

Calculation of Water Purveyor Service Population

There is great variability in the characteristics of water purveyors in the State of Texas. Some purveyors are small with limited staff and resources, while others have hundreds of employees and extensive resources. Given this reality, it would be unfair to establish a “one size fits all” approach to the population calculation of any given purveyor. Instead of just one option, there should be a few that can address data and resource challenges and yet provide a means of providing a more sophisticated analysis option for growing urban areas.

Listed below are three methodologies that could be acceptable for the calculation of a service population based upon resources available. Each of the methods are common to one another in that they rely on Census data and they rely on a persons-per-connection ratio formula to calculate populations in non-Census years. Below are descriptions of each of the methods.

Method A – Baseline Decennial Census Data

This method is best suited for purveyors that are very limited in their resources (staff, technology, etc.) and have only limited Census data available.

This is the base method of population estimation for all municipal water purveyors in the state. The baseline/base year for population is the year of the Decennial National Census. The purveyor would use the available Census data as it best fits within the service area of the purveyor. This population estimate is then divided by the number of water connections as supplied on the Water Use Survey for the same year as the Census. This yields a person-per-connection ratio, which can be used in subsequent years (between decennial Census years) to estimate service population based on any updated service connection counts.

Method B – Baseline Decennial Census Data with Intra-Census Updates

This method is best suited for purveyors that may have more internal and data resources available at the time of the Census and in the years in between.

In some communities, the Census Bureau issues special reports containing updated population data that may be beneficial in upgrading population figures from estimates to actual. This may include such data as general population counts and specific proxy ratios for single family and multi-family type connections. The baseline/base year would remain the year of the decennial Census and the establishment of a person-per-connection ratio would be identical to Method A. In the years between decennial Censuses, the purveyor may use available population count data that is acceptable to the Texas Water Development Board to “reset” the person-per-connection ratio. An example of such a dataset would be the Census Bureau’s American Community Survey. This additional step will yield a more accurate population over time as compared to the decennial count alone. With this new data, the purveyor would recalculate the ratio and proceed forward in time as if it were the decennial Census again.

Method C – Census Tract Data with Intra-Decadal Updates and GIS analysis

This method is best suited for purveyors that have extensive resources (including GIS resources) and complex and rapidly expanding and changing service area characteristics.

Purveyors that have highly detailed information on customer account type and customer location can develop highly precise persons-per-connection ratios by census tract and by customer type. Similarly to Methods A and B, the purveyor would gather all Census data for its service area. Instead of using the gross Census count for a larger region, individual tract counts would be used. Where the entire tract falls within the service area, all connections and the total Census population are used. Where the tract is intersected by the service boundary, only part of the population and connections would be used. These partial tracts would have to be analyzed separately and individually in order to get the best population estimates. Once all connections and population counts are determined, a general person-per-connection ratio is developed much like in Methods A and B.

By using Census tracts in highly complex service areas, it may be possible to determine customer-specific person-per-connection ratios. For example, a tract may be entirely multi-family connections. Another tract may be entirely single family. Yet another may be entirely commercial. In each case, there may be a population count greater than zero, and thus a ratio can be developed. The advantage to the purveyor is that future population estimates can be tailored to what types of connections are added and whether they are added in the service area. At the very minimum, the use of Census tract data can yield a much more accurate general person-per-connection ratio.

For the years between the decennial Census, the specific ratios can be used in the same way as in Methods A and B for estimating new populations. As in Method B, a “reset” of the population can occur when new data becomes available and new ratios can be calculated.