Method Used for Projecting the Population

The population projections for Hamilton County jurisdictions are done in two parts. The first part is projection of total population for the whole county, while the second part is allocation or redistribution of the total population into jurisdictions.

The Age-Sex Cohort method is used for projecting the total population for Hamilton County for the decades of 2010, 2020, and 2030. Census years 1990 and 2000 form the base for the population projection.

1) The cohorts are ten-year age cohorts, projected by race and sex for each decade.
2) The projected population for each cohort is sum of surviving population and net migration for that cohort.
3) The surviving population is the product of initial population carried over from the previous decade multiplied by the survival rate for that cohort.
4) Net migration by race and sex is projected separately for each cohort by deducting deaths from the initial population to get an expected population and then finding the difference between the expected and the observed population. This difference is the net migration for that cohort. A correction factor (plus- minus) is used to project the net-migrations for the next decade.

Hamilton County has 49 jurisdictions including cities, townships, and villages. The next step after projecting the total decadal population is to allocate the projected population within these jurisdictions. This projected population is allocated by the ratio method. The ratio of the population of a jurisdiction to the total county population is calculated for the decades of 1970, 1980, 1990, and 2000 by using the census data. Curve fitting or extrapolation technique is used to project these ratios for the decades of 2010, 2020, and 2030.

The equations used in curve fitting include linear, geometric, exponential, modified exponential, Gompertz, and logistic. A statistical measure known as R^2 is calculated for the ratios for each of the jurisdictions for each of the six equations. The equation with the maximum R^2 value is chosen as the best-fit curve for that jurisdiction. The ratios for the decades 2010, 2020, and 2030 are calculated by using the best-fit curve for that jurisdiction.

The ratios for the year 2025 are computed by finding the difference between ratios in 2020 and 2030 and dividing by 2. The difference can have positive value if ratio has decreased between 2020 and 2030 or a negative value if ratio has increased between 2020 and 2030. If the difference is positive, then 2025 ratio is procured by subtracting the difference from 2020 ratio otherwise it is added.

The total county population projected for the decade of 2020 and 2030 is used to estimate a mid-point or average population for the year 2025. The total population for 2025 is allocated or redistributed into jurisdictions by using the ratios computed for the year 2025