Appendix 11

MetroScope scenario specifications

What is MetroScope?

MetroScope is an integrated land use and transportation computer model. MetroScope's main purpose is to systematically predict where employment and housing are more likely in the Portland-Vancouver-Hillsboro MSA to locate based on a given set of supply assumptions (i.e., capacity), market demand factors and regional-level macro-economic forecast. Supply is determined based on measured estimates of employment and housing capacity found in the buildable land inventory (see appendices 2 and 3). This capacity is calculated from estimates of vacant, redevelopable, and infill land. Local zoning is overlayed on the buildable land inventory to determine its status for accommodating housing or employment. For areas outside of Metro's jurisdiction, other sources are relied on to create capacity assumptions. The model will only allocate forecasted growth where capacity exists to accommodate the quantity of projected growth.

Market demand for housing and employment purposes are derived from Metro's seven-county population and employment growth forecast (see appendices 1a through 1d). MetroScope's role is to find an economically efficient distribution of this regional growth and to allocate this growth down to smaller geographic units (e-zones and census tracts).

The location choice for this market demand for housing is dependent on:

1. The location and amount of housing capacity, type of housing, by census tract
2. Household characteristics (household size, income, householder age, and whether the household includes children)
3. Proximity to work locations/choices
4. Relative home prices

In the same way, market demand for employment land need follows a parallel behavior for location choice:

1. The location and amount of industrial & commercial land by location (e-zone)
2. Industry characteristics (i.e., by NAICS)
3. Proximity to labor force, proximity to industry clusters & agglomeration
4. Relative real estate prices

Jobs by NAICS code are grouped together into building type affinities and these types are then matched up against the available supply to accommodate this demand.

How is MetroScope used to inform the 2014 Urban Growth Report?

Cities and counties in the region have planned for growth. Currently, there is more than enough zoned capacity to accommodate household and employment growth beyond the year 2035. However, zoned capacity may not always be in synch with market demand. MetroScope provides a means of testing how the market may respond to the region's adopted plans. To inform the 2014 UGR, three scenarios have been run to test the outcomes of continuing with currently adopted plans. The only difference in the input assumptions for the three scenarios is the level of demand assumed. Low, medium, and high growth scenarios were tested using the 2014 draft range forecast as the demand forecast control totals. MetroScope provides a number of outputs that are useful for the UGR, such as:

- Estimates of how much of the region's buildable land inventory may be market feasible in the next 20 years.
- Estimates of how much of the seven-county MSA's total population and employment growth may be "captured" in the Metro urban growth boundary.
- Estimates of how much commercial employment may occur in industrial zones.
- Data on housing demand by household type.
- Information about possible socioeconomic outcomes of current policies, including estimates of household cost burdens from housing and transportation expenses.

Overview of MetroScope scenario specifications

Table 1 summarizes the input assumptions used for the draft 2014 UGR scenarios. Additional detail follows.

Table 1: Summary of MetroScope specifications for 2014 UGR scenarios

Theme	Major category	Subcategory	Scenario Assumption
DEMAND (FORECAST)	Forecast control totals for Portland-Hillsboro-Vancouver, OR-WA, MSA (7 counties) *Source: MARIO14.xlsx*	Households	2010: 867,794 (Census 2010) 2035: 1,185,775 2010-35: 317,981 %APR: 1.26%
		Employment	2010: 968,800 (BLS 2010 estimate) 2035: 1,484,500 2010-35: 515,500 %APR: 1.76%
SUPPLY (CAPACITY)	Metro UGB	Vacant Buildable Land	2013 vacant land based on aerial photography, permit data, and assessor records and amended by local review. Environmental constraints based on latest 2010 data and major known utility easements
		Redevelopment and Infill	Taxlots are eligible for re-development if the total real market value(land and improvements) per square foot is less than a "strike price" informed by local jurisdiction review
		Recent UGB Expansions	Post-1994 expansion areas are a combination of local zoning, comp plans, and concept plans. New areas inside the UGB as a result of HB 4078 are assumed to follow the Metropolitan Housing Rule (50% capacity in Multi-family)
		Prospective UGB Expansions	Expansion locations based on the 2011 Urban Reserves decision and HB 4078. Timing of infrastructure availability informed by local jurisdiction review
	Tri-County Outside UGB	Urban Areas	Buildable capacity assumed to be twice the 2000 Census households, except where information was provided by local jurisdictions.
		Rural Residential	Exception land , excluding public ownership and high-value properties. Dwelling unit capacity calculated from minimum lot size of local zoning.
		Measure 49	Assumes three dwelling units per Measure 49 claims
	Clark County	Vacant and	2012 VBLM - provided by Clark County GIS, using Clark

Theme	Major category	Subcategory	Scenario Assumption
		Developed Land	County methodology
		Rural Residential	2012 Draft rural residential study
		Urban Growth Area Expansions	Clark Co. urban reserve areas in effect in 2009. Zoning is based on latest comp plans
	Columbia, Yamhill, Marion Counties	Urban Areas	Buildable capacity assumed to be twice the 2000 Census households, except where information was provided by local jurisdictions.
OTHER FORECAST INPUTS	Incentivized Redevelopment		Three tiers of incentives ($50,000, $25,000, or $10,000 per new redeveloped unit) which reflect either active urban renewal or other incentives, such as a vertical housing tax credit (refer to separate schedule of investments)
	Residential Construction Costs (SDC fees)		Per unit construction costs based on Metro and Homebuilders Association surveys.
	Residential Neighborhood Score		Neighborhood score is an input that describes the relative desirability of different neighborhoods based on statistical analysis of historic residential sales data.
	Transportation and Accessibility		Transportation networks from the Metro 2035 RTP: 2010, 2015 forecast years: 2010 network 2020, 2025 forecast years: 2017 network 2030, 2035 forecast years: 2035 "financially constrained" network

Demand forecast

See appendices 1a through 1d for additional information about the population and employment range forecast that is used as a control total for these scenarios. The forecast is for the seven-county Portland-Vancouver-Hillsboro metropolitan statistical area.

Metropolitan area supply summary

The land supply assumed for these scenarios is summarized in the following tables and graphs. This supply is made available to the model. Not all of the supply gets absorbed in the model during the 20-year planning timeframe.

Table 2: Residential supply (dwelling units) summary for 2014 UGR MetroScope scenarios

Capacity source	Single Family units	Multi-Family units	Total Units
UGB -- Vacant	48,590	40,857	89,447
UGB -- Redevelopment	70,110	233,128	303,238
Future UGB Expansions	44,692	81,900	126,592
3-County Outside UGB	20,818	5,087	25,905
Clark County	58,635	26,687	85,322
Neighbor Counties	41,387	5,003	46,390
Region	284,232	392,662	676,894

Figure 1: Residential supply (dwelling units) summary for 2014 UGR MetroScope scenarios

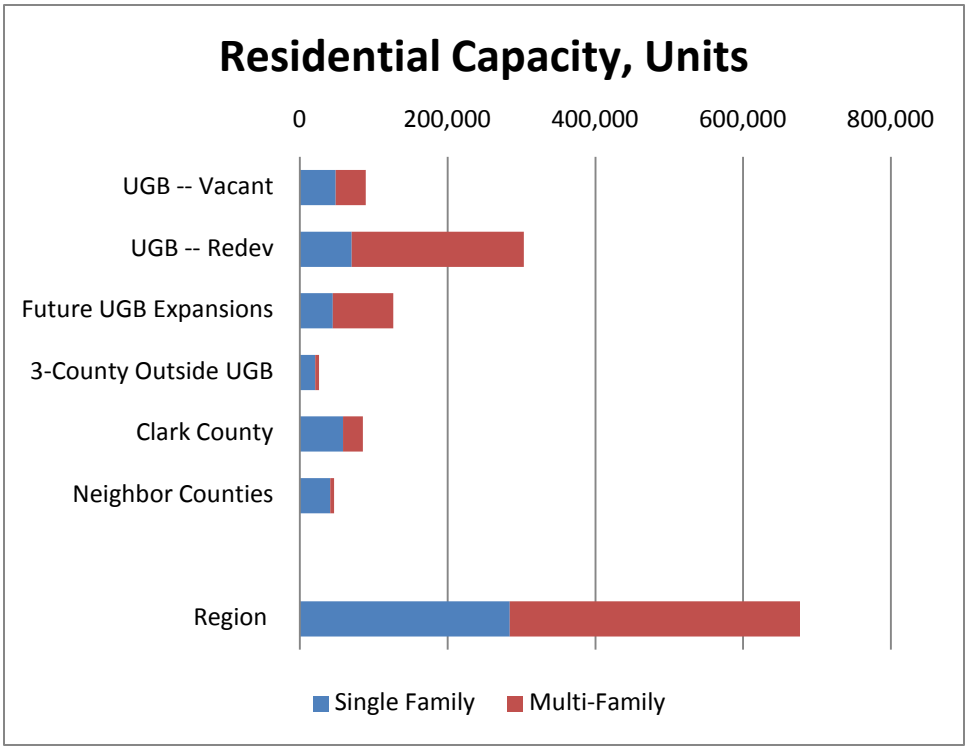
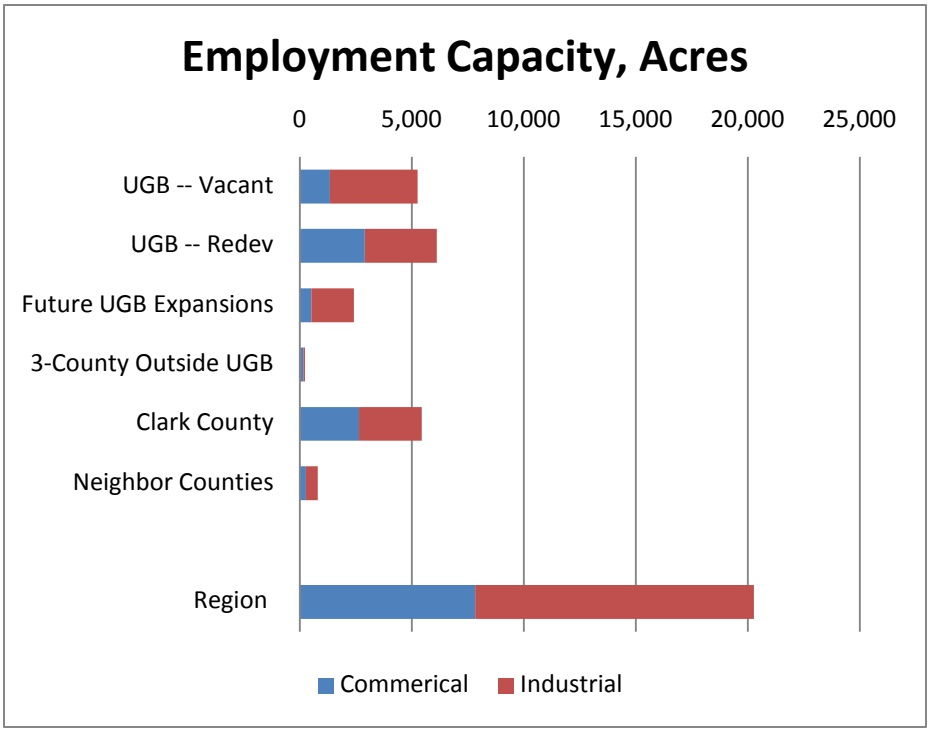


Table 3: Employment supply (acres) summary for 2014 UGR MetroScope scenarios

Capacity sources	Commercial acres	Industrial acres
UGB -- Vacant	1,352	3,905
UGB -- Redevelopment	2,900	3,210
Future UGB Expansions	511	1,911
3-County Outside UGB	162	73
Clark County	2,641	2,799
Neighbor Counties	272	536
Region	7,838	12,435

Figure 2: Employment supply (acres) summary for 2014 UGR MetroScope scenarios



Metro urban growth boundary (UGB) supply

Metro conducts a detailed buildable land inventory (BLI) for lands inside the urban growth boundary. The following is a brief summary of the BLI methodology. For a much more complete description of the BLI methodology, refer to the Appendix 2.

The starting point in the determining the BLI is the Metro Vacant Land Inventory, which is based on aerial photographs. The region's buildable land inventory is divided into "redevelopment" and "vacant". Tax lots that were previously categorized as "partially vacant" are now sorted into either category or the other.

Tax lots are considered vacant if they are either at least 95% vacant, or have an both an area of less than 2,000 square feet and a developed part which is less than 10% of the entire tax lot. In addition, a portion of the area is set aside for future streets, calculated on a per tax lot basis.

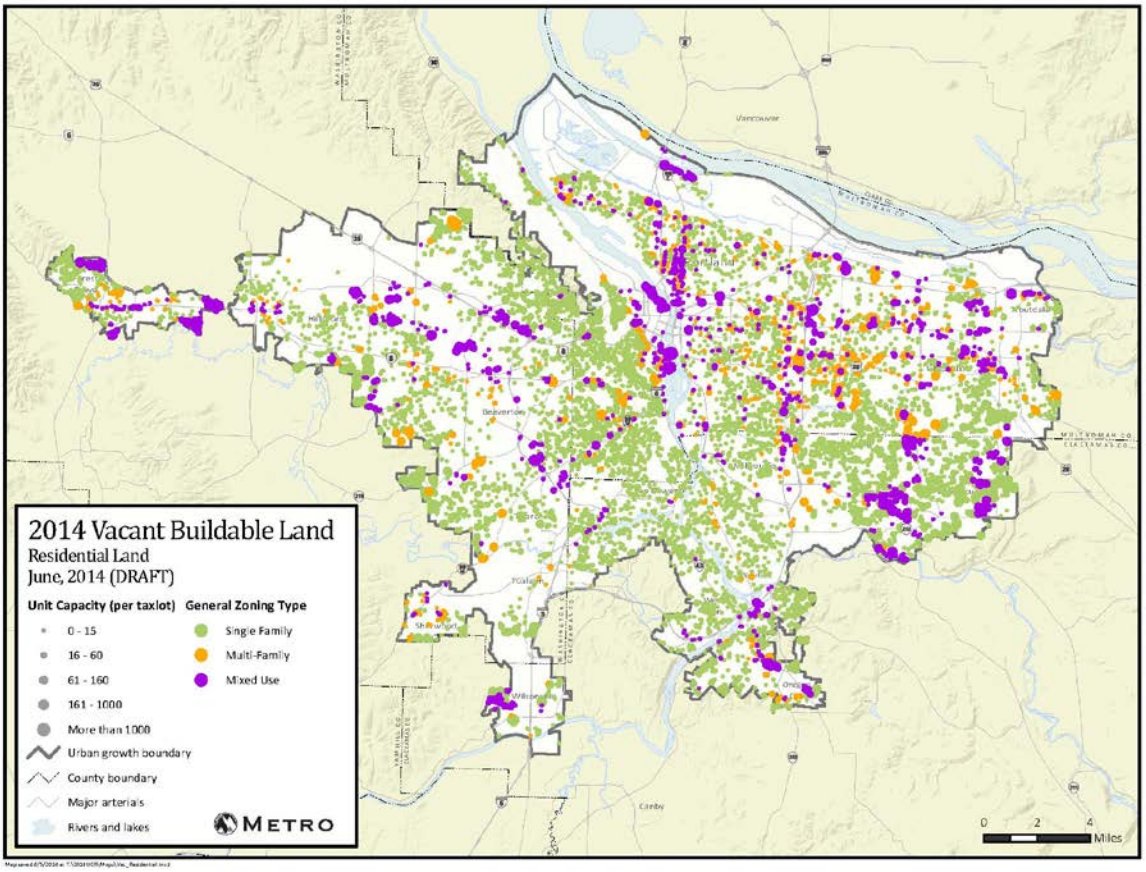
Tax lots which are considered developed are determined to be eligible for re-development if the total real market value (land and improvements) per square foot is less than a "strike price," as described in Appendix 2. Tax lots which do not have the potential to provide residential or employment growth capacity are removed.

Capacity on each residentially-zoned parcel is calculated as a function of the minimum lot size for its zoning class and the area of the tax lot under environmental constraint. In the case of multi-family (MFR) zoning, redevelopment must add at least 50% more units over the number of existing units, or at least three units total. For mixed-use zoning (MUR), the buildable area is split into residential and employment uses by a factor which varies over the geography of the UGB.

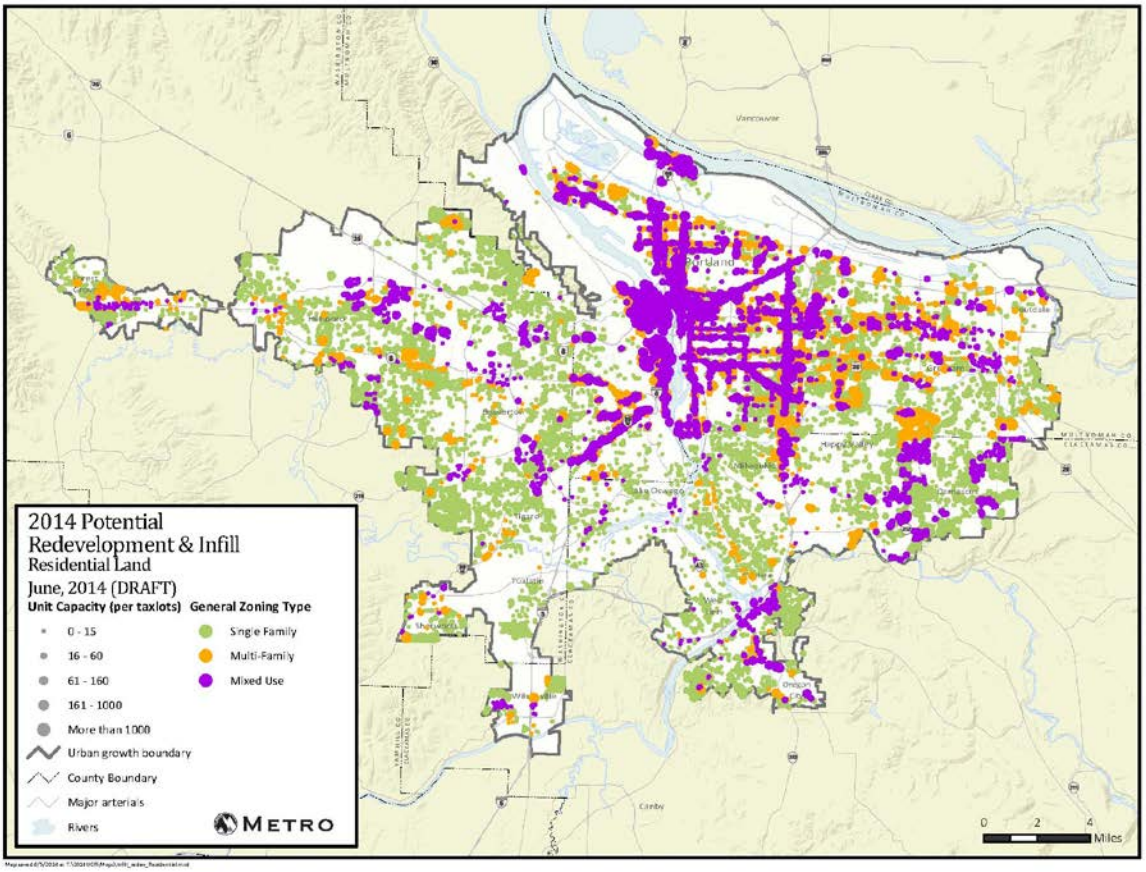
Employment-zoned land applies a simple approach of netting out all constrained land. This is based on the input of the BLI technical working group, which indicated that constrained areas are typically avoided altogether by new commercial or industrial employment uses.

Please refer to the maps "Vacant Residential", "Vacant Employment", "Infill Residential", and "Infill Employment."

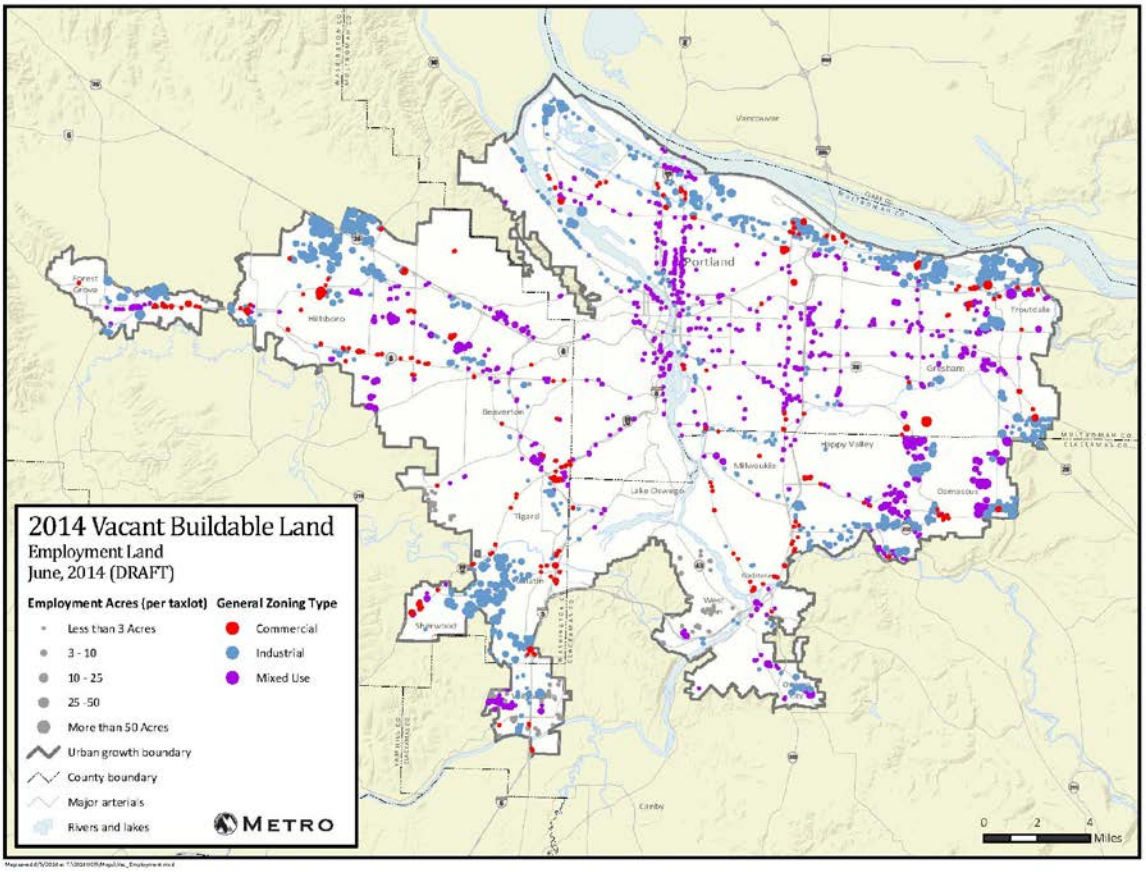
Map 1: Residential vacant buildable land



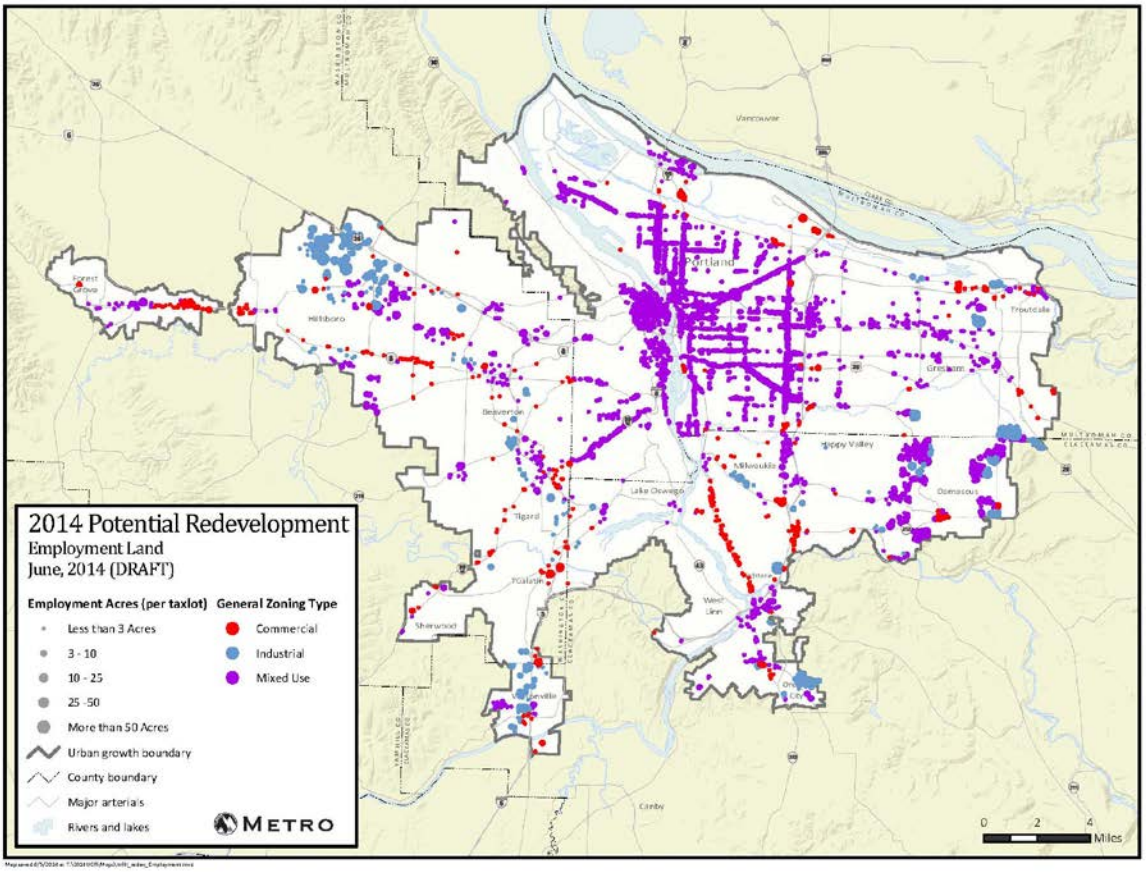
Map 2: Residential redevelopment and infill buildable land



Map 3: Employment vacant buildable land



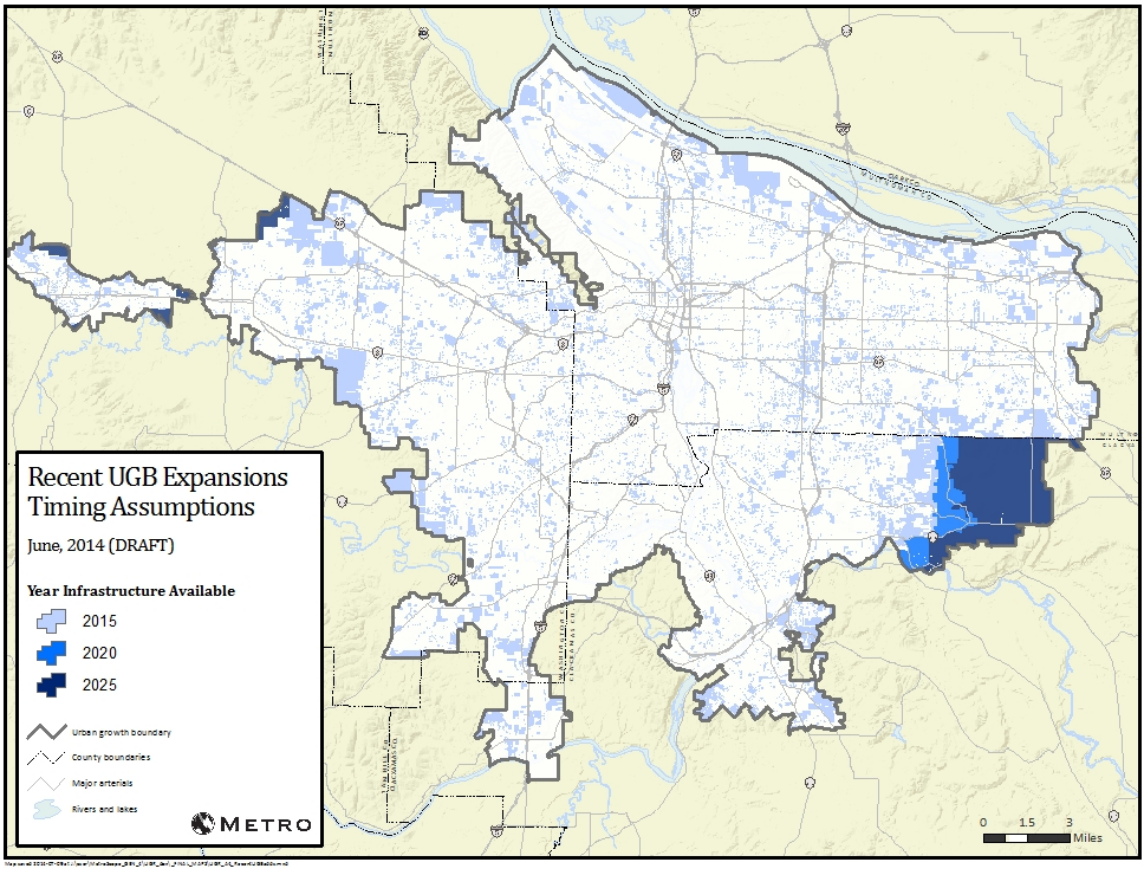
Map 4: Employment redevelopable buildable land



Growth capacity in recent UGB expansions

Planning documents, rather than GIS analysis, were typically the basis for how capacity in new urban areas is handled in the BLI. Possible sources of information included draft comprehensive plans, adopted concept plans, draft concept plans, and conditions of approval that were attached to UGB documents. There are also assumed delays between areas being added to the UGB and availability of the area for development (reflecting the time that it takes for governance, planning, and infrastructure finance issues to be sorted out). For example, because of its ongoing challenges, it is assumed that the majority of the Damascus area won't be available for development until the year 2025. Please refer to Map 5, which depicts the timing assumptions for land availability for development. This capacity also reflects the areas brought into the UGB by Oregon HB 4078. These areas were assumed to follow the Metropolitan House Rule (at least 50% of housing in multi-family units).

Map 5: Land availability timing assumptions for areas inside Metro UGB, including past UGB expansions



Capacity in prospective UGB expansions

For modeling purposes, it is assumed that designated urban reserves will be added to the UGB over time. Urban Reserves are areas adjacent to the UGB, which are deemed suitable to accommodate

development over the next 50 years. Modeling assumptions about future UGB expansions do not necessarily represent any policy direction or intent from the Metro Council and are strictly for research purposes in an attempt to model a continuation of policy implementation under state law.

The initial set of urban reserve parcels included those designated "vacant" in an inventory. From this, environmentally constrained land was removed with the formula: gross buildable acres = unconstrained land + 20% Title 13 constraints + 0% Title 3 constraints.

For urban reserve areas with residential capacity, the amount of net buildable acres is assumed be 75% of the gross acres, in order to account for streets and other public rights-of-way. If the area was designated as having only industrial, no land was taken out.

In the non-industrial areas, the net acres were split into Single Family Residential (70%), Multi-family Residential (24%) and Commercial (6%). Residential densities were chosen to achieve a previous Metro Chief Operating Officer recommendation of approximately 15 units per net acre, though there is no official policy basis for this assumption going forward. Exceptions to the above are where individual jurisdictions provided Metro with their own land use assumptions.

The MetroScope model assumes that all the land available has the necessary infrastructure to enable development. It is assumed that in general an area will have infrastructure available roughly five years after its introduction to the UGB.

Local jurisdictions provided Metro with the urban reserves timing in three phases (2025-2030, 2035-2040, 2045 or later). In some cases, at the request of the jurisdiction, portions of an urban reserve area were assumed to be made available in different years.

Please refer to Table 4 and Map 6 for location, timing, and capacity assumptions of prospective UGB expansions.

Table 4: Prospective UGB expansion modeling assumptions

Code	Year Available		SF DU	MF DU	Total DU	COM acres	IND acres
1C	2040		2,815	4,443	7,258	28	0
1D	2045		0	0	0	0	1,159
1F	2045		0	0	0	0	492
2A	2045		4,064	6,414	10,478	40	0
3B	2045		713	1,574	2,287	10	0
3C	2045		658	1,454	2,112	9	0
3D	2035		1,052	2,324	3,376	14	0
3F	2030		685	1,514	2,199	9	0
3G	2030		479	1,058	1,537	7	0
4A (1)	2040		1,293	2,856	4,148	18	0
4A (2)	2045		4,282	8,109	12,390	51	0
4B	2040		343	759	1,102	5	0
4C	2045		1,790	3,955	5,745	25	0
4D	2045		2,863	6,325	9,188	39	0
4E	2045		2,132	4,710	6,842	29	0
4F	2045		694	1,533	2,227	10	0
4G	2040		1,643	3,630	5,273	23	0
4H	2035		949	1,348	2,298	8	0
5A	2035		247	545	792	3	0
5B	2030		4,405	6,952	11,357	43	0
5D	2035		1,223	1,929	3,152	12	0
5F	2035		0	0	0	0	257
5G	2035		403	890	1,292	6	0
5H	2030		239	340	579	2	0
6A	2035		2,369	3,368	5,737	21	0
6B (1)	2035		1,846	2,913	4,758	18	0
6B (2)	2035		798	1,260	2,059	8	0
6B (3)	2045		804	1,269	2,073	8	0
6C (1)	2030		694	1,314	2,008	8	0
6C (2)	2035		433	820	1,254	5	0
6C (3)	2045		429	813	1,243	5	0
6D (1)	2035		445	702	1,147	4	0
6D (2)	2045		815	1,543	2,358	10	0
7A (1)	2040		309	585	895	4	0
7A (2)	2045		456	864	1,321	5	0
8A	2030		206	0	206	0	3
8C	2035		663	1,046	1,709	7	0

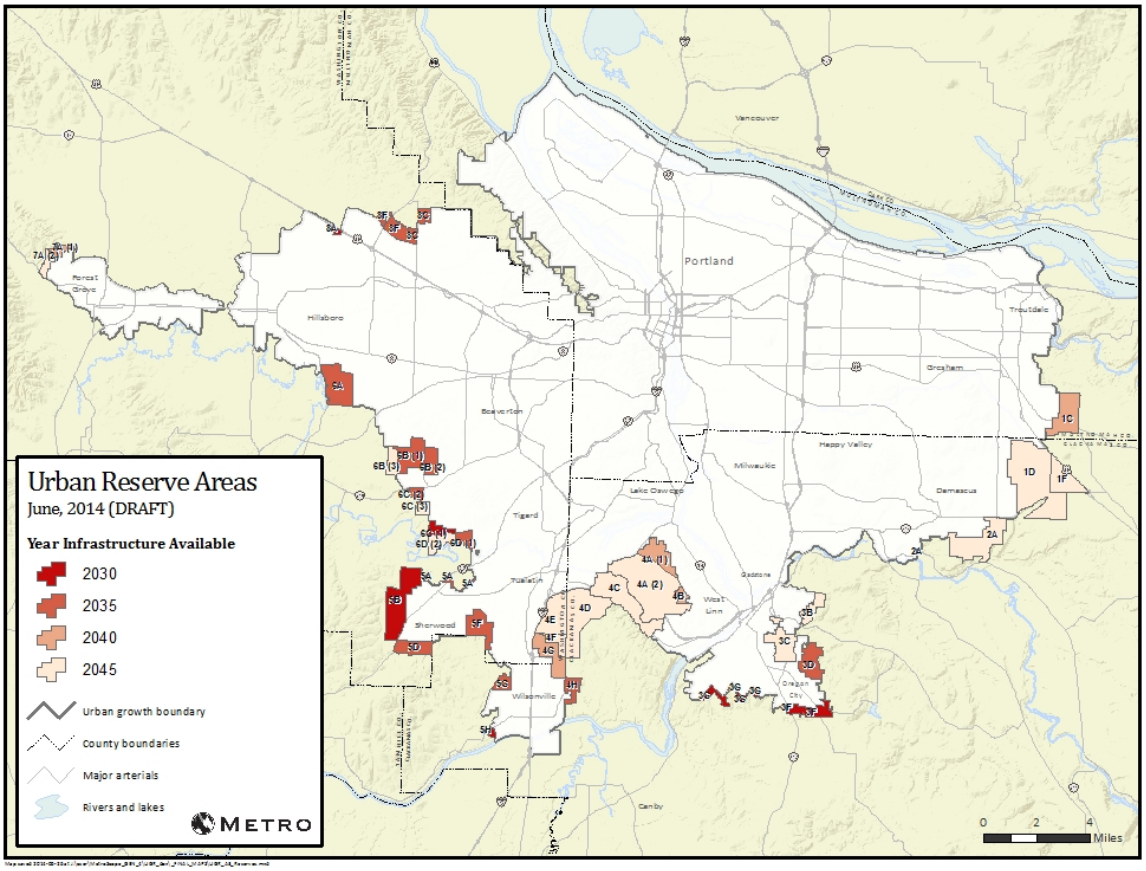
Code	Year Available		SF DU	MF DU	Total DU	COM acres	IND acres
8F	2035		1,453	2,742	4,195	17	0
	Total		**44,692**	**81,900**	**126,592**	**511**	**1,911**
	2030		6,708	11,177	17,885	70	3
	2035		11,881	19,888	31,769	124	257
	2040		6,403	12,273	18,676	77	0
	2045		19,700	38,562	58,262	240	1,651

Notes:

"Code" is the identification code from the original urban reserves decision.
Some reserves will have a different geography than when first defined, due to subsequent legislative decisions.

For some reserves, subareas were assumed to become available for development at different times.
Capacity for reserves 6A and 8A were provided by the City of Hillsboro, otherwise is from staff estimates.

Map 6: Prospective UGB expansion modeling assumptions



Growth capacity outside Metro's jurisdiction

For complete and consistent accounting of regional development, the modeling and forecasting of land use futures requires estimates of residential and employment capacity in outlying areas that fall in the shadow of the Portland socio-economic influence. These areas are:

- Neighboring cities outside the UGB
- Rural areas outside the UGB
- Clark County urban and rural areas
- Outer counties -- Columbia, Yamhill, and North Marion

These adjacent areas are part of the economic region because there are significant cross border commuting and economic trade activities among all of the counties in the MSA. These socio-economic ties are difficult to disentangle and, as a consequence, excluding these counties would severely distort econometric models designed to analyze, forecast and assess the economic conditions of the greater Portland economic region.

As a market equilibrium model, MetroScope mimics economic choices and conditions. A choice for some residents (and businesses / employees) may be to live in housing beyond the Metro UGB. Of course having supply (or capacity) outside the Metro UGB is not sufficient if there is not sufficient market demand for locations outside the UGB.

Growth capacity in neighboring cities in the three-county area

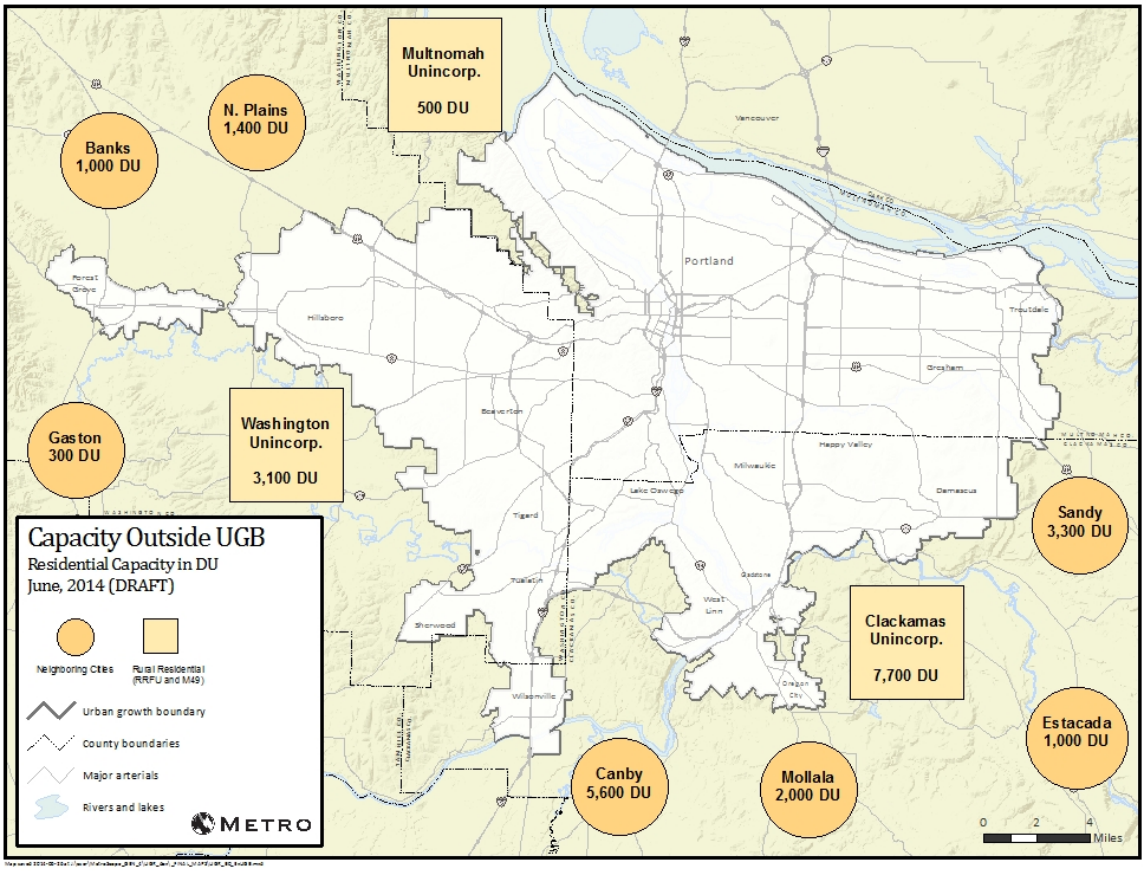
"Neighboring cities" are those jurisdictions that are inside Multnomah, Clackamas, or Washington County but outside the Metro UGB. Metro staff assumed that the capacity of each neighboring city would follow historic development trends, roughly doubling its size during the next 20 to 30 years. These cities were invited to participate in the forecast distribution and capacity reviews.

Where the neighboring cities did not provide GIS data to Metro (Canby, Molalla, Estacada, Gaston, and Banks), the initial 20-year dwelling unit supply was assumed to be equal to the number of households reported by the 2000 Census, file DP1. The share of the capacity by Single family vs. Multi-family was also taken from the 2000 Census, and a default density was applied (SFR8 @ 8.7 units/acre and MFR1 @ 12.3 units/acre).

Where the neighboring cities did provide GIS data to Metro (Sandy and North Plains), each local design type was converted to a Metro standard zoning class, with the appropriate density applied. The resulting capacity was assumed to be a 20-year supply.

Please refer to Map 7 for capacity of the neighboring cities and unincorporated areas.

Map 7: Residential growth capacity in neighboring cities assumed for modeling purposes



Rural residential growth capacity in the three-county area

At the outset of the Oregon Statewide Planning Program, counties were required to inventory farm and forest lands, and zone them as such, unless the land was physically developed by or irrevocably committed to other uses that made resource (farm or forest) use of the property impracticable. The process by which a local government shows this is called ´taking an exception´ to the appropriate resource Goal. Most counties included ´exception areas´ in their comprehensive plans, providing locations for residential, commercial, industrial, and public uses outside urban growth boundaries.

Taxlots on exception land (Metro RRFU zoning) were selected as having potential residential capacity. A subset of these was selected by criteria related to building value and ownership. Residential dwelling unit capacity was calculated as a function of the minimum lot size from the local zoning of each taxlot.

Based on an inspection of the tax lot records and aerial photos, taxlots having an assessed value of greater than $20,000 were considered developed, and excluded. This value seemed to give a reasonable balance between including existing homes and excluding more marginal structures.

Taxlots were excluded if they were publicly owned (including US, state, county and city governments, cemeteries, water districts, school districts and other entities), owned by homeowner associations, or owned by major utilities. These selections were made based on owner name and should be a good representation of properties that would not likely develop, though it is not an exhaustive list.

The capacity for additional units was calculated by:

(1) Divide the GIS acres by minimum lot size and round down to nearest integer
(2) Subtract 1 if the parcel is already developed
(3) Exclude all parcels that have been flagged as urban reserves or public properties

Finally, some additional capacity was added for "lots of record":

(1) Select tax lots that are not developed but have zero calculated capacity
(2) Of these, select lots that are at least 0.5 acre in size
(3) Add 1 unit of capacity to each of these lots

Please refer to Map 7 for a summary of the assumed capacity of unincorporated areas.

Growth capacity from Measure 49 claims

In 2004, Oregon voters passed Measure 37, which required state and local governments to either waive land use regulations or compensate landowners when a regulation reduces a property's fair market value. However, the scale of proposed Measure 37 development, especially in the Willamette Valley where 60 percent of the claims were filed, alarmed conservationists and farm groups. They worked with Democratic legislators to write Measure 49 during the 2007 legislative session and refer it to voters.

Measure 49 gives landowners who have filed Measure 37 claims the right to build homes as compensation for land use regulations imposed after they acquired their properties. Claimants may build up to three homes if allowed when they acquired their properties. Claimants may build up to 10 homes if allowed when they acquired their properties and they have suffered reductions in property values that justify the additional home sites.

Measure 49 capacity assumptions are based on data collected from the state/PSU database on Measure 49 claimants. We assumed that each measure 49 claim would produce three additional single family houses.

Growth capacity in urban Clark County, Washington

The buildable capacity for Clark County inside the Urban Growth Area (UGA) was taken from the 2011 Vacant Buildable Land Inventory (VBLM), a planning tool developed by Clark County to analyze residential, commercial, and industrial lands within urban growth areas. The VBLM analyzes potential residential and employment capacity based on vacant and underutilized land classifications.

This potential capacity is used to determine the amount of urban land needed to accommodate projected population and job growth for the next 20 years during plan updates and to analyze land consumption or conversion rates on an annual basis for plan monitoring purposes.

This approach differs from that used in the Metro UGB, but represents the best practices and local expertise of Clark County staff. Capacity from future UGA additions was determined from the taxlots inside the "Urban Reserve" areas as defined in the most recent Comprehensive Plan.

The model classifies lands into three urban land use categories residential, commercial, and industrial. Lands are grouped into land use codes based on comprehensive plan designations for model purposes. Lands designated as parks & open space, public facility, mining lands, or airport within the urban growth areas are excluded from available land calculations.

To determine the buildable capacity, the following VBLM classifications were selected:

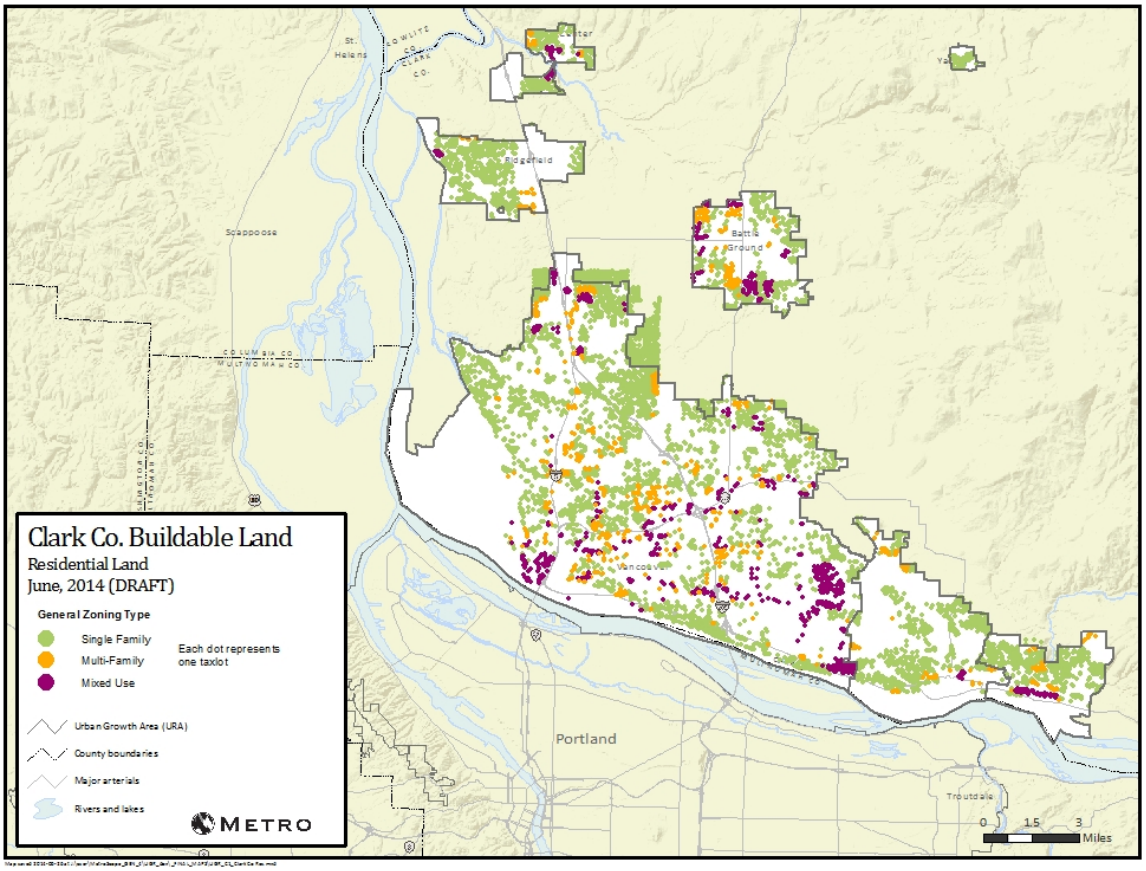
Residential Vacant -- RES class 3, Vacant
Commercial Vacant -- COM class 2, Vacant
Industrial Vacant -- IND class 1, Vacant

Residential Refill -- RES class 4, Underutilized
Commercial Refill -- COM class 3, Underutilized
Industrial Refill -- IND class 2, Underutilized

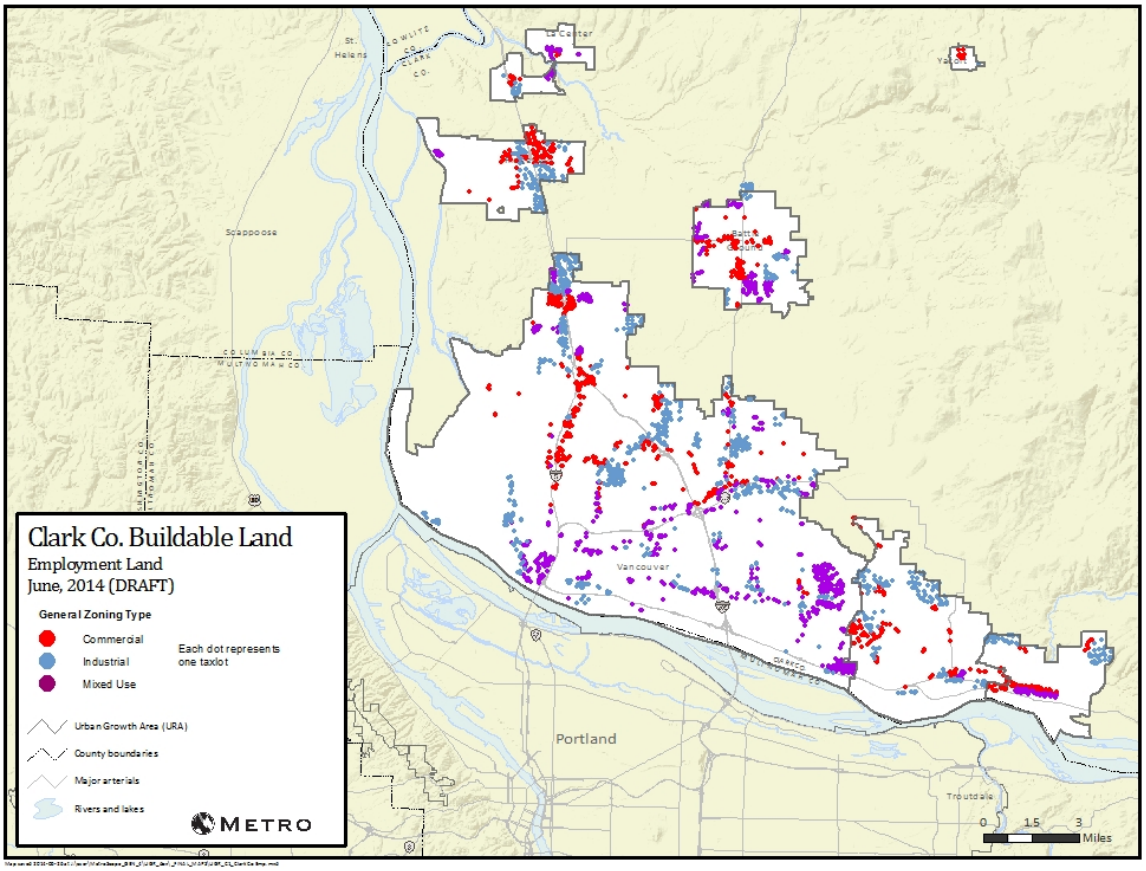
To determine the buildable capacity for the MetroScope scenarios, each of the Clark County local zoning codes was converted to an equivalent Metro zone class, from a crosswalk table created by Clark County and Metro planning staff.

Please refer to Map 8 and Map 9 that depict residential and employment buildable land in Clark County, Washington. More information about the VBLM can be found at http://gis.clark.wa.gov/vblm/assets/VBLM.pdf.

Map 8: Clark County, Washington residential buildable land



Map 9: Clark County, Washington employment buildable land



Rural residential growth capacity in Clark County, Washington

A formal Vacant Buildable Lands Model (VBLM) for determining future urban residential and employment land use capacity has been in place since the beginning of Clark County's Growth Management Planning process. However, the VBLM excludes rural areas outside of urban growth areas. Since rural capacity is a component of the overall capacity a different, a simplified process has been created by Clark County staff to account for rural capacity.

Rural residential lands have minimum lot sizes of 5 acres or more with the exception of rural centers which have minimum lot sizes of 1 acre. Rural residential and resource lands are classified as built, vacant, or underutilized lands.

Classifications are based on criteria such as assessed building value, total area, and minimum lot size. Known public lands (Federal, State, and local) and Western Forest Protected Lands are excluded. Vacant lots four acres or larger, but less than minimum lot area, are considered buildable. This is based on the potential of lots qualifying for legal lot determinations. No reductions for critical areas. It is assumed that a building envelope would be available on larger rural lots.

Other model assumptions

The MetroScope model incorporates several other input assumptions that are intended as proxies for location preferences (neighborhood scores), system development charges, and development incentive programs such as urban renewal.

Incentivized redevelopment

Incentivized residential redevelopment is a set of model assumptions which represent attempts by local governments to revitalize specific areas, and in broader context, to implement the 2040 Growth Concept.

The purpose of the incentive for is to make the units more affordable for development. This can reflect such things as active urban renewal or a vertical housing tax credit. Many of the incentivized redevelopment areas are in higher-density locations that carry higher residential price tags (land prices and costs of construction per square foot are typically higher). The impact of the incentive is that prospective homeowners (or renters) are more likely to locate in the area, other things being equal, because rents should be lower with the incentive than otherwise.

The areas receiving incentives include Urban Renewal Areas, Regional Centers, Town Centers, and other development strategies (Portland's Transit-Oriented Development and Neighborhood Prosperity Initiative). The amount of incentive per dwelling unit for each areas is one of three tiers ($50,000, $25,000, or $10,000), estimated by Metro staff and local jurisdictions.

In the MetroScope model, the incentivized capacity is defined by those taxlots which are both identified as having potential for redevelopment, and fall within the geographies of the areas described above.

The incentive does not prioritize the housing capacity, but it does make it more likely to be built than non-incentivized capacity. The non-residential supply is not incentivized.

Please refer to Map 10 and Table 5 for more detail about the model's incentive assumptions, which are based on currently adopted programs.

Map 10: Areas with modeled assumptions for residential incentive programs

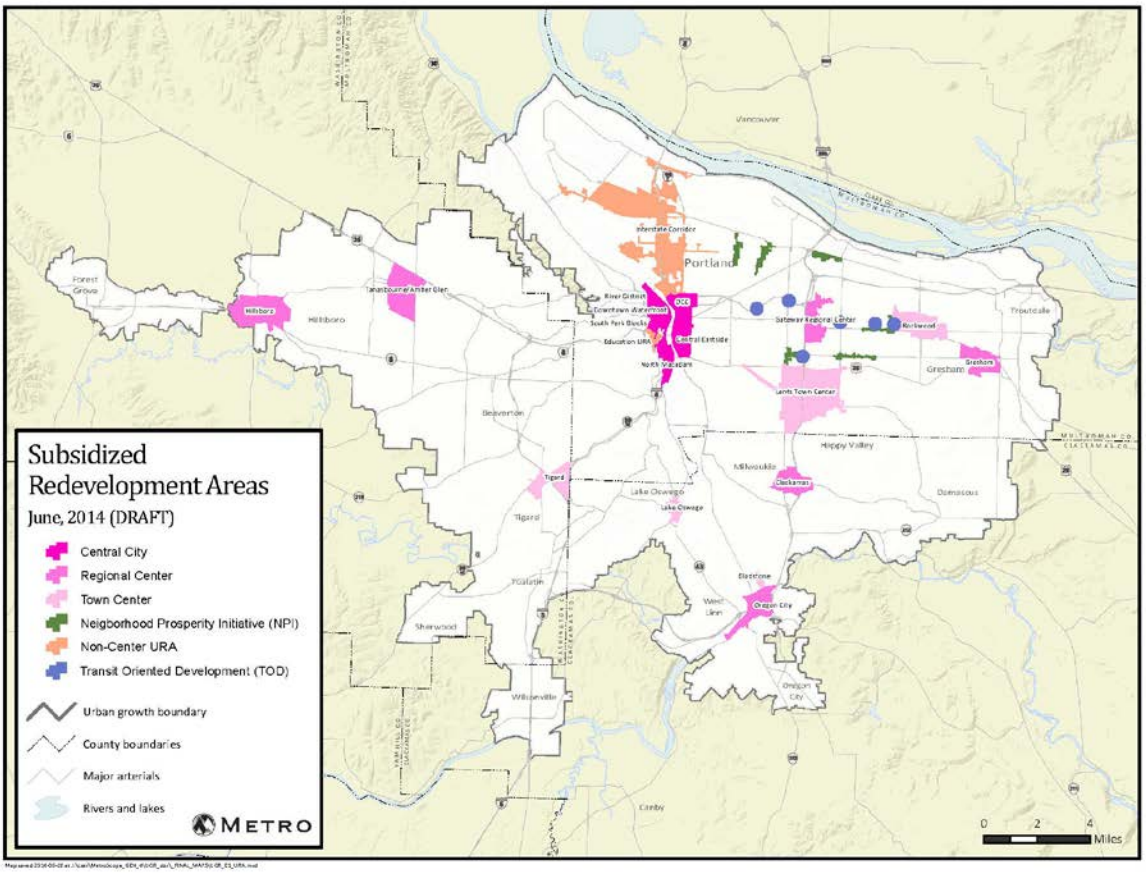


Table 5: Areas with modeled assumptions for residential incentive programs

City of Portland	Type	Incentive per DU	SF DU	MF DU	Total DU
Central Eastside	Central City	$50,000	0	1,196	1,196
Downtown Waterfront	Central City	$50,000	0	3,376	3,376
North Macadam	Central City	$50,000	0	10,574	10,574
Oregon Convention Center	Central City	$50,000	0	7,105	7,105
River District	Central City	$50,000	0	5,336	5,336
South Park Blocks	Central City	$50,000	0	787	787
Gateway Regional Center	Regional Center	$25,000	0	4,233	4,233
Lents Town Center	Town Center	$10,000	682	17,209	17,891
Education URA (PSU)	Non-Center URA	$10,000	0	831	831
Interstate Corridor	Non-Center URA	$50,000	194	19,036	19,230
NPI - 42nd Avenue	NPI	$10,000	14	813	827
NPI - 82nd Avenue and Division	NPI	$10,000	38	2,690	2,728
NPI - Cully Blvd	NPI	$10,000	4	1,960	1,964
NPI - Division Midway	NPI	$10,000	0	507	507
NPI - Parkrose	NPI	$10,000	2	339	341
NPI - Rosewood	NPI	$10,000	61	248	309
TOD - E 122nd Ave MAX Station	Portland TOD	$10,000	6	84	90
TOD - E 148th Ave MAX Station	Portland TOD	$10,000	128	1,001	1,129
TOD - E 162nd Ave MAX Station	Portland TOD	$10,000	4	54	58
TOD - NE 60th Ave MAX Station	Portland TOD	$10,000	1	308	309
TOD - NE 82nd Ave MAX Station	Portland TOD	$10,000	2	1,851	1,853
TOD - SE Division St	Portland TOD	$10,000	1	978	979
Rest of UGB	**Type**	**Incentive per DU**	**SF DU**	**MF DU**	**Total DU**
Clackamas	Regional Center	$25,000	0	248	248
Gresham	Regional Center	$25,000	14	365	379
Hillsboro	Regional Center	$25,000	238	408	646
Oregon City	Regional Center	$25,000	0	886	886
Tanasbourne/AmberGlen	Regional Center	$25,000	8	1,553	1,561
Gladstone	Town Center	$10,000	10	0	10
Lake Oswego	Town Center	$10,000	3	33	36
Rockwood	Town Center	$10,000	0	1,135	1,135
Tigard	Town Center	$10,000	67	337	404
Outside UGB	**Type**	**Incentive per DU**	**SF DU**	**MF DU**	**Total DU**
Canby	Neighbor City	$10,000	0	600	600
Sandy	Neighbor City	$10,000	0	600	600

Vancouver	Neighbor City	$25,000	0	6,000	6,000
			SF DU	**MF DU**	**Total DU**
Portland Total			1,137	80,516	81,653
UGB Total			1,477	85,481	86,958
Region Total			1,477	92,681	94,158
Notes:					
NPI = Neighborhood Prosperity Initiative					
TOD = Transit Oriented Development					
DU = Dwelling unit					
MF = Multifamily					
SF = Single-family					

System development charges (SDCs)

SDCs are one-time fees charged by local jurisdictions that are based on the development of a property. They apply to both new construction and residential projects which increase impacts on infrastructure. State law allows SDCs to be charged to help pay for five types of capital facilities: water, stormwater, sewer, transportation, and parks. Local jurisdictions must provide research and analysis to justify the amount they charge for each SDC.

SDCs for the MetroScope scenarios were estimated with data from the Homebuilders Association of Metropolitan Portland and a 2009 Metro study. Separate fees were assumed for both single family and multi-family units. Please refer to Table 6 for details about the SDC assumptions used for modeling purposes.

Table 6: SDC assumptions for MetroScope modeling (per residence)

Jurisdiction	Source	SFR	MFR
Gladstone	Home Builders	$6,650	$6,650
Happy Valley	Metro Survey	$30,000	$27,000
Beaverton	Metro Survey	$21,087	$19,158
Cornelius	Home Builders	$15,063	$15,063
Durham	Metro Survey	$17,188	$17,188
Fairview	Metro Survey	$7,091	$6,371
Forest Grove	Metro Survey	$16,657	$16,657
Gresham	Home Builders	$16,665	$16,665
Springwater	Home Builders	$31,034	$31,034
Pleasant Valley	Home Builders	$24,578	$24,578
Hillsboro	Home Builders	$16,691	$16,691

Johnson City	Metro Survey	$18,088	$13,081
King City	Home Builders	$11,713	$11,713
Lake Oswego	Metro Survey	$22,470	$15,378
Maywood Park	Metro Survey	$18,088	$13,081
Milwaukie	Metro Survey	$9,127	$8,750
Oregon City	Metro Survey	$19,747	$18,747
Portland Central City	Metro Survey	$18,088	$13,081
Rivergrove	Metro Survey	$500	$500
Sherwood	Metro Survey	$23,351	$17,897
Tigard	Metro Survey	$16,535	$13,716
Troutdale	Metro Survey	$14,659	$13,311
Tualatin	Metro Survey	$17,185	$17,185
West Linn	Metro Survey	$29,291	$22,257
Wood Village	Metro Survey	$9,982	$9,982
Wilsonville	Metro Survey	$22,123	$17,444
Multnomah Cty Unincorp	Metro Survey	$16,500	$16,500
Washington Cty Unincorp	Metro Survey	$18,000	$14,000
Clackamas County Unincorp	Metro Survey	$19,000	$15,000
Vancouver	Staff Estimate	$19,000	$15,000
Battle Ground	Staff Estimate	$19,000	$15,000
Camas	Staff Estimate	$19,000	$15,000
Ridgefield	Staff Estimate	$19,000	$15,000
Washougal	Staff Estimate	$19,000	$15,000
Clark County Unincorp	Staff Estimate	$4,000	$4,000
Other Rural	Staff Estimate	$4,000	$4,000
Other Urban	Staff Estimate	$19,000	$15,000
Sources:			
2011 Metro Survey, Homebuilders 2010 Survey, Metro Staff Estimates			

Residential neighborhood score

The residential neighborhood score is rough measure of how much people would be willing to pay for a similar house in different locations around the region. It is used as an input assumption for modeling to recognize these market dynamics. There are a many reasons that an identical house in two different neighborhoods might sell for very different prices. It could be because of the quality of the housing stock, a walkable business district, proximity to parks, or a number of other things.

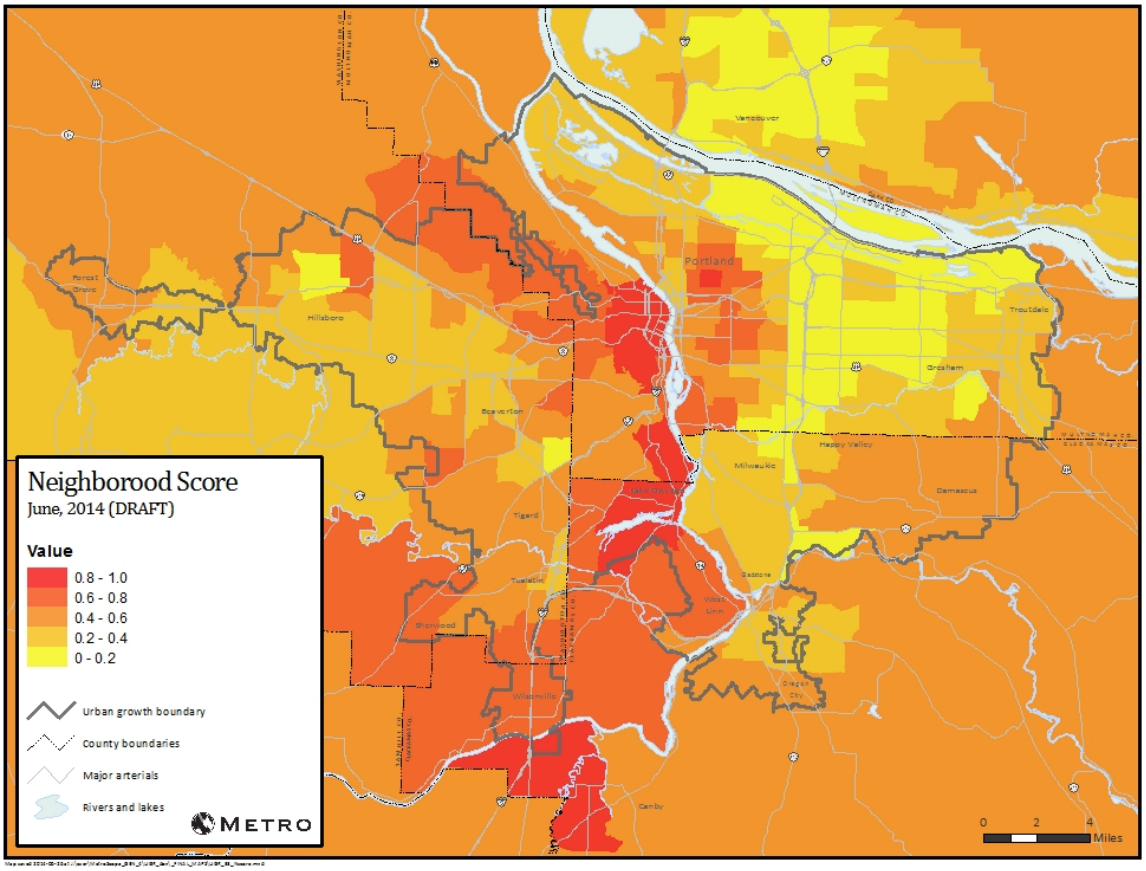
We don't directly observe how much people are willing to pay for these things, but people pay indirectly for them by choosing a house (or apartment) that has the right bundle of amenities and price that suits their wants and needs. For example, if apartments in a more walkable neighborhood cost more than apartments in a less walkable neighborhood, then we may be able to tease out how much that amenity is worth to people in dollar terms.

Most of those things are very difficult to quantify or measure, and so we must perform a data analysis known as a "hedonic regression". A hedonic regression for housing tries to decompose the sale price into the various attributes of the house itself, such as house size and lot size, as well as location-based attributes, such as a typical commute time or school quality.

Since we are forecasting over a 20 to 40 year time horizon, we tend to focus on the most basic and measurable of these attributes, the ones that we can derive from assessor and zoning data, such as house size, lot size and location. The raw data for this analysis come from the assessor files for single family homes sold between 2004 and 2012.

In the end, each census tract gets a relative score between zero and one, which becomes a parameter in the MetroScope residential location choice equations. Please refer to Map 11 for a depiction of neighborhood score assumptions.

Map 11: Neighborhood score assumptions by location

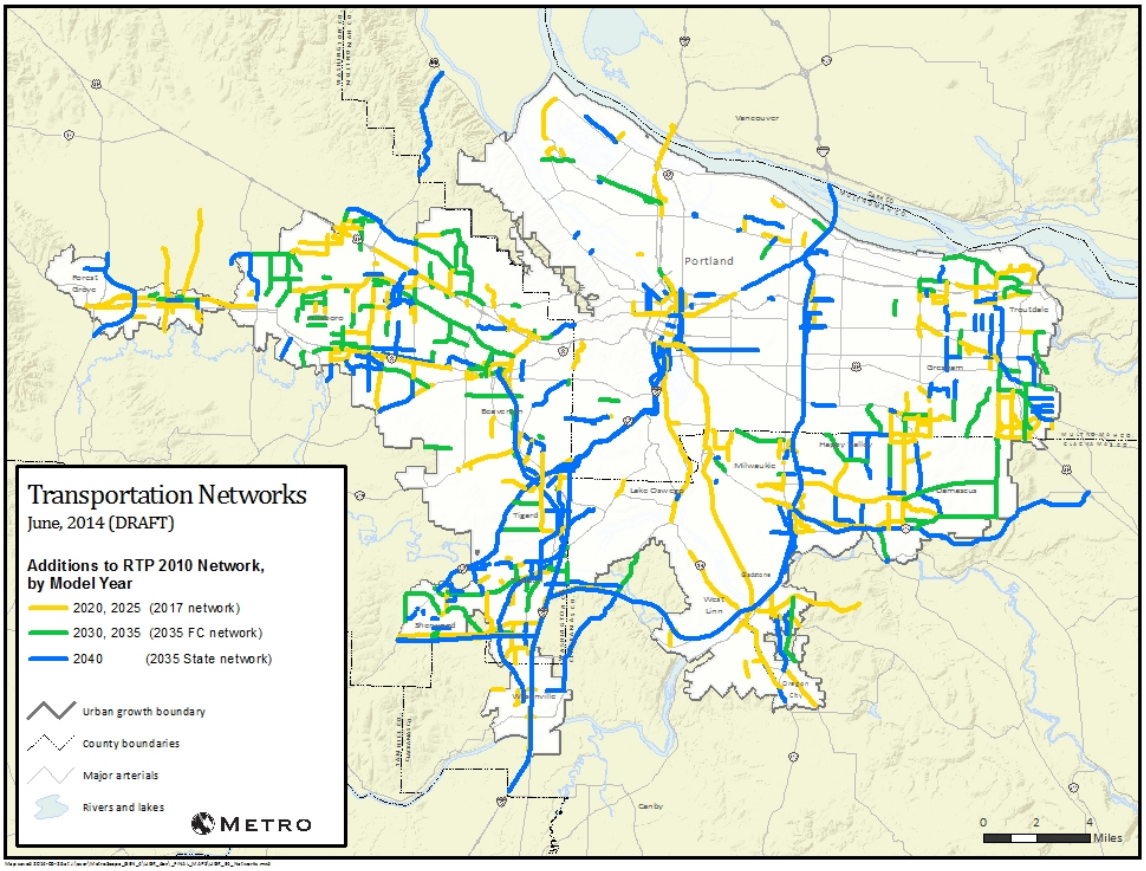


Transportation and accessibility

The MetroScope land use model is integrated with a transportation model, so that travel times can influence the location choices of households and employment, which in turn can influence vehicle trips on the transportation network. Transportation networks used in MetroScope UGR scenarios are from the Metro 2035 Regional Transportation Plan:

2010, 2015 forecast years:	2010 network
2020, 2025 forecast years:	2017 network
2030, 2035 forecast years:	2035 "financially constrained" network

Please refer to Map 12 for an illustration of which transportation projects were added in each year. A complete list of projects can be found at:

http://library.oregonmetro.gov/files//2035_rtp_appendix_june2010_web.pdf

Map 12: Transportation networks assumed in MetroScope modeling