Appendix 4

Housing Needs Analysis (revised as of 9/23/14)

This revised draft incorporates two corrections described on the final page of this appendix.

Introduction

Metro is required under state law to complete a buildable land inventory (includes vacant, infill and redevelopment capacity) and an assessment of housing need at least every 5 years. The buildable land inventory methods and results are summarized in appendices 2 and 3, respectively. This report summarizes relevant Census data, key forecast assumptions, forecast results (derived from MetroScope scenarios[1]) and compares likely housing demand to the residential growth capacity of the current urban growth boundary.

This analysis uses a range forecast. Once the Metro Council makes a growth management decision and chooses a point in the range forecast for which to plan, this Housing Needs Analysis will be updated to reflect that decision. A final Housing Needs Analysis will then be submitted for consideration by the state Land Conservation and Development Commission.

What's new in the 2014 Urban Growth Report housing needs analysis?

- Eliminated the "residential refill rate[2]" in the calculation of housing need.
- Replaced refill rate with direct measures of residential infill and redevelopment supply estimates; now included in the single family buildable land inventory (BLI) as *infill* capacity and the multifamily BLI as *redevelopment* capacity. The methodology for how Metro estimated single family infill and multifamily redevelopment is spelled out in the *BLI methodology* whitepaper (see Appendix 2).
- Synchronized the BLI database with MetroScope Urban Growth Report (UGR) scenario(s) – thus enabling a tightly integrated MetroScope scenario(s) to fit with the UGR framework.[3] This will

[1] 3 scenarios: high growth forecast, medium-baseline growth forecast, and a low growth forecast scenario

[2] Previous Urban Growth Reports used a refill rate to describe the share of future residential growth that would be accommodated through redevelopment and infill. The refill rate was expressed as a percent share of demand and was not tied to the buildable land inventory.

[3] The integration of MetroScope within the analysis framework of the UGR provides a more substantial economic planning basis to: 1) improve the inventory of buildable lands, 2) accurately compare how the distribution of households by income bracket, age bracket and household size distributes to available housing supplies, 3) determine housing need by rent and price, 4) document the housing inventory by densities and types of residence by local jurisdiction, 5) and include infill and redevelopment in the evaluation of housing need. Utilizing MetroScope provides a stronger planning basis to test the likely market response/outcome and socio-economic impacts and tradeoffs of ordinances and incentives to increase population densities in urban areas while taking into account 1) key facilities [e.g., transportation infrastructure], 2) ESEE consequences of development [e.g., future settlement patterns after considering economic, social and environmental growth factors], 3) projected use of urban land [i.e., redevelopment].

lead to better coordination between the UGR and subsequent forecast allocation work. The MetroScope scenarios used for this analysis are intended to represent a continuation of currently adopted policies[4].

- Used the capture rate (i.e., the future share of residential growth and development in the Metro UGB relative to the MSA total) that is an output of a MetroScope scenario for making housing needs calculations (instead of using historically observed capture rate figures as with past UGRs). The capture rates used in this analysis are somewhat higher than historic observations (around 70% depending on scenario vs. 62.8% historical reading).
- Required data on historic residential development trends are reported in a separate report (Appendix 5).

What key aspects are the same in this housing needs analysis?

- Using a range forecast to acknowledge uncertainty in the regional forecast.
- Assuming no changes to currently adopted plans and zoning designations.
- Buildable lands for residential uses are inventoried by housing location, type and density.
- Only a portion of the buildable land inventory is expected to be market feasible in the 20-year planning timeframe. This report describes how 20-year estimates were made.
- Number of needed (i.e., demanded) housing units are reported by price / rent ranges and average density.
- The analysis reflects varied housing demand for different household sizes, incomes, and ages.
- Manufactured homes (a construction technique, not a housing type) are assumed to be available to be placed in any jurisdiction in Metro which allows/permits for appropriate residential development densities.
- Mimicking how real markets function, redevelopment and infill supply are linked to household demand (redevelopment and infill become more likely with higher market demand). At the higher end of the forecast demand range, there is increased redevelopment or infill supply.

Data, Forecast and Methods

Prospective Buildable Land Inventory (BLI)

- The BLI is considered a year 2014 estimate of residential and non-residential (employment) supply. The inventory has been reviewed and accepted by local jurisdictions. Data are individual tax lots and stored in a master geodatabase capable of being queried for the UGR and suitable for a MetroScope scenario.
- BLI consists of identified vacant tax lots plus infill and redevelopment tax lots deemed capable of potential of supporting residential development in the future under existing plans and zone designations.

[4] As an example, current policies include but not limited to: 1) current zoning and comprehensive plans, 2) urban / rural reserves, 3) regional transportation plans (RTP), 4) system development charges (SDC), and 5) urban renewal areas (and/or development subsidies).

- The BLI has parts that are deemed prospective because redevelopment and infill are not certainties. At this point, it is just as likely that a tax lot "eligible[5]" for redevelopment (or infill) does or does not actually redevelop. To the extent we can forecast where redevelopment happens, we utilize MetroScope – an integrated land use model – to make future estimates of the amount of realizable redevelopment and infill to count in the UGR inventory.
- The infill and redevelopment supply inventory was designed to be ahead of the 20-year market for MetroScope modeling purposes. The rationale for this is to assume for the model a 20-year land supply on hand at the end of the 20-year forecast horizon.
- For purposes of evaluating the Metro UGB, the geography of the supply inventory is clipped to the current UGB and the timeframe for the supply has to be estimated for a 20-year inventory, particularly for infill and redevelopment supply.
- For MetroScope modeling, we utilize the longer time frame and additional BLI data estimates which include Clark County, rural and neighboring city capacity estimates. We necessarily include this information so that we can model the Metro UGB capture rate forecast from a seven-county MSA (Clackamas, Columbia, Multnomah, Washington and Yamhill counties in Oregon and Clark and Skamania counties in Clark).
- In summary, MetroScope, a market-based land use and integrated with a transportation model, is used to estimate how much of the infill and redevelopment capacity can be counted on as market feasible in the next 20 years. We count 100 percent of identified vacant land in the BLI, but will only count a fraction of the infill and redevelopment capacity in the BLI for the UGR need analysis in accord with forecast information derived from a MetroScope Scenario[6].

Forecast[7]

- Regional range forecast (high, baseline and low growth scenarios) for population and employment, 2015 to 2035. Housing demands are derived from these growth range scenarios represented by the population and employment drivers for each forecast range and interval.
- The population forecast is integrated with the employment forecast so that economic trends affect the migration component of population. Natural population increases (births – deaths) are estimated from birth and death rates found in the 2012 National Population Projections (source: Census data). Rates are adjusted so that they calibrate with birth and death rates of the last 10 years for the region.
- Population forecast is converted into households by income bracket, age bracket (age is of the head of household), and household size (we call this distribution of household characteristics/ profile: an HIA matrix)
- HIA households are converted into types of housing demand (i.e., needed housing by tenure and structure type).

[5] Eligibility requirements for infill and redevelopment are spelled out in Appendix 2.
[6] Additional MetroScope details may be found in Appendix 11.
[7] Regional forecast details may be found in Appendix 1a.

Housing needs general methodology

1. Determine the portion of households in the regional MSA household forecast that may choose to locate in the Metro UGB. A MetroScope scenario predicts the outcome of residential capture rate. The capture rate measures the proportion of future housing development (i.e., growth) in the Metro UGB relative to growth in the MSA for years 2015 to 2035. Other things being equal, the capture rate varies according to the demand forecast.
2. Sort year 2015 and 2035 projected households in the Metro UGB into socio-economic classes by: a) household size, b) income bracket, c) age bracket. This is a "3 dimensional matrix" of household size-income-age. Household size has 5 attribute levels. There are 8 income brackets and 5 age brackets. (We call this the 5 x 8 x 5 HIA matrix.)
3. Estimate the growth by HIA class for 2015 to 2035 to array the 20 year growth in households in size, household income and age brackets. An HIA class in the matrix represents households in the same socio-economic strata based on household size, income and age bracket characteristics.
4. Relate a set of residential housing preferences to each HIA class for tenure (own or rent) and housing structure type (single family or multi-family). Residential preference patterns for each HIA class are based on findings from a MetroScope scenario. Each HIA class is found to have proportional affinities to OSF (owner single family), OMF (owner multi-family), RSF (renter single family), and RMF (renter multifamily). These affinities are preferences used going forward to predict – by tenure and structure type – the Metro UGB housing demand forecast.
5. Tally this housing need forecast by OSF, RSF, OMF and RMF (see: Table 3)
6. Complete a gap analysis of projected housing need by type (SF – single family and MF – multi-family) against the BLI (sorted by SF and MF), shown in Figure 9 to 11.

Methodology step by step

Step 1: Capture rate and Metro UGB job forecast

From the regional MSA jobs forecast, we compute how much population (i.e., number of households) growth will locate inside the Metro UGB. A MetroScope UGR scenario provides residential location choice projections for population and households so we can compute Metro UGB household shares. Table 1 presents the MSA and UGB household estimates and projections for the baseline growth forecast.

Table 1: Regional Household Forecast - baseline scenario (source: 2014-2040 Regional Range Forecast – Scen. #1462)

	Metro UGB	MSA Forecast (7 counties)	percent share (UGB / MSA)
2015 (base year) Households	613,000	898,700	68.2%
2035 Households	820,100	1,185,800	69.2%
2015 Housing Units (6.9 % vacancy rate)	655,500		
2035 Housing Units (4.0 % vacancy rate)	852,900		
2015-35 Housing Growth Difference	197,400		

- Total projected housing demand for the Metro UGB (2015 to 2035) is *197,400* dwelling units.
- Percentage of Metro UGB growth was determined from MetroScope Scen. #1462 (baseline scenario)
- MSA forecast for 7 counties includes Columbia, Clackamas, Multnomah, Washington and Yamhill counties in Oregon plus Clark and Skamania counties in Washington State.
- 6.9 percent vacancy rate (source: U.S. Census, 2010)
- 4.0 percent vacancy rate (source: 2009 UGR assumption)
- Implied captured is 72 percent for years 2015 to 2035 (baseline - medium growth scenario)

Step 2: Sort Metro UGB housing forecast into HIA classes

For the sake of brevity, we do not show the year 2015 and year 2035 HIA matrices as they are 3-way tables that are each 5 by 8 by 5 in size (which equals a total of 200 cells), which do not lend themselves well to reporting in written form.

Step 3: Estimate the growth in households by HIA[8]

Instead, we summarize in Figure 1 the marginal summations of the HIA matrix for illustrative purposes for the change in households between 2015 and 2035. (The actual forecast projections by HIA class are available upon request.)

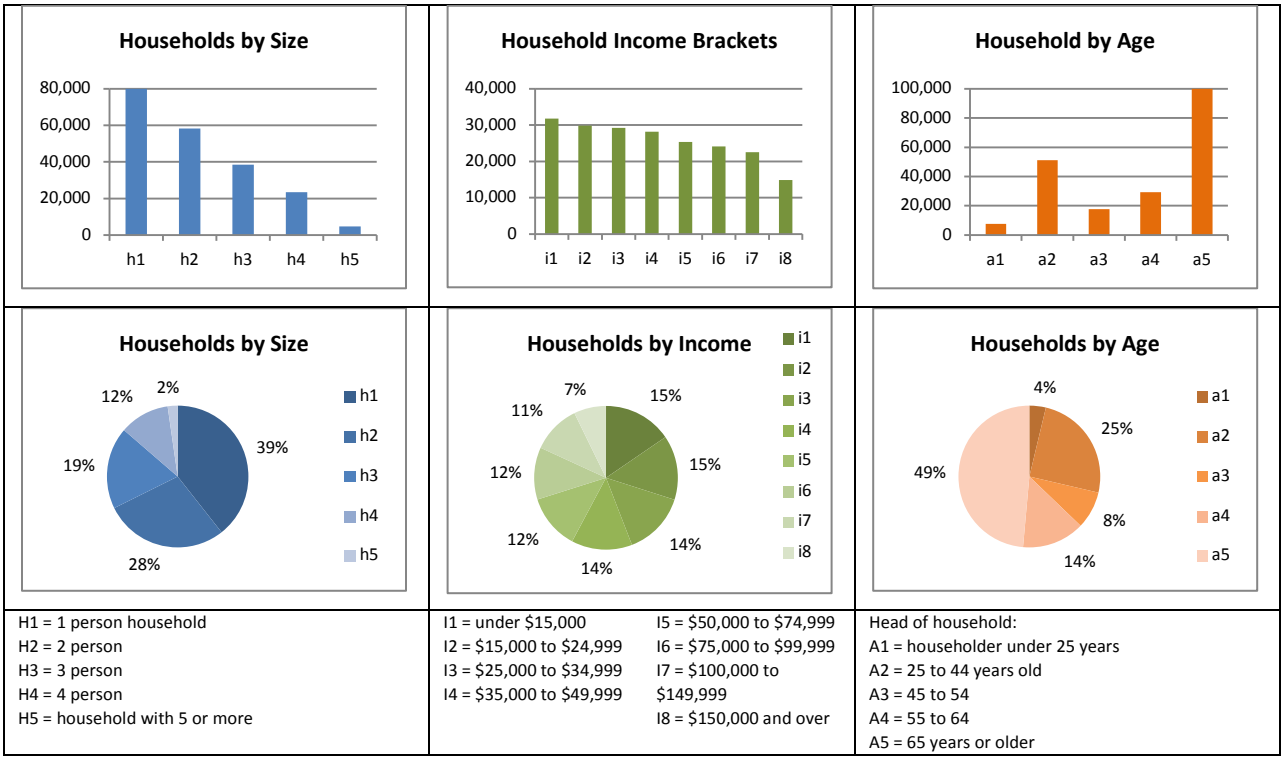


Figure 1: 2015 to 2035 HIA forecast marginal distributions (source: MetroScope Scen. #1462)

[8] Please note that we use the term "household" and "housing unit" interchangeably. This is because we are talking about units that are dimensioned by housing characteristics (i.e., tenure and type) as well as attributed with household characteristics (age, income and number of persons in a household who could occupy the unit).

- 61 percent of future households are expected to be of 1 or 2 persons. This is consistent with overall projected declines in average household sizes from 2.60 (in 2010) to 2.47 (in 2035) for the MSA region. Despite a decline in average household size, the absolute number of households with 3 or more persons increases in number by 2035 as compared to 2010 figures.
- Note that the income brackets are not equally spaced. (They were by construction initially divided into 8 equal proportions to the extent possible given available Census categories.) The regional forecast overall anticipates proportionally fewer households in the middle income bracket with the numbers proportionally bifurcating into both lower and upper end income brackets in general.
- The influence of the baby boom generation is felt by the large proportion of older householders at the margin (41 percent of the net change in population and households are in the retirement age group – 65 years and older, another 13% in pre-retirement – ages 55 to 64.) An increase in median age of the population is expected due to the increase proportion of retirement age householders, yet the number of householders in younger age categories is expected to increase in absolute numbers.

Addendum:

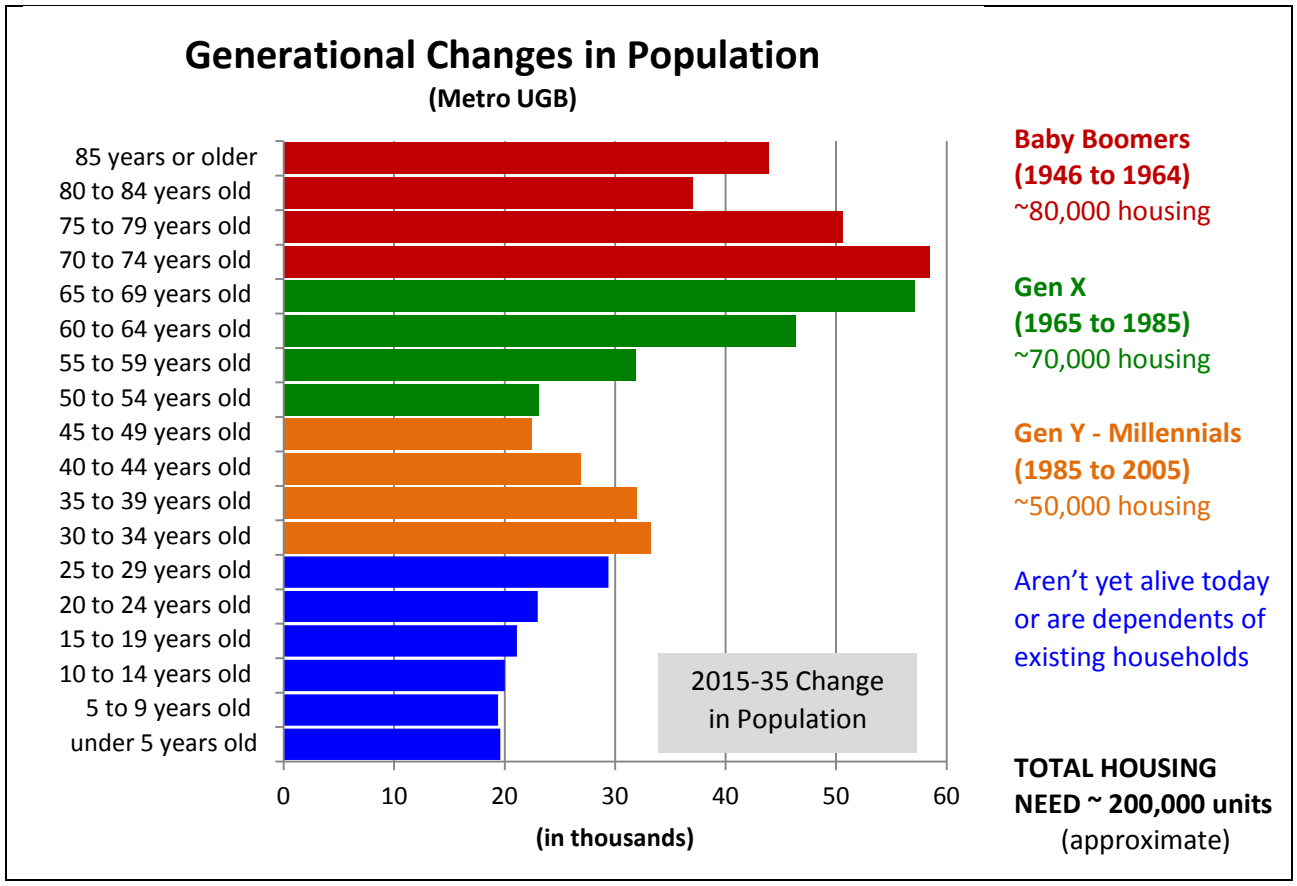


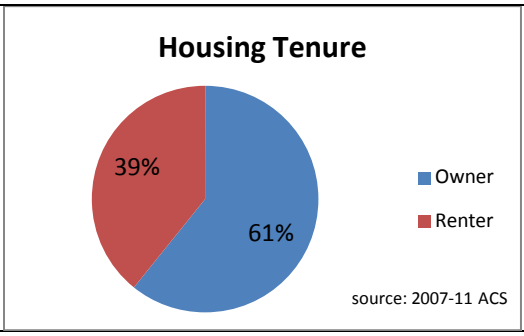
Figure 2: Groupings of age cohorts by Generation (approximate) – medium baseline scenario (scen #1462)

- *As Figure 2 illustrates, there will be more demand for housing by structure type (i.e., SF or MF) and tenure (i.e., own or rent) of all types for each generation in the future. The numbers going forward (2015 to 2035) indicate an approximate need for more housing units to accommodate the needs for the increase in baby boomers, Gen X, and Millennials.*
- *By 2035, the last of the baby boomers will all be of retirement age and the leading edge of the Gen X generation will also be entering retirement. Current Census information indicates homeownership remains fairly high and don't begin tapering off until residents reach age 85. Even at 85 years and older, the current cohort data show homeownership still above 50%. Baby boomers are said to be healthier than previous generations. With healthier lifestyles, it is conceivable (possible) that baby boomers and subsequent generations may age in place longer and maintain a higher ownership rate than current peers. This augurs for longer delays before senior householders choose to relinquish their single family home in favor of living in multifamily dwelling units or perhaps a group quarter living arrangement.*
- *There has been nascent talk that Millennials (or even the tailing end of Gen Xers) are changing their "preferences" for structure type and opting for life in apartments. However, it is still early in their life cycle with many of them delaying when they marry and have kids. Census data would suggest that once couples form families, their preferences switch dramatically in favor of "single family style" development forms[9].*

Steps 5 and 6 are detailed later in this report, beginning with 2010 Census data as a contextual backdrop to the housing need forecast.

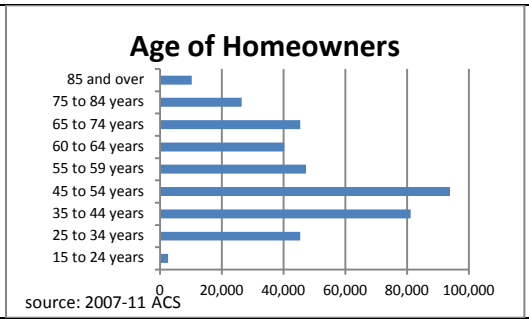
2010 Census of Population and Housing – the current housing story

(unless otherwise noted, data are for the three-county area)

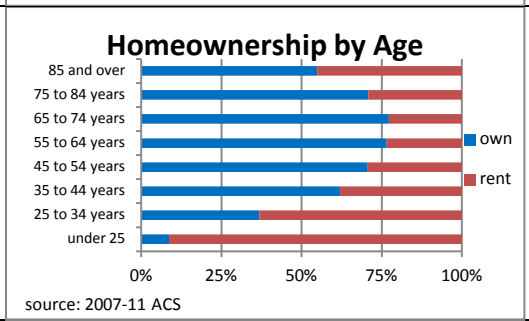
Tenure (own / rent) and Age	
• Homeowners held a 22 percentage point edge over the number of renters in the Tri-counties (Clackamas, Multnomah, and Washington). • 392,300 owners • 253,100 renters	

[9] Is it possible that single family development forms instead of developing horizontally as single family detached units or single family attached units as row houses but develop vertically as mid to high-rises apartments and condo units in more urban locations with 3 or more bedrooms to accommodate households with children? Presently, we see very little inventory and construction if any of the "vertical single family" development form.

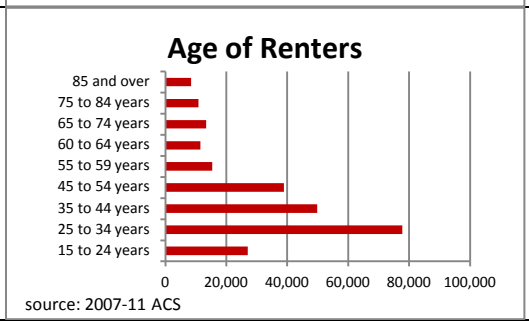
- Absolute number of home owners peaked at middle age (45 to 54 year)
- The drop in home ownership numbers in seniors came from a decline in the number of householders.
- Retirees (65 and over) who owned homes out-numbered renters 2 to 1



- Share of home ownership by age rose and peaked up to age 75 before edging lower.
- Ownership tapered slightly faster at 85 years and over (perhaps age becomes an issue in the upkeep and maintenance of owned homes).
- Ownership share in the oldest cohort was more than half (55 percent).

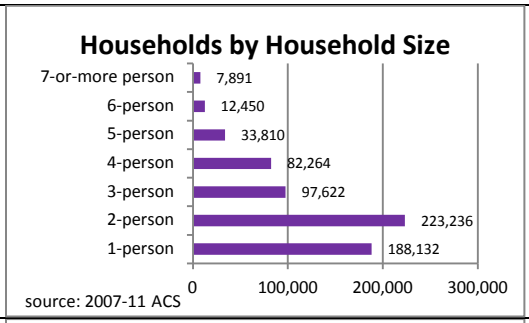


- Renters were more apt to be younger (under 35 years).
- The proportion of renters fell off with age, presumably when they were more likely to be married or starting families.

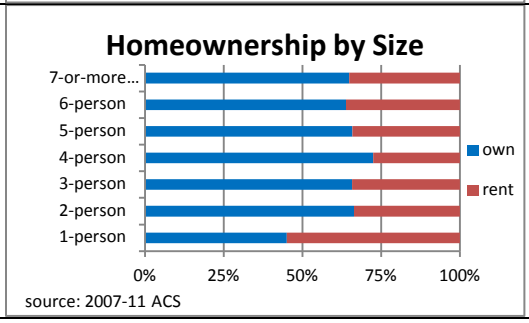


Tenure and household size

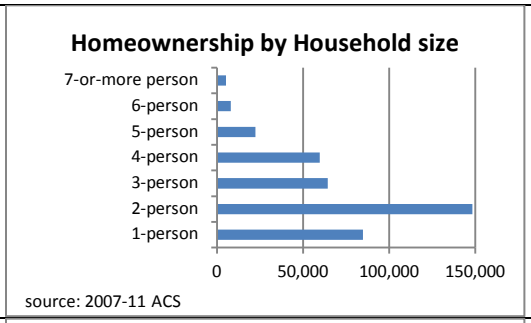
- 645,405 households in the 3-county area.
- 411,400 households were 1 or 2 person
- Household size was related to tenure choice.
- 45 percent of single-person households owned (55 percent rent).



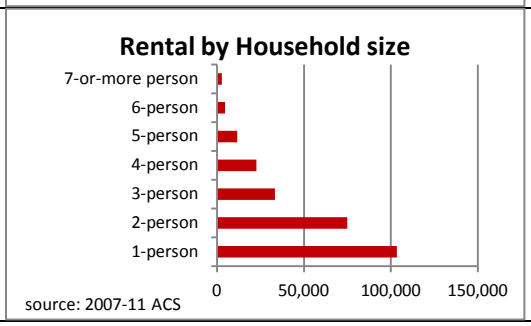
- Home ownership increased with larger households (up to 4-person households, 73 percent own)
- Households with 2 or more residents were more likely to own (about 66 percent).



- Majority of people who own homes lived in households with 2 or more people, although there were over 80,000 1-person households who owned their own home.

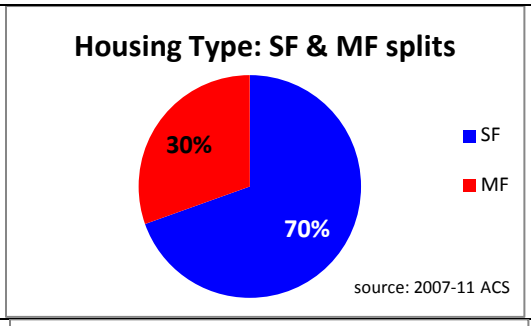


- Majority of renters were 1 or 2 person households.
- 75,000 households with 3 or more persons rented.

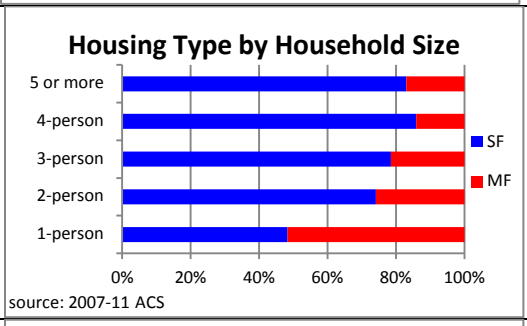


Housing Type: single family (SF) or multifamily (MF) and household size

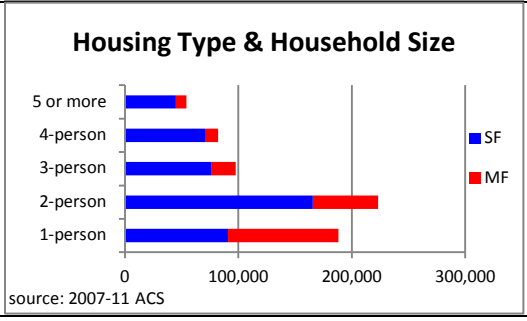
- 70 percent of households occupied a form of single family housing.
- Single family units are defined in these charts as: 1-unit detached or attached, and / or mobile, manufactured home



- Larger households were more likely to occupy single family housing.
- About half of the 1-person households occupied single family housing.

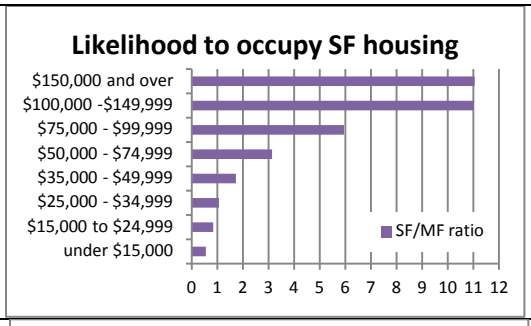


- This graph shows the relationship between household size and housing type for the 3-county area.



Housing Structure Type: single family (SF) or multifamily (MF) and household income bracket

- Households with higher incomes were more likely to live in a SF structure.
- Of the subset of low income bracket homeowners, some were headed up by retirees with fixed incomes.



- The chart (right) shows the distribution or proportion of housing type by household income bracket.
- Lower income household were more likely to occupy multifamily homes and higher income households were more likely to occupy single-family homes.

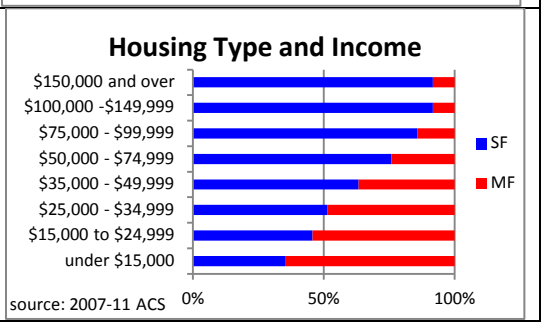


Table 2: 2010 Census, comparing household size, income, and age against demand by structure type and tenure relationships

RESIDENTIAL HOUSING BY SOCIOECONOMIC CLASS (source: Census 2010)

geography: Tri-county (Clackamas, Multnomah, Washington) 6/11/14
time span: 2010 data

		Household by size		Demand for: SF	MF	%SF	%MF	own	rent	%own	%rent
1 person	h1	29%	189,322	95,722	93,600	51%	49%	87,178	102,144	46%	54%
2 persons	h2	35%	225,656	169,783	55,872	75%	25%	153,365	72,291	68%	32%
3 persons	h3	15%	98,293	73,814	24,479	75%	25%	61,828	36,465	63%	37%
4 persons	h4	12%	77,962	64,847	13,115	83%	17%	54,713	23,249	70%	30%
5 or more persons	h5	8%	54,173	44,532	9,640	82%	18%	35,263	18,910	65%	35%
		100%	645,405	448,698	196,707	70%	30%	392,346	253,059	61%	39%

		HH by income bracket		Demand for: SF	MF	%SF	%MF	own	rent	%own	%rent
under $15,000	i1	13%	83,675	32,424	51,251	39%	61%	22,977	60,699	27%	73%
$15,000 to $24,999	i2	11%	70,983	35,184	35,798	50%	50%	27,055	43,928	38%	62%
$25,000 - $34,999	i3	11%	70,453	38,706	31,747	55%	45%	31,374	39,079	45%	55%
$35,000 - $49,999	i4	15%	97,762	64,976	32,786	66%	34%	54,569	43,193	56%	44%
$50,000 - $74,999	i5	19%	122,254	95,367	26,887	78%	22%	83,000	39,253	68%	32%
$75,000 - $99,999	i6	12%	78,025	68,211	9,813	87%	13%	62,688	15,337	80%	20%
$100,000 - $149,999	i7	12%	75,719	70,307	5,412	93%	7%	67,646	8,074	89%	11%
$150,000 and over	i8	7%	46,534	43,522	3,011	94%	6%	43,037	3,496	92%	8%
		100%	645,405	448,698	196,707	70%	30%	392,346	253,059	61%	39%

		HH by householder age		Demand for: SF	MF	%SF	%MF	own	rent	%own	%rent
under 25 years old	a1	5%	33,679	23,491	10,187	70%	30%	19,961	13,718	59%	41%
25 to 44 years old	a2	34%	217,562	151,567	65,995	70%	30%	131,488	86,074	60%	40%
45 to 54 years old	a3	21%	135,907	94,629	41,278	70%	30%	83,335	52,572	61%	39%
55 to 64 years old	a4	19%	121,777	84,411	37,366	69%	31%	74,303	47,474	61%	39%
65 years or older	a5	21%	136,480	94,599	41,881	69%	31%	83,258	53,222	61%	39%
		100%	645,405	448,698	196,707	70%	30%	392,346	253,059	61%	39%

source: U.S. Census and Metro Research Center

SF = 1 unit attached or detached, mfg. home

MF = multifamily unit, apartment or condo

Table 2 summarizes the residential conditions for the Portland tri-county area for year 2010 based on data from the U.S. Census. This table summarizes the 5x8x5 HIA matrix for year 2010.

- 70 percent of households occupied a 1-unit structure (i.e., a single family)
- 30 percent of households occupied a multifamily residence – includes attached units of 2 or more (i.e., multifamily, duplex, triplex and other plexes are included in this category)
- 61 percent of households owned their residence
- 39 percent of households rented their residence

The information in table 2 illustrates the historic relationship between household characteristics (household size, income bracket and age bracket) and housing characteristics (tenure and housing structure type (i.e., single family (SF) and multi-family(MF)). The projection for housing demand in the UGR does not use this Census information to forecast future housing demand. For that, MetroScope

data are used and are tabulated in the next section of this report. The next section includes marginal details of the 5x8x5 HIA matrix used in forecasting residential demand for single and multi-family.

UGR MetroScope scenario results

Data in this section are derived from a MetroScope scenario that is intended to illustrate how the population and employment growth forecast may play out with a continuation of currently adopted land use and transportation policies. These modeled data inform the UGR's assessment of future housing needs.

Figures 3 to 5 illustrate the household characteristics in year 2010, the change in characteristics between 2015 and 2035, and the projected outlook in 2035. The UGR residential need estimate is based on these changes in residential composition and projected shift in housing demand between 2015 and 2035 (figures shown are from the baseline medium growth scenario). It is clear that shifts in housing preference are in part predicated on projected demographic shifts and the economy. It is also apparent that state (Washington and Oregon), regional, and local land-use policies in effect today (and presumably in future years) such as zoning ordinances, the UGB and urban reserves will have a profound impact on regulating housing demand and residential location choice.

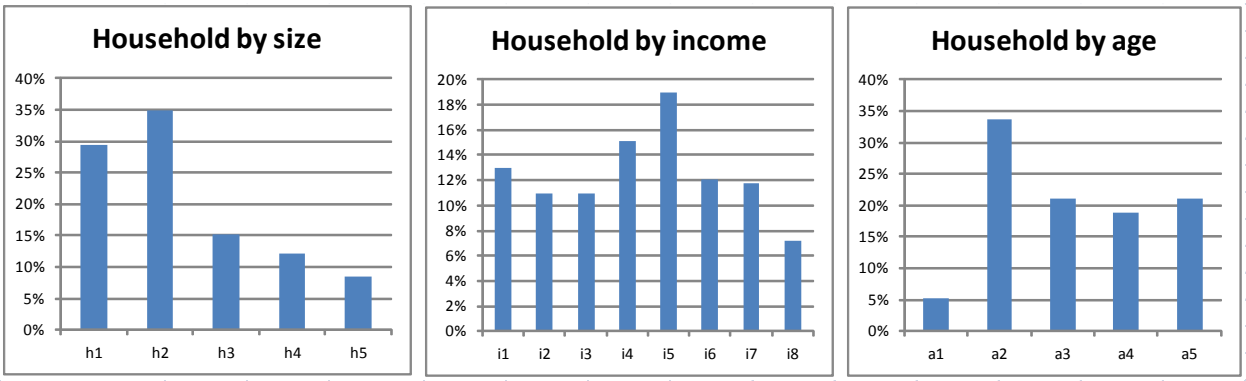


Figure 3: 2010 Household characteristics

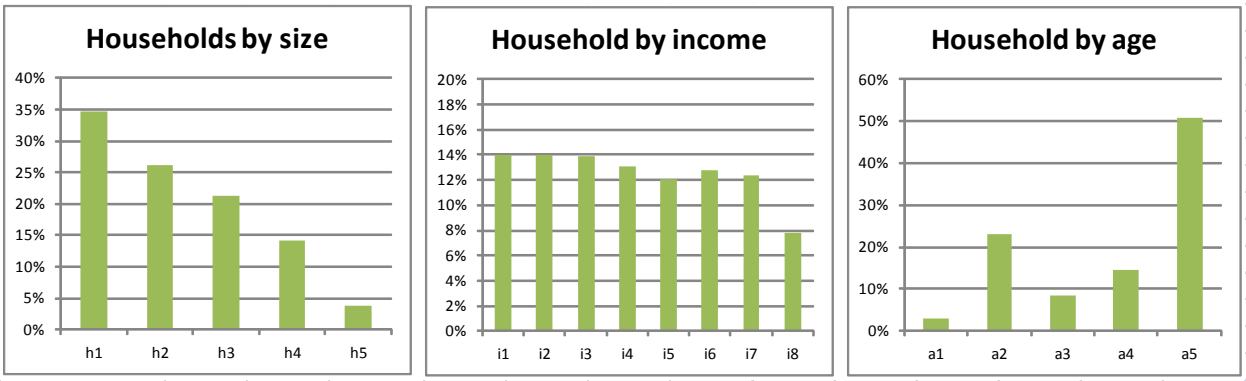


Figure 4: Change in Household characteristics (2015 to 2035) – baseline medium growth scenario

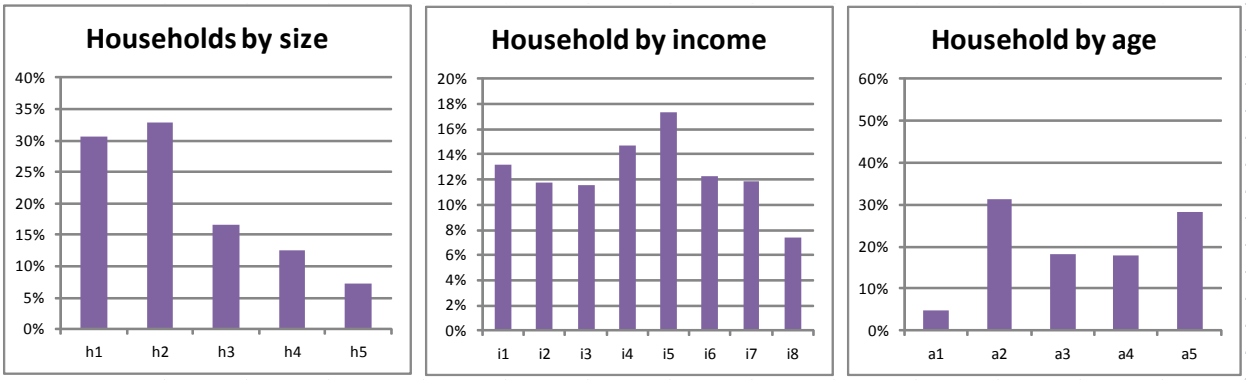


Figure 5: 2035 Household characteristics – baseline medium growth scenario

According to the baseline medium growth forecast scenario:

- 6 out of 10 net new households are expected to be 1 or 2 person. Figure 4 shows proportionally larger increases in 1 and 2 person households.
- Average household size in the Tri-county is expected to fall from 2.54 (in 2010) to 2.48 (in 2035); marginal household size projected to be 2.30.
- Partly due to the increase in numbers of 1-person households, there will be a larger share of lower income households at the margin – making up 42% of net new households, see Figure 4 income brackets i1, i2, and i3 which are households with under $35,000 .
- The lower to middle income category (i4 and i5 - $35,000 to $74,999) loses share between 2015 and 2035, particularly indicative of the on-going economic pressures on middle-income Americans, Figure 4.
- Largest increase in number of households by age will be seen in the retired cohort (65 years and older), Figure 4.

Table 3 summarizes the anticipated shift in demand for residential housing based on MetroScope Scen. #1462 results[10] (the baseline medium scenario). *The tables and figures shown derive from the baseline medium growth scenario, but the reader should be aware that the values in the HIA matrix shown in Table 3 will necessarily show a shift in housing demand between tenure and structure type between the low, medium and high growth scenarios. The resulting shift in housing demand preferences in the Metro UGB for 2015 to 2035 is in part due to the obvious difference in population growth rates in the low, medium and high. The change is not only in demand, but the response in the consumer supply for housing must shift between the low to medium to high scenarios to accommodate increased housing demand outlook. Because the housing supply is unevenly distributed among cities, structure types are also unequally allocated (as evidenced by the BLI estimates), transportation accessibility varies (street*

[10] The technical basis for the MetroScope scenario is outlined in Appendix 11. The appendix provides a basic overview of socio-economic, land use, real estate, transportation and policy/political assumptions. Although technical in nature, these specifications have the power to influence residential demand, the development form and composition of future housing (and employment) trends for cities and the region inside and outside the Metro UGB. The technical specifications reflect current policies

networks differ), real estate values and neighborhood quality measures are not the same across the region, redevelopment and public investments are more prevalent in some cities than others, this uneven distribution of housing supply attributes creates opportunities for competitive imbalances in residential absorption between scenarios. (Addendum to explain in few economic details for why supply and demand factors necessarily shift between scenario alternatives.)

Table 3: Baseline - medium growth scenario (MetroScope Scen #1462) – *REVISED*

RESIDENTIAL FORECAST PROJECTIONS BY SOCIOECONOMIC CLASS (MetroScope basis)

geography: Metro UGB
time span: 2015 to 2035
Scen #1462 **(medium)**

8/29/14

		Households by size		Demand for: SF	MF	%SF	%MF	own	rent	%own	%rent
1 person	h1	40%	78,593	13,077	65,516	17%	83%	38,419	40,174	49%	51%
2 persons	h2	28%	55,315	20,398	34,916	37%	63%	40,716	14,599	74%	26%
3 persons	h3	19%	37,126	22,855	14,270	62%	38%	27,166	9,960	73%	27%
4 persons	h4	11%	22,482	17,123	5,359	76%	24%	17,867	4,615	79%	21%
5 or more persons	h5	2%	3,884	3,471	413	89%	11%	3,756	128	97%	3%
		100%	197,400	76,926	120,474	39%	61%	127,923	69,477	65%	35%

		HH by income bracket		Demand for: SF	MF	%SF	%MF	own	rent	%own	%rent
under $15,000	i1	16%	30,797	5,423	25,374	18%	82%	10,301	20,496	33%	67%
$15,000 to $24,999	i2	15%	28,916	8,435	20,481	29%	71%	14,947	13,969	52%	48%
$25,000 - $34,999	i3	14%	28,297	9,288	19,009	33%	67%	16,300	11,997	58%	42%
$35,000 - $49,999	i4	14%	26,887	9,444	17,443	35%	65%	18,151	8,736	68%	32%
$50,000 - $74,999	i5	12%	23,696	9,045	14,650	38%	62%	18,209	5,487	77%	23%
$75,000 - $99,999	i6	12%	22,975	12,067	10,909	53%	47%	17,798	5,178	77%	23%
$100,000 - $149,999	i7	11%	21,371	12,486	8,885	58%	42%	18,168	3,203	85%	15%
$150,000 and over	i8	7%	14,461	10,738	3,723	74%	26%	14,050	411	97%	3%
		100%	197,400	76,926	120,474	39%	61%	127,923	69,477	65%	35%

		HH by householder age		Demand for: SF	MF	%SF	%MF	own	rent	%own	%rent
under 25 years old	a1	4%	7,159	256	6,903	4%	96%	616	6,543	9%	91%
25 to 44 years old	a2	24%	48,049	11,876	36,173	25%	75%	20,714	27,334	43%	57%
45 to 54 years old	a3	8%	15,827	3,206	12,621	20%	80%	10,382	5,445	66%	34%
55 to 64 years old	a4	14%	27,901	10,635	17,266	38%	62%	20,716	7,185	74%	26%
65 years or older	a5	50%	98,464	50,953	47,511	52%	48%	75,495	22,968	77%	23%
		100%	197,400	76,926	120,474	39%	61%	127,923	69,477	65%	35%

source: Metro Research Center SF = 1 unit attached or detached, mobile home MF = multifamily unit, apartment or condo

6

For brevity, the HIA matrices for the high and low growth scenarios are not reported. However, it should be noted that the summary tables for the high and low growth differ from this medium baseline table on tenure and structure type preferences. Under the high growth scenario, the SF/MF ratio is 38 percent / 62 percent and the aggregate tenure is unchanged, and we see small variations in individual household size, income bracket and age. Under the low growth scenario, the SF/MF ratio is 42 percent / 58 percent and unchanged in aggregate for tenure, with subtle variations in the details.

Table 4: Baseline - medium growth scenario

Residential Demand by Value Class

5/19/2014

MetroScope UGR Scenario #1462 Results

2015

UGB 2015

Value Class	Total Residential Demand (units)				Residential Prices		Est. Monthly Rent	
	Owner Single Family	Owner Multi-family	Renter Single Family	Renter Multi-family	Owner Single Family	Owner Multi-family	Rental Single Family	Rental Multi-family
1	32,134	3,981	2,304	17,174	$ 85,062	$ 82,228	$ 594	$ 341
2	34,995	2,971	9,215	32,778	120,071	116,423	790	384
3	41,831	3,116	6,715	28,651	146,220	146,930	969	449
4	41,709	1,910	8,045	26,407	174,310	166,718	1,136	502
5	45,403	2,308	5,827	21,694	211,744	203,193	1,314	570
6	46,250	1,771	9,891	26,187	240,862	228,855	1,505	647
7	43,644	1,112	10,938	24,263	308,826	278,718	1,814	763
8	45,834	1,104	14,451	18,389	485,427	434,509	3,168	1,167
	331,800	18,273	67,386	195,543				
	54%	3%	11%	32%				

2035

UGB 2035

Value Class	Total Residential Demand (units)				Residential Prices		Est. Monthly Rent	
	Owner Single Family	Owner Multi-family	Renter Single Family	Renter Multi-family	Owner Single Family	Owner Multi-family	Rental Single Family	Rental Multi-family
1	36,699	14,726	2,454	27,487	$ 126,987	$ 105,755	$ 764	$ 467
2	44,988	15,488	8,464	40,720	182,219	162,159	956	522
3	46,189	11,101	5,430	36,715	225,363	210,320	1,113	591
4	55,806	10,406	7,340	37,894	268,789	245,241	1,338	678
5	53,118	8,079	7,735	34,186	321,264	297,240	1,587	774
6	59,070	6,749	9,220	32,249	368,411	344,918	1,892	895
7	53,702	3,203	10,059	29,589	454,937	429,537	2,309	1,065
8	59,853	3,940	16,393	31,048	734,872	699,781	4,091	1,636
	409,425	73,692	67,095	269,888				
	50%	9%	8%	33%				

Note: "value class" refers to the aggregation of household characteristics attributed by household size, income, and age of householder (i.e., HIA) into eight household types as shown in Table 4.

The MetroScope scenario model uses 400 types of households[11] that are determined by household size, income, household age and whether children are present. To make analysis and presentation feasible,

[11] Household refers to the residents, not the residence. Although when we forecast which households demand which type of housing and tenure, the unit of measure switches to housing units. The difference between households and housing units is defined by an occupancy factor.

the 400 types have been simplified to eight household types (described as "value class" in some tables in this report). The value classes roughly correspond to income bracket, but are not precise because the classes also consider the impact that household size and age may have on residential preferences. These eight value classes thus correspond to household types and are ranked roughly commensurate with income generally increasing from value class one to value class eight. (see Table 4)

- The market share for owner single family (OSF) is expected to fall to 50 percent in 2035, from 54 percent in 2015. In total, the SF market share (own + rent) is 65 percent (54 percent OSF + 11 percent RSF) in 2015 and 58 percent (50 percent OSF + 8 percent RSF) in 2035, a 7 percent drop in market share expected between 2015 and 2035. (In 2010, the Census estimated the SF market share to be about 70 percent).
- Change in product type mix (2015 to 2035) is nearly equally divided by owner single family (37 percent) and renter multi-family (36 percent).

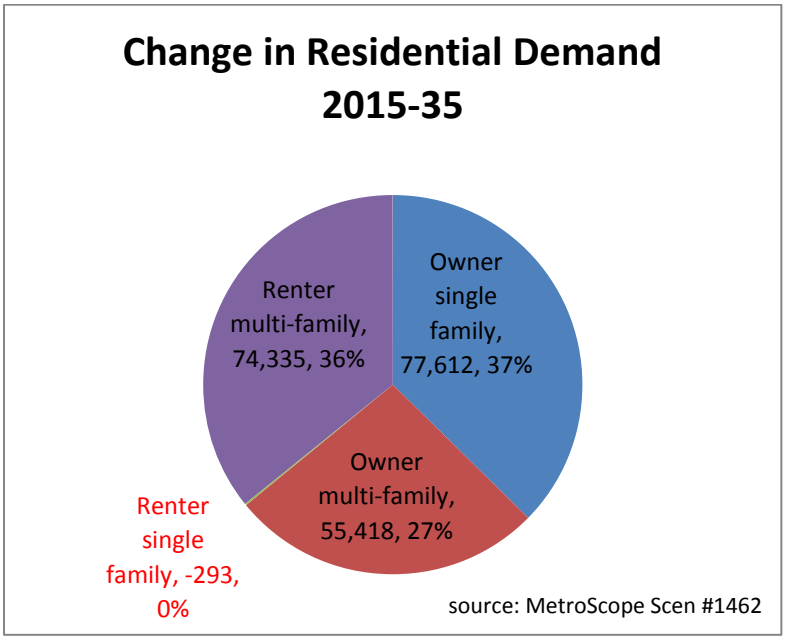


Figure 6: change in residential demand by type and tenure in the Metro UGB (2015-2035) - *REVISED*

- Remaining market share of owner multifamily is expected to be driven by a 3 fold increase of condos between 2015 and 2035. This marks a significant change in consumer product demand.
- Tenure rates (i.e., ownership) are about the same in 2015 (57 percent) and 2035 (59 percent).
- The renter multifamily market (i.e., apartments for rent) is expected to edge up to 33 percent of the market from 32 percent.
- There is little change expected in the renter single family market between 2015 and 2035 as evidenced in the 0 percent change shown in Figure 6.

Residential buildable land inventory capacity

The buildable land inventory includes capacity for about 390,000 dwelling units. Additional detail about the inventory can be found in Appendix 3. This estimate is less than what would be allowable under adopted local zoning codes since not all developed land will redevelop to its fully allowed extent in the next 20 years. Likewise, as described later in this report, not all the buildable land inventory is counted for this analysis.

30 percent of the buildable land inventory's capacity is for single family (SF) homes, of which there are about 118,000 units. SF capacity is defined to include single family detached units, single family attached units (e.g., duplexes, triplexes, row houses and townhomes), manufactured home capacity or any other unit type that may be considered as a standalone 1-unit structure.

About 70 percent of the UGB's residential buildable land inventory capacity is for multifamily residences. Multifamily (MF) capacity includes apartments and condominium units. Typically, this capacity is counted in multifamily residential (MFR) districts or mixed use residential / commercial (MUR) districts. Capacity for nearly 274,000 MF dwelling units is estimated in this prospective buildable land inventory.

Addendum (September 2014):

The initial capacity estimated for the urban reserves added to the Metro UGB by HB 4078 (2013) near the city of Forest Grove is denoted in Table 5.

	Single Family (SFR5 Units)	Multi-Family (MUR2 Units)	Single Family Capacity (Acres)	Multi-Family Capacity (Acres)	Commercial (Acres)	Industrial (Acres)	Total (Acres)
Forest Grove – N	570	572	91.7	31.4	7.9	0.0	131.0
Forest Grove - S	107	108	17.2	5.9	1.5	0.0	24.6
Total:	677	680	118.9	37.3	9.4	0.0	155.6

Table 5: Preliminary estimates of residential and non-residential capacity for urban reserves added near Forest Grove by HB 4078 (source: 2014 BLI)

Additional comprehensive planning information and revisions given by the city of Forest Grove to Metro, the designated residential and commercial capacity estimates are now all moved into industrial. The net is a loss of 677 SF and 680 MF units from the BLI and 9.4 acres of neighborhood commercial that had been programmed into these two urban reserve locations. There is a net gain of 155.6 acres of adjusted industrial land for the BLI. These adjustments are summarized into the various UGR appendices.

Table 6: 2014 Buildable Land Inventory by Regionalized Zone Class Designations - ***REVISED***

Current Dwelling Unit Capacity
(as of September 2014)

	Redevelopment	Vacant	Total
SFR1	595	1,718	2,313
SFR2	636	1,938	2,574
SFR3	4,158	4,984	9,142
SFR4	1,096	1,577	2,673
SFR5	11,183	8,904	20,087
SFR6	11,183	6,046	17,229
SFR7	12,632	11,079	23,711
SFR8	9,332	5,625	14,957
SFR9	4,373	1,724	6,097
SFR10	2,772	1,703	4,475
SFR11	0	0	0
SFR12	2,655	975	3,630
SFR13	0	0	0
SFR14	4,791	509	5,300
SFR15	4,704	1,131	5,835
SFR16	0	0	0
MFR1	3,010	1,485	4,495
MFR2	8,234	2,314	10,548
MFR3	9,915	4,569	14,484
MFR4	2,802	584	3,386
MFR5	31,873	2,140	34,013
MFR6	0	0	0
MFR7	27,833	2,383	30,216
MUR1	2,458	2,329	4,787
MUR2	479	985	1,464
MUR3	1,583	1,874	3,457
MUR4	3,170	704	3,874
MUR5	4,164	2,451	6,615
MUR6	2,838	2,886	5,724
MUR7	2,871	978	3,849
MUR8	3,446	663	4,109
MUR9	94,834	4,898	99,732
MUR10	33,618	8,934	42,552
UGB total	**303,238**	**88,090**	**391,328**

	Redev	Vacant	Total
SFR	70,110	47,913	118,023
MFR	83,667	13,475	97,142
MUR	149,461	26,702	176,163
	303,238	**88,090**	**391,328**

Glossary of Regionalized Zone Class Designations

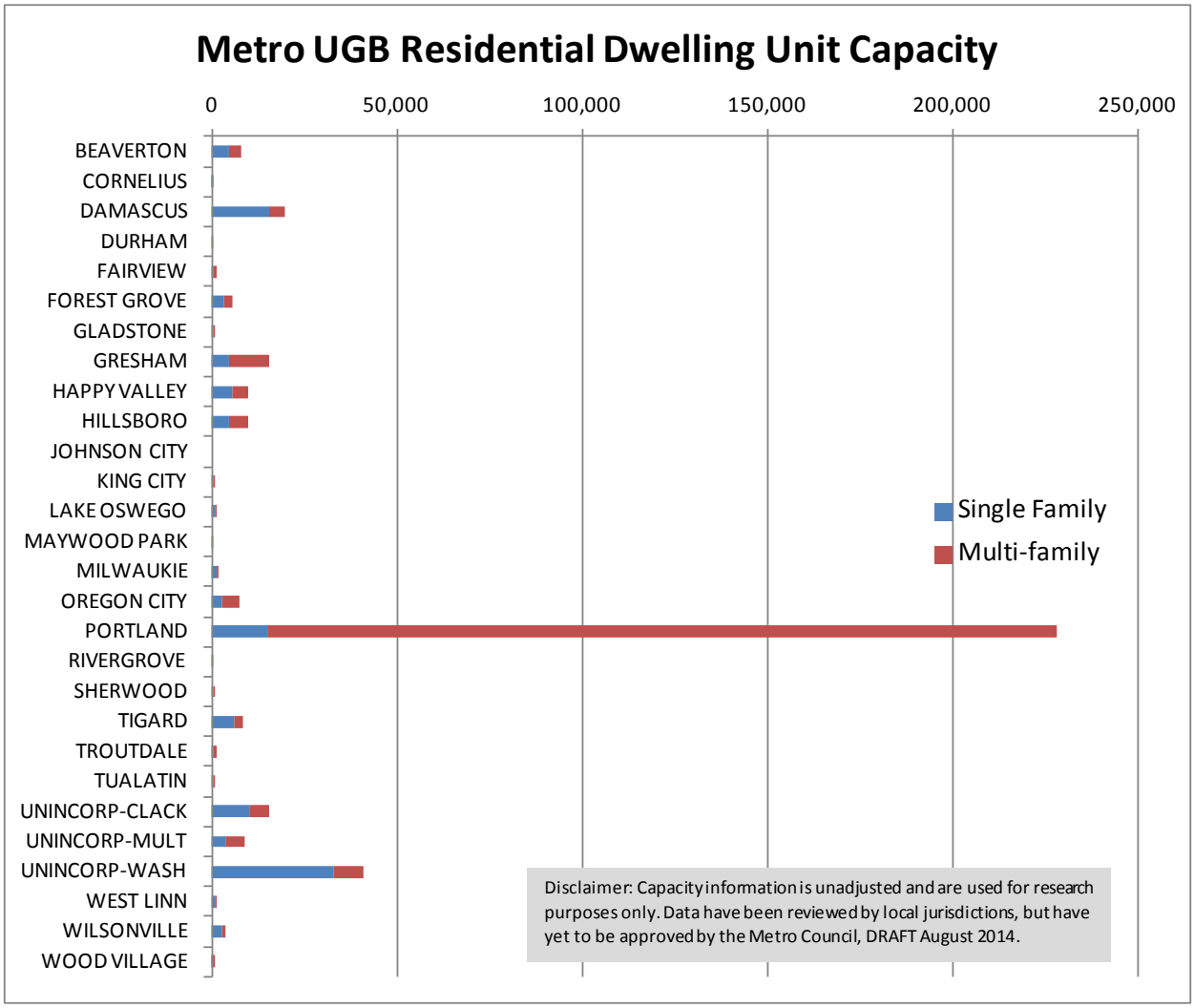
Single Family Residential Zone Classes (SFR)
SFR# where # = specified units per net acre

Multi-family Residential Zone Classes (MFR):
MFR1: 4 to 15 units per net acre
MFR2: 16 to 20
MFR3: 21 to 25
MFR4: 26 to 30
MFR5: 31 to 35
MFR6: 36 to 45
MFR7: 46 to 85

Mixed Use Residential Zone Classes (MUR):
MUR1: 4 to 15 units per net acre
MUR2: 16 to 20
MUR3: 21 to 25
MUR4: 26 to 30
MUR5: 31 to 35
MUR6: 36 to 45
MUR7: 46 to 65
MUR8: 66 to 100
MUR9: 101 to 125
MUR10: 126 to 700

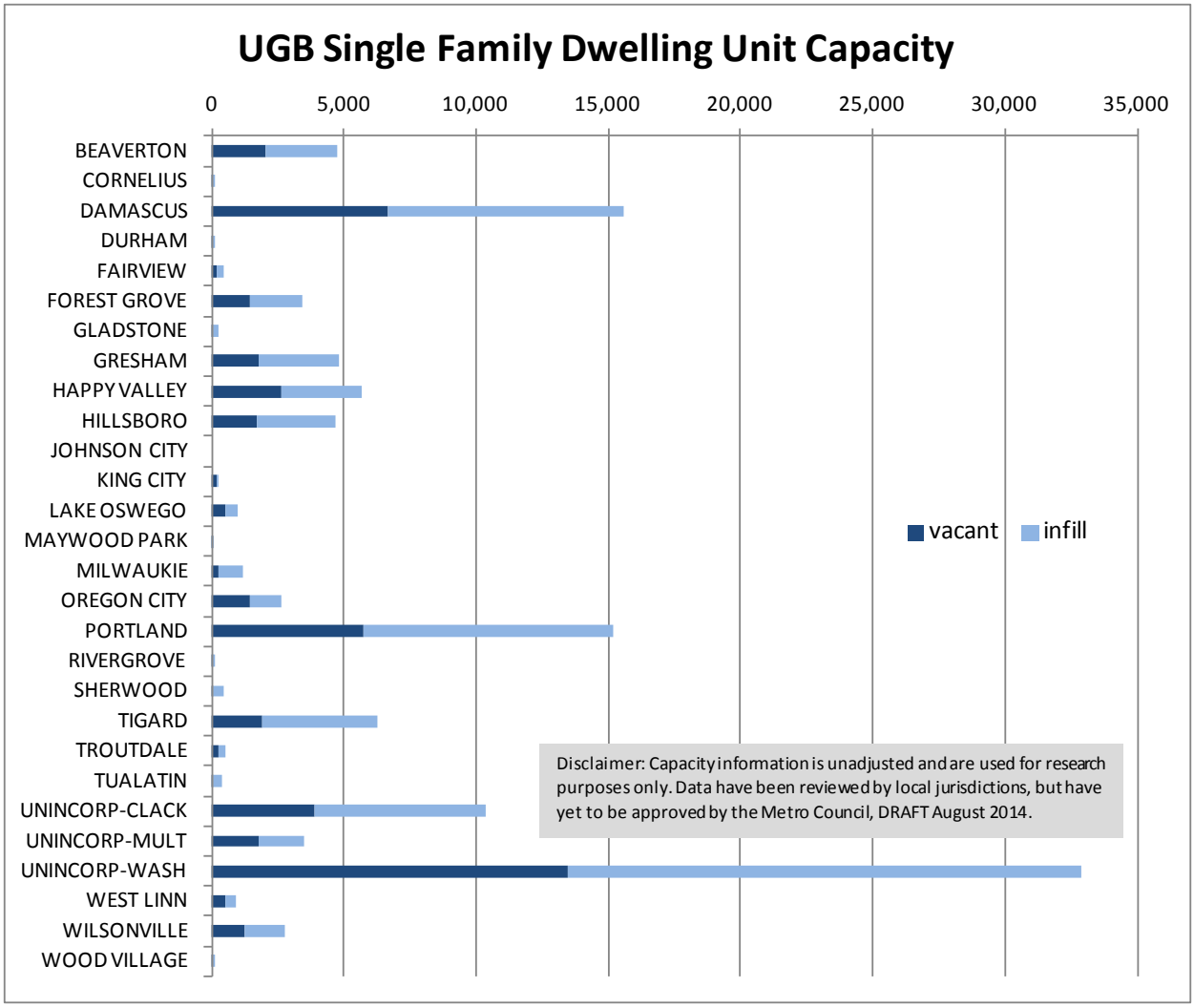
Table 6 enumerates the distribution of residential capacity by generalized regional zone classes in the Metro UGB. The majority of the region's potentially developable supply of housing is found in single family infill (18 percent) and multifamily redevelopment (60 percent). For reasons described later in this report, not all the infill and redevelopment inventory is counted in this UGR analysis. The rest is vacant capacity, which is all counted in the UGR analysis. Figure 7 illustrates the buildable land inventory capacity by jurisdiction for single family and multifamily housing. Figure 8 and Figure 9, respectively, illustrate the single family and multifamily capacity broken out by infill and vacant for each local jurisdiction.

Figure 7: 2014 Residential Buildable Land Inventory (prospective) by jurisdiction - *REVISED*



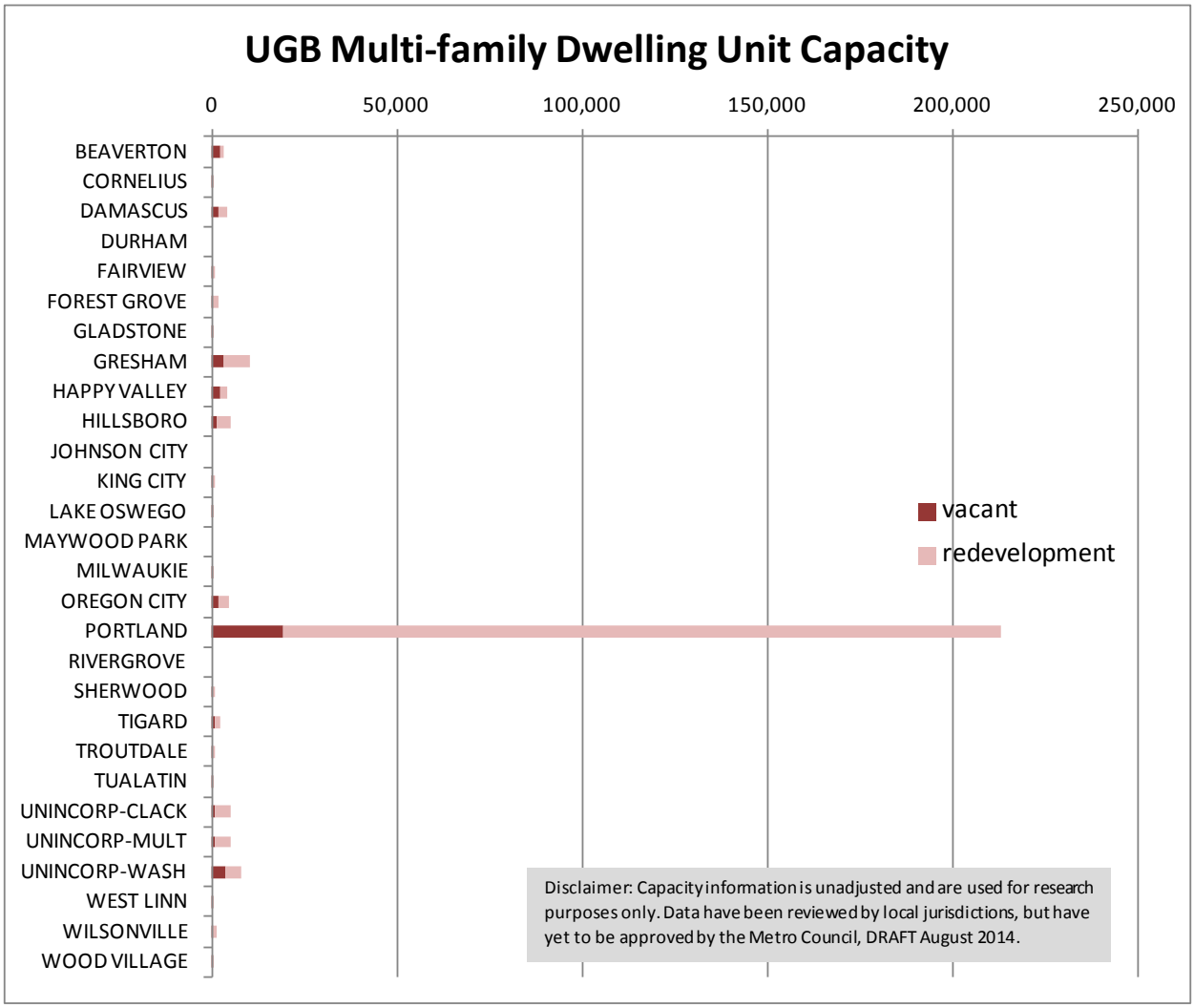
The figures include all vacant capacity and all prospective single family infill and multi-family redevelopment capacity. As noted elsewhere, all vacant capacity are used in the UGR net need computation, while about half (less than) of the prospective multi-family redevelopment capacity is counted in the UGR net need computation. The capacity is deemed prospective because we do not fully count all redevelopment or infill unless growth projections indicate there is sufficient demand for the potential to be realized. The amount realized varies according to the amount of residential demand per scenario.

Figure 8: Prospective Single-family dwelling unit capacity included in buildable land inventory by jurisdiction - *REVISED*



Note: axis dimensions changed

Figure 9: Prospective Multifamily dwelling unit capacity included in buildable land inventory by jurisdiction - ***REVISED***



Note: axis dimensions changed

Market feasibility of the buildable land inventory

This analysis begins with the premise that not all the region's buildable land inventory is likely to be market feasible in the 20-year timeframe. Some reasons for this include:

- Land assembly challenges
- Infrastructure deficiencies
- Annexation challenges
- Financial feasibility of infill and redevelopment:
    - The buildable land inventory identifies possible candidates for redevelopment and infill

- Though without the necessary and sufficient demand prospective redevelopment and infill don't happen, thus not all redevelopment and infill candidates will actually develop in the next 20 years
- Not all sites that do redevelop will redevelop to the maximum density allowed under current zoning, so some loss in efficiency is likely

Addendum:

The list represents a few items that could foretell difficulty in absorbing the vacant, infill and redevelopment capacity identified in the buildable land inventory. Land assembly challenges suggest that a relative scarcity of larger to mid-size parcels may be a barrier to development at expected densities in the future. Moreover, a collection of smaller tax lots (and not necessarily contiguous) is not necessarily the same as one larger tax lot(s) because of economies of scale. In economic terms, economies of scale accrue cost advantages to firms or organizations due to size, output or scale of operation, with cost per unit of output generally decreasing with increasing scale and efficiency because fixed costs can be spread out over more housing units. In terms of residential development, smaller tax lots and parcels may not "pencil out" due to higher cost of construction per housing unit because of lower operational efficiencies because of small area, infill lots or physical encumbrances around redevelopment near existing improvements.

Infrastructure deficiencies and financial feasibility concerns are immediate barriers to future development of "greenfields", but may also be an impediment to redevelopment and infill. If the existing infrastructure (e.g., water, sewer, roads, gas lines, etc.) cannot adequately provide the necessary level of service to accommodate increased density levels, this may be a barrier. In unsettled new urban areas, if residents have no access to roads, utilities, and other infrastructure amenities are nonexistent, any prospective notions of future capacity are unrealizable.

The lack of financial feasibility has been a growing issue for municipal organizations going forward as federal funding for roads, sewer and water works has been sharply scaled back in recent decades. Municipalities and utility districts generally have capital improvement programs, but these generally fall short for funding the infrastructure needed to open up prospective urban reserves.

Annexation challenges and other political barriers pose possible obstacles to developing out the capacity estimated in the prospective buildable land inventory. Because annexations have a significant impact on the rights of individual landowners, developers, and city residents, many conflicts may arise to oppose or support adding rural lands to city limits. Voter approved annexation further deepens the potential challenges to city annexations. According to the League of Oregon Cities, the following cities in the Metro UGB require voter approval for annexation: King City, Lake Oswego, Oregon City, Sherwood and West Linn (source: http://www.orcities.org/Portals/17/A-Z/VoterAnnexation09132013.pdf). *City annexations make available urban services such as sewer, water, and mass transit and make possible urban level development to occur. Challenges to city annexation thus may make governance and provision of urban services prohibitive to future land development at expected densities.*

Given the prospective buildable land inventory, this housing needs analysis estimates how much of this inventory is likely to be market feasible supply between 2015 and 2035. Following the advice of Metro's public and private sector technical advisory group, MetroScope, an integrated land use and transportation model was used to make those estimates. A detailed description of the inputs used for this modeling can be found in Appendix 11. To add perspective on possible rates of market absorption of the inventory, the following section extrapolates a variety of historic absorption alternatives.

Testing the reasonableness of the potential supply: a comparison with hypothetical growth trends

How long could the residential buildable land inventory in the current Metro UGB last (without additional replenishment) given different hypothetical absorption rate (i.e., consumption) assumptions?

To provide some comparison with modeled results, this analysis examines how long the buildable land inventory might last with a variety of absorption alternatives based on history, ranging from the extreme (historical high and low growth scenarios that perpetuate for years) to more typical annual development rates for both single and multifamily structure types for a 20 year span. The range of historical data is from annual permits of single (SF) and multifamily (MF) from 1960 to 2012. The absorption rate is carried out for 20 years in a row to see how many years it would take to exhaust the inventory. These are intended as hypothetical illustrations.

Growth scenario alternatives considered:

- Development rate at the historical minimum
    - Historical minimum for SF = 2,300 units (in 1982 – a recession year)
    - Historical minimum for MF = 793 units (in 1983 – a recession year)
- Development rate at historical maximum
    - Historical maximum for SF = 12,348 units (in 1977)
    - Historical maximum for MF = 9,949 units (in 1972)
- Decade by decade average annual absorption rate
    - Historical Highs (9,582; 1990's decade) and lows (3,311; 2010-12) for SF
    - Historical Highs (6,285; 1970's decade) and lows (2,141; 2010-12) for MF
- Average annual absorption rate for recession and non-recession years between 1960 to 2012
    - SF: development rate of recession years = 4,741 per year average
    - SF: development rate of non-recession years = 7,836 per year average
    - MF: development rate of recession years = 2,265 per year average
    - MF: development rate of non-recession years = 5,080 per year average
- 1960 to 2012 absorption average over all years
    - SF = 6,960 average per year
    - MF = 4,283 average per year
- UGR (MetroScope scenario) average annual absorption
- Census (HIA based) average annual absorption

Hypothetical absorption rate findings are shown in Table 7.

- The UGR MetroScope scenario estimates current supply of SF capacity could last up to 24 years, which by comparison is most similar to the SF recession scenario at 25 years.
- The Census-based scenario estimates current supply lasting up to 19 years for single family, which, by comparison, is most similar to the average absorption rate over the last 50+ years. (Not a surprising conclusion since the Census scenario is a cumulative sum total of all development in the region for all time and the last 50 years scenario is essentially the half-life for the modern era of this region.)
- By all accounts, there is more than a 20 year inventory of multifamily product for all the scenarios considered based on the prospective supply given for the UGB.

Table 7: hypothetical absorption scenarios for residential buildable land inventory inside the current UGB

Current estimate of Metro UGB SF capacity (SUPPLY):	**119,100 units**
Hypothetical - Years Available if SUPPLY is consumed at a rate of *X thousand* per year:	
(hypothetical annual consumption rates)	
historical minimum (2,300 in a year)	52 years
historical maximum (12,300 in a year)	10 years
decade average low (3,300 average)	36 years
decade average high (9,600 average)	12 years
recession years average (4,700 per year)	25 years
non-recession years average (7,200 per year)	15 years
1960 to 2012 average (7,000 per year)	17 years
+/- 1 std. dev.	+/- 5 years
MetroScope annual average absorption (5,000 per year)	24 years
Census (HIA) annual average preference rate (6,400 per year	19 years
Current estimate Metro UGB MF capacity (SUPPLY):	**280,602 unadjusted units**
Hypothetical - Years Available if MF SUPPLY is consumed at a rate of *X thousand* per year:	
(hypothetical annual consumption rates)	
historical minimum (800 in a year)	354 years
historical maximum (10,000 in a year)	28 years
decade average low (2,100 average)	131 years
decade average high (6,300 average)	45 years
recession years average (2,200 per year)	124 years
non-recession years average (5,100 per year)	55 years
1960 to 2012 average (4,300 per year)	**66 years**
+/- 1 std. dev.	+/- 22 years
MetroScope annual average absorption (4,500 per year)	26 years
Census (HIA) annual average preference rate (3,100 per year	38 years

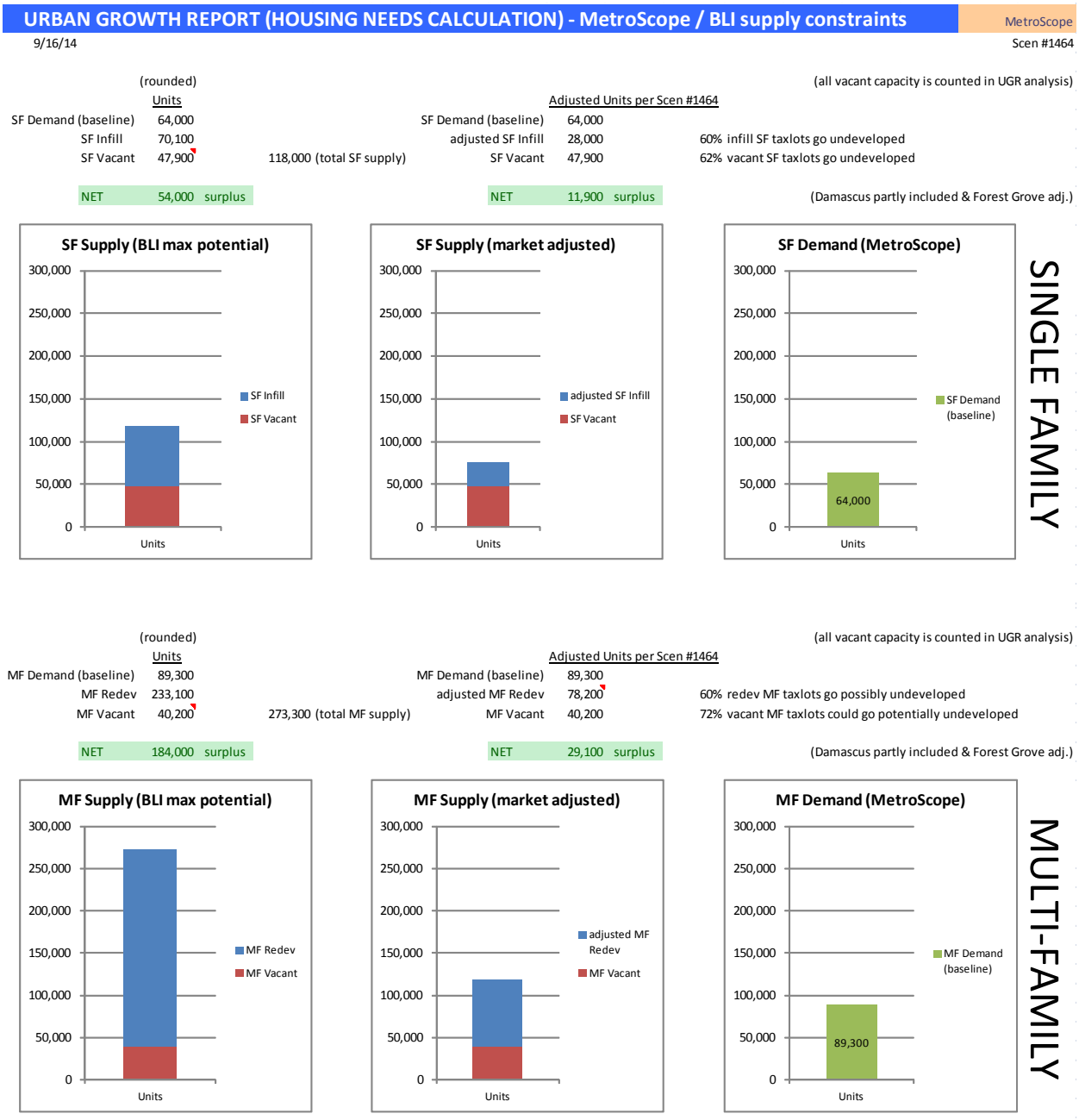
Modeled market absorption of the buildable land inventory

For the following assessments, modeled absorption data (MetroScope scenario) are used (not Census nor historic data). In Figures 10, 11 and 12, "adjusted" supply refers to the amount of the buildable land inventory that gets absorbed in the modeled growth scenario. It is this amount that is being counted as capacity in the Urban Growth Report. Different demand assumptions (from the range forecast) result in different amounts of redevelopment and infill supply in each scenario.

Low growth scenario summary of housing capacity needs

At the low end of the range forecast for accommodating household growth, there is no need for additional growth capacity for multifamily or single-family housing. Detail is provided in Figure 10.

Figure 10: summary of single family and multifamily housing capacity, demand, and need under the low growth scenario (Metro UGB, 2015-2035) - *REVISED*



Addendum (Aug. 2014): adjusted prospective inventory for Forest Grove – switch residential capacity to industrial; corrected HIA housing matrix – switch HIA matrix from 7 county to Metro UGB

Baseline (medium growth scenario) summary of housing capacity needs

At the midpoint of the range forecast for household growth, there is no need for additional growth capacity for either single family or multifamily housing. Detail is provided in Figure 11.

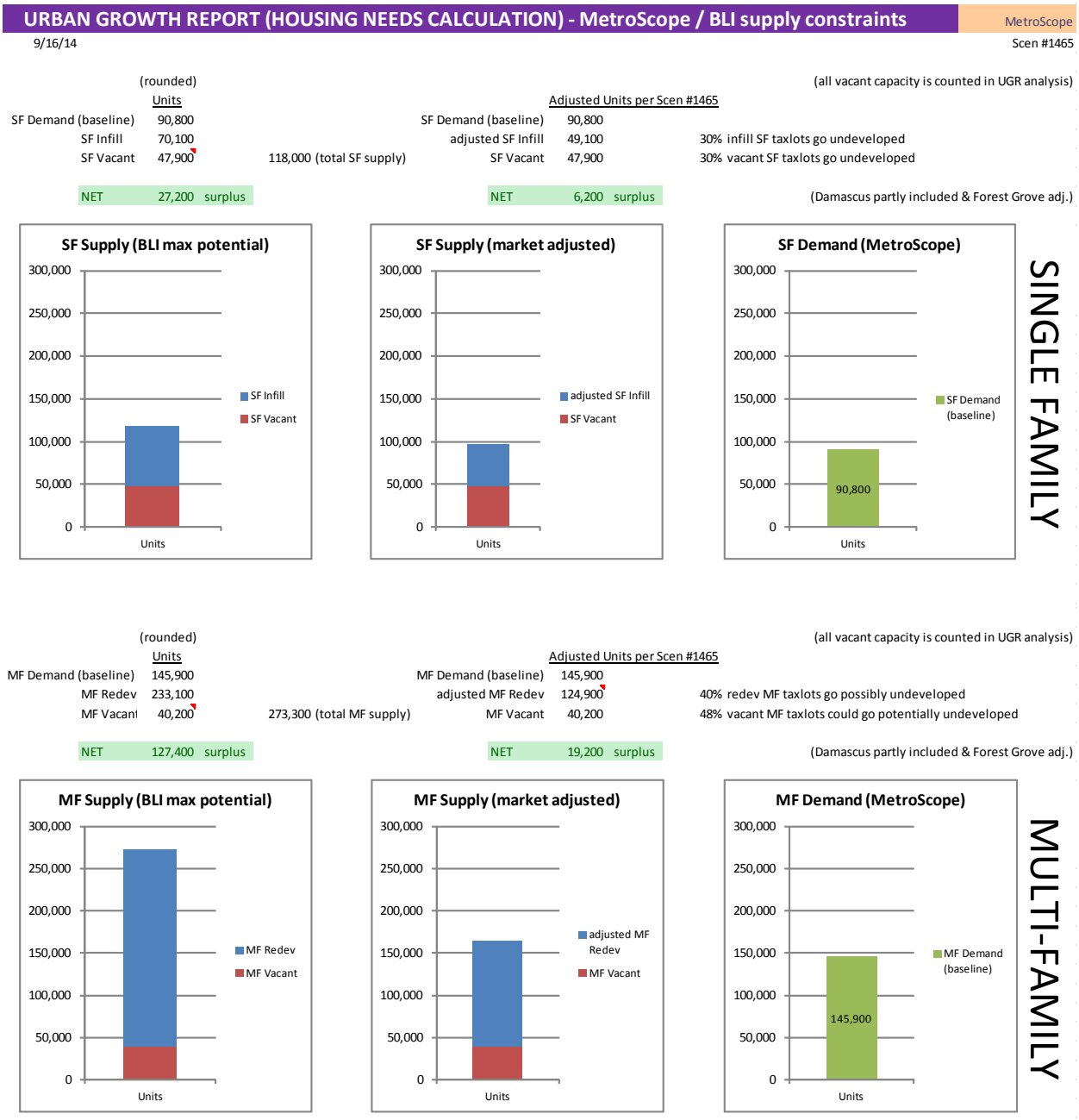
Figure 11: summary of single family and multifamily housing capacity, demand, and need under the baseline (medium) growth scenario (Metro UGB, 2015-2035) - *REVISED*

Addendum (Aug. 2014): adjusted prospective inventory for Forest Grove – switch residential capacity to industrial; corrected HIA housing matrix – switch HIA matrix from 7 county to Metro UGB

High growth scenario summary of housing capacity needs

At the high end of the range forecast for household growth, there is no need for additional growth capacity for either single family or multifamily housing. Detail is provided in Figure 12.

Figure 12: summary of single family and multifamily housing capacity, demand, and need under the high growth scenario (Metro UGB, 2015-2035) - *REVISED*



Addendum (Aug. 2014): adjusted prospective inventory for Forest Grove – switch residential capacity to industrial; corrected HIA housing matrix – switch HIA matrix from 7 county to Metro UGB

Summary of housing capacity needs

Table 8 and Table 9 summarize residential capacity needs for the low, medium and high growth scenarios. At the low end of the forecast range and at the midpoint of the forecast range, there is no regional need for additional single-family or multifamily housing capacity. At the high end of the forecast range, there is a regional need for additional single-family housing capacity, but not multifamily.

Addendum (Aug. 2014): Tables 8 and 9 summarize (and include corrections to) the market supply and demand estimates. A correction was made to the HIA housing demand matrix and a change to unincorporated Washington supply because of HB 4078 and Forest Grove. This overall results in less demand for SF units and more demand for MF units.

Table 8: Metro UGB single-family residential needs 2015 to 2035 expressed in dwelling units - *REVISED*

	Single-family dwelling units			
	Buildable land inventory	**Market-adjusted supply**	**Demand**	**Surplus or need**
Low growth forecast	118,000*	75,900	64,000	+11,900
Middle (baseline) growth forecast		90,000	76,900	+13,100
High growth forecast		97,000	90,800	+6,200

**Forest Grove adjustment – residential to industrial change per HB 4078 – reduces SF capacity by 700 units*

Table 9: Metro UGB multifamily residential needs 2015 to 2035 expressed in dwelling units - *REVISED*

	Multifamily dwelling units			
	Buildable land inventory	**Market-adjusted supply**	**Demand**	**Surplus or need**
Low growth forecast	273,300**	118,400	89,300	+29,100
Middle (baseline) growth forecast		130,100	120,500	+9,600
High growth forecast		165,100	145,900	+19,200

***Forest Grove adjustment – residential to industrial change per HB 4078 – reduces MF capacity by 700 units*

Additional analysis details from MetroScope scenarios

Three (3) MetroScope-Urban Growth Report Scenarios were prepared for the 2014 Urban Growth Report. The 3 scenarios included were derived from the "high", "medium or baseline", and "low" growth population and employment projections[12]. The following section provides additional details about those scenarios. Appendix 11 describes in more detail the inputs used in creating each of these scenarios.

[12] Detailed specifications for the population and employment growth forecast may be found in Appendix 1a.

Average density by housing type

As required under ORS 197.296, figure 13 shows the estimates of housing need by type and density range under each scenario alternative.

Figure 13: Housing need by type and density range for three scenarios (2015- 2035, Metro UGB) - *REVISED*

MetroScope UGR Scenarios, residential absorption estimates (2010 to 2035)

MetroScope UGR LOW -- Scenario #1464
MetroScope UGR MEDIUM -- Scenario #1462
MetroScope UGR HIGH -- Scenario #1465

(MetroScope Supply-side module)

		Dwelling Unit Absorption				% of DU Absorbed by Zoning			
Zone Class	Nominal Units / Acre	Low	Medium	High		Low	Medium	High	general zone class
SFR1	1	264	468	1,543		0.6%	0.6%	1.9%	single family product
SFR2	2	483	1,001	1,451		1.0%	1.4%	1.8%	
SFR3	3	2,109	5,010	6,616		4.6%	6.8%	8.0%	
SFR4	4	575	1,618	2,092		1.2%	2.2%	2.5%	
SFR5	5	7,382	12,169	13,855		15.9%	16.5%	16.8%	
SFR6	6	7,829	10,607	12,060		16.9%	14.4%	14.6%	
SFR7	7	8,293	15,727	14,294		17.9%	21.3%	17.3%	
SFR8	8	6,769	10,433	11,953		14.6%	14.1%	14.5%	
SFR9	9	3,590	4,189	4,274		7.7%	5.7%	5.2%	
SFR10	10	2,756	2,945	2,969		5.9%	4.0%	3.6%	
SFR11	11	0	0	0		0.0%	0.0%	0.0%	
SFR12	12	1,415	2,299	2,732		3.1%	3.1%	3.3%	
SFR13	13	0	0	0		0.0%	0.0%	0.0%	
SFR14	14	1,948	3,380	4,226		4.2%	4.6%	5.1%	
SFR15	15	2,916	4,027	4,405		6.3%	5.5%	5.3%	
SFR16	16	0	0	0		0.0%	0.0%	0.0%	
MFR1	12.3	533	1,737	2,503		0.5%	1.3%	1.6%	multifamily product
MFR2	17.8	903	1,859	3,352		0.8%	1.4%	2.2%	
MFR3	23.3	4,483	6,945	9,557		4.1%	5.3%	6.3%	
MFR4	29.4	565	716	792		0.5%	0.5%	0.5%	
MFR5	33.4	15,988	20,073	22,474		14.5%	15.2%	14.7%	
MFR6	40	0	0	0		0.0%	0.0%	0.0%	
MFR7	73.1	13,612	15,413	17,526		12.3%	11.7%	11.5%	
MUR1	11.2	397	510	676		0.4%	0.4%	0.4%	
MUR2	18.2	162	210	359		0.1%	0.2%	0.2%	
MUR3	23.1	533	743	1,228		0.5%	0.6%	0.8%	
MUR4	29.1	1,352	1,738	2,329		1.2%	1.3%	1.5%	
MUR5	34.6	1,210	1,584	1,949		1.1%	1.2%	1.3%	
MUR6	40.1	2,010	2,880	3,561		1.8%	2.2%	2.3%	
MUR7	54.6	931	1,719	2,216		0.8%	1.3%	1.5%	
MUR8	75.5	1,644	1,841	2,352		1.5%	1.4%	1.5%	
MUR9	110.5	46,191	51,787	57,202		41.8%	39.3%	37.5%	
MUR10	222.5	20,112	22,151	24,484		18.2%	16.8%	16.0%	
TOTAL UNITS ABSORBED		**156,956**	**205,780**	**235,031**		**Percent SF/MF split**			
single family subtotal		**46,330**	**73,874**	**82,470**	**single family**	30%	36%	35%	
multifamily subtotal		**110,626**	**131,905**	**152,562**	**multifamily**	70%	64%	65%	

	Low	Medium	High
Single Family Average Density	7.6	7.4	7.2
Multifamily Average Density	104.9	99.8	96.7
Average Density (all types)	76.2	66.6	65.3

differences in projected absorption owe to: estimates approximating Metro UGB and urban reserves calculations, model convergence between supply and demand modules, and vacancy rate forecasts

Regional residential demand summary

Table 10 summarizes scenario details for household, housing, and location choice for residents in the Metro UGB (i.e., forward looking capture rate). The MSA forecast is the starting point because the time-series data (i.e., employment and population) is better for counties than for estimates of the data history of UGB's. Moreover, the best economic / employment data arrive to us from federal and state employment sources as MSA. Historical data with sufficient and necessary detail are not available for the Metro UGB; also, the UGB is periodically amended while counties rarely change boundaries. Having static boundaries means that measurement errors are minimized and therefore economic and demographic forecasts are more reliable (as in the case of counties or MSA's that are grouped together with the same counties).

Table 10: housing needs forecast details

UGR Forecast Details	High (MS Scenario #1465)	Medium (MS Scenario #1462)	Low (MS Scenario #1464)
2015 MSA Household Estimate (source: Metro Regional Forecast)	917,000	898,700	880,300
2035 MSA Household Forecast (source: Metro Regional Forecast)	1,256,700	1,185,800	1,114,400
2015 UGB Household Estimate (source: MetroScope UGR forecast scenario)	625,900 (68.3 percent share)	613,000 (68.2 percent share)	603,600 (68.6 percent share)
2035 UGB Household Forecast (source: MetroScope UGR forecast scenario)	870,900 (69.3 percent share)	821,100 (69.2 percent share)	768,000 (68.9 percent share)
Capture Rate (2015-35) (source: UGR calculation)	72.0 percent	72.1 percent	70.2 percent
2015 Vacancy Rate (source: 2010 Census)	6.9 percent	6.9 percent	6.9 percent
2035 Vacancy Rate (source: UGR assumption)	4.0 percent	4.0 percent	4.0 percent
2015-35 Housing Demand Forecast (source: UGR calculation)	236,600	197,400	153,300

As expected, the high growth regional scenario yields a greater housing unit demand (236,000 total units) for the Metro UGB relative to the metropolitan MSA forecast. Transitively, the medium (or so-called baseline) scenario yields less growth than the high, but more growth than the low alternative. The

household projections were defined from the regional range forecast and the Metro UGB shares and capture rates were derived from MetroScope growth scenarios.

The MetroScope scenarios used for this analysis differ only in the input assumptions for housing demand levels. This means that, for each scenario, the buildable land inventory and all other supply and transportation assumptions remained unchanged across all three. The difference is that the high growth socio-economic forecast is used for the high growth MetroScope scenario and so on. More population and employment growth generally generates more demand for housing and this level of growth will respond and play itself out in the Metro UGB housing markets a little differently in terms of price, location and residential ownership and structure type demand than in the case of baseline or the low growth forecast alternatives.

Some of these scenario findings like location choice materialize in the capture rate being different for each scenario alternative. The capture rate (as illustrated in Table 10) don't vary across scenarios very much, but compared to historical experience they are somewhat higher than the 63 percent calculated in prior analyses. The higher capture rate projected under the MetroScope scenarios is due to many factors, such as the dwindling residential housing supply going forward in neighbor cities and rural areas adjacent to Metro UGB. Clark County's growth capacity, with its urban growth area, has fewer surpluses in the future as compared to the past. Likewise, as is currently being observed, existing urban areas in the Metro UGB continue to be a draw for growth.

Modeled housing demand

Demographic factors also play a role in some of the shift in housing type demand going forward. As noted in the regional forecast, the share of households made up of 1-person or 2-person households is expected to rise. This means that net new households are, other things being equal, have a greater propensity to demand multi-family (at least until they start forming families with children). Also, an aging population on balance also has a slightly higher affinity to shift into multi-family development forms, although as the Census data suggests, this doesn't happen until at least until individuals are about 80 to 85 years old.

Economic factors, in particular household income, play a function in determining tenure and the choice between single-family or multifamily development forms. The regional economic forecast predicts proportionally fewer middle-income bracket households and families, meaning a disproportionate rise in the number of lower income households. This results in a slight increase in renter multi-family (RMF) demand as seen in Table 11.

There is also a rise in the very high income brackets predicted in the net change in households. Disproportionate increases in the number of high income households (especially in the high growth scenario) show up in higher home ownership (65 percent in high scenario, 64 percent in medium, 63 percent in low) as compared to the 2010 Census which rang up 60 percent own and 40 percent rent.

Table 11: MetroScope Scenario Housing Need Alternatives – Household Demand by Tenure and Structure Type

UGR Forecast Details	Census Estimate (2010)	High (Change: 2015 – 35)	Medium (Change: 2015 – 35)	Low (Change: 2015 – 35)
Owner 1-unit structure (OSF)	58 percent	38 percent	39 percent	40 percent
Owner multi-family (OMF)	3 percent	27 percent	26 percent	25 percent
Renter 1-unit structure (RSF)	11 percent	0 percent	0 percent	2 percent
Renter multi-family (RMF)	28 percent	35 percent	35 percent	33 percent

Census definitions for structure types:
Single family (SF) = 1-unit detached, 1-unit attached, mobile home, and boat, RV, van, etc.
Multi-family (MF) = 2 units or more

Table 11 summarizes the shift between projected household characteristics (referring to HIA distribution) and their market-clearing demand for housing by type and tenure. Demand shifts materially between the 2010 Census and the future scenarios. But between scenarios, the variations are not very pronounced.

The forecast scenarios show a major shift in the type of housing under demand, from single family (SF) to multi-family (MF). Pre-adoption of the Regional Framework Plan (RFP) in 1995, the UGB had a mix of about 70 percent SF and 30 percent MF. After the RFP and local government implementation of regional housing policies, the split between new SF and MF became 60 percent / 40 percent, SF over MF. More recently, during the Great Recession, the residential permit ratio between SF and MF became 50 / 50. The recession may have had an outsized impact on the residential development ratio between SF and MF units built, but there appears to be so far an increase favoring MF preferences over the last 10 to 15 year span.

Over the forecast period (2015 to 2035), the growth forecast alternatives derived from MetroScope clearly signal an even greater shift to MF. We surmise that –at least in part – the shrinking share of SF demand may owe to a shift in socio-economic patterns prompted by (1) a decline owing to smaller average household size – see Table 12, (2) a population that is increasingly getting older (rising median population age) – see Table 13, and a proportionate rise in lower income bracket households.

The demand for housing type seems more likely to be influenced by the market clearing effect of what will be the supply of housing types which are implied under current state, regional, and local regulations. The breakdown of the buildable land inventory shows a maximum potential supply of multifamily registering a market share of 70 percent and 30 percent single-family (which includes in its definition 1-unit attached, 1-unit detached, duplexes and triplexes and manufactured homes). Aside

from the buildable land inventory and model inputs, a more practical consideration is that the region has struggled to urbanize past UGB expansion areas, which will be a primary source of future single-family housing capacity. If traditional supplies of SF homes are limited by the market and regulations, how will the region accommodate future needs of families? The MetroScope scenarios suggest that the condo market (or a proxy for "vertical single family housing") will need to expand significantly. Although the market share appears to be very small at this time, the forecast projects the housing market will move to accommodate the SF housing share by providing condominiums (i.e., owner multi-family) that will have the square footage and amenities to accommodate tomorrow's families. The increase in owner multi-family is over 55,000 units between 2015 and 2035, from a 2015 estimate of 18,000 units (see Table 4 and Figure 6). This is a 3-fold increase in market share.

Table 12: Baseline Forecast illustration of households by size

		Regional Forecast (medium scenario)		Household Difference	
	Household size	2015	2035	(2015-35)	percent share
1 person	1	192,978	271,571	78,593	40%
2 persons (couple)	2	224,012	279,327	55,315	28%
3 persons	3	101,343	138,469	37,126	19%
4 persons	4	76,759	99,241	22,482	11%
5 or more persons	5	60,408	64,292	3,884	2%
	Total	**655,500**	**852,900**	**197,400**	**100 %**

Table 13: Baseline Forecast illustration of households by householder age

		Regional Forecast (medium scenario)		Household Difference	
	Age Bracket	2015	2035	(2015-35)	percent share
under 25 years old	1	43,767	50,926	7,159	4%
25 to 44 years old	2	247,003	295,051	48,049	24%
45 to 54 years old	3	135,340	151,167	15,827	8%
55 to 64 years old	4	108,192	136,093	27,901	14%
65 years or older	5	121,199	219,662	98,464	50%
	Total	**655,500**	**852,900**	**197,400**	**100 %**

A final point is that overall demand for housing (regardless of scenario) will be larger in 2035. The marginal shares of households by size, income and age are certainly shifting up (and down) over the forecast period and by these shifts have implications on residential demand, but taken all together there is absolute growth in every major category distribution for households. This leads to the conclusion that

there will be in absolute terms additional demand for housing of all types, by tenure (i.e., own or rent) and type (i.e., SF or MF).

Urban renewal (residential reinvestment) capacity and absorption

(source: MetroScope Scen. #1462)

These scenarios include inputs that serve as proxies for existing investment programs such as urban renewal. The rationale behind urban residential incentives (at least how MetroScope models residential reinvestments in the region) is to simulate the kind of market action that might be anticipated areas with existing investment programs. Other things being equal, the residential redevelopment incentive makes these locations relatively more attractive because of a lower cost of construction, but realized growth won't automatically gravitate to these areas unless there is sufficient demand or preference for these locations in the first place. Modeling the economic impact of these investment requires estimates for 1) the number of subsidized units (i.e., capacity) and 2) an investment amount.

The places identified for a residential investment assumption are specified by 1) urban renewal areas (URA), 2) Portland's transit-oriented development tax abatement locations, and 3) Portland's neighborhood prosperity initiative (NPI) sites. The incentivized capacity is defined based on the geography of the site or area and the number of residential dwelling units estimated as potentially redevelopable under the BLI. This residential redevelopment supply is then assumed to get (for modeling purposes) a lower cost of residential construction assumption. For locations designated *central city*, assume $50,000 incentive; *regional center*, assume $25,000 incentive; for *all other* incentive areas, assume $10,000. Over the years, these assumptions have been reviewed with local jurisdictions.

Incentivized locations compete with other potentially developable areas for residential housing. All other market factors in the MetroScope model are active. The resulting modeling and forecasting effect of the incentives is that it tends to speed up the timing of market absorption making the area more attractive (other things being equal) for development to occur going forward.

Figure 14 and Table 14 summarize the model's incentive assumptions as well as modeled absorption of the incentivized units through 2035. As one can observe, the estimated total number of units receiving a form of residential reinvestment incentive is just under 88,000 dwelling units (or 22% of total capacity estimated for the Metro UGB). Overall incentivized housing unit absorption is about 80% and with about 29% of single family (SF) units remaining and 20% of incentivized multi-family units undeveloped by year 2035 . Generally, incentivized units will absorb more quickly than other residential capacity.

Figure 14: Modeled incentivized capacity absorption (capacity that gets absorbed between 2015 and 2035 is shown in "green". The purple segment of each bar represents the capacity that is still undeveloped by year 2035.)

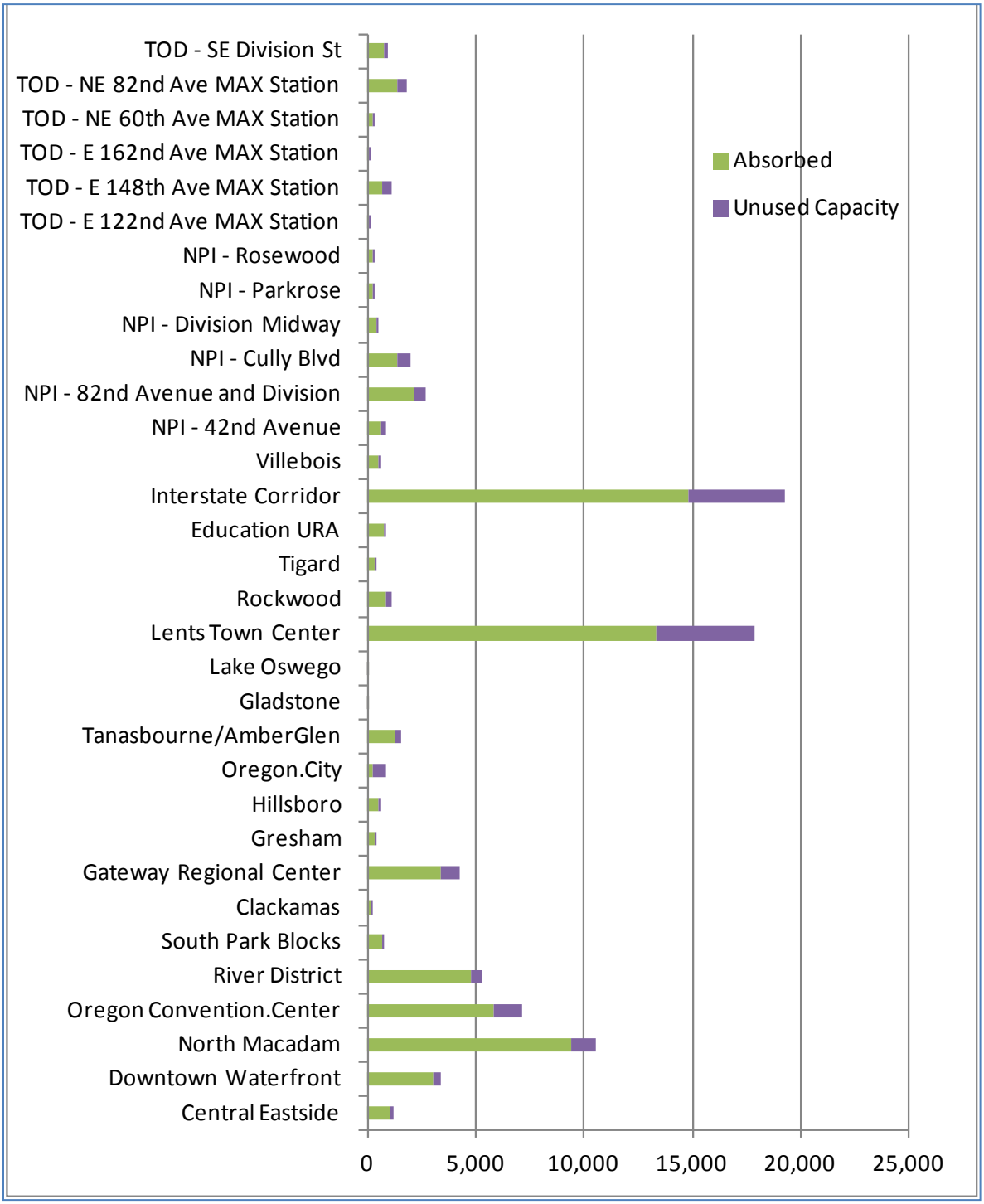


Table 14: Urban Renewal Capacity and Absorption by the Numbers for each location

Urban Renewal Location		Urban Renewal Capacity			UR Capacity Absorbed			Unused Capacity by 2035			% Capacity Remaining		
	Type	SF	MF	Total	SF	MF	Total	SF	MF	Total	SF	MF	Total
Central Eastside	Central City	0	1,196	1,196	0	1,028	1,028	0	168	168	--	14%	14%
Downtown Waterfront	Central City	0	3,376	3,376	0	3,055	3,055	0	321	321	--	9%	9%
North Macadam	Central City	0	10,574	10,574	0	9,402	9,402	0	1,172	1,172	--	11%	11%
Oregon Convention.Center	Central City	0	7,105	7,105	0	5,871	5,871	0	1,234	1,234	--	17%	17%
River District	Central City	0	5,336	5,336	0	4,809	4,809	0	527	527	--	10%	10%
South Park Blocks	Central City	0	787	787	0	707	707	0	80	80	--	10%	10%
Clackamas	Regional Center	0	248	248	0	203	203	0	45	45	--	18%	18%
Gateway Regional Center	Regional Center	0	4,233	4,233	0	3,405	3,405	0	828	828	--	20%	20%
Gresham	Regional Center	14	365	379	9	303	312	5	62	67	39%	17%	18%
Hillsboro	Regional Center	238	408	646	161	342	504	77	66	142	32%	16%	22%
Oregon.City	Regional Center	0	886	886	0	254	254	0	632	632	--	71%	71%
Tanasbourne/AmberGlen	Regional Center	8	1,553	1,561	7	1,267	1,274	1	286	287	11%	18%	18%
Gladstone	Town Center	10	0	10	9	0	9	1	0	1	8%	--	8%
Lake Oswego	Town Center	3	33	36	2	28	30	1	5	6	26%	16%	16%
Lents Town Center	Town Center	682	17,209	17,891	431	12,918	13,349	251	4,291	4,542	37%	25%	25%
Rockwood	Town Center	0	1,135	1,135	0	855	855	0	280	280	--	25%	25%
Tigard	Town Center	67	337	404	33	274	307	34	63	97	50%	19%	24%
Education URA	Non-Center UR	0	831	831	0	757	757	0	74	74	--	9%	9%
Interstate Corridor	Non-Center UR	194	19,036	19,230	184	14,594	14,778	10	4,442	4,452	5%	23%	23%
Villebois	Non-Center UR	530	105	635	464	34	498	66	71	137	12%	67%	22%
NPI - 42nd Avenue	NPI	14	813	827	13	609	622	1	204	205	8%	25%	25%
NPI - 82nd Avenue and Division	NPI	38	2,690	2,728	36	2,144	2,180	2	546	548	5%	20%	20%
NPI - Cully Blvd	NPI	4	1,960	1,964	4	1,392	1,396	0	568	568	5%	29%	29%
NPI - Division Midway	NPI	0	507	507	0	431	431	0	76	76	--	15%	15%
NPI - Parkrose	NPI	2	339	341	2	256	258	0	83	83	22%	24%	24%
NPI - Rosewood	NPI	61	248	309	23	193	216	38	55	93	62%	22%	30%
TOD - E 122nd Ave MAX Station	Portland TOD	6	84	90	4	72	76	2	12	14	33%	15%	16%
TOD - E 148th Ave MAX Station	Portland TOD	128	1,001	1,129	47	638	685	81	363	444	63%	36%	39%
TOD - E 162nd Ave MAX Station	Portland TOD	4	54	58	1	39	40	3	15	18	63%	28%	31%
TOD - NE 60th Ave MAX Station	Portland TOD	1	308	309	1	255	256	0	53	53	5%	17%	17%
TOD - NE 82nd Ave MAX Station	Portland TOD	2	1,851	1,853	2	1,383	1,385	0	468	468	3%	25%	25%
TOD - SE Division St	Portland TOD	1	978	979	1	774	775	0	204	204	6%	21%	21%
UGB Total		2,007	85,586	87,593	1,435	68,292	69,726	572	17,294	17,867	29%	20%	20%

MetroScope residential absorption projections by Jurisdiction

(addendum)

Tables 15, 16, and 17 summarize how much of the prospective residential capacity is absorbed between 2015 and 2035, according to each MetroScope growth scenario[13]. The supply of prospective residential units is included as a reference against absorption estimates. For modeling purposes, we consider the inventory to approximate 40+ years of residential supply if all vacant and redevelopment/infill are absorbed. Included in each table is the amount of residential absorption by jurisdiction and by structure type.

Highlights of the baseline medium growth residential capacity consumption scenario:

[13] Directly tabulated MetroScope data will differ by thousands of dwelling units because of rounding errors innate to modeling in a partial general equilibrium model (like MetroScope) and vacancy rate assumptions applied in the UGR but not in a MetroScope scenario.

- *As to be expected, more units are absorbed in the high scenario as compared to the medium and low growth alternatives.*

Observations on projected single family development:

- *The 2014 BLI estimates capacity for 118,000 single family (SF) units – 47,900 on vacant land and up to 70,100 infill units in the current Metro UGB.*
- *From 2015 to 2035, the number of SF lots absorbed is expected to be nearly 74,000 units based on the assumptions folded into the baseline medium scenario (#1462).*
- *Uninc. Washington County leads all jurisdictions with nearly 21,100 single family units developed during the 20-year period.*
- *Regionwide, 63% (74,000 out of 118,000) of the prospective buildable inventory of single family is used.*
- *By 2035, we anticipate nearly all vacant SF tax lots inside the Metro UGB to be absorbed in the baseline medium scenario. We anticipate what remains after 20 years will be infill lots that may be too difficult to build on or access.*

Observations on projected multi-family development:

- *The 2014 BLI estimates nearly 273,300 multi-family (MF) units of inventory potentially available if demand were sufficient to absorb all of this MF redevelopment supply.*
- *However, not all the redevelopment supply is counted in the UGR because redevelopment doesn't happen unless required by sufficient market demand to induce it to happen.*
- *From 2015 to 2035, the number of MF units absorbed is expected to be about 142,000 units based on assumptions folded into the baseline medium scenario (#1462).*
- *Multi-family development in the city of Portland (113,500 MF units absorbed) far outpaces any individual suburban city and exceeds the efforts of all other cities combined (18,400 units). In order for Portland to achieve the baseline expectations in MF absorption by 2035, the city will have to be very successful in redeveloping at higher densities than what will be torn down. Portland will have to absorb about half of its estimated redevelopment capacity from its recognized potential BLI (113,500 used out of 213,200 units).*
- *City of Portland leads all jurisdictions with nearly 113,500 multi-family units developed for the next 20 years, with 54% of its prospective multi-family inventory used during the UGR period.*
- *In general, cities near the suburban fringes of the Metro UGB find a majority of their prospective multi-family dwelling capacity going unused, for example, Damascus (96%), Happy Valley (87%), Oregon City (83%), Wilsonville (63%), Gresham (71%), uninc. Multnomah County (98%), Cornelius (83%), Forest Grove (78%), Sherwood (61%), and uninc. Washington County (61%).*

Excel files supporting this appendix:

MARIO14.xlsx
UGR-HNA 2014 model (LOW).xlsx
UGR-HNA 2014 model (MEDIUM).xlsx
UGR-HNA 2014 model (HIGH).xlsx

Table 15

UGR LOW Forecast **2014 Buildable Land Inventory - Residential Capacity & Absorption**

Georgaphy Current UGB
Units DU (HH x 1.05)
Output Supply Side
Time Span 20 Years (2015-2025)

Metro Research Center DRAFT 8/19/2014 **Scenario #1464**

Local Government	BLI Capacity			DU used 2015-2035			DU remaining in 2035			% DU remaining in 2035		
	SF	MF	Total	SF	MF	Total	SF	MF	Total	SF	MF	Total
Clackamas Total	**40,326**	**20,288**	**60,614**	**14,365**	**2,240**	**16,605**	**25,961**	**18,048**	**44,009**	**64%**	**89%**	**73%**
DAMASCUS	15,554	4,003	19,557	4,191	96	4,287	11,363	3,907	15,270	73%	98%	78%
GLADSTONE	236	331	567	174	193	367	62	138	200	26%	42%	35%
HAPPY VALLEY	5,658	4,346	10,004	1,021	395	1,416	4,637	3,951	8,588	82%	91%	86%
JOHNSON CITY	0	0	0	0	0	0	0	0	0	--	--	--
LAKE OSWEGO	1,010	465	1,475	524	288	812	486	177	663	48%	38%	45%
MILWAUKIE	1,177	59	1,236	767	21	788	410	38	448	35%	64%	36%
OREGON CITY	2,635	4,695	7,330	981	385	1,366	1,654	4,310	5,964	63%	92%	81%
RIVERGROVE	36	0	36	19	0	19	17	0	17	46%	--	46%
WEST LINN	924	124	1,048	366	21	387	558	103	661	60%	83%	63%
WILSONVILLE	2,760	1,092	3,852	1,835	264	2,098	925	828	1,754	34%	76%	46%
UNINCORP-CLACK	10,336	5,173	15,509	4,487	577	5,064	5,849	4,596	10,445	57%	89%	67%
Multnomah Total	**24,532**	**231,302**	**255,834**	**10,125**	**101,168**	**111,293**	**14,407**	**130,134**	**144,541**	**59%**	**56%**	**56%**
FAIRVIEW	421	703	1,124	185	43	228	236	660	896	56%	94%	80%
GRESHAM	4,808	10,514	15,322	1,514	1,768	3,282	3,294	8,746	12,040	69%	83%	79%
MAYWOOD PARK	32	0	32	20	0	20	12	0	12	38%	--	38%
PORTLAND	15,180	213,246	228,426	6,962	99,033	105,995	8,218	114,213	122,431	54%	54%	54%
TROUTDALE	546	969	1,515	201	221	423	345	748	1,092	63%	77%	72%
WOOD VILLAGE	39	581	620	14	1	15	25	580	605	65%	100%	98%
UNINCORP-MULT	3,506	5,289	8,795	1,230	101	1,331	2,276	5,188	7,464	65%	98%	85%
Washington Total	**53,842**	**22,395**	**76,237**	**21,840**	**7,218**	**29,058**	**32,002**	**15,177**	**47,179**	**59%**	**68%**	**62%**
BEAVERTON	4,747	3,269	8,016	3,097	1,222	4,320	1,650	2,047	3,696	35%	63%	46%
CORNELIUS	88	153	241	4	22	26	84	131	215	95%	85%	89%
DURHAM	42	0	42	12	0	12	30	0	30	72%	--	72%
FOREST GROVE	3,439	1,990	5,429	1,073	226	1,298	2,366	1,764	4,131	69%	89%	76%
HILLSBORO	4,661	5,311	9,972	1,448	2,245	3,694	3,213	3,066	6,278	69%	58%	63%
KING CITY	223	169	392	164	65	228	59	104	164	27%	62%	42%
SHERWOOD	467	524	991	152	63	214	315	461	777	68%	88%	78%
TIGARD	6,243	2,270	8,513	2,939	933	3,872	3,304	1,337	4,641	53%	59%	55%
TUALATIN	351	188	539	144	117	262	207	71	277	59%	38%	51%
UNINCORP-WASH	33,581	8,521	42,102	12,808	2,324	15,132	20,773	6,197	26,970	62%	73%	64%
UGB TOTAL	**118,700**	**273,985**	**392,685**	**46,330**	**110,626**	**156,956**	**72,370**	**163,359**	**235,729**	**61%**	**60%**	**60%**

Table 16

UGR MEDIUM Forecast **2014 Buildable Land Inventory (BLI) -- Residential Capacity**

Georgaphy Current UGB
Units DU (HH x 1.05)
Output Supply Side
Time Span 20 Years (2015-2025)

Metro Research Center DRAFT 8/19/2014 **Scenario #1462**

Local Government	BLI Capacity			DU used 2015-2035			DU remaining in 2035			% DU remaining in 2035		
	SF	MF	Total	SF	MF	Total	SF	MF	Total	SF	MF	Total
Clackamas Total	**40,326**	**20,288**	**60,614**	**24,634**	**4,307**	**28,941**	**15,692**	**15,981**	**31,673**	**39%**	**79%**	**52%**
DAMASCUS	15,554	4,003	19,557	9,305	152	9,457	6,249	3,851	10,100	40%	96%	52%
GLADSTONE	236	331	567	201	219	420	35	112	147	15%	34%	26%
HAPPY VALLEY	5,658	4,346	10,004	2,530	561	3,091	3,128	3,785	6,913	55%	87%	69%
JOHNSON CITY	0	0	0	0	0	0	0	0	0	--	--	--
LAKE OSWEGO	1,010	465	1,475	583	324	907	427	141	568	42%	30%	38%
MILWAUKIE	1,177	59	1,236	984	41	1,025	193	18	211	16%	31%	17%
OREGON CITY	2,635	4,695	7,330	1,779	789	2,568	856	3,906	4,762	32%	83%	65%
RIVERGROVE	36	0	36	23	0	23	13	0	13	35%	--	35%
WEST LINN	924	124	1,048	439	37	477	485	87	571	52%	70%	54%
WILSONVILLE	2,760	1,092	3,852	1,912	408	2,320	848	684	1,532	31%	63%	40%
UNINCORP-CLACK	10,336	5,173	15,509	6,877	1,775	8,652	3,459	3,398	6,857	33%	66%	44%
Multnomah Total	**24,532**	**231,302**	**255,834**	**15,947**	**117,562**	**133,509**	**8,585**	**113,740**	**122,325**	**35%**	**49%**	**48%**
FAIRVIEW	421	703	1,124	344	292	636	77	411	488	18%	58%	43%
GRESHAM	4,808	10,514	15,322	2,898	3,019	5,916	1,910	7,495	9,406	40%	71%	61%
MAYWOOD PARK	32	0	32	27	0	27	5	0	5	17%	--	17%
PORTLAND	15,180	213,246	228,426	10,276	113,525	123,801	4,904	99,721	104,625	32%	47%	46%
TROUTDALE	546	969	1,515	345	381	726	201	588	789	37%	61%	52%
WOOD VILLAGE	39	581	620	28	222	250	11	359	370	27%	62%	60%
UNINCORP-MULT	3,506	5,289	8,795	2,028	125	2,153	1,478	5,164	6,642	42%	98%	76%
Washington Total	**53,842**	**22,395**	**76,237**	**33,293**	**10,036**	**43,329**	**20,549**	**12,359**	**32,908**	**38%**	**55%**	**43%**
BEAVERTON	4,747	3,269	8,016	3,478	2,116	5,594	1,269	1,153	2,422	27%	35%	30%
CORNELIUS	88	153	241	9	26	34	79	127	207	90%	83%	86%
DURHAM	42	0	42	15	0	15	27	0	27	65%	--	65%
FOREST GROVE	3,439	1,990	5,429	1,821	433	2,253	1,618	1,557	3,176	47%	78%	58%
HILLSBORO	4,661	5,311	9,972	2,722	2,644	5,366	1,939	2,667	4,606	42%	50%	46%
KING CITY	223	169	392	182	112	294	41	57	98	18%	34%	25%
SHERWOOD	467	524	991	194	161	355	273	363	636	58%	69%	64%
TIGARD	6,243	2,270	8,513	3,615	1,355	4,970	2,628	915	3,543	42%	40%	42%
TUALATIN	351	188	539	172	139	311	179	49	228	51%	26%	42%
UNINCORP-WASH	33,581	8,521	42,102	21,085	3,052	24,137	12,496	5,469	17,965	37%	64%	43%
UGB TOTAL	**118,700**	**273,985**	**392,685**	**73,874**	**131,905**	**205,780**	**44,826**	**142,080**	**186,905**	**38%**	**52%**	**48%**

Table 17

UGR HIGH Forecast **2014 Buildable Land Inventory (BLI) -- Residential Capacity**

Georgaphy Current UGB
Units DU (HH x 1.05)
Output Supply Side
Time Span 20 Years (2015-2025)

Metro Research Center DRAFT 8/19/2014 **Scenario #1465**

Local Government	BLI Capacity			DU used 2015-2035			DU remaining in 2035			% DU remaining in 2035		
	SF	MF	Total	SF	MF	Total	SF	MF	Total	SF	MF	Total
Clackamas Total	**40,326**	**20,288**	**60,614**	**30,012**	**6,318**	**36,330**	**10,314**	**13,970**	**24,284**	**26%**	**69%**	**40%**
DAMASCUS	15,554	4,003	19,557	11,748	196	11,943	3,806	3,807	7,614	24%	95%	39%
GLADSTONE	236	331	567	223	233	456	13	98	111	6%	30%	20%
HAPPY VALLEY	5,658	4,346	10,004	3,811	764	4,576	1,847	3,582	5,428	33%	82%	54%
JOHNSON CITY	0	0	0	0	0	0	0	0	0	--	--	--
LAKE OSWEGO	1,010	465	1,475	610	373	984	400	92	491	40%	20%	33%
MILWAUKIE	1,177	59	1,236	1,094	47	1,141	83	12	95	7%	21%	8%
OREGON CITY	2,635	4,695	7,330	2,146	1,440	3,586	489	3,255	3,744	19%	69%	51%
RIVERGROVE	36	0	36	23	0	23	13	0	13	35%	--	35%
WEST LINN	924	124	1,048	476	44	520	448	80	528	48%	65%	50%
WILSONVILLE	2,760	1,092	3,852	1,817	537	2,354	943	555	1,498	34%	51%	39%
UNINCORP-CLACK	10,336	5,173	15,509	8,063	2,683	10,746	2,273	2,490	4,763	22%	48%	31%
Multnomah Total	**24,532**	**231,302**	**255,834**	**18,840**	**133,121**	**151,962**	**5,692**	**98,181**	**103,872**	**23%**	**42%**	**41%**
FAIRVIEW	421	703	1,124	397	533	930	24	170	194	6%	24%	17%
GRESHAM	4,808	10,514	15,322	3,580	4,565	8,145	1,228	5,949	7,177	26%	57%	47%
MAYWOOD PARK	32	0	32	30	0	30	2	0	2	7%	--	7%
PORTLAND	15,180	213,246	228,426	11,975	126,744	138,718	3,205	86,502	89,708	21%	41%	39%
TROUTDALE	546	969	1,515	458	630	1,088	88	339	427	16%	35%	28%
WOOD VILLAGE	39	581	620	32	410	442	7	171	178	17%	29%	29%
UNINCORP-MULT	3,506	5,289	8,795	2,368	240	2,609	1,138	5,049	6,186	32%	95%	70%
Washington Total	**53,842**	**22,395**	**76,237**	**33,618**	**13,123**	**46,740**	**20,224**	**9,272**	**29,497**	**38%**	**41%**	**39%**
BEAVERTON	4,747	3,269	8,016	3,782	2,406	6,188	965	863	1,828	20%	26%	23%
CORNELIUS	88	153	241	10	79	89	78	74	152	88%	49%	63%
DURHAM	42	0	42	19	0	19	23	0	23	54%	--	54%
FOREST GROVE	3,439	1,990	5,429	2,294	1,069	3,363	1,145	921	2,066	33%	46%	38%
HILLSBORO	4,661	5,311	9,972	3,374	3,218	6,592	1,287	2,093	3,380	28%	39%	34%
KING CITY	223	169	392	151	126	277	72	43	115	32%	26%	29%
SHERWOOD	467	524	991	224	221	445	243	303	546	52%	58%	55%
TIGARD	6,243	2,270	8,513	4,165	1,543	5,708	2,078	727	2,805	33%	32%	33%
TUALATIN	351	188	539	179	155	334	172	33	205	49%	18%	38%
UNINCORP-WASH	33,581	8,521	42,102	19,419	4,306	23,725	14,162	4,215	18,377	42%	49%	44%
UGB TOTAL	**118,700**	**273,985**	**392,685**	**82,470**	**152,562**	**235,031**	**36,230**	**121,423**	**157,654**	**31%**	**44%**	**40%**

Errata (summary of 9/23/14 revisions to previous July 2014 draft)

This revised draft reflects two corrections. Tables and graphs that have been revised in this draft are so noted. Finally, this draft provides additional explanation of several topics that have been of interest to policy makers and stakeholders.

First, in one step of the report's calculations of housing demand, data describing the relative shares of different household types for the larger seven-county area (instead of the urban growth boundary) were used by mistake. As a result, the July 2014 draft overestimated demand for single-family housing within the urban growth boundary.

A second correction relates to lands added to the urban growth boundary by the Oregon Legislature in March 2014 under House Bill 4078, which addressed the designation of urban and rural reserves and made changes to the urban growth boundary. At the request of staff from the City of Forest Grove, the revised analysis counts lands added near Forest Grove as industrial, rather than residential. This has the effect of reducing the region's residential capacity, but increasing its industrial capacity.

- *Corrected the legend for the household income pie chart seen in figure 1, page 5.*
- *Added figure 2, "Generational Changes in Population, Metro UGB" and three additional bullets that illustrate and explain expected net increase in housing demand (2015 to 2035) for each generation of residents, pages 6 and 7.*
- *Page 13, added a paragraph accompanying table 3 to explain demand (and supply) factors necessarily shift between scenario alternatives, which results in shifts in tenure and housing type.*
- *Table 3, page 14 has been revised. It has been replaced with the corrected household, income and age bracket projections for the Metro UGB (was incorrectly reported with MSA proportions), most notable dropping the single family proportion to 39% (incorrectly reported as 45%) and raising the multifamily proportion to 61% (incorrectly reported as 55%).*
- *Figure 6, page 16, has been revised to reflect the correction in adjusted residential demand for housing by type and tenure*
- *Page 17, addendum disclosing the change in BLI due to a correction in the Forest Grove residential supply.*
- *Table 6, page 18; figures 7 thru 9, pages 19-21 has been revised to reflect the correction to the BLI*
- *Added additional context of possible market impediments to building out the buildable land inventory, page 22*
- *Figures 10 thru 12 and summary tables 8 and 9 (pages 26-29) have been revised to reflect changes in the BLI (i.e., Forest Grove adjustment) and housing demand by tenure and type (i.e., Metro UGB correction).*
- *Figure 13 has been revised to correctly show residential absorptions for years 2015 to 2035 (earlier draft had dwelling unit absorption for 2015 to 2040).*
- *Added a section describing residential absorption results for each scenario, beginning on page 37.*

- *Residential absorption estimates (by scenario) by jurisdiction are shown in Tables 15 (low scenario), 16 (medium scenario), and 17 (high scenario).*