

**Long Range Transportation Plan – 2040  
Environmental Justice Analysis**

**Rhode Island Division of Statewide Planning**

**September 2020**

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## APPENDIX

Transportation 2037 (2017 Interim Update), Transportation Equity Benefit Analysis Section.  
State Guide Plan Element No. 611

### Environmental Justice Mapping

Percentage of Black or African American Individuals in RI by Census Tract  
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Percentage of LEP - French, Haitian, or Cajun Individuals in RI by US Census Tract  
Percentage of LEP - Asian and Pacific Island Individuals in RI by US Census Tract  
Percentage of LEP - Chinese (incl. Mandarin, Cantonese) Individuals in RI by US Census Tract  
Percentage of Carless Households in RI by US Census Tract



## INTRODUCTION

The State of Rhode Island is committed to integrating the principles of environmental justice in all of our transportation planning programs and activities. This commitment to analyzing equity as it applies to Rhode Island's transportation project selection and programming was first included in the Long-Range Transportation Plan, *Transportation 2020*. The transportation equity analysis is conducted every 3 to 5 years (or occasionally more often) during preparation and adoption of a long-range transportation plan update or with an update to the *State Transportation Improvement Program (STIP)*.

For Long Range Transportation Plans, the Division of Statewide Planning conducts a benefits and burden analysis of the identified environmental justice populations. Quantification of benefits and burdens is performed on a macro level using an equation termed the "Location Quotient." The environmental justice populations' proximity to an interstate highway (due to air quality concerns) is used as a variable to measure burden and the proximity to bus transit routes is used as the variable to measure benefit.

As part of the Long-Range Transportation Plan, *Transportation 2040*, the transportation equity benefit analysis was conducted using the location quotient method utilizing the most recent US Census data (2018). This analysis was conducted in a similar manner as performed previously under *Transportation 2037 (2017 Interim Update)*. For a point of comparison, the analysis conducted in *Transportation 2037* is discussed and incorporated by reference herein. The results in *Transportation 2037* are compared to the results of the equity benefit analysis conducted as part of *Transportation 2040* to determine if progress has been made to improve transportation equity. The summary of results is shown in **Table 1: Summary of Environmental Justice Analysis, Summary of 2010 and 2018 Data**.

In summary, this analysis found that a higher proportion of minorities and populations below the poverty level continue to live within proximity of the interstate highways and are typically subject to poor air quality conditions. This study also determined that the subject populations are situated in areas of Rhode Island that are in proximity to better transit service and location of the state's employment centers.

Addressing equity in transportation is a continuing process and meeting the needs of select population groups is a priority for every project. Evaluating the effects of new projects and plans on environmental justice populations begins at an early stage. Existing transportation networks represents a challenge to the outright remedy of the burdens that environmental justice populations face in Rhode Island.

The Rhode Island Public Transit Authority and the Rhode Island Department of Transportation strive to provide transit service and infrastructure improvements to population centers within

the state, with a particular focus on environmental justice populations. Local municipalities are also engaged in the process of addressing equity in transportation and work with select population groups to continue to improve quality of life through state funded programs and other initiatives to address transportation inequality in Rhode Island.

<b>Table 1: Summary of Environmental Justice Analysis, Comparison of 2010 and 2018 Data</b>			
<b>Long Range Transportation Plan</b>	<b>Transportation 2037</b>	<b>Transportation 2040</b>	
<b>Location Quotient</b>	<b>2010</b>	<b>2018</b>	<b>Comparison Year</b>
Minority Individuals within 250 Feet of RI's Interstate Highways	1.60	1.93	Minority individuals continue to live in census tracts that are in close proximity to the state's highways and therefore have a higher exposure to mobile source pollutants. There is also a growing minority population in census tracts adjacent to the State's interstate highways.
Low Income Individuals within 250 Feet of RI's Interstate Highways	1.48	1.63	Individuals living in poverty continue to live in census tracts that are in close proximity to the state's highways and have a higher exposure to mobile source pollutants. The results suggest the population could have increased over the years but a more precise study would need to be conducted to make this conclusion.
Minority & Low-Income Individuals within 1/2mile of a RIPTA Bus Stop	1.50	1.54	Minority & Low-Income population access to transit for zero-car households remains relatively unchanged.
Carless Households within ½ Mile of a RIPTA Bus Stop	1.88	1.88	Access to transit for zero-car households remains unchanged.

## IDENTIFYING SELECT POPULATION GROUPS

### ENVIRONMENTAL JUSTICE POPULATIONS

The subject populations for the Environmental Justice (EJ) component of this analysis are minorities and individuals in poverty/low-income individuals.

#### Minority Populations

According to the Federal Transit Administration (FTA): “A minority population means any readily identifiable group or groups of persons who live in a geographic proximity, and if circumstances warrant, geographically dispersed or transient persons such as migrant workers or Native Americans who will be similarly affected by a proposed [transportation] program, policy or activity.”<sup>1</sup> Minority individuals include persons who identify as any one of the following groups defined by the U.S. Census Bureau in accordance with guidelines provided by the U.S. Office of Management and Budget (US OMB):

- Black or African-American
- Hispanic or Latino of any race
- Asian American
- American Indian or Alaska Native
- Native Hawaiian or Pacific Islander

US OMB considers Hispanic or Latino of any Race within the minority population, as this statistic is a characteristic of ethnicity and therefore for this analysis it is tracked as a unique select population group. Additionally, this analysis, includes these categories:

- Other (race category)
- Two or more races

Accordingly, the “non-minority” population consists of all other persons not included in any of the above named groups, namely those identifying as non-Hispanic White alone.

For this analysis, the category of “White alone” has been subtracted from the state’s total 2018 American Community Survey (ACS) population to determine the state’s total *Minority*

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<sup>1</sup> U.S. Department of Transportation, Federal Transit Administration, “Environmental Justice Policy Guidance for Federal Transit Administration Recipients.” 15 Aug. 2012. Page 6. [http://www.fta.dot.gov/documents/FTA\\_EJ\\_Circular\\_7.14-12\\_FINAL.pdf](http://www.fta.dot.gov/documents/FTA_EJ_Circular_7.14-12_FINAL.pdf).

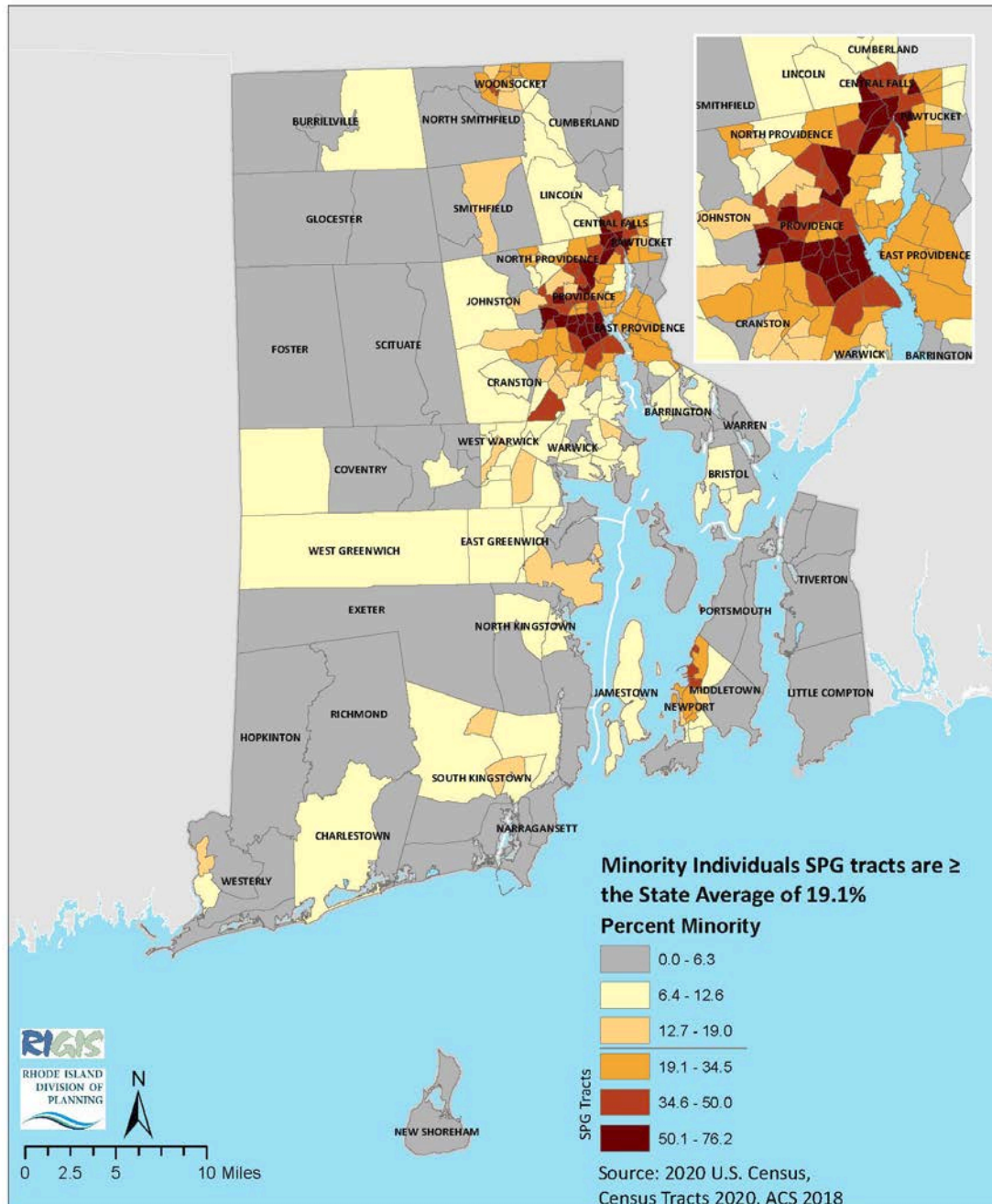
*Population* (See **Map 1: Transportation Equity Benefit Analysis - Percentage of Minority Individuals in RI by US Census Tract**).

## Map 1: Transportation Equity Benefit Analysis - Percentage of Minority Individuals in RI by US Census Tract

### Transportation Equity Benefit Analysis

May 2020

Percentage of Minority Individuals in RI by U.S. Census Tract



Minority Populations are protected under the Environmental Justice Executive Order 12898 and is also pertinent to Title VI.

## Populations Living in Poverty

The U.S. Census Bureau established poverty status for individuals based on a combination of an individual's household composition, size, and income. The individuals in poverty/low-income category is protected in the Environmental Justice Executive Order 12898.

To determine populations living in poverty for this environmental justice analysis, the 5-Year 2018 ACS poverty thresholds (below 200% of poverty) was utilized. The ACS poverty threshold was selected because the data featured the number of individuals within the population as opposed to the number of families or households in the state. It was concluded that data pertaining to individuals rather than number of families or households would be more inclusive. Additionally, the 2018 ACS poverty threshold was selected to account for Rhode Island's high cost of living relative to nationally defined poverty thresholds, and to capture the greatest number of individuals living within the margins of poverty.

According to the 5-year 2018 ACS figures for poverty status in the past 12 months, "below 200% of poverty" includes all those described as "in poverty," plus some people who have income above poverty but less than 2 times their poverty threshold."

## INDIVIDUALS WITH A DISABILITY

Another population group selected for inclusion within this analysis was individuals with a disability, as this group may experience limited travel mobility. This group may exhibit unique travel patterns and needs compared to the rest of the population. Individuals with a disability were identified according to the ACS as exhibiting serious difficulty with one of the four basic areas of functioning – hearing, vision, cognition, and ambulation. The functional limitations namely include bathing and dressing, and difficulty performing errands such as shopping, or visiting a doctor's office alone.

## LIMITED ENGLISH PROFICIENCY

In compliance with Executive Order No. 13166, Improving Access to Services for Persons with Limited English Proficiency (LEP), the purpose of which is to ensure accessibility to programs and services to eligible persons who are not proficient in the English language were also analyzed. In addition, the Division of Statewide Planning has completed an LEP Plan for its own planning program services. These efforts were conducted using guidance that was issued by the U.S. Department of Transportation (DOT) to ensure that persons in the United States are not excluded from participation in DOT-assisted programs and activities simply because they face challenges communicating in English.

**Table 2: Select Population Group Data (2018) and Census Tracts with Significant Presence of SPG Populations**, highlights nine (9) Select Population Groups (SPG) for the Environmental Justice analysis. It identifies the State percentage for each SPG, as well as the number and percentage of census tracts meeting the threshold used to quantify a significant SPG presence. *A similar evaluation was performed for Transportation 2037, and those results are incorporated by reference as part of this study in Table 1, Summary of Environmental Justice Analysis, Summary of 2010 and 2018 Data and the complete study is included in the Appendix to this report.* A comparison of historical SPG tracts (2010) and present day tracts (2018) are used in the following benefits and burdens study to evaluate the Long Range Transportation Plan’s impact on environmental justice groups and the progress made over the past several years to address equity in transportation.

**Table 2: Select Population Group Data (2018) and Census Tracts with Significant Presence of SPG Populations**

Select Population Group Data Table									
Select Population Group Code	Select Population Groups (SPG)	Data Source	Total RI Population within the data source	Total SPG Population in RI	State Percentage of SPG Population in RI	Threshold used to quantify significant presence within tracts in RI (SA=State Average used)	Number of tracts meeting threshold used to quantify significant SPG presence within RI tracts	Total Number of Census tracts in RI (excluding water only)	Percentage of tracts meeting threshold used to quantify significant SPG presence within RI tracts†
1	Minority Individuals (Race)	2018 5-Year ACS (DP05)	1,056,611	202,109	19.1%	≥19.1% SA	87	240	36.3%
1.1	Black or African American	2018 5-Year ACS (DP05)		69,254	6.6%	≥6.6% SA	83	240	34.6%
1.2	American Indian & Alaskan Native	2018 5-Year ACS (DP05)		5,484	0.5%	≥0.5% SA	63	240	26.3%
1.3	Asian	2018 5-Year ACS (DP05)		35,663	3.4%	≥3.4% SA	74	240	30.8%
1.4	Native Hawaiian & Other Pacific Islander	2018 5-Year ACS (DP05)		863	0.1%	≥0.1% SA	20	240	8.3%
1.5	Other	2018 5-Year ACS (DP05)		58,136	5.5%	≥5.5% SA	59	240	24.6%
1.6	Two or More Races	2018 5-Year ACS (DP05)		32,709	3.1%	≥3.1% SA	100	240	41.7%
2	Hispanic or Latino Origin	2018 5-Year ACS (DP05)	1,056,611	158,858	15.0%	≥15.0% SA	66	240	27.5%
3	Individuals in Poverty/Low-Income (200% of Poverty Level)	2018 5-Year ACS (S1701)	1,016,029	288,025	28.3%	≥28.3% SA	103	240	42.9%
4	Female Householder w/ Children Under 18	2018 5-Year ACS (B11005)	410,885	34,144	8.3%	≥8.3% SA	89	240	37.1%
5	School-Age Children (Ages 5-19)	2018 5-Year ACS (DP05)	1,056,611	189,856	18.0%	≥18.0% SA	91	240	37.9%
6	Aging Individuals (≥65)	2018 5-Year ACS (DP05)	1,056,611	174,210	16.5%	≥16.5% SA	117	240	48.8%
7	Individuals with a Disability	2018 5-Year ACS (S1810)	1,040,879	141,478	13.6%	≥13.6% SA	119	240	49.6%
8	Individuals with Limited English Proficiency (All Languages)	2018 5-Year ACS (C16001)	1,002,024	85,931	8.6%	≥8.6% SA	74	240	30.8%
	Top 5 LEP Language groups in the State of RI		-	-	-	-	-	-	-
8.1	Spanish	2018 5-Year ACS (C16001)	1,002,024	52,278	5.2%	5.0%	62	240	25.8%
8.2	Other Indo-European	2018 5-Year ACS (C16001)	1,002,024	5,276	0.5%	5.0%	18	240	7.5%
8.3	French, Haitian, or Cajun	2018 5-Year ACS (C16001)	1,002,024	13,942	1.4%	5.0%	6	240	2.5%
8.4	Other Asian and Pacific Island	2018 5-Year ACS (C16001)	1,002,024	4,598	0.5%	5.0%	1	240	0.4%
8.5	Chinese (incl. Mandarin and Cantonese)	2018 5-Year ACS (C16001)	1,002,024	3,874	0.4%	5.0%	1	240	0.4%
9	Carless Households*	2018 5-Year ACS (DP04)	410,885	39,631	9.6%	≥9.6% SA	95	240	39.6%

†There are a total of 244 U.S. Census Tracts in the State of Rhode Island, however 3 tracts cover water only and not land (and not land) and one tract encompasses the airport and contains no population. The water only tracts (3) and the airport tract (1) was deducted from the total (244) to calculate the percentage of tracts meeting threshold used to quantify significant SPG presence within RI's 240 tracts.

Safe Harbor Thresholds were used. Safe Harbor "...provides written translations of vital documents for each eligible LEP language group that constitutes five percent or 1,000, whichever is less, of the population of persons eligible to be served or likely to be affected or encountered. - U.S. Department of Health and Human Services



## PRINCIPLES OF ENVIRONMENTAL JUSTICE

The State embraces the following three core principles to guide our efforts in environmental justice:

- **Outreach** - Reach out to involve target populations in the planning process.
- **Burdens** - Prevent disproportionately high adverse impacts.
- **Benefits** - Ensure an equitable distribution of benefits.

The discussion that follows is organized by these principles.

### OUTREACH

Outreach activities are intended to provide input and guidance to the planning process to achieve environmental justice goals in both the Long-Range Transportation Plan (LRTP) and the State Transportation Improvement Program (STIP) among other initiatives. The following outreach activities and collaborative measures are used in Rhode Island transportation planning programs:

- Transportation Advisory Committee (TAC) Membership: the Providence Cultural Equity Initiative, the Child Opportunity Zone of Pawtucket, and the Narragansett Indian Tribe are represented on the TAC.
- Environmental Justice List: An e-mail list consisting of 175 social advocacy groups (housing, elderly, Hispanic, etc.) for target populations was developed and is used in notifying communities of major planning activities.
- RIPTA Bus Users Forum: The Accessible Transportation Advisory Committee (ATAC) provides an opportunity for transit dependent residents to discuss bus service issues directly with transit operators and planners.
- Coordinated Public Transportation - Human Services Plan: RIPTA brought together many agencies (Elderly Affairs, Human Services, Labor and Training, Commission on Disabilities) that were key to the development of the Coordinated Public Transportation – Human Services Plan that is incorporated by reference in the LRTP.

In addition, the Division of Statewide Planning maintains a Public Participation Plan in accordance with Federal guidelines that reinforces its commitment to transparent communications and engagement with the public regardless of race, color, national origin, age, income, or ability, and with public and private agencies to support the statewide transportation planning process. The Division's Public Participation Plan was last updated in June 2019.

## BURDENS

Transportation systems exist to provide mobility and quality of life benefits. Unfortunately, the construction and operation of these systems can have adverse impacts such as excessive noise, degraded air quality, degraded water quality, and isolation or fracturing of neighborhoods. Equity and environmental justice goals seek to ensure that target populations do not bear a disproportionate share of these “burdens.” Quantifying burdens on a macro level can be accomplished with the following equation termed “Location Quotient”:

$$\frac{[Environmental\ Justice\ Population\ in\ the\ Study\ Area \div General\ Population\ in\ the\ Study\ Area]}{[Environmental\ Justice\ Population\ in\ the\ Reference\ Area \div General\ Population\ in\ the\ Reference\ Area]}^2$$

A number greater than 1 indicates that there is a greater proportion of the Environmental Justice population in the study area. For the purposes of this plan and in consideration of the analytical tools available to staff, exposure to vehicle emissions was undertaken as a case study to determine if there is a disproportionate adverse impact on environmental justice populations.

Poor air quality can aggravate respiratory conditions such as asthma. On-road mobile sources of emissions (car, truck, and bus) contribute to degraded air quality, although point sources (power plants and factories) and area sources (lawn mowers and leaf blowers) contribute as well. Rhode Island has a rate of asthma that is fourth highest in the nation, and 1 in 10 households in Rhode Island has someone with this disease.<sup>3</sup>

A University of Southern California (USC) study (part of the large California Children's Health Study) has found a link between asthma rates and how close the subjects live to a freeway. Specifically, the number of children who suffered asthma attacks increased as the distance between their homes and a major thoroughfare decreased. Those living within 82 yards of a freeway had a 50 percent greater risk of exhibiting asthma symptoms than were children that lived more than 328 yards away. Higher traffic volumes on different roads were also related to increased rates of asthma.<sup>4</sup>

In another study, it was determined that young children who live close to a major roadway were twice as likely to score lower on tests of communications skills, compared to those who

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<sup>2</sup> Methodological Challenges of Environmental Justice Assessments for Transportation Projects, TRB, TRC #2013, 2007.

<sup>3</sup> Behavioral Risk Factor Surveillance System, 2018.

<sup>4</sup> <https://news.usc.edu/21269/USC-researchers-link-asthma-in-children-to-highway-proximity/>

live farther away from a major roadway, according to an analysis by researchers at the National Institutes of Health and the University of California, Merced. Moreover, children born to women exposed during pregnancy to higher-than-normal levels of traffic-related pollutants -- ultra-fine airborne particles and ozone -- had a small but significantly higher likelihood of developmental delays during infancy and early childhood.<sup>5</sup>

Diesel emissions, in particular, can pose a health hazard in these urban neighborhoods where asthma rates are often higher than in suburban neighborhoods. Diesel emissions can result from on-road trucking as well as larger delivery vehicles that traverse many low-income, minority, and transit dependent neighborhoods.<sup>6</sup>

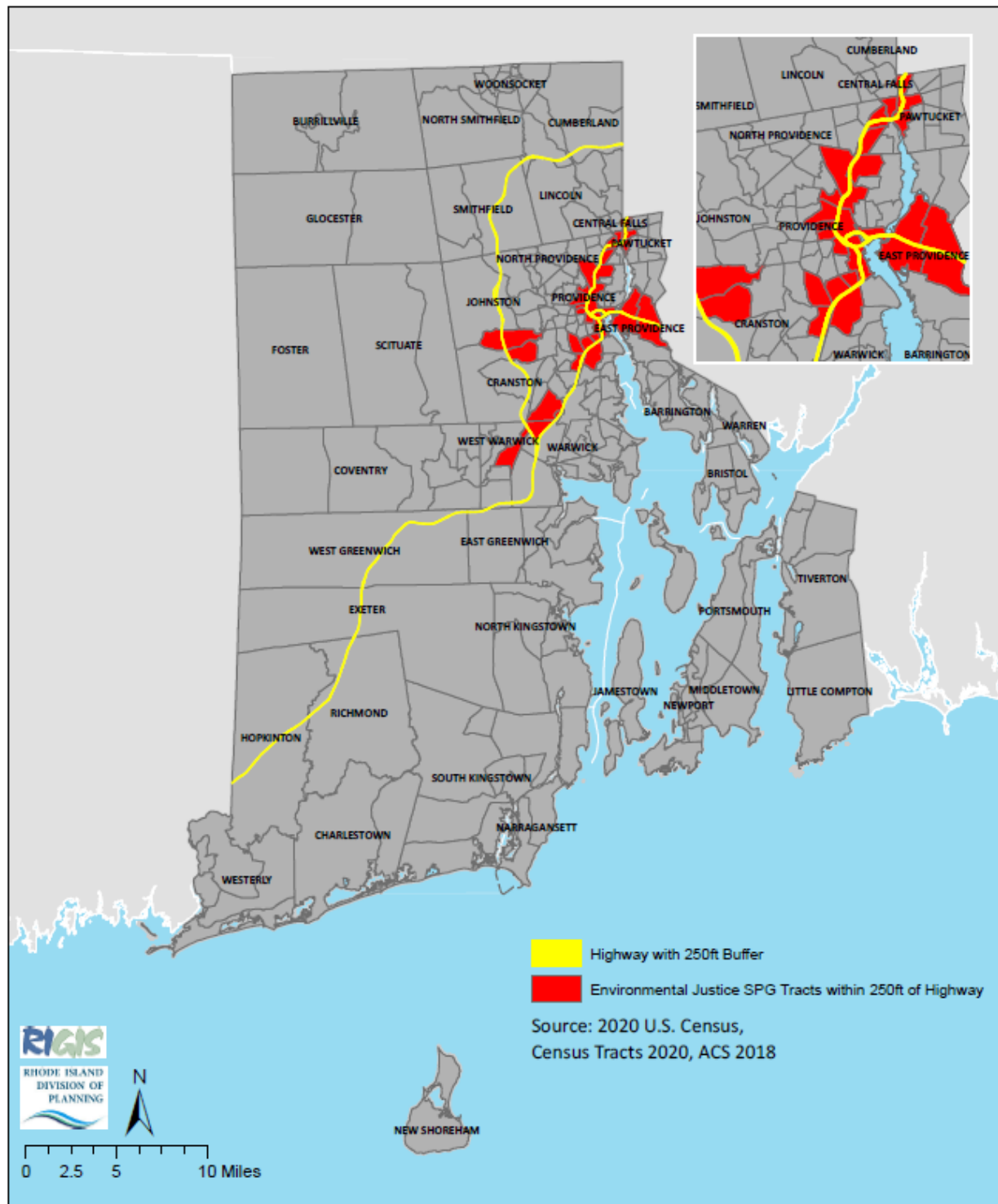
In an effort to determine the exposure of Rhode Island's environmental justice populations to excessive emissions, census tracts with greater than average concentrations of target populations were mapped with a 250-foot buffer around Rhode Island's Interstate highways and freeways, including I-95, I-195, and I-295 (for a total length of approximately 150 miles). The 250-foot buffer (approximately 82 yards as noted in the USC study) becomes the *Study Area* (See **Map 2: Environmental Justice SPG within 250ft of a Highway in RI by U.S. Census Tract**). Vehicles on other roadways also contribute to poor air quality, but a principal arterial has mobility benefits that balance out the burdens (access to commercial areas, services, residential neighborhoods, sidewalks, bus routes, etc.). Interstate highways, however, provide mobility benefits only without providing access to property or allowing for non-motorized modes or transit stops. Therefore, close proximity to an Interstate is assumed in this case to be more of a burden than a benefit. The *Reference Area* is the entire State of Rhode Island.

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<sup>5</sup> NIH/Eunice Kennedy Shriver National Institute of Child Health and Human Development, <https://www.sciencedaily.com/releases/2019/04/190409164002.htm>

<sup>6</sup> Note that the current RIPTA bus fleet includes 243 buses, trolleys, and vans of which 62 are hybrids (gas and electric) and all vehicles use ultra-low sulfur diesel to reduce emissions. In September 2019, RIPTA also brought 3 electric buses into active service as part of a pilot to help inform the Authority's efforts on procuring up to 20 electric buses into service in FY 2022.

Map 2: Environmental Justice SPG within 250ft of a Highway in RI by U.S. Census Tract)



## MINORITY POPULATIONS

This mapping exercise presented the following Location Quotient equation for combined minority populations as evaluated in *Transportation 2037*. This is then compared with the results using 2018 data:

$$\frac{7,691 \div 20,367}{248,882 \div 1,052,567} \quad \frac{37.8\%}{23.6\%}$$

As determined in *Transportation 2037*, 37.8% of the minority population in the study area (*numerator*) were within 250 feet of the State's interstate highways. Similarly, 23.6% of the minority population in the State of Rhode Island (*denominator*) was within 250 feet of the State's interstate highways. The calculated ratio, or location quotient, of these two percentages was 1.60, which indicated that a higher proportion of minorities live within the study area and that there was a disproportionate burden when the analysis was performed as part of *Transportation 2037*.

Using 2018 ACS data, 36.9% of the minority population in the study area (*numerator*) is within 250 feet of the interstate. Similarly, 19.1% of the minority population in the State of Rhode Island (*denominator*) is currently within 250 feet of the State's interstate highways. The location quotient equation for combined minority populations is illustrated below.

$$\frac{43,309 \div 117,482}{202,109 \div 1,056,611} \quad \frac{36.9\%}{19.1\%}$$

The calculated ratio, or location quotient, of these two percentages is 1.93, which indicates that a higher proportion of minorities continue to live within this study area and this figure has grown in recent years. By comparison, the ratio is larger than that found in *Transportation 2037* indicating a growing community within these areas and consequently, an increase in the transportation burden on minorities. **Table 3: Minority Individuals (Race)**, details all the datapoints utilized to arrive at the annual comparison and the calculated location quotient ratios.

Table 3: Minority Individuals (Race) Within 250 Feet of Rhode Island's Interstate Highways					
		2010		2018	
BURDEN			Percentage (Numerator)		Percentage (Numerator)
Study Area	SPG Population	7,691	37.8%	43,309	36.9%
	Total Population	20,367		117,482	
			Percentage (Denominator)		Percentage (Denominator)
Reference Area	Total SPG Population in RI	248,882	23.6%	202,109	19.1%
	Total Population in RI	1,052,567		1,056,611	
	Location Quotient	1.60		1.93	
Data source: 2010 US Census and 2018 ACS 5-year					

It should be noted that persons living in the study area is an estimate based on the total number of persons in the census tract that intersects the 250-foot buffer. The actual number of persons living within 250 feet of the State's interstate highways is actually likely much lower. A more detailed study would need to be performed to determine the actual population within the study area.

#### POPULATIONS BELOW THE POVERTY LEVEL

The case study presented the following Location Quotient equation for populations living below the poverty level according to 2010 U.S. Census data, as evaluated in *Transportation 2037* and incorporated by reference.

Using the Location Quotient equation, the population below the poverty level in the study area is illustrated below:

$$\frac{3,538 \div 20,367}{123,396 \div 1,052,567} \quad \frac{17.4\%}{11.7\%}$$

As determined in *Transportation 2037*, 17.4% of the population below the poverty level in the study area (*numerator*) was within 250 feet of the State’s interstate highways. Similarly, 11.7% of the population below the poverty level in the State of Rhode Island (*denominator*) was within 250 feet of the State’s interstate highways. The calculated ratio, or location quotient was 1.48, which indicates a larger number of persons living in poverty might be disproportionately burdened by the environmental effects of mobile source air pollution due to their proximity to the interstates.

Using 2018 ACS data, 44.5% of the population below the poverty level in the study area (*numerator*) is within 250 feet of the State’s interstate highways. Similarly, 27.3% of the minority population in the State of Rhode Island (*denominator*) is within 250 feet of the State’s interstate highways. The location quotient equation for the population below the poverty level is illustrated below.

$\frac{50,085 \div 112,491}{288,025 \div 1,056,611}$	$\frac{44.5\%}{27.3\%}$
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The calculated ratio, or location quotient, is 1.63, indicates the community living in areas that experience a higher degree of mobile source air pollution has grown when comparing 2010 with 2018. **Table 3: Individuals in Poverty/Low Income Within 250 feet of the State’s Interstate highways**, details all the datapoints utilized to make an annual comparison and arrive at the calculated location quotient ratios.

Table 4: Individuals in Poverty/Low Income (200% of Poverty Level) Within 250 Feet of Rhode Island’s Interstate Highways					
BURDEN		2010		2018	
			Percentage (Numerator)		Percentage (Numerator)
Study Area	SPG Population	3,538	17.4%	50,085	44.5%
	Total Population	20,367		112,491	
			Percentage (Denominator)		Percentage (Denominator)
Reference Area	Total SPG Population in RI	123,396	11.7%	288,025	27.3%
	Total Population in RI	1,052,567		1,056,611	
	Location Quotient	1.48		1.63	
Data source: 2010 US Census and 2018 ACS 5-year					

It should be noted again that persons living in the study area is an estimate based on the total number of persons in the census tract that intersects the 250-foot buffer. The actual number of persons living within 250 feet of the State's interstate highways is actually likely much lower. A more detailed study would need to be performed to determine the actual population within the study area.



## ADDRESSING MOBILE SOURCE POLLUTION FROM INTERSTATES IN RHODE ISLAND

Rhode Island's transportation plans, policies, and programs advance the goal of reducing vehicle emissions, particularly diesel emissions, by encouraging diesel retrofitting programs and the use of alternative fuels. LRTP 2040 encourages reducing vehicle miles traveled through public transit and non-motorized modes of transportation (bicycle and pedestrian) which help to achieve many goals related to improved air quality, physical fitness, reduced congestion, and are free or low-cost modes. It should be noted that overall air quality is improving, and the passenger vehicle fleet is becoming cleaner with improving mileage standards and better engine technology.

## BENEFITS

Transportation provides a means to access shopping, gainful employment, health care and other services, and social and recreational activities. Without adequate means of transportation, quality of life can suffer. Transportation system investments should be equitably distributed, and access to transportation services should also be equitable such that disadvantaged populations can reasonably accomplish the activities of daily life. Public transportation service is not a convenience, but rather a necessity for transit dependent residents.

## ACCESS TO TRANSIT

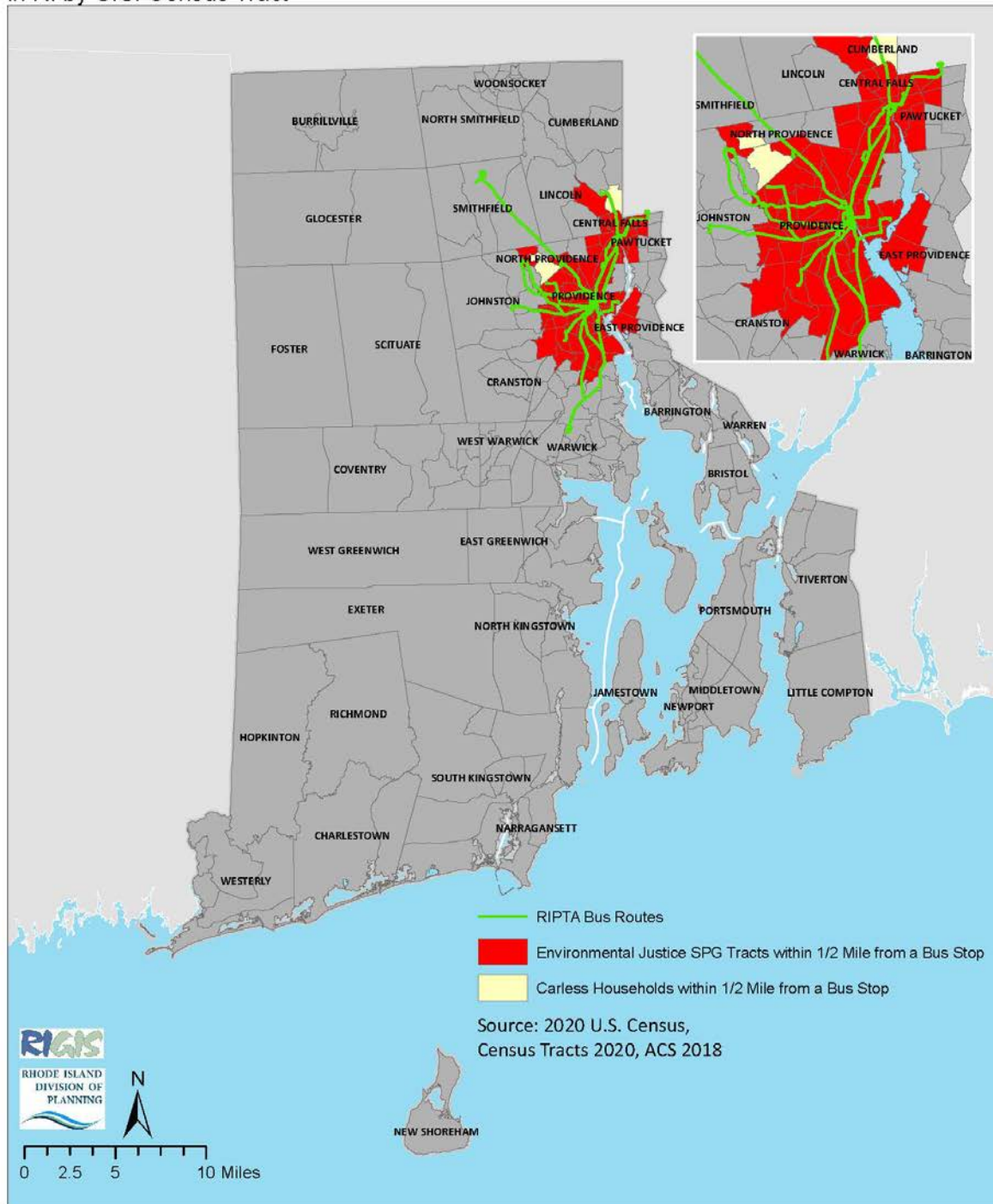
As part of this equity benefit analysis, a location quotient was again used to determine if select population groups have equitable transit access. Firstly, a polygon coverage was created for geographic analysis by defining a half-mile radius buffer around transit stops served by transit. This transit service area coverage was then overlaid on target populations to determine the number of people in the access area. (See **Map 3: Environmental Justice SPG and Carless Households within ½ Mile from a RIPTA Bus Stop in RI by US Census Tract**)

**Map 3: Environmental Justice SPG and Carless Households within ½ Mile from a RIPTA Bus Stop in RI by US Census Tract**

## Transportation Equity Benefit Analysis

May 2020

Environmental Justice SPG and Carless Households within 1/2 Mile from a RIPTA Bus Stop in RI by U.S. Census Tract



The same Location Quotient equation as used in the previous section was used for this analysis for combined minority and low-income populations.

#### MINORITY & POPULATIONS BELOW THE POVERTY LEVEL

According to *Transportation 2037*, 53.2% of the populations was identified as a minority and living below the poverty level in the study area (*numerator*) is within a ½ mile of a RIPTA bus stop. Similarly, 35.4% of the populations identified as a minority and was living below the poverty level in the State of Rhode Island (*denominator*) is within a ½ mile of a RIPTA bus stop. The calculated ratio, or location quotient as determined in *Transportation 2037*, was 1.50, which indicated greater access to transit for environmental justice populations.

$\frac{283,839}{372,278} \div \frac{533,487}{1,052,567}$	$\frac{53.2\%}{35.4\%}$
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Using 2018 ACS data, 71.3% of the populations identified as a minority and living below the poverty level in the study area (*numerator*) is within a ½ mile of a RIPTA bus stop. Similarly, 46.4% of the populations identified as a minority and living below the poverty level in the State of Rhode Island (*denominator*) is within a ½ mile of a RIPTA bus stop. Using the 2018 ACS, the calculation is the following:

$\frac{335,274}{490,134} \div \frac{470,437}{1,056,611}$	$\frac{71.3\%}{46.4\%}$
--	-------------------------

The calculated ratio, or location quotient, is 1.54, which indicates that access to transit for environmental justice populations has seemingly remained unchanged. **Table 4: Minority Individuals & Individuals in Poverty/Low Income**, details all the datapoints utilized to arrive at the calculated location quotient ratios and provide an annual comparison.

Table 5: Minority Individuals (Race) & Individuals in Poverty/Low Income (200% Below Poverty) Within 1/2 Mile of a RIPTA Bus Stop					
BENEFIT - ACCESS TO TRANSIT		2010		2018	
			Percentage (Numerator)		Percentage (Numerator)
Study Area	SPG Population	283,839	53.2%	335,274	71.3%
	Total Population	533,487		470,437	
			Percentage (Denominator)		Percentage (Denominator)
Reference Area	Total SPG Population in RI	372,278	35.4%	490,134	46.4%
	Total Population in RI	1,052,567		1,056,611	
	Location Quotient	1.50		1.54	
Data source: 2010 US Census and 2018 ACS 5-year					

The transit program recommended in the Transit Master Plan and incorporated by reference in *Transportation 2040* is expected to benefit minority and low-income households by increasing frequent transit service available to them and opening up new areas served by transit, thereby increasing access to jobs and other opportunities.

#### TRANSIT DEPENDENT HOUSEHOLDS

Another demographic group that is considered in this analysis is “transit dependent” as defined by zero-car households, of which there were 37,563 in the transit service area according to 2010 U.S. Census data evaluated as part of *Transportation 2037*. According to the findings, 17.6% of households within a ½ mile of a bus stop in the study area were carless. Similarly, 9.4% of households within a ½ mile of a bus stop within the State of RI were carless. The calculated ratio, or location quotient illustrated below, is 1.88, which indicates greater access to transit for zero-car households

$\frac{37,563}{38,137} \div \frac{213,395}{406,573}$	$\frac{17.6\%}{9.4\%}$
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Compared with current data, according to the 5-Year 2018 ACS, there were 29,028 zero-car households in the transit service area. Using 2018 ACS data, 18.1% of households within a ½ mile of a RIPTA bus stop in the study area were carless. Similarly, 9.6% of households within a ½ mile of a RIPTA bus stop within the State of RI were carless. The calculated ratio, or location quotient illustrated below, is 1.88, which indicates that access to transit for zero-car households remains unchanged

$$\frac{29,028 \div 160,505}{39,631 \div 410,885} \quad \frac{18.1\%}{9.6\%}$$

**Table 6: Carless Households** details the datapoints utilized to arrive at the calculated location quotient ratios.

Table 6: Carless Households Within 1/2 Mile of a RIPTA Bus Stop					
BENEFIT - ACCESS TO TRANSIT		2010		2018	
			Percentage (Numerator)		Percentage (Numerator)
Study Area	SPG Households	37,563	17.6%	29,028	18.1%
	Total Households	213,395		160,505	
			Percentage (Denominator)		Percentage (Denominator)
Reference Area	Total SPG Households in RI	38,137	9.4%	39,631	9.6%
	Total Households in RI	406,573		410,885	
	Location Quotient	1.88		1.88	
Data source: 2010 US Census and 2018 ACS 5-year					

Access to jobs is one of the most critical issues for low-income and transit dependent households in the State of Rhode Island. RIPTA administers several programs to meet this need including Jobs Access Reverse Commute (JARC) and New Freedoms Initiatives. However, the growth of employment in suburban areas and the lack of adequate transit service to these areas often create barriers for transit-dependent residents searching for job opportunities. Additionally, developments that locate low cost and senior housing in areas with lower land costs may serve the state's affordable housing goals but put a great strain on RIPTA's ability to serve these locations.

Transportation to jobs was raised as a key issue in the Coordinated Plan for Public Transportation and Human Services. This Coordinated Plan continues to support bus service as part of its environmental justice program. In addition, further development of the transit component of the travel demand model will enable analysis of other indicators such as travel time to work.

## **HOW THE LRTP 2040 ADVANCES ENVIRONMENTAL JUSTICE GOALS**

The guiding EJ principles followed by US DOT are briefly summarized as follows:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

There are a number of transportation issues that this LRTP identifies as important to minority, low-income, or transit dependent populations and the goal areas identified in LRTP 2040 were developed in particular to serve EJ communities.

## **CONNECT PEOPLE AND PLACES**

Pedestrian and bicycle safety is an important issue that affects minority, low-income households, and especially transit dependent households living in our more urbanized communities. According to the 5-Year 2018 American Community Survey 9.6 percent of households in Rhode Island do not own a vehicle, and for many of them, walking, and riding a bike is an important means of travel. However, pedestrians and cyclists face many safety hazards in urban areas where traffic volumes are high.

LRTP 2040 promotes pedestrian and bicycle safety in urban areas of Rhode Island by incorporating by reference the many bicycle safety and enhancement projects outlined in the Bicycle Master Plan. RIDOT's project development process considers the installation or enhancement of bicycle amenities in nearly every project pursuant to detailed traffic analysis studies and in alignment with Highway Safety and related plans. RIDOT also considers increasing on-road bicycle networks via resurfacing projects through the State Transportation Improvement Program's Pavement Capital Program and Maintenance Program.

## MAINTAIN TRANSPORTATION INFRASTRUCTURE

The traffic safety goals of the plan involve education, as well as engineering and enforcement. This is particularly important when addressing the needs of the environmental justice populations. The use of safety devices such as seatbelts and the routine state safety inspection of vehicles are lower within these demographics. LRTP 2040 incorporates by reference Rhode Island's Highway Safety Plan that emphasizes the protection of vulnerable roadway users such as bicyclists and pedestrians, which are found in higher numbers in environmental justice communities. Design policies also stress the importance of pedestrian access to transit and the need for ADA improvements along heavily traveled corridors. Improved emergency response cites the special evacuation needs of those with mobility impairments, the elderly and transit dependent populations.

It is expected that highway improvements proposed as part of Transportation 2040 will have a positive impact on surrounding communities including minority or low-income neighborhoods, by reducing congestion, reducing traffic and safety incidents, and improving access. The design for the recent improvements to Route 6/Route 10 evolved such that there were minimal adverse impacts to minority or low-income neighborhoods. The operational and safety improvements all occurred largely within existing rights of way and did not affect residential neighborhoods. RIDOT conducted outreach during the design process of the Route 6/Route 10 project was done in English and Spanish. The interstate system was examined along its entire length with respect to the proximity of environmental justice populations, as close proximity is considered a burden due to degraded air quality.

## STRENGTHEN COMMUNITIES

The goal of equity is to "ensure that the transportation system equitably serves all Rhode Islanders regardless of race, ethnic origin, income, age, mobility impairment, or geographic location." The objectives refer to equitable distribution of projects and access to services. The policies and strategies reinforce the need for outreach and avoidance of disproportionate adverse impacts. They also set forth the need for provision of travel training for non-English speaking populations.

Multimodal planning emphasis is placed on transit and connections to and between modes. The creation of additional "mini transit hubs," maintenance of Kennedy Plaza, provision of additional traveler information, travel training for the disabled, and expansion of private participation is all beneficial to the environmental justice populations.

## PROMOTE ENVIRONMENTAL SUSTAINABILITY

Land Use 2025, Rhode Island's State Land Use Plan, calls for directing growth and investments within an "urban services boundary" and creating development that is more conducive to successful use. Environmental objectives identify the need to reduce air and noise pollution, which may impact target populations disproportionately. The majority of low income, minority, and transit dependent populations are found within this urban area and improved transit service will benefit all. Select population groups like environmental justice communities will also be the focus in preparation of Land Use 2050, the next update to the land use plan. Land Use 2050 will incorporate by reference the transportation plans that support and comprise the LRTP. Planning aspects of recognize the "needs of underserved communities" and "supports inclusive transportation planning and resource allocation processes that are accessible to, understood by, and constructively engage all population groups."

## SUPPORT ECONOMIC GROWTH

Economic development objectives and policies deal directly with getting people to and from work sites. Transit recommendations in LRTP 2040 are specifically intended to improve mobility for low-income households. The Jobs Access Program is designed to help low income workers gain access to job site otherwise unavailable to them. The recommendation to extend hours of service for the bus system is intended to benefit the transit dependent person who often cannot access certain activities because bus service stops at 8:00 p.m. on many routes. Alternative transportation options have been developed recently to help address the challenge of providing access to job centers that are not located in areas with a lot of transit activity (i.e., Quonset) and of providing access to jobs that begin at staggered times. Fixed route public transit is not a viable service for low ridership travel like access to jobs that are located in remote areas and serve individual workers.

These many goals, policies, and strategies are critical components of Rhode Island's environmental justice program that the State will strive to pursue and improve. The State of Rhode Island remains committed to involving minority groups and low-income groups in our planning process, and to developing plans and programs that provide an equitable distribution of benefits and burdens.



## HOW THE STIP ADVANCES ENVIRONMENTAL JUSTICE GOALS

For the FFY 2018-2027 State Transportation Improvement Program (STIP), a quantitative cost analysis of projects programmed in areas identified with significant populations of minority and low-income areas was conducted. Based on the results of the last analysis, the percentage of transportation improvement projects in the categories of Bridge, Pavement, Traffic Safety, Drainage, Transportation Alternatives, and Transit Capital, in the minority and low-income census tracts far exceeds the percentage of the target population as it compares to the total state population.

Overall, the implementation of these types of projects in the STIP is extremely equitable and beneficial to Rhode Island's disadvantaged citizens as the rehabilitation of existing transportation infrastructure provides an overwhelming positive impact on a neighborhood in that it improves safety, increases mobility and may provide construction workforce opportunities for local residents; therefore benefits rather than burdens a community. The full results of this study are presented in the STIP. See: <http://www.planning.ri.gov/planning-areas/transportation/tip.php>.

In examining the equitable distribution of transit services and projects, it has been determined that two-thirds of RIPTA's system serves minority neighborhoods. The route system has Providence as its hub, with additional intra-city service in Pawtucket, Woonsocket, and Newport. This corresponds well with areas where minority concentrations are the greatest. The paratransit service is now a statewide system. Additional information on RIPTA's commitment to Civil Rights, Title VI can be found at [www.ripta.com/civil-rights--title-vi](http://www.ripta.com/civil-rights--title-vi).

# APPENDIX

December 2017

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## ENVIRONMENTAL JUSTICE ANALYSIS

The State of Rhode Island is committed to integrating the principles of environmental justice into all of our transportation planning programs and activities. This commitment to equity was first included in the Long Range Transportation Plan in *Transportation 2020* (completed in 2001). A full assessment of our planning process, including environmental justice actions undertaken, was conducted in 2005 and 2010 as part of a federal certification review. In 2008 Statewide Planning conducted a benefits and burden case study of the environmental justice population based on 2000 U.S. Census data and select elements of the 2008 transportation system. Quantification of burdens was conducted on a macro level using an equation termed the “Location Quotient.” The target population’s environmental justice proximity to an interstate and bus routes was used as a variable in the 2008 case study, along with access and air quality assumptions to calculate the measure of burden. It was determined that a higher proportion of minorities and populations below the poverty level live within the case study area and that there is a disproportionate burden, for example, poor air quality, with regards to the transportation systems studied. As part of this update, the location quotient analysis was employed using 2010 Census figures. This analysis found that a higher proportion of minorities and populations below the poverty level continue to live within the case study area and there continues to be a disproportionate burden with regards to the transportation systems studied.

The transit program recommended in this Plan is expected to benefit minority and low-income households by increasing transit service available to them and by increasing their access to jobs and other opportunities. As part of the 2008 Plan update, a benefits analysis was conducted to determine if target environmental justice populations have equitable transit access. Another demographic group that is considered in this analysis is “transit dependent” as defined by zero-car households. The same location quotient equation used in the burdens analysis was used for this analysis for combined minority and low income populations. It was found that Rhode Island’s environmental justice populations, along with transit dependent populations have greater access to transit than the state population as a whole. As part of this update, the same analysis was conducted using 2010 Census figures. The findings of this exercise concluded that environmental justice populations along with transit dependent populations continue to have greater access to transit than the state population as a whole.

As part of the FY 201-2025 Transportation Improvement Program update, a quantitative analysis of the projects that are programmed for minority and low income areas was conducted. In summary, this analysis found that in nearly all cases, the percentage of transportation improvement projects in the categories of Highway, Pavement Management, Bicycle/Pedestrian, Enhancement, Traffic Safety Programs, and Major Projects with Multi Year Funding, in the minority and low-income census tracts far exceeds the percentage of the target population as it compares to the total state population. Overall, the implementation of these types of projects in the TIP is extremely equitable and beneficial to Rhode Island’s disadvantaged citizens as the rehabilitation of existing transportation infrastructure provides an overwhelming positive impact on a neighborhood in that it improves safety, increases mobility and may provide construction workforce opportunities for local residents; therefore benefits rather than burdens a community. The full results of this study are presented in the TIP ([www.planning.state.ri.us/tip/TIP%20Full%207-12-12%20Final.pdf](http://www.planning.state.ri.us/tip/TIP%20Full%207-12-12%20Final.pdf) ).

In examining the equitable distribution of transit services and projects, it has been determined that two-thirds of RIPTA's system serves minority neighborhoods. The route system has Providence as its hub, with additional intra-city service in Pawtucket, Woonsocket, and Newport. This corresponds well with areas where minority concentrations are the greatest. The paratransit service is now a statewide system. Additional information on RIPTA's commitment to Civil Rights, Title VI can be found at [www.ripta.com/civil-rights--title-vi](http://www.ripta.com/civil-rights--title-vi).

## IDENTIFYING ENVIRONMENTAL JUSTICE POPULATIONS

The target populations for environmental justice are minorities, low-income individuals, and persons with disabilities. Minority is defined as including four ethnic groups: Hispanic, Black, Asian, and Native Indian, consistent with the Federal Environmental Justice Order. With the exception of persons with disabilities, these populations have been identified and mapped using data from the 2010 Census. For this update, the Census definition of minority was utilized which is the total population minus all white, non-Hispanic persons. The data for persons with disabilities has not yet been released. The updated environmental justice population mapping can be found at the end of this document.

*See E.J. Maps #4-9  
Through 4-16*

In compliance with Executive Order No. 13166, Improving Access to Services for Persons with Limited English Proficiency (LEP), the purpose of which is to ensure accessibility to programs and services to eligible persons who are not proficient in the English language, Statewide Planning compiled data and mapping of LEP populations as part of a RIDOT Environmental Impact Statement (EIS) for the South County Commuter Rail Study. In addition, Statewide Planning completed an LEP Plan for its own planning program services. These efforts were conducted using guidance that was issued by the U.S. Department of Transportation (DOT) to ensure that persons in the United States are not excluded from participation in DOT-assisted programs and activities simply because they face challenges communicating in English.

The mapping for these efforts is provided within this plan, a test case study, along with the other environmental justice mapping.

## PRINCIPLES OF ENVIRONMENTAL JUSTICE

The State embraces the following three core principles to guide our efforts in environmental justice:

- **Outreach** - Reach out to involve target populations in the planning process.
- **Burdens** - Prevent disproportionately high adverse impacts.
- **Benefits** - Ensure an equitable distribution of benefits.

The discussion that follows is organized by these principles.

## OUTREACH

Outreach activities are intended to provide input and guidance to the planning process to achieve environmental justice goals in both the Long Range Transportation Plan and the Transportation Improvement Program. The following outreach activities have occurred from 2007 to the current day in 2012:

- Transportation Advisory Committee (TAC) Membership: The Governor’s Commission on Disabilities and the Narragansett Indian Tribe are represented on the TAC.
- Environmental Justice List: An e-mail list consisting of 49 social advocacy groups (housing, elderly, Hispanic, etc.) for target populations was developed and is used in notifying the community of major planning activities.
- Bus Users Forum: The Accessible Transportation Advisory Committee (ATAC) provides an opportunity for transit dependent residents to discuss bus service issues directly with transit operators and planners.
- Flyers: Public participation brochures have been developed in Spanish and have been distributed and posted on our website.
- Open House: A major event was held in March 2007 at the Blackstone Valley Visitor Center (also a bus terminal) and advertised in Spanish and English.
- Inner City Students: Several lectures and planning exercises were held in 2007 – 2008 in conjunction with the University of Rhode Island at Feinstein High School in Providence.
- Coordinated Public Transportation - Human Services Plan: RIPTA brought together many agencies (Elderly Affairs, Human Services, Labor and Training, Commission on Disabilities) that were key to the development of this Plan. Statewide Planning assisted in this effort with extensive census mapping of target populations, mailings to our Social Advocacy Group list, and e-mail notifications to our EJ list.

Meeting the needs of the “underserved communities” is found in the goal of the Planning section of this Plan’s recommendations. The policies related to this goal run the spectrum of a program that is accessible, constructively engages, is inclusive, institutes outreach, and emphasizes all members of the environmental justice community.

## BURDENS

Transportation systems exist to provide mobility and quality of life benefits. Unfortunately, the construction and operation of these systems can have adverse impacts such as excessive noise, degraded air quality, degraded water quality, and isolation or fracturing of neighborhoods. Equity and environmental justice goals seek to ensure that target populations do not bear a disproportionate share of these “burdens.” Quantifying burdens on a macro level can be accomplished with the following equation termed “Location Quotient:”

EJ population in the study area / total population in the study area (U.S. Census, 2000 or 2010)

EJ population in the reference area / total population in the reference area<sup>1</sup>

A number greater than 1 indicates that there is a greater proportion of the EJ population in the study area. For the purposes of this plan and in consideration of the analytical tools available to staff, exposure to vehicle emissions was undertaken as a case study to determine if there is a disproportionate adverse impact on environmental justice populations.

Poor air quality can aggravate respiratory conditions such as asthma. On-road mobile sources of emissions (car, truck, and bus) contribute to degraded air quality, although point sources (power plants and factories) and area sources (lawn mowers and leaf blowers) contribute as well. Rhode Island has a rate of asthma that is 8<sup>th</sup> highest in the nation, and 1 in 10 households in Rhode Island has someone with this disease.<sup>2</sup> A University of Southern California (USC) study (part of the large California Children's Health Study) has found a link between asthma rates and how close the subjects live to a freeway. Specifically, the number of children who suffered asthma attacks increased as the distance between their homes and a major thoroughfare decreased. Those living within 82 yards of a freeway had the highest rates of asthma, while those living 83 to 166 yards away had the second-highest rates. A family's socioeconomic status, exposure to secondhand smoke and the type of housing did not explain the differences in asthma rates.<sup>3</sup>

The current 2015 bus fleet includes 338 buses, trolleys, and vans including 52 hybrid buses. All vehicles use ultra-low sulfur diesel to reduce emissions. The primary bus routes traverse many low-income, minority, and transit dependent neighborhoods as well as the state's freeways. Diesel emissions in particular can pose a health hazard in these urban neighborhoods where asthma rates are often higher than in suburban neighborhoods.

In an effort to determine the exposure of Rhode Island's environmental justice populations to excessive emissions, census tracts with greater than average concentrations target populations were mapped with a 250' buffer around Interstate highways and freeways. The 250' buffer (approximately 82 yards as noted in the USC study) becomes the study area. Vehicles on other roadways also contribute to poor air quality, but a principal arterial has mobility benefits that balance out the burdens (access to commercial areas, services, residential neighborhoods, sidewalks, bus routes, etc.) Interstate highways, however, provide mobility benefits only without providing access to property or allowing for non-motorized modes or transit stops. Therefore, close proximity to an Interstate is assumed in this case to be more of a burden than a benefit. The reference area is the entire State.

*CASE STUDY: What percentage of RI's EJ populations live within 250 feet of Interstate highways compared to the population as a whole?*

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<sup>1</sup> Methodological Challenges of Environmental Justice Assessments for Transportation Projects, TRB, TRC #2013, 2007.

<sup>2</sup> Behavioral Risk Factor Surveillance System, 2002.

<sup>3</sup> <http://www.cleanairchoice.org/outdoor/AsthmaFreeway.asp>

This mapping exercise presented the following Location Quotient equation for combined minority populations according to 2000 U.S. Census data:

$$\frac{8,073 / 30,218}{167,081 / 1,048,319}$$

The calculated ratio is 1.68 which indicates that in fact a higher proportion of minorities live within this study area and that there is a disproportionate burden.

*See Map # 4-15  
Case Study: EJ  
Populations within  
250' of Interstates  
and Freeways*

This mapping exercise presented the following Location Quotient equation for combined minority populations according to 2010 U.S. Census data:

$$\frac{7,691 / 20,367}{248,882 / 1,052,567}$$

The calculated ratio is 1.60 which indicates that a higher proportion of minorities continue to live within this study area and that there is a disproportionate burden; however the ratio is just slightly smaller than that found in 2000 indicating a slight reduction in the transportation burden on minorities.

Similarly with population below the poverty level in 2000, the equation is:

$$\frac{5,938 / 30,218}{120,548 / 1,048,319}$$

The calculated ratio is 1.71 which, again, indicates a disproportionate burden.

Using the 2010 population below the poverty level, the equation is:

$$\frac{3,538 / 20,367}{123,396 / 1,052,567}$$

The calculated ratio is 1.48 which, again, indicates a disproportionate burden, however the burden has improved over the past 10 years.

This Plan presents the following recommendations to begin to address this concern. These recommendations are also found in Part Five with numbers noted in parentheses.

1. Amend CMAQ criteria to award more points to projects improving air quality in areas close to freeways. (EQ.3.d)
2. Through program implementation of diesel retrofits for school buses, begin with school districts in affected areas. (EN.3.e)
3. Increase use of vegetated buffers along the highway to trap particulates and improve air quality. (En.3.c)

Additionally, in order to better understand this situation, further study is encouraged to attempt to obtain historic data from 1970, 1980, and 1990. Identification of a trend would determine whether the problem is getting better or worse. From the limited data that was analyzed (2000 and 2010), it does appear that the disproportionate burden is shrinking. Also, Statewide Planning has generated a map that identifies locations suitable for high-density housing. In future refinements of this map, the State should consider a new site screening criteria related to health impacts due to emissions exposure for all populations, not just target populations.

Rhode Island's transportation plans, policies, and programs advance the goal of reducing diesel emissions by encouraging diesel retrofitting programs and the use of alternative fuels. All new RIPTA fixed route buses will be equipped with diesel particulate filters and engines with lower emissions levels. This plan also encourages non-motorized modes of transportation (bicycle and pedestrian) which help to achieve many goals related to improved air quality, physical fitness, reduced congestion, and are free or low-cost modes. It should be noted that overall air quality is improving and the passenger vehicle fleet is becoming cleaner. Additionally, the standards for transit bus engines have been getting more stringent on the amount of emissions that are acceptable, which results in improved air quality in areas with a lot of transit activity. Over time, living in proximity to a highway should have increasingly fewer health impacts.

It is beyond the scope of this Plan to investigate other potentially disproportionate adverse impacts to environmental justice populations, such as freeway noise and degraded water quality.

## **BENEFITS**

Transportation provides a means to access shopping, gainful employment, health care and other services, and social and recreational activities. Without adequate means of transportation, quality of life can suffer. Transportation system investments should be equitably distributed, and access to transportation services should also be equitable such that disadvantaged populations can reasonably accomplish the activities of daily life. Public transportation service is not a convenience, but rather a necessity for transit dependent residents.

*CASE STUDY: What percentage of RI's target populations live in area served by transit compared to the population as a whole?*

## **ACCESS TO TRANSIT**

The transit program recommended in this Plan is expected to benefit minority and low-income households by increasing transit service available to them and by increasing their access to jobs and other opportunities. As part of this Plan update, an analysis was conducted to determine if target populations have equitable transit access. Firstly, a polygon coverage was created for geographic analysis by defining a half-mile radius buffer around transit stops. This transit service area coverage was then overlaid on target populations to determine the number of people in the access area. The same Location Quotient equation as used in the previous section was used for this analysis for combined minority and low income populations. Using the 2000 Census, the calculation is the following:

$$\frac{259,574}{310,434} / \frac{771,704}{1,048,379}$$

The calculated ratio is 1.14 which indicates greater access to transit for environmental justice populations.

Using the 2010 Census, the calculation is the following:

$$\frac{283,839}{372,278} / \frac{533,487}{1,052,567}$$

The calculated ratio is 1.50 which indicates that access to transit for environmental justice populations continues to improve.

Another demographic group that is considered in this analysis is “transit dependent” as defined by zero-car households, of which there were 38,422 in the transit service area in 2000:

$$\frac{38,422}{44,518} / \frac{771,704}{1,048,379}$$

The calculated ratio is 1.19 which indicates greater access to transit for zero-car households.

According to the 2010 Census, there were 37,563 zero-car households in the transit service area:

$$\frac{37,563}{38,137} / \frac{533,487}{1,052,567}$$

The calculated ratio is 1.94 which indicates that access to transit for zero-car households continues to improve.

Access to jobs is one of the most critical issues for low-income and transit dependent households in the State of Rhode Island. RIPTA administers several programs to meet this need including Jobs Access Reverse Commute and New Freedoms Initiatives. However, the growth of employment in suburban areas and the lack of adequate transit service to these areas often create barriers for transit-dependent residents searching for job opportunities. Additionally, developments that locate low cost and senior housing in areas with low land costs may serve the state’s affordable housing goals but put a great strain on RIPTA’s ability to serve these locations.

Transportation to jobs was raised as a key issue in the Coordinated Plan for Public Transportation and Human Services. This Plan continues to support bus service as part of its environmental justice program. RIPTA should also continue its efforts to give transit users a voice through a forum such as the New Public Transit Alliance (NUPTA) and continue its efforts to improve bus scheduling. Further development of the transit component of the travel demand model will enable analysis of other indicators such as travel time to work.

*See Map # 4-16  
Case Study: EJ  
Populations within ¼  
Mile of a Transit Stop*



## **HOW THIS PLAN ADVANCES ENVIRONMENTAL JUSTICE GOALS**

There are a number of transportation issues that this Plan identifies as important to minority, low-income, or transit dependent populations. There is an entire section of the plan recommendations that addresses Equity (described below). In addition, our commitment to environmental justice is pervasive throughout the recommendations section, and applicable references are also noted below.

### **EQUITY**

The goal of equity is to “ensure that the transportation system equitably serves all Rhode Islanders regardless of race, ethnic origin, income, age, mobility impairment, or geographic location.” The objectives refer to equitable distribution of projects and access to services. The policies and strategies reinforce the need for outreach and avoidance of disproportionate adverse impacts. They also set forth the need for provision of travel training for non-English speaking populations.

### **BICYCLE & PEDESTRIAN**

Pedestrian and bicycle safety is an important issue that affects minority, low-income households, and especially transit dependent households living in our more urbanized communities. According to the 2010 American Community Survey 10.2 percent of households in Rhode Island does not own a vehicle, and for many of them, walking, and riding a bike is an important means of travel. However, pedestrians and cyclists face many safety hazards in urban areas where traffic volumes are high. This Plan promotes pedestrian and bicycle safety in urban areas of the state.

### **DESIGN**

Design policies stress the importance of pedestrian access to transit and the need for ADA improvements.

### **ECONOMIC DEVELOPMENT**

Economic development objectives and policies deal directly with getting people to and from work sites.

### **EMERGENCY RESPONSE**

Emergency response cites the special evacuation needs of those with mobility impairments, the elderly and transit dependent populations.

## **ENVIRONMENT**

Environmental objectives identify the need to reduce air and noise pollution, which may impact target populations disproportionately.

## **FINANCE**

Over a quarter of the policy recommendations within the Finance section are devoted to the enhancement of the economic well-being of the transit system service within the state. In addition, ADA improvements are singled out for special consideration for financial restructuring to provide long-term fiscal stability.

## **HIGHWAY AND INTERSTATE**

None of the proposed freeway improvements are expected to adversely affect any minority or low-income neighborhoods. The design for the improvements to Route 6 evolved such that there were minimal adverse impacts to minority or low-income neighborhoods. The operational and safety improvements all occurred largely within existing rights of way and did not affect residential neighborhoods. RIDOT outreach during the design process was done in English and Spanish. The interstate system was examined along its entire length with respect to the proximity of environmental justice populations, as close proximity is being considered as a burden due to degraded air quality. And lastly, the FY 2013 – 2016 Transportation Improvement Program (TIP) includes an analysis that demonstrates that bicycle, highway, and enhancement projects are equitably distributed.

## **INTERMODAL**

Intermodal planning emphasis is placed on transit and connections to and between modes. The creation of additional “mini transit hubs,” maintenance of Kennedy Plaza, provision of additional traveler information, travel training for the disabled, and expansion of private participation is all beneficial to the environmental justice populations.

## **LAND USE AND CORRIDORS**

*Land Use 2025*, Rhode Island’s State Land Use Plan, calls for directing growth and investments within an “urban services boundary” and creating development that is more conducive to successful use. The majority of low income, minority, and transit dependent populations are found within this urban area and improved transit service will benefit all.

## PLANNING

Planning aspects recognize the “needs of underserved communities” and “supports inclusive transportation planning and resource allocation processes that are accessible to, understood by, and constructively engage all population groups.”

## SAFETY

The safety goals of the plan involve education, as well as engineering and enforcement. This is particularly important when addressing the needs of the environmental justice populations. The use of safety devices such as seatbelts and the routine state safety inspection of vehicles are lower within these demographics.

## TRANSIT

Other transit recommendations in the Plan are specifically intended to improve mobility for low-income households. The Jobs Access Program is designed to help low income workers gain access to job site otherwise unavailable to them. The recommendation to extend hours of service for the bus system is intended to benefit the transit dependent person who often cannot access certain activities because bus service stops at 8:00 p.m. on many routes. Alternative transportation options need to be developed to address the challenges of providing access to job centers that are not located in areas with a lot of transit activity and of providing access to jobs that begin at staggered times. Fixed route public transit is not a viable service for low ridership travel like access to jobs that are located in remote areas and serve individual workers.

These many goals, policies, and strategies are critical components of Rhode Island’s environmental justice program that the State will strive to pursue and improve. The State of Rhode Island remains committed to involving minority groups and low-income groups in our planning process, and to developing plans and programs that provide an equitable distribution of benefits and burdens.

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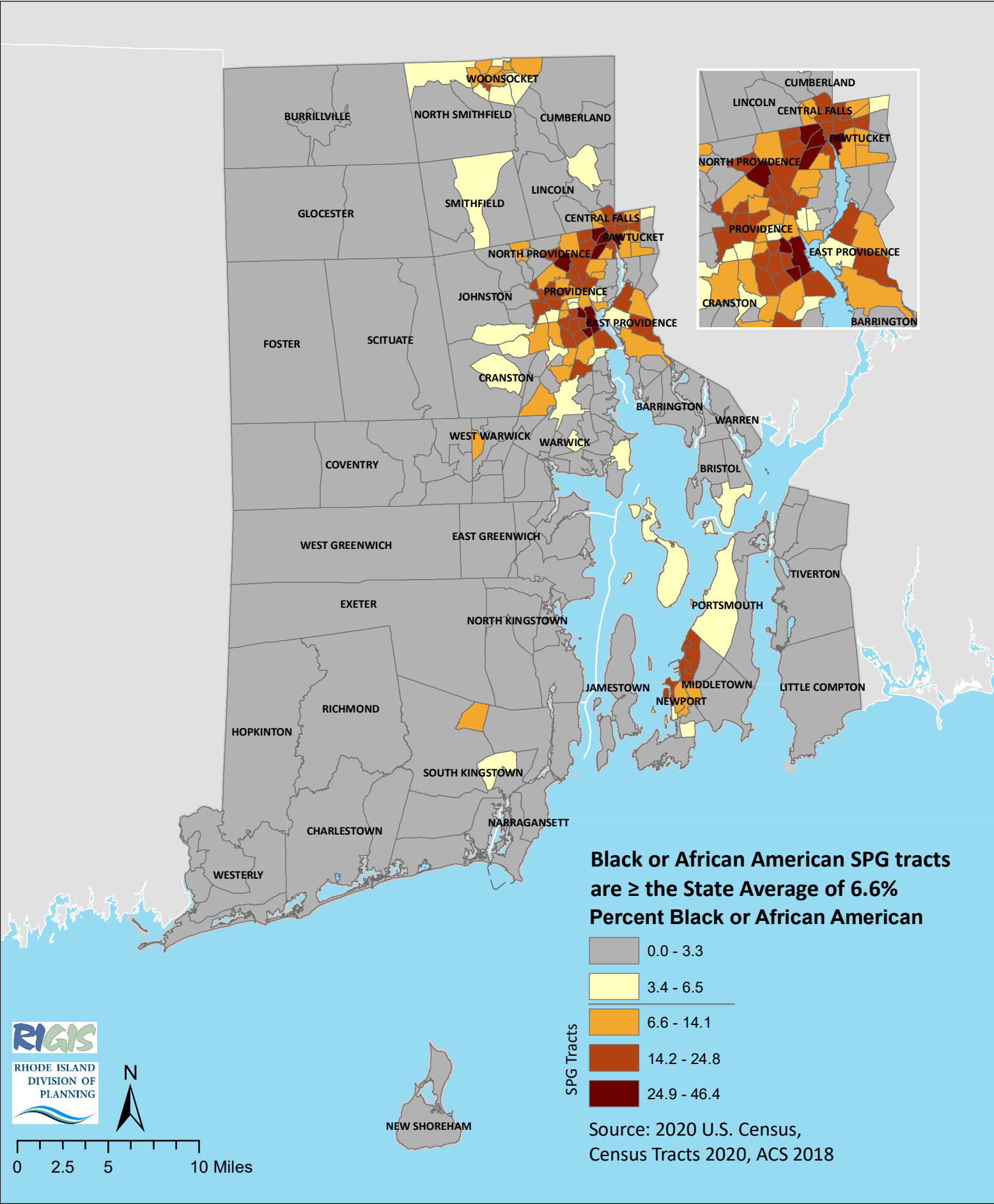
## AIR QUALITY ANALYSIS

### EXECUTIVE SUMMARY

As part of its transportation planning process, the State of Rhode Island conducted an air quality analysis for both the FY 2013-2016 Transportation Improvement Program (TIP) and *Transportation 2037*, the Long Range Transportation Plan 2012 Update. The air quality analysis included a statewide analysis for ozone precursor emissions of volatile organic compounds (VOCs) and oxides of nitrogen (NO<sub>x</sub>).

# Transportation Equity Benefit Analysis

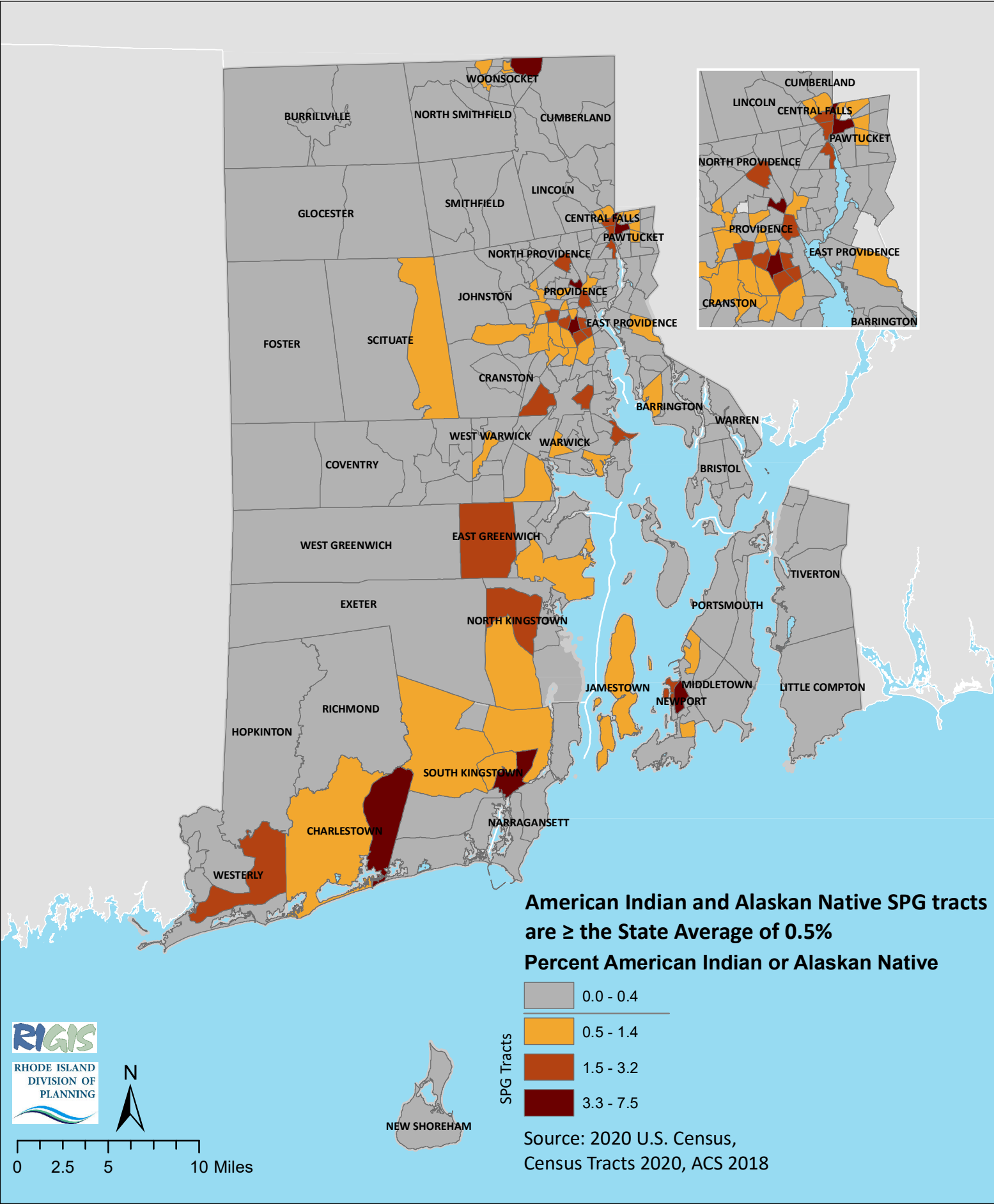
Percentage of Black or African American Individuals in RI by U.S. Census Tract



# Transportation Equity Benefit Analysis

May 2020

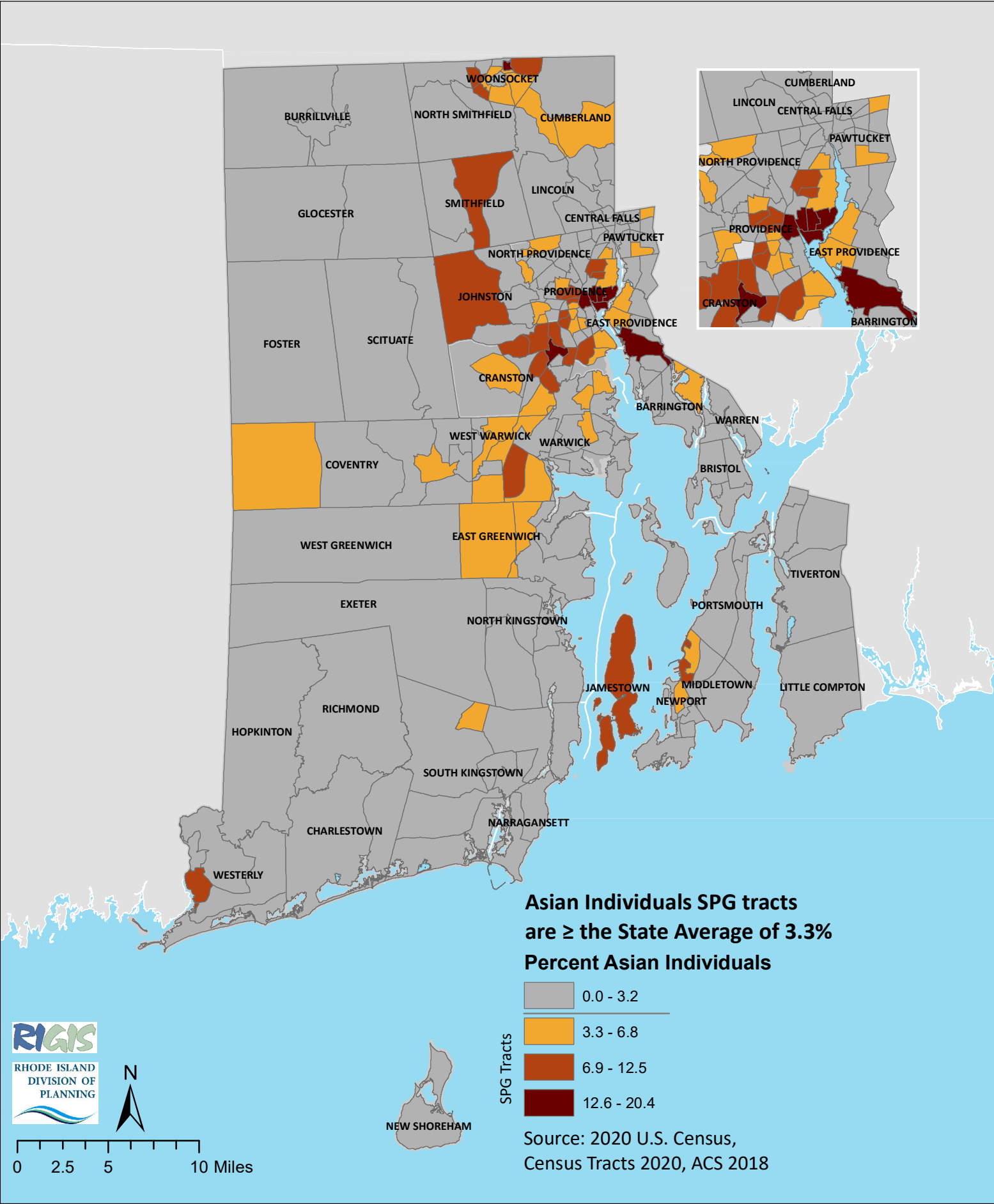
## Percentage of American Indian and Alaskan Native Individuals in RI by U.S. Census Tract



# Transportation Equity Benefit Analysis

May 2020

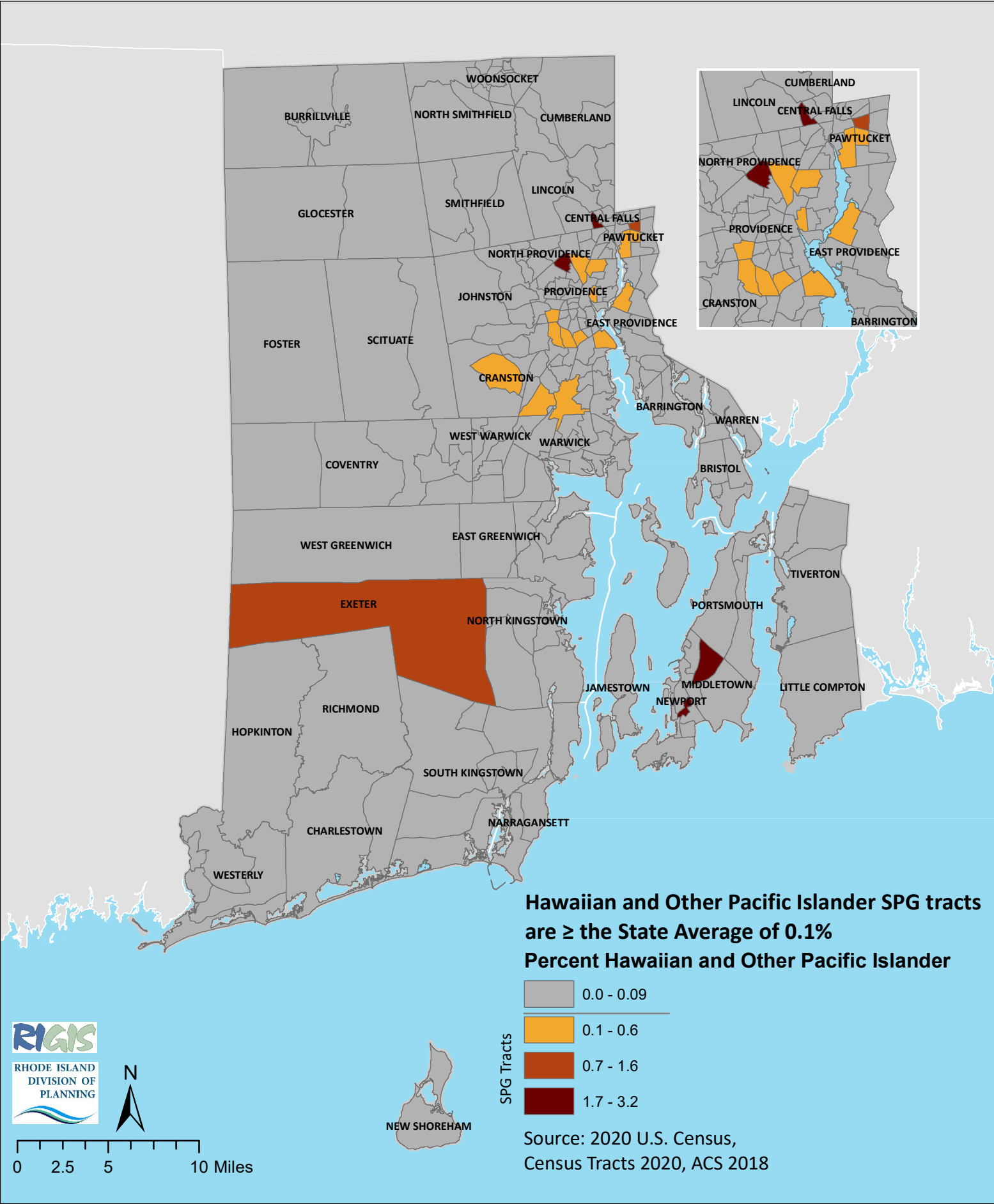
## Percentage of Asian Individuals in RI by U.S. Census Tract



# Transportation Equity Benefit Analysis

May 2020

Percentage of Hawaiian and Other Pacific Islander Individuals in RI by U.S. Census Tract

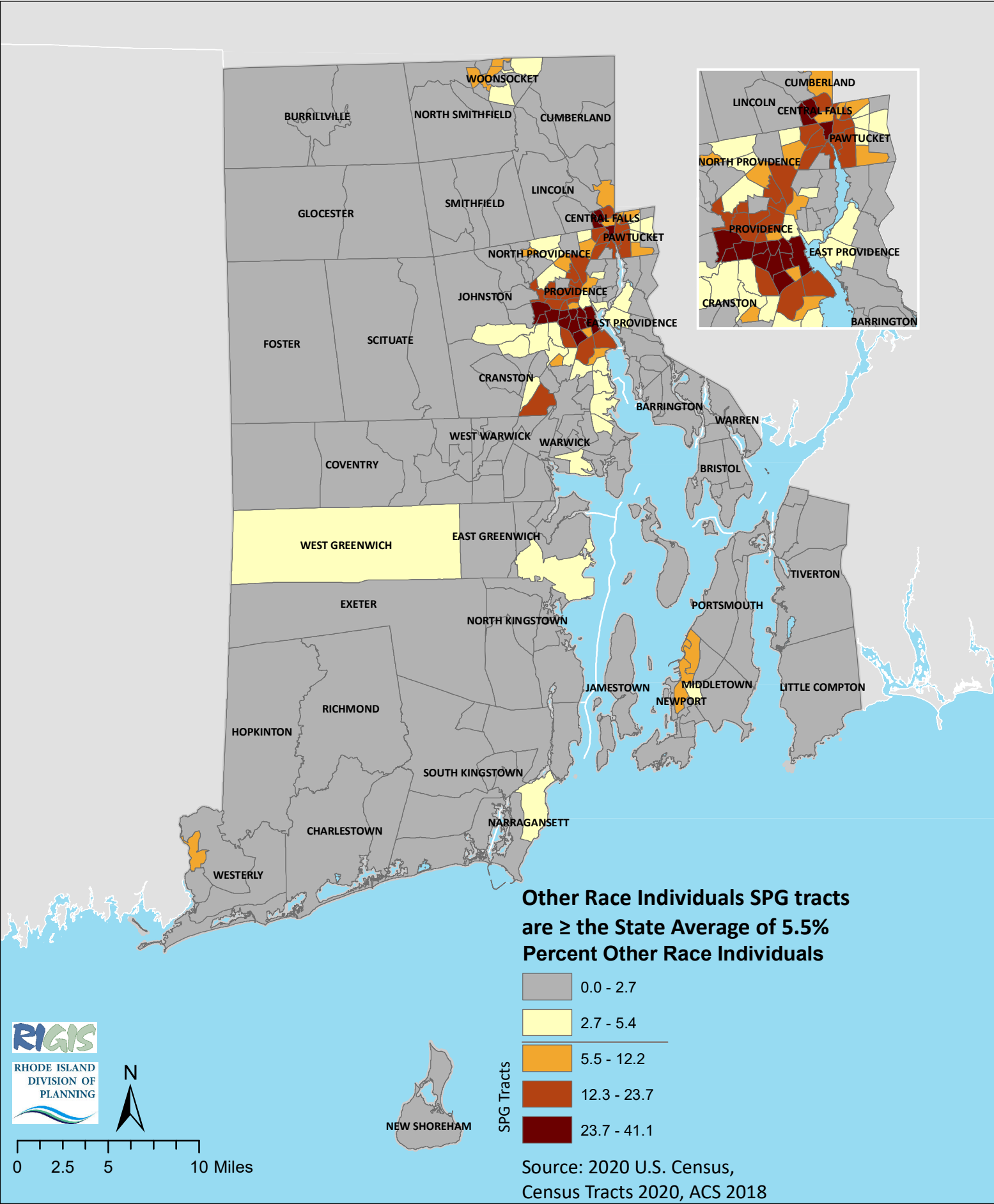




# Transportation Equity Benefit Analysis

May 2020

Percentage of Other Race Individuals in RI by U.S. Census Tract

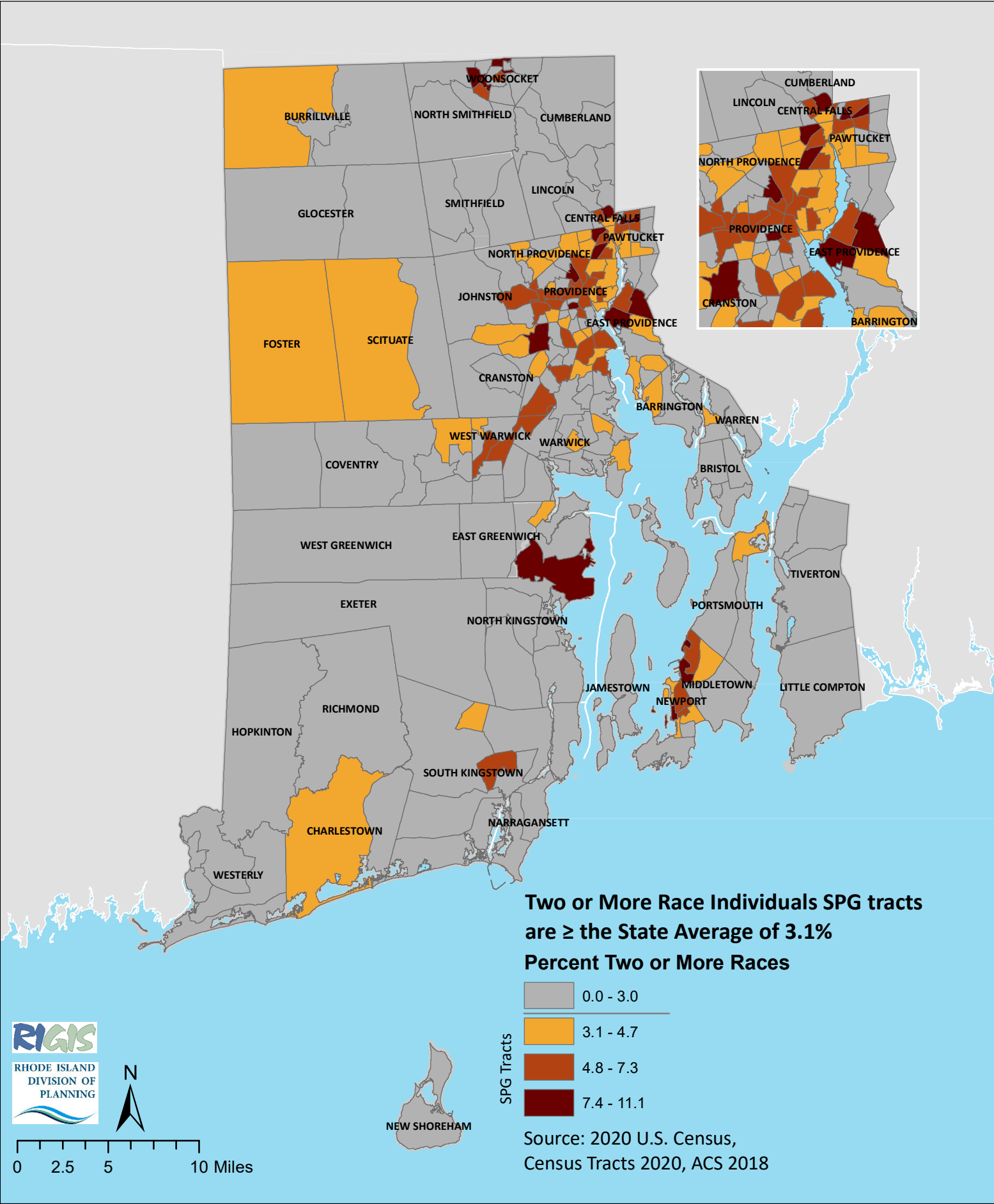




# Transportation Equity Benefit Analysis

May 2020

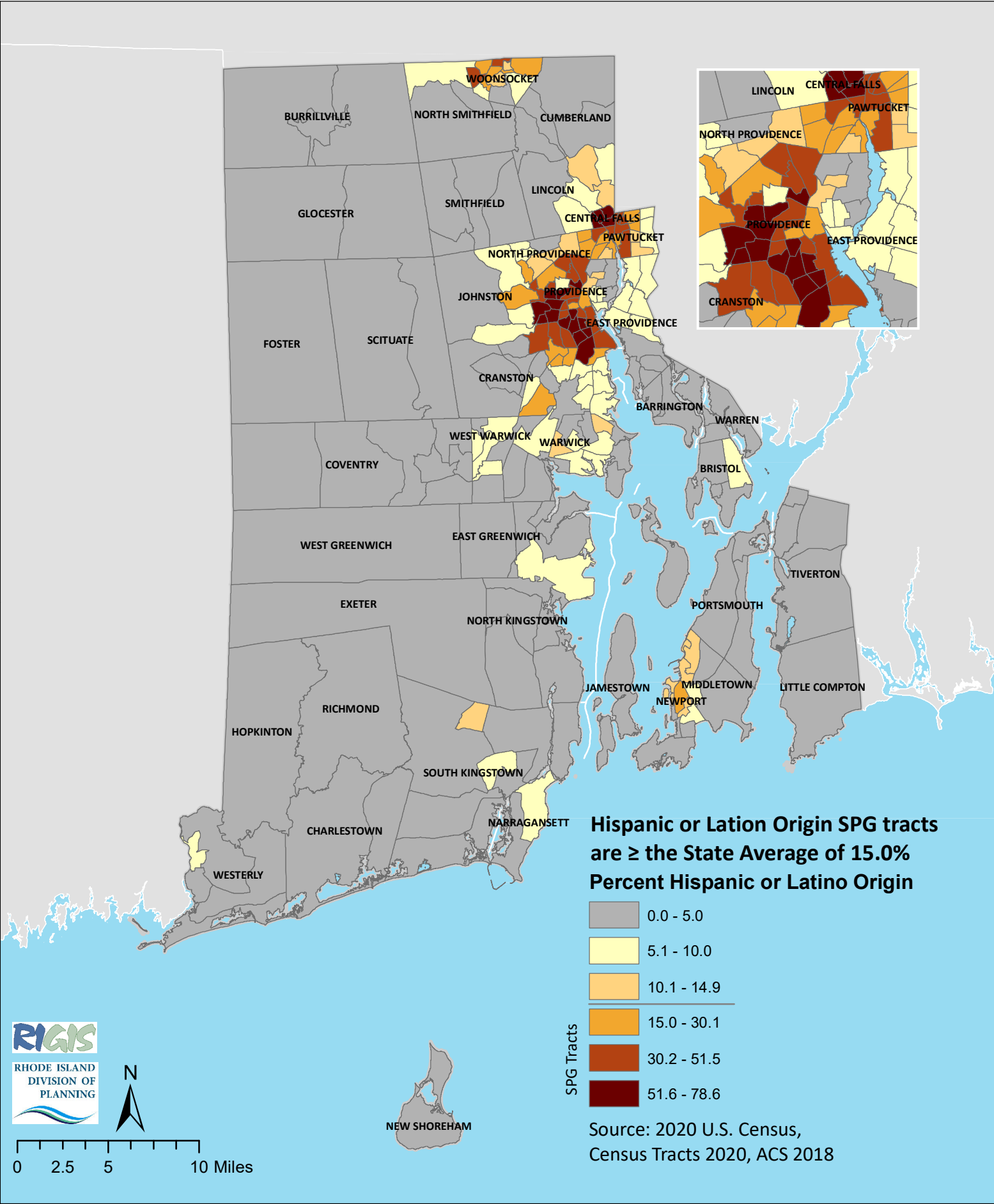
Percentage of Two or More Race Individuals in RI by U.S. Census Tract



# Transportation Equity Benefit Analysis

May 2020

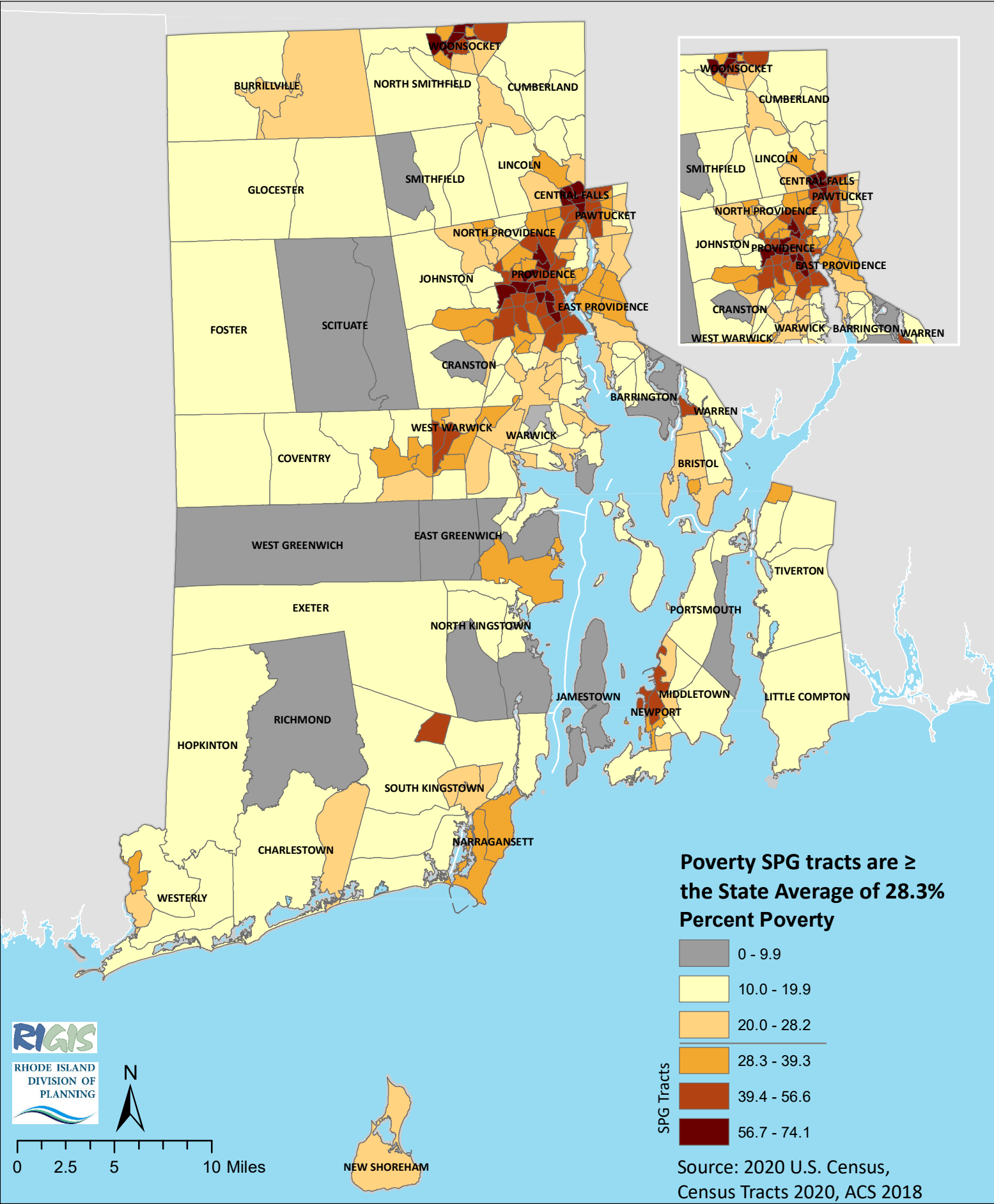
## Percentage of Hispanic or Latino Origin Individuals in RI by U.S. Census Tract



# Transportation Equity Benefit Analysis

May 2020

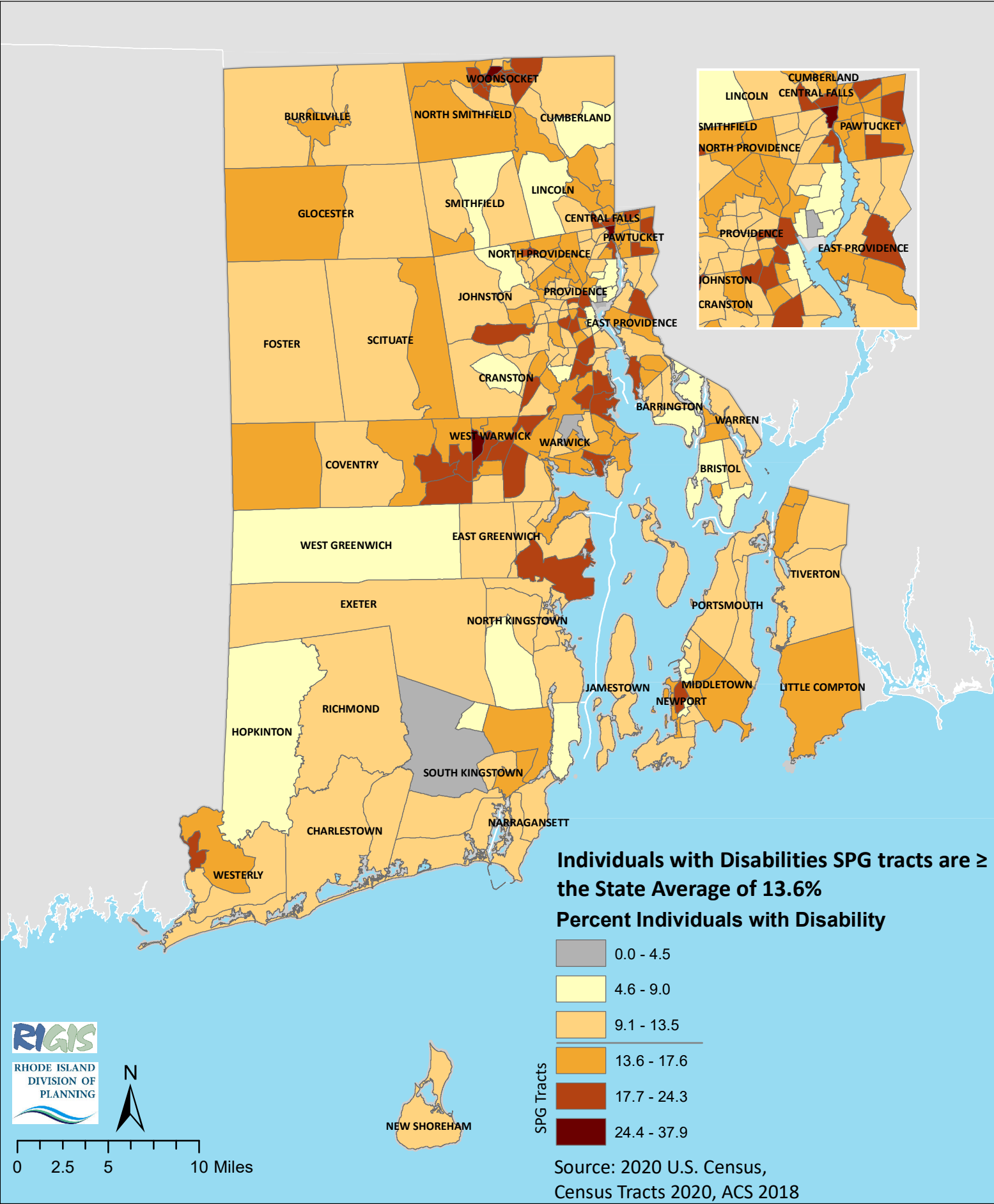
## Percentage of Individuals in Poverty/Low-Income in RI by U.S. Census Tract



# Transportation Equity Benefit Analysis

May 2020

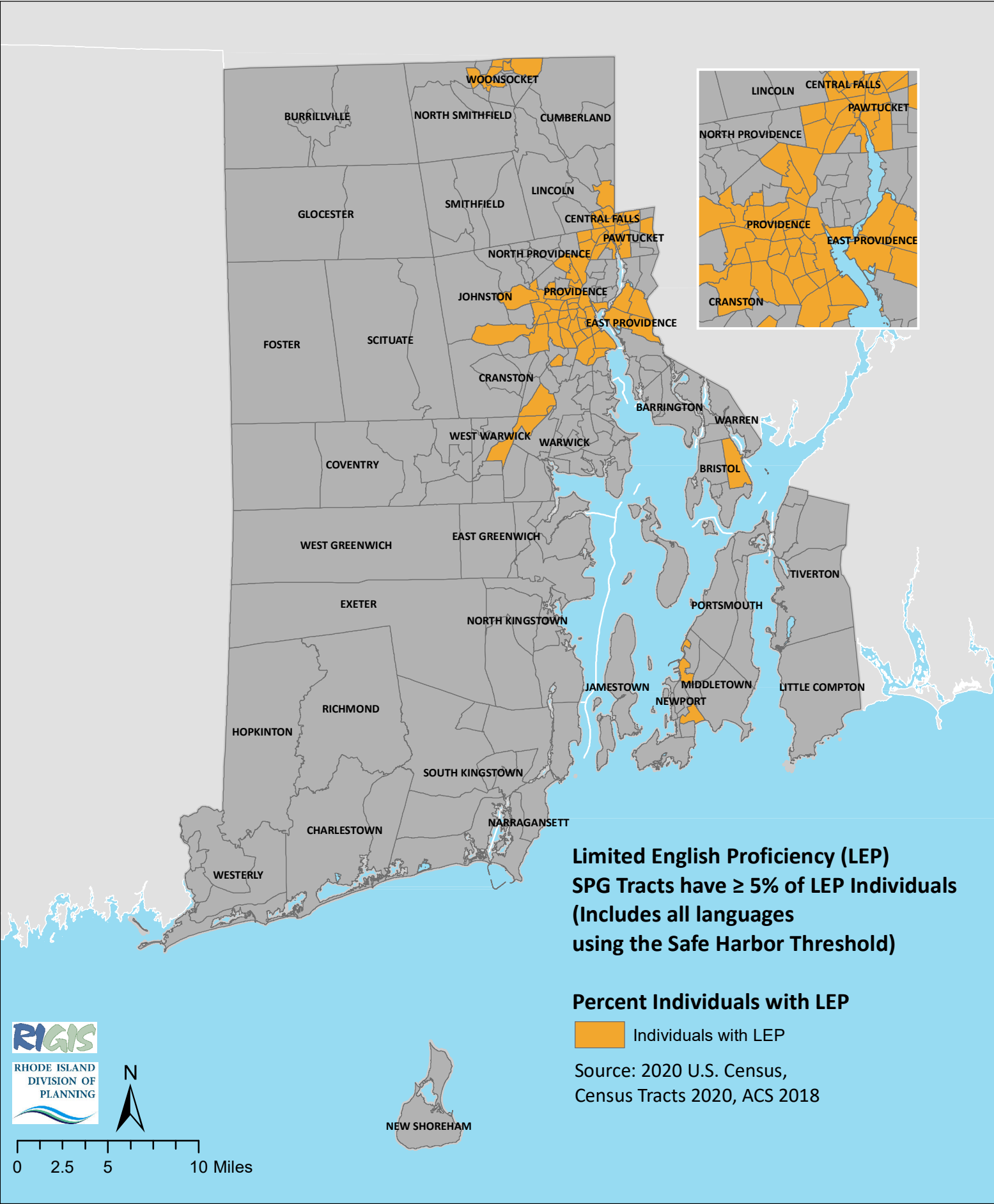
Percentage of Individuals with Disabilities in RI by U.S. Census Tract



# Transportation Equity Benefit Analysis

May 2020

## Percentage of LEP Individuals in RI by U.S. Census Tract

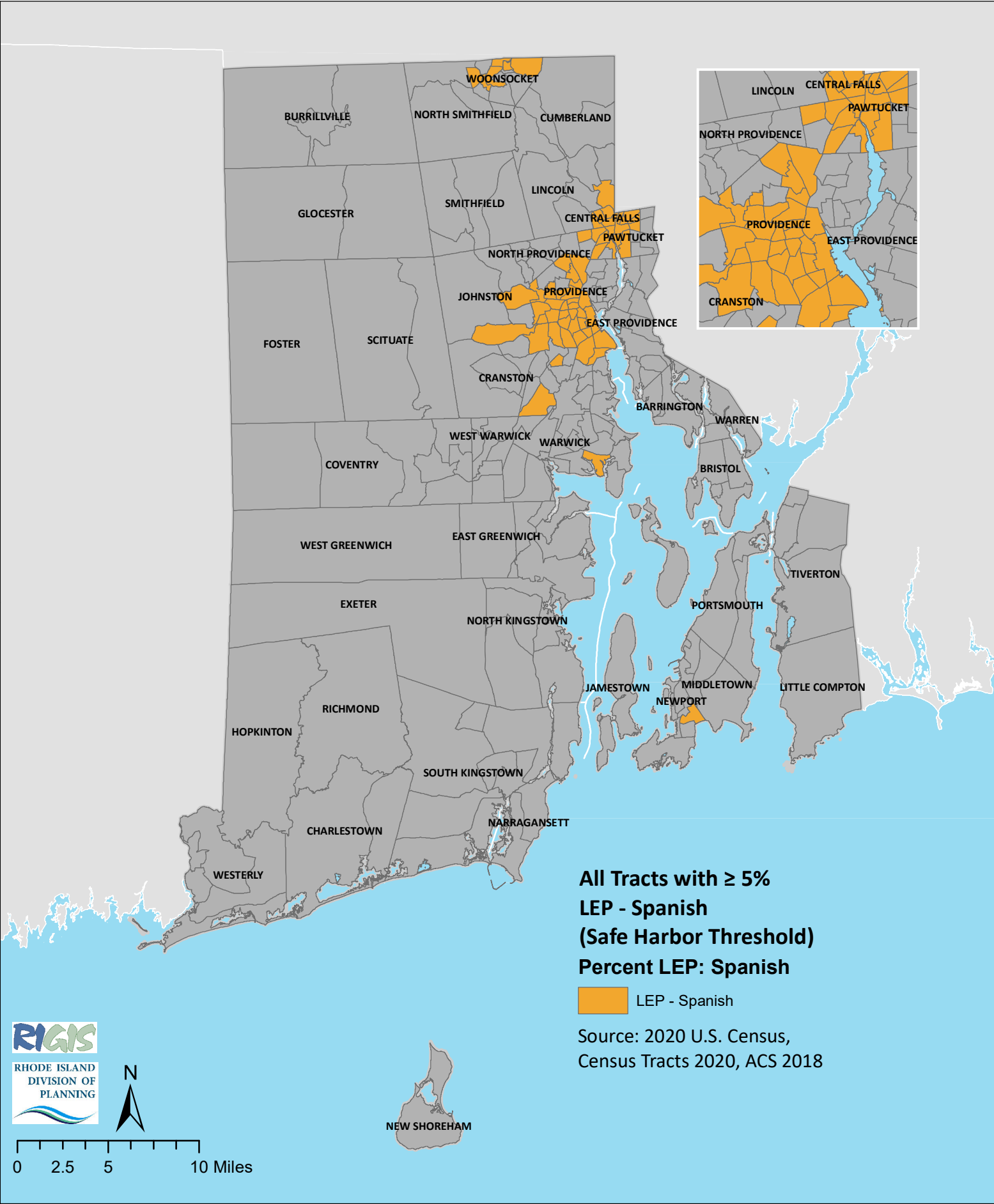




# Transportation Equity Benefit Analysis

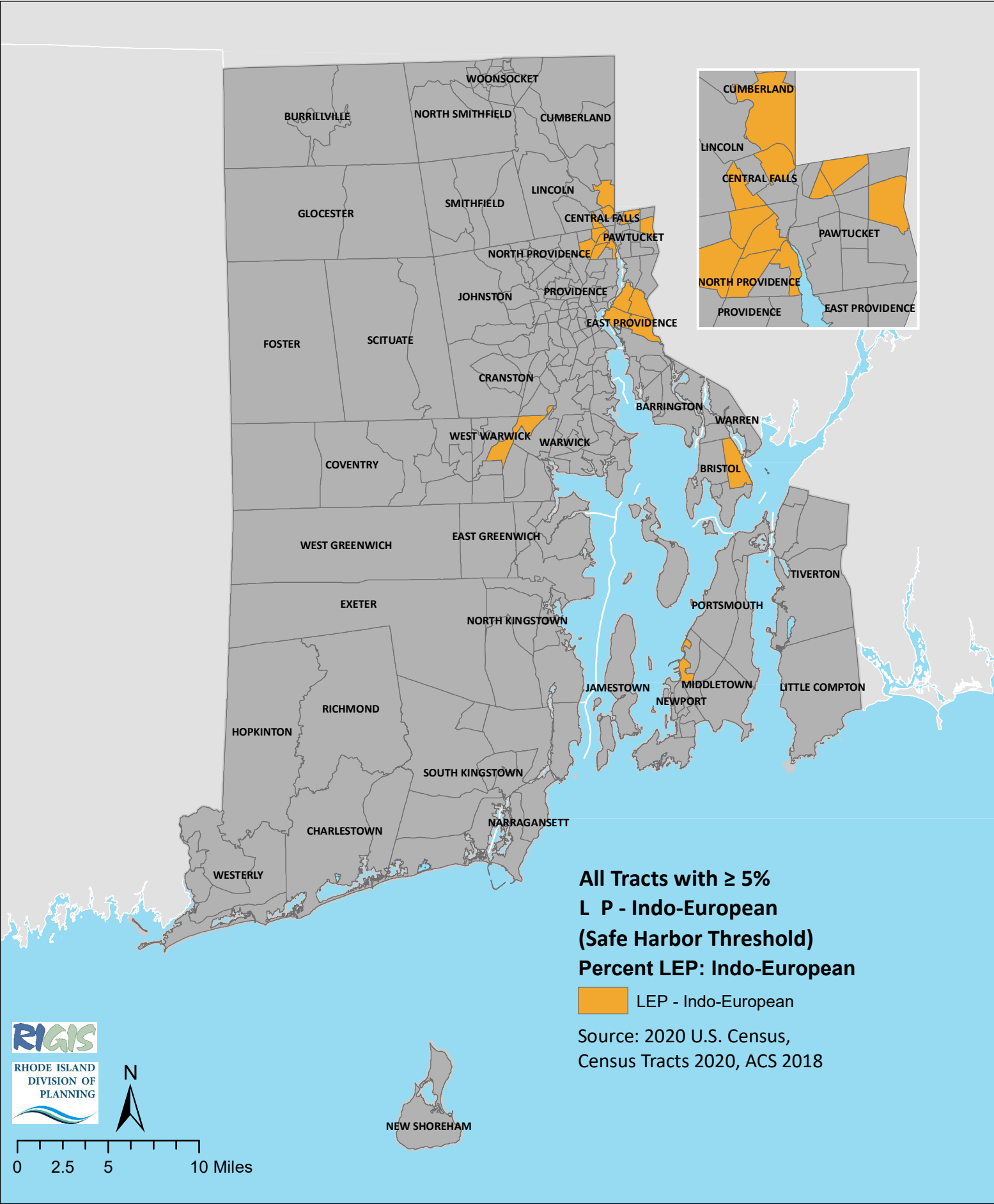
May 2020

Percentage of LEP - Spanish Individuals in RI by U.S. Census Tract



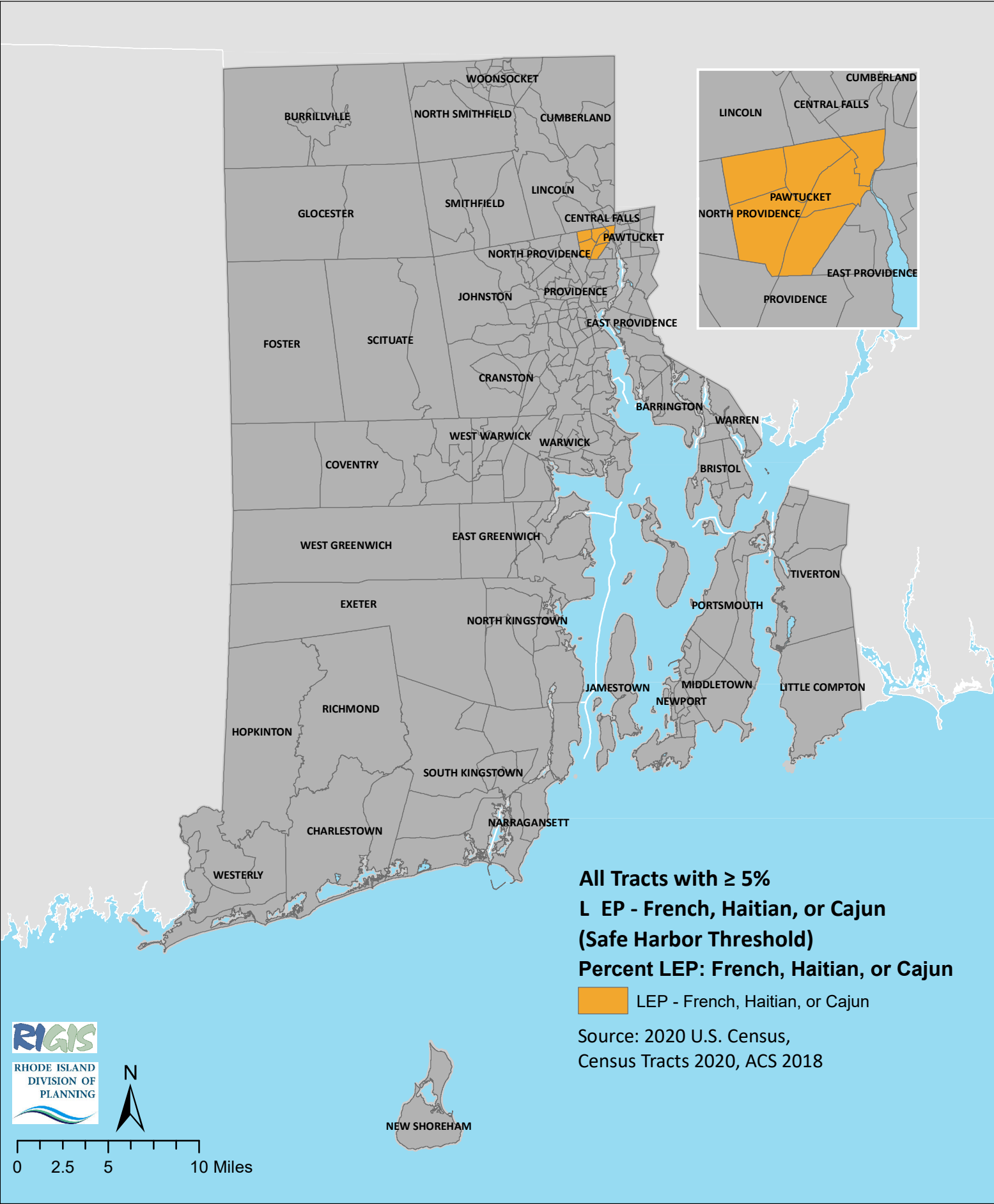
# Transportation Equity Benefit Analysis

Percentage of LEP - Indo-European Individuals in RI by U.S. Census Tract



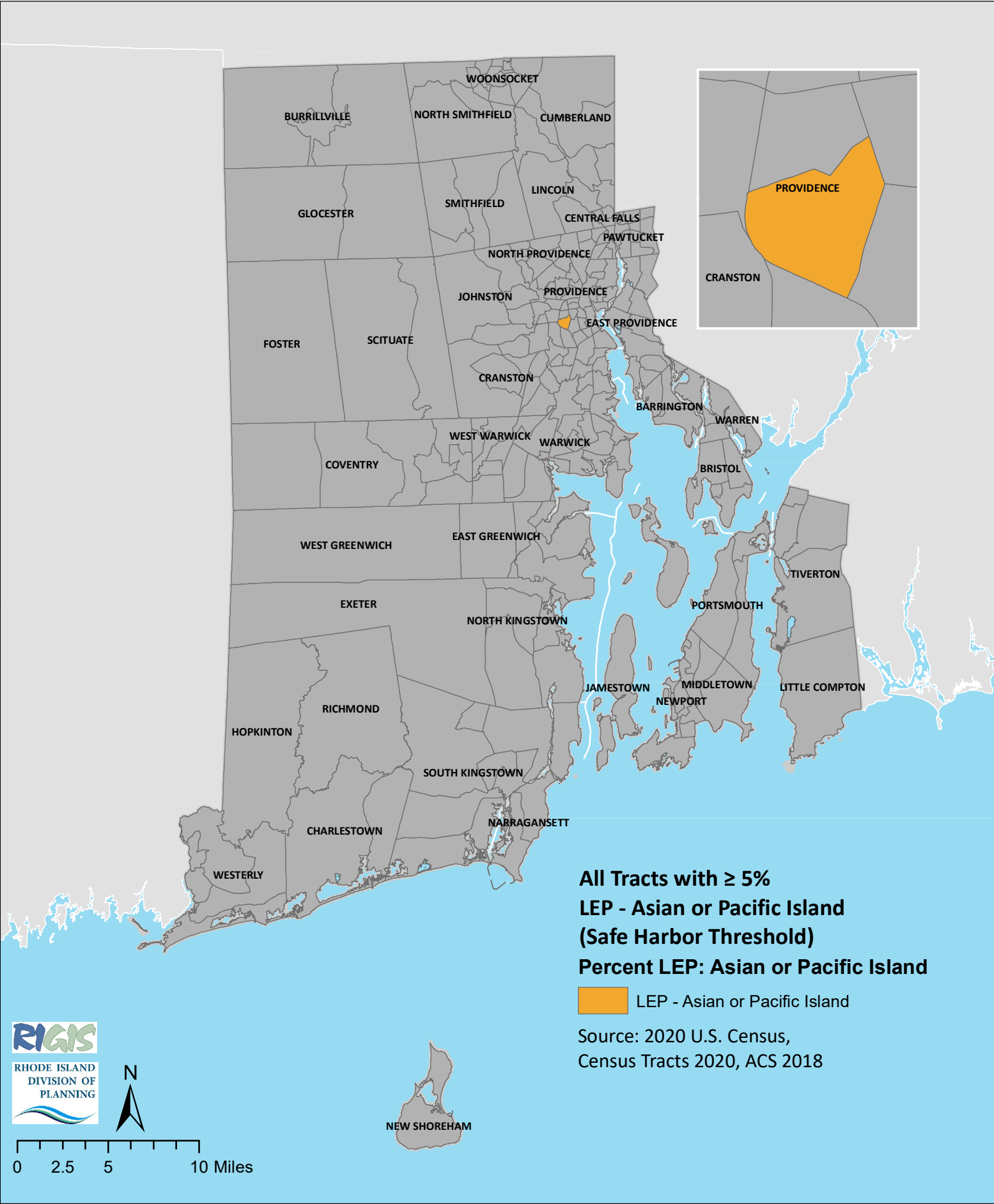
# Transportation Equity Benefit Analysis

Percentage of LEP - French, Haitian, or Cajun Individuals in RI by U.S. Census Tract





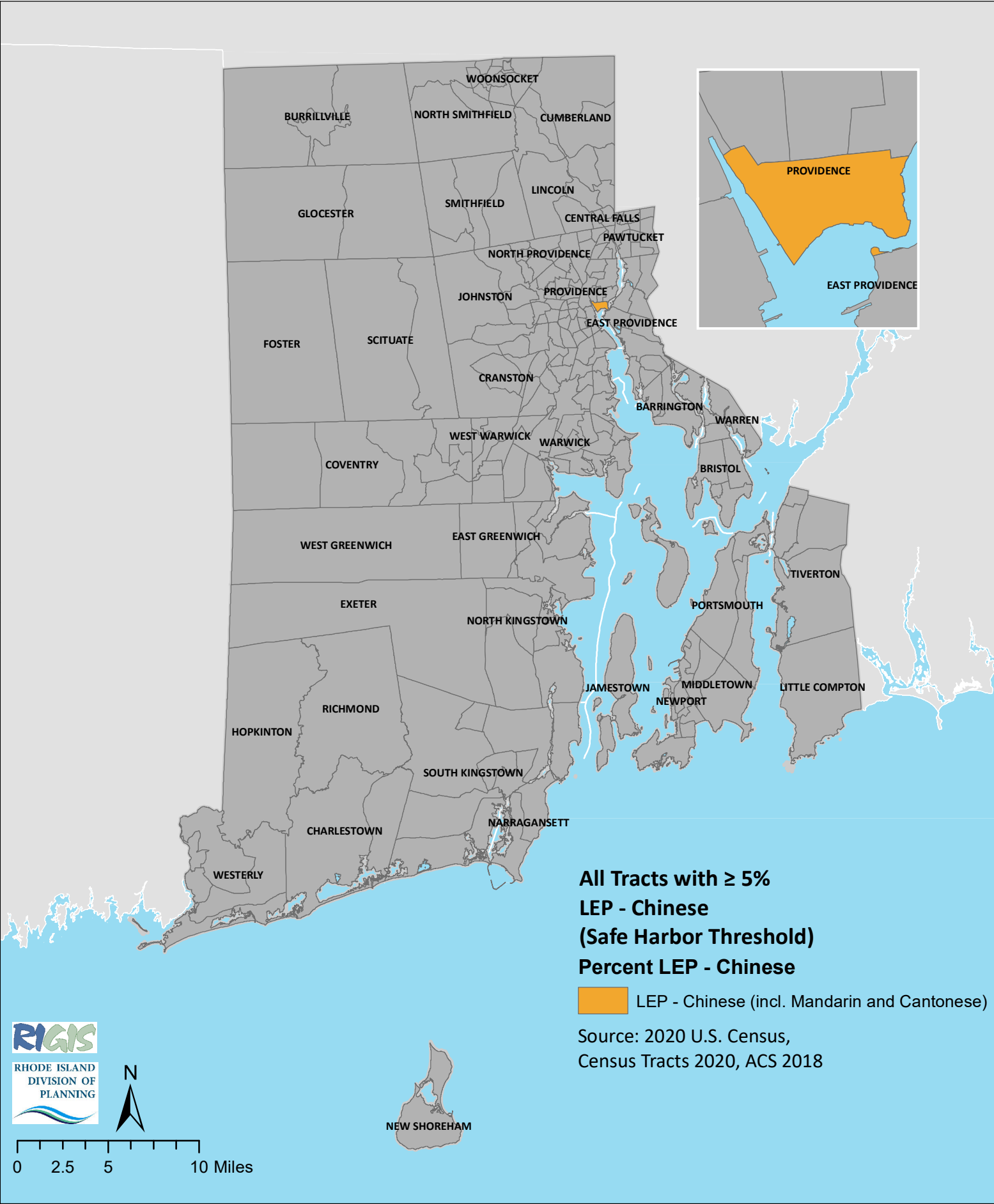
Percentage of LEP - Asian or Pacific Island Individuals in RI by U.S. Census Tract



# Transportation Equity Benefit Analysis

May 2020

Percentage of LEP - Chinese Individuals in RI by U.S. Census Tract



# Transportation Equity Benefit Analysis

## Percentage of Carless Households in RI by U.S. Census Tract

