Carl Vinson
Institute of Government
UNIVERSITY OF GEORGIA

Methodology

2026 Long-Term Population Projections

Released: July 21, 2026

Introduction

The Applied Demography Program at the University of Georgia's Carl Vinson Institute of Government produced the 2026 Long-Term Population Projections, which estimates the resident population of Georgia and its counties in single-year intervals from 2026 through 2065. These projections serve as a resource for state and local decision-makers as they plan for future infrastructure, services, and community needs.

This methodology statement describes the data sources, assumptions, and analytical procedures used to develop the 2026 Long-Term Population Projections. The projections were produced using the cohort-component method, a standard demographic forecasting technique that builds projections by following cohorts through the projection horizon. This approach was used to project populations by age, sex, and race and ethnicity for each of Georgia's counties. The projection process incorporated publicly available data from state and federal agencies, regional expertise, and current research on demographic trends and population change in the United States.

Like all population projections, these estimates are based on assumptions about future demographic processes and conditions that may or may not occur. Population change can be influenced by factors beyond the scope of demographic modeling, including shifts in federal policy, economic conditions, migration patterns, natural disasters, public health crises, and other unforeseen events. Likewise, decisions made by state and local leaders can affect future population growth and distribution.

Users should recognize that, despite the use of established demographic methods and substantial efforts to reflect current and historical population trends, projections are not predictions and may not precisely reflect future population outcomes for the state or any individual county. The Applied Demography Program regularly reviews and refines its models to incorporate new data, emerging trends, and advances in demographic research. These projections are demographic in nature, focusing on the components of population change—births, deaths, aging, and migration— based on observed historical and current patterns. As such, they should be interpreted with an understanding of the assumptions, methods, and limitations described in this report.

Projection Methodology

OVERVIEW

The projections in this report were produced using a cohort-component projection method, a widely used approach throughout the United States for conducting population projections. This method leverages historical data on demographic components (fertility, mortality, and migration), and assumptions about component rates over time to project a population into the future. The Institute used the Census Bureau's Vintage 2025 Population Estimates as the base population for Georgia, and 2026 as the launch year. The cohort populations are constructed for single year of age, four race/ethnic groups, and two sex groups for each of Georgia's 159 counties. For each year in the projection period, the surviving population is advanced by one year of age using projected age-specific survival rates and net migration rates.

COHORT-COMPONENT PROJECTION METHOD

In the cohort-component method, separate rates for the components of population change are projected for each population cohort. In this case, cohorts refer to people who share the following characteristics in a projection year: age, race or ethnicity, and sex. *Components* refer to the components of population change: births, deaths, and migration. These projected components for each cohort are then combined as follows:

$$P_{t2} = P_{t1} + B_{t1-t2} - D_{t1-t2} + M_{t1-t2},$$

where P_{t2} = the population projected at future date $t_1 - t_2$,

P_{t1} = the population at the base year t_1,

B_{t1-t2} = the number of births that occur during the interval $t_1 - t_2$,

D_{t1-t2} = the number of deaths that occur during the interval $t_1 - t_2$, and

M_{t1-t2} = the net migration that takes place during the interval $t_1 - t_2$.

Appropriately applying the cohort-component technique involves four steps:

1. Obtain a base population by compiling the cohorts in the projection area at the launch time.
2. Determine migration, survival, and fertility measures for each cohort.
3. Model trends in fertility, survival, and migration rates per cohort over the total projection period.
4. Apply the cohort-specific rates to each cohort thereby updating the base population with component trends iteratively over each year in the projection period.

POPULATION DATA AND BASELINE RATES

Base Population

The baseline population for the 2026 Long-Term Population Projections used the Census Bureau's Vintage 2025 population estimates for Georgia's counties. Institute faculty and staff modified the Census population estimates to project cohorts. Specifically, the population was grouped into single-year age groups (0 to 84, and age 85 and over), two sex groups (male and female), and four racial and ethnic groups (non-Hispanic White, non-Hispanic Black or African American, non-Hispanic Other, and Hispanic).

Faculty and staff at the Institute modified population estimates because a consistent panel of cohorts is necessary for accurate projections. At the time of production, Vintage 2025 county-level population estimates were only available for the total population. These estimates did not include 2025 age, sex, and race characteristics. The Institute made two modifications. The first modification was to estimate five-year age, sex, and race characteristics for the 2025 population totals in the vintage 2025 population estimates. The second modification was to create county-level single-year age, race, and sex estimates across the base period of 2000-2025. This level of detail is necessary to calculate age-specific fertility and mortality rates outlined below. To accomplish this level of detail, the Institute applied the age, sex, and race distribution from other Census datasets to the annual county postcensal estimates across the base period.

Five-year age, sex, and race characteristics for the 2025 population totals were estimated by applying a moving-average method to the 2024 distribution. Additionally, the estimated 2025 counts by characteristics were controlled to the totals for the Vintage 2025 postcensal estimate total population for each county.

In order to obtain a cohesive dataset with totals for single-year age, race, and sex groups for all 159 counties in Georgia for the 2020-2025 postcensal estimates, the Institute applied the statewide single-year age distribution to each county's existing five-year age group distribution. For the years 2010-2019, the Institute applied the single-year age distribution from the 2020 Census Modified Age and Race Census (MARC) file to the postcensal estimates. To ensure that 2010-2019 values aligned with 2020-2025 postcensal estimates, the Institute also adjusted the values for 2010-2019 using the Das Gupta error closure method, the same strategy used by the Census Bureau for producing intercensal estimates. Finally, for the years 2000 to 2009, the Institute applied the statewide single-year age structure from the 2010 intercensal estimates to the county-level intercensal estimates for 2000-2009.

Fertility

The Institute collected birth data from the Georgia Department of Public Health's (DPH) Office of Health Indicators and Planning (OHIP) Online Analytical Statistics Information System (OASIS)[i]. The data include the age (ages 10-55), race, sex, birth order event, and county of residence of the mother from 2000 to 2025. The Institute team included preliminary DPH birth data from the year 2025 to achieve a full panel, and modified the race and ethnicity characteristics into the same four groups used in the base population. Historical (2000-2025) age-specific fertility rates (ASFR) for each birth order event across the four racial and ethnic groups were calculated using the internal intercensal estimates developed by the Institute of Government.

Age-specific fertility rates (ASFR) for each birth order event across four racial and ethnic groups were projected for each year in the projection period using Gaussian Process Regressions, described below. These rates were projected at the state and regional levels and applied to the base population in each county.

Mortality

Death data were collected from the Georgia Department of Public Health's (DPH) Office of Health Indicators and Planning (OHIP) Online Analytical Statistics Information System (OASIS)[i]. The data include single year of age (0-100, and 100 and over), race and ethnicity, sex, and primary county of residence for years 2000 to 2025. The Institute team included preliminary DPH death data from the year 2025 to achieve a full panel and modified the race and ethnicity characteristics of the mortality data into the same four groups used in the base population. Historical (2000-2025) age, race and ethnicity, and sex specific mortality rates were calculated using the internal intercensal estimates developed by the Institute.

Age, race and ethnicity, and sex-specific mortality rates were projected for each year in the projection period using Gaussian Process Regressions. These rates were projected at the state level and applied to the base population in each county.

After evaluating multiple scenarios, Institute researchers chose to remove mortality data from 2020 and 2021, due to the elevated number of deaths during those years. This removal produced a more stable projection of long-term mortality rates.

Migration

Institute of Government faculty and staff calculated residual net migration rates and schedules from the 2000-2025 population estimates to produce an age, race and ethnicity, and sex structure at the county level and at the Georgia Department of Community Affairs (DCA) regional level. Historical (2000-2025) age, race and ethnicity, and sex-specific migration rates were calculated using the internal intercensal estimates developed by the Institute of Government.

Age, race and ethnicity, and sex-specific migration rates were projected for each year in the projection period using Gaussian Process Regressions. Rates were calculated at the county level and region level. County and region migration rates were evaluated for each county and cohort combination.

A review panel of Institute of Government experts evaluated county and region migration rates for each county cohort combination. In rare cases, county migration rates were adapted from other jurisdictions outside of the target county's DCA region, where appropriate, based on comparable geographic and demographic characteristics.

Group Quarters Data

A "group quarters" is a place where people live or stay in a group living arrangement that is owned or managed by an organization providing housing and/or services for the residents. Examples include nursing homes, university housing, and prisons. The 2025 projections incorporate stochastic simulations for the group quarters population to adjust for changes in the group quarters population size since the 2020 decennial Census count.

The base group quarters population file provides estimates of the total group quarters population by county for 2020, broken down by five-year age groups, race, and sex, for use as a reference in projecting future group quarters populations. This population file was created from two component census tables, both descending from the 2020 Census Demographic and Housing Characteristics File (DHC):

1. A combined version of tables PCT18A - PCT18H: Group Quarters Population by Sex by Age by Major Group Quarters Type (All Races)
2. Table PCO1: Group Quarters Population by Sex by Age

Table 1 was used as the base table, as it had a total estimate closer to the official Census Bureau total. Each five-year age group in Table 2 was classified into one of the three larger age groups from Table 1. Then, in Table 1, the total population by sex was calculated for each of the three larger age groups. The individual race estimates were then divided by the sex-age group totals to find the proportion of each age group accounted for by each race group.

The tables were then combined based on county, sex, and the three larger age groups from Table 1. New estimates were calculated for each five-year age group using the race proportions calculated earlier, rounding down to ensure only whole persons were counted. This process is summarized by the equation below. The process occurred four times for each sex and five-year age group combination and once for each race group.

*New Estimate = Old Estimate * (Race total for large age group/Total for large age group)*

POPULATION APPROACH AND MODEL

The Institute of Government uses a bottom-up approach to projection. Institute faculty and staff produce a projection by age, race and ethnicity, and sex for each of the 159 counties in Georgia, and the sum of all these projections becomes the state projection. Our internal review of the projections includes analysis and expertise on local trends and economic development in Georgia. While the projection itself is ultimately a demographic method that relies on demographic fundamentals, the state-level projection is cross-validated with other sources, including independent projections, neighboring-state projections, and autoregressive integrated moving-average methods.

Projecting Rates and Gaussian Process Regression

Institute demographers modeled fertility, mortality, and migration rates using Gaussian Process Regression (GPR), a flexible, nonparametric machine learning method commonly used to model time-series and spatial data. GPR is particularly well-suited to modeling demographic components because it can capture long-term trends (e.g., shifts in fertility) while accounting for year-to-year variability (e.g., fluctuations in migration). By accommodating fluctuations caused by factors such as policy shifts, economic conditions, natural disasters, and public health events as observed in demographic data, GPR provides a robust framework for estimating component rates and their long-term trajectories.

Unlike traditional forecasting methods that rely on a single predetermined model structure, GPR evaluates a range of possible functions that can explain the observed data and identifies the model that best represents the historical patterns. This flexibility allows the method to incorporate both long-term demographic trends and more recent changes in population dynamics across the variety of counties and cohorts in Georgia.

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[i] oasis.state.ga.us