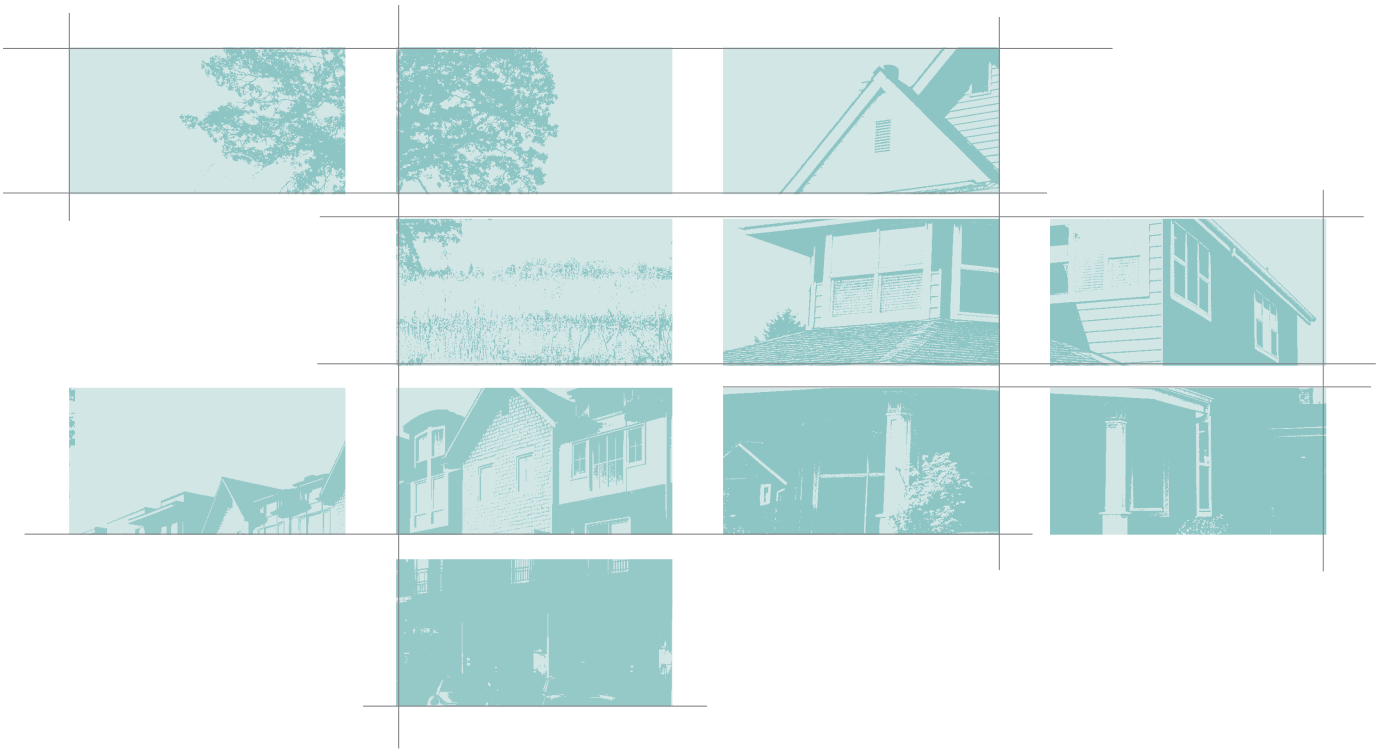

PRELIMINARY URBAN GROWTH REPORT

2009 – 2030

Residential

March 2009 draft

Metro | *People places. Open spaces.*

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INTRODUCTION

Oregon's land use laws were crafted to protect and maintain a high quality of life for our residents. Because one of the most important measures of quality of life is the ability to choose an appropriate and affordable place to live, our land use laws address how we as a society provide housing opportunities for people.

In the Portland metropolitan area, Metro is the agency legally responsible for anticipating changes in population and monitoring the availability of an array of housing to meet people's needs. Oregon land use law requires that Metro maintain capacity sufficient to house the numbers 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 capacity within the urban growth boundary, forecasts population growth over a 20-year timeframe, calculates the anticipated need, and documents the results of these analyses in an urban growth report. This preliminary urban growth report provides the analysis of residential capacity and demand, described in the context of a range. A separate report provides an analysis of employment capacity and demand.

This preliminary residential urban growth report is not intended to solve any identified capacity gap. That determination remains for local and regional discussion, 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 twenty 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 this preliminary urban growth report will likely be amended as a result of local and regional discussions and policy changes made in the spring and summer of 2009. This preliminary analysis provides a vehicle for seeking feedback on assumptions. The analysis will be revised and released as a draft in September for the Metro Council to consider for adoption.

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 preliminary urban growth report provides the region with an opportunity to assess how it has been performing and 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 climate change demand that we do things differently and make a new approach to our growth management responsibilities all the more timely.

The determination of housing demand and capacity is necessarily part art and part science. State statutes and statewide planning goals direct the region to determine what share of growth can "reasonably" be accommodated inside the existing boundary 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 boundary 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 or not there is a residential capacity need when looking out over the next 20 years, but also to place growth management decisions in the context of the region's desired outcomes.

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 preliminary 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 well in advance of required growth management decisions to allow for adequate consideration of local policy options (e.g. zoning and public investments) and regional policy options (e.g. boundary adjustments and transportation investments) and the likely outcomes of those options. To inform that discussion, a report on the region's historic performance is attached to this report as Appendix 2.

As the region's leaders review this analysis of forecasted residential demand and the current boundary's capacity to meet that demand, there are a number of questions to keep in mind:

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. The world is changing rapidly - what policy and investment adjustments might the region need to make to prepare?
3. What 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?
4. 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?
5. What are the public and private costs associated with growth management choices?
6. How do we equitably distribute the benefits and burdens of growth across the region?
7. Should the region prioritize investments that best leverage local commitments? What does a jurisdiction need to have in place to take advantage of regional investments?
8. In addition to the creation of residential capacity, are there reasons (based on the six desired outcomes) to expand the urban growth boundary? Under what conditions should the boundary be expanded?
9. How might our region's policies and investments interact with actions taken in neighbor cities, Clark County, and Salem?
10. How might public and private actions reinforce each other to achieve the region's desired outcomes?

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 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 boundary. It is up to all of the cities and counties in the region to

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.

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[1] 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 (e.g. 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))

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

[1] *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)

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 boundary or exclusively through future boundary expansions. There are potential limitations and tradeoffs to each approach.

Permit data reveals that very little residential growth has actually occurred in boundary expansion areas. Out of all of the residential units permitted in the three-county area during the 1998 to 2008 period, only four percent occurred in expansion areas that were added to the urban growth boundary after it was originally put in place thirty years ago, in 1979. Accommodating the majority of growth through boundary 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 boundary expansion areas; 3) it has also become clear that a growth strategy that relies primarily on boundary expansions would likely result in increased automobile reliance, making it difficult or impossible to reduce greenhouse gas emissions as mandated by Oregon law. In light of increasing energy costs, automobile dependence would result in higher combined costs of transportation and housing.

STATUTORY REQUIREMENTS

This capacity analysis is required in order 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."

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."

TIMELINE

This preliminary residential urban growth report is being released well before decisions must be made to allow substantial discussion at both the policy and technical levels. Refinements to the data and assumptions as well as local and regional actions that affect residential capacity that are put in place in 2009 will be considered for inclusion in the final urban growth report adopted by Metro Council.

Spring-Summer 2009: Regional leaders will engage in a more specific discussion of the long-term aspirations of local communities and the capacity assumptions in the preliminary analyses, culminating in a draft urban growth report to be issued in September 2009.

December 2009: Metro Council will accept a 2030 population and employment range forecast and complete a final report that describes any capacity gap to be addressed in 2010.

December 2010: Local and regional governments will continue to implement policies and investments to create and enhance great communities while accommodating anticipated growth. Metro Council will submit plans to accommodate at least 50 percent of any 20-year capacity need (through local and regional actions inside the boundary or through expansions) to the Oregon Land Conservation and Development Commission.

December 2011: *If any* additional 20-year capacity need remains, the Metro Council will consider urban growth boundary expansions into designated urban reserves.

REPORT ORGANIZATION

Metro's approach to this preliminary residential 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:

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 how well existing policies measure against a series of indicators

Next steps: indicates growth management decision timeline

Metro has produced a substantial amount of information that supports this report. Much of this is contained in the following appendices:

Appendix 1	Capacity methodology
Appendix 2	Report on past performance (related to six desired outcomes)
Appendix 3	Documentation of MetroScope scenario assumptions
Appendix 4	Forecast (full population and employment forecast write up; available April 2009)
Appendix 5	Legal requirements for urban growth report (Available with August draft urban growth report)

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[2] 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)

[2] *"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 1**) 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 2**) 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 1 **Percent of state tax collections in 2006**
Source: Oregon Taskforce on Comprehensive Revenue Restructuring

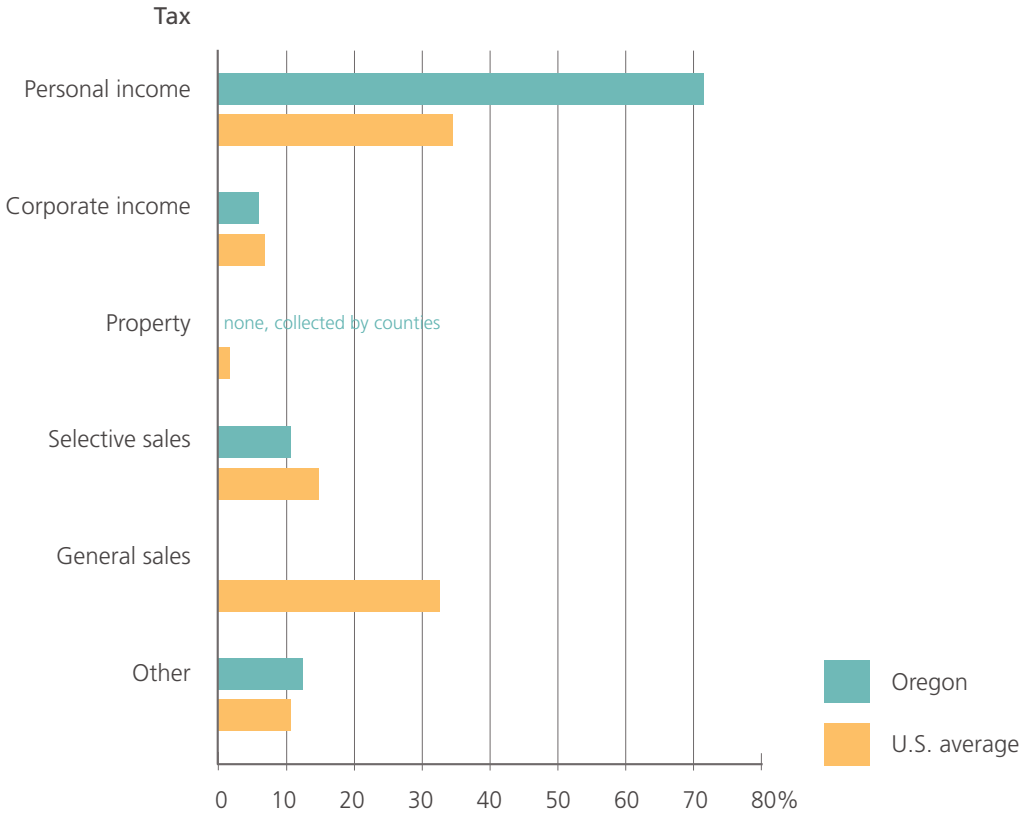
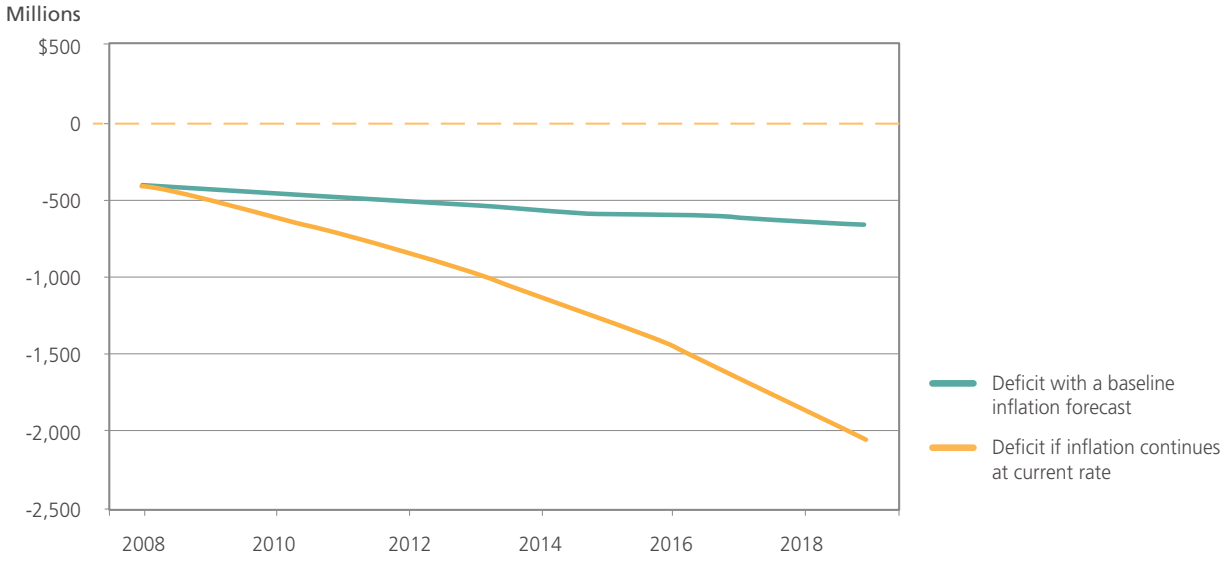


Figure 2 **Projected gap between city/county revenue and expenditures under two inflation scenarios**
Source: Oregon Taskforce on Comprehensive Revenue Restructuring



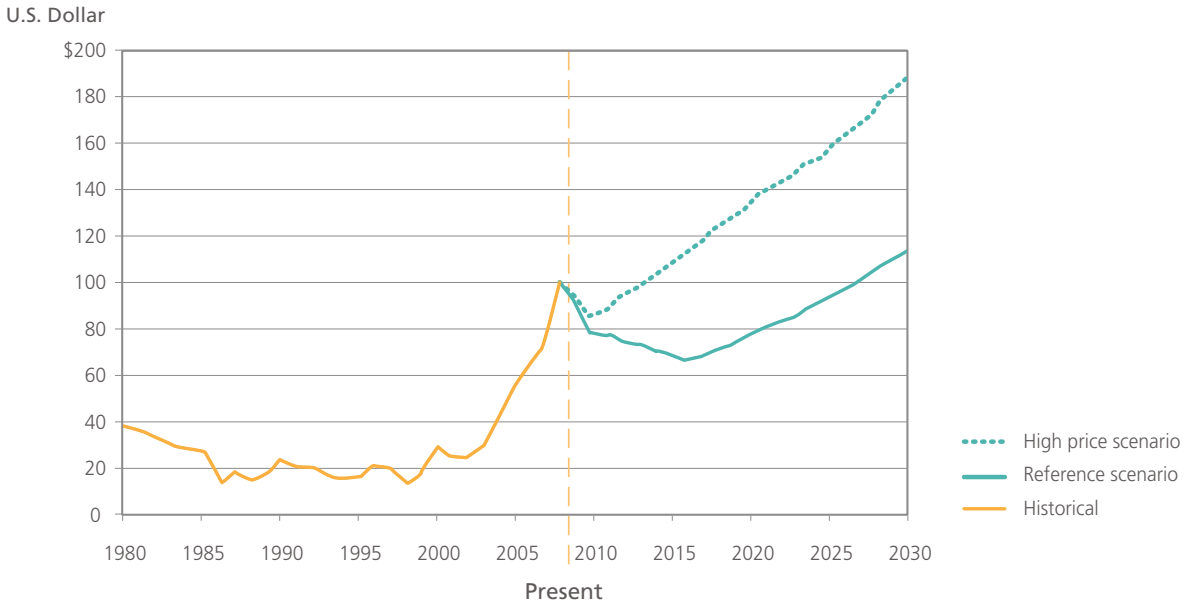
Energy prices and residential demand

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 3**) 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.

Figure 3 Forecasted world oil price per barrel under two scenarios
Source: U.S. Energy Information Administration



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.

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 4.

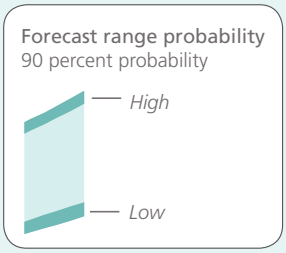
What does the range mean?

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.

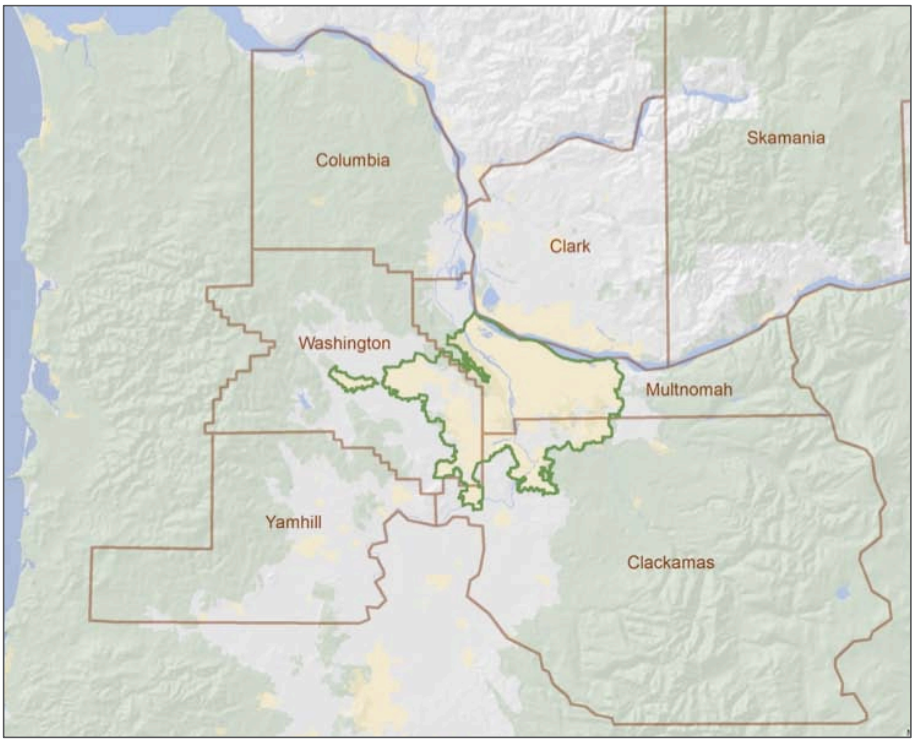


Forecast overview

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 population 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 U.S. It relies on national growth factors obtained from the economic forecasting firm Global Insight, Inc., as well as birth and death rates derived from the U.S. Census Bureau's most current "middle series" fertility and survival rates.

The regional geography for the Portland-Beaverton-Vancouver OR-WA Primary Metropolitan Statistical Area (PMSA) 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. For purposes of this preliminary report, the forecast time period is 2030.

Map 1: Portland-Beaverton-Vancouver OR-WA PMSA



Geographic extent of the regional forecast encompasses seven counties. The Metro urban growth boundary comprises a fraction of the land area of the region.

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 4 and Table 1**)

These are but a few examples of the many factors that will ultimately affect both population and employment trends in the region.

Figure 4: 2007 – 2060 Population forecast
Portland, Beaverton, Vancouver PMSA, Source: Metro

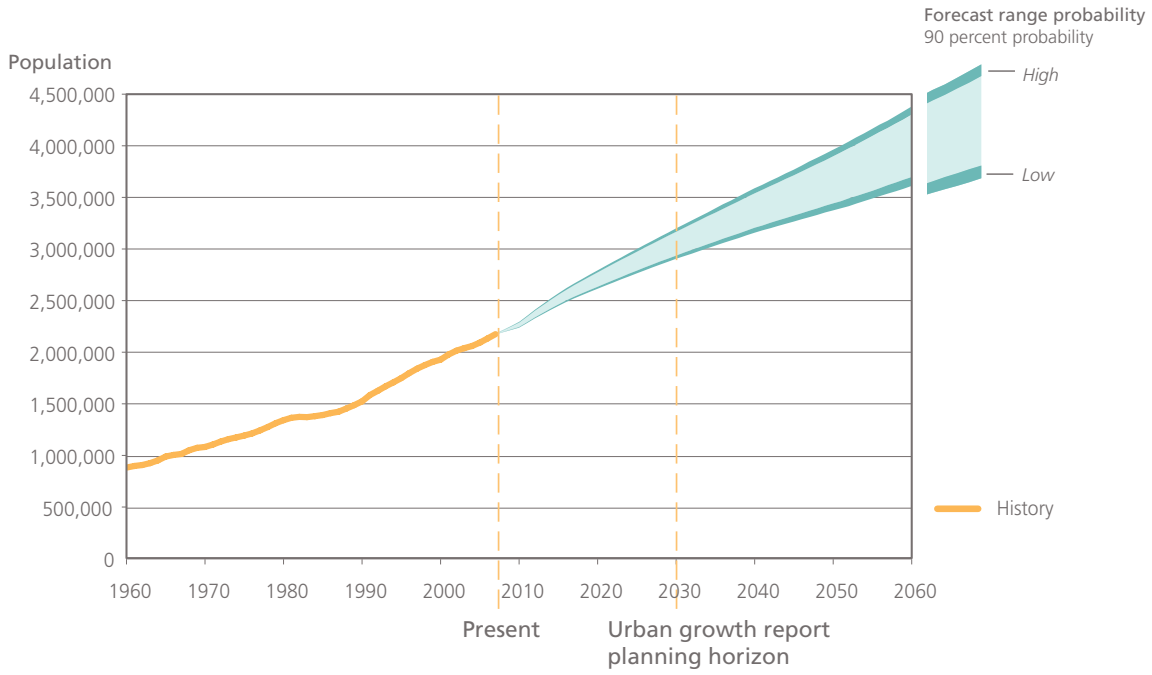


Table 1: Population range forecast and annual percentage rate change from year 2000
Portland, Beaverton, Vancouver PMSA, Source: Metro

Year	Low end of range	High end of range
2000 *1,927,881 Actual*		
2030	2,903,300	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

Since people live in households and households are more indicative of the range of dwelling units needed within the 20-year time horizon, 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. (**See Table 2**)

Table 2: Household forecast and annual percentage rate change from year 2000
Portland, Beaverton, Vancouver PMSA, Source: Metro

Year	Low end of range	High end of range
2000 *742,300 Actual*		
2030	1,181,300	1,301,800
	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 preliminary report is based on historical data from 1979 to present. (**See Table 3**) 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 3) for this preliminary urban growth report are included in the "Performance" section of this report.

Table 3: Metro urban growth boundary 20-year capture rate
Portland, Beaverton, Vancouver PMSA, Source: Metro

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). Maintaining a twenty-year supply for housing that is updated every five years may avoid this complication, but Metro included a vacancy rate in previous analyses to facilitate housing market functionality. 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.

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 4**.

Table 4: Dwelling unit demand range in Metro urban growth boundary, 2007-2030 [3]
61.8% capture rate, 4% vacancy rate

Low end of forecast range	High end of forecast range
224,000 dwelling units	301,500 dwelling units

[3] *Our base year is necessarily 2007 because this represents the latest RLIS buildable land data.*

SUPPLY (CAPACITY) RANGE

Determining the total residential capacity of the current urban growth boundary is not as simple as adding up the maximum zoned capacity of all parcels. Many parcels inside the 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. Because of 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 boundary, in Clark County, Washington and in neighboring cities.

Capacity changes over time as real estate market conditions change. A primary purpose of this preliminary urban growth report is to begin a discussion of how the region might make more of its existing capacity market-feasible, both on vacant 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?

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 2). The 2040 Growth Concept calls for encouraging growth in centers and corridors to minimize impacts on existing neighborhoods and the need for boundary expansions.

Development in urban growth boundary expansion areas: The region's original urban growth boundary 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 urban growth boundary contained 227,491 acres. Subsequent expansions have added a total of 28,000 acres to the urban growth boundary and make up about 11 percent of the land area of the current urban growth boundary. These expansions have been made with the aim that they maintain these qualities while providing additional residential and employment capacity.

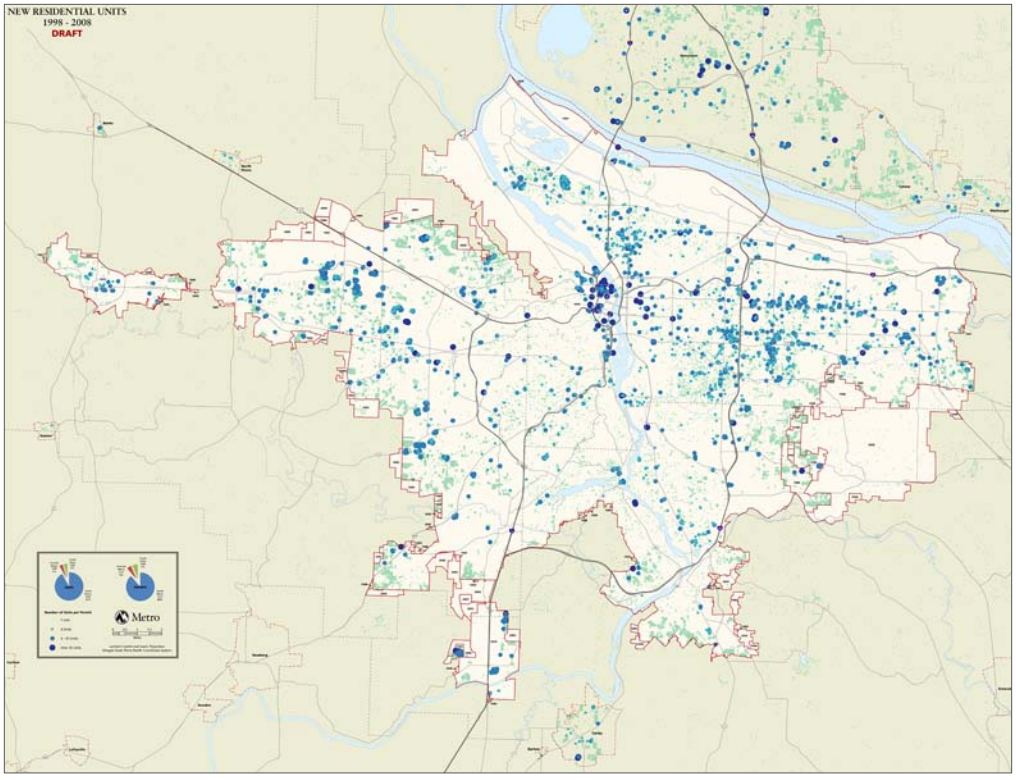
Permit data for the ten-year period from 1998 through 2008[4] provide some insight into where development has happened and whether or not it is in keeping with the 2040 regional vision. The permit data indicate that relatively little new development has occurred in these boundary expansion areas (5.5 percent of permitted units) when compared with the amount that has occurred inside the original boundary (94.5 percent of permitted units). (**See Table 5**) This is despite the fact that the 28,000 acres of urban growth boundary expansions comprise 11 percent of the land area of the current boundary. Also of note, the majority of the development that has occurred in post-1980 boundary expansions has been single-family development. There appears to be a limited market for higher density housing products in boundary expansion areas.

[4] *Caveat – a limitation of this data that not all permitted units were necessarily built.*

Table 5: Dwelling unit permits by UGB expansion area, 1998-2008

	In current boundary	In original 1979 boundary	In 1980-1999 boundary expansion areas	In 2000-2008 boundary expansion areas
All permitted dwelling units				
Total number of units	90,566	85,657	4,411	498
Percentage of total unit permits in current boundary	100%	94.6%	4.9%	0.5%
Single-family dwelling units				
Total number of units	52,748	48,473	3,777	498
Percentage of total unit permits in current boundary	58.2%	54%	4.2%	0.5%
Multi-family dwelling units				
Total number of units	37,818	37,184	634	0
Percentage of total unit permits in current boundary	41.8%	41.1%	0.7%	0%

Map 2: New residential units by permit type, 1998-2008



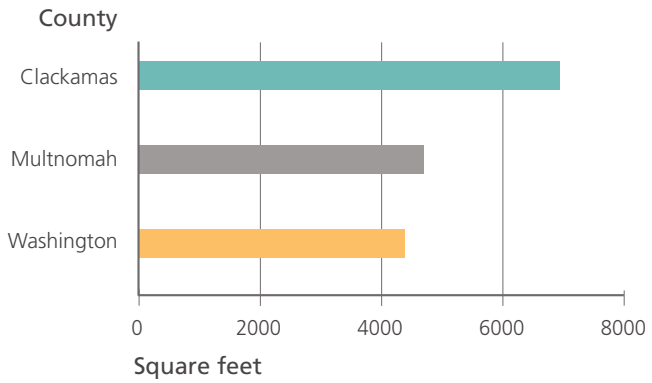
Development in centers and corridors: Over the past ten years (from 1998 to 2008), 32.4 percent of the residential building permits issued in the current urban growth boundary were in the region's central city, centers, and corridors, the very places identified in our long-range vision, the 2040 Growth Concept. These permit data indicate that, of the various 2040 design types, the region's designated corridors have accommodated a significant share of residential growth. Corridors, accommodating 15.2 percent of new residential units (permits) over this time period, are followed by town centers at 8.3 percent, the Central City at 6.5 percent, and regional centers at 2.3 percent. (**See Table 6**)

Table 6: Dwelling unit permits by 2040 design type, 1998-2008

	In current boundary	Within central city	Within regional centers	Within town centers	Within corridors	Within centers and corridors
All permitted dwelling units						
Total number of units	90,566	5,928	2,125	7,496	13,783	29,332
Percentage of total unit permits in current boundary	100%	6.5%	2.3%	8.3%	15.2%	32.4%
Single-family dwelling units						
Total number of units	52,748	8	279	1,907	5,031	7,225
Percentage of total unit permits in current boundary	58.2%	0%	0.3%	2.1%	5.6%	8%
Multi-family dwelling units						
Total number of units	37,818	5,920	1,846	5,589	8,752	22,107
Percentage of total unit permits in current boundary	41.8%	6.5%	2.0%	6.2%	9.7%	24.4%

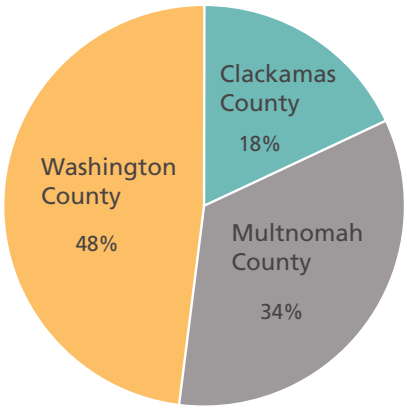
Trends in single-family residences (newly built homes from 2000 to 2005)

Figure 5: Average lot size for new single family construction, 2000-2005



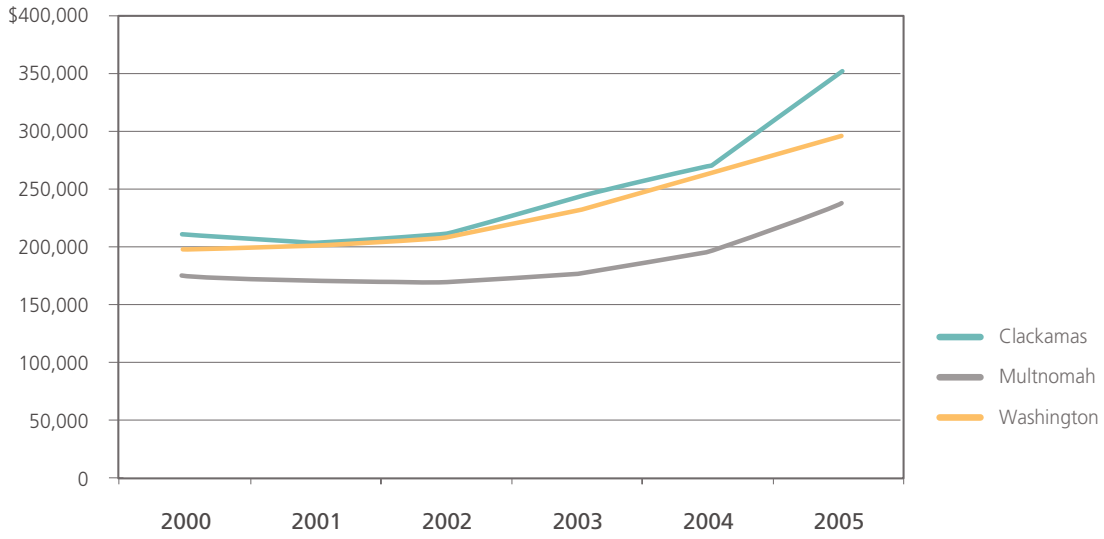
Average lot sizes for new construction vary considerably from county to county with lot sizes in Multnomah and Washington counties averaging about 4,500 square feet, about 2/3 of the average lot size in Clackamas County (7,000 square feet). (**See Figure 5**) These data are for entire counties, not just areas inside the boundary.

Figure 6: Percentage of newly built single-family houses, 2000-2005



Almost half of the newly built (2000 to 2005) single-family residences are in Washington County. (**See Figure 6**)

Figure 7: Median home sale price for newly built homes, 2000-2005



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 7**)

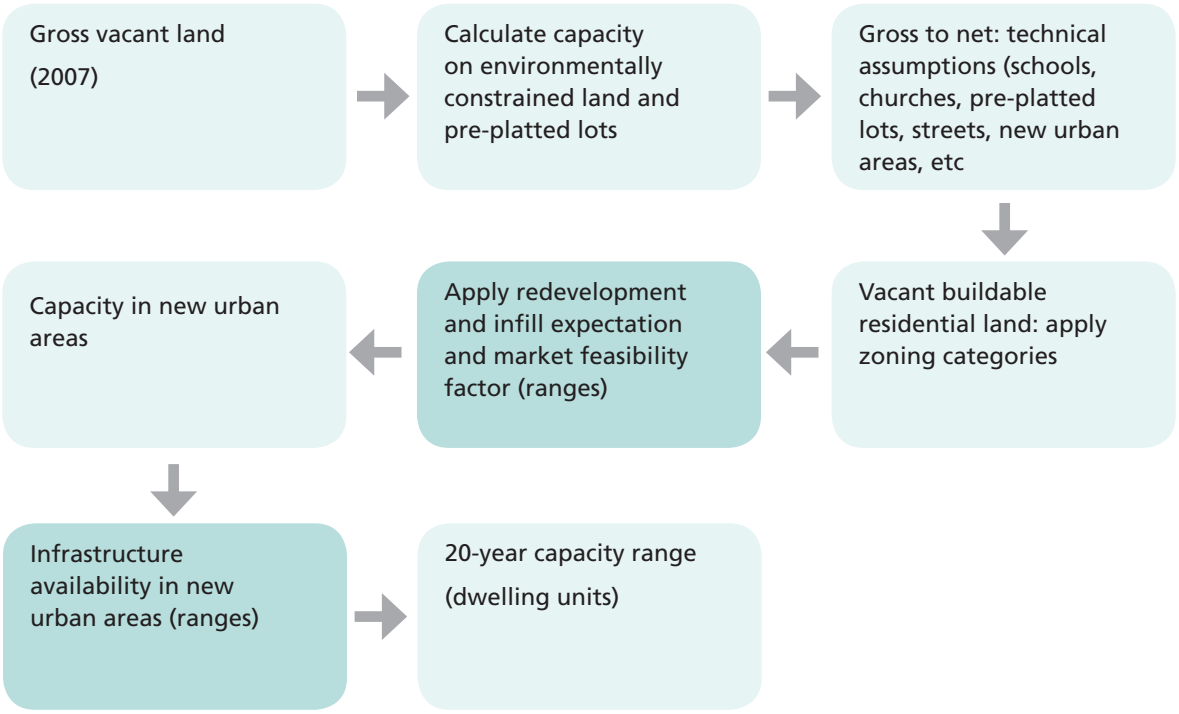
Implementation of the 2040 Growth Concept through local zoning changes: Local governments have taken substantial steps to implement the region's vision for its centers and corridors. From the years 2000 to 2007, many vacant lands have been rezoned as mixed-use residential, adding capacity for an additional 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 urban growth boundary 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 8 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 1.

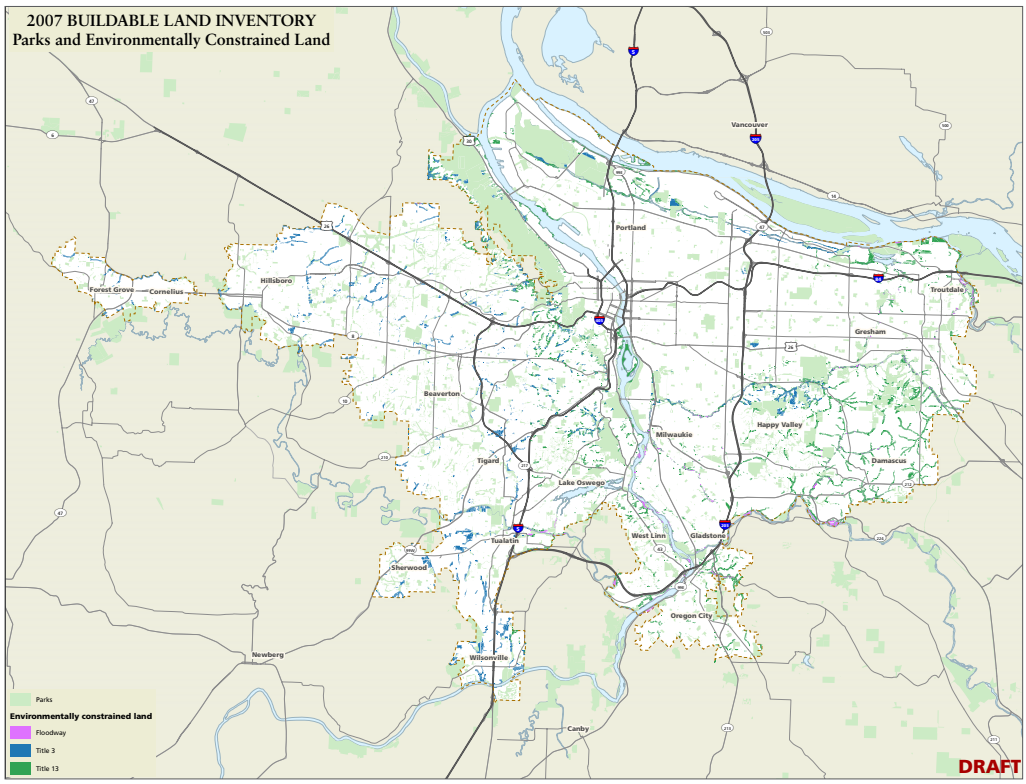
Figure 8: Steps in analyzing residential capacity



Gross vacant land: Vacant land inside the current (as of January 2009) Metro urb 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 values open space, habitat protection, and clean water protection for their contributions to the quality of life citizens of our region enjoy. **(See Map 3)** 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). 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 3: Parks and protective overlays



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 urban growth boundary already own 1,000 acres of vacant land. The regional forecast includes a projection of student population and enrollment for residents inside the boundary. A land need forecast for future schools is calculated from the regional forecast and student-acre ratios. This forecast identified no additional land need other than what schools presently own; thus no additional set aside is assumed except for the 1,000 acres that schools have already land banked.

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. 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: The future park land demand forecast is based on an estimate of existing system development charges (SDC) which local jurisdictions levy on new development. The land estimate for future parks is based on how much land SDC fees are likely able to purchase in the next 20 year period.

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 new urban areas which were brought into the boundary have yet to receive urban zoning densities – zoning still retains rural residential zoning densities or other rural designation. Including new urban areas through the conventional land density calculation and assuming rural densities would provide an inaccurate assessment of future residential capacity of new urban areas. A more accurate means of forecasting residential capacity for the new urban areas is to rely on the most current concept plan density assumptions, therefore these units are calculated separately as detailed below.

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 9** 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 7**)

Figure 9: Percentage of dwelling unit capacity on vacant lands inside the urban growth boundary

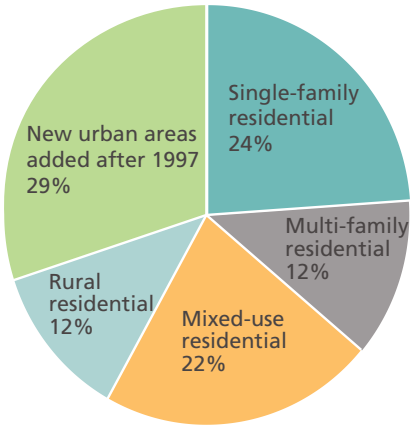


Table 7: Initial dwelling unit estimate from environmentally unconstrained vacant land

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 10 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 10: Percentage of dwelling unit capacity on vacant land by zone class
Excludes post 1997 urban growth boundary expansion land

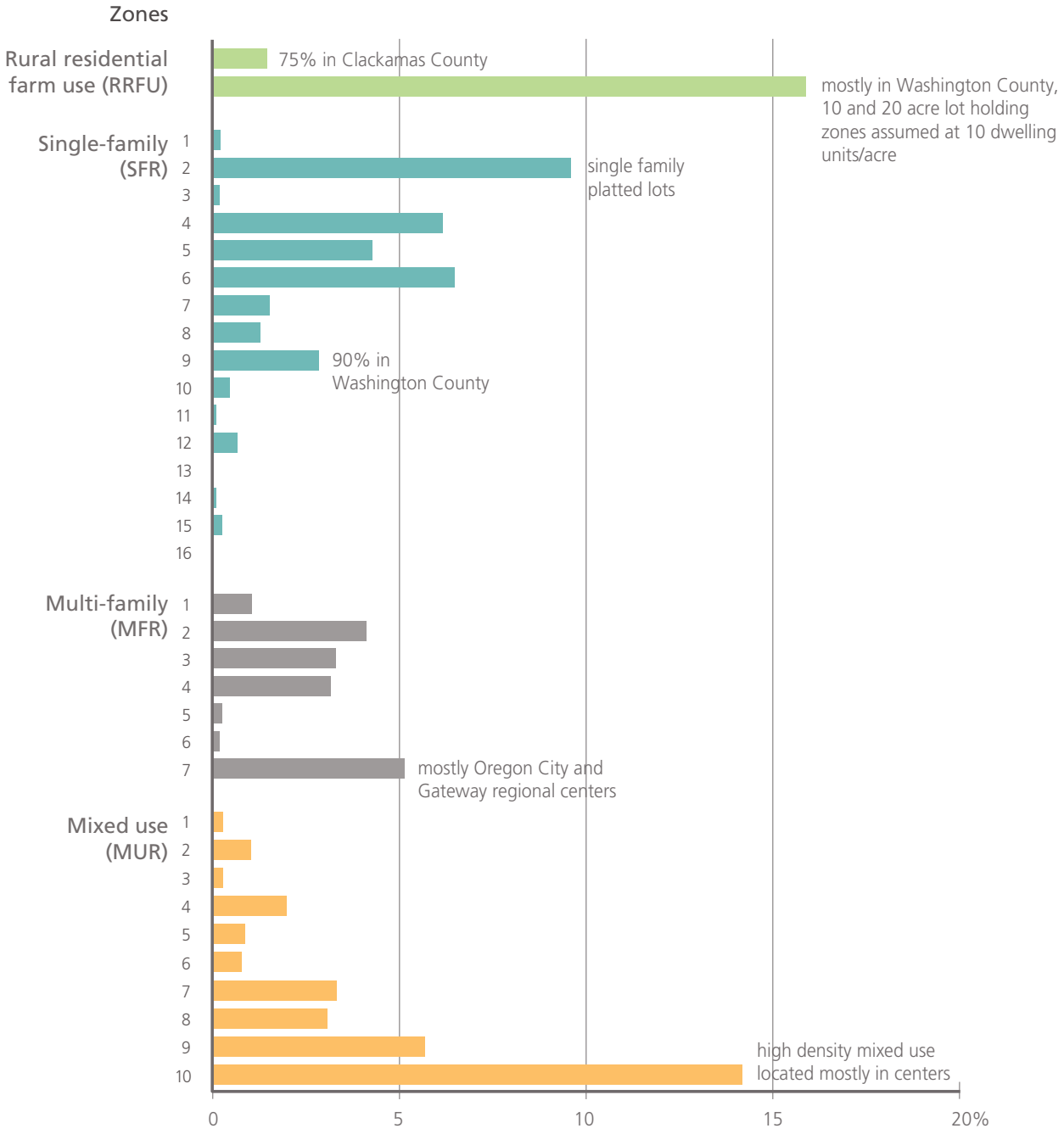


Figure 10 zoning types

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)

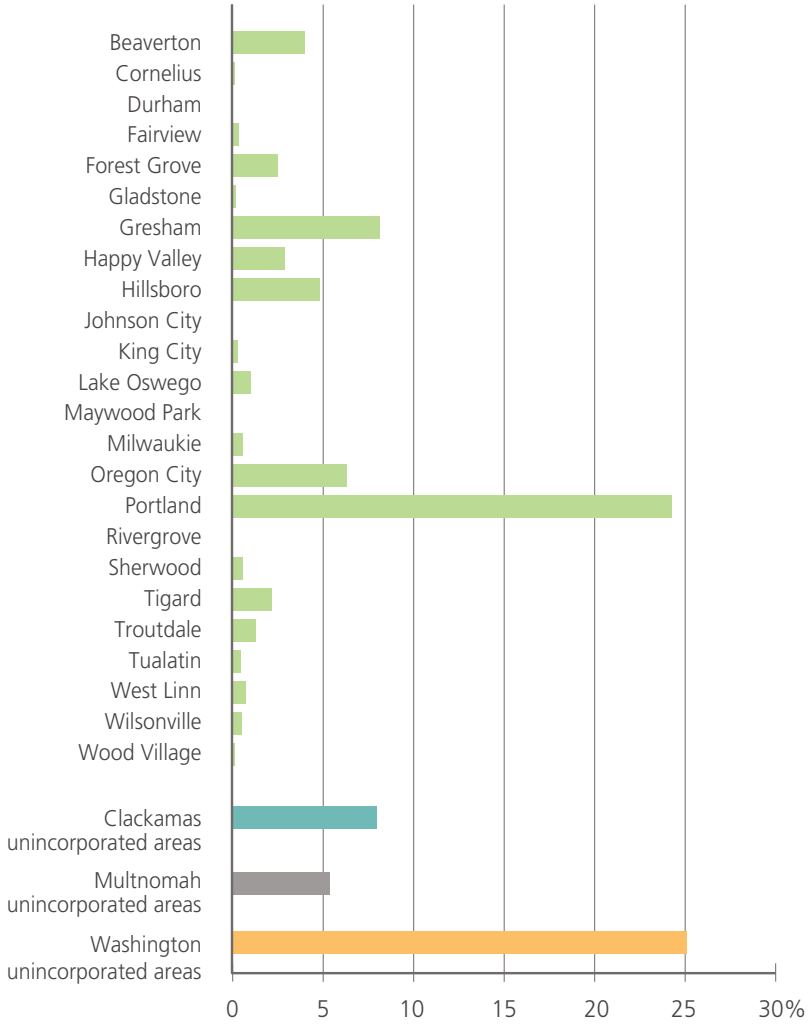
1 Max density permitted is 15 units / net acre.
2 Max density permitted is 20 units / net acre.
3 Max density permitted is 25 units / net acre.
4 Max density permitted is 30 units / net acre.
5 Max density permitted is 35 units / net acre.
6 Max density permitted is 40 units / net acre.
7 Max density 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 11 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 11: Percentage of dwelling unit capacity on net vacant buildable land by jurisdiction (maximum zoning applied)
Excludes post 1997 urban growth boundary expansion land



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: The underbuild factor is based on physical constraints, such as odd shaped lots, that make development up to 100 percent of maximum-zoned density to be impractical. Consistent with previous studies and discussion in the 2002 urban growth report process, this report 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 and infrastructure availability in new urban areas.

Residential refill demand: Residential refill is the combination of expected amount of future redevelopment and infill. It is not the available capacity that is established through local zoning, it is a "demand" estimate of the number of future dwelling units that will be accommodated on land that the RLIS database counts as "developed land" in the year 2007. A refill rate may be derived from a discrete MetroScope scenario or historical data. The observed residential refill rate for 2000 to 2006 averaged about 27 percent. Annual historical rates have fluctuated between 15 and 35 percent, depending upon economic business cycle activity. Historical data show the refill rate falling during economic downturns and rising when the economic cycle gained momentum. MetroScope scenarios have indicated that the future refill rate could increase above 40 percent. This preliminary analysis uses the historical rate to inform the low end of the supply range and the modeled rate to inform the high end of the supply range. The rate is multiplied against future housing unit demand to arrive at a projection of residential refill and represents the extent to which the unused zoned capacity of developed land will get used through redevelopment.

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) 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.

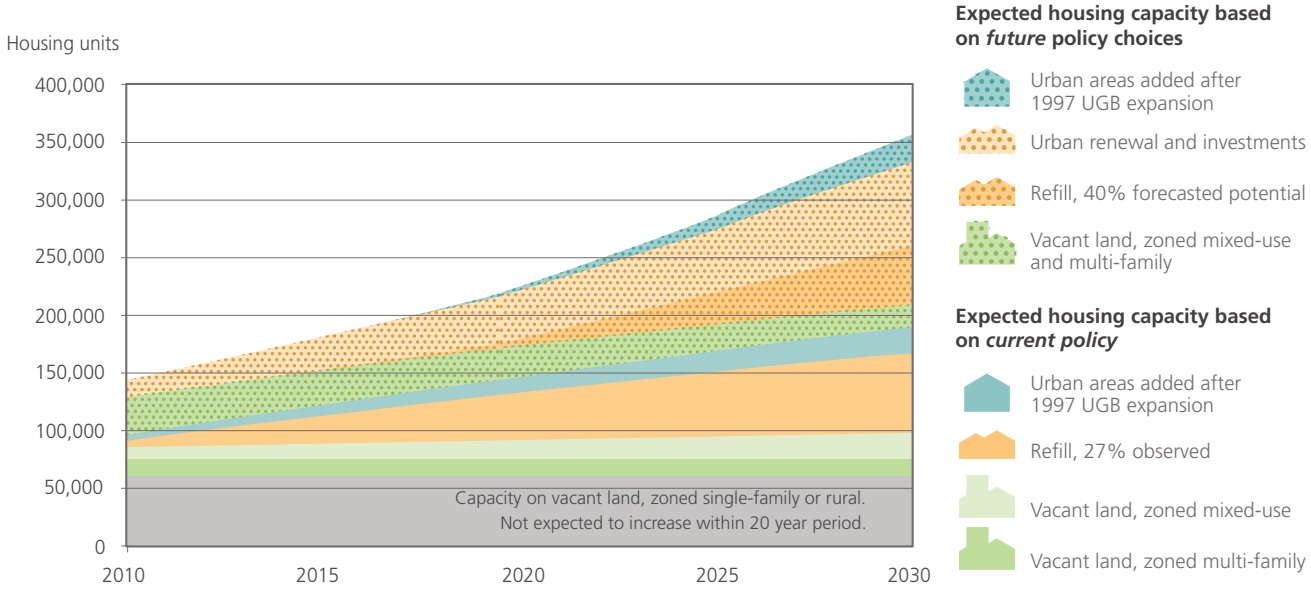
New urban area market feasibility factor: New urban areas are not expected to yield full development at maximum planned density in the next 20 years due to infeasible market conditions, lack of infrastructure and/or financing ability to produce urban densities. Market feasibility is derived from a discrete 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 12 depicts the range of potential residential capacity in the current urban growth boundary. 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 deemed to be zoned capacity that requires additional policy or investment actions to render it market feasible by the year 2030.

Figure 12 Residential dwelling unit capacity range: 2010-2030
Within current Metro urban growth boundary



Expected housing capacity based on *current* policies

The first type of capacity that is depicted in **Figure 12** is zoned capacity inside the current urban growth boundary 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 (27 percent, in keeping with historic rates) that could occur through redevelopment and infill ("refill") by the year 2030 (shown in orange). Finally, a portion of new urban areas (areas brought into the urban growth boundary since 1997) is deemed to be market feasible by the year 2030 (shown in blue).

Expected housing capacity based on *future* policy choices

The second type of capacity that is depicted in **Figure 12** 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. 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 12** are derived from MetroScope scenarios that test the effects of different policy and investment options. A final potential source of capacity is through future urban growth boundary expansions (not shown in **Figure 12**). These expansions, if they occur, will also require significant investments to be market-feasible.

Table 8 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 8 Assumptions that establish the range of capacity

Low supply assumptions:	**High supply assumptions:**
• Market feasibility factor applied to high-density multi-family and new urban areas • Refill at 27% (observed) • No units from urban renewal or incentives	• Market feasibility factor NOT applied to high-density multi-family and new urban areas • Refill at 40% (forecasted potential) • Additional units from urban renewal and/or incentives
184,500 dwelling units	**358,300 dwelling units**

There are two categories of potential capacity within the current urban growth boundary. 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?

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.

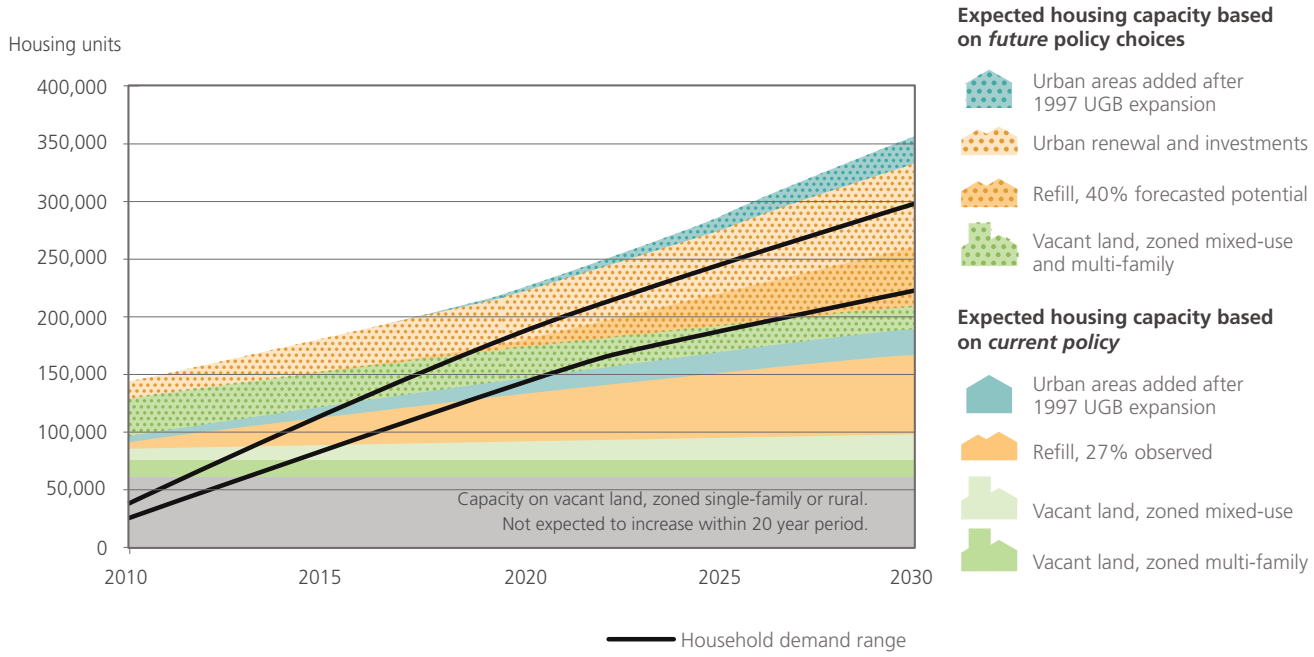
The next section of this report reconciles the 20-year supply range described in this section with the projected demand range and lays out policy choices and implications.

RECONCILIATION (DEMAND AND SUPPLY)

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 13 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. It is evident from the figure that the region must take some action, (e.g. make policy changes or investments), to provide sufficient capacity to meet even the low range of the 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 expanding the urban growth boundary.

Figure 13 Household demand forecast and sources of residential capacity
Within current Metro urban growth boundary



The potential difference between projected dwelling unit demand and supply (in the year 2030) could range from a deficit of 117,000 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?

PERFORMANCE

This preliminary 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. Scenario outputs can give us a sense of where we may be headed in relation to our six desired outcomes.

MetroScope is an equilibrium model that is designed to mimic the real estate market, 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 there is a capacity gap, the scenarios do not produce the capacity analysis. Rather, scenarios inform the capacity analysis. As previously mentioned in the Capacity Range section of this preliminary 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.

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

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	
Population	1,292,600	Population	1,469,400
Jobs	1,433,738	Jobs	1,985,697

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 3. 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 and the City of Portland. 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.).

Scenario findings

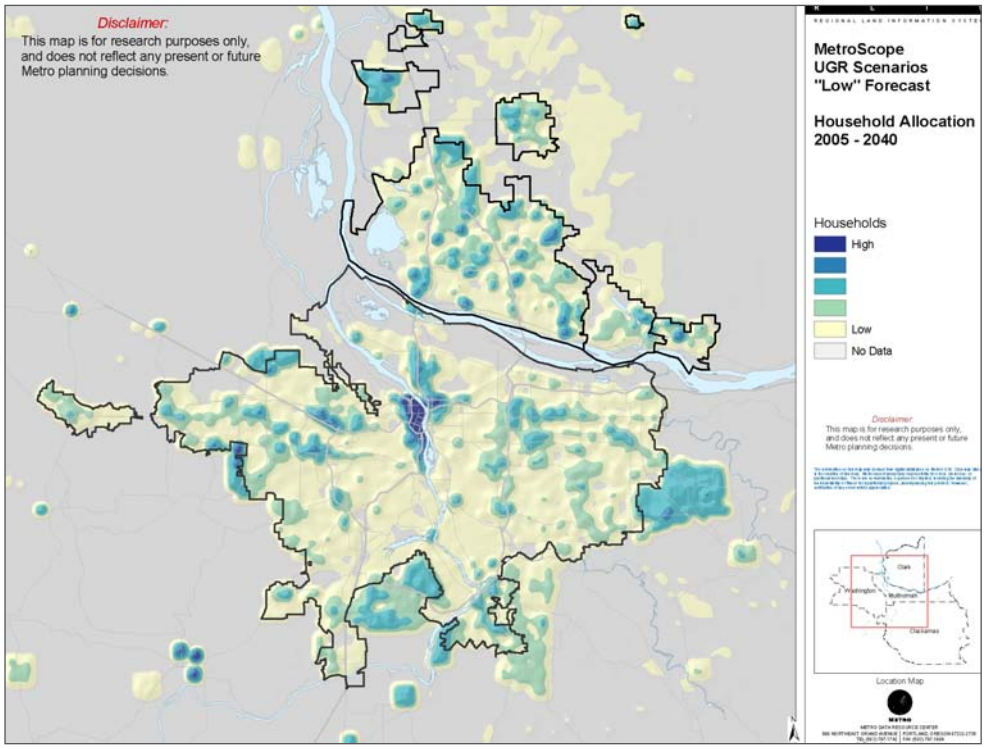
Because they do not test different policy options, only different population growth rates, these two scenarios produce results that are often similar. **Different policy choices would produce different results.**

Household and job distribution

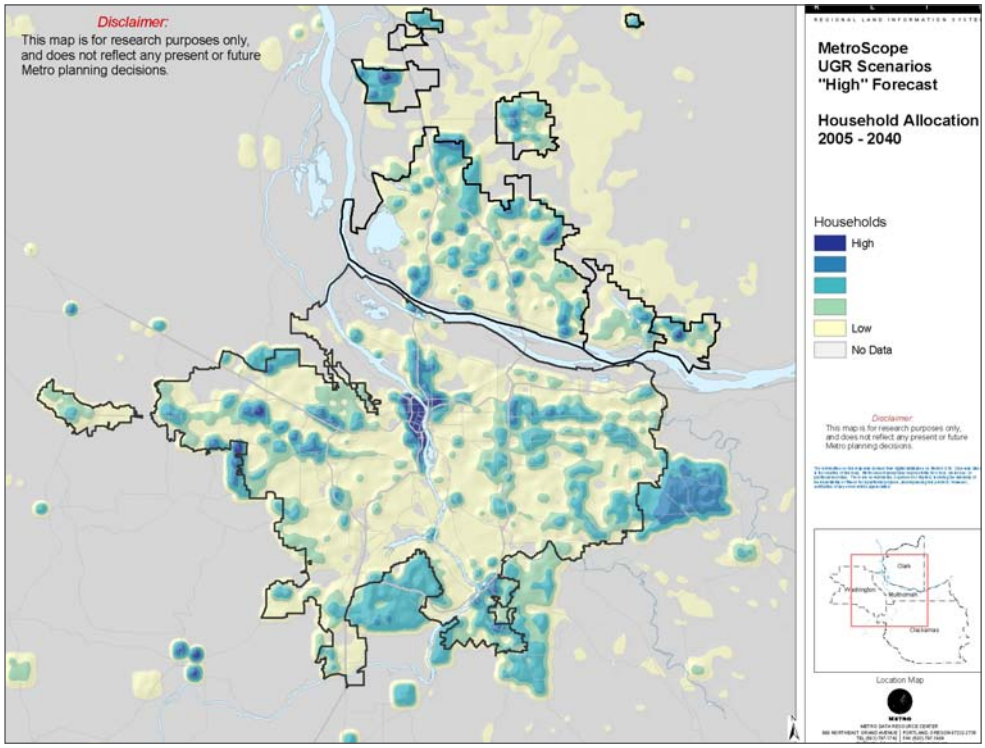
One of the primary outputs of MetroScope scenarios is the dwelling unit distribution that could occur, given assumed policies and investment. Since the two scenarios only test the effects of high or low population growth (i.e. they don't test different policy or investment options), these two maps show similar patterns for the distribution of new households by the year 2040. Both maps show a portion of new households locating in existing urban areas and a portion locating in prospective UGB expansion areas that were assumed for the purpose of producing the scenarios based on expansions consistent with current state law directing expansion to exception areas. These scenarios also show a share of new households locating in neighbor cities and in Clark County. Many of these households will commute to the Metro region. Attracting more new households to centers and corridors will be essential for achieving many of the region's desired outcomes, including the reduction of transportation-generated greenhouse gas emissions.

The following maps show the change in dwelling unit and job distributions by the year 2040 for the low growth and high growth scenarios.

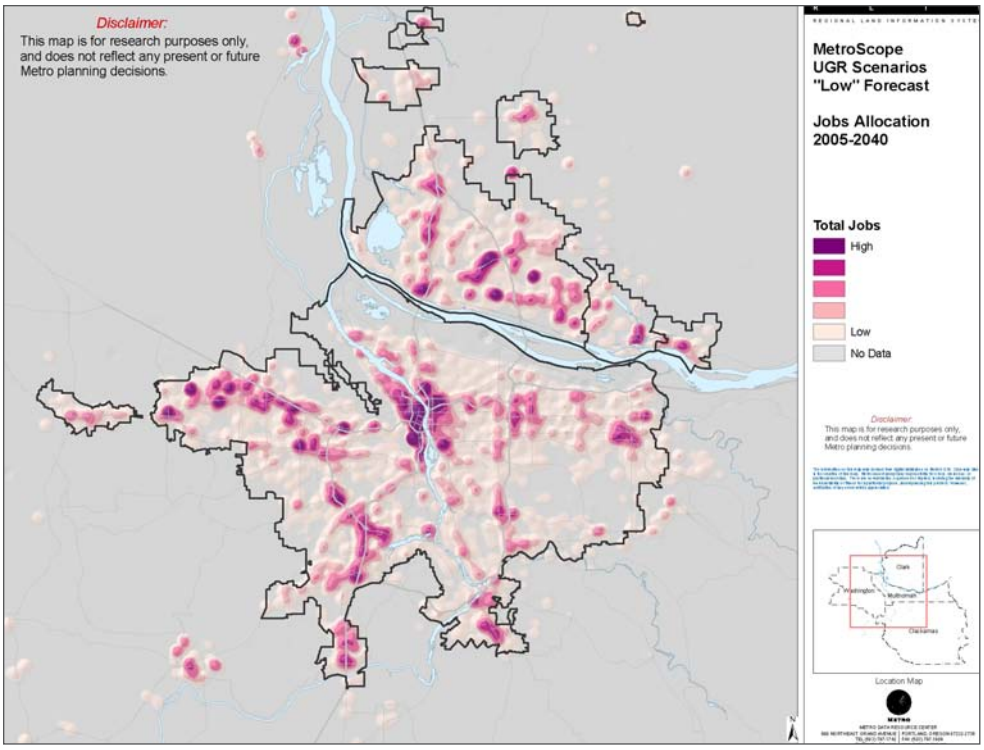
Map 3 Distribution of new households by the year 2040, LOW growth scenario



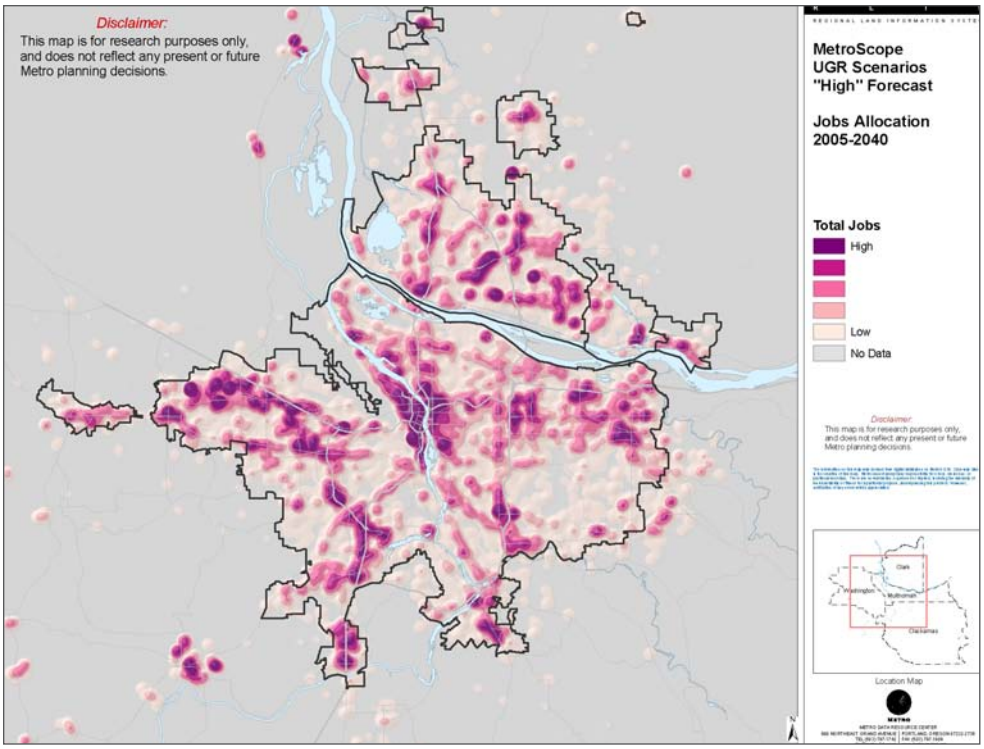
Map 4 Distribution of new households by the year 2040, HIGH growth scenario



Map 5 Distribution of new JOBS by the year 2040, LOW growth scenario

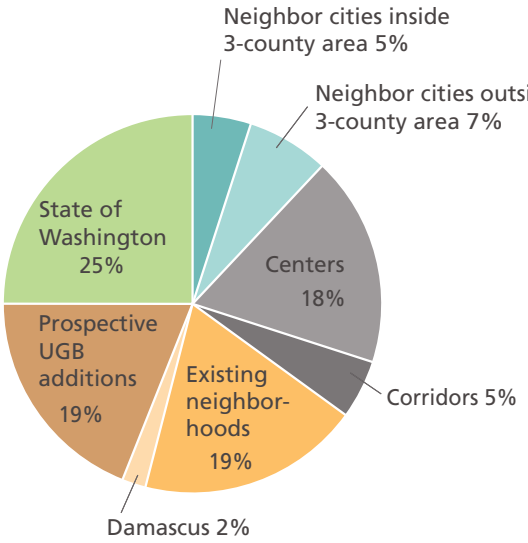


Map 6 Distribution of new JOBS by the year 2040, HIGH growth scenario

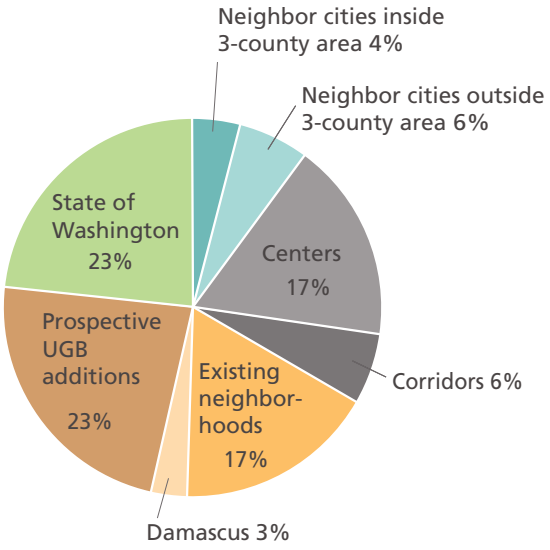


Distributions of new households in the 7-county area (year 2040)

Figure 14 Low growth scenario



High growth scenario



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 percent of new household growth in the 3-county area[5] 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

[5] *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

Acres developed in future (assumed) UGB expansion areas by the year 2040

Low growth scenario	High growth scenario
16,733 acres	26,674 acres

Why does this measure matter?

Growth in UGB expansion areas necessarily entails the conversion of agricultural or habitat lands. Ecologists posit that when only 10 percent of a watershed is covered with impervious surfaces there are detrimental effects on water quality. Typically, urbanization creates far greater impervious surface coverage than 10 percent. Absent other policy or investment choices, these scenarios show continued urbanization of rural lands.

Applies to desired outcomes

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

The long-term intent of a UGB expansion is that the area be developed for new housing and jobs. This measure indicates the degree to which that may occur by the year 2040. Since, in the scenarios, there are a number of expansion areas that do not become available until the year 2035, it is not reasonable to expect that all UGB expansion areas will be developed by 2040.

This measure is somewhat ambiguous; a higher percentage can either indicate that UGB expansion locations and sizes are mismatched with market demand or it can mean that efforts to attract households and jobs to existing urban areas inside the UGB have been successful, thereby reducing demand in UGB expansion areas.

SCENARIO RESULTS

Average one-way commute distance (for new households in the 7-county area in the year 2040)

Low growth scenario	High growth scenario
12.6 miles	12.7 miles

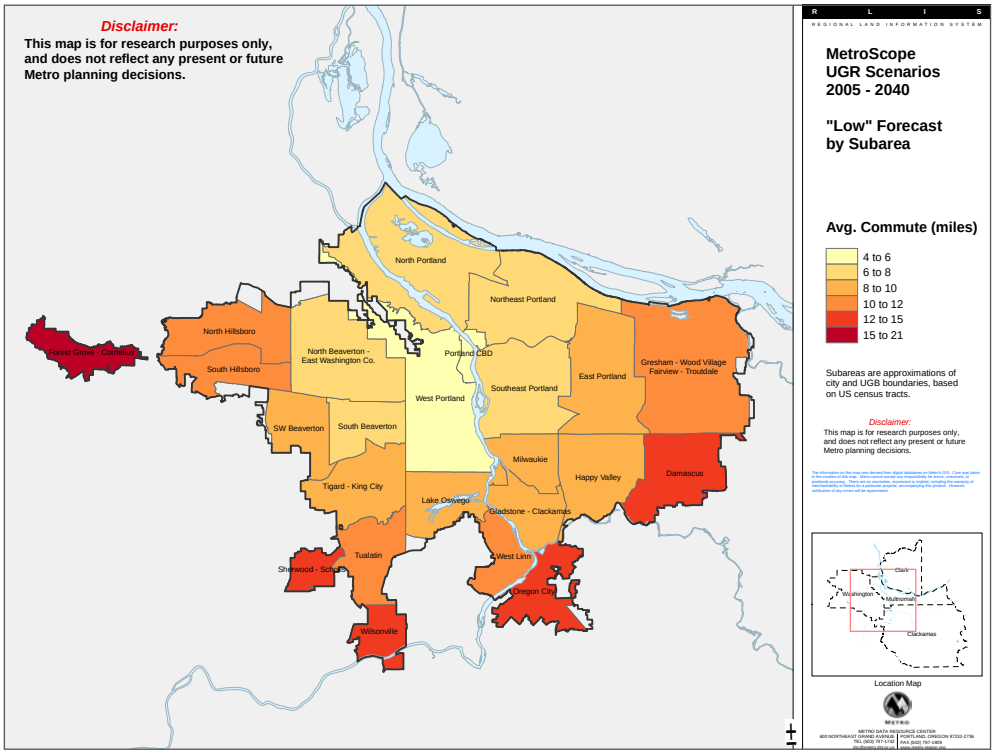
Why does this measure matter?

Commute miles are a useful indicator of overall travel behavior. Longer commutes tend to be an outcome of living in suburban or exurban locations. 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. These scenarios indicate that there are big differences in average commute distance, depending on where future households choose to locate. (See Maps 7 and 8)

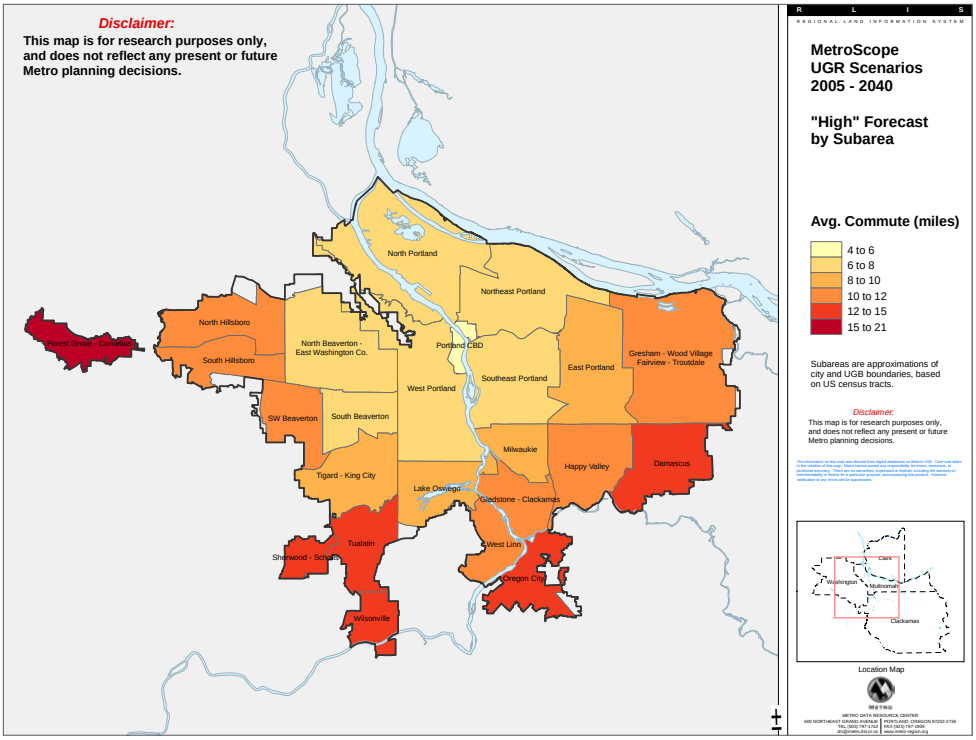
Applies to desired outcomes

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

Map 7 Commute distances, LOW growth scenario



Map 8 Commute distances, HIGH growth scenario



SCENARIO RESULTS

Total daily commute miles (for new households in the seven-county area in the year 2040)

Low growth scenario	High growth scenario
13,047,500 miles per day	17,292,700 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 2040 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. It appears that the region will need to take much more ambitious and coordinated steps to comply with State greenhouse gas reduction targets.

Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ 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 2000 to 2040)

Low growth scenario	High growth scenario
$44.44 billion	63.79 billion

Why does this measure matter?

Applies to desired outcomes

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

The United States faces a crisis in deteriorating and inadequate infrastructure. The Portland metropolitan region shares in this crisis. A 2008 infrastructure study commissioned by Metro estimates the cost of building public and private facilities to accommodate growth in the three-county Portland metro area through 2035 will run between $27 and 41 billion. Traditional sources of funds would likely cover half of that. In addition, the region needs $10 billion to repair and rebuild existing systems. System development charges, gas taxes and other revenue sources are not keeping pace with rising costs. Voter approved tax limitations and other ballot initiatives further constrain the ability of communities to provide services. There is much to do. We need to consider the return on these kinds of public investments; pool regional resources where appropriate; strategically manage future demand; embrace emerging technologies and creative approaches; and identify new sources of funding.

The region needs to take on the challenge of paying for infrastructure, not just to accommodate growth, but for ongoing maintenance and replacement. One way to address this challenge is to reduce demand for infrastructure by capitalizing on investments the public has already made. Shorter commutes require fewer miles of road or transit service per household. Likewise, higher densities lead to more efficient use of infrastructure, not just transportation but also sewer and water as well as schools and parks. MetroScope estimates public infrastructure costs using national construction cost data and a formula that is based on development densities and commute distances. These estimated costs are only the capital costs of building new infrastructure to serve new households and jobs and do not include maintenance of these new facilities or the maintenance and upgrade of existing facilities. This measure does assume urban levels of service, which are not likely in rural parts of the 7-county area. Thus, costs in rural areas (and thus the total) are likely to be exaggerated. Costs are in 2005$ and are not adjusted for inflation.

SCENARIO RESULTS

Average capital costs of infrastructure to serve one new household (average for all new households in 7-county area from 2000 to 2040)

Low growth scenario	High growth scenario
$80,465	$79,635

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.

Applies to desired outcomes

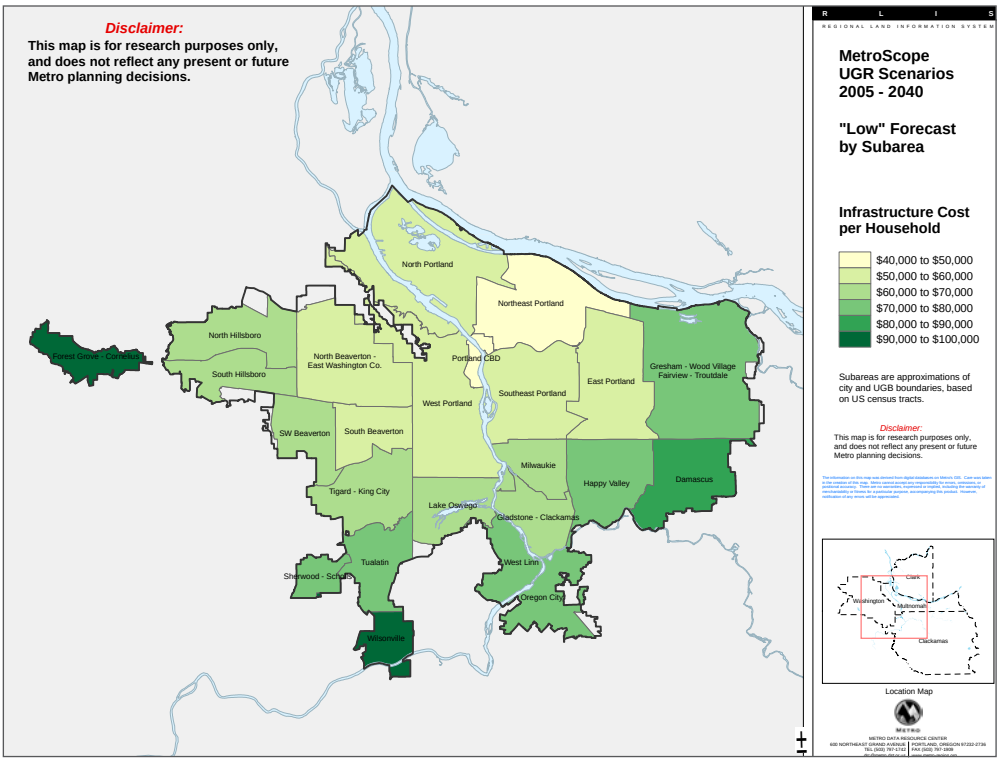
- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Equity

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.[6] Costs are in 2005$ and are not adjusted for inflation.

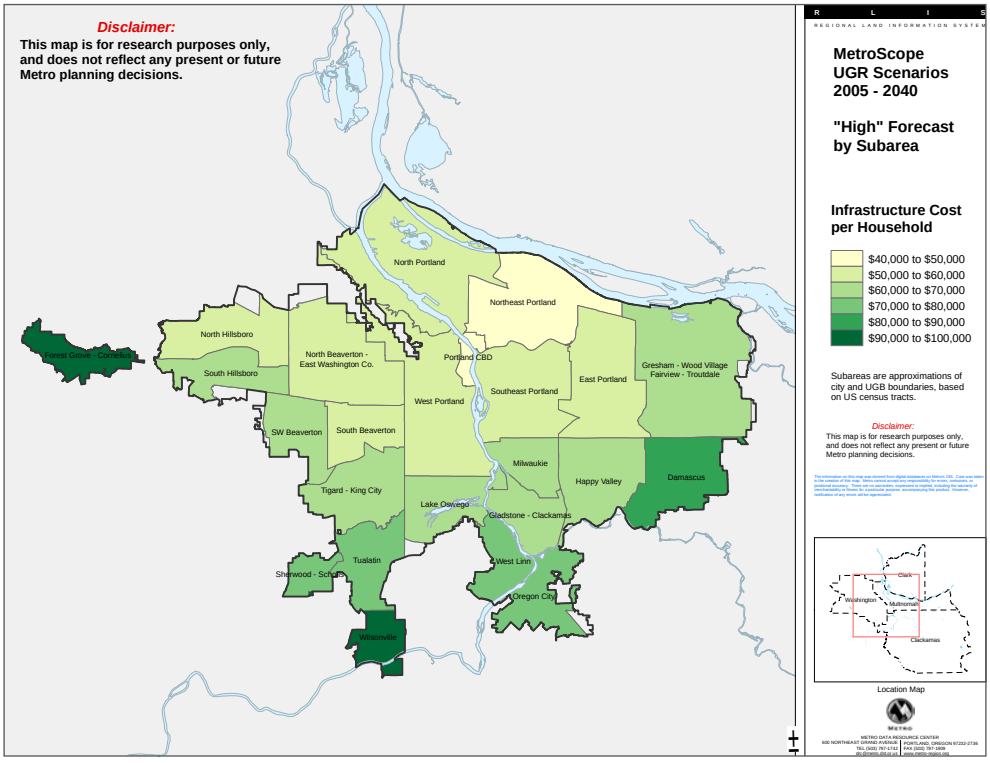
These scenarios indicate that there may be some per-household cost savings to be realized through the economies of scale that accompany higher population growth rates. Additional cost savings may be realized through compact development. (See Maps 9 and 10)

[6] *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.*

Map 9 Infrastructure costs by new household, LOW growth scenario



Map 10 Infrastructure costs by new household, HIGH growth scenario



SCENARIO RESULTS

Average annual private cost of housing and transportation (per new household in 7-county area in the year 2040)

Low growth scenario	High growth scenario
$30,419	$30.523

Why does this measure matter?

When people sign a lease or buy a house, the cost of the residence itself is clear. However, the longer-term costs of transportation are not always so obvious and, in fact, are often underestimated (particularly when gasoline prices are volatile). These two costs should be thought of as a budgetary bundle as the region considers how to contend with housing affordability. For this measure, a comprehensive set of costs is tallied that are derived from the U.S. Bureau of Labor Statistics' Consumer Expenditure Survey. These costs include, for instance, rent or mortgage payments, utilities, the costs of buying, maintaining and operating a car, and transit fares. Costs are expressed in 2005$ and are not adjusted for inflation.

Applies to desired outcomes

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

SCENARIO RESULTS

Residential-source greenhouse gas emissions (billion pounds per year)

Low growth scenario	High growth scenario
33.4 billion pounds/year	37.56 billion pounds/year

Why does this measure matter?

Residential sources are responsible for a large portion of greenhouse gas emissions. Residential and commercial energy consumption accounted for 30 percent of all emissions in the state of Oregon in 2004 (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.

Applies to desired outcomes

- ✓ Economic competitiveness and prosperity
- ✓ Reduce greenhouse gas emissions

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.

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.

SCENARIO RESULTS

Home ownership rate (inside UGB)

Low growth scenario	High growth scenario
77.3%	78.4%

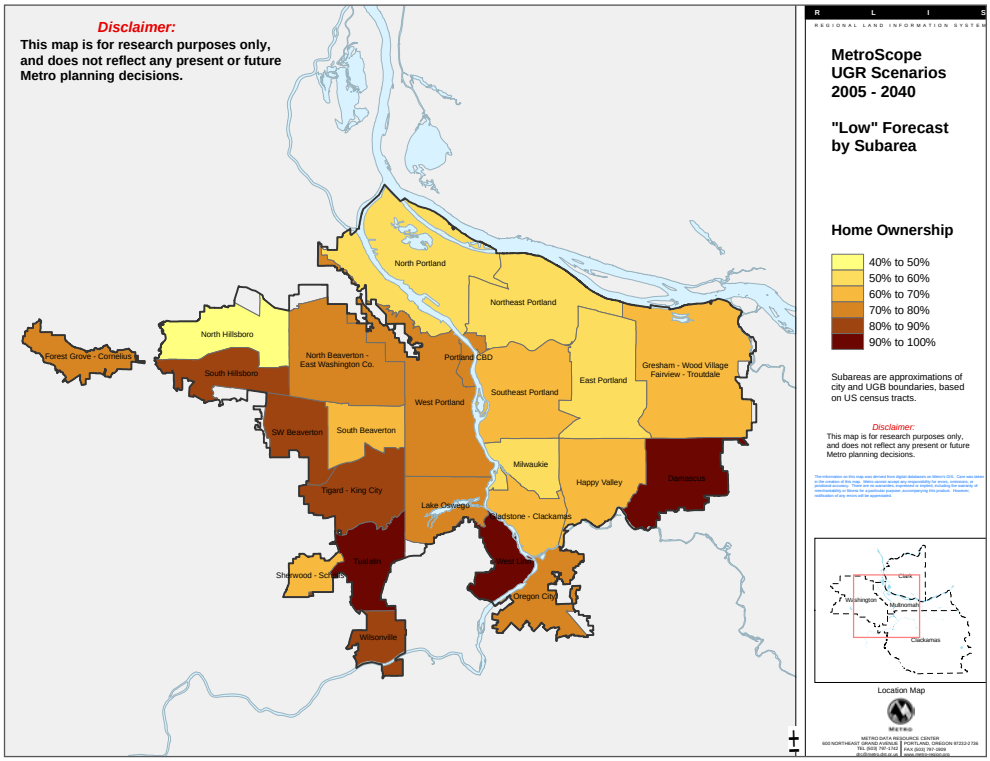
Why does this measure matter?

Applies to desired outcomes

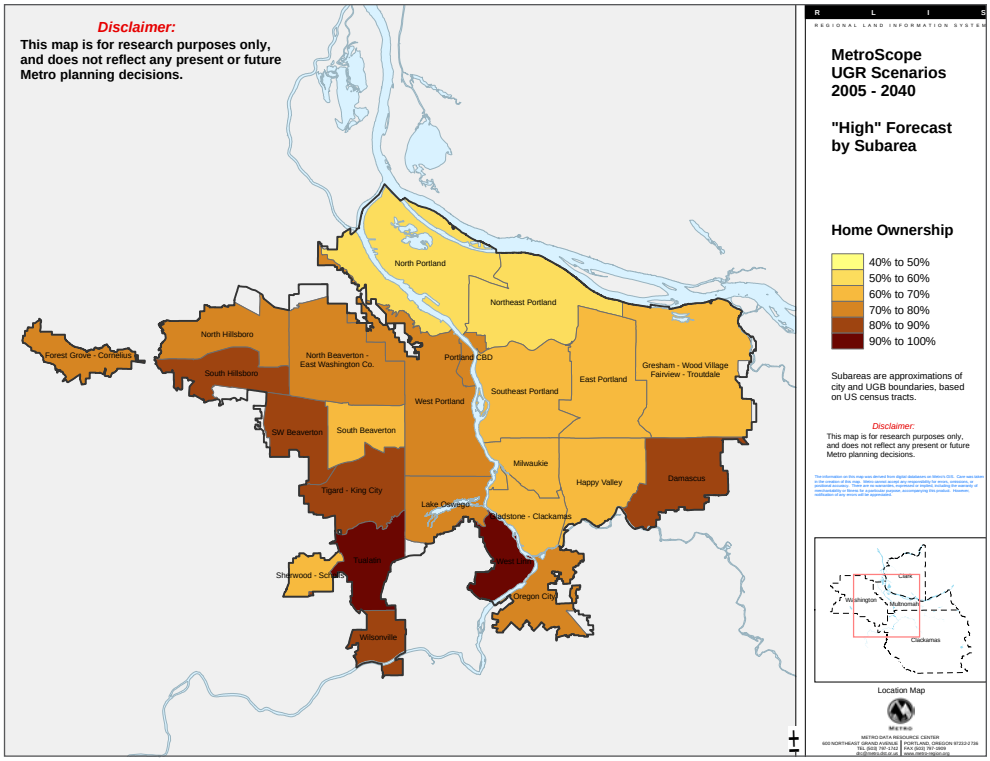
- ✓ Economic competitiveness and prosperity
- ✓ Equity

In the U.S., a person's home is often their most valuable asset and is regarded not only as a residence, but also as an investment. The home ownership rate can tell us something about the availability of housing choices, whether or not residents are benefitting from the region's economic prosperity, and whether or not those benefits are equitably distributed. However, we should bear in mind that home ownership tends to become less prominent in denser urban environments and is not necessarily an indicator of economic well-being. Increasing homeownership rates have been achieved in the past as a direct result of substantial investment on the part of the public sector through subsidies. A tightening of lending practices (not considered in these scenarios) is likely to reduce home ownership rates throughout the entire United States. Economist and author Richard Florida has described the potential benefits of increasing rental rates to allow for a more mobile labor force that can nimbly take advantage of opportunities in different locations (Clarke 2009). (See Maps 11 and 12)

Map 11 Home ownership, LOW growth scenario



Map 12 Home ownership, HIGH growth scenario



SCENARIO RESULTS

UGB capture rate

Low growth scenario	High growth scenario
63.6%	66.9%

Why does this measure matter?

The UGB capture rate is the measure of the percentage of new households 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. But, 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

- ✓ Transportation choices
- ✓ Reduce greenhouse gas emissions
- ✓ Clean air and water, healthy ecosystems

SCENARIO RESULTS

Refill rate

Low growth scenario	High growth scenario
39.9%	36.7%

Why does this measure matter?

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 2040). 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. 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.

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.

HOUSING NEEDS ANALYSIS

Shortly after the release of this preliminary urban growth report, a preliminary housing needs analysis will be released. The housing analysis will provide finer-grained detail on potential future housing needs. Oregon Statewide Planning Goal 10 states that plans must 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…." In summary, Metro must not only determine how many dwelling units will be needed to accommodate the forecast population, it must determine what types and densities of housing will be affordable, commensurate with the financial capabilities of Oregon households.

The housing analysis will make use of the same two MetroScope scenarios (high growth and low growth) presented in this preliminary urban growth report. As directed by the Metro Technical Advisory Committee, housing affordability will include both the cost of housing and the cost of transportation. Results will be reported using a number of subareas that roughly approximate city boundaries. In the case of larger cities, such as Portland, results will be reported for subareas of the city. In some cases, smaller cities have been grouped together in a subarea in order to preserve the accuracy of the data (MetroScope is a regional model and accuracy is likely to diminish with smaller geographies).

As with all of the information presented in this report, the preliminary housing needs analysis is based on our best understanding of past and current policy and investment direction. These assumptions are likely to change in the future as the Local Aspirations work program provides better information. As those assumptions are clarified, the results of the housing needs analysis will also change.

NEXT STEPS

This preliminary residential urban growth report is intended to spark discussion and debate about the local and regional policy and investment choices that will influence growth management decisions in 2010. Current efforts to learn about community aspirations may result in adjustments to capacity calculations, and robust discussions over the next year could impact local and regional investments. This preliminary analysis is intended to illustrate the cause and effect of local and regional policies and investments and how they impact the supply and demand ranges.

After regional discussion this spring and summer, Metro will release a draft residential UGR for public review and comment in Fall 2009. The final UGR will be adopted by resolution by the Metro Council in December 2009. The final 2009 UGR will lay out the roadmap for growth management decisions in 2010.

Summer 2009: Regional leaders will engage in a more specific discussion of the long-term aspirations of local communities and the capacity assumptions in the preliminary analyses, culminating in a draft UGR to be issued in September 2009.

Fall 2009: Metro Council will, with Clackamas, Multnomah and Washington counties, adopt urban reserves, informed by the 40-50 year population and employment range forecast.

December 2009: Metro Council will accept a 2030 population and employment range forecast and submit a final UGR to the Oregon Land Conservation and Development Commission that describes any capacity gap to be addressed in 2010.

2010: Local and regional governments will continue to implement policies and investments to create and enhance great communities while accommodating anticipated growth. Metro Council will submit plans to accommodate at least 50 percent of any 20-year capacity need (through local and regional action to increase capacity or by expanding the boundary) to LCDC.

2011: *If any* additional 20-year capacity need remains, the Metro Council will consider urban growth boundary expansions into designated urban reserves.

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APPENDIX 1: CAPACITY METHODOLOGY

Preliminary DRAFT 2009-2030 Urban Growth Report

The Metro Council is expected to complete any capacity adjustments by the end of 2010 through regulations that bolster the amount of capacity in the existing UGB using urban investments and/or policy changes that increase densities or with possible Urban Growth Boundary (UGB) expansions. Dating forward 20 years yields a forecast horizon in year 2030. As interpreted from ORS 197.296 (20-year land supply statute), a 23 year time span is needed to synchronize limitations in lagged supply data from RLIS (i.e. housing capacity estimates are based on a July 2007 vacant land inventory) and state regulations that require a sufficient supply to meet a 20 year residential demand forecast.

2009 to 2030 PRELIMINARY Urban Growth Report (UGR)

DRAFT Residential Dwelling Capacity Range Assessment

March 2009

Line No.		Residential DEMAND Assumption Low	Baseline	High
	Residential Demand Estimates (in Dwelling Units)			
1a/	7-County Population Forecast (2007 to 2030)	728,200	875,000	1,024,400
1b/	7-County Household Forecast (2007 to 2030)	348,600	408,300	469,100
2/	**Capture 61.8% of 7-County Forecast in Metro UGB**	**215,400**	**252,300**	**289,900**
3/	plus: 4% vacancy rate (source: 2000 Census)	8,600	10,100	11,600
4/	**Dwelling Unit Demand in the Metro UGB:**	**224,000**	**262,400**	**301,500**

Line No.		Residential SUPPLY Assumptions BASELINE	
	July 2007 Vacant Land Inventory (Metro UGB):		
5/	**Gross Vacant Land in current Metro UGB**	**44,800**	
6/	less: Local Water Quality, floodways and Habitat Protection areas (ENV)	8,600	
7/	**Gross Vacant Buildable Acres in Metro UGB (GVBA)**	**36,200**	
8/	less: Fed., State, Municipal exempt land (actual count)	3,200	
9/	less: Acres of Platted Single Family Lots (actual count)	1,300	A
10/	less: Acres for Future Places of Worship and Social Org. (actual = 600 acres)	700	C
11/	less: Major Easements (Natural Gas, Electric & Petroleum) (actual count)	1,000	R
12/	less: Acres for Future Streets (0%, 10%, 18.5%)	4,900	E
13/	less: Acres for New Schools (H=45, M=55, E=70; actual = 1,000 acres)	1,000	S
14/	less: Acres for New Parks (based on SDC fees)	1,100	
15/	less: New Urban Areas (actual net of ENV, future streeets and dev. land)	7,900	
16/	**Net Vacant Buildable Acres (NVBA) - total**	**15,000**	
	Net Vacant Buildable Acres (NVBA) by Type (less-New Urban Areas):	**Metro UGB**	
17a/	Net Vacant Buildable Acres - Mixed Use Residential (MUR)	1,000	
17b/	Net Vacant Buildable Acres - Residential	6,400	

Line No.		Residential CAPACITY Assumption Low	Baseline	High	
	Residential Housing Supply Assessment - Metro UGB				
18/	**Dwelling Unit Capacity of Vacant Land at Local Zoning (or Plan) - 2008 Q3**	**63,600**	**63,600**	**63,600**	
18a/	less: High-density MFR products not market feasible within next 20 years	(18,600)	(18,600)		
19/	add: Res. Development in vac. Mixed Use Districts (MUR)	29,100	29,100	29,100	
20/	less: Capacity Lost to SFR Underbuild @ 5%	(2,300)	(2,300)	(2,300)	
21a/	add: Res. Development Capacity on ENV land (no. taxlots wholly in Title 3)	100	100	100	
21b/	add: Res. Development Capacity on Title 13 areas (80% of zoned capacity)	19,300	19,300	19,300	U
22/	add: Units from Platted Single Family Lots under 3/8 acre (actual count)	8,800	8,800	8,800	N
23/	add: Units from Residential Refill @ 27%	60,500	68,100	81,400	I
23a/	add: Units from Residential Refill @ 40% (addition of 13% more)			39,200	T
23b/	add: Potential Units from *Subsidized* Residential Refill			71,100	S
24/	add: Estimated Capacity from New Urban Areas	48,000	48,000	48,000	
25/	less: New Urban Development not yet market feasible	(24,000)	(24,000)		
26/	**Subtotal: Dwelling Unit Capacity Supply Range**	**184,500**	**192,100**	**358,300**	

Line No.		Low Supply - High Demand		Low Demand - High Supply
27/	**Net Need in Residential Dwelling Units (deficit):**	**(117,000)**	**(70,300)**	**134,300**

Housing Demand Calculations:

Line 1a) 7-county PMSA Population Forecast: The regional population forecast is derived from Metro's Regional macro-economic forecast model. This model forecasts population growth 30 years into the future. The regional geography for the Portland-Beaverton-Vancouver, OR-WA Primary Metropolitan

Statistical Area (PMSA) now comprises a total of 7-counties (i.e., Clackamas, Columbia, Multnomah, Washington and Yamhill counties in Oregon and Clark and Skamania counties in the State of Washington) – consistent with changes to federal data reporting standards. This is a change in geographic scope from an earlier 4-county SMSA (Standard Metropolitan Statistical Area) delineation to the present 7-county PMSA. The delineation is defined in the Federal Register by the Office of Management and Budget (OMB). "Re-drawing" PMSA delineations are required to be revised in order to reflect actual changes in the economic structure of regions as they grow and expand.

Line 1b) 7-county PMSA Household Forecast: The population forecast in line 1a is converted to a forecast of number of households using *age-adjusted headship rates* derived from Census information and Metro's regional macro-economic model. [source: Metro 2008-2040 Regional Forecast]

From Census estimates, the average household size for the PMSA is 2.57 persons per household in year 2000. The formation of future households and their composition is expected to change over time as family sizes decrease and the average age of the population increases making single-person households more prevalent in the future. By 2030, the average household size in the PMSA declines to 2.46 persons per household.

The assumption that future household sizes will decline has been vetted a number of times over the course of external peer review panels convened to analyze and review the veracity of the regional forecast and forecasting models and methods. Each time, demographers and professional forecasters have affirmed the assumption that the average household in the future will be smaller than today's household.

Line 2) Metro UGB Capture Rate (from a 7-county share): Capture rate is defined as the marginal share of future households expected to locate within the Metro UGB (with the remainder then locating elsewhere within the 7-county PMSA). The initial capture rate assumption (61.8%) is based on historical time series data obtained for 1979 to present. [source: Metro Research Center and Census data]

Historical Capture Rate Series for the Metro UGB – 20-year Capture Rates

	2000	2001	2002	2003	2004	2005	2006	2007	Average
Rate:	62.2%	62.2%	62.2%	63.1%	62.2%	61.8%	60.4%	60.0%	61.8%

Source: Metro Data Research Center

Note: a forecast of Metro UGB capture rate can be derived from a discrete MetroScope scenario. This scenario would have the advantage of employing a capture rate that is economically consistent with a number of future policy implementations including the Regional Transportation Plan (RTP), urban renewal, other urban investment subsidy assumptions, zoning and comp plan changes, etc. Assuming an historical rate may be wrong if future policies diverge from current conditions.

However, starting with preliminary UGR that assumes an historical average rate makes sense as policy makers can start from a common point and seek to redirect and bolster existing trends to align with future transportation and land use goals. As new policies emerge, they can be tested and new capture rates can be forecasted for future UGR assumptions.

Line 3) Vacancy Rate: Housing unit estimates are converted from households using a vacancy rate. Housing units are not the same as the number of households. [source: 2000 U.S. Census, Demographic Profile for the Portland-Vancouver, OR-WA PMSA]

The definition of housing units introduces differences in housing types, i.e., single family, multifamily, and manufactured housing as dwelling types that should be considered under existing housing need statues – ORS 197.296. Goal 10 also speaks to housing types which on a consistent basis will be addressed in the *Housing Needs Analysis Report*.

The initial assumption for the preliminary draft residential UGR assumes four percent, which is in keeping with the 2002 Residential UGR assumption.

Line 4) Dwelling Unit Demand Forecast: The resulting regional housing unit demand forecast is derived from Metro's Regional Forecast and vacancy rate assumption in line 3. [source: UGR calculation]

Housing Supply Calculations:

Line 5) Gross Vacant Land: Vacant land inside the current (as of January 2009) Metro UGB is calculated based on exacting manual measurements of vacant land using photogrametric techniques and supplementary GIS data (including building permits and assessor tax lot information). [source: Actual RLIS measurement]

Line 6) ENV: *Environmental* constraints: Undeveloped land that should be protected from future development is subtracted from *gross vacant land*. The land that is deducted includes Metro's Title 3 (which includes floodplains) Title 13 (riparian habitat areas), and floodways – as implemented by local jurisdictions. To the extent that areas with steep slopes intersect with the environmental constraints, they too are excluded from the 2007 buildable land inventory. Elsewhere, steep slopes are included in the buildable land inventory. For example, in jurisdictions located in Washington County, the deduction for environmental constraints is equal to the area delineated in maps provided by Clean Water Services. The map coverage from Clean Water Services are included in RLIS map/data layers. For further detailed explanations, please refer to the buildable land inventory GIS meta data description. [source: Actual RLIS measurement]

Line 7) GVBA: Gross Vacant Buildable Acres (GVBA) in the Metro UGB is defined as *gross vacant land* minus *environmental constraints*. [source: Actual RLIS measurement]

Gross-to-Net Calculations:

Line 8) Fed., State, Municipal Vacant Land: For purposes of measuring residential capacity per ORS 197.296, Federal, State and local municipal owned vacant land is removed from gross vacant buildable acres. [source: Actual RLIS measurement]

For calculating nonresidential land capacity, Federal, State and municipally owned land is added back into the estimation of employment land capacity.

Line 9) Platted SFR tax lots: An assumption that already platted tax lots under 3/8 of an acre in size will not subdivide into higher density housing products. [source: Actual GIS measurement] The capacity of existing SFR (single family residential) platted lots are not lost; they are returned to the calculation of residential capacity in line 22.

Line 10) Future Churches: (Only an additional 100 acres is set aside.) This is an assumption that sets aside future land supply in order to accommodate the development of future churches and social organizations. [source: Actual RLIS measurement and per capita forecast estimate]

The per capita estimate of future land need for this category is based on 1.4 acres per 1,000 future residents. [source: 1997 UGR church per capita rate assumption]

In the current preliminary UGR, a total of 700 acres is needed to accommodate an expected increase in church and social organization land needs. According to RLIS vacant land data, churches and social organizations already own 600 acres. The net amount that is deducted from other (i.e., residential or employment) future uses is thus calculated to be 100 acres for the 20-year forecast horizon. Per capita growth in population is derived from the 2008-2040 Regional Forecast.

Line 11) Major Utility Easements: Easements have been mapped for major utilities; this includes natural gas pipelines, petroleum pipelines and major electric lines (e.g., BPA powerlines). Pursuant to ORS 197.296, a consideration of easements is estimated to remove vacant land that is coincident with major easement lines identified in the Metro UGB as it has been deemed unsafe for future residential development in these areas. [source: Actual RLIS measurement]

Line 12) Future Streets ("skinny streets"): An assumption which sets aside a portion of the vacant land supply in order to accommodate future streets for undeveloped land inside the current Metro UGB. This assumption is calculated on a per tax lot basis:

- Tax lots under 3/8 acre assume 0% set aside for future streets
- Tax lots between 3/8 acre and 1 acre assume a 10% set aside for future streets
- Tax lots greater than an acre assume an 18.5% set aside for future streets

The basis for these net street deduction ratios derive from previous research completed by the Data Resource Center and local jurisdictions during the 2002 UGR. The current street set aside rates are based on "skinny street" assumptions for a total of 4,900 acres.

Line 13) Future Schools: (No additional lands are set aside.) This is the assumption that sets aside a portion of the future vacant land supply in order to accommodate a growth projection for land needed to build future schools in the Metro UGB. The school land demand forecast is based on a student per capita basis:

- High school – 45 students per acre
- Middle school – 55 students per acre
- Elementary school – 70 students per acre

The basis for these net school deduction ratios are compared with national school building standards and interviews with building officials at Tigard-Tualatin School District, Beaverton School District and Portland Public School District. The sets of assumptions for student-acre ratios were vetted and finalized through MTAC. [source: for further details on national school standards, please refer to DLCD safe-harbor subcommittee reports].

According to the 2007 RLIS vacant land supply inventory database, school districts in the Metro UGB already own 1,000 acres of vacant land. The regional forecast includes a projection of student population and enrollment for residents inside the Metro UGB. [source: A land need forecast for future schools is calculated from the regional forecast and student-acre ratios. This forecast identified no additional land need other than what schools presently own; thus no additional set aside is assumed except for the 1,000 acres that schools have already land banked.]

The preliminary UGR approach does not analyze need by individual school district or regional subareas, so there may be some school districts that have a future surplus and others with a future gap.

Line 14) Future Parks: (Based on SDC fees.) This is an assumption which sets aside a portion of vacant land supply in order to accommodate a growth projection for future neighborhood and community parks in the Metro UGB. The future park land demand forecast is based on an estimate of existing system development charges (SDC) which local jurisdictions levy on local residents. The land estimate for future parks is based on how much land SDC revenues are likely to purchase over the next 20-year period. This assumption is based on information provided by MTAC members and review of local SDC regulations to forecast future park acquisitions. MPAC endorsed this assumption for the 2002 UGR. [source: 2002 UGR assumption for new park acquisitions]

Line 15) New Urban Areas: This is a new line added to the 2009 Residential Urban Growth Report. The purpose of this line item is to recognize that new urban areas which were brought into the Metro UGB have yet to receive urban zoning densities – zoning still retains rural residential zoning densities or other rural designation. Including new urban areas through the conventional land density calculation and assuming rural densities would provide an inaccurate assessment of future residential capacity of new urban areas. A more accurate means of forecasting residential capacity for the new urban areas is to rely on the most up to date information available from local jurisdictions, in some cases that is initial concept plan density assumptions, in others comprehensive plan designations or local zoning.

The future capacity of new urban areas is not lost, but is added back in line 24. Please see line 24a thru line 24o for individual capacity assumptions for the new urban areas.

Related: see explanation for line 25.

Line 16) Gross-to-Net total (Net Vacant Buildable Acres - NVBA): An internal UGR calculation step which is a subtotal amount that is the net vacant buildable acres inside the Metro UGB (less new urban areas) after subtracting for line items 8 thru 15.

Line 17 a-d) Detailed NVBA by Type: Line 17 verifies the subtotal shown on line 16. Lines 17 a-d show details of line 16 categorized by general zoning class in the amount of vacant buildable acres. The buildable acres in line 17b and 17c (part) will carry over to the Employment UGR. Lines 17a (part), 17c (part) and 17d (all) carry into line 18 and line 19 for calculation of residential capacity (see below for additional details).

Also carrying over to the employment UGR is the capacity found on government owned land. The acreage amount totals up to an additional 3,200 gross buildable acres.

Line 18) Maximum Housing Capacity from SFR and MFR Zones: Maximum residential dwelling unit capacity is calculated from local zoning and comprehensive plan designations (i.e., comprehensive plans applied only to Portland and Wilsonville) and based on the net vacant buildable acres shown on line 17a (part), 17b (all), and 17c (part).

Dwelling unit density assumptions on net vacant buildable acres vary by zoning type:

Capacity from Line 17a) Only half (50%) of the vacant acreage zoned for mixed use residential development (i.e., MUR) is assumed available for residential capacity. The remaining half is assumed not to be used for residential development owing to horizontal mixed use development in designated mixed use districts. Maximum densities vary from 8.9 dwelling unit (DU)/net acre up to 350 DU/net acre. Amounts vary based on vacant land in each mixed use zoning class. The residential capacity in mixed use residential districts is reported separately on line 19 and amounts to estimated capacity of 29,100 dwelling units.

Capacity from Line 17b) All 6,400 acres of residential land in line 17b are calculated into residential capacity and shown in total on line 18. This residential capacity is based on maximum zoning (or comprehensive plan) density per local zoning ordinances as of the 3rd quarter 2008 RLIS database. Zoning capacity and densities vary for SFR1 (1 unit per acre) thru SFR16 (16 units per acre) and MFR1 (13.3 units per acre) thru MFR 7 (53.5 units per acre). [source: Metro Standardized Regional Zone Classification System (RLIS: zoneclass)]

Capacity from Line 17c) Farm and Forest designated land in UGB (not in new urban areas) = 10 units per net acre [source: 2002 UGR]. 65% of RRFU designated land is assumed to go towards future residential capacity. The rest will go towards employment uses. This assumption is based on a cross tabulation of vacant RRFU land and 2040 design types. 65% of RRFU vacant land is designated in design types that accommodate residential development. This residential capacity is reported in line 18 and the capacity amounts to approximately 17,300 dwelling unit.

Capacity from Line 17d) No residential capacity assumed on industrial, commercial, and mixed use employment (MUE) areas / zoning. (MUE zoning is defined as mix of commercial and industrial; not to be confused with MUR zoning that is a mix of commercial and residential – typically office/retail and multifamily development)

Based on the RLIS vacant land inventory, UGR gross to net reductions and zoning density assumptions, the maximum residential dwelling unit capacity derived from residential vacant land produces about 46,300 dwelling units. Average dwelling unit density from line 18 is about 8 units per net acre, which averages in RRFU, SFR and MFR vacant land and zoning assumptions.

Summary Dwelling Unit Capacity from environmentally unconstrained vacant land:

RRFU	17,300 units	10 units per net acre
Single Family (SFR)	28,200 units	5 units per net acre
Multifamily (MFR)	18,100 units	26.5 units per net acre
SUBTOTAL (line 18)	63,600 units	7.9 units per net acre
Mixed Use Res. (line 19)	29,100 units	28.5 units per acre
TOTAL	92,700 units	10.8 units per net acre

Line 18a) High-Density MFR feasibility factor: Market feasibility is derived from a discrete MetroScope scenario. This factor is a capacity discount for high density multifamily (MFR7, MUR8 to MUR10) product that is forecasted not likely to fully develop in the course of the next 20-year growth horizon. This housing product is a non-performing capacity asset that cannot be utilized by the market because its zoning is far ahead of projected market demand. [source: MetroScope]

In the "high" supply capacity scenario assumption, the supply deduction of high density multifamily (and mixed use residential) housing units from the supply is removed. In order to achieve this assumption, it is assumed that policy actions implemented today will help close the gap between the demand for living in high rise apartments and the construction costs of high density development. In order for this outcome to materialize, MetroScope scenarios indicate that achievable rents necessarily must significantly rise in order to help close the gap between the supply and demand for this segment of housing product.

Line 19) Mixed-Use Residential (MUR) Zoned Capacity: Mixed-use residential density and capacity are calculated from zoning (or comprehensive plans) and reported on this line. 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 base how much horizontal mixed-use is actually occurring. Nevertheless, in order to recognize that horizontal mixed-use does and will occur in the future, we assume a 50% ratio of the two forms of mixed-use development. The result for purposes of calculating capacity in line 19 is to halve the vacant land capacity for future residential development. [source: UGR 2009 assumption]

The estimated residential unit capacity from 500 (derived from 1,000 acres X 50% MUR ratio = 500 acres) acres of MUR zoned vacant land represents 29,100 dwelling units. The average DU per acre is approximately 28.5 units per net acre.

The total dwelling unit capacity and density from unconstrained vacant land totals a maximum yield of 92,700 units for a DU/acre of approximately 10.8 units per net acre.

Line 20) Underbuild (physical development constraints): The underbuild is based on physical constraints that make practical development up to 100 percent of maximum zoned density to be impractical. Capacity lost to single family residential underbuild assumes a 5 percent loss from maximum capacity as calculated from the single family dwelling unit capacity embedded in the calculation of line 18. The 5 percent rate is an assumption synthesized from oral communication provided by MTAC members. [source: oral statements from MTAC members]

Line 21a) Title 3 Capacity "add back": Title 3 protects the water quality of the region by delineating development setback rules that prohibit development along streams, rivers, floodways and flood prone areas. This setback varies depending upon conditions along the waterway, such as steep slopes. The Title 3 "no build buffers" are defined by maps maintained by the Data Resource Center RLIS database.

Capacity for one dwelling unit is assumed for each tax lot wholly inside the Title 3 buffer and zoned for future residential development. This line adds back minimal capacity resulting from subtracting environmental (ENV) land from **line 6**.

Precedent from prior UGR studies determines this allowance on the assumption that land owners have the ability to exercise the right to build one dwelling unit on land that governments have designated for protection of an environmental resource. [source: 2002 UGR assumptions]

Line 21b) Title 13 Capacity "add back": Implementation of Title 13 differs significantly from Title 3 in that Title 13 is implemented by allowing development as long as it is "habitat friendly". Land owners may comply with Title 13 by mitigating the impact future development may have on the environment.

Delineation of exact Title 13 environmental areas for this preliminary UGR is based on individual analysis and tabulation of local ordinance and implementation of Metro's Title 13 code. Local jurisdictions that have adopted Title 13 code language have been precisely mapped into the tabulation. For local jurisdictions that have not yet adopted Title 13 code language into city ordinances, the environmental delineation is based on Metro's modeling of Title 13 implementation.

This line adds back 80% of the residential capacity from Title 13 that was deducted in line 6. Please note that line 6 combines Title 3 and 13 ENV as one deduction, but the more detailed GIS data distinguishes which tax lots are in (or intersect) Title 3 and which ones are in (or intersect) Title 13. For purposes of calculating the capacity added back for Title 13 delineated vacant land, the residential capacity is based on local zoning less 20% capacity to account for mitigation efforts. [source: local jurisdiction ordinances and information]

Line 22) Platted SFR "add back": The count of tax lots under 3/8 of an acre are tabulated and recorded on line 23. This line corresponds to the "add back" in dwelling units associated with the net acre deduction in line 9. [source: Actual RLIS measurement]

Line 23) Residential Refill Demand: Residential refill is the combination of expected amount of future redevelopment and infill (it is not the available capacity). It is a "demand" estimate. It is the predicted estimate of what we anticipate will be the number of future dwelling units that will be accommodated

on land that the RLIS database considers as developed land in the year 2007. A refill rate can be determined from observation of past experience or from a discrete MetroScope scenario. A residential refill rate for the recent period based on data from 2000 to 2006 was about 27% average. The annual historical rates have fluctuated between 15% and 35%, depending upon economic business cycle activity. Historical data show the refill rate falling during economic downturns and rising when the economic cycle gained momentum. [source: Refill Studies and MetroScope]

This rate is then multiplied against future housing unit demand to arrive at a projection of residential refill. This refill is a forecast.

The amount of refill fluctuates between a low and high demand housing forecast. In this preliminary draft residential UGR, the refill rate may vary depending upon demand assumptions. The refill number is based on a 27% historical refill rate times the number of dwelling unit demand projected for the Metro UGB (shown in **line 4**).

Line 23a) Upper Range of possible Refill: This is redevelopment and infill that could materialize above what the historical refill rate would assume as possible refill capacity. Scenario tests with alternative land use capacity and growth forecast assumptions indicate the future refill rate could top 40%. We assume that this may be a realistic top-end of the refill rate range. This is a "high" capacity residential supply assumption. [source: MetroScope Scenarios (2008)] This represents uncertainty in the supply capacity for dwelling units inside the existing UGB. This represents what it is estimated to be the likely high-end of the refill range supply.

Line 23b) Potential Units from Subsidized Residential Refill: This represents potential redevelopment and infill IF local governments take additional actions today to bolster residential demand and supply in designated 2040 centers and corridors. This is a "high" capacity residential supply assumption that requires policy action in order to realize any capacity towards the preliminary UGR.

Line 24) Estimated Capacity from New Urban Areas: This is a subtotal of lines 24a to 24o.

Line 24 a-o) New Urban Area Capacity Assumptions: These group of line items detail the theoretical buildout capacity assumed for individual new urban area addition to the Metro UGB during previous periodic reviews. [source: Various Concept Plans]

Line 25) New Urban Area market feasibility factor: New urban areas are not expected to yield full development in the next 20 years due to infeasible market conditions, lack of infrastructure and/or financing ability to render urban development densities to occur. Market feasibility is derived from a discrete MetroScope scenario.

Line 26) Dwelling Capacity / Supply: Total Dwelling Unit Capacity tallied from lines 18 to 24

Line 27) Residential Gap Assessment: Deficit (or surplus) housing supply

APPENDIX 2: REPORT ON THE REGION'S PAST PERFORMANCE

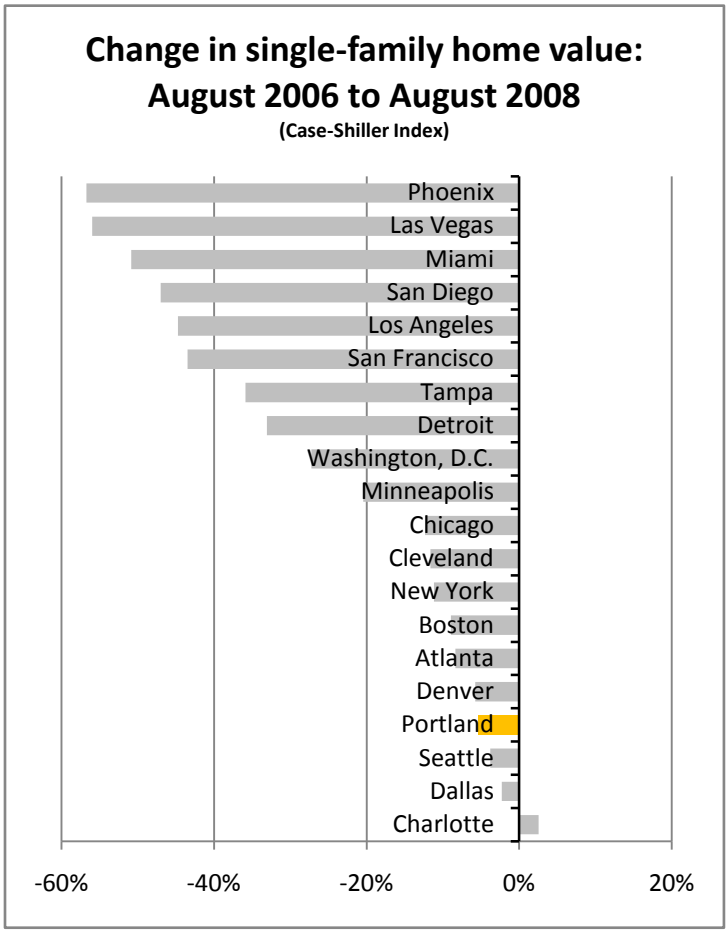
The region's historic performance in achieving its desired outcomes

Unlike past UGRs, this report is intended to assess not only residential capacity and need, but to provide some basic information about how the region has been performing in terms of its six desired outcomes.

Preservation of home values

Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity



For most families, a house is their single largest investment. In the Portland metro region, home values have remained relatively stable during a tumultuous two years when values have crashed in many other cities. Given the complexity of the dynamics that influence housing values, it is difficult to explain why some cities have fared better than others. However, it is likely that actions taken at the local and regional level to implement the 2040 Growth Concept, with its focus on reinforcing existing centers and corridors and restrained approach to outward growth, deserve some of the credit.

Costs of living (source: U.S. Bureau of Labor Statistics)

Two primary household budget items are housing and transportation. Operating on the assumption that transportation costs would always be minimal, a common tactic has been to "drive until you qualify for the mortgage." Now it has become clear that energy price increases are here to stay. We must account for the combined cost of housing and transportation when considering housing and transportation choices.

Compared with other cities in the western U.S., the Portland region offers housing and transportation at relatively low prices. When these costs are expressed as a percentage of income, the Portland region is about average in affordability (amongst cities in the western U.S.).

Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices
6. Equity

Average annual cost of housing[1] per household (2005)

Phoenix	$ 8,414
Portland	$ 9,862
Denver	$10,078
Seattle	$10,741
Honolulu	$10,887
Anchorage	$11,391
Los Angeles	$13,030
San Diego	$14,511
San Francisco	$15,947

Average annual cost of transportation per household (2005)

Denver	$8,646
Portland	$8,845
Seattle	$9,491
San Francisco	$9,518
Honolulu	$9,921
Phoenix	$10,549
Los Angeles	$10,972
San Diego	$11,301
Anchorage	$12,596

Average annual cost of housing and transportation per household (2005):

Portland	$18,707
Denver	$18,724
Phoenix	$18,963
Seattle	$20,232
Honolulu	$20,808
Anchorage	$23,987
Los Angeles	$24,002
San Francisco	$25,465
San Diego	$25,812

Average annual cost of housing and transportation as a percent of income (2005)

Denver	29%
San Francisco	29%
Honolulu	30%
Phoenix	31%
Seattle	32%
Portland	33%
Anchorage	34%
Los Angeles	36%
San Diego	37%

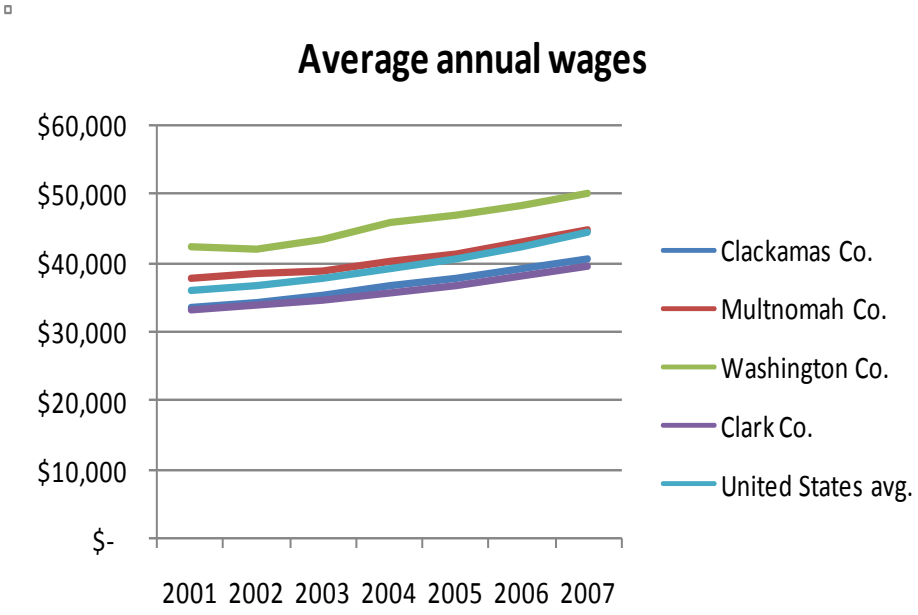
[1] "shelter" portion only of housing costs only

Average annual wages (U.S. Bureau of Labor Statistics)

Applies to desired outcome(s):

2. Economic competitiveness and prosperity
6. Equity

The ability to find gainful employment is an important measure of the economic and social well-being of the region. Average annual wages in both Multnomah and Washington counties have consistently exceeded the national average. A healthy economy is the product of many factors, including the preservation of the region's quality of life, which is an important attractor of employers and a skilled work force.



Water quality (source: Oregon Department of Environmental Quality)

Applies to desired outcome(s):

5. Clean air and water, healthy ecosystems

How we care for our watersheds now and in the future will be a critical means of preserving our region's environmental health and its identity as a leader in conservation and sustainability. The Oregon Water Quality Index (OWQI) is tracked by the Oregon Department of Environmental Quality. The index analyzes a defined set of water quality variables and produces a score describing general water quality. The water quality variables included in the OWQI are temperature, dissolved oxygen (percent saturation and concentration), biochemical oxygen demand, pH, total solids, ammonia and nitrate nitrogens, total phosphorus, and bacteria.

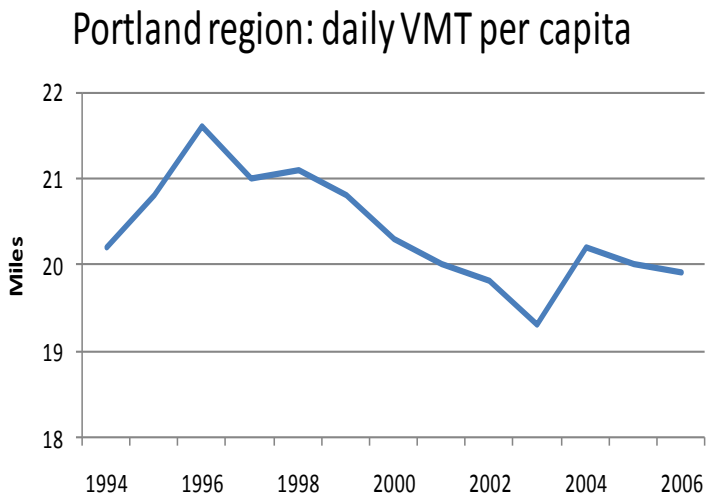
	2003	2004	2005	2006
Sandy River at Troutdale Bridge	91	91	91	90
Beaverton Creek at Cornelius Pass Rd. (Orenco)	53	55	56	54
Clackamas River at High Rocks	91	91	91	92
Clackamas River at McIver Park	95	95	95	95
Clackamas River at Memaloose Rd.	92	92	92	95
Columbia Slough at Landfill Rd.	37	39	43	44
Fanno Creek at Bonita Rd. (Tigard)	62	61	61	62
Johnson Creek at SE 17th Ave. (Portland)	29	29	31	30
Swan Island Channel midpoint (Willamette River)	80	81	81	81
Tualatin River at Boones Ferry Rd.	59	61	60	57
Tualatin River at Elsner Rd.	66	66	65	63
Tualatin River at Hwy 210 (Scholls)	65	65	63	62
Tualatin River at Rood Bridge	76	78	78	80
Willamette River at Hawthorne Bridge	82	83	84	85
Willamette River at SP&S railroad bridge (Portland)	79	80	84	82
Columbia River at Portland Marker 47	82	83	83	86

Very poor	Poor	Fair	Good	Excellent
Less than 60	60 – 79	80 - 84	85 - 89	90 - 100

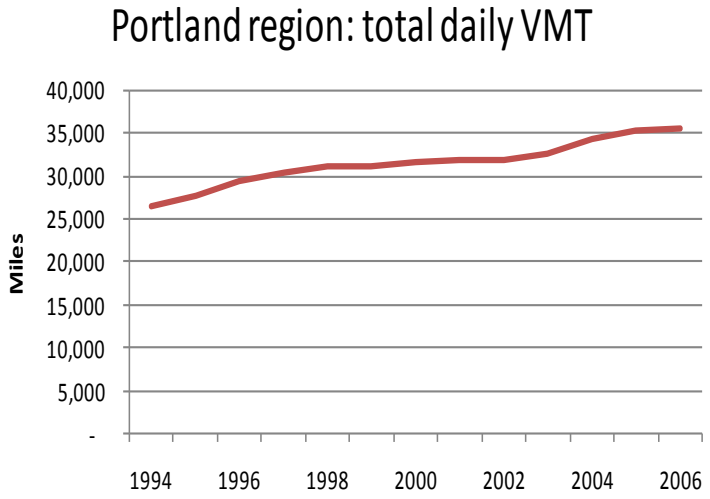
Vehicle miles travelled (VMT) (source: Federal Highway Administration)

Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices
4. Reduce greenhouse gas emissions
5. Clean air and water, healthy ecosystems



On average, each of us is driving less than we did in the mid 1990s. This is a trend that will need to continue in order to reduce greenhouse gas emissions.



However, we will need to see even greater reductions in per capita VMT. Because of population growth, total daily VMT for the region has increased. In order to reduce greenhouse gas emissions below 1990 levels[2], each of us (and future residents) will need to drive much less than we do today. The compact urban form envisioned in the 2040 Growth Concept is the surest way to make that reduction in total VMT.

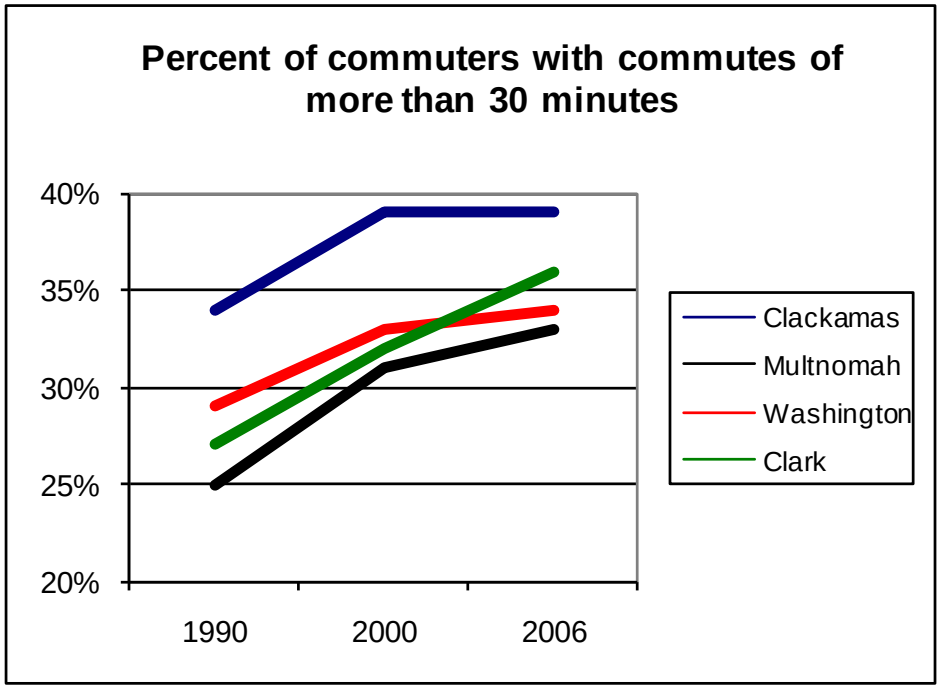
[2] Oregon state law requires that growth in greenhouse gas emissions be halted by 2010, that emissions be reduced to 10% below 1990 levels by 2020, and 75% below 1990 levels by 2050.

Commute time (source: U.S. Census Bureau)

Good growth management practices can help to reduce the distance between home and work. However, as the region has matured as a metropolitan area, commute times have increased. A steadfast commitment to good land use policy, reinforcement of centers and corridors, and smart transportation investments remain the most effective means of moderating commute times (and other trip times).

Applies to desired outcome(s):

2. Economic competitiveness and prosperity
3. Transportation choices
4. Reduce greenhouse gas emissions
5. Clean air and water, healthy ecosystems
6. Equity



Commute by bicycle

(source: U.S. Census)

In many communities throughout the United States, commuting by bicycle is all but impossible. Many cities in our region have been planned in ways that make bicycle commuting a viable and pleasant option. There's still much room for improvements, however.

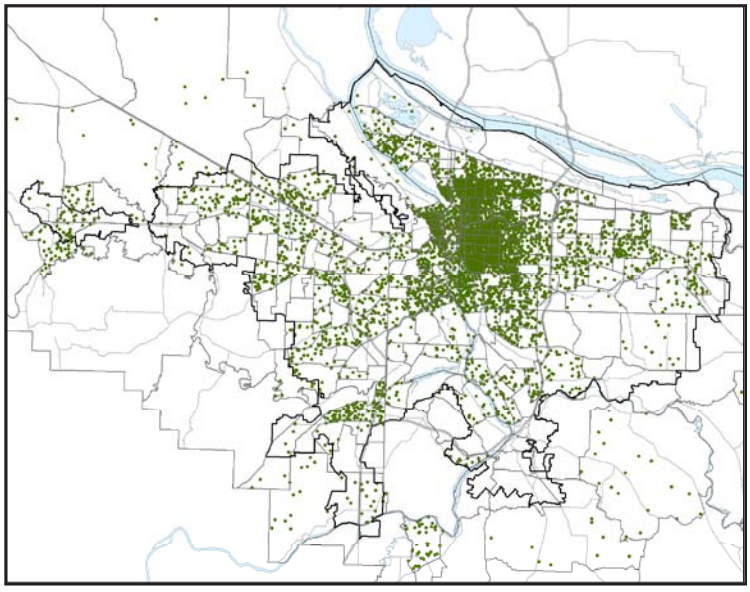
Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices
4. Reduce greenhouse gas emissions
5. Clean air and water, healthy ecosystems
6. Equity

1990	
Sacramento	1.9%
Seattle	1.5%
Portland	1.1%
Phoenix	1.1%
San Diego	1.1%
San Francisco	1.0%
Hillsboro	0.9%
Beaverton	0.7%
Los Angeles	0.6%
Gresham	0.3%
New York	0.3%
Atlanta	0.3%
Lake Oswego	0.0%

2000	
San Francisco	2.0%
Seattle	1.9%
Portland	1.8%
Sacramento	1.4%
Phoenix	0.9%
San Diego	0.7%
Los Angeles	0.6%
New York	0.5%
Gresham	0.4%
Hillsboro	0.4%
Beaverton	0.3%
Atlanta	0.3%
Lake Oswego	0.2%

2006	
New York	5.5%
Portland	4.2%
Seattle	2.3%
San Francisco	2.3%
Sacramento	1.3%
Hillsboro	1.1%
Beaverton	0.9%
San Diego	0.8%
Los Angeles	0.6%
Phoenix	0.6%
Atlanta	0.5%



Year 2000 (3-county area)
One dot = one bike commuter
.9% of commuters
6,425 bike commuters

Commute by transit (source: U.S. Census)

Our region has good reasons to be proud of the transit system that we continue to build. But, we should continue to strive for better. Several other cities in the U.S. provide examples of how much more we may be able to increase transit ridership.

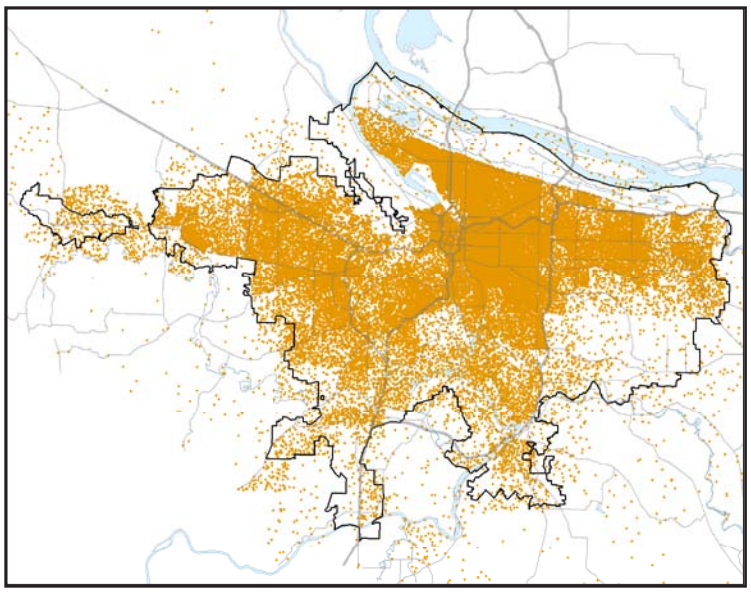
Applies to desired outcome(s):

7. Vibrant, walkable communities
8. Economic competitiveness and prosperity
9. Transportation choices
10. Reduce greenhouse gas emissions
11. Clean air and water, healthy ecosystems
12. Equity

1990	
New York	51.9%
San Francisco	33.2%
Atlanta	19.7%
Seattle	15.8%
Portland	11.0%
Los Angeles	10.5%
Gresham	5.5%
Beaverton	4.9%
San Diego	4.2%
Sacramento	4.0%
Hillsboro	3.5%
Phoenix	3.1%
Lake Oswego	2.9%

2000	
New York	52.8%
San Francisco	31.1%
Seattle	17.6%
Atlanta	15.0%
Portland	12.3%
Los Angeles	10.2%
Beaverton	8.3%
Gresham	7.6%
Hillsboro	6.5%
Sacramento	4.6%
San Diego	4.2%
Lake Oswego	3.7%
Phoenix	3.3%

2006	
New York	54.2%
San Francisco	30.3%
Seattle	17.8%
Atlanta	14.8%
Portland	12.6%
Los Angeles	10.9%
Beaverton	10.1%
Hillsboro	7.7%
Sacramento	4.6%
San Diego	4.1%
Phoenix	3.7%



Year 2000 (3-county area)
One dot = one transit commuter
7.6% of commuters
55,831 transit commuters

Commute by driving alone (source: U.S. Census)

Driving alone remains the predominant mode of commuting in our region. In order to make other modes viable choices for more people, we must continue taking an integrated approach to land use and transportation.

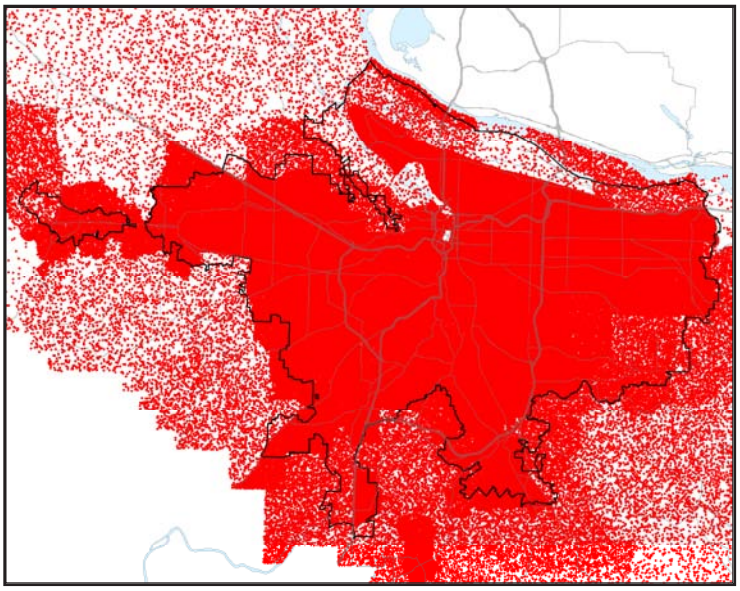
Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices
4. Reduce greenhouse gas emissions
5. Clean air and water, healthy ecosystems
6. Equity

1990	
New York	24.0%
San Francisco	38.5%
Seattle	58.7%
Atlanta	61.2%
Portland	65.0%
Los Angeles	65.2%
San Diego	70.7%
Sacramento	71.7%
Hillsboro	73.4%
Phoenix	73.7%
Gresham	75.7%
Beaverton	76.7%
Lake Oswego	81.9%

2000	
New York	24.9%
San Francisco	40.5%
Seattle	56.5%
Portland	63.7%
Atlanta	64.0%
Los Angeles	65.7%
Sacramento	71.0%
Phoenix	71.7%
Beaverton	72.5%
Gresham	72.5%
Hillsboro	73.4%
San Diego	74.0%
Lake Oswego	78.8%

2006	
New York	23.5%
San Francisco	40.5%
Seattle	55.2%
Portland	60.6%
Atlanta	64.9%
Los Angeles	67.2%
Hillsboro	68.3%
Sacramento	72.5%
Phoenix	72.7%
San Diego	74.7%
Beaverton	75.0%



Year 2000 (3-county area)
One dot = one drive alone commuter
71.5% of commuters
523,140 drive alone commuters

Commute by walking (source: U.S. Census)

The ability to walk to work is perhaps the most basic measure of how the region is faring in creating a compact urban form. By this measure, some of our region's communities are faring better than others.

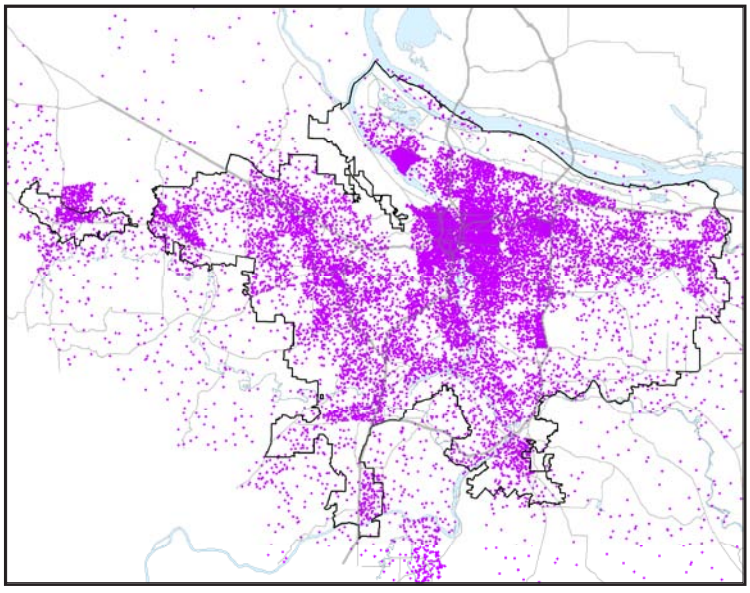
Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices
4. Reduce greenhouse gas emissions
5. Clean air and water, healthy ecosystems
6. Equity

1990	
New York	10.7%
San Francisco	9.8%
Seattle	7.2%
Portland	5.6%
San Diego	4.9%
Los Angeles	3.9%
Atlanta	3.8%
Sacramento	3.4%
Phoenix	2.7%
Hillsboro	2.6%
Beaverton	2.3%
Gresham	1.6%
Lake Oswego	1.6%

2000	
New York	10.4%
San Francisco	9.4%
Seattle	7.4%
Portland	5.2%
San Diego	3.6%
Los Angeles	3.6%
Atlanta	3.5%
Beaverton	3.1%
Sacramento	2.8%
Hillsboro	2.2%
Phoenix	2.2%
Lake Oswego	2.0%
Gresham	1.8%

2006	
New York	9.8%
San Francisco	9.6%
Seattle	8.4%
Portland	5.2%
Atlanta	4.6%
Hillsboro	4.2%
San Diego	3.6%
Los Angeles	3.4%
Sacramento	3.0%
Beaverton	2.4%
Phoenix	1.9%



Year 2000 (3-county area)
One dot = one walk commuter
3.2% of commuters
23,761 walk commuters

Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Economic competitiveness and prosperity
3. Transportation choices

Active living (source: Centers for Disease Control)

Urban form plays an important role in either encouraging or discouraging physical activity. The opportunity to visit open spaces or incorporate biking or walking into everyday routines are a couple of ways that residents of the Metro region have benefited from a tradition of good planning.

Percent of metropolitan area population that gets recommended amount of physical activity (year 2005)

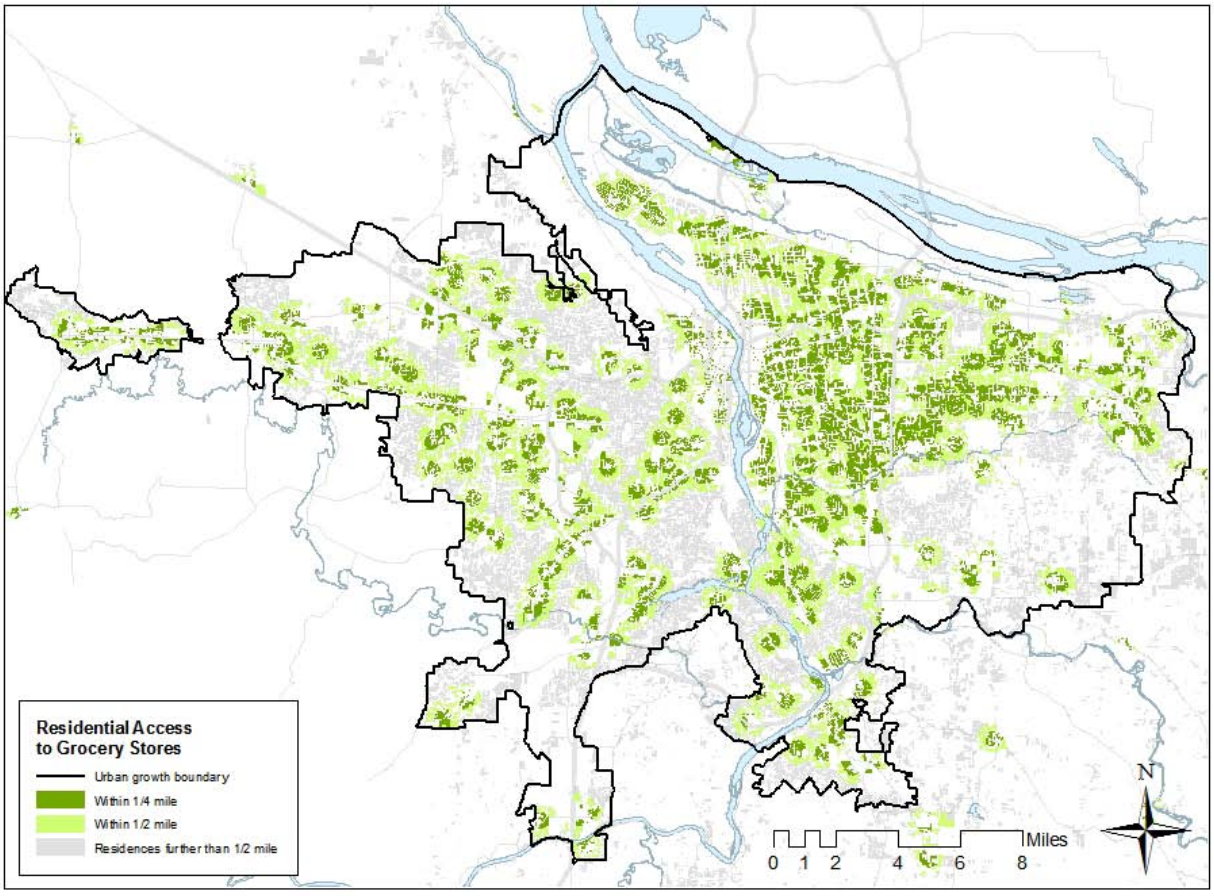
San Francisco	53%
Portland	52%
San Diego	52%
Seattle	51%
Phoenix	51%
Denver	50%
Albuquerque	48%
Los Angeles	45%
Austin	44%
Atlanta	41%

Grocery store[3] within walking distance

Applies to desired outcome(s):

1. Vibrant, walkable communities
2. Transportation choices
6. Equity

Many communities in our region have mixed-use developments that give people the option of walking to take care of everyday tasks such as grocery shopping. These communities are vibrant places to live and work and will be key to reducing the region's auto dependence.



[3] Includes convenience stores

Jobs-to-housing balance

Ideally, people would live close to where they work, thereby saving money and time spent commuting. However, for a number of reasons, achieving a jobs-to-housing balance at the local jurisdiction level (i.e. city) does not appear to have the intended effect of shortening commutes:

- Many households have two or more employees, thereby reducing the likelihood that all members of a household will find employment in their city of residence.
- Employees have specific qualifications and wage requirements that will not necessarily be met by jobs that are nearby.
- Employers have specific worker requirements that will not necessarily be fulfilled by the local labor pool.
- Workers may change jobs with some frequency, but each job change will not necessarily result in a residential move.
- Wages and rents may be mismatched for an employee in a given city.

Data from the U.S. Census Bureau (Longitudinal Employer-Household Dynamics) indicate that many Metro region residents make commutes[4] not only to other cities, but to other counties. However, most trips are for non-commute purposes. Creating a local mix of uses is an important means of reducing non-commute trip frequency and distance.

Year 2006 data on commute behavior are summarized on the following pages for Clackamas, Clark, Washington and Multnomah counties.

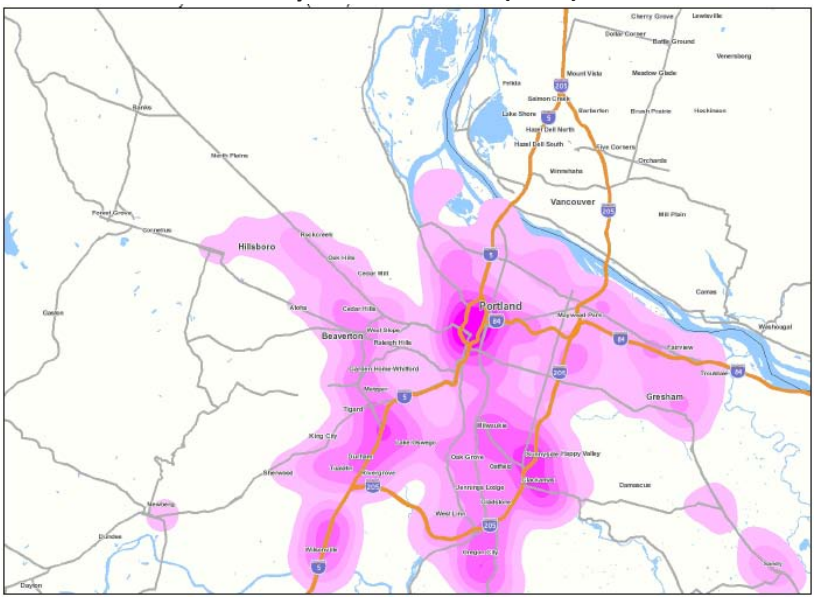
[4] Data on following pages is for primary job only

Jobs-to-housing balance: Clackamas County

Source: U.S. Census Bureau (Longitudinal Employer-Household Dynamics)

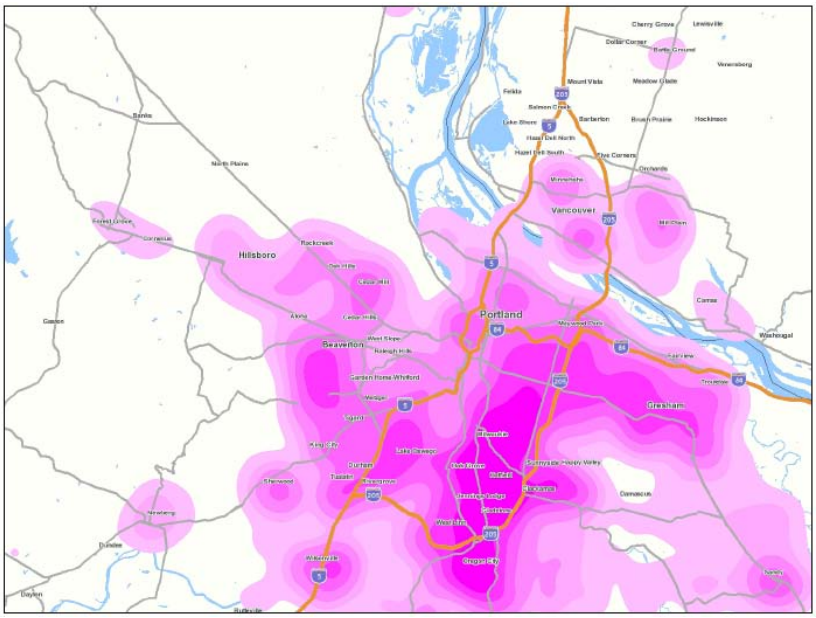
Clackamas County is sending workers to and attracting workers from locations throughout the region.

Where Clackamas County residents work (2006)



Portland	29.6%
Oregon City	5.3%
Beaverton	4.0%
Lake Oswego	3.8%
Tigard	3.7%
Milwaukie	3.6%
Wilsonville	3.4%
Gresham	3.3%
Tualatin	2.9%
Hillsboro	2.0%
All Other Locations	38.6%

Where Clackamas County workers reside (2006)



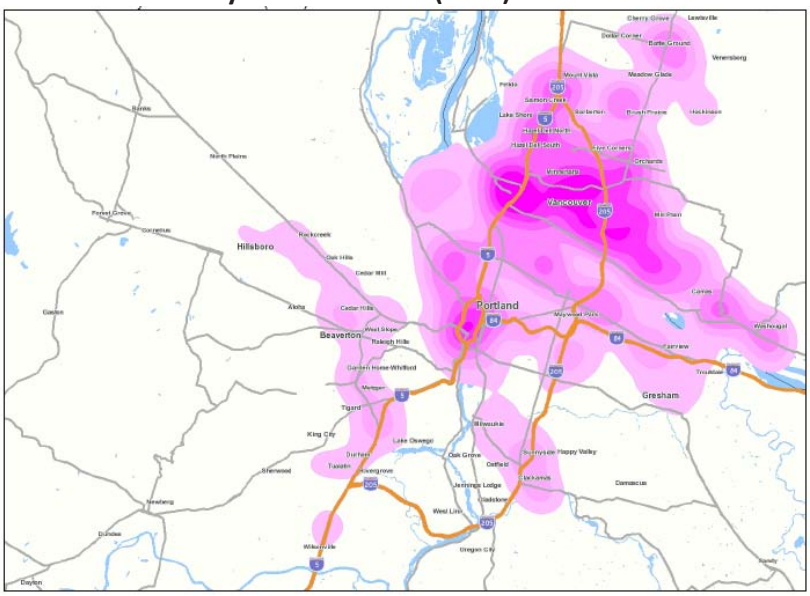
Portland	19.4%
Gresham	4.6%
Oregon City	4.5%
Lake Oswego	3.0%
Beaverton	3.0%
West Linn	2.8%
Milwaukie	2.6%
Salem	2.5%
Oatfield	2.3%
Canby	2.2%
All Other Locations	53.0%

Jobs-to-housing balance: Clark County

Source: U.S. Census Bureau (Longitudinal Employer-Household Dynamics)

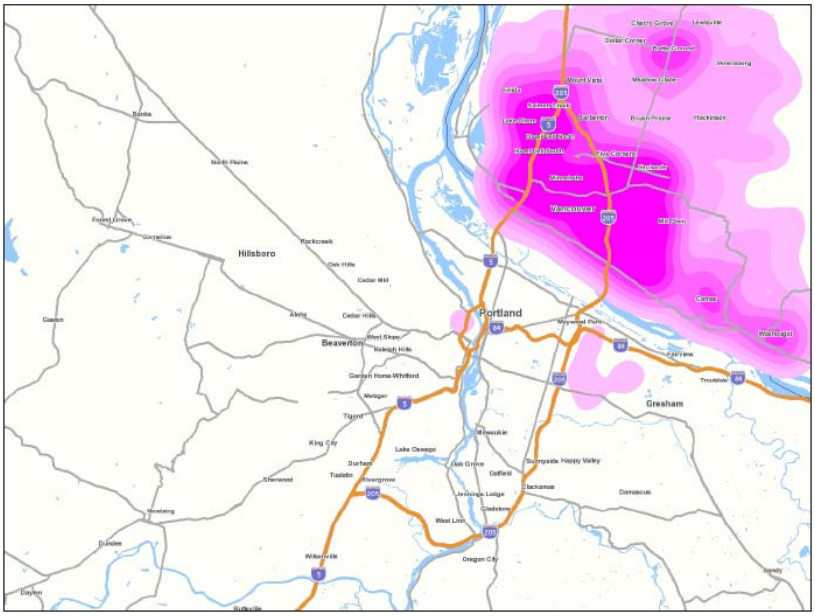
Many Clark County residents commute to jobs in the Metro region, particularly in Portland. However, most of Clark County's jobs are filled by those who live north of the Columbia River.

Where Clark County residents work (2006)



Vancouver	31.4%
Portland	21.9%
Camas	3.1%
Orchards	1.9%
Salmon Creek	1.9%
Walnut Grove	1.7%
Battle Ground	1.6%
Seattle	1.6%
Five Corners	1.5%
Gresham	1.5%
All Other Locations	31.9%

Where Clark County workers reside (2006)



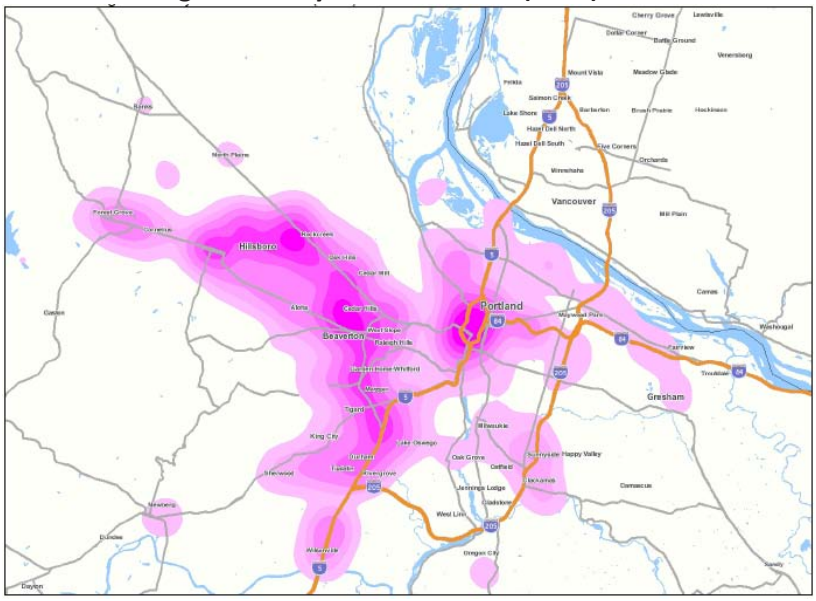
Vancouver	29.3%
Portland	5.0%
Orchards	4.3%
Salmon Creek	3.8%
Camas	3.2%
Five Corners	3.0%
Battle Ground	2.9%
Washougal	2.4%
Hazel Dell North	2.2%
Mill Plain	2.1%
All Other Locations	41.8%

Jobs-to-housing balance: Washington County

Source: U.S. Census Bureau (Longitudinal Employer-Household Dynamics)

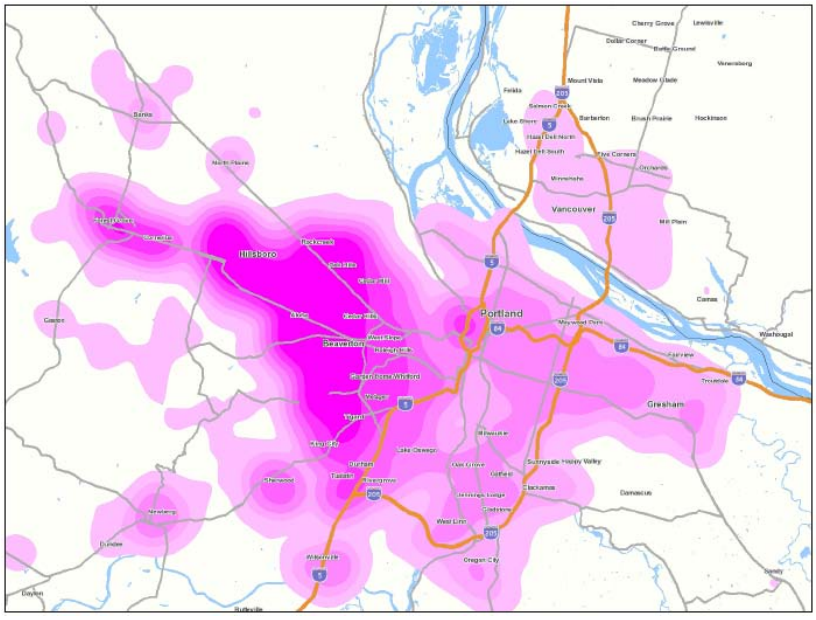
Washington County is sending workers to and attracting workers from locations throughout the region.

Where Washington County residents work (2006)



Portland	25.1%
Hillsboro	16.7%
Beaverton	15.6%
Tigard	6.1%
Tualatin	3.2%
Forest Grove	2.2%
Lake Oswego	2.1%
Wilsonville	2.0%
Aloha	1.8%
Salem	1.4%
All Other Locations	23.8%

Where Washington County workers reside (2006)



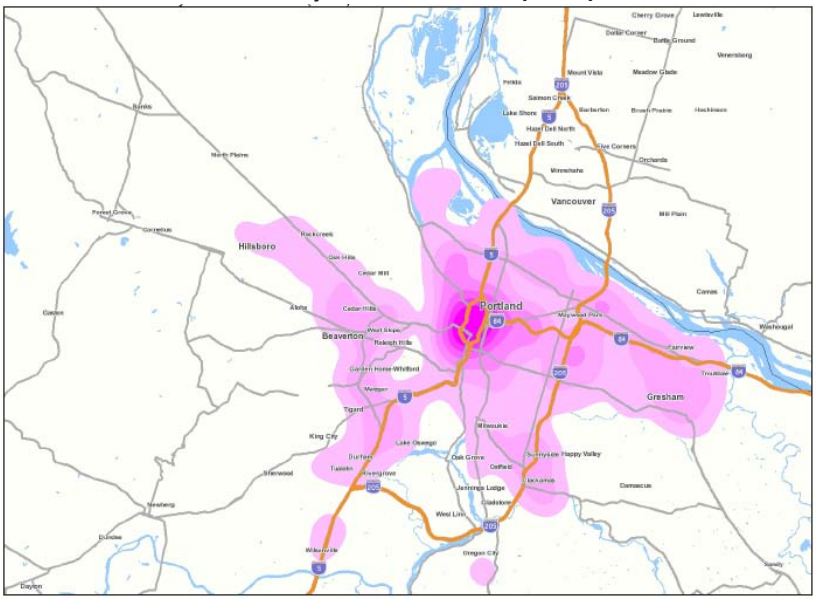
Portland	17.0%
Hillsboro	10.6%
Beaverton	9.9%
Aloha	5.2%
Tigard	3.9%
Forest Grove	2.5%
Tualatin	2.0%
Gresham	1.9%
Lake Oswego	1.7%
Vancouver	1.5%
All Other Locations	43.8%

Jobs-to-housing balance: Multnomah County

Source: U.S. Census Bureau (Longitudinal Employer-Household Dynamics)

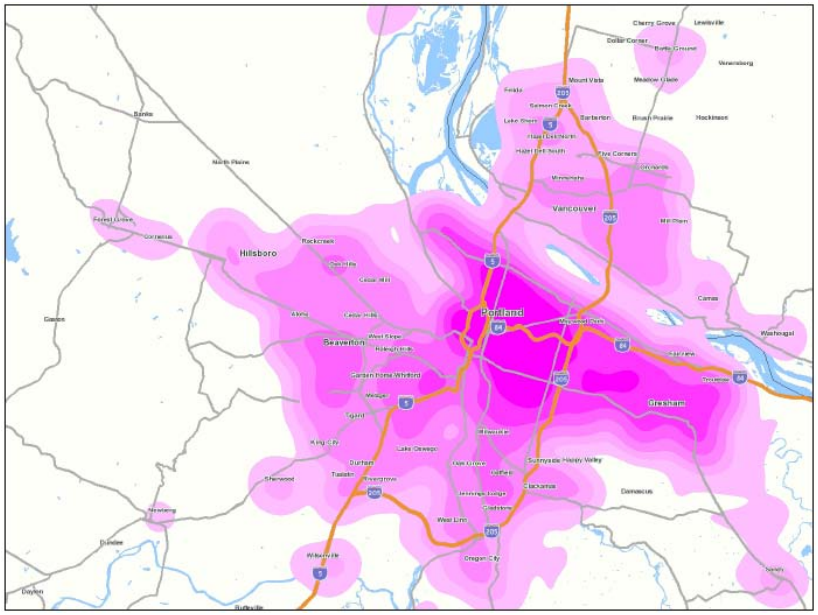
Multnomah County is sending workers to and attracting workers from locations throughout the region.

Where Multnomah County residents work (2006)



Portland	58.2%
Gresham	5.9%
Beaverton	4.7%
Hillsboro	2.6%
Tigard	2.6%
Vancouver	1.5%
Lake Oswego	1.4%
Milwaukie	1.4%
Tualatin	1.3%
Salem	1.2%
All Other Locations	19.2%

Where Multnomah County workers reside (2006)



Portland	42.6%
Gresham	7.2%
Vancouver	4.2%
Beaverton	3.5%
Hillsboro	1.8%
Lake Oswego	1.6%
Tigard	1.5%
Troutdale	1.3%
Aloha	1.3%
Milwaukie	1.2%
All Other Locations	33.8%

APPENDIX 3: METROSCOPE SCENARIO ASSUMPTIONS

Purpose

This technical appendix is intended to provide documentation of the policy and investment assumptions that were made for the MetroScope scenarios described in this preliminary UGR. The purpose of these scenarios is to illustrate the possible future outcomes of current policies and investments.

Disclaimer

The assumptions made for these scenarios are for research purposes only and are not intended to reflect future policy direction. It is anticipated that many of these policy and investment assumptions will be subject to change as more is learned about local aspirations and as cities update their comprehensive plans through periodic review.

About MetroScope

MetroScope is an integrated land use and transportation simulation model that operates on economic principles. The model's main purpose is to predict where the region's employment and housing will locate in the future. The total population number that the model attempts to locate is determined in a separate population forecast. Along with the prediction of location choices, the model estimates outcomes such as housing price appreciation. These outcomes are, in part, the consequences of explicit policy choices made both by Metro and local jurisdictions. Such policy choices include, for example, UGB expansions, investments in infrastructure, and zoning designations. MetroScope provides a means of considering how the market might respond to those choices in the long term.

A MetroScope scenario seeks equilibrium, the price point(s) at which housing or employment demand matches supply. For example, if demand for housing in a particular census tract outstrips capacity, prices will increase until a supply and demand equilibrium is reached.

Local jurisdiction input on scenario assumptions

Metro staff consulted with representatives of the three counties (Clackamas, Multnomah, and Washington) as well as the City of Portland in determining what assumptions should be made for these preliminary scenarios.

Major categories of scenario assumptions

The assumptions used for this and other MetroScope scenarios fall into three major categories. The details of these categories are explained further in this document.

- **Demand:** A range forecast establishes the total number of new households and jobs in the 7-county region that are distributed in the scenario.

- **Supply:** Capacity assumptions in the Metro UGB, Clark County, neighbor cities, and rural areas are based on inventories of vacant and buildable land as well as existing zoning.
- **Other variables:** Other assumptions that affect scenario behavior include the transportation network, construction costs and subsidies, and consumer preferences.

Demand:

Population and employment range forecast assumptions

MetroScope scenarios assume fixed population and employment control totals. The assumed totals are from a range forecast for the year 2040 for the larger 7-county region that includes all of Washington, Clackamas, Multnomah, Columbia and Clark counties, most of Yamhill County, and a small portion of Marion County.

Given a set of policy and investment assumptions, MetroScope predicts a possible future distribution of new households and jobs in the 7-county region. As an equilibrium model, MetroScope will find a "home" for all forecasted households and jobs; the model will not identify a capacity gap (because the maximum zoned capacity for the 7-county area easily accommodates the growth forecast).

In order to incorporate a range forecast into scenario modeling, it was necessary to conduct multiple scenarios, each with a different population and employment control total assumption. Three scenarios were conducted for the purposes of this preliminary UGR: high end of range forecast, low end of forecast, and midpoint of forecast. Control totals for each of these scenarios are summarized below:

Scenario	Population control total	Employment control total
High end of range forecast	1,469,400	1,985,697
Midpoint of range forecast	1,381,000	1,707,414
Low end of range forecast	1,292,600	1,433,738

Supply:

Metro UGB supply: zoning

Regional Land Information System (RLIS) data, maintained by Metro, provide zoning assumptions for scenarios. The three counties (Clackamas, Multnomah, and Washington) provide Metro with quarterly updates to the RLIS zoning data. Local zoning designations are translated into 44 generalized zoning classifications, each of which has an assumed maximum zoned capacity.

Metro UGB supply: vacant land

Vacant land is defined in two ways:

1) Tax lots with no improvement value or buildings.

2) Partially developed parcels with an undeveloped portion of at least one-half acre.

Using aerial photography, Metro conducts surveys of vacant land inside the UGB. This survey is conducted using the aerial photographs as well as building permit and tax assessor data. All parcels inside the UGB are examined to determine if they qualify as vacant.

The vacant land designation does not indicate whether or not the parcel is for sale, if there are plans to develop it, if there are constraints to its development (e.g. zoning or environmental constraints such as wetlands or steep slopes), or if there is a market demand for its development.

This MetroScope scenario assumes the 2007 vacant land survey, the most up-to-date buildable land information that is available (the process of analyzing the aerial photographs and applying the buildable land definition is a time consuming one that prevents the use of a more current inventory).

Metro UGB supply: buildable land

Buildable land is identified by deducting environmentally constrained land from the vacant land inventory. This MetroScope scenario assumes the 2007 buildable lands survey.

Metro UGB supply: refill land

"Refill" refers to both redevelopment and infill development. Redevelopment occurs when a structure is removed and another is built in its place. Infill occurs when more units are constructed on an already-developed site. Since "vacant" land includes any tax lot or any part of a tax lot that has a vacant portion larger than ½ acre, infill only includes development on an existing developed lot or partially developed lot with a vacant portion smaller than ½ acre.

Refill development tends to occur when market conditions make it profitable to develop (or redevelop) these tax lots, typically when land prices reach a certain level. Thus, refill capacity is based on the relationship between a tax lot's size, land value, and improvement value. Metro calculates refill capacity in consultation with local jurisdiction staff.

For scenario modeling purposes, tax lots that have a high enough ratio of land to improvement value and that are of sufficient size are counted as refill capacity. This determination varies by county and by zoning designation. Like zoned capacity, refill capacity will not necessarily get used in the model simply because it exists. MetroScope scenarios subject refill capacity to a simulated market test. Whether or not the capacity gets used in the scenario is a function of many factors including price, accessibility, and zoning.

Metro UGB supply: recent UGB expansion areas

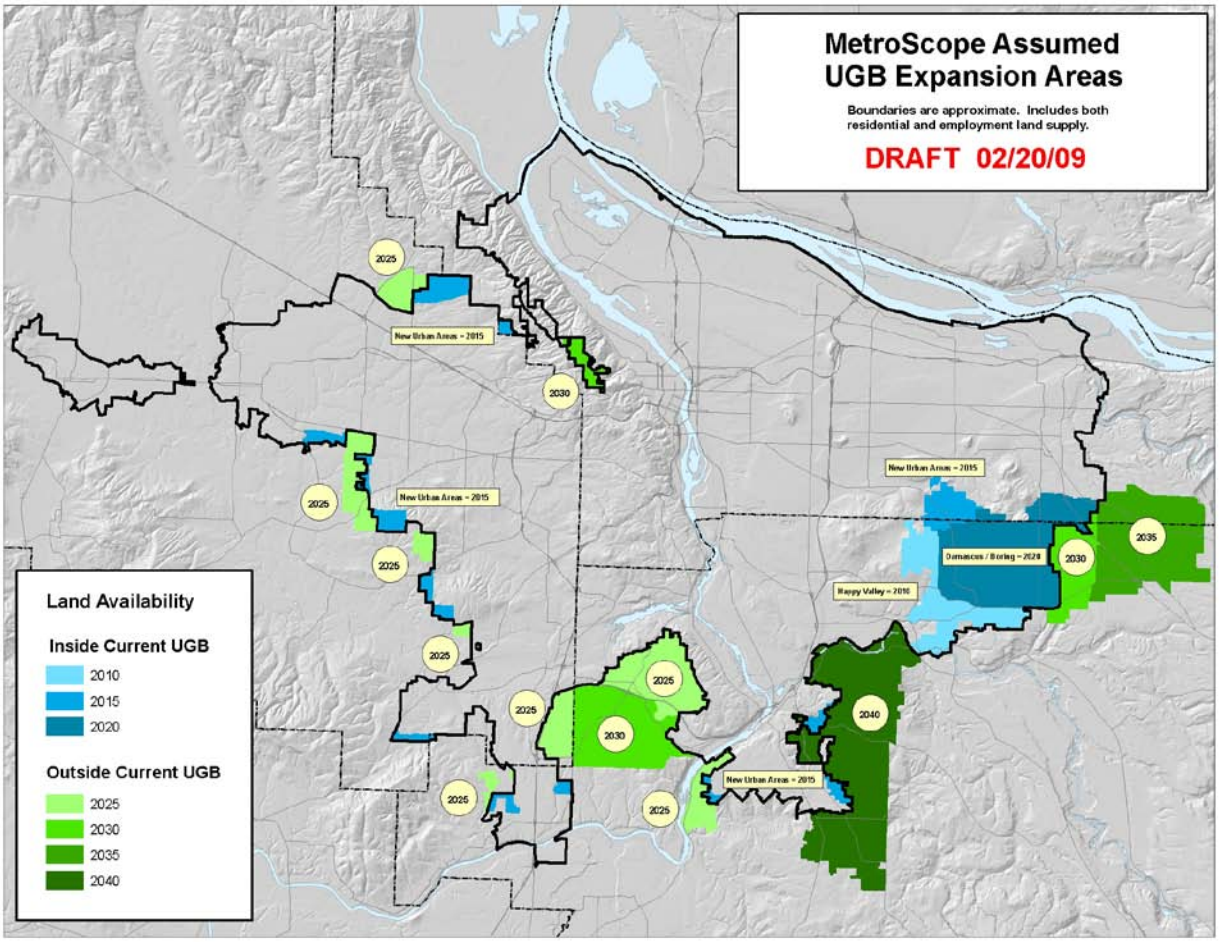
In reality, lands are not immediately developable upon their inclusion in the UGB. In order for lands to be developable, planning must have been completed and infrastructure financing needs to be in place. To mimic that delay, these scenarios assume that there is a development delay for lands that have previously been added to the UGB. By the end of the delay, it is assumed that infrastructure funding has become available through an unspecified mechanism.

Metro UGB expansion area (past expansions only)	Assumed date of availability for development
Happy Valley	2010
Damascus	2020
All other areas added to the Metro UGB since 1998 (other than Happy Valley and Damascus)	2015

Metro UGB supply: prospective UGB expansions

This scenario assumes a continuation of past policies and trends, including the trend of expanding the UGB according to state-mandated land hierarchies. It is assumed that there is no need for prospective UGB expansions until five years after the date that Damascus becomes available to the model (prospective UGB expansions are available in 2025, five years after Damascus is assumed available).

The map below shows the sequence of prospective UGB expansions that are assumed for this scenario, including the aforementioned areas that have been added to the UGB since 1998.



Clark County supply: zoning

Zoning for Clark County is assumed to be the zoning that was in place in the year 2005.

Clark County supply: vacant, buildable land

For vacant buildable land in Clark County, Washington, Metro uses the county's 2005 data. Clark County uses a different methodology for inventorying its vacant, buildable land than Metro.

Clark County supply: refill land

Clark County has a different method than Metro for identifying refill capacity. However, for MetroScope modeling purposes, Metro applies its refill definitions to Clark County land.

Clark County supply: prospective urban growth area expansions

In January 2008, Clark County added approximately 19 square miles of urban growth areas. [1] This scenario assumes that those urban reserve areas are metered in roughly equal proportions as depicted on the map below. This scenario assumes the zoning found in current comprehensive plans.

INSERT CLARK COUNTY EXPANSION MAP

[1] A portion of the 19 square mile expansion was overturned and is now on appeal at the Washington State Superior Court. Because the issue remains unresolved, these scenarios assume the full 19 square miles are available.

The County's appeal was filed June 12, 2008. It seeks to overturn a recent decision and order from the Western Washington Growth Management Hearings Board that found that the County did not comply with the State's Growth Management Act when bringing lands previously designated for agricultural uses into the urban growth area. If the County's appeal is not successful, those areas will revert to resource land designations previously in place, unless they have already been annexed to a city and are now within city limits.

Neighbor City supply:

MetroScope scenarios distribute growth not just to the Metro UGB and to Clark County, but to cities outside of the Metro UGB that are within the 7-county area (e.g. Canby, Sandy, Banks, North Plains, Newberg, etc.). Oregon's State economist's 2004 county-level population forecast is used to estimate future growth in these cities. Neighbor City capacities are assumed to match forecasted population growth.

City	County	Assumed capacity for new dwelling units
Canby	Clackamas	7500
Sandy	Clackamas	3000
Molalla	Clackamas	5000
Estacada	Clackamas	1000
North Plains	Washington	2500
Gaston	Washington	1000
Banks	Washington	2000
Clatskanie	Columbia	1000
Ranier	Columbia	600
Prescott	Columbia	400
Columbia City	Columbia	800
St. Helens	Columbia	2400
Scapoose	Columbia	1100
Vernonia	Columbia	500
Newberg	Yamhill	16000
Dundee	Yamhill	1000
Yamhill	Yamhill	2400
McMinville	Yamhill	8400
Dayton	Yamhill	1500
Amity	Yamhill	3400
St. Paul	Marion	1000
Aurora	Marion	3500
Gervais	Marion	2500
Woodburn	Marion	8500

Measure 49 rural residential supply:

The passage of Measure 37 and its subsequent replacement by Measure 49 created the possibility of additional residential capacity outside of urban growth boundaries. The maximum possible amount of rural (non-UGB) Measure 49 capacity was assumed for these scenarios: three dwelling units of capacity for each residential-zoned Measure 37 claim, for a total of 6,087 dwelling units. It is unlikely that all of those Measure 37 claims have been re-filed under Measure 49 and unlikely that all those that were re-filed will be built. However, they are considered as available capacity in these scenarios. The effects of

this Measure 49 capacity on the overall (7-county) household distributions in these scenarios is likely negligible.

Other variables:

Accessibility: transportation network

This MetroScope scenario assumes the 2005 network for the 2005, 2010 and 2015 Metroscope allocation runs and then uses the 2035 RTP "true" financially constrained network for the 2020, 2025 and 2035 iterations. The "True" Financially Constrained RTP network only includes those projects that are in the Financially Constrained RTP for which there is an identified source of funding for construction (some projects in the Financially Constrained RTP only have an identified source of funding for planning and engineering).

Notable projects **included** in this scenario's transportation network:

- Sunrise from I-205 to 122nd
- Interchange improvements to US 26, OR 217 and I-205
- Milwaukie light rail
- Portland to Lake Oswego streetcar
- Eastside streetcar; Burnside/Couch streetcar to Hollywood Transit Center
- Bus rapid transit on McLoughlin from Milwaukie to OR City
- All day service for the WES commuter train
- New street connections and arterial street expansion are provided throughout the system. Major streets are retrofitted for walking, biking and transit (wider sidewalks, safer street crossings, landscaped buffers, improved bus stops and bikeways)
- Parking costs are increased in the Portland central city, regional centers and town centers

Notable projects that are **not included** in this scenario's transportation network for lack of an identified source of construction funding**:**

- I-5/99W connector
- The Columbia River Crossing
- I-5/I-84 interchange improvements

The 2035 Financially Constrained RTP assumes:

- An increase of one cent per gallon per year in the statewide gas tax for system operations and maintenance.
- A $15 increase in the state vehicle registration fee every eight years to pay for system expansion.
- Continuation of past local and federal funding levels for system expansion.
- $9.07 billion of investments that can be funded with resources the region expects.

Construction costs: system development charges

This scenario assumes that all new dwelling units are assessed a $25,000 per dwelling unit system development charge. This charge appears as an additional construction cost.

Construction costs: residential subsidies

Cities throughout the region have implemented effective strategies for attracting more households to their centers and corridors. These strategies include urban renewal, tax abatement, and investments in public amenities. These scenarios assume that residential subsidies will be in place in the future as well. The guiding principle for making subsidy assumptions for these scenarios was to err on the side of being conservative and only include those locations that have active urban renewal or that have some other identifiable tool in place that acts as a residential subsidy (for instance, a vertical housing tax credit).

These scenarios assume varying levels of residential subsidies in different locations. Three different subsidy levels are assigned: $50,000, $25,000 and $10,000 per dwelling unit. The upper end of the range, $50,000 per dwelling unit, was estimated through staff conversations with the Portland Development Commission.

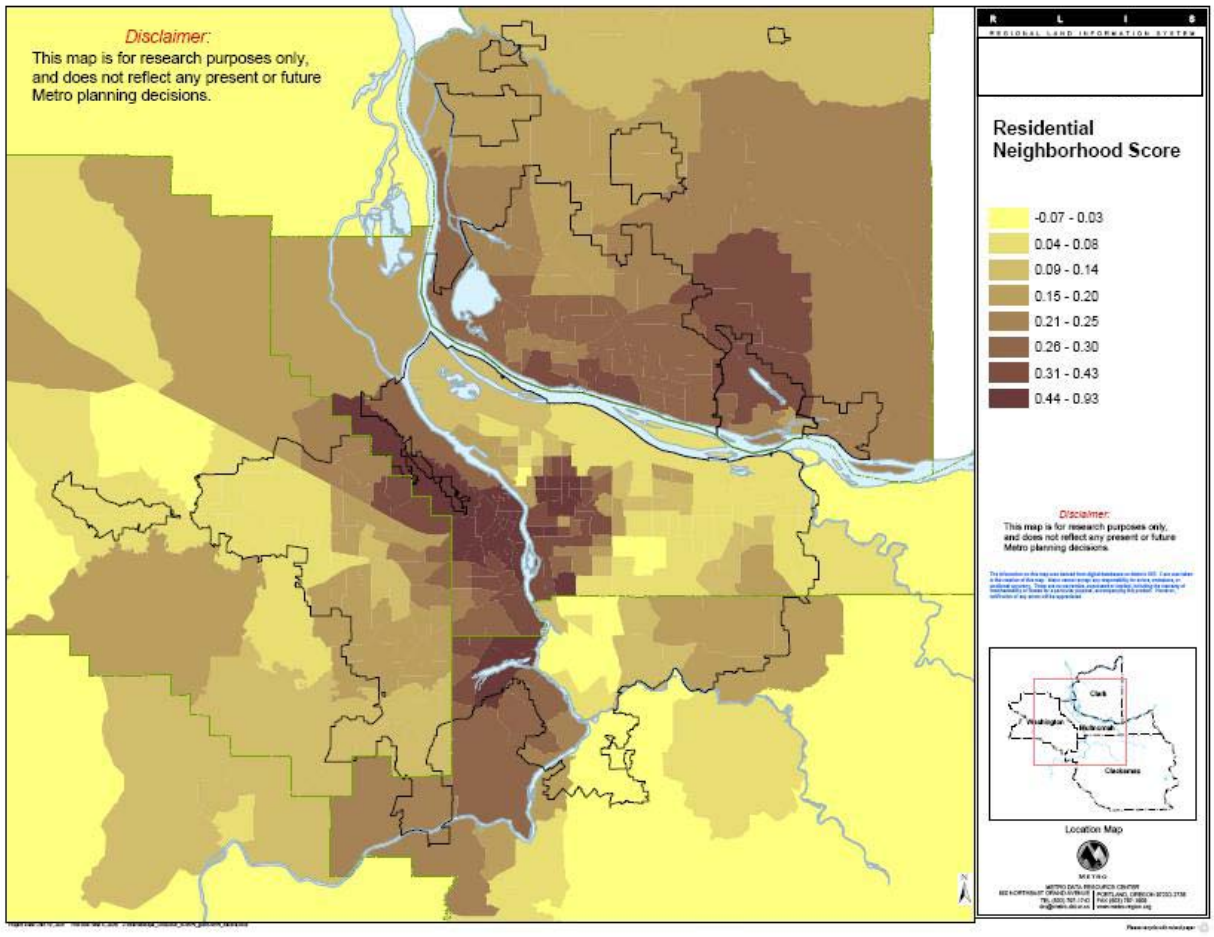
Assumptions are also made regarding the timing of the subsidy (expressed as the percentage of the total number of subsidized units that are available to the market in each five year increment). The level and timing of subsidies assumed in this scenario are professional judgments made by staff and, like all other scenario assumptions, were reviewed by representatives of the three counties and the City of Portland.

					Percent of subsidized dwelling units available (timing)							
Location	Type	Active urban renewal? (residential only)	Reason for subsidy assumption (other than active urban renewal)	Tier*	2010	2015	2020	2025	2030	2035	2040	Total number of subsidized units
Downtown	CC	yes		A	20%	40%	40%					13500
North Macadam	CC	yes		A	33%	33%	33%					7500
Oregon Conv. Center	CC	yes		A	33%	33%	33%					3000
River District	CC	yes		A	25%	25%	25%	25%				24000
South Park Blocks	CC	yes		A	25%	25%	25%	25%				2000
Beaverton	Reg. Ctr.	charter amendment approved by voters, but no active UR	vertical housing program applied on a case-by-case basis (not an abatement zone)	B			20%	20%	20%	20%	20%	2000
Clackamas	Reg. Ctr.	yes		B	25%	25%	25%	25%				2000
Gateway	Reg. Ctr.	yes		B	25%	25%	25%	25%				2000
Gresham	Reg. Ctr.		Vertical housing tax abatement	B	33%	33%	33%					2000
Oregon City	Reg. Ctr.	yes		C	33%	33%	33%					2000
Vancouver	Reg. Ctr.		Parking revenues go to redevelopment. City built parking structure	B	20%	20%	20%	20%	20%			6000
Gladstone	Town Ctr.	yes		C	20%	20%	20%	20%	20%			1200
Hollywood	Town Ctr.		tax abatement, TOD subsidies	B	25%	25%	25%	25%				1200
Lake Oswego	Town Ctr.	yes		B		20%	20%	20%	20%	20%		1200
Lents	Town Ctr.	yes		B		20%	20%	20%	20%	20%		1200
Milwaukie	Town Ctr.		light rail to be built; vertical housing tax abatement	C				25%	25%	25%	25%	1200
Rockwood	Town Ctr.	yes		B			20%	20%	20%	20%	20%	1200
Sherwood	Town Ctr.	yes		C		20%	20%	20%	20%	20%		1200
Tigard	Town Ctr.	yes		C			20%	20%	20%	20%	20%	1200
Troutdale	Town Ctr.	yes		C			20%	20%	20%	20%	20%	1200
Interstate	Non-ctr. UR	yes		A	25%	25%	25%	25%				8000
MLK	Non-ctr. UR	yes		A	20%	20%	20%	20%	20%			3500
Villebois	Non-Ctr UR	yes		C		20%	20%	20%	20%	20%		1000
Canby	City	yes		C			20%	20%	20%	20%	20%	600
Sandy	City	yes		C			20%	20%	20%	20%	20%	600

Consumer preferences: neighborhood score

Recognizing that consumers would be willing to pay different prices for the same residence, were it in different locations, MetroScope scenarios have an input assumption called neighborhood score. A neighborhood score is assigned to each census tract. The score represents the relative market desirability of the census tract and is based on historic residential sales prices. Statistical regression analysis is used to determine what portion of a residence's value can be attributed to its location (neighborhood). This statistical analysis controls for private improvements (e.g. lot size, residential square footage, number of bathrooms, age of house, number of bedrooms, etc). The neighborhood score remains static through the course of the scenario.

The map below displays this scenario's neighborhood score assumptions. A higher score (darker color) indicates that the census tract historically has had a higher market desirability.[2]



[2] Areas with sparse residential sales data (i.e. rural areas) may exhibit exaggerated neighborhood scores (the result of a small number of high value sales). Urbanized areas with more sales activity are likely to have more accurate neighborhood scores.

APPENDIX 4: POPULATION AND EMPLOYMENT FORECAST

Documentation available soon (early spring 2009

APPENDIX 5: UGR LEGAL REQUIREMENTS

To be produced for the August 2009 DRAFT Urban Growth Report

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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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