the following considerations:

- Inclusion of the land east of SE 232nd Drive that has been identified through the Damascus Boring Concept Plan process as either an extension of the proposed town center, or as land supporting a future town center.
- Identification of edges or boundaries, such as Noyer Creek and N. Fork Deep Creek, which will provide a buffer between urban and rural lands.
- Protection of significant natural landscape features, including Deep Creek and the Clackamas River Bluffs.

Oregon City Area

Context/Rural Status

This area in Clackamas County is generally defined by the Clackamas River on the north, Ferguson Road on the east, Henrici Road on the south and the Willamette River on the west. According to the Agricultural Lands Inventory, most of this area is designated as Conflicted agricultural land, with some Important agricultural land designation along the southern boundary. The area includes the Abernethy Creek natural landscape feature and a portion of the Newell Creek feature. According to the Forestry Lands Inventory, portions of the north central section of the area are designated as Mixed Forest Agriculture, with a small portion of the southern section designated as Wildland Forest.

County Reserves Study Status

The Clackamas County Policy Advisory Committee (PAC) has recommended an urban reserve designation under the state factors on 1,443 total acres within three subareas. The three subareas are known as Northeast of Oregon City (1,228 acres), East of Oregon City (146 acres) and South of Oregon City (69 acres). The PAC recommends the following areas as rural reserves:

- A strip of land between the Clackamas River and generally Clackamas River Road.
- The Holcomb and Abernethy creek riparian areas.
- The Newell Canyon area around Hwy 213 and the area east of the Holly Lane corridor.
- The area south of the South of Oregon City subarea.

Northeast of Oregon City

This subarea is defined by the UGB and a line just east of S. Clackamas River Drive on the west, just south of S. Clackamas River Drive on the north, just west of South Beaton and South Hilltop roads on the east, and south of Pam Drive and the flatter area north of Holcomb Creek on the south. According to the Agricultural Lands Inventory, the entire area is designated as Conflicted agricultural land. The southern portion of the area includes a part of the Abernethy Creek natural landscape feature. According to the Forestry Lands Inventory, portions of the northeast and southern sections of the area are designated as Mixed Forest Agriculture. This area is made up of a series of flat, bench sections interspersed with creeks and their associated steeper slopes. Currently, it is a mix of rural residential with some agricultural activities mostly along the northern and northeastern boundaries.

Suitability Notes

a) Portions of the upper Northeast Oregon City section are suitable for future urbanization based on topography, future availability of urban services and the potential for walkable neighborhoods between the creek canyon areas. While there is an existing rural road network that could serve as the backbone of an urban network, creek crossings present challenges for full connectivity between neighborhoods.
b) Transportation connections to the larger urban area are limited by the Clackamas River and associated bluffs to the west and north, and the rural area to the east. This limits good access to the area from the southwest only and the impacted I-205/Hwy 213 interchange is problematic for accommodating a high volume of additional trips.

c) While the southern portion includes a peninsula bench that may be suitable for urbanization, it is discontinuous with adjacent land to the east and west, as well as to the UGB to the south.

Metro Chief Operating Officer Recommendation

This subarea should not be considered for inclusion within urban reserves due to limited opportunities for urban densities, mixed use, and employment areas and limited transportation connections to the existing urban area.

East of Oregon City

This subarea is a narrow corridor along Holly Lane with the UGB to the north and south. It is concentrated around the spine of Holly Lane and varies from approximately 150 feet to approximately 800 feet on each side of that roadway. According to the Agricultural Lands Inventory, the entire area is designated as Conflicted agricultural land. This area includes the Abernethy Creek natural landscape feature. According to the Forestry Lands Inventory, the area does not include any identified forestry zones.

Suitability Notes

a) Portions of the East of Oregon City section are suitable for future urbanization based on topography and the future availability of urban services.
b) Holly Lane would serve as an important connection between northeast and southeast Oregon City which are already within the UGB.

Metro Chief Operating Officer Recommendation

The area from the Oregon City boundary on the west, including Hwy 213 and Newell Creek canyon, to the existing UGB on the east should be considered for inclusion within urban reserves. If the City deems Holly Lane important for long-term roadway connectivity for future urbanization, then this entire area should be included as an urban reserve due to Metro code 3.01.030(b)(2). This code section states that amendments to the UGB shall not result in the creation of an island of urban land outside the UGB or an island of rural land inside the UGB. The Abernethy Creek natural landscape feature should be considered for rural reserve designation. The specific amount and location of these reserves should be guided by the following considerations:

- Including the entire section of land between the Oregon City boundary of the west and east would provide for better north/south transportation connectivity.
- Protecting the Newell Creek riparian corridor.

South of Oregon City

This subarea includes three small sections along the southern boundary of Oregon City. According to the Agricultural Lands Inventory, the entire area is designated as Important agricultural land. These sections do not include a natural landscape feature. According to the Forestry Lands Inventory, the sections do not include any identified forestry zones. These sections are small, mostly flatter bench areas that extend from the southern boundary of Oregon City. To the south are steeply-sloped areas including tributary head-waters to Beaver Creek.

Suitability Notes

a) The South of Oregon City bench sections are suitable for future urbanization based on topography and the future availability of urban services.
b) Urbanization of these small areas would complement existing Oregon City neighborhoods directly to the north.
c) The steep topography immediately to the south of these areas would serve as a natural buffer between Oregon City and rural lands.

Metro Chief Operating Officer Recommendation

These small bench areas should be considered for inclusion within urban reserves. Inclusion of these areas would serve as a logical extension of existing City neighborhoods. The land south of the bench areas should be considered for rural reserve designation consistent with the PAC recommendation. These reserves should be guided by the following considerations:

- Including land that can be urbanized with good transportation connectivity and availability of urban services from Oregon City immediately to the north.
- Providing a natural buffer between urban and rural uses as well as protecting tributaries to Beaver Creek, using the steep slopes immediately to the south.

Additional Metro Chief Operating Officer Recommendation

Based on the factors listed below, a limited area to the southeast of Oregon City should be considered for inclusion within urban reserves. The consideration should include an area centered on Henrici Road, from approximately Hwy 213 to Beavercreek Road, and extending to the natural topographic boundary to the south of the roadway. This potential reserve area should be guided by the following considerations:

- The area is contiguous to existing Oregon City urban services.
- The topography is well-suited for urban-level development, including transportation access and connectivity.
- Henrici Road forms the backbone of a transportation system that could accommodate urban uses and complement the City's east/west connections.
- The Agricultural Lands Inventory designates the area as Conflicted agricultural land.
- The Forestry Lands Inventory contains no designated forestry zones.
- The steep slopes to the immediate south would serve as a natural boundary and buffer between urban and rural uses.

Stafford Basin Area

Context/Rural Status

This area in Clackamas County is generally defined by I-5 on the west, Lake Oswego on the north, West Linn on the east and by a line extending from approximately Elligsen Road on the west to Pete's Mountain Road on the east. The According to the Agricultural Lands Inventory, the entire area is designated as Conflicted agricultural land, except for two small fingers of land along the southern boundary that are designated as Important agricultural land. This area also includes the Wilson Creek and Tualatin River natural landscape features. According to the Forestry Lands Inventory, there are no designated forestry zones except a small finger of land in the southeastern portion that is Mixed Forest Agriculture.

County Reserves Study Status

The Clackamas County Policy Advisory Committee (PAC) has recommended approximately 734 acres of this area for urban reserve designation under the state factors. Based on the PAC discussions, this land would be suitable for both residential and employment uses. The PAC has recommended that approximately 3,000 acres of land along the Tualatin River and in the vicinity of Wilson Creek be designated as a rural reserve. This diverse area is characterized by a variety of landscapes including flat areas between the Tualatin River and I-205, riparian areas with steeper slopes and rolling hills. Land uses include mostly rural residential with some farm activities, a small commercial node, as well as schools, parks and churches.

Suitability Notes

a) The entire area is adjacent and accessible to existing and future planned public infrastructure including I-5, I-205 (recently designated as a regional priority corridor for high capacity transit) and four surrounding full-service cities.
b) The I-205/Stafford Road interchange area is suitable for higher density and/or employment uses based on topography, availability of services and access to important transportation corridors.
c) The remaining section north of the Tualatin River is a mix of areas that are suitable for urbanization and ones that are constrained by steeper slopes and creek riparian areas.
d) The section south of I-205 is characterized by pockets that are suitable for urbanization and other areas that are more parcelized and feature topography ranging from mild slopes to those over 25 percent.

Metro Chief Operating Officer Recommendation

A more significant amount of land than has been recommended by the county should be considered for inclusion within urban reserves, notwithstanding the political challenges concerning governance. The specific location of these reserves should be guided by the following considerations:

- The suitability of sections of this area to provide employment uses for this regional subarea, leveraging existing transportation corridors, as well as providing for some mixed use and residential uses.
- The I-205/Stafford Road interchange area could help maintain and further enhance the local and regional economy through its strategic location along the I-205 employment corridor and close proximity to I-5. There is even a potential for a town center at this location.

- Consideration should be given for urban reserves south and southwest of I-205 to create support for the
  I-205/Stafford Road interchange center area.
- Ensure the protection of the Tualatin River and Wilson Creek riparian areas.

East Wilsonville Area

Context/Rural Status

This area in Washington and Clackamas Counties is adjacent to the City of Wilsonville and is generally defined by SW Frobase Road on the north, SW 45th Drive on the east, the Willamette River on the south and the UGB on the west. According to the Agricultural Lands Inventory, this area is designated as Important agricultural land with the exception of a small amount of land near SW 82nd Avenue and SW Frobase Road that is designated as Conflicted agricultural land. There are no identified natural landscape features or designated Forestry lands in the area.

Clackamas County Reserves Study Status

The Clackamas County Policy Advisory Committee (PAC) has recommended two areas for urban reserve designation under the state factors. The first area (143 acres) is east of Wilsonville, south of the county line and west of Stafford Road. This recommended area contains six parcels that are bisected by a stream that runs in a north-south direction through the center of the area. It is characterized by relatively flat open agricultural lands with a forested stream corridor and rural residences. A BPA power line runs through the lower portion of the area in a northwesterly direction. Based on the PAC summary information, this land would be suitable for residential uses. The second recommended area (264 acres) is also east of Wilsonville and bisected by SW Advance Road. The area is characterized by open agricultural lands with a couple of forested stream corridors and rural residences concentrated along SW 60th Avenue. This area also contains a BPA power line that runs through the upper portion of the area in a northwesterly direction. Based on the PAC summary information, this land would be suitable for residential uses. The PAC has recommended the area south and east of the urban reserve areas as rural reserves, with the exception of an undesignated arc of land directly east of the first area and south of SE Homesteader Road and north of SW Kahle Road. In addition, the PAC has recommended that the stream corridors within the urban reserves be designated as rural reserves as well as four parcels of West Linn Wilsonville School District property that are located adjacent to the UGB in the second area.

Suitability Notes

a) The two Clackamas County areas are suitable for future urbanization based on topography and availability of appropriate service providers.
b) Both of these areas could be designed to be walkable with a well connected system of streets, bikeways and trails that provide a range of housing types and connect to the existing urban fabric of Wilsonville.
c) There is no natural boundary or edge to provide a buffer for the agricultural activities to the east.

Metro Chief Operating Officer Recommendation

These areas in Clackamas County should be considered for inclusion within urban reserves to provide additional long-term housing opportunities that will support the City of Wilsonville's desire to focus on infill and redevelopment to create a compact urban form and to address the City of Wilsonville's imbalance of jobs and housing. The city has indicated that they have a sufficient land supply for a period greater than 20 years, thus urban reserves in this area should be considered a long-term supply of land. The remaining land in this area should be considered

for rural reserves consistent with the PAC recommendation. The specific amount and location of these reserves should be guided by the following considerations:

- Identifying areas in which walkable, well connected residential development could occur in the long-term that will support the desired compact urban form of the City of Wilsonville.
- The identification of edges or boundaries is needed to provide a buffer between urban lands and the agricultural activities to the east.
- If the land adjacent to the West Linn Wilsonville School District property is included as an urban reserve, then the school property should also be included as an urban reserve.

Washington County Reserves Study Status

The Washington County Reserves Coordinating Committee (RCC) has recommended 424 acres in this area for urban reserve designation under the state factors. The recommended area is located north of the City of Wilsonville, north of the county line and south of SW Frobase Road. The area is characterized by gently rolling forested and open agricultural parcels, and includes a mobile home park. According to pre-qualified concept planning efforts undertaken by the City of Wilsonville, this area may be appropriate for residential and limited employment uses. The RCC did not recommend any rural reserve areas in this portion of Washington County.

Suitability Notes

a) This area is suitable for future urbanization based on topography and availability of appropriate service providers.
b) Portions of this area could be designed to be walkable with a well connected system of streets, bikeways and trails that provide a range of housing types and connect to the existing urban fabric of Wilsonville.
c) The lands adjacent to SW Elligsen Road have the capacity to provide long-term employment opportunities.
d) There is no natural boundary or edge to provide a buffer for the rural lands to the east.

Metro Chief Operating Officer Recommendation

This area in Washington County should be considered for inclusion within urban reserves to provide additional long-term housing and limited employment opportunities that will support the City of Wilsonville's desire to focus on infill and redevelopment to create a compact urban form. The city has indicated they have a sufficient land supply for a period greater than 20 years, thus urban reserves in this area should be considered a long-term supply of land. The specific amount and location of these reserves should be guided by the following considerations:

- Identifying areas in which walkable, well connected residential development could occur in the long-term that will support the desired compact urban form of the City of Wilsonville and provide long-term employment opportunities.
- The identification of edges or boundaries is needed to provide a buffer between urban and rural land.

To the degree the region decides to designate urban reserve areas south of I-205, coordination will be necessary with the City of Wilsonville during concept planning of the areas to ensure that infrastructure investments support both areas and to minimize any impacts one area may have on the other.

South Sherwood/West Wilsonville Area

Context/Rural Status

This area in Washington and Clackamas Counties is generally defined by the UGB on the north and east, the Willamette River on the south and the Washington-Clackamas County line and SW Ladd Hill Road on the west. According to the Agricultural Lands Inventory, the northern portion of the area is designated as Conflicted agricultural land, and the southern portion is Important agricultural land. The area includes the Tonquin Geologic Area natural landscape feature and is near the Parrett Mountain natural landscape feature. According to the Forestry Lands Inventory, the area generally associated with Coffee Lake Creek near Wilsonville and Mill Creek near SW Bell Road is designated as Mixed Forest Agriculture.

Clackamas County Reserves Study Status

The Clackamas County Policy Advisory Committee (PAC) has recommended two areas for urban reserve designation under the state factors. The first area (1,803 acres) stretches from the Washington-Clackamas County line south of Sherwood, in a southeasterly direction to Wilsonville in the vicinity of SW Grahams Ferry Road and SW Boeckman Road. The southern edge of the area is defined by SW Tooze Road. This recommended area is characterized by rolling to relatively flat open agricultural lands with forested stream corridors and rural residences concentrated on SW Ladd Hill Road, SW Morgan Road and SW Grahams Ferry Road/SW Malloy Way. Based on the PAC summary information this land would be suitable for both residential and employment uses. The second recommended area is 63 acres in size and made up of four parcels on the south side of SW Wilsonville Road. The area contains two residences with the remainder of the land in agricultural production. Based on the PAC summary information this land would be suitable for residential uses. The PAC has recommended the area between the large urban reserve area and the county line to the north be designated as a rural reserve, along with area west of SW Ladd Hill Road and south of Corral Creek. In addition, the PAC has recommended the French Prairie area south of the Willamette River as a rural reserve.

Suitability Notes

a) The northern Clackamas County area is suitable for future urbanization based on topography and availability of appropriate service providers; however, there are challenges related to transportation services in the general area that need to be addressed.
b) Portions of this northern area could be designed to be walkable with a well connected system of streets, bikeways and trails, but connecting the entire area to the existing urban transportation system will be difficult due to the limited portion of the proposed urban reserve that is adjacent to Wilsonville.
c) Metro policy, found in Metro code 3.01.030(b)(2), states that amendments to the UGB shall not result in the creation of an island of urban land outside the UGB or an island of rural land inside the UGB. Including the entire northern area would violate the direction of this policy by creating an island of rural land inside the UGB. Thus, if the entire area was deemed suitable for inclusion as an urban reserve, then all of the land between it and the current UGB would also need to be designated as an urban reserve.
d) Urbanization in a portion of this area could support Sherwood's desire to be a complete community consistent with the 2040 Growth Concept by providing employment

opportunities to address the city's recent rapid residential growth, building upon the city's success in providing access to nature and recreational facilities, while preserving ecological systems within the area.

e) The Tonquin Geologic Area provides a natural buffer between the majority of Wilsonville and the lands being considered for urban reserve status. There is not, however, an obvious natural boundary to the south of the northern area that provides an edge between urban and rural uses.
f) The southern Clackamas County area is suitable for urbanization based on topography, availability of appropriate service providers, and the ability to design a walkable community with a range of housing types that can easily be connected to the existing urban fabric of Wilsonville.
g) Metro's Grahams Oaks Regional Park is adjacent to the southern area, thereby providing recreational opportunities and trails connecting to the Villebois neighborhood of Wilsonville.

COO Recommendation

These two areas in Clackamas County should be considered for inclusion within urban reserves to help meet regional employment goals and to provide some additional housing opportunities for Sherwood and Wilsonville. The land south of Corral Creek should be considered for rural reserves. Consistent with the PAC recommendation, the French Prairie area south of the Willamette River should be considered for rural reserve designation. The specific amount and location of these reserves should be guided by the following considerations:

- The ability of the land to provide needed regional and local employment opportunities.
- Identifying the areas in which walkable, well connected residential development could occur that will support the compact urban form of the adjacent city.
- The identification of edges or boundaries that will provide a buffer between urban and rural lands.
- The protection of the Tonquin Geologic Area natural landscape feature.
- Coordination with the lands being considered in Washington County so an island of urban land outside the UGB or an island of rural land inside the UGB is not created.
- Prior to urbanization the region needs to address transportation capacity issues on Highway 99W and Tualatin Sherwood Road and consider the transportation improvements that were identified in the I-5 to 99W planning process.

Washington County

The Washington County Reserves Coordinating Committee (RCC) has recommended 531 acres in this area for urban reserve designation under the state factors. The recommended area is located between the cities of Sherwood and Tualatin, north of the county line. The area is characterized by forested and open parcels, some of which have been highly manipulated for industrial uses and flat lands along stream corridors owned by the federal government. The area includes a Tualatin Valley Fire and Rescue facility and the Tualatin Valley Sportsmen Club, which owns a significant portion of land in the center of the Washington County area. According to pre-qualified concept planning efforts undertaken by the Cities of Sherwood and Tualatin, this area may be appropriate for industrial uses. The RCC has recommended a very small area of land near Coffee Lake Creek as a rural reserve.

Suitability Notes

a) Portions of the area between Sherwood and Tualatin are suitable for future urbanization based on topography and availability of appropriate service providers, however, there are challenges related to transportation services in the general area that need to be addressed.
b) Redevelopment of the rural industrial uses currently in the area could provide employment opportunities that help balance Sherwood's recent rapid residential growth and maintain Tualatin's job-housing balance.
c) Tualatin's Knife River area of interest, located west of SW Waldo Way and north and south of SW Tonquin Road, provides the opportunity to extend 124th Avenue to any future east west arterial roads, thereby making use of future public and private infrastructure investments and providing needed transportation improvements.
d) U.S. Fish and Wildlife lands along Rock Creek may provide an edge between urban and rural lands while preserving the natural integrity of the stream corridor.

COO Recommendation

This area in Washington County should be considered for inclusion within urban reserves to help meet regional employment goals and local employment needs for the City of Sherwood. The specific amount and location of these reserves should be guided by the following considerations:

- The identification of suitable land that will support the local needs of the adjacent communities in providing needed employment opportunities and future transportation connections.
- The identification of edges or boundaries such as the National Wildlife Refuge lands that can provide a buffer between urban and rural lands.
- Prior to urbanization the region must address transportation capacity issues on Highway 99W and Tualatin Sherwood Road and consider the transportation improvements that were identified in the I-5 to 99W planning process.
- Coordination with the lands being considered in Clackamas County so an island of urban land outside the UGB or an island of rural land inside the UGB is not created.

West Sherwood Area

Context/Rural Status

This area in Washington County is generally defined by the Tualatin River in the north, the Washington and Clackamas County line on the east, the UGB and SW Parrett Mountain Road in the south and W Lebeau Road on the west. According to the Agricultural Lands Inventory, the northern area is designated as Foundation agricultural land, the western portion is Important agricultural land and the southern portion is Conflicted agricultural land. This area is near the Parrett Mt./Chehalem Mts. natural landscape features. According to the Forestry Lands Inventory, the northern portion of the area is designated as Mixed Forest Agriculture and the southeastern portion of the area, near the Washington/Clackamas County border is designated as Wildland Forest.

County Reserves Study Status

The Washington County Reserves Coordinating Committee (RCC) has recommended 2,969 acres in this location for urban reserve designation under the state factors. The recommended area is separated into two areas adjacent to the City of Sherwood. The main area to the west of the city stretches approximately one-half mile from the current UGB in the west and the south and is defined by the Tualatin River floodplain in the north and the UGB in the east. The area is mixture of flat lands near the Tualatin River in the north and rolling hills in the middle and southern portions. The area is characterized by rural residences, forested parcels and smaller scale agricultural activities and has a power line running through the northern portion. A series of three small areas (totaling 122 acres) on the north side of the city, between the Tualatin River floodplain and the current city limits has also been identified as potential urban reserves. This small area is a mixture of forested and agricultural lands and also has a power line running through most the three areas. According to pre-qualified concept planning efforts undertaken by the City of Sherwood, these areas may be appropriate for mostly residential development with dispersed mixed-use neighborhood centers, limited employment and a station community along a future High Capacity Transit (HCT) corridor. The RCC has recommended that the land adjacent to the south, west and north should be designated as a rural reserve with the exception of some land around Chicken Creek and Highway 99W south of the city.

Suitability Notes

a) This area is suitable for future urbanization based on topography and availability of appropriate service providers, however there are some challenges related to transportation services that need to be addressed.
b) Urbanization in this area should support Sherwood's desire to be a complete community consistent with the 2040 Growth Concept by preserving ecological systems, providing a range of housing types, building upon the city's success in providing access to nature and recreational facilities and providing employment opportunities to address the recent rapid residential growth the city has experienced.
c) The Tualatin River provides a natural buffer to preserve the extensive agricultural lands to the northwest and the Tualatin River National Wildlife Refuge provides an edge for the city in the north. There is no natural boundary for providing an edge between urban and rural lands to west.

Metro Chief Operating Officer Recommendation

This area should be considered for inclusion within urban reserves to help Sherwood continue to develop into a Great Community and meet the goals of the 2040 Concept Plan. The land adjacent to the proposed urban reserve area to the south, west and north should be considered as a rural reserve consistent with the RCC recommendation. The specific amount and location of these reserves should be guided by the following considerations:

- The ability of the land to support the local aspirations of the adjacent communities in providing needed housing, mixed-use center-type services, a potential station community and employment opportunities to balance recent rapid residential growth.
- The opportunity to enhance transportation connections to support the Near Term Regional Priority for a High Capacity Transit (HCT) line on Highway 99W.
- The identification of edges or boundaries that will provide a buffer between urban and rural lands to the west and protect the Foundation agricultural lands in the north portion of the area.
- The protection of significant natural landscape features, including Parrett Mt.
- Prior to urbanization, the region needs to address transportation capacity issues on Highway 99W and Tualatin-Sherwood Road and consider the transportation improvements that were identified in the I-5 to 99W planning process.

Bull Mountain Area

Context/Rural Status

This area in Washington County west of Tigard is generally defined by Scholls Ferry Road on the north, the UGB on the east, the Tualatin-Sherwood Road on the south and the Tualatin River on the west. According to the Agricultural Lands Inventory, the entire area is designated as Foundation agricultural land. This area also includes the Tualatin River natural landscape feature. According to the Forestry Lands Inventory a swath of land running south from SW Scholls Ferry Road to the Tualatin River, west of SW Roy Rogers Road is designated as Mixed Forest Agriculture.

County Reserves Study Status

The Washington County Reserves Coordinating Committee (RCC) has recommended 1,560 acres in this location for urban reserve designation under the state factors. The recommended area is made up of two areas identified by the City of Tigard and one area identified by the City of King City as potential urban reserves. The two Tigard areas straddle SW Roy Rogers Road, north of SW Beef Bend Road and encompass 888 acres. They are defined on the east by the 2002 UGB expansion areas 63 and 64 and on the west by the Tualatin River floodplain. The area identified by King City (672 acres) is defined by SW Roy Rogers Road on the west, SW Beef Bend Road on the north, the UGB on the east and the Tualatin River on the south. This relatively flat area contains small farms, forested land and rural residences mostly concentrated near the UGB and SW 137th Avenue. According to pre-qualified concept planning efforts undertaken by King City and an initial planning study by Tigard, this area may be appropriate for residential development with dispersed mixed-use neighborhood centers and civic uses. In general, the RCC has recommended that the land adjacent to the west as well as the Tualatin River National Wildlife Reserve is designated a rural reserve.

Suitability Notes

a) This area is generally suitable for future urbanization based on topography and availability of some services, however, there are challenges related to extending urban services through unincorporated lands to a significant portion of the area and the identification of a provider of potable water.
b) Urbanization in this area should support the recent planning efforts for 2002 expansion area 63 & 64 by providing a walkable and well connected system of streets, bikeways, and recreation trails that complement the West Bull Mt. plan, in addition to preserving the natural resources and providing access to nature and recreational facilities.
c) The Tualatin River provides a natural buffer to preserve the extensive agricultural lands to the west and the Tualatin River National Wildlife Refuge to the south.

Metro Chief Operating Officer Recommendation

Tthe area identified as the Rural Element in the West Bull Mountain Concept Planning Area should be considered for inclusion within urban reserves. This area is defined by SW Roy Rogers Road to the west, SW Beef Bend Road to the south, the UGB to the north and SW 150th to the east. To the degree that Tigard and King City can resolve urban service and governance issues, the region could consider additional urban reserves in this area to the south and west. The remaining land in this area should be considered for rural reserve designation, consistent with

the RCC recommendation. The specific amount and location of these additional reserves should be guided by the following considerations:

- The ability of the land to support the local aspirations of the adjacent communities in providing needed housing, mixed-use center type services and recreation opportunities.
- The areas identified by Tigard, including the Rural Element in the West Bull Mountain Concept Planning Area, are not contiguous to the city, preventing near-term annexation. For this reason, any urban reserves in this area would need to be considered as a long-term supply of land.
- There are north-south and east-west transportation facilities in reasonable proximity that could support the Near Term Regional Priority for a High Capacity Transit (HCT) line along the Highway 99W corridor.
- The Tualatin River floodplain provides an edge or buffer between future urban lands and the Foundation agricultural lands to the west.
- The protection of significant natural landscape features such as the Tualatin River will support the nearby Tualatin River National Wildlife Refuge.

Cooper Mountain Area

Context/Rural Status

This area in Washington County is generally defined by Butternut Creek on the north, the UGB on the east, the Tualatin River on the west and Rood Bridge Road on the south. According to the Agricultural Lands Inventory, the entire area is designated as Foundation agricultural land. This area also includes the Cooper Mt. and Tualatin River natural landscape features. According to the Forestry Lands Inventory, a large swath of land heading west from Cooper Mountain to Clark Hill Road is designated as Mixed Forest Agriculture.

County Reserves Study Status

The Washington County Reserves Coordinating Committee (RCC) has recommended 7,367 acres for urban reserve designation under the state factors. The recommended area is defined by SW River Road on the west, SW Rosedale Road and the UGB on the north, the UGB on the east and Scholls Ferry Road on the south. This large area varies in topography from the hilltop terrain of Cooper Mountain that slopes west and south to relatively flat lands along SW River Road and SW Scholls Ferry Road. The area includes large scale agricultural operations, rural residences concentrated around SW Riggs Road, portions of SW Farmington Road and SW 175th Avenue, and active and inactive quarries. Numerous streams flow from the upland portion of the area, ultimately flowing into the Tualatin River. The area also includes Metro's Cooper Mountain Regional Park. According to pre-qualified concept planning efforts undertaken by the City of Beaverton, this area may be appropriate for mostly residential development with dispersed mixed-use neighborhood centers. The RCC has recommended that the land adjacent to the west and south be designated a rural reserve.

Suitability Notes

a) The flatter southern and western portions of the RCC-recommended area are more suitable for future urbanization based on topography and minimally constrained land. These areas, however, also provide some challenges to urbanization due to distance from existing services, needed transportation improvements, and being adjacent to unincorporated urban areas.
b) The lands adjacent to the existing urban areas are more constrained due to slopes and headwater stream areas that make it more difficult to develop a compact urban form with a well connected transportation system.
c) The Tualatin River provides a natural buffer to preserve the extensive agricultural lands to the west and south. There is, however, no obvious edge or boundary prior to reaching the Tualatin River that could protect the Foundation agricultural lands to the east of the river.

Metro Chief Operating Officer Recommendation

Land in the vicinity of SW Scholls Ferry Road and SW 175th Avenue should be considered for inclusion within urban reserves to support the continued development of the Murray Scholls Town Center area. The remaining land should be considered for rural reserves based on the Foundation agricultural land designation. The specific amount and location of these reserves should be guided by the following considerations:

- Providing a limited amount of land to support the Murray Scholls Town Center through needed housing, commercial services and recreation opportunities.

- An edge or boundary will need to be identified to provide a buffer between urban and rural lands.
- The protection of significant natural landscape features, including Cooper Mt. and the Tualatin River.
- The protection of the large expanse of Foundation agricultural land near the Tualatin River.
- A significant portion of the urban land adjacent to the proposed urban reserve is in unincorporated Washington County. The County and its cities have agreed that future urban areas will be incorporated, thus any land that falls in this situation that is designated as an urban reserve should be considered a relatively long-term source of land supply.

South Hillsboro Area

Context/Rural Status

This Washington County area is defined by the Tualatin River to west, the Tualatin Valley Highway to the north, SW 209th Avenue to the east and SW Rosedale Road to the south. This flat area is characterized by large and medium scale agricultural activities interspersed with rural residences concentrated near SW River, SW Rosedale and SW Rosa Roads. Butternut and Gordon Creeks traverse the area prior to flowing into the Tualatin River. The Reserves Vineyard and Golf Club is located near the center of the area and a BPA power line runs in a north-south direction through the eastern portion of the area. According to the Agricultural Lands Inventory, the northern portion of the area is designated as Conflicted, with the remainder of the area designated as Foundation agricultural land. The western edge of the area is defined by the Tualatin River natural landscape feature. There are no designated Forestry lands in the area.

County Reserves Study Status

The Washington County Reserves Coordinating Committee (RCC) has recommended 2,330 acres in this area for urban reserve designation under the state factors. According to Hillsboro's pre-qualified concept planning efforts for this area, approximately 6 acres would be appropriate for employment uses and 1,258 for residential uses including Town and Neighborhood Centers. The remaining acreage would be dedicated to open space and roadways. The RCC has recommended rural reserve designations for the land immediately to the west and the land to the south is an additional urban reserve area.

Suitability Notes

a) This area is very suitable for future urbanization based on topography, availability of appropriate service providers and access to important transportation corridors, although future north-south and east-west transportation improvements will be necessary to accommodate the expected growth in the area.
b) This area can be designed to be walkable with a well connected system of streets, bikeways and trails, and can complement the nearby employment locations by providing additional housing opportunities as well as town center activities for the adjacent neighborhoods to the east, thus reducing the need to travel north for everyday services.
c) This area would help ensure the continued successful implementation of the 2040 Plan through its ability to meet the Great Communities' characteristics including preservation of ecological systems, providing a range of housing types and governance.

Metro Chief Operating Officer Recommendation

This area should be considered for inclusion within urban reserves. The land to the west should be considered for rural reserves consistent with the RCC recommendation. The specific amount and location of these reserves should be guided by the following considerations:

- Inclusion of a significant amount of residential land in this location, combined with Hillsboro's desire to increase densities in downtown Hillsboro and the Tanasbourne/Amber Glen communities will help meet the city's desire to reduce the jobs to housing ratio.
- Its close proximity to major westside employment areas, including Intel's Aloha campus, may help reduce home-to-work vehicle miles traveled

- The Tualatin River provides an edge or buffer to the large expanse of Foundation agricultural land to the west.
- There is no natural edge to the south, thus the identification of an edge or boundary is needed to provide a buffer between urban and rural lands.

Cornelius/Forest Grove Area

Context/Rural Status

This area in Washington County is both north and south of Forest Grove and Cornelius and is generally defined by NW Kemper Road and NW Osterman Road on the north, the UGB in the east, the Tualatin River and SW Stringtown Road on the south and the UGB on the west. According to the Agricultural Lands Inventory, the entire area is designated as Foundation agricultural land. This area also includes the Tualatin River, Lower Gales Creek and the confluence of Dairy and McKay Creek natural landscape features. There are no designated Forestry lands in the area.

County Reserves Study Status

The Washington County Reserves Coordinating Committee (RCC) has recommended approximately 7,400 acres for urban reserve designation under the state factors. The recommended area is made up of two areas identified by the City of Forest Grove and three areas identified by the City of Cornelius as potential urban reserves. The 3,145 acre area to the north of Forest Grove is defined by NW Thatcher Road on the west, generally north of NW Purdin and NW Verboort Roads on the north, east of NW Martin Road on the east and the UGB on the south. The 37-acre area to the south of Forest Grove is adjacent to the Taylor Way Industrial Area and is defined by the Tualatin River floodplain. The 2,695 acre area to north of Cornelius is defined by NW Martin Road in the west (contiguous to the Forest Grove area), the vicinity of an eastern extension of NW Verboort Road on the north and the UGB on the east and south. The two areas to the south of Cornelius (320 acres and 1,203 acres) are defined by the city limits and the Tualatin River. This entire area is generally comprised of large scale agricultural activities interspersed with a few pockets of rural residences concentrated in the community of Verboort and north of Tualatin Valley Highway east of Cornelius. A number of streams pass through this flat area ultimately flowing into the Tualatin River. The area north of Cornelius also includes the Killarney West and McKay Creek Golf Courses. According to the Forest Grove and Cornelius pre-qualified concept planning efforts for this area, approximately 75% of the land would be dedicated to residential use and 25% dedicated to employment use. The RCC has recommended rural reserve designation on the land north of the recommended north urban reserve areas and south of the south urban reserve areas.

Suitability Notes

a) This area is suitable for urbanization based on topography and the availability of appropriate urban service providers.
b) This area can be designed to be walkable with a well connected system of streets, bikeways and trails to provide a range of housing types, employment opportunities and the preservation of natural ecological systems.
c) The area includes some of the best agricultural land in the state. To the north of Cornelius and Forest Grove, there is a well-established agricultural community that is part of the Tualatin Valley Irrigation District, representing a significant investment in agricultural infrastructure and a key component for providing agricultural product flexibility. To the south are Foundation agricultural lands as well.
d) Existing (and any future) transportation access points to the Hwy 26 corridor occur on rural roads that pass through the extensive agricultural land to the north, significantly

impacting the viability of the agricultural community. To improve such access would require considerable regional resources.

e) Large scale urbanization in the area to the north may detract from implementing the 2040 Plan by placing thousands of households and jobs farther away from centers and transit corridors, thus increasing Vehicle Miles Traveled (VMT) and making it more difficult to support the recently adopted High Capacity Transit (HCT) corridor from Hillsboro to Forest Grove.

Metro Chief Operating Officer Recommendation

A limited amount of acreage adjacent to Cornelius and Forest Grove should be considered for inclusion within urban reserves to meet long term housing and employment needs. These areas should provide development opportunities to complement the existing Town Center and Main Street urban areas. Specifically, the area between Cornelius and Hillsboro to the south should be considered for urban reserves and Cornelius should determine the best use of this land in terms of residential or employment use. The identified employment area south of Forest Grove should be considered for an urban reserve as well as land south of NW Purdin Road and east of NW Thatcher Road. The remaining land in this area should be considered for rural reserves based on its Foundation agricultural land designation. The specific size and location of these reserves should be guided by the following considerations:

- Forest Grove has indicated they have enough residential zoned land within the current UGB to meet the demand for the next 20 years.
- Forest Grove and Cornelius have identified a significant amount of vacant job land within their UGBs to accommodate approximately 8,700 jobs. It is mostly small parcels, which is the type of parcel that is identified in their respective Economic Opportunity Analyses as most in demand to accommodate "spin off" users from Hillsboro's "cluster anchor" target industry.
- Beyond Council Creek, there is lack of a hard edge or buffer to separate urban and rural uses on the north side of Cornelius and Forest Grove.
- The protection of the extensive block of Foundation agricultural land to the north of Forest Grove and Cornelius.
- The protection of significant natural landscape features, including the Tualatin River, Lower Gales Creek and the confluence of Dairy and McKay Creek natural landscape features.

North Hillsboro Area

Context/Rural Status

This area in Washington County is generally defined by the City of North Plains and the Portland and Western Railroad tracks on the north, NW Cornelius Pass Road and the UGB adjacent to NW Shute Road in the east, the UGB along NW Evergreen Road on the south and NW Glencoe Road on the west. According to the Agricultural Lands Inventory, the entire area is designated as Foundation agricultural land. This area also includes a minor portion of the Rock Creek Headwaters natural landscape feature. According to the Forestry Lands Inventory, there are some Mixed Forest Agriculture designated lands on the northern edge of the area.

County Reserves Study Status

The Washington County Reserves Coordinating Committee (RCC) has recommended approximately 8,150 acres of this area for urban reserve designation under the state factors. The recommended area is defined by Dairy Creek to the west from NW Evergreen Road to Highway 26, Jackson School Road to the west and north of Highway 26, existing roads and the Portland and Western Railroad to the north, Rock Creek to the east and the existing UGB to the south. This area is characterized by large scale agricultural activities interspersed with a few pockets of rural residences concentrated near the following intersections: Highway 26/NW Shute Road, NW West Union Road/NW Helvetia Road, NW West Union Road/NW Cornelius Pass and NW Evergreen Road/NW Glencoe Road. A number of streams traverse this flat area, ultimately flowing into McKay Creek at the western edge of the area. This area also includes Waible Reservoir. According to Hillsboro's pre-qualified concept planning efforts for this area, approximately 3,000 acres would be appropriate for employment uses and 3,100 acres for residential uses. The remaining acreage is dedicated to open space and roadways. The RCC has recommended rural reserve designations to land west of McKay Creek. The land directly north of the urban reserve designated land is undesignated, with some rural reserve designated land further to the north.

Suitability Notes

a) This area is very suitable for future urbanization based on topography, availability of appropriate urban service providers and access to important transportation corridors.
b) This area also contains large blocks of Foundation agricultural lands, although the agricultural activities on the lands south of Highway 26 are more impacted due to the adjacent urban lands on two sides and the heavily used roadways on all four sides.
c) Urbanization of this area for employment purposes would help maintain and further enhance the local and regional economy through its strategic location along the Hwy 26 employment corridor; specifically to attract the "cluster anchor" industrial users that Hillsboro is targeting.
d) Urbanization of this area would help ensure the continued successful implementation of the 2040 Plan through its ability to meet the Great Communities' characteristics including preservation of ecological systems, optimizing regional investments, governance and meeting future economic needs.

Metro Chief Operating Officer Recommendation

Land in this area most suitable for employment purposes should be considered for inclusion within urban reserves to provide key long-term employment opportunities. The remaining land

in this area should be considered for rural reserves based on its Foundation agricultural land designation. The specific amount and location of these reserves should be guided by the following considerations:

- The separation of neighbor cities from the Metro area, in this case North Plains.
- The protection of large areas of Foundation agricultural land, including land north of Hwy 26 and west of McKay Creek.
- The identification of edges or boundaries, such as McKay Creek and Highway 26 that will provide a long-term hard edge between urban and rural lands.
- Because of this lands suitability for long-term employment needs for a specific type of industrial user, preservation of the land for this "cluster anchor" sector of the economy will be necessary.

Cornelius Pass Area

Context/Rural Status

This area in Washington County is generally defined by NW Kaiser Road on the north, the county line on the east, Hwy. 26 on the south and NW Helvetia Road on the west. According to the Agricultural Lands Inventory, the area between Cornelius Pass Road and 185th Avenue is designated as Foundation agricultural land, with the remainder identified as Important agricultural land. This area also includes the Rock Creek natural landscape feature. According to the Forestry Lands Inventory, a small portion of the area east of NW 185th Avenue is designated as Mixed Forest Agriculture.

County Reserves Study Status

The Washington County Reserves Coordinating Committee (RCC) has recommended approximately 1,725 acres of this area for urban reserve designation under the state factors. The recommended area is defined by NW West Union Road on the south, NW 185th Avenue and the UGB on the east, the Washington/Multnomah County line on the east and north and Cornelius Pass on the west. The area is characterized by rolling hills, riparian areas along Rock Creek and its tributaries, and Holcomb Lake. Land uses include farms, rural residential and commercial. According to the Beaverton pre-qualified concept planning efforts for this area, approximately 542 acres would be appropriate for residential development centered on three mixed-use neighborhood centers. The RCC has also recommended that the land directly north of the urban reserve designated land be undesignated, with some rural reserve designated land further to the north.

Suitability Notes

a) The lower portion of this area near NW West Union Road and NW 185th Avenue is more suitable for future urbanization based on topography and availability of urban services by appropriate service providers.
b) Urban services extended to the North Bethany expansion area could effectively serve the lower portion of this area, thus providing for an efficient use of public and private infrastructure investments.
c) This entire area is adjacent to unincorporated urban areas, thus the land must be considered a long-term supply due to the agreement between Washington County and its cities that future urban areas will be incorporated.
d) Rock Creek provides an edge or boundary for the agricultural lands to the northwest.
e) This area would help ensure the continued successful implementation of the 2040 Plan through its ability to meet the Great Communities' characteristics by providing a range of housing types, a system of streets, bikeways, and recreation trails that connect to adjacent neighborhoods, and the preservation of ecological systems.

Metro Chief Operating Officer Recommendation

The area near the intersection of NW 185th Avenue and NW West Union Road should be considered for inclusion within urban reserves. Rural reserve consideration should be given to Foundation agricultural land that connects to the larger expanse of Foundation agricultural land north of Highway 26. The specific amount and location of these reserves should be guided by the following considerations:

- Urban reserves in this location should complement the adjacent neighborhoods and commercial areas by providing multi-modal transportation connections and recreational opportunities along natural resource corridors.
- Protection of the Foundation agricultural land to the northwest that connects to the larger expanse of agricultural land that is north of Hwy 26 and west of Cornelius Pass Road.
- The land to the south and east of the proposed urban reserve is unincorporated Washington County. The county and its cities have agreed that future urban areas will be incorporated, thus any land in this area designated as an urban reserve should be considered a relatively long-term source of land supply until the City of Beaverton is in a position to annex the area.

West Multnomah County Area

Context/Rural Status

This area in Multnomah County is generally defined by NW Germantown Road on the north, NW Skyline Blvd on the east and the Washington/Multnomah County line on the west and south. The area is characterized by forested hills sloping in a westerly direction, bisected by stream corridors with interspersed locations of farmland and rural residences. According to the Agricultural Lands Inventory, the majority of this area is designated as Conflicted agricultural land with the exception of a small amount of land around NW Germantown Road and NW Kaiser Road that is designated as Important agricultural land. This area also includes portions of the Rock Creek Headwaters natural landscape feature. According to the Forest Land Inventory, this area includes some Wildland Forest between NW Springville Road and NW Thompson Road.

County Reserves Study Status

The Multnomah County Citizen Advisory Committee (CAC) recommended no urban reserve areas in this location. The CAC also recommended that all of the land in the Northwest Multnomah County study area be a rural reserve, with the exception that a strip of land along Multnomah Channel be undesignated. Multnomah County staff has recommended a small 80-acre urban reserve area east of the 2002 UGB Expansion Area 93 (Bonny Slope). The intent of this small urban reserve area is to connect Area 93 to the City of Portland. County staff also recommends that the remainder of the area be rural reserve, with the exception that an area east of the North Bethany project area (in Washington County) be undesignated.

Suitability Notes

a) Multnomah County does not provide urban services, thus these services would need to be provided by the City of Portland or Washington County, making the majority of this area difficult to serve.
b) In general, the area is not suitable for creating a walkable well-connected community served by streets, transit, trails and bikeways, with the exception of a small relatively flat area north of NW Springville Road at the county line.
c) As a result of Multnomah County not providing urban services, planning and development of Area 93 has been delayed for a number of years. Including additional land to the east of this area will provide the opportunity for a more efficient development pattern that can be more efficiently and cost effectively served with public services as well as an opportunity to preserve and enhance the natural ecological systems in a more comprehensive manner.

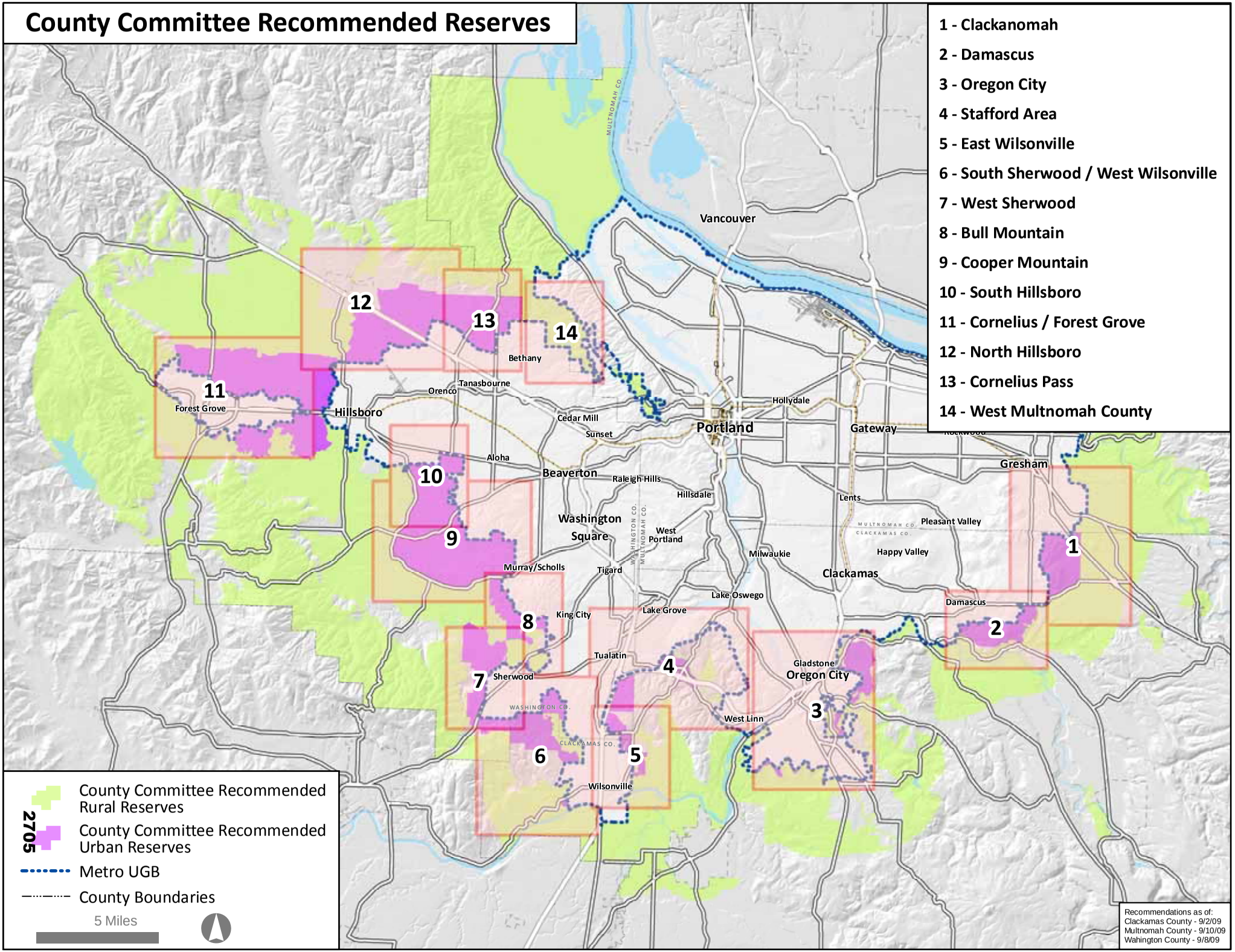
Metro Chief Operating Officer Recommendation

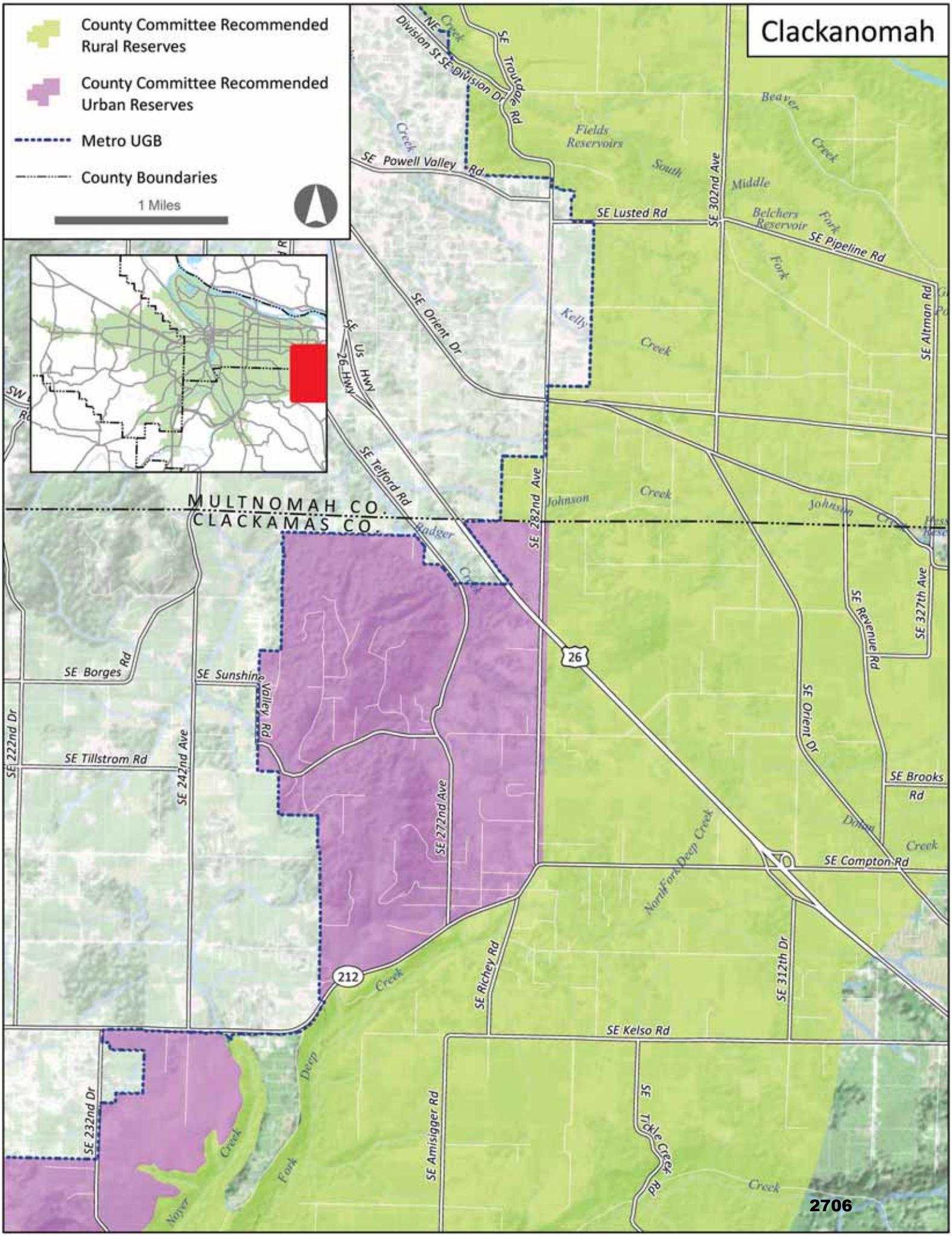
The remaining portion of Area 93, including the “star” shaped area along NW Thompson Road, should be considered for inclusion within urban reserves to assist in the planning and development of the western portion of Area 93 that was included in the UGB in 2002. Rural reserve consideration should be given to the identified significant natural landscape feature within the area, as well as Sauvie Island.

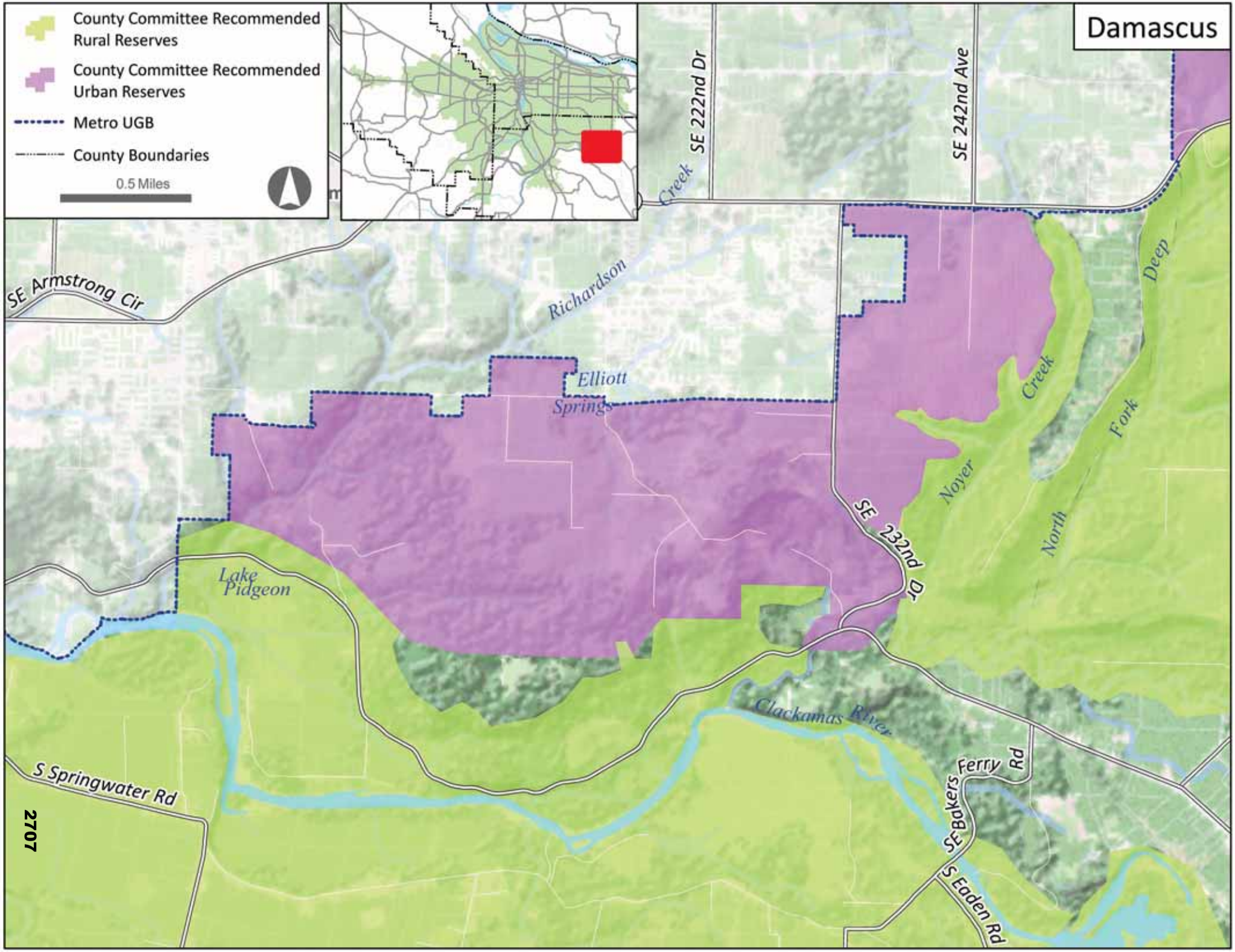
This area also represents an opportunity for the region to consider how to deal with “problematic landscapes” with mixed topography, relatively low agricultural value and interspersed habitat of high value. Similar areas exist in other parts of the region, including

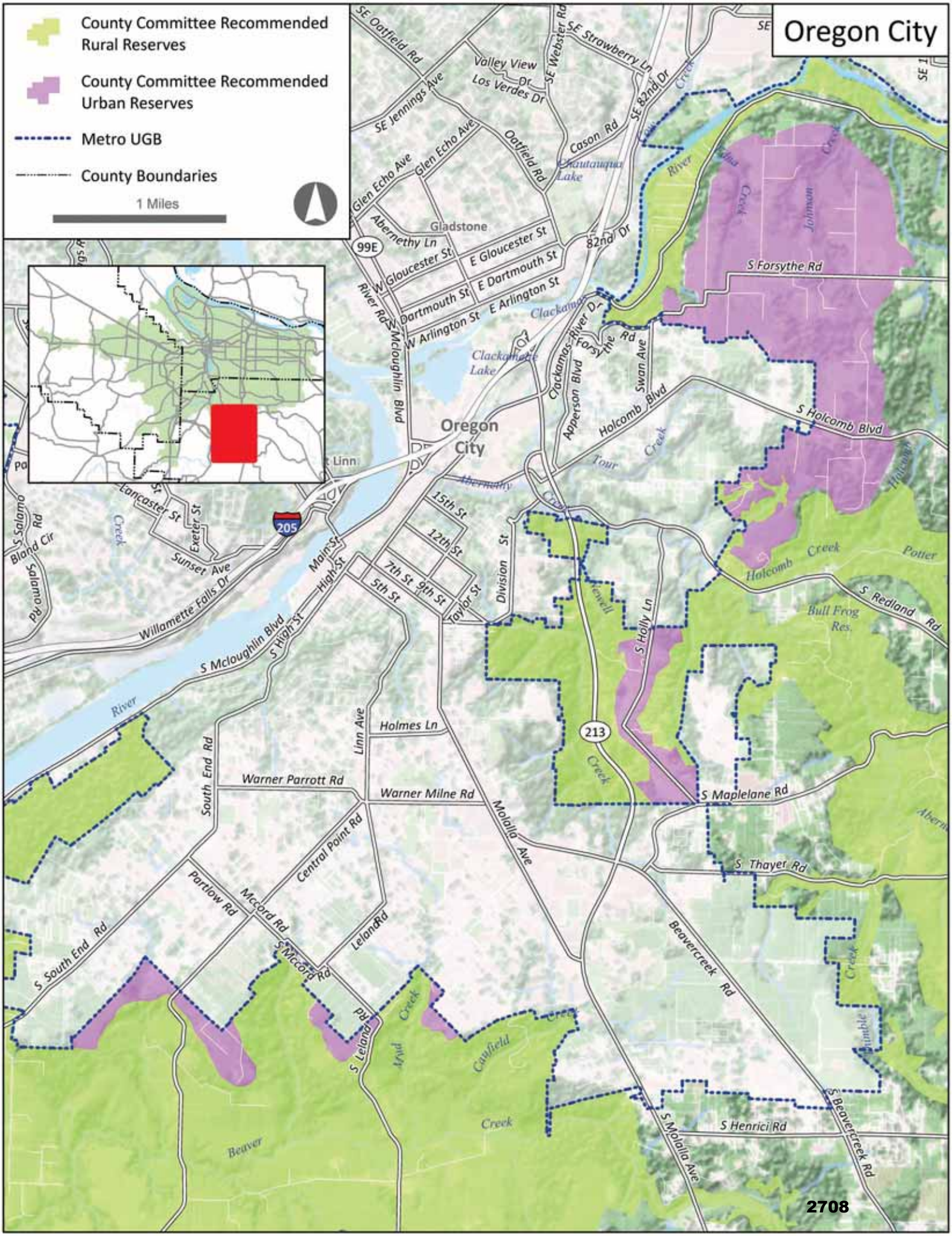
areas already inside the UGB, such as Damascus. The opportunity is to provide for other housing choices and to get private development to help finance public acquisition of natural resources. However, the region should consider this opportunity only if Multnomah and Washington Counties and the City of Portland agree to work out the delivery of urban services and of governance and only if the Metro Council places conditions on the urban reserve to ensure achievement of the opportunities presented.

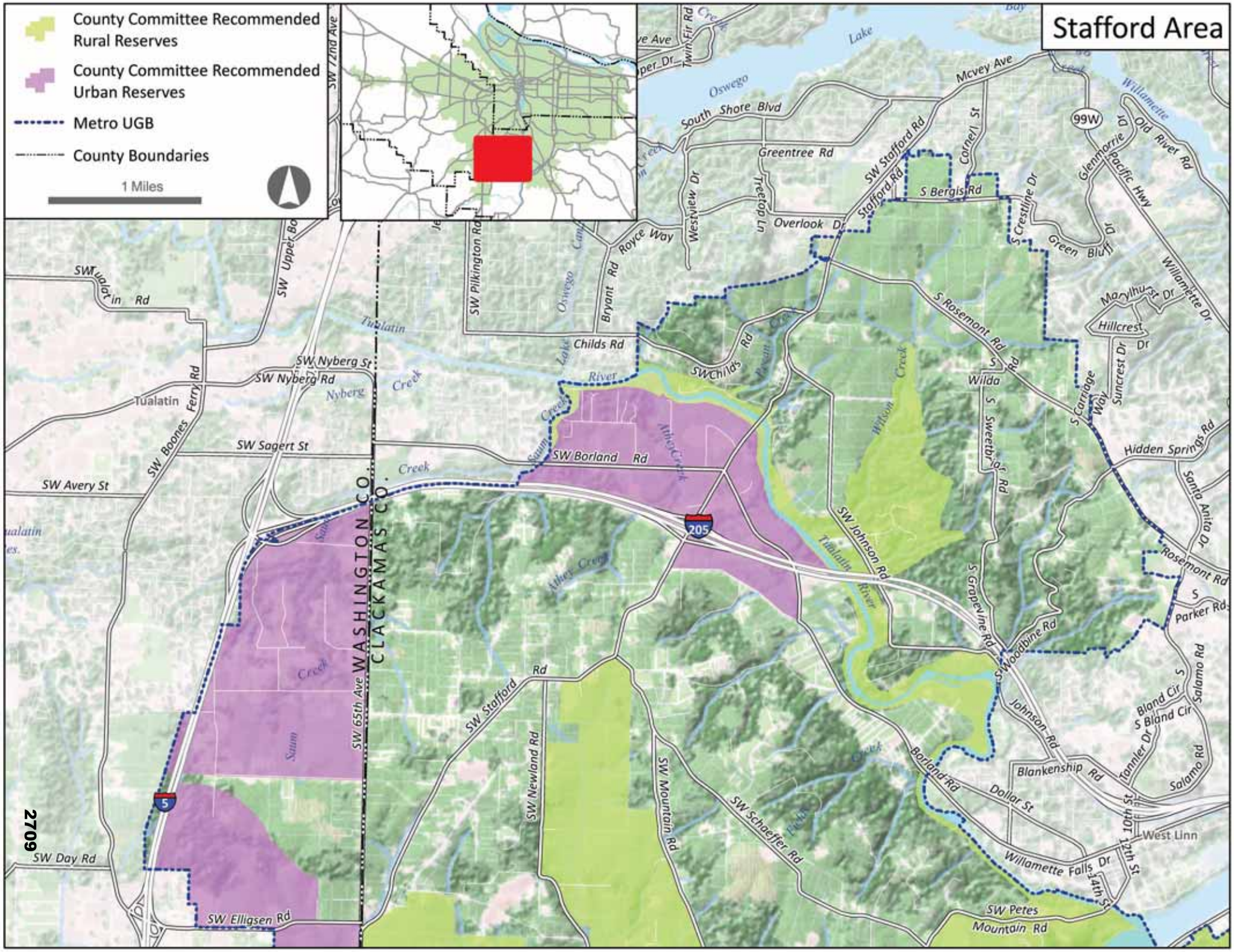
County Committee Recommended Reserves

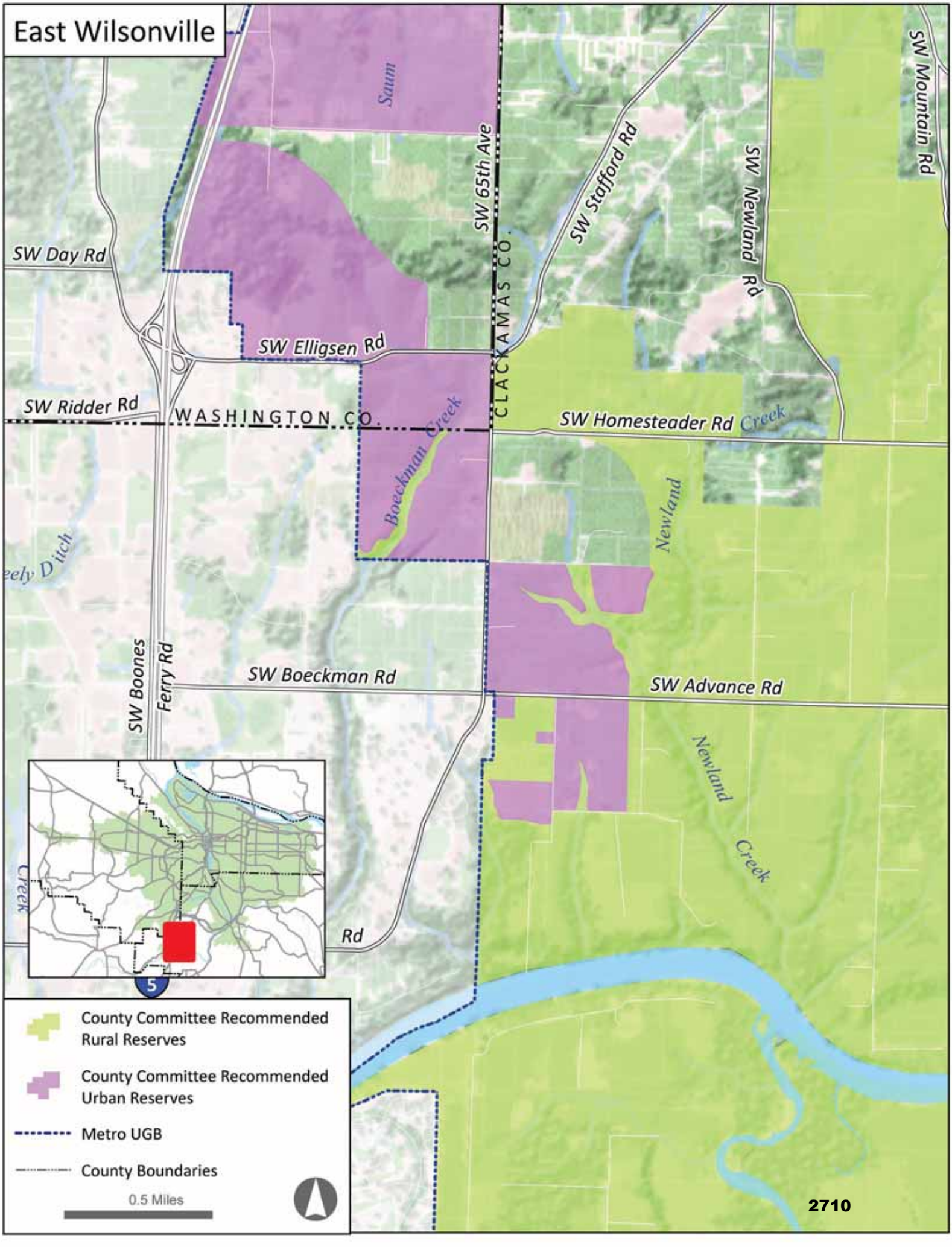


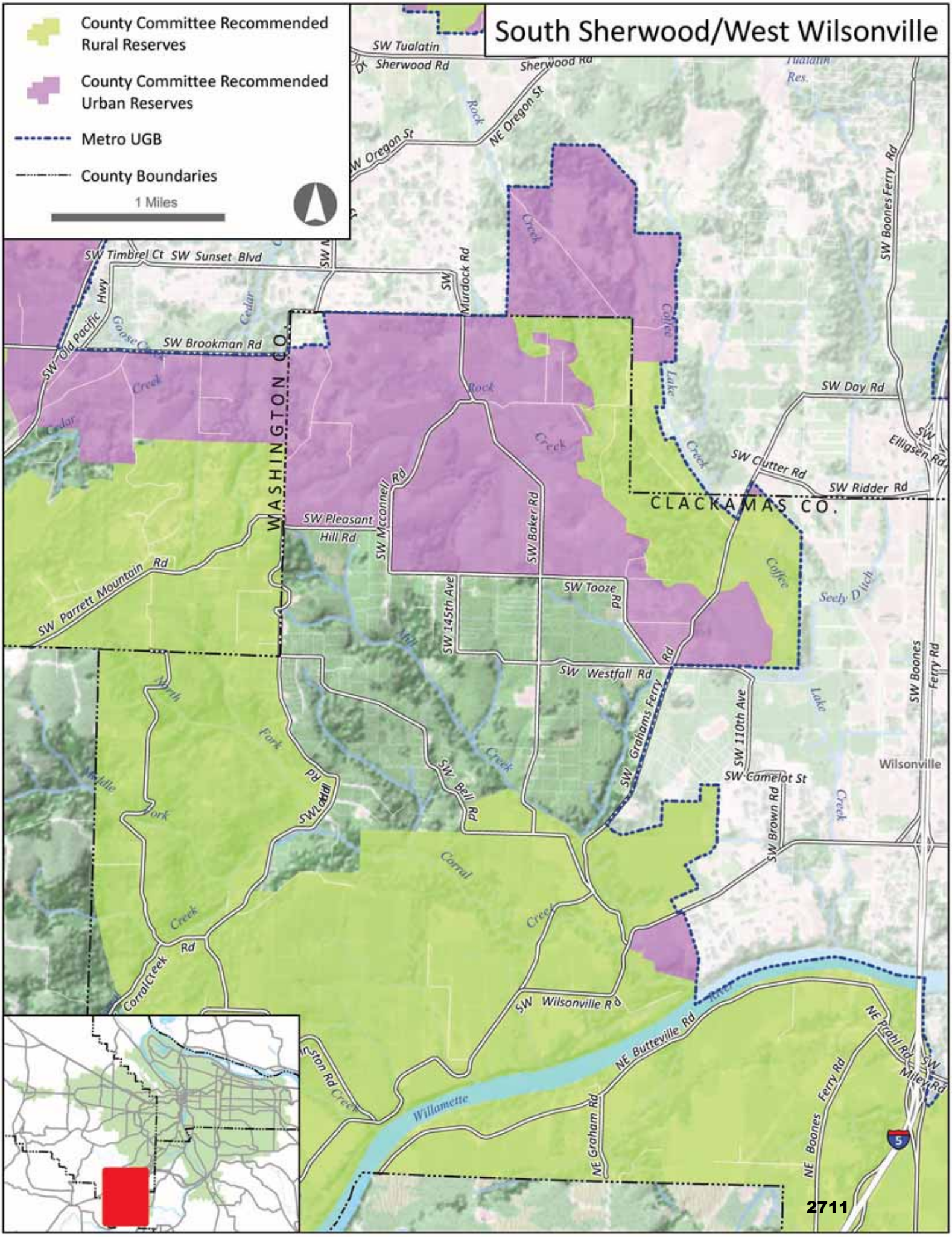

Clackanomah
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
1 Miles
MULTNOMAH CO.
CLACKAMAS CO.
SE Powell Valley Rd
SE Division St
SE Troutdale Rd
SE Orient Dr
SE Us Hwy 26 Hwy
SE Telford Rd
SE Lusted Rd
SE 302nd Ave
SE Pipeline Rd
SE Altman Rd
SE 282nd Ave
SE Revenue Rd
SE 327th Ave
SE Borges Rd
SE Sunshine Valley Rd
SE 222nd Dr
SE Tillstrom Rd
SE 242nd Ave
SE 272nd Ave
SE Brooks Rd
SE Compton Rd
SE Richey Rd
SE 312th Dr
SE Kelso Rd
SE 232nd Dr
SE Amisigger Rd
SE Tickle Creek Rd
Fields Reservoirs
South Fork Kelly Creek
Middle Fork Beaver Creek
Belchers Reservoir
Johnson Creek
Badger Creek
North Fork Deep Creek
Deep Creek
Noyer Creek
26
212
2706

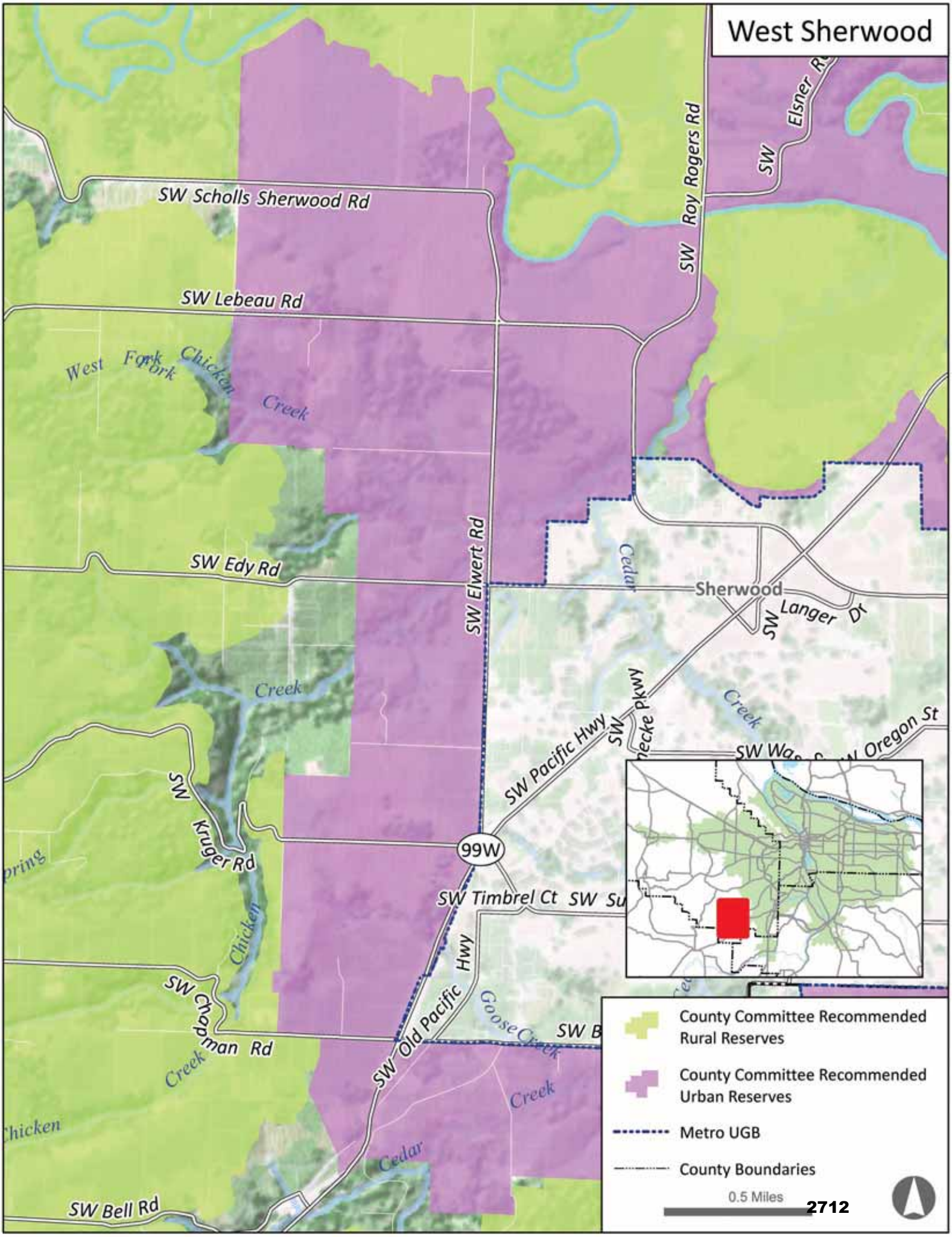

County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
0.5 Miles
Damascus
SE 222nd Dr
SE 242nd Ave
Creek
SE Armstrong Cir
Richardson
Elliott Springs
Deep
Creek
Noyer
Fork
North
SE 232nd Dr
Lake Pidgeon
Clackamas River
S Springwater Rd
SE Bakers Ferry Rd
S Eaden Rd
2707


Oregon City
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
1 Miles
Oregon City
Gladstone
Willamette River
Clackamette Lake
Tour Creek
Holcomb Creek
Johnson Creek
Mud Creek
Caufield Creek
Beaver Creek
Bull Frog Res.
Chautauqua Lake
SE Oatfield Rd
SE Webster Rd
SE Strawberry Ln
Valley View Dr
Los Verdes Dr
SE Jennings Ave
Glen Echo Ave
Oatfield Rd
Cason Rd
SE 82nd Dr
Abernethy Ln
99E
W Gloucester St
E Gloucester St
W Dartmouth St
E Dartmouth St
W Arlington St
E Arlington St
82nd Dr
S Forsythe Rd
River Rd
W Mcloughlin Blvd
Clackamas River Dr
Forsythe Rd
Swan Ave
Apperson Blvd
Holcomb Blvd
S Holcomb Blvd
Lancaster St
Exeter St
Sunset Ave
Willamette Falls Dr
S Salamo Rd
Bland Cir
205
Main St
High St
15th St
12th St
7th St
9th St
5th St
Taylor St
Division St
Jewell
S Holly Ln
S Redland Rd
S Mcloughlin Blvd
S High St
Linn Ave
Holmes Ln
213
South End Rd
Warner Parrott Rd
Warner Milne Rd
S Maplelane Rd
Central Point Rd
Molalla Ave
S Thayer Rd
Partlow Rd
Mccord Rd
S Mccord Rd
Leland Rd
S Leland Rd
S South End Rd
Beavercreek Rd
S Henrici Rd
S Beavercreek Rd
S Molalla Ave
2708


Stafford Area
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
1 Miles
WASHINGTON CO.
CLACKAMAS CO.
SW Borland Rd
SW Stafford Rd
SW Johnson Rd
SW Mountain Rd
SW Schaeffer Rd
SW Newland Rd
SW Childs Rd
SW Nyberg Rd
SW Sagert St
SW Avery St
SW Day Rd
SW Elligsen Rd
SW Petes Mountain Rd
SW Boones Ferry Rd
SW 65th Ave
SW Pilkington Rd
Bryant Rd
Royce Way
Overlook Dr
Greentree Rd
South Shore Blvd
Mcvey Ave
S Bergis Rd
S Rosemont Rd
Hidden Springs Rd
Santa Anita Dr
Rosemont Rd
S Parker Rd
S Grapevine Rd
S Woodbine Rd
Johnson Rd
Blankenship Rd
Dollar St
Willamette Falls Dr
West Linn
Borland Rd
S Bland Cir
Tannler Dr
Salamo Rd
Old River Rd
Pacific Hwy
Willamette Dr
Green Bluff Dr
S Crestline Dr
Cornell St
Treetop Ln
Westview Dr
S Carriage Way
Suncrest Dr
Hillcrest Dr
Marylhurst Dr
S Sweetbriar Rd
S Wilda Rd
Tualatin River
Tualatin
Nyberg Creek
Saum Creek
Wilson Creek
Oswego Lake
Oswego Creek
Lake
Willamette
Bay
99W
5
205
2709


East Wilsonville
Saum
SW 65th Ave
SW Stafford Rd
SW Newland Rd
SW Mountain Rd
SW Day Rd
SW Elligsen Rd
SW Ridder Rd
WASHINGTON CO.
CLACKAMAS CO.
SW Homesteader Rd
Boeckman Creek
Creek
Newland
eely Ditch
SW Boones Ferry Rd
SW Boeckman Rd
SW Advance Rd
Newland Creek
Creek
Rd
5
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
0.5 Miles
2710


South Sherwood/West Wilsonville
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
1 Miles
WASHINGTON CO.
CLACKAMAS CO.
SW Tualatin
Sherwood Rd
NE Oregon St
SW Timbrel Ct
SW Sunset Blvd
SW Old Pacific Hwy
SW Brookman Rd
SW Murdock Rd
SW Boones Ferry Rd
SW Day Rd
SW Elligsen Rd
SW Clutter Rd
SW Ridder Rd
SW Pleasant Hill Rd
SW Mcconnell Rd
SW Baker Rd
SW Parrett Mountain Rd
SW Tooze Rd
SW 145th Ave
SW Westfall Rd
SW Grahams Ferry Rd
SW 110th Ave
SW Camelot St
SW Brown Rd
SW Boones Ferry Rd
Wilsonville
SW Bell Rd
SW Wilsonville Rd
NE Butteville Rd
NE Graham Rd
NE Boones Ferry Rd
NE Prahl Rd
SW Miley Rd
Willamette
Corral Creek
Coffee Lake Creek
Seely Ditch
Rock Creek
Cedar Creek
Goose Creek
Tualatin Res.
2711


West Sherwood
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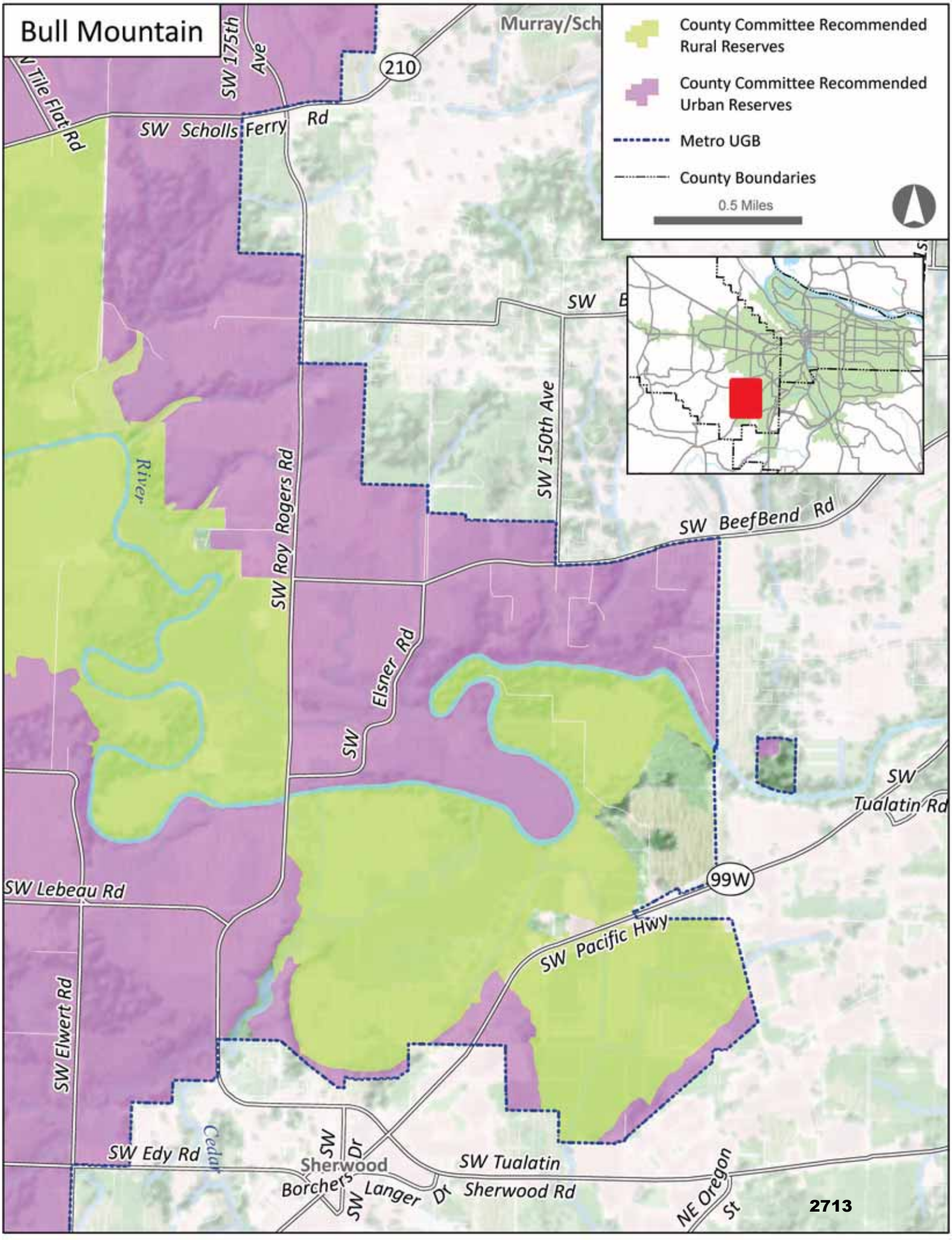
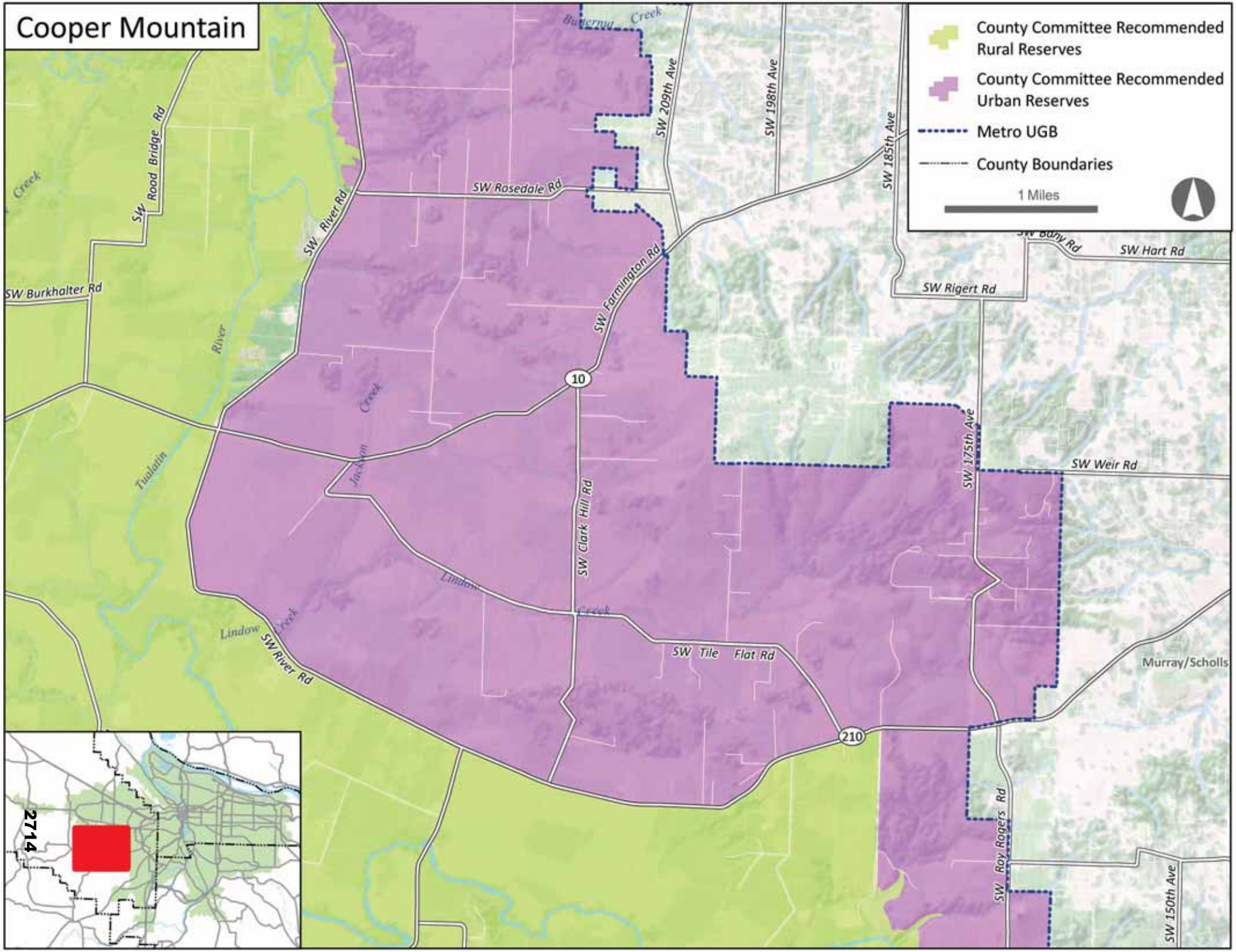
SW Roy Rogers Rd
SW Elsner Rd
SW Lebeau Rd
West Fork Chicken Creek
SW Elwert Rd
SW Edy Rd
Cedar
Sherwood
SW Langer Dr
Creek
SW Pacific Hwy
SW Oregon St
SW Kruger Rd
99W
SW Timbrel Ct
SW Old Pacific Hwy
Goose Creek
SW Chapman Rd
Chicken
Creek
SW Bell Rd
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
0.5 Miles


Bull Mountain
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
0.5 Miles
Murray/Sch
SW 175th Ave
210
N Tile Flat Rd
SW Scholls Ferry Rd
SW B
SW 150th Ave
SW Roy Rogers Rd
River
SW BeefBend Rd
SW Elsner Rd
SW Tualatin Rd
99W
SW Lebeau Rd
SW Pacific Hwy
SW Elwert Rd
SW Edy Rd
Cedar
SW Dr
Sherwood
Borchers
SW Langer Dr
SW Tualatin
Sherwood Rd
NE Oregon St
2713


Cooper Mountain
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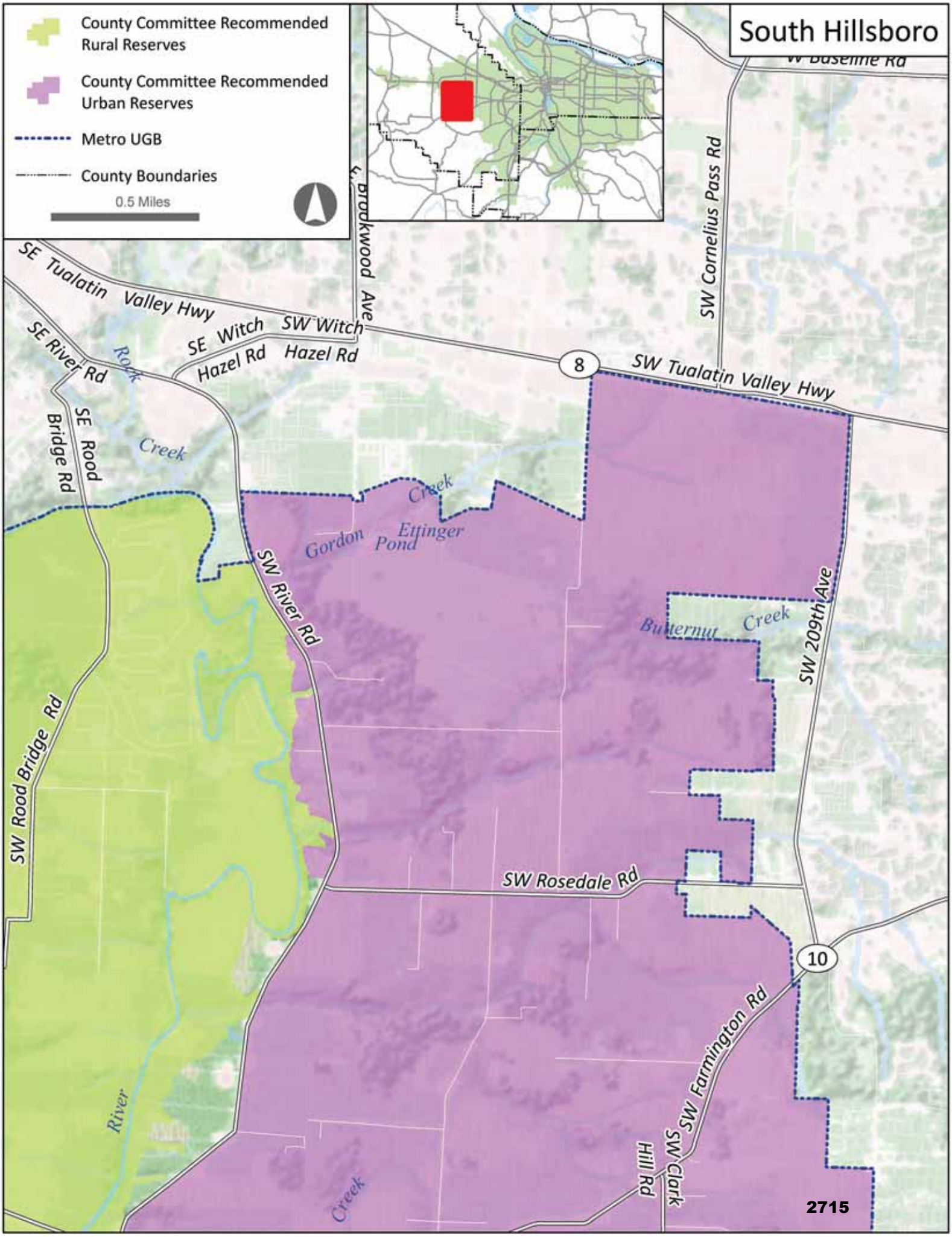
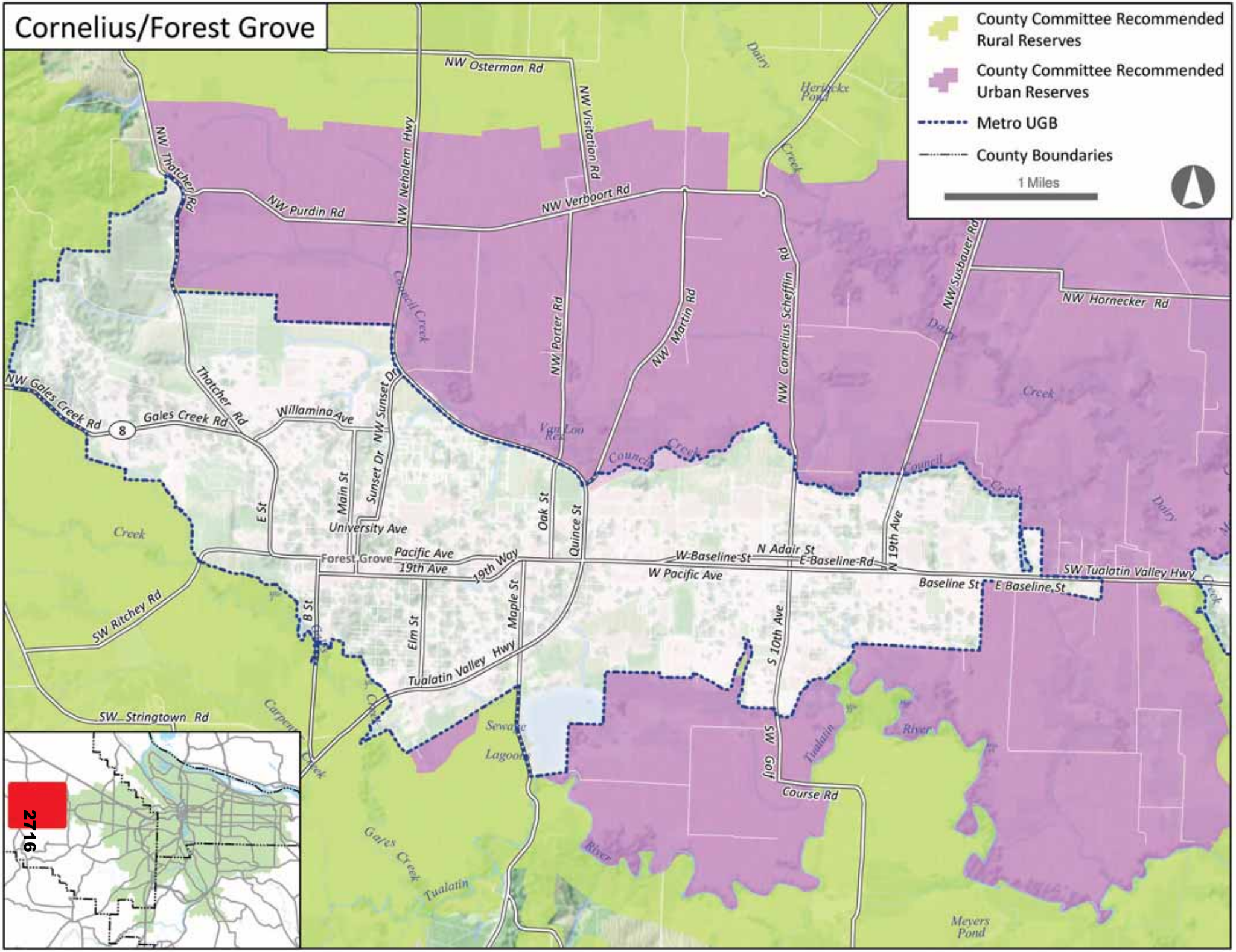
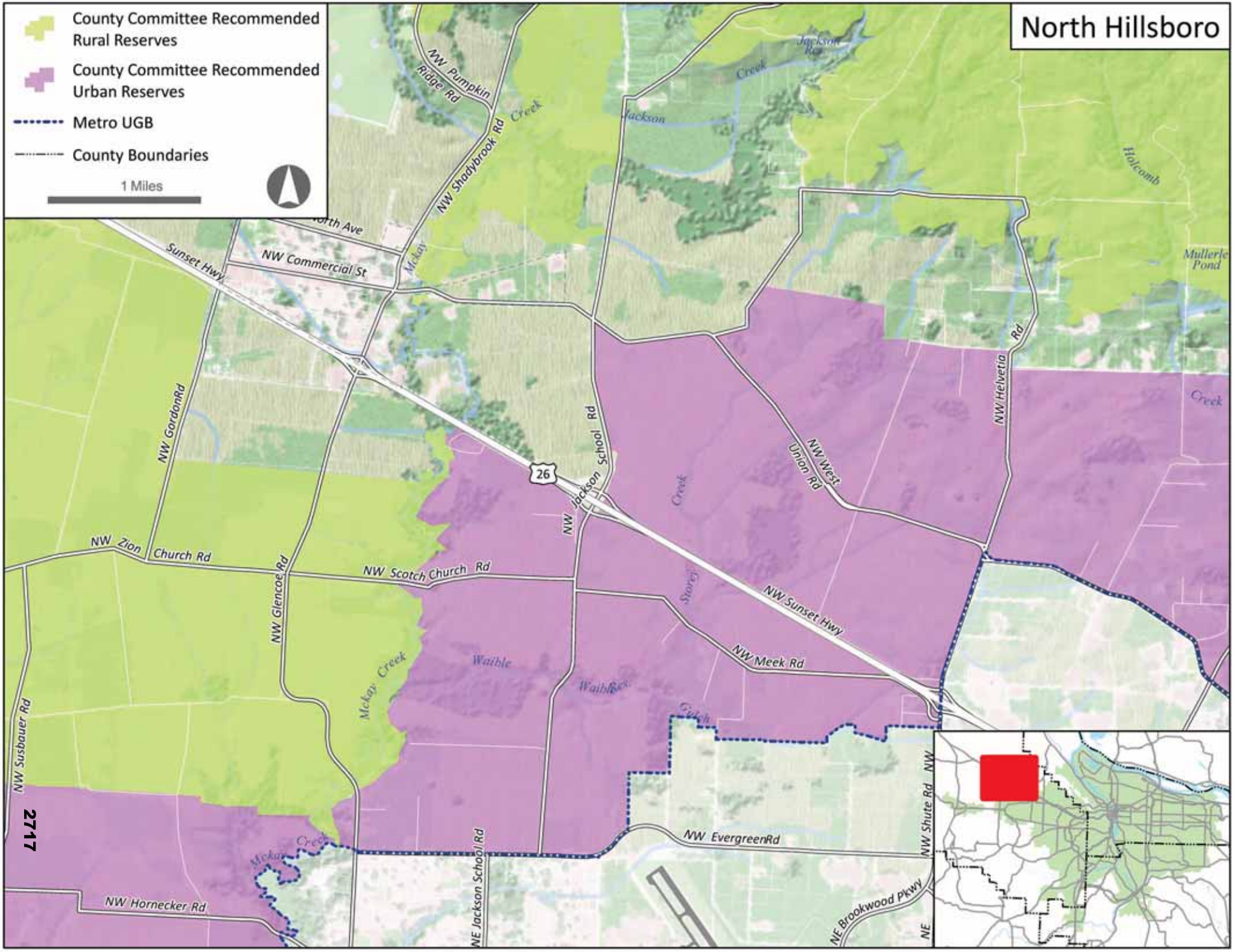
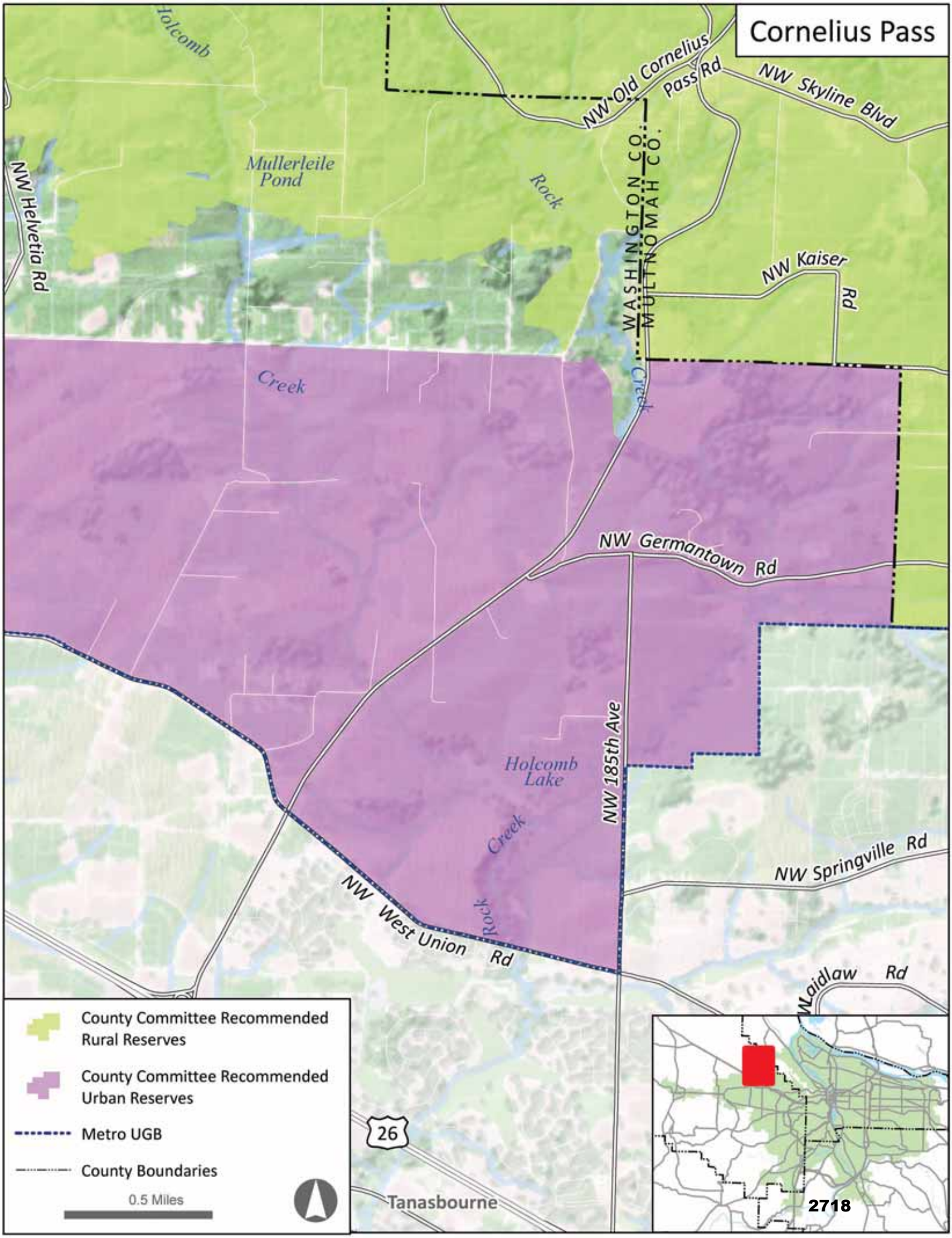
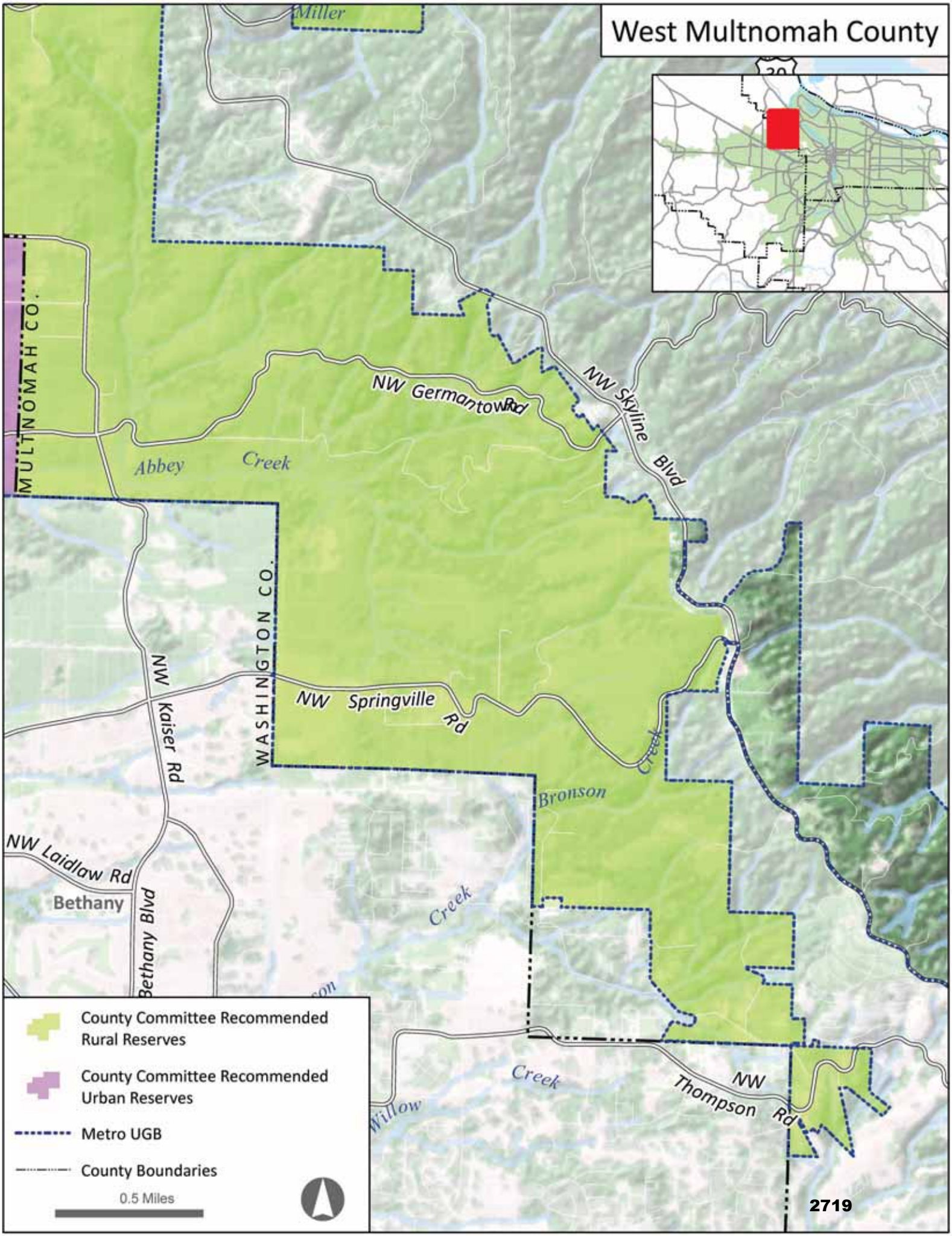
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
1 Miles
Butternut Creek
SW 209th Ave
SW 198th Ave
SW 185th Ave
SW Rood Bridge Rd
SW River Rd
SW Rosedale Rd
SW Farmington Rd
SW Burkhalter Rd
SW Bany Rd
SW Hart Rd
SW Rigert Rd
Tualatin River
Jackson Creek
10
SW Clark Hill Rd
SW 175th Ave
SW Weir Rd
Lindow Creek
SW River Rd
SW Tile Flat Rd
210
Murray/Scholls
SW Roy Rogers Rd
SW 150th Ave
2714


South Hillsboro
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
0.5 Miles
W Baseline Rd
SW Cornelius Pass Rd
SE Brookwood Ave
SE Tualatin Valley Hwy
SE Witch Hazel Rd
SW Witch Hazel Rd
SE River Rd
SE Rood Bridge Rd
Rock Creek
8
SW Tualatin Valley Hwy
Gordon Ettinger Pond
Creek
SW River Rd
Butternut Creek
SW 209th Ave
SW Rood Bridge Rd
SW Rosedale Rd
10
SW Farmington Rd
SW Clark Hill Rd
River
Creek
2715


Cornelius/Forest Grove
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
1 Miles
NW Osterman Rd
NW Thatcher Rd
NW Nehalem Hwy
NW Visitation Rd
NW Purdin Rd
NW Verboort Rd
NW Porter Rd
NW Martin Rd
NW Cornelius Schefflin Rd
NW Susbauer Rd
NW Hornecker Rd
NW Gales Creek Rd
Gales Creek Rd
Thatcher Rd
Willamina Ave
NW Sunset Dr
Main St
E St
University Ave
Oak St
Quince St
Forest Grove
Pacific Ave
19th Ave
19th Way
W Baseline St
E Baseline Rd
N Adair St
N 19th Ave
W Pacific Ave
SW Tualatin Valley Hwy
Baseline St
E Baseline St
SW Ritchey Rd
B St
Elm St
Maple St
Tualatin Valley Hwy
S 10th Ave
SW Golf Course Rd
SW Stringtown Rd
Sewage Lagoon
Gales Creek
Tualatin River
Meyers Pond
Council Creek
Dairy Creek
Van Loo Res
Herricke Pond
2716


North Hillsboro
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
1 Miles
NW Pumpkin Ridge Rd
NW Shadybrook Rd
Jackson Creek
Holcomb
Mullerle Pond
Sunset Hwy
NW Commercial St
NW Gordon Rd
NW Jackson School Rd
NW Helvetia Rd
NW West Union Rd
26
NW Zion Church Rd
NW Scotch Church Rd
NW Glencoe Rd
NW Sunset Hwy
NW Meek Rd
McKay Creek
Waible Creek
Storey Creek
NW Susbauer Rd
NW Evergreen Rd
NW Shute Rd
NE Jackson School Rd
NE Brookwood Pkwy
NW Hornecker Rd
2717


Cornelius Pass
Holcomb
NW Old Cornelius Pass Rd
NW Skyline Blvd
WASHINGTON CO.
MULTNOMAH CO.
Mullerleile Pond
Rock
NW Helvetia Rd
NW Kaiser Rd
Creek
NW Germantown Rd
NW 185th Ave
Holcomb Lake
Creek
NW Springville Rd
NW West Union Rd
Rock
Waidlaw Rd
26
Tanasbourne
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
0.5 Miles
2718


West Multnomah County
Miller
MULTNOMAH CO.
NW Germantown Rd
NW Skyline Blvd
Abbey Creek
WASHINGTON CO.
NW Kaiser Rd
NW Springville Rd
Bronson Creek
NW Laidlaw Rd
Bethany
Bethany Blvd
Willow Creek
NW Thompson Rd
County Committee Recommended Rural Reserves
County Committee Recommended Urban Reserves
Metro UGB
County Boundaries
0.5 Miles
2719

APPENDIX 3E-B

URBAN AND RURAL RESERVE DESIGNATION FACTORS – EXCERPTED FROM OREGON ADMINISTRATIVE RULES DIV. 027.

660-027-0050
Factors for Designation of Lands as Urban Reserves
Urban Reserve Factors: When identifying and selecting lands for designation as urban reserves under this division, Metro shall base its decision on consideration of whether land proposed for designation as urban reserves, alone or in conjunction with land inside the UGB:

(1) Can be developed at urban densities in a way that makes efficient use of existing and future public and private infrastructure investments;

(2) Includes sufficient development capacity to support a healthy economy;

(3) Can be efficiently and cost-effectively served with public schools and other urban-level public facilities and services by appropriate and financially capable service providers;

(4) Can be designed to be walkable and served with a well-connected system of streets, bikeways, recreation trails and public transit by appropriate service providers;

(5) Can be designed to preserve and enhance natural ecological systems;

(6) Includes sufficient land suitable for a range of needed housing types;

(7) Can be developed in a way that preserves important natural landscape features included in urban reserves; and

(8) Can be designed to avoid or minimize adverse effects on farm and forest practices, and adverse effects on important natural landscape features, on nearby land including land designated as rural reserves.

Stat. Auth.: ORS 195.141; ORS 197.040.
Other Auth.: Statewide planning goals (OAR chapter 660, division 15).
Stats. Implemented: ORS 195.137 to ORS 195.145.
Hist.:

660-027-0060
Factors for Designation of Lands as Rural Reserves
(1) When identifying and selecting lands for designation as rural reserves under this division, a county shall indicate which land was considered and designated in order to provide long-term protection to the agriculture and forest industries and which land was considered and designated to provide long-term protection of important natural landscape features, or both. Based on this choice, the county shall apply the appropriate factors in either section (2) or (3) of this rule, or both.

(2) Rural Reserve Factors: When identifying and selecting lands for designation as rural reserves intended to provide long-term protection to the agricultural industry or forest industry, or both, a county shall base its decision on consideration of whether the lands proposed for designation:

(a) Are situated in an area that is otherwise potentially subject to urbanization during the applicable period described in OAR 660-027-0040(2) or (3) as indicated by proximity to a UGB or proximity to properties with fair market values that significantly exceed agricultural values for farmland, or forestry values for forest land**;**

(b) Are capable of sustaining long-term agricultural operations for agricultural land, or are capable of sustaining long-term forestry operations for forest land;

(c) Have suitable soils where needed to sustain long-term agricultural or forestry operations and, for agricultural land, have available water where needed to sustain long-term agricultural operations; and

(d) Are suitable to sustain long-term agricultural or forestry operations, taking into account:
(A) for farm land, the existence of a large block of agricultural or other resource land with a concentration or cluster of farm operations, or, for forest land, the existence of a large block of forested land with a concentration or cluster of managed woodlots;
(B) The adjacent land use pattern, including its location in relation to adjacent non-farm uses or non-forest uses, and the existence of buffers between agricultural or forest operations and nonfarm or non-forest uses;
(C) The agricultural or forest land use pattern, including parcelization, tenure and ownership patterns; and
(D) The sufficiency of agricultural or forestry infrastructure in the area, whichever is applicable.

(3) Rural Reserve Factors: When identifying and selecting lands for designation as rural reserves intended to protect important natural landscape features, a county must consider those areas identified in Metro's February 2007 "*Natural Landscape Features Inventory*" and other pertinent information, and shall base its decision on consideration of whether the lands proposed for designation:

(a) Are situated in an area that is otherwise potentially subject to urbanization during the applicable period described OAR 660-027-0040(2) or (3);

(b) Are subject to natural disasters or hazards, such as floodplains, steep slopes and areas subject to landslides;

(c) Are important fish, plant or wildlife habitat;

(d) Are necessary to protect water quality or water quantity, such as streams, wetlands and riparian areas;

(e) Provide a sense of place for the region, such as buttes, bluffs, islands and extensive wetlands;

(f) Can serve as a boundary or buffer, such as rivers, cliffs and floodplains, to reduce conflicts between urban uses and rural uses, or conflicts between urban uses and natural resource uses;

(g) Provide for separation between cities; and

(h) Provide easy access to recreational opportunities in rural areas, such as rural trails and parks.

(4) Notwithstanding requirements for applying factors in OAR 660-027-0040(9) and section (2) of this rule, a county may deem that Foundation Agricultural Lands or Important Agricultural Lands within three miles of a UGB qualify for designation as rural reserves under section (2) without further explanation under OAR 660-027-0040(10).

Stat. Auth.: ORS 195.141; ORS 197.040.
Other Auth.: Statewide planning goals (OAR chapter 660, division 15).
Stats. Implemented: ORS 195.137 to ORS 195.145.

APPENDIX 3E-C

TECHNICAL METHODOLOGY USED TO DEFINE THE REGIONAL SCALE OF RESIDENTIAL LANDS WITHIN URBAN RESERVES

Overview

The reserves process has purposefully focused on studying the suitability of lands outside the growth boundary for future urban and rural uses rather than on identification of an exact number of acres required for each. Our ability to forecast growth and development trends for the far future is limited and no mathematical formula or methodology is provided in state law or administrative rule for determining the scale of urban reserves. Thus, rather than debating decimal points the region has properly focused on the discussion of desired outcomes and policy and investment choices available to us.

However, once a suitable set of lands are identified, we must ensure that, together with lands inside the existing urban growth boundary, the urban reserves can be planned to accommodate estimated urban population and employment growth for 40 to 50 years beyond 2010. When designating urban reserves, Metro will specify the number of years for which the urban reserves are intended to provide a supply of land. Defining the range of "sufficiency" for urban reserves will provide focus to the regional reserves discussion. The range is defined by the answers to three questions:

- How many people and jobs should we plan for?
- How many of these people and jobs should we plan to accommodate within the existing urban growth boundary?
- How efficient will development be within urban reserves?

Metro's draft urban growth report contains a detailed description of the methodologies used to analyze residential and employment capacity and demand at the 20-year time scale. These same concepts can be applied to the 40-50 year time scale to inform reserves decision-making. The purpose of this appendix is to explain how the UGR's methodologies were applied at the 40-50 year time scale to define a range of urban reserves sufficient to satisfy state law and administrative rules.

In addition to detailed data and technical analysis, the draft urban growth report contains extensive discussions of broad-scale social, economic, and demographic trends, performance reporting, and other pertinent information that inform the use of forecasts and assist with development of policy options and choices. This appendix does not attempt to replicate those discussions; the reader is encouraged to refer to the full urban growth report for this information.

Residential Demand

The following assumptions were made to determine a range of demand for residential urban reserves. For more information and discussion of the individual components, please refer to the draft urban growth report.

- **Forecast.** This analysis uses the seven-county residential forecast issued by Metro in May 2008, revised in April 2009 and contained as appendix 3B-4 of the Chief Operating Officer's Recommendation. The forecast is presented as a range to encourage discussion of the factors influencing growth rates and the risks and opportunities of planning for various points within

the range. The forecasts cover the seven-county Portland-Beaverton-Vancouver Metropolitan Statistical Area. Table C-1 lists the total population growth expected for the entire seven-county area.

Table C-1
Seven-County Residential Forecast, 2007-2050/2060*

	2007	2050		2060	
		Low Range	High Range	Low Range	High Range
Total residents	2,175,000	3,372,200	3,959,000	3,609,300	4,376,000
New residents	-	1,197,200	1,784,000	1,434,300	2,201,000

*2007 is used as the base year in the residential analysis to match the most recent buildable lands data on the supply side.

This results in a range of uncertainty of approximately 1,000,000 residents (2060 high forecast minus 2050 low forecast) for the reserves process. It is estimated that there is a 90 percent chance that the rate of growth will fall within this forecasted range, but high confidence comes at the price of larger variability. The full scope of the range is important to consider in our planning work, but the large variability may make it more difficult to arrive at a reserves conclusion. Therefore, this report recommends that the range be further narrowed by focusing on the middle one-third of the forecast range (see Figure C-1). This retains a range to work with but eliminates the more unlikely very low and very high growth forecasts. Table C-2 lists the resulting narrowed forecast. In the table, "mid ⅓ low" and "mid ⅓ high" refer to the bottom and top, respectively, of the middle third of the total forecast range.

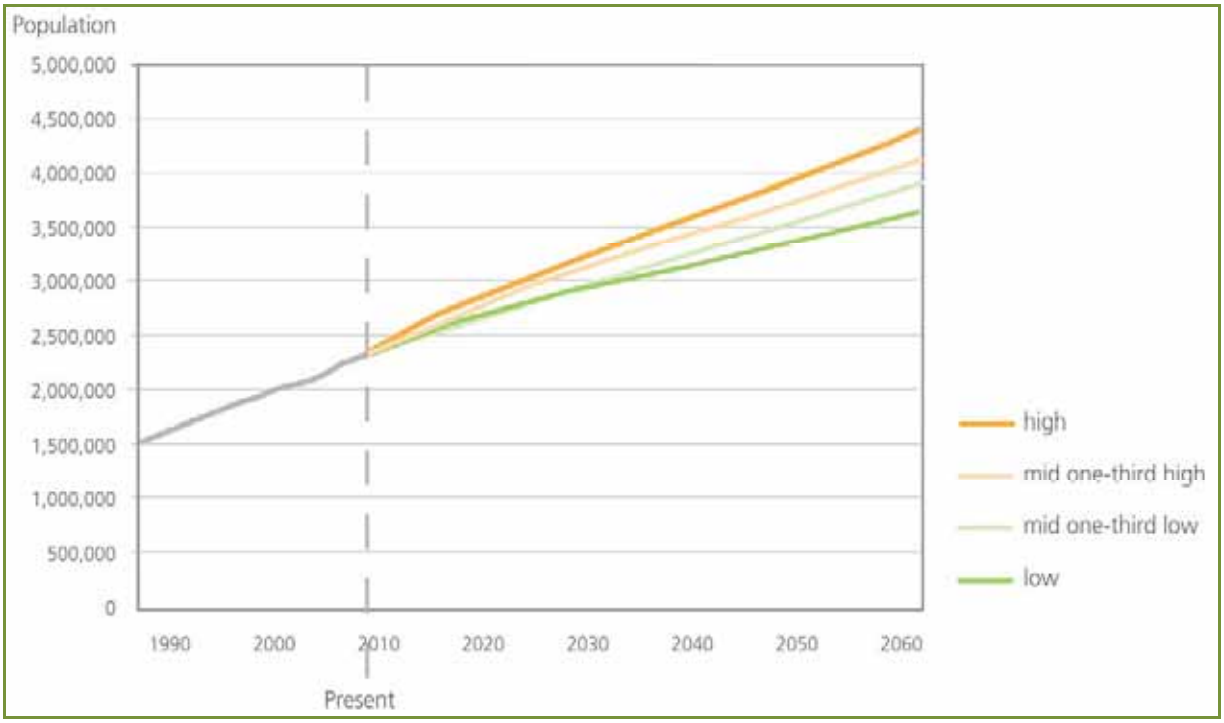


Figure C-1: Seven-county population forecast

Table C-2
7-County Residential Forecast, 2007-2050/2060, narrowed to middle one-third

	2007	2050		2060	
		Mid ⅓ low	Mid ⅓ high	Mid ⅓ low	Mid ⅓ high
Total residents	2,175,000	3,603,300	3,738,700	3,904,800	4,082,400
New residents	-	1,428,300	1,563,700	1,729,800	1,907,400

The resulting range is now under 500,000 residents.

The next step is to translate the population forecast into households and determine how many of those households we must plan for within the Metro urban growth boundary.

- **Household Size.** Household composition is expected to change over time as family sizes decrease and the average age of the population increases, making single-person households more prevalent in the future. This analysis uses the household size estimates from Metro's forecast, which decline from 2.57 persons/household in 2000 to 2.44 persons/household in 2030 and beyond.
- **Capture Rate.** The capture rate is the percentage of seven-county growth that is expected to locate within the Metro urban growth boundary. Capture rates have varied over time and will vary in the future based on policy and investment actions. This analysis utilizes a capture rate of 61.8 percent as recommended in the UGR.
- **Vacancy Rate.** This is the percent of dwelling units that need to be vacant at any given moment to allow people to move from residence to residence. This analysis utilizes a vacancy rate of four percent as recommended in the UGR.

Table C-3 summarizes the dwelling unit demand range within the Metro urban growth boundary for the reserves timeframe based on the components described above.

Table C-3
Metro UGB dwelling unit demand, 2007-2050/2060

	2050		2060	
	Mid ⅓ low	Mid ⅓ high	Mid ⅓ low	Mid ⅓ high
New households	630,800	775,700	754,300	827,100
New households captured within UGB (61.8%)	389,800	424,000	466,200	511,100
Add 4% vacancy rate	15,600	17,000	18,600	20,400
Total dwelling unit demand	*405,400*	*441,000*	*484,800*	*531,600*

Thus, the total demand for new dwelling units within the reserves time frame ranges from 405,400 to 531,600 using the middle third of the forecast.

Residential capacity

The following assumptions were made to determine how much growth will be accommodated within the existing urban growth boundary. As with the demand analysis, please refer to the draft urban

growth report for additional detail and discussion of the individual components. It's important to note that throughout this analysis, no upzoning is assumed beyond what's in current local government zoning ordinances and comprehensive plans. All of the capacity is based on current zoning and comprehensive plans, even though a significant amount of upzoning will likely take place around the region over the next 50 years.

- **Vacant land capacity.** The amount of vacant land within the urban growth boundary is determined by an extensive analysis conducted by Metro with significant participation and comment by local governments. The most recent analysis reflects conditions in 2007. The urban growth report contains extensive documentation and discussion of the various calculations used in this analysis. This reserves analysis makes the following assumptions:
    - *Gross-to-net calculations.* The amount of vacant land inside the UGB is calculated based on manual measurements of aerial photos and GIS data. The most recent inventory (July 2007) identified 44,800 acres of vacant land within the urban growth boundary. However, not all of this land can be built on, so the UGR deducts land area for a variety of reasons, from public ownership to environmental regulations to expected street right-of-way. This converts land supply from gross acreage to net buildable acres. The UGR found there is a net vacant buildable acreage inventory of 6,400 residential acres and 1,000 acres zoned for mixed-use.
    - *Zoned capacity.* This analysis uses the UGR assessment of maximum housing capacity for single family and multi-family zoned lands of 63,600 units.
    - *High density multi-family feasibility.* The UGR deducts 18,600 high-density units from the vacant land supply based on computer model results indicating certain types of units will not be market feasible by 2030. Additional policy and investment actions can make these units market feasible. In keeping with the focused investment strategy outlined in the *Strategies for a Sustainable and Prosperous Region*, this analysis assumes that over a 40 to 50 year timeline these vacant multi-family units will develop. Therefore these 18,600 dwelling units are not deducted from the reserves capacity analysis.
    - *Residential development in mixed-use districts.* As in the UGR, this analysis adds 29,100 residential units that are expected to be built in mixed-use areas such as downtowns.
    - *Single-family underbuild.* Underbuild refers to physical constraints not deducted at the beginning that make practical development of 100 percent of zoned capacity unlikely. This analysis mirrors the UGR in assuming a 5 percent loss (2,300 units) within the existing growth boundary due to underbuild.
    - *Title 3 and 13 "add backs."* Land was deducted from the original inventory due to environmental overlays and regulations. However, a reduced level of development can take place on these lands. This analysis mirrors the UGR in adding back 19,400 units to account for this level of development.
    - *Platted single-family lots under 3/8 acre.* As in the UGR, an assumption is made that the 8,800 existing vacant lots under 3/8 acre will not be subdivided into higher density housing even if zoning would allow it.
    - *New urban areas.* Areas added to the UGB after 1997 (such as North Bethany, Damascus and Pleasant Valley) are separated from the gross vacant land supply to acknowledge the fact that they have yet to receive urban zoning densities. The most current concept

plan designations are used in the UGR to determine a residential capacity of 48,000 dwelling units in these areas. In the UGR half of this capacity is considered to be not market feasible before 2030 due largely to lack of urban infrastructure. In the reserves analysis all of the capacity in new urban areas is counted. Clearly the region can and should deliver this infrastructure and complete these communities in the next 40 to 50 years. This assumption is supported by the focused investment strategy outlined in the *Strategies for a Sustainable and Prosperous Region*.

As summarized in Table C-4, vacant residential and mixed-use lands within the existing UGB are expected to accommodate 166,600 dwelling units over the reserves timeframe.

Table C-4
Metro UGB vacant land residential capacity in existing UGB 2007-2050/2060

Factor	Dwelling units
Base capacity of vacant land	63,600
Add residential development in mixed use districts	29,100
Subtract single family underbuild	-2,300
Add capacity on Title 3 and 13 lands	19,400
Add platted lots under 3/8 acre	8,800
Add capacity in new urban areas	48,000
Total vacant land capacity	***166,600***

- **Redevelopment and infill ("refill").** Residential capacity within the existing UGB is based not just on the zoned capacity of vacant buildable land, but also on the amount of redevelopment and infill (collectively called "refill") that is likely to occur. In some locations, the zoned capacity may exceed the current market feasibility of development. The amount of market-feasible infill potential can be increased if governments take policy actions and make targeted public investments.

  Refill rates are expressed as a share of residential development. From 1997 to 2006 the annual residential refill rate varied from 15.6 percent to 34.2 percent, meaning that between 15.6 and 34.2 percent of all residential development in the region took place through either redevelopment or infill. Refill predictions are informed by a variety of sources, described more completely in the UGR. Taking into account past refill rates, future shifts in demographics and housing preference, scenario results and our region's stated policy objectives, it is estimated that *current* policy direction and investment trends would produce an average refill rate of 33 percent through the year 2030.

  However, the *Strategies for a Sustainable and Prosperous Region* calls for the region to focus and enhance our investments in the future, stimulating growth in downtowns and along main streets while minimizing our contributions to climate change and protecting farms, forests, and natural areas. Metro has completed computer simulations that project refill rates well over 40 percent through the application of additional policies and investments in downtowns and main streets. The region should assume that such investment strategies will be implemented, leading

to increased redevelopment and infill in these areas, expressed in this analysis as refill rates higher than historic levels.

Informed by historic trends and projections of the future, this analysis assumes an average residential refill rate of 40 percent for the reserves timeframe (i.e., through the reserves timeframe 40 percent of forecast population growth is anticipated to be accommodated via infill and redevelopment within the existing urban growth boundary).

Table C-5 summarizes the application of the residential capacity factors to the reserves timeframe.

Table C-5
Metro area dwelling unit demand and capacity, 2007-2050/2060

	2050		2060	
	Mid ⅓ low	Mid ⅓ high	Mid ⅓ low	Mid ⅓ high
Total dwelling unit demand	405,400	441,000	484,800	531,600
Total capacity of vacant land	166,600	166,600	166,600	166,600
% of residential growth accommodated on vacant lands	41%	38%	34%	31%
Add 40% refill	162,200	176,400	193,900	212,600
% of residential growth accommodated within existing UGB (refill + vacant)	81%	78%	74%	71%
Dwelling units accommodated within urban reserves	76,600	98,000	124,300	152,400
% of residential growth accommodated within urban reserves	19%	22%	26%	29%

Efficiency of development within urban reserves

The final step in determining a residential acreage range for urban reserves is to estimate the number of acres required to accommodate the projected number of dwelling units. The following assumptions apply:

- **Gross-to-net conversion.** This analysis assumes a standard set of deductions to estimate the net buildable land area for urban reserve areas, similar to that used in the UGR and in recent concept planning efforts around the region. 40 percent of gross land area is assumed to be non-buildable due to environmental restrictions, public ownership, and similar factors. This leaves 60 percent of the total as the "gross buildable" land area. Not all of this will be used for housing units however, so 25 percent of this gross buildable area is then deducted to account for required street right-of-way, parks and school areas, and other deductions. The remainder (45 percent of the original gross area) is the "net buildable" area and is the basis for calculating dwelling unit capacity in the next step. These assumptions can be refined in the reserves process once specific areas are identified as urban reserves; areas of high suitability may tend to require fewer deductions than the average.
- **Average dwelling unit density.** This analysis assumes that over a 40 to 50 year timeframe urban growth boundary expansions will develop with a more compact, efficient form in response to

market demands, environmental change, policy and investment choices and other factors. This will mirror and support increased efficiencies inside the UGB in downtowns and along main streets. An average density of 15 units/net buildable acre reflects this assumption while allowing for variations over time and across different geographies.

This is the last step in developing a residential acreage range for urban reserves. As summarized in Table C-6, the acreage estimates range from 11,300 acres to 22,400 acres depending on the timeframe chosen and the point in the range forecast that is used. It should be noted that if the full forecast range is used (rather than the recommended middle third) this range expands to 5,900 to 29,400 acres.

Table C-6
Residential acreage range for urban reserves, 2007-2050/2060

	2050		2060	
	Mid ⅓ low	Mid ⅓ high	Mid ⅓ low	Mid ⅓ high
Dwelling units accommodated within urban reserves	76,600	98,000	124,300	152,400
Net buildable acres required at 15 units/acre	5,100	6,500	8,300	10,100
Gross acres required	11,300	14,400	18,400	22,400

APPENDIX 3E-D

TECHNICAL ASSUMPTIONS MADE TO NARROW THE SCALE OF EMPLOYMENT LANDS FOR URBAN RESERVES

Overview

The reserves process has purposefully focused on studying the suitability of lands outside the growth boundary for future urban and rural uses rather than on identification of an exact number of acres required for each. Our ability to forecast growth and development trends for the far future is limited and no mathematical formula or methodology is provided in state law or administrative rule for determining the scale of urban reserves. Thus, rather than debating decimal points the region has properly focused on the discussion of desired outcomes and policy and investment choices available to us.

However, once a suitable set of lands are identified, we must ensure that, together with lands inside the existing urban growth boundary, the urban reserves can be planned to accommodate estimated urban population and employment growth for 40 to 50 years beyond 2010. When designating urban reserves, Metro will specify the number of years for which the urban reserves are intended to provide a supply of land. Defining the range of "sufficiency" for urban reserves will provide focus to the regional reserves discussion. The range is defined by the answers to three questions:

- How many people and jobs should we plan for?
- How many of these people and jobs should we plan to accommodate within the existing urban growth boundary?
- How efficient will development be within urban reserves?

Metro's draft urban growth report contains a detailed description of the methodologies used to analyze residential and employment capacity and demand at the 20-year time scale. The urban growth report's employment analysis was developed by a consultant team led by E.D. Hovee & Company, LLC. The Hovee team reviewed global, national and local trends, conducted focus groups with employers, analyzed recent job location data, updated and categorized the region's employment and industrial land inventory and developed a new employment demand paradigm.

In addition to detailed data and technical analysis, the draft urban growth report contains extensive discussions of broad-scale social, economic, and demographic trends, performance reporting, and other pertinent information that inform the use of forecasts and assist with development of policy options and choices. This appendix does not attempt to replicate those discussions; the reader is encouraged to refer to the full urban growth report for this information.

The concepts developed for the urban growth report can be applied to the 40-50 year time scale to inform reserves decision-making. However, there are many good reasons to believe that our region's economy will change between 2030 and 2060. For this reason, this fall the region should consider whether different assumptions are appropriate when considering our economy more than 20 years from now.

This appendix lists the assumptions used to extend the employment capacity analysis to the reserves timeframe and summarizes the demand and capacity analysis. It includes a memo from E.D. Hovee &

Company with recommendations on the assumptions to be used in extending the employment demand analysis to the reserves timeframe.

Employment Demand

As noted above, this report generally extends the assumptions for 2030 to the reserves timeframe. However, in several areas these assumptions were modified in consultation with Eric Hovee of E.D. Hovee & Company, LLC. Options considered and modifications made are discussed in a memo from Eric Hovee that is attached to this appendix, and summarized here. For more information and discussion of the individual components, please refer to the draft urban growth report.

- **Forecast.** This analysis uses the seven-county employment forecast issued by Metro in May 2008, revised in April 2009 and contained as appendix 3B-4 of the Chief Operating Officer's Recommendation. The forecast is presented as a range to encourage discussion of the factors influencing growth rates and the risks and opportunities of planning for various points within the range. The forecasts cover the seven-county Portland-Beaverton-Vancouver Metropolitan Statistical Area. Table D-1 lists the total growth in jobs expected for the entire seven-county area.

Table D-1
Seven-County Employment Forecast, 2007-2050/2060*

	2007	2050		2060	
		Low Range	High Range	Low Range	High Range
Total jobs	1,037,000	1,537,300	2,193,400	1,648,400	2,422,900
New jobs	-	500,300	1,156,400	611,400	1,385,900

*2007 is used as the base year in the employment analysis to match the residential analysis.

This results in a range of uncertainty of almost 900,000 jobs (2060 high forecast minus 2050 low forecast) for the reserves process. It is estimated that there is a 90 percent chance that the rate of growth will fall within this forecasted range, but high confidence comes at the price of larger variability. This full scope of the range is important to consider in our planning work, but the large variability may make it more difficult to arrive at a reserves conclusion. Therefore, this report recommends that the range be further narrowed by focusing on the middle one-third of the forecast range (see Figure 1). This retains a range to work with but eliminates the more unlikely very low and very high growth forecasts. Table D-2 lists the resulting narrowed forecast. In the table "mid ⅓ low" and "mid ⅓ high" refer to the bottom and top, respectively, of the middle third of the total forecast range.

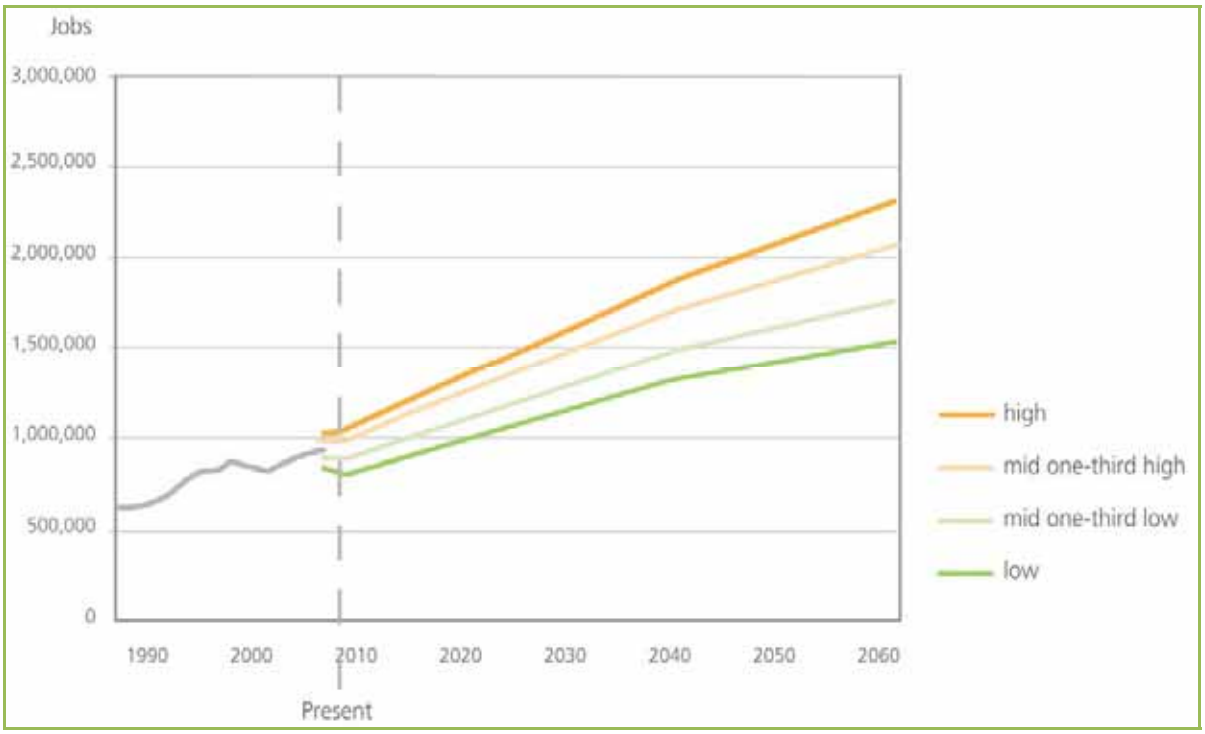


Figure D-1: Seven-county employment forecast

Table D-2
7-County Employment Forecast, 2007-2050/2060, narrowed to middle one-third

	2007	2050		2060	
		Mid ⅓ low	Mid ⅓ high	Mid ⅓ low	Mid ⅓ high
Total jobs	1,037,000	1,733,300	1,982,000	1,880,700	2,164,200
New jobs	-	696,300	945,000	843,700	1,127,200

The resulting range is now less than half of the full range, a variation of approximately 430,000 jobs.

The next step is to determine how many of those jobs we must plan for within the Metro urban growth boundary.

- **Sector forecast.** Employment growth rates are forecast for a number of employment sectors. Over time, growth rates will vary among sectors as the national and regional economy changes. The sector mix is generally extrapolated forward from 2030 to 2060 consistent with the trends identified in the urban growth report.
- **Capture rate.** The capture rate is the percentage of seven-county growth that is expected to locate within the Metro urban growth boundary. Capture rates have varied over time and will vary in the future based on policy and investment actions. In the employment analysis conducted in the urban growth report, capture rates are projected separately for a variety of industry sectors, adding up to an overall projected capture rate from 2010 to 2030 of 73 percent (low growth forecast) and 75 percent (high growth forecast). This report assumes that capture rates will drop 5 percent after 2030, based on an overall trend observed since the 1980s and reflecting the reality that employment to population ratios are likely to move towards balance

throughout the region (the residential capture rate is projected to be approximately 62 percent). Table D-3 summarizes the capture rate assumptions through 2050/2060.

Table D-3
Metro UGB employment demand, 2007-2050/2060

	2050		2060	
	Mid ⅓ low	Mid ⅓ high	Mid ⅓ low	Mid ⅓ high
New jobs	696,300	945,000	843,700	1,127,200
New jobs captured within the UGB	*515,300*	*699,300*	*624,300*	*834,100*

Therefore, over the reserves timeframe, the region should plan to accommodate between 515,300 and 834,100 new jobs within the Metro urban growth boundary.

- **Allocating jobs to building type.** Forecasted jobs are assigned to one of six building types, based on recent trends and professional expertise. The building type in which jobs are located could change over time as the real estate market matures, land prices increase and technologies shift. Based on a review of national literature and the business outreach conducted as part of the development of the urban growth report, there is a general expectation that industrial activity will continue to shift from general industrial space for production to R&D and administration/marketing, indicating greater utilization of office space. These trends are reflected in this analysis by reducing the percentage allocation of space allocated to general industrial and warehouse building type uses by 10 percent for the construction, manufacturing, wholesale, transportation/warehouse/utilities and information sectors. The reductions in space are instead assigned to office and flex building types.
- **Building square footage per employee.** Space needs are determined by applying a square foot per employee calculation that varies by building type and by geography. These calculations were revised in the draft urban growth report based on input from local jurisdictions. *MetroScope* outputs have suggested generally increasing densities over time. Consequently the employment analysis has been adjusted to reflect an overall density increase per employee of about 5 percent between 2030 and 2060.
- **Floor area ratios by building type.** Increased floor area ratios (FARs) have been identified as a key policy choice that could reinforce this region's sustainability advantage but that might involve tradeoffs for some traded sector industries that have other location options inside or outside the region. Consequently, this analysis assumes an approximate 20 percent increase in FARs from 2030-2060 for new development in the central city, corridors, regional centers and town centers, consistent with an overall strategy of enhancing efficiency and employment density in these areas. To reflect concerns heard from industry experts about industrial employment, no increase in FAR is presumed in Title 4 Regionally Significant Industrial Areas or in added UGB lands to accommodate large lot uses.

Except as noted above, all other factors included in the urban growth report's employment demand methodology have been consistently applied to the reserves timeframe. The sum total of all the calculations is presented in Table D-4.

Table D-4 Employment demand in acres, 2007-2050/2060				
	2050		2060	
	Mid ⅓ low	Mid ⅓ high	Mid ⅓ low	Mid ⅓ high
Total industrial demand (acres)	1,900	5,800	2,800	6,400
Total non-industrial demand (acres)	4,000	5,100	5,000	5,700

Employment capacity

The following assumptions were made to determine how much employment growth will be accommodated within the existing urban growth boundary. As with the demand analysis, please refer to the draft urban growth report for additional detail and discussion of the individual components. It's important to note that throughout this analysis, no upzoning is assumed beyond what's in current local government zoning ordinances and comprehensive plans. All of the capacity is based on current zoning and comprehensive plans, even though a significant amount of upzoning will likely take place around the region over the next 50 years.

- **Buildable employment and industrial land within the UGB.** The urban growth report includes a thorough analysis of the buildable land supply within the UGB, and the analysis has been reviewed and supplemented by local governments. The inventory includes tax lots characterized as vacant or partially vacant. Deductions from this supply were made to account for environmental protections, steep slopes and future streets. Following this, the remaining land was divided into six tiers based on development readiness. For the UGR's 20-year timeframe, some of the land in the lowest tiers was deducted from the available capacity to build a "low supply" scenario. However, it is assumed that over 40 to 50 years, all vacant industrial and employment lands will become development-ready.
- **New urban areas.** As in the residential analysis, all of the employment capacity available in new urban areas (areas added to the UGB after 1997, such as North Bethany, Damascus and Pleasant Valley) is assumed to be available on the reserves timeframe. Capacity estimates are based on the most current concept plan designations. In the UGR half of this capacity is considered to be not market feasible before 2030 due largely to lack of urban infrastructure. In the reserves analysis all of the capacity in new urban areas is counted. Clearly the region can and should deliver this infrastructure and complete these communities in the next 40 to 50 years. This assumption is supported by the focused investment strategy outlined in the *Strategies for a Sustainable and Prosperous Region*.
- **Refill rates.** Employment capacity within the existing UGB is based not just on the zoned capacity of vacant buildable land, but also on the amount of redevelopment and infill (collectively called "refill") that is likely to occur. As the region continues to mature a general increase in refill rates is anticipated. Application of a flat refill rate would likely understate actual refill activity as the metro area transitions towards an increased proportion of developed to greenfield sites. Consequently in this analysis a 5 percent increase in refill rates in the outer ring of subareas is assumed after 2030.
- **Market subarea demand and supply.** The Draft UGR shows that the region's capacity on vacant lands is not always located where employment demand is projected to be. The analysis at the

20-year timeframe is supported by computer simulations which are not of use in the longer timeframe of the reserves project. However, potential mismatches in capacity and demand at the 20-year timeframe highlights the role that both refill and targeted UGB expansions will play in the future. The region is committed to distributing both the benefits and burdens of growth equitably around the region, and employment opportunities are a critical part of that mix. Over the reserves timeframe we should assume that policy and investment decisions are made to support existing employment areas in all parts of the region.

Table D-5 summarizes the application of the employment capacity factors to the reserves timeframe.

Table D-5
Metro area employment demand and capacity, 2007-2050/2060

	2050		2060	
	Mid ⅓ low	Mid ⅓ high	Mid ⅓ low	Mid ⅓ high
Total industrial demand (acres)	1,900	5,800	2,800	6,400
Industrial capacity within UGB (acres)	12,703	12,703	13,346	13,346
Total non-industrial demand (acres)	4,000	5,100	5,000	5,700
Non-industrial capacity within UGB (acres)	9,245	9,245	10,302	10,302

Based on this analysis, the UGB contains adequate capacity to accommodate overall employment growth in the reserves timeframe, even in the mid-high forecast. However, one key issue remains, regarding providing lots over 25 acres for larger users. This issue was analyzed in the draft urban growth report. It is likely that single-tenant and multi-tenant employment users in this size range will need to be largely accommodated on vacant buildable lands because redevelopment and infill (refill) appears to be a more likely source of capacity for smaller lot needs. It is impossible to predict with any certainty the number of large lot users expected to come to this region 50 years from now, so this analysis proposes an extension of the analysis described in the UGR. The 20-year UGR analysis shows a rough match between supply and demand for large lots, so it is reasonable to assume that much of the region's large lot supply in the reserves timeframe would come from urban reserves. A reasonable extension of historical demand informed by future growth estimates suggests that approximately 100 acres per year would be appropriate over the reserves timeframe, equating to 2,000 acres for the period 2030 – 2050 and an additional 1,000 acres for 2050 – 2060. No adjustments are made for the higher or lower forecast due to the uncertainty surrounding these numbers and the similarity between need projections identified in the UGR.

Large lot employers represent a significant opportunity to diversify and support the regional economy. Therefore, suitable lands with a net buildable acreage between 2,000 and 3,000 acres should be identified for urban reserve designation. As noted elsewhere in the Chief Operating Officer's recommendation, these lands should be protected to ensure they are used for this vital regional economic need, and a fast-track UGB expansion process should be considered to allow quick response to important economic opportunities.

Efficiency of development within urban reserves

The final step in determining an employment acreage range for urban reserves is to estimate the number of acres required to produce the net buildable acres illustrated in Table D-5. The following assumptions apply:

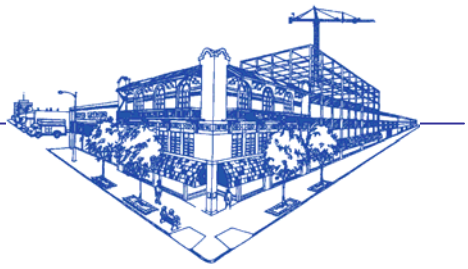
- **Gross-to-net conversion.** This analysis assumes a standard set of deductions to estimate the net buildable land area for urban reserve areas, similar to that used in the UGR and in recent concept planning efforts around the region. 40 percent of gross land area is assumed to be non-buildable due to environmental restrictions, public ownership, and similar factors. This leaves 60 percent of the total as the "gross buildable" land area. Not all of this will be developed however, so 25 percent of this gross buildable area is then deducted to account for required street right-of-way, parks, and other deductions. The remainder (45 percent of the original gross area) is the "net buildable" area and is the basis for calculating the urban reserve acreage range. Note that these assumptions can be refined in the reserves process once specific areas are identified as urban reserves; areas of high suitability may require fewer deductions than the average.

This is the last step in developing a employment acreage range for urban reserves. A range of employment land between 4,400 and 6,700 acres is recommended by application of these methods, as summarized in Table D-6.

Table D-6
Employment acreage range for urban reserves, 2007-2050/2060

	2050		2060	
	Mid ⅓ low	Mid ⅓ high	Mid ⅓ low	Mid ⅓ high
Net buildable acres required	2,000	2,000	3,000	3,000
Gross acres required	4,400	4,400	6,700	6,700

E. D. Hovee
& Company, LLC
Economic and Development Services



MEMORANDUM

To:	John Williams, Metro Dennis Yee, Metro
From:	Eric Hovee
Subject:	Employment Options for Urban Reserves Process
Date:	September 14, 2009

This memorandum is intended to outline options that might be considered to address employment growth and associated industrial/commercial building and land needs as part of the urban reserves process for the Portland Urban Growth Boundary (UGB) to 2050/60.

Options are considered within the context of observed employment and development trends together with the adopted *2040 Growth Concept* to discourage unnecessary urban sprawl and make more efficient use of land. This "reduced footprint" approach is also consistent with an objective to invest for improved land utilization within the existing UGB before expanding outside as needed for additional employment land area.

Specific topics covered by this memorandum are:

- Metro Employment Range Forecasts
- UGB Capture Rates
- Converting Jobs to Building Types
- Building Square Footage per Employee
- FARs by Building Type (or Design Type)
- Refill Rates
- Vacant Land Capacity

For each topic, key elements of the current forecast analysis with the preliminary 2030 employment Urban Growth Report (UGR) are outlined. This is followed by a review of options suggested for consideration with employment reserves over a time horizon of 40-50 years that is at least twice that of the UGR 2030 forecast period. With each topic, a recommended approach is also noted, concluding with summary identification of revisions actually being proposed by Metro staff for this portion of the urban reserves analysis.

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METRO EMPLOYMENT RANGE FORECASTS (BY SECTOR)

Current 2030 Forecast. Metro's *20 and 50 Year* forecast report provides a low to high job forecast range. Employment sector allocations are based on a combination of Global Insight projections and past trend / location quotient (LQ) extrapolation. My understanding is that the Metro Chief Operating Officer's recommendation for the employment UGR will be for the mid-range forecast to 2030.

A base case employment forecast extending beyond 2040 to 2050/60 is generated using a fixed employment-to-population (e-p) ratio of 0.51. It is noted that the e-p ratios to 2040 vary quite a bit depending on the forecast range (low-medium-high) and year considered. The 0.51 ratio projected beyond 2040 is just above the peak reported historical experience of 0.505 (in 2000).

2050/60 Options. There are a variety of options that could be considered as offering the potential effect of altering employment footprint for the region, such as:

- Moving to the lower side of the forecast range, whether as an explicit policy objective or to reflect a lower e-p ratio (depending in part on age mix of population).
- Revise the mix of employment in out-years, for example, to further reduce expected industrial job growth – moving more into alignment with national employment projections.
- More focused attention on self-employed and telecommuters, especially if this portion of the workforce were to be identified as an increasing share of total employment.

Recommended Approach. While a case might be made for any of these options, the approach suggested with the 40/50-year reserves analysis would be to focus on retaining the *mid-range forecast (to 2060) as is.* This is for reasons including:

- Consistency with the mid-range approach being recommended for the 2030 UGR.
- Speculative nature of other options that might be considered (as for an increased share of self-employed / telecommuters).
- Policy preference to err on the side of offering flexibility to accommodate more traded sector industrial activity (an option not possible if not covered by the reserves analysis)
- Ability to deal with reduced shares of some employment sectors in the UGB by varying capture rates (per the added discussion with the next section of this analysis).

Revisions Made. The Metro/Hovee employment spreadsheet model has now been extended to 2060 utilizing the 2060 mid-range forecast. Individual sectors are generally extrapolated forward at an annual job growth rate of 0.85% from 2040-2060, but with industry sector adjustments made to reflect industries viewed as having stronger or weaker long-term growth potentials based on factors including observed growth rates, anticipated demographics and changing regional competitive advantage. When summed, the individual employment sectors add to the previously prepared regional 2060 mid-range employment control total.

UGB CAPTURE RATES

Current 2030 Forecast. Projected UGB capture rates have dropped somewhat from about 83% of PMSA employment from 1983-2000 to 82% (2010-15/mid-scenario) and then to 79% (2015-30). These overall projected UGB capture rates are calculated based on weighted industry-specific capture rates.

Capture rates increase somewhat with the low scenario (as more of lower total regional growth stays in the UGB) and less with the high scenario. As noted by the UGR report, detailed industry trending of historical industry-specific capture rates is not easily accomplished due to the change from SIC to NAICS job classifications, making long-term assessment of industry-specific trends more challenging.

2050/60 Options. Looking beyond 2030, UGB capture rate options would appear to include:

- Holding industry-specific rates at the same levels as projected with the UGR to 2030.
- Dropping the overall job capture rate by 4-5% points, continuing what appears to be the *within UGB* job erosion trend since about the 1980s. Industry specific ratios could be adjusted down by this overall adjustment or varied individually (as noted below).
- Dropping UGB capture ratios to better balance employment-population (e-p) ratios throughout the region – reflecting both increasing regional travel congestion and possible regional/local policy priorities for reduced commute travel times or more balanced local jurisdiction fiscal capacities. *Note:* The projected Metro UGB population capture rate is 61.8% with the preliminary residential UGR. This is about 16-18% points below the UGB employment capture rate projected with the employment UGR at 78-80%.
- Reducing industry-specific capture rates differentially, to reflect already lower capture and presumed more rapid continued reduction for some industrial activities (such as manufacturing, transportation/warehouse/utilities and construction). This approach also assumes that functions such as finance and management that are more highly centralized remain so. A similar argument might be applied to wholesale trade (the industrial sector with the highest existing UGB capture rate) *Note:* this industry-specific approach might also be combined with other options as noted above.

Recommended Approach. Drop the UGB employment capture by at least 4-5% points and consider further reduction to also reflect improved jobs-housing balance in and out of the UGB. Also apply more rapid reductions to industrial sectors with already lower rates of UGB capture.

While there is no perfect formula, a simple solution that addresses this combination of possible approaches would be an across the board 10% point UGB capture reduction across all industry specific capture rates. For example, in this scheme the manufacturing UGB capture rate would drop from 81% to 71% while finance drops from 92% to 82%.

Revisions Made. Based on further discussion with Dennis Yee, the Metro UGB share was dropped by 5.0% points for every NAICS sector. This reflects observed trends including some added impetus for improved jobs-housing balance across the non-UGB portions of the PMSA.

ALLOCATING JOBS TO BUILDING TYPES

Current 2030 Forecast. The preliminary employment UGR maintains constant allocations both near term (to 2015) and longer term (to 2030). This is accomplished by a matrix indicating the proportion of employment by industry allocated to each of six building types (office, institution, flex/business park, general industrial, warehouse, and retail).

2050/60 Options. While there is little detailed quantitative data that we are aware of on this topic, there is a general expectation that industrial activity remaining in the U.S. (especially manufacturing) will continue to shift from general industrial space for production to R&D and admin/marketing, with greater utilization of office space.

These trends are supported by national literature and Portland metro area results of focus group and interview research conducted by our form with key business and industry groups. Also noted is that , with the exception of larger users, more industrial firms can generally be expected to be occupants of multi-tenant flex/business park space.

Recommended Approach. For purposes of a reduced footprint reserves scenario (beyond 2030), suggested is an approach that might involve:

- Consider reducing the percentage allocation of space allocated to general industrial and warehouse building type uses by in the range of 10% to potentially as much as one third (33%). This reduction would be applied to the construction, manufacturing, wholesale, TWU, and information sectors – for which 40%+ of space is currently allocated to general industrial and warehouse uses.
- Assigning one-half of the reduction in manufacturing and information space allocation noted above to office space use, the other half to flex/BP. Assign one-quarter of the reduction in construction, wholesale and TWU to office, the other three-quarters to flex/BP.

Revisions Made. Changes to the spreadsheet model have been made at the lower end of the range considered – reducing general industrial allocations 10% for the uses as indicated above.

BUILDING SQUARE FOOTAGE PER EMPLOYEE

Current 2030 Forecast. The May UGR draft provides square foot per employee estimates that are varied by building type and by geography (central area, inner ring, outer ring). Input data has been revised based on input from local jurisdictions, in large measure to account for what are perceived as differences between the three ring geographies. These ring-to-ring variations are especially pronounced for general industrial, warehouse/distribution and flex space.

With both the UGR report and more recent revisions made by Dennis Yee, input assumptions currently are held constant across the near term (to 2015) and longer term (to 2030) time periods.

2050/60 Options. Research conducted with the employment and economic trends analysis indicates that there appear to be somewhat conflicting space utilization forces at work to for most of the building types considered. Whether building square footage required to house the typical employee increases or decreases depends on how these countervailing forces play out and also may vary with the specific mix of businesses within a particular building type (especially for industrial uses). This is a topic for which more detailed Metro data monitoring capability in the future will become of increased importance – if changing employment land needs are to be more effectively understood and monitored over time.

Recommended Approach. In the absence of other clear and compelling data, a suggested approach would be to slightly increase the density factors as currently provided with the preliminary UGR, also reflecting modifications that local jurisdictions have researched to provide.

Note: A building type for which current space utilization factors with the UGR seems somewhat odd is flex/BP. In theory, flex space densities should be about mid-way between those of office and general industrial/distribution space as flex typically reflects a mix of these other uses. From this standpoint, the outer ring figure of 990 square feet per employee seems particularly high as a sustainable long-term average. It may reflect categorization of building space as flex/BP that would be considered as general industrial in other locales. If there were to be a change made, it might be to reduce this more to the 600-650 square foot per employee range for the 40-50 year time horizon. In exchange, the general industrial density might be increased from the 600 to 800 square feet per employee.

Revisions Made. MetroScope outputs have suggested generally increasing densities over time. Consequently, the employment spreadsheet indicates an overall increase of about 5% between 2030 and 2050/60 (rounded to the nearest 25 square feet per employee). The density hierarchy has also been rationalized so that building square footage per job for General Industrial now exceeds that of Flex/BP which also exceeds that of Office across each of the three ring geographies.

FARs By Building Type

Current 2030 Forecast. The May UGR varied floor area ratios (FARs) by building type, subareas and design type – but resulting FARs were then held constant across the near term (to 2015) and longer term (to 2030) time periods. Based on private business sector input, the retail FARs have been revised down, with lower rates now indicated for 2010-15 than for the 2015-30 time frame.

2050/60 Options. With the employment and trends analysis completed for Metro (and accompanying presentations), we have consistently discussed increasing FAR as both a potential opportunity and challenge for the future – especially in the out-years beyond the forecast horizon of the 2030 UGR. Experience from 2000-2006 provides clear evidence of increased employment FARs for urban design types but, to this point, not for Title 4 industrial-related design types.

Increased FARs have been identified as a key policy choice that could reinforce this region's sustainability advantage but that might involve tradeoffs for some traded sector industries that have other location choices whether in or outside this metro region. Also noted is a wide range of opinion regarding the desirability and feasibility of increasing employment development density that was heard from the business focus groups conducted in late 2008/early 2009.

With initial modeling for FARs as part of a possible *policy driven* option (in March), we initially tested assumptions of an approximate 45% increase in FARs for urban design types and 30% increase in industrial (Title 4) design types by 2050/60. Note that base year figures for some building/subarea/design types have since been ratcheted down, so that the 2050/60 FARs in many cases would not be as great as initially modeled.

With the Portland EOA, economic modeling reflected an approximately 34% increase for Central City office FAR, 16% in other FARs outside of industrial districts (in five year increments) through 2035. FARs for industrial areas of the Willamette-Columbia (and residential areas) were not increased over time but held constant.

Options that might be considered for the 40-50 year time frame of the reserves analysis include:

- Holding FARs at maximum 2030 UGR levels (as revised per retail input by Dennis Yee).
- Increasing FARs across the board by a constant amount – as an absolute or % bump.
- Increasing FARs more selectively, by building, subarea ring, and/or design type. *Note:* Key challenges are parking assumptions for commercial and urban design types, land banking & buffers/campus setting for flex / industrial uses or Title 4 lands.

Recommended Approach. An approach similar to but somewhat modified from our initial modeling is suggested for consideration, specifically:

- An approximate 20% - 40% increase in FARs from 2030-60 for new development with all urban design types (including central area , corridors, regional and town centers)
- A 10% - 20% increase in FARs for new development with the Title 4 industrial, and employment design types (and also the 'other' category)
- No increase in the Title 4 RSIA areas, with these lower FARs also targeted for added UGB lands to accommodate large lot uses (and associated early year land banking to also support future expansion needs of these large lot employers).

Note: The chart attached at the end of this memo illustrates resulting FARs at the *lower end* of the range indicated by building , subarea and design type. For industrial buildings, relevant notes are that outer ring FARs go to 0.26, a figure that is eminently achievable for most uses but may require greater build-out and less area for open space buffers, outside storage and extensive landscaping on-site.

For commercial uses, a good bellweather is provided by retail on corridors which now goes to an FAR range of 0.36 - 0.42. This reflects a modest transition still generally accommodated with at-grade parking but at somewhat reduced ratios and/or on-street parking.

Similar FARs are noted for office use with outer ring FARs; inner ring FARs go to 0.60 which may require that some portion of parking for new development be provided with structures, depending on transit availability to support reduced parking ratios.

Revisions Made. Changes to the employment spreadsheet model have been made at the lower end of the range recommended for consideration – for a 20% increase in FAR for urban design types over the 2030-50/60 time frame, a 10% increase for Title 4 industrial and employment designations, and no increase for Title 4 RSIA areas (per the chart attached as an appendix to this memorandum).

REFILL RATES

Current 2030 Forecast. The May preliminary UGR report references refill rates that are outputs of the MetroScope, estimated at 24% for industrial and 45% for non-industrial uses. Detailed data with the economic model reflects a comparison of refill rates suggested by E. D. Hovee economic modeling together with MetroScope results. A *potential* refill category is also included as part of the Metro employment capacity analysis, illustrating the effects of essentially doubling the MetroScope refill outputs.

2050/60 Options. Available for consideration are options to:

- Maintain existing MetroScope/Hovee based refill rates as applied for the UGR to 2030 (though continued application of the existing rates to 2050/60 may well understate actual refill activity, especially if the Metro area continues to transition toward an increased proportion of developed to Greenfield sites).
- Re-run the MetroScope model assuming 2050/60 employment and reduced footprint assumptions (and apply new outputs – if feasible).
- Increase refill rates for the 2030-50/60 period (to better reflect continued maturation of the metro area urbanized environment and Metro policy objectives)
- Transition to the approach of the recently completed Portland Economic Opportunities Analysis (EOA), which essentially calculates refill as a *residual* – as needed to balance supply with demand.

Recommended Approach. Ideally, anticipated refill rates could be adjusted up to reflect added refill beyond 2030 consistent both with an increasingly mature metro region (having a larger proportion of already developed sites) and reduced footprint policy objectives. Consequently, a preferred approach would be to re-apply MetroScope (if this can feasibly be re-run in the time frame needed). If re-running MetroScope is not possible within the time frame available, a back-up alternative would be to adjust refill rates up somewhat from the current UGR forecast (20 years) for the 40/50 time horizon of the urban reserves process.

Revisions Made. Changes made involve a 5% increase in outer ring refill rates, with no change to higher refill rates already applied for central and inner rings (as compared with refill rates in the 20-year preliminary employment UGR).

VACANT LAND CAPACITY (LAND TIERS ANALYSIS)

Current 2030 Forecast. The preliminary UGR capacity analysis places strong reliance on Tier A/B sites near term (through 2015/20), with increased reliance on Tiers C-G post-2020. Input data from local jurisdictions has resulted in increases to the vacant land inventory that will be incorporated in a revised final UGR.

2050/60 Options. Application of the input assumptions related to employment range, UGB capture, job/building type allocations, FARs and refill rates can be expected to substantially affect the comparison of employment demand versus need. However, it is still likely that increasing reliance will be placed on providing required infrastructure for both existing and new urban areas (brought into the UGB since 1997) to meet anticipated demand, especially in the 20-50 time period important for the urban reserves analysis.

While perhaps not directly required for the quantitative portion of this reserves analysis, increased attention to subarea marketability may be important for credibility with the public review process. This assurance is needed with respect to potential viability of as yet undeveloped areas already in the UGB and in establishing criteria or guidelines for employment reserves that might be considered for eventual UGB addition.

Even with the preliminary employment UGR (focused on a shorter 20-year time horizon), concern has been expressed by jurisdictions and private sector reviewers with subarea projections that may not coincide with market subareas that have been the recent focus of greatest employment growth. These questions may be amplified by the longer-term 40-50 year look for suitable urban reserves.

Recommended Approach. Whether included directly within the reserves analysis or as a supplemental report, it is suggested that discussion of employment reserves more explicitly address topics including:

- Funding options and strategic approach for bringing employment infrastructure on-line in advance of or in synch with employment and associated land demand.
- More detailed analysis of subarea demand / supply gaps – including a strategy for how shortages are most appropriately addressed by subarea and/or demand might be shifted to subareas with excess capacity (including discussion of cluster agglomeration and siting issues – as for high tech and distribution).
- Threshold criteria for adding employment UGB (related to items such as site and infrastructure suitability and funding capacity, priority for accommodating not easily predicted large lot/large employer needs, and triggers for UGB inclusion/development).

Revisions Made. No changes made to spreadsheet model. Topics identified above may be addressed in Metro narrative accompanying the quantitative outputs with a final urban reserves report.

APPENDIX. RESERVES ANALYSIS FAR ASSUMPTIONS (2030-2050/60)

Illustrated by the chart on the next two pages are FARs that would be associated with:

- 40% FAR increase across urban design types (Central City, Corridors, Regional Center, Town Center)
- 20% FAR increase for Title 4 types (Industrial, Employment) plus Other
- No FAR increase for RSIA designated lands

INDUSTRIAL BUILDINGS

Subareas	Central	Corridors	Regional Center	Town Center	RSIA	Industrial	Employment	Other
Central	1.20	0.60	-	0.72	0.50	0.53	0.50	0.53
Inner Westside	-	0.36	0.72	0.72	-	0.32	0.32	0.32
Inner North & East	1.20	0.36	0.72	0.72	0.25	0.32	0.32	0.32
Inner Clackamas	-	0.36	0.72	0.72	0.25	0.32	0.32	0.32
Inner I-5	-	0.36	0.72	0.72	-	0.32	0.32	0.32
Outer Westside	-	0.36	0.60	0.60	0.25	0.26	0.26	0.26
East Mult Co	-	0.36	0.60	0.60	0.25	0.26	0.26	0.26
Outer Clackamas	-	-	-	0.60	0.25	0.26	0.26	0.26
Outer I-5/205	-	0.36	0.60	0.60	0.25	0.26	0.26	0.26

WAREHOUSE DISTRIBUTION BUILDINGS

Subareas	Central	Corridors	Regional Center	Town Center	RSIA	Industrial	Employment	Other
Central	1.20	0.60	-	0.72	0.50	0.53	0.50	0.53
Inner Westside	-	0.36	0.72	0.72	-	0.32	0.32	0.32
Inner North & East	1.20	0.36	0.72	0.72	0.25	0.32	0.32	0.32
Inner Clackamas	-	0.36	0.72	0.72	0.25	0.32	0.32	0.32
Inner I-5	-	0.36	0.72	0.72	-	0.32	0.32	0.32
Outer Westside	-	0.36	0.60	0.60	0.25	0.26	0.26	0.26
East Mult Co	-	0.36	0.60	0.60	0.25	0.26	0.26	0.26
Outer Clackamas	-	-	-	0.60	0.25	0.26	0.26	0.26
Outer I-5/205	-	0.36	0.60	0.60	0.25	0.26	0.26	0.26

FLEX BUILDINGS

Subareas	Central	Corridors	Regional Center	Town Center	RSIA	Industrial	Employment	Other
Central	1.20	0.60	-	0.72	0.50	0.53	0.50	0.53
Inner Westside	-	0.36	0.72	0.72	-	0.32	0.32	0.32
Inner North & East	1.20	0.36	0.72	0.72	0.25	0.32	0.32	0.32
Inner Clackamas	-	0.36	0.72	0.72	0.25	0.32	0.32	0.32
Inner I-5	-	0.36	0.72	0.72	-	0.32	0.32	0.32
Outer Westside	-	0.30	0.60	0.60	0.25	0.26	0.26	0.26
East Mult Co	-	0.30	0.60	0.60	0.25	0.26	0.26	0.26
Outer Clackamas	-	-	-	0.60	0.25	0.26	0.26	0.26
Outer I-5/205	-	0.30	0.60	0.60	0.25	0.26	0.26	0.26

OFFICE BUILDINGS

Subareas	Central	Corridors	Regional Center	Town Center	RSIA	Industrial	Employment	Other
Central	7.20	1.80	-	1.20	1.00	1.05	1.00	1.05
Inner Westside	-	0.60	1.80	0.72	-	0.53	0.53	0.53
Inner North & East	4.80	0.60	1.80	1.20	0.30	0.53	0.53	0.53
Inner Clackamas	-	0.60	1.20	0.72	0.30	0.53	0.53	0.53
Inner I-5	-	0.60	1.80	0.72	-	0.53	0.53	0.53
Outer Westside	-	0.42	1.20	0.72	0.35	0.37	0.37	0.37
East Mult Co	-	0.42	1.20	0.72	0.35	0.37	0.37	0.37
Outer Clackamas	-	-	-	0.72	0.35	0.37	0.37	0.37
Outer I-5/205	-	0.42	1.20	0.72	0.35	0.37	0.37	0.37

RETAIL BUILDINGS

Subareas	Central	Corridors	Regional Center	Town Center	RSIA	Industrial	Employment	Other
Central	1.20	0.60	-	0.72	0.50	0.53	0.50	0.53
Inner Westside	-	0.40	1.00	0.60	-	0.37	0.35	0.37
Inner North & East	1.20	0.40	1.00	1.00	0.30	0.37	0.35	0.37
Inner Clackamas	-	0.40	1.00	0.60	0.30	0.37	0.35	0.37
Inner I-5	-	0.40	1.00	0.60	-	0.37	0.35	0.37
Outer Westside	-	0.36	0.46	0.40	0.30	0.32	0.31	0.32
East Mult Co	-	0.36	0.46	0.40	0.30	0.32	0.31	0.32
Outer Clackamas	-	-	-	0.40	0.30	0.32	0.31	0.32
Outer I-5/205	-	0.36	0.46	0.40	0.30	0.32	0.31	0.32

INSTITUTIONAL BUILDINGS

Subareas	Central	Corridors	Regional Center	Town Center	RSIA	Industrial	Employment	Other
Central	7.20	1.80	-	1.20	1.00	1.05	1.00	1.05
Inner Westside	-	0.60	1.80	0.72	-	0.53	0.53	0.53
Inner North & East	4.80	0.60	1.80	1.20	0.30	0.53	0.53	0.53
Inner Clackamas	-	0.60	1.20	0.72	0.30	0.53	0.53	0.53
Inner I-5	-	0.60	1.80	0.72	-	0.53	0.53	0.53
Outer Westside	-	0.42	1.20	0.72	0.35	0.37	0.37	0.37
East Mult Co	-	0.42	1.20	0.72	0.35	0.37	0.37	0.37
Outer Clackamas	-	-	-	0.72	0.35	0.37	0.37	0.37
Outer I-5/205	-	0.42	1.20	0.72	0.35	0.37	0.37	0.37

APPENDIX 3E-E

SAMPLE INTERGOVERNMENTAL AGREEMENT RESOLUTION

Attached is a sample resolution that would be used to formalize the Metro Council's approval of an intergovernmental agreement between Metro and a county to designate urban and rural reserves in that county. If consensus can be reached on urban and rural reserves among all four partner jurisdictions, the Council would approve three such resolutions, one with each county. Approval of intergovernmental agreements is scheduled for December 2009.

BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF APPROVING AN INTERGOVERNMENTAL AGREEMENT BETWEEN METRO AND _____ COUNTY TO DESIGNATE URBAN RESERVES AND RURAL RESERVES IN THE COUNTY AND AUTHORIZING THE COUNCIL PRESIDENT TO SIGN THE AGREEMENT	)))	RESOLUTION NO. 09-XXXX Introduced by Chief Operating Officer Michael Jordan with the Concurrence of Council President David Bragdon

WHEREAS, Metro and Clackamas, Multnomah and Washington Counties have declared their mutual interest in long-term planning for three-county area for which they share land use planning authority in order to ensure the development of great communities within the urban growth boundary surrounded by prosperous farms, ranches, woodlots, forests, and natural resources and landscapes; and

WHEREAS, the 2007 Oregon Legislature enacted Senate Bill 1011, codified at ORS 195.137 to 195.145 ("the statute"), at the request of the four governments and many other local governments and organizations in the region and state agencies, to establish a new method to accomplish the goals of the four governments through long-term planning; and

WHEREAS, the statute authorizes Metro to designate Urban Reserves and _____ County to designate Rural Reserves in that county to accomplish the purposes of the statute, which are consistent with the goals of the two governments; and

WHEREAS, the Land Conservation and Development Commission ("LCDC") adopted rules to implement the statute on January 25, 2008, as directed by the statute; and

WHEREAS, the statute and rules require the four governments to work together in their joint effort to designate reserves and to enter into formal agreements between Metro and each county to designate reserves in a coordinated and concurrent process prior to adoption of ordinances adopting reserves; and

WHEREAS, Metro and_____ County sought and received comments on the preliminary analyses of suitability of land for designation of land for urban reserves and rural reserves from the Reserves Steering Committee, Metro's Metro Policy Advisory Committee, _____County's Policy Advisory Committee, reserves partner governments _____ County and _____ County, other local governments in the region, state agencies and public, private and non-profit organizations and citizens at numerous open houses and public hearings; and

WHEREAS, Councilor Kathryn Harrington, Council Liaison to the partner counties for Urban and Rural Reserves, has proposed an Intergovernmental Agreement (IGA) between Metro and _____ County that proposes the designation of particular urban and rural reserves and the adoption of specific policies; and

WHEREAS, the proposed IGA has the support of all three partner counties and has been coordinated with proposed IGAs between Metro and _____ County and Metro and _____ County; now, therefore,

BE IT RESOLVED that the Metro Council

1. Accepts the proposed Intergovernmental Agreement between Metro and _____ County, attached to this resolution as Exhibit A, as a final proposal for designation of urban and rural reserves to be adopted by ordinance in 2010, and authorizes the Council President to sign the agreement on behalf of Metro.
2. Directs the Chief Operating Officer to submit the proposed final urban and rural reserves and the proposed policies to implement the reserves for public hearings leading to a decision to adopt urban reserves and implementing policies in 2010.

ADOPTED by the Metro Council this __ day of December, 2009.

_____
David Bragdon, Council President

Approved as to form:

_____
Daniel B. Cooper, Metro Attorney

APPENDIX 3E-F

KEY ELEMENTS OF 2010 URBAN AND RURAL RESERVES ORDINANCE

The Reserves Ordinance will designate urban reserves to accommodate long-range (40-50 years) population and employment growth. The ordinance will also adopt a map that shows the location of both urban reserves adopted by the Metro County and rural reserves adopted by Clackamas, Multnomah and Washington Counties. It will also adopt Council policy on urban and rural reserves to be amended into the Regional Framework Plan. The Chief Operating Officer recommends a conservative approach to reserves to reflect the great difficulty predicting growth or development trends over such a long period of time.

New Strategies

Strategy 1: Measure Performance of Investments and Tools and Use Lessons Learned from Performance

The Chief Operating Officer recommends that the Council:

- Monitor the performance of urban reserves to determine whether they contribute to achievement of the Outcomes the region seeks for Centers and Corridors

- Monitor the performance of rural reserves to determine whether they contribute to the success of agriculture and forestry in the great metropolitan region.

Strategy 2: Invest in Our Centers, Corridors and Employment Areas

The Chief Operating Officer recommends that the Council:

- Commit Metro to conceptual planning of designated urban reserves, prior to their inclusion in the UGB, to determine the appropriate providers of urban services and appropriate cities to govern the areas

- Seek the agreement of the three counties to collaborate in conceptual in the Intergovernmental Agreements leading to designation of urban reserves.

Strategy 3: Use Tools to Direct Growth to Centers, Corridors and Employment Areas

The Chief Operating Officer recommends that the Council:

- Given the inherent uncertainties of very long-range planning, designate an amount of urban reserves adequate for the more conservative end of the 40-50-year reserves planning period

- Designate urban and rural reserves that will provide long-term protection for the agricultural and forest industries of the greater region

- Ensure that designated urban reserves include an ample supply of land suitable for industrial use adjacent and nearby the existing UGB

- Designate as urban reserves lands that will help existing Centers and Corridors achieve our desired Outcomes or lands that are suitable to become new Centers and Corridors that will achieve the Outcomes

- Be mindful in the designation of urban reserves to protect an opportunity for neighbor cities outside the UGB to maintain their identities separate from the Metro area and achieve their own aspirations.

Metro | *People places. Open spaces.*

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and good transportation choices for people and businesses in our region. Voters have asked Metro to help with the challenges that cross those lines and affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to protecting open space, caring for parks, planning for the best use of land, managing garbage disposal and increasing recycling. Metro oversees world-class facilities such as the Oregon Zoo, which contributes to conservation and education, and the Oregon Convention Center, which benefits the region's economy.

Metro representatives

Metro Council President – David Bragdon

Metro Councilors
Rod Park, District 1
Carlotta Collette, District 2
Carl Hosticka, District 3
Kathryn Harrington, District 4
Rex Burkholder, District 5
Robert Liberty, District 6

Auditor – Suzanne Flynn

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BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF APPROVING AN INTERGOVERNMENTAL AGREEMENT BETWEEN METRO AND CLACKAMAS COUNTY TO DESIGNATE URBAN RESERVES AND RURAL RESERVES IN THE COUNTY AND AUTHORIZING THE COUNCIL PRESIDENT TO SIGN THE AGREEMENT	)))	RESOLUTION NO. 09-XXXX Introduced by Chief Operating Officer Michael Jordan with the Concurrence of Council President David Bragdon

WHEREAS, Metro and Clackamas, Multnomah and Washington Counties have declared their mutual interest in long-term planning for three-county area for which they share land use planning authority in order to ensure the development of great communities within the urban growth boundary surrounded by prosperous farms, ranches, woodlots, forests, and natural resources and landscapes; and

WHEREAS, the 2007 Oregon Legislature enacted Senate Bill 1011, codified at ORS 195.137 to 195.145 ("the statute"), at the request of the four governments and many other local governments and organizations in the region and state agencies, to establish a new method to accomplish the goals of the four governments through long-term planning; and

WHEREAS, the statute authorizes Metro to designate Urban Reserves and Clackamas County to designate Rural Reserves in that county to accomplish the purposes of the statute, which are consistent with the goals of the two governments; and

WHEREAS, the Land Conservation and Development Commission ("LCDC") adopted rules to implement the statute on January 25, 2008, as directed by the statute; and

WHEREAS, the statute and rules require the four governments to work together in their joint effort to designate reserves and to enter into formal agreements between Metro and each county to designate reserves in a coordinated and concurrent process prior to adoption of ordinances adopting reserves; and

WHEREAS, Metro and Clackamas County sought and received comments on the preliminary analyses of suitability of land for designation of land for urban reserves and rural reserves from the Reserves Steering Committee, Metro's Metro Policy Advisory Committee, Clackamas County's Policy Advisory Committee, reserves partner governments Multnomah County and Washington County, other local governments in the region, state agencies and public, private and non-profit organizations and citizens at numerous open houses and public hearings; and

WHEREAS, Councilor Kathryn Harrington, Council Liaison to the partner counties for Urban and Rural Reserves, has proposed an Intergovernmental Agreement (IGA) between Metro and Clackamas County that proposes the designation of particular urban and rural reserves and the adoption of specific policies; and

WHEREAS, the proposed IGA has the support of all three partner counties and has been coordinated with proposed IGAs between Metro and Multnomah County and Metro and Washington County; now, therefore,

BE IT RESOLVED that the Metro Council

1. Accepts the proposed Intergovernmental Agreement between Metro and Clackamas County, attached to this resolution as Exhibit A, as a final proposal for designation of urban and rural reserves to be adopted by ordinance in 2010, and authorizes the Council President to sign the agreement on behalf of Metro.
2. Directs the Chief Operating Officer to submit the proposed final urban and rural reserves and the proposed policies to implement the reserves for public hearings leading to a decision to adopt urban reserves and implementing policies in 2010.

ADOPTED by the Metro Council this __ day of December, 2009.

_____
David Bragdon, Council President

Approved as to form:

_____
Daniel B. Cooper, Metro Attorney

BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF APPROVING AN INTERGOVERNMENTAL AGREEMENT BETWEEN METRO AND MULTNOMAH COUNTY TO DESIGNATE URBAN RESERVES AND RURAL RESERVES IN THE COUNTY AND AUTHORIZING THE COUNCIL PRESIDENT TO SIGN THE AGREEMENT	)))	RESOLUTION NO. 09-XXXX Introduced by Chief Operating Officer Michael Jordan with the Concurrence of Council President David Bragdon

WHEREAS, Metro and Clackamas, Multnomah and Washington Counties have declared their mutual interest in long-term planning for three-county area for which they share land use planning authority in order to ensure the development of great communities within the urban growth boundary surrounded by prosperous farms, ranches, woodlots, forests, and natural resources and landscapes; and

WHEREAS, the 2007 Oregon Legislature enacted Senate Bill 1011, codified at ORS 195.137 to 195.145 ("the statute"), at the request of the four governments and many other local governments and organizations in the region and state agencies, to establish a new method to accomplish the goals of the four governments through long-term planning; and

WHEREAS, the statute authorizes Metro to designate Urban Reserves and Multnomah County to designate Rural Reserves in that county to accomplish the purposes of the statute, which are consistent with the goals of the two governments; and

WHEREAS, the Land Conservation and Development Commission ("LCDC") adopted rules to implement the statute on January 25, 2008, as directed by the statute; and

WHEREAS, the statute and rules require the four governments to work together in their joint effort to designate reserves and to enter into formal agreements between Metro and each county to designate reserves in a coordinated and concurrent process prior to adoption of ordinances adopting reserves; and

WHEREAS, Metro and Multnomah County sought and received comments on the preliminary analyses of suitability of land for designation of land for urban reserves and rural reserves from the Reserves Steering Committee, Metro's Metro Policy Advisory Committee, Multnomah County's Citizens Advisory Committee, reserves partner governments Clackamas County and Washington County, other local governments in the region, state agencies and public, private and non-profit organizations and citizens at numerous open houses and public hearings; and

WHEREAS, Councilor Kathryn Harrington, Council Liaison to the partner counties for Urban and Rural Reserves, has proposed an Intergovernmental Agreement (IGA) between Metro and Multnomah County that proposes the designation of particular urban and rural reserves and the adoption of specific policies; and

WHEREAS, the proposed IGA has the support of all three partner counties and has been coordinated with proposed IGAs between Metro and Clackamas County and Metro and Washington County; now, therefore,

BE IT RESOLVED that the Metro Council

1. Accepts the proposed Intergovernmental Agreement between Metro and Multnomah County, attached to this resolution as Exhibit A, as a final proposal for designation of urban and rural reserves to be adopted by ordinance in 2010, and authorizes the Council President to sign the agreement on behalf of Metro.
2. Directs the Chief Operating Officer to submit the proposed final urban and rural reserves and the proposed policies to implement the reserves for public hearings leading to a decision to adopt urban reserves and implementing policies in 2010.

ADOPTED by the Metro Council this __ day of December, 2009.

_____
David Bragdon, Council President

Approved as to form:

_____
Daniel B. Cooper, Metro Attorney

BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF APPROVING AN INTERGOVERNMENTAL AGREEMENT BETWEEN METRO AND WASHINGTON COUNTY TO DESIGNATE URBAN RESERVES AND RURAL RESERVES IN THE COUNTY AND AUTHORIZING THE COUNCIL PRESIDENT TO SIGN THE AGREEMENT	)))	RESOLUTION NO. 09-XXXX Introduced by Chief Operating Officer Michael Jordan with the Concurrence of Council President David Bragdon

WHEREAS, Metro and Clackamas, Multnomah and Washington Counties have declared their mutual interest in long-term planning for three-county area for which they share land use planning authority in order to ensure the development of great communities within the urban growth boundary surrounded by prosperous farms, ranches, woodlots, forests, and natural resources and landscapes; and

WHEREAS, the 2007 Oregon Legislature enacted Senate Bill 1011, codified at ORS 195.137 to 195.145 ("the statute"), at the request of the four governments and many other local governments and organizations in the region and state agencies, to establish a new method to accomplish the goals of the four governments through long-term planning; and

WHEREAS, the statute authorizes Metro to designate Urban Reserves and Washington County to designate Rural Reserves in that county to accomplish the purposes of the statute, which are consistent with the goals of the two governments; and

WHEREAS, the Land Conservation and Development Commission ("LCDC") adopted rules to implement the statute on January 25, 2008, as directed by the statute; and

WHEREAS, the statute and rules require the four governments to work together in their joint effort to designate reserves and to enter into formal agreements between Metro and each county to designate reserves in a coordinated and concurrent process prior to adoption of ordinances adopting reserves; and

WHEREAS, Metro and Washington County sought and received comments on the preliminary analyses of suitability of land for designation of land for urban reserves and rural reserves from the Reserves Steering Committee, Metro's Metro Policy Advisory Committee, Washington County's Reserves Coordinating Committee, reserves partner governments Multnomah County and Washington County, other local governments in the region, state agencies and public, private and non-profit organizations and citizens at numerous open houses and public hearings; and

WHEREAS, Councilor Kathryn Harrington, Council Liaison to the partner counties for Urban and Rural Reserves, has proposed an Intergovernmental Agreement (IGA) between Metro and Washington County that proposes the designation of particular urban and rural reserves and the adoption of specific policies; and

WHEREAS, the proposed IGA has the support of all three partner counties and has been coordinated with proposed IGAs between Metro and Clackamas County and Metro and Multnomah County; now, therefore,

BE IT RESOLVED that the Metro Council

1. Accepts the proposed Intergovernmental Agreement between Metro and Washington County, attached to this resolution as Exhibit A, as a final proposal for designation of urban and rural reserves to be adopted by ordinance in 2010, and authorizes the Council President to sign the agreement on behalf of Metro.
2. Directs the Chief Operating Officer to submit the proposed final urban and rural reserves and the proposed policies to implement the reserves for public hearings leading to a decision to adopt urban reserves and implementing policies in 2010.

ADOPTED by the Metro Council this __ day of December, 2009.

_____
David Bragdon, Council President

Approved as to form:

_____
Daniel B. Cooper, Metro Attorney

2010 UGB Urban and Rural Reserves Ordinance

The Reserves Ordinance will designate urban reserves to accommodate long-range (40-50 years) population and employment growth. The ordinance will also adopt a map that shows the location of both urban reserves adopted by the Metro County and rural reserves adopted by Clackamas, Multnomah and Washington Counties. It will also adopt Council policy on urban and rural reserves to be amended into the Regional Framework Plan. The Chief Operating Officer recommends a conservative approach to reserves to reflect the great difficulty predicting growth or development trends over such a long period of time.

New Strategies

Strategy 1: Measure Performance of Investments and Tools and Use Lessons Learned from Performance

The Chief Operating Officer recommends that the Council:

- Monitor the performance of urban reserves to determine whether they contribute to achievement of the Outcomes the region seeks for Centers and Corridors

- Monitor the performance of rural reserves to determine whether they contribute to the success of agriculture and forestry in the great metropolitan region.

Strategy 2: Invest in Our Centers, Corridors and Employment Areas

The Chief Operating Officer recommends that the Council:

- Commit Metro to conceptual planning of designated urban reserves, prior to their inclusion in the UGB, to determine the appropriate providers of urban services and appropriate cities to govern the areas

- Seek the agreement of the three counties to collaborate in conceptual in the Intergovernmental Agreements leading to designation of urban reserves.

Strategy 3: Use Tools to Direct Growth to Centers, Corridors and Employment Areas

The Chief Operating Officer recommends that the Council:

- Given the inherent uncertainties of very long-range planning, designate an amount of urban reserves adequate for the more conservative end of the 40-50-year reserves planning period

- Designate urban and rural reserves that will provide long-term protection for the agricultural and forest industries of the greater region

- Ensure that designated urban reserves include an ample supply of land suitable for industrial use adjacent and nearby the existing UGB

- Designate as urban reserves lands that will help existing Centers and Corridors achieve our desired Outcomes or lands that are suitable to become new Centers and Corridors that will achieve the Outcomes

- Be mindful in the designation of urban reserves to protect an opportunity for neighbor cities outside the UGB to maintain their identities separate from the Metro area and achieve their own aspirations.