Greater RVA Transit Vision Plan

Glossary of Data Used for Identifying Initial Phase II Recommendations

Corridors recommended in Phase I of the Greater RVA Transit Vision Plan were based on long-range transit demand, using projections for 2040. These corridors were reviewed in Phase II to identify segments that could support transit for near-term implementation. The following analysis was used to identify transit-supportive areas of the Phase I corridors.

Data Type	Description
Activity Density	• Combined employment and population per acre by traffic analysis zone (TAZ) in 2017, according to RRTPO forecast. • DRPT identifies different levels of transit investment based on activity density in its Multimodal System Design Guidelines. • Areas with a minimum of 10 residents or employees or more per acre are supportive of fixed-route transit, which corresponds with TAZs shown in green on the map. TAZs shown in red and orange indicate densities supportive of more intensive transit invest, such as bus rapid transit or light rail. Areas in blue have fewer than 10 residents or employees per acre would generally not warrant fixed route service, according to the Multimodal System Design Guidelines.
Transit-Supportive Employment	• Employment per acre by TAZ in 2017, according to RRTPO forecast. • Identifies areas that meet density thresholds for transit investment from DRPT's Multimodal System Design Guidelines by employment density alone by having 10 employees or greater per acre.
High Density of Working Populations	• Top quartile of census tracts with the highest density of workers within the PlanRVA MPO region, according to the 2016 American Community Survey (ACS) 5-year estimate. • Top quartile corresponds with tracts that had 2.3 workers or more per acre.
Environmental Justice Populations	• Top 20 percent of census tracts in the region according to an index comparing environmental justice populations to the regional average, based on 2016 ACS 5-year estimates. • Indexed populations include: non-white or Hispanic populations, individuals with disabilities, low-income households, elderly populations, populations with limited English proficiency, and low vehicle ownership households. • Methodology for indexing environmental justice populations matches work completed for RRTPO's current effort on the Richmond Regional Park and Ride Investment Strategy. Further discussion of environmental justice methodology can be found on the following page.
Low Vehicle Ownership	• Lowest quartile of census tracts by average number of vehicles owned per household, based on 2017 ACS 5-year estimate. • Average number of vehicles per household was normalized by average number of persons per household to avoid identifying smaller households as having low vehicle ownership. • Lowest quartile corresponds with tracts that had fewer than 0.63 vehicles per person.
High Transit Usage	• Highest quartile of census tracts using transit as a means to work by percentage of all trips, according to 2017 ACS 5-year estimate. • Highest quartile corresponds with tracts that had a transit mode share of 2.63% or greater.

Environmental Justice (EJ) Data Analysis

The overall process used to calculate and map the EJ needs by census tracts was as follows:

1. The average value in the study area was calculated for each of the socioeconomic factors from the 2016 5-Year ACS tables and the values in each individual census tract were compared to the study area averages. Each census tract was scored for each socioeconomic factor based on the number of standard deviations the individual census tract value was from the study area average. Note that scores were not normalized by census tract population in an effort to identify areas with high raw numbers of people.
2. The scores were summed for all socioeconomic factors in a census tract to determine an overall combined EJ score for each census tract.
3. Each census tract was ranked according to the combined score and the census tracts were grouped into five tiers (each tier containing 20% of the census tracts). The highest tier corresponded to the highest concentration of EJ populations.

The 2016 5-Year ACS data (average between 2012 and 2016) was used in this analysis. Only the census tracts located within the TPO boundary were included in the analysis. Using this data, the calculations described below were performed to develop six factors that are often associated with environmental justice populations.

Population	Calculation
Low-Income	The percentage of the census tract population for which poverty status is determined that is below the poverty level.
Elderly	The percentages of age groups “65 to 74 years” and “75 years and over” in the total census tract population. These two percentages were summed and multiplied by the total census tract population to get the total number of people over the age of 65 in the census tract.
Limited English	The percentage of residents five years of age and older who “Speak English less than ‘very well’”. The census tract population with limited English proficiency was calculated as this percentage times the total population in the census tract.
Vehicle Ownership	The calculation of the number of low-vehicle ownership households was the summation of households with two or more residents with either “no vehicle available” or “one vehicle available”.
Disability	The number of noninstitutionalized civilians with a disability.
Non-White or Hispanic	The percentage of “white alone, not Hispanic” population was multiplied by the total population in the census tract and then subtracted from the total population in the census tract to get the number of people in the census tract who identified either as non-white or Hispanic.

To rank the census tracts by highest aggregate concentration of EJ populations, the standard deviation and the mean was calculated for each environmental justice factor for all census tracts. Each tract’s difference from the mean was then divided by the standard deviation for each environmental justice factor to develop a score (example calculation of low-income score shown below). The scores for all the environmental justice categories in a census tract were then summed to give a total score (2nd calculation shown below). Ranked scores were grouped into five tiers with an equal number of census tracts in each tier. All census tracts were geographically cross-referenced with the study area so that only those tracts present within the study area would be included in the ranking process and display.

$$LowIncome_{score} = \frac{Census\ Tract\ Low\ Income\ Population - Mean\ Low\ Income\ Population}{Population\ Standard\ Deviation}$$

$$Total_{score} = Low\_Income_{score} + Elderly_{score} + Limited\_English_{score} + Vehicle\_Ownership_{score} + Disability_{score} + NonWhite\_Hispanic_{score}$$