I. General Discussion

State and Local Authority: Development of population projections for Growth Management Act (GMA) planning purposes is a shared responsibility between state and local governments.

As directed by statute RCW 43.62.035, the Office of Financial Management (OFM) prepares a range of possible population growth for Washington's counties to use as they plan for future growth under the GMA. These population projections are baselined to 2010 and extend to 2040, and are presented by age and gender in five-year increments.[1]

As indicated in RCW 36.70A.110 and RCW 36.70A.115, local officials are responsible for selecting a 20-year GMA planning target that is within the high and low growth projections prepared by OFM. County officials select the county planning target; then within each county, population planning targets for cities, towns and unincorporated areas are developed among all affected local jurisdictions as part of the city and county planning process.

GMA Projection Process: State law requires that OFM produce GMA county population projections in high, medium and low series. The medium series development starts with the OFM's November state population forecast. State growth is allocated to each county based on an evaluation of assumptions regarding the county's demographic and economic trends plus a variety of projection techniques. The medium projection is the one considered most likely to occur based on current information and trends. However, the future does not always follow past trends, and uncertainty exists because current conditions can change in ways that are unforeseeable. For planning purposes this uncertainty must be considered, and the OFM high and low series represent a measure of this uncertainty.

High and Low Series: The high and low series form uncertainty bands above and below the medium (and most likely) projection. They do not represent particular alternative scenarios. In 2012, when OFM developed the high and low series, we considered each county's historical high and low growth trends and the likelihood of such trends repeating. For example, we evaluated whether the high growth experienced by some counties in the early nineties would happen again and determined to what extent that trend should be considered for the development of the high band. Uncertainty bands are larger for small counties, counties with erratic growth patterns and counties experiencing recent rapid growth. In contrast, counties with a more steady growth history have narrower bands. The potential for changes to group quarter populations—for example, people living in college dorms, military bases or correctional institutions—also contributes to the width of the uncertainty bands. Less accessible counties and those more distant from job centers have wider bands because people may be willing to commute longer distances for lower housing costs. Counties where the majority of recent growth has been due to international migration were assigned wider uncertainty bands because of ambiguities surrounding federal immigration policy.

For the majority of the counties, the only adjustment made was to shift the high or low band up or down based on OFM's 2012 thru 2017 population estimates data. The one exception is King County where the

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[1] The most recent decennial census serves as the base year for the projections. OFM's April 1 postcensal population estimates and actual vital statistics data are used for years 2011 to 2016. Estimated vital statistics data are used for 2017. The projections begin in 2018.

high series was increased because of higher than expected growth between 2012 and 2017 and a more optimistic assumption about immigration.

II. OFM State Population Forecast

OFM's annual November population forecast is an important part of developing the GMA county population projections. The county population projections from the GMA medium series must sum to the state totals from the November forecast. The state population forecast uses a cohort component model. The model uses the most recent federal census counts by single year of age and gender, along with fertility rates, mortality rates and net migration trends to project age specific populations forward in time. While a detailed description of the state forecast assumptions can be found on OFM's website at https://ofm.wa.gov/sites/default/files/public/legacy/pop/stfc/stfc2017/stfc_2017.pdf, the following is a general description of the inputs:

Fertility: Population growth due to births is projected based on forecasted changes to the total fertility rate (TFR), a measure of the total number of children born per woman in her lifetime. For the November 2017 forecast, actual births from 2010 to 2016, along with estimated births for 2017, were incorporated into the model. TFRs for future years were recently evaluated and updated. Historically, Washington's TFR tracks the national TFR closely. The Washington TFRs were linked to the U.S. historical fertility rates via a regression model, then projected based on the Census Bureau's 2014 projected TFRs.[1]

According to Census Bureau's 2014 projection, the national TFR is likely to decline to 1.86 by 2040.[2] For the 2017 state forecast, Washington's TFR in 2040 is 1.90, a drop of 0.10 from the forecast used in the 2012 GMA projections. It is expected that the number of immigrants coming from Asian and Pacific Island (API) countries are likely to exceed those from Mexico and other Latin American countries. The API populations' lower TFR is one of the major factors for the decline in both the national and Washington TFRs. Other factors include millennials delaying having children and lower birth rates experienced by second generation Hispanic women.

Mortality: Population decline due to deaths is projected based on life expectancy and a set of age and sex specific survival rates. For the 2017 state forecast, life expectancy was updated based on the Census Bureau's 2014 national projections and the National Center for Health Statistics (NCHS) U.S. life tables for 2014.[2,3] Because of the historical correlation between U.S. and Washington life expectancy at birth (e0), and the availability of more recent Census data, the Washington life expectancies were adjusted based on a linear model incorporating the Census Bureau's 2014 projected U.S life expectancies.

In general, both men and women are likely to live longer than previously expected. By 2040, life expectancy is projected to be 81.4 years for males and 85.6 years for females. For the 2012 projections, 2040 life expectancies were 79.5 years for males and 84.5 years for females. In addition, life expectancies for both genders are converging faster over the next 25 years with a difference of 4.2 years by 2040 compared to the previously expected difference of 5.0 years.

Washington's population aged 65 and over is expected to grow by almost 140 percent between 2010 and 2040. This rapid increase in elderly population, whose mortality risk is much higher than the general

[2] U.S. Census Bureau (2014). *Methodology, Assumptions, and Inputs for the 2014 National Projections*. Retrieved from http://www2.census.gov/programs-surveys/popproj/technical-documentation/methodology/methodstatement14.pdf.
[3] Arias, A., Heron, M., and Jiaquan, X. (2017). *United States Life Tables, 2014*. National Vital Statistics Reports, 66(4). National Center for Health Statistics. Retrieved from https://www.cdc.gov/nchs/data/nvsr/nvsr66/nvsr66_04.pdf.

population, is projected to cause Washington's crude death rate (CDR) to increase from 7.1 per 1,000 persons in 2010 to 9.6 by the end of the forecast horizon.

Migration: Migration is an important, but difficult to predict, component of population change. OFM uses an econometric model to forecast short-term migration. This model weighs Washington's relative attractiveness to job seekers against that of California and the U.S. as a whole. The short-term migration forecast is transitioned into long-term migration expectations based on historical data. For the 2017 state forecast, four additional models were used to validate the net migration assumptions including: Component Method II, the Hamilton-Perry method, a time series model based on Census Bureau's historical domestic and international migration and a linear extrapolation model. The econometric and cohort models were combined to produce short and medium-term migration, which runs from 2018 to 2025. The other three models were used to produce long-term migration.

The estimated and projected net migration for 2015 to 2020 period in 2017 is 394,100, about 184,100 higher than expected in the 2012 GMA projections. The long-term migration expectation of 48,700 is 3,700 people per year higher than the value used in 2012 GMA projections.

These adjustments were made based on the unique economic and demographic changes that occurred after the release of the 2012 GMA projections, and the anticipated impacts on domestic and international migration. While the migration expectations for the 2018 to 2025 period were raised largely because of the expected strength of Washington's economy, the long-term migration expectation received only a modest increase. The recent gains in net migration are not likely to continue indefinitely. This is because the nation's population is aging which should result in an overall decrease in mobility, and because current federal immigration policy seems to be moving towards stricter controls. Therefore, the projections assume that immigration is not likely to reach pre-recession levels even if the economic situation improves. Finally, we believe that economic conditions in immigration-sending countries will likely improve, which would make moving to the U.S. (and Washington) less desirable.

III. 2017 GMA County Projections

Prior to producing 2017 GMA county projections, the 2012 GMA projected populations were compared to OFM 2017 estimated populations. In absolute terms, the projections for 24 counties (61 percent) were tracking closely with a difference within 2 percent. Eight counties (21 percent) had a difference between 2 and 3 percent. Seven counties (18 percent) had a difference of more than 3 percent. The largest differences were for King, Adams and Kittitas counties where the absolute differences were 5.0 percent for King and 4.4 percent for Adams and Kittitas. The full evaluation report is available at: https://ofm.wa.gov/sites/default/files/public/legacy/pop/gma/projections17/gma_2017_update_report.pdf.

Based on the analysis of 2010 to 2017 trends for fertility, mortality and migration, two major patterns have emerged. First, the population in large metropolitan counties grew faster than expected since 2012, whereas suburban and rural counties have recovered much more slowly from the recession. Second, the pace of Hispanic counties' population growth is slower than expected due to the slowdown of immigration and the decline in total fertility rates.

Changes to the fertility, mortality and migration assumptions in the state forecast model (discussed above) impact the GMA county projections because OFM's county projection model takes a "top down" approach in which projected state growth is allocated to counties for the medium series projection based on the state total.

Fertility: The county-level TFRs used in the 2012 GMA projections were used as the starting point for the 2017 GMA projections. Adjustments were made to the 2012 TFRs based on actual births data and OFM's postcensal age and sex estimates. For 2015, actual TFRs were used directly for counties with larger populations; the three year average TFR was used where the 2015 TFR was inconsistent with recent or historic trends. For the 2020 to 2040 period, only minor adjustments were made to most of the counties because of uncertainty regarding future migration and fertility trends. The 2017 TFR assumptions are summarized as follows:

Counties with very high TFRs: Adams, Franklin, Grant, Okanogan and Yakima have the highest TFRs in the state – above 2.4 children per woman. These counties have large Hispanic populations, and 40 percent or more of the Hispanic population is foreign born. While TFRs are expected to remain high in these counties, moderate decline is expected over the projection horizon. The TFRs were adjusted upwards for Yakima and down for Adams, Franklin, Grant and Okanogan through 2020 or 2025, then kept at the 2012 GMA levels (or close to) for the remainder of the forecast period.

Counties with moderately high TFRs: Benton, Chelan, Douglas and Skagit TFRs (between 2.1 and 2.3) are distinctly higher than the state TFR. These counties have relatively high Hispanic populations but fewer foreign born Hispanics and more racial diversity relative to the very high TFR counties. The TFRs for these counties are expected decline as the foreign born population declines. With the exception of Benton, the TFRs for these counties were adjusted downwards through 2020 or 2025, then kept at the 2012 GMA levels (or close to) for the remainder of the forecast period.

Counties with TFRs near the state TFR: Historically, Snohomish, Pierce, Kitsap and Clark tend to have TFRs just above the state mean, while Spokane's TFR falls just below. For these counties, actual TFRs are used for 2015, then kept at the 2012 GMA levels for the remainder of the forecast period. The one exception is Clark which was lowered by 0.1 between 2020 and 2040 to be more consistent with the recent trend.

Counties with low TFRs: Counties with a high proportion of the population attending college have the lowest TFRs, and are expected to remain low in the future. Extreme cases include Whitman and Kittitas which have historically had TFRs of 1.5 or lower. Moderate cases include Walla Walla and Whatcom, where TFRs are also influenced by factors such as the size of the Hispanic population. The actual TFR or three year average was used for 2015, then kept at the 2012 GMA levels for the remainder of the forecast period. The one exception was Kittitas where recent TFRs have been trending over 1.5 so the TFR for 2020 was brought up to 1.6 before returning to 1.5 from 2025 onwards.

King and Thurston counties: These two counties historically have low TFRs due to the large proportions of women of childbearing age who are either attending college or pursuing a professional career. Thurston's TFRs are tracking closely with the 2012 GMA values and were kept throughout the forecast period. King's TFR of 1.71 in 2010 declined to 1.61 in 2015 which is consistent with the 2012 GMA expectation of 1.64. The 1.64 TFR was used for the remainder of the forecast period.

Remaining counties: The remaining counties are rural with relatively large retirement populations. The diverse characteristics of these counties make generalization difficult. The 2015 TFRs and, in some cases, the 2020 TFRs, were updated based on actual data or trends. The TFRs for most counties were kept at the 2012 GMA levels for the remainder of the forecast period, except for Grays Harbor, Jefferson, Pend Oreille and San Juan which received minor adjustments based on recent trends.

Mortality: The 2017 GMA projection of Washington counties' mortality is based on the NCHS U.S. life tables for 2014.[3] The projected life expectancy at birth, i.e. the average number of years a person is expected to live from age 0, is used to project the number of deaths each county will experience. Life expectancies for all counties are expected to continue to increase but at a slower pace than in earlier periods. Since the 2012

GMA projections, life expectancy increased from 78.5 years in 2010 to 78.9 in 2014. Based on historical patterns, we made several adjustments to the national life expectancy to better reflect Washington and its counties' particular mortality experiences:

Using the U.S. life expectancy as a base, we add 0.1 year to reflect historical mortality differences between Washington the U.S. as a whole. We then further increase the future life expectancy by 1.5 years per decade based on historical trends.

Historically, life expectancy is higher for Hispanic populations. At the county level, however, if 25 percent of the population is Hispanic, life expectancy was adjusted upwards by 1.1 years at the base year and then trended forward (for the 2012 GMA projections we added 1.2 years). Affected counties include Adams, Chelan, Douglas, Franklin, Grant and Yakima.

Research at the national level has also shown that people with higher education tend to have higher life expectancies than their counterparts. Using information from 2011–2016 American Community Survey, we increased life expectancy by 0.75 year at the base year for most counties in which more than 32 percent of the population over age 25 has at least a bachelor's degree, and we decreased life expectancy by 0.75 year for most counties in which 20 percent or less of the population over age 25 have at least a bachelor's degree.

Actual deaths occurring between 2010 and 2014 were compared to those produced by the model. Additional adjustments were made (ranging from -0.5 to 1.0) to the 2010 life expectancies to reduce the gap between actual and projected deaths.

Migration: Migration is the most difficult of all demographic dynamics to predict. While numerous socioeconomic factors impact local migration dynamics, certain counties have characteristics likely affecting future migration. The following characteristics were considered during the allocation process:

Over the last five years, large metropolitan counties, Clark, King, Pierce and Snohomish in particular, experienced strong economic growth, which attracted migrants from other states and counties. Such growth patterns were extended from 2018 to 2020 then transitioned downwards to 2025. From 2025 onwards, migration expectations for those counties were set based on historical trends.

Areas experiencing growth from retirees and telecommuters will continue to attract such migrants.

Over the last two decades, about 70% of Washington's net migration came from abroad, with the majority of these immigrants authorized through the family reunification program and settling in counties where their families were located. This trend is expected to continue.

The most recent economic downturn still has a lingering impact on certain small and rural counties' net migration. From 2010 to 2017, they had much slower population growth than projected in 2012. We expect some counties to recover more quickly, but if a county historically has had low or negative migration, we project lower levels of migration than in the 2012 GMA projections.

Unlike the 2012 GMA projections, we did not make any additional adjustments to migration in counties with large military and college group quarters populations.