

## Methodology for School-Age Population Estimates for Incorporated Towns

### BACKGROUND

The *Code of Virginia* (58.1-605) states: "The council of any city and the governing body of any county may levy a general retail sales tax at the rate of one percent to provide revenue for the general fund of such city or county.... Such local sales tax moneys shall be credited to the account of each particular city or county levying a local sales tax.... One half of such payments to counties (shall be paid by the county treasurer) into the town treasury of each such town for general governmental purposes the proper proportionate amount received by him in the ratio that the school age population of each town bears to the school age population of the entire county."

The *Code of Virginia* requires that these estimates of school-age population shall be provided by the Weldon Cooper Center for Public Service.

This document describes the process and methodology for developing estimates of the school-age (5-19) population of towns as of July 1 of the current year (t). These estimates are updated annually.

### METHODOLOGY

The *Code of Virginia* requires that 5-19-year-old individuals be counted in the location where their parents/guardians reside (even if the individuals are confined in a correctional institution or are 18-19-year-old adults living independently at college or in the military). While the Census Bureau counts individuals ages 5-17 in the school division/town where their parents/guardians reside, 18-19-year-old individuals are counted where they live and sleep most of the time, which may be with a parent/guardian or may be elsewhere, such as in a college dormitory or military barracks. Therefore, to comply with the *Code of Virginia*, the Weldon Cooper Center developed the following methodology, which utilizes available town and county population data, to estimate the population of 5-19-year-olds in towns.

**STEP 1** is to estimate the 5-17-year-old population of each town (to capture those who are accounted for by the Census Bureau at their parent/guardian's residence). Since the Census Bureau does not report town population estimates by age for the current year (t), this estimate is produced by multiplying the 2020 Census 5-17 population proportion of each town (the most recent available data on town population by age) by the Census Bureau current year (t) estimate of the total population of each town, and further multiplying it by the double ratio of the 5-17 portion of the parent county's population in year (t) to that in 2020.

The assumption in using a double ratio of the parent county's 5-17 portion of the population is that growth or decline trends in a town's 5-17 population should be similar to trends in their parent county. The formula for this step is as follows. The result of this calculation will be used subsequently in Step 3.

*Step 1: Estimate of 5 to 17 year old town population on July 1 of year (t) =*

$$\frac{\text{Census Count of 5 to 17 year old Town Population from Census 2020}}{\text{Census Count of Total Town Population from Census 2020}} * \text{Census Estimate of Total Town Population on July 1 of year (t)}$$

$$\left( \frac{\text{Census Estimate of 5 to 17 year old Parent County Population on July 1 of year (t)}}{\text{Census Count of 5 to 17 year old Parent County Population on April 1, 2020}} \right) / \left( \frac{\text{Census Estimate of Total Parent County Population on July 1 of year (t)}}{\text{Census Count of Total Parent County Population on April 1, 2020}} \right)$$

**STEP 2** is to calculate the ratio of the estimated 5-19 population to the estimated 5-17 population for the *parent county*<sup>1</sup> (the county in which the town is located – not to be confused with where the parent or guardian resides). The result of this step will be used subsequently in Step 3.

$$\text{Step 2: Parent County Ratio} = \frac{\text{Estimate of 5 to 19 year old Parent County Population on July 1 of year (t)}}{\text{Estimate of 5 to 17 year old Parent County Population on July 1 of year (t)}}$$

Note that for towns located in two counties, the *Parent County Ratio* is computed as:

$$\frac{\left( \frac{\text{Estimate of 5 to 19 year old Population in Parent County 1}}{\text{Population in Parent County 1}} \right) + \left( \frac{\text{Estimate of 5 to 19 year old Population in Parent County 2}}{\text{Population in Parent County 2}} \right)}{\left( \frac{\text{Estimate of 5 to 17 year old Population in Parent County 1}}{\text{Population in Parent County 1}} \right) + \left( \frac{\text{Estimate of 5 to 17 year old Population in Parent County 2}}{\text{Population in Parent County 2}} \right)}$$

The result of Step 2 – the *Parent County Ratio* – shows the relationship between the 5-17 and 5-19 populations in the *parent county*. For example, if Thomas Jefferson County has 100 5-17-year-olds,

<sup>1</sup> These estimates are produced by the Weldon Cooper Center. See Division Methodology document for details: [https://demographics.coopercenter.org/sites/demographics/files/SCAPE\\_Divisions\\_Methodology.pdf](https://demographics.coopercenter.org/sites/demographics/files/SCAPE_Divisions_Methodology.pdf)

and 120 5-19-year-olds, the ratio from Step 2 would be  $120/100 = 1.2$ . This means that the 5-19 population is 20% larger than the 5-17 population in that county.

**STEP 3** is to combine the results of Steps 1 and 2 by applying the relationship between the 5-17 and 5-19 populations in the county to the towns in the county. Continuing the previous example, if in Step 1 James Madison Town (located in Thomas Jefferson County) was estimated to have ten 5-17-year-olds; the final step would be to increase that number by 20% ( $10 * 1.2$ ), which was computed in Step 2, to yield an estimate of twelve 5-19-year-olds in James Madison Town.

Step 3 yields an estimate of the 5-19-year-old population in each town, under the assumption that the ratio of the 5-17-year-old town population to the 5-19-year-old town population equals the ratio of the 5-17-year-old parent county population to the 5-19-year-old parent county population. The formula used for the final computation is:

*Step 3: Estimate of 5 to 19 year old town population on July 1 of year (t) =*

$$\begin{array}{l} \textit{Estimate of 5 to 17 year old Town} \\ \textit{Population on July 1 of year (t)} \\ \textit{(from Step 1)} \end{array} * \begin{array}{l} \textit{Parent County Ratio} \\ \textit{(from Step 2)} \end{array}$$