

## Arizona July 1, 2023 Population Estimates – Methodology

### A. Group Quarters Population (GQ Pop)

1. Establish the total GQ population in each place (incorporated place or unincorporated balance of county) as of Census 2020 adjusted for the results from the Count Question Resolution (CQR) program and the Post Census Group Quarter Review (PCGQR) program.
2. Track the GQ population of major facilities annually starting April 2020 and for each subsequent Year (using May 1 or July 1 as the reference day).
3. Find the change in GQ population in these facilities between April 2020 and the estimate year. If data is missing for either April 2020 or for the estimate year, then that record is not used in calculating the change. Aggregate these changes at the place level.
4. Estimate GQ population of each place by adding the base GQ population from Step 1 and the population change from Step 3.
5. The sum of GQ populations of all places within a county is the GQ population estimate for that county.

### B. Housing Units (HU) and Household Population (HH Pop)

1. Start with the Census 2020 housing units, household population, and persons per housing unit, for each sub-county jurisdiction, taking into account the results of the CQR program.
2. Determine the July 1, 2023 housing unit stock by adding cumulative completions or building permits between Q2 2020 and Q2 2023 to the Census 2020 housing stock. For permits, a six-month lag is assumed for single-family units and 2-to-4-unit buildings; a 12-month lag is assumed for 5-plus-unit buildings. It is assumed that 98% of permits are built. Mobile homes are assumed to be in place the same quarter they are permitted with a 100% placement rate. Find the number of demolitions for the entire period and subtract them from the housing stock.
3. Annexed housing units are added to the housing stock for the acquiring jurisdiction and are subtracted from the housing stock of the losing jurisdiction. The result is the housing unit estimate for July 1, 2023.
4. Identify the pre-annexation housing unit change for each jurisdiction for FY2023 (completions – demolitions). Multiply this by persons per housing unit from Step 1. This gives the pre-annexation household population change for FY2023.
5. Add annexed household population or subtract de-annexed household population. This is the household population change for FY2023 that is due to housing unit change and annexation/de-annexation. The annexed population is reported by the jurisdictions based on ground knowledge of the area or block level population from the 2020 Census.
6. Add this change to the household population from the July 1, 2022 population estimates to get the uncontrolled household population for July 1, 2023.

7. Aggregate uncontrolled household population at the county level.

### **C. Modified Composite Method of Population Estimates**

1. Start with July 1, 2022 total population estimates. Use the age group information from the published OEO 2022 medium series of projections.

2. Find the percent change of indicator data from 2022 to 2023.

2a. 0-4: Births during the five-year period prior to July 1, 2023 minus deaths to those births compared to the same data over the five-year period prior to July 1, 2022.

2b. 5-17: Public school enrollment data (October 1, 2021 to October 1, 2022):

Because of the rapid increase in the number of students enrolled in Empowerment Scholarship Accounts (ESA), ESA impact needs to be incorporated. Not all ESA students should be added back to the October 1 enrollment because some of them were never in a public school system and would not have been included in the October 1 enrollment data anyway. According to ADE, in FY2024, approximately 40% of ESA students were enrolled in a public school in the prior year. We do not have the metric for prior years. We assume that it was similar. Therefore, we add 40% of the Q1 FY2022 ESA student count to October 1, 2021 enrollment and add 40% of the Q1 FY2023 ESA student count to October 1, 2022 enrollment.

2c. 18-64: Driver license/ID data from ADOT, July 1, 2022 and July 1, 2023. These two data sets use a consistent method. The year-over-year percent change should be a good presentation of the population change.

2d. 65+: Medicare enrollment, June 2022 and June 2023. We tried to also use Social Security enrollment data, but they are still not available as of December 1, 2023.

3. Apply the percent change to 2022 population by age group to get 2023 population estimates by age group. Sum age groups for total population.

4. Because of the timing of the information from the Census Bureau, the 2022 population estimates did not include the Post Census Group Quarter Review (PCGQR) adjustment for Maricopa County, but the 2023 population estimates will include them. Therefore, the PCGQR adjustment is added to the result from Step C.4 for Maricopa County.

### **D. Controlled Household Population**

1. Subtract county-level GQ population estimate (Step A.5) from the county total population estimate from the modified composite method (Step C) to derive household population.

2. Take the average of the HH Pop from Step B.7 and Step D.1. This is the controlled HH Pop at the county level.

3. Divide the county-level controlled HH Pop (Step D.2) by the uncontrolled HH pop to get the control factor for the county.

4. Multiply place-level uncontrolled HH Pop to get the controlled household population for the place.

### **E. Aggregation**

Place-level estimates are finalized by adding the GQ population and household population at the jurisdiction level.

County population estimates are sums of population estimates for all jurisdictions (including cities and towns and the unincorporated balance of county) within the county. The State population estimate is the sum of population estimates for all counties.

### **F. Incorporation of CQR and PCGQR and a Special Case**

The U.S. Census Bureau has reviewed and approved or partially approved the Count Question Resolution (CQR) cases and Post Census Group Quarter Review (PCGQR) cases submitted by several Arizona jurisdictions. These results are incorporated to update the 2020 Census base household population and GQ population. The City of Yuma is treated here as a special case. The City submitted 20 PCGQR cases. The Census Bureau informed the City and the Arizona State Demographer's Office that it approved seven of the cases without specifying which seven or providing the exact adjustment to the base GQ population. The State Demographer's Office contacted the Census Bureau in an attempt to obtain more details about the approved cases but learned that it is the Census Bureau's policy to provide that information only to the Population Estimates Program (PEP) within the Bureau. The PEP will further process that information for updating its estimate base of GQ population. However, because of the timing of the approval of the PCGQR cases and the schedule of population estimates, the base will not be updated until the Vintage 2023 population estimates (which will not be available until late May of 2024). The State Demographer's Office reviewed all 20 cases submitted by Yuma and was not able to discern which seven cases the Census Bureau might have approved. Based on the reports that the City has been providing to the State Demographer's Office, the City's GQ population had a decline of 761 between April 2020 and July 2023. However, that change estimate uses the City's April 2020 count as the base, and that count is significantly higher than the 2020 Census count. Because the Census Bureau has approved some of the City's PCGQR cases but it is unclear how many people that will add to Yuma's base GQ population for 2020, the State Demographer's Office decided to keep the 2020 Census base GQ population and apply 0 change to estimate the July 1, 2023 population. When the Census Bureau publishes the actual adjustment to the 2020 Census base GQ population, the State Demographer's Office will adopt that adjustment and resume the standard method of estimating GQ population for the City of Yuma in future estimate years.