ARTS2050

METROPOLITAN TRANSPORTATION PLAN UPDATE ▸ *Future Mobility*

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TECHNICAL REPORT #2: REVIEW OF DATA AND EXISTING CONDITIONS

Draft MTP
July 13, 2020

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MODERN MOBILITY partners

The Augusta Regional Transportation Study (ARTS) as a federally-designated agency was established as a bi-state Metropolitan Planning Organization (MPO) in 1970. The ARTS MPO working collaboratively with partner agencies is responsible for making policy about local transportation and deciding how to spend Federal funds for carrying out the transportation planning process. The ARTS MPO is also responsible for overseeing multimodal and long range transportation planning within the ARTS planning area to ensure continued accessibility, connectivity, efficiency, mobility, and safety for the movement of people and freight.

The ARTS planning area includes Richmond County, and the Cities of Hephzibah and Blythe in Georgia; the Fort Gordon Military Reservation; parts of Columbia County, including the City of Grovetown; and, parts of Aiken and Edgefield Counties in South Carolina, including the Cities of Aiken, North Augusta, New Ellenton and Burnettown.

ARTS METROPOLITAN TRANSPORTATION PLAN UPDATE

Future Mobility 2050

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The Augusta Regional Transportation Study (ARTS) Metropolitan Planning Organization (MPO) is committed to enforcing the principle that "No person in the United States shall, on the grounds of race, color, age, sex (including gender identity and expression), marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, national origin, or disability, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity as provided by Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, and any other related non-discrimination Civil Rights laws and authorities under any program or activity receiving federal financial assistance."

The ARTS MPO is also committed to taking positive and realistic affirmative steps to ensure the protection of rights and opportunities for all persons affected by its plans and programs.

Prepared in cooperation with the Georgia Department of Transportation, South Carolina Department of Transportation and the Federal Highway Administration.

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1 Introduction

The Data Collection Report is the second of a series of technical reports updating the Augusta Metropolitan Transportation Plan (MTP). This report illustrates current demographic and socioeconomic trends, land use patterns (including currently adopted plans for future land use), environmental features, and the existing multimodal transportation systems within the region. **Figure 1-1** shows the ARTS planning area that will be the focus of the MTP. The report also includes a review of relevant plans, projects, and studies, and discusses the progress since the previous plan was completed in 2015.

1.1 Project Description

The Metropolitan Transportation Plan (MTP) is the official multimodal transportation plan developed and adopted through the metropolitan transportation planning process for the Augusta Regional Transportation Study (ARTS). The ARTS Metropolitan Planning Organization (MPO) approved its 2040 Long Range Transportation Plan (LRTP) (Transportation Vision 2040) in 2015. That plan will serve as the basis for this plan update. (Note: Based on changes in federal guidance, ARTS has decided to change the title from LRTP which has been used in previous updates to MTP beginning with this update. Although the name has changed, content areas, process, and purpose remain consistent.) While some priorities from the 2040 LRTP have changed or been met since 2015, many of the original priorities remain. Plan Update goals and priorities are reviewed in the **Technical Report #3: Development of Goals, Objectives and Measures of Effectiveness**.

The MTP planning process and policy document are federally mandated and serve as a prerequisite for receiving federal transportation funding.[i] The MTP is a long range planning document, but it also contributes to the annual Unified Planning Work Program (UPWP)[ii] and the 4-Year Transportation Improvement Program (TIP)[iii].

The ARTS MTP covers a thirty-year planning horizon and is updated at least once every five years. The MTP can be amended at any time, and the ARTS Policy Committee must approve any update or amendment to the MTP. Interested parties, including the public, have an opportunity to review and comment on the MTP. Projects must be included in the MTP before being placed in the ARTS MPO Transportation Improvement Program (TIP).

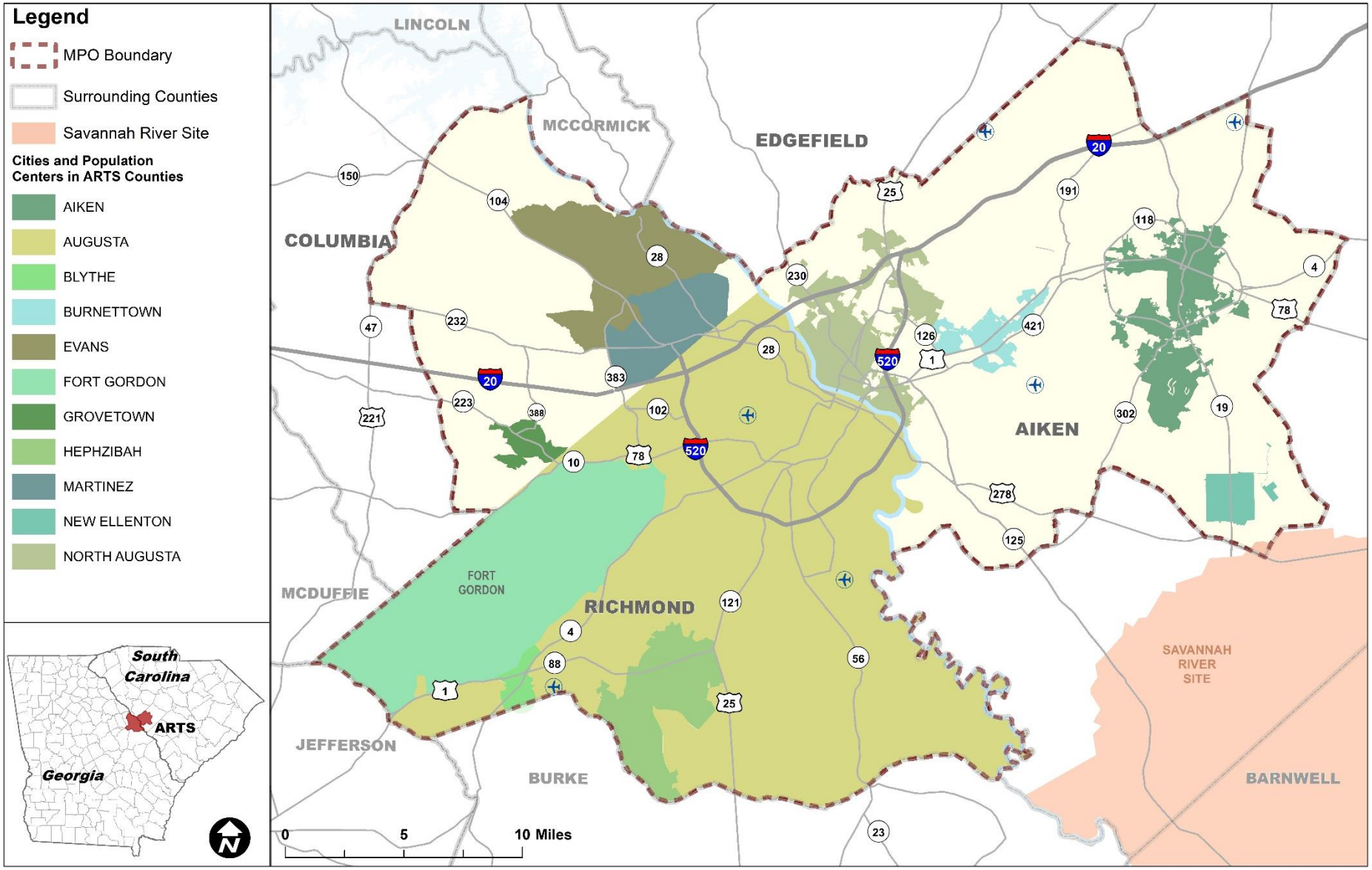
The ARTS 2050 MTP includes long-range and short-range strategies and actions that lead to the development of an integrated multimodal transportation system in the ARTS planning area. In addition, the 2050 MTP:

- Identifies near-term demand for passenger and goods movement,
- Identifies Congestion Management System strategies,
- Identifies pedestrian, walkway, and bicycle facilities,
- Assesses capital investment and other measures to preserve the existing transportation system,
- Reflects a multimodal evaluation of the transportation, socioeconomic, environmental, and financial impact of the Transportation Plan,
- Reflects consideration of local plans, goals, and objectives,
- Outlines, as appropriate, transportation enhancement activities, and
- Includes a financial plan demonstrating that the identified projects can be implemented using current and proposed revenue sources.

A key outcome of this plan update will be identifying or confirming local community visions and priorities.

1.2 Project Area Overview

The 2050 MTP will refer to the "ARTS planning area," which includes all of Richmond County, the eastern portion of Columbia County, most of Aiken County, and a small portion of Edgefield County. Richmond and Columbia Counties are in Georgia, and Aiken and Edgefield Counties are in South Carolina (as shown in Figure 1-1).



Source: ESRI

Figure 1-1. ARTS Planning Area (2019)

2 Socioeconomic Data

This chapter reviews changes in population, demographic characteristics, and employment opportunities in the four-county area from the 2040 plan. Assessment of existing population, employment, development patterns, and other socioeconomic characteristics of the region is key to understanding the existing demand for transportation services and to identify infrastructure needs. The socioeconomic make-up of the area also establishes which areas need improvements the most.

This chapter contains the following sections:

- Population
- Environmental Justice
- Jobs and Economy
- Socioeconomic Data for the Travel Demand Model

In this chapter, all existing conditions and socioeconomic data come from the United States Census' American Community Survey (ACS) unless otherwise noted. Population demographic estimates derive from the 2013-2017 ACS 5-Year Estimates because these are the most reliable data with the largest sample size available for population analysis. However, the base year data for the traffic model uses a different combination of data sources and uses 2015 as the population estimation year. This is because the model is only for predictive purposes and serves as a baseline for growth that will influence future traffic demand. By contrast, the 2013-2017 ACS 5-Year Estimate provides a description of current conditions. **Section 2.4.1** provides a more detailed explanation of the 2015 base year data sources.

2.1 Population

Table 2-1 includes a summary of key demographic characteristics for the four counties that are part of the ARTS planning area. Statistics are from the 2013-2017 ACS 5-Year Estimate, the most recent data at the time of this report's publication. Richmond County has the largest population with nearly 202,000 residents, while Edgefield County has the smallest population with about 27,000 residents. Columbia County has the highest average household size (3.13) in the four-county area. Richmond County has the largest share of minority and low-income populations in the four-county area with nearly 130,000 (64 percent) minority residents and 47,000 (24 percent) low-income residents.

Table 2-1. Demographic Summary (2013-2017 ACS 5-yr)

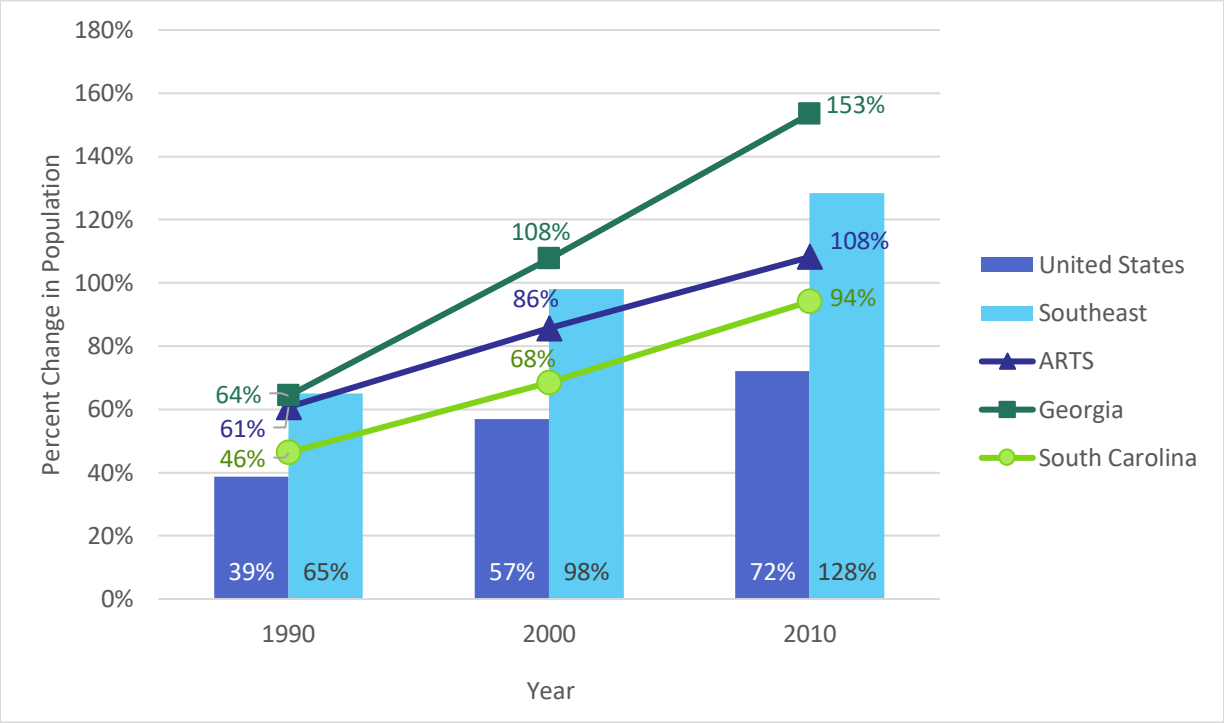
Demographic Characteristic	Georgia		South Carolina		Four-County Area
	Columbia County	Richmond County	Aiken County	Edgefield County	
Total Population	143,723	201,568	165,707	26,620	537,618
Population Density	0.77 per acre	0.97 per acre	0.24 per acre	0.08 per acre	0.38 per acre
Number of Households	45,823	72,361	65,703	9,054	192,941
Percent population in Occupied Housing Units	99.7% (143,225)	95.3% (192,160)	98.3% (162,971)	89.4% (23,787)	97.1% (522,143)
Average Household Size	3.13	2.66	2.48	2.63	2.76*

Demographic Characteristic	Georgia		South Carolina		Four-County Area
	Columbia County	Richmond County	Aiken County	Edgefield County	
Median Age	36.4	33.7	41.0	42.6	37.1*
Percent Workers (Age 16 or More) without Access to Vehicles	1.0%	3.6%	1.7%	2.5%	2.2%
Percent Low Income Population (Income below Poverty Threshold)	8.6% (12,269)	24.2% (46,692)	16.7% (27,183)	15.5% (3,715)	17.2% (89,859)
Median Household Income	$74,162	$39,430	$47,413	$47,500	$51,575*
Total Minority Population	42,918 (30%)	129,926 (64%)	55,262 (33%)	11,580 (44%)	239,686 (45%)
Percentage Population with Disability	11.2%	16.7%	14.1%	16.7%	14.4%
Percent Population High School Graduate or Higher (Age 25+)	92.3%	83.0%	86.2%	81.5%	86.4%
Percent Population with Bachelor's Degree or Higher (Age 25+)	34.4%	21.0%	25.8%	19.5%	26.0%

Source: 2013-2017 ACS 5-Year Estimate
**Weighted average of the respective numbers for four-counties based on their populations.*

2.1.1 Historic Population Growth

It is important to assess the history of changes in population to accurately understand where the ARTS planning area is now and how populations may change in the future. **Figure 2-1** compares percent changes in population at different geographical levels such as the ARTS planning area, States of Georgia and South Carolina, Southeast Region, and United States from 1990 to 2010. Population in the southeastern portion of the United States has grown rapidly since 1990, as depicted in **Figure 2-1**. This graph shows the change in population over recent decades relative to the year 1960, an established base year with robust available population data selected for calculating growth rates compared to a historic reference point. Although the four-county region exhibited a slower increase in population growth than Georgia during this time frame, the growth rate still exceeded that of South Carolina and the United States overall, with its 2010 population growing to more than double what it was in 1960.

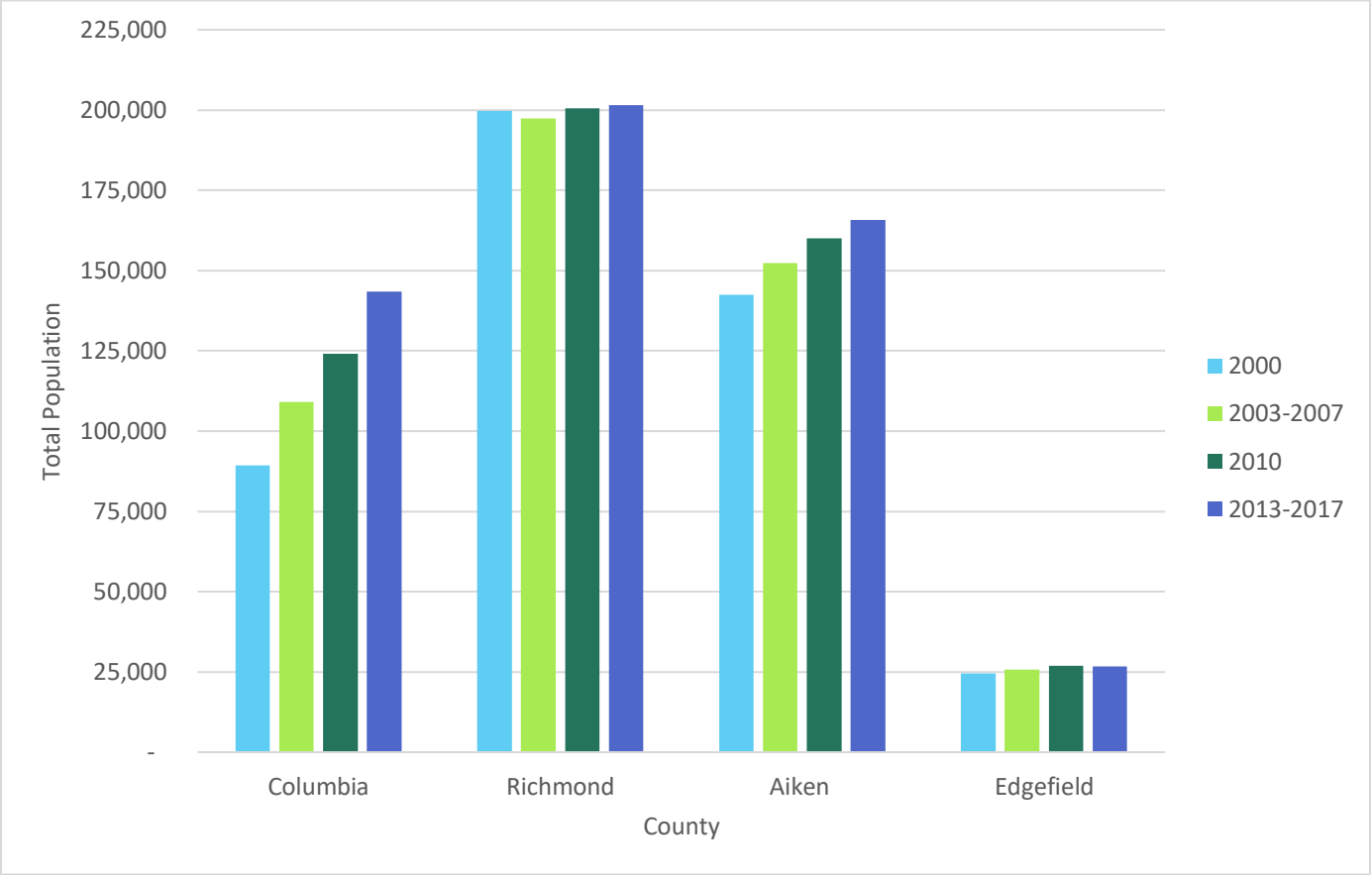


Source: ARTS 2040 LRTP (2015), 1990-2010 US Census

Figure 2-1. Population Change (1990 – 2010) Relative to Base Year 1960

As of 2017, the ARTS planning area remains the second most populous MPO in Georgia behind Atlanta and the fourth most populous MPO in South Carolina behind Columbia, Charleston, and Greenville. While the ARTS planning area has grown considerably in the last few decades, it is especially important to see where the growth is occurring in more recent years.

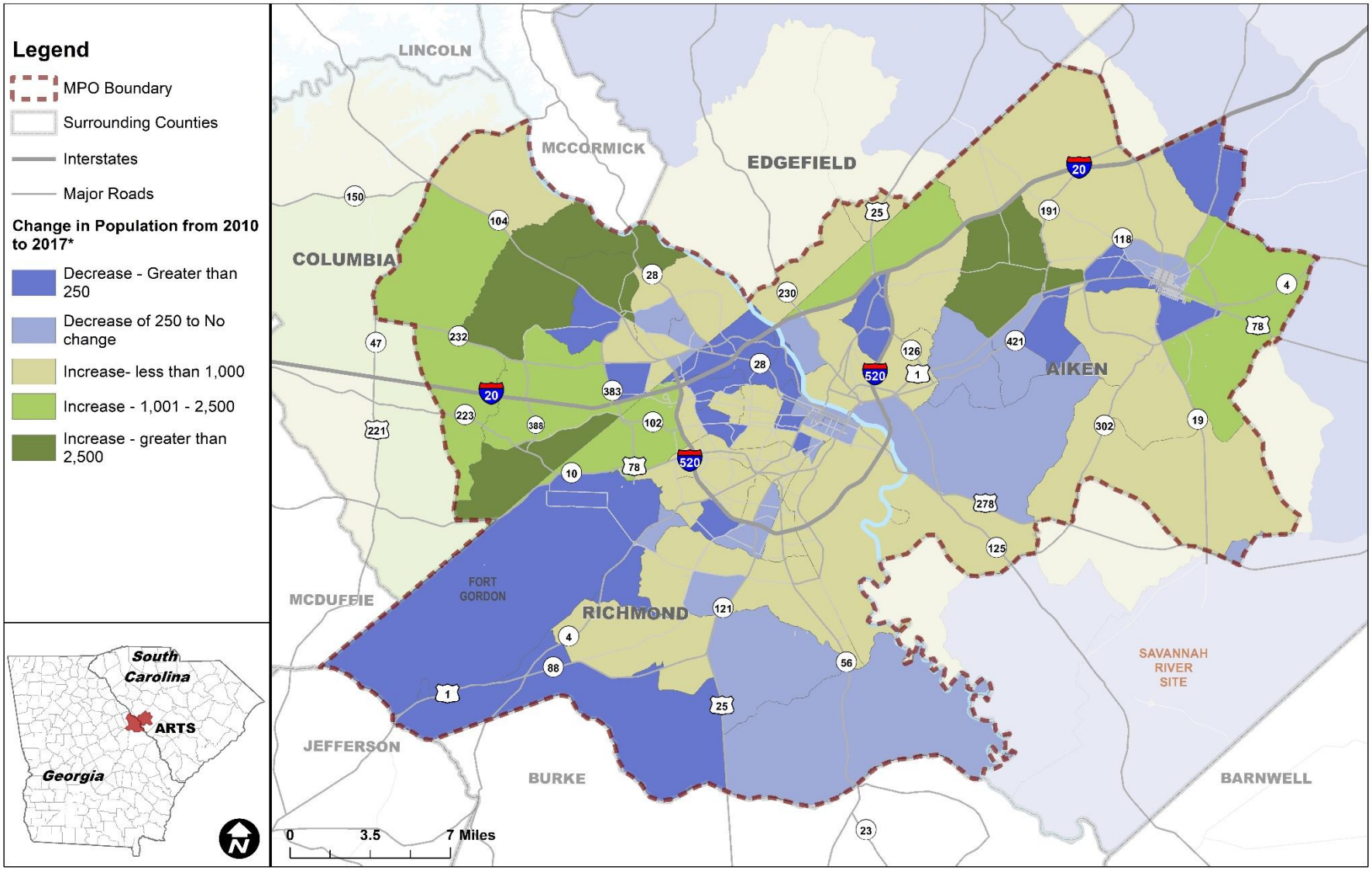
Figure 2-2 illustrates more recent changes in the population from 2000 onward in the four-county area. Population in Richmond and Edgefield Counties has stayed stable since 2000. Edgefield County experienced a minor decrease of just under two percent in population after 2010, but since then it changed course and rose by over half percent. However, Columbia County has experienced rapid growth in the past few years. It grew from under 90,000 in 2000 to about 143,723 (2013-2017 ACS estimates), an increase of over 60 percent. Aiken County also grew, albeit at a slower pace from Columbia County, from about 142,552 in 2000 to about 165,707 in 2017, an increase of 16.2 percent.



Source: 2000 US Census, 2003-2007 ACS 5-Year Estimate, 2010 US Census, 2013-2017 ACS 5-Year Estimate
** 2017 refers to the ACS 5-year period estimate for 2013-2017*

Figure 2-2. Population by County (2000 – 2017*)

Overall, the four-county area grew by about 81,408 people since 2000. Over two-thirds of this growth occurred in Columbia County. **Figure 2-3** provides further geographic context for these trends. About 75 percent of census tracts in Columbia County grew in population since 2010, and the population in about two-thirds of census tracts in Edgefield County decreased since 2010.



Source: 2010 US census, 2013-2017 ACS 5-Year Estimate
** 2017 refers to the ACS 5-year period estimate for 2013-2017*

Figure 2-3. Change in Population by Census Tract (2010-2017*)

2.1.2 Population Density and Distribution

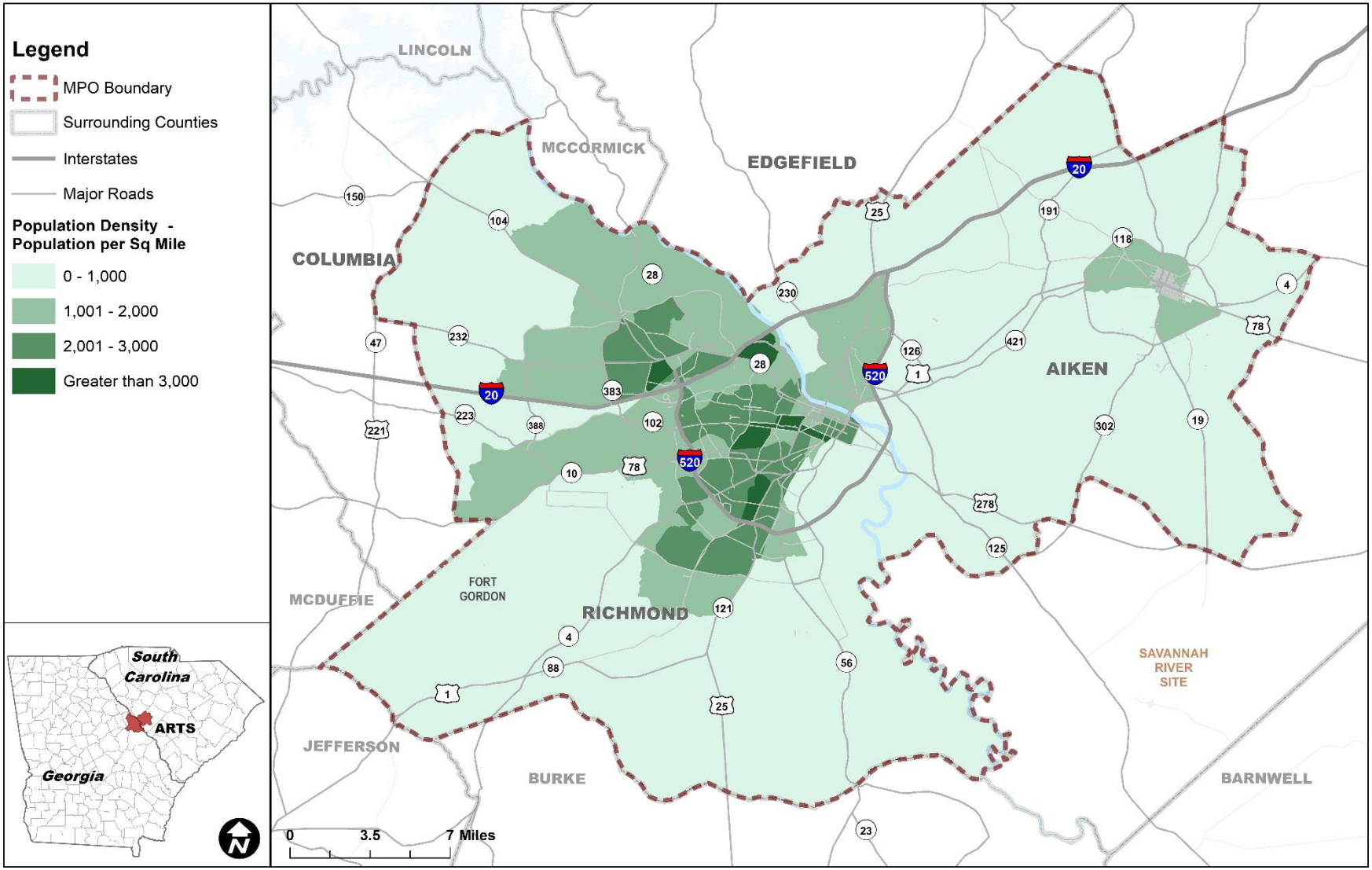
Population density measures how many people live in a specific area, such as a square mile or an acre. Urban areas tend to have a higher number of people within a given geographic area, and rural areas tend to have a smaller number of people per area. Per the 2013-2017 ACS 5-year estimate population statistics, Columbia County and Richmond County both are more densely populated than the Aiken/Columbia/Edgefield/Richmond Four-County Area, the State of Georgia, and the State of South Carolina. Conversely, Aiken and Edgefield Counties have lower population densities than the averages for the Four-County Area, the State of Georgia, and the State of South Carolina. Richmond County has the highest population density with nearly one person for each acre of land area in the County. Edgefield County, on the other hand has the lowest population density in the four-county area with only about 1 person for every 12 acres of land area. **Table 2-2** presents the comparison of population densities of the four counties and their respective states.

Table 2-2. Population Density (2013-2017 ACS 5-Year Estimate)

	Georgia		South Carolina		Four-County Area	Georgia	South Carolina
	Columbia County	Richmond County	Aiken County	Edgefield County			
Total Population	143,723	201,568	165,707	26,620	537,618	10,201,635	4,893,444
Land Area (acres)	185,658	207,571	685,459	320,262	1,398,950	36,808,634	19,238,848
Population Density	0.77 per acre	0.97 per acre	0.24 per acre	0.08 per acre	0.38 per acre	0.28 per acre	0.25 per acre

Source: 2013-2017 ACS 5-Year Estimate

Census tracts in northern Richmond County near Downtown Augusta and those in the eastern part of Columbia County are more densely populated than the rest of the ARTS planning area. Census tracts in the cities of North Augusta and Aiken were also understandably denser than the rest of Aiken County.

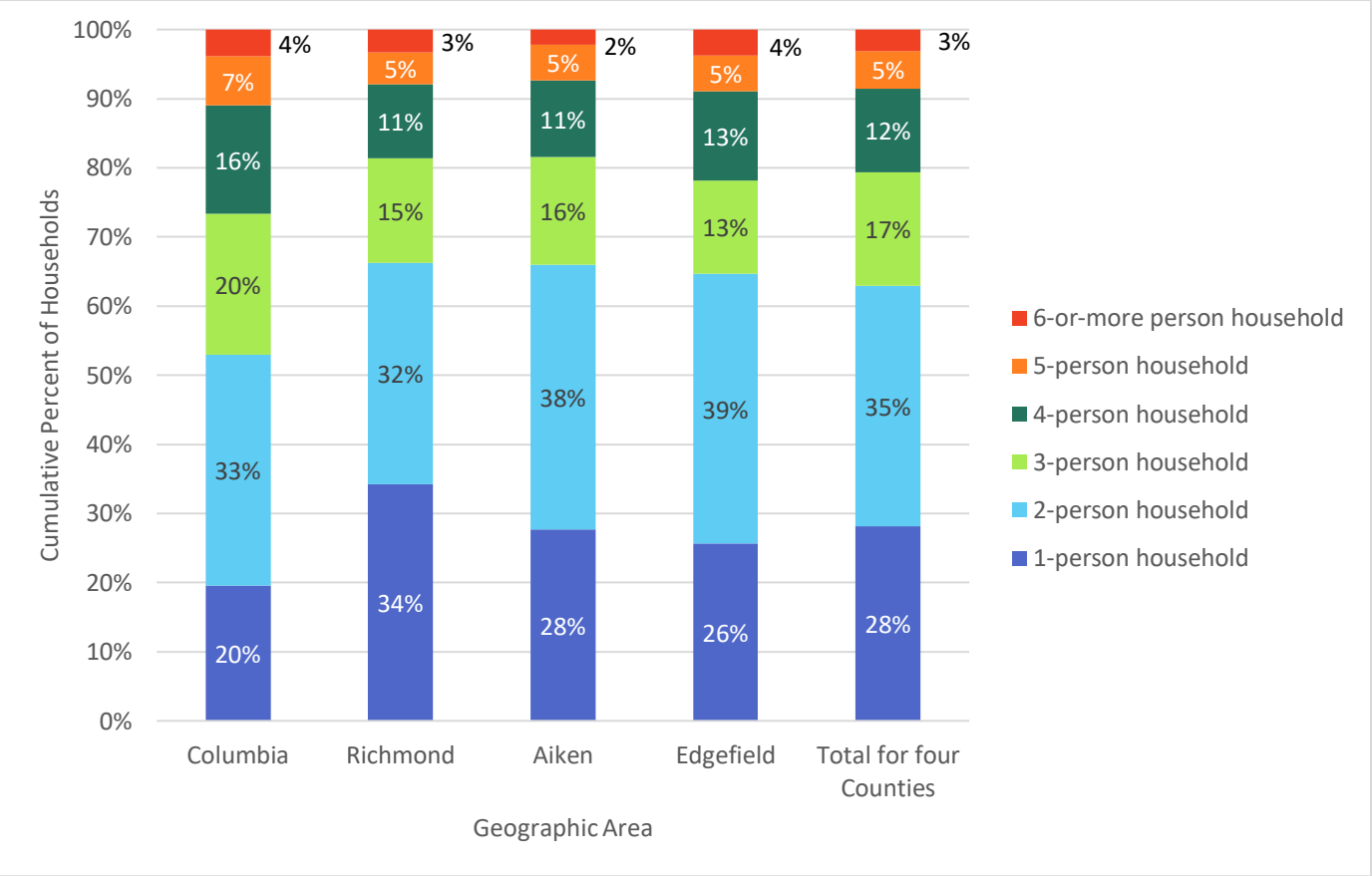


Source: 2013-2017 ACS 5-Year Estimate

Figure 2-4. Population Density by Census Tract (2013-2017 ACS 5-Year Estimate)

2.1.3 Households

The four-county area has nearly 228,700 housing units, of which nearly 84 percent are occupied. More than 60 percent of households in the ARTS planning area are home to two or fewer persons. **Figure 2-5** and **Table 2-3** show a summary of household characteristics for the ARTS planning area. Geographical distribution of households is understandably very similar to that of the population, with a higher density in the northern parts of the City of Augusta, the eastern parts of Columbia County and in the cities of North Augusta and Aiken. **Figure 2-6** illustrates household density by census tract in the ARTS planning area.



Source: 2013-2017 ACS 5-Year Estimate

Figure 2-5. Household Size (2013-2017 5-Year Estimate)

Table 2-3. Household Characteristics (2013-2017 ACS 5-Year Estimate)

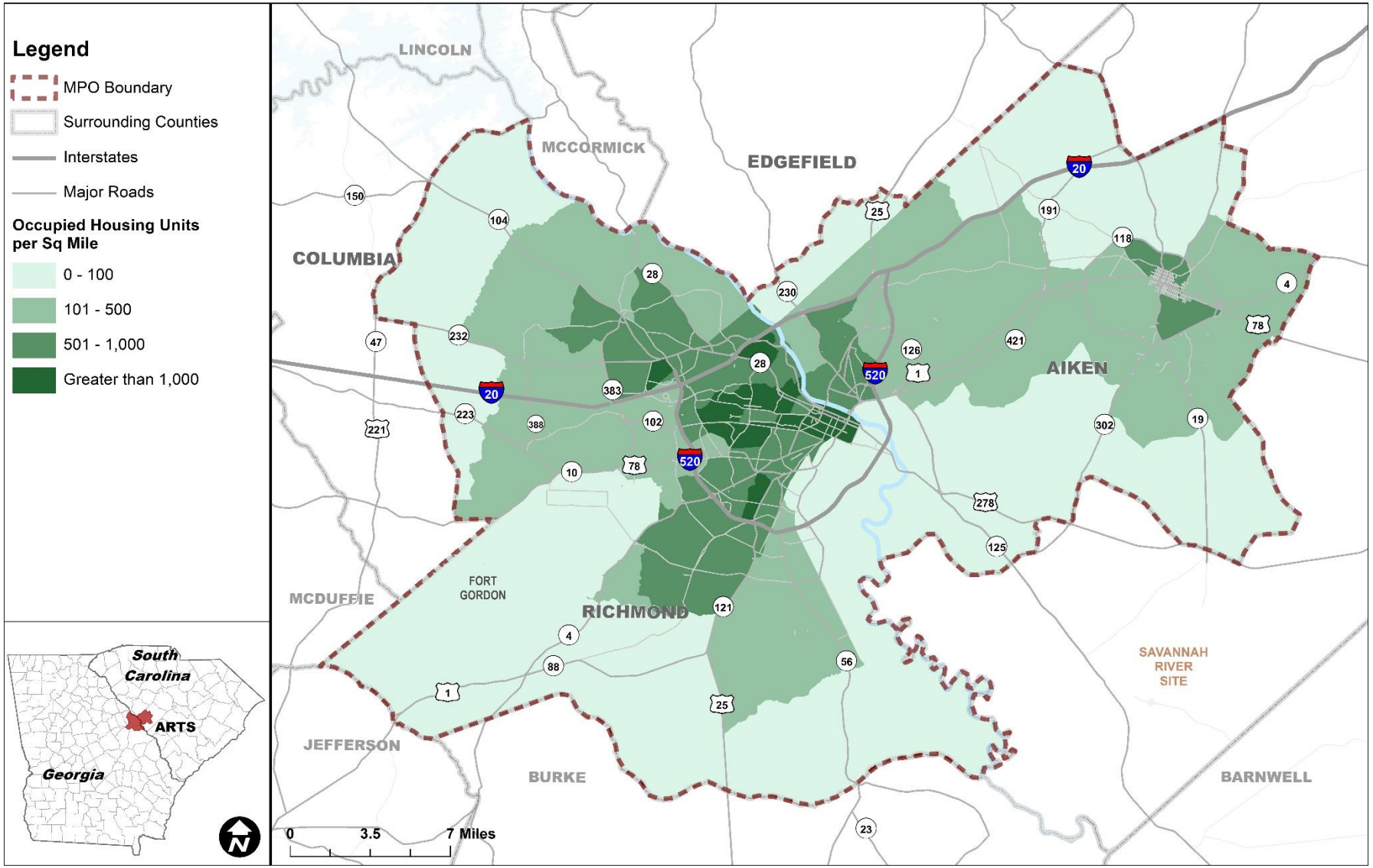
	Georgia		South Carolina		Four-County Area
	Columbia County	Richmond County	Aiken County	Edgefield County	
Total Housing Units	54,941	87,732	75,249	10,781	228,703
Total Occupied Housing Units	45,823 (83%)	72,361 (82%)	65,703 (87%)	9,054 (84%)	192,941 (84%)
Population in Occupied Housing Units*	143,225 (99.7%)	192,160 (95.3%)	162,971 (98.3%)	23,787 (89.4%)	522,143 (97.1%)
Population in Owner Occupied Housing Units	114,510 (80%)	101,411 (53%)	116,387 (71%)	18,103 (76%)	350,411 (67%)
Population in Renter Occupied Housing Units	28,715 (20%)	90,749 (47%)	46,584 (29%)	5,684 (24%)	171,732 (33%)
Average Household Size	3.13	2.66	2.48	2.63	2.76**
Percent Family Households***	77%	60%	68%	72%	67%
Percent Non-Family Households	23%	40%	32%	28%	33%

Source: 2013-2017 ACS 5-Year Estimate

** ACS defines a housing unit as a room, a house, an apartment, or a group of rooms that are occupied or are intended to be occupied as a separate living quarters. Separate living quarters are defined as "those in which the occupants do not live and eat with other persons in the structure and which have direct access from the outside of the building or through a common hall." A housing unit is occupied if a person or group of persons is living in it at the time of the interview or if the occupants are only temporarily absent, as for example, on vacation. Population in residences such as group quarters, student housing and temporary residences are not counted as population living in occupied housing units. As a result, population in occupied housing units does not cover 100 percent of total population.*

*** Weighted average of the respective numbers for four-counties based on their populations.*

**** ACS defines family household as "a group of two persons or more (one of whom is the householder) related by birth, marriage, or adoption and residing together; all of such persons (including related subfamily members) are considered as members of one family".*

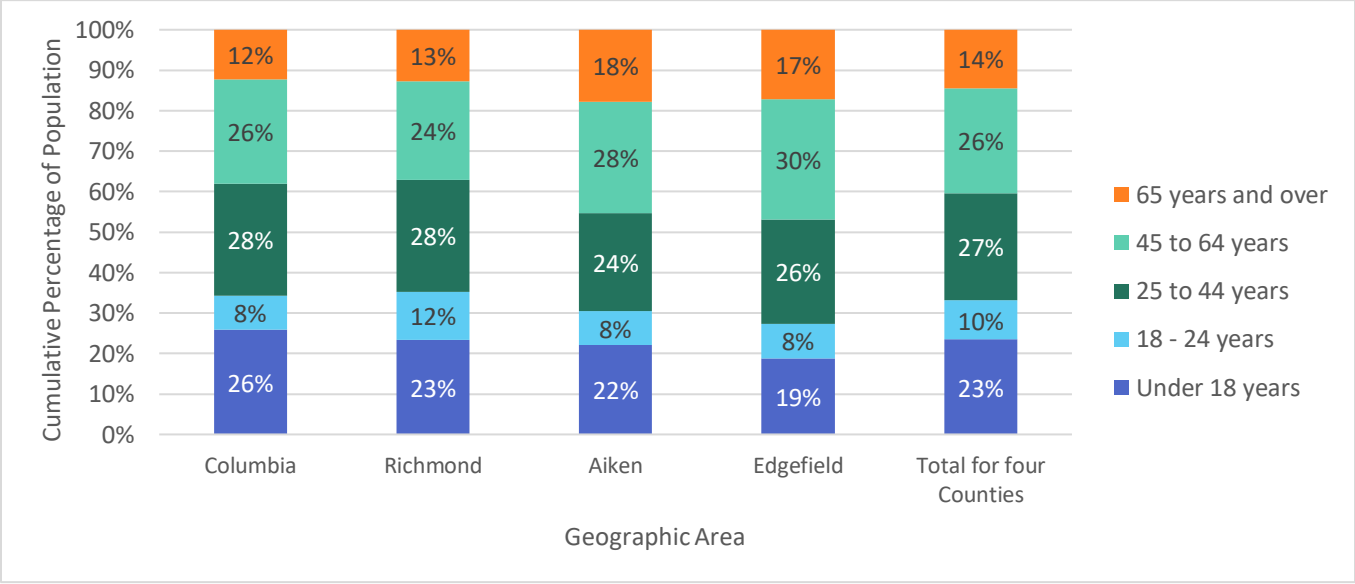


Source: 2013-2017 ACS 5-Year Estimate

Figure 2-6. Occupied Housing Units per Square Mile by Census Tract (2013-2017 ACS 5-Year Estimate)

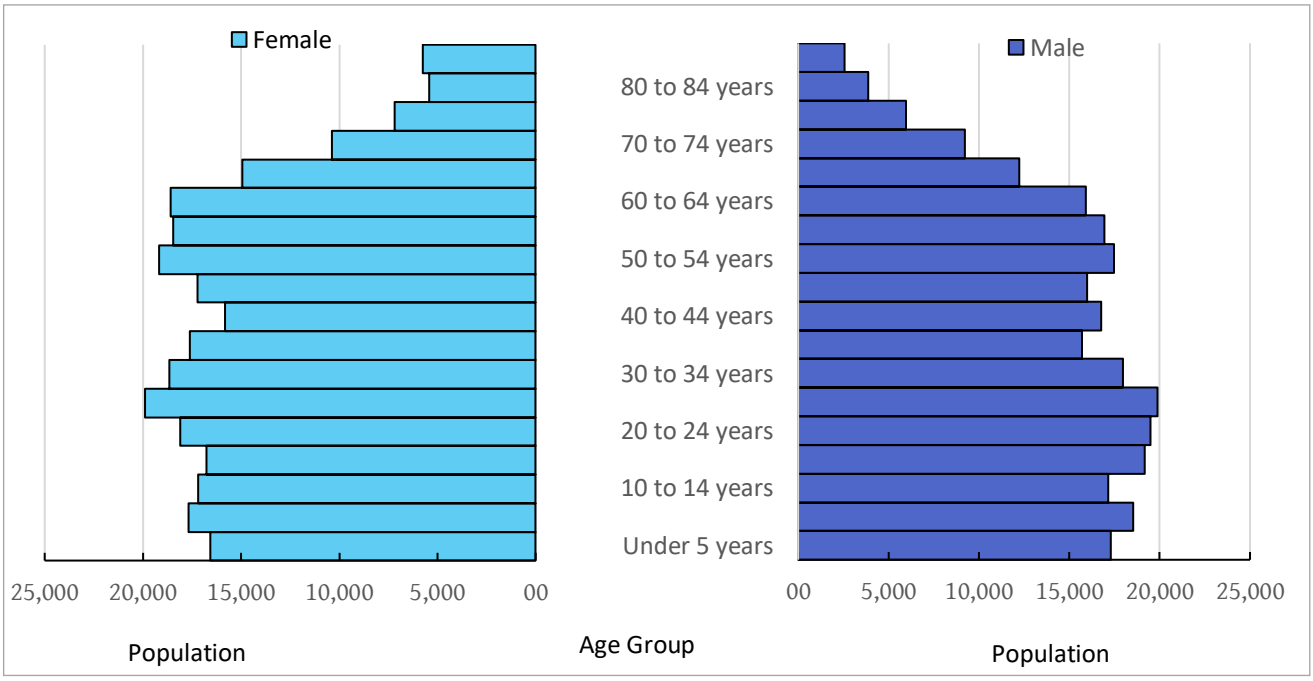
2.1.4 Age/Generations

Figure 2-7 illustrates the 2013-2017 ACS 5-Year Estimate age distribution in counties in the ARTS planning area. Columbia and Richmond Counties have higher proportions of the population in younger age groups, and Aiken and Edgefield Counties have higher proportions of the population in older age groups.



Source: 2013-2017 ACS 5-Year Estimate

Figure 2-7. Population Age Groups by County (2013-2017 ACS 5-Year Estimate)



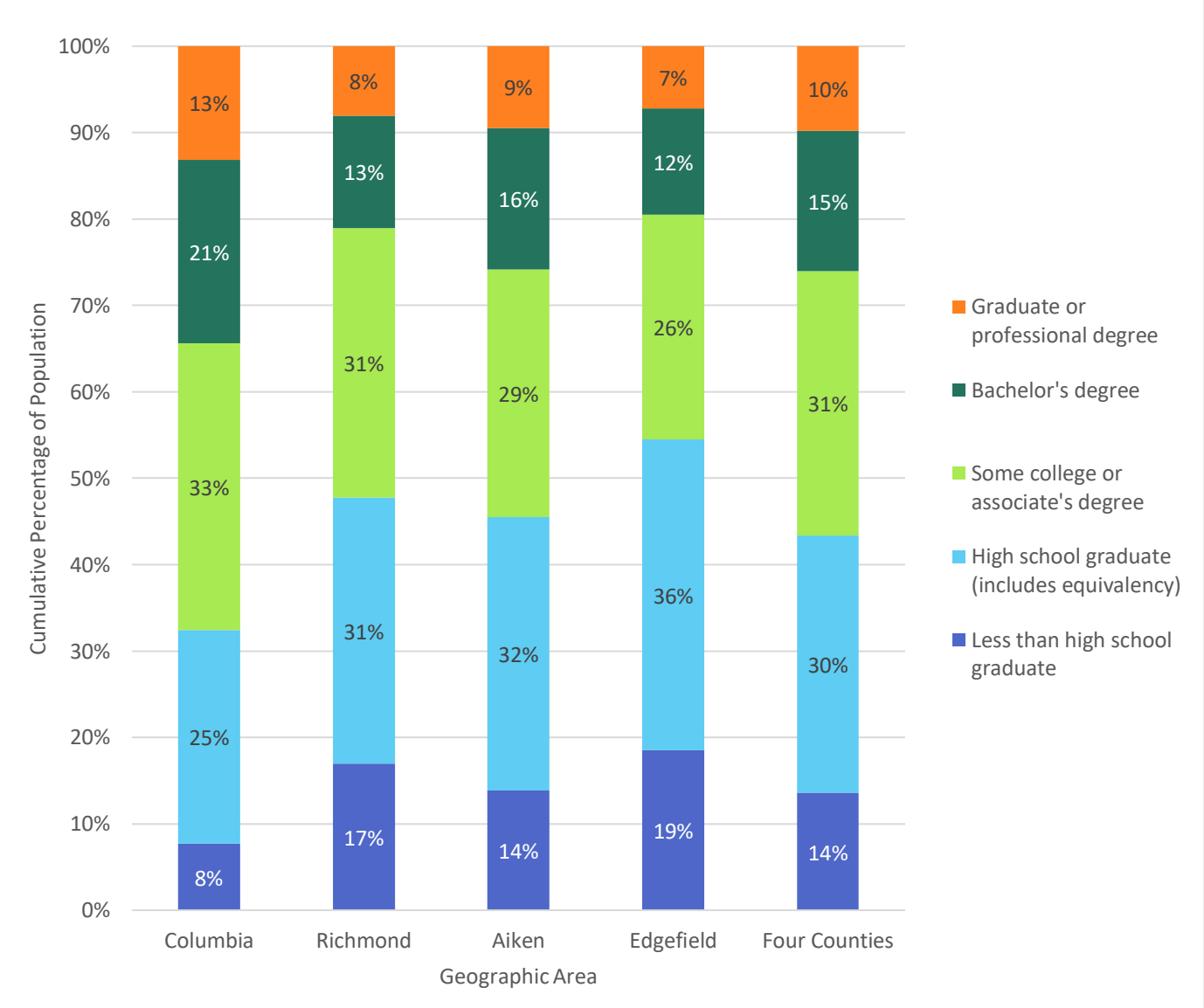
Source: 2013-2017 ACS 5-Year Estimate

Figure 2-8. Total Population in Four-County Area by Age Group (2013-2017 ACS 5-Year Estimate)

Figure 2-8 shows the four-county population distribution by age group. Stationary pyramids like this one reflect low fertility and mortality rates, and a relatively steady population size. The four-county population pyramid is a stationary pyramid because of the almost equal numbers for almost all the age groups, with smaller population counts expected for the oldest age groups.

2.1.5 Educational Attainment

Figure 2-9 summarizes the percentage of population over the age of 25 by highest level of education attainment in the ARTS planning area. Residents of Columbia County seem to have higher educational attainment, with nearly 70 percent of population above the age of 25 years having at least some college or associate degree.

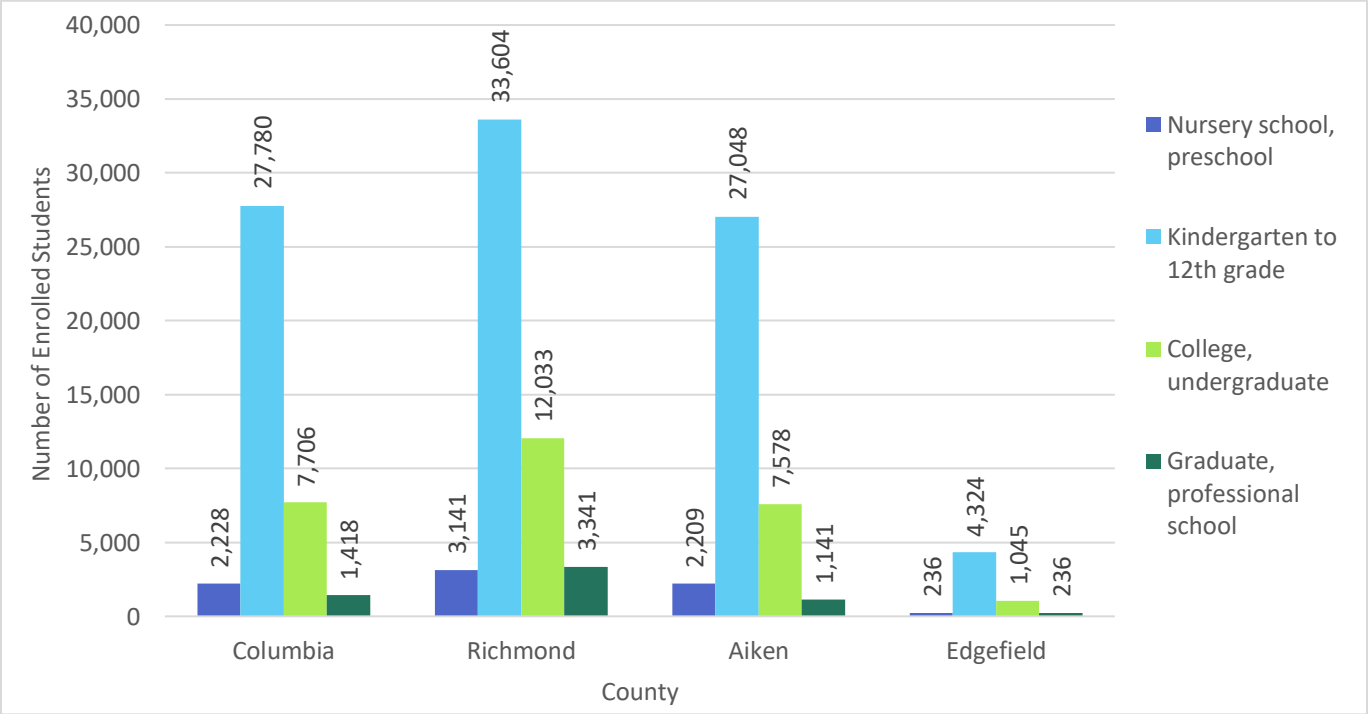


Source: 2013-2017 ACS 5-Year Estimate

Figure 2-9. Educational Attainment (2013-2017 ACS 5-Year Estimate)

2.1.6 School Enrollment Data

Figure 2-410 summarizes school enrollment by level of education for counties in the ARTS planning area. Richmond County has the highest enrollment in each educational category, likely because it also has the highest population. Richmond County also has the highest number of students enrolled in some college, undergraduate or undergraduate level programs. This is likely due to the large number of colleges located within Richmond County.



Source: 2013-2017 ACS 5-Year Estimate

Figure 2-10. School Enrollment (2013-2017 ACS 5-Year Estimate)

Table 2-4 shows the proportion of the population 3-year-olds and over enrolled in school. Columbia County has the highest proportion of enrollment with 27 percent, and Edgefield County has the lowest proportion of enrollment with 22 percent.

Table 2-4. Proportion of School-Enrolled Population (2013-2017 ACS 5-Year Estimate)

County	Proportion of School-Enrolled Population of Total County Population
Columbia	27%
Richmond	26%
Aiken	23%
Edgefield	22%
Total for four Counties	25%

Source: 2013-2017 ACS 5-Year Estimate

2.2 Environmental Justice

Executive Order 12898 defines Environmental Justice (EJ) populations as persons belonging to any of the following groups:

- Black/African American;
- Hispanic;
- Asian American;
- American Indian or Alaskan Native; and,
- Low Income – a person whose household income is at or below the poverty guidelines established by the US Department of Health and Human Services (HUD).

In addition to the federal definition of EJ that includes only minority and low income populations, the present study also considers other groups such as the senior population, population with limited English proficiency (LEP) and households without access to a vehicle. Considering the reach of the transportation systems to such populations, it is important to provide comprehensive transportation solutions to all residents of the ARTS planning area. Actively engaging these population groups in the planning process itself is also important.

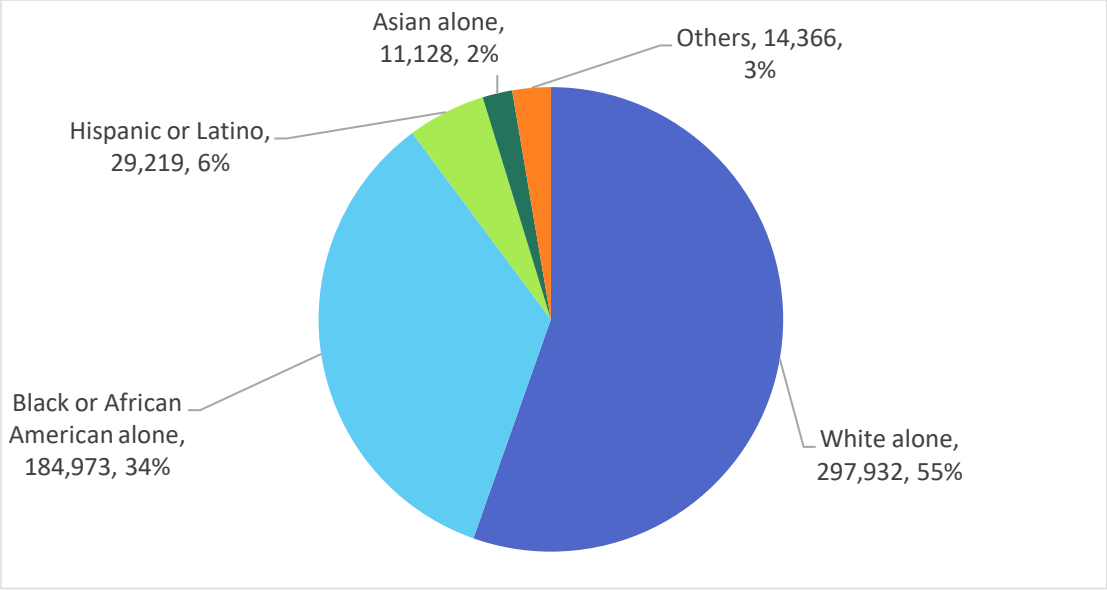
The concept of Environmental Justice (EJ) recognizes planning processes have historically underrepresented minority and low-income populations, and transportation improvements have had disproportionately negative effects on EJ communities. Therefore, the purpose of the EJ Executive order is to ensure that these groups are not disproportionately negatively impacted by transportation improvements. The intent of EJ analysis is to identify these populations to the extent possible by their characteristics, facilitating special efforts to involve them early and continuously throughout the transportation planning process to minimize and mitigate potential impacts to these population groups. The geographic data analysis then allows decision makers to assess whether project impacts are in areas that have concentrations of these traditionally underrepresented communities. As recommended projects advance, the project development process will include a more detailed impact analysis. The following sections summarize existing proportions of the population and their geographic distribution in the following categories: race and ethnicity, income, senior population, LEP population, and household vehicle availability.

2.2.1 Race and Ethnicity

Figure 2-11 shows the racial makeup of the population in the ARTS planning area. 2013-2017 ACS data identifies about 45 percent of the population in this area as a minority. The Black or African American population formed the largest portion of the minority population in the area, with nearly 34 percent of total population. The Hispanic or Latino/a population is the second highest share of the minority population, with about 6 percent of the total population. **Figure 2-12** summarizes racial composition for each of the counties in the ARTS planning area. Richmond County has the highest proportion of minority communities at nearly 65 percent of the population; the majority of the population in Richmond County is Black or African American (nearly 55 percent). Columbia County has the lowest percentage of minority population, about 30 percent. Aiken County has a comparable share of minority population with about 34 percent.

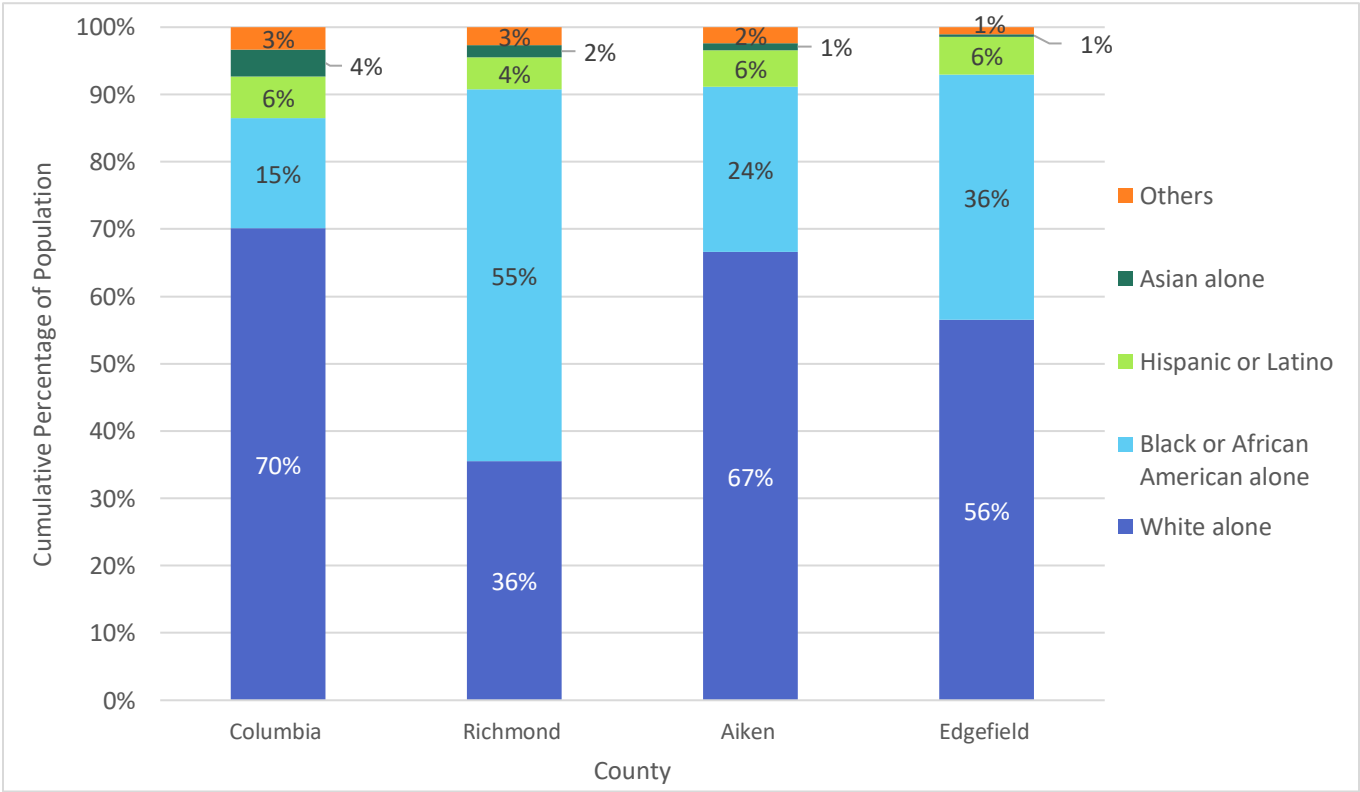
Figure 2-13 provides further details about geographical distribution of minority populations in the ARTS planning area. In many Richmond County census tracts, minority populations make up 50 percent or more of the population Some Census Tracts in southeastern parts of Columbia County bordering Richmond County and Cities of Aiken and

North Augusta also have minority populations of 50 percent or more. In some areas in the eastern and central parts of Richmond County, minority populations make up 75 percent or more of the population.



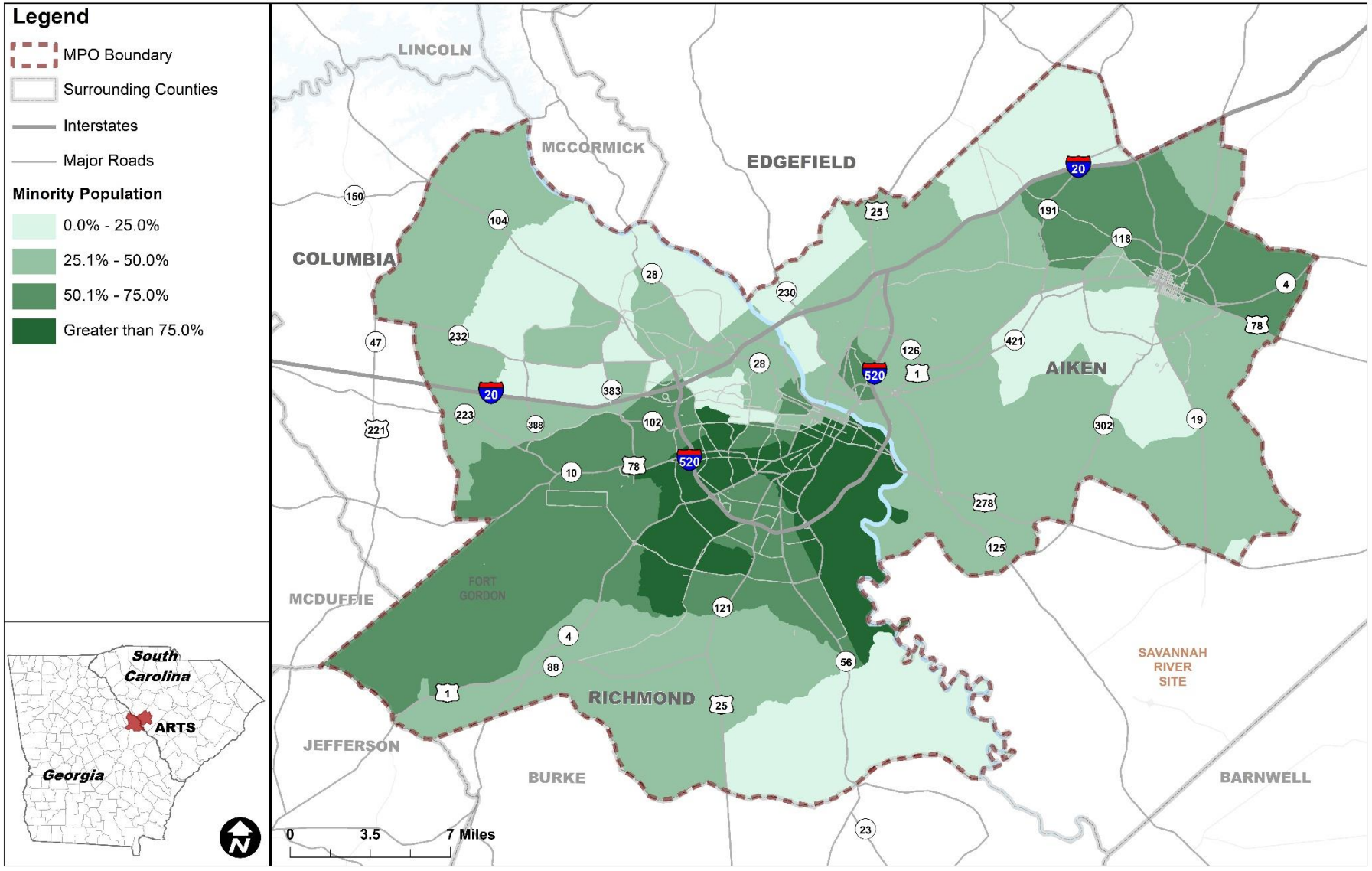
Source: 2013-2017 ACS 5-Year Estimate

Figure 2-11. Four-County Area Population by Race (2013-2017 ACS 5-Year Estimate)



Source: 2013-2017 ACS 5-Year Estimate

Figure 2-12. Racial Composition by County (2013-2017 ACS 5-Year Estimate)

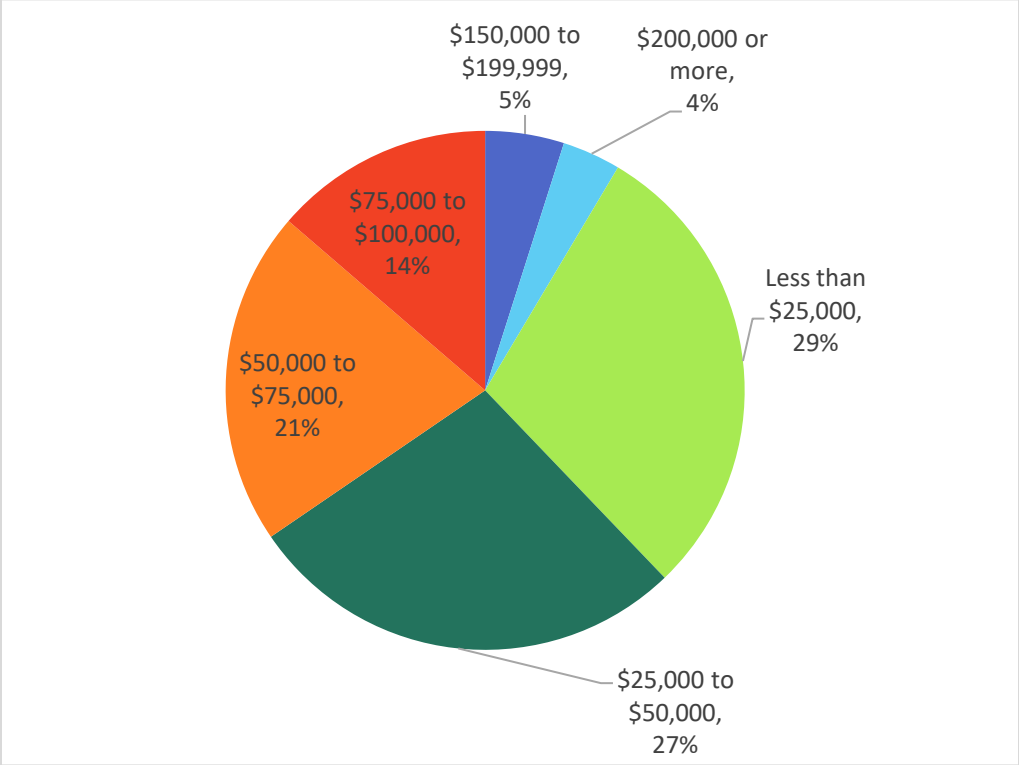


Source: 2013-2017 ACS 5-Year Estimate

Figure 2-13. Percent Minority Population in ARTS Planning Area by Census Tract (2013-2017 ACS 5-Year Estimates)

2.2.2 Income

Figure 2-14 shows the proportion of households in the four-county region by income. Over half of the four-county households have annual incomes of $50,000 or lower, and less than 10 percent of households have annual incomes over $150,000. The median household income of Augusta Richmond County Metropolitan Statistical Area is about $49,064 based on ACS 2013 – 2017 data. As $50,000 is the closest data point available in household income data, $50,000 was used to compare the distribution of households in various income levels.

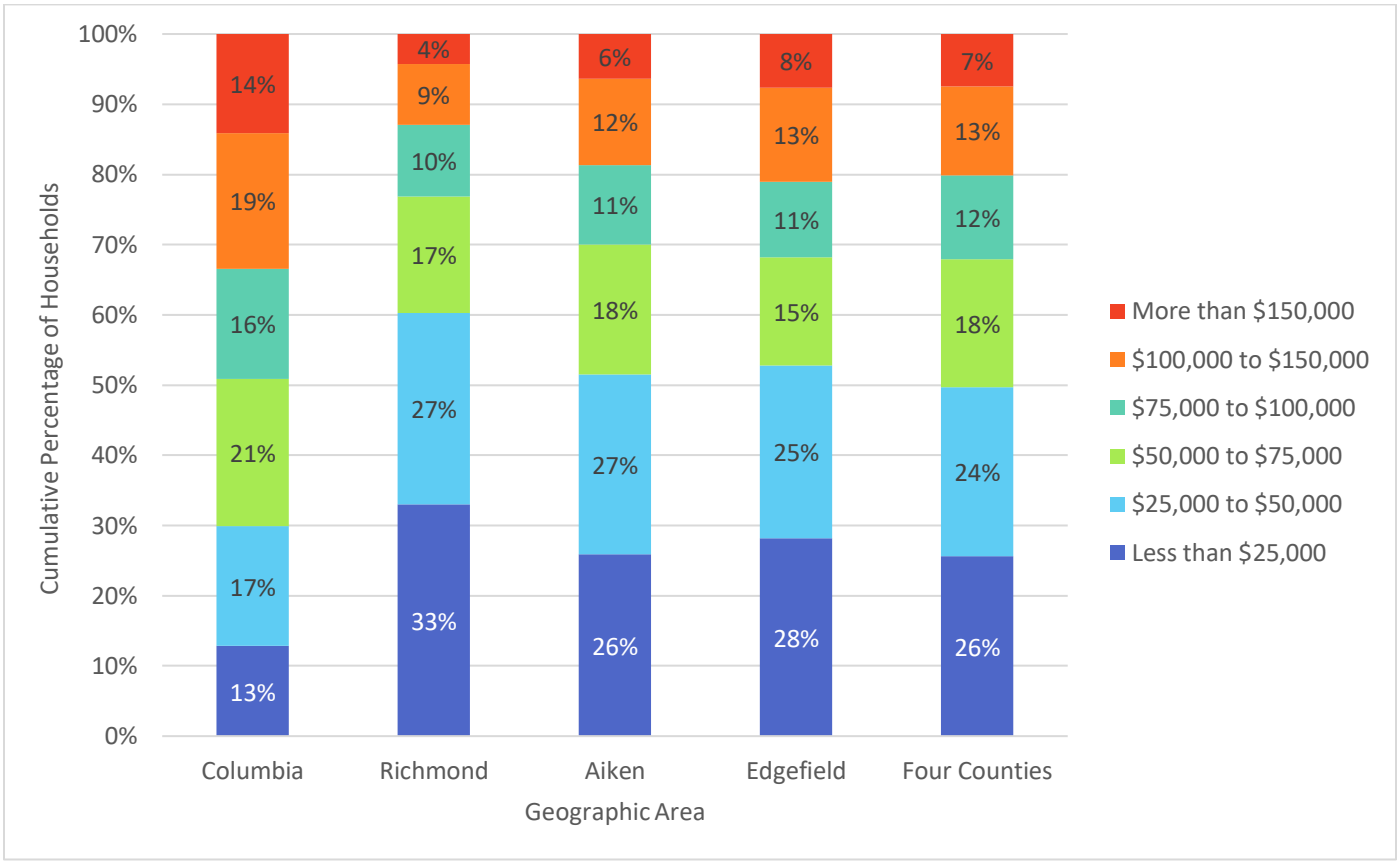


Source: 2013-2017 ACS 5-Year Estimate

Figure 2-14. Proportion of Households in Four-County Region by Income (2013-2017 ACS 5-Year Estimate)

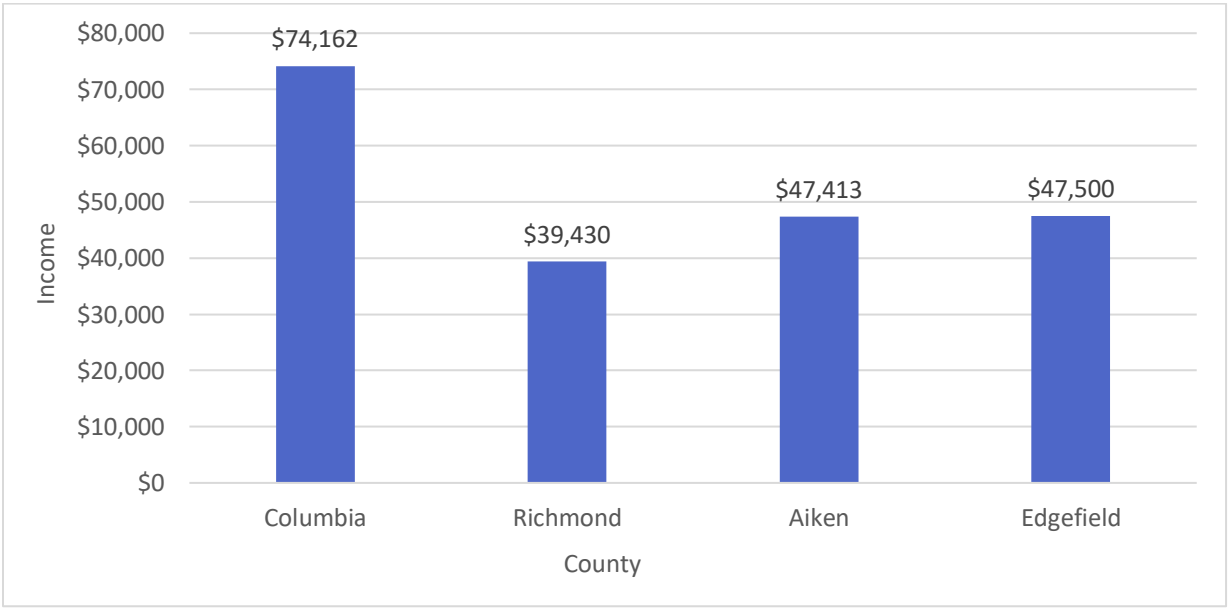
Figure 2-15 summarizes the proportion of households in several income categories and illustrates the differences in median household incomes between the four counties. Columbia County has the highest median household income at nearly $74,000, while Richmond County has the lowest at about $39,000 (see **Figure 2-16**). Nearly 30 percent of households in Richmond County have incomes below $30,000, compared to about 13 percent of households in Columbia County. Columbia County has just above 30 percent of households with incomes above $100,000, while about 13 percent of households in Richmond County have incomes at this level.

The median divides the income distribution into two equal parts: one-half of the cases falling below the median income and one-half above the median. For households and families, the median income is based on the distribution of the total number of households and families including those with no income.[iv]



Source: 2013-2017 ACS 5-Year Estimate

Figure 2-15. Percent Households by Income by County (2013-2017 ACS 5-Year Estimate)

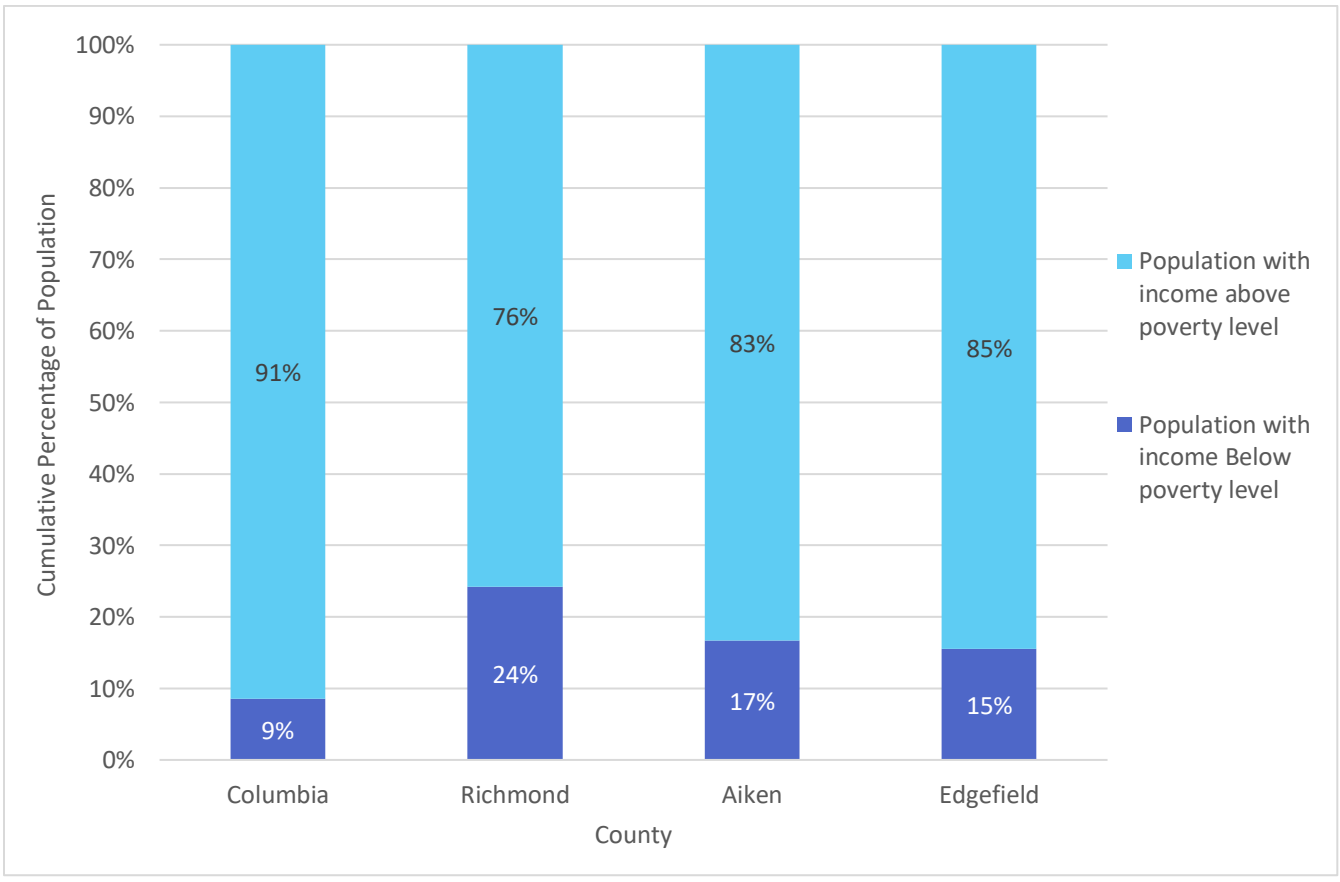


Source: 2013-2017 ACS 5-Year Estimate

Figure 2-16. Median Income by County (2013-2017 ACS 5-Year Estimate)

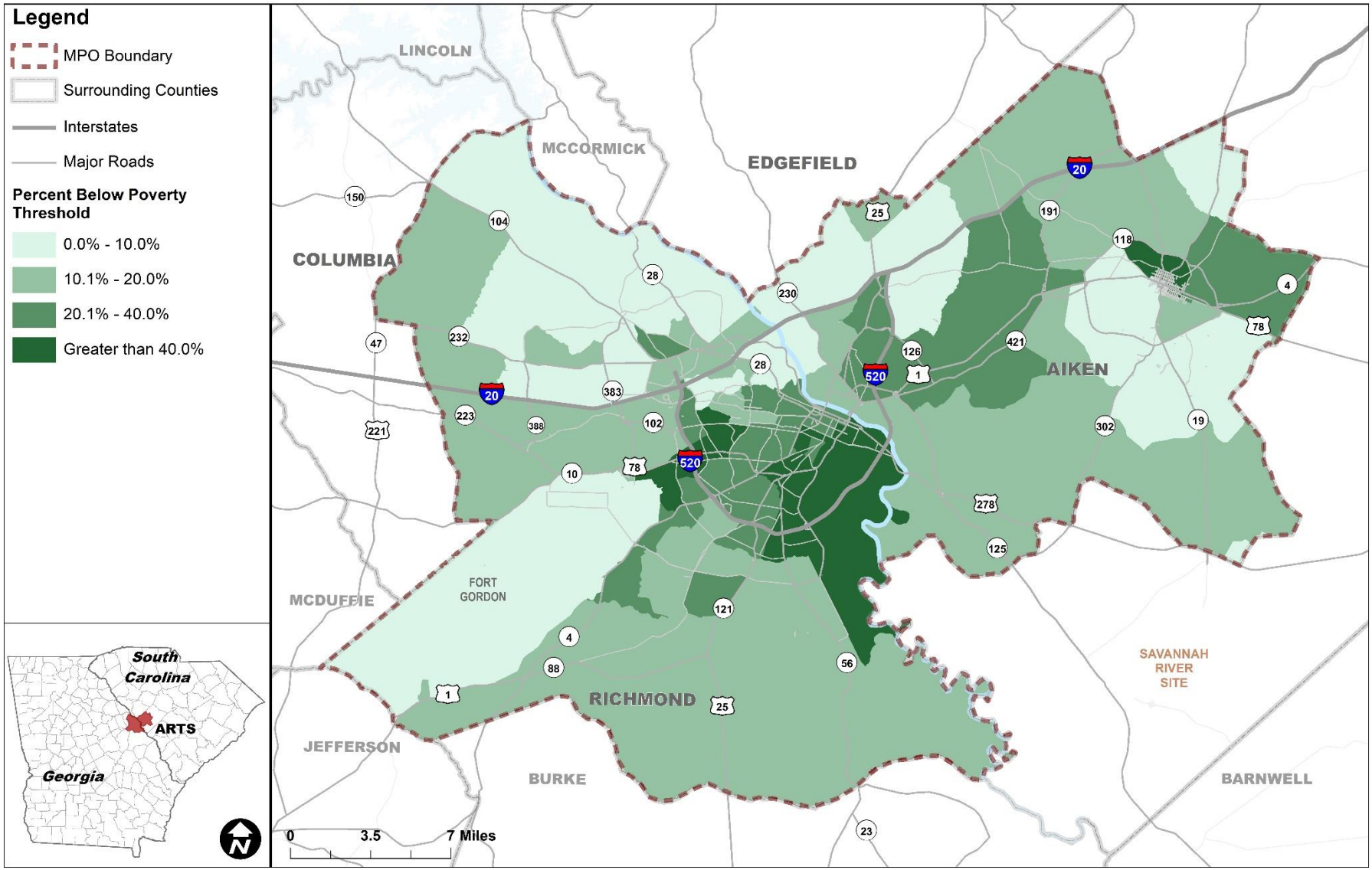
Figure 2-17 illustrates the number and proportion of people with incomes below the federally-determined poverty line. The United States Census uses this benchmark as a comparative figure amongst all geographic areas, and the poverty rate is a primary metric for determining means-tested program eligibility. The Census determines poverty based on the poverty threshold – the minimum amount of income needed to pay for basic needs, and the measure sets out a different poverty threshold based on family size and age of household members. The same poverty thresholds are used throughout the United States. If total household income of a household falls below this threshold, every member of the household is considered to be in poverty.

ACS provides an estimate of population with household income below the poverty line (also known as the poverty threshold). **Figure 2-18** illustrates the geographic distribution of individuals below the poverty threshold in the ARTS planning area. Census tracts in the northeastern portion of the City of Augusta, tracts northeast of Fort Gordon, and the City of Aiken have higher concentrations of individuals below the poverty threshold. Nearly 20 percent of the individuals in Richmond County have incomes below the poverty threshold, while large portions of Columbia, Aiken, and Edgefield Counties have populations with 10 percent or fewer individuals below the poverty threshold.



Source: 2013-2017 ACS 5-Year Estimate

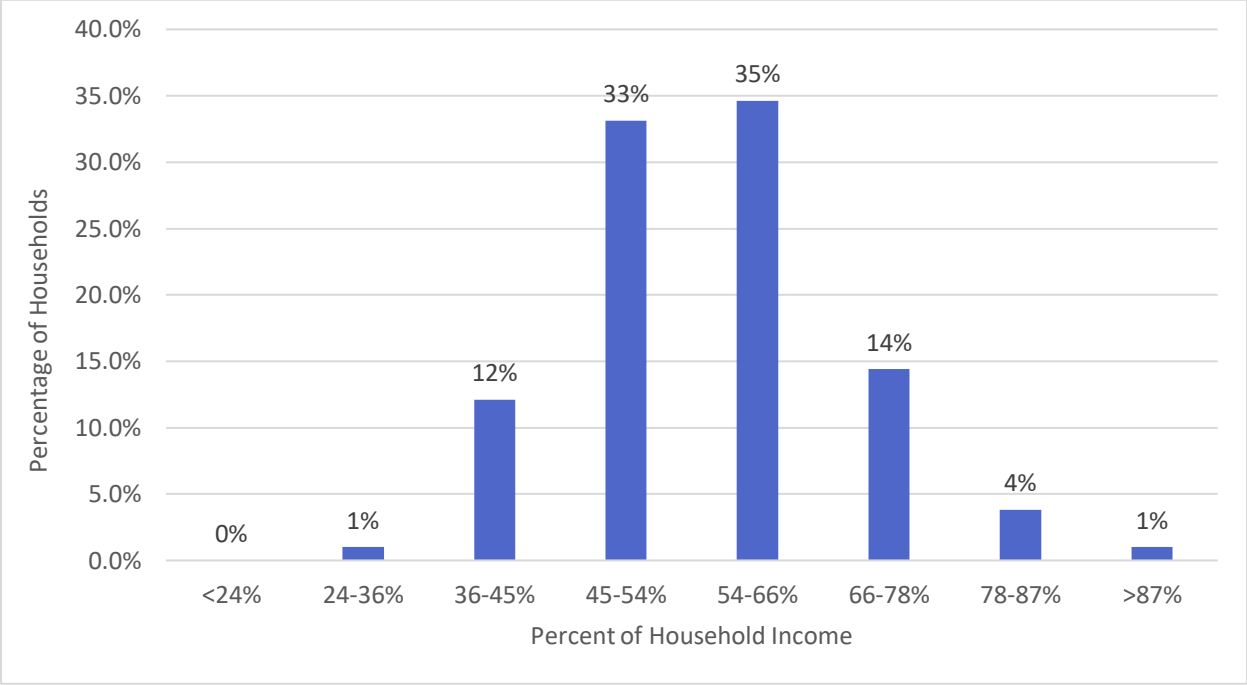
Figure 2-17. Proportion of Low-Income Population by County (2013-2017 ACS 5-Year Estimate)



Source: 2013-2017 ACS 5-Year Estimate

Figure 2-18. Population Below Poverty Threshold in ARTS Planning Area by Census Tract (2013-2017 ACS 5-year Estimate)

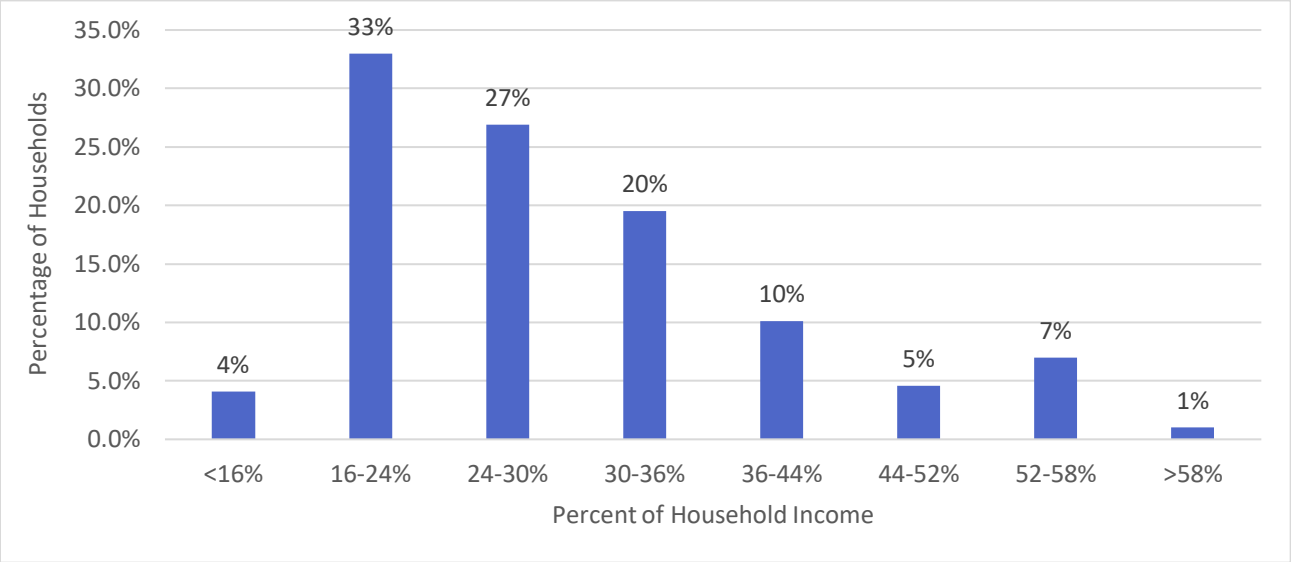
Although traditional measures only consider housing costs when determining a location's affordability, more comprehensive measures also consider the cost of transportation. The Center for Neighborhood Technology has found that the proportion of a household's income used for housing and transportation best reflects a location's affordability. In general, a household has access to affordable housing and transportation if these two costs comprise 45 percent or less of total household income. The average household in the ARTS planning area spends 56 percent of its income on housing and transportation, 11 percentage points higher than recommended. **Figure 2-19** shows that most of the ARTS planning area households spend more than the recommended amount on housing and transportation: approximately 87 percent of households spend over this threshold.



Source: Center for Neighborhood Technology

Figure 2-19. Percent of Income used for Household Housing and Transportation Costs (2017)

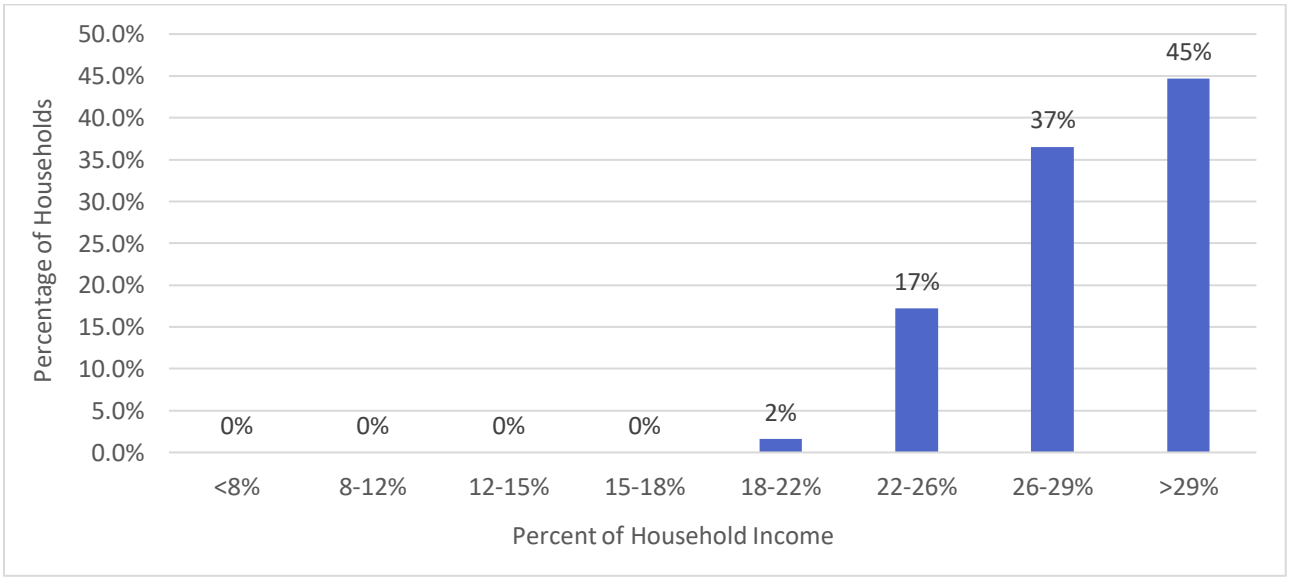
The Center for Neighborhood Technology recommends that households spend no more than 30 percent of income on housing costs. **Figure 2-20** shows the average household expenditure on housing costs is 28 percent of household income. Approximately 42 percent of ARTS planning area households spend more than the recommended proportion of income on housing costs



Source: Center for Neighborhood Technology

Figure 2-20. Percent of Income used for Household Housing Costs (2017)

The Center for Neighborhood Technology considers affordable transportation to be 15 percent of household income. Households in the ARTS planning area do not meet this criterion; **Figure 2-21** shows that 100 percent of households pay at least 18 percent of their incomes on transportation costs. The average household expenditure on transportation costs is 28 percent of household income.

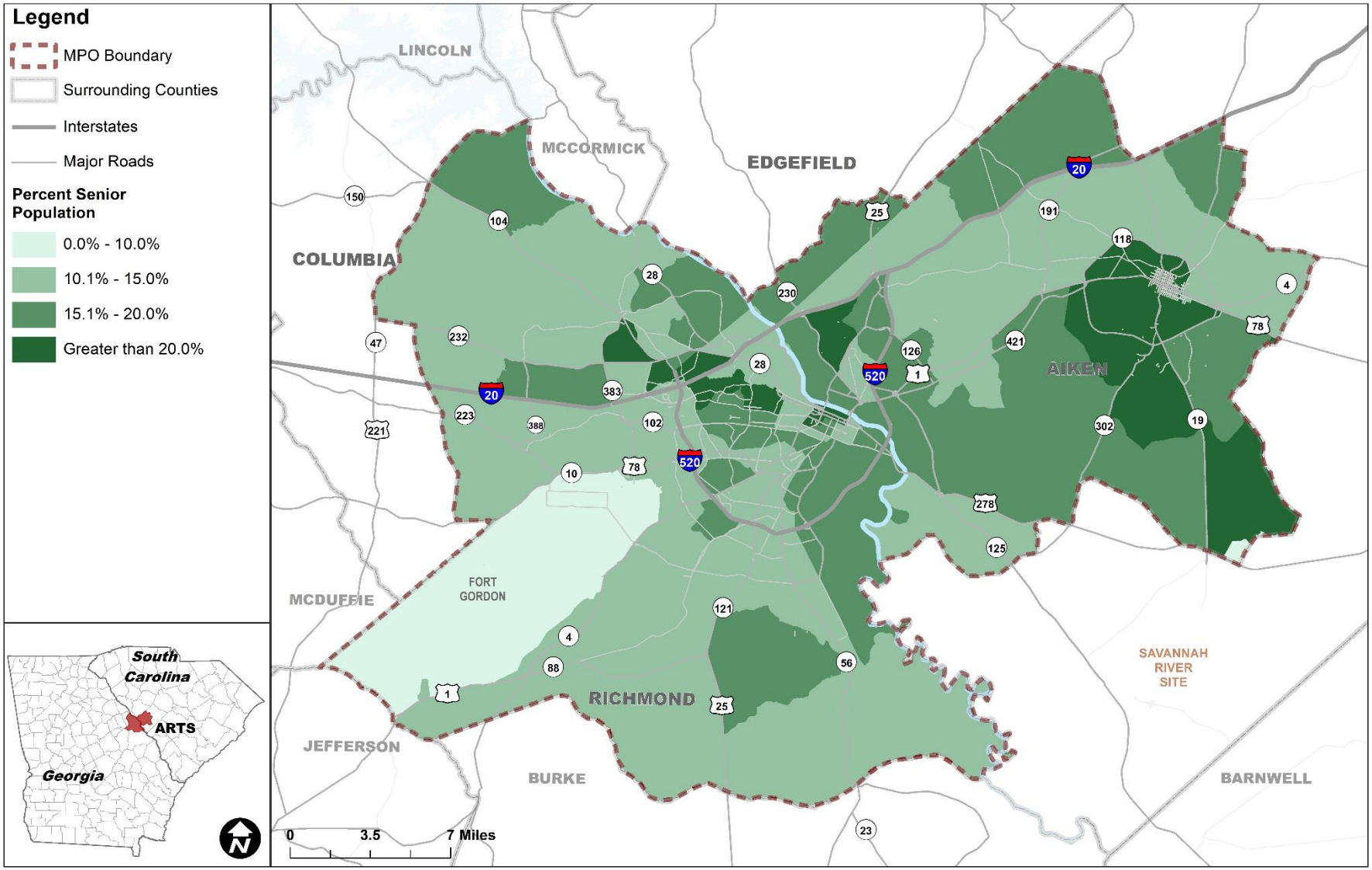


Source: Center for Neighborhood Technology

Figure 2-21. Percent of Income used for Household Transportation Costs (2017)

2.2.3 Senior Population

Figure 2-22 illustrates the geographical distribution of the senior population age 65 or above in the ARTS planning area. Census Tracts near the City of Aiken, northern parts of the City of Augusta, and eastern parts of Columbia County have higher shares of senior populations.

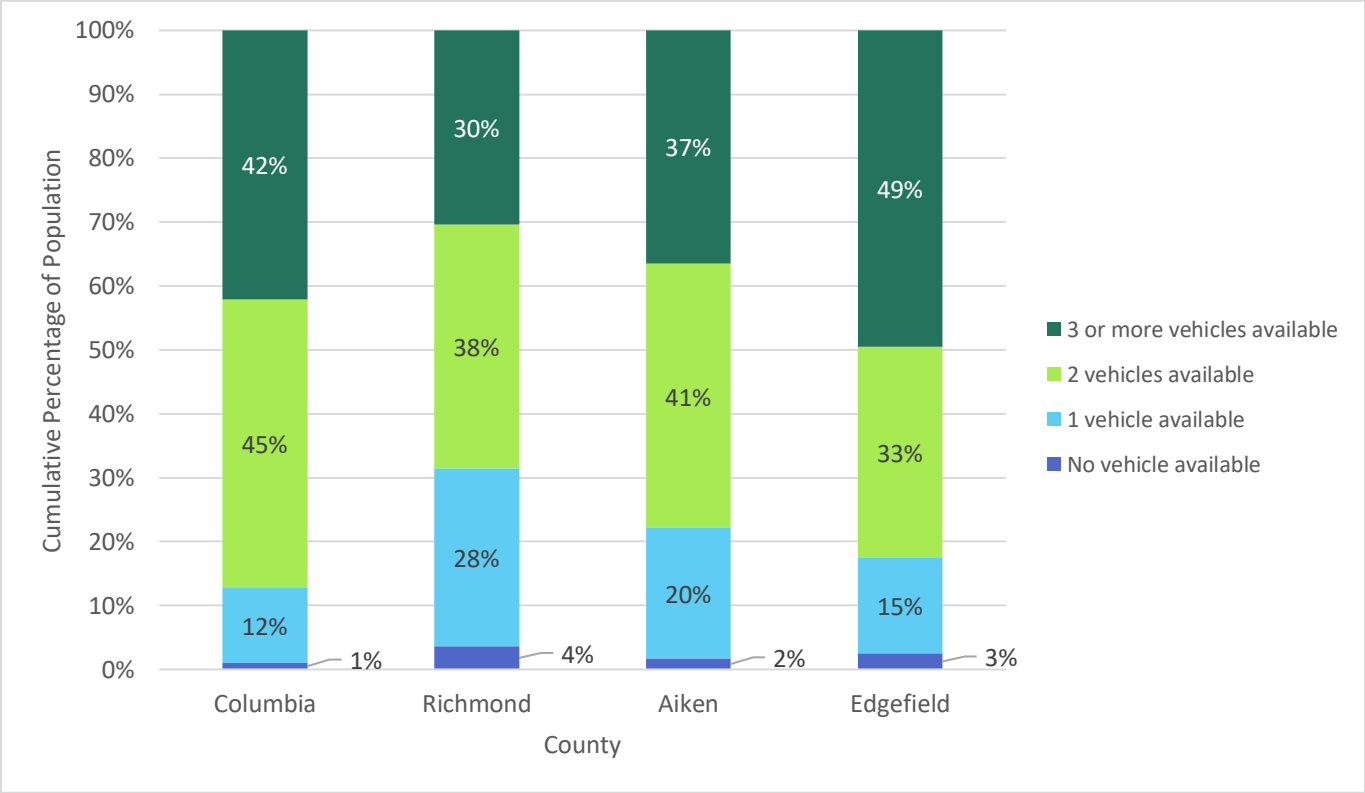


Source: 2013-2017 ACS 5-Year Estimate

Figure 2-22: Percent Senior Population-Age 65 or Above by Census Tract (2013-2017 ACS 5-Year Estimate)

2.2.4 Vehicle Availability

The four counties in the ARTS planning area contain approximately 193,000 households. **Figure 2-23** illustrates the percentage of these households without access to a vehicle. Richmond County has the highest percentage of such households at nearly 4 percent, while Columbia County has the smallest with about one 1 percent of households without access to a vehicle.



Source: 2013-2017 ACS 5-Year Estimate

Figure 2-23. Percent Households by Number of Vehicles Available (2013-2017 ACS 5-Year Estimate)

2.2.5 Population with Limited English Proficiency

The Census defines the LEP population as individuals greater than 5 years of age and speaking English less than "very well". The LEP population in the ARTS planning area includes people speaking Spanish, Asian, and Indo-European languages. The LEP population needs to be given special attention during the planning process to effectively include all groups within the ARTS planning area. About 2.7 percent of the population in the ARTS planning area was identified as LEP. The planning process for the 2050 MTP has incorporated translations of project related surveys and key materials into Spanish and Korean languages to widen the reach of public input.

Advertisements were placed in media sources distributed widely among minority populations. Emails were also sent out to a distribution list to inform the public about upcoming outreach events for the 2050 MTP. In addition to advertisements and emails, ARTS staff presented information about the 2050 MTP at various community meetings and festivals to reach a wider audience. **Technical Report #1** includes a detailed description of all public outreach activities conducted during the 2050 MTP update process.

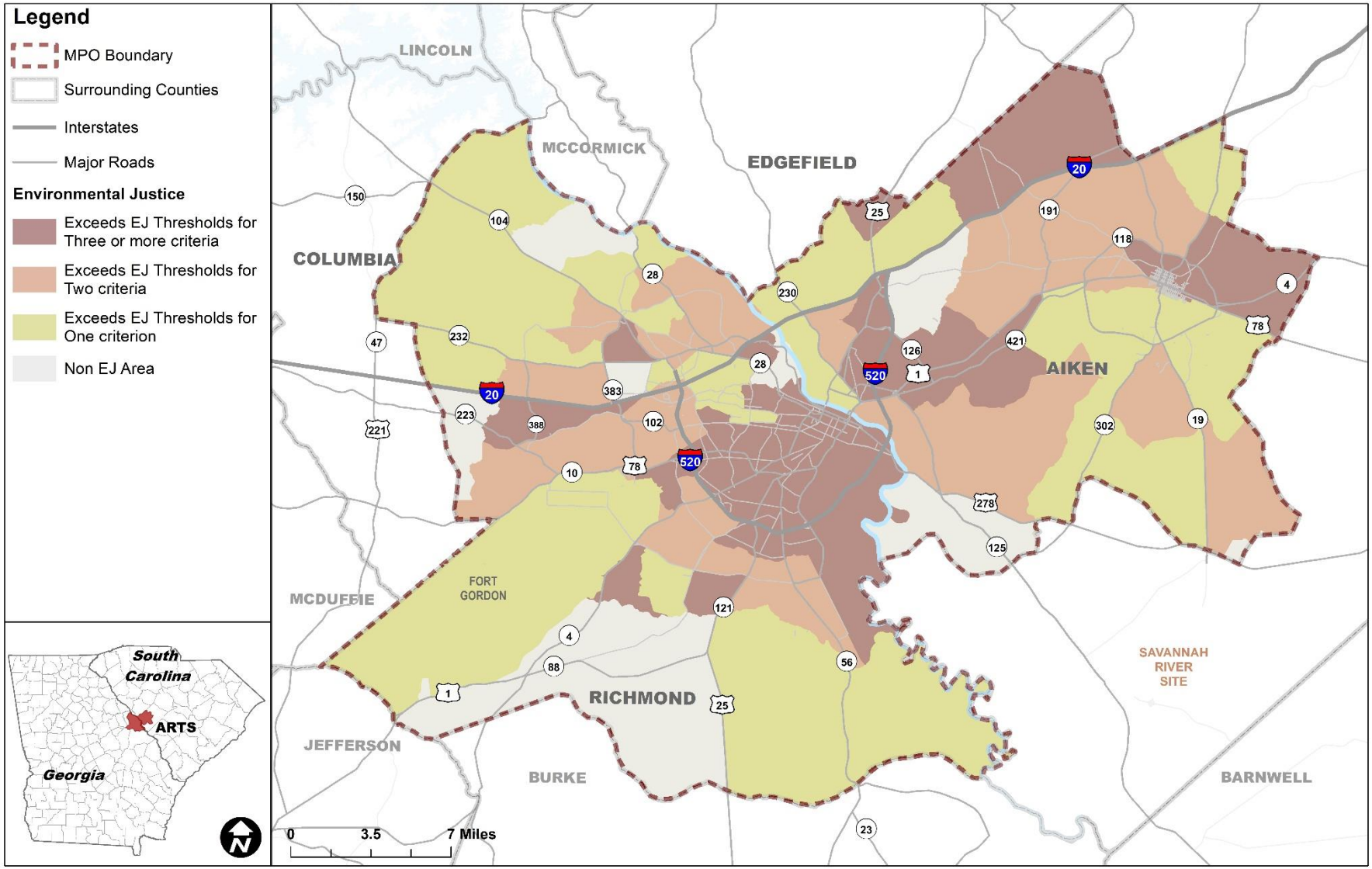
2.2.6 Environmental Justice Assessment

Table 2-5 summarizes Environmental Justice thresholds for the five categories discussed in this section. These thresholds were derived from the four-county area average in each category. **Figure 2-24** illustrates the number of categories that exceed their respective threshold for each census tract. While any census tract that exceeds the EJ threshold for at least one category will be considered as an EJ area, Census tracts with higher numbers of categories exceeding their thresholds indicate a potentially more sensitive area that will likely need some special attention in the planning process. Any project recommendations made in these areas would be assessed further for any impacts to specific EJ neighborhoods and communities.

Table 2-5. Environmental Justice Thresholds in the ARTS Planning Area (2013-2017 ACS 5-Year Estimate)

Demographic	ARTS Planning Area	Threshold
Total Population	460,015	-
Occupied Household Units	165,311	-
Minority Population	211,252	45.9%
Seniors	65,245	14.2%
Population with Income below Poverty Line	78,145	17.5%
Population that can Speak English less than "Very Well"	11,477	2.7%
Housing Units without a Vehicle	11,184	6.8%

Source: 2013-2017 ACS 5-Year Estimate

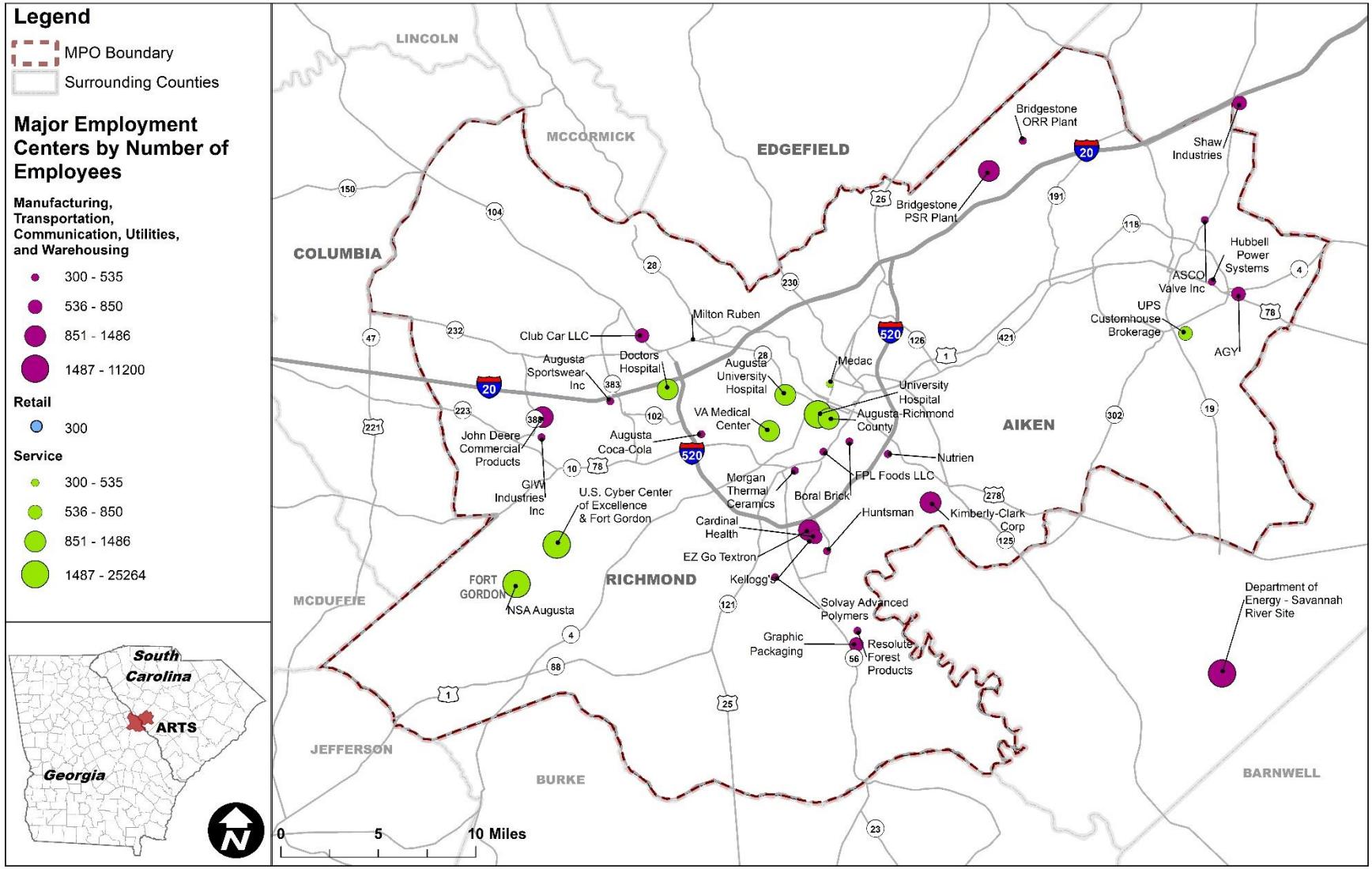


Source: ARTS 2040 LRTP (2015), 2013-2017 ACS 5-Year Estimate

Figure 2-24. Environmental Justice Areas by Census Tract (2013-2017 ACS 5-Year Estimate)

2.3 Jobs and Economy

Transportation plays a critical role in developing and shaping communities by providing access to employment and other activities. In other words, transportation infrastructure forms the foundation of opportunities for economic growth in the region. According to the 2017 National Household Travel Survey (NHTS), trips made to and from work, as well as trips due to work-related business, accounted for 16 percent of annual person miles traveled and 13 percent of all person trips. Thus, in addition to the number of housing units provided, the presence of employment sites within an area is a significant contributor to overall traffic. This section analyzes current employment data, collected from the Georgia Department of Labor and South Carolina Department of Employment and Workforce, to understand the nature of current employment opportunities within the ARTS planning area. **Figure 2-25** illustrates major employment centers within and in close proximity to the ARTS planning area, such as the US Cyber Center of Excellence, Fort Gordon, Savannah River Site, and Augusta University Hospital, by their industry sectors and number of employees.



Source: Augusta Economic Development Authority, Development Authority of Columbia County, Aiken Chamber of Commerce

Figure 2-25. ARTS Planning Area Employment Centers (2019)

2.3.1 Employment Status

Table 2-6 provides a summary of employment status in the ARTS planning area relative to state and national levels. Columbia and Edgefield Counties have lower unemployment rates than do the rest of the planning area, Georgia, South Carolina, and United States. Richmond County has the highest unemployment rate compared to the other geographies.

Table 2-6. Employment Status of Residents (2013-2017 ACS 5-Year Estimate)

Area	Population 16 Years and Over	Civilian Labor - Employed	Civilian Labor - Unemployed	Armed Forces	Not in Labor Force
Columbia County	111,009	56.9%	3.5%	3.3%	36.3%
Richmond County	159,145	49.5%	6.5%	3.4%	40.6%
Aiken County	133,252	53.1%	5.3%	0.3%	41.4%
Edgefield County	22,350	46.6%	3.7%	0.1%	49.7%
Four-County Area	425,756	52.4%	5.2%	2.2%	40.2%
South Carolina	3,926,466	55.5%	4.3%	0.8%	39.3%
Georgia	7,985,333	57.7%	4.7%	0.6%	37.1%
United States	255,797,692	58.9%	4.1%	0.4%	36.6%

Source: 2013-2017 ACS 5-Year Estimate

2.3.2 Employment Sectors

Table 2-7 compares employment by industry within the ARTS planning area to that of Georgia, South Carolina and the United States. Statistics reflect the proportions of jobs located within a geographic area, regardless of employee's county of residence. The ARTS planning area has similar job shares to the states and country in various sectors, including Retail, Information, Transportation and Warehousing, and Utilities, and Other Services except Public Administration. Notably, Edgefield County has comparatively higher shares of jobs in the Agriculture, Forestry, Fishing and Hunting and Mining, and Manufacturing industries than the other ARTS planning area counties, both states, and the country. Likewise, Richmond and Columbia Counties have comparatively higher shares of jobs in the Educational Services, and Health Care and Social Assistance sectors. Richmond County also has a notably higher proportion of jobs in Arts, Entertainment, and Recreation, and Accommodation and Food Services.

Table 2-7. Percent Employed Civilians by Employment Sectors (2013-2017 ACS 5-Year Estimate)

Subject	Columbia County	Richmond County	Aiken County	Edgefield County	Four-County Area	Georgia	South Carolina	United States
Civilian employed population 16 years and over	63,139	78,704	70,753	10,410	223,006	4,606,329	2,181,046	150,599,165
Agriculture, forestry, fishing and hunting, and mining	0%	1%	2%	6%	1%	1%	1%	2%
Construction	7%	5%	8%	8%	7%	7%	7%	6%
Manufacturing	9%	9%	14%	16%	11%	11%	14%	10%
Wholesale trade	2%	2%	1%	2%	2%	3%	3%	3%
Retail trade	12%	14%	12%	12%	13%	12%	12%	11%
Transportation and warehousing, and utilities	6%	5%	6%	4%	5%	6%	5%	5%
Information	2%	2%	2%	2%	2%	2%	2%	2%
Finance and insurance, and real estate and rental and leasing	5%	4%	4%	3%	4%	6%	6%	7%
Professional, scientific, and management, and administrative and waste management services	11%	10%	11%	9%	11%	12%	10%	11%
Educational services, and health care and social assistance	27%	26%	21%	20%	24%	21%	22%	23%

Subject	Columbia County	Richmond County	Aiken County	Edgefield County	Four-County Area	Georgia	South Carolina	United States
Arts, entertainment, and recreation, and accommodation and food services	8%	12%	9%	6%	10%	9%	10%	10%
Other services, except public administration	4%	5%	5%	8%	5%	5%	5%	5%
Public administration	7%	6%	4%	5%	6%	5%	5%	5%

Source: 2013-2017 ACS 5-Year Estimate

2.4 Socioeconomic Data for Travel Demand Model

Future projections of socioeconomic data are an integral part of developing the MTP and will be used as a foundation for estimating existing as well as future travel demand within the area. A base year of 2015 and future horizon year of 2050 were used in this process. Socioeconomic data projections were developed in close coordination with local planning partners and Georgia Department of Transportation (GDOT) during the planning process for forecasting future population, household and employment within the ARTS planning area.

2.4.1 Base Year (2015) Data for Travel Demand Model

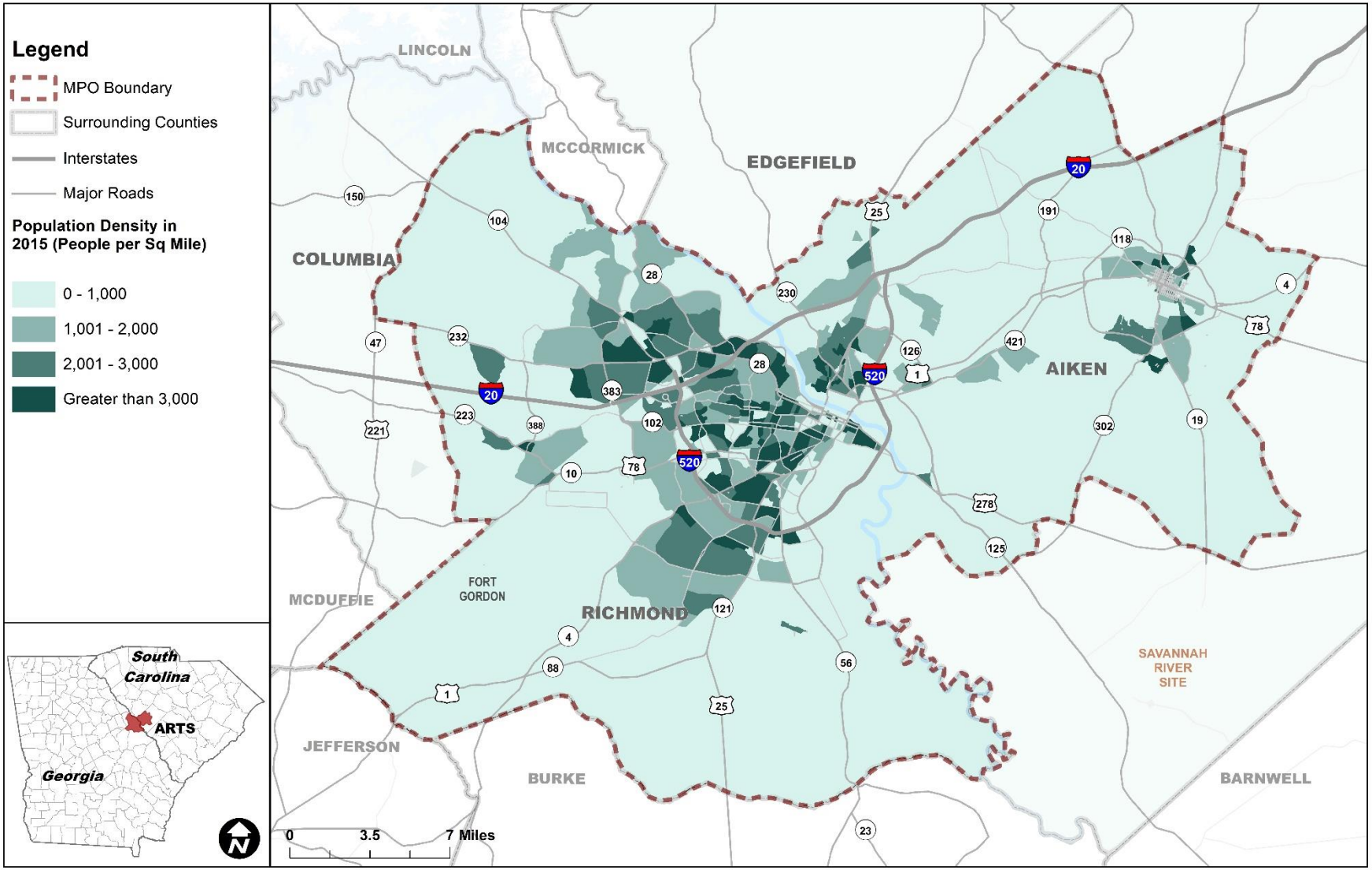
The 2015 base year population and household data used for the travel demand model development for the four counties in the ARTS MPO is shown in **Table 2-8**. Please note that the Base Year Data will produce slightly different population and household estimates than those found earlier in this report, which are based on most recent ACS data. Base Year Data is based on the Georgia Statewide Travel Demand Model (GSTDM) which uses a combination of 2015 Census Data, 2015 Woods & Poole population estimates, and 2015 Regional Economic Models, Inc. (REMI). Data for this model are used only to generate predictions surrounding the growth that will influence future traffic demand and are not intended to perfectly match the Census' existing condition estimates.

Table 2-8. 2015 Base Year Population and Employment (Model Run 2019)

County	2015 Total Population	2015 Total Household	2015 Household Size	2015 Total Employment
Columbia	137,782	50,107	2.75	30,624
Richmond	192,878	71,808	2.69	127,310
Aiken	163,427	73,571	2.22	43,706
Edgefield	23,810	9,099	2.62	9,299
Grand Total	**517,897**	**204,585**	**2.53**	**210,939**

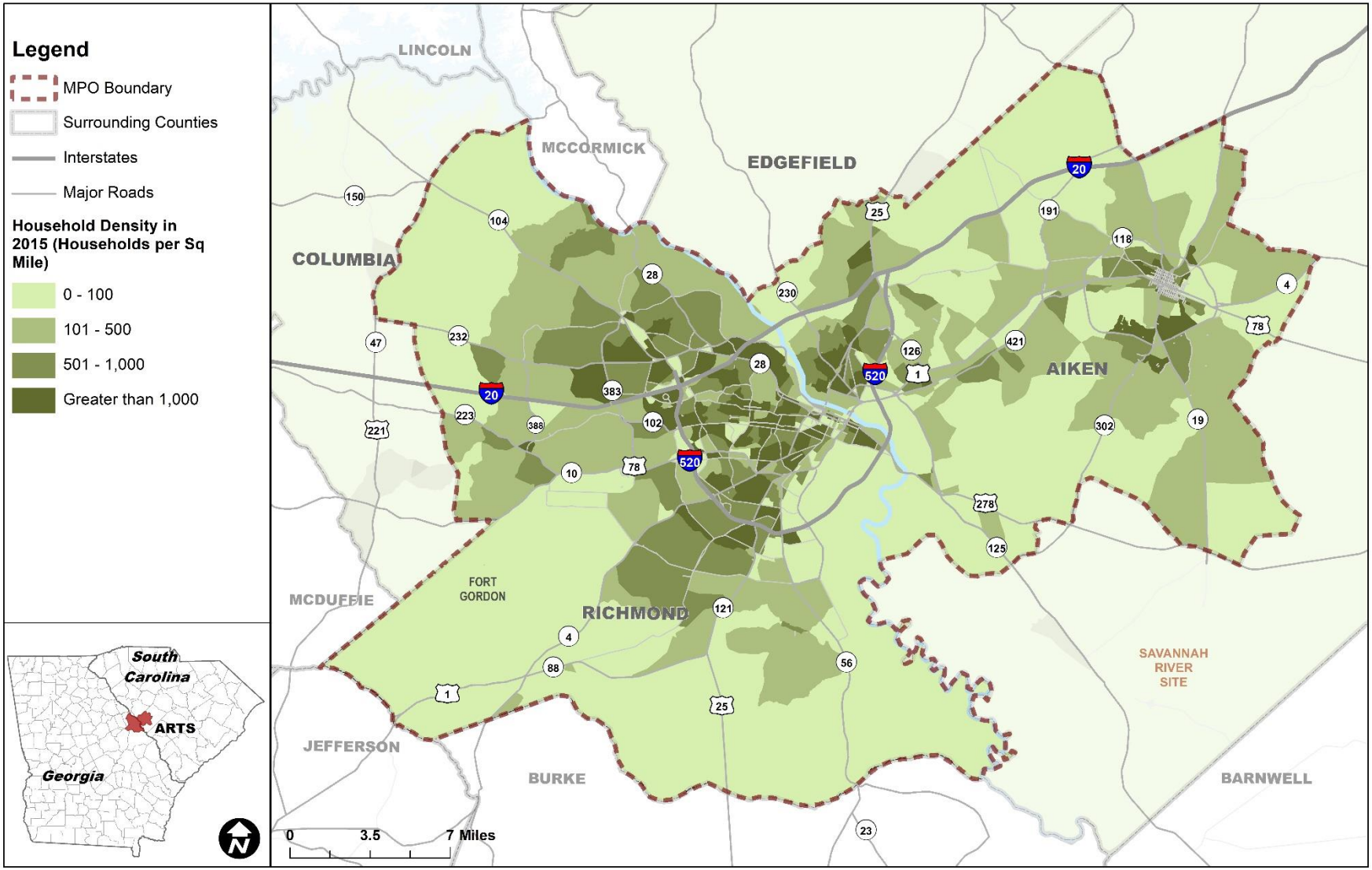
Source: Georgia Statewide Travel Demand Model (GSTDM) based on: 2011-2015 ACS 5-Year Estimate, Woods & Poole (2015), and REMI (2015)

The 2015 base year data shows that Richmond County is the largest in terms of the size of population and numbers of employed; while Aiken County has the largest number of households. In terms of household size, Columbia County ranks the largest with an average of 2.75 people per household. Richmond County also has the largest number of jobs as well with 127,310 (over 60 percent of total jobs in the four-county area). It also has the highest employment to population ratio of 0.66, reflecting 0.66 jobs per county resident. **Figure 2-26, Figure 2-27** and **Figure 2-28** illustrate the 2015 population density, household density, and employment density, respectively. Analysis focuses on density because more employment or residential density typically correlates with more traffic. This is because more people are traveling to jobs and homes within a confined location.



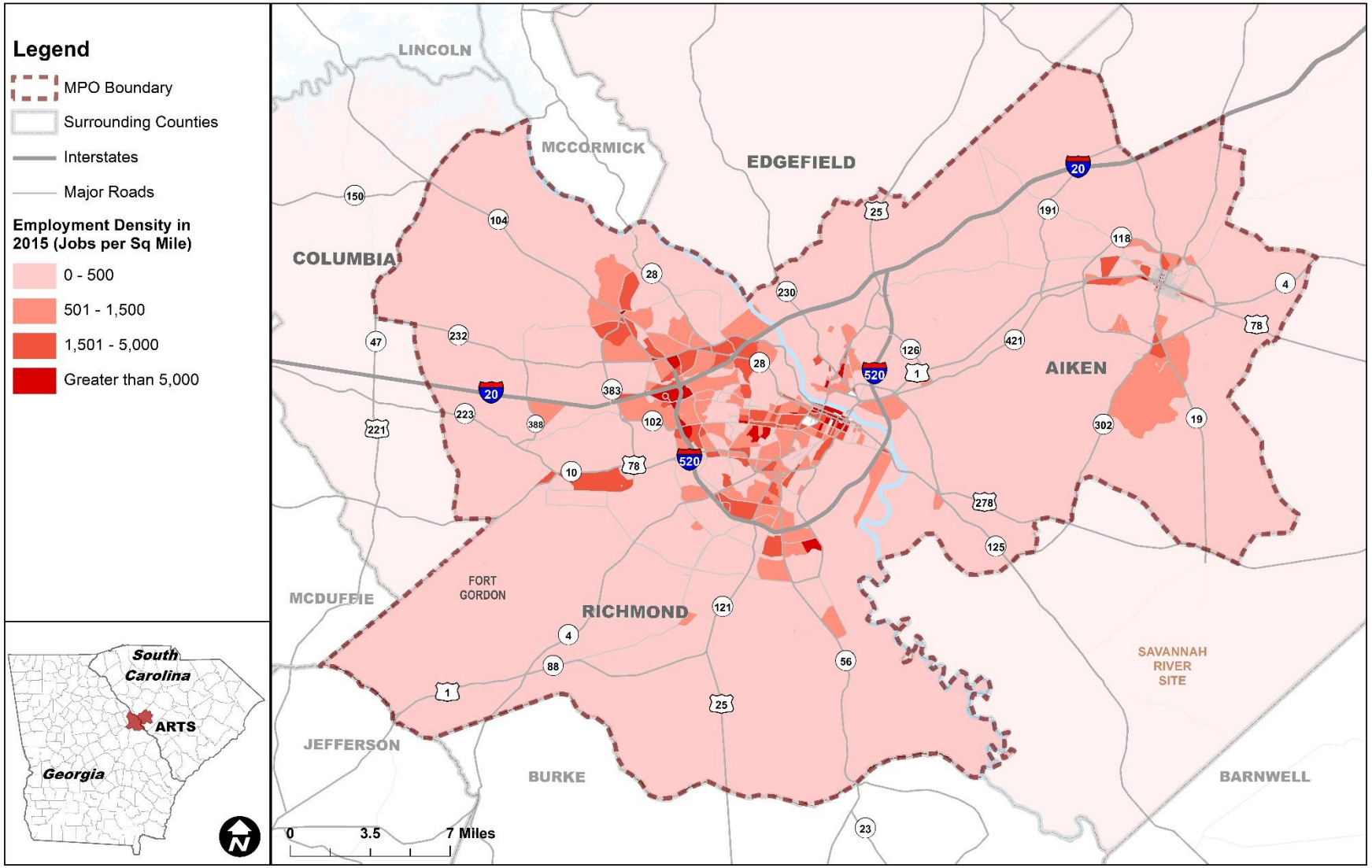
Source: Georgia Statewide Travel Demand Model (GSTDM), based on 2011-2015 ACS 5-Year Estimate, Woods & Poole (2015), and REMI (2015)

Figure 2-26. 2015 ARTS Population Density by Traffic Analysis Zone (Model Run 2019)



Source: Source: Georgia Statewide Travel Demand Model (GSTDM), based on 2011-2015 ACS 5-Year Estimate, Woods & Poole (2015), and REMI (2015)

Figure 2-27. 2015 ARTS Household Density by Traffic Analysis Zone (Model Run 2019)



Source: Georgia Statewide Travel Demand Model (GSTDM), based on 2011-2015 ACS 5-Year Estimate, Woods & Poole (2015), and REMI (2015)

Figure 2-28. 2015 ARTS Employment Density by Traffic Analysis Zone (Model Run 2019)

2.4.2 Future (2050) Projections for the ARTS Travel Demand Model

The 2050 population and employment projections use the following data sources for reference:

- Georgia Governor's Office of Planning and Budgeting (OPB)
- South Carolina Revenue and Fiscal Affairs Office (RFAO)
- American Community Survey (ACS)
- Projections from Local Comprehensive Plans
- Woods & Poole
- REMI Data
- Georgia Statewide Travel Demand Model (GSTDM) 2015/2050
- 2010/2040 ARTS LRTP Projections

Using the above data sources, blended annual growth rates were estimated for population and employment for four counties respectively. For Edgefield County's population, the annual growth rate of 1.08 percent from Edgefield County 2019 Comprehensive Plan was used per County's direction, as it was assumed to be a more likely indicator of the future growth for the County.

The total control numbers for population and employment were calculated for all four counties using the recommended annual growth rates, which were approved by the local planning partners. Household Size Trends (population/household) were used to project 2050 households based on 2050 population projections and estimated household size in 2050. The 2050 control totals for population, households, and employment are shown in **Table 2-9.**

Table 2-9. 2050 Control Totals for Population and Employment Projections (Model Run 2019)

County	2050 Total Population	2050 Total Household	2050 Total Employment	Population Growth (2015 – 2050)	Households Growth (2015 – 2050)	Employment Growth (2015 – 2050)
Columbia	263,005	96,975	50,357	125,223 (91%)	46,868 (94%)	19,733 (64%)
Richmond	205,836	77,248	150,359	12,958 (7%)	5,440 (8%)	23,049 (18%)
Aiken	197,142	89,062	64,556	33,715 (21%)	15,491 (21%)	20,850 (48%)
Edgefield	34,669	13,556	10,469	10,859 (46%)	4,457 (49%)	1,170 (13%)
Grand Total	**700,652**	**276,841**	**275,741**	**182,755 (35%)**	**72,256 (35%)**	**64,802 (31%)**

Source: OPB, RFAO, ACS, Edgefield County (2019), Woods & Poole, REMI, GSTDM, ARTS MPO (2010)

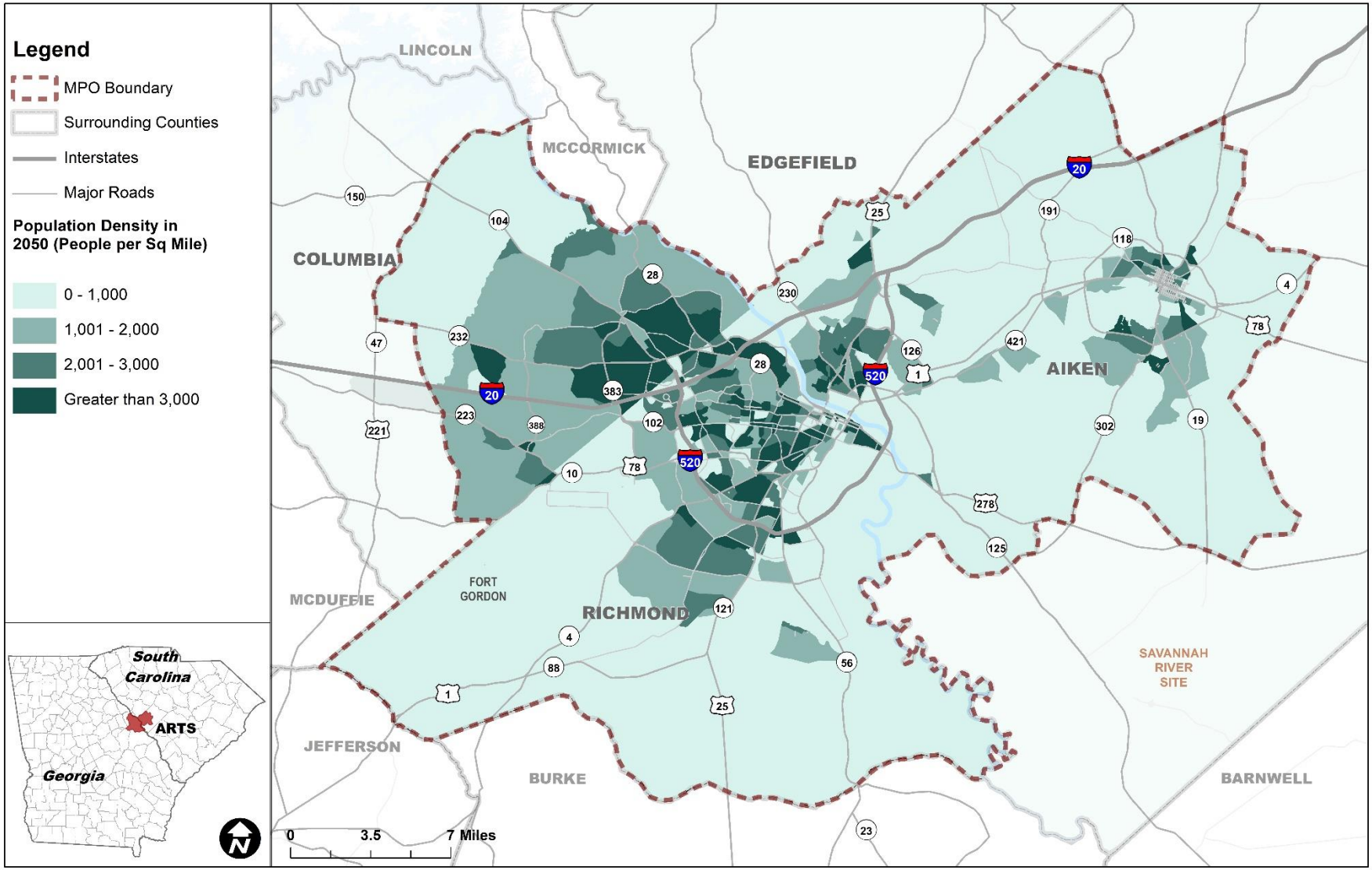
Detailed methodology and approach for forecasting the socioeconomic data for each county and at each Traffic Analysis Zone (TAZ) level can be found in Appendix I - ARTS Future SE Data Memo. **Figure 2-29**, **Figure 2-30**, and **Figure 2-31** illustrate projected 2050 population density, household density, and employment density, respectively.

2050 school enrollment was projected using the 2050 projected population and the ratio of school enrollment to total population in 2015. For college enrollment projections, the overall college enrollment data from 2000 to 2015 from University System of Georgia was obtained and the annual growth rate (2.67 percent) was developed for Columbia and Richmond Counties. For Edgefield and Aiken Counties, the historical annual growth rate (2.05 percent) was obtained from the South Carolina Commission on Higher Education. These annual growth rates were then applied to the 2015 College Enrollment data to project the 2050 College Enrollment.

Table 2-10. 2050 Control Totals for School (K-12) and College Enrollment at Institutions within Each County (Model Run 2019)

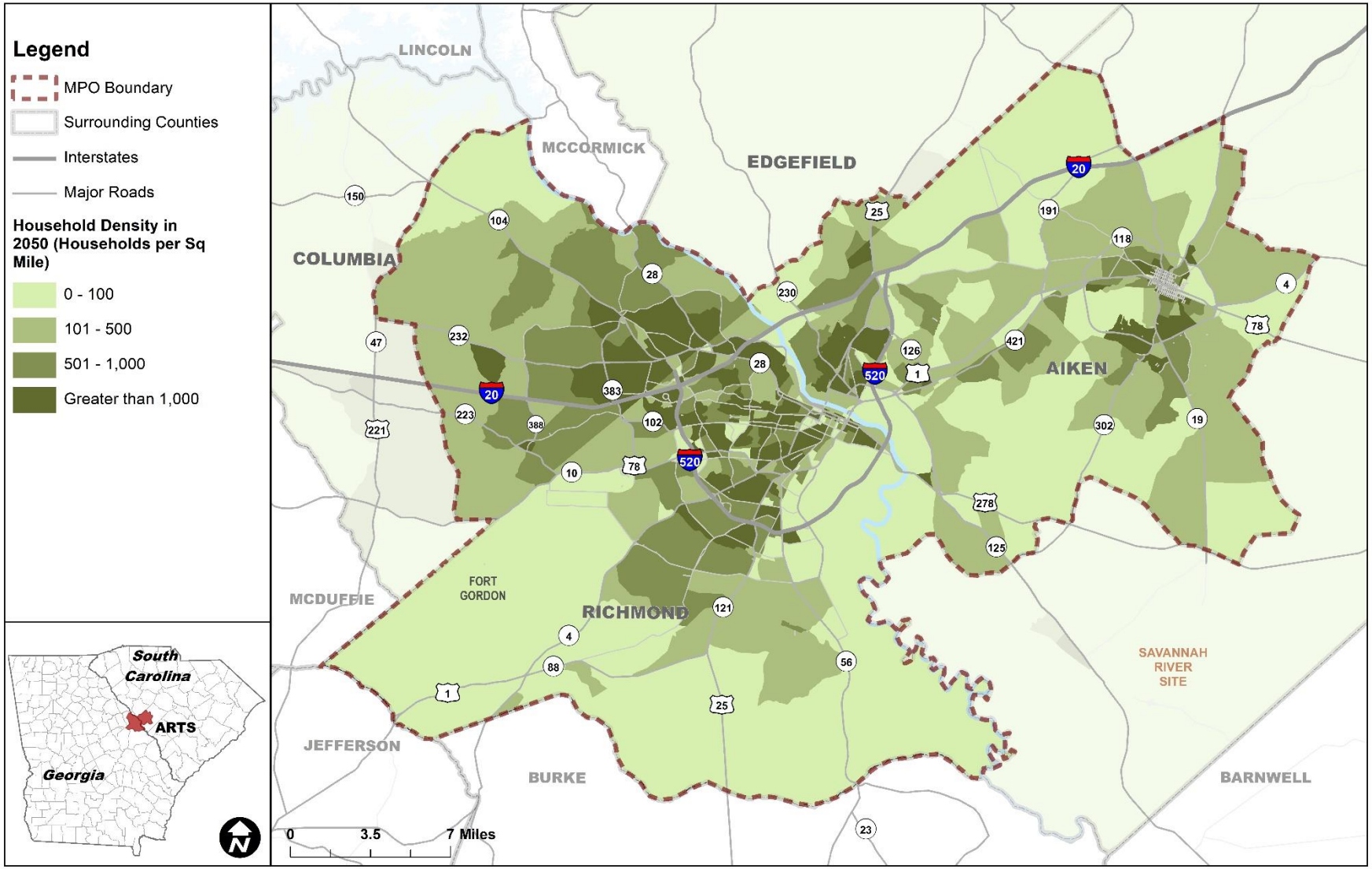
County	2050 School Enrollment	2050 College Enrollment
Columbia	52,128	0
Richmond	36,132	41,188
Aiken	30,961	13,091
Edgefield	5,958	423
Grand Total	**125,179**	**54,702**

Source: OPB, RFAO, ACS, Edgefield County (2019), Woods & Poole, REMI, GSTDM, ARTS MPO (2010)



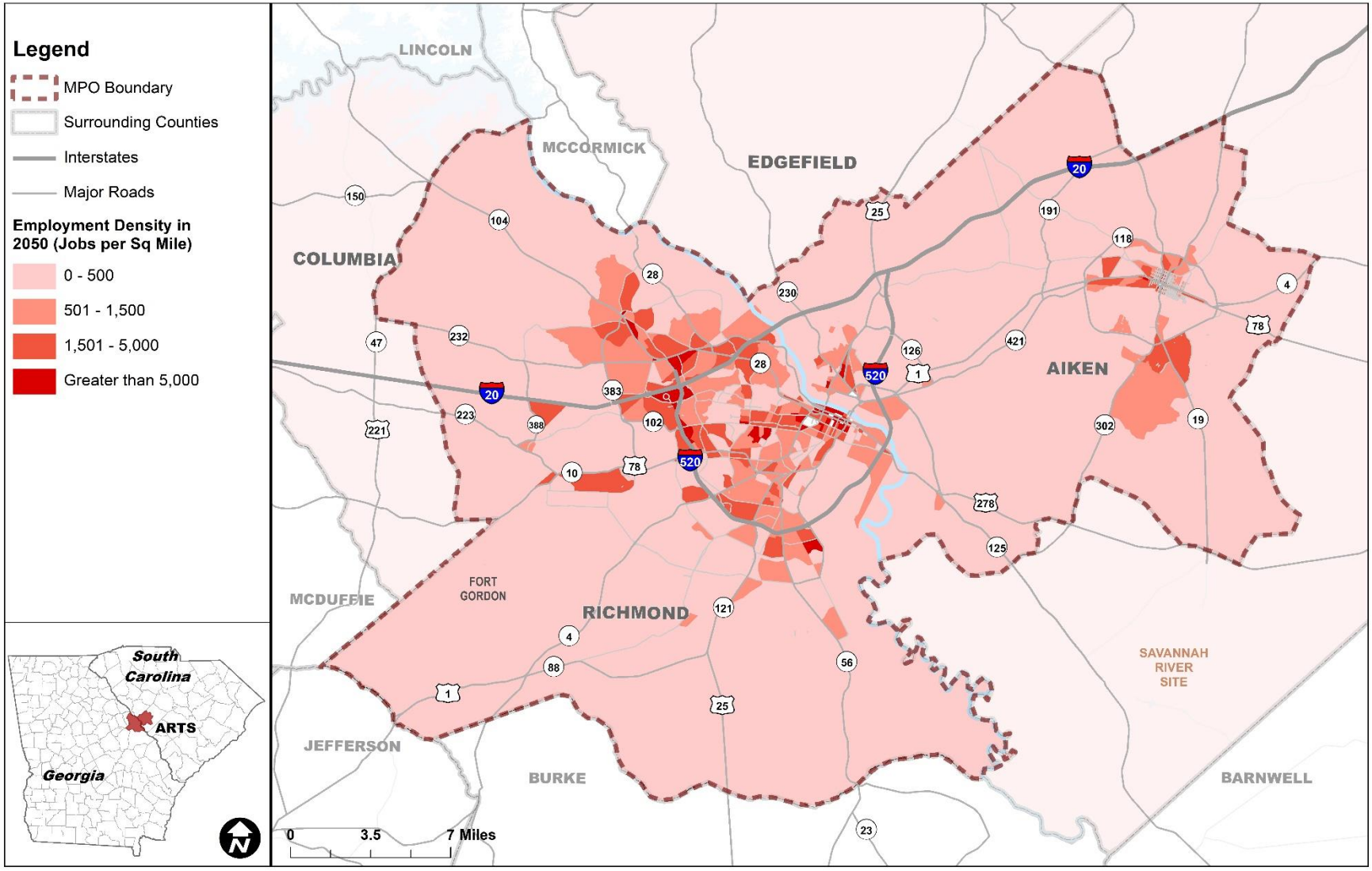
Source: OPB, RFAO, ACS, Edgefield County (2019), Woods & Poole, REMI, GSTDM, ARTS MPO (2010)

Figure 2-29. Projected 2050 ARTS Population Density by Traffic Analysis Zone (Model Run 2019)



Source: OPB, RFAO, ACS, Edgefield County (2019), Woods & Poole, REMI, GSTDM, ARTS MPO (2010)

Figure 2-30. Projected 2050 ARTS Household Density by Traffic Analysis Zone (Model Run 2019)



Source: OPB, RFAO, ACS, Edgefield County (2019), Woods & Poole, REMI, GSTDM, ARTS MPO (2010)

Figure 2-31. Projected 2050 ARTS Employment Density by Traffic Analysis Zone (Model Run 2019)

2.4.3 Assumptions and Limitations

There are some limitations related to the future socioeconomic projections at the TAZ level due to the lack of the detailed 2050 future land use information. To determine where future population and employment growth are expected within each county, local growth and development plans were reviewed. Future land use information is available for Columbia and Richmond Counties, but not for Aiken and Edgefield Counties.

For the counties where the detailed 2050 land use information is not available, ARTS 2010 and 2040 socioeconomic data at the TAZ level in the previously adopted Long Range Transportation Plans (LRTPs) were reviewed and utilized as a reference for distributing the increase in controlled totals for population, household, and employment from 2015 to 2050 to different TAZs within each county. For employment, detailed job sectors including Agriculture, Mining and Construction (AMC); Manufacturing, Transportation, Commerce, Utility and Wholesale (MTCUW); and, Retail and Service were also distributed at the TAZ level for each County.

Should the detailed comprehensive plans and future land use maps become available, the distribution of population and employment data by detailed job sectors can be updated in the next MTP to reflect the future land use growth patterns more accurately.

3 Land Use

Comprehensive plans, including future land use maps, indicate the desired future growth and development for a city or county. Each jurisdiction is responsible for adopting and implementing their own future land use plan, resulting in the situation where the underlying analyses, timeframe, scope and scale of the plans may differ from each other. Generally, however, each plan identifies areas slated for more intensive development, commercial and industrial centers, and residential uses, all of which indicate growing need for transportation infrastructure. Areas of lower intensity, like designated rural land uses, suggest sections of the ARTS planning area that will have comparatively lower future demand for transportation resources. This section reviews existing land use patterns, future land use plans, developments of regional impact, and community, historic, and cultural resources.

This chapter contains the following sections:

- Zoning
- Future Land Use
- Developments of Regional Impact
- Community Facilities
- Natural and Cultural Resources

3.1 Zoning

Figure 3-1 and Table 3-2 show zoning categories for the ARTS planning area aggregated into general land uses. These land uses are based on each individual county's adopted zoning maps, and categories have been combined to simplify the display and emphasize the primary land use within each zone. There are several limitations to this type of map: zoning is not land use, so there may be clusters of existing land uses not depicted here. In addition, several areas within the ARTS planning area boundary do not have publicly available zoning information, such as Fort Gordon. However, despite these limitations **Figure 3-1** illustrates the existing development patterns.

There are large swaths of residential land use throughout central Augusta, eastern Columbia County, Edgefield County, and the southeastern portion of Aiken County. Areas that permit multifamily residential development ("Residential MF") are likely denser and may require additional mobility infrastructure including sidewalks, trails and bicycle facilities. Likewise, areas marked for "planned development" may require transportation infrastructure improvements in anticipation of clustered, mixed-use development.

Commercial and business development typically cluster along arterial and collector streets, especially near areas of higher residential density. Large employers and industrial land uses are generally located along railroad lines, interstate highways or in the center of the city or county.

Table 3-1. Total Area by General Zoning Categories (2019)

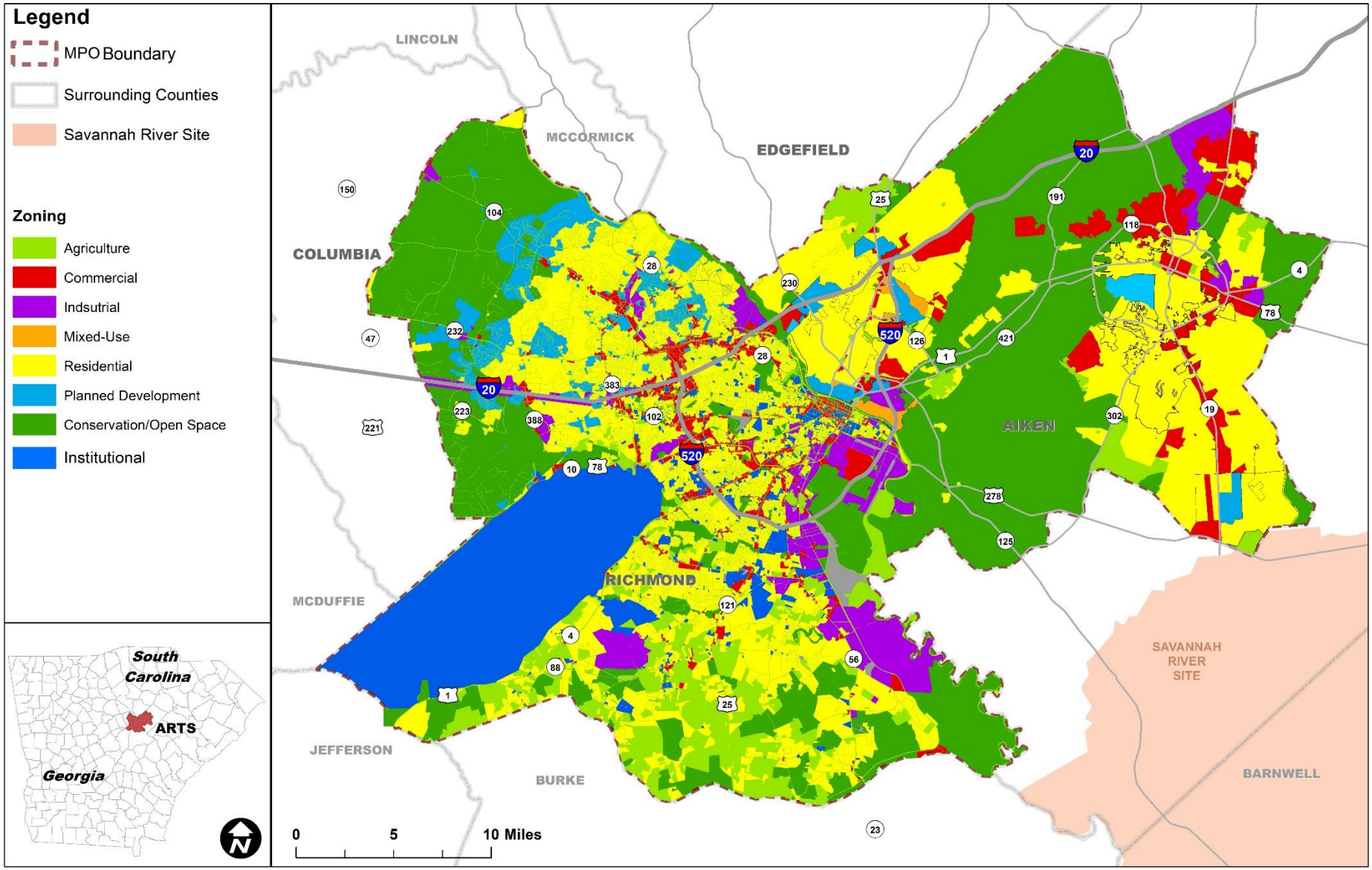
Zoning	Sq. Miles	%
Rural/Open	223.71	27.2%
Residential	178.9	21.8%
Agricultural	133.84	16.3%
Special	99.03	12.0%
Business/Commercial	52.737	6.4%
Industrial	46.98	5.7%
Residential Multifamily	47.11	5.7%
Planned Development	30.62	3.7%
Unclassified	9.546	1.2%
Total	**822.473**	**100%**

Source: ARTS MPO

Table 3-2. General Zoning Categories by County (2019)

Zoning	Columbia		Richmond		Aiken		Edgefield	
	Sq. Miles	%	Sq. Miles	%	Sq. Miles	%	Sq. Miles	%
Agricultural	0	0.0%	126.38	36.1%	6.02	1.9%	1.44	7.9%
Business/Commercial	4.44	3.2%	14.24	4.1%	34.01	10.8%	0.047	0.3%
Industrial	4.37	3.2%	34.83	9.9%	7.77	2.5%	0.01	0.1%
Planned Development	17.65	12.8%	0.29	0.1%	12.68	4.0%	0	0.0%
Residential	41.95	30.5%	72.57	20.7%	58.01	18.3%	6.37	34.8%
Residential Multifamily	0.61	0.4%	10.73	3.1%	35.77	11.3%	0	0.0%
Rural/Open	63.14	45.9%	0	0.0%	159.66	50.5%	0.91	5.0%
Special	5.35	3.9%	91.38	26.1%	2.3	0.7%	0	0.0%
Unclassified	0	0.0%	0	0.0%	0	0.0%	9.546	52.1%
Total Area	137.51	100.0%	350.42	100.0%	316.22	100.0%	18.323	100.0%

Source: ARTS MPO



Source: ARTS MPO, Aiken County, Columbia County

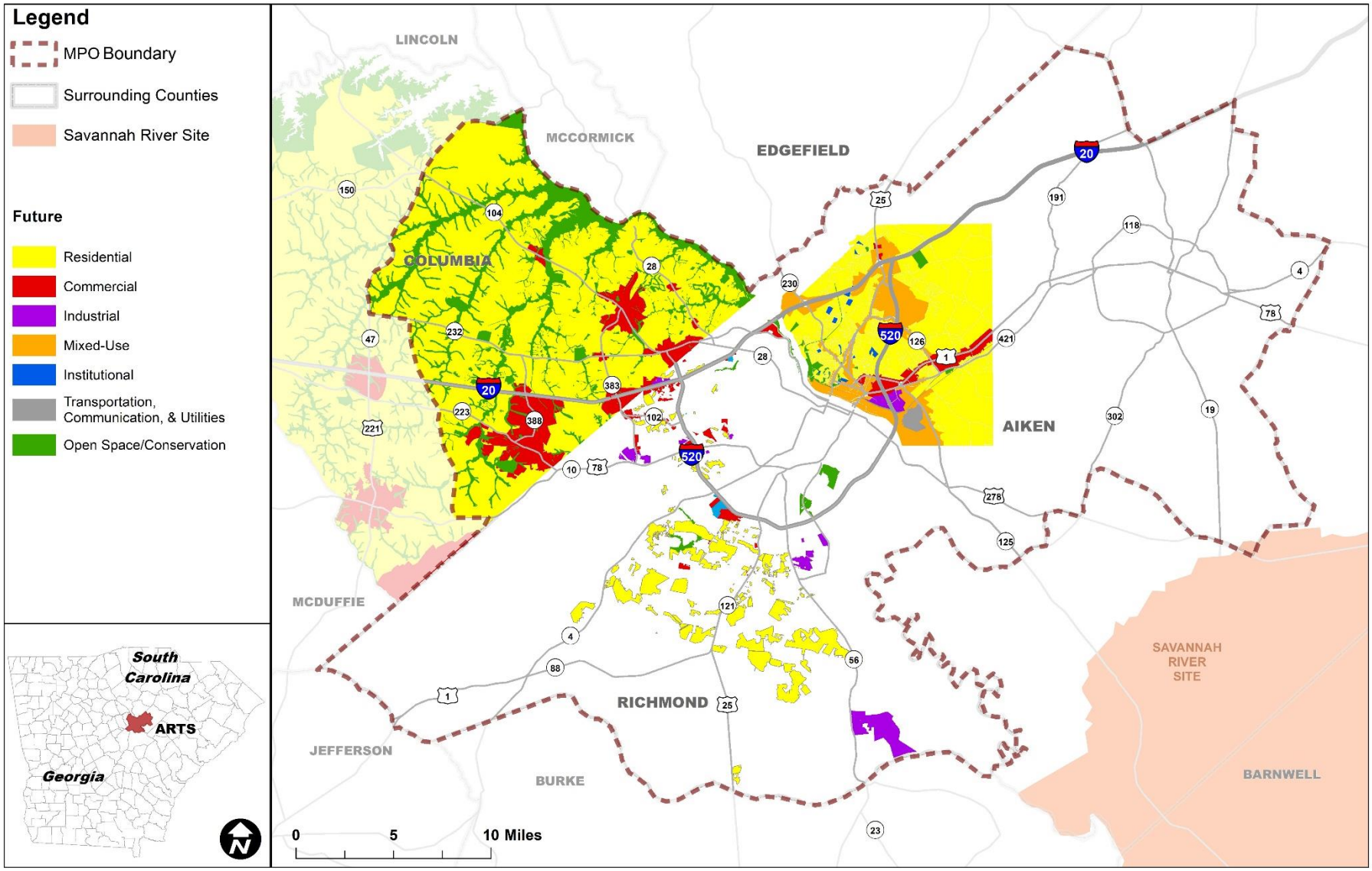
Figure 3-1. ARTS Planning Area General Zoning Categories (2019)

3.2 Future Land Use

Columbia County envisions clusters of development surrounded by residential neighborhoods and corridors to connect these clusters to one another (see **Figure 3-2**). The presence of rural neighborhoods emphasizes the importance of concentrated density in the southeastern portion of Columbia County. This planned density may indicate a need for future capacity improvements and corridor enhancements. Activity and town centers may indicate a need for additional mobility infrastructure for vehicles as well as pedestrians and cyclists.

Richmond County's future land use plan calls for commercial, industrial, and office development primarily centered on the interstates (see **Figure 3-2**). In the urban center of Augusta, employment centers associated with the medical complex, central business district and Augusta University are expected to continue and strengthen. Low density and rural residential land uses are prescribed mostly outside of I-520. These development patterns will likely inform transportation needs for the future and will determine locations with the greatest need for increased connectivity.

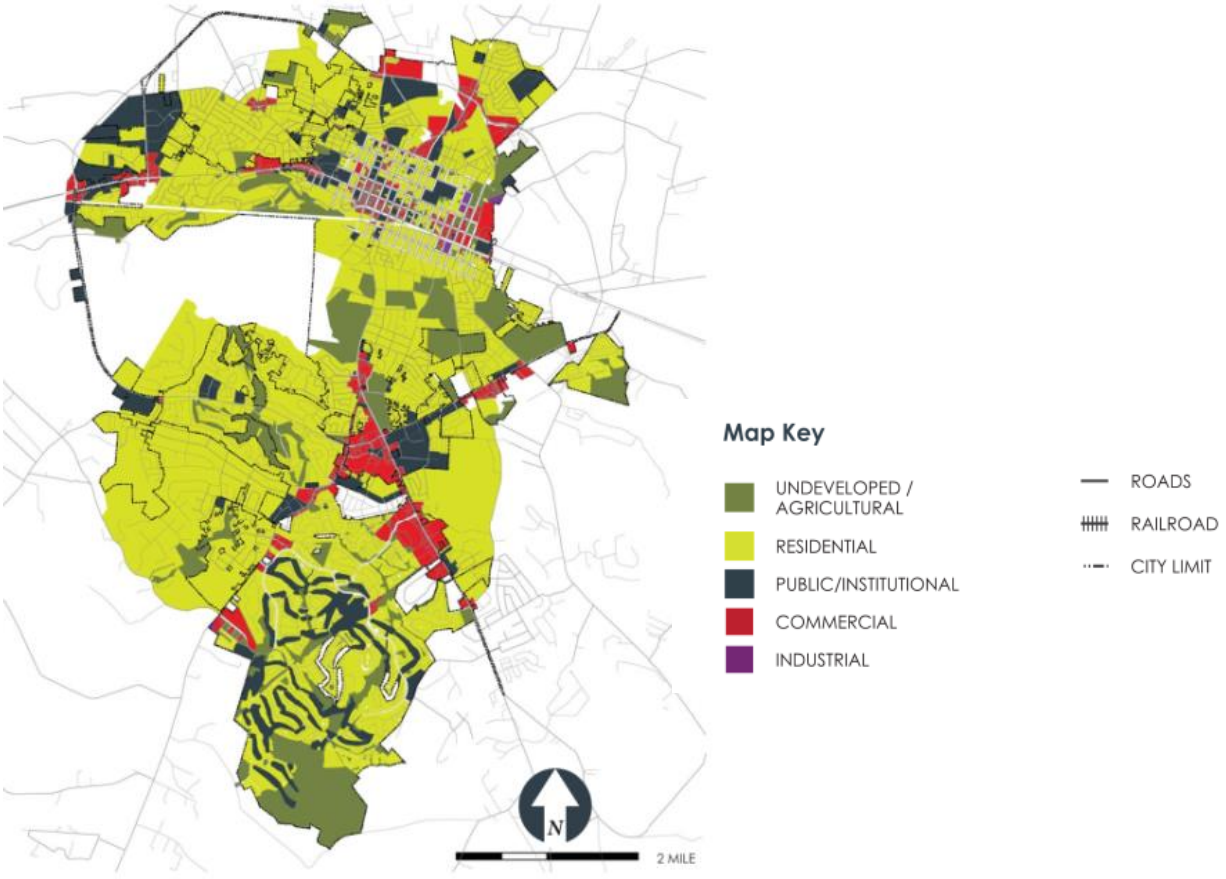
North Augusta sets forth a future land use plan illustrating large areas of mixed-use development and a primary commercial corridor, indications that these locations will need additional connectivity and mobility capacity in the future (see **Figure 3-2**). Abundant residential land use may indicate a large portion of people commuting outside of the area for work and recreation.



Source: ARTS MPO, Columbia County, North Augusta

Figure 3-2. Richmond and Columbia Counties and North Augusta Future Land Use Plan (2019)

The City of Aiken has primarily residential land uses with some commercial clusters and corridors (see **Figure 3-3**). These locations may require additional connectivity and increased transportation infrastructure capacity.



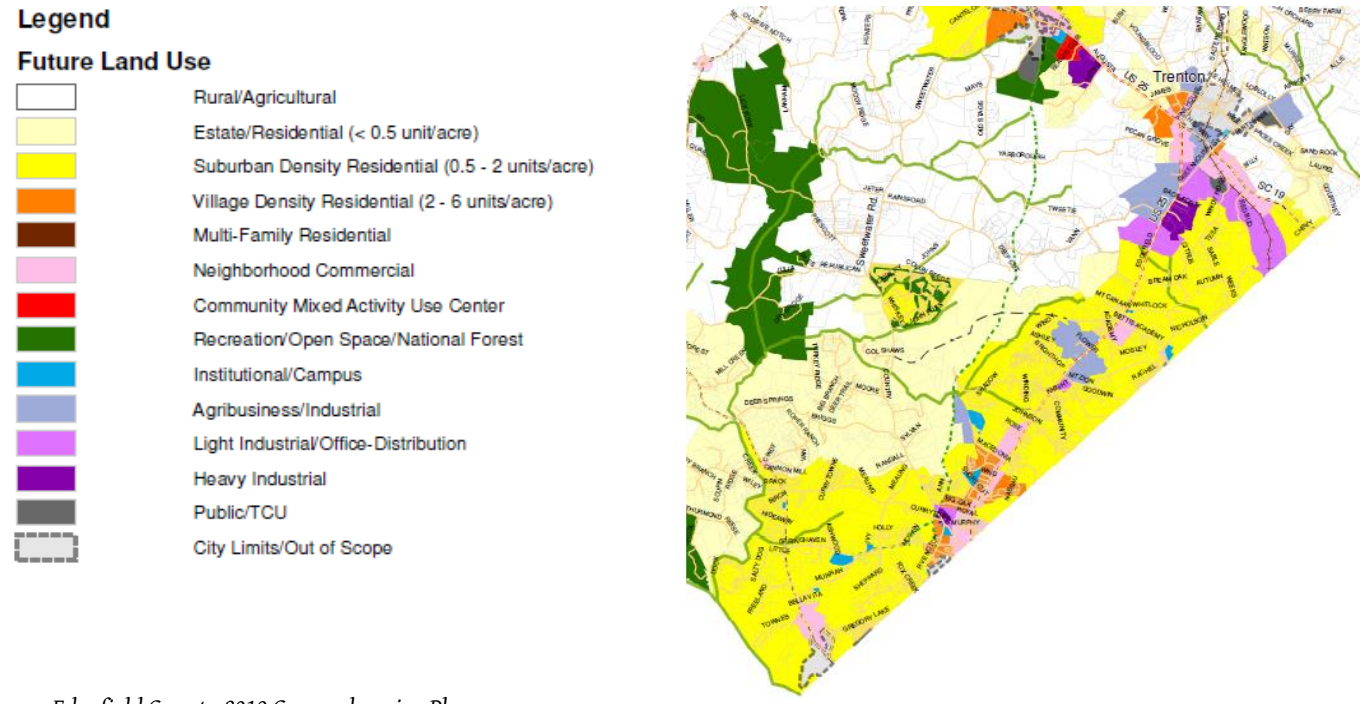
Source: City of Aiken Comprehensive Plan 2017

Figure 3-3. City of Aiken Future Land Use Plan (2017)

Unincorporated Aiken County's land use goals include preservation of rural and agricultural land. Development should be highly context-sensitive and located primarily in existing urban areas.

Grovetown envisions a relatively dense city center surrounded by residential infill development. The community aims for radial open space corridors, land uses that transition from a dense urban character to a suburban residential character, and mixed use areas in the north of the city.

The portion of Edgefield County within the ARTS planning area is primarily residential with only a small neighborhood commercial corridor (see **Figure 3-4**). This may indicate high demand for transportation infrastructure during commuting hours for the people who live in Edgefield and work elsewhere.



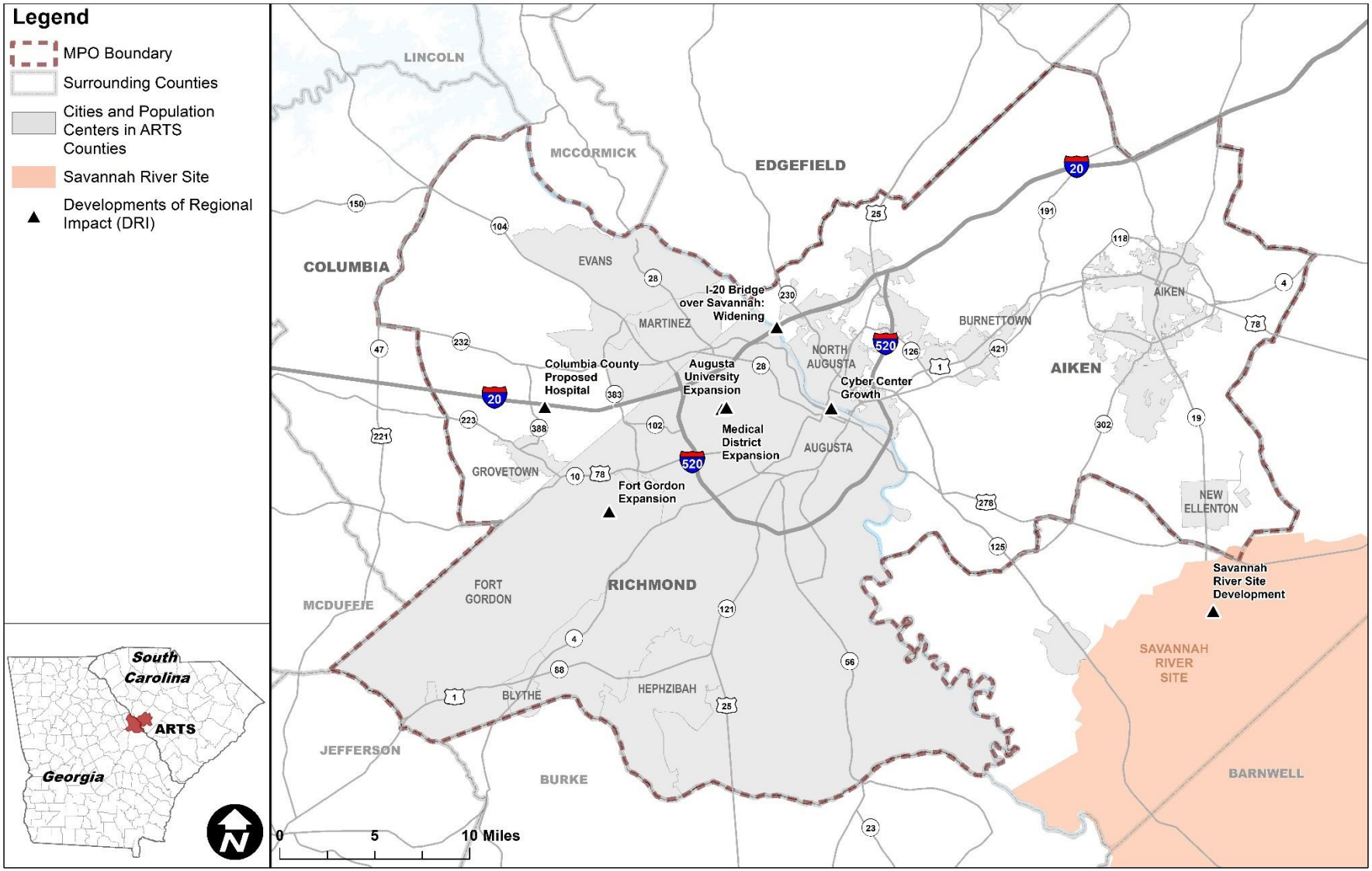
Source: Edgefield County 2019 Comprehensive Plan

Figure 3-4. Edgefield County Future Land Use Plan - Area within ARTS Planning Area (2019)

3.3 Developments of Regional Impact

Large-scale developments with far-reaching impacts are known as Developments of Regional Impact (DRI). Developments may include employment centers, infrastructure improvement projects, and cultural attractions that draw residents, employees, and tourists to the area. Within the ARTS project area, the following completed, in-progress, or planned developments have large impacts outside of their immediate development sites (see **Figure 3-5**):

- I-20 Bridge of Savannah River widening
- Augusta University continued expansions
- Proposed new Columbia County hospital (first in the county)
- Army Cyber Command and Fort Gordon expansions (no details available for security reasons)
- Georgia Cyber Center continued growth
- Savannah River Site continued development
- Augusta Medical District continued expansions

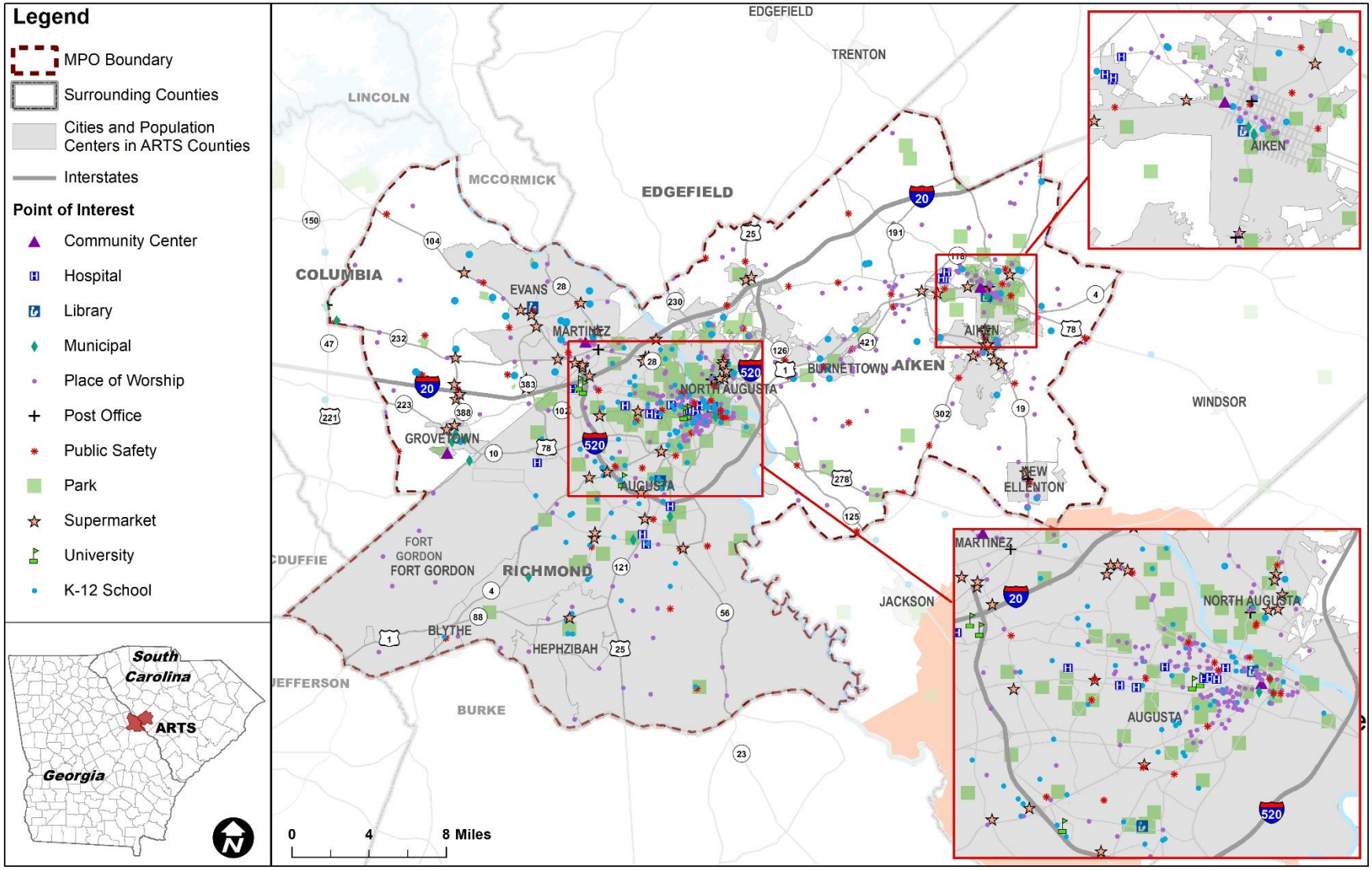


Source: ARTS MPO

Figure 3-5. Developments of Regional Impact (2019)

3.4 Community Facilities

Understanding where community facilities are is important when thinking about current and future transportation needs. Community facilities reflect destinations for residents and visitors of the area and are drivers of local trips. Community Facilities in the ARTS planning area are clustered in cities and are dense in the City of Aiken, North Augusta, and Augusta downtown areas (see **Figure 3-6**).



Data Source: ARTS MPO, Columbia County, Aiken County

Figure 3-6. Community Facilities (2019)

3.5 Natural and Cultural Resources

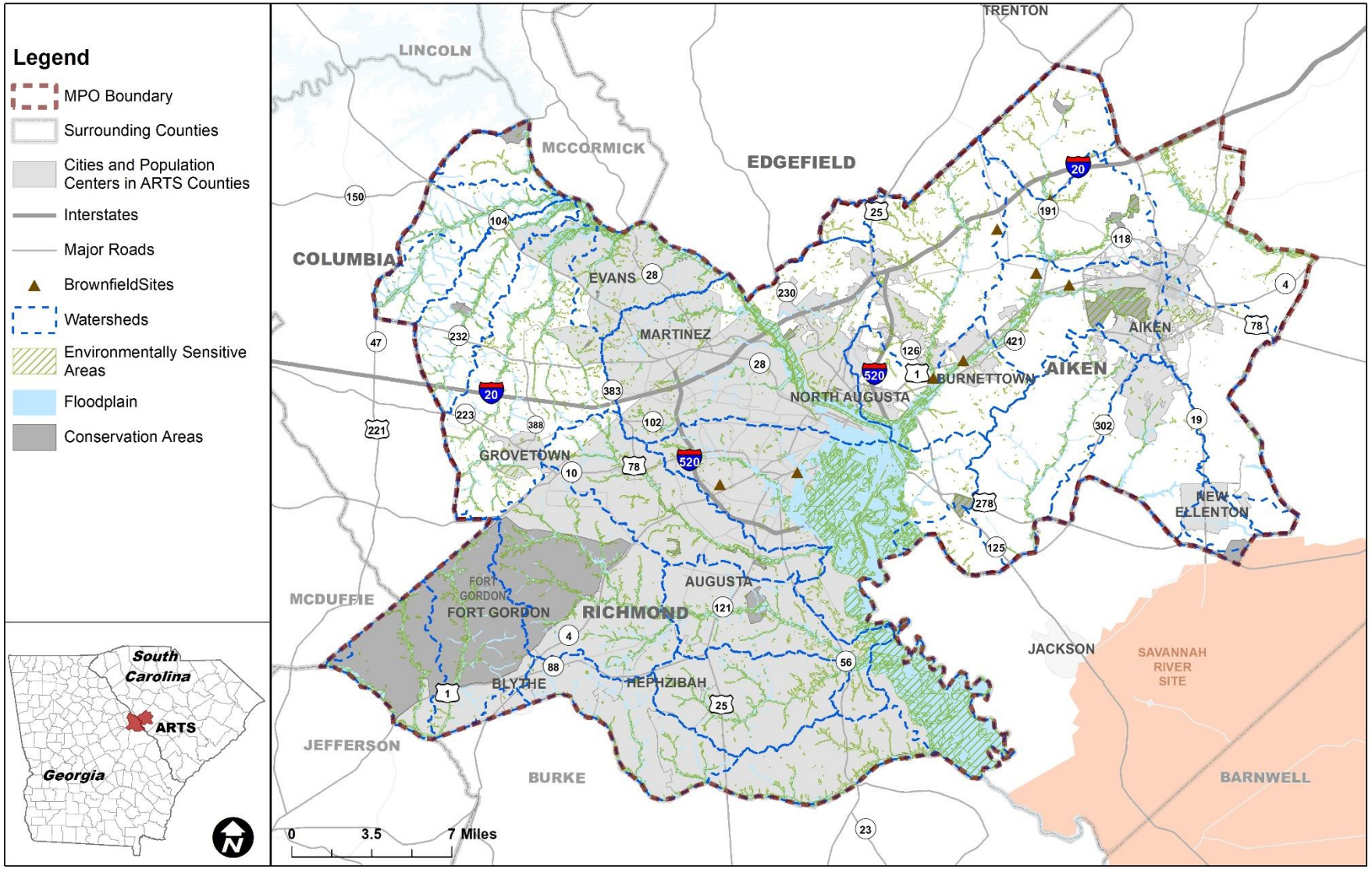
Environmentally sensitive areas, natural resources, streams, and rivers are all precious assets to any community and provide a true sense of place to visitors and residents alike. Thus, it is important to ensure that potential transportation improvements do not adversely impact these resources. Sensitive environmental areas include floodplains, conservation areas, brownfields, and watersheds (see **Figure 3-7**).

The ARTS planning area lies within the central Savannah River Basin. Many of the environmentally sensitive areas within this region are wetlands and floodplains associated with the vast network of rivers and streams. The most highly concentrated environmentally sensitive area is along the Savannah River, western Columbia County, southeast of downtown Augusta, GA and in southern Richmond County. Further north, environmentally sensitive areas continue and extend along Horse Creek and Sand River of Aiken County SC. Horse Creek represents a series of creeks that extend from the Savannah River. Butler Creek, Little Horse Creek, and Sandy Run Creek are other notable areas where measurable wetlands exist. Policy recommendations and future project selection should consider these areas and prioritize preservation.

Historical districts and culturally significant areas are also at risk of damage by human action. It is therefore important for the ARTS MTP to consider the locations of historically sensitive areas, including historic sites, cemeteries, and historic districts (see **Figure 3-8**). Most these resources are clustered in downtown North Augusta and Augusta and in the City of Aiken (see **Figure 3-9** and Figure **3-10)**.

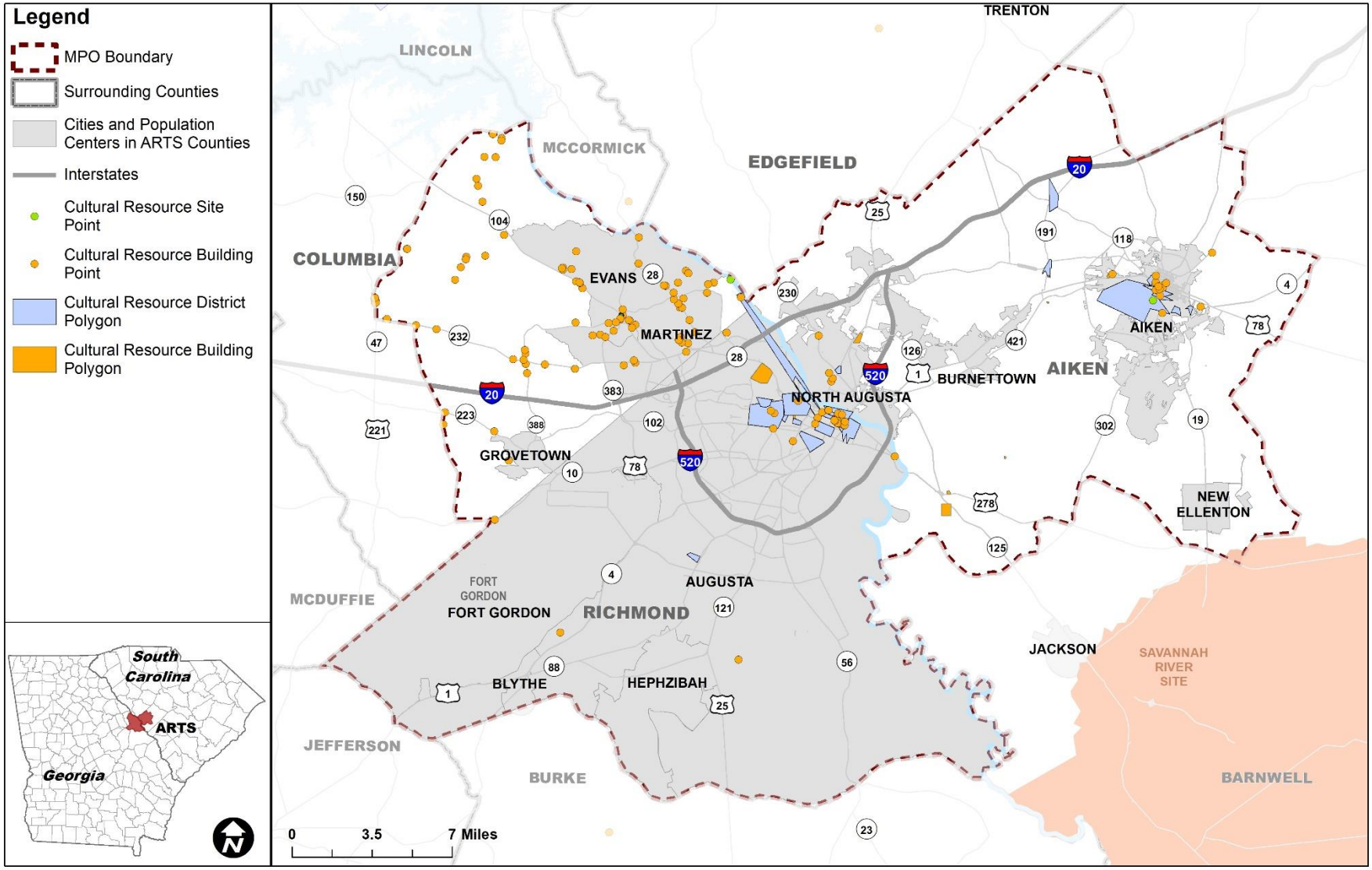
In 2018, Columbia County conducted a Historic Resource Survey as part of its Vision 2035 plan. The Survey identified buildings, districts, landscape figures, and significant sites within County boundaries. **Figure 3-11** highlights the surveyed resources within the ARTS planning area. The Columbia County Historic Resource Study was a preliminary identification of resources that, if found to be in the proximity of proposed transportation projects, may require additional survey work. Any site noted as a cultural resource in any capacity will require agencies to consult with the appropriate State and/or Tribal Preservation Offices in the identification and evaluation of historic properties. Surveyed resources do not indicate project impacts but are indications of potential need for additional study.

Over a dozen sites are listed in the National Register of Historic Places including: Augusta Canal Industrial District; Pinched Gut Historic District (otherwise known as Olde Town); Broad Street Historic District; Summerville Historic District; Green Street Historic Street; Laney-Walker North Historic District; Harrisburg-West End Historic District; Sand Hills Historic District (also known as Elizabethtown); Bethlehem Historic District; Augusta Downtown Historic District; and, Paine College Historic District. In addition to National Historic designation, Downtown, Olde Town, and Summerville also have Local Historic District designation with individually prepared Design Guidelines Manuals.



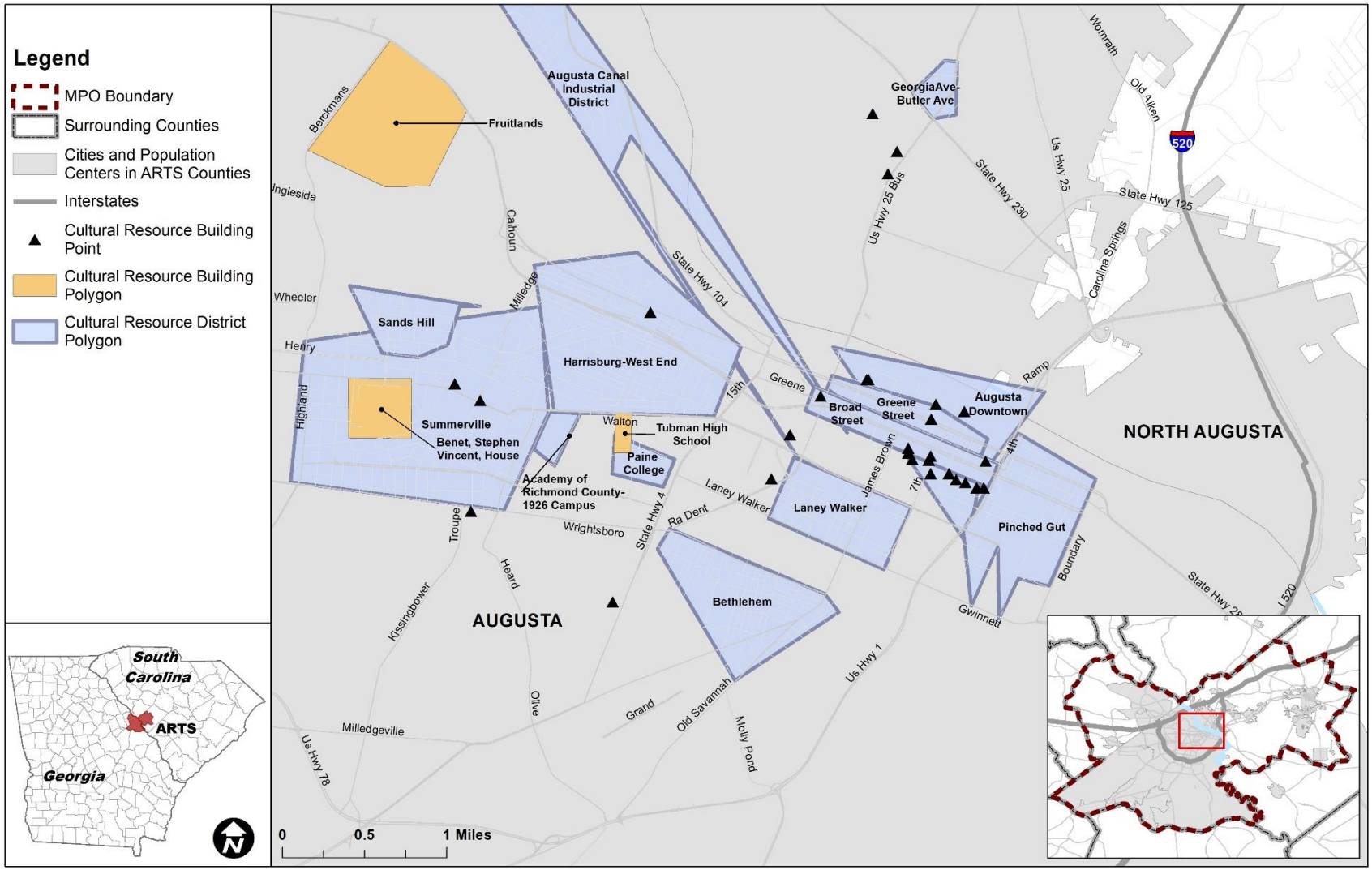
Source: ARTS MPO

Figure 3-7. Natural Resources (2019)



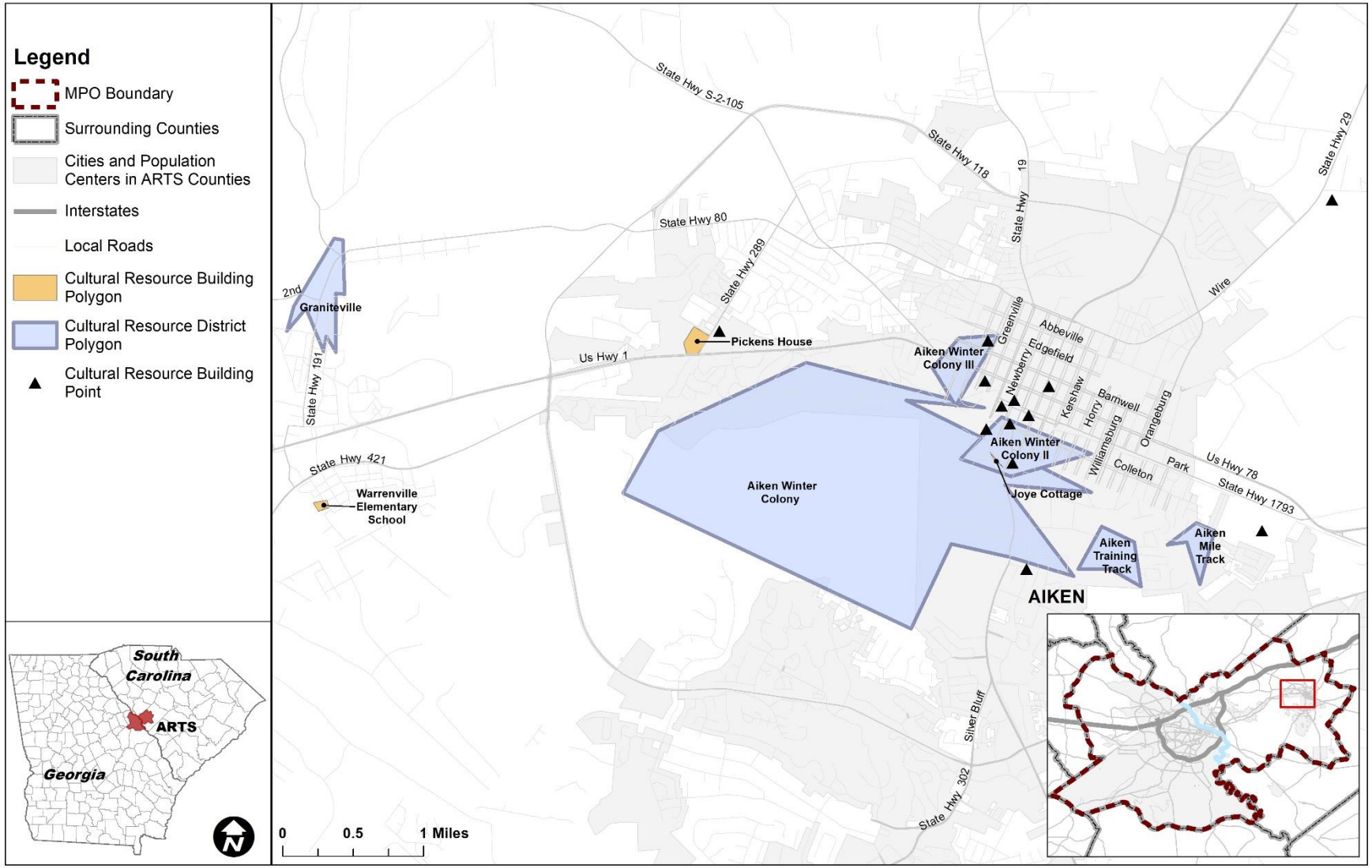
Source: National Park Service's National Register of Historic Places (2019), Columbia County Historic Resource Survey (1993)

Figure 3-8. Historically Sensitive Areas (2019)



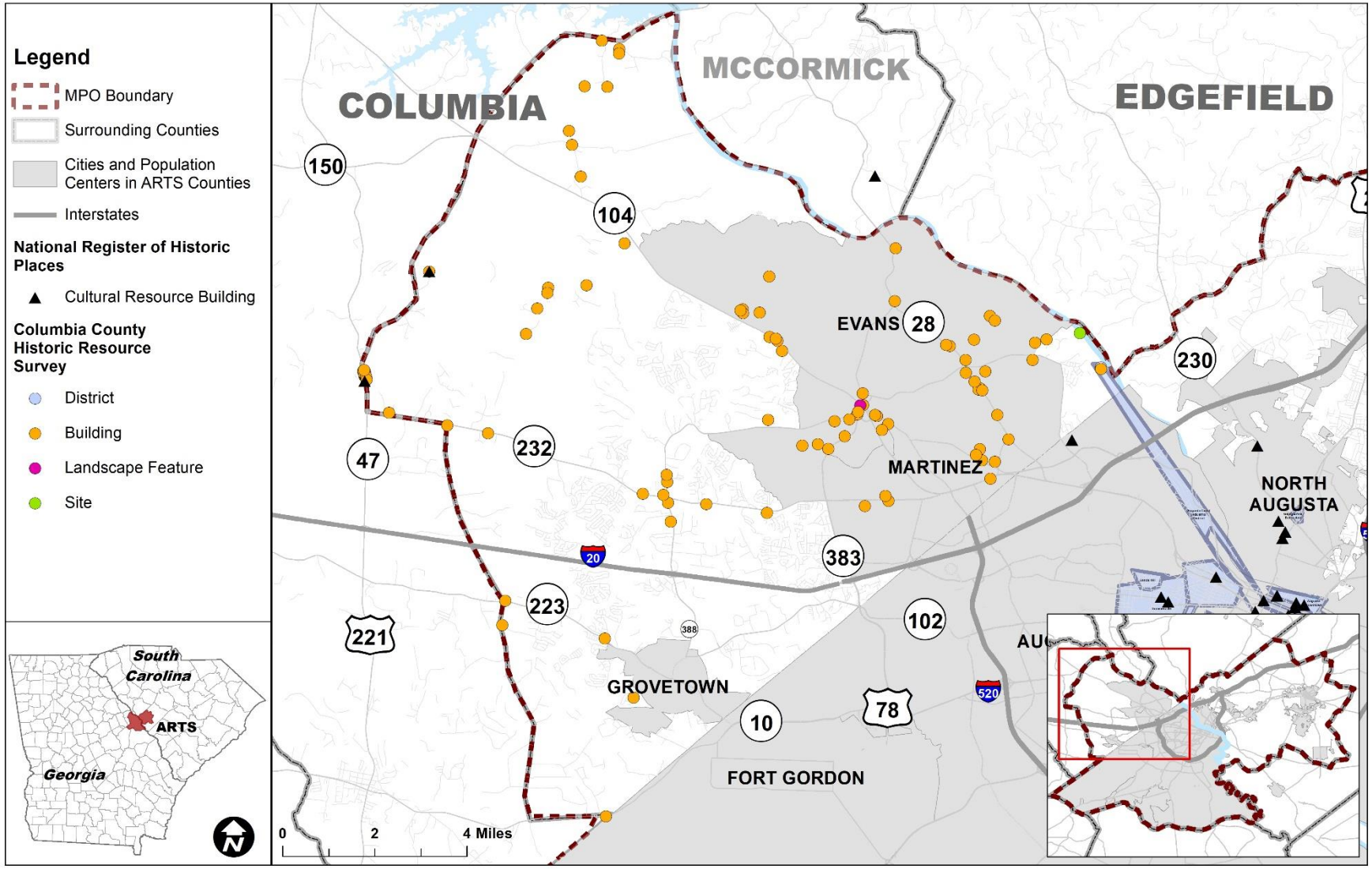
Source: National Park Service's National Register of Historic Places (2019)

Figure 3-9. Historically Sensitive Areas: Augusta and North Augusta (2019)



Source: National Park Service's National Register of Historic Places (2019)

Figure 3-10. Historically Sensitive Areas: City of Aiken (2019)



Source: Source: National Park Service's National Register of Historic Places (2019), Columbia County Historic Resource Survey (2018)

Figure 3-11. Historically Sensitive Areas: Columbia County (2018)

4 Transportation, Mobility, and Safety

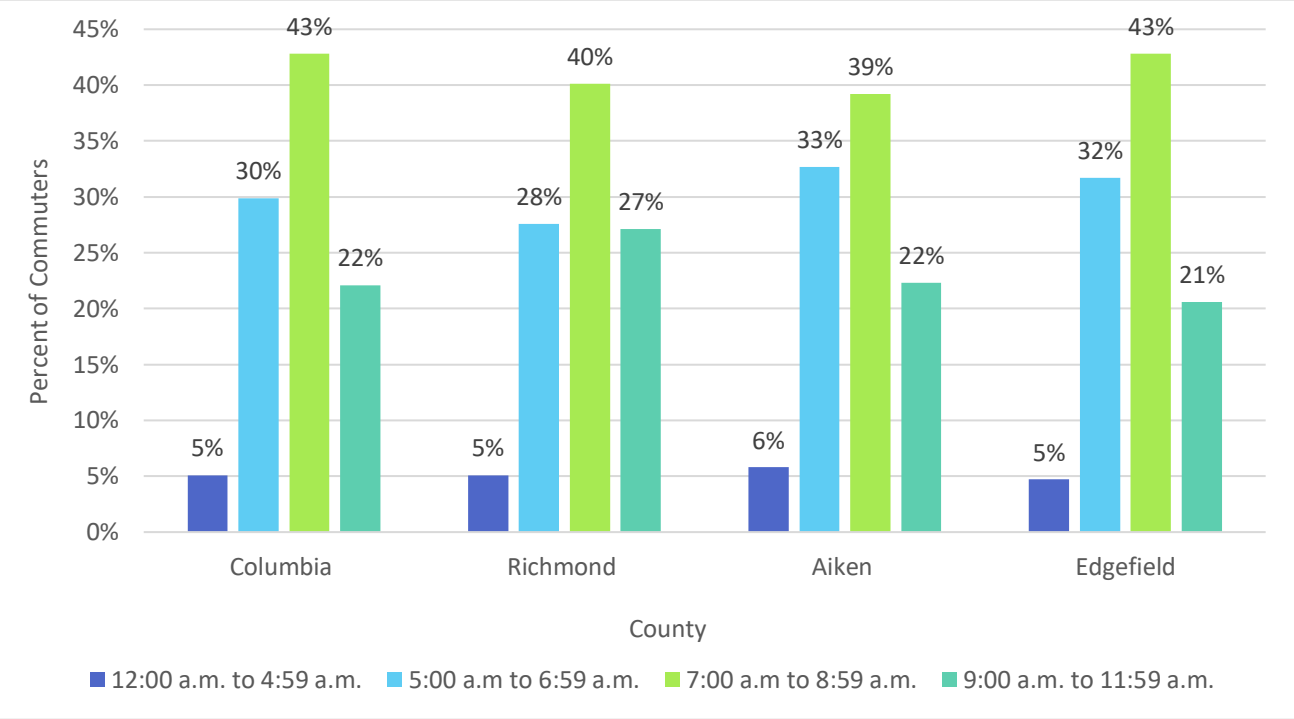
Information about regional travel patterns and modes helps shape an understanding of the ARTS planning area's transportation needs. Factors such as commuting flows, travel time, and other system characteristics are critical to understand current and future needs, which will shape the 2050 MTP. This chapter presents an inventory of existing transportation systems in the ARTS planning area including roads, highways, and bridges.

This chapter contains in following sections:

- Commute Statistics
- Roadway Network and Inventory
- Roadway Capacity
- Congestion Management
- Traffic Control Systems
- Bridge Inventory and Conditions
- Security and Evacuation Routes
- Pavement Quality
- Environmental Health and Air Quality

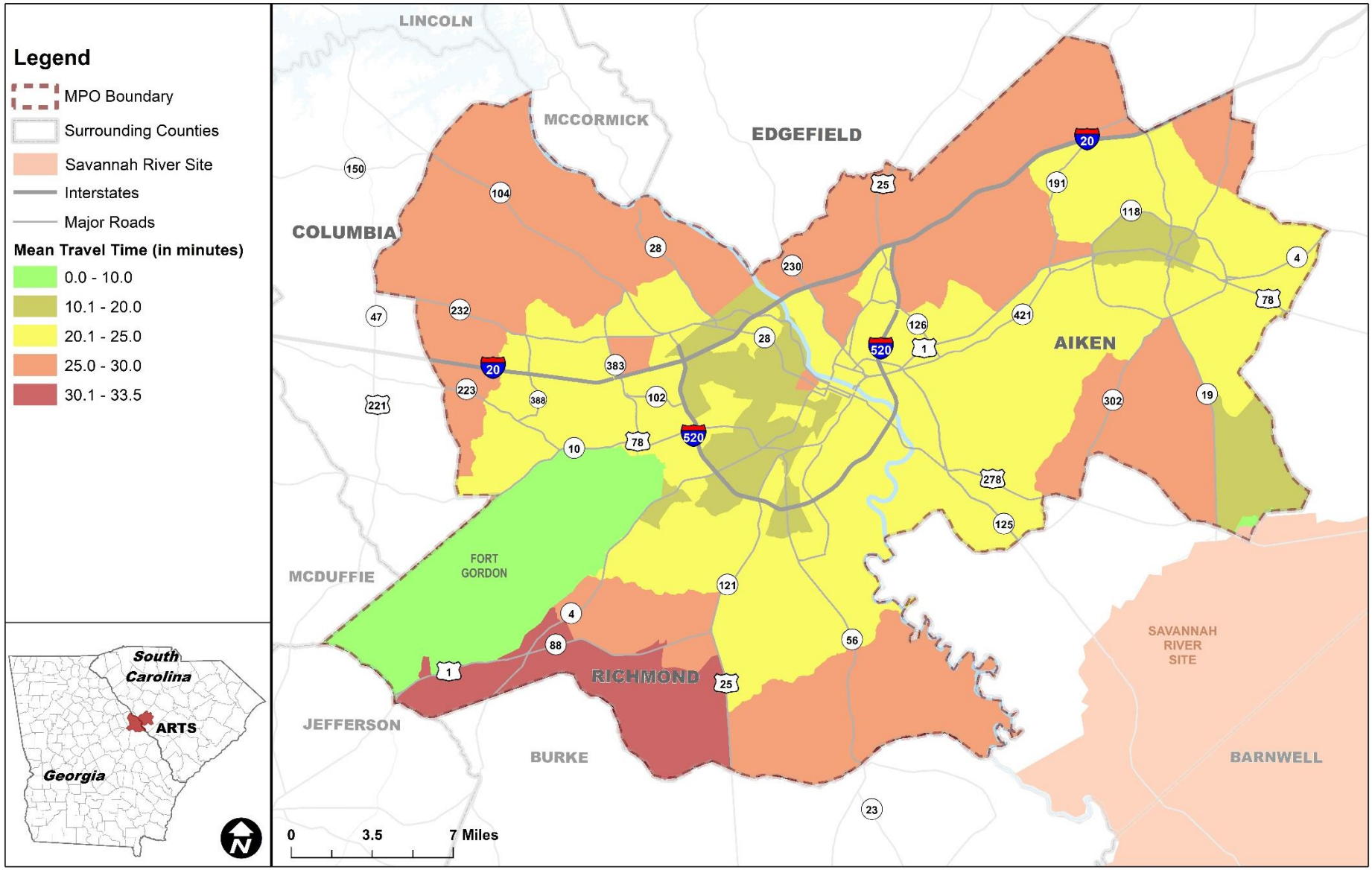
4.1 Commute Statistics

Commute times among the four ARTS planning area counties show similar trends, illustrated in **Figure 4-1** and **Figure 4-2.** In all counties, the majority of workers travel to work between 7:00 a.m. and 9:00 a.m. However, all four counties also demonstrate early-morning commuters, indicated by the nearly 30 percent of employees from each county that travel to work before 7:00 a.m.



Source: 2013-2017 ACS 5-Year Estimate

Figure 4-1. Morning Commute Patterns by Time of Day (2013-2017 ACS 5-Year Estimate)

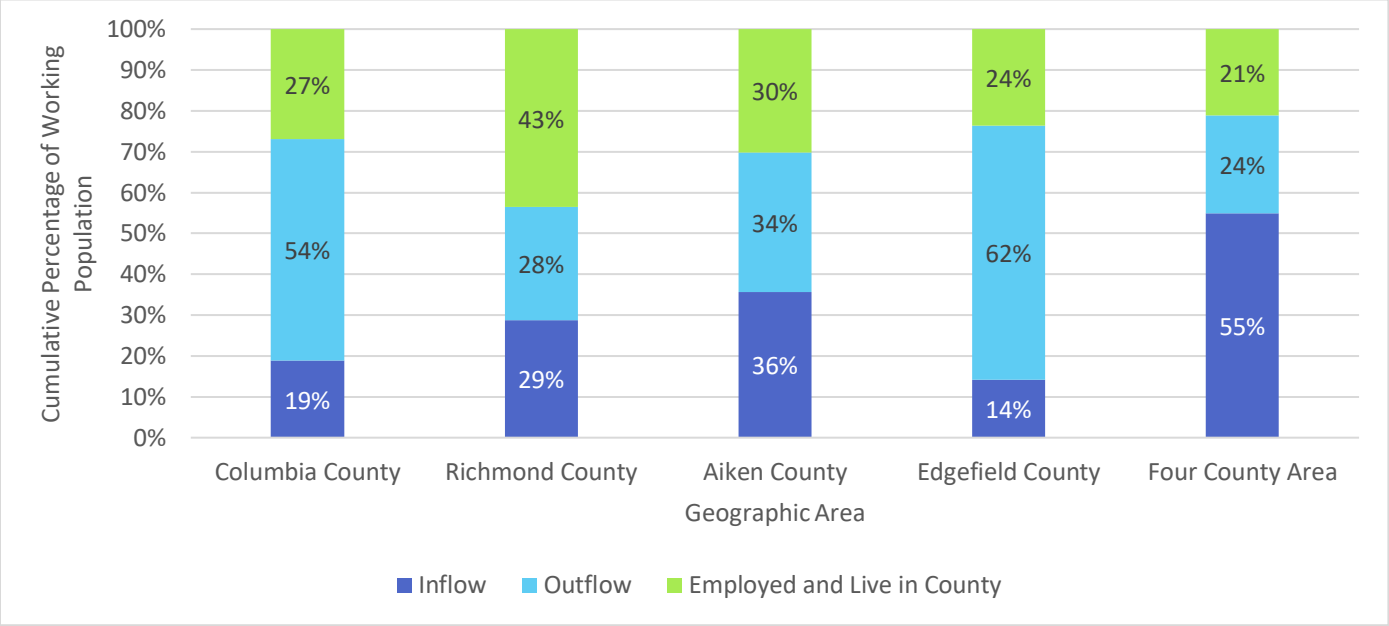


Source: 2013-2017 ACS 5-Year Estimate

Figure 4-2. Mean Commute Time to Work by Census Tracts in ARTS Planning Area (2013-2017 5-Year Estimate)

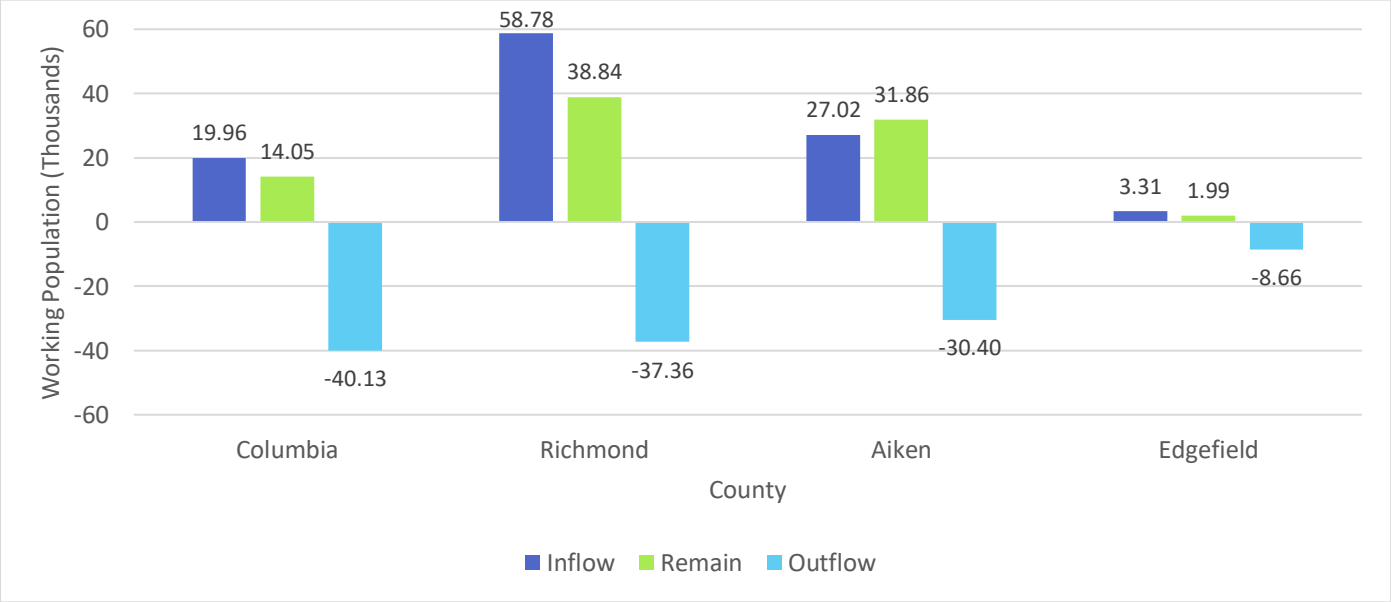
4.1.1 Work and Home Locations

Figure 4-3 and **Figure 4-4** present where employees live in relation to their county of employment. Columbia and Edgefield Counties have the largest percentage of population commuting outside of these respective counties.



Source: Longitudinal Employer-Household Dynamics (2017)

Figure 4-3. Employee Flow by County of Employment (2017)



Source: Longitudinal Employer-Household Dynamics (2017)

Figure 4-4. Employee Flow by County of Employment (2017)

By contrast, Richmond County has the smallest proportion of employees working elsewhere and has the largest proportion of employees commuting in from outside of the county's borders. Aiken County has an almost equal number of employees coming in for work as are leaving for employment. Overall, the majority of employees within the four-county area also live in the four-county area.

Table 4-1 summarizes county of work for residents of the four-county area. Most workers who reside in Richmond and Aiken Counties are employed within each respective county. Nearly 74 percent of workers residing in Columbia County commute outside their county for work, with the largest destination being Richmond County. Similarly, nearly 81 percent of workers living in Edgefield County travel outside of their county for work. Workers from Edgefield County seem least dependent on the four-county area for employment with nearly 39 percent travelling outside of the four-county area for work.

Table 4-1. County of Work by County of Residence (2017)

County of Residence	County of Work									
	Columbia		Richmond		Aiken		Edgefield		Outside Four-County Area	
Columbia	14,048	26%	21,408	40%	2,925	5%	183	<1%	15,615	29%
Richmond	8,410	11%	38,840	51%	4,784	6%	220	<1%	23,948	31%
Aiken	1,979	3%	9,411	15%	31,856	51%	982	2%	18,027	29%
Edgefield	393	4%	1,573	15%	2,527	24%	1,988	19%	4,164	39%

Source: Longitudinal Employer-Household Dynamics (2017)

4.1.2 Travel Time to Work

Average commute times for Columbia and Richmond Counties have slightly increased when comparing 2008-2012 ACS data to 2013-2017 ACS data, and average commute times for Aiken and Edgefield Counties have slightly decreased as shown in **Table 4-2.**

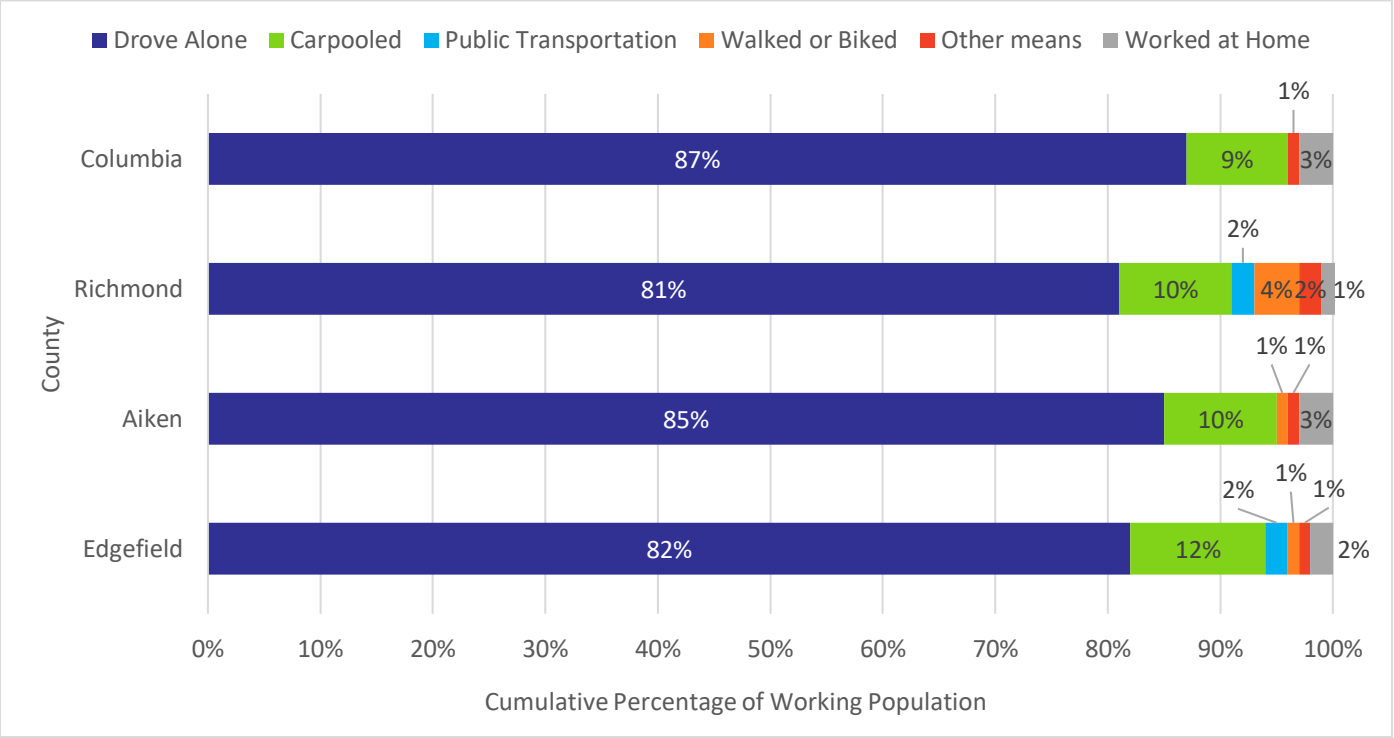
Table 4-2. Mean Travel Times to Work (2008-12 & 2013-17 ACS 5-Year Estimates)

	Columbia	Richmond	Aiken	Edgefield
ACS 2008-2012 (in minutes)	25.3	20.1	25.4	26.6
ACS 2013-2017 (in minutes)	25.5	20.5	24.9	25.2

Source: 2008-2012 ACS 5-Year Estimate, 2013-2017 ACS 5-Year Estimate

4.1.3 Journey to Work by Travel Mode

The journey to work trips in the ARTS planning area are predominantly made by private vehicle, as shown in **Figure 4-5.** Use of private automobile averages 95 percent of mode split, with vehicle use in Richmond County being slightly lower at 91 percent of workers using private vehicles. This difference may be due to a slightly higher share of those walking to work. Carpooling makes up approximately 11 percent of private vehicle trips for counties within the ARTS planning area. Edgefield County has the highest percentage of workers carpooling at 12 percent.



Source: 2013-2017 ACS 5-Year Estimate

Figure 4-5. Journey to Work by Travel Mode (2013-2017 ACS 5-Year Estimates)

As a whole, the working population predominantly uses driving alone as the mode of choice. However, planning for future commuting needs will need to account for the 10 percent of Richmond County, 5 percent of Aiken County, 4 percent of Edgefield County, and 4 percent of Columbia County that travel by other modes or work at home. It will also be important to consider the nearly 10 percent of people who carpool to work. Less than ideal transportation systems, compounded by a sprawling development pattern that further separates population and employment locations, could limit the job potential and quality of life for ARTS planning area residents and employees.

4.1.4 Park and Ride

The ARTS planning area includes a nearly 220-space park and ride facility in the City of North Augusta at I-20 and US 25. There is another park and ride facility located at Wheeler Road/Marks Church Road in Augusta. These facilities offer commuters an opportunity to carpool to their destinations. Currently, existing bus routes in ARTS planning area do not serve a park and ride facility. In the future, bus service in the ARTS planning area could connect these park and ride facilities with employment centers.

The 2040 LRTP identified some locations for park and ride facilities in the ARTS planning area such as US 1 (Deans Bridge Rd) Southwest park and ride at Tobacco Road; Walmart/Southpointe Plaza park and ride; and, US 78 (Gordon Highway) park and ride. However, these are yet to be funded.

4.2 Roadway Network and Inventory

This section provides an overview of existing roadway network in ARTS planning area. The data used in this chapter were collected from agencies such as ARTS, GDOT and South Carolina Department of Transportation (SCDOT).

Streets and highways are categorized by functional classifications based on the character of traffic service they are intended to provide to motor vehicles and their users. Each class has specific design criteria according to its intended purposes. For example, high speed limited access highways will have more lanes, fewer entry and exit points, and higher design speeds when compared to a local road designed for low speeds with multiple access points. There are three highway functional classifications as defined by the Federal Highway Administration (FHWA): arterials, which include interstates, freeways and expressways, and, principal and minor arterials; collectors, including major and minor; and local roads. Descriptions of the major functional classes and their subtypes follow in **Table 4-3.** GDOT and SCDOT use these functional classifications due to FHWA Directive 23 CRF 470[1], which mandates that each state transportation agency has the primary responsibility for developing and updating the functional road classification in rural and urban areas and existing roads and streets in its jurisdiction.

Table 4-3. Functional Classification Descriptions

Class	Description
Interstate	Highest classification of Arterials designed and constructed with mobility and long-distance travel in mind.
Other Freeways and Expressways	Similar to interstates, these roadways are designed to maximize mobility with no direct land use access. These roadways have directional travel lanes usually separated by some type of physical barrier, and their access and egress points are limited to on- and off-ramp locations.
Major Arterials	Serve major centers of metropolitan areas. These roadways provide mobility so traffic can move from one place to another quickly and safely. Prioritizing higher mobility with a low degree of access enables travel at the highest level of service for the longest uninterrupted distance.
Minor Arterials	Provide service for trips of moderate length and serve geographic areas that are smaller than their higher Arterial counterparts and offer connectivity to the higher Arterial system.
Collectors	Collectors serve a critical role in the roadway network by gathering traffic from Local Roads and funneling them to the Arterial network. Major collectors tend to provide more mobility than access. They are longer in length, have lower connecting driveway densities, have higher speed limits, are spaced at greater intervals, have higher Annual Average Daily Traffic (AADT), and may have more travel lanes than minor arterials.
Local	Consists of all roads not defined as an arterial or collector. These roadways provide access to homes, businesses, and other property (with limited or no through movement) by prioritizing lower mobility and high accessibility.

Source: 2040 LRTP (2015)

Road Classification	Columbia County	Richmond County	Georgia	Aiken County	Edgefield County	South Carolina	Total
Interstate	10	22	32	29	0	29	61

[1] https://www.fhwa.dot.gov/legsregs/directives/fapg/cfr0470a.htm

Other Freeways and Expressways	0	27	27	0	0	0	27
Other Principal Arterials	89	140	229	87	4	91	320
Minor Arterials	15	85	100	107	2	109	209
Collector	81	138	219	211	7	218	437
Local	633	998	1,631	1,282	47	1,329	2,960
Total	828	1,410	2,238	1,716	60	1,776	**4,014**

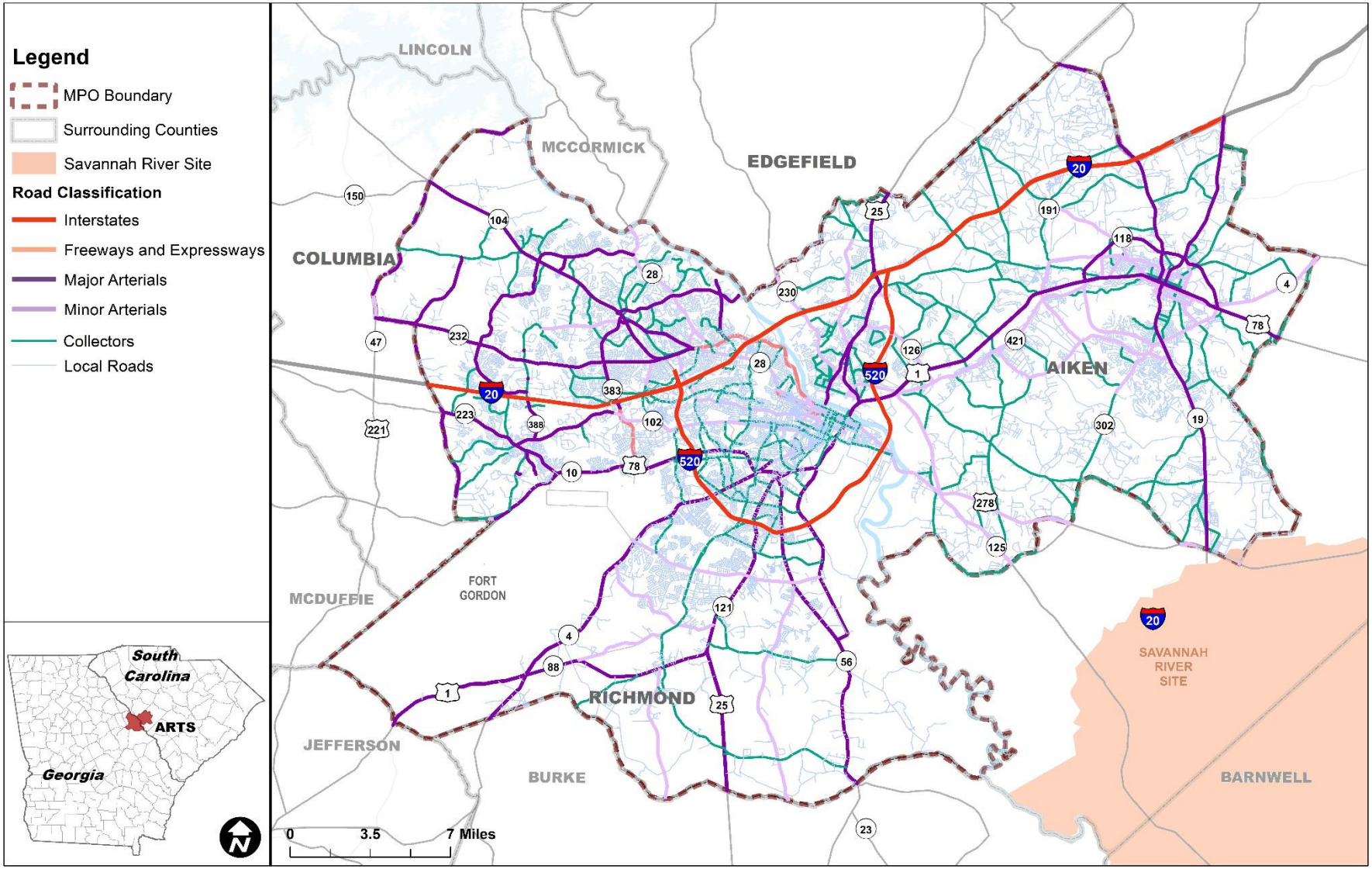
Table 4-4

summarizes road miles by functional classification. The ARTS planning area's highway classifications, simplified to include expressways, arterials, collectors, and local roads, are presented in **Figure 4-7.** ARTS planning area has two interstates – I-20 and I-520. I-20 connects ARTS planning area with other major regions in southeastern US like Columbia, SC to the east and Atlanta GA, Birmingham AL, Jackson MS, Dallas TX to the west. I-520 is an auxiliary circumferential interstate. GA 104 or Riverwatch Parkway acts as a Freeway/Expressway. ARTS planning area also includes several US Highways such as US 1, US 25, US 78 and US 278, which are mostly classified as Principal or Minor Arterials.

Table 4-4. 2019 Road Miles by Functional Classification (in miles)

Road Classification	Columbia County	Richmond County	Georgia	Aiken County	Edgefield County	South Carolina	Total
Interstate	10	22	32	29	0	29	61
Other Freeways and Expressways	0	27	27	0	0	0	27
Other Principal Arterials	89	140	229	87	4	91	320
Minor Arterials	15	85	100	107	2	109	209
Collector	81	138	219	211	7	218	437
Local	633	998	1,631	1,282	47	1,329	2,960
Total	828	1,410	2,238	1,716	60	1,776	**4,014**

Source: National Highway Planning Network (2019)



Sources: ARTS; Columbia County; GDOT, SCDOT

Figure 4-6. Roadway Classification (2019)

4.3 Roadway Capacity

This section includes an overview of modeled roadway capacity in the ARTS planning area. Modeled data comes from the ARTS MPO's travel demand model, maintained by GDOT and their consultant, HNTB. The statewide model is typically run for areas outside of MPOs and is adapted for MPO analysis.

The travel demand model discussed in this report was used to assess existing and future traffic conditions in the ARTS planning area. This model covers the complete four-county area, including portions of the counties outside of the ARTS planning area. Outputs of the model also provide details needed to assess capacity of major transportation facilities in the model area. As the regional travel demand model is supposed to provide traffic movement across this multi-county area, it is an appropriate tool for general traffic patterns on major roadways, but not for the local roads in the area. As a result, some of the smaller local roadway facilities are not included in the model network.

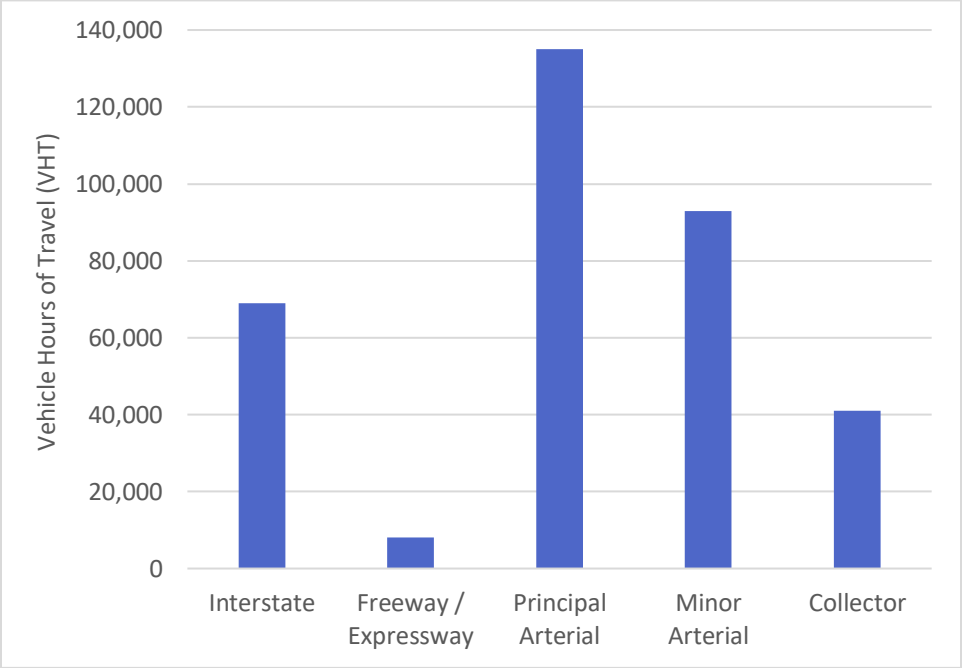
The model calculates base year Vehicle Miles Traveled (VMT), Vehicle Hours of Travel (VHT), and Level of Service (LOS) for 2015 in a First Network Model Run. **Table 4-5**, **Figure 4-7**, and **Figure 4-9** present the 2015 base year summaries.

Table 4-5. 2015 Highway Mileage and Vehicle Miles Traveled (VMT) in Four-County Area (Model Run 2019)

Facility Type	Mileage (miles)	VMT (1,000 miles)
Interstate	84 (5%)	3,318 (29%)
Freeway / Expressway	8 (<1%)	182 (2%)
Principal Arterial	254 (15%)	3,643 (31%)
Minor Arterial	453 (27%)	2,873 (25%)
Collectors	864 (52%)	1,549 (13%)
Total	**1,664**	**11,565**

Source: GDOT – ARTS Travel Demand Model Update, First Network Analysis (2019)

Table 4-5 provides a summary of mileage and total vehicle miles traveled on modeled roadways in the four-county area. **Table 4-5** also highlights the importance of the interstate system. While the interstate system accounts for only five percent of the mileage, it had nearly 29 percent of vehicle miles traveled in 2015. On the other hand, while Collectors have over 50 percent of mileage, traffic on these facilities only accounted for about 13 percent of total vehicle miles traveled. **Figure 4-7** illustrates total vehicle hours of travel on these facility types. Vehicles spent the highest number of hours on Principal Arterials with nearly 135,000 hours, which were about 39 percent of the total vehicle hours of travel.



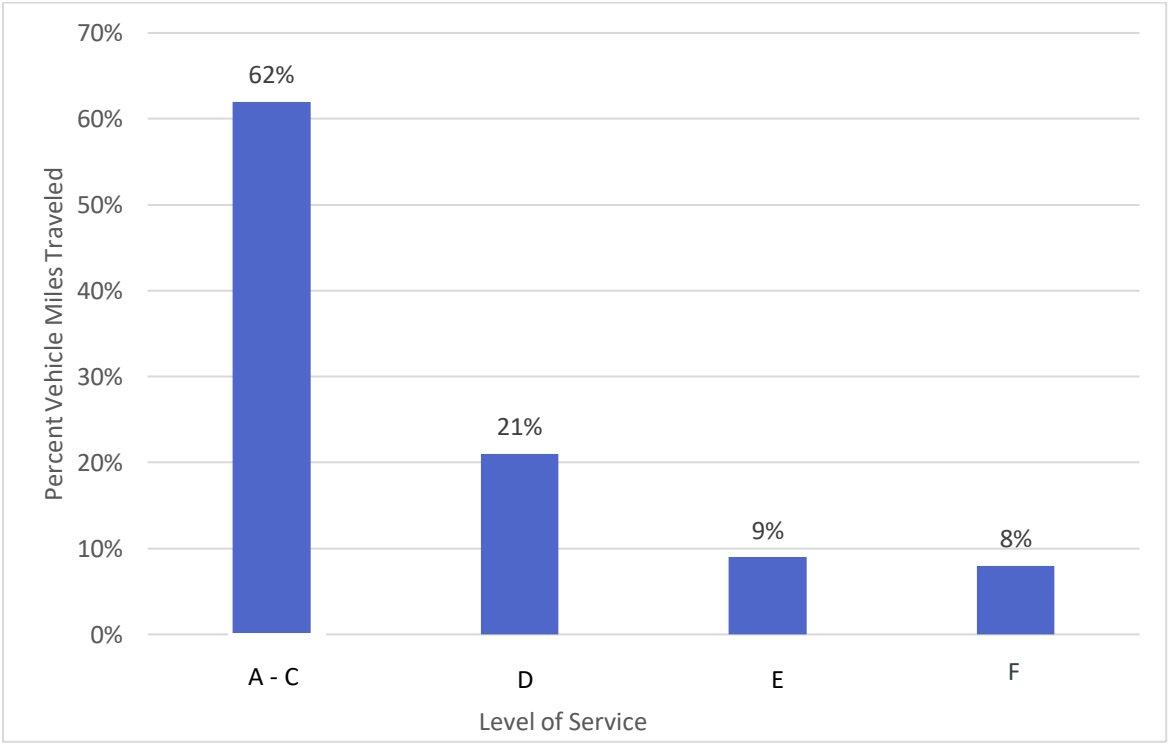
Source: GDOT – ARTS Travel Demand Model Update, First Network Analysis (2019)

Figure 4-7: 2015 Vehicle Hours of Travel (VHT) in Four-County Area

GDOT's travel demand model also matches travel demand with the existing capacity to identify roadway segments which near or exceed their capacity. The model compares capacity on roadway segments with the estimated volume to determine level of service (LOS). **Figure 4-8** provides a general visualization for LOS. This metric is used as a proxy to identify potential segments with traffic congestion. Model estimates the level of service by taking a ratio of estimated volume on a roadway segment with its capacity (V/C ratio). LOS A through F indicate varying levels of traffic, from free flow conditions in LOS A to heavily congested stop-and-go conditions in LOS F. LOS A through C generally indicate free flow to near-free flow of traffic. **Figure 4-9** summarizes the percent of total Vehicle Miles Traveled (VMT) by the roadways' Level of Service. Over 60 percent of vehicle miles traveled occurred at Level of Service of C or better, while just under 10 percent of VMT was on roadway segments that exceeded their capacity.

Source: Quality/Level of Service Handbook, Florida Department of Transportation (2013)

Figure 4-8. Level of Service (LOS)

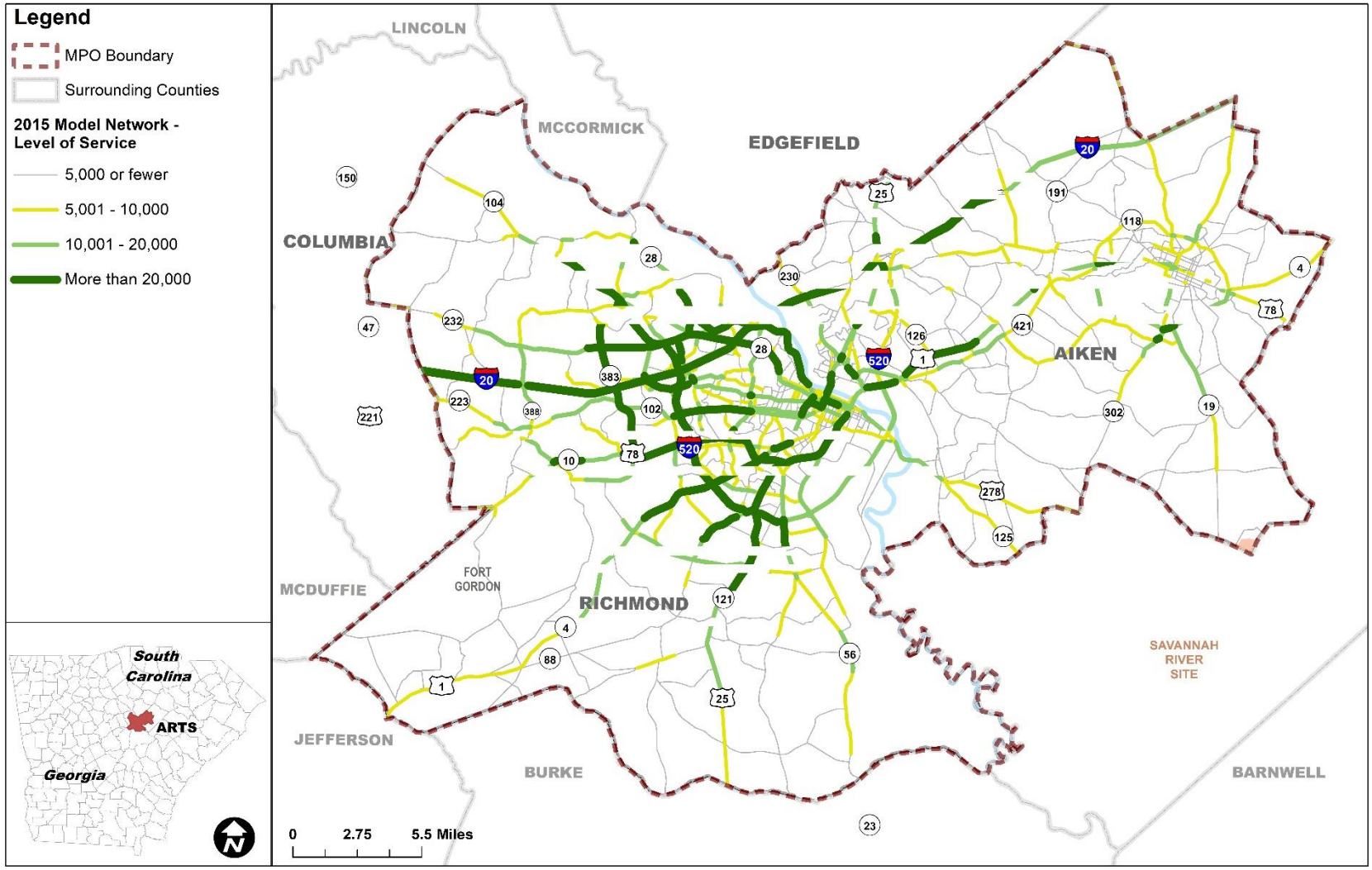


Source: GDOT – ARTS Travel Demand Model Update, First Network Analysis (2019)

Figure 4-9. 2015 Percent Vehicles Miles Traveled by Level of Service (Model Run 2019)

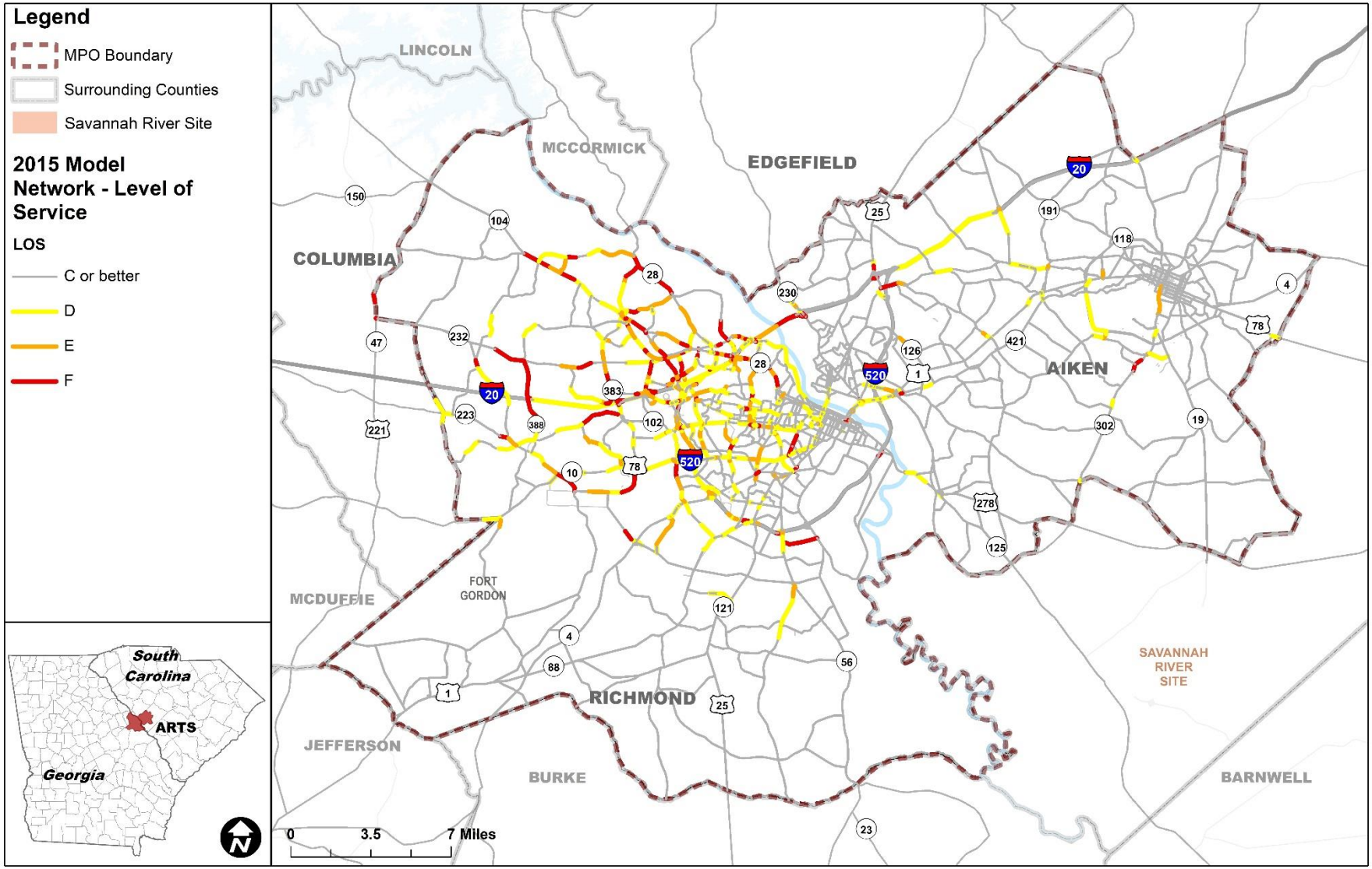
Figure 4-10 and **Figure 4-11**, respectively, illustrate average weekday roadway volume and daily Level of Service on roadways in ARTS planning area. Highest traffic volumes are observed on major facilities such as interstates – I-20 and I-520, US and State highways such as US 1, US 25, US 78, GA 25, GA 104. Segments with LOS

E or F are mostly on major facilities in northern parts of Richmond County and eastern parts of Columbia County.



Source: GDOT-ARTS Travel Demand Model, First Network Analysis (2019)

Figure 4-10. 2015 Average Daily Traffic Volume on Roadways in Four-County Area (Model Run 2019)



Source: GDOT-ARTS Travel Demand Model, First Network Analysis (2019)

Figure 4-11. 2015 Level of Service of Roadways in Four-County Area (Model Run 2019)

4.4 Congestion Management

The ARTS MPO adopted an updated Congestion Management Process (CMP) in 2018. This latest CMP identifies seriously congested corridors and proposes congestion management processes to improve travel conditions. The CMP network includes interstates, arterial roadways, transit, and bicycle and pedestrian infrastructure. While the previous section provided an overview of the existing capacity of the transportation system in ARTS planning area, this section delves deeper into the performance of various major roadways.

4.4.1 Congestion Measurement

CMP data comes from ARTS, Regional Integrated Transportation Information System (RITIS) for the HERE real-time data, the Georgia Electronic Accident Reporting System (GEARS) through GDOT and SCDOT, and the South Carolina Department of Natural Resources (SCDNR).

HERE real-time travel data forms the basis for a Travel Time Index (TTI) calculation. TTI is the ratio of travel time during the peak travel period to travel time during free-flow conditions. TTI at PM peak periods identify CMP network congestion locations. A TTI over 1.0 means more congestion; a TTI of 1.0 or lower indicates free-flowing traffic.

On-going CMP monitoring comes from several sources including periodic reviews of real-time roadway travel data, freight and key goods movement corridor evaluations, annual crash monitoring, transit performance updates from the region's transit providers, and pedestrian and bicycle infrastructure updates as new projects are completed.

The corridor congestion analysis classified corridors as either Not Congested or Borderline, Marginally, or Seriously Congested. Seriously Congested conditions are defined as an observed average travel speed at least 30 percent lower than the posted speed limit, which translates into a TTI of 1.10 or higher during PM peak. **Table 4-6** summarizes the congestion thresholds used in this process. Congestion corridor selection for the 2018 CMP began with the 53 CMP corridors from the previous CMP plan. This was supplemented with 2018 TTI data and forecasted 2040 TTI data. Congestion thresholds depend on TTI measurements by county and congestion frequency. For corridors where TTI data was not available, congestion determinations were made based on Google Maps traffic predictions or local knowledge (referenced as "Google" in **Table 4-7**). For corridors where TTI data seemed inaccurate based on local knowledge, adjustments were made to congestion determinations to fit on-the-ground, experienced levels of congestion.

Table 4-6: ARTS Planning Area Congestion Thresholds

Congestion Category	Condition Description	Columbia County and Richmond County TTI Threshold	Aiken County TTI Threshold
Borderline Congested	Corridors are not completely congested but experience recurring congestion along one or more segments	TTI between **1.10** and **1.19** during PM peak	TTI between **1.00** and **1.05** during PM peak
Marginally Congested	Corridors have recurring congestion along multiple segments	TTI between **1.20** and **1.29** during PM peak	TTI between **1.05** and **1.10** during PM peak
Seriously Congested	Corridors have recurring congestion along most segments where travelers experience the highest delays	TTI is **1.30** or higher during PM peak	TTI is **1.10** or higher during PM peak

Source: Regional Integrated Transportation Information System (2018)

4.4.2 Seriously Congested Corridors

Table 4-7 shows that of the 53 corridors surveyed in the ARTS planning area for the 2018 CMP, 31 were Seriously Congested. This reflects an increase in the number of congested corridors surveyed; in 2014, 11 corridors were Seriously Congested of the 15 surveyed.

The 2018 CMP analysis indicates 5 Seriously Congested corridors in Aiken County, 10 in Columbia County, and 16 in Richmond County. There were no corridors surveyed in Edgefield County.

Table 4-7. ARTS Congestion Management Process Corridors (2018)

ID	County	Congestion Management Process Corridor	2018 TTI	Congestion Status
1	Aiken	Atomic Rd between Buena Vista Ave and Silver Bluff Rd	1.01	Borderline Congested
2	Aiken	SR 126 (Belvedere-Clearwater Rd) between US 25 (Edgefield Rd) and US 1	Google	Not Congested
3	Aiken	Bettis Academy Rd between Ascauga Lake Rd and Fields Cemetery Rd	Google	Not Congested
4	Aiken	SR 125 (Buena Vista Ave) between Martintown Rd and Georgia Ave	1.03	Borderline Congested
5	Aiken	Dougherty Rd between SR 19 (Whisky Rd) and SR 302 (Silver Bluff Rd)	Google	Marginally Congested
6	Aiken	US 25 (Georgia Ave/Edgefield Rd) between Savannah River and I-20	1.00	At Risk of Congestion
7	Aiken	Knox Ave between Martintown Rd and Georgia Ave	1.15	Seriously Congested
8	Aiken	SC 19 (Laurens St) between South Boundary St and I-20	1.05	Marginally Congested
9	Aiken	SR 230 (Martintown Rd) between E. Buena Vista Ave and I-20	1.26	Seriously Congested
10	Aiken	SR 203 (E. Pine Log Rd) between US 78 and Silver Bluff Rd	1.13	Seriously Congested
11	Aiken	US 78 (Richland Ave) between Beaufort St and Vaucluse Rd	1.12	Seriously Congested
12	Aiken	SC 118 (Hitchcock Pkwy) between US 1/US 78 and Silver Bluff Rd	0.95	At Risk of Congestion
13	Aiken	SR 302 (Silver Bluff Rd) between SR 19 (Whiskey Rd) and Savannah Dr	0.88	Not Congested
14	Aiken	US 1 between Richland Ave and I-20	1.08	Marginally Congested
15	Aiken	US 1/US 78 between Martintown Rd and Pine Log Rd	1.01	Borderline Congested
16	Aiken	SR 19 (Whiskey Rd) between Richland Ave and Powderhouse Rd	Local	Seriously Congested
17	Columbia	I-20 between Euchee Creek and Columbia/Richmond County Line	1.00	At Risk of Congestion
18	Columbia	Baston Rd between Fury's Ferry Rd and Washington Rd	Google Maps	Marginally Congested
19	Columbia	Belair Rd between Washington Rd and Wrightsboro Rd (Including I-20 Ramps)	1.37	Seriously Congested
20	Columbia	I-520/Bobby Jones Expressway between I-20 and Washington Rd	1.48	Seriously Congested
21	Columbia	SR 232 (Columbia Rd) between Washington Rd and Hereford Farm Rd	1.12	Borderline Congested
22	Columbia	Evans-to-Locks Rd between Stevens Creek Rd and Washington Rd	Google Maps	Seriously Congested

ID	County	Congestion Management Process Corridor	2018 TTI	Congestion Status
23	Columbia	Flowing Wells Rd between Wheeler and Washington Rd	Google Maps	Seriously Congested
24	Columbia	Fury's Ferry Rd between Savannah River and Washington Rd	1.72	Seriously Congested
25	Columbia	Old Evans Rd between Bobby Jones and Washington Rd	1.39	Seriously Congested
26	Columbia	Riverwatch Parkway between Pleasant Home Rd and Old Evans Rd	1.37	Seriously Congested
27	Columbia	SR 223 (Robinson Ave) between Wrightsboro Rd and Gordon Hwy	1.79	Seriously Congested
28	Columbia	SR 104 (Washington Rd) between Hardy McManus and Pleasant Home Rd	1.37	Seriously Congested
29	Columbia	Wrightsboro Rd between Barton Chapel Rd and Robinson Ave	1.38	Seriously Congested
30	Richmond	I-20 between Richmond County Line and SR 104 (Riverwatch Pkwy)	1.02	At Risk of Congestion
31	Richmond	I-520/Bobby Jones Expressway between I-20 and Laney Walker Blvd	1.02	At Risk of Congestion
32	Richmond	13th St/RA Dent Blvd between Reynolds St and Wrightsboro Rd	1.44	Seriously Congested
33	Richmond	15th Street between Reynolds St and MLK Jr. Blvd	1.69	Seriously Congested
34	Richmond	SR 56 (Mike Padgett Hwy) between Lumpkin Rd and SR 56 Loop	1.14	Borderline Congested
35	Richmond	Deans Bridge Rd between MLK Blvd and Willis Foreman Rd	1.48	Seriously Congested
36	Richmond	Doug Barnard Pkwy/New Savannah Rd between Gordon Hwy and Tobacco Rd	1.00	Not Congested
37	Richmond	Greene St between E Boundary St and 12th St	1.66	Seriously Congested
38	Richmond	Gordon Hwy between Savannah River and SR 223	1.20	Borderline Congested
39	Richmond	Jackson Rd/Walton Way Ext/Davis Rd between Washington Rd and Wrightsboro Rd	Google Maps	Seriously Congested
40	Richmond	John C Calhoun Expressway between Washington Rd and 12th St	1.36	Seriously Congested
41	Richmond	US 25 (Peach Orchard Rd) between Tubman Home Rd and SR 88	1.94	Seriously Congested
42	Richmond	SR 104 (Riverwatch Pkwy) between Pleasant Home Rd and 15th St	1.33	Seriously Congested
43	Richmond	Tobacco Rd between Deans Bridge Rd and Doug Barnard Pkwy	1.14	Borderline Congested
44	Richmond	Walton Way Segment #1 between Gordon Hwy and Milledge Rd	1.32	Seriously Congested
45	Richmond	Walton Way Segment #2 between Bransford Rd and Jackson Rd	Google Maps	Seriously Congested
46	Richmond	Walton Way Extension between Bransford Rd and Jackson Rd	Google Maps	At Risk of Congestion
47	Richmond	Washington Rd between John C Calhoun Expressway and Pleasant Home Rd	1.72	Seriously Congested
48	Richmond	Wheeler Rd between Walton Way Extension and Flowing Wells Rd	Google Maps	Seriously Congested
49	Richmond	Windsor Spring Rd between Peach Orchard Rd and SR 88	1.85	Seriously Congested
50	Richmond	Wrightsboro Rd Segment #1 between Barton Chapel Rd and Jackson Rd	1.66	Seriously Congested
51	Richmond	Wrightsboro Rd Segment #2 between Jackson Rd and Highland Ave	1.20	Borderline Congested

ID	County	Congestion Management Process Corridor	2018 TTI	Congestion Status
52	Richmond	Wrightsboro Rd Segment #3 between Highland Ave and 15th St	1.45	Seriously Congested
53	Richmond	SR 104 (Riverwatch Pkwy) between Alexander Dr and I-20	1.04	Seriously Congested

Source: Regional Integrated Transportation Information System (2018)

4.5 Traffic Control System

Traffic operational improvement involves a plethora of engineering based strategies that address congestion. Traffic surveillance and control systems, motorist information systems, traffic control centers, and computerized signal systems are some of the tools used in mitigating congestion along local roads. Other engineering strategies such as road widening, alternative route development, channelization, bottleneck removal, variable speed limits and computerized signal systems are implementation strategies local jurisdictions can use to relieve congestion. Traffic operational improvements allow the effective movement of persons and goods throughout the region, increases the safety and security for users, and addresses congestion.

4.6 Bridge Inventory and Conditions

Within the ARTS boundary, there are a total of 389 bridges, of which 246 are in Georgia, and 143 are in South Carolina. The study area is bisected by the Savannah River that is crossed by seven bridges along six routes, namely:

- I-20 (two bridges, one in each direction)
- US 25 (13th Street in Georgia and Georgia Avenue in South Carolina)
- 5th Street (Jefferson Davis Memorial Bridge)
- US 1/US 278 (Gordon Highway in Georgia and Jefferson Davis Highway in South Carolina)
- I-520 (Bobby Jones Expressway in Georgia and the Palmetto Parkway in South Carolina)
- GA/SC 28 Sand Bar Ferry Road

The FHWA maintains a National Bridge Inventory (NBI), which includes various metrics and conditions ratings for each bridge. The NBI's rankings include classifications based on the bridge's importance:

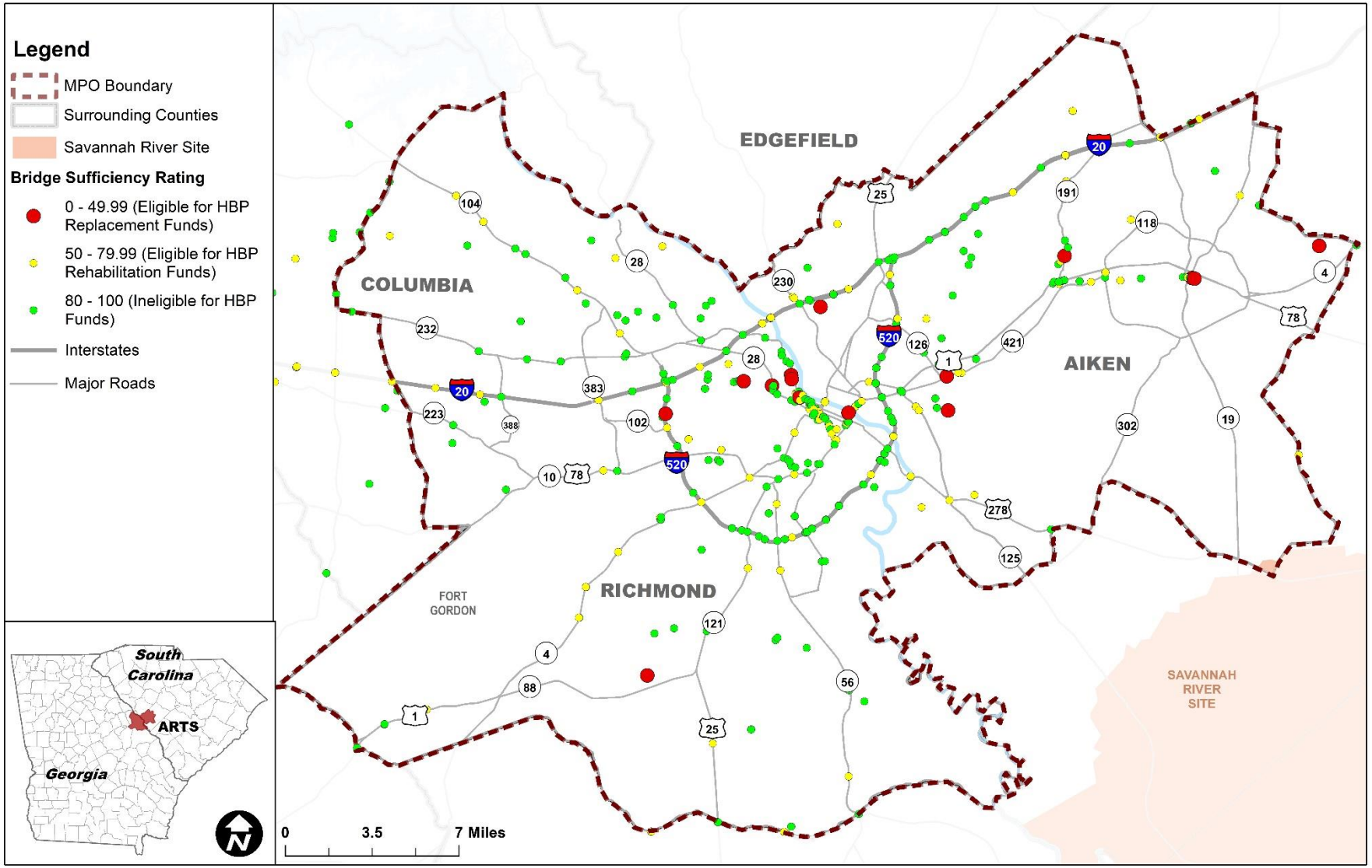
- **Critical**: structure with a high cost to build/replace or loss would have a major effect on the area
- **Essential**: loss of structure would affect commerce or emergency response
- **Other**: all other structures not rated as Critical or Essential

In addition, the NBI can classify bridges as:

- **Structurally Deficient:** a bridge that has significant load carrying elements that are in poor or worse condition due to deterioration and/or damage. A structurally deficient bridge is not unsafe and is not likely to collapse.
- **Functionally Obsolete:** a bridge that does not meet current traffic demands on the structure. A bridge may be constructed using design standards from an earlier period that

have become outdated. For example, a bridge with no sidewalks on a section of roadway with sidewalks, or a bridge with narrow shoulders that do not meet current safety standards would both be classified as functionally obsolete.

NBI ratings help determine whether a bridge is eligible for Highway Bridge Program (HBP) funds. HBP is a federal program that provides funds to states to improve highway bridge conditions. A bridge is eligible depending on its Sufficiency Rating, a calculation that considers Structural Adequacy and Safety, Serviceability and Functional Obsolescence, Essentiality for Public Use, and Special Reduction considerations (see **Figure 4-13**).



Source: US Federal Highway Administration National Bridge Inventory (2019)

Figure 4-12. Bridge Sufficiency Rating (2019)

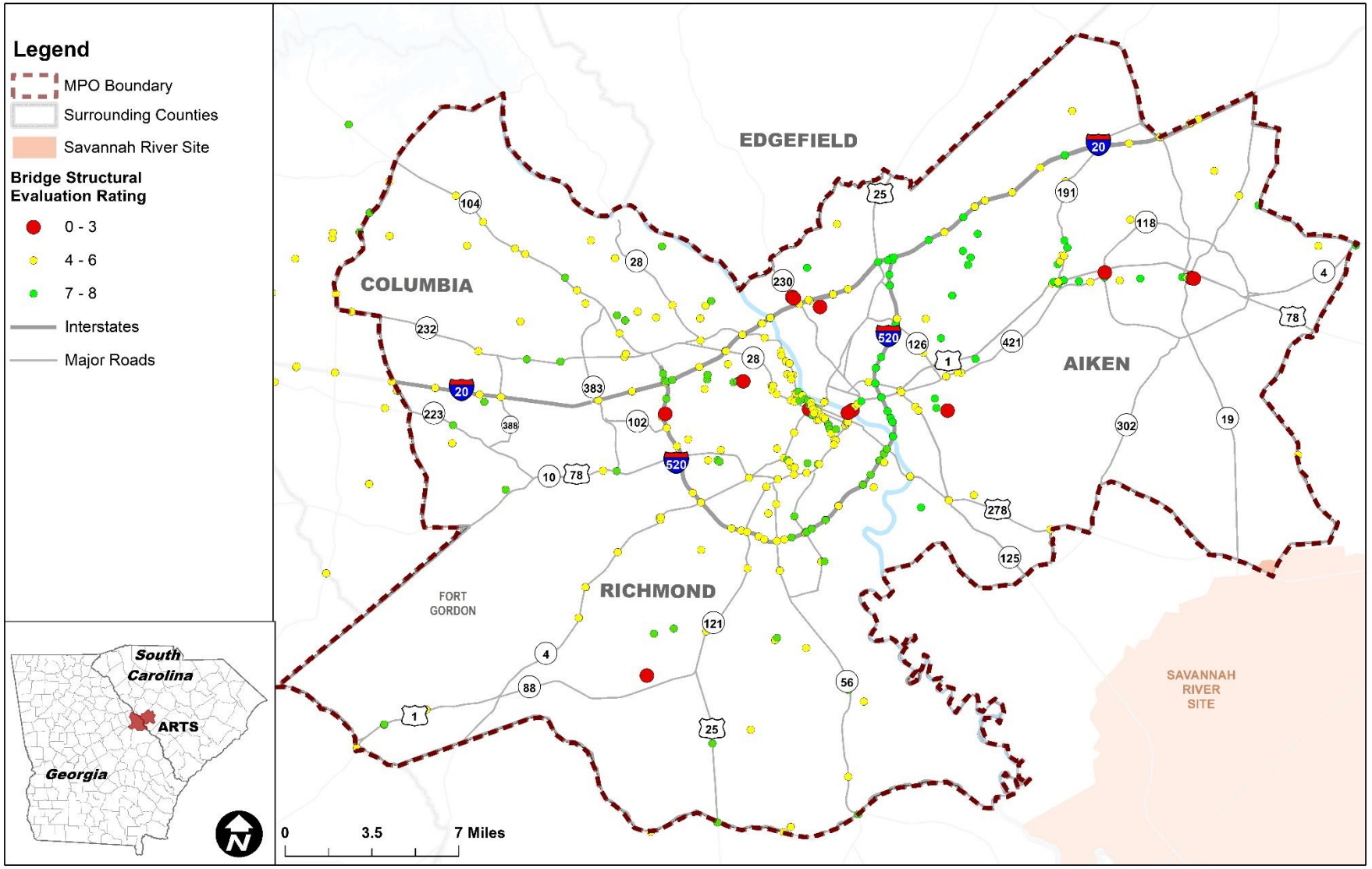
Sufficiency Ratings are on a scale of 0 (an entirely deficient bridge) to 100 (a completely sufficient bridge). Bridges with Sufficiency Ratings less than 50 are eligible for HBP replacement funds. There are 15 of these bridges within the ARTS boundary, 7 in Georgia and 8 in South Carolina (see **Table 4-8**). Bridges with Sufficiency Ratings between 50 and 80 are eligible for HBP Rehabilitation funds. There are 117 of these bridges within the ARTS boundary, 68 in Georgia and 49 in South Carolina.

Table 4-8. Bridges with Sufficiency Ratings <30 (Eligible for HBP Replacement Funds, 2019)

Description	County	State	NBI Bridge ID	Local Bridge ID	Sufficiency Rating	Project Status
US 1 at Savannah River, at the Georgia/South Carolina state line	Aiken	SC	000000000010098	10098	7.9	
5th Street at Savannah River, at the South Carolina state line	Richmond	GA	000000024500940	245-0094-0	11.4	
Marks Church Road at Rae's Creek, 11 miles north of Hephzibah	Richmond	GA	000000024550050	245-5005-0	12.2	
S-2-180 at abandoned railroad, at Fairfield Street in Aiken	Aiken	SC	000000000008506	8506	20.3	
Goodrich Road at Canal Spillway, 13.7 miles northeast of Hephzibah	Richmond	GA	000000024550190	245-5019-0	27.5	
Windsor Spring Road at NS Railroad, .5 miles north of Hephzibah	Richmond	GA	000000024500710	245-0071-0	31.2	2040 LRTP Tier 2
S-2-166 at NS Railroad, at Union Street in Aiken	Aiken	SC	000000000008317	8317	31.5	
S-2-145 at tributary to Horse Creek, 3 miles north of Beach Island	Aiken	SC	000000000001990	1990	36.6	
Goodrich Road at Canal Spillway, 13.9 miles northeast of Hephzibah	Richmond	GA	000000024550200	245-5020-0	37.2	
C-2025 at Pole Branch, at North Augusta	Aiken	SC	000000000006835	6835	39.9	
Goodrich Road at Canal Spillway, 13.2 miles northeast of Hephzibah	Richmond	GA	000000024550150	245-5015-0	43.6	
S-2-33 at Gregg Canal, at Graniteville	Aiken	SC	000000000006211	6211	46.4	
Berckmans Road at Rae's Creek, 12.9 miles northeast of Hephzibah	Richmond	GA	000000024550800	245-0080-0	46.7	
Broad Street at Rae's Creek, 13.1 miles northeast of Hephzibah	Richmond	GA	000000024550270	245-0027-0	47.6	
SC 421 at Little Horse Creek, 1 mile east of Clearwater	Aiken	SC	000000000002447	2447	49.3	2017-2022 TIP

Source: US Federal Highway Administration National Bridge Inventory (2019)

Figure 4-13 illustrates bridge structural evaluation rating based on NBI data. Structural evaluation rating for bridges in ARTS planning area ranged from 0 to 8 in 2019. A rating between 0 to 3 indicates a major deficiency; a rating between 4 to 6 indicates that the structural condition meets minimum criteria; a rating of 7 or higher indicates that the bridge's structural condition is better than the present minimum criteria. **Table 4-9** lists the bridges with structural evaluation ratings of less than 4.



Source: US Federal Highway Administration National Bridge Inventory (2019)

Figure 4-13. 2019 Bridge Structural Evaluation Rating (2019)

Table 4-9. Bridges with Structural Evaluation Ratings <4 (Deficient, 2019)

Description	County	State	NBI Bridge ID	Local Bridge ID	Structural Evaluation Rating	Project Status
Bullhead Run Branch at US 1 Connector Interchange, at North Augusta	Aiken	SC	081206000003150	3150	0	
Br of Fox Gully B at Pole Branch, 3 miles north of North Augusta	Aiken	SC	081206000003155	3155	0	
Turkey Creek Bridge at unnamed stream, 2 miles west of Aiken	Aiken	SC	081206000003153	3153	0	
S-2-180 at Norfolk Southern, at Fairfield Street in Aiken	Aiken	SC	000000000008506	8506	0	
C-2025 at Pole Branch, at North Augusta	Aiken	SC	000000000006835	6835	0	
5th Street at Savannah River, at the South Carolina state line	Richmond	GA	000000024500940	245-0094-0	2	
Marks Church Road at Rae's Creek, 11 miles north of Hephzibah	Richmond	GA	000000024550050	245-5005-0	2	
S-2-166 at Norfolk Southern, at Union Street, Aiken	Aiken	SC	000000000008317	8317	2	
US 1 CONN at Savannah River, at Georgia/South Carolina state line	Aiken	SC	000000000010098	10098	2	
Fifteenth Street at Augusta Canal, 12.9 Mi NE of Hephzibah	Richmond	GA	000000024550740	245-0074-0	3	
Berckmans Road at Rae's Creek, 12.9 Mi NE of Hephzibah	Richmond	GA	000000024550800	245-0080-0	3	
Windsor Spring Rd at NS RR. (734145P), .5 Mi N of Hephzibah	Richmond	GA	000000024500710	245-0071-0	3	2040 LRTP Tier 2
S-2-145 at tributary to Horse Creek, 3 miles north of Beech Island	Aiken	SC	000000000001990	1990	3	

Source: US Federal Highway Administration National Bridge Inventory (2019)

4.7 Security and Evacuation Routes

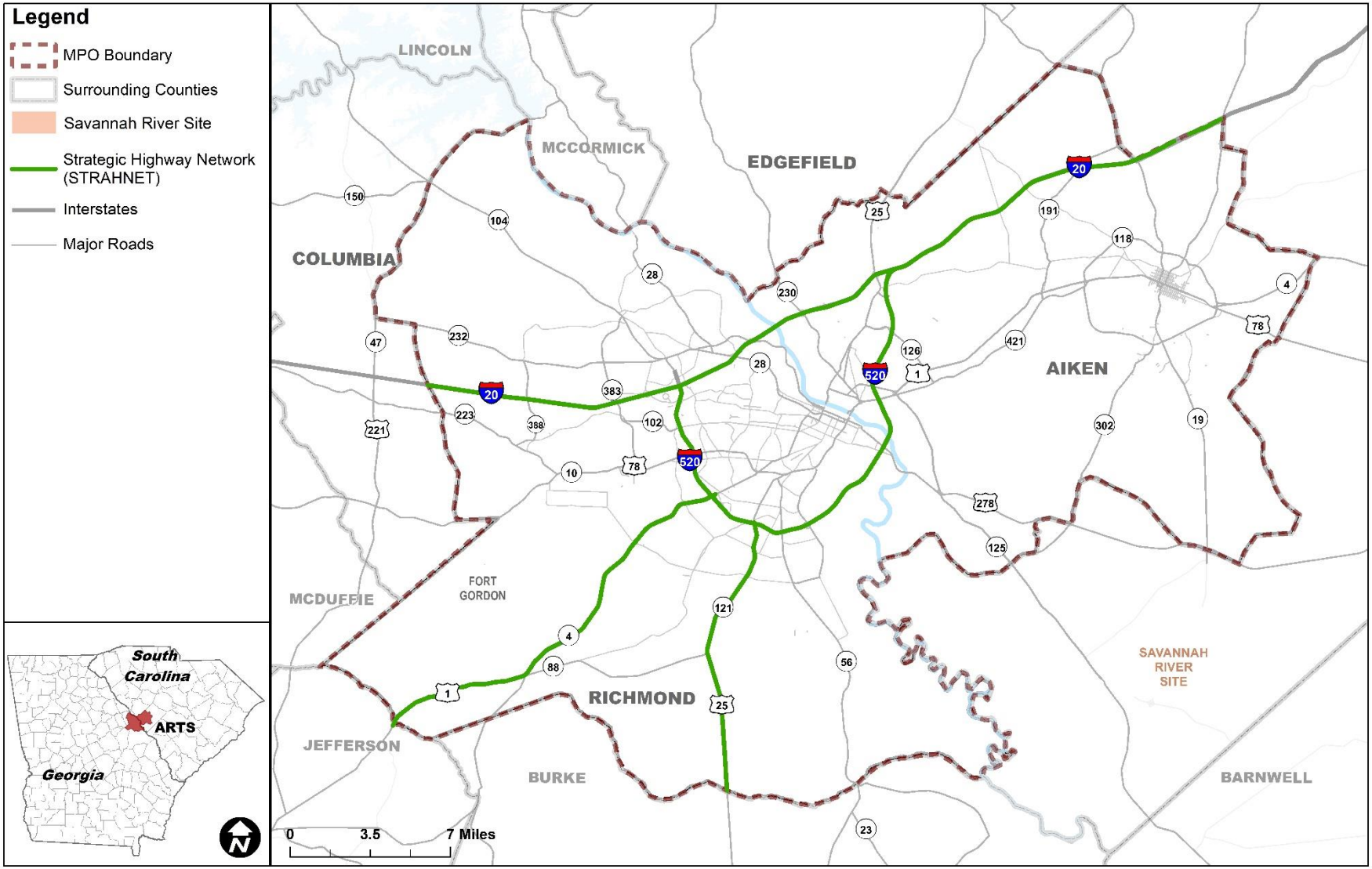
Goals and objectives for the 2050 MTP include "Improve transportation network security benefitting all users"; "Improve Transportation System Resiliency"; and, "Reduce vulnerability of existing transportation infrastructure to natural disasters". It is important for a region to have a plan of action to have a resilient

infrastructure in case of – (1) Natural disasters; (2) Intentional physical as well as technological harm, such as a terrorist attack or cyber-attack; and, (3) unintentional harm, such as hazardous materials spillage after a crash or landslide after heavy rains. While agencies in the ARTS planning area are responsible for securing their respective transportation systems, ARTS coordinates closely with agencies including, but not limited to: GDOT, SCDOT, Augusta-Richmond County, Columbia County, Aiken County, Edgefield County, Augusta Transit, Best Friend Express, and, Columbia County Commission Transit. To maintain a secure transportation system, cross-agency coordination is required at state, county, and local levels.

GDOT, SCDOT, Richmond County, Aiken County, and Edgefield County have all adopted Emergency Operations Plans (EOPs), and Columbia County has adopted a Hazard Mitigation Plan (HMP), which all include action plans in case of emergencies and guidelines for coordination between federal, state, and local agencies. GDOT adopted a revised EOP in 2017, which superseded the plan dated 2013. Augusta-Richmond County Emergency Management Agency adopted its current EOP in 2015, which was later revised in 2016. Columbia County adopted a local resolution regarding emergency management in 2015 which recommends developing an EOP for the County. SCDOT updated its EOP in 2019, which integrates the results of State Preparedness Report and the Threat and Hazard Identification and Risk Assessment, and other applicable local, tribal and state threat and hazard data to develop and build the response and recovery capabilities listed in the EOP. Aiken County Department of Emergency Management revised its EOP in June 2019 in coordination with the South Carolina Emergency Management Division. Edgefield County, on the other hand, developed the National Hazard Mitigation Plan in 2015.

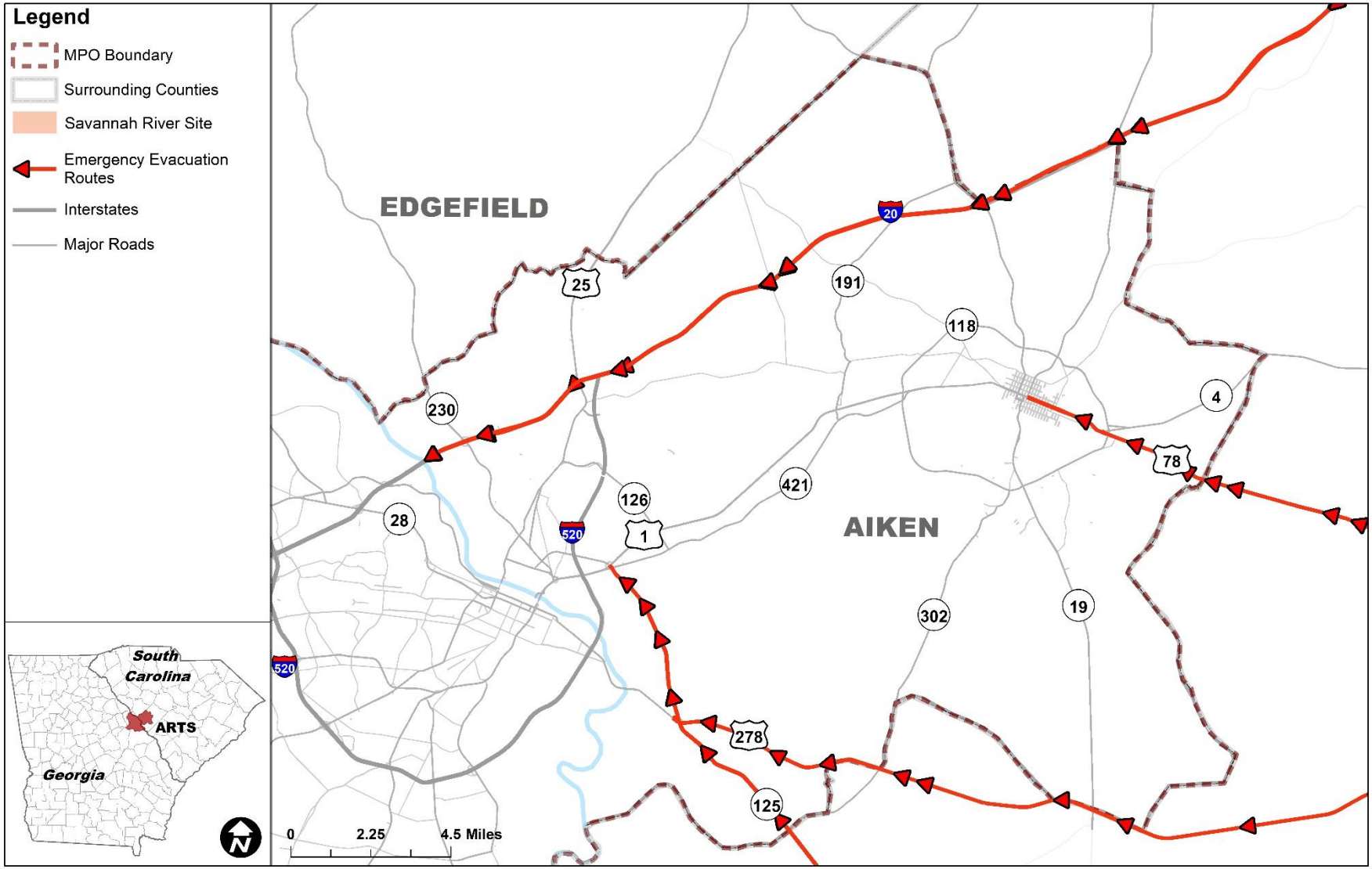
Major roadways such as those on the Strategic Highway Network (STRAHNET) are key in evacuating large numbers of people during emergencies. STRAHNET is a network of highways and includes interstates and arterials (for long-distance travel) and connectors (to connect individual installations to the routes). **Figure 4-14** illustrates STRAHNET routes in the ARTS planning area. I-20 and I-520 are STRAHNET interstate routes; Gordon Highway (US Highway 78) from the I-520 to Fort Gordon is classified as a STRAHNET Connector; and, US Highway 1 (Deans Bridge Road) and US Highway 25 (Peach Orchard Road) south of their intersections with I-520 are classified as Non-Interstate STRAHNET Routes.

South Carolina's designated evacuation routes funnel a large portion of traffic through the ARTS planning area (see **Figure 4-15**). Routes originating at Bluffton, Hilton Head Island, Oakatie, and Beaufort all terminate at Atomic Road (SR-278) in North Augusta. Routes that originate at Edisto Beach and John's Island terminate at SR-78 in downtown Aiken. In addition, evacuation routes that begin in the coastal region in northern South Carolina direct traffic inland and to I-20. The evacuation routes then consolidate on I-20 and continue south towards Augusta and the ARTS planning area. Georgia has designated evacuation routes, which are primarily designed to move populations in coastal areas inland towards Macon and Atlanta in case of hurricanes.



Source: Highway Performance Monitoring System (2017)

Figure 4-14. STRAHNET Routes (2017)



Source: SCDOT Interactive Evacuation Map (2019)

Figure 4-15. Evacuation Routes in South Carolina (2019)

4.8 Pavement Quality

Quality of pavement can impact several ride quality characteristics such as comfort, roadway capacity, useful life and safety as well. Roughness of a road surface is measured using the International Roughness Index (IRI). IRI is usually reported in inches per mile, with higher ratings indicating rougher roads. FHWA considers a roadway with IRI of 95 inches per mile or less to have good ride quality, and a roadway with an IRI of 170 inches per mile or less to have acceptable ride quality. **Figure 4-16** shows IRI for major roadways in the ARTS planning area, as collected from the Highway Performance Monitoring System (HPMS).

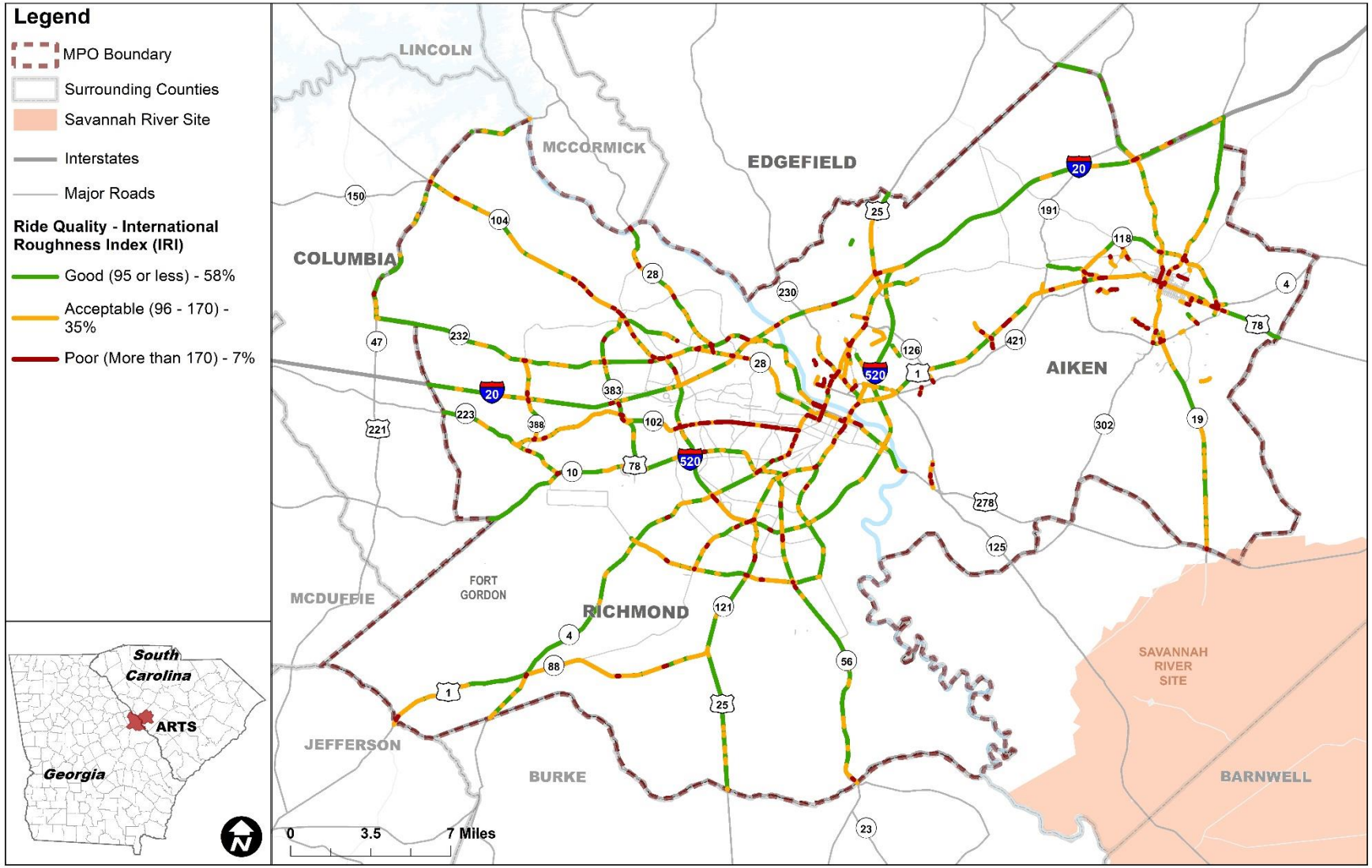
4.9 Environmental Health and Air Quality

All of the ARTS planning area is currently classified as in attainment according to the National Ambient Air Quality Standards (NAAQS) for six common air pollutants. These pollutants are considered harmful to public health and the environment, and come from numerous and diverse sources. The six (6) criteria pollutants include: Carbon Monoxide (CO), Oxides of Nitrogen (NO2), Sulfur Dioxide (SO2), Ozone (O3), Lead (Pb), and Particulate Matter (PM). In the ARTS planning region, there are two (2) active air quality monitoring stations, namely in Augusta (Bungalow Road) and Evans (Riverside Park) both situated in Georgia.

The MPO is evaluating the feasibility of establishing the Environmental Protection Agency (EPA) Advance Program in Richmond County or the ARTS planning area. The EPA Advance Program is a federal initiative that "promotes local actions in attainment areas to reduce ozone and/or fine particle pollution (PM2.5) to help these areas continue to maintain the National Ambient Air Quality Standards (NAAQS)." The program focuses on giving those areas in attainment tools to proactively maintain and improve local air quality standards. Improving local air quality positively impacts long-term health protection.

There are two Advance Programs: Ozone (O3) and Particulate Matter (PM). States, regions and cities may choose to align with one program or with both. The State of South Carolina is already a state participant in the Ozone and PM Advance Program. Richmond County in Georgia could be considered as the new area of participation. Below are some of the potential benefits from Richmond County's participation in the Advanced Programs (2019 ARTS Air Quality Technical Memorandum):

- Effectively and demonstrably contributes to the health and economic well-being of the county through proactively improving air quality;
- Creates a conduit for state, local agencies and EPA to collaboratively work together in developing a coordinated response to air quality issues;
- Voluntary compliance attracts like-minded community stakeholders who in turn proactively advance policies and interventions to maintain attainment and communication;
- Efficiently directs available resources toward actions to address air quality problems quickly and effectively; and,
- Ozone Advance participants may receive Preferred Status when applying for existing EPA grants and programs. This status creates the potential for program participants to take advantage of funding opportunities that are available for additional reduction activities.



Source: Highway Performance Monitoring System (2017)

Figure 4-16. Pavement Quality (2017)

5 Traffic Safety

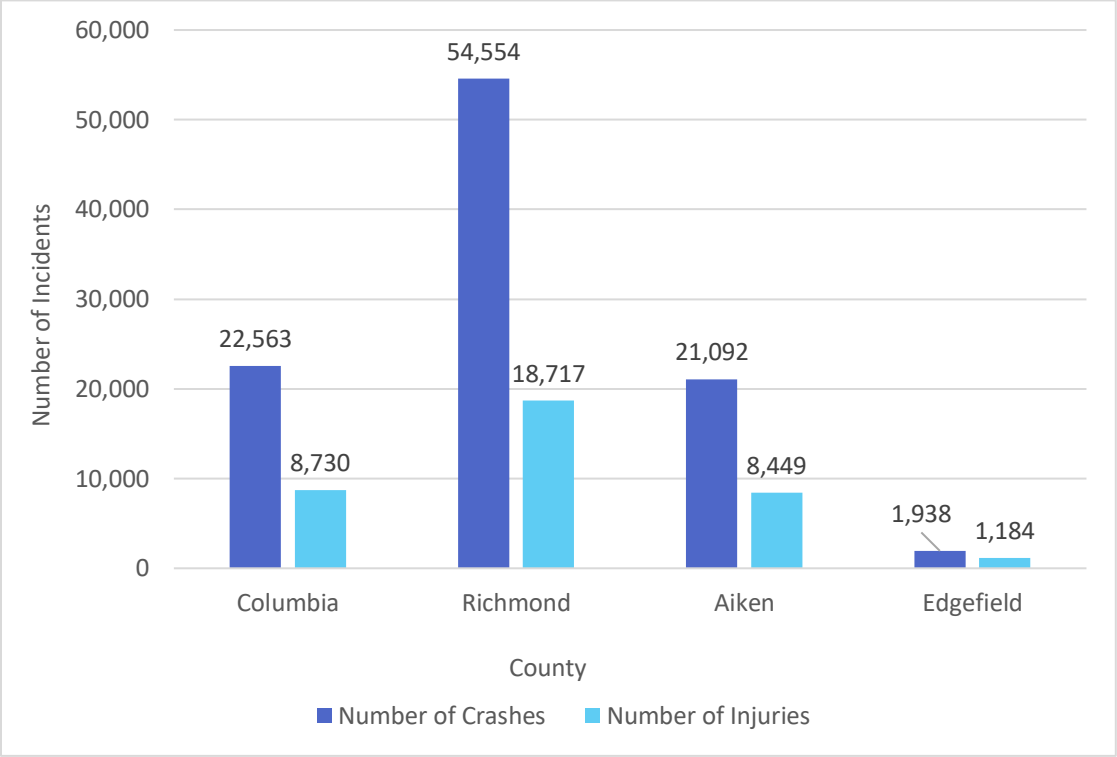
This section presents a summary of crash data for the ARTS planning area. Crash data were gathered separately from SCDOT and GDOT, and both datasets have been combined for consistency. In Georgia, Georgia Electronic Accident Reporting System (GEARS) includes all crashes that were reported in the state. Due to the nature of field data collection, the GEARS dataset includes multiple crash reports where key information such as location, time, or other factor is missing or has conflicting information. GDOT removes these suspect crash records to facilitate use of this data in further analysis. Cleaned data was collected from GDOT and SCDOT for the purpose of this study. Crash data for 2012-2017 were used to summarize crash propensity for the ARTS planning area. The inventory also includes crash statistics such as key crash locations, crash types, and crashes involving fatalities or pedestrians/bicyclists.

This chapter contains the following sections:

- Crash Summary
- Fatal Crashes
- Pedestrian and Bicycle Crashes
- High Crash Intersections and Link Segments

5.1 Crash Summary

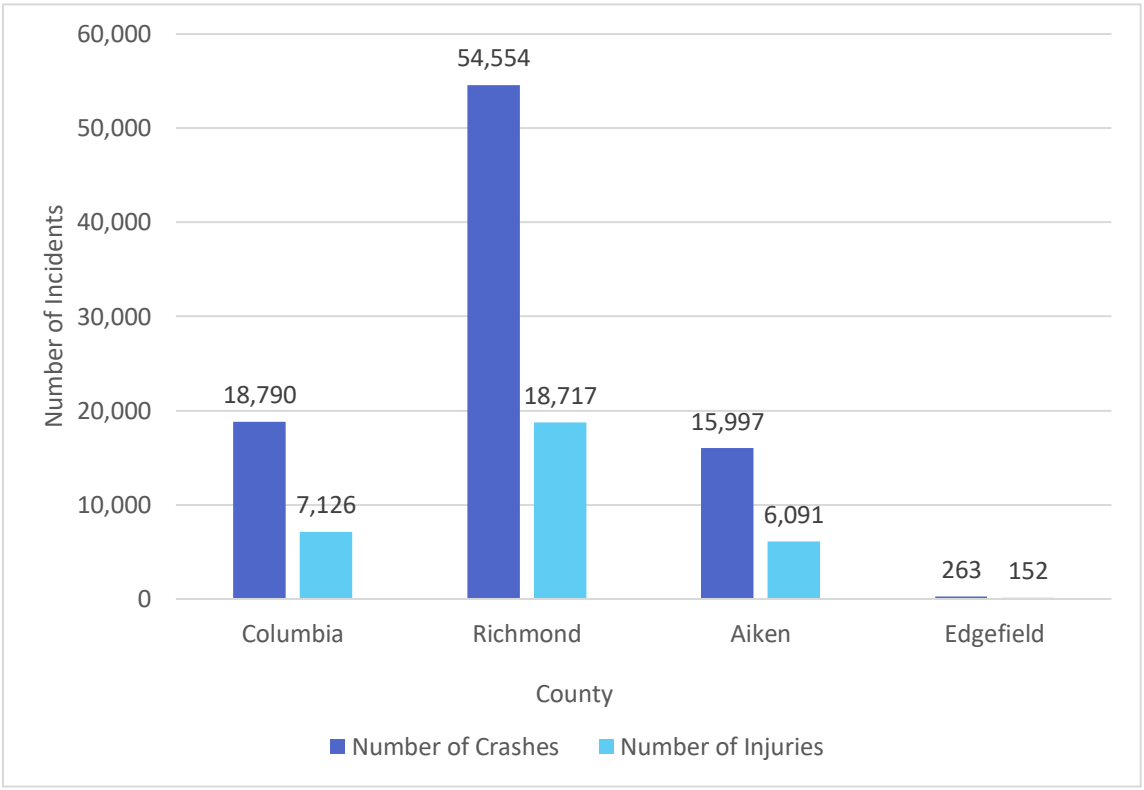
There were about 100,147 crashes in the four-county area during the last 6-year period (2012-2017), of which 417 crashes involved a fatality and 37,080 crashes involved at least one injury. **Figure 5-1** summarizes the total number of crashes and crashes involving a non-fatal injury in the four-county area from 2012 to 2017.



Source: GDOT, ARTS MPO, SCDOT

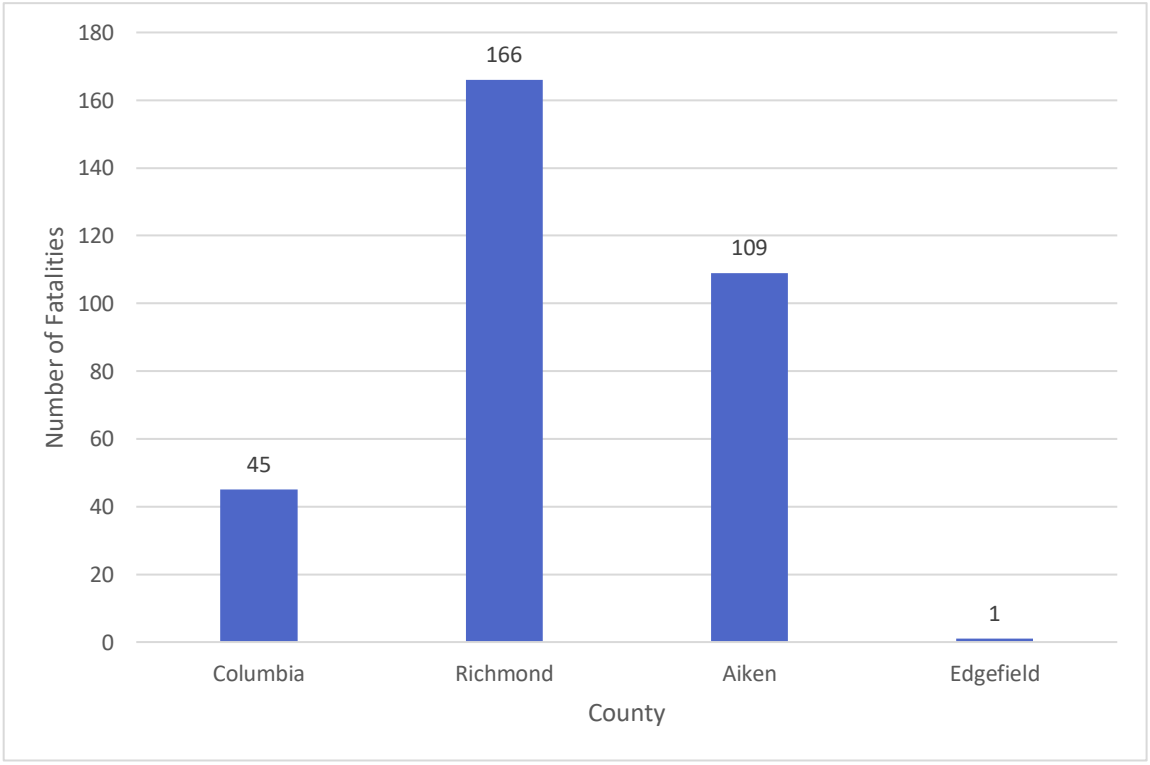
Figure 5-1. Number of Crashes and Injuries by County within the Four-County Area (2012-2017)

All crashes within the four-county area were mapped and crashes within the MPO boundary were identified based on GIS analysis. While **Figure 5-1** provides a summary of crash data for the four-county area, it important to focus on crashes within the ARTS planning area as that is the area of focus for the 2050 MTP. Within the ARTS planning area, there were 89,604 crashes, 32,086 non-fatal injuries, and 321 fatalities reported during the last 6-year period (2012-2017). **Figure 5-2** shows total number of crashes and number of non-fatal injuries, and **Figure 5-3** shows number of fatalities by county within the ARTS planning area. Out of all crashes reported, 23 percent (20,721 crashes) involved non-fatal injuries and 0.34 percent (299 crashes) involved fatalities. Nearly one (1) out of four (4) crashes involved at least one injury indicating a relatively high potential of severe crashes.



Source: GDOT, ARTS MPO, SCDOT

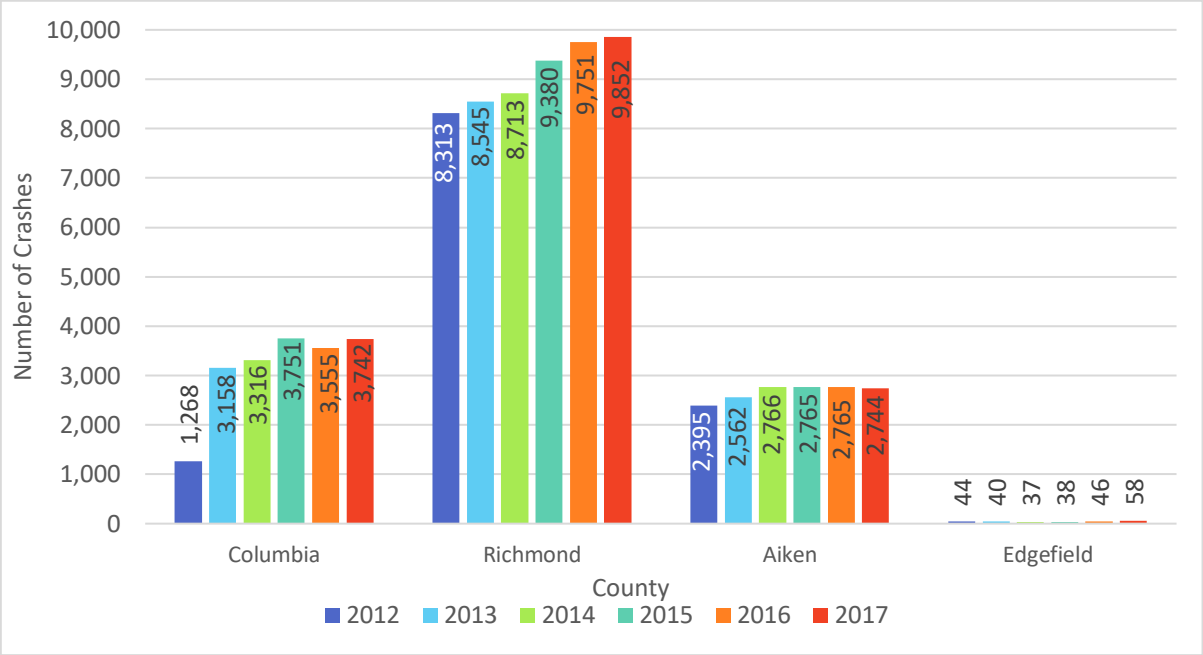
Figure 5-2. Number of Crashes and Non-Fatal Injuries by County within the ARTS Planning Area (2012-2017)



Source: GDOT, ARTS MPO, SCDOT

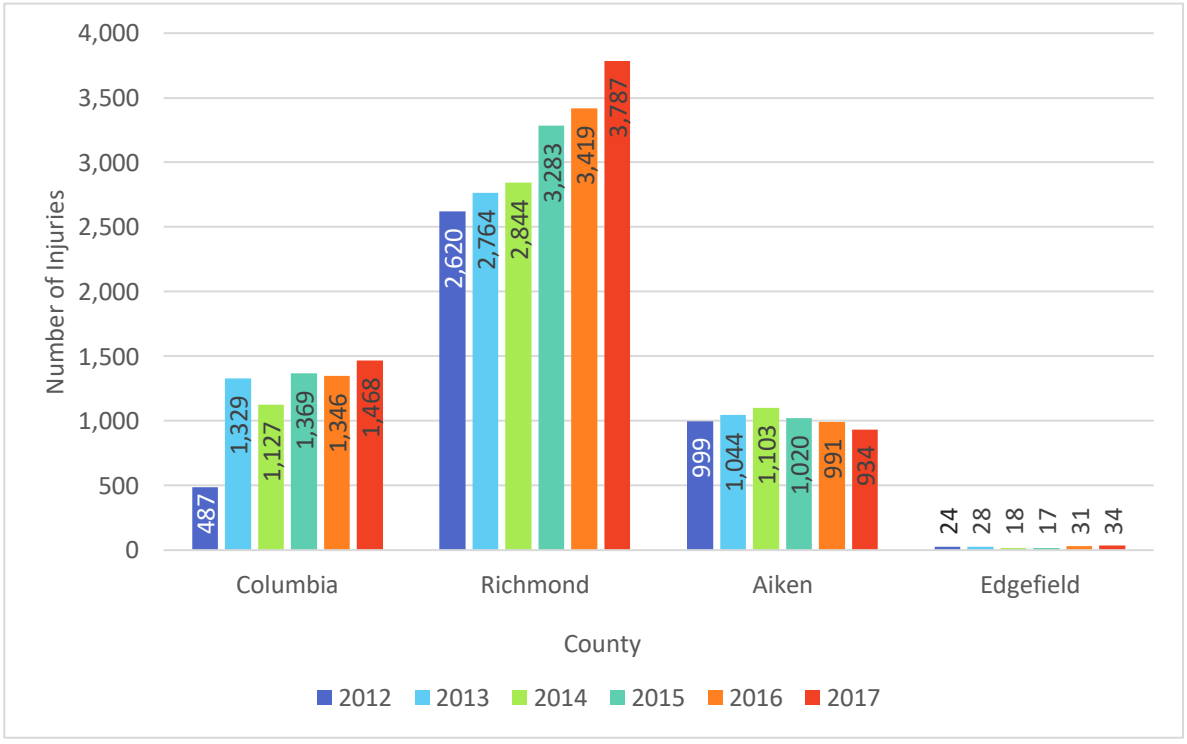
Figure 5-3. Number of Fatalities by County within the ARTS planning area (2012-2017)

As shown in **Figure 5-4**, total number of crashes increased over the last 6-year period (2012-2017) in Richmond and Columbia counties. In Aiken County, the number of total crashes stayed at the same level and decreased slightly since 2014.



Source: GDOT, ARTS MPO, SCDOT

Figure 5-4. Trend of Total Crashes by County (2012-2017)

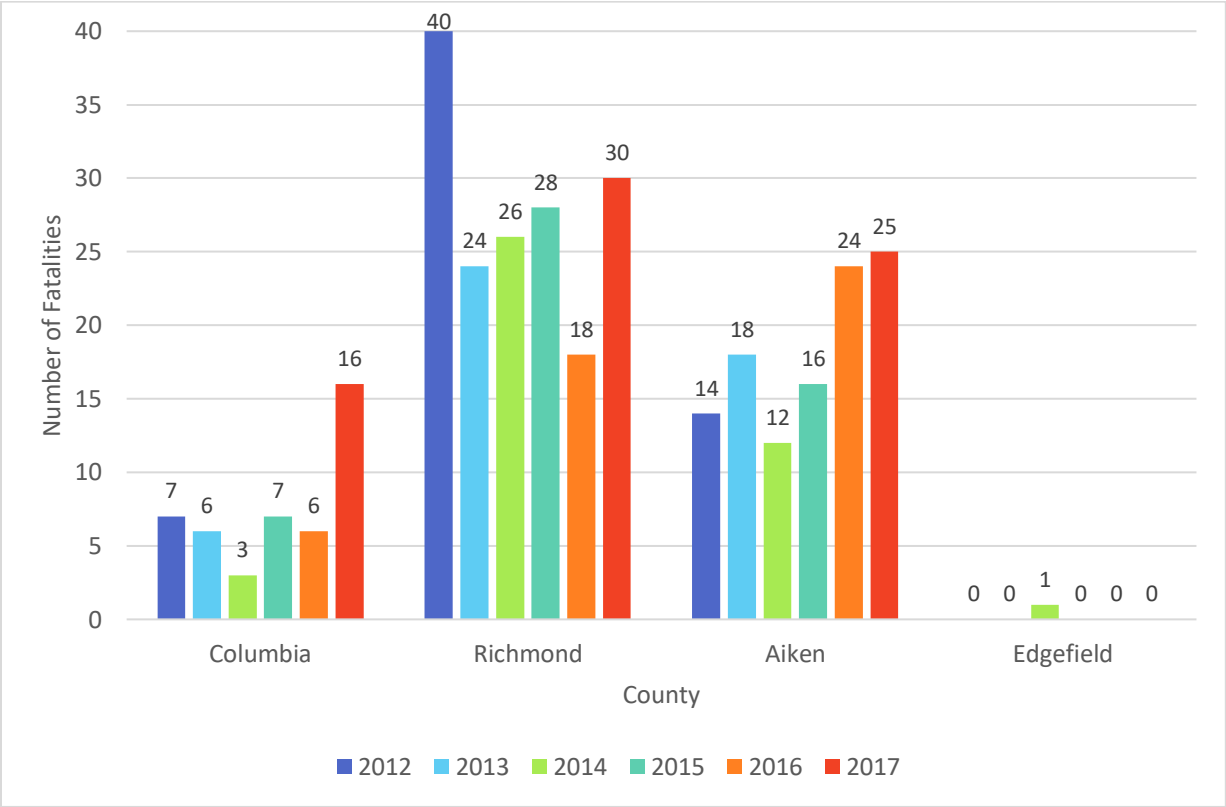


Source: GDOT, ARTS MPO, SCDOT

Figure 5-5. Annual Trend of Total Non-Fatal Injuries by County (2012-2017)

Figure 5-5 shows annual trend of total non-fatal injuries by county. The crash history indicates that the number of injuries significantly increased annually in Richmond County.

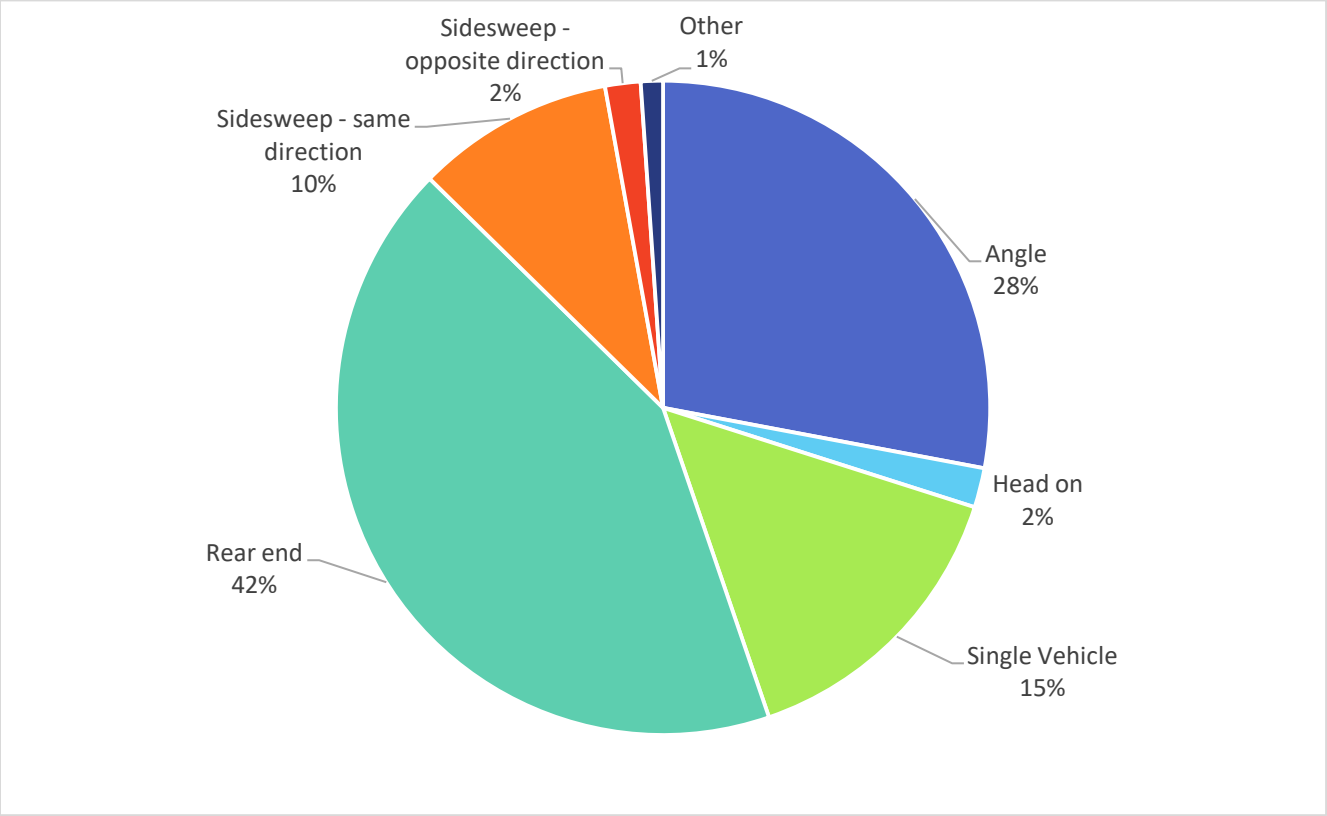
Figure 5-6 shows annual trend of total fatalities by county. The number of fatalities has increased from 2012 to 2017 in every county, with the exception of Richmond County having 40 fatalities in 2012.



Source: GDOT. ARTS MPO, SCDOT

Figure 5-6. Annual Trend of Total Fatalities by County (2012-2017)

Figure 5-7 summarizes crashes by manner of collision. This result indicates that rear end collisions (43 percent) were the most common types of crashes occurring in the ARTS planning area followed by angle collisions (28 percent) and single vehicle collisions (15 percent).

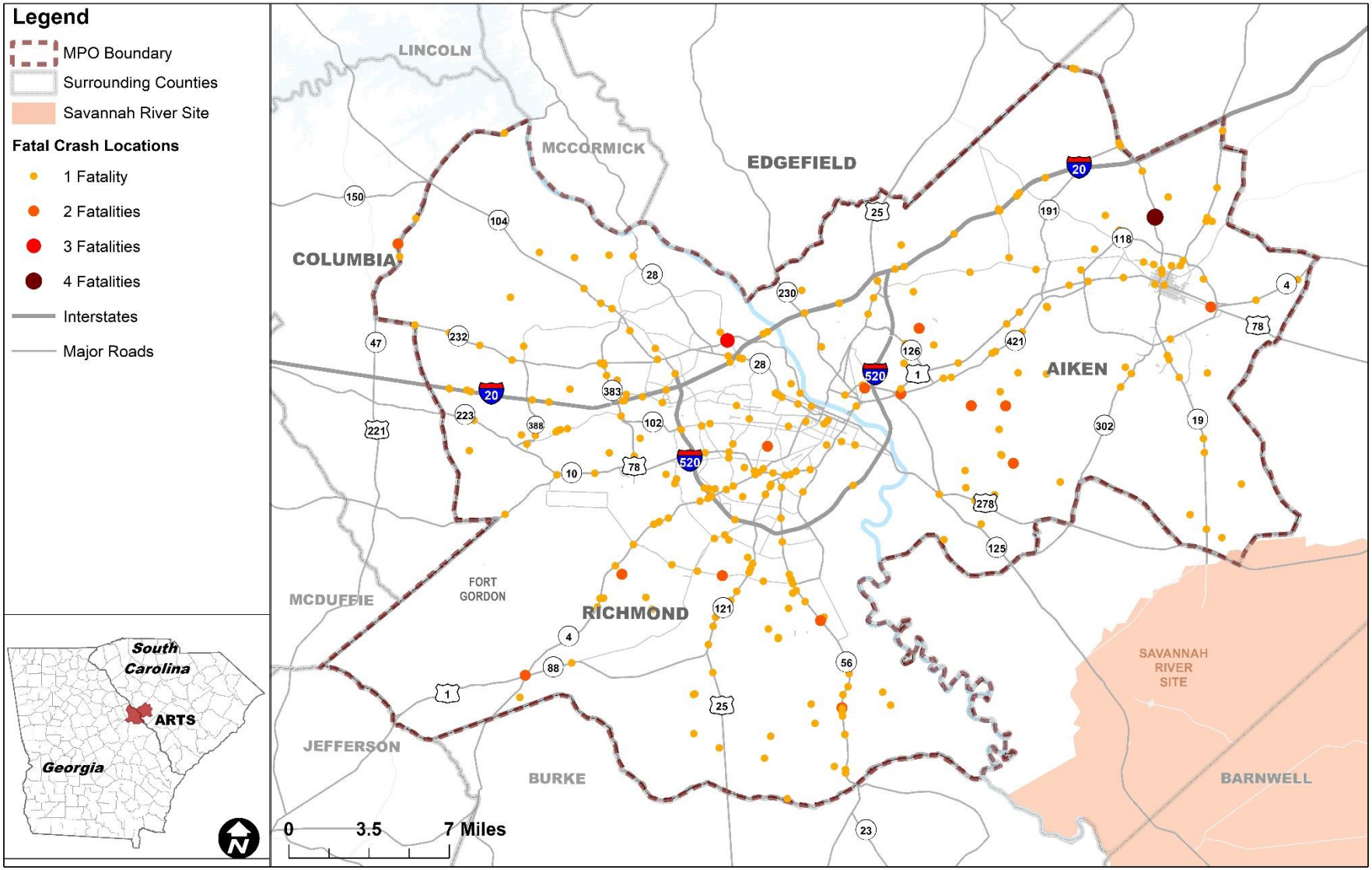


Source: GDOT, ARTS MPO, SCDOT

Figure 5-7. Crashes by Crash Types (2012-2017)

5.2 Fatal Crashes

Figure 5-8 shows locations of fatal crashes and the number of fatalities reported at each fatal crash. Multiple fatalities have been reported near intersections of GA 104 at Stevens Creek Road, SC 19 at SC 1303/Shiloh Heights Road, and US 1/Jefferson Davis Highway at US 278/Atomic Road and along GA 56.

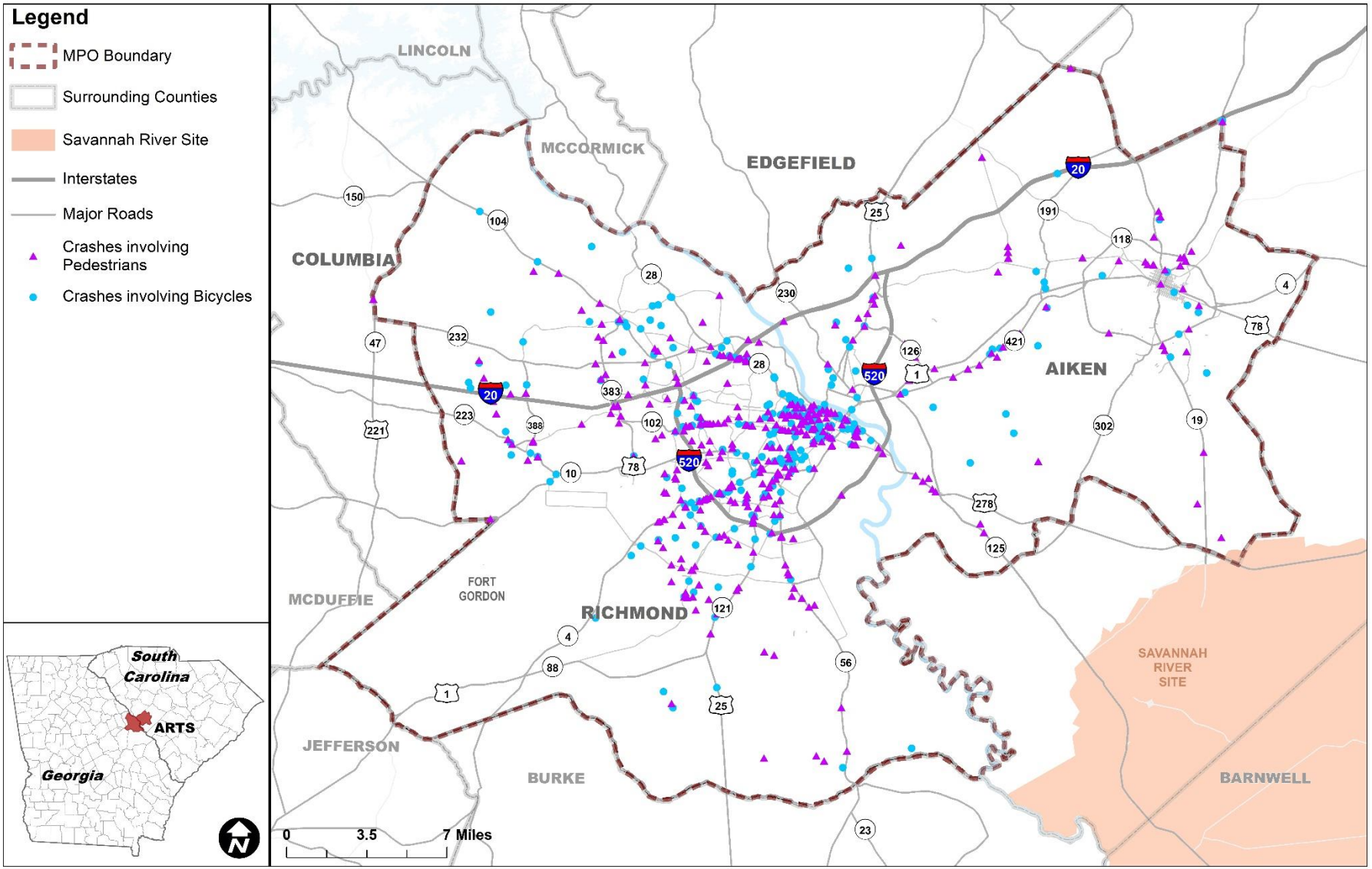


Source: National Highway Traffic Safety Administration Fatality Analysis Reporting System

Figure 5-8. Fatal Crash Locations and Number of Fatalities (2012-2017)

5.3 Pedestrian and Bicycle Crashes

Out of all crashes reported within 2012-2017, approximately 0.5 percent (404 crashes) involved a pedestrian, and 0.3 percent (261 crashes) involved a bicyclist. **Figure 5-9** shows the locations of crashes involving bicycles and pedestrians. Downtown Augusta and Georgia highways such as SR 4, SR 121, SR 56, and Wrightsboro Road were observed to have a high number of crashes involving bicycles and pedestrians, which correlates with expected locations of high bicycle and pedestrian activities.

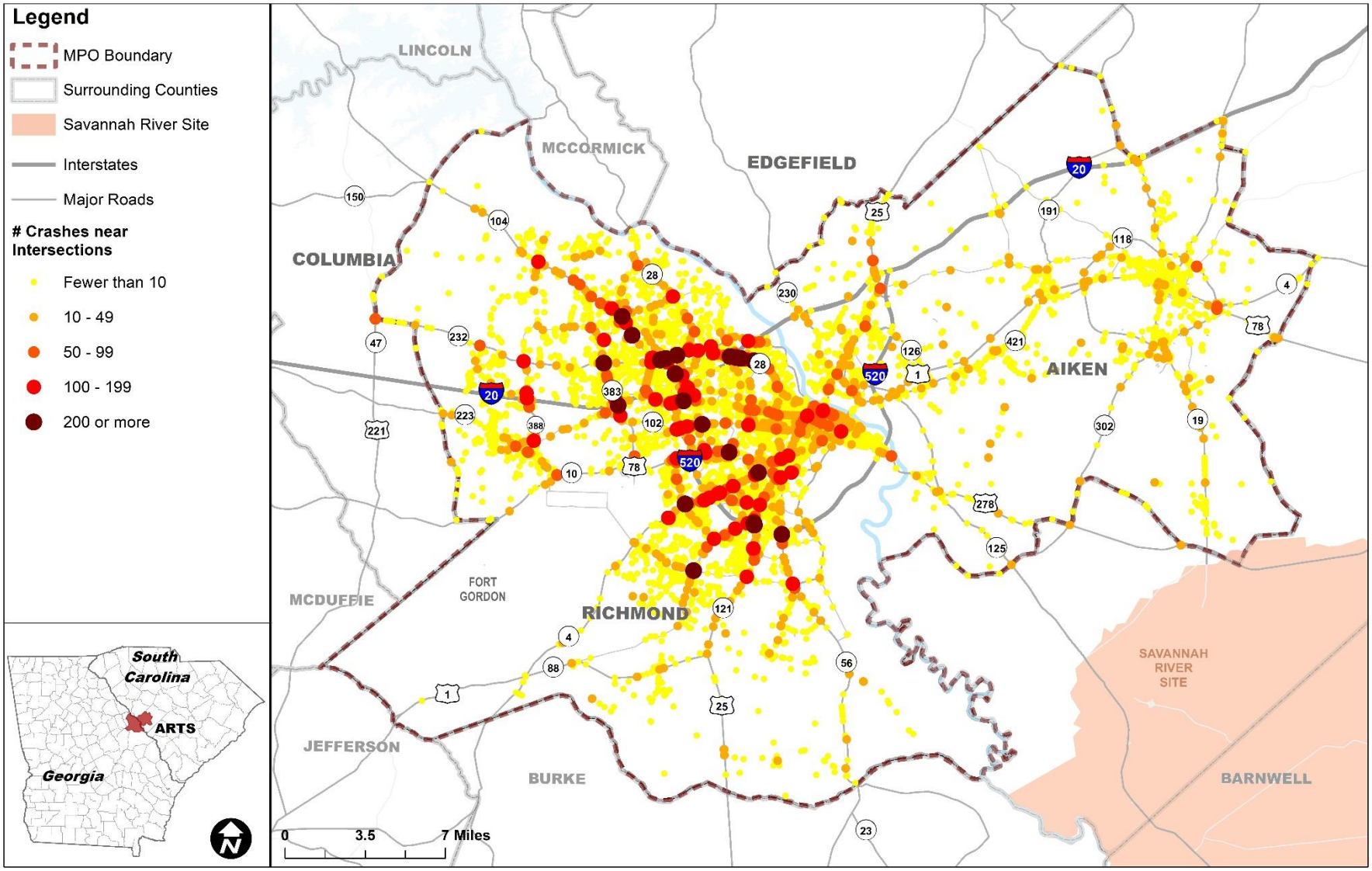


Source: GDOT, ARTS MPO, SCDOT

Figure 5-9. Bicycle and Pedestrian Crash Locations (2012-2017)

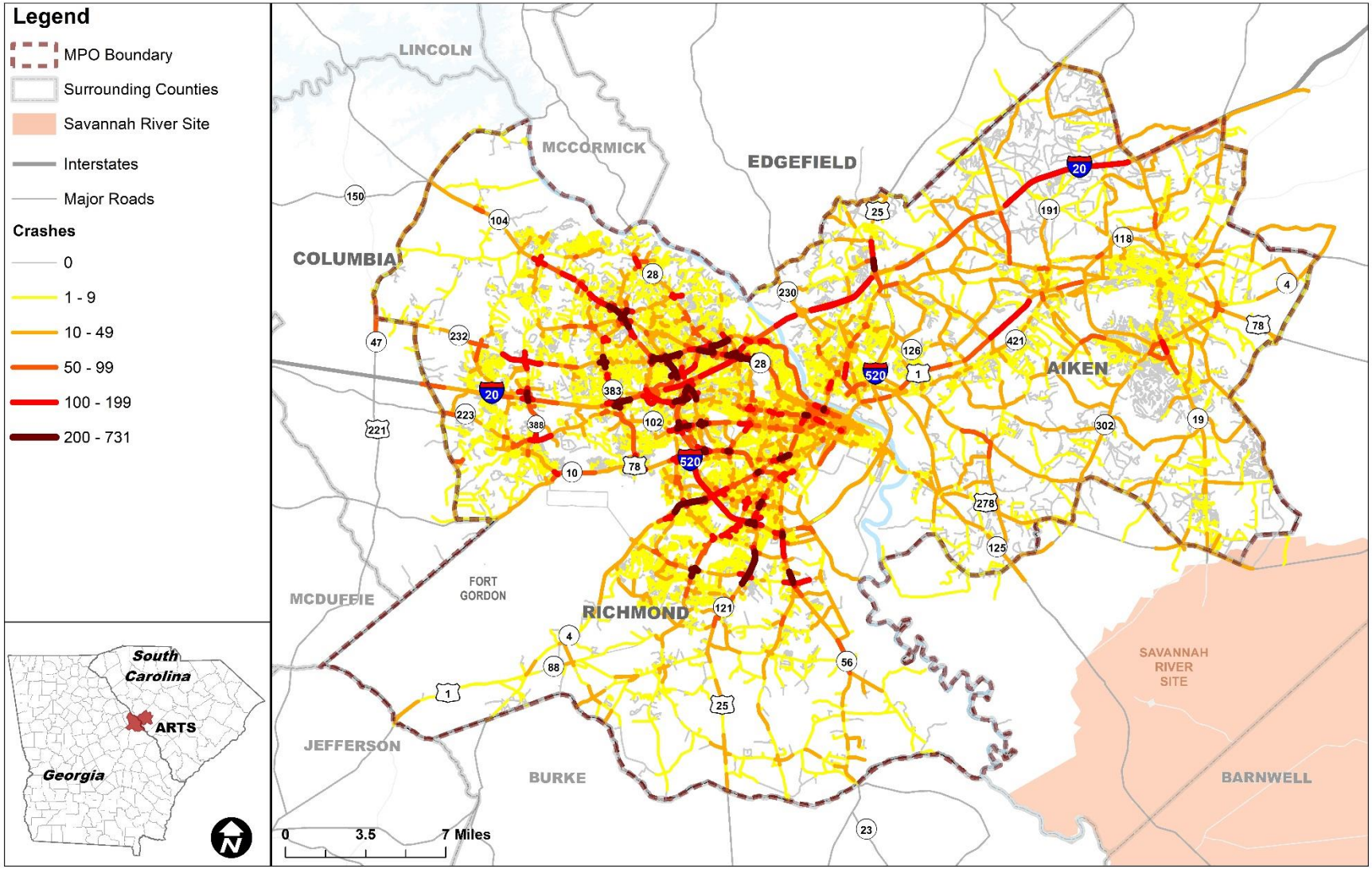
5.4 High Crash Intersections and Highway Links

High crash locations in the ARTS planning area include Interstates, State Routes, and US Highways as shown **Figure 5-10** and **Figure 5-11.** These maps identify intersections and road segments with higher numbers of crashes such as those on I-20, I-520, GA 232/Columbia Road, GA 28/GA 101/Washington Road, Wrightsboro Road, GA 4, US 25/GA 121, GA 56, and Windsor Spring Road.



Source: GDOT Crash Data 2012-2017, SCDOT Crash Data 2012-2017

Figure 5-10. High Crash Intersection Locations (2012-2017)



Source: GDOT Crash Data 2012-2017, SCDOT Crash Data 2012-2017

Figure 5-11: High Crash Link Locations (2012-2017)

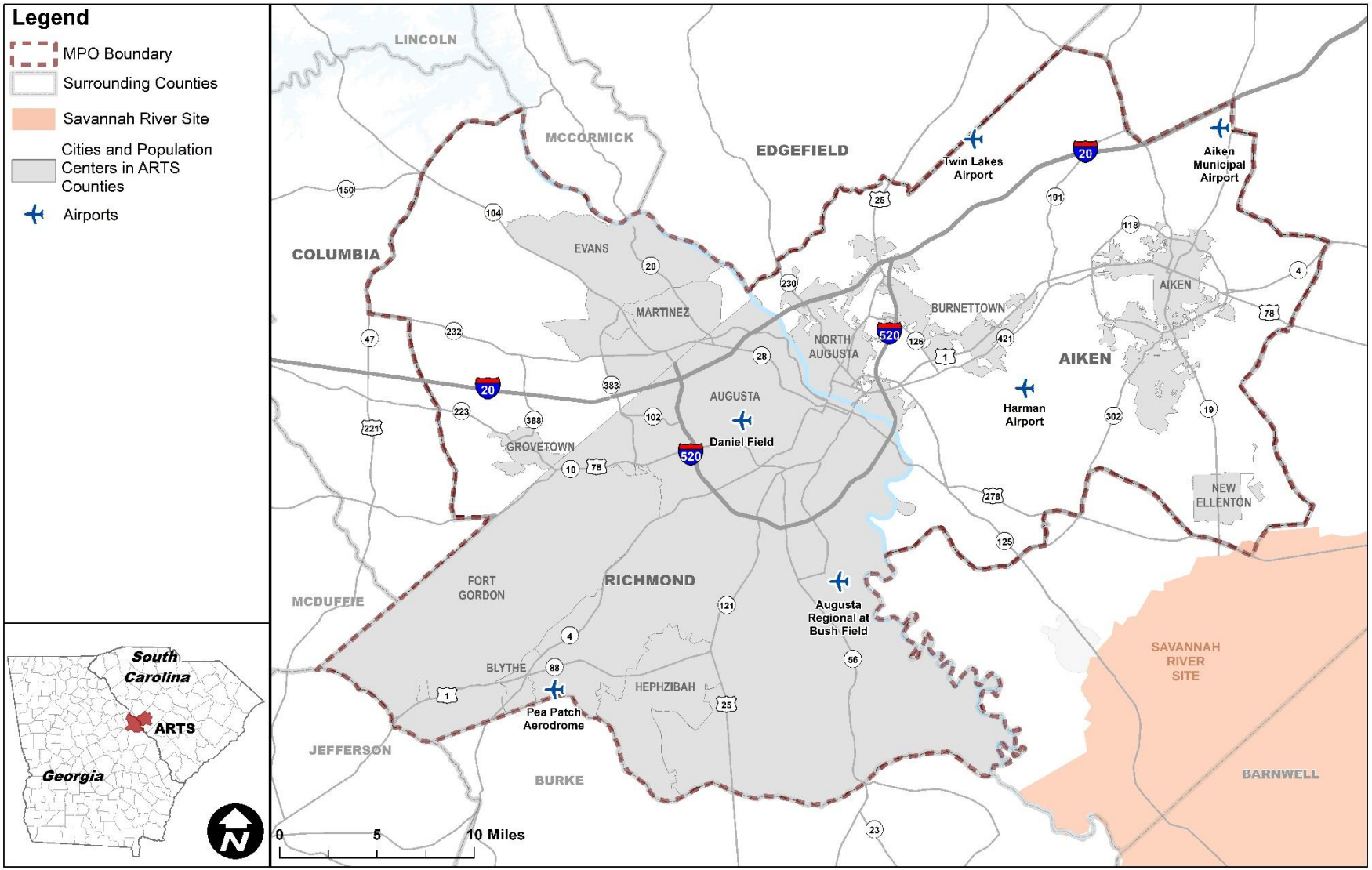
6 Aviation and Air Cargo

Airports within the ARTS planning area are utilized for passenger movement, medical transport, and freight movement and serve as key connections both within and outside of Georgia and South Carolina. Aviation needs will be important when considering future economic growth. This section provides information on existing conditions and capacities for the six local airports within the ARTS planning area.

The ARTS planning area is served by three commercial and general aviation airports. These are the Augusta Regional Airport [at Bush Field], Daniel Field, and Aiken Municipal Airport. Augusta Regional Airport and Daniel Field are in Georgia, and Aiken Municipal Airport is in South Carolina. Twin Lakes Airport, Harman Airport, and the Pea Patch Aerodrome are all privately owned and require permission prior to landing. Locations of airports within the ARTS region are shown in **Figure 6-1.**

This chapter provides existing conditions for the following public airports:

- Augusta Regional Airport
- Daniel Field Airport
- Aiken Municipal Airport



Source: ARTS MPO

Figure 6-1. Airports (2019)

General statistics about the six area airports are available in **Table 6-1.**

Table 6-1. ARTS Planning Area Airport Summary Statistics (2019)

Airport	Ownership	Based Aircraft	Acreage	Operations 2018-2019
Augusta Regional	City of Augusta	16	1,411	31,825
Daniel Field	Augusta-Richmond County	51	146	30,000*
Harman Airport	Private	1	0	0
Pea Patch Aerodrome	Private	25	25	0
Twin Lakes Airport	Private	55	No data	1,508
Aiken Regional Airport	City of Aiken	11	No data	28,105

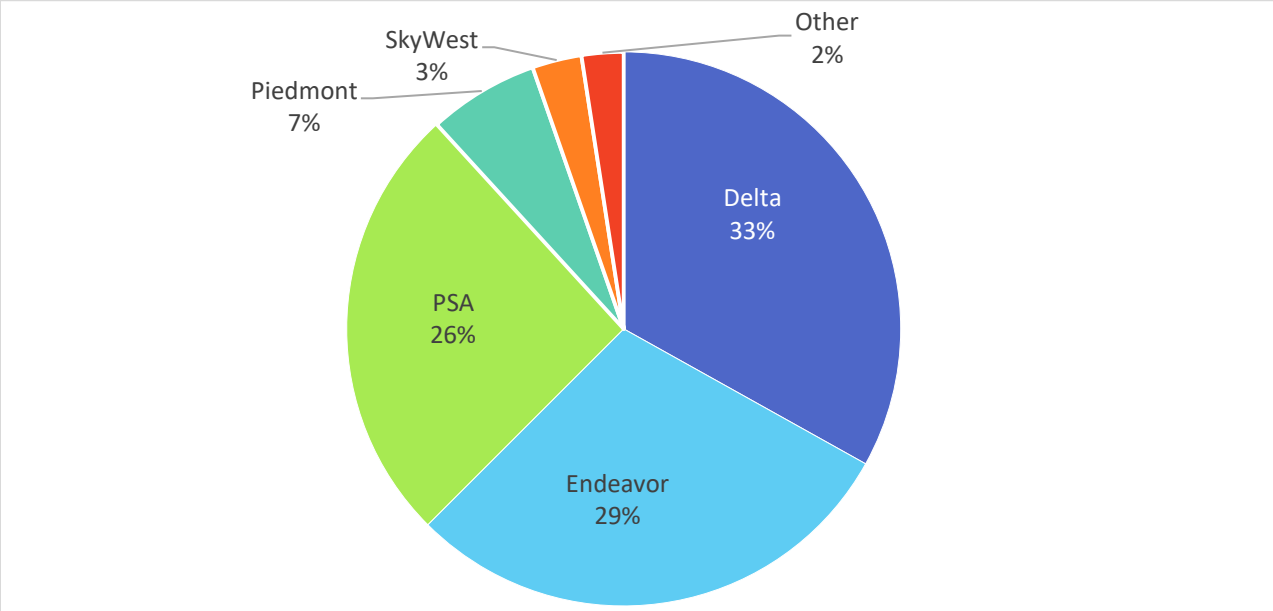
*Data for 2016-2017

Source: US Federal Aviation Administration Airport Master Records (2016-2019)

6.1 Augusta Regional Airport

Augusta Regional Airport is a city-owned and operated, public use airport located eight miles south of downtown Augusta. The Federal Aviation Administration (FAA) has classified Augusta Regional Airport as Non-hub because it has more than 10,000 passengers boardings per year but makes up less than 0.05 percent of the total passenger boardings within the United States. The airport is also designated as a Fixed Based Operator (FBO) and is permitted to provide aeronautical services such as fueling, hangar, aircraft parking, rental and maintenance, and flight instruction.

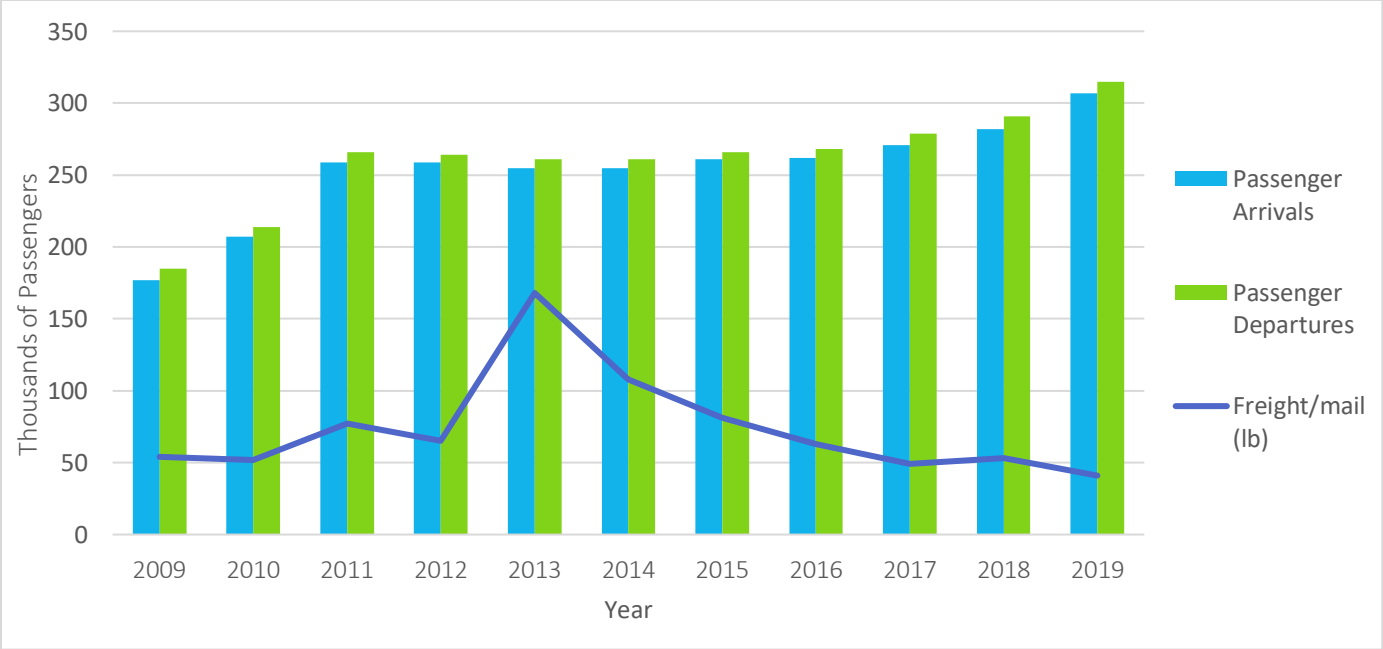
Between August 2018 and July 2019, Delta operated 33 percent of flight carrier shares at Augusta Regional Airport. Endeavor, a subsidiary of Delta, operated another 29 percent of carrier shares, and PSA, a subsidiary of American Airlines, operated 29 percent of shares. Piedmont, a subsidiary of American Airlines, Skywest, and other airlines made up the remainder of carrier shares, with 6.5 percent, 3 percent, and 2.5 percent respectively (see **Figure 6-2**). Sixty four (64) percent of flights went to Atlanta, GA, 32 percent of flights went to Charlotte, NC, and 3 percent of flights went to Dallas-Fort Worth, TX. Less than one-percent of flights went to New York, NY; Washington, DC; and Miami, FL. As of January 7, 2020, direct flights from Augusta to Washington D.C. were made available at the Augusta Regional Airport via American Airlines. At least one flight is scheduled to D.C. every day.



Source: US Federal Aviation Administration (2019)

Figure 6-2. Carrier Shares for August 2018 - July 2019

Figure 6-3 shows trends in passengers and freight traveling through Augusta Regional Airport in the past decade. Air passenger throughput has shown a steady increase since 2015, despite falling freight throughputs since 2013. Statistics provided by Augusta Regional Airport indicate that in 2019, 83 percent of departures and 82 percent of arrivals were on time. The average departure delay was 66 minutes, and the average arrival delay was 61 minutes. Two percent of flights were cancelled.



Source: US Department of Transportation, Bureau of Transportation Statistics (2009-2019)

Figure 6-3. Augusta Regional Airport Passengers and Freight (2009 – 2019)

The Augusta National Golf Tournament, commonly referred to as The Masters, creates the busiest season for the Augusta Regional Airport and Daniel Field Airport. The economic impact of Augusta Regional Airport is significant. As of 2011, the airport supported the region with 1,561 jobs with an annual payroll of $59,016,500 and a total economic output of $269,632,600.[v] A new passenger terminal facility opened in 2011, consisting of 14,000 square feet of flight planning, crew area, and amenities for passengers. The recently created credit card parking lot and taxiway expansion further strengthened Augusta Regional Airport's role in the regional economy. An update to the Georgia Statewide Airport Economic Impact Study, anticipated in 2020, will likely show increased economic contributions due to the improvements and expansions that have taken place in the intervening years.

6.2 Daniel Field Airport

Daniel Field Airport is publicly owned and operated by the General Aviation Commission (GAC). The two-runway airport is on 146 acres of land approximately five miles from downtown Augusta. The Georgia Aviation System Plan classifies Daniel Field Airport as a Level 1 Airport, one of thirty in the State of Georgia. Daniel Field is primarily used by corporate and private clients for business and recreational purposes, and the Airport hosts the Augusta Squadron of the Civil Air Patrol. In 2001, Daniel Field Airport had an economic impact of more than $15 million, providing 127 total jobs with a total payroll of $4,372,600.

Daniel Field provides fuel, parking, hangars, recreational flying, corporate/business jets, flight training and instruction, experimental aircraft, charters, and aircraft repair. Landside services include 99 apron parking spaces, 62 hangar spaces, 70 auto parking spaces, and a 6,700-square foot terminal and administrative building. Because it is located less than three miles from the Augusta National Golf Course, Daniel Field Airport plays an important role during Masters Week, the first full week in April. During this time, charter and corporate operators attending the Masters Golf Tournament use the Airport extensively. Medical air services also use the airport almost daily due to the numerous medical facilities in the Augusta region. According to the GAC, Daniel Field Airport has over 27,500 flight operations each year.

6.3 Aiken Municipal Airport

Aiken Municipal Airport is city-owned and managed and is located five miles north of the Aiken, SC central business district on 70 acres of land. The Airport has two runways and averages 120 daily aircraft operations. Of these operations, 61 percent are for local general aviation, 32 percent for transient general aviation, 6 percent for air taxis, and 1 percent for military operations. Aiken Municipal Airport operates year-round with extended hours during Masters Golf week. Currently, no scheduled commercial airlines operate to or out of Aiken Municipal Airport.

The airport has two runways and accommodates: hotel shuttles, car rentals, and taxi services; passenger, commercial, and air freight services; corporate and business jets; recreational flying and agricultural spraying; and flight training and the testing of experimental aircraft.

7 Freight

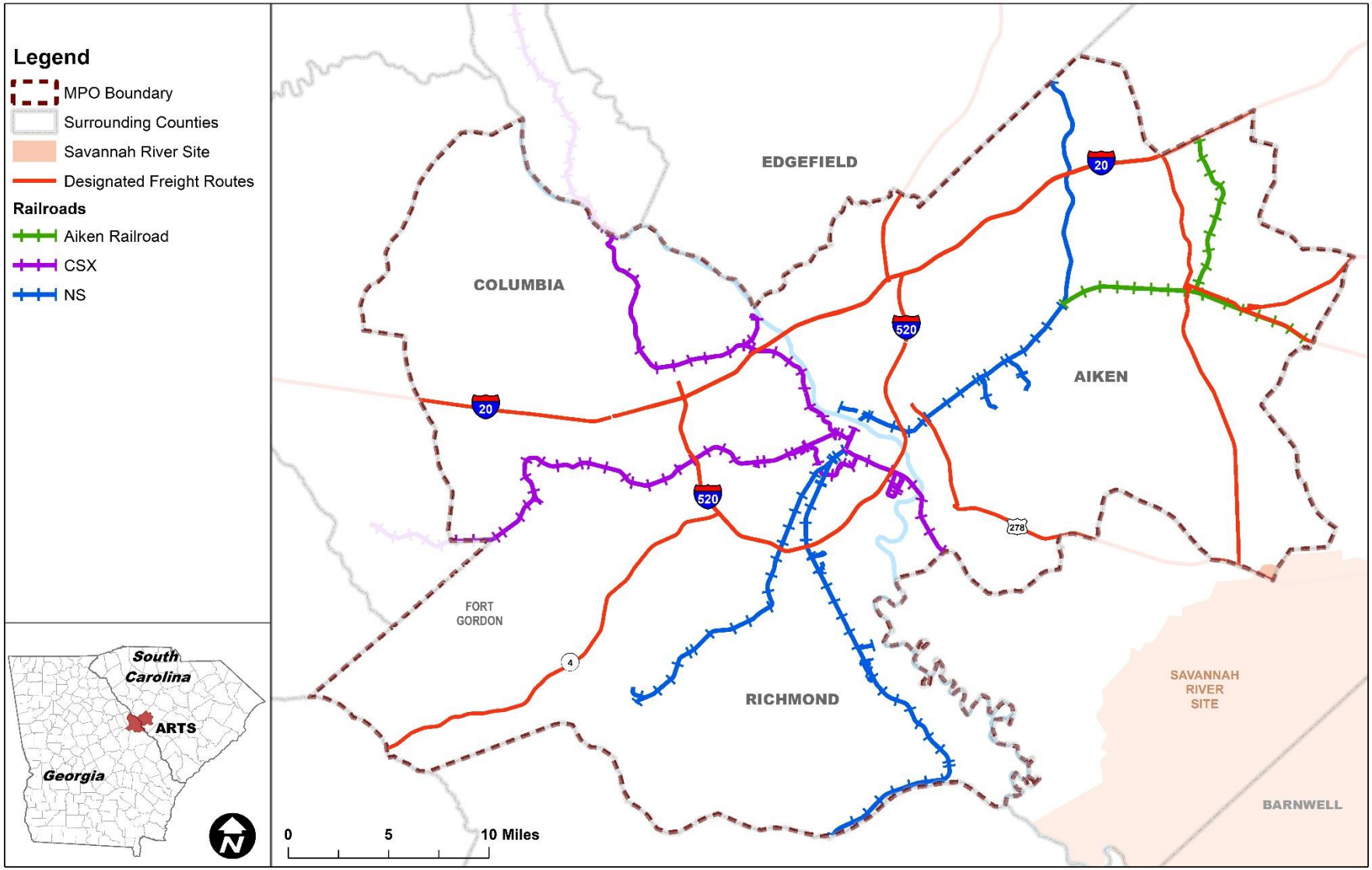
Freight is a significant component of transportation demand within the ARTS planning area. Trucking and rail are the primary and secondary freight movement modes, respectively. I-20 and I-520 are the two routes within the ARTS planning area with the highest volumes of freight by weight and value. I-20 provides primary truck access through ARTS, while I-520 provides radial access to the City of Augusta. Despite several miles of navigable waterways in the study area, these are not used to transport freight. The following section provides information on the existing freight network, including truck movements and rail facilities.

This chapter contains the following sections:

- Freight Network
- Truck Movements
- Truck Parking
- Freight Rail

7.1 Freight Network

The ARTS planning area's freight network is comprised of over 315 miles of highway, including Interstates and Arterials, and over 180 miles of railroad. See **Figure 7-1** for the full freight network.



Source: 2040 LRTP (2015)

Figure 7-1. Freight Network (2019)

In addition to the designated freight routes shown in **Figure 7-1**, the 2008 Augusta Regional Freight Profile identifies a list of potential truck routes. Based on the truck volume and truck percentage, whether the route is a major thoroughfare vital to the circulation of vehicles in the region, or the route is near a cluster of freight users, the following additional routes are identified as potential truck routes: U.S. 1, U.S. 25, U.S. 278, GA 4, GA 28, GA 104, SC 121, SC 125, SC 126, SC 230, SC 302, Belair Road, Wheeler Road, Tobacco Road, Broad Street, GA 88, SC 39, SC 118, SC 19, and U.S. 78.

7.2 Truck Movements

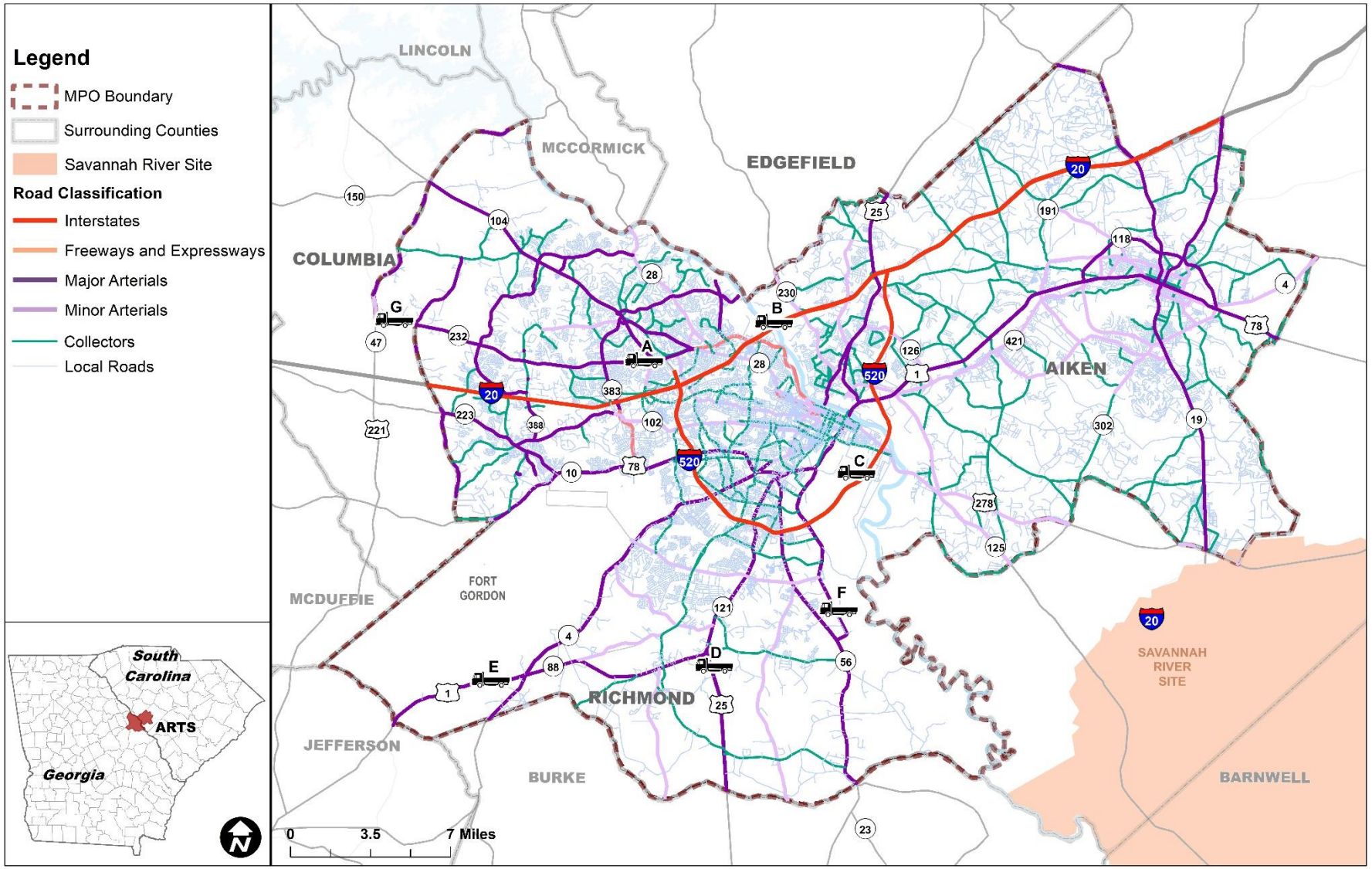
The Georgia Statewide Freight and Logistics Plan examines different data sources of economic and freight forecasts in Georgia and estimates truck flow data using the IHS Markit TRANSEARCH data. The TRANSEARCH data estimates truck flows by mode and by commodity for 2013 and 2050, including inbound, outbound and internal flows. According to the Georgia Statewide Freight and Logistics Plan, Richmond County was identified as one of the top 20 Georgia Counties with highest inbound and outbound Truck Tons in 2013 and 2050.

The Georgia Department of Transportation's Traffic Analysis and Data Application (TADA) also provides data collected from the Georgia Traffic Monitoring Program on public roads. TADA provides the annual average daily traffic (AADT) and heavy truck traffic percentages from 2008 to 2017. There are several locations in the ARTS planning area that had at least 4,000 AADT and over 10 percent heavy truck traffic in 2017. **Table 7-1** lists the road name, functional class, AADT, and truck traffic percentage of these locations and serves as the map key for **Figure 7-2**, which illustrates the locations of heavy truck traffic.

Table 7-1. Characteristics of the Identified Heavy Truck Traffic Locations (2017)

Map Key	Road Name	Functional Class	2017 Annual Average Daily Traffic	Truck Traffic (%)
A	**Carl Sanders Highway / I-20 @ Columbia County Line**	1U: Urban Principal Arterial - Interstate	73,700	11.00%
B	**Carl Sanders Highway / I-20 @ South Carolina State Line**	1U: Urban Principal Arterial - Interstate	60,000	13.00%
C	**Bobby Jones Expressway / I-520**	1U: Urban Principal Arterial - Interstate	26,300	13.00%
D	**Peach Orchard Road / U.S. Route 25**	3U: Urban Principal Arterial - Other	14,100	11.00%
E	**Deans Bridge Road / U.S. Route 1**	3U: Urban Principal Arterial - Other	7,510	21.00%
F	**Doug Barnard Parkway**	4U: Urban Minor Arterial	7,390	16.00%
G	**Columbia Road**	4U: Urban Minor Arterial	7,250	14.00%

Source: GDOT Traffic Analysis and Data Application



Source: GDOT Traffic Analysis and Data Application

Figure 7-2. Locations of Heavy Truck Traffic (2017)

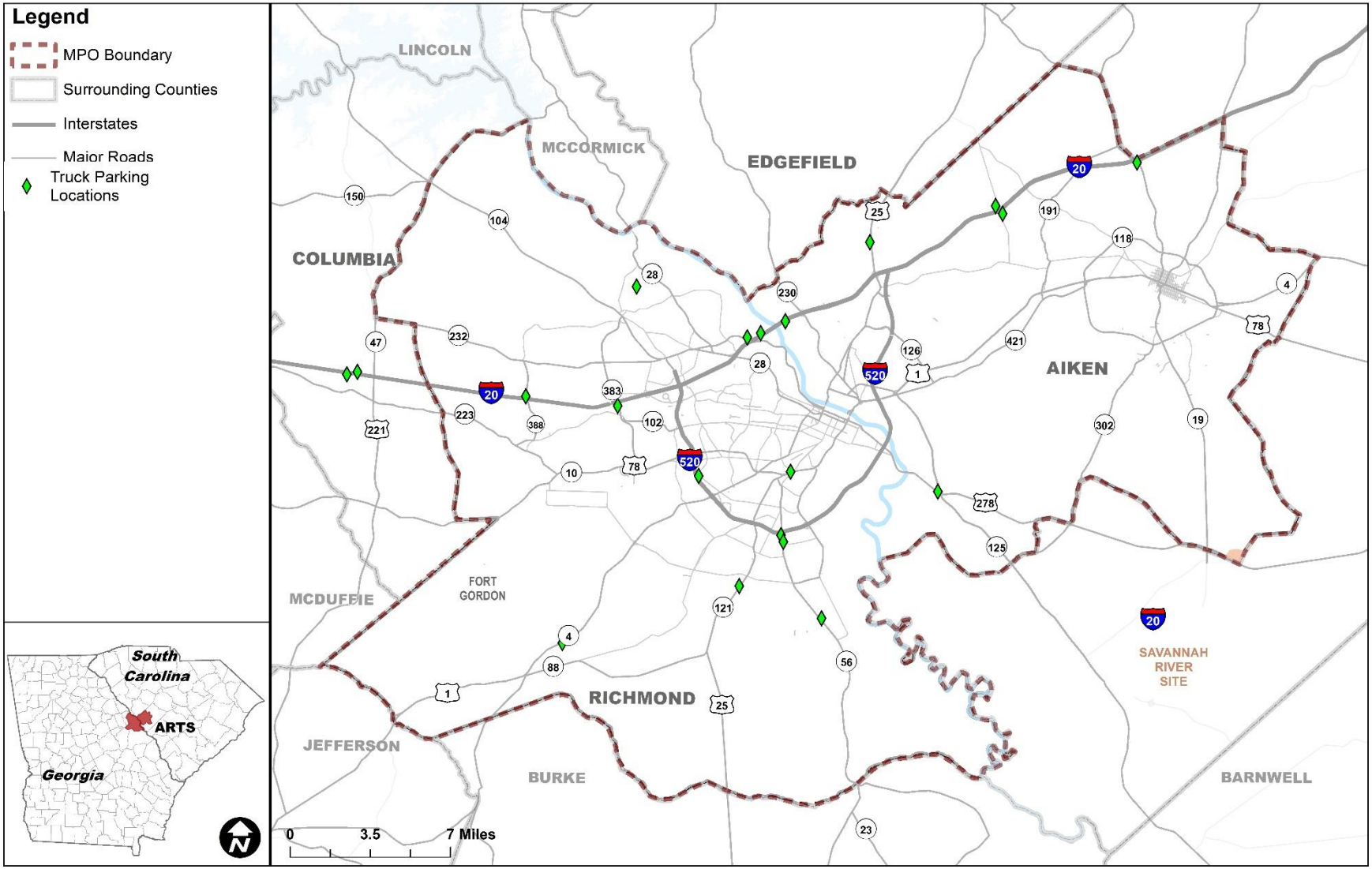
Because there is no direct interstate connection between the study area, Macon, GA, Savannah, GA, Charleston, SC, and Greenville, SC, freight vehicles use the arterial highway network. The following are designated as key truck routes in the ARTS planning area:

- I-20, I-520, and US 1/SR 4 (Fall Line Freeway) are part of the Georgia Statewide Designated Freight Corridor and the Governor's Road Improvement Program (GRIP) - a system of economic development highways that, when complete, will connect 95 percent of Georgia cities with populations of 2,500 or more to the Interstate Highway System and will place 98 percent of Georgia's population within 20 miles of a four-lane road.
- I-20, I-520, US 4, US 19, US 25, and US 78 are part of South Carolina's Strategic Freight Roadway Network.
- I-20 between Atlanta, GA and South Carolina is a designated Long-Haul Interstate Corridor.

7.3 Truck Parking

In 2012, MAP-21 legislation mandated an Electronic Logging Device (ELD) rule, which went into effect December 2017, that directs all motor carriers to install automatic computers that monitor a driver's hours of service. Intended to help create a safer work environment for drivers and the public, the ELD dictates that truck drivers may only drive for a maximum of 11 hours per day, after which the driver must stop for a minimum of 10 hours. This makes parking for commercial trucking vehicles a major concern for most urban areas.

Figure 7-3 shows truck parking locations in the ARTS planning area, eight of which are located near I-20 and three of which are located near I-520. These truck parks and stops allow overnight parking and are open 24 hours year-round. There may be a need both for more truck parking in the ARTS planning area, and for careful consideration as to its siting to support residential quality of life.



Source: Google Maps

Figure 7-3: Truck Parks in the ARTS Planning Area (2019)

7.4 Freight Rail

There are currently two major railroad operators within the ARTS planning area: CSX Transportation (CSX) and Norfolk Southern Railways (NS) are Class I railroad companies. Class I railroads are defined as those that operate over thousands of route miles, employ thousands of people, and have revenues and budgets in the billions of dollars.[vi] CSX has mainlines and spur tracks that serve Aiken, Columbia, and Richmond Counties. CSX's main terminal is in Augusta off Laney-Walker Boulevard. CSX's TRANSFLO terminal, a point of transfer for bulk commodities between railcars and trucks, is also in Augusta between Wrightsboro Road and Olive Road. Norfolk Southern's rail yard is at East Boundary Road and Gwinnett Boulevard. Both CSX and NS have small facilities in south Richmond County and central Augusta.

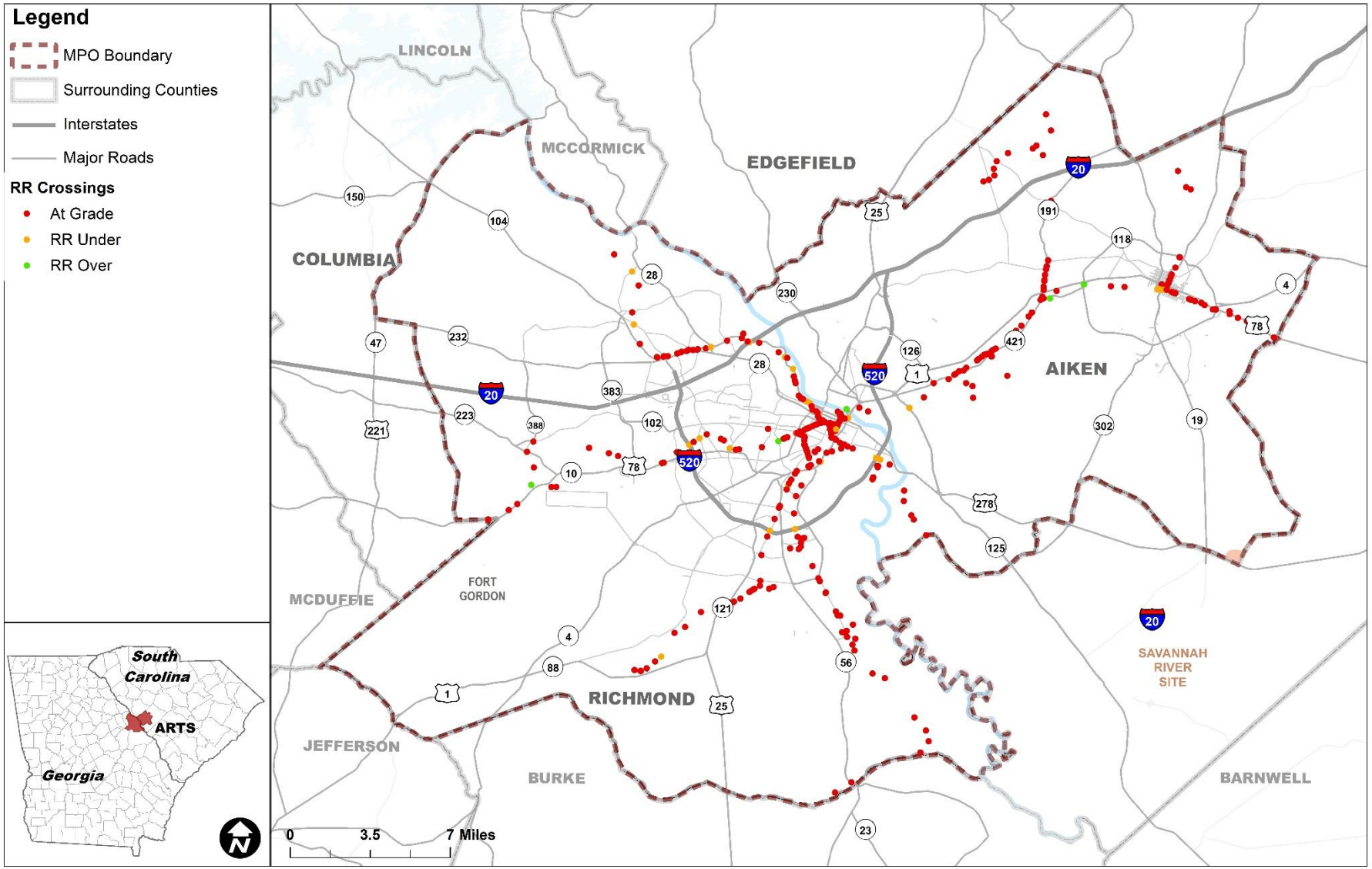
The ARTS planning area also has a Short Line, or Class III rail. These are tracks that cover a shorter distance and accommodate low tonnage railcars. Short Line railroads serve a limited area and have an operating revenue under $40 million. Aiken Railway Company, LLC (AIKR), the only Short Line operator in the ARTS planning area, is a subsidiary of Western Carolina Railway Service Corporation. It leases and operates two NS lines in Aiken County for a total of 18.9 miles of railroad.

Table 7-2 presents different types of traffic control devices that have been developed and installed at highway-railroad at-grade crossings to warn and inform crossing users in the four-county ARTS planning area. **Figure 7-4** shows locations of rail crossings in the ARTS planning area, and **Table 7-3** shows types of railroad crossings in the four-county ARTS planning area.

Table 7-2. ARTS Four-County At-Grade Railroad Crossing Traffic Control Devices (2019)

Highway-Railroad Grade Crossing Traffic Control Device	Columbia: 21 Crossings		Richmond: 154 Crossings		Aiken: 120 Crossings		Edgefield: 28 Crossings	
	Number	%	Number	%	Number	%	Number	%
Advance Warning Signs Blank/Unknown	0	0.0%	41	26.8%	19	15.8%	19	70.4%
Advance Warning Signs None	21	100.0%	87	56.9%	81	67.5%	3	11.1%
Bells Yes	18	85.7%	66	43.1%	36	30.0%	15	55.6%
Bells None	3	14.3%	87	56.9%	84	70.0%	12	44.4%
Cantilevered Flashing Light Structure Yes	5	23.8%	24	15.7%	16	13.3%	15	55.6%
Cantilevered Flashing Light Structure Blank/Unknown	16	76.2%	56	36.6%	74	61.7%	1	3.7%
Cantilevered Flashing Light Structure None	na	na	73	47.7%	30	25.0%	11	40.7%
Gate Configuration 2 Quad	18	85.7%	42	27.5%	6	5.0%	2	7.4%
Gate Configuration 4 Quad	0	0.0%	0	0.0%	1	0.8%	0	0.0%
Gate Configuration Median Gates	2	9.5%	1	0.7%	1	0.8%	0	0.0%
Signs or Signals at Crossing	19	90.5%	127	83.0%	105	87.5%	25	92.6%
Signs or Signals at Crossing Unknown	0	0.0%	11	7.2%	6	5.0%	1	3.7%
No Signs or Signals at Crossing	2	9.5%	15	9.8%	9	7.5%	1	3.7%
Pavement Markings None	3	14.3%	58	37.9%	59	49.2%	9	33.3%
Pavement Markings Unknown	1	4.8%	8	5.2%	11	9.2%	0	0.0%
Pavement Markings Yes	17	81.0%	87	56.9%	50	41.7%	18	66.7%
Simultaneous Traffic Signal Preemption	5	23.8%	14	9.2%	3	2.5%	2	7.4%

Source: Grade Crossing Inventory System OSA FRA, Table 4 in ARTS Traffic Conflicts at Highway-Railroad Crossings, 2010-2019 Report



Source: Grade Crossing Inventory System OSA FRA

Figure 7-4. Locations of Rail Crossings (2019)

Table 7-3. ARTS Four-County Types of Railroad Crossing (2019)

Four-County Railroad Crossings						
Railroad Crossing Type	**Columbia**	**Richmond**	**Aiken**	**Edgefield**	**Total**	**Percent**
At-grade	32	229	208	63	532	90.0%
Railroad Under	2	24	16	4	46	7.8%
Railroad Over	1	1	6	5	13	2.2%
Total	35	254	230	72	591	100%
Percent	5.9%	42.9%	38.9%	12.2%	100%	

Source: Grade Crossing Inventory System OSA FRA

8 Transit

The availability of transit is essential to the region's ability to provide additional mobility options to residents, workers and visitors, to accommodate future growth, and to expand its employment opportunities. In addition to serving as an alternative to the private motor vehicle as a transportation mode, transit is especially important for people without access to a vehicle, people with a disability and aging seniors. For people in the ARTS planning area that can relate to one or more of the preceding categories, access to transit is not a choice, it is a necessity.

This chapter contains the following sections:

- Existing Transit Service
- Microtransit and Other Transit Providers
- Intercity Bus Service
- Passenger Rail

8.1 Existing Transit Service

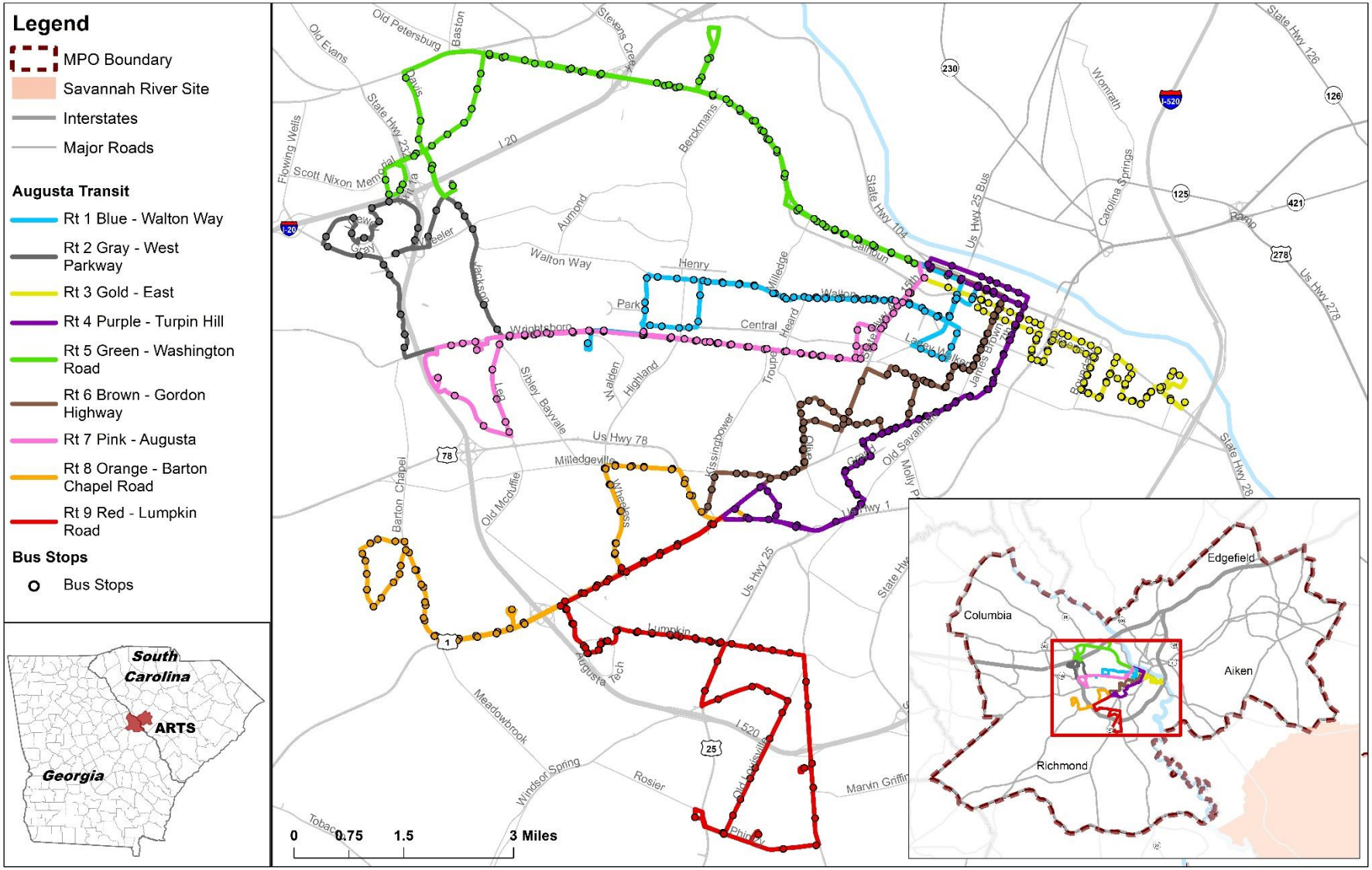
There are four agencies within the ARTS planning area that provide transit and related services. These agencies are: Augusta Transit (AT), Columbia County Commission Transit (CCCT), Lower Savannah Council of Governments (LSCOG) and Aiken Senior Life Services (previously known as Aiken Area Council on Aging). AT and Best Friend Express (BFE) are fixed route transit and paratransit systems in the ARTS planning area. Rural transportation providers include Pony Express, a part of BFE for rural Aiken County and Richmond County Transit, a part of AT.

8.1.1 Augusta Transit

AT runs nine fixed routes primarily in and around the City of Augusta, which are operated by an international multimodal transportation operator – RATP Dev. Most of AT's fixed routes connect downtown Augusta with the outer parts of the City. Generally, public transit services operate from 6:30 a.m. to 8:00 p.m. Monday through Friday. None of the routes by AT operate on late evening or on Sunday. AT's fixed routes, as illustrated in **Figure 8-1**, serve the northern half of the City of Augusta. The southern part of City of Augusta is not served directly by AT's fixed routes. Paratransit vehicles of Richmond County Transit System operate in areas classified as non-urban by GDOT, such as Hephzibah, McBean and Blythe from 6 a.m. to 3:45 p.m. Reservations are required to avail of this service.

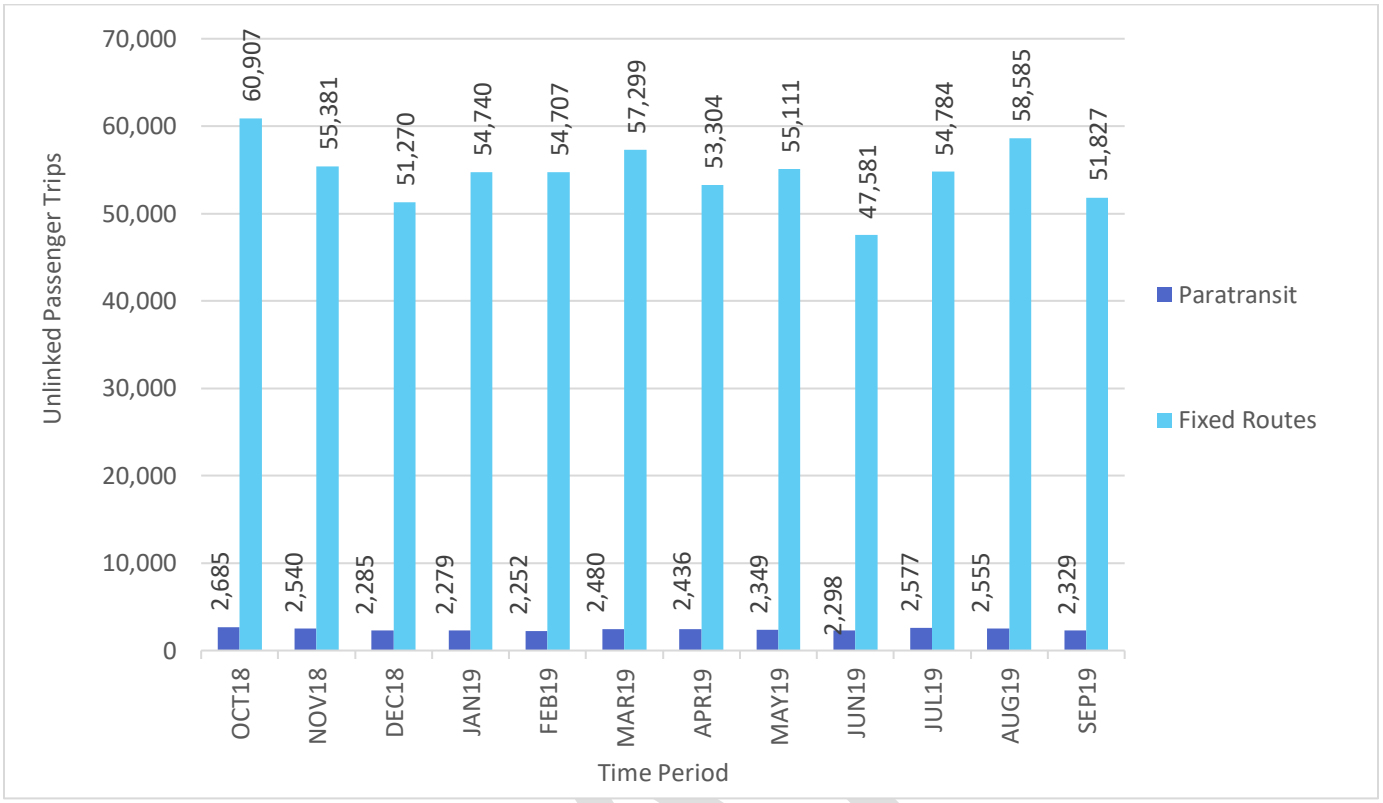
AT provides origin-to-destination paratransit services for persons with a permanent or temporary disability that prevents them from using fixed-route services. Paratransit services are offered within ¾ mile of AT's fixed route services complying with the American with Disabilities Act (ADA) of 1990. Paratransit service has similar operating hours to that of the fixed route system.

Figure 8-2, **Figure 8-3** and **Figure 8-4** show the observed ridership on Augusta Transit Routes. While fixed-route ridership levels have generally remained steady over the past two years, demand response ridership has increased in the past year.



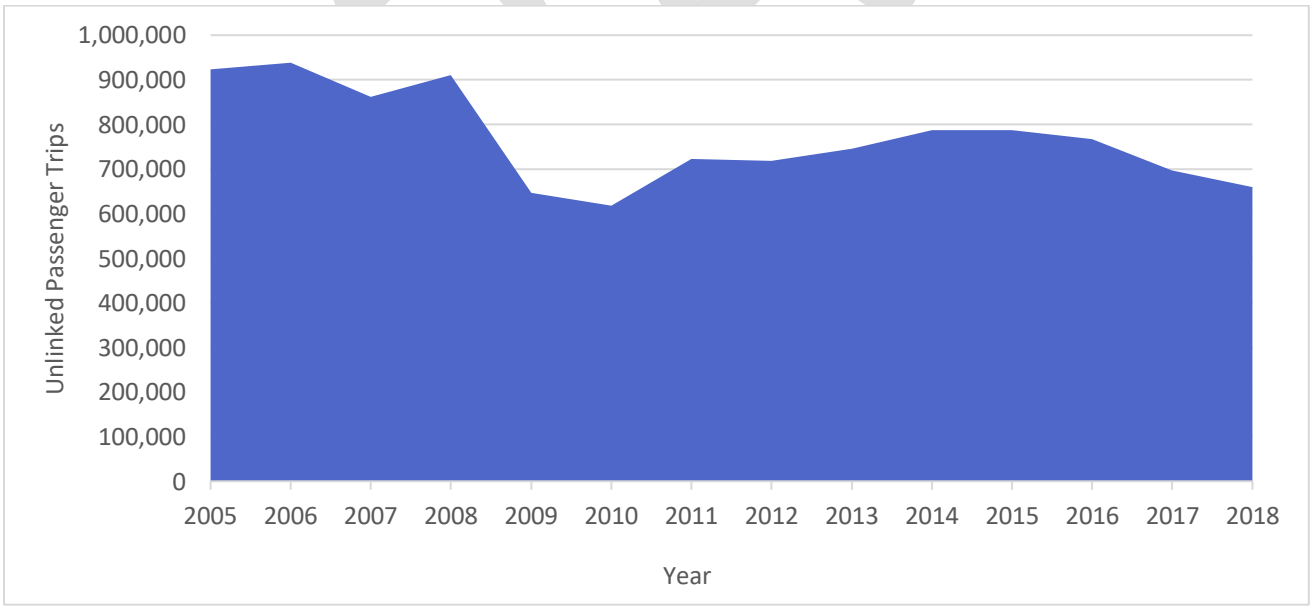
Source: ARTS MPO, Augusta Transit

Figure 8-1. Augusta Transit Bus Routes (2019)



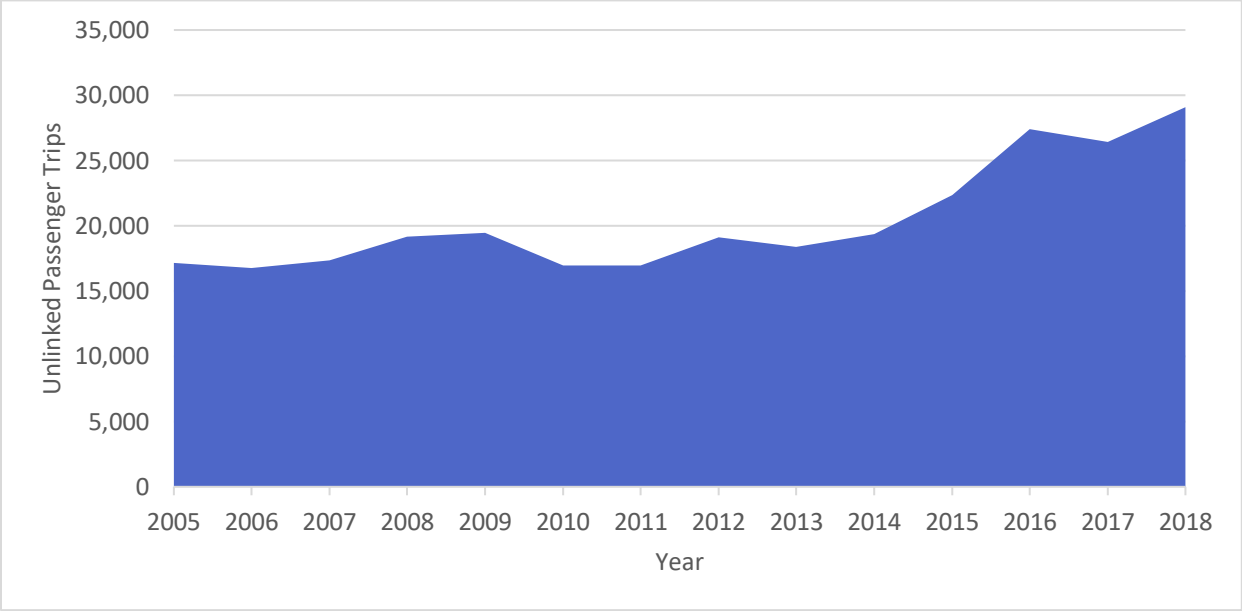
Source: National Transit Database (2019)

Figure 8-2. System-wide Monthly Person Trips on Augusta Transit (October 2018 – September 2019)



Source: National Transit Database (2018)

Figure 8-3. System-wide (Fixed Route) Annual Passenger Trips on Augusta Transit (2005-2018)

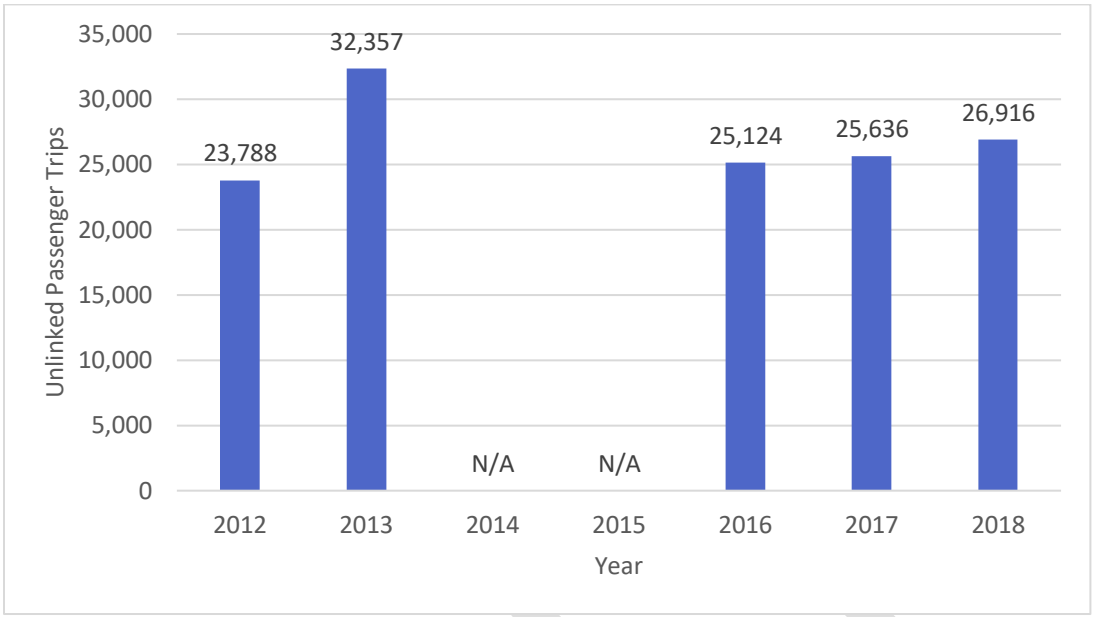


Source: National Transit Database (2018)

Figure 8-4. System-wide (Demand Response) Annual Passenger Trips on Augusta Transit (2005-2018)

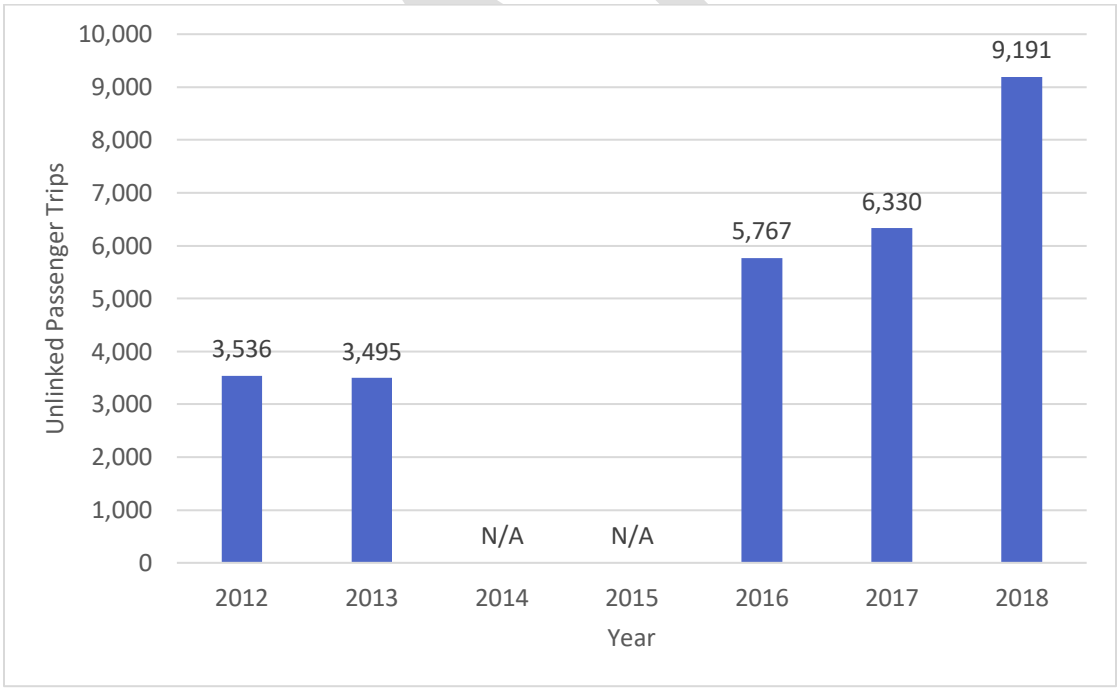
8.1.2 Lower Savannah Council of Governments (LSCOG)

LSCOG is one of the regional planning organizations in South Carolina. It receives federal and state funds for the operation of transit in urbanized areas of Aiken County. LSCOG provides a fixed route service – BFE and an ADA paratransit service — Dial-A-Ride. LSCOG contracts with a local transit provider for the operation of these services. BFE operates a circular weekday service on three routes between the hours of 7:00 a.m. to 7:00 p.m. Currently, there is no weekend service. All vehicles utilized for public transportation are ADA compliant and are equipped with lifts for wheelchair accessibility. **Figure 8-7** shows BFE's three fixed routes. Service area for Dial-A-Ride includes ¾ mile around the BFE's regular fixed routes within South Carolina. Reservations for Dial-A-Ride trips must be made no later than the day before the date for the trip.



Source: National Transit Database (2018)

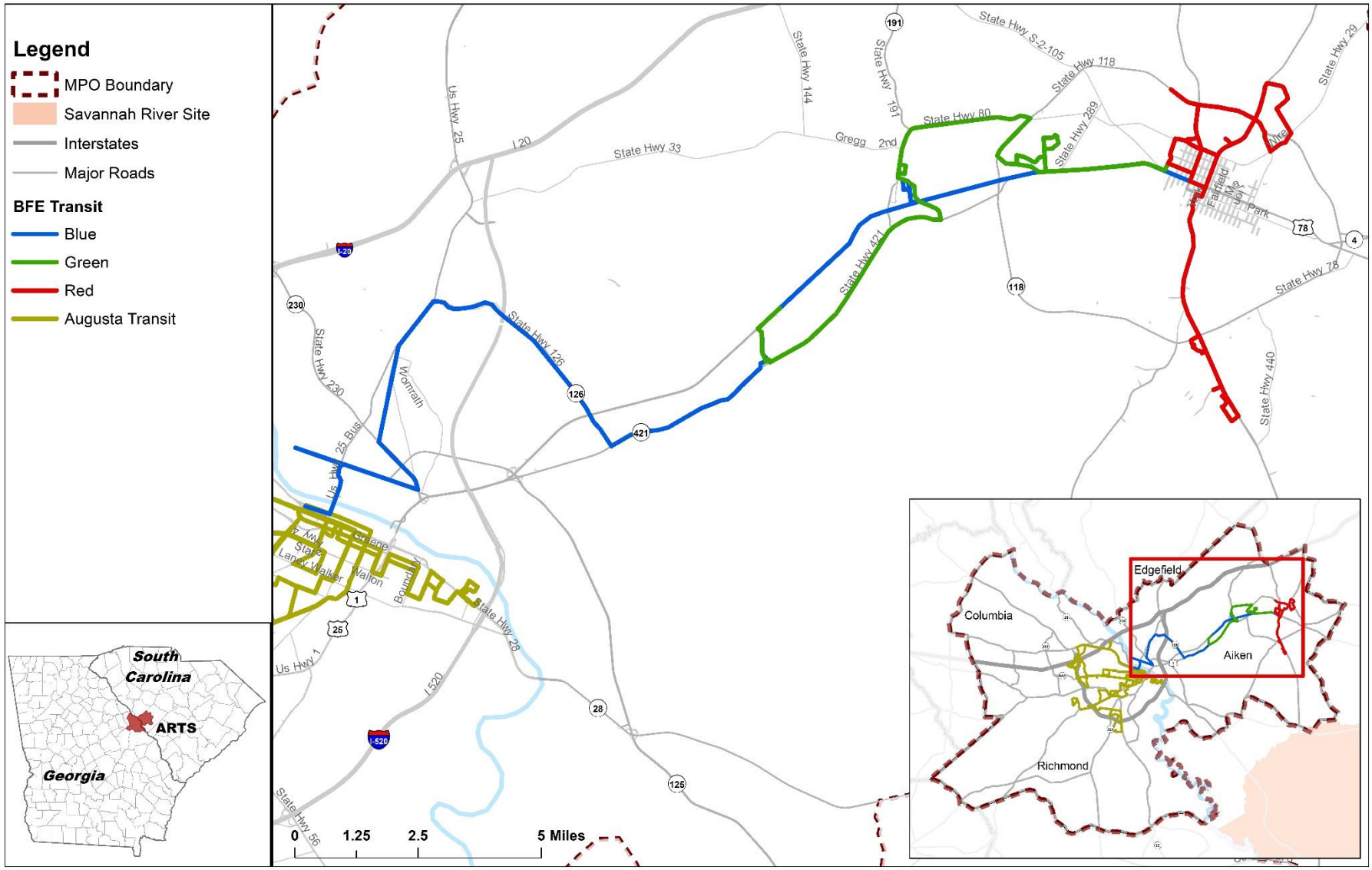
Figure 8-5. System-wide (Fixed Route) Annual Passenger Trips on Best Friend Express (2012-2018)*



Source: National Transit Database (2018)

Figure 8-6. System-wide (Direct Response) Annual Passenger Trips on Best Friend Express (2012-2018)*

*No data available for 2014 and 2015.

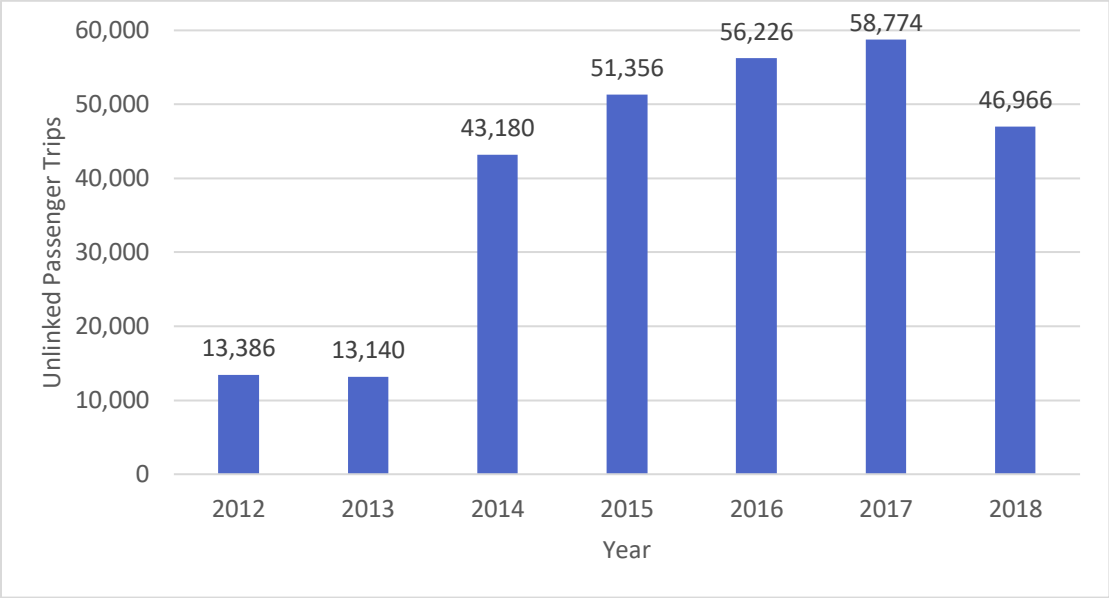


Source: Best Friend Express (2019)

Figure 8-7. Best Friends Express Bus Routes (2019)

8.1.3 Columbia County Commission Transit

Columbia County Commission Transit (CCCT) is an appointment based curb-to-curb rural transit service. CCCT is available for all residents of Columbia County and serves all Columbia County and Richmond County destinations (apart from areas south of Gordon Highway). The earliest drop off time is 10:00 am and the latest pick-up time is 3:30 p.m.



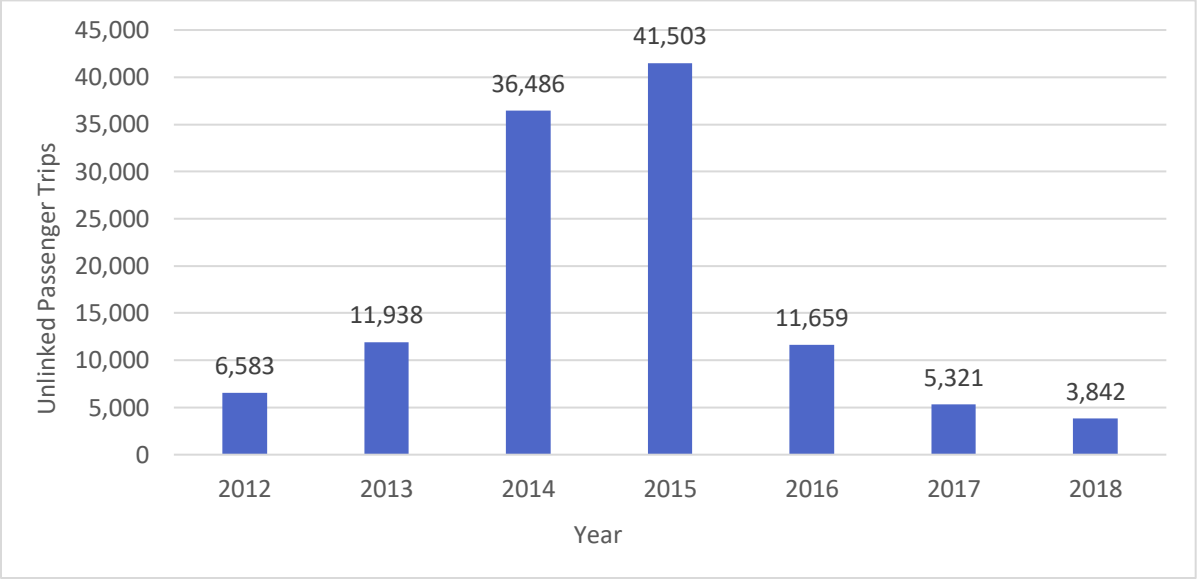
Source: National Transit Database (2018)

Figure 8-8. System-wide (Direct Response) Annual Passenger Trips on CCCT (2012-2018)

8.1.4 Aiken Senior Life Services

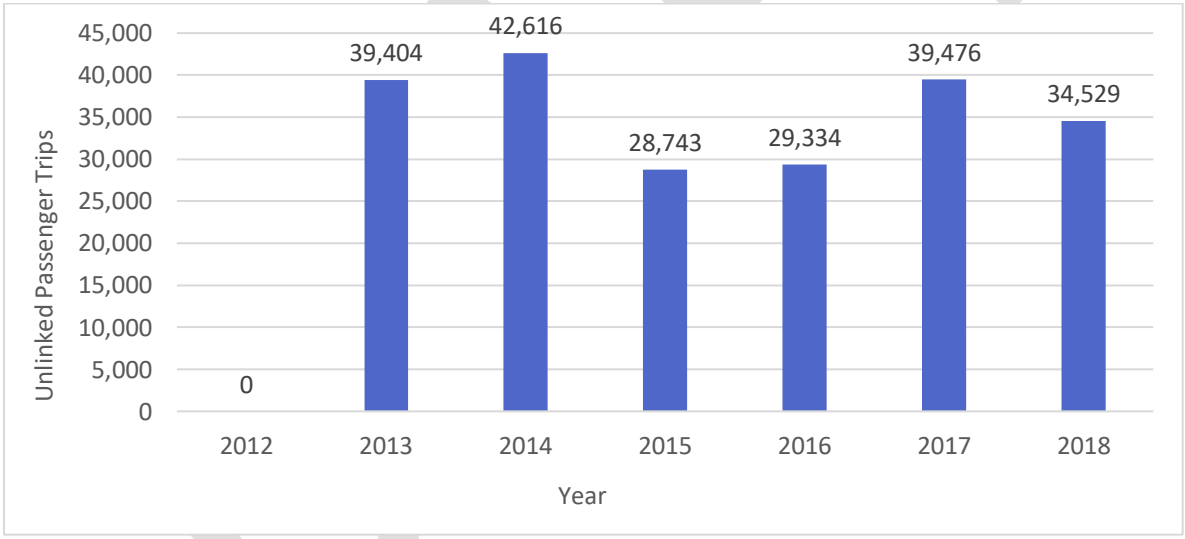
Aiken Senior Life Services, previously known as the Aiken Area Council on Aging, Inc., provides a variety of programs and services to promote the well-being of aging persons living in Aiken County. It also provides a coordinated transportation services to the public outside the "urbanized portion" of Aiken County. Programs by Aiken Senior Life Services' include:

- Pony Express: Aiken Senior Life Services offers transportation to people throughout Aiken County, operating the Pony Express bus service. This is a free public transportation service for the rural areas of Aiken County, which includes New Ellenton, Jackson, Beech Island, Wagener, Salley, and parts of North Augusta and the City of Aiken. All vehicles that are used to provide this service are ADA-compliant.
- Medicaid Non-Emergency Medical Transportation: This program offers transportation to and from medical treatment and related appointments. This can and does include infusion therapies, physical and occupational therapies, and doctor's appointments.
- Senior Transportation: This program allows Aiken Senior Life Services to provide transportation for medical appointments not covered in the previous section, shopping assistance, and for Aiken Senior Life Services's Congregate Dining programs hosted at five meal sites throughout Aiken County.



Source: National Transit Database (2018)

Figure 8-9. System-wide (Fixed Route) Annual Passenger Trips on Aiken Senior Life Services (2012-2018)



Source: National Transit Database (2018)

Figure 8-10. System-wide (Direct Response) Annual Passenger Trips on Aiken Senior Life Services (2012-2018)*

*No data available for 2012 Direct Response Service

8.1.5 Transit Reach

It is important to assess reach of fixed transit routes in the region so as to understand reliable access to transit for population groups in the area. **Figure 8-11** illustrates the limited reach of fixed route transit services in the ARTS planning area and compares it with the Environmental Justice (EJ) population. Reach of fixed route transit will be discussed further in the needs assessment section.

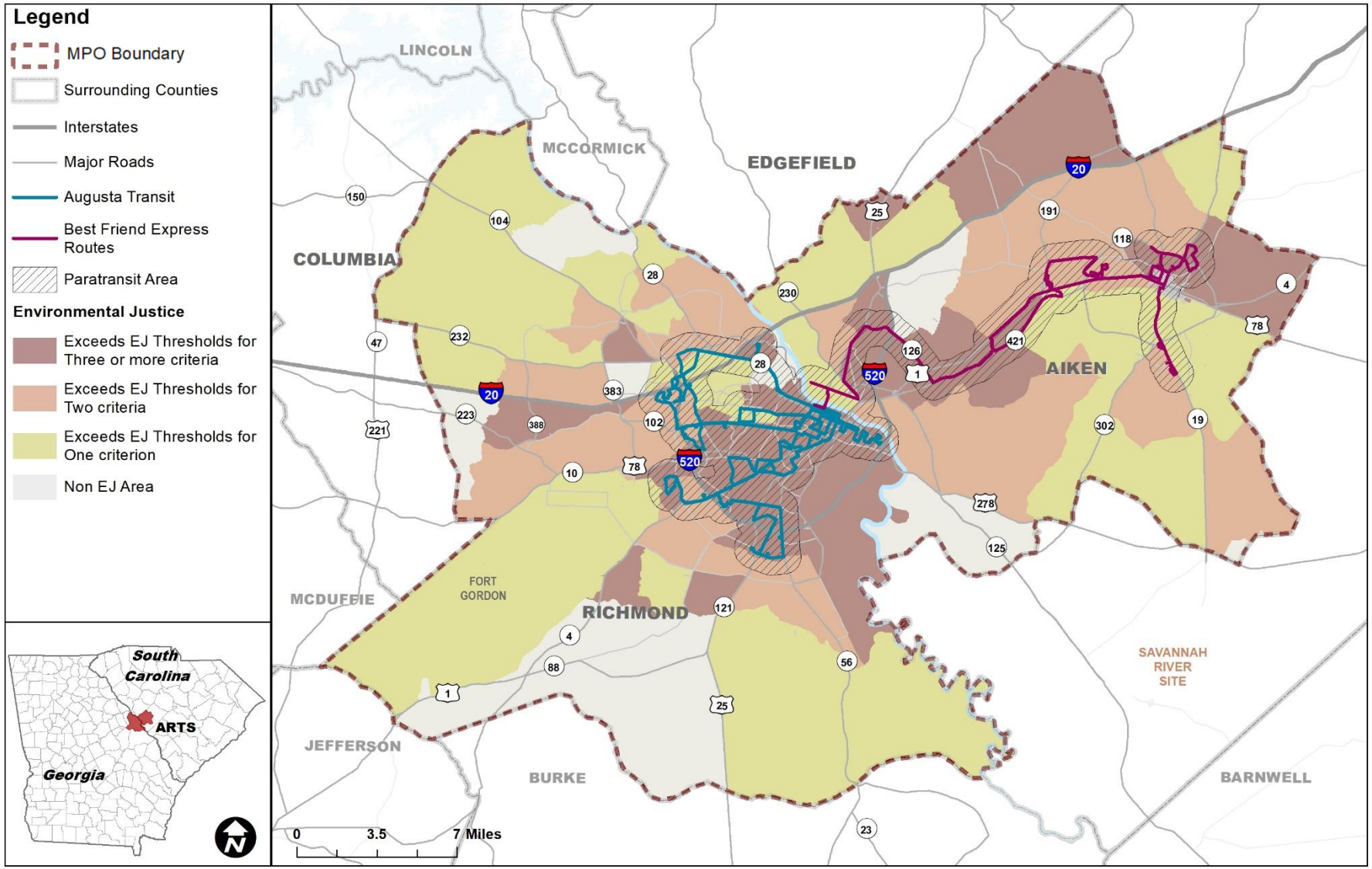


Figure 8-11. Environmental Justice Populations and Fixed Routes in ARTS Planning Area (2013-2017 ACS 5-Year Estimate)

8.1.6 Transit Performance

Table 8-1 and **Table 8-2** summarize the performance of transit operators in the ARTS planning area for the year 2018 based on the National Transit Database (NTD). AT tops the chart on highest number of annual unlinked passenger trips on fixed route systems in the ARTS planning area with about 659,599 trips in 2018. On the other hand, CCCT had the highest passenger trips on the demand response service.

Table 8-1. Performance Summary for Fixed Route Operators in the ARTS Planning Area (2018)

Agency Name	Operating Expenses	Fare Revenue	Unlinked Passenger Trips	Operating Expense per Passenger Trip	Vehicle Revenue Miles	Vehicle Revenue Hours	Vehicles Operated in Maximum Service
Augusta Transit (AT)	$3,603,571	$552,214	659,599	$5.46	545,666	42,593	12
Lower Savannah COG (LSCOG)	$443,920	$25,719	26,916	$16.49	123,322	6,875	3
Aiken Senior Life Services	$393,848	$0	3,842	$102.51	66,320	3,940	4

Source: National Transit Database (2018)

Table 8-2. Performance Summary for Demand Response Operators in the ARTS Planning Area (2018)

Agency Name	Operating Expenses	Fare Revenue	Unlinked Passenger Trips	Operating Expense per Passenger Trip	Vehicle Revenue Miles	Vehicle Revenue Hours	Vehicles Operated in Maximum Service
Augusta Transit (AT)	$1,148,915	$72,369	29,087	$39.50	205,428	18,109	7
Columbia County Commission Transit (CCT)	$582,861	$19,011	46,966	$12.41	272,627	16,298	10
Lower Savannah COG (LSCOG)	$285,783	$20,502	9.191	$31.09	66,080	6,278	4
Aiken Senior Life Services	$457,376	$0	34,529	$13.25	280,450	17,652	13

Source: National Transit Database (2018)

8.2 Microtransit and Other Transit Providers

In addition to the transit service discussed in the previous section, the ARTS planning area also includes other microtransit or transit operators providing transit access to senior centers in Columbia County and Edgefield County; JagExpress, which is Augusta University's Express Shuttle Service; Burke Transit; and, Master's Transportation Ministry.

- Edgefield County Senior Center - Peach Blossom Express
- Freeloader shuttle service – app based free shuttle service in downtown areas of Aiken and Augusta
- Free transportation to and from Senior Centers for Columbia County residents

- JagExpress – Augusta University's Express Shuttle Service
- Burke Transit – Rural transportation on a per call basis
- Master's Transportation Ministry

8.3 Intercity Bus Service

Southeastern Stages and Greyhound are the two major providers of inter-city bus service to the ARTS planning area. These providers operate out of four bus stations in the study area: Southeastern Stages at 1546 Broad Street; Fort Gordon Bus Station at 36200 36th St and Quick Pantry; Aiken Bus Station at 1125 Greene Street; and, the Aiken Terminal located at 2170 University Parkway. The ARTS planning area is also served by private services such as Groome Transportation which operates several daily shuttles between Augusta and the Hartsfield-Jackson Atlanta International Airport.

8.4 Passenger Rail

The ARTS planning area is currently not served by passenger rail. The closest passenger rail facilities to the ARTS planning area are provided by AMTRAK in Denmark, SC (62 miles away), Columbia, SC (74 miles away), Gainesville, GA (140 miles way), Savannah, GA (128 miles) and Atlanta, GA (148 miles away).

9 Active Transportation

Active transportation refers to any form of self-propelled, human-powered transportation such as walking or biking. Infrastructure such as sidewalks, trails, and bicycle facilities serve a critical function in the development of comprehensive multimodal transportation networks by providing an additional means of moving people. Given that, at some point along a given trip, every traveler is a pedestrian, these facilities must be taken into consideration. For places that cater to the non-motorist, such as schools, libraries, mixed-use commercial centers and recreation areas, sidewalks take on an increased importance. In areas with high non-motorized traffic, crosswalks at intersections should be provided to minimize conflicts between people and vehicles. This section summarizes the existing inventory of pedestrian and bicycle facilities including bike lanes, sidewalks, and multi-use trails in the ARTS planning area.

This chapter contains the following sections:

- Sidewalks
- Trails and Greenways
- Bike Lanes
- Safe Routes to School (SRTS)
- Complete Streets

9.1 Sidewalks

A sidewalk is a vital component in creating a walkable and healthy community because it separates vehicles from pedestrians. This separation enhances the safety, connectivity, and comfort of pedestrians and bicyclists. In addition to sidewalks, other important elements creating a pedestrian friendly environment include: pedestrian signals, crosswalk treatments, signage, pedestrian refuge islands, and streetscape elements. Although most residents within the ARTS planning area drive to work, there are several thousand people who walk as their primary commuting mode (see **Table 9-1**). This number does not reflect the number of people who walk to other destinations (such as running errands), nor does it reflect the number of people who would like to walk to work.

There are concentrations of sidewalk infrastructure in the urban cores of downtown Augusta, GA and Aiken, SC. Sidewalks also occur in small clusters scattered throughout Columbia County (see **Figure 9-1**). However, many gaps still exist in the current pedestrian mobility network.

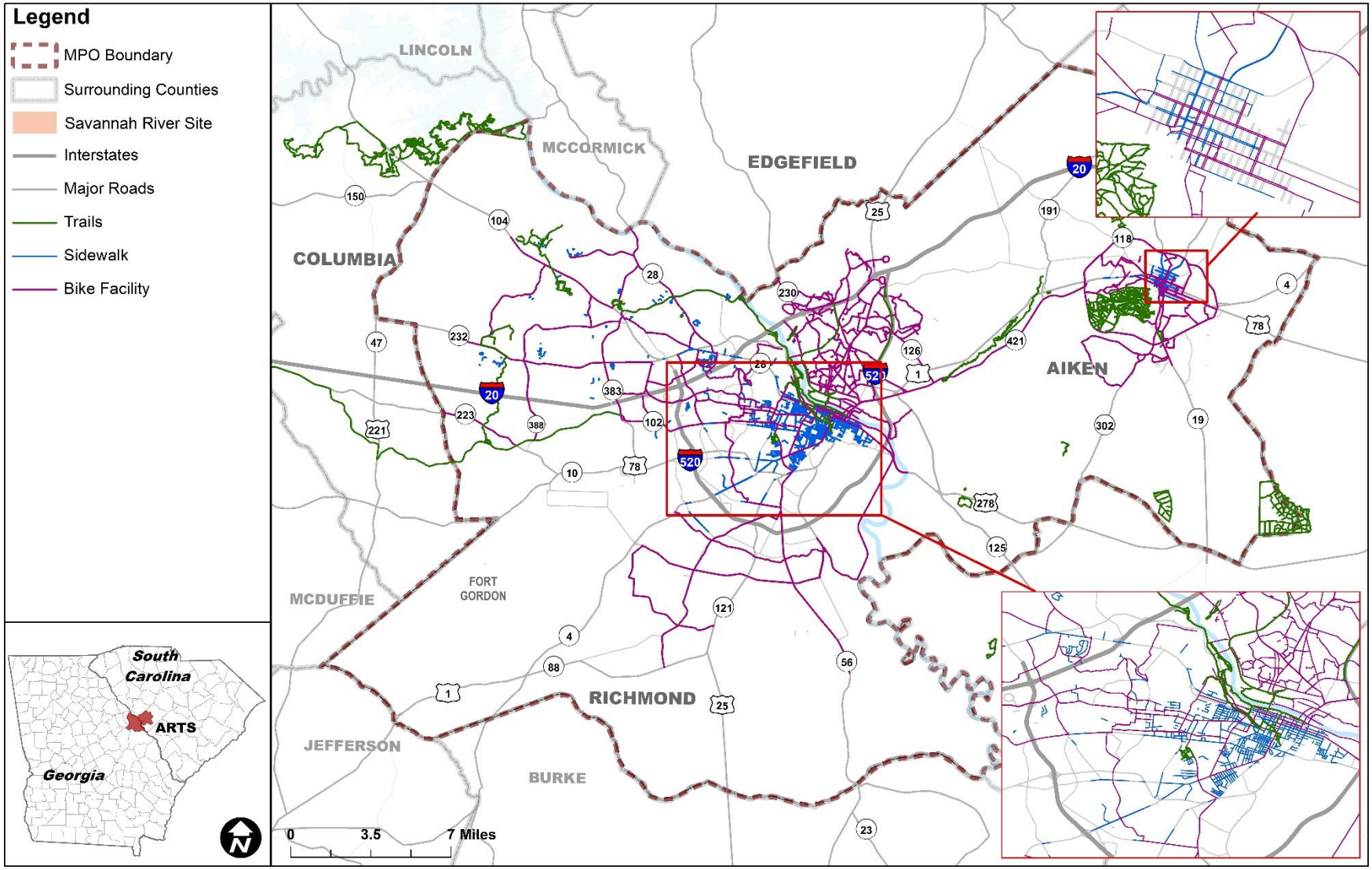
Past plans have called for additional pedestrian infrastructure. In 2017, Aiken County released the Aiken County Bicycle and Pedestrian Plan, which recommended physical infrastructure such as separated, multi-use paths for bicyclists and pedestrians, greenways, and striped bike lanes. The plan also recommended continued and expanded safety and educational programs to encourage and improve non-motorized transportation conditions. In addition, the 2040 LRTP recommends sidewalk improvements throughout the four-county area. The 2012 Augusta Regional Transportation Study Bicycle and Pedestrian Plan provided a set of minimum design standards and guidelines for the design of bicycle and pedestrian facilities. In addition to engineering guidelines, policy and education recommendations were put forward in the Plan. Educating motorists about sharing the road, encouragement of safe routes to school programs and consistent enforcement of existing laws and regulations, all these initiatives have a role in creating bicycle and pedestrian friendly spaces in the study area.

Table 9-1. Number of Residents Walking to Work (2013-2017 ACS 5-Year Estimate)

County	Columbia County	Richmond County	Aiken County	Edgefield County
Walked	178	2851	692	140

Source: 2013-2017 ACS 5-Year Estimate

It is also important to assess the conditions of existing infrastructure. The City of Augusta completed ADA Self Evaluation and Transition Plan in 2016 which assesses conditions of existing sidewalks, ramps and access to bus stops. As part of this ADA Self-Evaluation and Transition Plan, Augusta evaluated these infrastructure categories to determine compliance with ADA regulations. Recommendations from the ADA plan will also be used to inform needs assessment for pedestrian and bicycle infrastructure.



Source: 2040 LRTP (2015), ARTS Bicycle and Pedestrian Plan (2012)

Figure 9-1. Existing Active Transportation Infrastructure (2012)

9.2 Trails and Greenways

The ARTS planning area has several multi-use recreational trails that link communities, strengthen connectivity and enhance access. Multi-use trails are open for non-motorized uses only and often combine recreational uses shared by pedestrians, bicyclists, and equestrians. The Augusta Canal, North Augusta Greeneway, Columbia County's Euchee Creek Greenway (currently under construction), and Aiken County's Hitchcock Woods are four high-quality and very popular local examples of multi-use trails (**see Figure 9-1**).

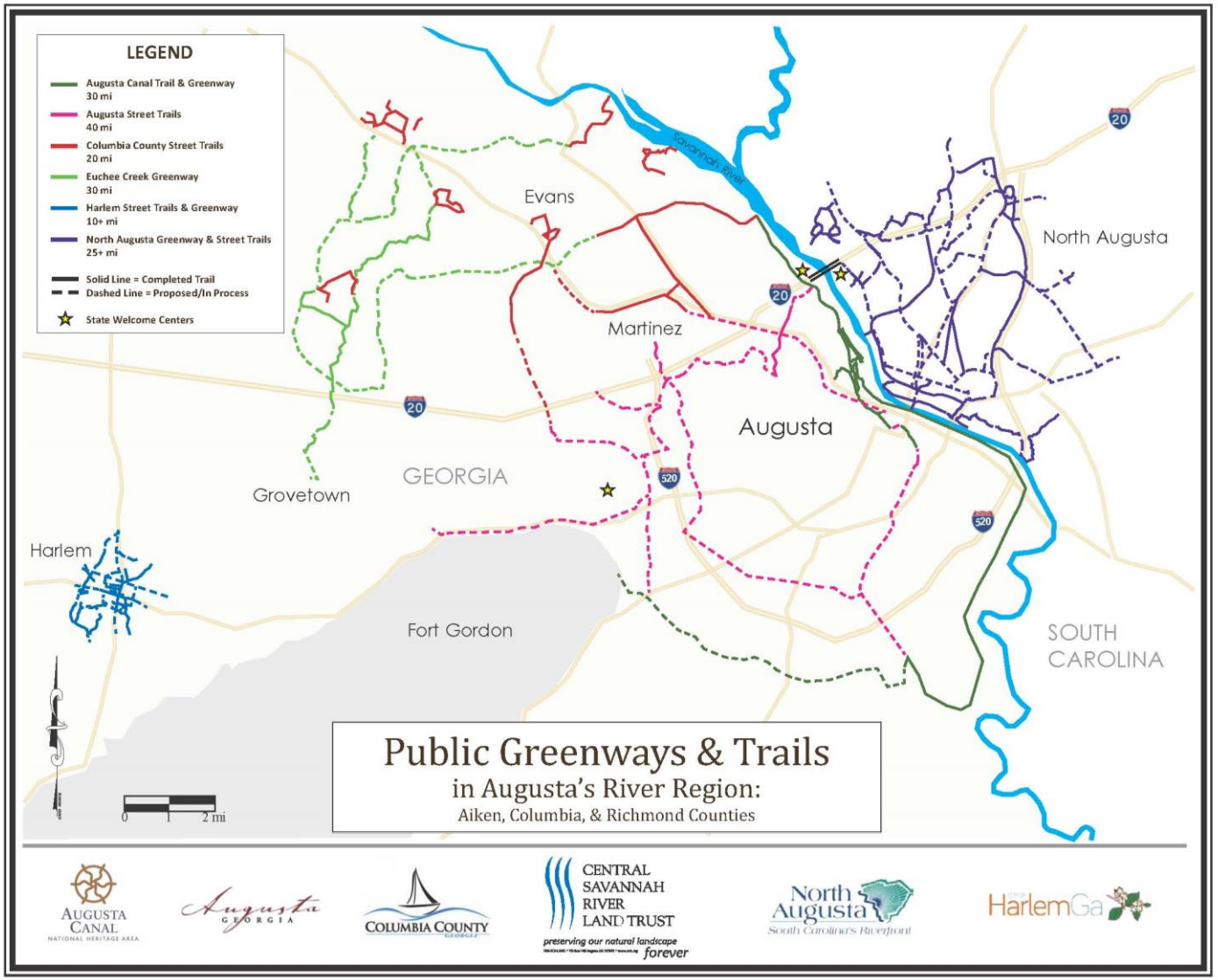
The Augusta Canal multi-use trail includes multiple trails, side-trails, and paths within the Augusta Canal National Heritage Area. Main trails include: Towpath Trail, Augusta Canal Historic Trail, and River Levee Trail; to name but a few. The multi-use trails connect pedestrians and cyclists from downtown Augusta, GA, to Petersburg Boat Dock on the Savannah River in Columbia County, GA; and, to residential subdivisions located along the Evans-to-Locks Road, Evans, GA.

Residents of North Augusta, SC commonly refer to the North Augusta Greeneway as "The Greeneway". The Greeneway was initially developed as a Rails-to-Trails project that followed an abandoned right-of-way of the former Central of Georgia Railway (later renamed as the Central Rail Road and Banking Company of Georgia). As a greenway of 13 miles in length, it is mostly shaded and meanders throughout the riverfront community of North Augusta, SC. The greenway connects to Riverview Parkway in North Augusta, SC. Riverview Parkway Trail loops around the Hammonds Ferry neighborhood, Brick Pond Park and continues along the Savannah River. Another greenway system includes the Palmetto Parkway Bike Path. Palmetto Parkway Bike Path parallels I-520 and runs south from Ascauga Lake Road to Atomic Road.

Columbia County's Euchee Creek Greenway is an extensive nature park and trail system that will follow the Euchee Creek from Harlem Grovetown Road to Wrightsboro Road. Currently, the facility is under construction with only portions complete and open to the public. The Euchee Creek Greenway is located within a floodplain and is predominately flat, making the Euchee Creek corridor most favorable for trail development.

Aiken County's Hitchcock Woods is the largest urban nature trail system in the study area. The 70 miles of sandy trails, rings itself around the City of Aiken's urban core. The public trail is open to equestrians, hikers, dog walkers, joggers, and horses with carriages.

Figure 9-2 illustrates a comprehensive trail network and includes both existing (solid line) and proposed (dashed line) facilities surrounding the Savannah River. The built-out network will create a fully connected River Region greenway and trail system that connects all four counties in the ARTS planning area. In addition to the network illustrated here, Columbia County plans to further expand its on street trail infrastructure along Furys Ferry Road and across the Savannah River, creating additional multimodal connections between South Carolina and Georgia.



Source: Central Savannah River Land Trust

Figure 9-2. Existing and Planned Regional Greenway and Trail Network (2017)

9.3 Bike Lanes

Bicycling can serve as an alternative transportation mode choice integrated into the transportation system, and it provides added economic, social, environmental, and health benefits. Cycling related sporting events such as the Ironman Triathlon bring in millions of dollars to the region each year, while multiple leisure and fitness bicycling groups can be seen on weekend morning rides throughout Augusta, GA, and North Augusta, SC.

Table 9-2 indicates the number of persons who use bicycling as their means of transportation to work. Although it is a small portion of people commuting by bicycle, these are important users of the ARTS planning area transportation network. Both Richmond and Aiken counties display the highest numbers of riders. Richmond and Aiken counties both have central business districts, densely built environments, and university districts that to some degree provide safe environments conducive to bicyclists.

Table 9-2: Residents Biking to Work (2013-2017 ACS 5-Year Estimate)

County	Columbia County	Richmond County	Aiken County	Edgefield County
Bicycle Commuters	0% (0)	0.3% (246)	0.3% (208)	0% (0)
Margin of Error*	±0.1	±0.2	±0.3	±0.3

Source: 2013-2017 ACS 5-Year Estimate
** Margin of Error reported for Bicycle Commuters due to the small percent of commuters reported in this statistic. Confidence Interval for Margin of Error for 2013-2017 5-year ACS is 90%.*

A variety of bicycle infrastructure is available or planned for the ARTS planning area, including greenways, multi-use paths, dedicated bike lanes, sidewalks, and paved shoulders. **Figure 9-1** represents the 2012 bicycle infrastructure in the study area. Established bicycle infrastructure is predominantly found in Aiken County, which has dedicated bike routes as well as an extensive greenway system located within North Augusta, SC and the City of Aiken, SC. Richmond County features an extended greenway system near the Savannah River and Riverwatch Parkway. **Figure 9-3** highlights the areas of the ARTS planning area most suitable for additional bicycle infrastructure.

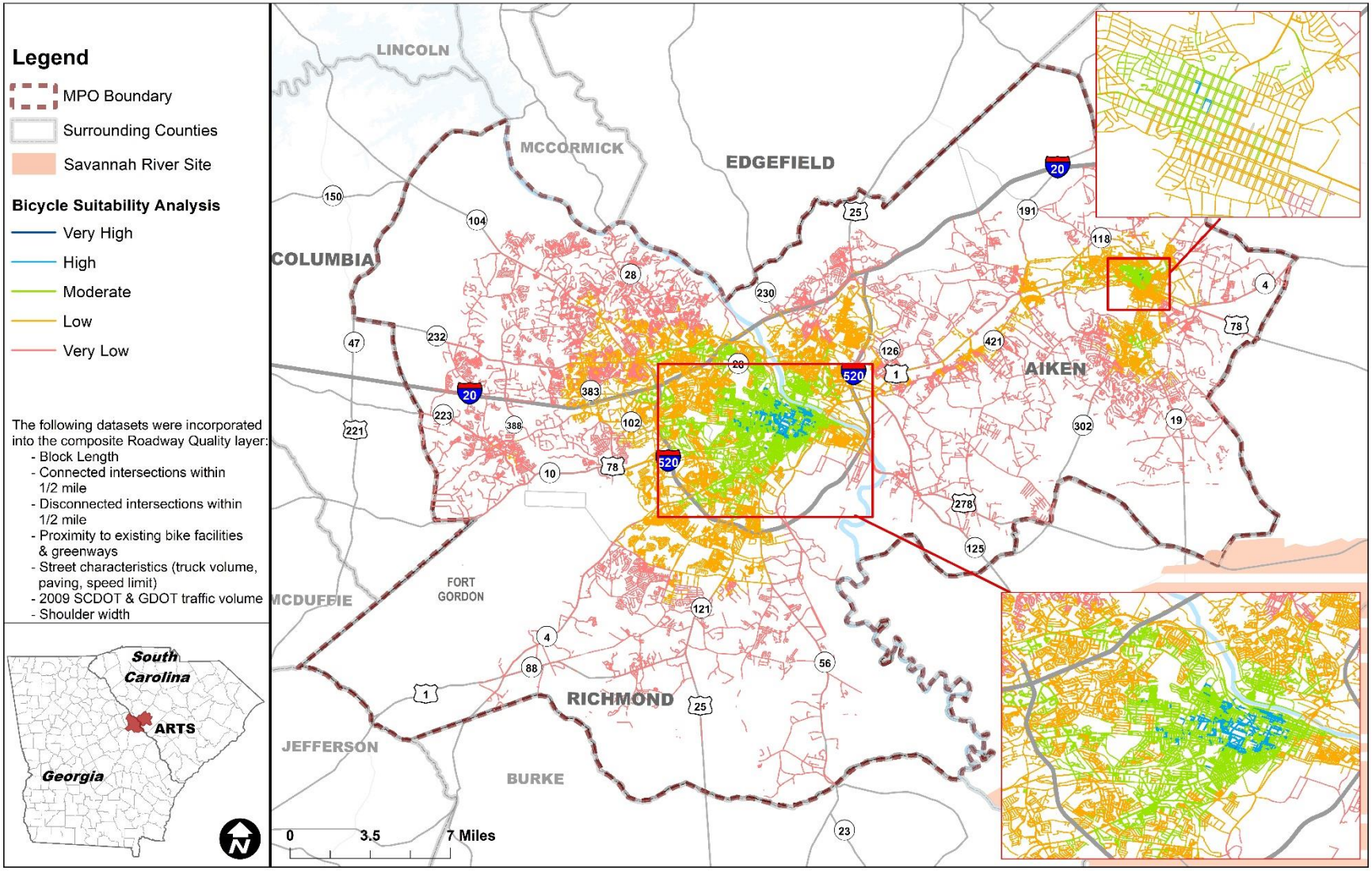
More recent plans have made provisions for increased bicycle infrastructure within the ARTS planning area. Plan Aiken Comprehensive Plan (2017) focuses recommendations on transportation choices through dense land uses that promote transit, non-motorized transportation infrastructure. The Aiken County Bicycle and Pedestrian Plan (2017) recommends physical infrastructure such as separated, multi-use paths for bicyclists and pedestrians, greenways, and striped bike lanes. The plan also recommends continued and expanded safety and educational programs to encourage and improve non-motorized transportation conditions. The City of North Augusta Comprehensive Plan (2016) places heavy emphasis on pedestrian and bicycle provisions, including a Complete Streets policy, an expanded greenway, a sidewalk inventory, and connectivity studies. In addition, the 2040 LRTP allocated funds to many miles of enhanced bicycle infrastructure in its short-, mid-, and long-term phases. Many of these projects, like the North Augusta Bergen Road Tunnel and James Brown Boulevard Streetscape have been completed.

9.3.1 Bicycle Policy Overview

Although several jurisdictions within the ARTS planning area have historically lacked policies for a strong bicycle network, there has been a recent push in the bicycling community together with local officials. This coalition seeks to provide a safer and a more active bicycle friendly network that captures the needs of both recreational and daily travel users. Proposed priorities include bicycle parking locations, continued dedicated bike infrastructure during state road resurfacing projects, and connecting the current network through additional connectors and routes.

None of the jurisdictions within the study area have explicit state-of-the-art guidance on bicycle and pedestrian facilities in their development ordinances. Streetscape Design Guidelines are an essential component of Form Based Codes. They graphically show how pedestrian and bicycle improvements can exist in harmony with building form, parking areas, landscaping and other modes of transportation in all zoning districts. Both North Augusta, SC., and Aiken County, SC, incorporate some elements of Form Based Code in their development standards.

Likewise, none of the jurisdictions within the study area considered multi-modal level of service criteria in their development review process. North Augusta, SC, does prioritize traffic mitigation measures that include multi-modal features. There were also no strategies identified for incorporating sidewalk or bicycle facilities on existing streets and roadways. Jurisdictions within the study area have incorporated approaches to regulating automobile and bicycle parking; however, the provision of bicycle parking facilities is not a requirement in any of the regulations reviewed for this analysis.



Source: ARTS Bicycle and Pedestrian Plan (2012)

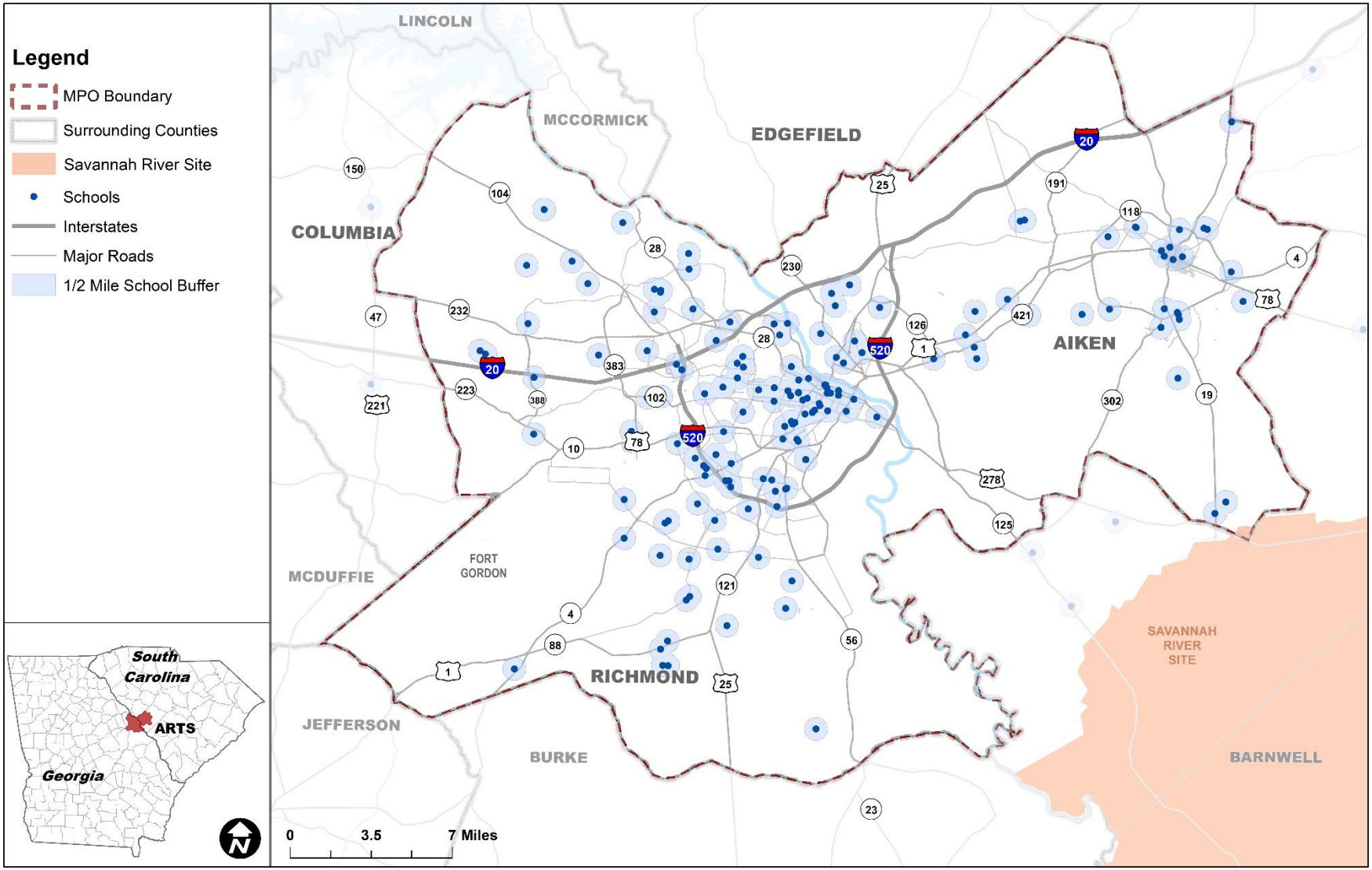
Figure 9-3. Bicycle Suitability Analysis (2012)

9.4 Safe Routes to School

Safe Routes to School is a national program that provides funding to local communities. Eligible projects include those that encourage walking and biking to school through infrastructure improvements (such as connected sidewalks and bike lanes) and programs (such as "walking buses" for students that live near one another), traffic safety enforcement measures, and bike safety classes.

Schools can form partnerships with the Safe Routes to School program, pledging to implement programs and educational efforts. Based on level of involvement and student participation, schools can partner at the bronze, silver, gold, or platinum level. In Columbia County, Lewiston Elementary School is a Gold Partner, and River Ridge Elementary School is a Bronze Partner. In Richmond County, A. Brian Merry Elementary, C .T. Walker Traditional Magnet, Freedom Park Elementary, Goshen Elementary, and Tutt Middle Schools are Bronze Partners. **Figure 9-4** shows a half-mile radius around each school in the ARTS planning area. These buffered areas reflect reasonable walking distances for children to get to school and therefore are suitable areas to improve pedestrian and bicycle infrastructure.

Aiken County has four active projects that have received funding from the SC Safe Routes to School program: Hitchcock Parkway improvements, four bridge replacements on I-20, improvements on Whiskey Road, and intersection improvements at Atomic Road and North Silverton Street.



Source: ARTS MPO (2019)

Figure 9-4. Half Mile Buffer Areas around Schools (2019)

9.5 Complete Streets

A Complete Street is a standard transportation planning practice that involves designing local roads to accommodate all users, regardless of age or ability. Complete streets emphasize an inclusion of all modes of travel into roadway design, including bicycles, pedestrians, motorized vehicles, and public transit. Many state DOTs have formally adopted Complete Streets policies that encourage local jurisdictions to incorporate Complete Streets design and planning into their practices.

The USDOT Complete Streets Policy was signed on March 11, 2010. The Policy Statement reads:

> "The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide—including health, safety, environmental, transportation, and quality of life—transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes."[vii]

9.5.1 State Policy

Georgia and South Carolina have both adopted Complete Streets policies. GDOT formally adopted its Complete Streets policy on September 20, 2012. The language is now incorporated into the GDOT Design Policy Manual and regulated by GDOT for all transportation projects using state or federal funds. State transportation projects in planning, concept development, or preliminary engineering phases are expected to comply with the Policy. Projects in the final design or approval of right-of-way stage must also comply.

SCDOT adopted a Complete Streets resolution in 2003 and is strongly committed to improving conditions for walking and bicycling. SCDOT requires that local municipalities make bicycle and pedestrian improvements an integral part of their programs when using state and federal funds.

9.5.2 Local Policy

There are no locally adopted Complete Streets policies within the ARTS planning area. However, state policies encourage counties in the ARTS planning area to draft, adopt, and update their ordinances to include Complete Streets policies and design guidelines. Aiken County, Richmond County, Columbia County, and the City of North Augusta include elements of Complete Streets guidance in their local zoning and subdivision regulations. While not as robust as full Complete Streets ordinances, these bicycle and pedestrian infrastructure guidelines reflect increased consideration of non-motorized transportation modes.

- **Aiken County – Article VII – Land Development Regulations, Sec. 24-7.15 – Sidewalks:** Sidewalks are required on one side of the street for any subdivision with at least 50 lots. Sidewalks can also be required by the planning commission to create a pedestrian network between adjacent subdivisions or existing streets, especially near schools and/or public recreation areas. The minimum sidewalk width is four feet within a subdivision and five feet when providing access to public facilities.

- **Richmond County – Subdivision Regulations: Article IV; Design Standards, Sec. 404 Sidewalks:** Sidewalks are required on arterial and collector streets within subdivisions that are adjacent to existing arterials.

- **Columbia County – Chapter 74 – Subdivisions: Sec. 74-117 Required Improvements:** The planning commission may require sidewalks as part of a pedestrian traffic system within one-mile of a school, neighborhood recreation destination, commercial area, or other public place.
- **City of North Augusta – Article 14.4, Table 14-2, 3, and 4 – Street Types and Design:** Sidewalks on boulevards, avenues, and collector streets must be between six and twenty feet wide. Sidewalks on all other streets must be at least five feet wide. On parkways, the sidewalk can be between six and fifty feet from the paved roadway and will take the form of a multi-use Greenway. Streets with design speeds of 45 miles per hour or higher without curb, gutter, and sidewalk must have a minimum six-foot paved shoulder. Sidewalks are required on both sides of local and collector roads and on one side of all arterial roads.

10 Transportation System Management and Operations Data

This section summarizes existing Transportation System Management and Operations (TSM&O) resources and other relevant initiatives, projects, and studies throughout the ARTS planning area including the states of Georgia and South Carolina.

This chapter contains the following sections:

- Existing TSM&O Resources
- Initiatives, Projects and Studies

10.1 Existing TSM&O Resources

TSM&O attempts to improve the performance of existing roadways through increased efficiency and throughput of people on current infrastructure in a comprehensive fashion, rather than a single project, road segment, or corridor. TSM&O strategies not only rely on traffic engineering solutions to optimize the existing system (such as signal synchronization and access management) but also rely on resource utilization, infrastructure, personnel, and data management strategies to extend the useful life of the existing transportation system and improve its reliability. The comprehensive and holistic approach requires agencies to coordinate projects with other stakeholders, jurisdictions, public agencies, and modes.

The Federal Highway Administration supports the following TSM&O strategies:

- **Active Transportation and Demand Management** – The management, control, and influence of travel demand, traffic demand and flow
- **Arterial Management** – The management of arterials that may entail access management or traffic signal timing
- **Bottleneck Mitigation** – Focuses on recurring localized, recurring congestion at traffic bottlenecks
- **Congestion Pricing** – Involves varying roadway pricings based on demand, can be time of day and level of congestion.
- **Integrated Corridor Management** – An approach that focuses on collaborative management of the transportation corridor as a system
- **Emergency Transportation Operations** – Provides users with a safe and reliable system under extreme circumstances
- **Freeway Management** – Implementation of policy, strategies, and technologies to improve freeway performance
- **Freight Technology and Operations** - The effective management of moving goods in the system
- **Incentives** – Implementing behavioral economics to assist travelers in choosing alternative modes of transport, different departure times, and different routes

- **Managed Lanes** – Highway facilities that are implemented and managed in response to changing conditions
- **Planned Special Events Traffic Management** – Provides users with a safe and efficiently managed transportation system in the case of planned special events (sporting events, music venues, festivals, etc.)
- **Road Weather Management** – Focuses on providing users with a safe and efficient system during and after particular weather conditions
- **Real Time Traveler Information** – Provide information for users to choose the safest and most efficient routes
- **Traffic Incident Management** – Verifying, responding, and clearing traffic incidents in a way that it minimizes disruption in the system
- **Transit Operations and Management** – The management and operations of transit in a safe and efficient manner
- **Travel Demand Management** – Providing users with effective travel choices to shift or reduce the demand for travel in congested conditions
- **Work Zone Management** – Organizing and operating areas that are impacted by road or rail construction to minimize delay and provide safety for workers

Traditionally, a congested network has been addressed by constructing additional lanes, interchanges, and roads. However, TSM&O improvements optimize the system as is without completely excluding capacity building projects. Given the relatively low costs of TSM&O improvements, agencies should assess the costs and benefits of potential capital investments before the planning, design, and construction occur.

10.2 Initiatives, Projects, and Studies

The following section provides a brief outline of the TSM&O strategies and programs implemented in the State of Georgia and ARTS planning area that can improve the performance of the existing transportation system.

10.2.1 State Initiatives and Programs

GDOT's current missions statement reads, "Georgia DOT is committed to deliver the most effective and efficient transportation system focused on innovation, safety, sustainability, and mobility." Effective operation of the existing system is a key factor in achieving this mission and is a critical element of integrating, planning for, and advancing innovative transportation technologies that are rapidly entering the transportation domain.

GDOT's existing traffic operations programs include:

- **Regional Traffic Operations Program (RTOP)** is a multi-jurisdictional signal optimization program. The goal of the program is to increase traffic throughput, reduce traffic delay, and reduce emissions by optimizing traffic signals along key regional corridors.
- **Regional Traffic Signal Operations (RTSO, also known as RTOP-Lite)** is a sister program of the Regional Traffic Operations Program. The program focuses on traffic signal operations at the district level.
- **Georgia NaviGAtor and Advanced Traffic Management System (ATDM)** is the primary source of real-time traffic and travel information. The Georgia NaviGAtor Program involves data collection with video cameras to capture traffic flow data. Additionally, the Advanced Traffic Management System supports the

use of cameras and detection devices with BlueTOAD technologies along major routes. BlueTOAD™ is an acronym for Bluetooth Travel-time Origination and Destination.

- **Highway Emergency Response Operators (HERO) program** provides traffic-related incidents services in Metro Atlanta. The service monitors thirty-one routes and four-hundred miles in the metropolitan area. In the 2018 Fiscal Year, the program assisted 111,600 vehicles. The services employed are meant to clear roads, restore normal traffic operations, and assist stranded motorists with flat tires, dead batteries, fuel, or coolant.
- **Coordinated Highway Assistance & Maintenance Program (CHAMP)** is a roadside assistance program that functions along major corridors and interstates outside of the Atlanta Metropolitan Area. The program primarily serves both I-59 and I-24. It provides maintenance and supports emergency responders on interstates outside of the area that is covered by the HERO Program (except I-59 and I-24).

Other TSM&O strategies implemented in the State of Georgia include the following:

- **Georgia Express Lanes** are priced lanes that are alongside key and congested corridors in the Atlanta Metropolitan Region. The express lanes are meant to provide efficient and reliable travel times during peak hours. The varying toll price always allows for free-flowing travel.
- **Georgia Commute Options** is a program that encourages commuters to use alternative commute options. The program provides free services and incentives that favors alternative modes of travel from single occupancy vehicles. For example, a guaranteed ride home program, carpool matching service, and cash prizes are currently being used to assist commute alternatives.
- **The Weigh in Motion (WIM) Project** uses a scale to collect axle weights, gross vehicle weight, axle spacing, vehicle length, and vehicle speed. The scale and system accurately determine the vehicle's weight classification and compares the measured weight limits for vehicles within that class. The Weigh in Motion scales can reduce emissions and improve traffic flow.

SCDOT's TSM&O strategies include:

- **Rural Interstate Freight Corridor Mobility Improvement Program** is a program that targets interstate corridors in rural areas that need improvement. The program focuses on corridors that are expected to have increased freight movement. The program is being developed and implemented to reduce congestion, prevent freight bottlenecks, and create a reliable system for the movement of goods.
- **Transportation Alternatives Program (TAP)** is a grant program to provide funds on a reimbursement basis to entities hoping to improve or implement bicycle facilities, pedestrian facilities, and streetscaping.
- **I-95 Corridor Coalition's Vehicle Probe Project** is a program and initiative to provide comprehensive and real-time travel information along the I-95 corridors. The systems for this project collect real-time speed, location, and trajectory data. The coalition members in the State of South Carolina include Central Midlands Council of Governments (COATS), Spartanburg Area Transportation Study (SATS), and Waccamaw Regional Council of Governments.

10.2.2 ARTS Planning Area Initiatives and Programs

In 2002, ARTS completed the **Augusta Regional Advanced Transportation Management System (ATMS) Master Plan**, which is a twenty-year plan for implementing an Intelligent Transportation System (ITS) in the Augusta Region. The major components included regional control centers in Aiken and Augusta, new field equipment (fiber optic cable, traffic signal controllers, CCTV cameras, radar speed and volume detectors, dynamic message signs,

etc.), and the deployment of the Georgia Department of Transportation HERO and South Carolina Department of Transportation State Highway Emergency Programs on local freeways. The preceding components would provide routing suggestions and real-time video for emergency response activities in the network. In addition to ATMS Master Plan, other TSM&O strategies implemented in the ARTS planning area are summarized in **Table 10-1**.

Table 10-1: TSM&O Strategies in the ARTS Planning Area

TSM&O Strategy	Aiken County	Edgefield County	Columbia County	Richmond County
Active Transportation and Demand Management – The management, control, and influence of travel demand, traffic demand and flow.	• Dynamic Ridesharing through Uber, Lift • On-demand paratransit	• Dynamic Ridesharing through Uber, Lift • On-demand paratransit	• Dynamic Ridesharing through Uber, Lift • On-demand paratransit	• Dynamic Ridesharing through Uber, Lift • On-demand paratransit • Dynamic parking reservation & capacity will be part of the proposed Broad Street Parking meters[viii]
Arterial Management – The management of arterials that may entail access management or traffic signal timing.	n/a	n/a	n/a	Intelligent Transportation System (ITS) that includes over 100 pan, tilt, and zoom cameras to monitor traffic along busy corridors. A GIS system is used to regularly update signal timing in growing areas.
Bottleneck Mitigation – This focuses on recurring bottlenecks.	n/a	n/a	n/a	Adaptive system to assist with bottleneck areas. The system has grown since its introduction almost a decade ago. Busy corridors are watched and adjusted daily through the Augusta Transportation Management Center.

TSM&O Strategy	Aiken County	Edgefield County	Columbia County	Richmond County
Congestion Pricing – Involves varying roadway pricings based on demand, can be time of day and level of congestion.	n/a	n/a	n/a	n/a
Integrated Corridor Management – An approach that focuses on collaborative management of the transportation corridor as a system.	n/a	n/a	Yes	Yes
Emergency Transportation Operations – Provides users with a safe and reliable system under extreme circumstances.	n/a	n/a	Coordinated traffic signals have first responders vehicle priority capacity	Coordinated traffic signals have first responders vehicle priority capacity[ix]
Freeway Management – Implementation of policy, strategies, and technologies to improve freeway performance.	Widening of I-20 Savannah River Bridge may introduce dynamic lane management	n/a	n/a	Widening of I-20 Savannah River Bridge may introduce dynamic lane management
Freight Technology and Operations - The effective management of moving goods in the system.	• Large trucking companies may employ fleet location, speed and energy use optimization capability. Exact capability not known. • Rail corporations employ rail car location, speed and	• Large trucking companies may employ fleet location, speed and energy use optimization capability. Exact capability not known. • Rail corporations may employ rail car location,	• Large trucking companies may employ fleet location, speed and energy use optimization capability. Exact capability not known. • Rail corporations may employ rail car location,	• Large trucking companies may employ fleet location, speed and energy use optimization capability. Exact capability not known. • Rail corporations may employ rail car location,

TSM&O Strategy	Aiken County	Edgefield County	Columbia County	Richmond County
	energy use optimization capability. Exact capability not known.	speed and energy use optimization capability. Exact capability not known.	speed and energy use optimization capability. Exact capability not known.	speed and energy use optimization capability. Exact capability not known.
Incentives – Implementing behavioral economics to assist travelers in choosing alternative modes of transport, different departure times, and different routes.	n/a	n/a	n/a	n/a
Managed Lanes – Highway facilities that are implemented and managed in response to changing conditions.	n/a	n/a	n/a	n/a
Planned Special Events Traffic Management – Provides users with a safe and efficiently managed transportation system in the case of planned special events (sporting events, music venues, festivals, etc.)	n/a	n/a	n/a	Yes, during Masters week
Road Weather Management – Focuses on providing users with a safe and efficient system during and after particular weather conditions.	Dynamic signs on I-20	n/a	Dynamic signs on I-20	Dynamic signs on I-20

TSM&O Strategy	Aiken County	Edgefield County	Columbia County	Richmond County
Real Time Traveler Information – Provides information for users to choose the safest and most efficient routes.	Dynamic signs on I-20	n/a	Dynamic signs on I-20	Dynamic signs on I-20
Traffic Incident Management – Verifying, responding, and clearing traffic incidents in a way that it minimizes disruption in the system.	n/a	n/a	n/a	n/a
Transit Operations and Management – The management and operations of transit in a safe and efficient manner.	n/a	n/a	n/a	TripSpark: Transit/ paratransit scheduling software used by Augusta Transit[x]
Travel Demand Management – Providing users with effective travel choices to shift or reduce the demand for travel in congested conditions.	Notification through media blasts and mapping route apps	Notification through media blasts and mapping route apps	Notification through media blasts and mapping route apps	Notification through media blasts and mapping route apps
Work Zone Management – Organizing and operating areas that are impacted by road or rail construction to minimize delay and provide safety for workers.	n/a	n/a	Email notification and media blasts by GDOT of major road works	Email notification and media blasts by GDOT of major road works

11 Emerging Technologies and Shared Mobility

Recent advancements in technology have made it necessary to assess the potential for shared mobility services, emerging technologies such as electric vehicles, connected and automated vehicles, and upcoming data sources with a vast wealth of information that can inform major decisions. The following sections briefly discuss such technologies.

This chapter contains the following sections:

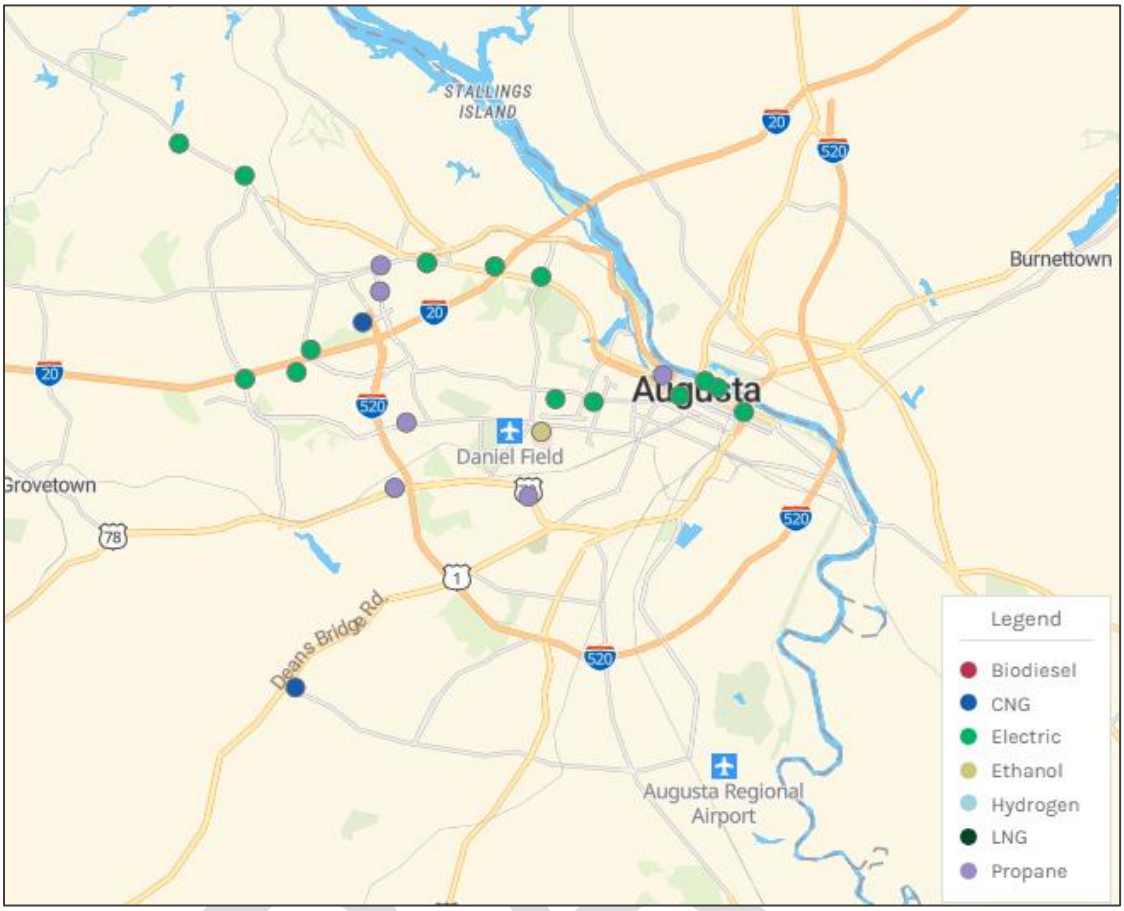
- Ridesharing Services
- Electric Vehicles
- Connected and Automated Vehicles
- Emerging Data Sources

11.1 Ridesharing Services

In addition to various ride-hailing taxi services, mobile application-based services such as Uber and Lyft operate in ARTS planning area. Transportation Network Companies (TNCs), also known as a Mobility-as-a-Service, such as Uber and Lyft, can potentially operate around the clock depending on driver availability. TNCs can play a major role in providing last mile connectivity to transit riders and to areas not currently served by transit directly. In connecting a rider to a destination that is not on the extended transit system, TNCs can extend the de facto service footprint of transit. Ride sharing services also play an important role in providing an alternative mode of access to major venues such as airports and sport tournaments. It is important to have regional policies in managing pick-up and drop-off for such services.

11.2 Electric Vehicles

While electric vehicles were invented in the 20th century, limitations in battery storage restricted their common use. Advancement in battery technologies over the years has made their single-charge traveling capacity similar to that of conventional gasoline powered cars. Electric cars are also becoming more affordable with this advancement in technology which makes owning such a vehicle within reach of many consumers. Electric vehicles provide environmental benefits over vehicles powered by internal combustion engines by reducing greenhouse gas emissions. This aspect is very important for a growing region such as the ARTS planning area to minimize emissions. A network of charging stations is key to support longer distance travel using electric vehicles. Alternative Fuels Data Center of US Department of Energy provides a list of charging stations throughout the country. **Figure 11-1** shows alternative fueling stations including electric charging outlets in the ARTS planning area.



Source: Alternative Fuel Data Center, US Department of Energy

Figure 11-1. Alternative Fueling Stations in the ARTS Planning Area (2020)

11.3 Connected and Automated Vehicles

Connected and Automated Vehicles (CAV) is a transformative technology that has great potential to change our daily commute. "Connected vehicle" combines leading edge technologies — advanced wireless communications, on-board computer processing, advanced vehicle-sensors, GPS navigation, smart infrastructure, and others — to provide the capability for vehicles to identify threats and hazards on the roadway and communicate this information over wireless networks to give drivers alerts and warnings. "Automated vehicles" are those in which at least some aspect of a safety-critical control function (e.g., steering, throttle, or braking) occurs without direct driver input. According to the (Institute of Transportation Engineers, automation has the potential to significantly impact our driving safety, personal mobility, energy consumption, operating efficiency, environmental sustainability, and land use.

Since the last MTP (Transportation Vision 2040), the advancement of CAV technology has emerged as a very real consideration for a long-range plan—bringing us even closer to the anticipated disruption that we must be prepared for. The ARTS MPO will need to be prepared to take advantage of opportunities to pilot technologies and integrate advancements by having first-hand knowledge of how these technologies can bring benefits to the community and the transportation system.

11.4 Emerging Data Sources

The prevalence and use of big data have been transforming how we analyze various transportation data to make decisions to plan, design, operate, and maintain its transportation system. As an affiliate member of the I-95 Corridor Coalition's Vehicle Probe Project, the ARTS MPO can access HERE real-time travel time data. This data has been used to measure congestion by calculating a Travel Time Index (TTI) in the ARTS Congestion Management Process (CMP) 2018 Update. The MPO also has access to the National Performance Management Research Data Set (NPMRDS) that includes average travel times on the National Highway System for their use in its performance measures and management activities. While the ARTS MPO is not currently utilizing such big data as part of its day-to-day activities, these data have tremendous potential to better understand the systemwide performance of transportation systems with a capability of pinpointing congested locations and areas based on real-time travel time data.

12 Previous Studies

The ARTS planning area is a multi-state and multi-county entity. As a result, there have been many previous studies conducted over the last several years that are relevant to the 2050 MTP's goal of improving future mobility. **Section 12-1** through **Section 12-9** of this report highlight some of the key recommendations that have arisen from these recent studies.

In addition to past recommendations from previous plans, the 2050 MTP will also consider statewide plans that, as of November, 2019, are still in progress. These are updates that will likely attain approval during the MTP update process. As various statewide agencies release these documents, the ARTS Team will review published recommendations and incorporate relevant items into the 2050 MTP.

Forthcoming statewide plan updates will likely include:

- GDOT Statewide Transit Plan
- GDOT Statewide Transportation Improvement Program
- GDOT State Rail Plan
- GDOT Transportation Asset Management Plan
- GDOT Statewide Transportation Plan
- GDOT Statewide Strategic Transportation Plan
- GDOT Statewide Freight and Logistics Action Plan
- SCDOT Statewide Multimodal Transportation Plan
- SCDOT Statewide Transportation Improvement Plan
- SCDOT Transportation Asset Management Plan
- SCDOT Multimodal Transportation Plan

12.1 Statewide Recommendations: Georgia and South Carolina

Figure 12-1. Key Terms in Statewide Plan Recommendations

Georgia and South Carolina both have statewide transportation plans that make largescale recommendations for all transportation modes. Recommendations from the Georgia Statewide Strategic Transportation Plan and the SCDOT Statewide Multi-Modal Plan focus on safety improvement, system maintenance and preservation, reliability enhancement, and congestion relief through system optimization and road widenings. Georgia and South Carolina also seek to maintain existing infrastructure while advancing and modernizing the transportation system; the plans also focus on improvements to the economy and environment through large-scale transportation upgrades.

South Carolina and Georgia have each adopted freight plans that recommend prioritizing capacity and reliability improvements along

routes included in the National Multimodal Freight Network. Within the ARTS planning area boundary, these are I-20, I-520, and US 1/SR 4 in Georgia, and I-20, I-520, US 4, US 19, US 25, and US 78 in South Carolina. In addition, major rail freight providors are Norfolk Southern and CSX Transportation. The freight plans emphasize the importance of connections between major freight roadways and railroads. Recommended projects increase first/last mile connections to freight corridors, increase system resilience, and implement technology and public/private partnerships to improve safety, air quality, efficiency, and intermodal connections.

Recent plans include:

- **Georgia Statewide Freight and Logistics Plan (2010)**: The purpose of this report is to describe the competitive position of Georgia's freight and logistics sector relative to other regions in the country, and to build a case for increased investment in Georgia's freight-related assets. The following four general themes were introduced to describe transportation in the State:

    1) Over the past few decades, Georgia's population and economy grew rapidly, and our unique world-class transportation assets were critical to that success

    2) Rather than investing to preserve and extend our competitive advantage in transportation, Georgia had been under-investing and "coasting" on past success

    3) At previous funding levels, performance would continue to deteriorate, threatening our ability to compete for jobs and growth in the future

    4) Alternatively, a new investment strategy supported by additional resources could transform our transportation network and create over $480 billion in GDP growth for Georgia over the next 30 years and generate up to 425,000 new jobs.

- **SCDOT South Carolina Statewide Freight Plan (2014):** This report recommends methods to integrate and connect the State's freight system. Methods include physical improvements, like intermodal connectors and multi-modal hubs and roadway and bridge infrastructure. Methods also include policies and practices, like increasing private and local investment and using information technology for real-time system monitoring and efficiency improvements.

- **SCDOT Statewide Multi-Modal Plan (2014)**: The vision for the 2040 SCDOT Multimodal Transportation Plan is "Safe, reliable surface transportation and infrastructure that effectively supports a healthy economy for South Carolina." The plan goas were developed in these categories: Mobility and System Reliability, Safety and Security, Infrastructure Condition, Economic and Community Vitality, Environment, and Equity.

- The **Georgia Statewide Strategic Transportation Plan (SSTP) (2018)** states recommendations to achieve statewide strategies. Generally, the document recommends aggressively investing in pavement and bridges and targeting roadway and intersection improvements to reduce fatalities. Additional recommendations fall into three categories:

    1) Statewide freight and logistics

    2) People mobility in Metro Atlanta (these are not relevant for the 2050 MTP)

    3) People mobility outside Metro Atlanta

12.2 Regional Recommendations: ARTS and Councils of Governments (COGs)

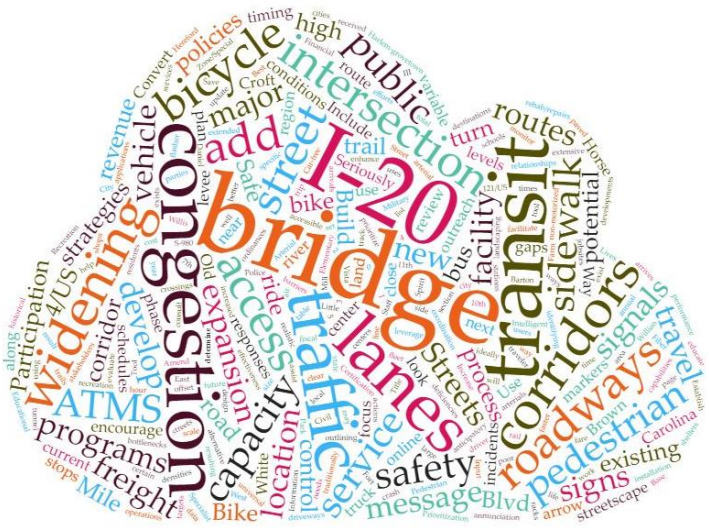


Figure 12-2. Key terms in Regional Plan Recommendations

Regional plans focus on maintaining and improving existing roadway infrastructure and improving intersection safety and operations. Specific projects focus on new turning lanes, capacity improvements, and congestion management while continuing to focus on corridors with high freight activity.

Plans in both states seek to adopt a regional focus on transit and active modes of transportation, like walking and bicycling. This includes improved bus networks and facilities to make transit more appealing. There is a regional emphasis on multi-modal considerations in all roadway projects as well as safety programs for pedestrians, bicyclists, and drivers.

To encourage economic development and improve conditions for all roadway users, plans recommend projects that are context-aware and fit into the larger region: concentrated development and growth can support transit service, first and last-mile roadway connections can facilitate freight routes, and multi-modal connections increase efficiency and reliability.

Recent plans include:

- **Augusta Regional Freight Profile (2008):** This document describes freight movement in the ARTS Planning Area based on existing data and interviews of key stakeholders in the region. Freight is transported from, to, through, and within the Augusta metropolitan area by truck, rail, and air. The profile analyzes how freight is moving in order to understand its impact on overall traffic patterns and modal interdependence of freight. It also provides alternative forecast methodologies to allow for an estimation of future freight flows in the region.
- **Augusta Regional Transportation Study Bicycle and Pedestrian Plan (2012):** This Plan primarily recommends non-physical improvements within the ARTS planning area. Instead, the majority of recommendations are programmatic, focus on safety training for road users, and seek to implement bicycle and pedestrian planning policies (see **Figure 12-3**).

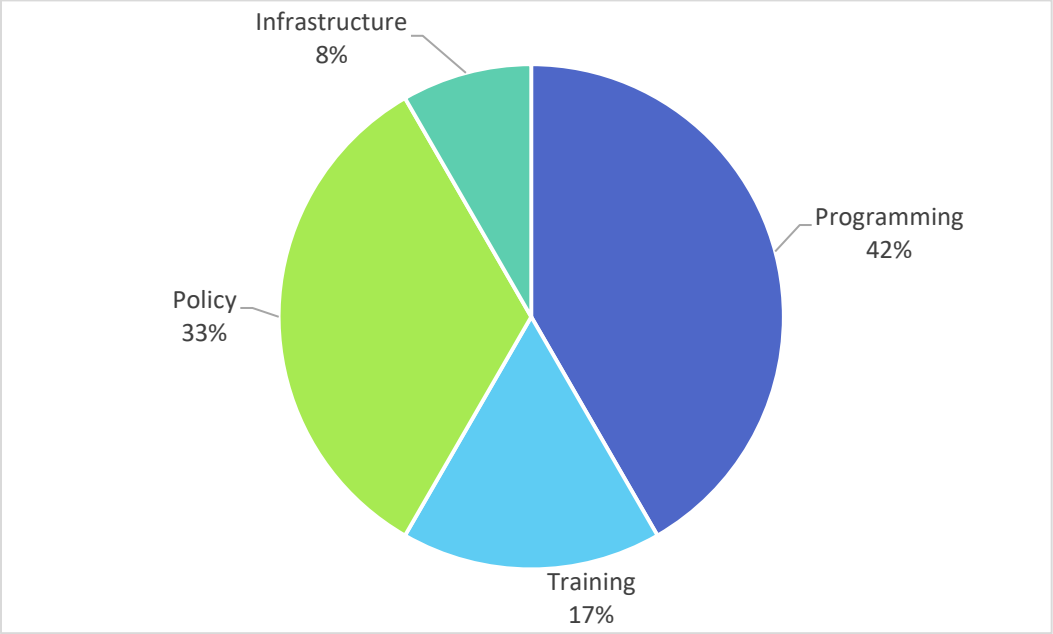


Figure 12-3. Bicycle and Pedestrian Recommendations

- **ARTS ATMS Master Plan (2013):** ARTS updated the ATMS Master Plan in 2013, which was originally developed in 2002. The ATMS Master Plan Update included the following tasks: Engage the ARTS stakeholders through a series of stakeholder meetings, inventory the existing ATMS assets, perform a needs assessment, define project goals and objectives, update the ITS architecture, develop ATMS project concepts, provide planning-level cost estimates, and develop an implementation plan and recommendations.

- **ARTS Congestion Management Process (2014 Report):** This report summarizes the results of travel time surveys conducted on major roads (i.e., corridors) in the ARTS planning area during March, April or May 2014; identifies the strategies and projects that are being implemented to alleviate traffic congestion on these roads; and, includes appendices with detailed information on the travel time survey results in 2014 and prior years. Four corridors, Silver Bluff Road (Aiken County), Belair Road and Flowing Wells Road (Columbia County) and Wheeler Road (Richmond County) experienced Seriously Congested (SC) conditions in all time periods surveyed in both directions.

- **ARTS FY 2017-2022 Transportation Improvement Program (TIP):** The TIP is a multi-year intermodal program serving as the link between planning for transportation system infrastructure needs, financing and capital improvement programming and project implementation. The ARTS TIP covers a four-year period for the Georgia portion of the MPO study area and a six-year period for the South Carolina portion. The ARTS TIP includes all transportation projects for highways, roads, bridges, ITS and traffic signals, bicycle and pedestrian, public transit and freight. It includes all identified phases of a project proposed for financing with federal funds. Whether a project is scheduled to be completed in one year or phased over several years, it must advance to the TIP in order to be eligible for federal funding.

- The **ARTS Public Participation Plan Update (2017):** This Plan emphasizes the importance of seeking public input on all plans and transportation projects. It is especially important to

consult with traditionally underserved populations. This plan will inform all future planning efforts.

- **Lower Savannah Council of Governments Comprehensive Economic Development Strategy (CEDS) (2017):** This report is designed to bring together the public and private sectors in the creation of an economic roadmap to diversify and strengthen regional economies encompassing Aiken, Allendale, Bamberg, and Barnwell Counties. The CEDS analyzes the regional economy and serves as a guide for establishing regional goals and objectives, developing and implementing a regional plan of action, and identifying investment priorities and funding sources.

- The **ARTS Congestion Management Process (CMP) 2018 Update (2019):** This document recommends broad categories of congestion management practices. There are 39 specific recommendations that fall into 4 tiers in decreasing levels of priority. From highest to lowest priority, these tiers are:

    1) Demand management (6 strategies, 13 recommendations)
    2) Traffic operations (4 strategies, 13 recommendations)
    3) Public Transportation (2 strategies, 6 recommendations)
    4) Road Capacity (2 strategies, 7 recommendations)

- **ARTS Monitoring Report Title VI Civil Rights Program (2019):** This is an annual update and review of the Augusta Georgia Title VI plan that highlights the planning activities, reports, public participation procedures, and any changes made by the ARTS Metropolitan Planning Organization (MPO) in compliance with Title VI for FY 2019. Outreach strategies include: Distributing public notices in multiple languages Spanish, Korean, and Chinese; Ensuring all ARTS documents, plans, and programs are available in large print for the sight impaired; and in FY 2020, the MPO will use online voting and surveying more and will attempt to incorporate "live meetings" online for the benefit of those who are challenged with transportation or mobility.

- **CSRA Regional Plan 2040 (2019):** The Central Savannah River Area (CSRA) Regional Plan is the long-range plan for the management of the region's projected growth by local governments and the CSRA Regional Commission. The CSRA's vision and goals, together with an appraisal of socioeconomic, land use, and environmental opportunities and threats, set the strategic direction for the regional work program. The regional work program then defines priorities and timing for implementation.

12.3 Local Recommendations: Cities and Counties

Figure 12-4. Key Terms in Local Plan Recommendations

Recent local-scale planning documents focus on county- and city-level recommendations. In general, roadway recommendations center on widenings and capacity improvements. Additional travel lanes paired with traffic signals, turning lanes, and shoulders aim to relieve vehicle congestion.

In addition to transportation-specific planning documents, local comprehensive plans emphasize a need for multi-modal facilities and infrastructure. These include new and repaired sidewalks, increased bike lane connectivity, off-road multi-use recreational trails, and greenway networks throughout the region. There is also a local emphasis on increased access to transit and additional ARTS planning area transit coverage.

Recent Plans include:

- **Comprehensive Plan City of New Ellenton, South Carolina 2008:** An inventory and analysis to determine the City of New Ellenton, South Carolina's needs and future development strategies. These elements include population, economic conditions, natural resources, historic and cultural resources, housing, transportation, community facilities, priority investment area and land use. There were two transportation recommendations: 1. Seek Federal and State funding assistance to expand and improve transportation services in the City of New Ellenton; and, 2. Improve communication efforts between the SCDOT District Maintenance Office and City Administration. Request notification from the District Office when improvements are planned (e.g. tree trimming, repaving, etc.).

- **Realizing the City: The Augusta Sustainable Development Agenda (ASDA) (2010):** This plan does four things; first, identifies a large set of sites for future development, classifies them into a set of discrete project types, selects an illustrative prototypical example of each type, then develops and analyzes that project; secondly, establishes the Priority Development District, that runs from the downtown riverfront through the center of urban and suburban population centers to Rocky Creek, with major roadway improvements on the spine; thirdly, recommends a set of policies that can facilitate focusing growth and development in healthier and more

sustainable ways; and finally, recommends that the City create the Office of Implementation, whose purpose is to encourage realization of these projects for all parts of Augusta.

- **Aiken County Urbanized Area Bicycle & Pedestrian Plan (2012):** Aiken County and the City of Aiken, in partnership with the Augusta Regional Transportation Study (ARTS), commissioned this regional Bicycle and Pedestrian Plan with an intent to improve the area's bicycling and pedestrian environment. The chief outcome of the Plan is an integrated, seamless framework to facilitate walking and biking as viable transportation choices throughout the entire region. The Plan provides recommendations in three categories; program, policy, and infrastructure.

- **Augusta-Richmond County Analysis of Impediments to Fair Housing Choice (2013):** The purpose of this report is to identify current impediments to fair housing choice at work in Augusta and Richmond County and to suggest actions that the local community can consider in order to overcome the identified impediments.

- **Envision Augusta Comprehensive Plan 2035:** The official document that guides the future of Augusta-Richmond County. The plan document lays the groundwork for establishing a clear vision, identifies community goals and serves the following functions: lays out a desired future for Augusta-Richmond County; guides how that future will be achieved, and; formulates a coordinated long-term planning program. The plan document also addresses issues regarding transportation, economic development, cultural and natural resources, and land use in a coordinated manner.

- **Augusta Sustainable Development Implementation Program (2013):** The Augusta Sustainable Development Implementation Program lists priority recommendations derived from the Augusta Sustainability Development Agenda (ASDA) Study. The area focused on a 4.5 mile north-south spine in the core of the city. This spine includes 15th Street and Deans Bridge Road. The project entails four interrelated work tasks: 1. Developing a detailed plan for the Priority Development District and action/feasibility plans for up to three prototypical projects; 2. Developing a detailed plan for a multi-modal transportation corridor bisecting the district; 3. Revising current codes to facilitate higher density, mixed use, mixed-income development in the district; 4. Creating an implementation plan for green, affordable housing in the district. The project is a community-based blueprint with extensive public and stakeholder involvement throughout the process.

- **Vision 2035 Columbia County, Georgia Columbia County Comprehensive Plan (2015):** Recognizing the County will continue to be the fastest growing county in the region, this plan balances the need for residential and economic growth with the desire to maintain rural character. This plan identifies the need to plan in more specific detail for activity centers and major corridors as well as for green space, parks, economic development, and public infrastructure including water, sewer and transportation.

- The **City of North Augusta Comprehensive Plan (2016)** places heavy emphasis on pedestrian and bicycle provisions, including a Complete Streets policy, an expanded Greeneway, a sidewalk inventory, and connectivity studies. Recommendations fall into categories that are all closely aligned with a vision for enhanced streetscapes for all users (see **Figure 12-5**).

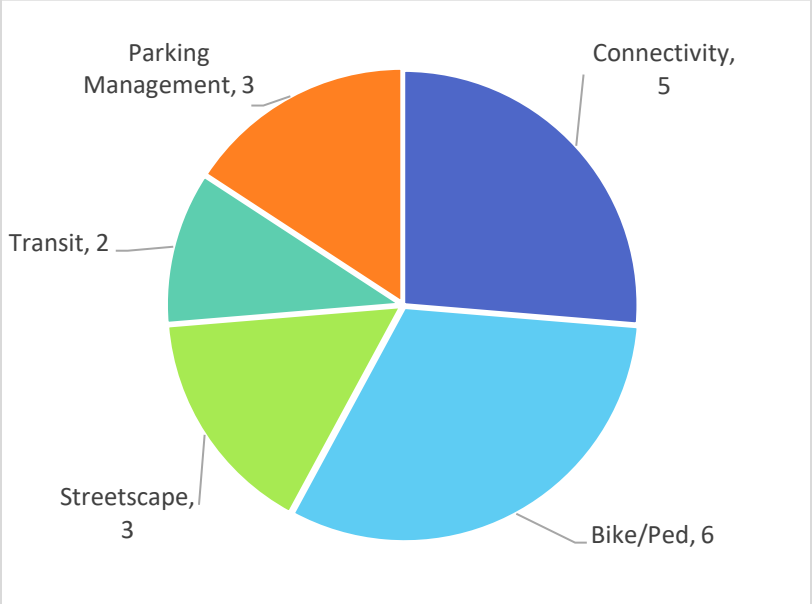


Figure 12-5. North Augusta Comprehensive Plan Recommendations by Category

- The **Augusta ADA Self-Evaluation and Transition Plan (2016)** recommends addressing high barrier sidewalk sections, curb ramps, pedestrian signals, island crosswalks, railroad crossings, and bus stops.
- The **City of Grovetown Comprehensive Plan (2016)** recommends recreational trails and pedestrian connections to schools and between developments. The Plan also recommends higher intensity development and access management standards for major roads.
- **Plan Aiken Comprehensive Plan (2017)** focuses recommendations on transportation choices through dense land uses that promote transit, non-motorized transportation infrastructure, and adoption of a Complete Streets policy. The Comprehensive Plan calls for road improvements that minimize adverse environmental impacts and promote an age sensitive environment

- **Augusta Transit Comprehensive Operational Analysis (2017):** The study provided an opportunity to take a fresh look at the transit system's effectiveness and efficiency in serving a community that has seen significant change since the current transit system was initially designed. The study consisted of five major components: assessment of existing conditions, market analysis; identification of service issues and opportunities; development of service scenarios; final service recommendations; and, fares and funding analysis.
- The **City of Aiken Comprehensive Plan (2017)** has three priority levels and encompasses projects in four general categories: road widening, bike/pedestrian infrastructure, operational improvements, and intersection improvements.
- The **Aiken County Bicycle and Pedestrian Plan (2017)** recommends physical infrastructure such as separated, multi-use paths for bicyclists and pedestrians, greenways, and striped bike lanes. The plan also recommends continued and expanded safety and educational programs to encourage and improve non-motorized transportation conditions. Recommendations fall into six categories (some projects fall into multiple categories):
    - Multi-Use Paths: 9 recommendations
    - Striped Bike Lanes: 7 recommendations
    - Paved Shoulders: 2 recommendations
    - Greenways: 1 recommendation
    - Shared Lane Markings: 1 recommendation
    - Programming/Policies: 13 recommendations

- The **Augusta-Richmond County Comprehensive Plan (2018):** This plan focuses on improvements to bus routes and facilities, roadway safety improvement and widenings, and traffic signal coordination and modernization.

- **Best Friend Express Transit Development Plan (2018):** This plan examined the existing transit service, Aiken County demographics, stakeholder input, transit impacts and options for the future services. Recommendations were provided in the following categories; efficiency improvements, additional service on the Red Route, addition of Saturday service, increased marketing/investment in technology, consideration of Project Jackson service, potential new routes and transition to traditional bus stops.

- **Edgefield County Comprehensive Plan (2019):** This plan is organized based on the original seven elements included on the South Carolina Planning Enabling Act plus additional chapters covering transportation and priority investment recommendations. Each element begins with an inventory of existing conditions, includes a statement of needs and goals, and identifies implementation strategies and time frames for completion. The plan specifically focused on the County's strategic plan goals of economic development, public safety, recreation and infrastructure.

12.4 Area- Specific Recommendations: Corridors and Districts

Small-scale and localized plans focus on particular corridors and districts. Area-specific plans for the ARTS planning area focus on capacity improvement, operations, and safety. District studies call for increasing walkability by installing sidewalks and wider shoulders, and implementing street lights, medians, and pedestrian crossings.

Corridor studies seek to improve vehicle conditions by reconfiguring intersections, adding turn lanes, and optimizing signal timing. These plans recommend widening roads to relieve congestion and realigning median openings and intersections to minimize vehicle conflicts.

Both district and corridor plans recommend creating a sense of place through gateways, streetscaping, connections to green space, and water access where possible.

Figure 12-6. Key terms in area-specific plan recommendations

Recent plans include:

- **Whiskey Road-Powderhouse Road Connector Study Final Report (2006):** The goal of the study was to enhance current and future traffic circulation and safety in the south Aiken area, specifically looking at east-west travel between Whiskey Road and Powderhouse Road south of Pine Log Road, as well as a possible north-south connection between Pine Log Road and Whiskey Road and/or Powderhouse Road. Several alternatives were present and ranked for further consideration and detailed study.

- **Northside Comprehensive Plan (2008):** The City of Aiken led an effort to examine the future development in an area encompassing 33 square miles of the City of Aiken's water and sanitary sewer service area north of the, referred to as the Northside Area. This Plan provides guidance on where and how growth should occur and acts as a framework for decision-making related to annexation requests, and sanitary sewer and water service provision.

- **Westobou: A Shared Vision Master Plan (2009):** This is a twenty-year plan, aimed at guiding both short and long range decision making. To this end, the planning effort looks at issues and opportunities within both the Urban Area and its broader region. This Master Plan is built on the solid foundation of a number of prior master planning efforts completed and largely implemented over the past twenty-five years. The Plan was also charged with finding common themes upon which the two communities could develop "a shared vision." During the course of this work, a unified logo was developed. The word "Westobou," the Native American word for the Savannah River, is used in the Plan to capture the regional, cross boundary nature of the area. The Plan is designed to be inclusive and recognizes that the Urban Area is part of a larger five-county community, spanning two states, and that Augusta and North Augusta are tied to one another by the Savannah River.

- **Reclaiming Historic Harrisburg (2011):** Harrisburg, which is located northwest of downtown Augusta, is bordered roughly by the Savannah River to the north, 15th Street to the east, Walton Way to the south, and Milledge Road to the west. This report focuses on five major improvement areas: neighborhood identity, neighborhood revitalization, Broad Street enhancements, Augusta Canal connectivity, and Calhoun Expressway improvements. Each of the associated recommendations is made with the goal of improving public safety and livability within Harrisburg, while fostering its sustainable character.

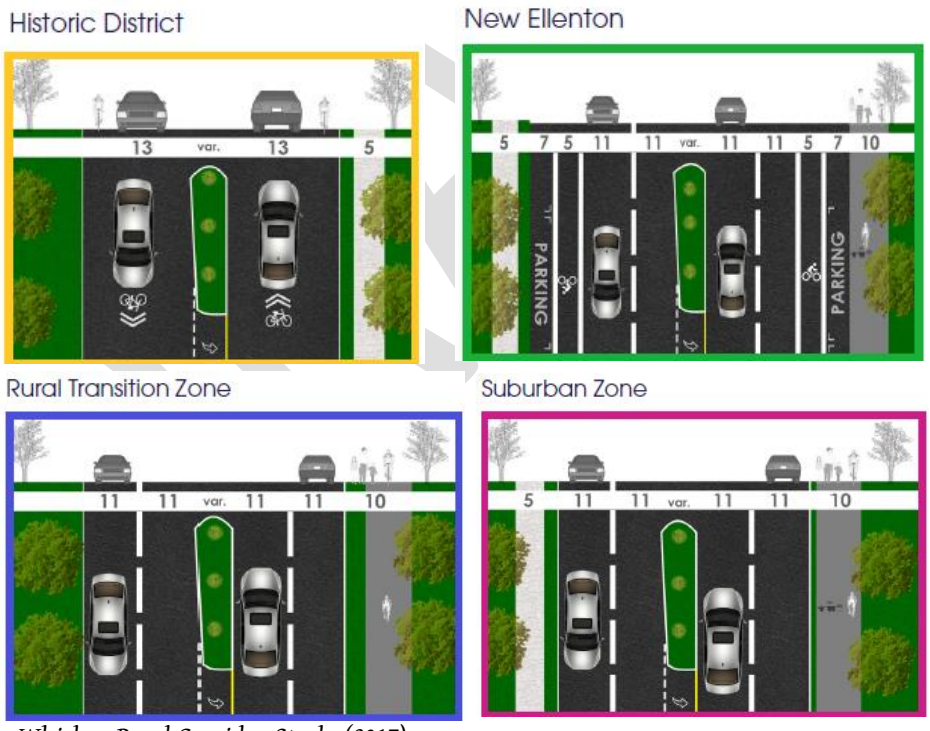
- The **US 1/US 78 Corridor Study (2012):** This study recommends improvements to safety, access management, and congestion management. The overarching goal is to upgrade the travel, safety and aesthetic characteristics of the corridor in advance of, and in preparation for, potential redevelopment.

- The **Northside Transportation Study (2012):** This study aims for three implementation phases based on traffic attracted by network additions. Recommended first phase projects will attract traffic and relieve existing arterials, recommended second phase projects will improve connectivity and increase travel options, and recommended third phase projects will improve connectivity as long-term development continues.

- **Dougherty Road Corridor Study (2013):** The Dougherty Road Corridor Study seeks to improve the efficiency of the roadway through assessment of not only the Dougherty Road corridor, but also those corridors in the immediate vicinity that directly impact the functionality of Dougherty Road. This vicinity, or area-of interest, includes residential neighborhoods

immediately north and south of Dougherty Road, commercial areas along Whiskey Road and Silver Bluff Road, and extends to the commercial area immediately south of Pine Log Road. This area-of-interest provided context for the analyses to determine the most appropriate improvements. Recommendations seek to affect positive change for the area-of-interest.

- The **SC 19 (Edgefield Highway) Corridor Study (2014):** The study recommends projects that streamline vehicle travel, improve intersection functionalities, and implement land uses that are conducive to transportation efficiency. Project recommendations fall into five categories:
    - Intersection/Operations Improvements: 11 recommendations
    - Streetscapes/Shared Roadway Striping: 5 recommendations
    - Widening: 5 recommendations
    - Pedestrian Connectivity: 2 recommendations
    - Compatible Lane Uses: 10 recommendations
- The **Whiskey Road Corridor Study (2017):** This study recommends redesigning the roadway to accommodate different travel modes depending on the character of the area (see **Figure 12-7**).



Source: Whiskey Road Corridor Study (2017)

Figure 12-7. Whiskey Road Recommended, Context-Sensitive Roadway Designs

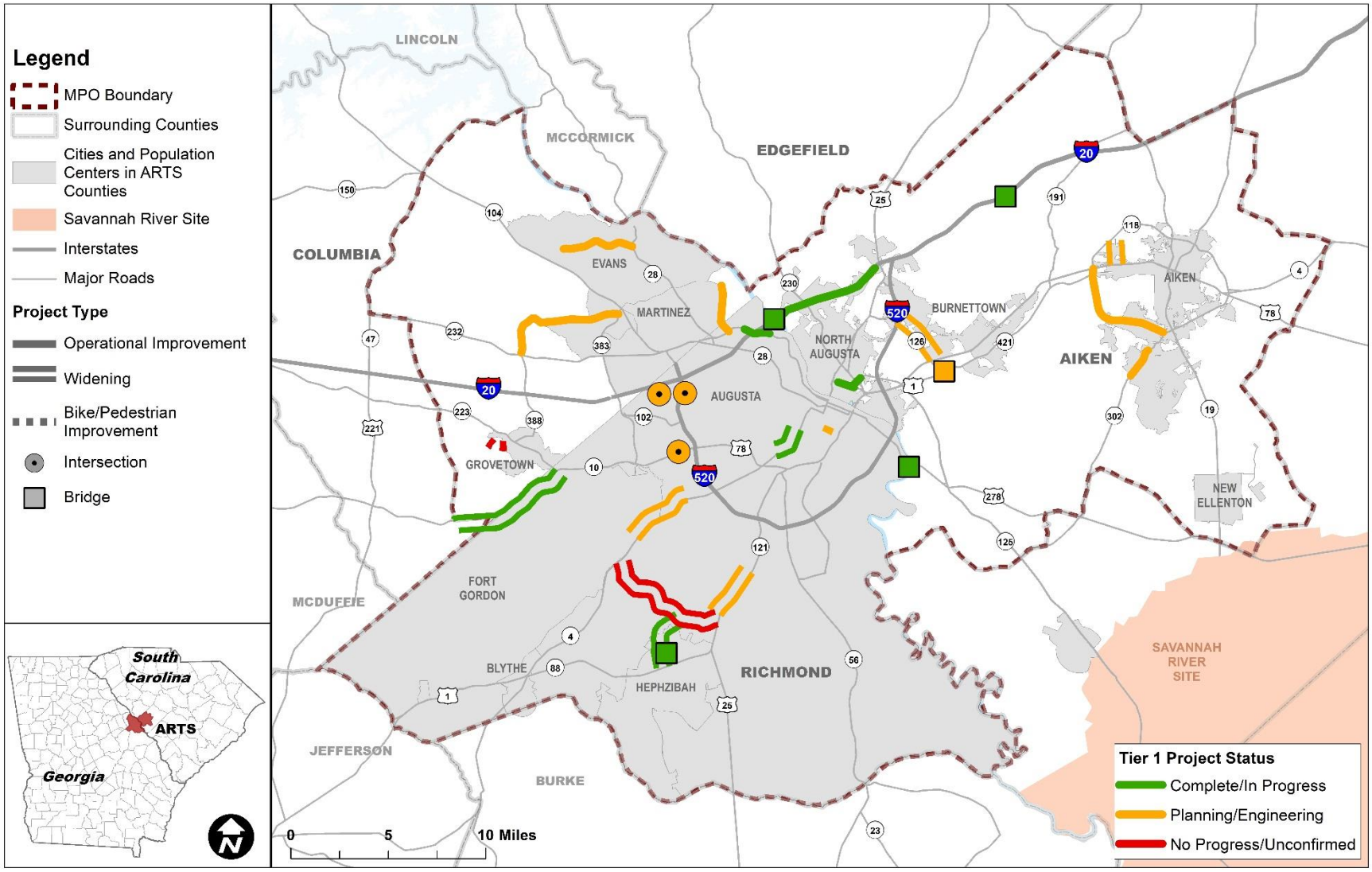
12.5 2040 LRTP Recommendations

The last time this document was updated, the resulting plan was referred to as the 2040 Long Range Transportation Plan (LRTP) Transportation Vision 2040. Based on changes in federal guidance, this current update will be the 2050

Metropolitan Transportation Plan (MTP). Although the name has changed, content areas, process, and purpose remain consistent.

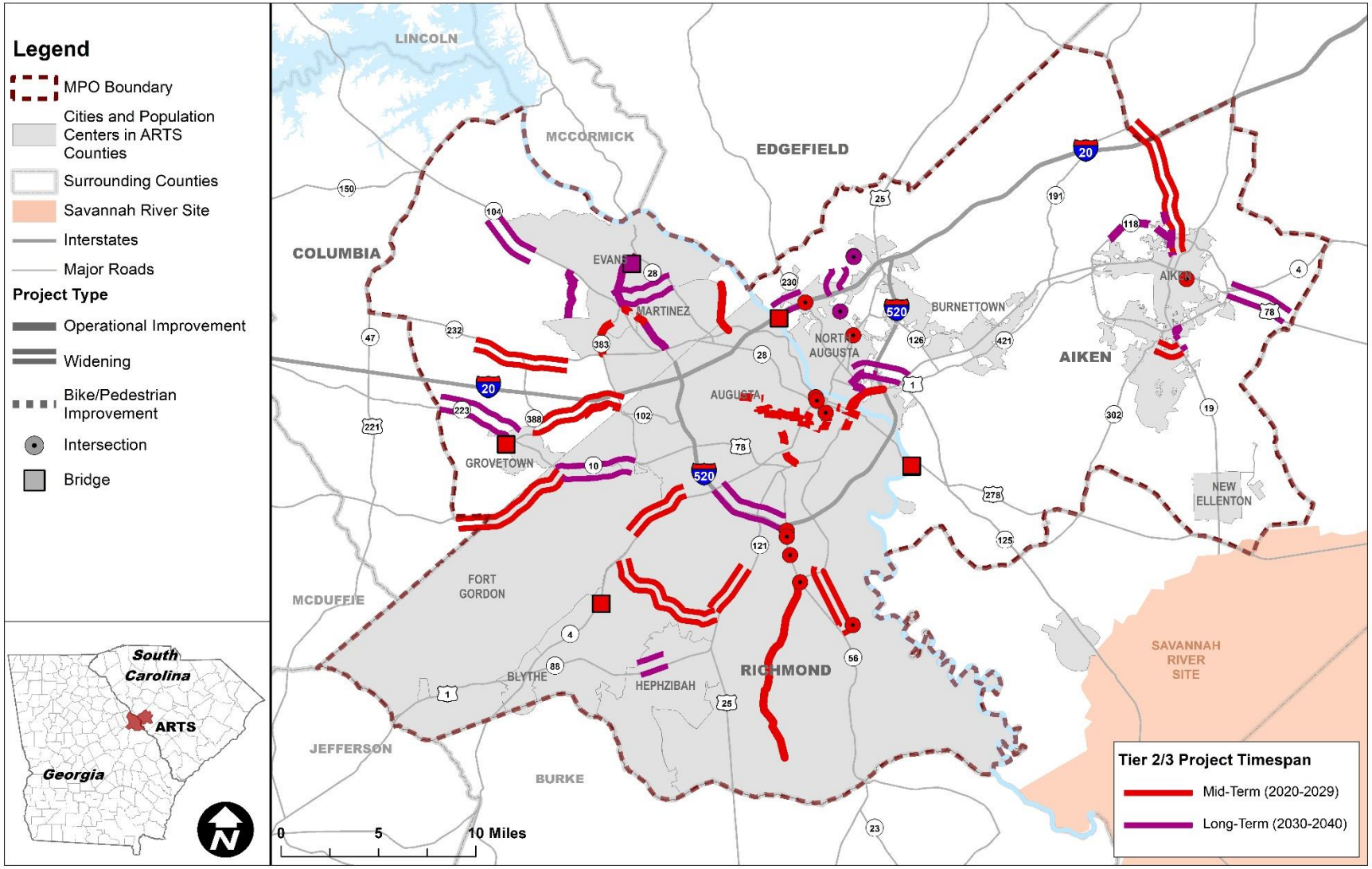
The 2040 LRTP, adopted in 2015, recommended a total of 99 location-specific projects to implement between 2015 and 2040. LRTP recommendations divided projects into three time scales:

- 29 projects were listed as **Short-Term** priorities to implement between **2015 and 2019.** These are committed projects in the 2015-2018 Transportation Improvement Program (TIP) and are programmed to begin preliminary engineering, right-of-way acquisition, or construction during the 2015-2018 planning period.
- 45 projects were listed as **Mid-Term** priorities to implement between **2020 and 2029**. These are medium-range funding priorities and are financially constrained.
- 25 projects were listed as **Long-Term** priorities to implement between **2030 and 2040**.



Source: 2040 LRTP (2015)

Figure 12-8. Short-Term Project Types, Locations, and Status (2019)



Source: 2040 LRTP (2015)

Figure 12-9. Mid- and Long-Term Project Types and Locations (2015)

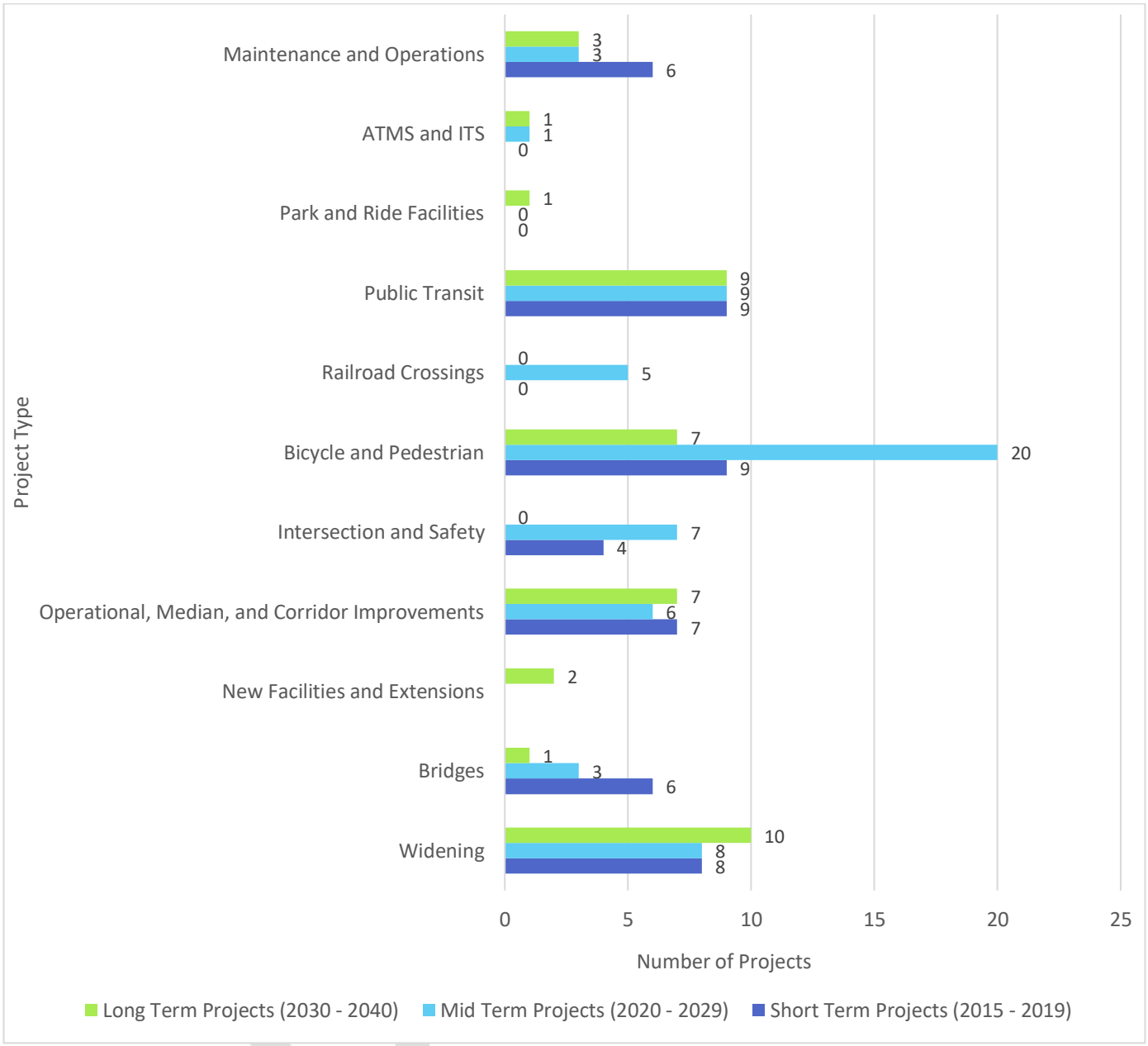
The ARTS MPO has made progress on 90 percent of short-term projects; 26 of the proposed 29 projects either have been completed, are under construction, or are in the pre-construction and engineering phase. See **Figure 12-8** for short-term project types, their locations, and their implementation status, and see **Figure 12-9** for mid- and long-term project types and their locations.

A fourth category is **High Priority Unfunded Projects**. Because funding forecasts at the time of the 2040 LRTP's adoption did not permit inclusion of all identified transportation improvement projects in the financially constrained time scales, future availability of funds may result in the projects' progression through the transportation planning process. Unfunded high priority projects address similar needs and issues as projects in the financially constrained program. Traffic safety improvements, congestion reduction, and additional bike and pedestrian facilities are some examples of unfunded high priority projects identified during the Transportation Vision 2040 LRTP update process.

In addition to location-specific projects, the 2040 LRTP also recommended programmatic and maintenance funds for use throughout the ARTS planning area. Those are discussed in more detail below.

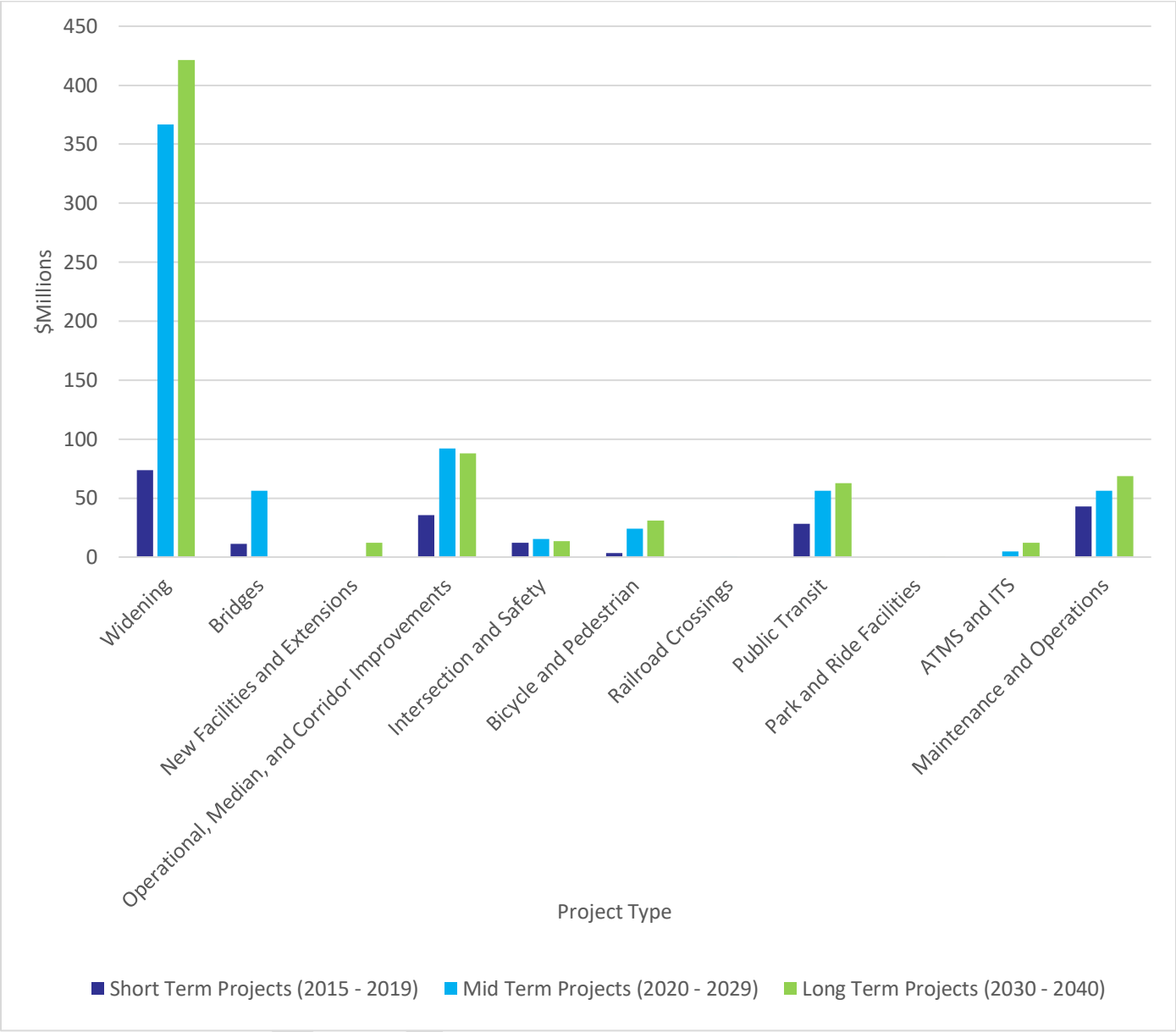
Project recommendations fall into several categories of improvement type (see **Figure 12-10** and **Figure 12-11**):

- **Widenings** add additional travel lanes in one or both directions with the goal of reducing traffic congestion and increasing road capacity.
- **Bridge** projects include structural improvements and widenings to improve safety and capacity.
- **New Facilities and Extensions** are new infrastructure projects or continuations of existing roadways.
- **Operational, Median, and Corridor Improvements** increase the efficiency of existing roadways and intersections through tools like improved signalization and road access management. Projects can typically be implemented relatively quickly and at a lower cost than other types of improvements.
- **Bicycle and Pedestrian** projects include bike and pedestrian infrastructure as well as multi-use, off-road trails and greenways. Projects also include pedestrian and bicycle safety and education programs.
- **Intersection and Safety** projects seek to increase safety, efficiency, and connectivity for all modes of transportation. Examples include new turning lanes, addition of crosswalks, and construction of medians and raised islands.
- **Railroad Crossings**, in this report included under Intersection projects, focus primarily on improving at-grade crossings and mitigating conflicts between trains and vehicles.
- **Public Transit** funding encompasses capital expenses and operational costs.
- **Park and Ride Facilities** are primarily considered in longer-range planning horizons.
- **Advanced Traffic Management System and Intelligent Transportation System (ATMS and ITS)** projects use technology to improve traffic flows and safety. Sensors send real time traffic data to on-the-ground infrastructure, such as traffic signals and electronic signs.
- **Maintenance and Operations** funds are set aside for system upkeep and management.



Source: 2040 LRTP (2015)

Figure 12-10. 2040 LRTP Projects by Project Types (2015)



Source: 2040 LRTP (2015)

Figure 12-11. 2040 LRTP Project Types by Funding Allocation (2015)

13 Conclusion and Next Steps

This Technical Report summarizes the existing conditions of the ARTS planning area's multi-modal transportation system. Existing data will serve as the input to **Technical Report #5's Needs Assessment**, a robust process that will determine areas of greatest need and determine where improvement projects may be necessary.

Population projections and modeled traffic data indicate that there will be significant transportation needs within Columbia County and within the ARTS planning area's urban areas like the City of North Augusta, the City of Aiken, and the City of Augusta. Areas with projected increases in travel demand, coupled with an inventory of aging or deficient transportation infrastructure, will determine areas in greatest need of transportation improvement in the short, medium, and long term.

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[i] Federally mandated process is established in the US Code of Regulations, Title 23- Highways, Section 134: Metropolitan Transportation Planning. https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title23-section134&num=0&edition=prelim#effectivedate-amendment-note

[ii] Copies of the most recent UPWP are located on the ARTS MPO's website: https://www.augustaga.gov/2086/Unified-Planning-Work-Program

[iii] Copies of the most recent TIP are located on the ARTS MPO's website: https://www.augustaga.gov/1994/Transportation-Improvement-Program

[iv] U.S. Census Bureau Quick Facts: https://www.census.gov/quickfacts/fact/note/US/INC110218

[v] 2011 Georgia Statewide Airport Economic Impact Study, GDOT: http://www.dot.ga.gov/InvestSmart/Aviation/Documents/ExecutiveSummary.pdf

[vi] GDOT, 2015 Georgia State Rail Plan: http://www.dot.ga.gov/InvestSmart/Rail/Documents/StateRailPlan/2015GeorgiaStateRailPlan-1-26-16.pdf

[vii] US Federal Highway Administration Bicycle and Pedestrian Program: https://www.fhwa.dot.gov/environment/bicycle_pedestrian/

[viii] **Augusta Downtown Parking System:** The City of Augusta is developing an application-based parking system, which is being implemented by a parking management company, SP+. There are currently sixty meters being proposed in the area. The parking meters are planned to be Wi-Fi enabled, which will allow users to identify available spots in the mobile application. The suggested costs of the parking spots are $1.50 per hour, $0.50 for twenty minutes, and a monthly $25 fee for employees. The parking facilities can be paid for via cash, coin, card, or application.

[ix] **Richmond County Emergency Vehicle Preemption System:** the emergency vehicle preemption improves the safety of the system. It was recently announced that the Augusta Fire Department is getting the emergency vehicle preemption system, which allows firefighters and first responders green lights at intersections to reduce response times

[x] **Augusta Transit Operations and Management**: provides transportation for up to 3,000 daily customers. The transit system runs approximately 2,313 miles for each weekday. The benefits of the system are that it mitigates traffic congestion and promotes high-occupancy travel. Additionally, **Richmond County Transit Vehicle Preemption System:** improves operational efficiency, increases ridership in the transit system, and reduces emissions.