Worksheet

5307/5340 Apportionment Sub-Allocation Formula

Introduction

For the sake of being equitable to all parties, the data contained in the formula below is objective and verifiable. Raw data will be obtained directly from the National Transit Database annual reporting profiles, or from ESRI Business Analyst, on an annual basis to populate the agreed upon formula.

The formula below is based as closely as possible off of the formula the Federal Transit Authority uses when determining initial allocations to the Urbanized Areas. Please see **Figure 1** for the FTA's allocations, and relevant variables to the Greenville Urbanized Area.

Formula

The formula inputs are based upon percentage shares of the total. Detailed numbers are shown in **Table 1**.

Share % = ((Population% x 25%) + (Pop Weighted Density%[1] x 25%) + (Bus Vehicle Revenue Miles% x 50%) x 90.8%) + (Effciency%[2] x 9.2%)

1) Population Weighted Density% = Population% x (Population / Area)

2) Efficiency% = Bus Passenger Miles Traveled [may substitute Unlinked Passenger Trips][2] / Operating Cost

Assumptions

Population: Census 2010 figures, based on calculations by ESRI Business Analyst

Area: Determined annually by GPATS Staff, given the applicable bus routes provided by GTA and CAT.

Bus Vehicle Revenue Miles, Bus Passenger Miles Traveled, Unlinked Trips, and Operating Cost: Provided annually by the National Transit Database, verified and corrected by GTA and CAT. The current year apportionment uses NTD data from two years prior. For example Fiscal Year 2014 Apportionments will be based off of the NTD data from Reporting Year 2012.

Definitions

Population: Census 2010 figures, tallied by ESRI Business Analyst, for the Transit-served areas of the Greenville Urbanized Area

Area: Bus Routes provided by Greenville Transit Authority and Clemson Area Transit were buffered by a ¾ mile radius, as this is what is required for ADA Demand Response Service by all public transit service providers. These areas were clipped to the border of the Greenville Urbanized Area, to establish Transit-served areas for each provider

Population Weighted Density: Density of each Transit-served area cannot be directly compared against the total, so the Population Density (Population/Area) is weighted by Population % Share of each area.

Bus Vehicle Revenue Miles: Provided by the National Transit Database, verified and corrected by GTA and CAT, this is the measure of miles traveled by buses annually while in revenue service.

Efficiency: This is the figure of ridership versus operating cost, to determine the cost effectiveness of a system.

Bus Passenger Miles Traveled: The measure of annual miles traveled per passenger, cumulative.

Unlinked Passenger Trips: The number of passengers boarding the buses.

Operating Cost: The expenses incurred as the result of running the transit systems.

Methodology

Population, Area, and Density: While the entire Greenville Urbanized Area provides population to the FTA apportionments, the formula is based off of the transit-served populations and areas to determine the split. The ¾ mile buffer of routes were provided to ESRI Business Analyst, which provided the data included at the back of this Worksheet. Census year 2010 data was used, as it is the most reliable.

Bus Passenger Miles Traveled vs. Unlinked Trips: The measure of Bus Passenger Miles Traveled is used in the FTA formula (**Figure 1**) to serve as the ridership value in determining the "Incentive Tier." However, as it has been operating in the Rural Program, Clemson Area Transit has not needed to measure or report BPMT, but instead would report Unlinked Trips. In an effort to measure system efficiency with what data is available, the formula will utilize Unlinked Trips for the time being until such time as CAT reports BPMT to the National Transit Database. CAT reporting BPMT in RY 2016 is an item of this Resolution. The FY 2018 apportionment formula, and future years, will utilize BPMT and not Unlinked Trips.

National Transit Database, Reporting Years (RY) vs. Fiscal Years (FY): It is critical that the inputs of this formula be consistent and verifiable, and therefore shall use the published NTD profiles for the Reporting Year which are uses for the current Fiscal Year apportionment. Even though more recent data may be gotten from the individual transit providers, that data will not be reflected in the apportionment until the following year. For example, the FY 2014 apportionment is based off of RY 2012 data. While RY 2013 data is available, this information will not be published until late Calendar Year 2014, and will not be used in the FTA apportionments until FY 2015. The RY 2012 Profiles for each provider is included at the back of this Worksheet.

Formula Breakdown

In developing a consistent formula, which would always result in showing the share of 100.00% of funding for both transit providers, the main focus was that the variables for each provider must be expressed as a share of the whole. Thus, for example, the Population variable is not expressed as 150,881 persons (Greenville) and 27,641 persons (Clemson), but 84.52% and 15.48%, respectively, of the whole of the transit-served area. **Table 1** details the inputs of the formula. Of note:

- The pink shaded variables constitute the percentages of the weights of each variable, as established by FTA.

- The blue shaded variables constitute the values which need to be updated on an annual basis.
- Overall figures are summed from the individual areas, except in the cases of Population Density, Population Weighted Density, and Efficiency.
- Shares of each variable are derived as their percentage of the Overall variables.
- The Microsoft Excel Spreadsheet of the working formula is available by request from GPATS.

Conclusion

Using Unlinked Trips for Fiscal Years 2014-2017, the formula for FY 2014 yields a 5307/5340 split between GTA and CAT to be:

GTA: 66.92%

CAT: 33.08%