APPENDIX 3 – GROWTH FORECAST FINDINGS

This appendix provides future-oriented decision-support information about the various decision options open to the Metro Council in the 2018 Urban Growth Management process.

Land Use Forecast Tool Overview

MetroScope, the region's land use allocation model

Metro uses MetroScope, an integrated land use and transportation computer model, to produce indicators of future land use performance to support Metro's Urban Growth Boundary decision. MetroScope systematically forecasts where future employment and housing are likely to locate in the Portland-Vancouver-Hillsboro MSA. The model simulates market interactions leading to household and employment location choice given a set of capacity inputs (e.g. the Buildable Land Inventory capacity, city-proposed UGB expansion capacity, and other development supply assumptions) and demand inputs (total population and job growth from the regional-level macro-economic forecast). It estimates supply as a result of simulated market behaviors and produces outputs including housing prices; household location choices by zone, type (single-family or multi-family), and tenure (own or rent); and employment locations by zone by employment land type. MetroScope's geographic zones are Census tracts or groupings thereof. See appendix 2 for a description of the BLI and appendix 1 for information about the regional forecast. Other model input assumptions appear below.

The location choice for housing in MetroScope's market simulation depends on:

- 1. The location and amount of housing capacity, type of housing (SF or MF), tenure (own or rent) by census tract
- 2. Household characteristics (i.e., household size, income, householder age, and whether the household includes children)
- 3. Proximity to work locations and choices
- 4. Relative home (or rent) prices

In the same way, location choice for employment land need depends upon:

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

The model groups job together by category into building type affinities and matches these to available supply to spatially allocate employment demand.

Metro convened a peer review of MetroScope in the autumn of 2018 which generally concluded that the model is sound for regional-level decision support and recommended additional model improvements.

Complete model method documentation, a validation report, and a summary of the peer review can be found at: <u>https://www.oregonmetro.gov/forecasting-models-and-model-documentation</u>.

Methodological Foundations and Model Limitations

- 1. MetroScope's market simulation:
 - a. Assumes that future employment land and residential consumption preferences will follow past observed behaviors. In other words, households' and firms' tendencies will not change but inputs (supply, amount of growth to plan for) may change;
 - b. Does not account for outside-MSA location options;
 - c. Does not explicitly consider racial and ethnic demographics.
- 2. Market segment information on residential (primarily income and household size) and nonresidential (building type) is available from this model but must be interpreted with caution since MetroScope was not validated at the market segment level.

MetroScope Data Structures and Timing Assumptions

Land use inputs to the MetroScope model have several key characteristics:

<u>Capacity</u> – inputs are in housing units for residential land, acres for employment land.

<u>Zoning</u> – inputs follow Metro Standard Regional Zoning (SRZ) categories. Each residential zone class has an associated density in units per net buildable acre, chosen to be consistent with information from each city expansion proposal.

<u>Census tract</u> -- the model's geographic unit of analysis (including for city-proposed UGB expansions) is 2010 census tracts.

<u>Year Infrastructure Available</u> –Metro assumed that all housing capacity in the city-proposed expansions would be available by Year 2023 and that housing production within the existing UGB would be absorbed consistent with historically-observed production rates.

Forecast Process Overview

Scenario Approach

Metro Council directed staff to provide decision options for the 2018 Urban Growth Management process. In response staff examined the ranges of choices and uncertainty in three key forecast inputs: (1) the range of possible overall regional growth in people and jobs, (2) a range of possible contributions of existing within-UGB capacity for housing and commercial construction, and (3) expanding or not expanding the urban growth boundary (UGB) based on proposals solicited from interested cities. Note that any city-proposed UGB expansions would be made into acknowledged urban reserves. The ranges for growth and existing capacity account for uncertainty in the various forecast assumptions.

Staff formulated different scenarios by combining different "settings" of those three key inputs. The "settings" used included:

- Growth = High, Medium, and Low versions of the Regional Economic Forecast (high and low represent roughly a 95% confidence interval around the medium or likely version)
- Existing Capacity = High, Medium, and Low versions of the Buildable Land Inventory ("low" = based on 2007-2015 historical redevelopment trends, medium = historical method @ 3 times greater likelihood of redevelopment, high = threshold price method)
- All or None of the city-proposed UGB Expansions

See Table 7: UGM Scenario Inputs for details on scenario inputs.

In all, staff tested 14 scenarios tested produced from variations of the above inputs. Model outputs for many of the scenarios were in nonrealistic ranges, indicating that those scenarios were impractical in the real world. Four scenarios emerged from the tests that appeared tenable based on values of the indicators; staff observe that those four scenarios offer a definition of the range of decision options. Indicators for the selected scenarios appear further below.

Note that the results from these scenarios are purely informational until the Metro Council makes a decision later in 2018. That decision will specify the "settings" that the region will plan for in terms of growth and existing capacity utilization, and whether or not to accept the various cities' expansion proposals.

How to interpret forecast results from this forecast series

This series of scenario forecasts uses a "reference" scenario as an analytic comparison case to other, more-realistic future scenarios. The reference scenario should not be interpreted as a realistic possible future because its outcomes are untenable (i.e. the model had to operate outside of its viable range).

The forecast findings contain uncertainty. Numbers are best used for comparison purposes rather than as absolute values, since cumulative uncertainty is at least plus or minus ten percent.

Forecast inputs and assumptions, including city-proposed UGB expansions

Common Inputs Across All Scenarios Table 1: UGM Scenario Assumptions

Other	Forecast Inputs, Common to All Scenarios				
UGB Vacant Capacity	2017 vacant land based on aerial photography, permit data, and assessor records and amended by local review. Environmental constraints based on latest 2010 data and major known utility easem				
Neighboring Cities Capacity	Urban areas outside the UGB. Capacity estimated by PSU 2015-2040 household growh projections.				
Rural Residential Capacity	Estimated from the three-county rural residential taxlots, excluding publicly-owned and high-value land.				
Subsidized Redevelopment	Three tiers of subsidies (\$50,000, \$25,000, or \$10,000 per new redeveloped unit) which reflect either active urban renewal or other incentives, such as a vertical housing tax credit.				
Clark County Capacity	Estimated from the 2016 Clark County Vacant Buildable Lands Model (VBLM)				
Residential Construction Costs (SDC fees)	Per unit construction costs from Metro, Homebuilders Association surveys, and input from local jurisdictions.				
Transportation and Accessibility	Transportation networks from the Metro 2035 RTPYear 2015:2015 NetworkYear 2018:2015 NetworkYear 2020:Interpolated from 2015 and 2027 No BuildYear 2025:2027 No BuildYear 2030:2027 Financially Constrained (FC)Year 2035:Interpolated from 2027 FC and 2040 FCYear 2038:2040 Financially ConstrainedYear 2040:2040 Financially Constrained				

Neighborhood Score Assumptions:

The neighborhood score is constructed as a relative index of neighborhood attractiveness after netting out the effects of accessibility, property value, lot size, and other directly measurable qualities. The neighborhood scores in areas added to the Metro UGB since 1997 may not have reflected recent urbanization, so the scores for the relevant census tracts were adjusted. Because development in the city-proposed expansion areas may change substantially from what exists today, the scores in the census tracts that approximate the city proposed expansions were revised to reflect the urbanization proposals (see next section for details)

Source: Metro Research Center, May 2018

Translating city-proposed UGB expansions into MetroScope formats

Residential and employment capacity for the proposed UGB expansion areas were provided by the jurisdictions in their "Letters of Interest" and in other communications. Note that given the accelerated timeline of the 2018 process the final city concept plans may differ slightly in detail (e.g. number of housing units) from the Letters of Interest. At the regional scale of analysis such minor differences will have no noticeable effect on the forecast indicators.

Since the jurisdictions did not yet provide the detailed zoning information that would be part of future comprehensive plans, Metro Research Center staff needed to translate the submitted generalized concept assumptions into RLIS (Regional Land Information System) standardized zone categories and density assumptions needed to run the MetroScope land use model. Additional input assumptions were required for mixed-use categories, i.e., MUR (mixeduse residential) splits.

Draft versions of the translated assumptions were sent to the jurisdictions for review and if necessary revision. Care was taken to make the resulting model inputs reflect the intent of each jurisdiction's city-proposed expansion provisions.

The data were incorporated into this first round of forecasting UGM (urban growth management) scenarios. The input assumptions are solely for the UGM process, and have not been used for any distributed forecast allocation.

Step 1: Metro determined which census tract(s) the expansion area occupies. In the case of multiple tracts, an approximate split of the total CITY-PROPOSED capacity was estimated based on geographic area.

Step 2: Jurisdictions confirmed the fraction of the total buildable acres in the expansion area that goes into each of four land use types: Residential, Commercial, Industrial, and Mixed-Use Residential (a combination of Multi-Family Residential and Commercial).

Step 3: Defined a number of Residential "design types", and their shares of the total residential capacity. The design types are defined by the share of land between single family and multi-family land types, and the density to be applied for each type. Metro proposed an initial set of design types, which were approved or modified by the jurisdictions.

The following tables summarize the methodology and assumptions for the 4 city-proposed expansion areas by Census tract (MetroScope's geographic unit of analysis). The map below illustrates the location of the city-proposals.

Map 1: City-proposed expansion areas



Table 2: Summary table of city-proposed capacity assumptions

City	Hillsboro	Wilsonville	Beaverton	King City	
Proposal Name	Witch Hazel	Frog Pond	Cooper Mtn.	King City	Totals
Residential Capacity					
SF Units	491	1,321	2,794	1,457	6,063
MF Units	357	0	904	1,844	3,105
Total Units	848	1,321	3,698	3,301	9,168
Employment Capacity Commercial Acres	0	0	0	4	4
Industrial Acres	0	0	0	0	0
Neighborhood Score					
Original	0.40	0.65	0.45	0.53	
Revised	0.50	0.65	0.62	0.60	

Table 3: Capacity worksheet – Hillsboro Witch Hazel expansion

Jurisdiction	Hillsboro Witch Hazel		Res. Design Types:	Type 1	Type 2	Туре 3	Total
Expansion Area			Share of Res. Acres	55%	45%		
Census Tract	323		Share of SF	50%	100%		
% in Tract	100%		SF Units/Acre	12.5	7.3		
			Total SF Units	251	240		491
Total Net Acres	73						
			Share of MF	50%	0%		
Share of Total Acres:			MF Units/Acre	17.8			
Residential	100%		Total MF Units	357	0		357
Commercial	0%						
Industrial	0%						
Mixed Use Res	0%		MUR, % Acres in MF	n/a			
			MUR Units/Acre				
			Total MUR Units	0	0		0
MUR, % Acres in Comm.	n/a						
Commercial Acres	0.0		Total Units	608	240	0	848

Table 4: Capacity worksheet- Wilsonville Frog Pond expansion

Jurisdiction	Wilson	ville	Res. Design Types:	Type 1	Type 2	Type 3	Total
Expansion Area	Frog Pond		Share of Res. Acres	20%	40%	40%	
Census Tract	227.02		Share of SF	100%	100%	100%	
% in Tract	100%		SF Units/Acre	12.5	9.7	8.7	
			Total SF Units	335	520	466	1,321
Total Net Acres	134						
			Share of MF	0%	0%	0%	
Share of Total Acres:			MF Units/Acre				
Residential	100%		Total MF Units	0	0	0	0
Commercial	0%						
Industrial	0%						
Mixed Use Res	0%		MUR, % Acres in MF	n/a			
			MUR Units/Acre				
			Total MUR Units	0	0	0	0
MUR, % Acres in Comm.	n/a						
Commercial Acres	0.0		Total Units	335	520	466	1,321

Table 5: Capacity worksheets – Beaverton Cooper Mtn. expansion

Jurisdiction	Beave	rton	Res. Design Types:	Type 1	Type 2	Type 3	Total
Expansion Area	Cooper	Mtn.	Share of Res. Acres	10%	40%	50%	
Census Tract	318.04	(West part)	Share of SF	90%	90%	90%	
% in Tract	75%		SF Units/Acre	10.9	8.7	6.2	
			Total SF Units	266	848	755	1,869
Total Net Acres	271						
			Share of MF	10%	10%	10%	
Share of Total Acres:			MF Units/Acre	33.4	33.4	33.4	
Residential	100%		Total MF Units	90	362	452	904
Commercial	0%						
Industrial	0%						
Mixed Use Res	0%		MUR, % Acres in MF	n/a			
			MUR Units/Acre				
			Total MUR Units	0	0	0	0
MUR, % Acres in Comm.	n/a						
Commercial Acres	0.0		Total Units	356	1,210	1,207	2,773
Jurisdiction	Beave	rton	Res. Design Types:	Type 1	Type 2	Type 3	Total
Expansion Area	Cooper	Mtn.	Share of Res. Acres	10%	20%	70%	
Census Tract	318.13	(East part)	Share of SF	100%	100%	100%	
% in Tract	25%		SF Units/Acre	17.4	8.7	6.2	
			Total SF Units	206	206	513	925
Total Net Acres	118						
			Share of MF	0%	0%	0%	
Share of Total Acres:			MF Units/Acre				
Residential	100%		Total MF Units	0	0	0	0
Commercial	0%						
Industrial	0%						
Mixed Use Res	0%		MUR, % Acres in MF	n/a			
			MUR Units/Acre				
			Total MUR Units	0	0	0	0
MUR, % Acres in Comm.	n/a						
Commercial Acres	0.0		Total Units	206	206	513	925

Table 6: Capacity worksheet - King City expansion

Jurisdiction King City		Res. Design Types:	Type 1	Type 2	Type 3	Total	
Expansion Area	King (City	Share of Res. Acres	50%	50%		
Census Tract	319.08	(West part)	Share of SF	50%	50%		
% in Tract	40%		SF Units/Acre	12.5	6.9		
			Total SF Units	381	212		593
Total Net Acres	128						
			Share of MF	50%	50%		
Share of Total Acres:			MF Units/Acre	12.3	12.3		
Residential	95%		Total MF Units	375	375		750
Commercial	0%						
Industrial	0%						
Mixed Use Res	5%		MUR, % Acres in MF	n/a			
			MUR Units/Acre				
			Total MUR Units	0	0		0
MUR, % Acres in Comm.	20%						
Commercial Acres	1.3		Total Units	756	587	0	1,343
Jurisdiction	King (City	Res. Design Types:	Type 1	Type 2	Type 3	Total
Expansion Area	King (City	Share of Res. Acres	50%	50%		
Census Tract	319.07	(East part)	Share of SF	50%	50%		
% in Tract	40%		SF Units/Acre	12.5	6.9		
			Total SF Units	556	308		864
Total Net Acres	187						
			Share of MF	50%	50%		
Share of Total Acres:			MF Units/Acre	12.3	12.3		
Residential	95%		Total MF Units	547	547		1,094
Commercial	0%						
Industrial	0%						
Mixed Use Res	5%		MUR, % Acres in MF	n/a			
			MUR Units/Acre				
			Total MUR Units	0	0		0
MUR, % Acres in Comm.	20%						
Commercial Acres	1.9		Total Units	1,103	855	0	1,958

Scenario-Specific Inputs

Table 7: UGM Scenario Inputs

UGM Scenario Assumption Options						
		Growth				
	INCH	1,306,722	Households			
	нюн	1,550,710	Jobs			
Vear 2038 MSA						
Households and	MED	1,236,650	Households			
Employment		1,402,420	Jobs			
	1000	1,143,847	Households			
	LOW	1,243,270	Jobs			

	1 1		
MED	MED	MED	MED

Existing Capacity						
	HIGH	362,822 Units	Threshold			
UGB Redevelopment	MED	319,504 Units	3x Redev. Probability of Trend			
	LOW	227,728 Units	Trend Regression			

UGB Expansion Capacity						
City Droposod	YES	9,167 Units	LOIs from Jurisdictions			
City Proposed	NONE	0 Units	Developable in Year 2023			

	 2.402	No. 100
	YES	YES

NONE

LOW

HIGH

MED

HIGH

NONE

LOW

NONE

Source: Metro Research Center, May 2018

Assumptions are for research purposes only and do not reflect a UGM decision or future UGB expansion decision by the current or future Metro Council.

Note that existing capacity totals differ slightly between the MetroScope inputs summarized above and the Metro BLI, which has its focus on the UGB, because of small production differences needed to account for ex-urban MetroScope geographies.

Residential Forecast Results – PRELIMINARY 2018 UGM Scenario Findings

Historical and Census Reference Information

Data specifically for the Metro UGB, particularly long-term history, is not usually available. Statistics for comparing Metro UGB performance substitute the Tri-county region (comprised of Clackamas, Multnomah and Washington) for the UGB.

	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>
Own	193,240	253,532	280,524	348,353	392,329
Rent	107,201	155,231	184,143	221,108	245,864
ownership%	64%	62%	60%	61%	61%
SF% of new					
households		<u>1970-80</u>	<u>1980-90</u>	<u>1990-00</u>	<u>2000-10</u>
over 10		56%	48%	65%	64%
years					
Source: U.S. Ce	nsus				

Table 8: Tenure (home ownership rate) of Metro Tri-county (Clackamas, Multnomah, and Washington)

Decennial census readings of tenure for the Tri-county region indicate a long-term stability of homeownership rates over the 40 years of data. The decade-to-decade change rate reveals some variability in the SF choice made by new households, falling between 48% and 65%.

 Table 9: Structure Type share (SF = single family, MF = multi-family) of Metro Tri-county (Clackamas, Multnomah, and Washington)

	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>
SF	233,013	311,185	333,013	396,868	443,781
MF	67,428	120,315	131,654	172,593	194,412
Single-					
family%	78%	72%	72%	70%	70%
Marginal					
change in		<u>1970-80</u>	<u>1980-90</u>	<u>1990-00</u>	<u>2000-10</u>
SF%		60%	66%	61%	68%
Source: U.S. C	Census				

The decennial census readings indicate an "average" single family final demand of about 70% and 30% for multi-family units. The SF marginal (or change between decades) indicates a range between 60% and 68% over the long-term period. The swings in marginal single family share appears to be somewhat correlated with regional real estate and business cycles. In decades of faster growth and an increase to economic prosperity, the marginal rate tends to rise. Changes in the federal tax code and interest rates may have also contributed to affordability during these periods making home buying more attractive.

Table 10: Median Owner Housing Unit Value (price in 2015 inflation adjusted dollars)

	1960	1970	1980	1990	2000	<u>2010</u>
Census Value	\$ <mark>89,91</mark> 0	\$ 102,307	\$ 184,584	\$ 131,112	\$ 240,076	\$ 325,416
Annual %chg.		1.3%	6.1%	-3.4%	6.2%	3.1%
Source IIS Con	1010					

Source: U.S. Census

The decennial census reports homeowner housing values and gross rents. Housing values and rents are figures reported by Census surveyees. Gross rents are a measurement of reported monthly rents which also include an imputation of home heating utility costs. The statistics in the nearby tables have been adjusted for inflation. The adjusted values show the purchasing power dollar value for year 2015 prices using the U.S. urban all-items consumer price index (CPI).

In the last 50 years, real median home values reported in the Census have risen 262%, while reported median rents rose just 59%.

Table 11: Median Gross Rents - monthly (rent in 2015 inflation adjusted dollars)

	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>
Rent	\$ 583	\$ 725	\$ 783	\$ 795	\$ 926	\$ 928
Annual %chg.		2.2%	0.8%	0.2%	1.5%	0.0%
Source: U.S. Ce	nsus					



Figure 1: Rolling 20-year Metro UGB capture rate; Average = 61% (data: 1979 to 2017)

The Metro UGB capture rate shows an average reading of 61% based on data from 1979 to present. This reading is of population growth within the Metro UGB and compared to MSA level population growth. The data points in the capture rate histogram show fluctuations in the 20 year capture rate on an annual rolling basis. Swings in the capture rate tend to move in a direct relationship with real estate and regional economic business cycles. This capture rate statistics is based on Census, PSU, ESRI Business Analyst figures and Metro Data Resource Center compilation of this data.

2018-2038 Growth Scenario Forecast Indicators

Table 12: Scenario Alternatives & Key Findings

		History	0	1	2	3	4
			1830	1831	1843	1835	1841
Line 1	GROWTH		MED	MED	LOW	MED	MED
Line 2	CAPACITY		LOW	HIGH	LOW	HIGH	MED
Line 3	UGB EXPANSION		NO	NO	NO	YES	YES
Line 4	FUTURE EXPANSIONS		NO	NO	NO	NO	NO
			Reference				Hedge
			Trend	Depend		Depend on	dependencies
			"No	on	Plan for	existing	on existing
			Action	existing	low	cap. w/ city	cap. w/ UGB
UGM N	Metrics:		Plan"	capacity	growth	UGB adds	adds
Figure 1	2018-2038 UGB Household Capture Rate (7- county)	61%	64%	72%	63%	72%	71%
	Historic Reference Period 1979-Present						
	2018 2028 Share of New Units by Tenurs Owners	C 49/	410/	410/	E 20/	4.70/	4.20/
rigure za	2018-2038 Share of New Units by Tenure, Downers	04%	41% E0%	41% E0%	23% //70/	42% E 20/	42% E 20/
	Listoric Pafarance Vagr for ALL households: (1000-2010 Co	50%	39%	59%	4770	36/6	36/6
	Historic Reference fear for ALL nousenolas. (1990-2010 Cer	lisusj					
Figure 2b	2038 Share of Units by Tenure, Owners	59%	55%	54%	57%	54%	54%
	2038 Share of Units by Tenure, Renters	41%	45%	46%	43%	46%	46%
	Historic Reference Year for ALL households: 2016 (ACS 1-ye	ear)					
Figure 3a	2018-2038 Share of New Units by Type, Single Family	64%	38%	30%	49%	31%	32%
gui e eu	2018-2038 Share of New Units by Type, Multi-Family	36%	62%	70%	51%	69%	68%
	Historic Reference Year for ALL households: (1990-2010 Ce	nsus)	02,0		01/0	0070	
Figure 3b	2038 Share of Units by Type, Single Family	68%	60%	56%	63%	56%	57%
	2038 Share of Units by Type, Multi-Family	32%	40%	44%	37%	44%	43%
	Historic Reference Year for ALL households: 2016 (ACS 1-year)						
Figure 4a	2038 Percentage of SF Capacity Remaining	N/A	0%	9%	12%	9%	8%
Figure 4b	2038 Percentage of MF Capacity Remaning	N/A	6%	36%	40%	38%	29%
Figure 5a	2010-2038 SF Housing Price, Relative Increase	207%	*	250%	161%	222%	292%
Figure 5b	2010-2038 MF Housing Price, Relative Increase	23%	*	76%	63%	67%	94%
	Historic Reference Period 1990-2010 (extrapolated to 28 ye	ars)					
Figure 6a	2010-2038 SE Housing Price, Annualized Percent	4.7%	*	5%	3%	4%	5%
Figure 6b	2010-2038 MF Housing Price. Annualized Percent	0.8%	*	2.0%	1.8%	1.9%	2.4%
0	Historic Reference Period 1990-2010						
	2038 MEDIAN = \$69,706			4.0			
Figure 7a	2038 Average Owner Monthy Housing Cost	\$1,784	*	\$3,771	\$2,881	\$3,488	\$4,257
Figure 7b	2038 Average Renter Monthy Housing Cost	\$1,258	*	\$2,189	\$2,049	\$2,111	\$2,383
	Historic Reference Year for ALL households: 2016 (ACS 1-ye	ear)					
	2028 Average Owner Months Henring Cost 1/ of his serve	2004	*	CEN/	F.00/	C004	720/
Figure 8a	2038 Average Owner Monthy Housing Cost, % of Income	30%	*	65%	50%	60%	/3%
Figure 8b	2038 Average Kenter Monthy Housing Cost, % of Income	30%	т т	38%	35%	36%	41%
	(ivieuran income Housenoids)						
	nistoric Rejerence Period: HOD benchmark		1020	1021	10/10	1025	10/1
* Sconaria	noduced uprealistically indicators (such as price appricat	ion) ind	icating that		L043	CCOT	1041
and the n	ublic sector would seek other solutions in the future such a	as the ot	her four sce	narios	Neto		





Chart 2: Forecast Housing Unit Price Apprciation 2018-2028 by Type, as APR



History: Single-family (SF) = 4.7% APR; Multifamily (MF) = 0.8% APR (Census: 1990-2010)



Chart 3: Forecast Year 2038 Total UGB Housings Unit Tenure Share





Homeownership rate history = 64% (Census: 1990-2010)

Chart 5: Forecast Type Share of All Housing Units in 2038



Chart 6: Forecast Type Share of New Housing Units 2018-2038



Structure type history: 64% SF; 36% MF (Census: 1990-2010)

Forecast Indicators Interpretations summary

Scenarios that suggest a viable "decision space" for Metro Council

Forecasts tested fourteen combinations of the growth, existing capacity, and expansion options describe above. **Not all scenarios can be considered tenable potential futures.** Staff identified the reference scenario (Scenario Zero) as representing recent historical trends carried forward (likely growth, low dependence on existing capacity, no UGB expansion or other public sector actions). Four of the other scenarios produced findings within or close to the range of historical values of the forecast indicators; staff suggest that those four scenarios define a tenable range of decision options for Council:

- 1) "Depend on existing capacity": Medium (Likely) growth / High existing capacity / No-expansion
- 2) "Plan for low growth": Low-growth / Low (historical) existing capacity / No-expansion
- 3) "Depend on existing capacity with choices added via city proposals": Medium (Likely) growth / High existing capacity / All city-proposed UGB expansions
- 4) "Hedge dependence on existing capacity and add housing choices via the city proposals": Medium (Likely) growth / Medium existing capacity / All city-proposed UGB expansions

Staff based their suggestion on several factors. First, indicators for the four suggested scenarios (1 through 4 above) show APR price appreciation for SF (3% to 5%) and MF (1.8% to 2.4%) in the range of historical values. The scenarios also show remaining MSA SF capacity close to/greater than 10% and ample MF capacity. Note that, in contrast, the reference scenario shows no remaining SF capacity and only about 5% MF capacity (which, given location preferences and other factors is essentially no remaining capacity). This highlights the need for more housing production than past trends have tended to produce (as tested in the other four scenarios) since the reference scenario is not a realistic possible future.

General Observations from the Forecast Scenarios

The reference scenario makes clear--by forecasting essentially no capacity left with a corresponding spike in price appreciation--that the region will need to increase housing production beyond historical production trends if it is to house its likely future population. Conversely, if decision-makers choose to plan for growth at the lower end of the forecast uncertainty band, then the Scenario 2 forecast suggests that historical housing production trends could be sufficient with no need for additional production from a UGB expansion.

Choosing to plan for likely growth would require--as tested in forecasts for Scenarios 1, 3, and 4 greater than historical housing production. This could be achieved by depending entirely upon existing capacity producing high numbers of housing units (especially through redevelopment) with no UGB expansion (Scenario 1), depending on high production with all or some city-proposed expansions to vary the housing choices (Scenario 3), or depending on medium-high production from existing capacity with some or all city-proposed expansions to provide additional choices (Scenario 4). Since high production levels from existing capacity depend upon MF redevelopment which in turn depends on having a strong economy (akin to the high end of the growth uncertainty range) Scenario 4 could be labeled a conservative dependence upon existing capacity.

Mix of Type and Tenure is Worth Thinking About

Staff observe that the forecast findings do suggest that decision-makers should reflect carefully on the housing choices (type and tenure) provided across the array of tenable alternatives. The forecasts tend to find that while consumers are probably willing to substitute MF for SF to a certain extent, that substitutability has limits: single-family and ownership opportunities will continue to be in strong demand. In other words, "the mix matters" as shown by changes across scenarios in the marginal choice of MF in future years and the asymmetry in the SF vs. MF price responses.

Housing Production in the City-Proposed Expansions Likely to Affect Regional Indicators

Scenarios 1 and 3 provide a look at the effects of housing production planned for in the city-proposed expansions, that being the only difference between forecast inputs for those two scenarios. The analysis indicates that if the total housing production in the city-proposed expansions comes to pass it would probably have noticeable but small effects at the regional level by lowering price appreciation somewhat in the SF (and very slightly in the MF) market and increasing the proportion of owned units somewhat. These findings should be considered in the context that they are within the model's margin of error.

Finally, the scenario forecasts altogether suggest two additional conclusions: if the region grows at the high end of the growth forecast uncertainty range then none of the housing production options tested is likely to suffice; and affordability will continue to be a challenge (no scenarios show particularly low price appreciation indicators). However, past experience has shown that expanding the UGB will not result in housing production if governance and infrastructure funding challenges are not addressed. It is important to note that the price statistics are aggregate indicators and not a statement of what individual households would actually experience.

Forecast Indicators Interpretations summary

The following section supplies a more-detailed discussion of the forecast indicators and each scenario.

Selection was based primarily on combinations of scenario input settings that yielded rent, home price and cost burdens that remained close to historical averages and trends. Economists often use price as an aggregate indicator of a healthy growing economy. The reaction of supply and demand reveal themselves in the performance of key price indicators, such as home values, rents and costs in the case of residential real estate markets. Staff judged the four selected scenario options plausible from a price appreciation standpoint for future renters and owners. The findings include regional aggregate cost burden indicators in consideration of the Housing and Urban Development (HUD) 30-percent-of-median household-income threshold as a guiding benchmark.

Because there is uncertainty in the scenario options, it is best to examine the scenarios comparatively, with a separate scenario as a reference case. The reference scenario should not be considered a tenable solution as compared to the four selected options. The reference case is based on the continuation of historic growth trends (i.e., medium regional growth), carrying forward historic-trend redevelopment capacity assumptions (i.e., redevelopment rate of the region for the last 9 years), and assuming no UGB expansions. The reference case is comparable to a "no action" plan or "status quo" scenario option. The discussion that follows shows future outcomes, with some more plausible than others. Taken as a whole, there are lessons learned.

Historical Trend "Reference" Scenario – Scenario O

The "no action" scenario is not a tenable scenario but it provides a useful reference or comparison for discussing the other scenarios. The "no action" scenario assumes the following main inputs for regional growth, buildable land inventory capacity and city-proposed UGB expansions.

Scenario 0 assumes:

- 1. Medium growth (i.e., likely trend regional employment and population growth);
- 2. Low or historical-trend existing capacity (i.e., redevelopment probabilities equal to historic rates over the last 9 years);
- 3. No UGB expansions.

Scenario 0 Discussion

- Surplus demand for SF products is indicated by the complete consumption of all single family (SF) capacity evidenced by a reading of 0% SF capacity remaining. Multifamily (MF) is virtually exhausted 6% left over.
- Surplus demand and no SF supply remaining causes sharp SF price appreciation reaching unrealistic values (or APR increases of almost 16% per year)
- Marginal ownership choice is 24 percentage points below the Census marginal share Historically, tenure choice has not shifted this rapidly.
- Mix of marginal structure type choice is "reversed" from historic absolute share. SF share is 26 percentage points below historic norms. This suggests continued demand for future SF capacity

(also evidenced by SF home prices spiking rapidly upward to unrealistic levels and the marginal ownership shift cited above)

• The scenario shows a consumer switch into MF which causes MF prices to also spike rapidly. Indeed, all price and affordability indicators are untenably high, signifying that this model run does not describe a viable, realistic future.

Scenario 0 Findings

- The price indices and complete consumption of SF supply suggest that this scenario does not represent a viable twenty-year solution.
- The results indicate that the region has need for additional housing production for both SF and MF--especially for SF--under the assumptions of likely growth and current market-trending levels for existing capacity.

Scenario 1

Scenario 1 assumes:

- 4. Likely (medium) Growth Forecast
- 5. High (threshold-price redevelopment) Existing Capacity Option
- 6. No UGB expansions

Scenario 1 Discussion

- Strong demand for SF products leaves only 9% SF capacity remaining.
- MF shows 36% capacity left over. The assumption of more redevelopment partly takes away price pressure in this scenario. However, demand to own still causes a sharp spike in home values (but rents to a much lesser extent as discussed in later bullet points).
- Surplus demand and little SF supply left over leads to a 20-year rice indictor increase of 250% in owner SF homes (or annual price increases of almost 4.6% per year). SF price increases are dampened as substitution partly draws away demand to into renting and MF residences.
- The swift SF price jump is additional evidence of strong demand for SF production.
- Marginal ownership choice is 23 percentage points below the Census marginal share Historically, tenure choice has not shifted this much, suggests that the limited capacity available for owner SF production might still be skewing forecast results.
- Mix of marginal structure type choice is reversed from the historic absolute share. SF share is 34 percentage points below historic norms.
- MF prices rise 76% by 2038. The assumption of a high MF redevelopment capacity in this scenario alternative helps dampen MF price appreciation.
- The owner affordability index indicator is 65% and the renter index is 38% of MFI, suggesting continuing concerns for affordability.

Scenario 1 Findings

• Scenario 1 assumes high redevelopment production within the current UGB, greater than historical trends. Redevelopment at this level would require a very strong economy and

perhaps (especially if actual economic growth is not particularly high) additional public sector policies and incentives to support and encourage the multi-family redevelopment market.

• If these conditions are met, Scenario 1 paints a conceivable future in which no UGB expansion would be necessary.

Scenario 2

Scenario 2 assumes:

- 7. Low Growth Forecast;
- 8. Low existing capacity assumption (historical trend redevelopment);
- 9. No UGB expansions.

Scenario 2 Discussion

- Growth at the lower end of the uncertainty range would take some pressure off housing production within the current UGB; SF capacity remaining indicator would be over 10% and MF at 40%.
- The higher supply-to-demand ratio in Scenario 2 produces the lowest price appreciation and affordability indicators across all the tenable scenarios (e.g. price appreciation at 3% APR for SF, 1.8% for MF)

Scenario 2 Findings

- Scenario 2 assumes historic-trend redevelopment production within the existing UGB and growth at the low end of the uncertainty range.
- If these conditions are met, Scenario 2 paints another conceivable future in which no UGB expansion would be necessary.

Scenario 3

Scenario 3 assumes:

- 1. Likely (medium) Growth Forecast
- 2. High Capacity Assumption (Threshold-price / high redevelopment option)
- 3. Expand the UGB using all four city-proposed expansions

Scenario 3 Discussion

- Scenario 3 is identical to 1 with the exception that 3 assumes all city-proposed UGB expansions enter the UGB and are made buildable by 2025, totaling about 9,200 more residential units.
- Strong demand for SF products is indicated by the low remaining SF capacity (9% remaining).
- MF shows 38% capacity left over. The assumption of more redevelopment dampens price pressures in a manner similar to scenario 1. Strong demand to own still causes home values to spike (but rents to a much lesser extent as discussed in later bullet points).
- Strong demand and little SF supply left over leads to a price jump of 222% in owner SF homes (or annual price increases of almost 4.3% per year). Prices in 3 don't rise as much as in scenario 1 because of the added city-proposed expansion capacity.

- Marginal ownership choice is 22 percentage points below the Census marginal share Historically, tenure choice has not shifted this much, suggests that the limited capacity available for owner SF production might be skewing forecast results.
- Mix of marginal structure type choice is "reversed" from the historic marginal share. SF share is 33 percentage points below historic norms.
- 20-year MF price indicator rises 67% by 2038. The assumed high level of redevelopment dampens the increase in MF price.
- The owner affordability index is 60% and the renter index is 36% of MFI, suggesting continued pressure on affordability.

Scenario 3 Findings

- Scenario 3 assumes production of redevelopment to exceed observed historical trends. Redevelopment at this level would require a very strong economy and perhaps additional public sector policies and incentives to support and encourage the multi-family redevelopment market.
- Housing production from the city-proposed expansions would probably lower price appreciation slightly and promote slightly higher ownership levels at the regional indicator level. This suggests that Scenario 3 provides somewhat more housing type and tenure choice than Scenarios 1 or 2.
- If these conditions are met, Scenario 3 describes a tenable choice that includes UGB expansions.

Scenario 4

Scenario 4 assumes:

- 1. Likely (medium) Growth Projection
- 2. Medium Capacity Assumption (triple historic probability of redevelopment @ at taxlot level)
- 3. Yes city-proposed UGB expansions

Scenario 4 Discussion

- Scenario 4 is most similar to Scenario 3, but with lower dependence upon existing within-UGB capacity
- Scenario 4 falls between Scenarios 1 and 3 in dependence upon existing capacity. The capacity setting in Scenario 4 asserts a 3-fold increase in the redevelopment probabilities over Scenario 2 (e.g. a taxlot 8% likely to redevelop in Scenario 2 would have a 24% probability in Scenario 4)
- Strong demand for SF products is indicated by the low amount of SF capacity remaining (8%)
- MF shows 29% capacity left over (Scenario 3=38%), consequently Scenario 4 price indices are close to the Scenario 3 outlook.
- Same demand as Scenario 3, but with less MF capacity than 3, the rise in price of SF housing is 292% (3=222%), rents rise 94% (3=67%). Yet another indication that SF and MF are not fully substitutable goods.
- The increase in SF price is another signal of the strong SF demand.

- Marginal ownership choice is 23 percentage points below the Census marginal share Historically, tenure choice has not shifted this much, suggests that the limited capacity available for owner SF production might be skewing forecast results.
- Mix of marginal structure type choice is "reversed" from the historic absolute share. SF share is 32 percentage points (Scenario 3=33%) below historic norms.
- The owner affordability index is 73% (Scenario 3=60%) and the renter index is 41% (Scenario 3=36%) of MFI, indicating continued pressure on affordability.

Scenario 4 Findings

- Scenario 4 assumes redevelopment capacity to exceed observed historical trend of last 9 years.
- Other things being equal, in order to hit a redevelopment probability that is set to 3 times greater than historical trend would require a very strong economy and perhaps public sector action to stimulate an increase in market-rate redevelopment
- SF price indicators still make affordability for owners a challenge, with less but still noticeable pressure on renters.
- If these conditions are met, Scenario 4 describes a tenable choice that includes UGB expansions with a less dependence upon existing capacity within the current UGB.

Closing Observations about the Residential Forecast Indicators

All scenario options point to the region needing more than historic-trend housing production. Potential public sector actions could include city-proposed UGB expansions, market-wise incentives to boost redevelopment above historical trends, or other public-sector initiatives to stimulate existing redevelopment activity within the current UGB. Also, increasing private sector redevelopment may occur as a market response to strong demand for housing. Robust price appreciations in all scenarios indicates the ongoing challenges of affordability.

The city-proposed UGB expansions provide potentially-feasible housing production and could offer additional types of choice (the concept-planned production would be about two-thirds SF). This is assuming that cities, local utility districts and private developers come together and are able to follow through with actual housing production commensurate with the proposals' concept plans.

- The capacity estimated for city-proposed expansions in total add up to about 1 year of residential production.
- The estimate is 9,200 units from totaling the city proposals. (This is a Metro estimate and will change as more detailed planning and zoning concepts are made available.)
- The region averages about 10,000 to 12,000 new units produced a year.
- In the current real estate cycle, new units have reached a peak of 17,000 permits in a year.
- Recent housing production conditions show some signs of MF production slowing.
- Historically, the homeownership rate is about 60% over the last 40+ years.
- Structure type final demand, historically, is about two-thirds single family (SF).
- Prior to the Great Recession, permits for SF construction ran close to 70% of total units

- Since then, the average has been closer to a 50/50 mix of SF and MF.
- The city-proposals' impact on real estate production is small as compared over the next 20 year period other things being equal amounts to less than 5% of total production demanded.
- City proposals (assuming the housing gets built) impact indicators in a directions that likely support regional policies related to housing choices.

Employment Forecast Results – PRELIMINARY 2018 UGM Scenario Findings

Note: the non-residential (employment land) supply planned for in the city-proposed UGB expansions is small. The city-proposed expansions are primarily focused on adding more residential supply to the current UGB.

MSA Employment Forecast

The MSA employment forecasts for the UGM – Low Growth, Medium (likely) Growth, and High Growth – appear in a table below. The forecast spans years 2018 to 2038, grouped by employment sectors (retail, service, industrial, and all else). Each forecast shows the growth between 2018 and 2038 and the shares of the total 2018-2038 growth for each sector. Note that there is either very small growth or a net loss for industrial employment over the 20-year time period.

The supersectors definitions, based on North American Industrial Classification System (NAICS) categories, appear in a separate table below.

Comparing the range forecasts, two things to note are first, that there is a wide range in the absolute growth, and second, that there is a shift in the shares by sector. The approach taken of interpreting results is to compare pairs of scenarios that reflect the changing of one policy variable at a time (i.e., the settings for growth, capacity, city-proposed UGB expansion and future expansions). As the range forecasts are relatively far apart, it makes sense to pair the scenario comparisons so that one is always comparing pairs with the same forecast setting.

To illustrate the difference in the sector growth shares, observe the sharper drop in industrial jobs in the low scenario relative to the medium growth forecast. Note also that industrial jobs edge up in the high growth scenario. These 7-county MSA forecast outcomes are not a consequence of Metro UGB land supply considerations, but relate to macroeconomic trends seen nationwide.

Table 13: MSA Employment Forecast Range, by Year and Supersector

MSA EMPLOYMENT

Growth Forecast	LOW	MED	HIGH					
Retail (2018)	230,430	242,680	257,880					
Service (2018)	302,543	323,823	351,710					
Industrial (2018)	150,667	165,717	7 181,560					
Other (2018)	439,972	476,642	517,302					
TOTAL (2018)	1,123,612	1,208,862	1,308,452					
Retail (2038)	242,170	264,190	285,480					
Service (2038)	362,875	407,399	452,777					
Industrial (2038)	131,725	156,571	181,673					
Other (2038)	522,322	590,132	646,572					
TOTAL (2038)	1,259,092	1,418,292	1,566,502					
2018 to 2038 change:								
Retail	11,740	21,510	27,600					
Service	60,332	83,576	101,067					
Industrial	-18,942	-9,146	113					
Other	82,350	113,490	129,270					
TOTAL	135,480	209,430	258,050					
MSA 2018 to 2038 Change Shares by Sector:								
Retail	9%	10%	11%					
Service	45%	40%	39%					
Industrial	-14%	-4%	0%					

61%

100%

54%

100%

50%

100%

Other

TOTAL

Table 14: Employment Supersector Definitions

EMPLOYMENT SECTORS

Retail and Consumer Services	NAICS 44,45,71,72	RETAIL	
Professional and Business Services	NAICS 22, 51-56	SERVICE	
Other Services	NAICS 81		
Manufacturing - Durable	NAICS 321, 331-333, 335-339		
Manufacturing - High Tech.	NAICS 334	INDUSTRIAL	
Manufacturing - Nondurable	NAICS 311-316,322-327		
Transportation, Warehousing	NAICS 48,49	03	
Agriculture, Mining and Forestry	NAICS 11, 21		
Construction	NAICS 23		
Wholesale Trade	NAICS 42		
Health and Social Services	NAICS 62	OTHER	
Education (private)	NAICS 61 (private)		
Government - Education	NAICS 61 (public)		
Government - Non-Education	All other public		

Table 15

UGB EMPLOYMENT, TOTALS BY SECTOR

	0	1	2	3	4
	1830	1831	1843	1835	1841
Growth Forecast	MED	MED	LOW	MED	MED
Existing Capacity	TREND	HIGH	TREND	HIGH	TREND+
UGB Expansion Capacity	NONE	NONE	NONE	YES	YES
Retail (2018)	175.611	175.985	167.424	175.622	174.689
Retail (2038)	185.977	187.043	172.704	186.141	184.278
change	10,366	11,058	5,280	10,519	9,589
% change	5.9%	6.3%	3.2%	6.0%	5.5%
•					
Service (2018)	255,572	255,843	239,123	255,559	255,996
Service (2038)	305,235	306,164	273,690	304,920	310,729
change	49,663	50,320	34,567	49,360	54,733
% change	19.4%	19.7%	14.5%	19.3%	21.4%
Industrial (2018)	129,829	129,781	117,963	129,829	128,908
Industrial (2038)	123,392	122,966	103,170	123,061	121,528
change	-6,438	-6,815	-14,793	-6,768	-7,380
% change	-5.0%	-5.3%	-12.5%	-5.2%	-5.7%
Other (2018)	362.728	363.295	335.882	362.776	362.989
Other (2038)	442.914	444.490	394.470	442.738	444.194
change	80,186	81,195	58,588	79,961	81,205
% change	22.1%	22.3%	17.4%	22.0%	22.4%
•					
TOTAL (2018)	923,740	924,904	860,392	923,786	922,582
TOTAL (2038)	1,057,517	1,060,662	944,034	1,056,859	1,060,729
change	133,778	135,758	83,642	133,073	138,146
% change	14.5%	14.7%	9.7%	14.4%	15.0%

Table, above, shows the employment distribution results for scenarios options selected as having tenable indicators.

Comparing UGM Scenario Impact – Metro UGB Employment

Paired comparisons are shown between scenario 0 (i.e., reference case) vs. the selected scenario options.

Changing existing capacity inside the Metro UGB

- Scenario 0 Low (historical trend) existing capacity vs. Scenario 1 High (threshold method) existing capacity
- Both have Likely (Medium) Growth, No UGB expansions

Scenario 0 shows a total 2018-2038 growth of 133,778 jobs, while Scenario 1 shows a total growth of 135,758, a difference of 1,981 jobs. In terms of relative change, Scenario 0 shows 14.5% while 1 shows 14.7%, a difference of 0.2 percentage points.

Changing the MSA level growth forecast

- Scenario 0 Medium Growth vs. Scenario 1 Low Growth
- Both assume Low (historical trend) existing capacity, No UGB expansions

Scenario 0 shows a total 2018-2038 growth of 133,778 jobs, while Scenario 1 shows a total growth of 83,642, a difference of 50,136 jobs in the Metro UGB. In terms of relative change, Scenario 0 shows 14.5% while Scenario 1 shows 9.7%, a difference of 4.8 percentage points.

Testing impact of city-proposed UGB expansions – low vs. high existing capacity assumptions

- Scenario 0 Low (historical trend) existing capacity vs. Scenario 3 High (threshold method) existing capacity
- Both have Likely (Medium) Growth,
- Scenario 0 No UGB expansions vs. Scenario 3 all city-proposed UGB expansions included

Scenario 0 shows a total 2018-2038 growth of 133,778 jobs, while Scenario 3 shows a total growth of 133,073, a difference of 705 jobs. In terms of relative change, Scenario 0 shows 14.5% while Scenario 3 shows 14.4%, a difference of 0.1 percentage points. Staff would not expect significant difference in these two scenarios for two reasons: very little employment capacity is assumed in the city proposals and all other capacity inputs are the same as the previous pair-wise comparison, which also revealed little impact on UGB employment

Testing impact of city-proposed UGB expansions – low vs. medium existing capacity assumptions

- Scenario 0 Low (Trend-Regression) Capacity vs. Scenario 4 Medium (Trend-Regression @ 3 times historical redevelopment rate) Capacity
- Both have Likely (Medium) Growth
- No city-proposed UGB expansions in Scenario 0 vs. Scenario 3, which has all city-proposed UGB expansions included

Scenario 0 shows a total 2018-2038 growth of 133,778 jobs, while Scenario 4 shows a total growth of 138,146, a difference of 4,368 jobs. In terms of relative change, Scenario 0 shows 14.5% while Scenario

1 shows 14.7%, a difference of 0.5 percentage points. Staff would not expect significant difference in these two scenarios for two reasons: very little employment capacity is assumed in the proposals and all other capacity inputs are the same as Scenario 0 vs. Scenario 1, a comparison that also revealed little impact on UGB employment

Conclusion - employment scenario results

Based on the scenario comparisons, there was little difference detected between the various scenarios on the employment future. In each comparison, the difference was only a few thousand jobs over the entire 20-year period, or a difference of less than half a percent when looking at growth relative to 2018. The results by employment sector likewise show little change between pairs of policy alternatives.

The explanation for the small changes is due to the fact that the scenarios assumed small changes to nonresidential land inputs in the scenarios. Total commercial land inside the UGB for the "Low" and "High" capacity scenarios was 2,153 and 2,529 acres, respectively – a difference of only 376 acres. Over twenty years, this represents a difference of less than only 20 acres per year. Only four acres of commercial land would be added to the UGB by all four city-proposed expansions taken together. There was no change in industrial land between the existing capacity options or between the city proposals. However, assuming the availability of UGB expansions for industrial uses would not increase industrial employment since the 7-county MSA industrial employment forecast points to decreased or flat industrial employment. For the future expansion scenarios, through 2038 there were 260 acres of capacity for each of industrial and commercial land. In summary, small changes in inputs yielded small changes in the employment allocations.