Development of the Intercensal Estimates of Population and Housing, 2000-2010
Washington State Office of Financial Management, Forecasting Division

Intercensal estimates are estimates developed between census years. Intercensal estimates are considered more accurate than other types of estimates because they are bracketed on both sides by decennial census counts or state-certified special census counts.

The intercensal estimates developed by the Office of Financial Management (OFM) are based on the housing unit method. The housing unit method assumes that the change in the number people varies with the change in number of housing units and counts of population living in group quarter facilities, as reported to OFM by local governments and institutions over the decade.

The basic assumptions of model are as follows:

- The federal decennial census counts for 2000[1] and 2010[1,2] are correct.
- State certified special census counts are assumed to be correct for any given year in the series.
- The OFM estimated populations for new incorporations are assumed to be correct[3].
- The change in household population change mirrors the pattern of housing change as reported to OFM by counties, cities and towns each year.
- The change in group quarter population[4] mirrors the change in population counts as reported to OFM annually.

The 2000-2010 intercensal estimates were developed using slightly different methodology than that used for OFM's 1990-2000 intercensal estimates[5] although both are based on the housing unit method and rely on many of the same basic assumptions. The 2000-2010 intercensal estimate series uses two interpolation techniques, simple linear interpolation and the interpolation method described in *The Methods and Materials of Demography* (Siegel & Swanson, 2004, p. 535) which utilizes the following equation:

$$P_t = Q_t \, \frac{[(10 - t)Q_{10} + tP_{10}]}{10 Q_{10}}$$

Where t is expressed in the years since the first census, P_t is the intercensal estimate at time t, Q_t is the postcensal[6] estimate at time t, P_{10} is the April 1, OFM adjusted 2010 federal census count, Q_{10} is the OFM April 1, 2010 postcensal estimate, and Q_0 is the OFM adjusted April 1, 2000 census count.

Note: We believe that the Siegel and Swanson method yields superior results compared to the method used by OFM to interpolate housing units for the 1990-2000 series. We intend to update the 1990-2000 series using the Siegel and Swanson method in the near future in order to provide a consistent set of intercensal estimates from 1990 onwards.

The basic process steps are as follows:

- Total housing units, occupied housing units, and group quarters populations were estimated by applying the above equation to decennial census and OFM county and city estimate data.
- Household size (average persons per occupied housing unit) estimates were developed using linear interpolation between decennial census points.

- Household population was estimated by multiplying estimated occupied housing units by estimated household size.
- Total population was estimated by adding household population estimates with group quarter population estimates.
- Occupancy rates were estimated by dividing estimated occupied housing units by estimated total housing units.

Notes:

1. This series uses adjusted federal census counts where applicable. The adjustments include:
   a. Controlling for annexations occurring between January 1 and April 1 in the decennial census years to account for boundary changes related to the timing of the federal census. City boundaries were fixed as of January 1 for data collection purposes whereas the actual census date is April 1.
   b. The substitution of state-certified special census counts in place of federal census counts.
   c. Federal corrections to census counts.

2. If the Census Bureau releases corrections resulting from the 2010 Census Count Question Resolution (CQR) Program, this data series may be revised in the future.

3. The City of Liberty Lake incorporated on August 31, 2001. The City of Spokane Valley incorporated on March 31, 2003.

4. Some changes in group quarter populations may be due to definitional changes and/or the inconsistent application of group quarter classifications between federal censuses.   In a select number of cases, group quarter populations were treated as household populations to accommodate these differences.

4. For information about the 1990-2000 estimate methodology, please see the following document: http://www.ofm.wa.gov/pop/hseries/ofm_april1_intercensal_estimates_methodology_1990-2000.pdf.

5. Postcensal estimates are developed based on data from the most recent census count. Postcensal estimates differ from intercensal estimates which are period estimates between census points.

References:

Siegel, J. & Swanson, D. (Eds.). (2004). *The methods and materials of demography* (2nd edition). Elsevier Academic Press, London.

Lowe, T. (2004). *Population trends*. Olympia, WA: Washington State Office of Financial Management.

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