









URBAN GROWTH REPORT

2009 – 2030

Employment and residential

January 2010

Metro | *People places. Open spaces.*

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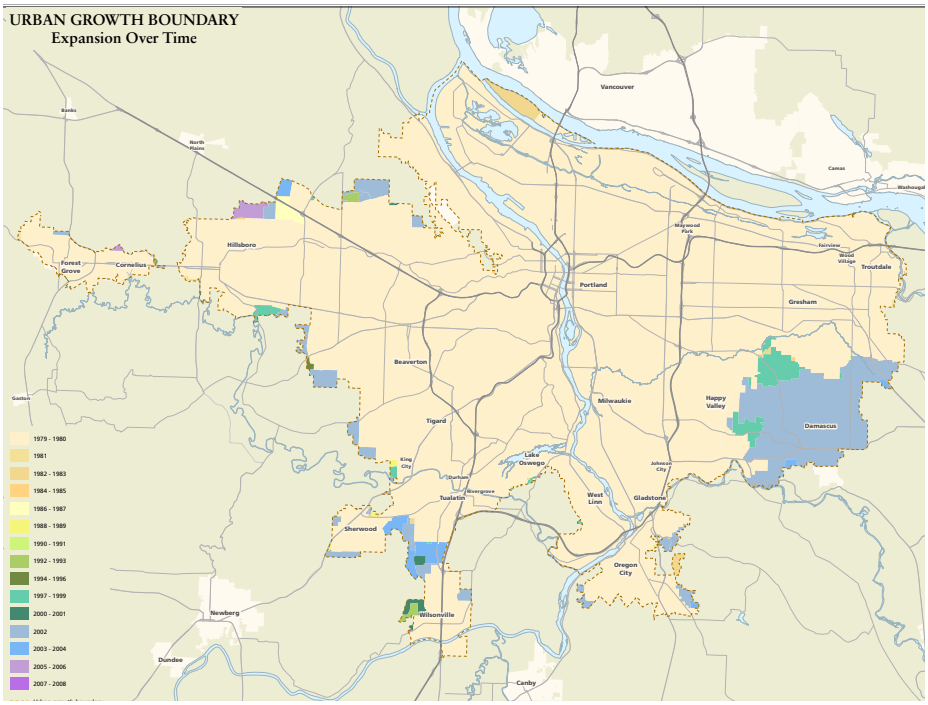
INTRODUCTION

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.

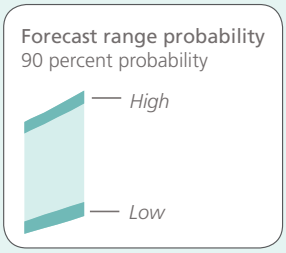
What does the range mean?

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.

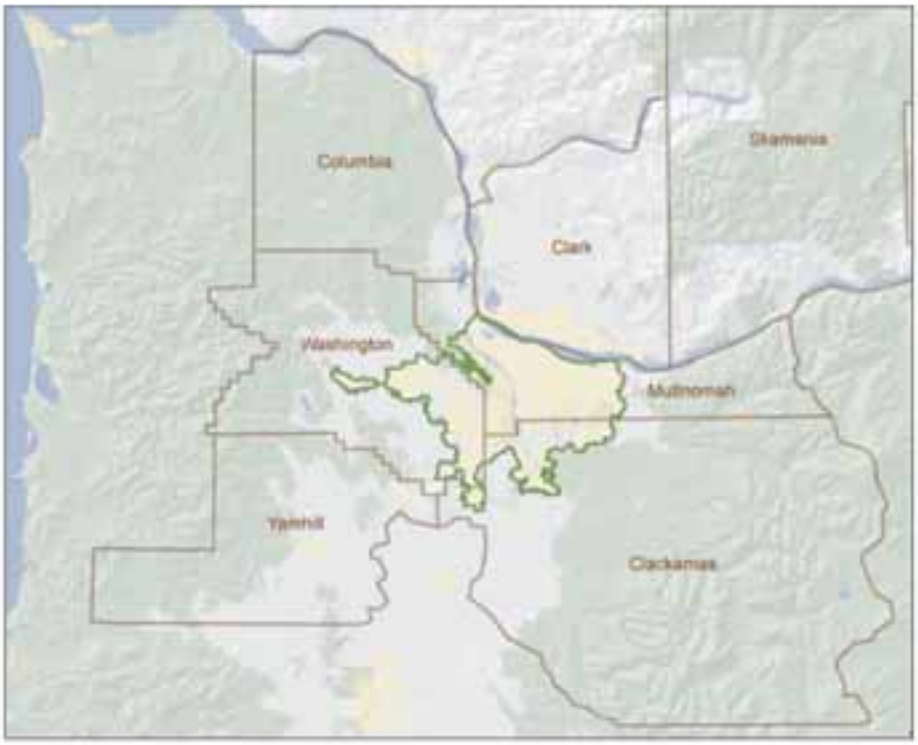
High end of range: There is a five percent chance that actual growth will be greater than the high end of the range.

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

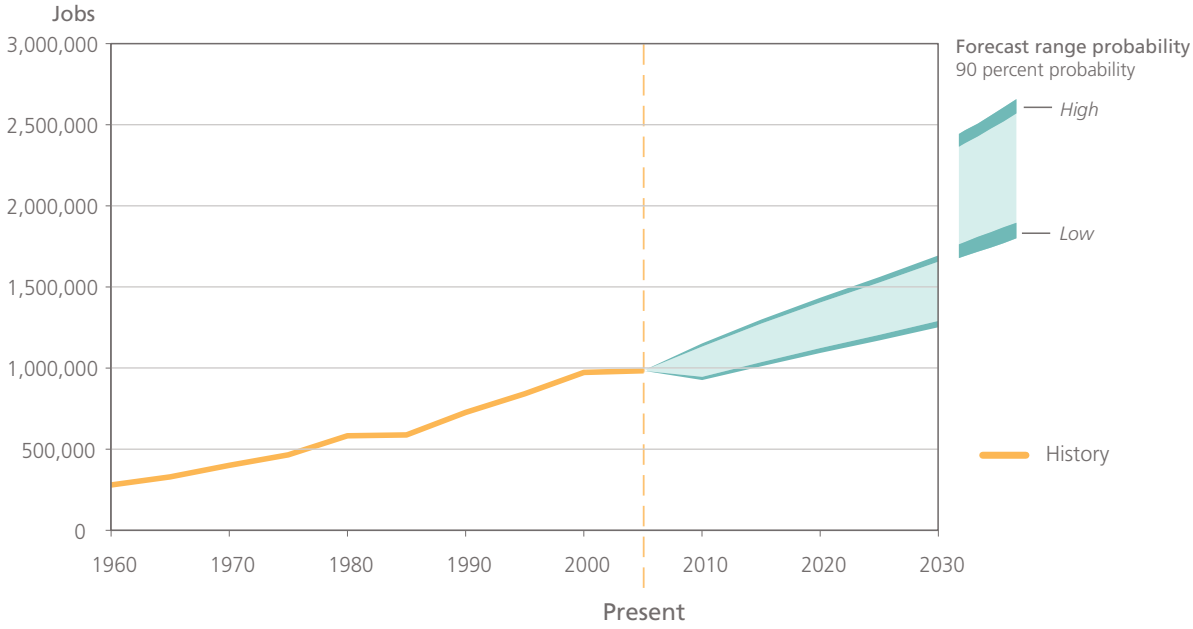


Table 2: Employment range forecast and annual percentage rate (APR) change from year 2000: Portland, Beaverton, Vancouver, OR-WA PMSA
Source: Metro, 2009

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

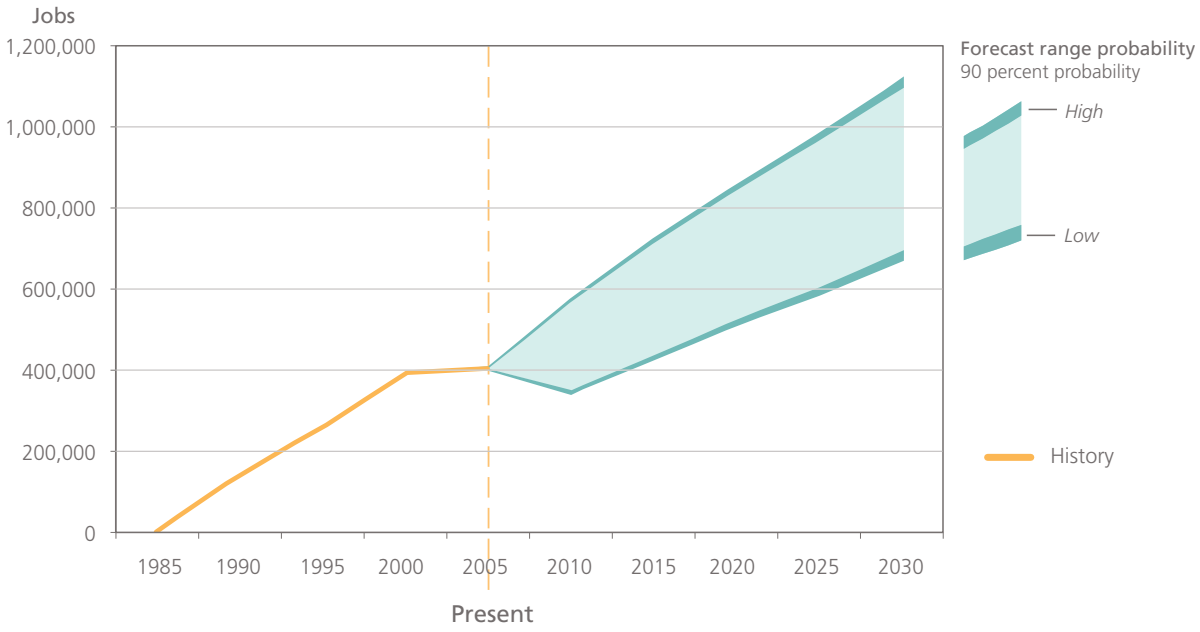
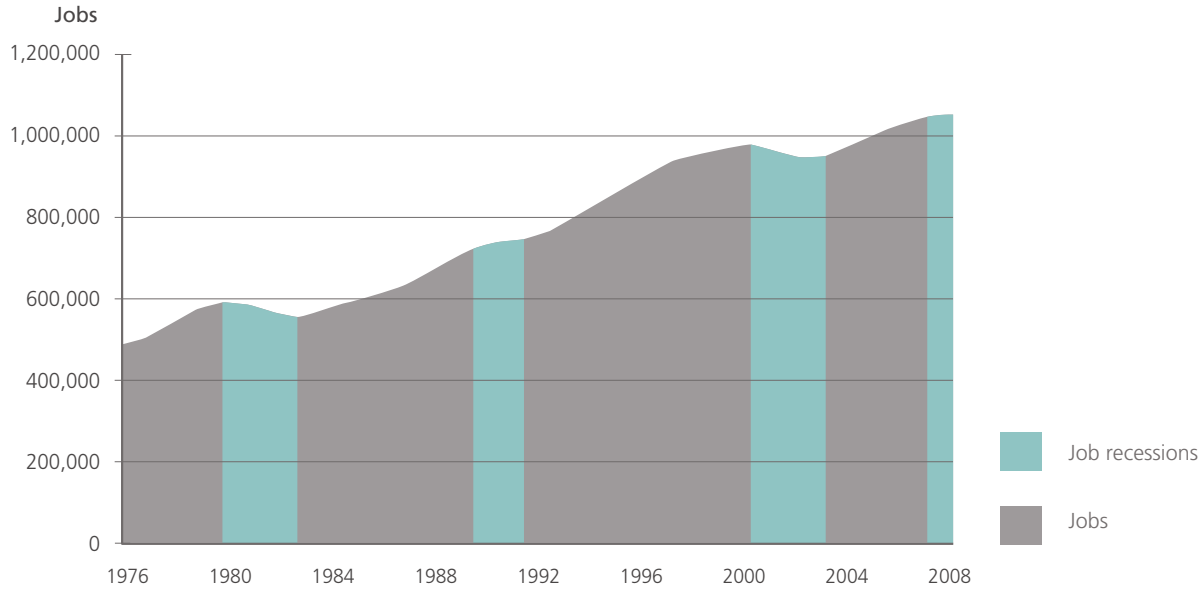


Table 3: Regional employment change, 5 and 20 year forecast by sector
Source: Metro, 2009

	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

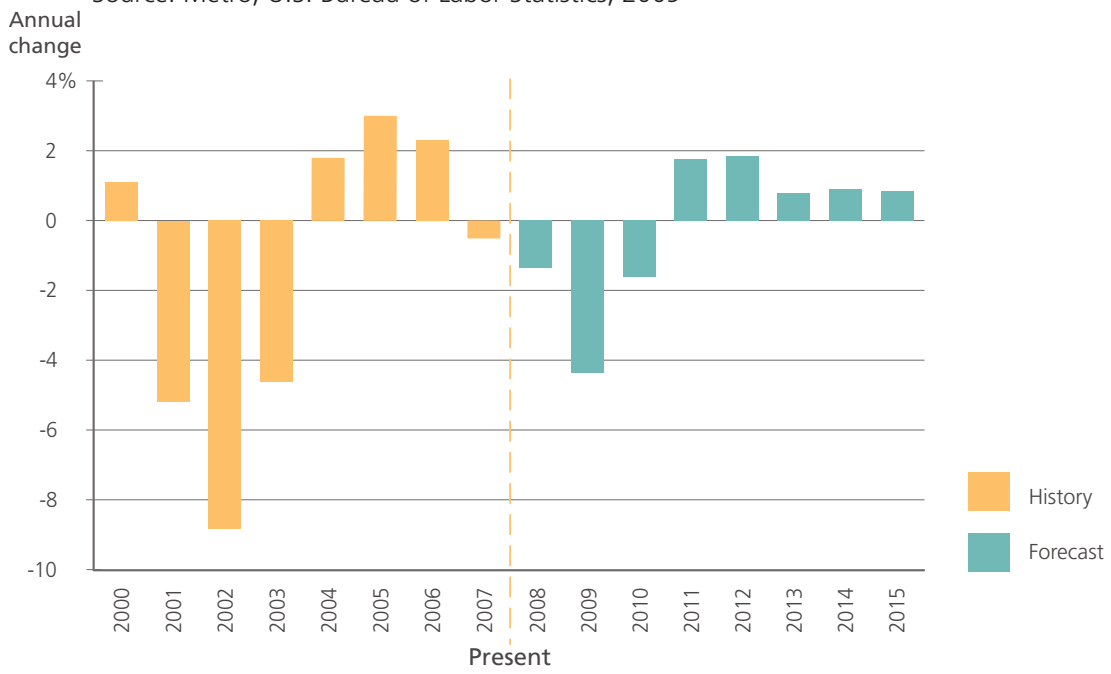
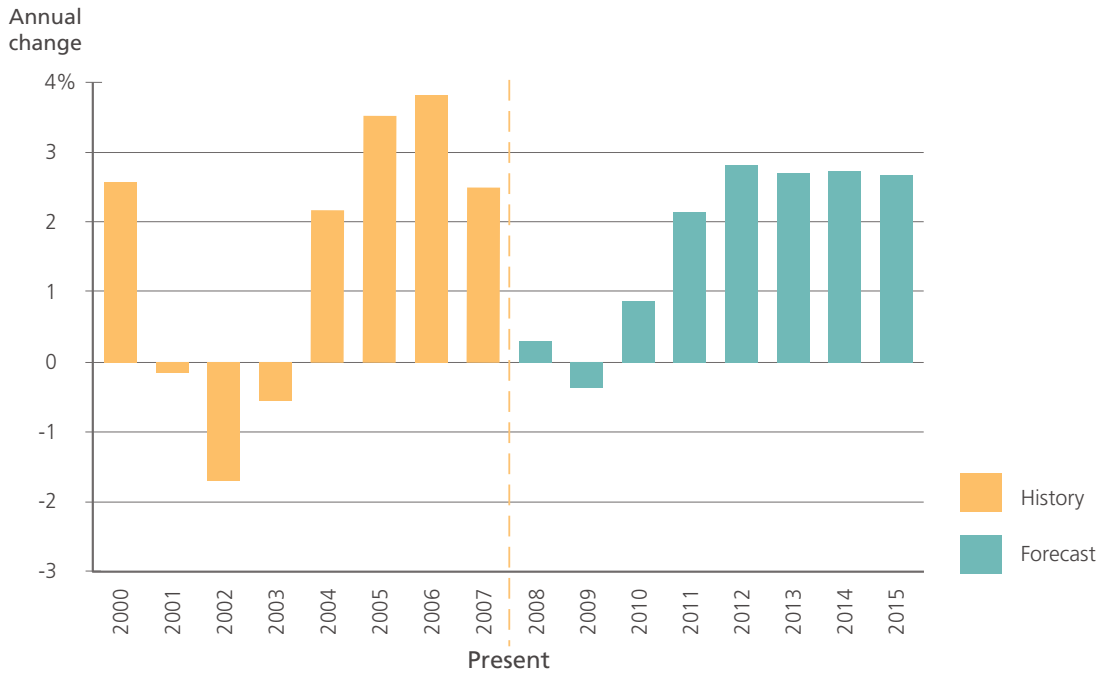
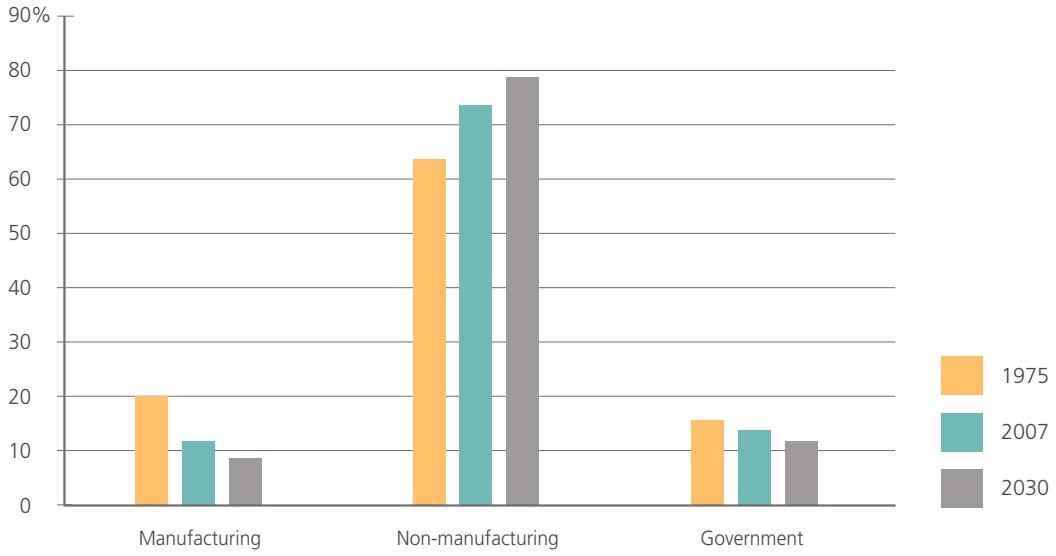


Figure 6: Total non-manufacturing employment, 7-county statistical area
Source: Metro, U.S. Bureau of Labor Statistics, 2009



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

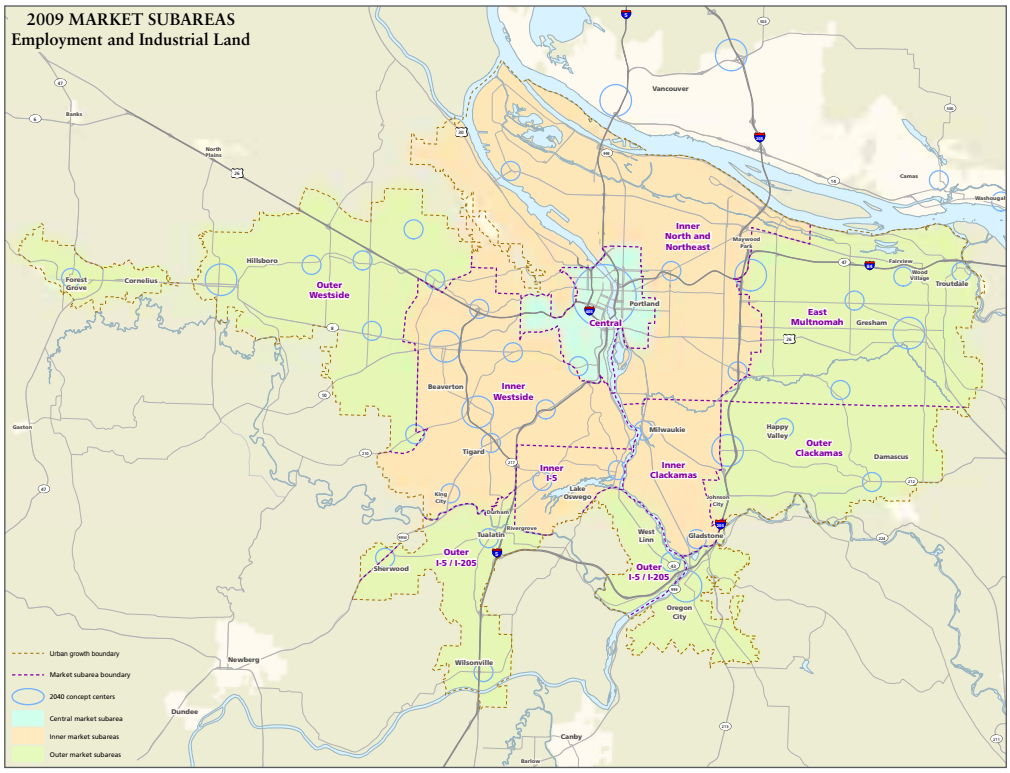
- The current recession continues for an extended period and both the Portland region and the entire state emerge slower than the rest of the country.
- International immigration slows and regional in-migration drops off sharply.
- Lack of a major research university dampens investment from firms requiring 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.

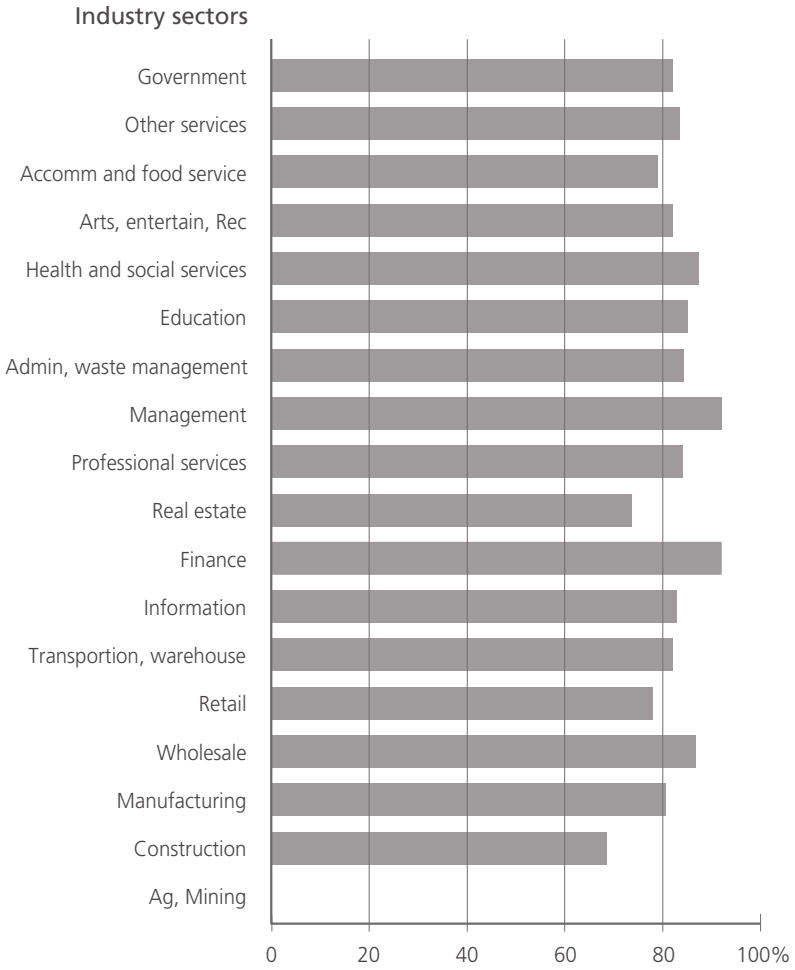
Due to changes in federal employment codes (SIC to NAICS), industry-level capture rates are unavailable. However, historical observed rates for total employment for the Metro UGB are shown in **Table 5.**

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

[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

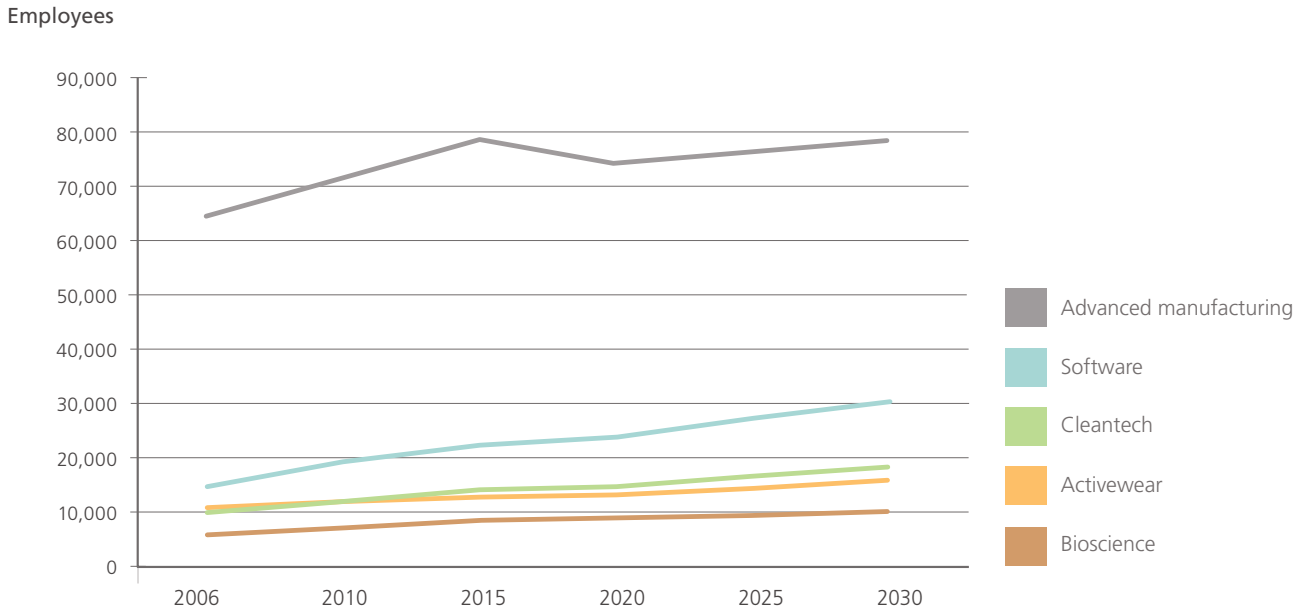
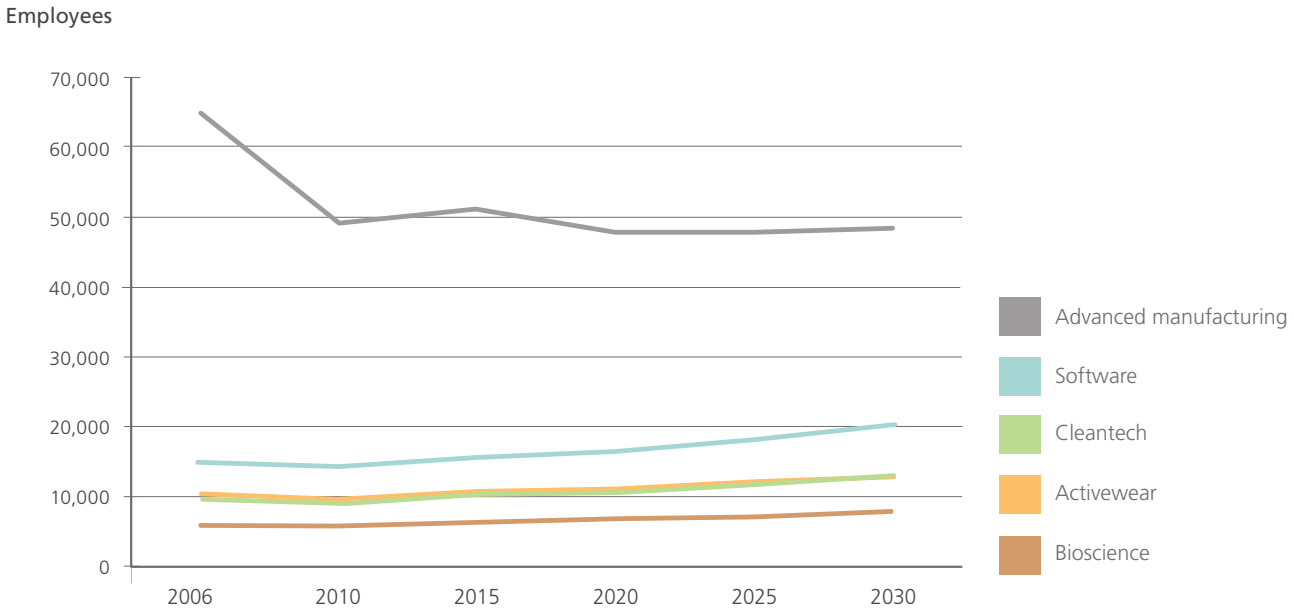


Figure 10: Projected cluster employment by cluster through 2030 (low growth forecast)
Source: Metro, 2009



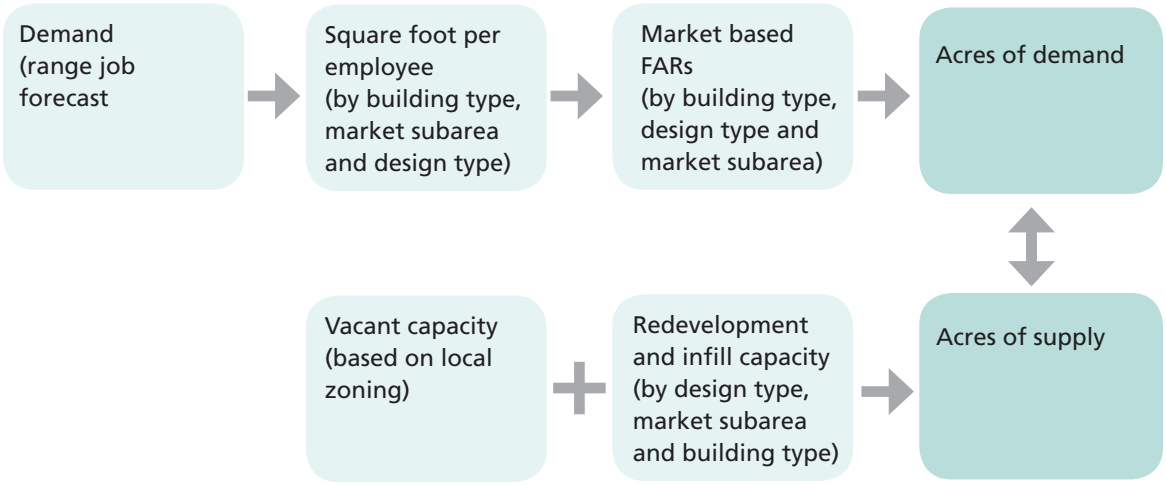
Under the high growth forecast, all five of the identified clusters would realize growth in employment by the year 2030. Under the low growth forecast, the Advanced Manufacturing cluster is forecasted to suffer the most of the five clusters, with no recovery to 2010 employment levels by the year 2030. 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.

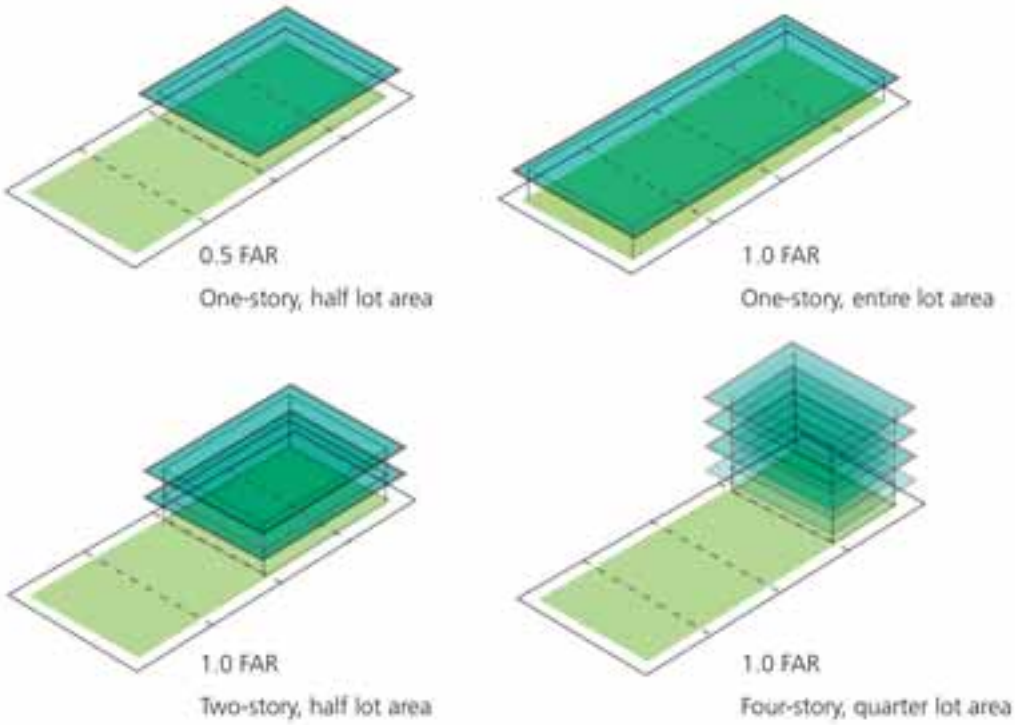
Building square feet to acres

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.

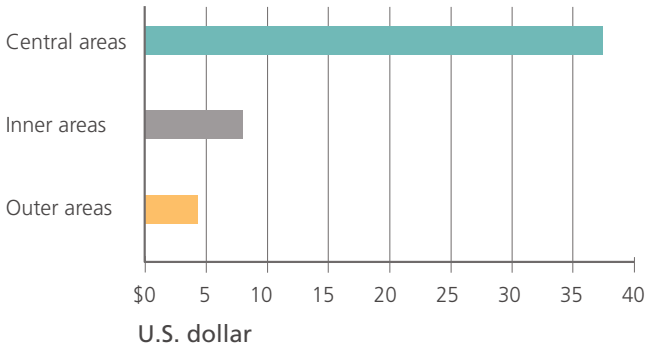
Figure 12: Illustration of floor area ratio (FAR)
Source: Metro, 2009



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: New employment, square feet and acreage demand, net of refill 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, net of refill demand, there will be a demand for between 274 and 4,930 acres of industrial capacity and between 1,944 and 3,832 acres of non-industrial capacity within the UGB by 2030.

Figures 14-17 show the 20-year capacity demand (net of refill 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, net of refill demand
Source: Metro and E.D. Hovee and Company, LLC, 2009

Figure 15: 2010-15 non-industrial capacity, net of refill demand
Source: Metro and E.D. Hovee and Company, LLC, 2009

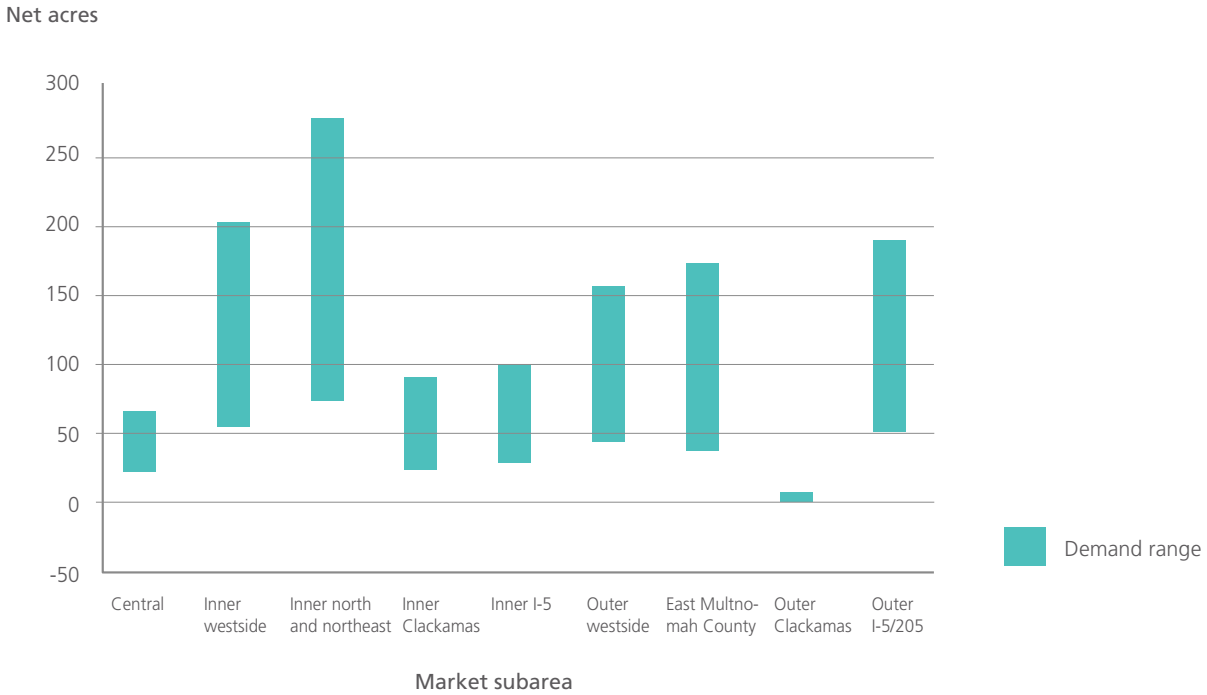


Figure 16: 2010-30 Industrial capacity, net of refill demand
Source: Metro and E.D. Hovee and Company, LLC, 2009

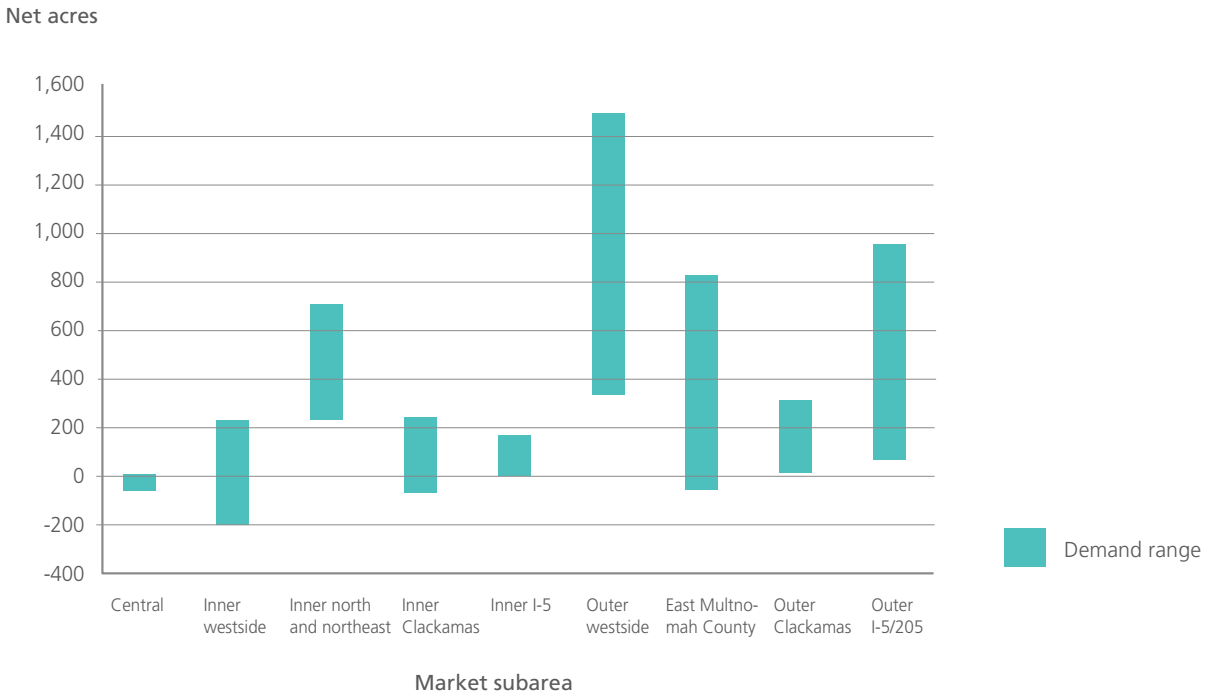
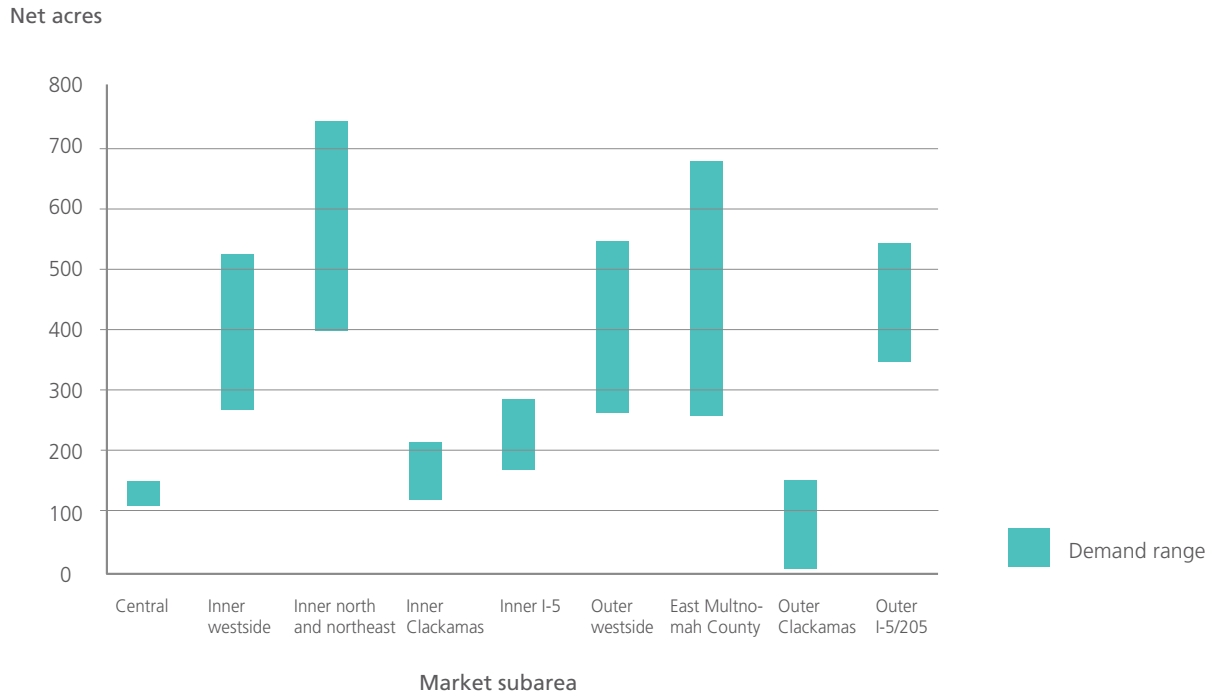


Figure 17: 2010-30 non-industrial capacity, net of refill demand
Source: Metro and E.D. Hovee and Company, LLC, 2009



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 using a forecast-based approach. Given this uncertainty, the Metro Policy Advisory Committee has recommended the consideration of additional large lot demand that supplements the demand identified through the employment forecast-based approach.

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. This is another reason why additional large lot demand is considered as a supplement to the demand identified through the employment forecast-based approach. However, these uses are extremely location specific and their preferences are not likely to be met 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.

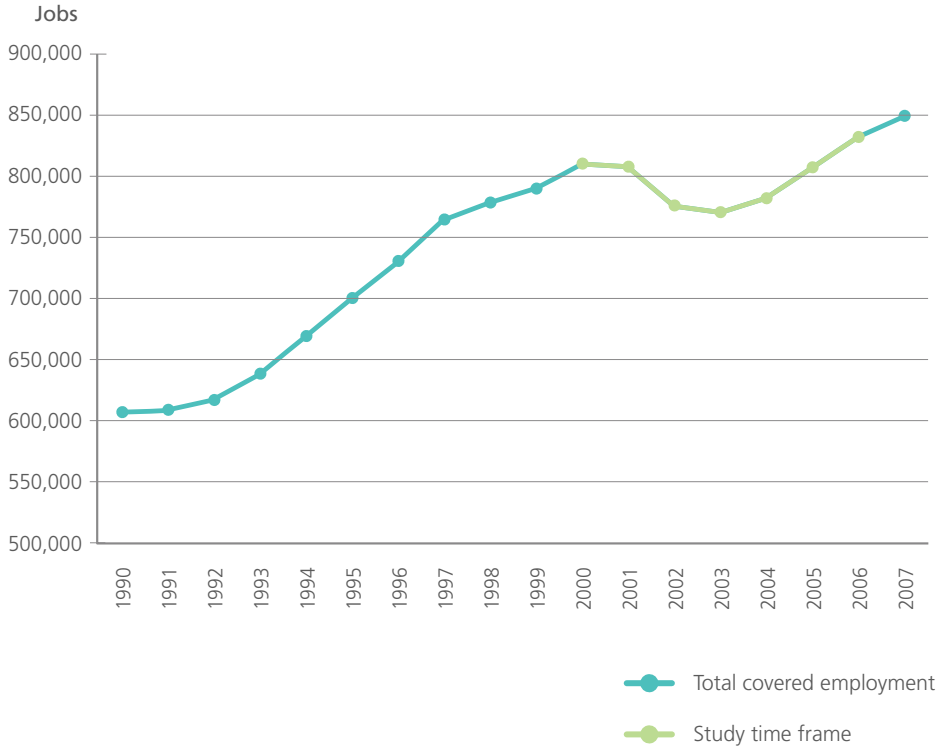
Employment trends

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

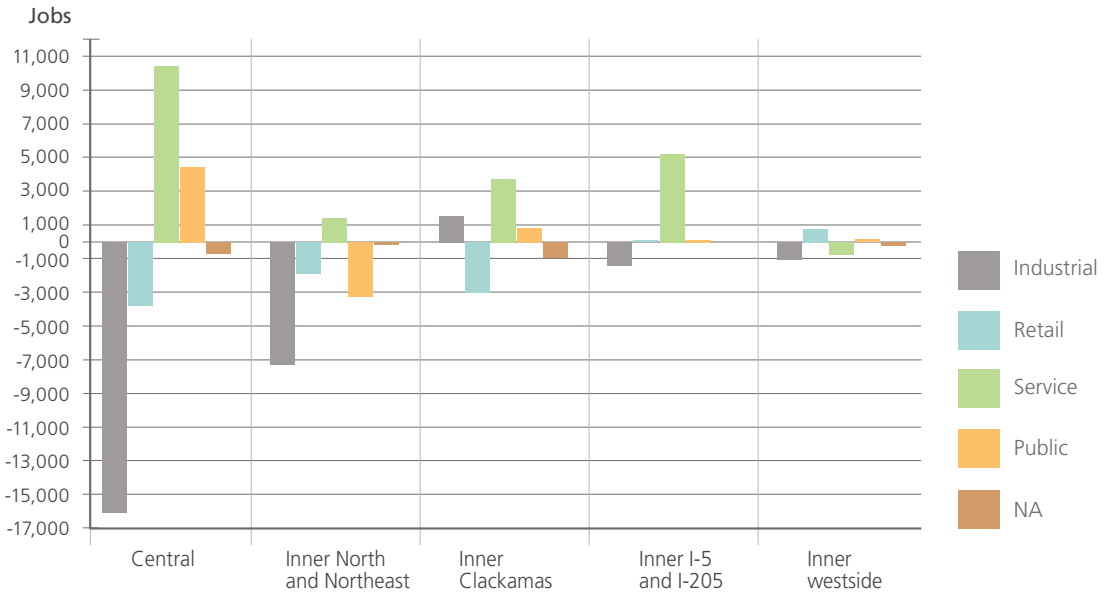
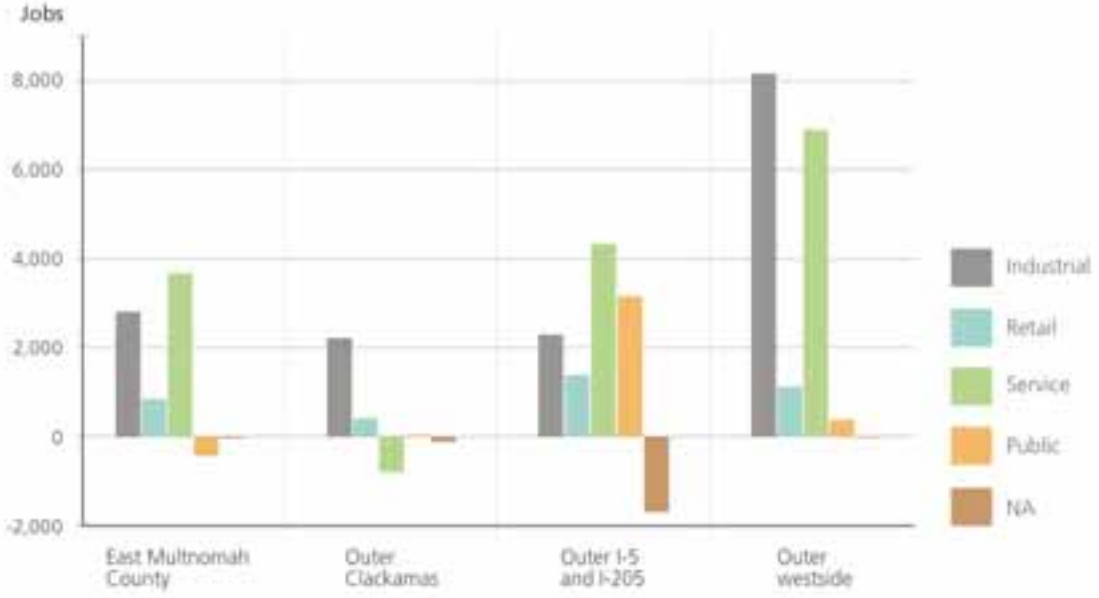


Figure 20: Job change by market subarea, outer rings, 2000-2006
Source: E.D. Hovee & Company, LLC



Job location by 2040 design type

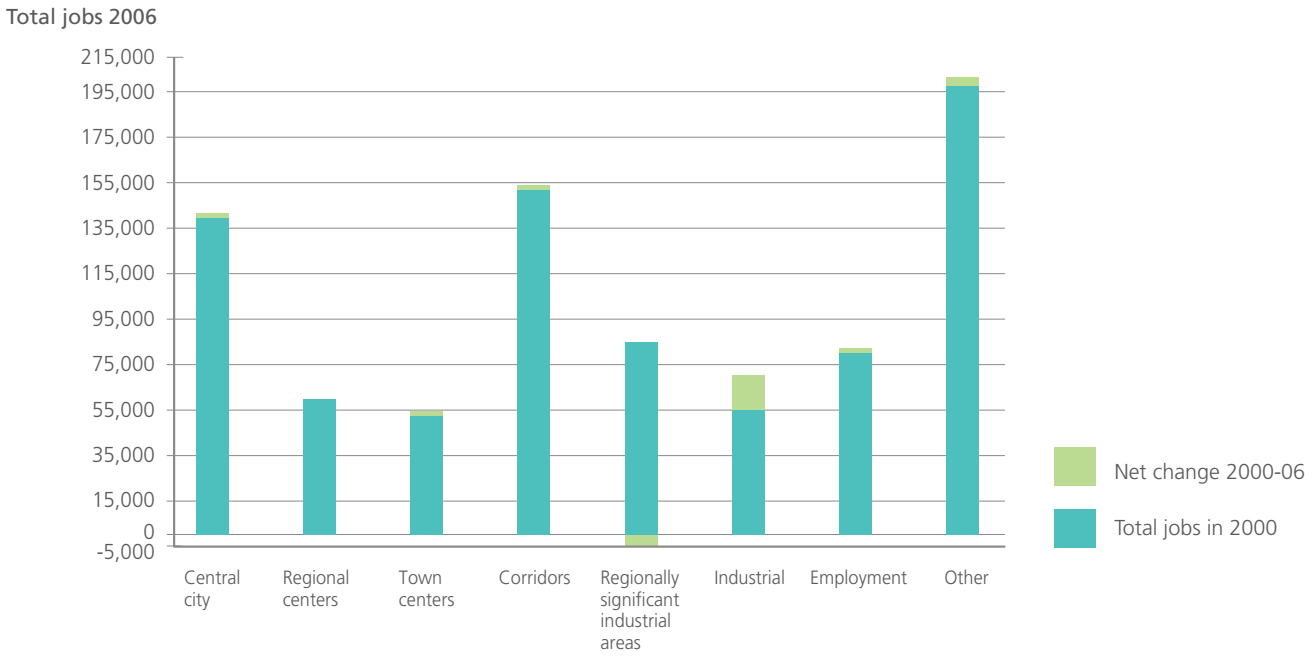
The region's 2040 Growth Concept calls for development to be focused in centers, corridors, employment and industrial areas. To better understand how successful current policies have been and to develop a basis for further policy discussion this analysis considers job growth by 2040 design types from 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

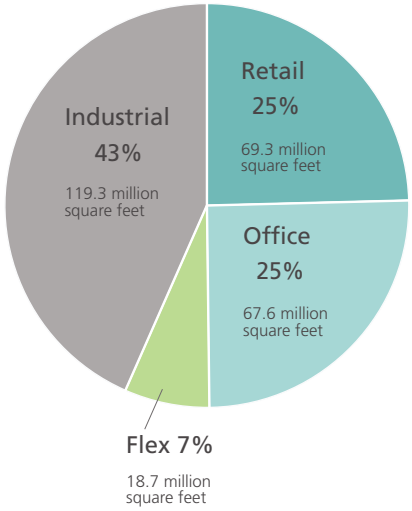
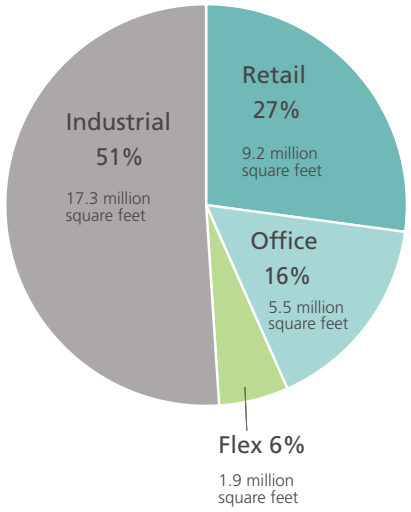


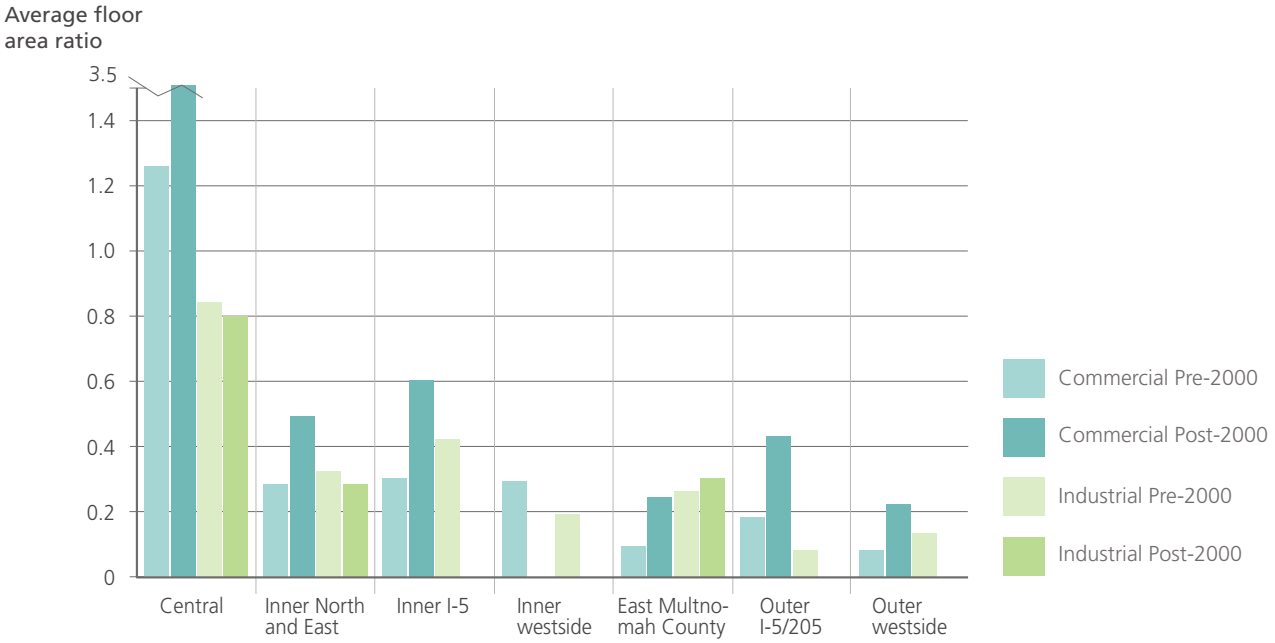
Figure 23: Inventory additions, post 2000
Source: CoStar, E.D. Hovee & Company, LLC



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**.

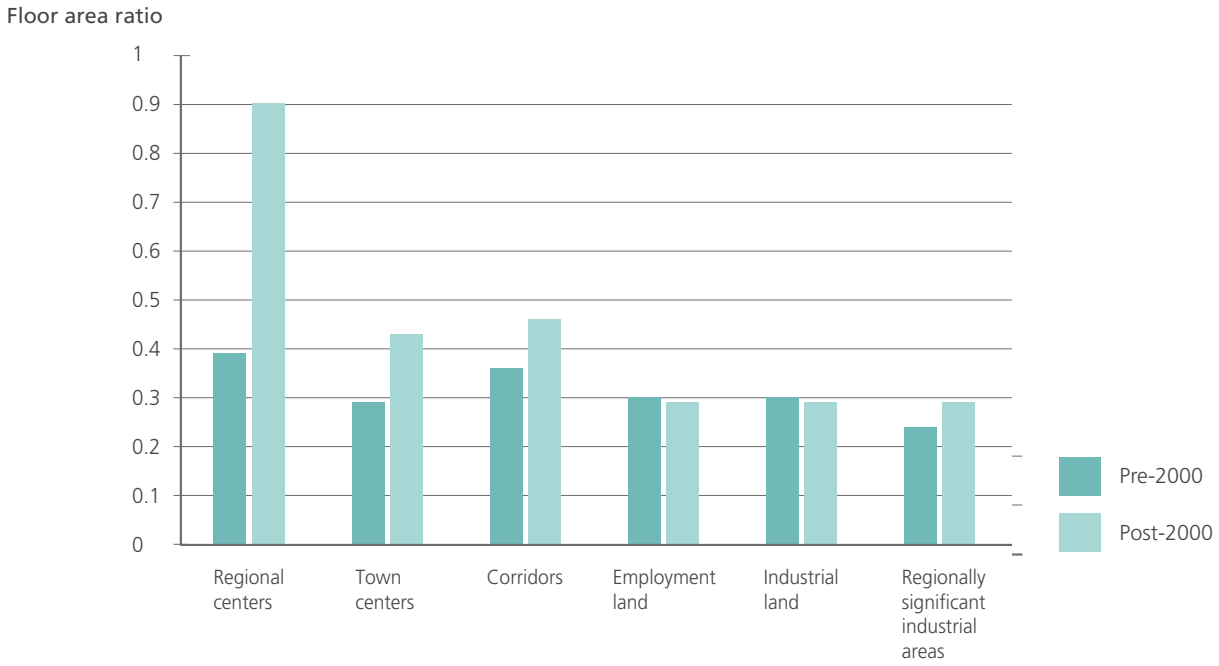
Figure 24: Floor area ratios by market subarea
Source: E.D. Hovee & Company, LLC



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

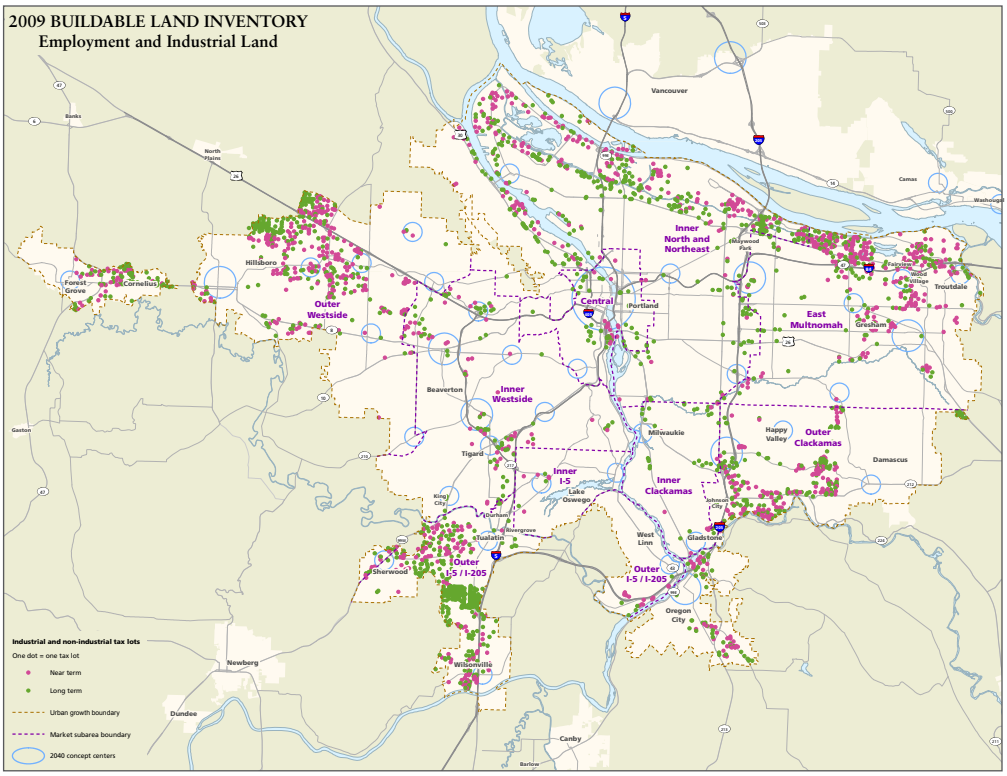
The region's buildable employment and industrial land supply is categorized by generalized land use classification, parcel size, and market subareas. This approach allows an analysis of both the amount of land supply as well as its ability to accommodate both the short- and long-term employment demand 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

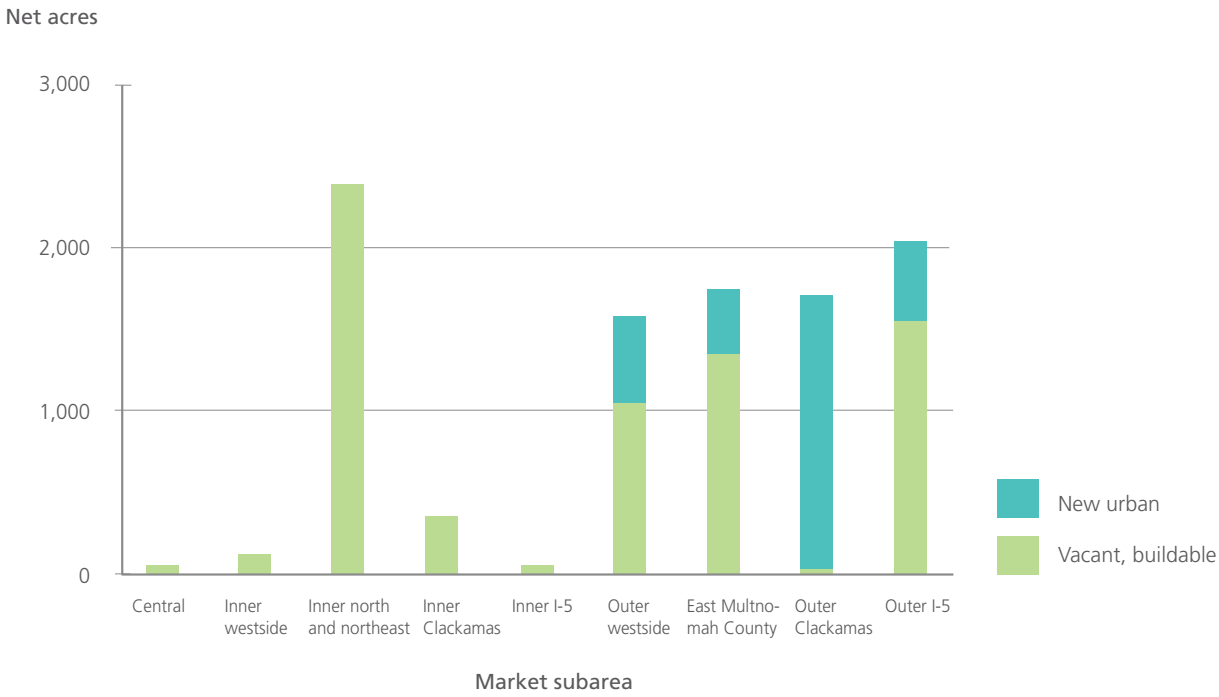
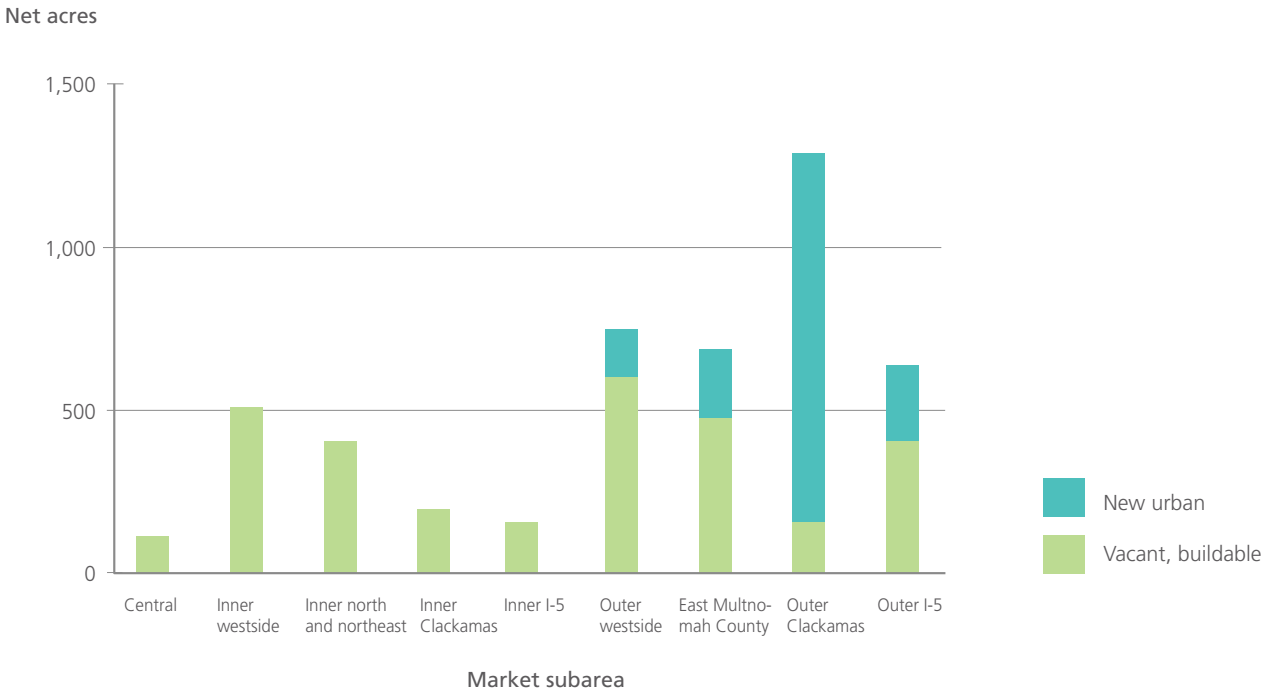


Figure 27: Non-industrial capacity on vacant buildable land in acres by market subarea
Source: Metro, FCS Group, based on local review, 2009



"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

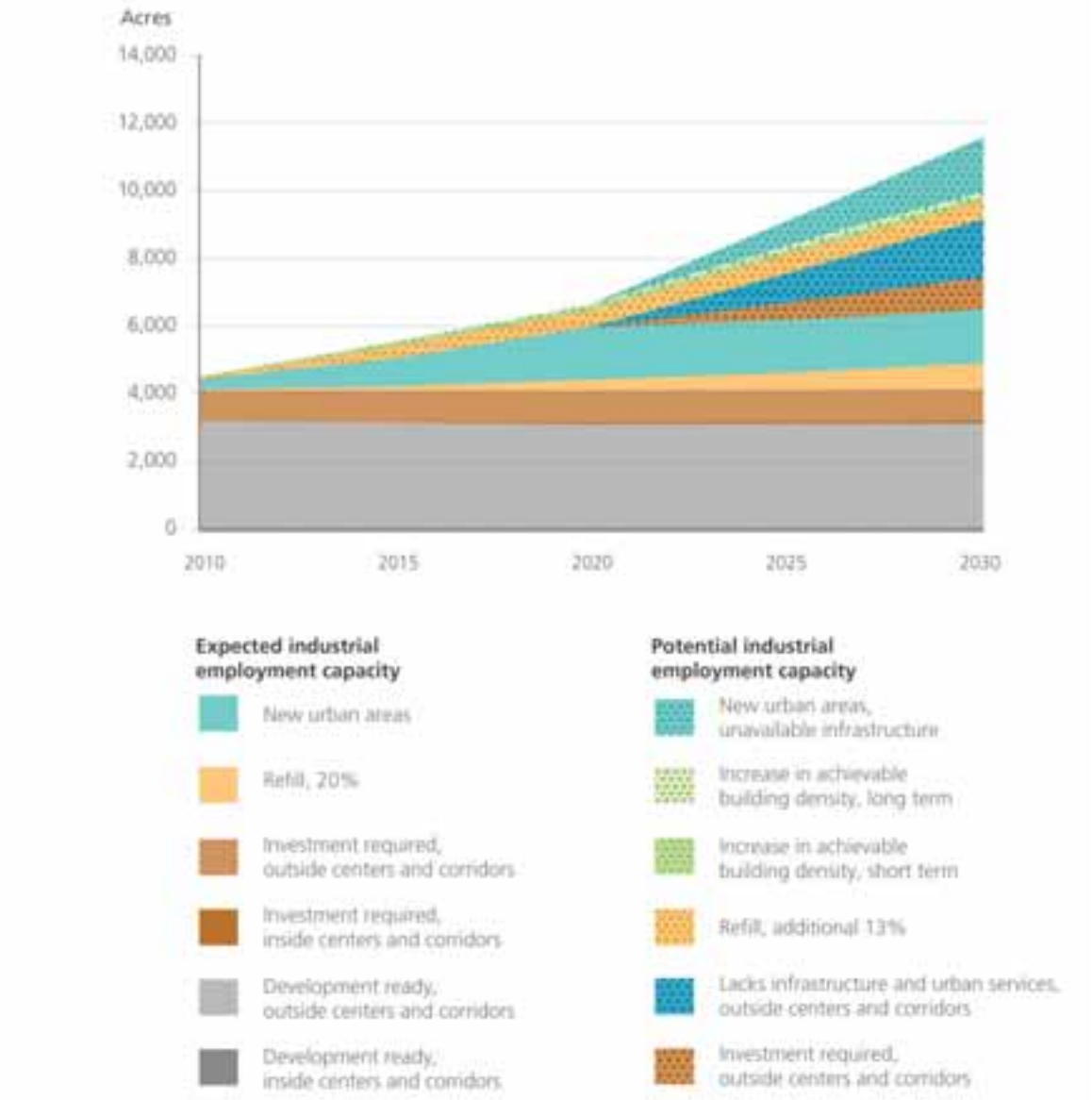
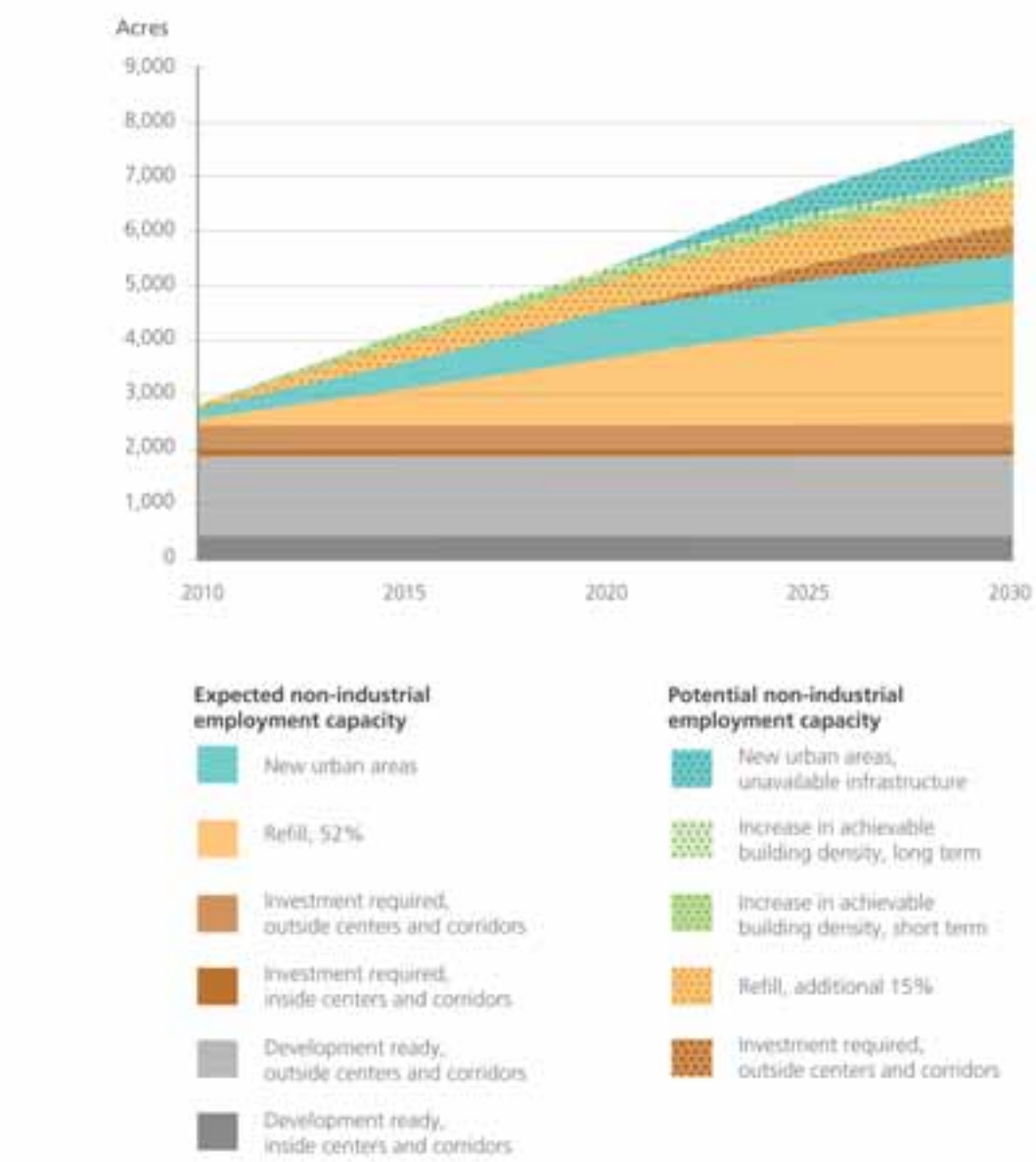


Figure 29: Non-industrial capacity range, within current Metro UGB, assumes no change in local zoning
Source: Metro, Hovee consultant team, 2009



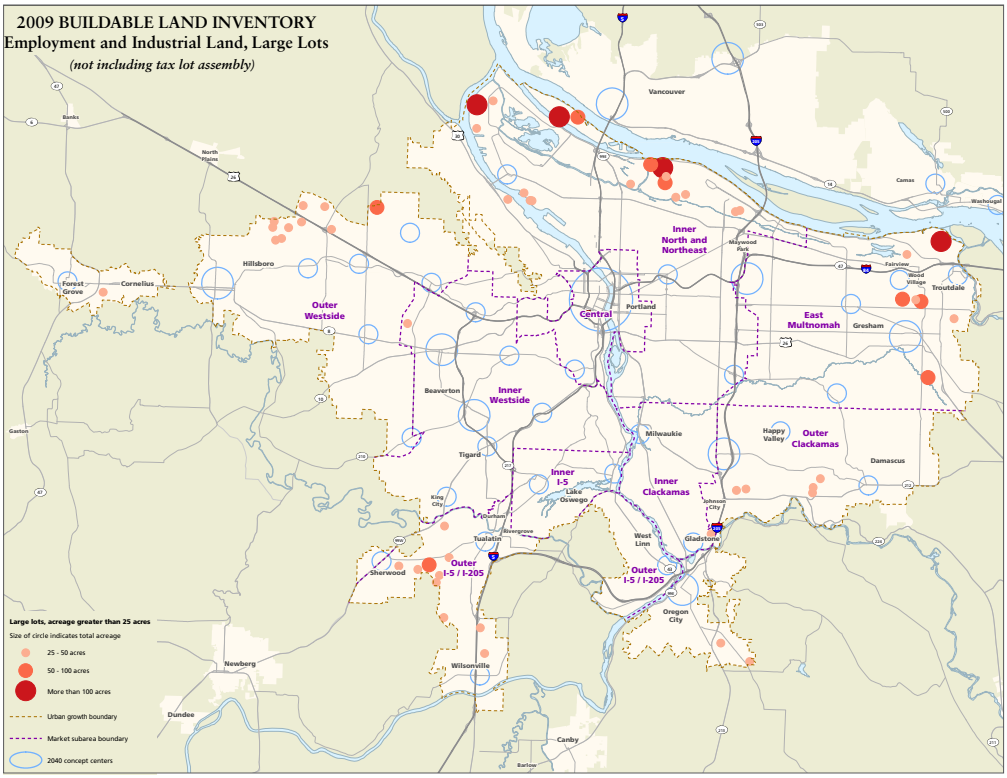
Buildable large lot supply

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.

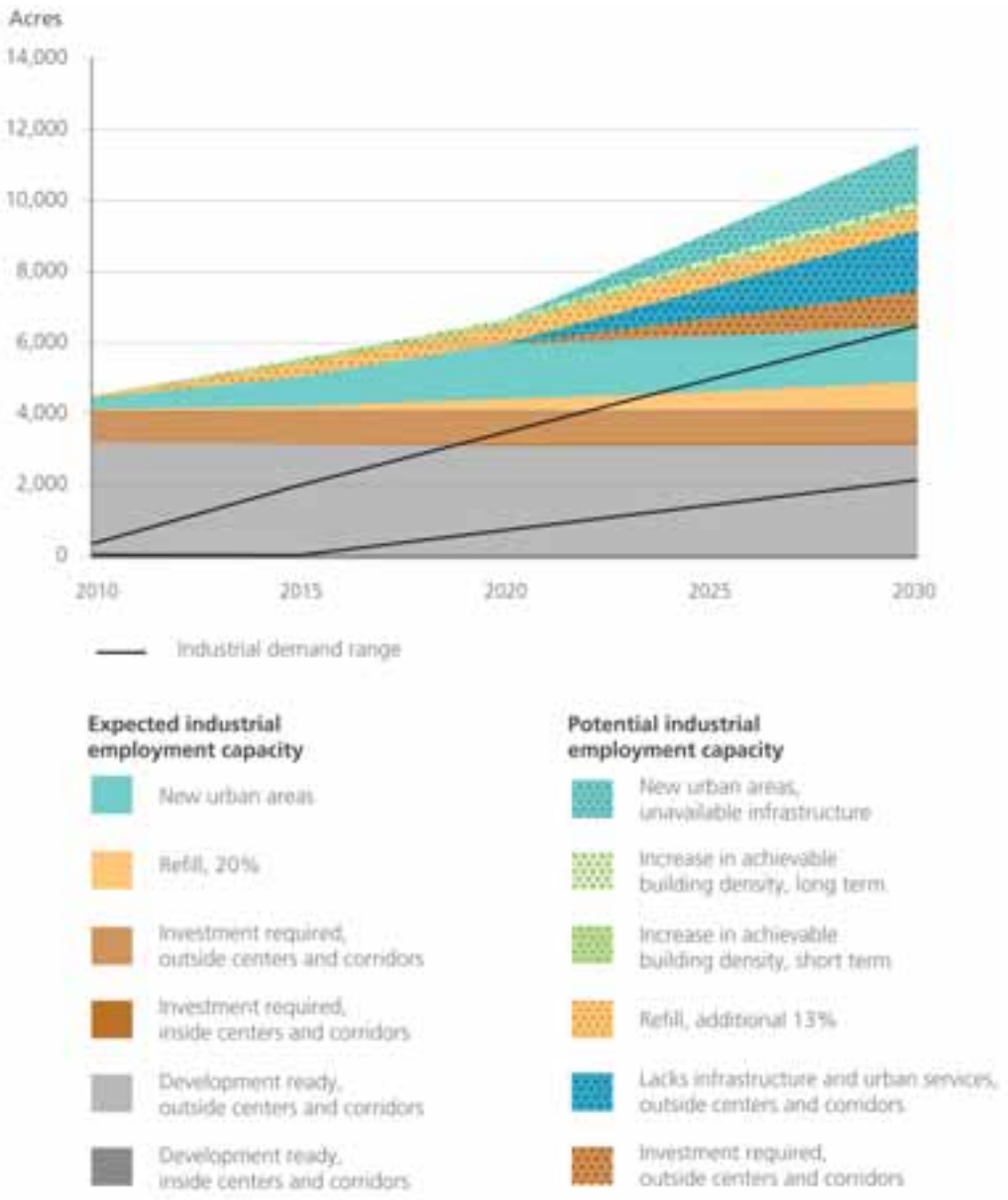
For industrial, the outer I-5/205, outer westside, inner north and northeast and east Multnomah County market subareas show sufficient capacity to meet forecasted demand. The vacant buildable capacity in outer Clackamas is almost entirely in new urban areas, requiring infrastructure and other investments 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 acreage demand range (from the 20-year forecast) for industrial and non-industrial employment along with the previously described capacity range. Large lot demand and capacity are addressed separately. The demand range is illustrated with two lines that show the upper and lower end of the acreage demand forecast.

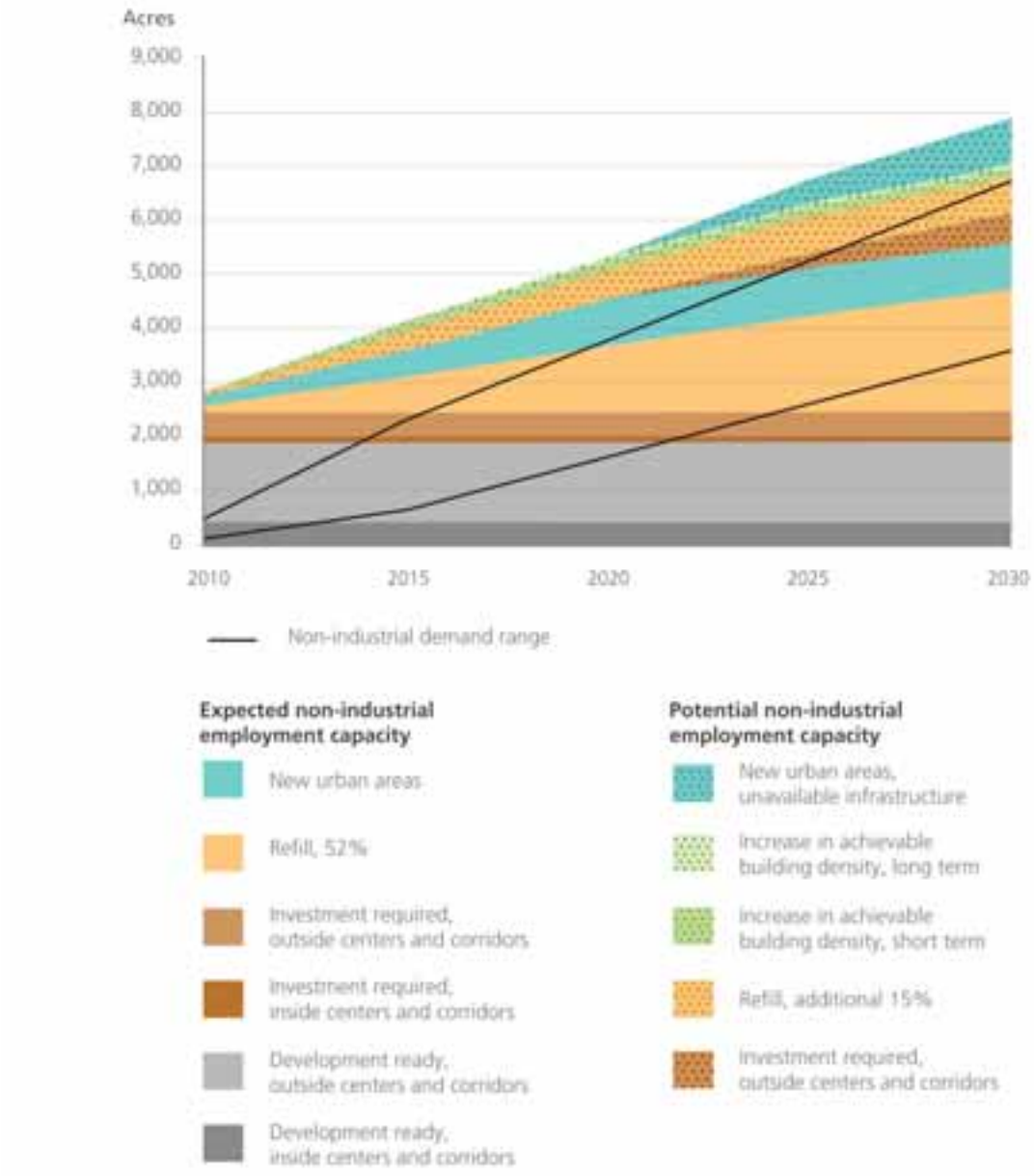
Figure 30: Industrial demand forecast and range, within current Metro UGB, assumes no change in local zoning
Source: Metro, Hovee consultant team, 2009



This portion of the analysis assesses the current urban growth boundary's capacity to accommodate industrial job growth on vacant, buildable land or through refill. The assessment of demand for large, vacant lots for industrial uses is handled separately. At both ends of the employment range forecast, there is adequate capacity inside the current urban growth boundary to accommodate the next 20 years of general industrial job growth.

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



Depending on the amount of non-industrial employment growth that is realized, there is demand for zero to 1,168 acres of additional capacity.

Comparison of large lot supply with forecast-based assessment of 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 employment forecast-based 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?

Policy basis for considering an expanded range of large lot demand

The forecast-based assessment of large lot demand provides policy makers with an initial range of potential demand to consider. However, as noted, assessing future large lot demand with a job forecast-based approach has limitations. There are legitimate policy reasons to consider a wider range of demand for large lots, using the initial forecast-based approach for a sense of scale. Doing so gives policy makers the flexibility to weigh the risks and benefits of providing too much or too little large lot capacity.

There is inherent uncertainty in forecasting employment in large, traded-sector firms, which may consider several cities, regions, states or countries when choosing a site. These firms can have economic multiplier effects, bringing wealth into the region and leading to spinoff firms and employment. A few cities in the region have identified large lot users (particularly high-tech manufacturers) as a primary focus of their economic development plans. The range of large lots that will be in demand over the next 20 years will be the product of a number of factors that are impossible to forecast, including:

- Decisions of individual firms that participate in a global marketplace; and
- The political will of cities, the region, and the State (both here and in other regions) to implement economic development strategies.

The forecast-based analysis also assumes that preferences for large lots will remain largely the same in the future as they are today. There are at least two countervailing trends that indicate preferences may change, particularly for industrial, warehouse, and distribution uses. The direction and degree of change is open to interpretation:

- Rising land prices may lead to more efficient use of land, thereby increasing the number of employees per acre; and
- The substitution of machinery and robotics for human labor may reduce the number of employees per acre.

An employment forecast-based approach may also have shortcomings for estimating land demand for rail, air and marine terminal uses. These uses are critical to the health of the region's economy. Freight terminal uses can require relatively large areas of land, but do not necessarily require high employment densities. Consequently, demand for these uses may not be adequately accounted for using an employment forecast alone.

No amount of technical analysis can provide a completely precise assessment of future large lot demand. Thus, the Metro Policy Advisory Committee has expressed a desire to have flexibility in the region's plans to attract and retain potential traded-sector employment growth. Due to the limitations of further technical analysis, the expansion of the potential range of large lot demand is being done on a policy basis rather than through technical analysis. This expansion of the range is consistent with the guidance offered by Oregon Administrative Rule 660-024-0040, which states that: "the 20-year need determinations are estimates which, although based on the best available information and methodologies, should not be held to an unreasonably high level of precision."

When the forecast-based analysis and policy considerations are taken into account, as recommended by the Metro Policy Advisory Committee, the total 20-year demand for additional capacity in large lot configurations is between 200 and 1,500 acres. Within this range, there is a need for policy flexibility in determining the sizes and locations of large lots to provide, so this final analysis does not specify those characteristics."

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

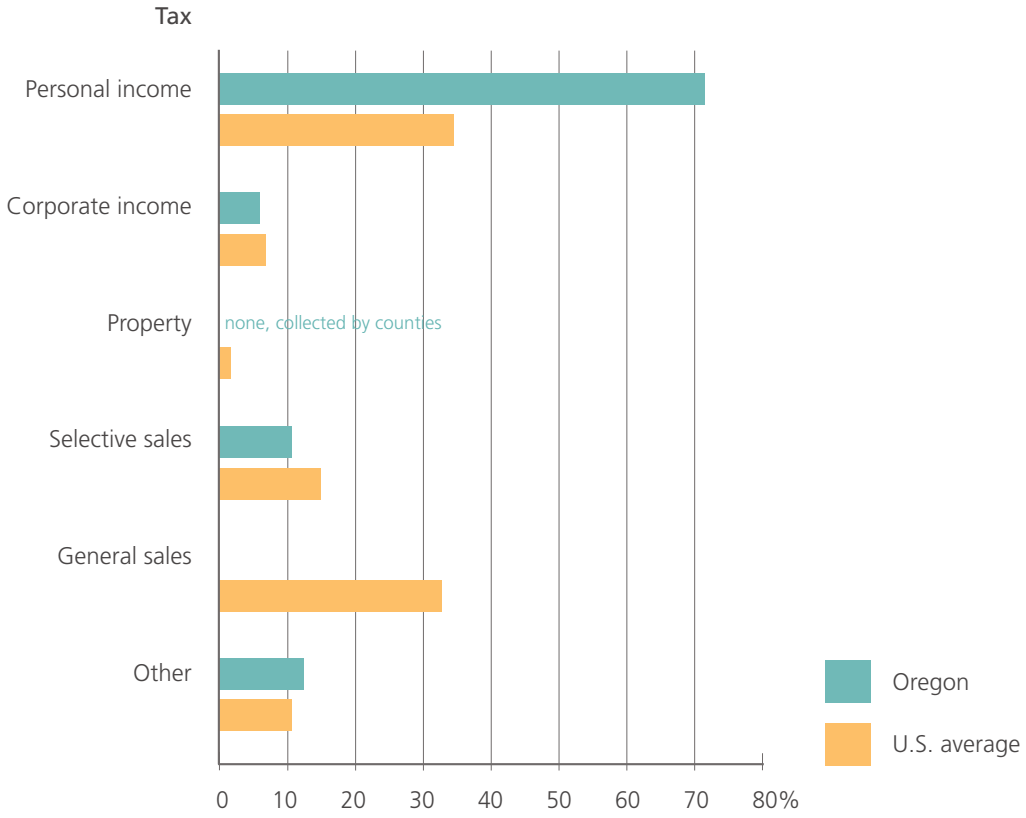
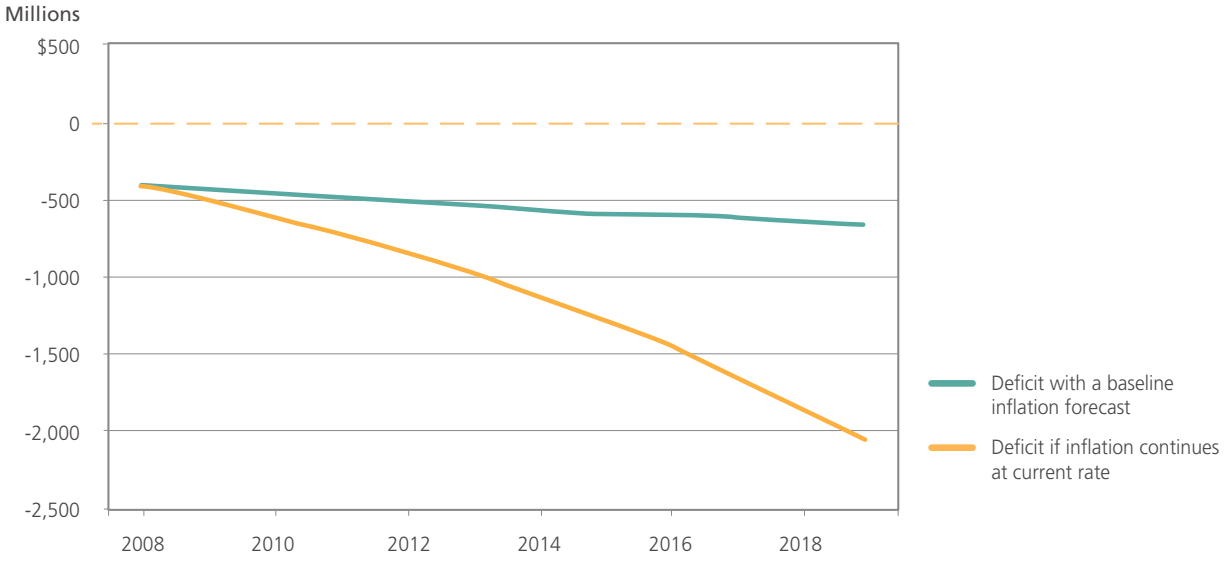


Figure 33 Projected gap between city/county revenue and expenditures under two inflation scenarios
Source: Oregon Taskforce on Comprehensive Revenue Restructuring, 2008



Energy prices and residential demand

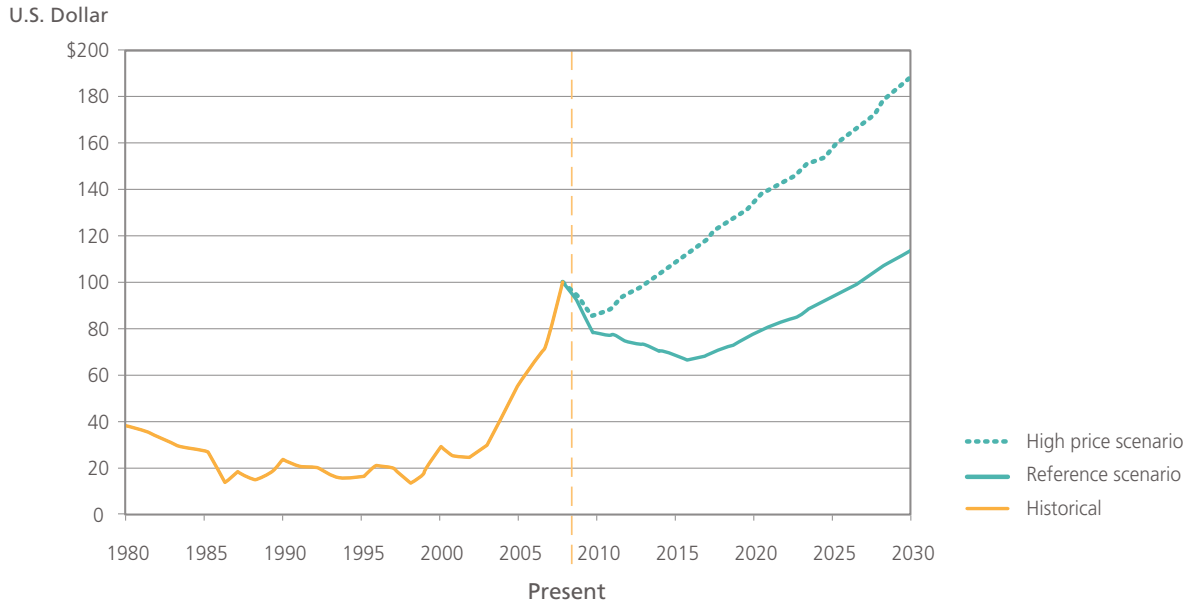
The energy costs that households incur for transportation and for operation of the household (e.g. heating, lighting) can influence a number of choices, including:

- 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

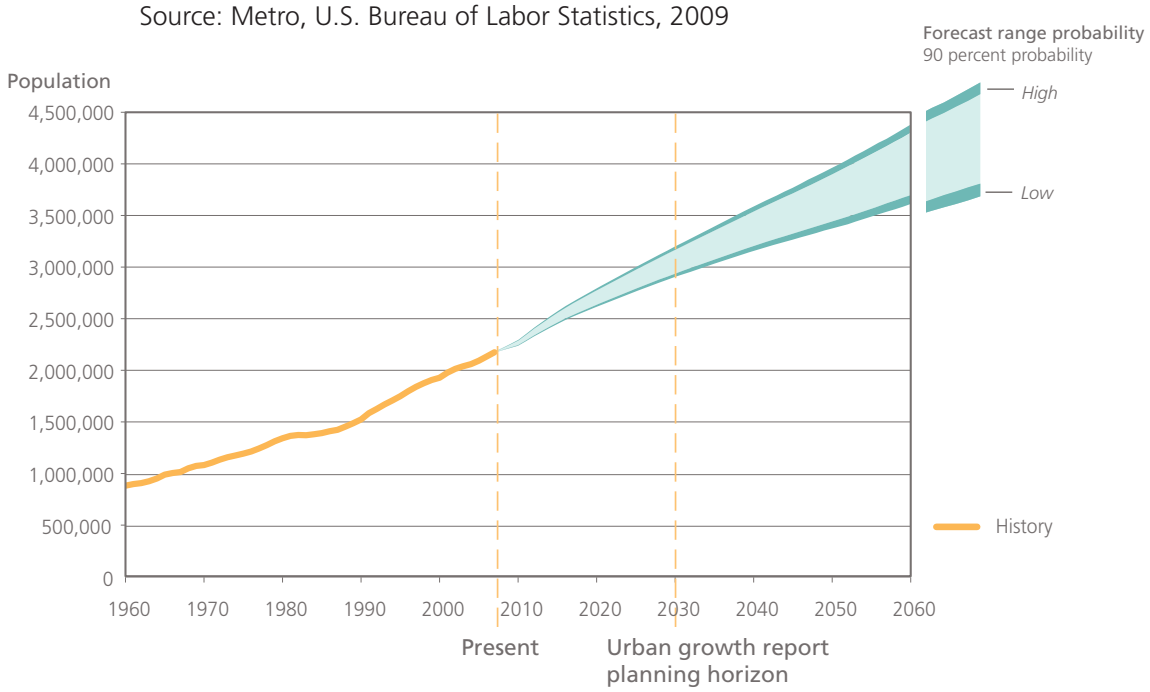


Table 34: Population range forecast and annual percentage rate change from year 2000, Portland, Beaverton, Vancouver PMSA,
Source: Metro, 2009

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

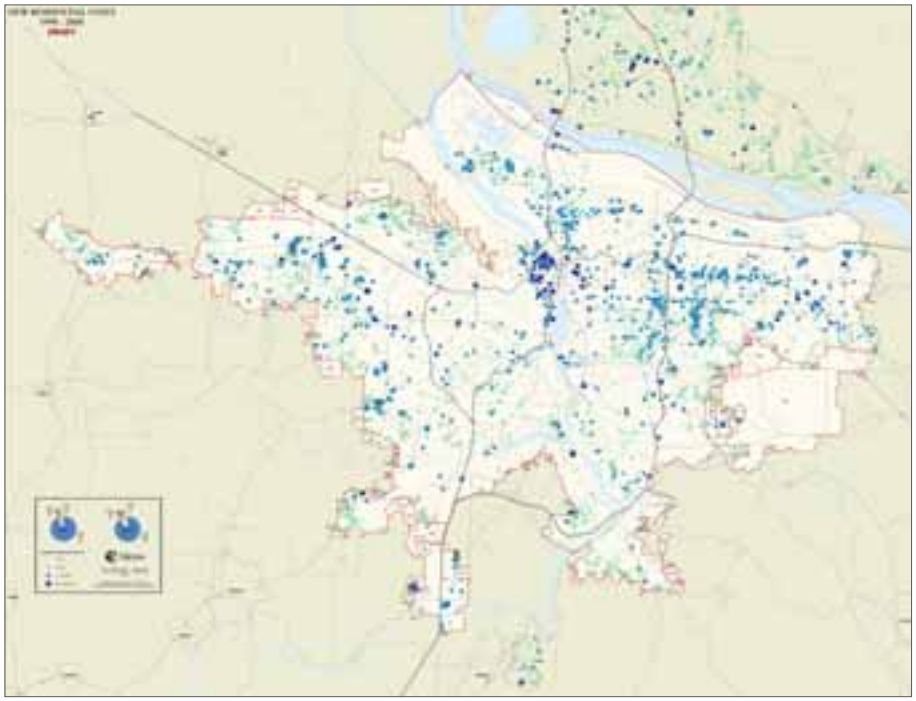
The region's original UGB was put into place thirty years ago (1979) with the purpose of encouraging the efficient use of land, creating vibrant communities and protecting our agricultural and natural heritage. The original UGB contained 227,491 acres. Subsequent expansions have added a total of 28,000 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.

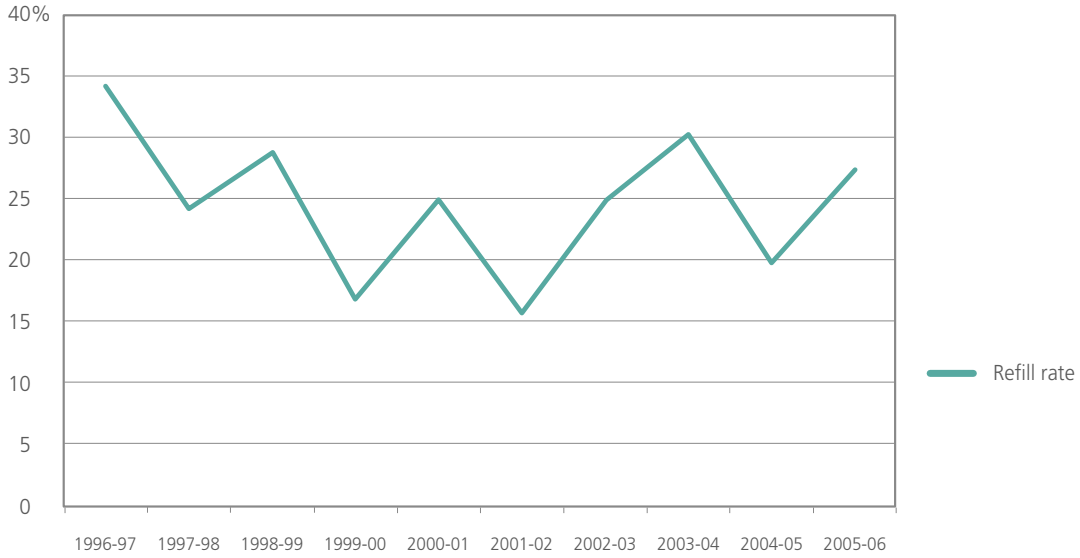
The subject of residential refill is significant in terms of both the legal and policy contexts. Metro accounts for a "refill" factor when estimating the residential land supply available within the urban growth boundary per the requirements of ORS 197.296 and 197.301. For instance, if the residential 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.

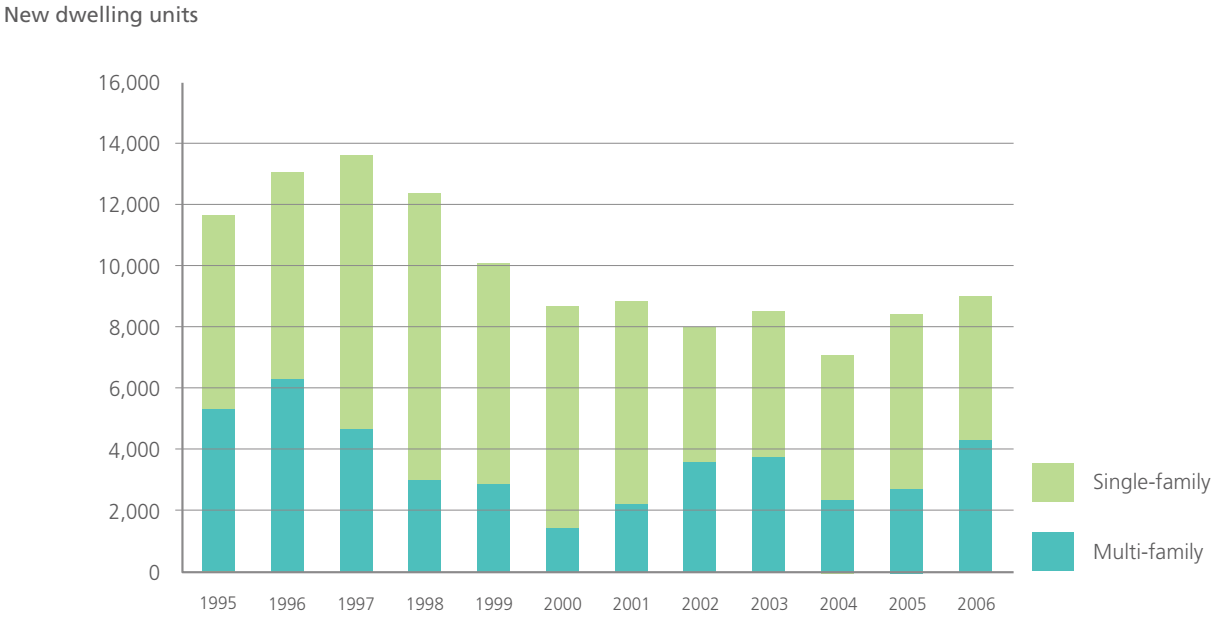
Figure 36: Residential refill rates over time
Source: Metro, 2009



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

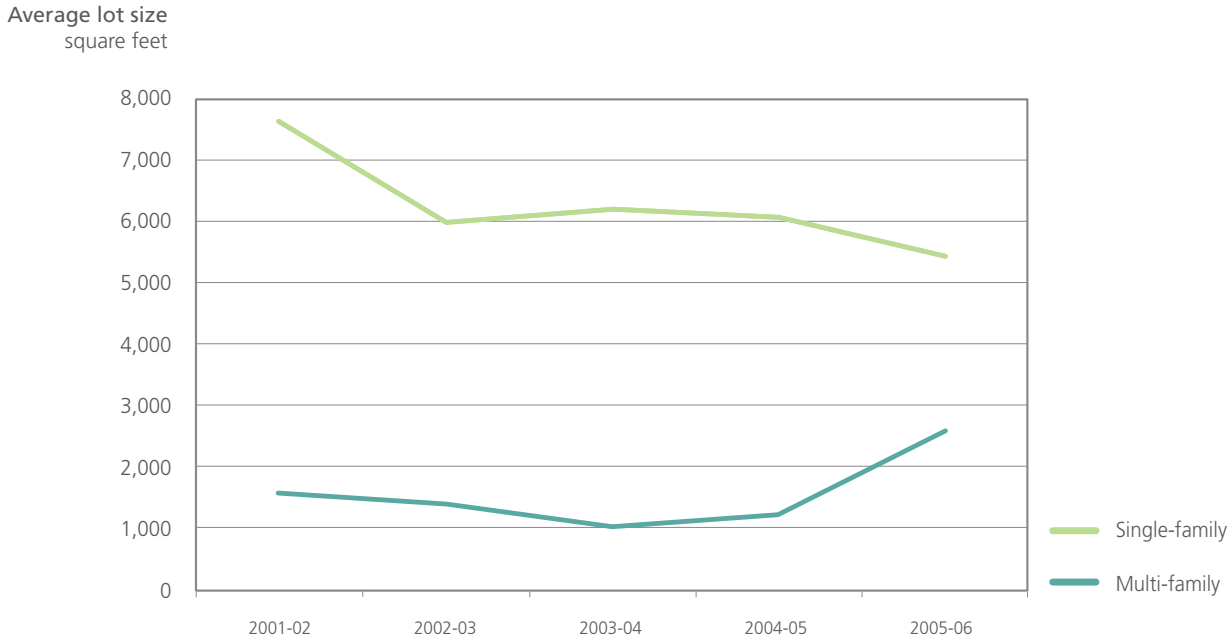


Density

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.

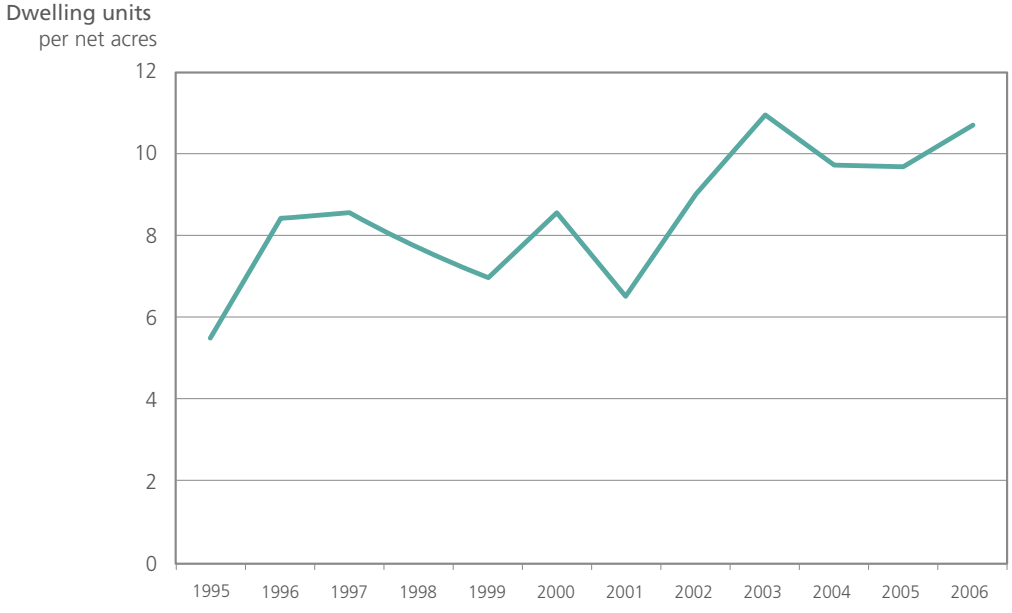
Figure 38 shows the trends in lot sizes for new single-family and multi-family construction. On average, new multi-family dwellings used about one quarter of the amount of land per unit that new single-family dwellings did, but in recent years there has been a trend of increasing multi-family lot size 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.**

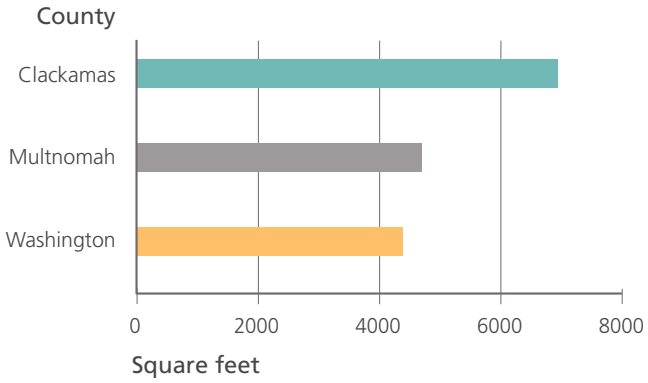
Figure 39: Average density per net acre of new dwelling units in the Metro UGB (1995-2006)
Source: Metro, 2009



Trends in single-family residences (newly built homes from 2000-2005)

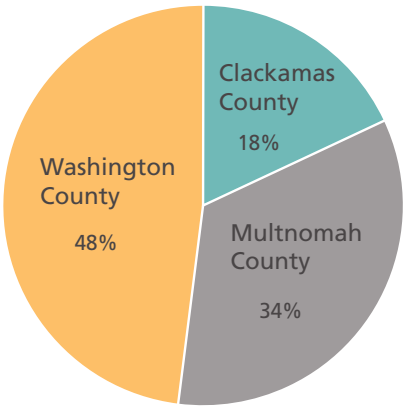
Average lot sizes for new construction vary considerably from county to county with lot sizes in Multnomah and Washington counties averaging about 4,500 square feet, about 2/3 of the average lot size in Clackamas County (7,000 square feet). (See **Figure 40**) These data are for entire counties, not 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.

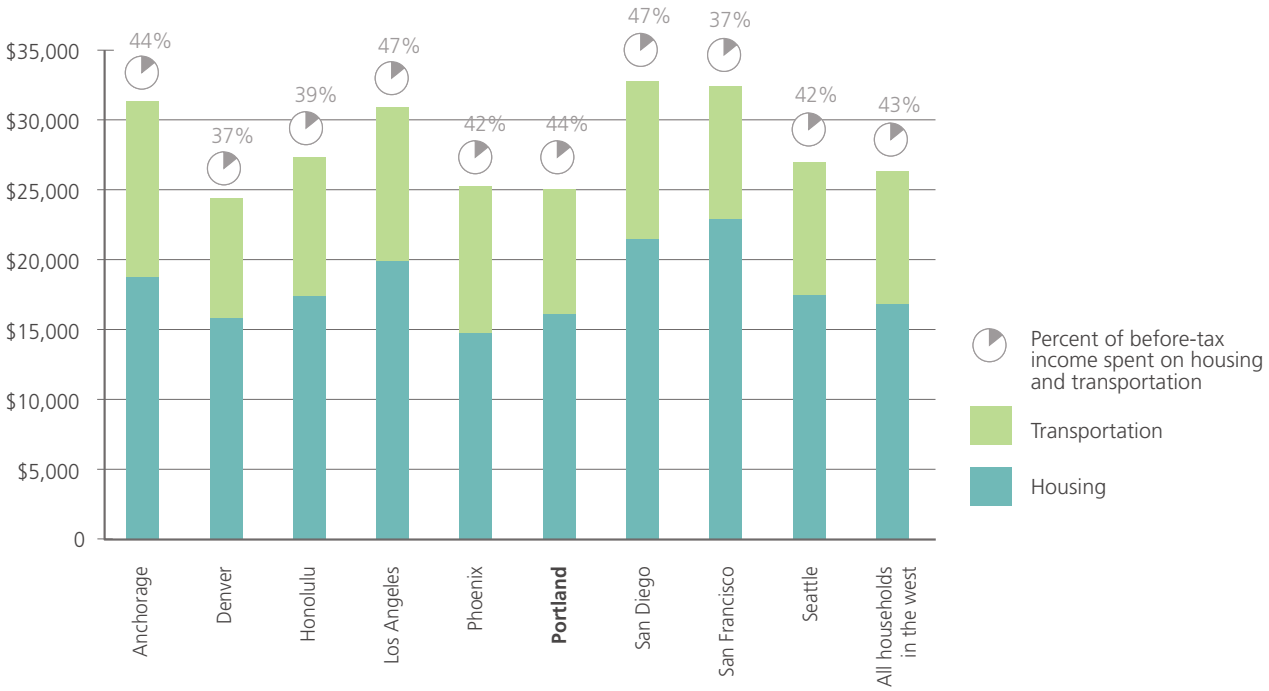
To get a sense of affordability, housing and transportation expenditures can be expressed as a percent of income. However, this metric has some shortcomings: some people are relatively wealthy despite having little current income and many people treat their home as not just shelter but an investment. 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

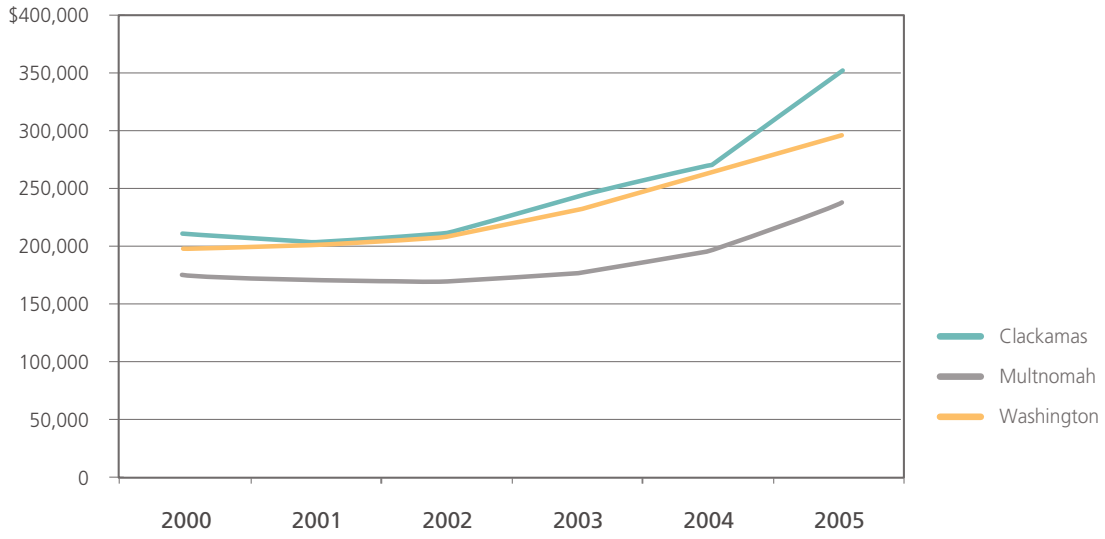


[28] *The year 2005 is used because data for the Portland region is only available through that year. The source of data is the United States Bureau of Labor Statistics.*

[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

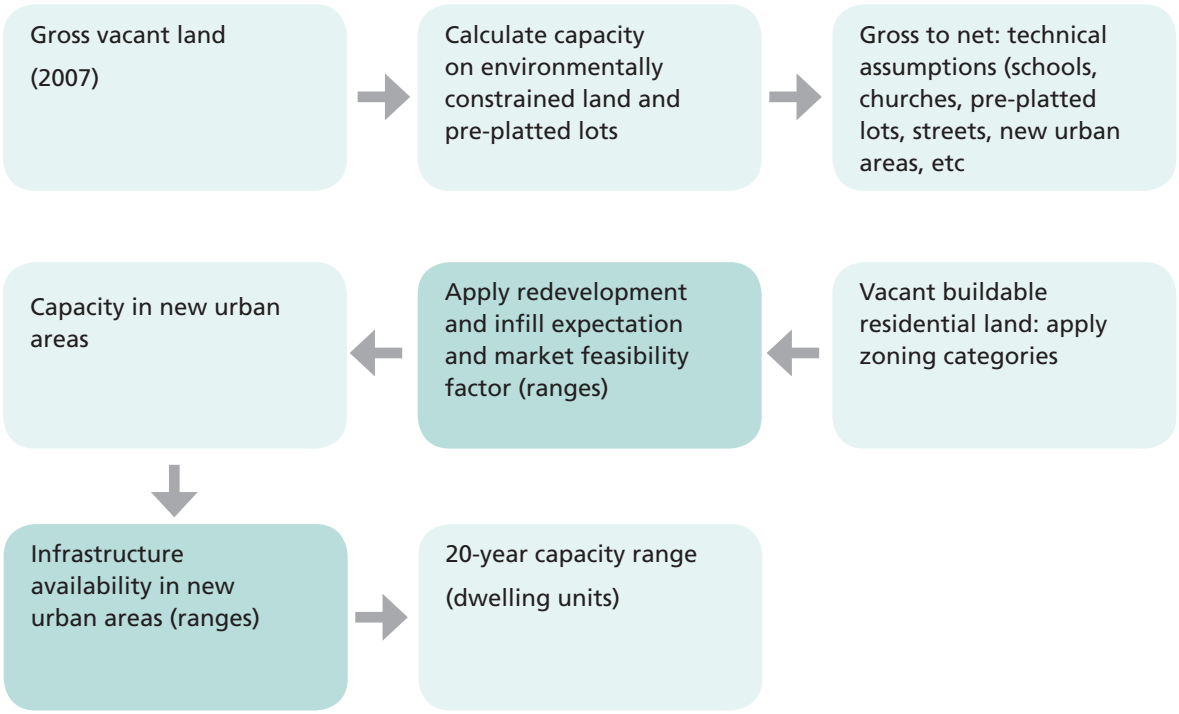
Local governments have taken substantial steps to implement the region's vision for its centers and corridors. From the years 2000 to 2007, many vacant lands have been rezoned as mixed-use residential, adding capacity for an additional 18,254 dwelling units. These types of actions are critical for protecting 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.

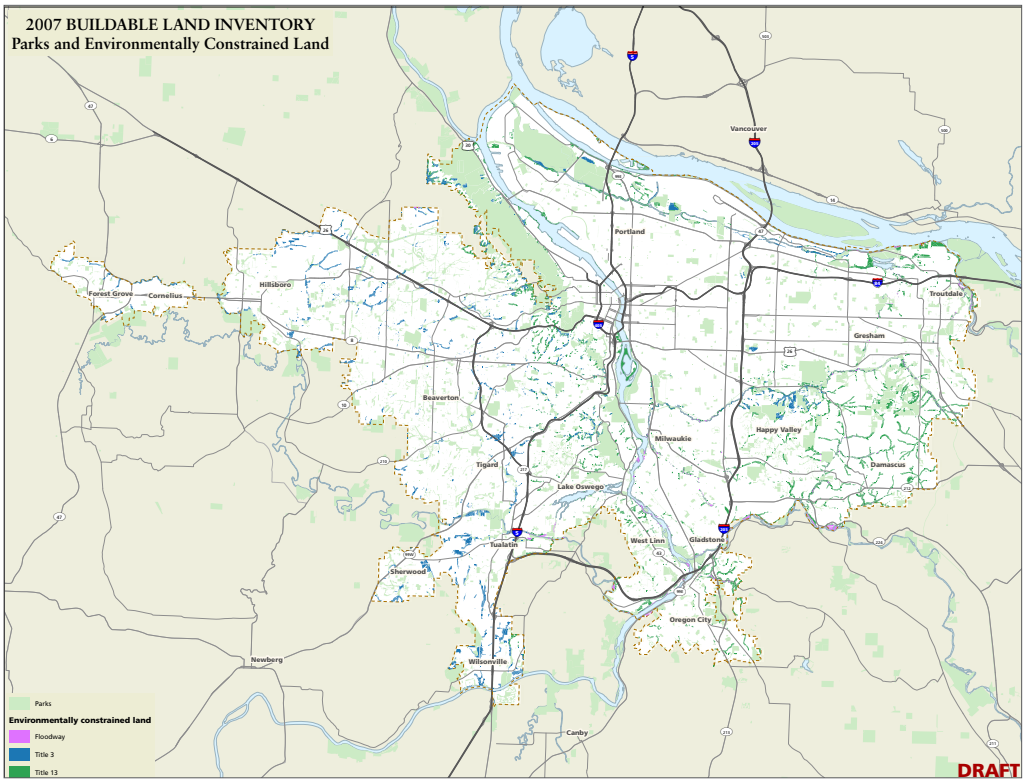
Figure 44: Steps in analyzing residential capacity
Source: Metro, 2009



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).

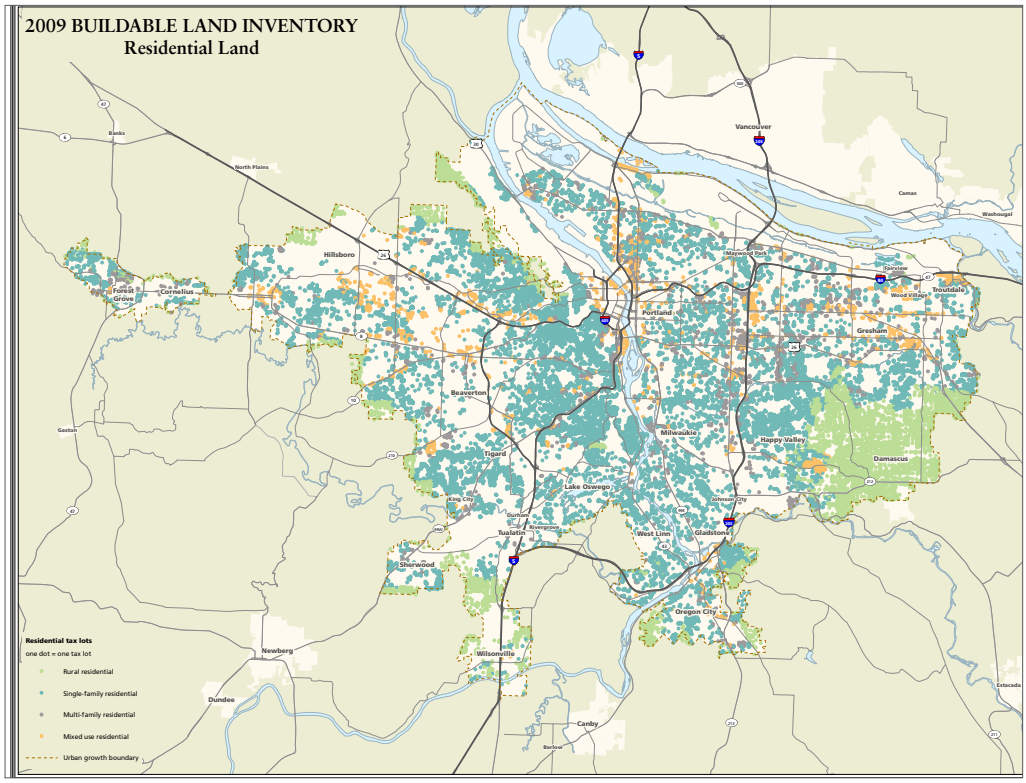
Environmental protection: The region's citizens value open space, habitat protection, and clean water protection for their contributions to the quality of life they enjoy. (See **Map 7**) The first step in analyzing capacity is to subtract from the gross vacant land those areas protected by Title 3 (water 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



Map 8 depicts the Metro UGB's buildable land supply that is zoned for residential uses. This buildable land inventory only includes vacant land and excludes the parks and protective overlays shown in **Map 7**

Map 8: Residential buildable land inventory
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. This urban growth report builds on the methodology that was used for the 2002 report. That methodology was recommended by MPAC in 2002 and was based on estimated park land acquisition revenues from 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 substantially alter 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.

To maintain an approach that is consistent with the one recommended by MPAC in 2002, an implied parks level of service was calculated as follows:

The 2002 Urban Growth Report forecasted growth of 220,700 dwelling units over the 20 year period and identified that 1,100 acres should be deducted from the vacant land supply for future parks for the same time period. The implied level of service was 1,100 park acres for 220,700 new dwelling units. The current Urban Growth Report forecasts 262,400 new dwelling units in the UGB over the next 20 years (baseline assumption). Applying the same implied level of service standard as used in 2002 (1,100 /220,700 * 262,400) results in a deduction of 1,300 acres from the region's vacant land supply to address future park demand.

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

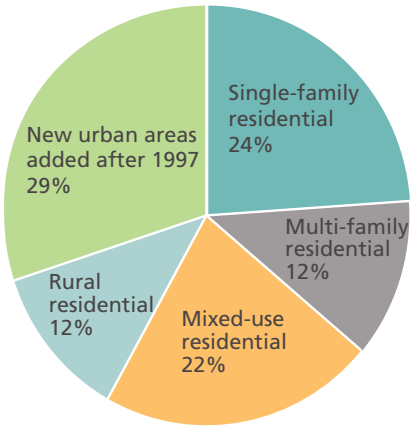


Table 44: Initial dwelling unit estimate from environmentally unconstrained vacant land
Source: Metro, 2009

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

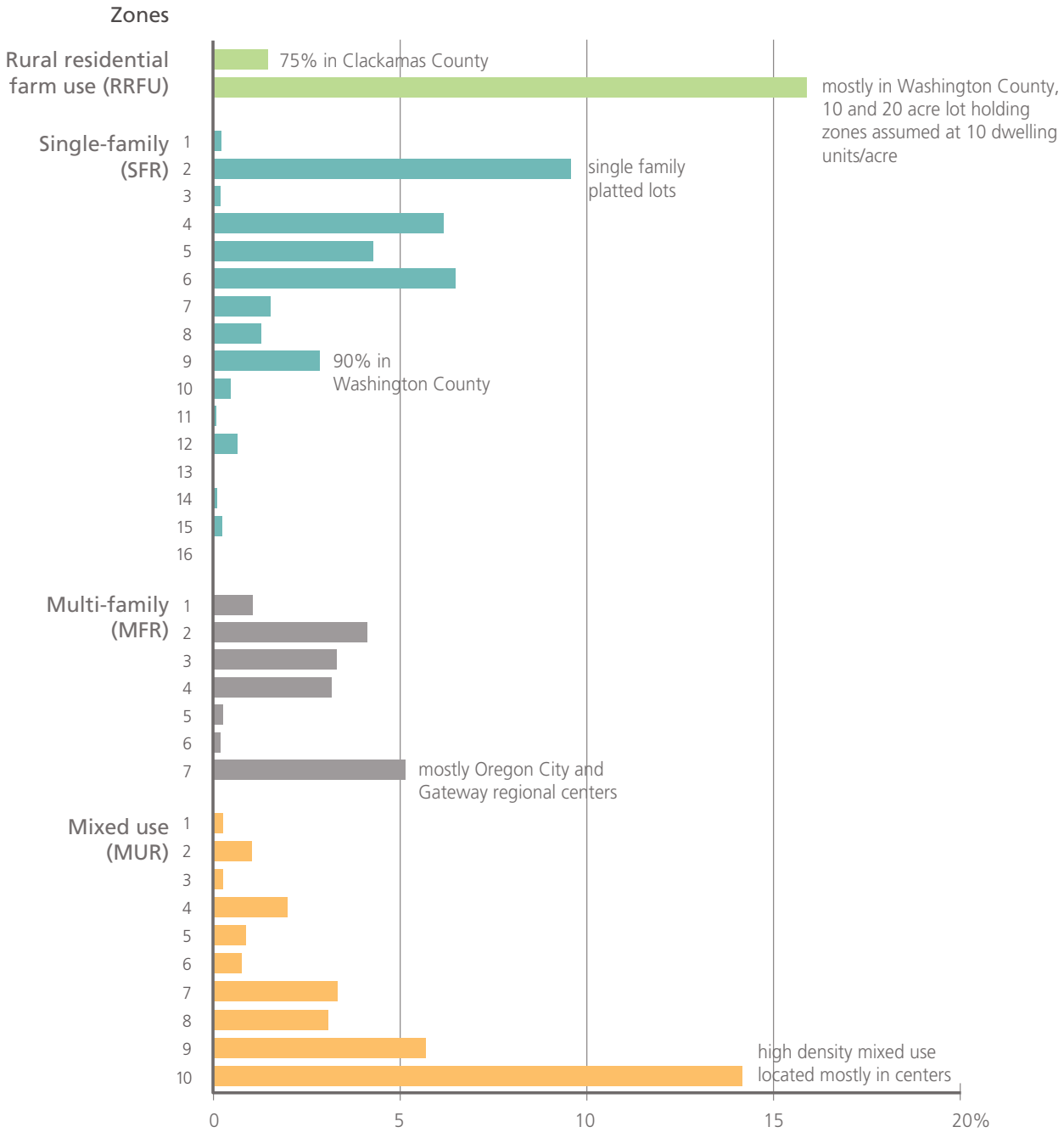


Figure 47 zoning types

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)

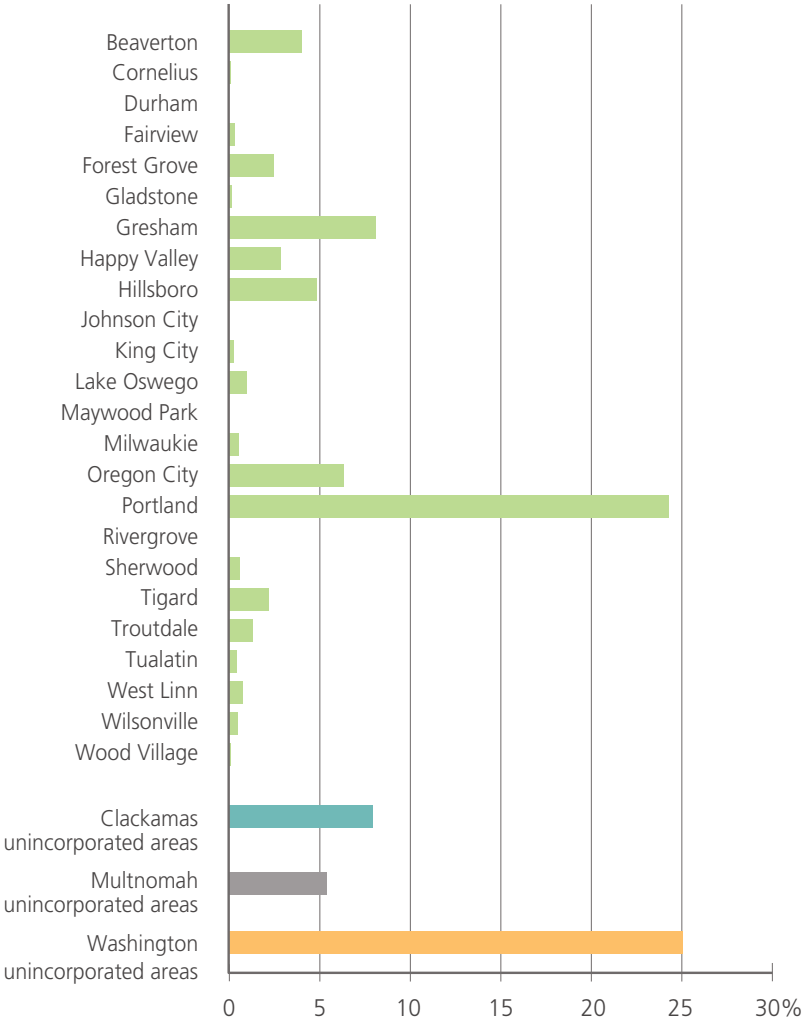
1 Max density permitted is 15 units / net acre.
2 Max density permitted is 20 units / net acre.
3 Max density permitted is 25 units / net acre.
4 Max density permitted is 30 units / net acre.
5 Max density permitted is 35 units / net acre.
6 Max density permitted is 40 units / net acre.
7 Max density 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

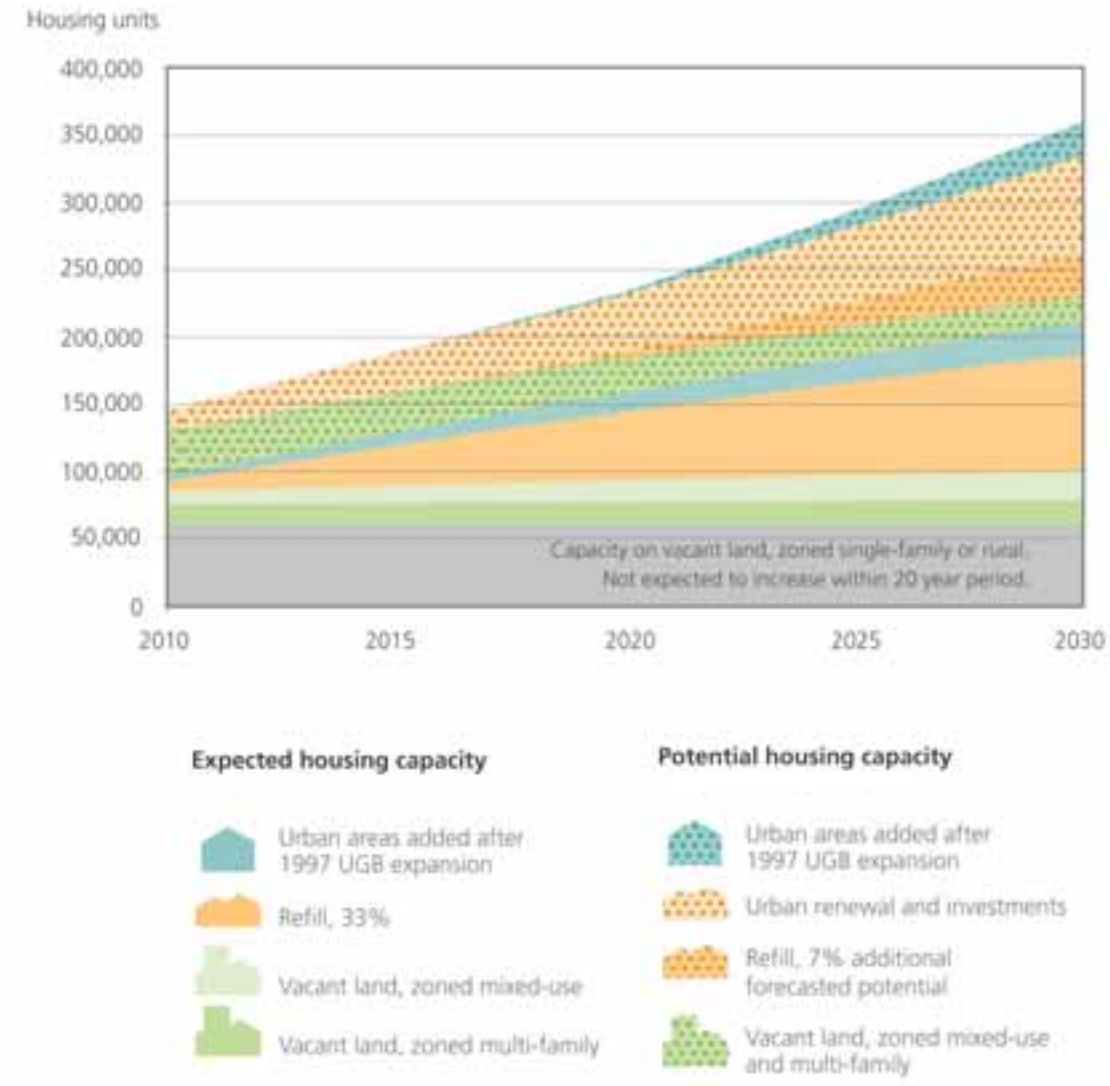


Table 42 shows the complete range of capacity over the next twenty years, as well as a description of the key assumptions that influence the low and high ends of the supply range.

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	• Market feasibility factor NOT applied to high-density multi-family and new urban areas
• Refill at 33%	• Refill at 40%
• No new urban renewal or incentives	• Additional units from urban renewal and/or incentives
196,600 dwelling units	**356,800 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

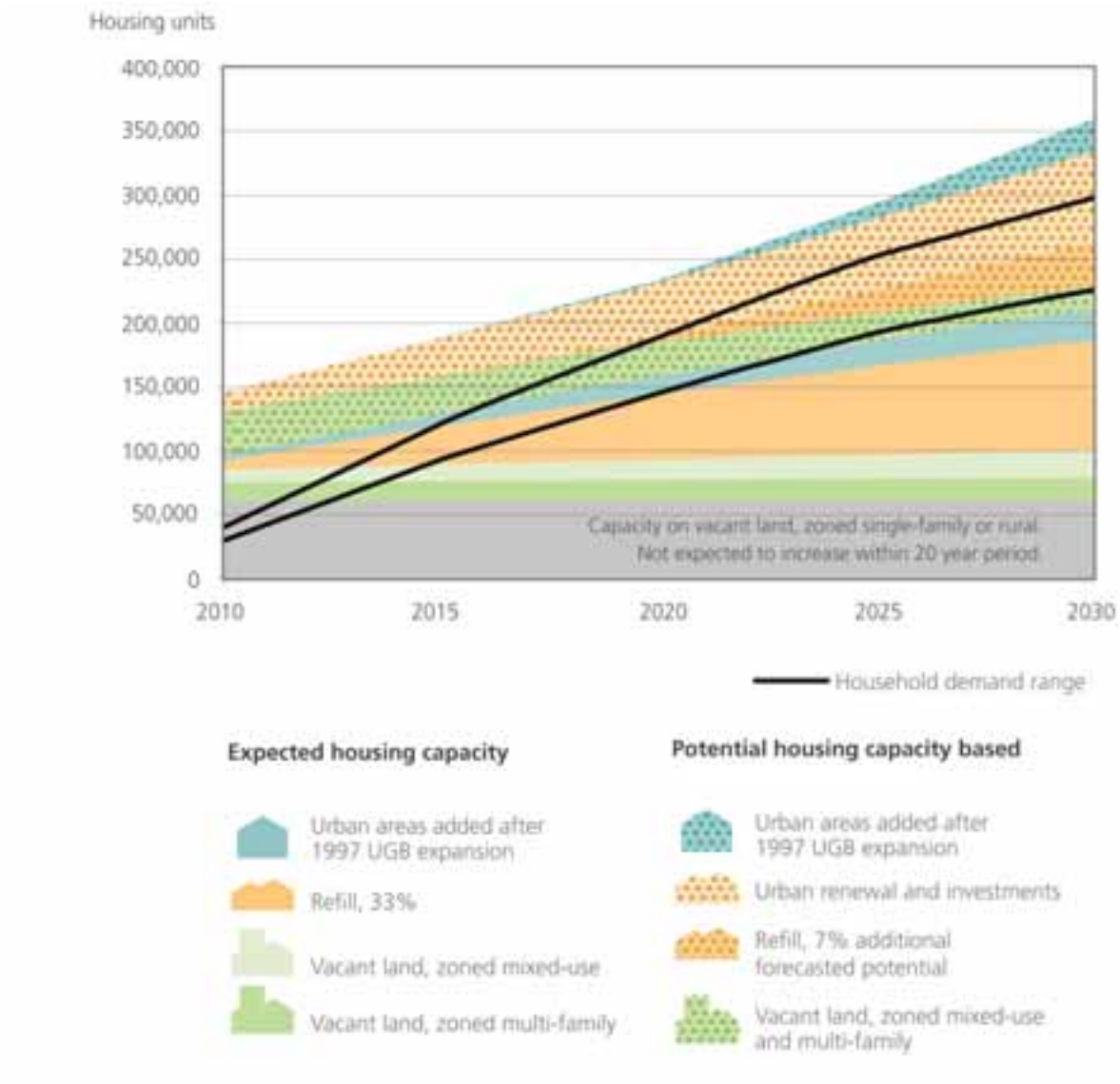
This assessment is reflective of uncertainty and describes both demand and supply in terms of a range, allowing policy makers to consider a range of possibilities and plan for contingencies. This approach supports decision-making focused on the outcomes that characterize a successful region and support 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.***

Through the year 2030, counting only the "solid" capacity, there is demand for additional capacity to accommodate between 27,400 to 104,900 households.

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 134,300 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

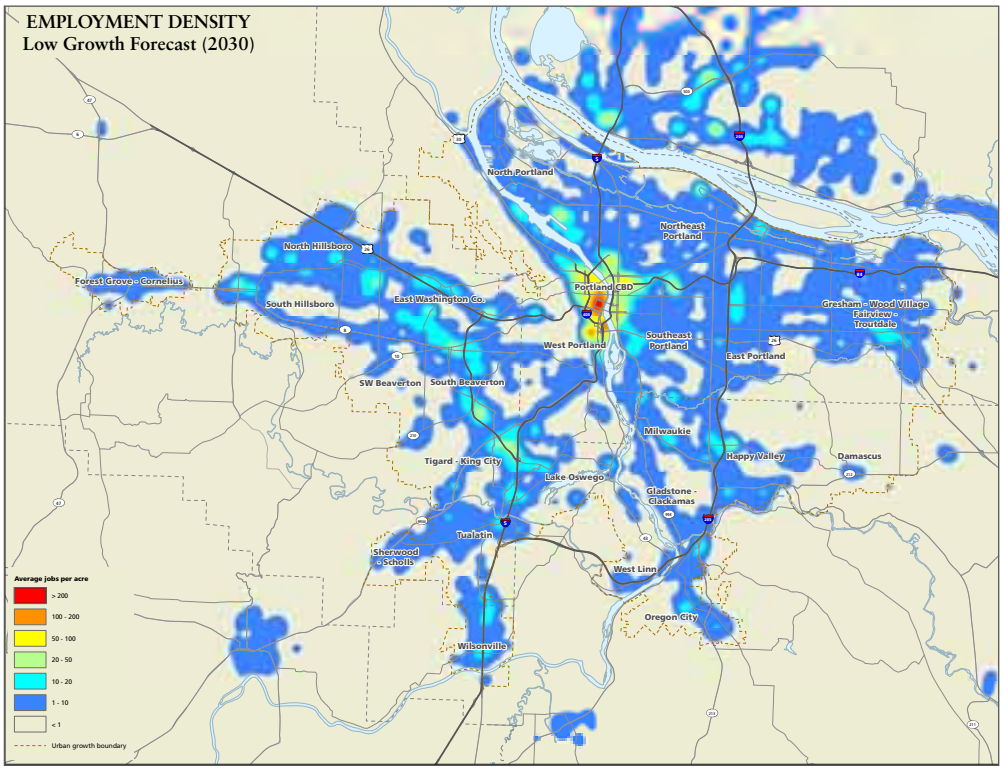
Scenario outputs can give a sense of where the region is headed in relation to our six desired outcomes.

- Vibrant, walkable communities
- Economic competitiveness and prosperity
- Transportation choices
- Reduce greenhouse gas emissions
- Clean air and water, healthy ecosystems
- Equity

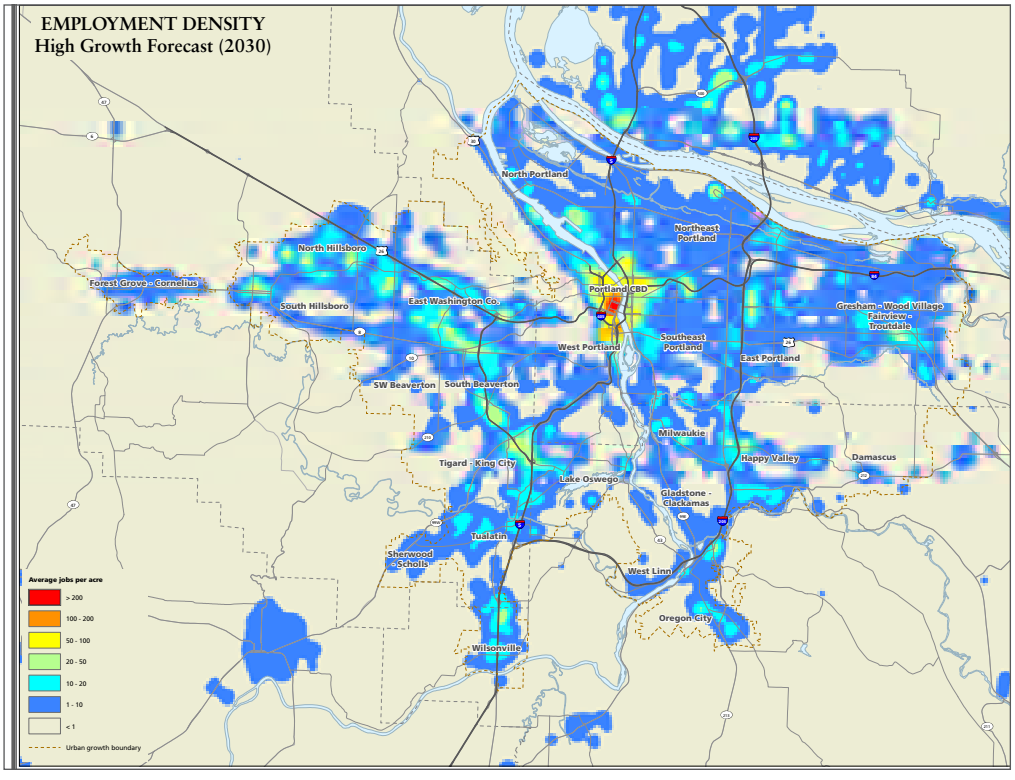
SCENARIO FINDINGS

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 9: Distribution of jobs in the year 2030, low growth scenario
Source: MetroScope scenario 912, 2009



Map10: 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

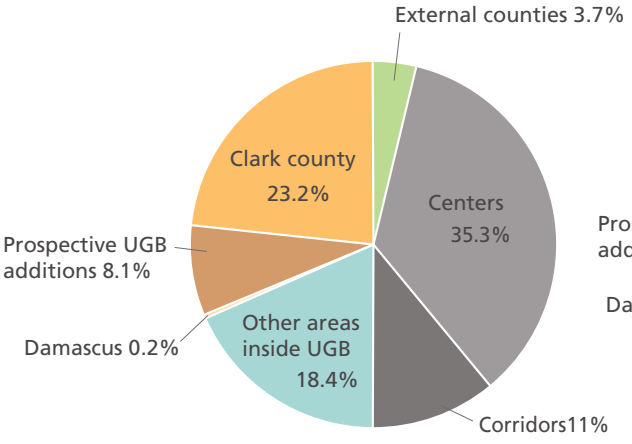
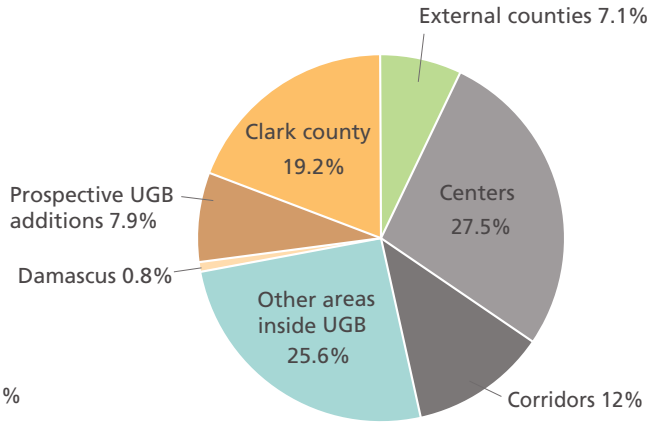


Figure 52: High growth scenario
Source: MetroScope scenario 911, 2009



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.

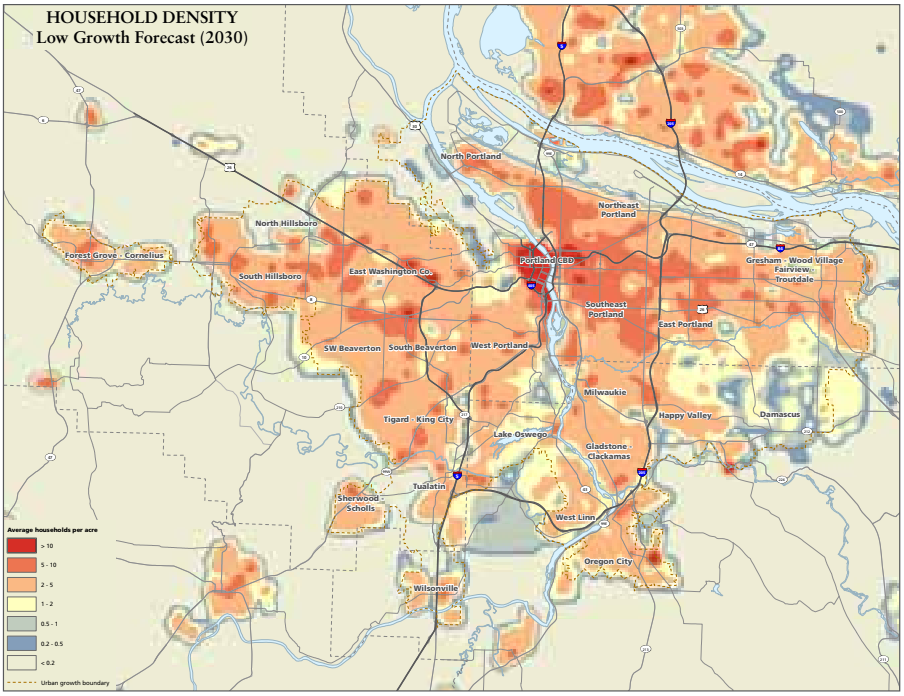
Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Reduce greenhouse gas emissions
- ✓ Clean air and water, healthy ecosystems
- ✓ Equity

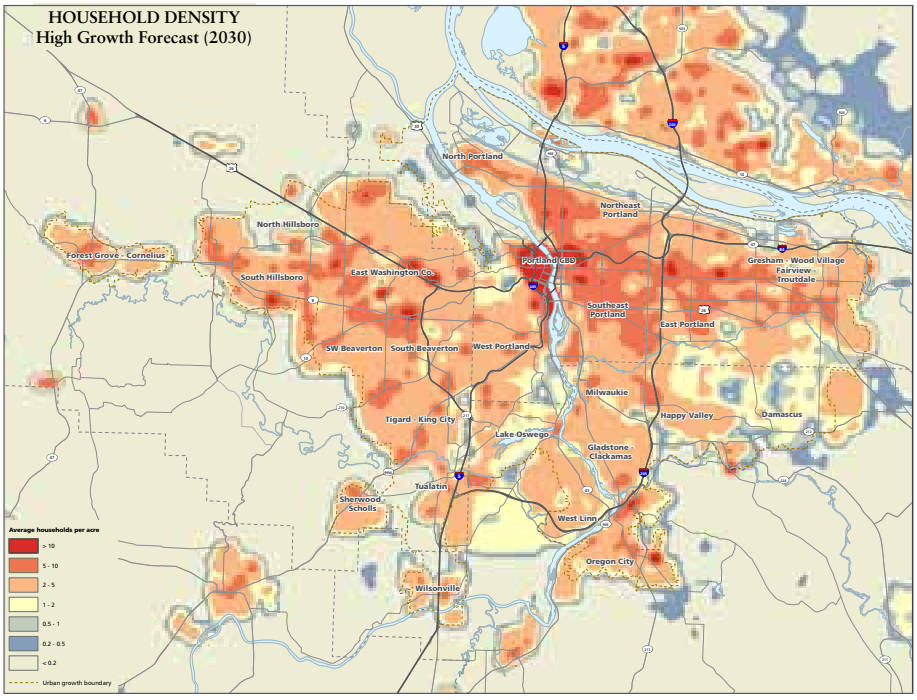
Scenarios indicate that, with a continuation of current policy direction, a smaller share of jobs may locate in centers under a high growth scenario than under a low growth scenario. Conversely, a greater share of jobs may locate in "all other areas inside the UGB" under a high growth scenario. Those 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 11: Distribution of households in the year 2030, low growth scenario
Source: MetroScope scenario 912, 2009



Map 12: 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

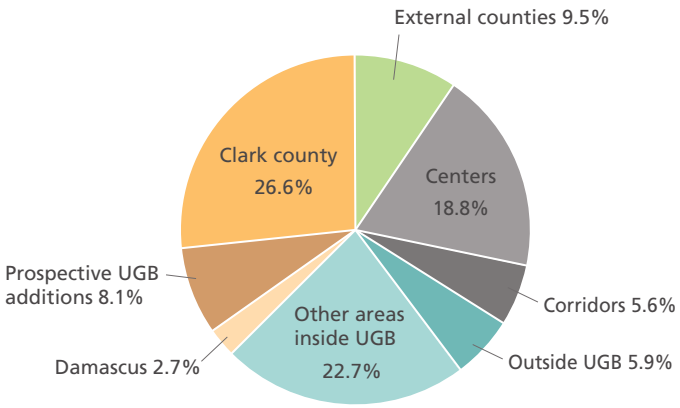
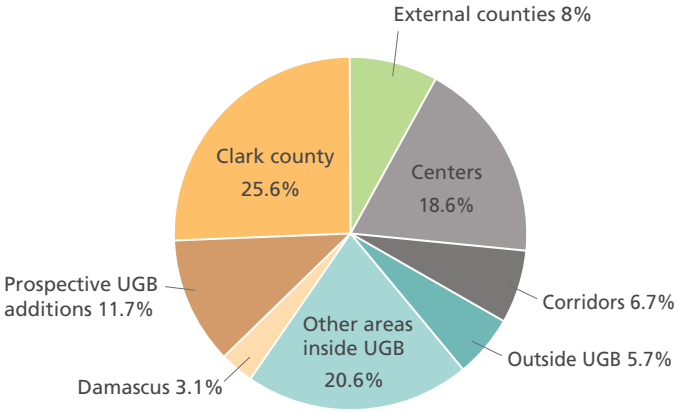


Figure 54: High growth scenario
Source: MetroScope scenario 911, 2009



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

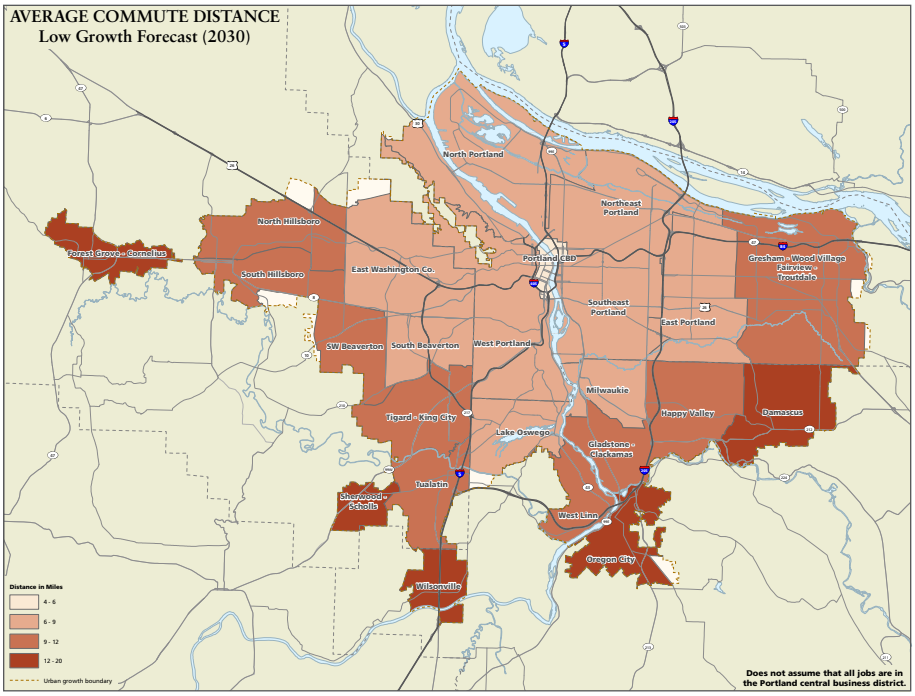
Counter intuitively, the refill rate in the high growth scenario is lower than it is in the low growth scenario. Even though the high growth scenario shows, in absolute numbers of new dwelling units, more refill development than the low growth scenario, the absolute amount of residential growth on vacant 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.

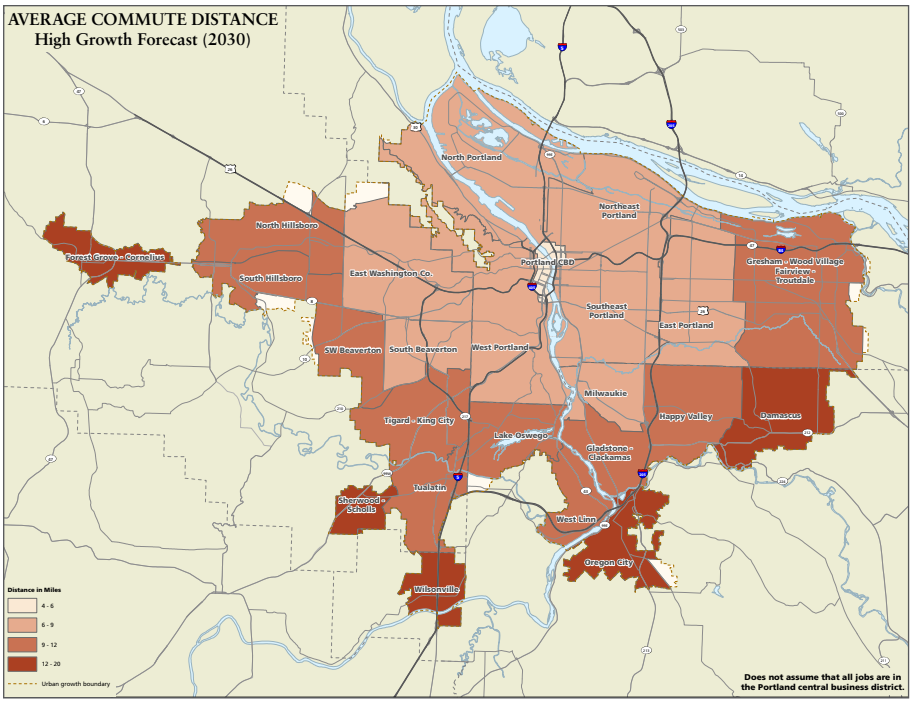
** Note: The forecasted year 2030 refill rate should be understood in the context of the scenario assumptions and the limitations of scenario modeling. One of the scenario assumptions that affects refill rates is that there will be a delay in providing infrastructure to recent UGB expansions such as 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 13: Average one-way commute distance, low growth scenario (all households)
Source: MetroScope scenario 912, 2009



Map 14: 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?

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Reduce greenhouse gas emissions
- ✓ Clean air and water, healthy ecosystems

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.

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

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.*

SCENARIO RESULTS

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.

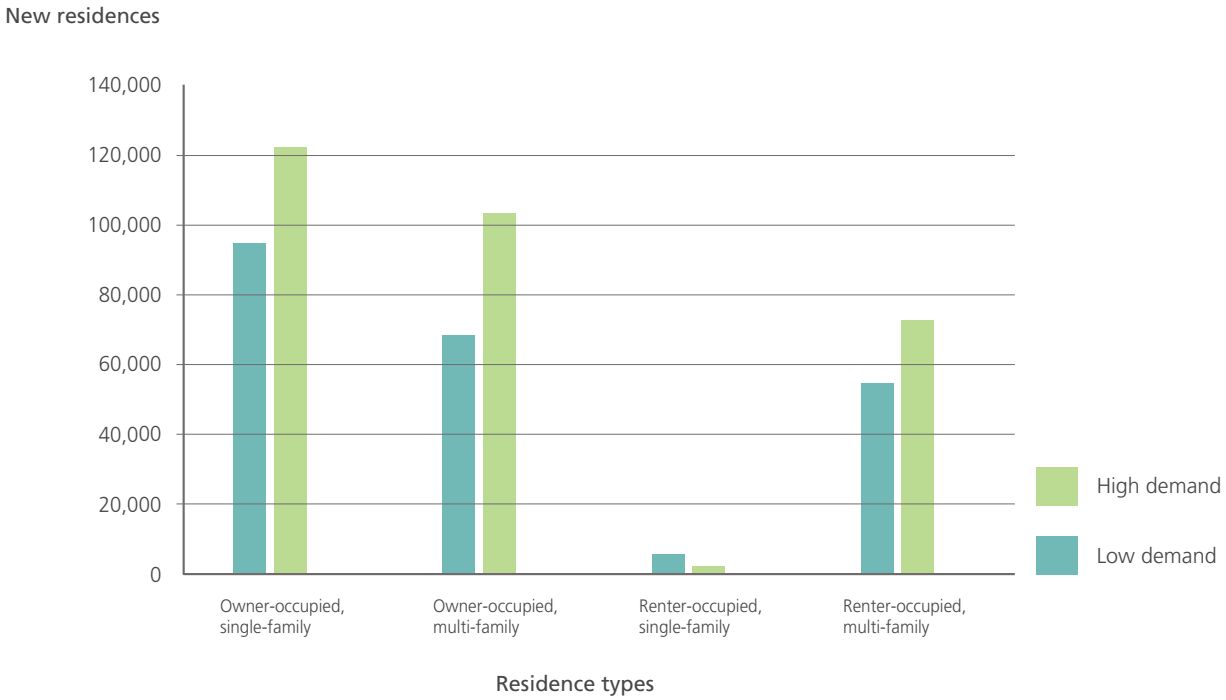
Future mix of housing types and ownership

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Equity

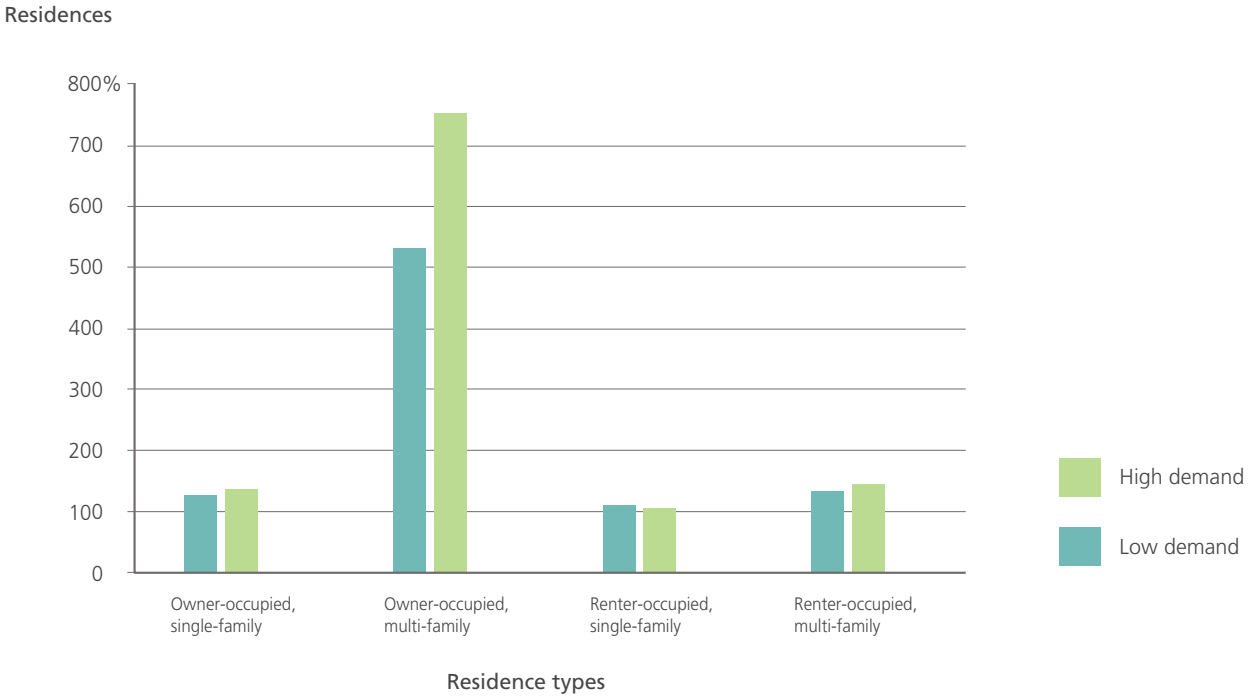
Assuming a continuation of current policies and investment trends, the region is likely to see an increase in the total numbers of all housing types by the year 2030 (see **Figure 55**). However, the likely increase in multi-family residences (both owned and rented) is particularly noteworthy. This potential 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

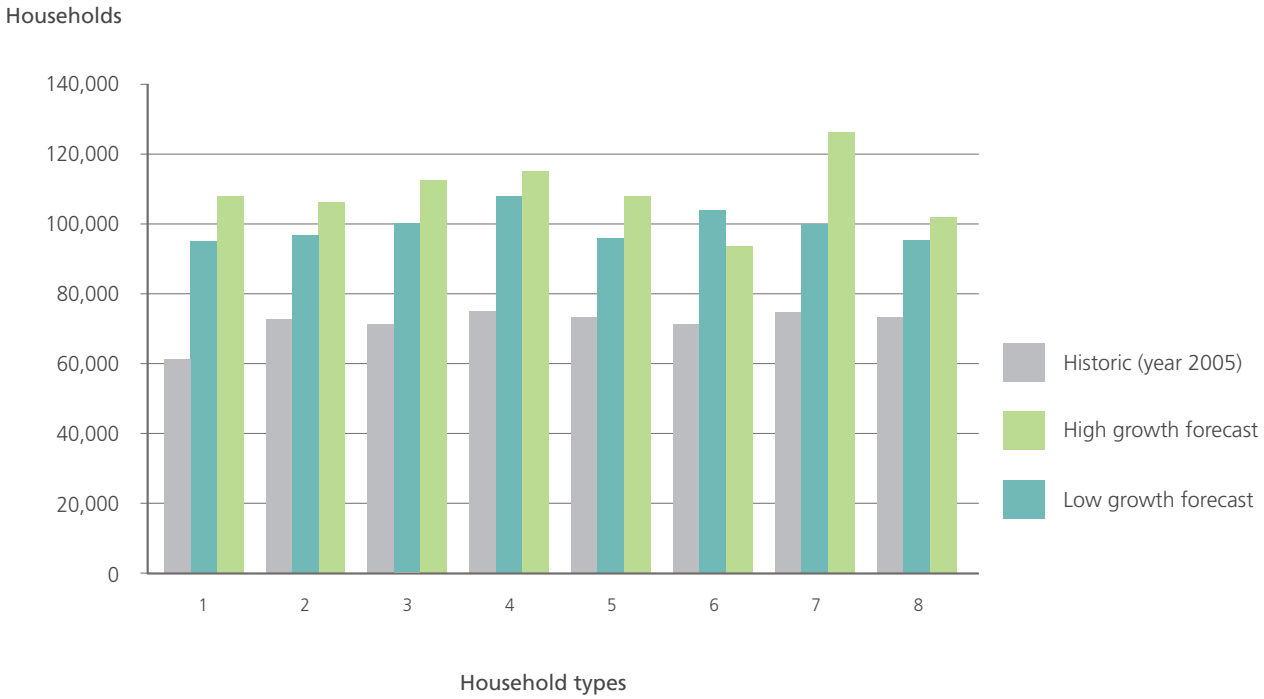
- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Equity

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.
- Expansion of housing voucher programs could increase housing choices for more households.

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 all households in the Metro region or about 43 percent of renter households). By the year 2030, if current trends and policies continue, between 17 to 23 percent of all households inside the Metro region or 51 to 69 percent of renter households 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.

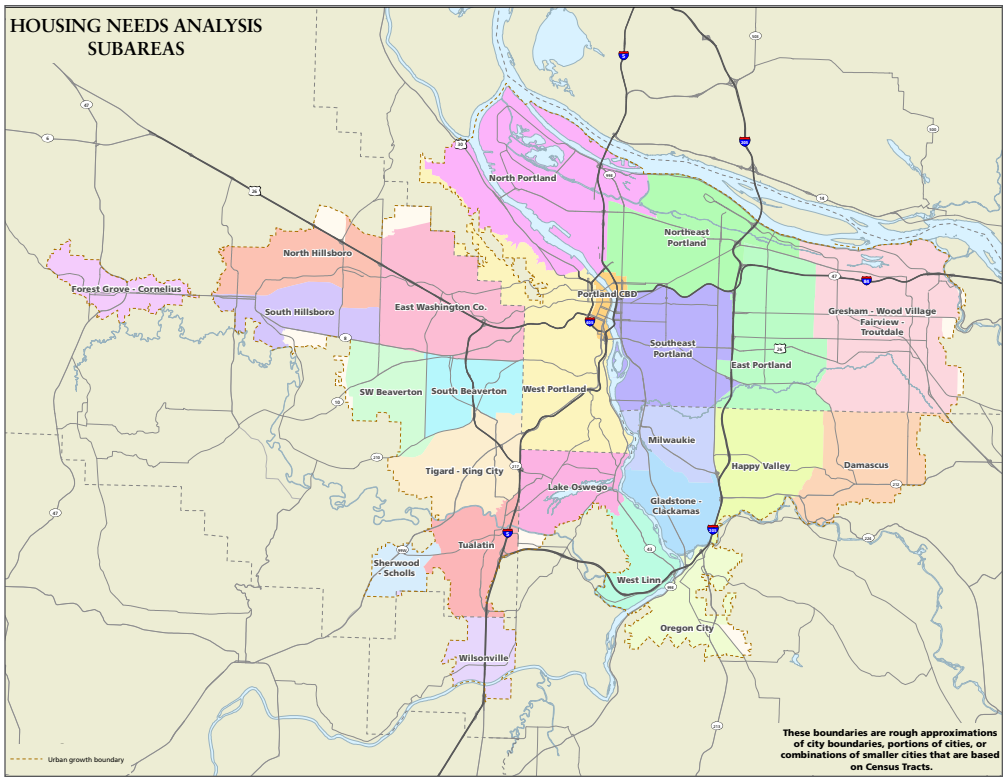
The subareas used in **Table 49** are illustrated in **Map 15**.

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

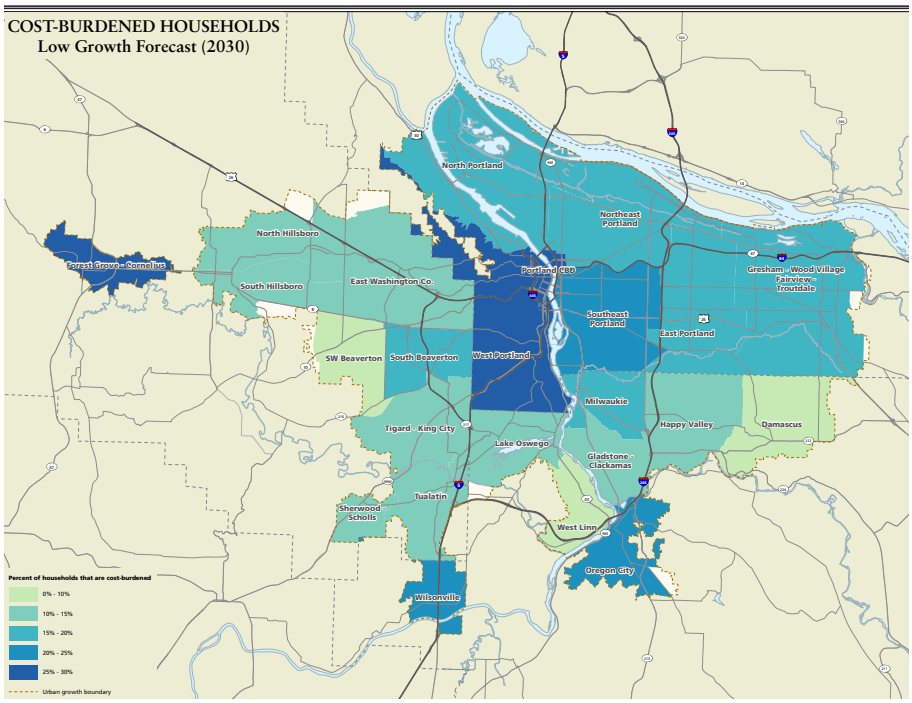
	2005		2030 LOW GROWTH FORECAST		2030 HIGH GROWTH FORECAST	
	Cost-burdened households	Percent of households cost-burdened	Cost-burdened households	Percent of households cost-burdened	Cost-burdened households	Percent of households cost-burdened
Portland central city	6,500	53%	12,900	29%	16,800	33%
Northeast 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	**92,060**	**16%**	**138,400**	**17%**	**200,300**	**23%**

Map 15 **Housing needs analysis subareas**
Source; Metro, 2009

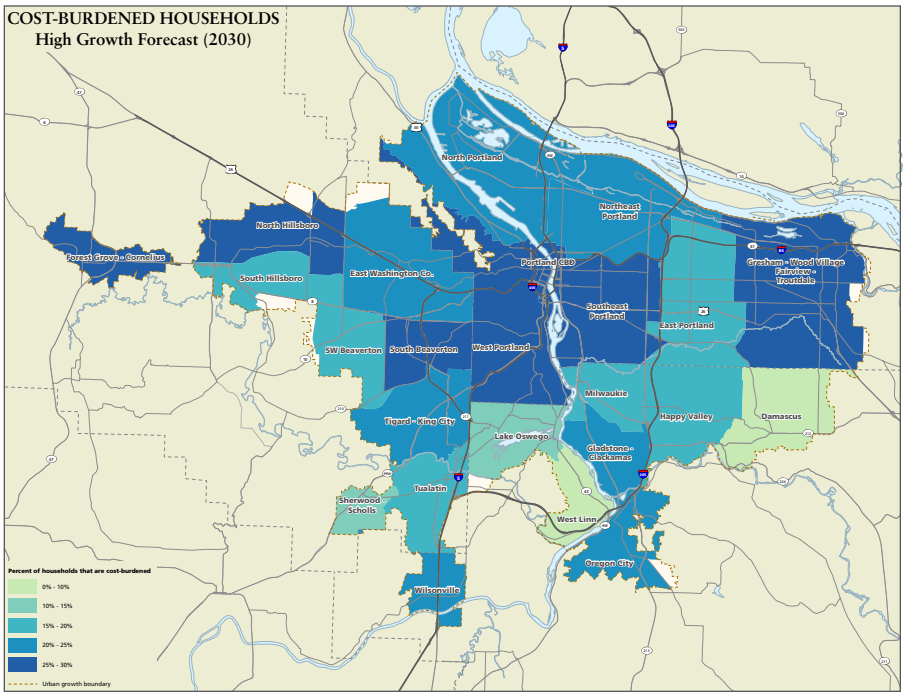


Maps 16 and 17 depict the percent of households that could be cost-burdened in the year 2030 (by subarea—rough approximations of city boundaries, portions of larger cities, or combinations of smaller cities). Though cost-burdened households are predicted to be distributed throughout the region, there 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 16: Share of households that are cost-burdened, LOW growth scenario
Source: MetroScope scenarios 912, 2009



Map 17: 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 ONE:

Summary of public comments on the Draft Urban Growth Report and Metro staff responses

COMMENT INDEX

FROM	*AFFILIATION*	*DATE*
Alford, Heidi		October 14, 2009
Anderson, Michael	Oregon Opportunity Network	October 14, 2009
Arcana, Judith		September 18, 2009
Battan, Jim		September 16, 2009
Becker, Michael		September 18, 2009
Bender, Rodney		September 18, 2009
Bidwell, Michael Patrick		September 18, 2009
Bookin, Beverly	Commercial Real Estate Economic Coalition	September 24, 2009
Boone, James L.		September 20, 2009
Brewster, Ginny		September 17, 2009
Brewster, Ginny		September 17, 2009
Brown, David		September 18, 2009
Brown, R.		September 18, 2009
Burke, Elizabeth		September 18, 2009
Carley, Ron and Fuglister, Jill	Coalition for a Livable Future	October 15, 2009
Carillo, Ken		September 18, 2009
Cavenaugh, Kevin		September 16, 2009
Cohen, Gerald J.	AARP – Oregon State Office	October 15, 2009
Conable, Barbara		September 18, 2009
Cox, Bill		September 18, 2009
Cusack, Tom		
Cushwa, Nancy		September 18, 2009
Davis, Tim		September 17, 2009
Deagle, Susie		September 18, 2009
Dibblee, Martha		September 15, 2009
Digman, Joe		September 18, 2009
Dorner, Catherine		September 18, 2009
Durtschi, Kay	Citizen Member – Metro Technical Advisory Committee	October 15, 2009
Effman, Jason		September 18, 2009
Elteto, Louis		September 18, 2009
Fain, Lisa		September 18, 2009
Fitzgerald, Marianne	Southwest Neighborhoods, Inc.	October 15, 2009
Franchesi, Cheryl and Terry		October 15, 2009
Frank, Lona Nelsen	ALPACAS of Tualatin Valley LLC	September 16, 2009
Gadea, Francisco		September 18, 2009
Gerth, John		September 18, 2009
Goldfarb, Gabriela		October 8, 2009
Goldsmith, Dell		October 10, 2009
Green, Karla		September 18, 2009
Gregory, Michele	Multnomah County Planning Commissioner	September 16, 2009
Hagen Jr., Jon Edwin		September 18, 2009

Employment UGR—technical comments		
Comment attribution	**Comment summary**	**Metro staff response**
of Realtors	reasonable.	by historic data and professional expertise.

Employment UGR—policy comments		
Comment attribution	**Comment summary**	**Metro staff response**
City of Cornelius, City of Forest Grove, City of North Plains, City of Hillsboro, City of Banks, Johnson-Reid, Port of Portland, Portland Business Alliance, Commercial Real Estate Economic Coalition	Undersupplying land for priority industry clusters would be harmful to the economy.	Metro performs the UGR analysis every five years to ensure a 20-year supply of capacity for jobs. The effect of this is that, in the short-term (five years), there will be four times the needed capacity for jobs. It is extremely unlikely that amount will be insufficient to accommodate growth before the next UGR analysis in five years. This five-year cycle creates a built-in cushion to allow for choices among sites. Experience has shown that the majority of recent solar manufacturing recruits have located in existing buildings and on smaller sites. The final UGR will reflect the Metro Policy Advisory Committee's recommendation to revise the identified demand for large lot capacity from 200-800 acres to 200-1,500 acres. This revision acknowledges potential shortcomings of using an employment forecast as the sole basis for assessing large lot demand.
Port of Portland	Regional choices related to land supply and transportation will determine the economic future of the region.	Many factors at the global, national, state, regional and local levels have effects on the region's economy. The UGR is not intended to serve as an economic development strategy; it informs land supply decisions that will be made in 2010.
Port of Portland	One of the "six desired outcomes" is economic competitiveness and prosperity—why is there no strategy presented to achieve this outcome or an assessment of how other desired outcomes may conflict with this outcome?	The purpose of the UGR is to identify whether a capacity gap exists and, if so, to what degree. This UGR intentionally presented a variety of policy options to consider for addressing land demand and achieving the region's desired outcomes, but it is not the purpose of the UGR to determine the specifics of those policy options. The viability of those policy options does not have an impact on the capacity analysis. Those policy options can be more thoroughly considered in 2010.
Port of Portland	The UGR and transportation investment strategy need to link up with industry cluster needs. Use the Portland Regional Partners for Business list of clusters instead of the Portland Development Commission's (PDC) list.	Though it may be beneficial to have a regional economic development strategy, Metro has not been charged with the task of developing that strategy and does not presume to have that role. Because there is no agreed upon regional economic development strategy, there is no "right" cluster list to use. The Draft UGR used the PDC list as a way of presenting information in a format that addresses the economic development priorities of many cities in the region. The full forecast, which includes all employment sectors, is the basis for the capacity assessment. The cluster forecast does not figure into the capacity assessment. New cluster definitions will not change the capacity assessment.
City of Portland	The vast majority of our jobs are created through the growth of small businesses. We need to nurture and	Metro's analysis indicates that most employment will occur in smaller firms. Attracting larger firms is also of importance to the region's economy.

Employment UGR—policy comments		
Comment attribution	**Comment summary**	**Metro staff response**
	retain those companies while attracting others.	
Port of Portland	Two key elements of the strategy for providing large lot supply (brownfield cleanup and fast process for UGB expansions) will be undefined at the close of public comment on October 15.	The purpose of the UGR is to identify whether a capacity gap exists and, if so, to what degree. This UGR intentionally presented a variety of policy options to consider for addressing land demand, but it is not the purpose of the UGR to determine the specifics of those policy options. The viability of those policy options does not have an impact on the capacity analysis. Those policy options can be more thoroughly considered in late 2009 and in 2010.
Port of Portland, Commercial Real Estate Economic Coalition	Brownfield cleanup should be a priority	Metro concurs that brownfield cleanup should be a regional priority and welcomes partnerships to institute more brownfield cleanup programs. A MPAC subcommittee will be looking at brownfield cleanup as one option to make more of the region's existing industrial capacity available.
City of Portland	The City of Portland is committed to cleaning up, over time, the City's brownfield sites.	The City has a strong brownfields cleanup program and Metro efforts, focused elsewhere in the region, serve as a complement. Metro staff is open to new opportunities to partner with the City of Portland in brownfield cleanup.
City of Portland	The City of Portland is committed to consolidating and assembling adjoining parcels to provide larger sites. Opening up huge tracts of otherwise excellent agricultural land for industry, when we have land with services already in the UGB, doesn't make sense from a regional investment point of view.	Metro staff is open to opportunities to partner with the City of Portland in employment land assembly.
Port of Portland	A regional infrastructure fund is needed to make industrial sites shovel ready.	Infrastructure funding shortfalls have made it difficult to develop the region's existing supply of land for industrial uses. Metro welcomes a discussion of developing a regional investment strategy, including discussions about possible funding sources.
Portland Business Alliance	There is no reason to expect that funding will be more readily available for refill development than for expansion and to assume otherwise overstates the region's ability to accommodate growth in the existing land supply.	The refill rates that are assumed in the UGR are based on a continuation of existing public investment trends.
Commercial Association of Realtors	The Association appreciates the UGR's improved analytical approach and sensitivity to market realities, but does not believe its estimates or projections. The UGR should make conservative, market-based assumptions.	Metro staff appreciates the input given by the Commercial Association of Realtors that informed some of the UGR's technical assumptions. Metro staff believes that its approach to this analysis is market reality-based.

Employment UGR—policy comments		
Comment attribution	**Comment summary**	**Metro staff response**
Commercial Association of Realtors	The UGR should not assume that the market will respond to our policies and investments.	As pointed out by the Commercial Association of Realtors, this UGR has an improved analytical approach that acknowledges market dynamics. The UGR's market assumptions are informed by modeling, historic evidence and the professional expertise of Metro staff, consultants, and private sector representatives.
Commercial Association of Realtors	The UGR should not assume political support for some set of future policy actions	The UGR only assumes those policies and investment trends that currently exist.
Port of Portland Portland Business Alliance	The "fast track" UGB expansion process that has been proposed by some will not be fast enough once planning, annexation, zoning, and infrastructure construction are considered.	An MPAC subcommittee will take up the issue of how to ensure that large lots are available and protected for industrial uses. The fast-track process is one proposal. Metro welcome other proposals.
Johnson-Reid	The draft UGR does not consider lands north of the existing Washington County UGB as candidate expansion areas for employment growth, modeling, and employment land capacity study.	The UGR's purpose is to identify any gap in the capacity of the current urban growth boundary (UGB) to accommodate growth. The UGR is not intended to examine how or where to fill a capacity gap outside of the current UGB. Scenario modeling was used to inform the UGR. Those scenarios assume a continuation of current policies and investment trends and, as such, assume that future UGB expansions will follow the existing hierarchy of lands as defined by State law. When urban and rural reserve designations are made, scenario assumptions about future UGB expansions will be adjusted.
Port of Portland	Habitat protection programs at the regional and local levels reduce the efficiency with which land is used inside the UGB.	Habitat protection and provision of parks and open spaces are key components of the 2040 Growth Concept. Balancing these goals with efficient development of land is often challenging and Metro is always looking for new ways of doing so.
Port of Portland	The UGR implies that there has been a problem of industrial land conversion and that there is a need to revise Title 4 of the Urban Growth Management Functional Plan. Title 4 provides adequate protection. If there are conversions from industrial uses, it is an enforcement issue.	Metro staff hopes to compile more information to determine whether industrial land conversion has been occurring and, if so, why. An MPAC subcommittee will take up the issue of how to ensure that large lots are available and protected for industrial uses.
Commercial Association of Realtors, Citizen comments (less than five)	Expand the UGB	The decision about whether or not to expand the UGB will be made by the Metro Council, in consultation with MPAC, in 2010. That decision will be based on the UGR's analysis and any new policies or public investments that are adopted by the end of 2010 that affect the region's capacity.
Citizen comments	Focus growth inside the existing UGB	The decision about whether or not to expand the UGB will be made by the Metro

Employment UGR—policy comments		
Comment attribution	**Comment summary**	**Metro staff response**
(approximately 100)		Council, in consultation with MPAC, in 2010. That decision will be based on the UGR's analysis and any new policies or public investments that are adopted by the end of 2010 that affect the region's capacity.
Port of Portland, Portland Business Alliance, Commercial Association of Realtors	30 days is not an adequate amount of time for public review and comment on the UGR	Metro must meet a State-mandated deadline (end of 2009) for the Metro Council's acceptance of the UGR. The public will be able to comment throughout most of 2010 on the various policy choices that will be considered for closing any capacity gap identified in the UGR. Metro staff appreciates the time commitment that various advisory committees have made in providing review of the UGR. Metro has been working with advisory committees to refine the approach and contents of the UGR since winter of 2008. A preliminary UGR was released in May 2009 in order to proactively solicit and respond to technical comments. To the extent possible, comments received on the preliminary UGR have been addressed in the draft UGR. Please see Appendix 1 to the Draft UGR for a summary of comments received and draft Metro staff responses.

Residential UGR—technical comments		
Comment attribution	**Comment summary**	**Metro staff response**
City of Portland	Future trends such as higher energy costs, carbon taxes or regulations, and changing demographics make Portland well-positioned to provide future residents with the kinds of housing choices that they will desire. Portland has the ability to accommodate 140,000 more households without any changes to zoning.	The UGR's analysis indicates that the City of Portland and the region have ample zoned capacity to accommodate the next 20 years of residential growth. The UGR shows a need to attract the residential market to that zoned capacity. Policies and investments that encourage redevelopment and infill in centers and corridors should remain the region's focus. The trends cited by the City may attract more of the forecasted households to existing urban areas than contemplated by the UGR.
Home Builders Association of Metropolitan Portland	How does Metro plan on achieving refill rates of 50 percent?	The draft UGR assumes a 33 percent refill rate, which is in keeping with historic rates and, according to Metro's market-based economic model, is likely to be achieved under current zoning.
City of Tualatin Portland Business Alliance	A 33 percent refill rate may not be a reasonable expectation.	The draft UGR assumes a 33 percent refill rate, which is in keeping with historic rates and, according to Metro's market-based economic model, is likely to be achieved under current zoning.
City of Tualatin	Where is the analysis that indicates where refill will be occurring?	Refill rates are expected to vary from city to city, with generally higher rates in Portland than in outlying communities. Please see Maps 1-4, attached to the end of this summary, which show historic and forecasted refill rates throughout the region for single-family and multi-family residential development.
Home Builders Association of Metropolitan Portland	Lands that are likely spots ("low-hanging fruit") for refill have already seen refill occur.	Redevelopment and infill (redevelopment in particular) are ongoing market phenomena. There are many underutilized sites throughout the region that remain ripe for redevelopment and new opportunities will continue to emerge over time.
Home Builders Association of Metropolitan Portland	How does Metro anticipate having 71,000 housing units subsidized to the tune of up to $50,000 per home and what will the impact be on schools and other public services if urban renewal districts are used to created these subsidies and pull money away from other public services?	The Home Builders Association is referring to scenario assumptions in its comment. For the purpose of scenario modeling, Metro assumed a continuation of existing investment trends. The residential incentive assumptions that Metro made were reviewed by cities, counties, the Portland Development Commission, and the Metro Technical Advisory Committee. There are no assumptions made about new levels of investment. Better performance may be achieved with additional investments, investments in different locations, or simply with additional time. It is not the role of the UGR to determine the possible impact on schools and other public services if cities continue their urban renewal programs.
Home Builders Association of Metropolitan Portland,	The assumption about future park needs that is made in the UGR capacity calculation is incorrect. Cities and park providers have more financial resources today than they	There is no specific guidance in state planning law, from ORS 197.296 or Goal 8 on Recreational Needs, on methods to determine park needs. There is no perfect way of estimating future park needs since there is no regional level of service standard

Residential UGR—technical comments		
Comment attribution	**Comment summary**	**Metro staff response**
Western Advocates, Inc.	did in 2002 (year of previous UGR) to purchase park land.	for parks. To maintain an approach that is consistent with the approach used in 2002, staff proposes keeping the implicit parks level of service found in the 2002 UGR: <u>In 2002 UGR:</u> Forecasted 220,700 dwelling unit growth in 20 year period System-development-charge-based park deduction = 1,100 acres Implied level of service = 1,100 park acres for 220,700 new dwelling units <u>Assuming same implied level of service as in 2002, then in 2009 UGR:</u> Forecasted 262,400 dwelling unit growth in 20 years (baseline assumption) 1,100 /220,700 * 262,400 = **1,300 acres** of new park deduction The acres of parks and open space cited in the Regional Infrastructure Analysis include natural areas and other non-active use spaces. The UGR's parks calculation is only intended to estimate the land demand for active-use parks (i.e. not natural areas) since these are lands that could otherwise be buildable for residential purposes. The buildable land inventory takes into account vacant lands that are not buildable because of regulatory protections (Titles 3 and 13 of the Urban Growth Management Functional Plan).
Legal Aid Services of Oregon (Hillsboro Regional Office), Tom Cusack	Revise the table appearing on page 21 of Appendix 8 (needed housing data tables) to more accurately show the need for subsidies at higher rent levels than the less-than-$400 rent level currently shown.	Metro staff appreciates the careful review of the data and agrees that additional rent and ownership price categories should be denoted as "partially assisted." All categories of rental housing below $1,100 in rent and owner-occupied housing that is $200,000 or less in value may need government assistance. Corrections to tables 303.1a and 303.1b in Appendix 8 will be made in the final UGR.
Tom Cusack	Metro should review existing reports, Census data, and the American Community Survey data to determine the relative rate of Portland Metro housing mismatch by income and rent levels and adjust their demand/supply projections accordingly.	The UGR's method and the method proposed by Mr. Cusack are both valid approaches, but are suitable for different purposes. The method proposed by Mr. Cusack would provide an assessment of current conditions, but would not depict the housing production that is likely to occur in the next 20 years as required for the UGR. To get a sense of the mismatch referenced by Mr. Cusack, the housing needs analysis scenarios forecast future housing production and the number of future cost-burdened households (renters paying more than 50 percent of their income

Residential UGR—technical comments		
Comment attribution	**Comment summary**	**Metro staff response**
		for housing and transportation). The UGR's approach acknowledges the fact that higher income households cannot be prevented from occupying market rate housing that is cheaper than what they could potentially afford.
Legal Aide Services of Oregon (Hillsboro Regional Office)	The report fails to mention and account for the impact of units otherwise affordable to lower income households being occupied by higher income households.	As pointed out in the comment, the analysis doesn't indicate what a household should pay (given their income), just what they do pay. This approach acknowledges that, rather than being static, housing prices are a product of market demand. This analytical approach is true to the dynamic faced by low income households in today's market. Without a housing quota system that sets aside housing for different income levels, this is also how future housing markets are expected to function. To assess affordability, the analysis provides information about the share of income spent on housing and transportation. For some households, this share is relatively small and for others it is substantial. It remains for policy discussion what can be done to improve these outcomes.
Legal Aid Services of Oregon (Hillsboro Regional Office), Tom Cusack	Add a narrative discussion and table that shows the relevant need for government housing including housing that receives public assistance.	Metro staff will add narrative to better describe affordable housing needs. The analysis indicates how many households (by rent or home price) may need government assistance. However, the question of how many households should receive government assistance is a policy matter that is open to interpretation. The UGR provides several analyses that can inform that discussion: Tables 303.1a and 303.1b, found in Appendix 8, provide the number of new, renter-occupied and owner-occupied dwelling units by rent or value range. In most rent ranges, there would appear to be a need for some amount of government assistance. This determination would also depend on wage levels. Tables 303.2a and 3032.b, found in Appendix 8, provide the number of renter-occupied dwelling units where the occupant is spending more than 50 percent of their income on transportation and housing. The UGR deems these households to be cost-burdened. The UGR further asserts that costs to these households may be reduced through a number of mechanisms including, but not limited to, subsidies. Other mechanisms include transit investments and changes to local zoning codes to allow a greater diversity of housing types and sizes.

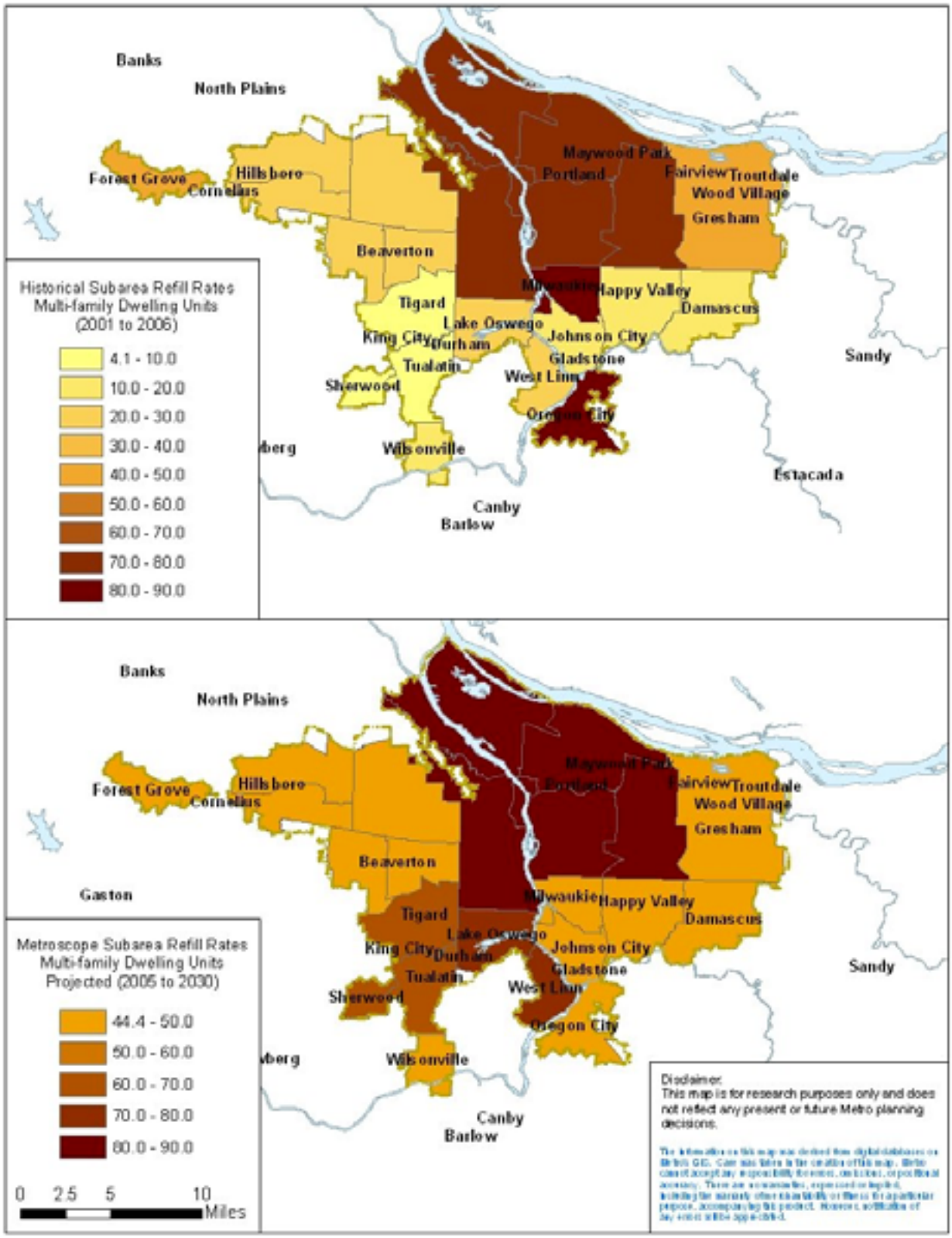
Residential UGR—technical comments		
Comment attribution	**Comment summary**	**Metro staff response**
Legal Aid Services of Oregon (Hillsboro Regional Office)	Households with children, not seniors, will represent the majority of low income renters.	In trying to make the report more readable, Appendix 7 blends owners and renters. As a consequence, the low income renters with children household type is perhaps not as visible in the report as it could be. Household type two for renters has the same low income as household type one but is younger and has a larger household with a much greater chance of children being present. This household type has a higher propensity to consume renter single family homes and to travel much further than renter household type one. As noted in the comment, they consume a larger house or apartment than do seniors. As a consequence their cost burden is substantially higher (15 – 30%) than household type one.

Residential UGR—policy comments		
Comment attribution	**Comment summary**	**Metro staff response**
City of Lake Oswego	The City supports the UGR's analysis and is committed to helping expand capacity in the Foothills area of Lake Oswego to create a dense, new transit-oriented neighborhood.	Metro looks forward to working with Lake Oswego and other cities to identify how to regional and local actions can be coordinated to achieve local aspirations that are supportive of the 2040 Growth Concept.
Home Builders Association of Metropolitan Portland	The public will not accept higher densities.	The UGR analysis does not assume any change to current zoning, so the UGR does not assume higher zoned densities in existing neighborhoods. The 2040 Growth Concept calls for focusing growth in centers and corridors as directed by the region's citizens.
City of Wilsonville Coalition for a Livable Future	Infill and redevelopment in centers and corridors are generally preferable and more efficient that outward expansion. Infill and redevelopment protect natural resources. There is no money for infrastructure in UGB expansion areas. Infill and redevelopment can help to fund the maintenance of existing infrastructure. Infill and redevelopment will be necessary to reduce carbon emissions.	Infill and redevelopment are key market responses that the 2040 Growth Concept calls for in centers and corridors.
League of Women Voters of Portland	Compact urban form and the integration of land use and transportation will be essential for addressing climate change and providing equity of opportunity. Areas around transit centers and light rail stations, such as Lents and Gateway offer great potential and deserve attention in the investment strategy.	Metro staff concurs.
Home Builders Association of Metropolitan Portland	Policies that push more households to live outside the Metro UGB do not mesh with Metro's goals for sustainability.	Metro staff concurs that there are negative implications of having more people choose to live in neighboring cities and commuting back to the Metro region. The draft UGR identifies a residential capacity gap. There are multiple ways to fill that gap that will be discussed in 2010.
Urban Greenspaces Institute	The urban forest canopy, headwaters areas, and upland habitat must receive heightened protection if the region is to pursue infill and redevelopment. Title 13 is insufficient protection.	In determining the region's capacity for growth, the UGR must only assume regulations that are currently in place.
League of Women Voters of Portland	The League supports the diversification of the region's housing stock, by type and price.	Metro staff concurs that additional housing options are needed in the region in order to reduce the number and share of households that are cost-burdened.
Oregon Opportunity Network,	Housing and transportation affordability must be considered in growth management and investment	Metro staff concurs and notes that the UGR analysis finds that many of the region's existing centers and corridors offer the most affordable housing and

Hammon, Virginia		October 8, 2009
Hanrahan, Steve		September 18, 2009
Harvey, Linda A.		September 18, 2009
Hauk, Marna		September 18, 2009
Helm, Polly		October 15, 2009
Heyne, Klaus		September 18, 2009
City of Hillsboro (Alwin Turiel)	City of Hillsboro	October 8, 2009
Hoem, Shirley		September 15, 2009
Houck, Mike	Urban Greenspaces Institute	October 10, 2009
Hunter, Christopher		September 18, 2009
Jackson, Kelly M.		September 18, 2009
Jacobson, Pat and Jake		September 18, 2009
Johnson, Chuck		September 18, 2009
Johnson, Ellen	Housing Land Advocates	October 15, 2009
Johnson, Michael		September 18, 2009
Jones, D.		September 18, 2009
Kaplan, Seth		September 18, 2009
Karlock, Jim		October 15, 2009
Kemper, Heather	Legal Aid Services of Oregon	October 15, 2009
Kraft, Tom		September 15, 2009
Kulley, Marlowe		September 17, 2009
City of Lake Oswego (Mayor Jack Hoffman)	City of Lake Oswego	October 13, 2009
LeFeber, Bob	Commercial Realty Advisors	October 14, 2009
Lanker, Stefan		September 18, 2009
Larco, Dorothy		September 18, 2009
Laws, Kathleen		September 18, 2009
Leinova, Avery S.		September 18, 2009
Lindsey, Carolyn		September 18, 2009
Lord, Pamela J.		September 18, 2009
Malmquist, Bret		September 18, 2009
Meehan, Hilary		September 18, 2009
Merchant, Bonnie		September 18, 2009
Micheletti, Dustin		September 18, 2009
McClanahan, Gary		September 18, 2009
McClay, Mauria		September 18, 2009
McCracken, Rhiannon		September 18, 2009
McDonough, Sandra	Portland Business Alliance	October 15, 2009
McGrath, Teresa		September 20, 2009
McKinney, Trenton		September 18, 2009
Neer, Steven		September 18, 2009
Nielsen, Charles E.		October 10, 2009
Nielsen, David	Home Builders Association of Metropolitan Portland	October 13, 2009
Newman II, Will		September 17, 2009
Newman II, Will		October 15, 2009
Parker, Terry		October 15, 2009
Parks, Lindsay		October 8, 2009
Pearmine, Katie		September 18, 2009
Peterson, Kathryn		September 18, 2009
Platt, Thomas		September 18, 2009
Platt, Thomas		September 18, 2009
Port of Portland (Bill Wyatt)	Port of Portland	October 15, 2009
City of Portland (Mayor Sam Adams)	City of Portland	October 15, 2009

Residential UGR—policy comments		
Comment attribution	**Comment summary**	**Metro staff response**
Housing Land Advocates, AARP, Legal Aid Services of Oregon (Hillsboro Regional Office)	decisions. Transit-Oriented Development should be promoted.	transportation options. Yet, an affordability problem is likely to persist and perhaps worsen with a continuation of current policies and investment trends. Growth management policies and transportation investments alone will not, however, solve the affordability problem.
Legal Aid Services of Oregon (Hillsboro Regional Office)	Set concrete, regional goals, objectives and performance measures for housing affordability. Go beyond voluntary measures as they have not resulted in local jurisdictions making affordable housing a priority.	Metro staff appreciates this input. These tasks do not, however, fall under the purview of the UGR.
Home Builders Association of Metropolitan Portland	30 days is not an adequate amount of time for public review and comment on the UGR	The public will be able to comment throughout most of 2010 on the various policy choices that will be considered for closing any capacity gap identified in the UGR. Metro staff appreciates the time commitment that various advisory committees have made in providing review of the UGR. Metro has been working with advisory committees to refine the approach and contents of the UGR since winter of 2009. A preliminary UGR was released in May 2009 in order to proactively solicit and respond to technical comments. To the extent possible, comments received on the preliminary UGR have been addressed in the draft UGR. Please see Appendix 1 to the Draft UGR for a summary of comments received and draft Metro staff responses. Metro continues to try to give review and comment opportunities, but must meet a State-mandated deadline (end of 2009) for the Metro Council's acceptance of the UGR.
Citizen comments (less than five)	Expand the UGB	The decision about whether or not to expand the UGB will be made by the Metro Council, in consultation with MPAC, in 2010. That decision will be based on the UGR's analysis and any new policies or public investments that are adopted by the end of 2010 that affect the region's capacity.
Citizen comments (approximately 100), Southwest Neighborhoods, Inc.	Focus growth inside the existing UGB	The decision about whether or not to expand the UGB will be made by the Metro Council, in consultation with MPAC, in 2010. That decision will be based on the UGR's analysis and any new policies or public investments that are adopted by the end of 2010 that affect the region's capacity.

Maps 1 through 4:
Multi-family residential refill rates (historical and forecasted)



Single-family residential refill rates (historic and forecasted)

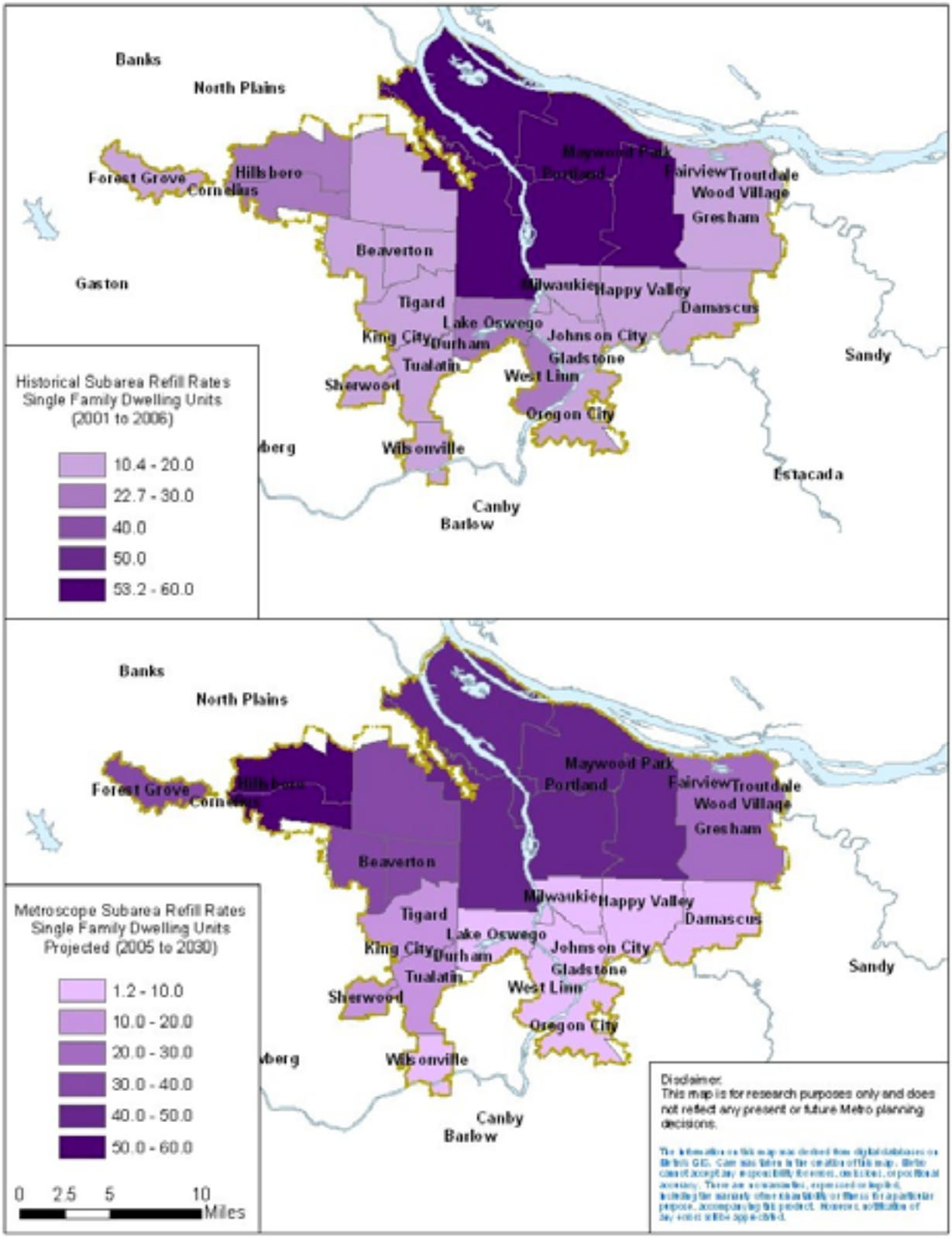


Table 1: Regional Forecast Comparison: History and 2000 UGR Forecast

Population - Portland Region (5 counties)

	Forecast	History	Difference	% Difference	commentary
2000	1,874,450	1,874,450	0	0.0%	forecast base year was 2000 Census
2001	1,902,500	1,922,984	-20,484	-1.1%	recession clouds pessimism in forecast outlook --> under-forecast population growth
2002	1,934,340	1,958,976	-24,636	-1.3%	
2003	1,963,690	1,983,367	-19,677	-1.0%	
2004	2,007,710	2,003,354	4,356	0.2%	jobless recovery dampens regional up turn
2005	2,049,190	2,035,565	13,625	0.7%	
2006	2,090,960	2,075,034	15,926	0.8%	
2007	2,132,750	2,115,394	17,356	0.8%	
2008	2,170,100	2,147,260	22,840	1.1%	unforeseen recession taints trend forecast --> over forecast population growth
2009	2,203,000	2,158,115	44,885	2.1%	as steep drop in housing prices and economy depresses in-migration flows

Sources: Metro Regional Forecast: 2000-2030, Sept. 2002; U.S. Census Bureau; PSU; OFM

Employment - Portland Region (5 counties)

	Forecast	History	Difference	% Difference	commentary
2000	958,010	960,910	-2,900	-0.3%	forecast base year was 2000 BLS jobs
2001	954,750	953,750	1,000	0.1%	job growth stalls as recession hits the region
2002	951,300	932,260	19,040	2.0%	recession grips regional economy over a longer and deeper duration
2003	976,480	922,520	53,960	5.8%	--> over forecast growth during this down-cycle
2004	1,009,280	941,930	67,350	7.2%	
2005	1,043,510	971,190	72,320	7.4%	"jobless" recovery begins adding to a jobs recovery as real estate & finance bubble
2006	1,068,030	1,002,487	65,543	6.5%	spurs economic growth across the nation as growth inches towards pre-recession
2007	1,090,440	1,021,862	68,578	6.7%	growth trend
2008	1,120,200	1,022,319	97,881	9.6%	recession hits again --> over forecast jobs as growth again cycles deeper below
2009	1,144,900	N.A.			expected pre-recession employment trends

sources: Metro Regional Forecast: 2000-2030, Sept. 2000; U.S. Bureau of Labor Statistics and Oregon State Employment Division

5 counties = Multnomah, Clackamas, Washington, Yamhill and Clark

Table 2: Site choices of solar manufacturing firms in Oregon

Company	City	Acres	Using existing building?	Notes
PV Powered	Bend	9	Undetermined (appears yes)	Company founded in Bend. 100,000 square feet of building on former Oregon Woodworking site. Manufactures power inverters.
Solaicx	Portland	21	yes	
SolarWorld	Hillsboro	94	yes	Company in final stages of expansion at Hillsboro site. Moved into existing Komatsu silicon wafer facility.
Peak Sun Silicon	Millersburg	8	no	Company has option to purchase an additional 90 acres in Millersburg
XsunX	Wood Village	8.28	yes	Company first chose Oregon as a location and then began a site selection process, looking for existing buildings. The building that XsunX leases previously housed Merix, a high-tech manufacturer.
SpectraWatt	Hillsboro	20	no	Intel spinoff on Intel campus (has 20 acres). Halted construction because of a lack of investment money. Moved to New York because of public incentives.
Sanyo	Salem	20	no	
Oregon Crystal Technologies	Gresham	Less than 1	yes	In Rockwood urban renewal area – deciding between 2 existing buildings
Uni-Chem	Eugene	200	yes	Locating in old Hynix semiconductor factory, which is 1,000,000 square feet. Remainder of property is vacant.

Pratt, Elizabeth	The League of Women Voters of Portland	October 15, 2009
Price, William R.		September 18, 2009
Qamar, Lawrence		October 15, 2009
Reid, Bill	Johnson Reid LLC	September 29, 2009
Roberts, Jeff		September 21, 2009
Rojas, Carlos		September 16, 2009
Rollow, Nina		September 18, 2009
Ross, Kelly	Western Advocates	October 15, 2009
Schlueter, Jonathan	Westside Economic Alliance	October 15, 2009
Seamons, Joe		September 18, 2009
Smith, Jefferson		October 15, 2009
Spady, Sha		September 21, 2009
Stec, Bradley		September 18, 2009
Stephens, Charlie		
Stout, Mel		September 15, 2009
Streicker, Gail		September 18, 2009
Swaren, Ron		October 15, 2009
Sweeney, J. J.		September 18, 2009
Thompson, James		September 18, 2009
Thrower, Ashley		September 18, 2009
Toll, Peter		September 16, 2009
City of Tualatin (Mayor Lou Ogden)	City of Tualatin	October 14, 2009
Waksman, Steve and Deborah		September 18, 2009
Wallauer, Martha and Robert		September 17, 2009
Washington County (Greg Miller)	Washington County	October 15, 2009
Waterston, Debra		September 18, 2009
Wilkerson, Carol Metzger		September 18, 2009
City of Wilsonville (Stephan Lashbrook)	City of Wilsonville	October 15, 2009
Wixson, Gene		September 18, 2009
Woodruff, Claire		September 18, 2009
Woods, Deanna G.		September 18, 2009
Young, Laura		October 12, 2009
Cities of Banks, Cornelius, Forest Grove, Hillsboro and North Plains (Mayors Kinsky, Bash, Kidd, Willey and Hatcher	Multiple Cities	October 9, 2009

Employment UGR—technical comments		
Comment attribution	**Comment summary**	**Metro staff response**
City of Cornelius City of Forest Grove City of North Plains City of Hillsboro City of Banks Johnson-Reid	Metro's cluster forecast is incorrect because it does not include NAICS code 334, which is the code under which solar panel manufacturing would fall.	All NAICS codes, including 334, are included in the Metro forecast. NAICS code 334 is also included in the cluster forecast. The UGR's narrative erroneously states that SolarWorld is in NAICS code 2211, but this text error has no effect on the forecast or the assessment of land need. See Appendix 3 to the UGR for a list of the NAICS codes that are included in each cluster. See Appendix 12 to the UGR for the complete forecast, which includes all sectors.
City of Cornelius City of Forest Grove City of North Plains City of Hillsboro City of Banks Johnson-Reid	The UGR should forecast future land needs for specific industry clusters, including high tech, solar manufacturing, and bio-pharma.	Statewide Planning Goal 14 (Urbanization) requires that Metro ensure capacity for housing and employment. It does not require Metro to supply land with the specific characteristics that may be desired by individual industries or industry clusters. Long-term predictions about the site needs of specific (and emerging) industries are likely to be incorrect. When making specific decisions to expand the UGB, the needs of industry clusters may be considered.
City of Cornelius, City of Forest Grove, City of North Plains, City of Hillsboro, City of Banks, Johnson-Reid, Port of Portland, Portland Business Alliance, Commercial Association of Realtors	The UGR does not adequately incorporate the analysis found in the Hillsboro Draft Economic Opportunities Analysis.	Statewide Planning Goal 9 (Economic Development) requires cities and counties to provide for the specific types of employment needs and opportunities they identify in their Economic Opportunity Analyses (EOA). Goal 9 does not, however, apply to Metro. Oregon Administrative Rule 660-024-0040(5) states that "except for a metropolitan service district [Metro]… the determination of 20-year employment land need for an urban area must comply with applicable requirements of Goal 9…" EOAs often identify specific employment sectors that are the focus of a city's economic development strategy. In EOAs, those priority clusters are sometimes assumed to see additional growth beyond what is indicated in a trend forecast. The UGR, on the other hand, provides an assessment of all employment sectors without identifying priority sectors. Though it may be beneficial to have a regional economic development strategy, Metro has not been charged with the task of developing that strategy and does not presume to have that role. Metro does, however, have a role in coordinating the population and employment forecasts for the region. Adding up the results of individual city forecasts would likely overstate regional growth in some sectors and understate it in others. Metro has some methodological concerns with the Hillsboro Draft Economic Opportunity Analysis (EOA). Primary concerns include: 1) The Hillsboro EOA's forecast treats Metro's older, pre-recession, medium forecast as a low (baseline) forecast. The Hillsboro EOA forecast explicitly rejects

Employment UGR—technical comments		
Comment attribution	**Comment summary**	**Metro staff response**
		the long-term impacts of the current recession on manufacturing sectors. 2) The Hillsboro forecast for NAICS code 334 (computer and electronic product manufacturing), and photovoltaic panel manufacturing, in particular, is so optimistic that it overwhelms the entire seven-county forecast for this sector. Population growth rates as well as the growth rates for other employment sectors have to have some logical consistency and also fit within the context of a national forecast. If the Hillsboro forecast for this sector were correct, it would have serious implications for overall regional growth as well. Factoring in the multiplier impact of the Hillsboro photovoltaic forecast would essentially explode the forecast for manufacturing, which in turn would stimulate growth in nonmanufacturing sectors such as services, retail, finance and other industries. Assuming the multipliers play out as usual, the employment forecast would likely increase from 1.5 percent annual growth (the current Metro forecast) and exceed two percent annual growth. Already, the Metro regional forecast is projected to grow faster than the U.S. average by 75 percent. At above two percent, our region's projected growth would exceed twice the normal rate. In addition, population growth would have to follow suit. Over a 20 year period, greater than two percent population and total employment growth is not realistic or sustainable. It is unlikely that a mature region like Portland metro can grow so much faster over the long-term than the regional, state and national trends depicted by other forecasters. The Hillsboro forecast for photovoltaic panel manufacturing employment is based on the Oregon Department of Energy goal for megawatts of electricity generated from solar panels. This methodology is predicated on the assumption that a significant share of the world's solar panels will be manufactured in Hillsboro. Solar panel manufacturing has entered a phase of standardization and overseas production, where companies will be competing based on low prices and low wages. Ramped up solar panel production in China and a softening of demand in Europe have resulted in a 50 percent drop in solar panel prices over the last year. This same trend has occurred in many other manufacturing sectors and is not expected to reverse itself. The greater degree of specificity found in the Hillsboro forecast, with its effort to make predictions about particular technologies (e.g. solar panels) makes it more

Employment UGR—technical comments		
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		likely to be incorrect. When planning for the longer term, policy decisions will be much better served by forecasts that portray generalized aggregates that are tied to national data that have been exposed to continuous scrutiny. The Hillsboro EOA does not provide documentation of the methodologies used to forecast additional growth in the bio-tech and high tech clusters.
City of Cornelius City of Forest Grove City of North Plains City of Hillsboro City of Banks Johnson-Reid	Metro's forecast understates growth in solar manufacturing, bio-pharma, and high tech manufacturing, sectors in which our region has historic strengths.	The Metro forecast is based on data from IHS Global Insight, an internationally respected economic forecasting firm whose data is used by numerous public and private institutions. That data is subsequently adjusted to reflect our region's historic trends and economic strengths. Metro's forecast, in fact, indicates that the region will have a faster rate of growth in manufacturing and, more specifically, electronics manufacturing than the United States as a whole. But, as with the rest of the U.S., it is anticipated that manufacturing will represent a smaller share of total employment in the future. The recent recession is anticipated to have long-lasting effects, particularly on industrial sectors. Metro's forecast model has been peer-reviewed as has the recent Metro forecast (which includes the employment forecast). The peer review panel expressed confidence in the forecast's methodologies and results.
Westside Economic Alliance	Metro's forecast calls for a substantial decrease in manufacturing employment. "The Westside Economic Alliance rejects the premises used to explain these forecasts and challenges Metro to reconsider the implications of this vision."	The Metro seven-county forecast indicates growth in manufacturing employment at both the high and low ends of the forecast range. The forecast indicates that manufacturing will represent a smaller share of future employment. The Metro forecast also indicates that at the high end of the employment range forecast, manufacturing may bounce back faster than the rest of the economy.
Westside Economic Alliance	Metro's forecast is incorrect because it assumes that phenomena such as global warming, rising fuel prices, and a degraded environment will stifle population growth in the seven-county region.	Metro's seven-county forecast makes no assumptions about possible catastrophic events. Forecasted population growth rates are the product of large-scale demographic trends. The UGR suggests that rising fuel prices and climate change are compelling reasons to consider growth management policies carefully. The use of a range forecast allows for that policy discussion.
Urban Greenspaces Institute	If Climate Change increases the number of floods and wildland fires, temperatures elsewhere in the U. S., especially in the arid regions of the Southwest, is it possible Climate Change "refugees" might increase population projects even more than your current	Metro staff agrees that there is evidence to suggest that climate change may cause inter-regional migrations, but it is not clear what the degree and direction of these migrations may be. Consequently, Metro's seven-county forecast makes no assumptions about possible catastrophic events. The UGR suggests that rising fuel prices and climate change are compelling reasons to consider growth

Employment UGR—technical comments		
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	modeling suggests?	management policies carefully. The use of a range forecast allows for that policy discussion.
Westside Economic Alliance	The seven-county forecast is wrong because growth rates are lower than at any time since Oregon was granted statehood.	Growth rates are forecasted to decline, but this is because of the mathematics of having an ever larger base (existing) population. When expressed in absolute numbers, the forecast is consistent with previous forecasts, which have proven accurate (see Table 1, attached to the end of this document, for a comparison of an older Metro forecast with actual growth).
City of Cornelius City of Forest Grove City of North Plains City of Hillsboro City of Banks Johnson-Reid	The presence of an existing solar manufacturing cluster in Hillsboro will result in western Washington County capturing the bulk of future high tech and solar manufacturing jobs.	Solar manufacturing firms can be found throughout Oregon, the United States, and the world. Please see Table 2, attached to the end of this document, for a summary of Oregon's recent solar recruits' location choices. Two out of the nine recruits are in Hillsboro (one of those two, SpectraWatt, has since relocated to New York because of public subsidies), while the remaining firms are dispersed throughout the state.
Port of Portland	A job forecast is inadequate for assessing land needs associated with commodity flows (freight, logistics).	This is a comment that Metro received on the preliminary UGR as well. Metro would welcome specific suggestions on how to perform this portion of the assessment differently, but has not received any to date. Staff proposes that the final UGR should reflect the Metro Policy Advisory Committee's recommendation to revise the identified demand for large lot capacity from 200-800 acres to 200-1,500 acres. This revision would acknowledge the potential shortcomings of using an employment forecast as the sole basis for assessing large lot demand. The UGR's analysis 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. These adjustments should address some concerns about land demand for freight uses.
Port of Portland	Freight facility expansion would likely consume other industrial land, which, in turn, would trigger demand for additional industrial land elsewhere in the region.	Freight-related jobs are included in the regional forecast and demand for capacity that is generated by these jobs is included in the UGR's assessment. Suggestions that a job forecast is not an adequate means of estimating land demand for freight uses have not been accompanied by specific suggestions for an alternative methodology.

Employment UGR—technical comments		
Comment attribution	**Comment summary**	**Metro staff response**
		Staff proposes that the final UGR should reflect the Metro Policy Advisory Committee's recommendation to revise the identified demand for large lot capacity from 200-800 acres to 200-1,500 acres. This revision would acknowledge the potential shortcomings of using an employment forecast as the sole basis for assessing large lot demand.
Port of Portland	Modify the region's assumed job capture rate to make it more aggressive.	The capture rates (industrial and non-industrial) used by Metro in the UGR are an output of scenario modeling. The policy and investment inputs into that modeling are intended to represent a continuation of current policies and investment trends. If the region is to achieve a higher job capture rate, it would likely need to implement new policies and investments. Expressing a different point of view, we have received comments from Clark County and Vancouver that the assumed capture rate is too high.
City of Cornelius City of Forest Grove City of North Plains City of Hillsboro City of Banks Johnson-Reid	Large, vacant lots are needed in order to attract solar manufacturers to the Portland metropolitan region.	The location choices of several of Oregon's recent solar manufacturing recruits indicate that large, vacant lots are not needed by most firms. Please see Table 2, attached to the end of this document, for a summary of Oregon's recent solar recruits' location choices. Of the nine recent recruits listed, seven are on properties smaller than 25 acres (three of those are on less than 10 acres). Two-thirds of these recent recruits, including SolarWorld, North America's largest solar manufacturer, have located in existing buildings. One firm, SpectraWatt, has left Oregon for New York despite having a vacant 20 acre site (cited reason is because the public subsidies offered were more enticing). Staff proposes that the final UGR should reflect the Metro Policy Advisory Committee's recommendation to revise the identified demand for large lot capacity from 200-800 acres to 200-1,500 acres. This revision would acknowledge the potential shortcomings of using an employment forecast as the sole basis for assessing large lot demand. The Metro staff recommendation is that the region should find ways to use our existing inventory of land more efficiently.
Port of Portland, Commercial Real Estate Economic Coalition	Land must be in the right amount and in the right location for the needed purpose.	Statewide Planning Goal 14 (Urbanization) requires that Metro ensure capacity for housing and employment. It does not require Metro to supply land with the specific characteristics that may be desired by individual industries or industry clusters.

Employment UGR—technical comments		
Comment attribution	**Comment summary**	**Metro staff response**
		The purpose of the UGR is to identify any gap in capacity, not to assess how and where to address the gap. Local and regional investments can support efficient utilization of land inside the UGB.
Port of Portland	Much of the region's inventory of industrial land is not ready for development due to substantial constraints including brownfield status, location or lack of infrastructure, and regulatory overlays.	These constraints are taken into account in the UGR. Brownfield sites are assumed to only be available for development in the longer term. Only half of the capacity in recent UGB expansion areas is assumed to be available in the 20-year time frame because of infrastructure shortcomings. Portions of tax lots with environmental constraints are not included in the buildable land inventory. See Tables 27 and 28 on pages 72 and 73 of the UGR for additional information.
Commercial Association of Realtors	The UGR should not assume that public financing will be in place for unknown targeted public investments.	The UGR only assumes those policies and investment trends that currently exist.
Port of Portland	The buildable land inventory does not account for upland habitat protections that reduce capacity for development.	Title 13 (Nature in Neighborhoods) upland habitat protections only apply to future UGB expansion areas. The UGR assesses the current UGB's capacity.
Urban Greenspaces Institute	How many acres of the region's supply of buildable land for employment are urban forest canopy, headwaters areas, and other natural resource lands?	The UGR's buildable land inventory takes into account existing environmental regulations, discounting the inventory where appropriate.
Port of Portland	The lack of development in new urban areas (areas brought into the UGB since 1997) is not necessarily because of a lack of infrastructure or governance, but because the land is not suitable for industrial development.	Past UGB expansions have been made in the types of locations that are dictated by current State law. Over time, these areas are intended to develop into complete communities, including employment opportunities. It is hoped that the designation of urban reserves will identify sites that are well-suited for development. Metro staff believes that infrastructure and governance must be addressed to make any future UGB expansion areas developable.
City of Tualatin, Commercial Association of Realtors	The UGR should not assume that industrial uses will locate in multi-story buildings.	The UGR's analysis does not assume that industrial uses will locate in multi-story buildings.
Commercial Association of Realtors	The UGR should not assume "ever-increasing" floor-area ratios for all building types with no regard for market feasibility.	Metro staff concurs and asserts that the UGR's assumptions regarding floor-area ratios (FAR) are conservative. No change in FAR is assumed in the short-term and very modest increases (10%) are assumed in the long-term. Assumptions about increases in FARs for industrial uses are particularly modest. The FARs that are assumed in the UGR account for the thresholds at which structured parking becomes necessary.
Commercial Association	The refill rates assumed in the UGR do not seem	The refill rates assumed in the UGR are the product of modeling that is informed

Appendices 2-13 are available electronically or printed upon request

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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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