Appendix 1b

Frequently asked questions about population and employment forecasting

How does Metro develop its employment and population forecasts?

We rely on computer models to forecast and help foresee future trends (and ranges) in employment and population growth in the region. The region is the Portland-Vancouver-Hillsboro MSA (i.e., Portland MSA). Our computer model is a statistical, regression-based economic representation of the regional economy. The econometric model is integrated with a traditional cohort-component population model. The econometric portion of the model predicts regional employment, income and wage trends while the cohort model predicts regional population growth. (This econometric model also has tie-ins to MetroScope – an integrated land use distribution model – and a Transportation Demand Model (TDM) to complete Metro's suite of detailed socio-economic, land use and transportation models).

What counties make up the Portland-Vancouver-Hillsboro MSA?

The U.S. Office of Management and Budget (OMB) has the responsibility of delineation and periodically refreshing the counties that make up metropolitan statistical areas (MSA). The recent rendition of the Portland MSA includes the following counties in two states.

Oregon counties:

- Clackamas
- Columbia
- Multnomah
- Washington
- Yamhill

Washington counties:

- Clark
- Skamania

Metro updates its regional definition and associated models whenever there is an official change in MSA delineations.

Why does Metro produce a forecast for the larger metropolitan area instead of the urban growth boundary, counties and cities?

Eventually, in coordination with cities and counties, Metro does produce forecasts for smaller geographies. However, we start with the seven-county MSA for several reasons, including:

- The most current population and employment numbers from the federal government are for the MSA geography. We want to make sure we can tie our forecast to actual historic numbers.
- We need to understand the larger context of the economic region before forecasting greater detail.
- We're "showing our work" instead of jumping to forecasts for smaller geographies.

What are the key assumptions for the regional population forecast?
A population forecast is comprised of 3 primary components:

- Births
- Deaths
- (Net) Migration.

Demographers use the term ”natural increase” to describe births and deaths added together. “Net migration” takes into account migration inflows minus migration outflows. The mechanics of any population model are simply adding together estimates of natural increases and net migration to arrive at a population forecast. Extrapolating natural increase and net migration into future years yields a population forecast.

The regional population forecast thus depends on projection rates for births, deaths and migration. The birth and death rate projections are assumptions derived from Census data and specifically adjusted for age. Race, ethnicity and sex are also major factors that affect birth and death rates. Differences caused by these factors are factored into the projections. The migration component derives from a regression analysis that considers economic trends with observed net migration data and is integrated with the Metro economic forecast. (The notion being that migration ebbs and flows with business cycles and economic trends.)

Birth rates – Metro relies on the U.S. Census Bureau to supply births rate assumption for future forecast years. These rates are age-adjusted according to the birth mother’s age. Because these birth rates are for the U.S., Metro re-calibrates these birth rates so that they align with historical age-adjusted birth rates observed in the Portland MSA for the last 15 years.

Death rates – Metro relies on the U.S. Census Bureau and Centers for Disease Control (CDC) to supply death rate assumptions. These rates are adjusted according to age bracket. Because these death rates are for the U.S., Metro re-calibrates the death rates so that they align with historical regional age-adjusted rates observed for the last 15 years.

Net Migration – Metro bases its migration forecast on historical trends. The historical net-migration estimates are provided by Portland State University Population Research Center. The Metro migration forecast is tied into the regional econometric model and regional forecast. We have found statistically significant socio-economic relationship between annual migration rates and the pace of regional economic activity. We exploit this relationship within the Metro regional econometric model to predict net migration flows to the MSA region.

What data sources are used in preparing the population forecast?

- Portland State University Population Center – basic county population estimates, http://www.pdx.edu/prc/population-estimates-0
- Washington State Office of Financial Management, http://www.ofm.wa.gov/pop/

- U.S. Census Bureau, National Population Projections, http://www.census.gov/population/projections/data/national/index.html
- Oregon county vital statistics, http://public.health.oregon.gov/BirthDeathCertificates/VitalStatistics/annualreports/CountyDataBook/Pages/cdb.aspx
- Washington State county vital statistics, http://www.doh.wa.gov/DataandStatisticalReports/VitalStatisticsData.aspx

What are the main economic drivers for the regional employment forecast?

The Metro regional employment forecast is based on projections from a structural econometric model. What this means is that for each key regional industry, we use statistics – i.e., regression analysis – to forecast what direction we think the employment in the industry will grow. The focus is to define an econometric or statistical relationship between the dependent variable (industry employment) and a set of one or more independent variables. This statistical relationship typically describes how we understand regional employment will grow over time with expected variations in the independent variable(s). Metro keeps this regional econometric model up to date with the most recent data available as it prepares the regional forecast.

For us to forecast regional employment trends, we need to have assumptions about future values for the independent variables in each regression equation. As we have done so in previous regional employment forecasts, we get future estimates for these independent variables from IHS Global Insight. IHS is the leading provider of diverse global market and economic information. IHS is a global information company with world-class experts in the pivotal areas shaping today's business landscape, including energy, economics, geopolitical risk, sustainability and supply chain management.

The Global Insight 30-year Long-term U.S. macroeconomic outlook serves up the economic drivers that are the cornerstone for the Metro regional forecast. The economic drivers (or variables) include:

- forecasts of GDP and its components (e.g., consumption, investments, imports/exports and government spending)
- interest and inflation rates
- foreign exchange rates
- production and productivity
- demographics

What data sources go into preparing the employment forecast?

- IHS Global Insight - U.S. macro-economic drivers (variables include GDP components, interest rates, foreign exchange rates, inflation rates, production and productivity, etc.), http://www.ihs.com/index.aspx (data are proprietary and on paid subscription)
- U.S. Census, http://www.census.gov/
- Bureau of Labor Statistics, http://www.bls.gov/home.htm

- Bureau of Economic Analysis, http://www.bea.gov/
- Oregon Employment Department, http://www.qualityinfo.org/olmisj/CEW

How are the "range forecasts" created by Metro?

To recognize that forecasts carry an element of uncertainty, Metro generates a forecast range for total regional population and employment by industry sector and sums the industry ranges for total regional employment. The ranges represent a 90% confidence interval that future employment and population for the region will fall within this growth band. Another way of saying is that 10% of the time we might expect growth to be faster or slower so that population and employment growth in these instances will fall outside of the confidence interval.

Since the methodology for creating the population and employment forecasts are different, the approach for creating ranges plays to the strengths of each methodology.

Population Range Methodology – The regional population forecast employs a standard cohort-component approach for projecting future population growth. Recall that the cohort-component relies on a set of assumptions for age-adjusted birth and death rates and net migration. Since these are assumptions, it's not much of a stretch to imagine that these assumptions could be wrong or have some standard error to them. Further, if we imagine that each of these assumptions is in actuality a continuous random variable, then it is possible to assign a probability density function that describes the expected value of the population component rate assumptions and to then ascribe a standard forecast error that is akin to a standard deviation to account for some uncertainty in these assumptions.

Having no prior knowledge of what the true shape of the probability density function is for the population components, we assert that the error distribution for each population component is normally distributed. A normal distribution is useful and a unique error distribution can be defined by a mean and a standard deviation. We assume that the expected values in the baseline forecast assumptions represent the mean of the normal distribution while the standard deviation is represented by estimating the standard error of the forecast for each birth and death rate component.

Applying a monte carlo computation method, each population component is randomized 10,000 times and each time a new alternative population simulation is calculated. Because of the properties of a normal distribution, the chance of one of the alternative population forecasts is more likely to fall closer to the expected or mean value represented by the baseline population forecast than near the tail ends. By tabulating all 10,000 alternative population simulations into a crosstab, we end up having a population forecast range or interval. Within in this interval, we can easily infer from the tabulation what percentage of forecast alternatives fall within 1, 2 or more standard deviations from the forecast baseline (or mean). By repeating the simulations many times and tabulating these results, we may infer from these random draws a confidence interval that is "bell-shaped".

Employment Range Methodology – The regional employment forecast is computed from a regional econometric model that is rooted in regression analysis. This means that for each equation there is a

forecast standard error calculated from the regression. From here, it is straight forward to infer a 1- or 2-standard deviation forecast range for each industry sector. The range is computed by taking the baseline forecast as an anchor point and adding/subtracting twice the value of the forecast error. This range represents a 90% confidence interval or 2 standard deviations.

What importance is attributed to the Metro baseline forecast for population and employment?
The baseline population (and employment) forecast serves as an anchor point for the range forecast. The range represents statistically a confidence interval (typically 2 standard deviations or equal to 90%) for the uncertainty the forecaster has over the forecast. The confidence bands usually grow wider over time as the forecast years increase away from the forecast base year. Typically, the base year for demographic data is a decennial census year (e.g., 2010) and the employment and other economic variables will vary with most base years set in the case of this forecast as 2013 (part year).

Why doesn't Metro use the population estimates from PSU's Population Research Center (PRC)?
Population estimates aren't the same as a population forecast or projection. As the PRC says on its website, population estimates are annual population estimates prepared by the center as current year estimates for the years in the decade between the most recent decennial census and the next decennial census. (source: http://www.pdx.edu/prc/population-estimates-0)

Why doesn't Metro use the population forecasts from PSU's Population Research Center (PRC)?
The timing of PRC's population forecast for the Metro area is out of sync with when Metro needs this information for the analysis to go into the 2014 Urban Growth Report.

PSU and DLCD are now working together to come up with a schedule to forecast population growth of the State and its counties and cities. But an agreement for this work has not yet been hammered out and forecast work has not yet begun. Meanwhile, Metro has need for this information now in order stay on schedule with meeting its 5-year mandate to review the region's capacity for accommodating a future 20-year growth expectation.

Is the Metro population forecast coordinated with PSU's Population Research Center (PRC)?
Yes. Metro and PRC formally reviewed and shared component assumptions for population growth of the region. Metro shared its forecast methodology with PRC and had them scrutinize the approach, component assumptions and review the forecast results for the baseline and range. PRC staff also participated in Metro's regional forecast review panel (see next question).

Was the regional forecast peer reviewed?
Yes. Metro convened a panel of experts from the region to review the veracity of the 2014 regional forecast (and range). The panel met twice. The first time was to discuss the U.S. macro-economic outlook (IHS Global Insight), review the model's structure and to provide preliminary feedback on the general tone and direction of the forecast assumptions. The second meeting was to confirm the veracity of the baseline and discuss factors and assumptions that could influence the direction and magnitude of a high and low growth forecast scenarios.

Members of the peer review panel included staffs from Portland State University (PSU) Population Research Center, PSU center for sustainability, PSU Northwest Economic Research Center (panel chaired by Dr. Thomas Potiowsky), NW Natural, Johnson Economics and EcoNorthwest Consulting. A summary of the panel's discussions is included in the Urban Growth Report's appendices.

Has the 2014 regional forecast been coordinated with local governments?

As yet, no. The regional forecast will be reviewed and coordinated with local jurisdictions in the context of Metro's growth distribution process depicted in Figure 1. This step takes place after state acknowledgement of the Metro Council's decision to adopt a regional forecast. When the time comes, the regional forecast will be distributed to traffic analysis zones (TAZ) for households and employment. In turn, TAZ estimates (which are smaller than census tracts) may be subtotaled to approximate population (or employment) by city limits. This work requires detailed coordination with cities and counties.

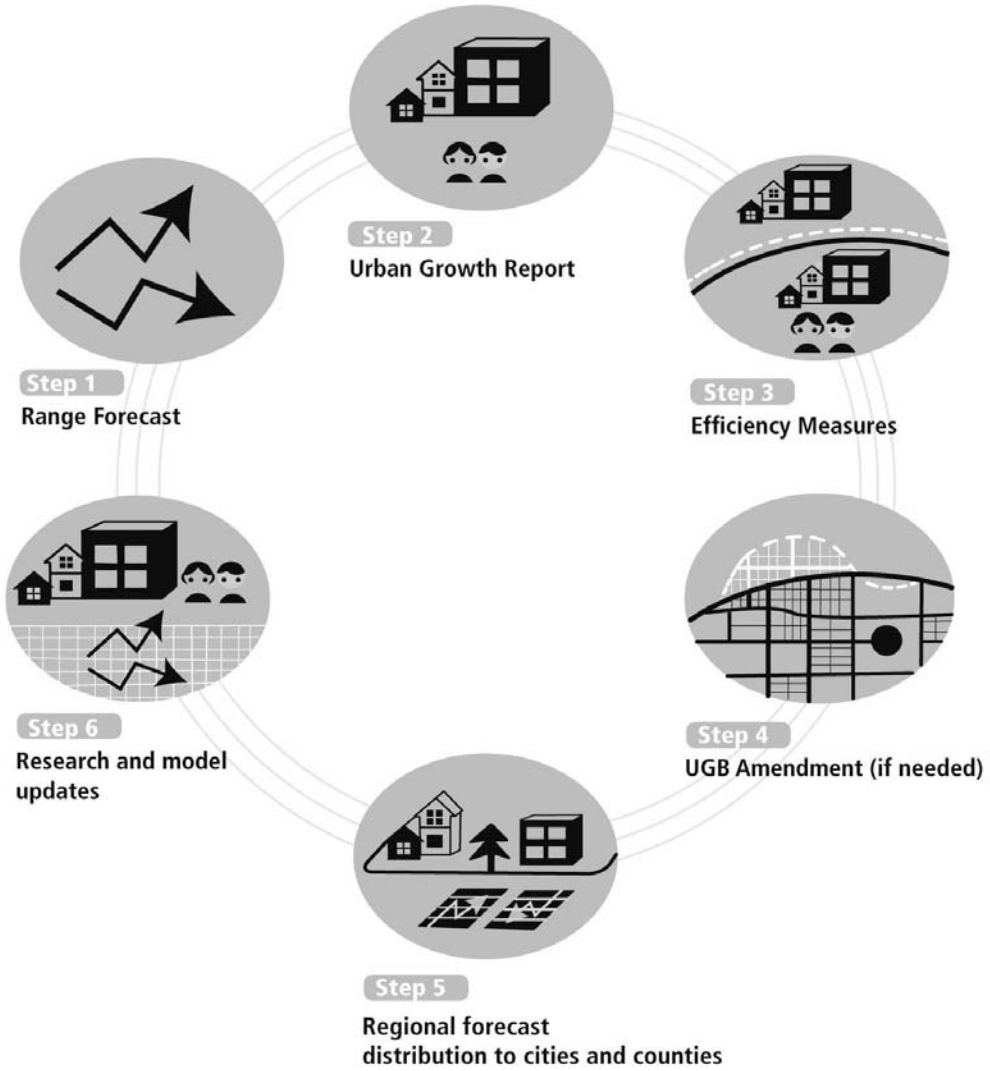

Figure 1: Illustration of Forecast, Legislative & Growth Coordination Cycle

What's different about regional vs. county forecasts (or other smaller geographies)?
Smaller geographies – even counties – historically experience broader growth trend fluctuations than regional or state forecasts. Bigger areas benefit from larger numbers that tend to smooth out local variations that are hard to predict or near impossible to expect. We see the regional and county differences play out in the forecast because of specific geographic disparities and advantages. For example, why did the high tech economy sprout in Silicon Forest in Washington County and not Clackamas or Multnomah? This historical idiosyncrasy creates regional and subregional growth rate differences that show up in the county-level job forecasts. Migration and differences in housing preferences and the mix of housing supply in each county played a role in bolstering suburban population growth during the 1980's and 90's. This too led to variations between county vs. regional growth rates.

What modeling tools does Metro use to prepare forecasts areas smaller than the Portland-Vancouver-Hillsboro metropolitan statistical area? Why?
MetroScope, which is a mathematical economic model developed to analyze and simulate urban growth and predict future development patterns. It is what scientists call an integrated land use and transportation model. It is state-of-the-art market equilibrium model which is capable of forecasting where population and employment will locate in the future. It is a model that explicitly considers where people live and work in the future after taking into account regulatory, market trends, and socio-economic factors that could impact the ease of future transportation and commuting, the price of real estate, and the availability of land supply for housing and industry growth. These are factors that a traditional cohort-component population model is not capable of assessing.

The smallest geography for which Metro produces forecasts is the Transportation Analysis Zone (TAZ). The TAZ forecast is primarily used by Metro and local area transportation forecasters and modelers. TAZ are pretty small areas – about ¼ the size of a typical census tract. There are over 2,100 TAZ geographic units in the Portland region. This data is used as inputs in modeling congestion, transit, and traffic flows for transportation and corridor planning projects. Examples of recent uses include the Columbia River Crossing (CRC) Study, Southwest Corridor Planning Project (SWCP0, East Metro Connections Plan (EMCP), and updates to the Regional Transportation Plan (RTP).

Why are forecasts sometimes incorrect?
Creating a forecast requires us to make assumptions or guesses about events that have not yet occurred, and if those future actual events don't match our assumptions about them, the forecast can be incorrect. Forecasts are not always correct – whether the models are founded on statistical relationships or cognitive – because the models we use are necessarily simplifications of the real world. If events in the real world drift away from the theoretical and practical underpinnings of our models, the forecast results from our model will look very different from the events that unfold in the future.

Forecasts are often not always correct due to unforeseen fluctuations in the inputs we use to make the forecast. And even when we are able to predict these fluctuations, we may be wrong about the

magnitude of change in these factors. Sometimes these fluctuations are simply measurement errors which are eventually revised or re-benchmarked according to better and more full accounting by federal and state statistical agencies. Regardless of the type of error – whether it's measurement error or a judgment error about how input assumptions will impact the forecast – these discrepancies in what we call inputs are partly to blame for forecasts that are not always correct.

The models we use are mathematical constructs of reality based on statistical relationships and observed over many years. If these statistical correlations break down in the future, regardless of how accurately we predict the input assumptions, the relationships between the input drivers and the forecasts are likely to be led astray from actual future events.

In sum, error sources include:

1. Historical estimates could be wrong (re-benchmarked/revised in later years when more/better data become available)
2. Socio-economic drivers / assumptions could be wrong (independent variables used in the forecasting of employment are themselves forecasts and likely based on other forecast assumptions)
3. Unanticipated and very large economic shocks are unanticipated
4. Theoretical basis for the forecast could be wrong
5. Statistical relationships assumed from econometric analysis do not carry forward into the future and therefore could lead to wrong conclusions.

Why do population forecasts seem more accurate than employment forecasts?
Population forecasts generally reveal themselves to be closer to actual trends because the factors / input assumptions that drive the forecast are more predictable. We have to rely on future assumptions about mortality and birth rates and future migration levels in order to forecast regional population growth.

Mortality and birth rates vary over time, but generally these variations happen slowly and in relatively predictable patterns. Additionally, the differences between national rates and regional rates are generally similar so we can very reasonably rely on national data sets to predict regional natural population increases.

Predicting migration is a more difficult problem and suffers from greater historical deviations. Moreover, past migration trends may not be directly comparable to future levels because of the potential for sweeping economic fluctuations that could swing the migration level wildly up or down according to regional business cycles.

Why do employment forecasts have greater uncertainty?
Employment (and economic) forecasts are generally less accurate because there are so many more variables involved that we are able to consider only part of the economic picture. There is a much

higher degree of uncertainty in the variables we use to predict regional employment. Besides more uncertainty in the input variables, the economic relationship between the regional economy and national/global economy is also subject to wider economic shifts. In other words, past performance is no guarantee of future results.

How do Metro's past Metro forecasts hold up when compared with actual growth?
Metro has looked back at three forecasts: 1985, 2000, and 2010 vintage forecasts. There's not enough history gone by to make a legitimate comparison of the 2010 regional forecast. This leaves the 1985 and 2000 forecasts for comparison.

1985 vintage regional forecast
The 1985 regional forecast shows a -9.4 percent forecast error in population. This is a pretty accurate forecast given that it has a less than 1% annual error rate (-9.4% / 15 years = -0.62%). The negative sign indicates population grew faster than projected. This is not surprising since the region experienced an unexpected higher level of migration in the late 80's and early 90's as "equity migrants" cashed out of lucrative homes in southern California and settled here in the Portland area due to its milder climate and attractive real estate opportunities.

The 1985 regional forecast showed a miniscule percent forecast error in employment of -3.3 percent by the end of its 20 year forecast horizon in 2005. This forecast was remarkably accurate despite the economic turmoil (positive and negative) that played out during the 20 year time frame.

Lastly, in terms of business cycle comparisons, both 1985 and 2005 are roughly at the same stage of the business cycle – i.e., both are trending up and somewhere in the middle of the peak and trough of their respective recessions. For trend analysis point of view, this is a fair comparison.

2000 vintage regional forecast
The 2000 regional forecast shows a 3.2 percent forecast error in population. Averaged over 10 years, this represents a pretty close difference between the forecast and actual events.

The 2000 regional forecast shows a very wide error margin in employment of 22.1% (or a difference of 211,688 jobs by 2010). The mitigating reason for this wide margin was of course the Great Recession. In terms of trend comparison purposes, this is the worst comparison to make because the 2000 base year was a peak business cycle year while 2010 is trough business cycle year. Without the recession (or comparing peak to peak in the trend) the regional economy would have yielded about 200,000 more jobs on a trend basis, but the unforeseen Great Recession caused instead a loss of 70,000 annual jobs (2008-10).

A Regional Population & Employment Forecast to 1990 & 2005

Portland Metropolitan Area : July 1985

A service of the Intergovernmental Resource Center, Metropolitan Service District

	Forecast Population		Actual Population (Census or PSU)				
	1990	2005	1980	1990	2000	2005	2010
7-county MSA	N/A	N/A	1,341,542	1,523,741	1,928,339	2,067,325	2,226,009
4-county region	1,410,500	1,739,572	1,242,645	1,412,344	1,789,915	1,919,220	2,066,399
3-county region	1,177,373	1,424,264	1,050,418	1,174,191	1,444,677	1,524,943	1,641,036
Clackamas County	284,067	362,477	241,911	278,850	338,391	359,308	375,992
Multnomah County	597,728	652,510	562,647	583,887	660,486	674,862	735,334
Washington County	295,578	409,277	245,860	311,554	445,800	490,773	529,710

1990		2005	
Difference	%Difference	Difference	%Difference
-1,844	-0.1%	-179,648	-9.4%
3,182	0.3%	-100,679	-6.6%
5,217	1.9%	3,169	0.9%
13,841	2.4%	-22,352	-3.3%
-15,976	-5.1%	-81,496	-16.6%

	Forecast Employment		Actual Employment (BLS)				
	1990	2005	1980	1990	2000	2005	2010
7-county MSA	N/A	N/A	582,700	730,400	973,300	983,600	968,800
4-county region	686,900	910,010	556,210	698,430	933,310	941,481	927,532
3-county region	595,400	780,010	491,131	607,167	810,325	807,118	793,019
Clackamas County	84,400	120,000	62,102	92,268	133,056	143,621	136,805
Multnomah County	370,400	433,000	334,766	375,768	453,254	428,305	421,452
Washington County	140,600	227,010	94,263	139,131	224,015	235,192	234,762

1990		2005	
Difference	%Difference	Difference	%Difference
-11,530	-1.7%	-31,471	-3.3%
-11,767	-1.9%	-27,108	-3.4%
-7,868	-8.5%	-23,621	-16.4%
-5,368	-1.4%	4,695	1.1%
1,469	1.1%	-8,182	-3.5%

7-county MSA: Oregon: Clackamas, Columbia, Multnomah, Washington & Yamhill.
Washington: Clark & Skamania

4-county: Clackamas, Multnomah, Washington & Clark

3-county: Clackamas, Multnomah & Washington

forecast source: Metro Data Resource Center

Economic Report to the Metro Council: 2000-2030 Regional Forecast

Proposed Final DRAFT; Released March 2002, Revised September 2002

Metro Data Resource Center, Gen 2.3 TAZ forecast allocation, final draft circa 2006

	Forecast Population							Actual Population (Census)			
	2000	2005	2010	2015	2020	2025	2030	1980	1990	2000	2010
7-county MSA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,341,542	1,523,741	1,928,339	2,226,009
5-county PMSA	1,874,450	2,049,190	2,233,890	2,394,100	2,571,100	2,768,200	2,955,300	1,297,977	1,477,895	1,874,449	2,165,592
4-county region	1,789,460	1,956,300	2,134,300	2,287,000	2,455,700	2,643,700	2,821,000	1,242,645	1,412,344	1,789,915	2,066,399
3-county region	1,422,316	1,543,528	1,697,006	1,775,618	N/A	N/A	2,177,840	1,050,418	1,174,191	1,444,677	1,641,036
Clackamas County	336,413	365,035	404,278	447,794	N/A	N/A	618,779	241,911	278,850	338,391	375,992
Multnomah County	643,962	683,949	734,980	744,632	N/A	N/A	863,170	562,647	583,887	660,486	735,334
Washington County	441,941	494,545	557,748	583,192	N/A	N/A	695,890	245,860	311,554	445,800	529,710

2000		2010	
Difference	%Difference	Difference	%Difference
1	0.0%	68,298	3.2%
-455	0.0%	67,901	3.3%
-22,361	-1.5%	55,970	3.4%
-1,978	-0.6%	28,286	7.5%
-16,524	-2.5%	-354	0.0%
-3,859	-0.9%	28,038	5.3%

	Forecast Employment							Actual Employment (BLS, OR & WA Labor Dept.)			
	2000	2005	2010	2015	2020	2025	2030	1980	1990	2000	2010
7-county MSA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	582,700	730,400	973,300	968,800
5-county PMSA	958,020	1,043,490	1,168,680	1,273,200	1,387,700	1,515,500	1,641,500	572,600	718,770	960,910	956,992
4-county region	930,900	1,011,860	1,134,000	1,234,900	1,345,600	1,469,000	1,590,100	556,210	698,430	933,310	927,532
3-county region	832,841	903,459	1,009,987	1,086,224	N/A	N/A	1,407,999	491,131	607,167	810,325	793,019
Clackamas County	134,639	146,256	166,060	188,964	N/A	N/A	251,284	62,102	92,268	133,056	136,805
Multnomah County	461,867	492,507	542,434	572,849	N/A	N/A	705,729	334,766	375,768	453,254	421,452
Washington County	236,335	264,697	301,492	324,411	N/A	N/A	450,986	94,263	139,131	224,015	234,762

2000		2010	
Difference	%Difference	Difference	%Difference
-2,890	-0.3%	211,688	22.1%
-2,410	-0.3%	206,468	22.3%
22,516	2.8%	216,968	27.4%
1,583	1.2%	29,255	21.4%
8,612	1.9%	120,982	28.7%

7-county MSA: Oregon: Clackamas, Columbia, Multnomah, Washington & Yamhill.
Washington: Clark & Skamania

5-county PMSA: Oregon State: Clackamas, Columbia, Multnomah, Washington & Yamhill; Washington State: Clark

4-county: Clackamas, Multnomah, Washington & Clark

3-county: Clackamas, Multnomah & Washington

2010-2040 Regional Forecast and Growth Distribution (GAMMA TAZ Forecast Distribution)

Final Draft, December 2012 (Metro ordinance #`12-1292A)

Metro Research Center - Economic Land Use Forecasting

	Forecast Population				Actual Population (Census)				2010	
	2010	2025	2035	2040	1980	1990	2000	2010	Difference	%Difference
7-county MSA	2,226,009	2,851,368	3,147,270	3,285,704	1,341,542	1,523,741	1,928,339	2,226,009	0	0%
4-county region	2,066,399	2,571,052	2,847,551	2,983,520	1,242,645	1,412,344	1,789,915	2,066,399	0	0%
3-county region	1,641,036	2,003,860	2,239,603	2,363,327	1,050,418	1,174,191	1,444,677	1,641,036	0	0%
Clackamas County	375,992	504,085	557,174	587,514	241,911	278,850	338,391	375,992	0	0%
Multnomah County	735,334	875,555	970,639	1,027,702	562,647	583,887	660,486	735,334	0	0%
Washington County	529,710	624,220	711,790	748,111	245,860	311,554	445,800	529,710	0	0%

	Forecast Employment				Actual Employment (BLS, OR & WA Labor Dept.)				2010	
	2010	2025	2035	2040	1980	1990	2000	2010	Difference	%Difference
7-county MSA	970,033	1,297,930	1,491,091	1,594,151	582,700	730,400	973,300	968,800	1,233	0.1%
4-county region	916,396	1,229,810	1,412,607	1,513,840	556,210	698,430	933,310	927,532	-11,136	-1.2%
3-county region	789,129	1,042,390	1,190,587	1,276,429	491,131	607,167	810,325	793,019	-3,890	-0.5%
Clackamas County	137,946	183,230	210,444	227,483	62,102	92,268	133,056	136,805	1,141	0.8%
Multnomah County	419,164	533,818	597,331	626,710	334,766	375,768	453,254	421,452	-2,288	-0.5%
Washington County	232,019	325,342	382,812	422,236	94,263	139,131	224,015	234,762	-2,743	-1.2%

7-county MSA: Oregon: Clackamas, Columbia, Multnomah, Washington & Yamhill.
Washington: Clark & Skamania

5-county PMSA: Oregon State: Clackamas, Columbia, Multnomah, Washington & Yamhill; Washington State: Clark

4-county: Clackamas, Multnomah, Washington & Clark

3-county: Clackamas, Multnomah & Washington