

Methodology for July 1, 2017 Population Estimates
For Maricopa and Pinal Counties by MAG and CAG

County-level estimates

County level estimates are produced by the State Demographer’s Office in the Office of Economic Opportunity (OEO) and serve as control totals for estimating household population at the jurisdiction level. Estimates are generated using the *Composite Method*, wherein administrative data is tracked and applied to age-specific cohorts. The Composite Method methods relies on the following data sources:

| Population cohort | Data sources |
|--------------------------|---|
| Age 0 – 4 | Births in last 5 years Deaths that happened to births in last 5 years |
| Age 5 – 17 | October 1 public school enrollment counts from Arizona Department of Education (ADE) |
| Age 18-64 | Active drivers licenses and ID cards from Arizona Department of Transportation (ADOT) |
| Age 65+ | Social security enrollment Medicare enrollment |

Jurisdiction-level estimates

The following describes the methodology applied to allocate county-level estimates to jurisdictions. This includes steps needed to account for special censuses conducted by Buckeye, Chandler, Queen Creek, Gilbert, Goodyear, Maricopa (city) and Peoria.

1) Roll-back special census counts from October 1, 2015 to July 1, 2015

This step estimates what the special census counts would be had they been conducted for July 1, 2015 rather than October 1, 2015. The methodology is as follows:

- 1) Calculate persons in households per residential unit from special census results.
- 2) Collect residential completions for July 1, 2015 to September 30, 2015. The completion data reflects MAG’s recent *catchup* efforts to collect missing completion data.
- 3) Estimate household population added from July 1, 2015 to October 1, 2015 by multiplying net completions by the household persons per residential unit factor.
- 4) Subtract the estimated household population growth for July 1 to October 1 from special census household population counts to obtain a July 1, 2015 household population estimate.

- 5) Subtract the net completions for July 1, 2015 to October 1, 2015 from special census residential unit counts to obtain a July 1, 2015 residential unit estimate.
- 6) Special census group quarter counts are not rolled back and used as reported.

2) Obtain base estimates for July 1, 2015

These steps generate the 2015 base used to generate the 2017 update. This is used in lieu of Census 2010 to account for the special census conducted by some jurisdictions. The method employed is as follows:

- 1) Obtain initial housing unit method (HUM) estimates for July 1, 2015:
 - a. Collect residential completions, group quarters facility changes and annexations for April 1, 2010 to June 30, 2015. Residential completions reflect MAG's recent *catchup* effort to collect missing completion data. Update counts for residential units, annexed residential units and annexed population.
 - b. Update the group quarters population by calculating the change in tracked group quarters facilities from April 1, 2010 to July 1, 2015 and adding it to the Census 2010 group quarters count.
 - c. Obtain the un-constrained household population by multiplying the non-annexed housing units by Census 2010 persons per household and occupancy rates and adding this to the annexed population.
 - d. Bench the unconstrained household population to match the July 1, 2015 county-level household population control.
 - e. Obtain total population by adding group quarter populations and household populations.
- 2) For jurisdictions that conducted a special census, replace estimates with the rolled-back special census counts for residential units, group quarters population, household population and total population as obtained through steps in Step 1.
- 3) Calculate a revised county-level group quarters population total. This is obtained by adding the sum of the special census group quarters counts to the sum of the group quarters estimates for cities that did not conduct a special census.
- 4) Calculate a revised county-level household population total. This is obtained by subtracting the revised group quarter population from the total population.
- 5) Adjust household population totals to match the county-level household population total. For cities that conducted a special census, this will be proportional to the rolled backs special census counts derived in Step 1. For cities that did not conduct a special census, this will be proportional to the original estimates derived in Step 2.1.

3) Recalculate HUM factors

Typically, the housing unit method (HUM) is applied by multiplying the housing stock by the occupancy rate and persons per households from the previous census. However, given that the base itself has been adjusted we are proposing using a simpler persons in households per

residential unit factor, calculated directly from the revised July 1, 2015 base, derived in Step 2. This is simply the household population for the revised base divided by the residential units in the revised base.

4) Estimate jurisdiction population for July 1, 2017

To obtain OEO/MAG estimates for July 1, 2017:

- 1) Collect residential completions, group quarters facility changes and annexations for July 1, 2015 to June 30, 2017. Update counts for residential units, annexed residential units and annexed population.
- 2) Update the group quarters population by calculating the change in tracked group quarters facilities from July 1, 2015 to July 1, 2017 and adding it to the estimated group quarters population for July 1, 2015.
- 3) Obtain the un-constrained household population by multiplying the non-annexed housing units by the household population per residential unit factor and adding this to the annexed population.
- 4) Bench the unconstrained household population to match the county-level household population control.
- 5) Obtain a final population by adding group quarter populations and household populations.