

Appendix 2: Documentation of MetroScope scenario assumptions

Purpose

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

Disclaimer

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

About MetroScope

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

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

Local jurisdiction input on scenario assumptions

Metro staff consulted with representatives of the three counties (Clackamas, Multnomah, and Washington) the City of Portland in determining what assumptions should be made for these preliminary scenarios. These assumptions were also vetted with the Metro Technical Advisory Committee (MTAC).

Major categories of scenario assumptions

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

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

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

Demand:

Population and employment range forecast assumptions

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

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

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

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

Supply:

Metro UGB supply: zoning

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

Metro UGB supply: vacant land

Vacant land is defined in two ways:

- 1) Tax lots with no improvement value or buildings.
- 2) Partially developed parcels with an undeveloped portion of at least one-half acre.

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

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

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

Metro UGB supply: buildable land

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

Metro UGB supply: refill land

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

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

For scenario modeling purposes, tax lots that have a high enough ratio of land to improvement value and that are of sufficient size are counted as refill capacity. This determination varies by county and by

zoning designation. Like zoned capacity, refill capacity will not necessarily get used in the model simply because it exists. MetroScope scenarios subject refill capacity to a simulated market test. Whether or not the capacity gets used in the scenario is a function of many factors including price, accessibility, and zoning.

Metro UGB supply: recent UGB expansion areas

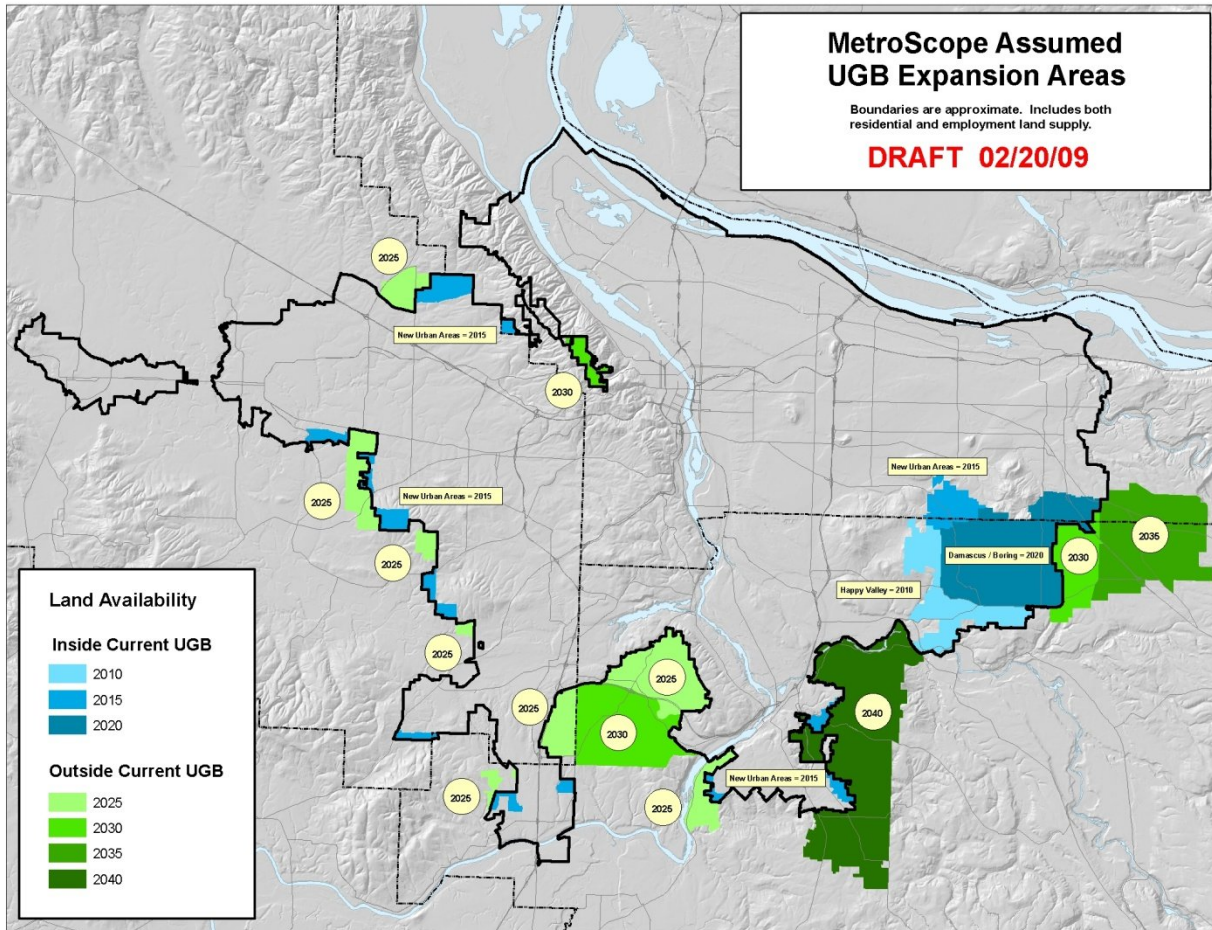
In reality, lands are not immediately developable upon their inclusion in the UGB. In order for lands to be developable, planning must have been completed and infrastructure financing needs to be in place. To mimic that delay, these scenarios assume that there is a development delay for lands that have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

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

Metro UGB supply: prospective UGB expansions

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

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



Clark County supply: zoning

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

Clark County supply: vacant, buildable land

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

Neighbor City supply:

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

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

Measure 49 rural residential supply:

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

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

Other variables:

Accessibility: transportation network

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

Notable projects included in this scenario's transportation network:

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

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

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

The 2035 Financially Constrained RTP assumes:

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

Construction costs: system development charges

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

Construction costs: residential subsidies

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

These scenarios assume varying levels of residential subsidies in different locations. Three different subsidy levels are assigned:

- Tier A: \$50,000 per dwelling unit
- Tier B: \$25,000 per dwelling unit
- Tier C: \$10,000 per dwelling unit.

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

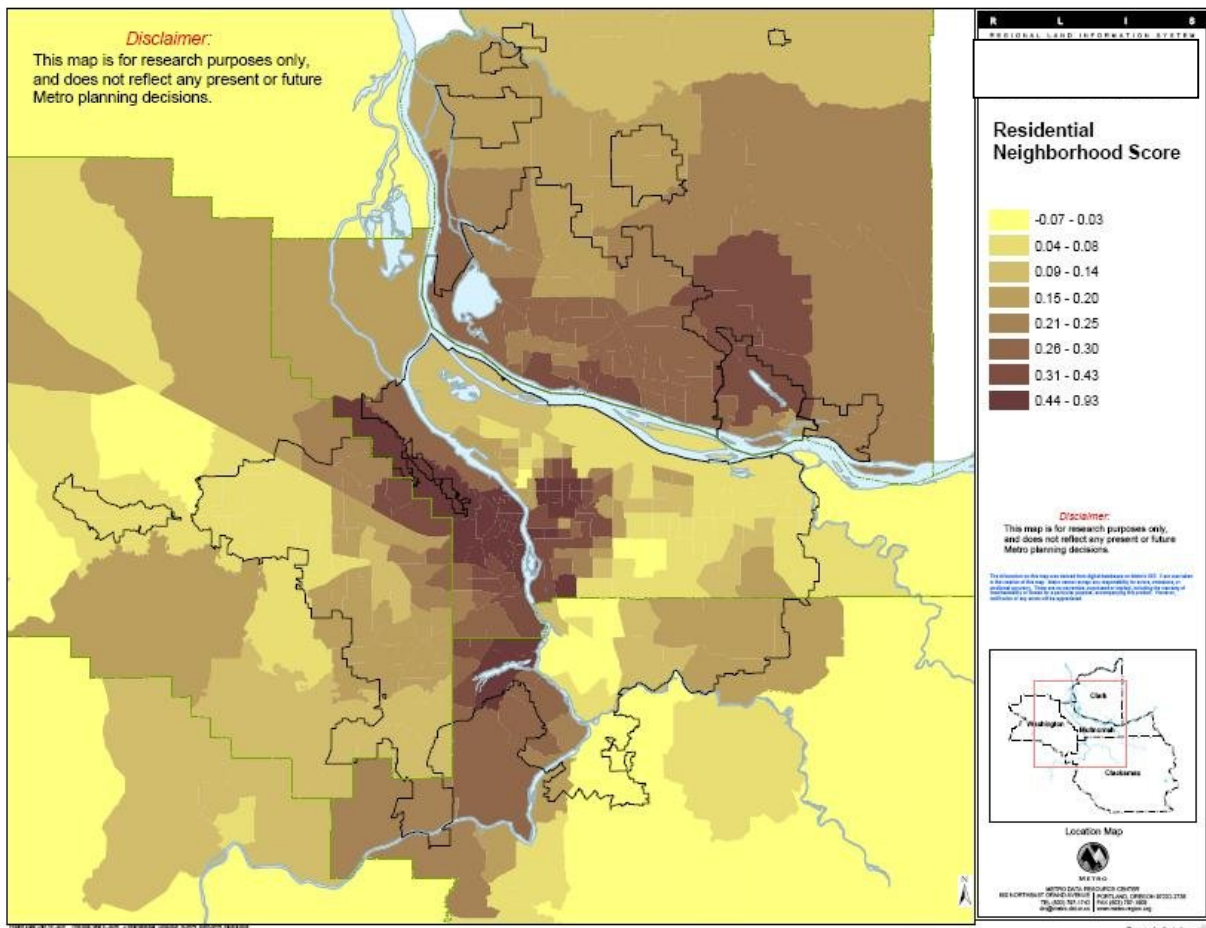
Assumptions are also made regarding the timing of the subsidy (expressed as the percentage of the total number of subsidized units that are available to the market in each five year increment). The level and timing of subsidies assumed in this scenario are professional judgments made by staff and, like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

Location	Type	Active urban renewal? (residential only)	Reason for subsidy assumption (other than active urban renewal)	Tier*	Percent of subsidized dwelling units available (timing)							Total number of subsidized units	
					2010	2015	2020	2025	2030	2035	2040		
Downtown	CC	yes		A	20%	40%	40%						13500
North Macadam	CC	yes		A	33%	33%	33%						7500
Oregon Conv. Center	CC	yes		A	33%	33%	33%						3000
River District	CC	yes		A	25%	25%	25%	25%					24000
South Park Blocks	CC	yes		A	25%	25%	25%	25%					2000
Clackamas	Reg. Ctr.	yes		B	25%	25%	25%	25%					2000
Gateway	Reg. Ctr.	yes		B	25%	25%	25%	25%					2000
Gresham	Reg. Ctr.		Vertical housing tax abatement	B	33%	33%	33%						2000
Oregon City	Reg. Ctr.	yes		C	33%	33%	33%						2000
Vancouver	Reg. Ctr.		Parking revenues go to redevelopment. City built parking structure	B	20%	20%	20%	20%	20%				6000
Gladstone	Town Ctr.	yes		C	20%	20%	20%	20%	20%				1200
Hollywood	Town Ctr.		tax abatement, TOD subsidies	B	25%	25%	25%	25%					1200
Lake Oswego	Town Ctr.	yes		B		20%	20%	20%	20%	20%			1200
Lents	Town Ctr.	yes		B		20%	20%	20%	20%	20%			1200
Milwaukie	Town Ctr.		light rail to be built; vertical housing tax abatement	C				25%	25%	25%	25%		1200
Rockwood	Town Ctr.	yes		B			20%	20%	20%	20%	20%		1200
Sherwood	Town Ctr.	yes		C		20%	20%	20%	20%	20%			1200
Tigard	Town Ctr.	yes		C			20%	20%	20%	20%	20%		1200
Interstate	Non-ctr. UR	yes		A	25%	25%	25%	25%					8000
MLK	Non-ctr. UR	yes		A	20%	20%	20%	20%	20%				3500
Villebois	Non-Ctr UR	yes		C	33%	33%	33%						2,500
Canby	City	yes		C			20%	20%	20%	20%	20%		600
Sandy	City	yes		C			20%	20%	20%	20%	20%		600

Consumer preferences: neighborhood score

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

The map below displays this scenario's neighborhood score assumptions. A higher score (darker color) indicates that the census tract historically has had a higher market desirability.¹



¹ Areas with sparse residential sales data (i.e. rural areas) may exhibit exaggerated neighborhood scores (the result of a small number of high value sales). Urbanized areas with more sales activity are likely to have more accurate neighborhood scores.