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**Appendix 1:**

# **Possible outcomes of current policies**

August 2010

## About Metro

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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## PURPOSE

This technical appendix is intended to provide documentation of the scenario that informs the draft 2010 Capacity Ordinance. This scenario was conducted to inform several aspects of the Capacity Ordinance analysis, including:

- Test the effectiveness of a variety of adopted efficiency measures
- Provide information about the possible outcomes of continuing current policy and investment trends

## Scenarios tested

Throughout this document, two different scenarios are compared:

**UGR scenario:** refers to the medium growth scenario that informed the 2009 UGR.

**Capacity Ordinance scenario:** refers to the medium growth scenario that informs the 2010 Capacity Ordinance.

## Disclaimer

This scenario is for research purposes only and to help inform policy discussions. To the degree possible, scenario assumptions reflect policies currently in place. To make the model function, however, some assumptions must be made about policy decisions that have not yet been rendered. This is the case, for instance, with assumed future UGB expansions. It is anticipated that many of model's assumptions will change as new local and regional policies are adopted. Different assumptions would produce different results.

## About MetroScope

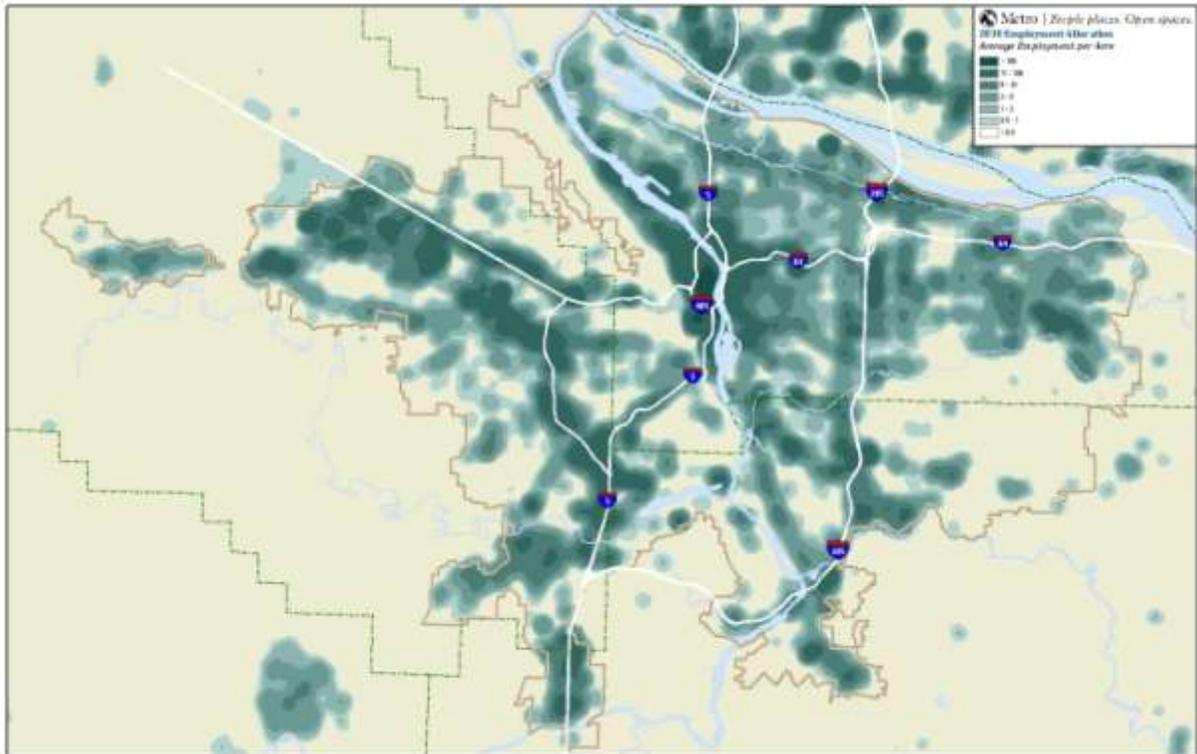
MetroScope is an integrated land use and transportation simulation model that operates on economic principles. The model's main purpose is to estimate where the region's employment and housing will locate in the future. The total number of households and jobs that the model attempts to locate is determined in a separate forecast (the middle of the 2009 range forecast is used for these scenarios). Along with the prediction of location choices, the model estimates outcomes such as housing price appreciation. These outcomes are, in part, the consequences of policy choices made both by Metro and local jurisdictions and larger macroeconomic factors that are part of the household and employment forecast. Regional and local policy choices include, for example, UGB expansions, investments in transportation facilities, 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 supply-and-demand equilibrium is reached.

## SCENARIO RESULTS

### Distribution of jobs in the 7-county area (year 2030)

One of the primary results that MetroScope scenarios can provide is the future distribution of jobs in the region. The map below shows the year 2030 job distribution results for the Capacity Ordinance scenario. Darker colors represent areas with more employees per acre.



## SCENARIO RESULTS

### Distribution of jobs in the 7-county area (year 2030)

#### Why does this measure matter?

Centers and corridors are the locations most likely to provide people with walkable access to everyday needs and transportation choices offering the potential to reduce transportation costs to the individual and to the employer. Employment areas<sup>1</sup> are designated as such to minimize conflicts with other uses.

The Capacity Ordinance scenario indicates future UGB expansions into urban reserves may attract more jobs than the expansions assumed in the UGR scenario.

#### Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Leadership on climate change
- ✓ Clean air and water, healthy ecosystems

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<sup>1</sup> RSIA, Industrial, and Employment areas designated under Title 4 of the Urban Growth Management Functional Plan are included in “other areas” here. “Other areas” also includes neighborhoods. Jobs that locate in neighborhoods would be consistent with local zoning and are likely to be retail and service uses that serve the neighborhood.

Figure 1: Capacity Ordinance scenario - distribution of new jobs (2005 - 2030)

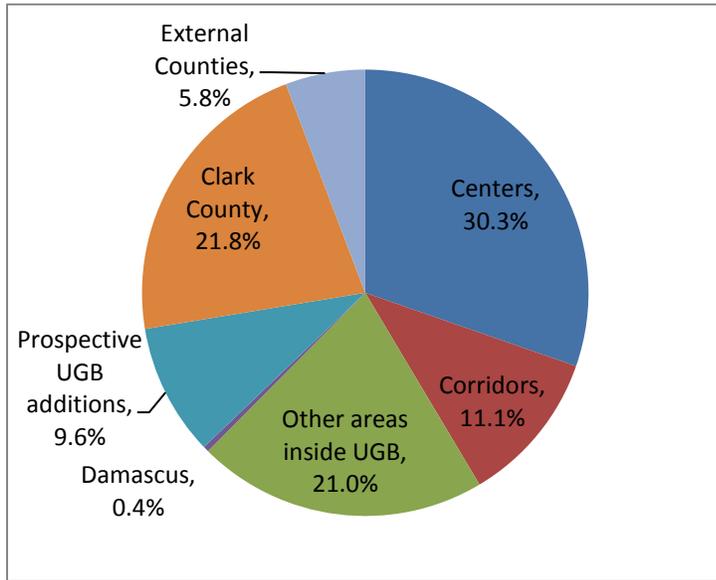
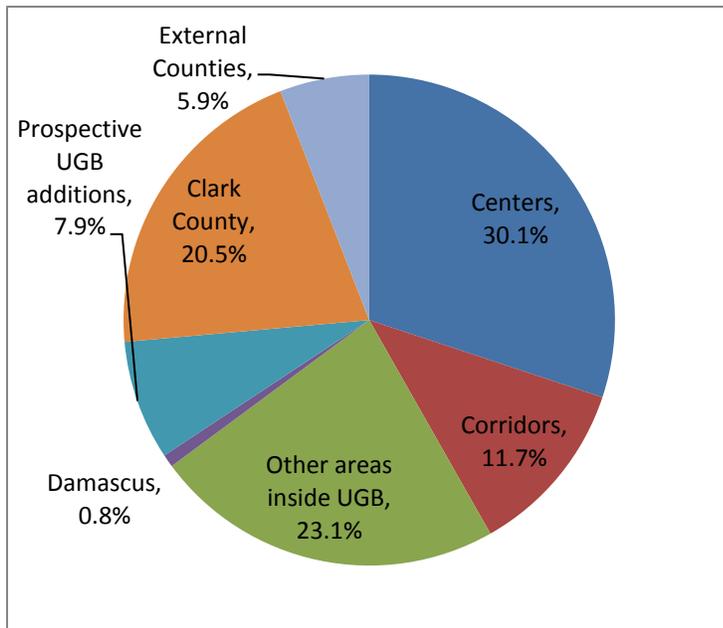


Figure 2: UGR scenario - distribution of new jobs (2005-2030)



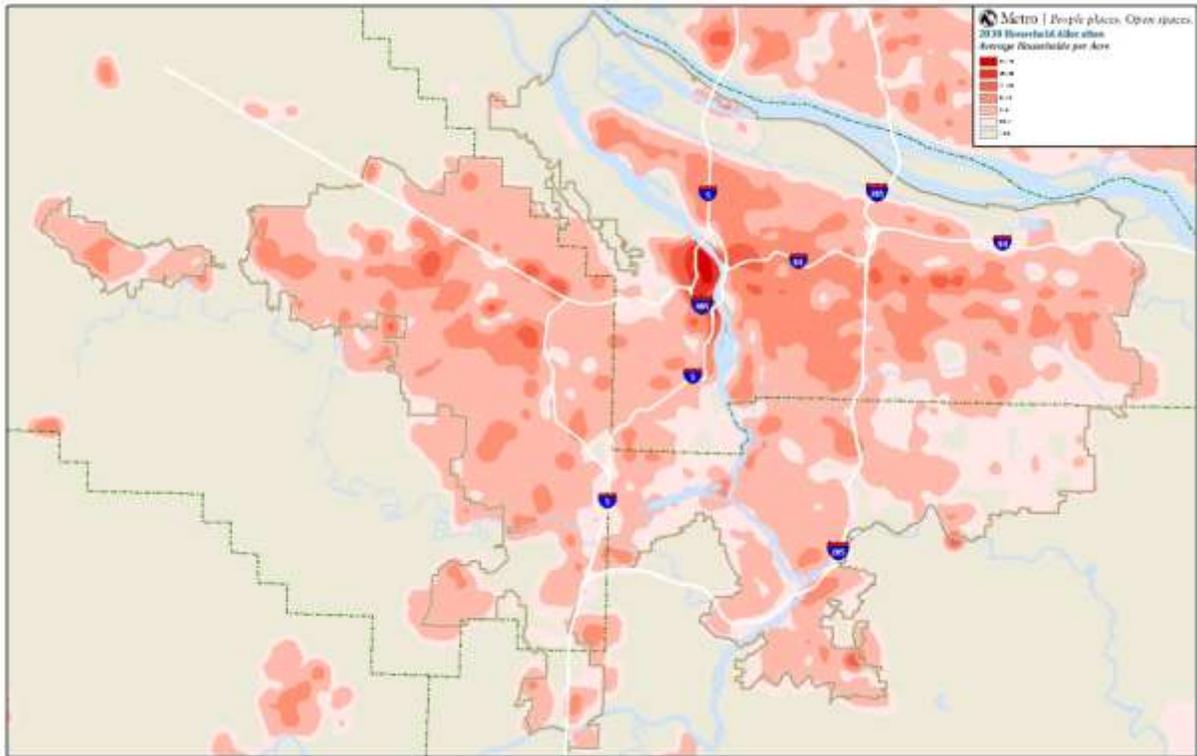
Notes:

- “External counties” refers to Yamhill, Columbia, and Skamania counties
- “Prospective UGB additions” refers to assumed future UGB expansion areas
- “Other areas inside the UGB” refers to all non-center and non-corridor areas inside the Metro UGB, including neighborhoods and Title 4 industrial and employment areas

## SCENARIO RESULTS

### Distribution of households in the 7-county area (year 2030)

One of the primary results that MetroScope scenarios can provide is the future distribution of households in the region. The map below shows the year 2030 household distribution results for the Capacity Ordinance scenario. Darker colors represent areas with more households per acre.



## SCENARIO RESULTS

### Distribution of households in the 7-county area (year 2030)

#### Why does this measure matter?

Centers and corridors are more 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.

Compared to the UGR scenario, the Capacity Ordinance scenario shows an increase in the share of new residences in centers and corridors – newly-adopted policies appear to help implement the 2040 Growth Concept.

#### Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Leadership on climate change
- ✓ Clean air and water, healthy ecosystems

Figure 3: Capacity Ordinance scenario - distribution of new households (2005 - 2030)

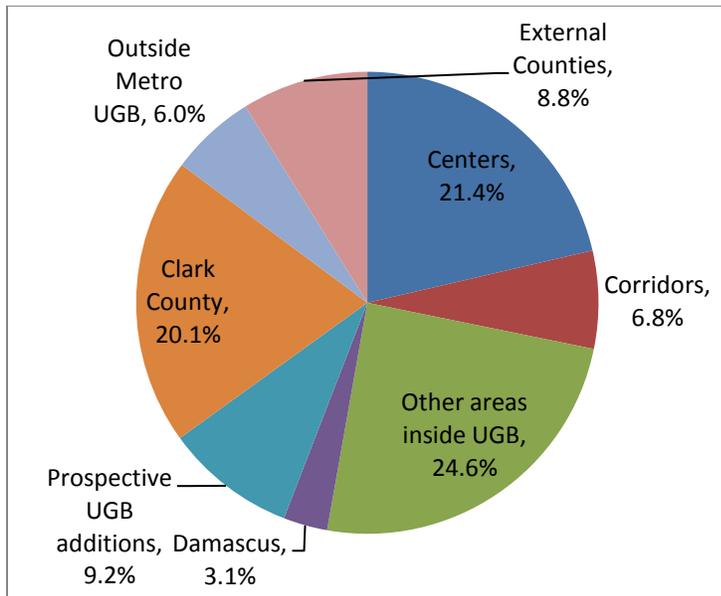
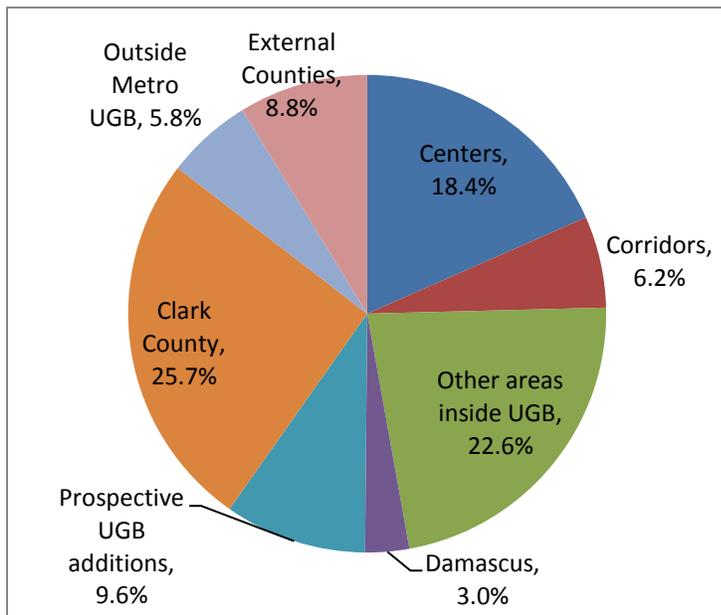


Figure 4: UGR scenario - distribution of new households (2005 - 2030)



Notes:

- “External counties” refers to Yamhill, Columbia, and Skamania counties
- “Prospective UGB additions” refers to assumed future UGB expansion areas
- “Other areas inside UGB” refers to all non-center and non-corridor areas inside the Metro UGB, including neighborhoods and Title 4 industrial and employment areas

## SCENARIO RESULTS

### Residential refill rate (2005 to 2030)

UGR scenario: 39 percent

Capacity Ordinance scenario: 41 percent

#### Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Leadership on climate change
- ✓ Clean air and water, healthy ecosystems
- ✓ Equity

#### Why does this measure matter?

The refill rate is the share of new residential development (percent of new dwelling units) that occurs through redevelopment or infill (in the case of these scenarios, the percent by the year 2030). Thus, refill rate is an important measure how efficiently land is used. Refill can be influenced through policy and investment actions. Higher refill rates are a good indication that policies and market conditions support the implementation of the 2040 Growth Concept with its emphasis on focusing growth in existing urban areas. Compared to the UGR scenario, the Capacity Ordinance scenario indicates a higher refill rate. The higher rate is likely caused by local and regional investments such as the 2035 State RTP that attract households to existing urban centers and corridors, as well as more modest future UGB expansions (scaled according to adopted urban reserves). By the year 2040, the refill rate moderates somewhat, most likely because additional UGB expansions are assumed available for development in later years.

## SCENARIO RESULTS

### Average one-way commute distance for households in the 7-county area (year 2030)

UGR scenario: 12.5 miles

Capacity Ordinance scenario: 12.4 miles

#### Applies to desired outcomes

- ✓ Vibrant, walkable communities
- ✓ Economic competitiveness and prosperity
- ✓ Transportation choices
- ✓ Leadership on climate change
- ✓ Clean air and water, healthy ecosystems

#### 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.<sup>2</sup> These same location choices also tend to produce long trips for meeting other needs, such as going to the grocery store. The scenarios indicate that there could be big differences in average commute distance, depending on where residents and employers locate.

Compared to the UGR scenario, the Capacity Ordinance scenario indicates a slightly shorter average commute distance for households in the seven-county region. Though modest from the perspective of an individual commuter, shorter commutes can have a cumulative impact in the seven-county region. Without improvements in fuel efficiency, additional reductions in travel will be necessary to reduce carbon emissions.

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<sup>2</sup> MetroScope scenarios do not assume that all employment is in central Portland. Employment and residential distributions throughout the region are the primary outputs of the scenario that determine commute distances.

## SCENARIO RESULTS

### Residential source greenhouse gas emissions (in billions of pounds per year by year 2030)

UGR scenario: 32.02 billion lbs

Capacity Ordinance scenario: 31.77 billion lbs

#### Applies to desired outcomes

- ✓ Leadership on climate change
- ✓ Clean air and water, healthy ecosystems

#### Why does this measure matter?

Residential sources are responsible for a large portion of greenhouse gas emissions. In 2004, residential and commercial energy consumption accounted for 30 percent of all emissions in the state of Oregon (State of Oregon, 2008). 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. 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.

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 2030, both scenarios would represent an increase in greenhouse gas emissions (all other things being equal). Along with shifts to smaller residences and compact development patterns, technological improvements in energy efficiency will be essential.

## SCENARIO RESULTS

### Mix of housing types and ownership

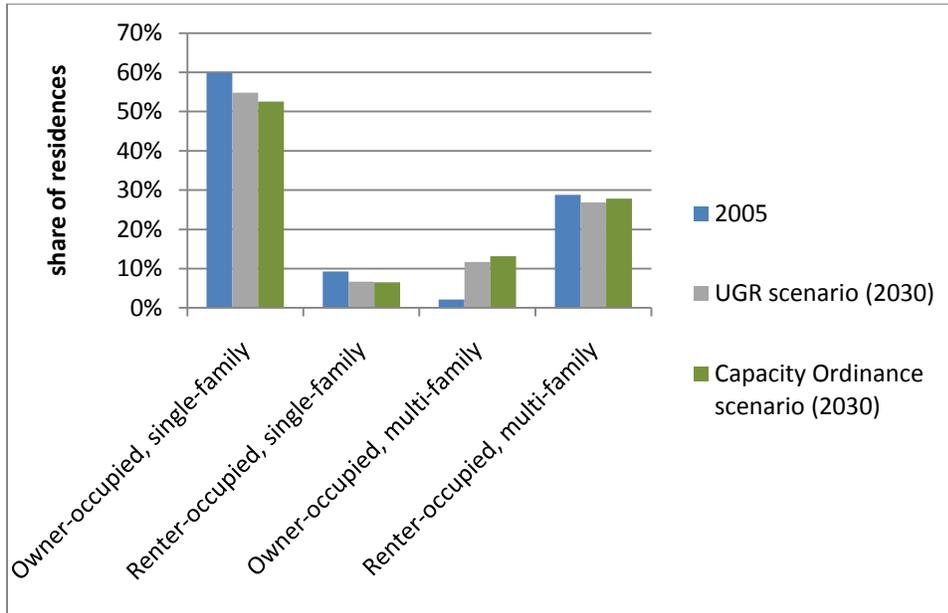
#### Why does this measure matter?

The region will see an increase in the total numbers of all housing types by the year 2030. However, the likely increase in multi-family residences (both owned and rented) is particularly noteworthy. The potential increase in multi-family units (180,000 more by 2030) is greater than the increase in single-family units (116,000 more by 2030). Researchers such as Dr. Arthur C. “Chris” Nelson, who has conducted pioneering research on urban settlement patterns, growth management and housing, have suggested that the focus of planning efforts should be apartment and condominium choices. Providing those choices will also be an important element of any strategy to increase transit ridership and reduce carbon emissions.

#### Applies to desired outcomes

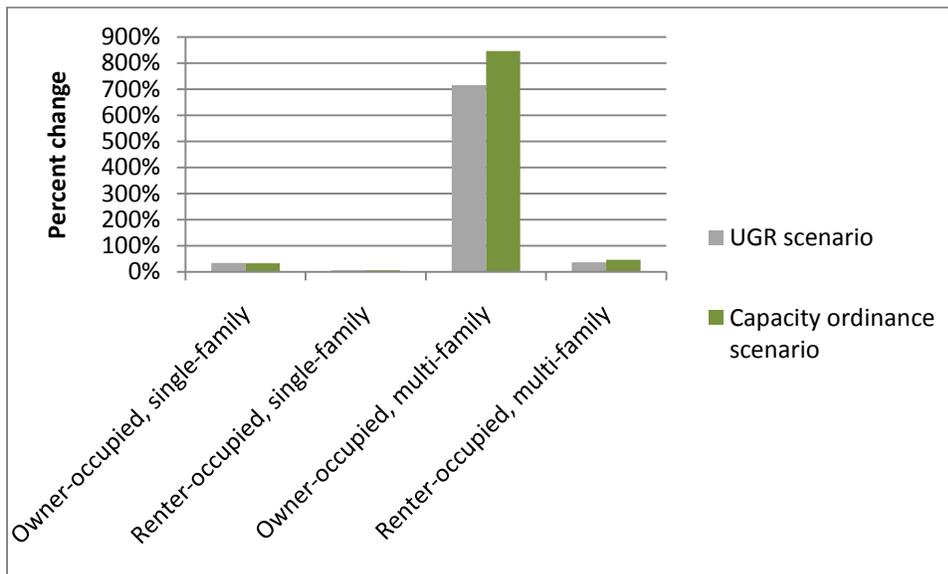
- ✓ Vibrant, walkable communities
- ✓ Transportation choices
- ✓ Leadership on climate change

Figure 5: share of all residences inside Metro UGB by type and ownership



Expressed as a percent change from 2005 to 2030, the shift in housing production towards multi-family is noteworthy.

Figure 6: percent change in numbers of residences by type and ownership (inside Metro UGB, 2005 to 2030)



## SCENARIO RESULTS

### Future household incomes

#### Why does this measure matter?

Household incomes are expected to vary considerably from location to location. However, there are not major differences in average household incomes under the two scenarios. Table 1 depicts average annual household incomes for the years 2005 and 2030 under two scenarios. The average household income for residents of renter-occupied multi-family units is forecasted to be about 60 percent of the average household's income in the Metro UGB.

#### Applies to desired outcomes

- ✓ Economic competitiveness and prosperity
- ✓ Equity

Table 1: Annual average household income (2005\$)<sup>3</sup> in the year 2030 under two scenarios (households inside Metro UGB)

	2005	UGR scenario (2030)	Capacity Ordinance Scenario (2030)
All households	\$52,300	\$55,700	\$56,100
Renter-occupied, multi-family	\$35,400	\$33,800	\$33,900

<sup>3</sup> Does not account for possible future inflation

## SCENARIO RESULTS

### Future mix of household types

#### Why does this measure matter?

MetroScope scenarios model 400 types of households<sup>4</sup>, which vary by household size, income, householder age and whether children are present. To make analysis and presentation feasible, the 400 types have been simplified to eight household types.

These eight household types are ranked roughly commensurate with income (income generally increases from household type one to household type eight). Differences in household characteristics translate into different choices of housing types and locations and transportation modes, as well as level of cost burden.

#### Applies to desired outcomes

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

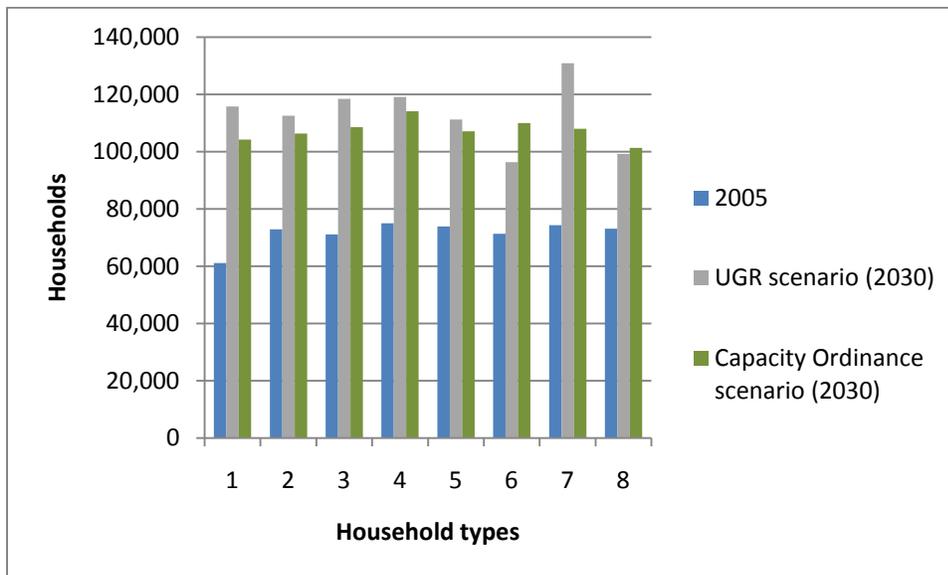
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<sup>4</sup> Household refers to the residents, not the residence

Table 2: generalized types of households referred to in MetroScope scenarios

Household type	Characteristics
1	These are some of the lowest-income households. Among renters, these are exclusively single-person households—primarily the elderly. Owners have a more even age and household size distribution.
2	These households can be of any age, but their income is among the lowest. These households are primarily childless.
3	With a bit more income than household type two, these households are primarily in the 25 to 44 age bracket, mostly without children, although about a third of homeowners have children.
4	With a broad age distribution and approaching middle income, these households are usually childless, especially among renters.
5	These households are larger and wealthier. The majority of homeowners have children.
6	With more income than household type five. Almost half of these households are between 25 to 44 years of age. Although the majority do not have children, two- and three-person households are most common.
7	Mostly without children, these households include very high-income couples, especially among owners.
8	Most of the homeowners in this household type have children. They are high wage earners.

Figure 7: Number of households by type inside UGB



## SCENARIO RESULTS

### Future housing and transportation affordability

#### A definition of “cost-burdened”

Homeownership represents an economic choice that requires some level of equity investment (recent lending practices notwithstanding). Defining cost-burden for homeowners is somewhat more difficult than for renters since many homeowners regard their homes as not just a residence but as an investment. Homeowners often spend a substantial portion of their income on their home, but do not necessarily perceive these expenditures as a burden. This is particularly the case for affluent homeowners or older homeowners without current income. For these reasons, this analysis assumes that to be cost-burdened, a household must rent, not own.

Because this analysis includes housing and transportation costs, the standard rule that no more than 30 percent of one’s income should be spent on housing needs adjustment. In 2007, many low-to-moderate-income households in the United States spent well over 50 percent of their income on housing and transportation<sup>5</sup>. In 2007, the national median percentage of income spent on these costs was 45 percent. In the absence of an accepted standard, this report proposes that **if a household rents its residence and spends 50 percent or more of its income on transportation and housing, it is considered cost-burdened.**

#### Definition:

For this analysis, a cost-burdened household rents and spends 50 percent or more of its income on housing and transportation.

#### Calculating housing and transportation affordability

In order to produce estimates of future housing and transportation expenditures for different household types in different locations, both historic and forecasted data are used:

Historic data: United States Bureau of Labor Statistics data on housing and transportation expenditures are augmented with other historic data on income levels, demographics, housing preferences and travel behavior.

Forecast data: MetroScope scenarios produce forecast data on household types (household size, income, age of householder), patterns of renting versus owning, and location choices.

Scenario results are analyzed and linked with the historic data. This analysis produces expenditure estimates for future households, depending on factors such as the household type, renting versus owning, and location.

#### Possible outcomes of continuing current policies and investment trends

As is the case today, in the year 2030, the amount that households spend on transportation and housing costs is likely to vary widely from community to community. Costs are likely to be lowest for those living

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<sup>5</sup> Source: United States Bureau of Labor Statistics

in smaller square footage condos or apartments, particularly in locations with access to multiple modes of transportation, including transit. Many of the region’s urban centers and transportation corridors will be the most affordable places to live. However, because of high market demand in these locations, many lower-income households are likely to struggle to cover housing and transportation costs.

**Future housing costs**

Scenarios indicate that, with population growth and a continuation of current policies and investment trends, housing costs for households inside the Metro UGB will increase in the future. Table 3 depicts annual housing expenditures for all households and for households in renter-occupied, multi-family housing, which are often most susceptible to cost-burden. Because homeownership is often regarded as an investment, owners are often willing to spend a greater share of their income on housing.

**Table 3: Average annual housing expenditures (2005\$) per household (households in Metro UGB)**

	<b>2005</b>	<b>UGR scenario (2030)</b>	<b>Capacity Ordinance scenario (2030)</b>
<b>All households</b>	\$19,200	\$27,200	\$29,300
<b>Renter-occupied</b>	\$10,400	\$12,800	\$13,100

**Table 4: Average share of annual household income (2005\$) spent on housing (households in Metro UGB)**

	<b>2005</b>	<b>UGR scenario (2030)</b>	<b>Capacity Ordinance scenario (2030)</b>
<b>All households</b>	37%	49%	52%
<b>Renter-occupied</b>	29%	38%	39%

### Future transportation costs

Scenarios indicate that, with a continuation of current policies and investment trends, transportation costs for households inside the Metro UGB will, on average, remain about the same in the future (see Table 5). As depicted in Table 6, residents of renter-occupied multi-family housing are forecast to spend a greater portion of their income on transportation than the average household in the Metro UGB.

Table 5: Average annual transportation expenditures (2005\$) per household (households in Metro UGB)

	2005	UGR scenario (2030)	Capacity Ordinance scenario (2030)
All households	\$5,400	\$5,600	\$5,500
Renter-occupied	\$3,800	\$3,900	\$3,900

Table 6: Average share of annual household income (2005\$) spent on transportation (households in Metro UGB)

	2005	UGR scenario (2030)	Capacity Ordinance scenario (2030)
All households	10%	10%	10%
Renter-occupied, multi-family	11%	12%	12%

### Future cost burden

With a continuation of current policy and investment direction, the number of cost-burdened households could double by the year 2030. In the year 2005, there were approximately 95,500 cost-burdened households inside the Metro UGB (about 17 percent of all households or about 45 percent of renter households in the region). By the year 2030, about 22 percent of all households and 67 percent of renter households in the UGB could be described as cost-burdened. Many of these households will be seniors on fixed incomes and the working class, some of which will have school-aged children. These results represent worsening conditions when compared to the results of the UGR scenario.

Table 7: cost-burdened households in 2005 and 2030 (households inside Metro UGB)

	Year 2005	UGR scenario (2030)	Capacity Ordinance scenario (2030)
Total cost-burdened households	95,500	153,300	189,700
Share of all households that are cost-burdened	17%	18%	22%
Share of renter households that are cost-burdened	45%	54%	67%

Increases in cost burden are, in part, the result of competition for residences in central locations. Increased demand in urban centers and corridors is a result of many factors, including population growth, adopted policies, and changing demographics. High market demand supports the development of multi-story buildings (where zoning allows), but this type of construction often requires more expensive materials and structured parking, leading to higher costs per square foot of residence. These increased costs per square foot are partially offset by having choices of smaller residences and multiple transportation options. While the increase in demand in centers and corridors is a primary goal of the 2040 Growth Concept, it is clear that additional strategies and investments are needed to ensure that these locations remain options for a variety of income levels.

Possible causes of cost burden:

- Increased numbers of future cost-burdened households appear to be caused by escalating housing costs rather than rising transportation costs.
- Inadequate funding for infrastructure: this constrains housing supply, which in turn makes it unaffordable for some households.
- High market demand in urban centers and transportation corridors: this increases the value of land and the per-square-foot cost of housing. Multi-story development often requires more expensive construction materials and structured parking. Without public investments or choices of smaller residences, these higher costs get passed on to residents.
- Insufficient transportation cost savings: Transportation cost savings offset housing price increases, but are not enough to guarantee affordability.
- Market rate housing is out of reach at lower wage levels.

The distribution of cost-burden is uneven throughout the region. These scenarios indicate that with a continuation of current policies and investment trends, this uneven distribution will persist in the future. Locations that offer the most affordable housing and transportation are likely to have higher concentrations of cost-burdened households. These scenarios indicate that urban center and corridor locations that offer the most affordable housing and transportation options could be home to many cost-burdened households. The central city, centers, corridors, and centrally-located neighborhoods are areas that are likely to remain in high demand amongst higher income households as well.

Table 8 provides a summary of the possible distribution of cost-burdened households in the years 2005 and 2030. Areas that have lower numbers and percentages of cost-burdened households have not necessarily provided affordable housing options. In some cases, there are fewer cost-burdened households simply because there are limited affordable options from which to choose.

**Table 8: Number and percent of cost-burdened households by subarea (2005 and 2030)**

	<b>2005</b>		<b>UGR scenario (2030)</b>		<b>Capacity Ordinance Scenario (2030)</b>	
	<b>Number of cost-burdened households</b>	<b>Share of renter households that are cost-burdened</b>	<b>Number of cost-burdened households</b>	<b>Share of renter households that are cost-burdened</b>	<b>Number of cost-burdened households</b>	<b>Share of renter households that are cost-burdened</b>
Portland central city	6,500	66%	13,900	78%	15,600	86%
Northeast Portland	7,400	51%	10,300	58%	12,900	75%
Gresham – Wood Village - Fairview - Troutdale	7,400	41%	10,500	43%	17,600	70%
East Portland	7,800	49%	11,300	49%	11,600	50%
Southeast Portland	16,200	55%	20,000	61%	23,100	71%
West Portland	11,700	57%	19,700	73%	22,800	87%
North Portland	4,000	53%	5,800	55%	6,300	60%
Lake Oswego	900	19%	2,500	52%	2,500	53%
Gladstone - Clackamas	2,100	45%	3,000	52%	3,400	63%
Milwaukie	2,700	44%	3,400	46%	3,300	46%
Happy Valley	1,600	31%	3,500	49%	3,500	48%
Damascus	200	45%	700	58%	900	71%
Oregon City	1,600	39%	6,200	68%	6,700	70%
West Linn	500	27%	900	40%	800	41%
Wilsonville	1,300	43%	2,200	59%	3,200	80%
North Hillsboro	2,100	22%	6,100	44%	8,700	59%
East Washington County	5,500	35%	8,000	35%	14,300	64%
South Beaverton	4,200	40%	5,200	45%	5,200	46%
Tigard - King City	3,300	37%	4,500	43%	7,800	72%
Tualatin	1,300	31%	1,700	37%	2,700	46%
Sherwood - Scholls	400	35%	1,000	57%	1,600	76%
SW Beaverton	1,900	24%	4,200	45%	5,100	54%
South Hillsboro	1,900	32%	4,000	53%	4,700	63%
Forest Grove - Cornelius	3,000	79%	4,500	86%	4,900	85%
<b>TOTAL</b>	<b>95,500</b>	<b>45%</b>	<b>153,300</b>	<b>54%</b>	<b>189,700</b>	<b>67%</b>

Figure 8 and Figure 9 depict the share of households that could be cost-burdened in the year 2030 (by subarea—rough approximations of city boundaries, portions of larger cities, or combinations of smaller cities). Though cost-burdened households are predicted to be distributed throughout the region, there are several concentrations including ones in the Portland central business district, southeast Portland, and west Portland, where housing and transportation options could be most affordable, and in outlying areas where housing prices may be lower, but transportation costs are higher.

Figure 8: share of all households that are cost-burdened in 2030 (Capacity Ordinance scenario)

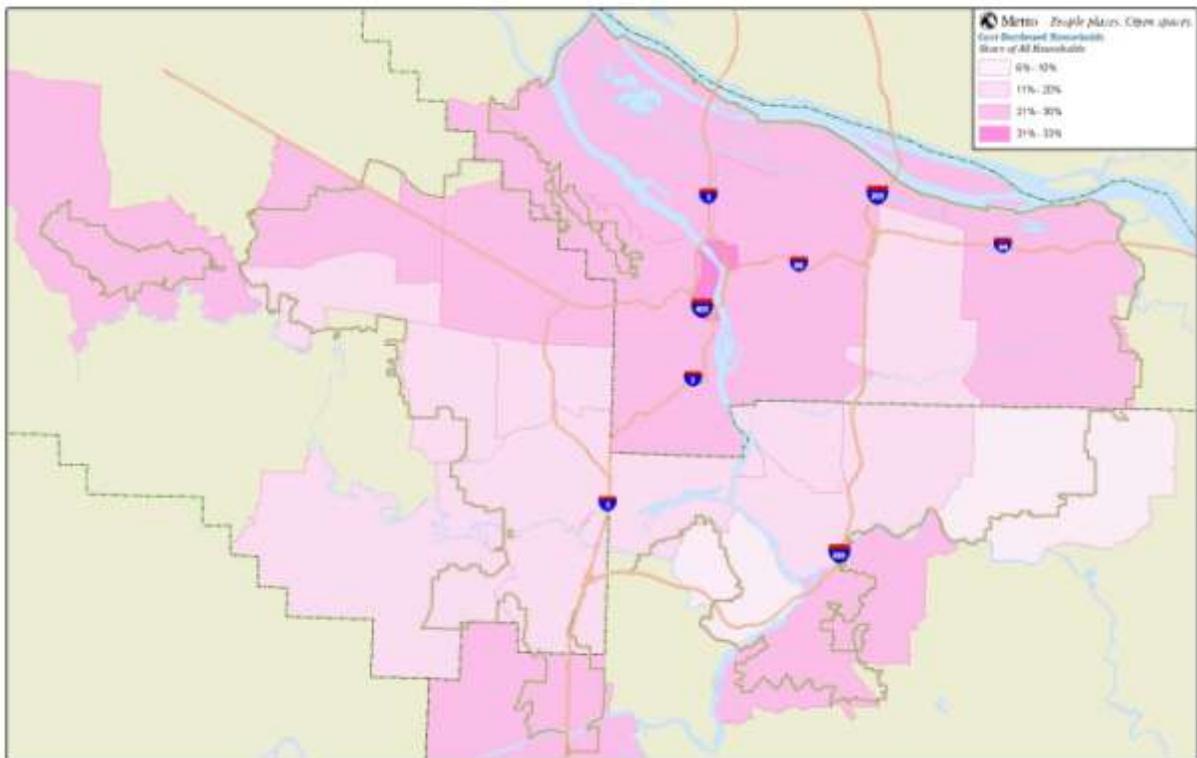
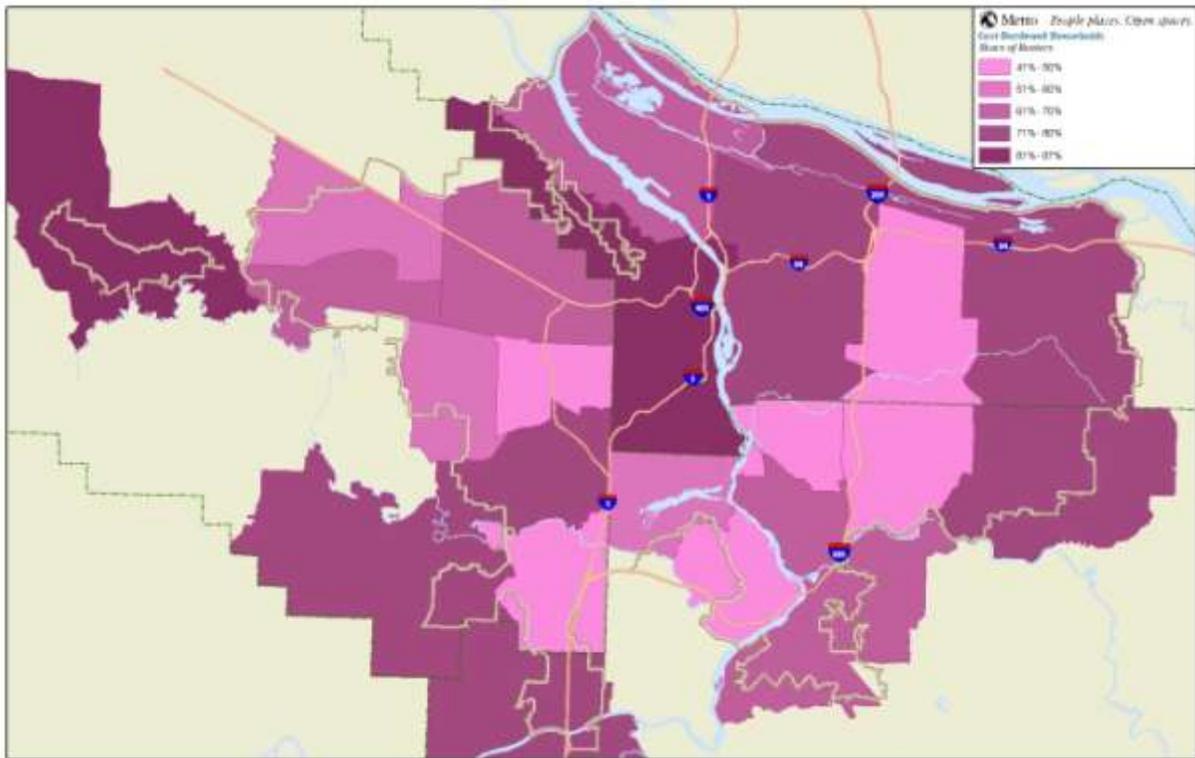


Figure 9: share of renter households that are cost-burdened in 2030 (Capacity Ordinance scenario)



### Policy choices

Urban centers and corridors are likely to be some of the region’s least costly communities in the future, but this does not mean that they are affordable for all. The Metro region’s leaders are counting on housing in centers and corridors to remain affordable in order to manage growth in a way that protects existing single-family neighborhoods and addresses new challenges such as climate change. To do so, concerted efforts are needed.

- New infrastructure investments can make better use of existing land inside the UGB.
- Incentives for mixed-use, multi-family development can reduce housing costs even further in urban centers and corridors.
- Policies that encourage the construction of smaller residences can provide more housing choices.
- Transit investments in centers and corridors can reduce transportation costs for residents.
- Wages are an important component of affordability. Ensuring a healthy regional economy will be essential.
- Household utilities represent a significant portion of housing expenditures. Programs that allow households to reduce utility consumption or costs will be important.
- Publically-subsidized housing will remain essential.

Collaborative efforts are needed to preserve our region’s livability and affordability. A failure to maintain affordable housing choices in the central city, centers, and corridors may put additional growth pressures on existing single-family neighborhoods and push more residents to less central locations where they could be more susceptible to increases in energy prices.

## 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 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, residential incentives, and consumer preferences.

### Demand:

#### Population and employment 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).

This scenario assumes the midpoint of the 2009 range forecast that was accepted by the Metro Council in December 2009. The midrange forecast indicates 1,381,000 households and 1,707,400 jobs in the 7-county region by the year 2040. Assuming different points on the range forecast would produce different scenario results.

### 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. RLIS zoning data used for this scenario are as of January 2010.

#### 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.

For consistency and to allow for comparison with the scenarios that informed the 2009 UGR, this MetroScope scenario assumes the 2007 vacant land survey.

**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). 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, this scenario assumes that lands that were previously added to the UGB are not immediately developable. By the end of the delay, it is assumed that infrastructure funding has become available through an unspecified mechanism. These timing assumptions are the same as those used for the 2009 urban growth report (UGR) scenarios and are based on advice received from county and city planning staff and the Metro Technical Advisory Committee.

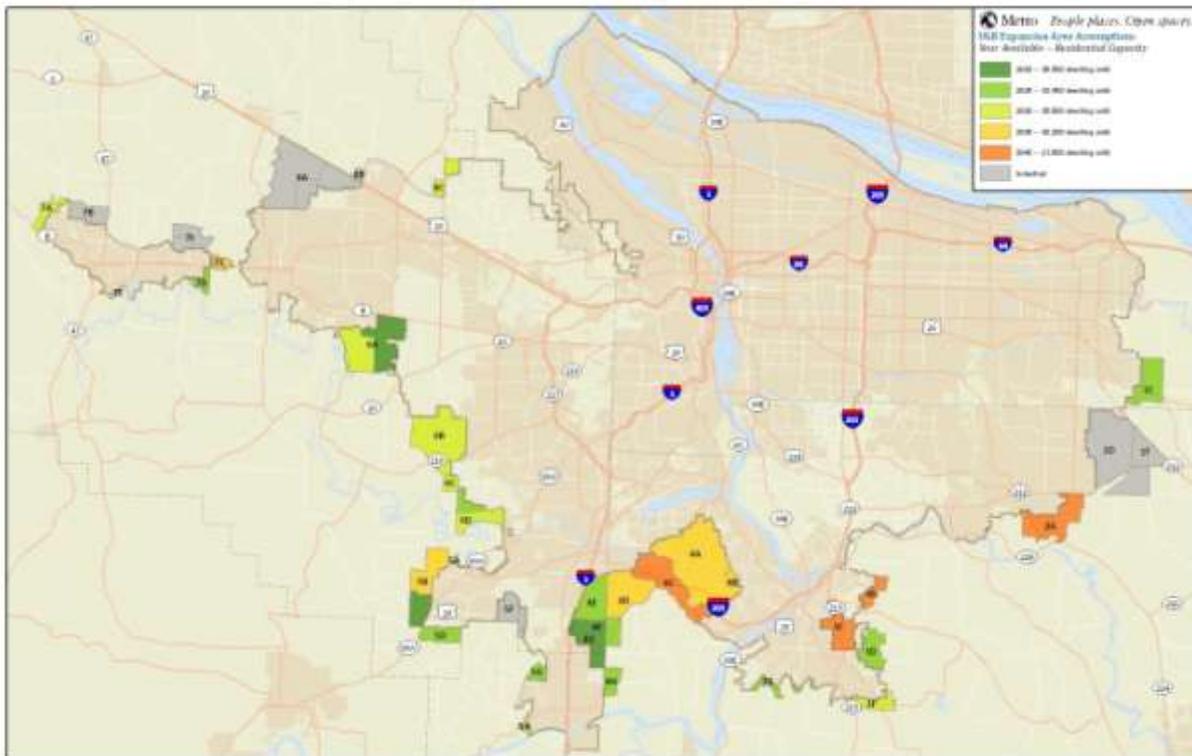
<b>Metro UGB expansion area (past expansions only)</b>	<b>Assumed date of availability for development</b>
Happy Valley	2010
Damascus	2020
All other areas added to the Metro UGB since 1998 (other than Happy Valley and Damascus)	2015

**Metro UGB supply: prospective UGB expansions**

The scenarios that informed the 2009 UGR assumed a continuation of past policies and trends, including the trend of expanding the UGB according to state-mandated land hierarchies. The new scenario, conducted to inform the 2010 Capacity Ordinance assumes that future UGB expansions will be made in urban reserves. The size of adopted urban reserves makes less land available for assumed future UGB expansions than historic usage and less than was assumed in previous scenario work.

Figure 10 shows the sequence of prospective UGB expansions that are assumed for this scenario. The assumed timing of future UGB expansions was determined in consultation with city and county planning departments.

Figure 10: assumed availability and capacity of prospective UGB expansion areas



**Clark County supply: zoning**

Zoning for Clark County is assumed to be the zoning that was in place in January 2010. The scenarios that informed the 2009 UGR assumed the zoning that was in place in 2005.

**Clark County supply: vacant, buildable land**

For vacant buildable land in Clark County, Washington, Metro used the county's January 2010 data. The 2009 UGR used the county's 2005 data. Clark County uses a different methodology for inventorying its vacant, buildable land than Metro.

**Clark County supply: refill land**

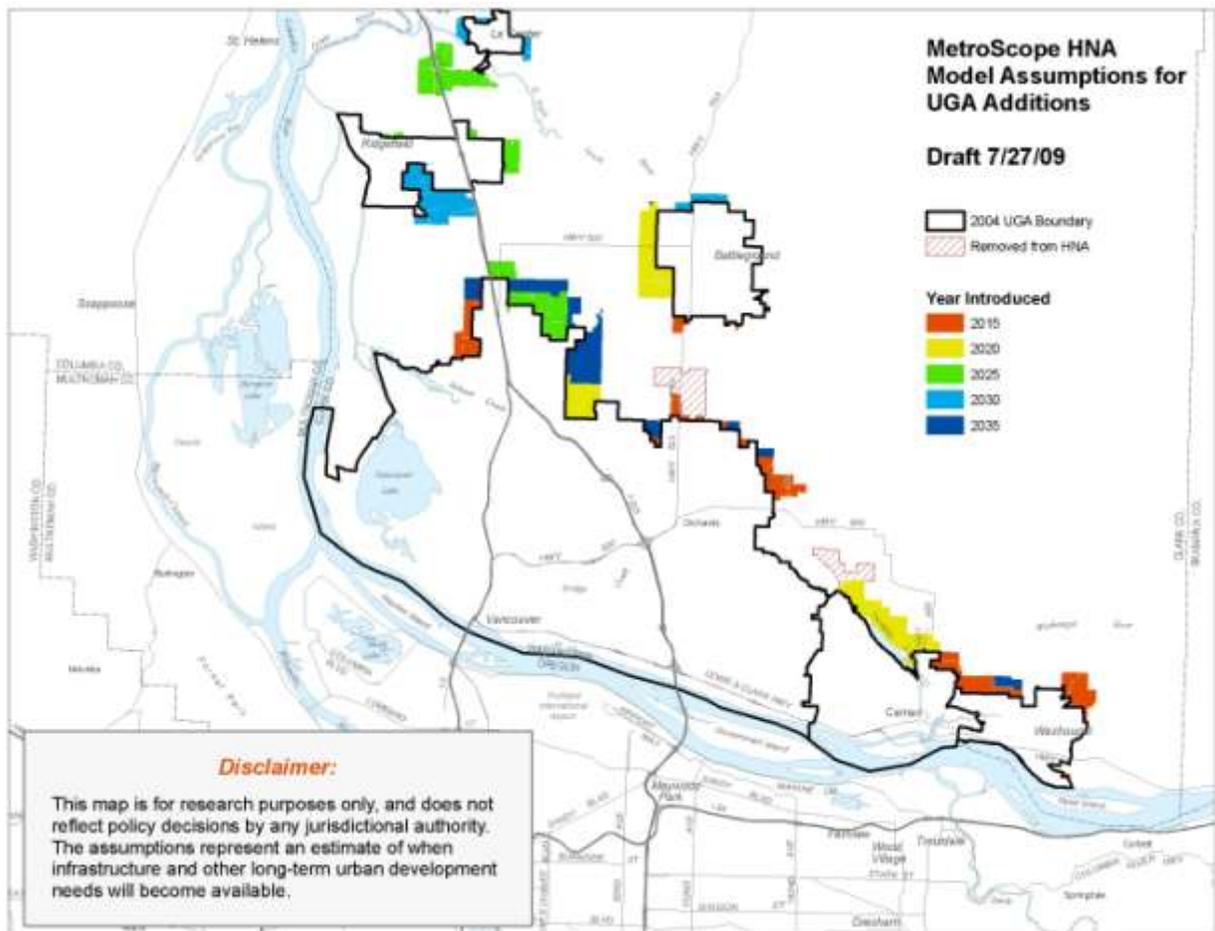
Clark County has a different method than Metro for identifying refill capacity. However, for MetroScope modeling purposes, Metro’s refill definitions are applied to Clark County land.

**Clark County supply: prospective urban growth area expansions**

In January 2008, Clark County added approximately 19 square miles of urban growth areas. A portion of the 19 square mile expansion was overturned and was appealed at the Washington State Superior Court.

Scenario assumptions for Clark County urban growth boundary expansions are based on the Superior Court decision. The timing and zoning assumptions were determined by Clark County staff. Those timing assumptions are depicted on the map below.

Figure 11: assumed availability of prospective Clark County urban growth areas



**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 State RTP network for the 2020, 2025 and 2035 iterations. The scenarios that informed the 2009 UGR used the 2035 "True" Financially-Constrained RTP. 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 2035 State RTP mobility projects **included** in this scenario's transportation network are:

##### *Notable transit mobility projects*

- Columbia River Crossing light rail train
- Milwaukie light rail
- SW corridor high-capacity transit
- WES service improvements
- I-205 bus rapid transit from Clackamas Town Center to Tualatin
- On-street bus rapid transit Division/Powell

##### *Notable throughway mobility projects*

- I-5 Columbia River Crossing
- Sunrise from I-205 to 172<sup>nd</sup> Ave.
- OR 217, US 26 & I-5/I-84 Interchange Improvements
- Operational improvements on I-205
- Operational improvements on I-5
- Additional interchange improvements on OR 217, US 26, I-5, I-205, and I-84

##### *Notable arterial mobility projects*

- I-5/99W Connector Alternative 7 (three arterial improvements including Southern Arterial)
- Sellwood Bridge

The project list for the 2035 State RTP also includes billions of dollars of investments in “community-building” projects, such as sidewalk improvements. For scenario purposes, community-building projects are handled differently than mobility projects. See the “Consumer preference: neighborhood score” section of this appendix for a description of how community-building projects are handled in this scenario.

**Construction costs: system development charges**

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

**Construction costs: residential incentives**

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 incentives will be in place in the future as well. The guiding principle for making incentive 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 incentive (for instance, a vertical housing tax credit).

These scenarios assume varying levels of residential incentives in different locations. Three different incentive levels are assigned:

Tier A: \$50,000 per dwelling unit

Tier B: \$25,000 per dwelling unit

Tier C: \$10,000 per dwelling unit.

The upper end of the range, \$50,000 per dwelling unit, was estimated through staff discussions with the Portland Development Commission and the City of Portland.

Assumptions are also made regarding the timing of the incentive (expressed as the percentage of the total number of incented units that are available to the market in each five year increment). The level and timing of incentives assumed in this scenario are professional judgments made by staff. The table below summarizes this scenario’s residential incentive assumptions. Changes to the assumptions used for the 2009 UGR scenarios are highlighted. These new incentive locations are included here on the advice of local jurisdictions, who have indicated that the incentive will be in place in 2010.<sup>6</sup> Incentive assumptions for the 2009 UGR scenarios were reviewed by staff from the three counties, the City of Portland, MTAC, and the Portland Development Commission.

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<sup>6</sup> Wood Village adopted an urban renewal district in February 2010. It was inadvertently omitted from updated scenario assumptions.

Location	Type	Active urban renewal? (residential only)	Reason for incentive assumption (other than active urban renewal)	Tier*	Percent of dwelling units with incentive available (timing)							Total number of incented units	
					2010	2015	2020	2025	2030	2035	2040		
Downtown	CC	yes		A	20%	40%	40%						13,500
North Macadam	CC	yes		A	33%	33%	33%						7,500
Oregon Conv. Center	CC	yes		A	33%	33%	33%						3,000
River District	CC	yes		A	25%	25%	25%	25%					24,000
South Park Blocks	CC	yes		A	25%	25%	25%	25%					2,000
Beaverton	Reg. Ctr.	Anticipated	urban renewal adoption anticipated	B		20%	20%	20%	20%	20%	20%		2,000
Clackamas	Reg. Ctr.	yes		B	25%	25%	25%	25%					2,000
Gateway	Reg. Ctr.	yes		B	25%	25%	25%	25%					2,000
Gresham	Reg. Ctr.		Vertical housing tax abatement	B	33%	33%	33%						2,000
Hillsboro	Reg. Ctr.	Anticipated	urban renewal adoption anticipated	B		20%	20%	20%	20%	20%	20%		2,000
Oregon City	Reg. Ctr.	yes		C	33%	33%	33%						2,000
Vancouver	Reg. Ctr.		Parking revenues go to redevelopment. City built parking structure	B	20%	20%	20%	20%	20%	20%			6,000
Gladstone	Town Ctr.	yes		C	20%	20%	20%	20%	20%				1,200
Hollywood	Town Ctr.		TOD tax abatement	B	25%	25%	25%	25%					1,200
Lake Oswego	Town Ctr.	yes		B		20%	20%	20%	20%	20%			1,200
Lents	Town Ctr.	yes		B		20%	20%	20%	20%	20%			1,200
Milwaukie	Town Ctr.	Anticipated	vertical housing tax abatement; urban renewal adoption anticipated	B		20%	20%	20%	20%	20%			1,200
Rockwood	Town Ctr.	yes		B	20%	20%	20%	20%	20%				1,200
Sherwood	Town Ctr.	yes		C		20%	20%	20%	20%	20%			1,200
Tigard	Town Ctr.	yes		C		20%	20%	20%	20%	20%			1,200
Amberglen	Town Ctr.		significant amenity investments planned	B		20%	20%	20%	20%	20%			5,000
Interstate	Non-ctr. UR	yes		A	25%	25%	25%	25%					8,000
MLK	Non-ctr. UR	yes		A	20%	20%	20%	20%	20%				3,500
Villebois	Non-Ctr UR	yes		C	33%	33%	33%						2,500
Portland TOD (1/4 mile radius around MAX stations at NE 60th, NE 82nd, 122nd, 148th, SE Division, Portland portion of 162nd	Non-Ctr UR		TOD tax abatement	C	25%	25%	25%	25%					1,200 at each location
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 residents are willing to pay different prices for 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).

In the 2009 UGR scenarios, the neighborhood score remained static through the course of the scenario. Past studies have indicated, however, that neighborhood scores change over time, sometimes due to public investments in amenities (see Appendix 2 for information about price premiums associated with urban amenities). For this scenario, neighborhood scores were conservatively increased in some locations to reflect the over \$3 billion in public investments included in the 2035 State RTP as "community-building" projects in centers, corridors, main streets

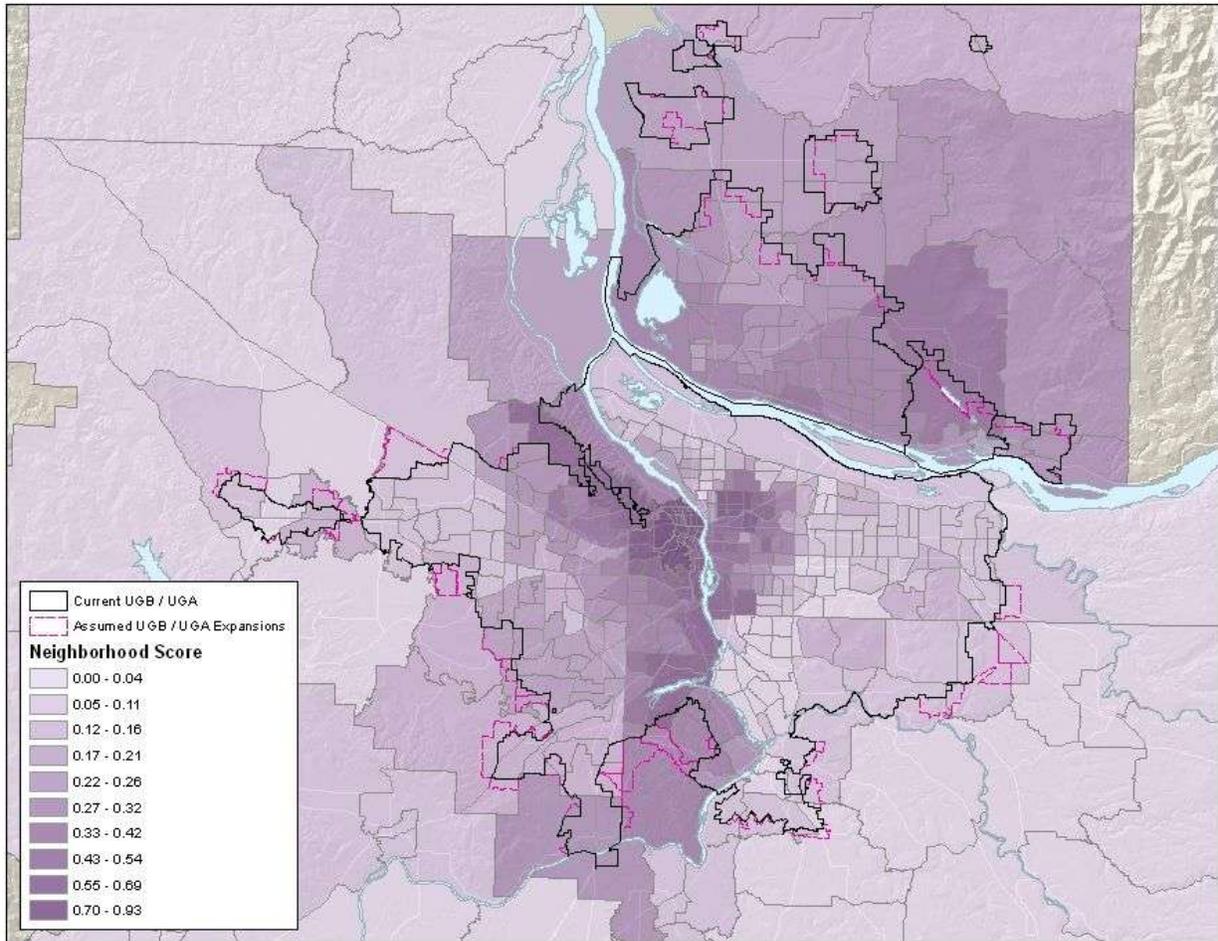
and station communities. Scores for neighborhoods that already have particularly high or low historic scores were not adjusted with the rationale that there are diminishing returns on investments in locations with high scores and that especially low scores are likely to persist in some locations. Neighborhoods with moderate scores are believed to be ones that are most likely to respond to community-building investments. Therefore, where warranted by community-building investments in the State RTP, scores were adjusted for neighborhoods that currently have moderate scores.

After identifying projects in the State RTP that qualify as “community-building” investments, the impact of those projects was estimated by first adding up the total expenditures on projects for each Census Tract. The total values were then divided by the sum of households and employees in the tract, to create a sort of “per capita” measure of investment by census tract. This method helps to normalize across zones covering different areas, with varying population and employment. In order to focus on areas with significant public investments, only census tracts with investments of at least \$500 per household/employee were considered for a neighborhood score improvement.

Census tracts with an existing neighborhood score between 0.10 and 0.50 were assumed to be the most likely to respond positively to community-building investments in public infrastructure. There were 84 census tracts in total with a neighborhood score in the 0.10 to 0.50 range and at least \$500 in community-building investments. These per household and employee investments were then ranked, highest to lowest. Natural breaks in this ranking were observed between the few zones that had the very highest levels of investment, up to \$33,800 per household/employee, and many more zones with low to moderate investments of \$500 to \$5000 per household/employee. So the census tracts were divided along these breaks into four groups, and neighborhood scores were adjusted as follows. The neighborhood scores for the top five census tracts, with investments of \$13,000 to \$33,800 per household/employee, were increased by 20%. Neighborhood scores for the next eight, with investments of \$5,300 to \$8,100, were bumped up by 15%. The following 38 tracts, with investments of \$1,700 to \$4,800 were increased by 10% and the bottom 33, with investments of \$500 to \$1,600, were increased by 5%. Overall, these changes increase the average neighborhood score in these 84 zones from 0.23 to 0.25.

Figure 12 displays this scenario's neighborhood score assumptions. A higher score (darker color) indicates that the census tract has a higher market desirability.<sup>7</sup>

Figure 12: assumed neighborhood scores by Census Tract



<sup>7</sup> 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.