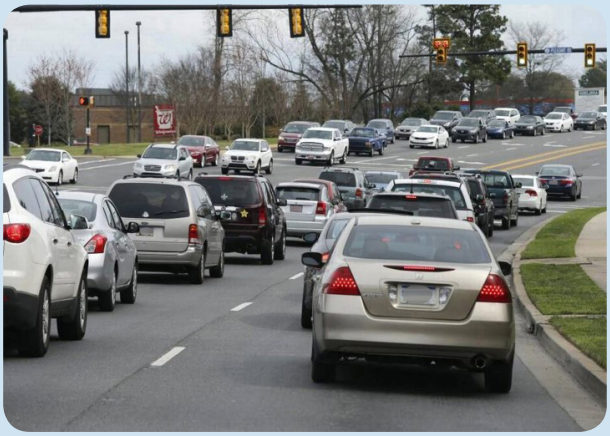

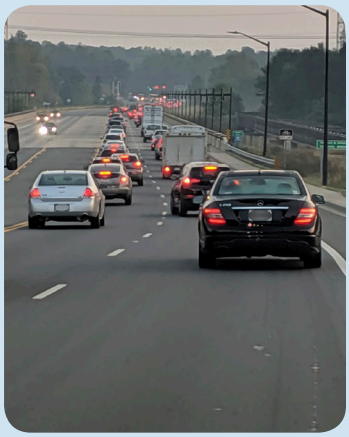

2050 Long Range Transportation Plan

April 2021

RFATS
Rock Hill-Fort Mill Area Transportation Study

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Introduction

About this Plan

This document is the 2050 Long Range Transportation Plan (LRTP) for the urbanized areas of York and Lancaster counties, South Carolina. It has been prepared by the Rock Hill - Fort Mill Area Transportation Study (RFATS), which is the agency responsible for regional transportation planning in this area. Federal law requires the preparation of this plan, and also specifies issues which the plan must consider.

The plan is multi-modal, covering highways, public transportation, freight, bicycle and pedestrian travel, as well as aviation. It includes a financial plan for transportation expenditures to 2050, as well as a congestion management process. The plan also takes social and environmental considerations into account, along with public involvement during the course of its preparation.

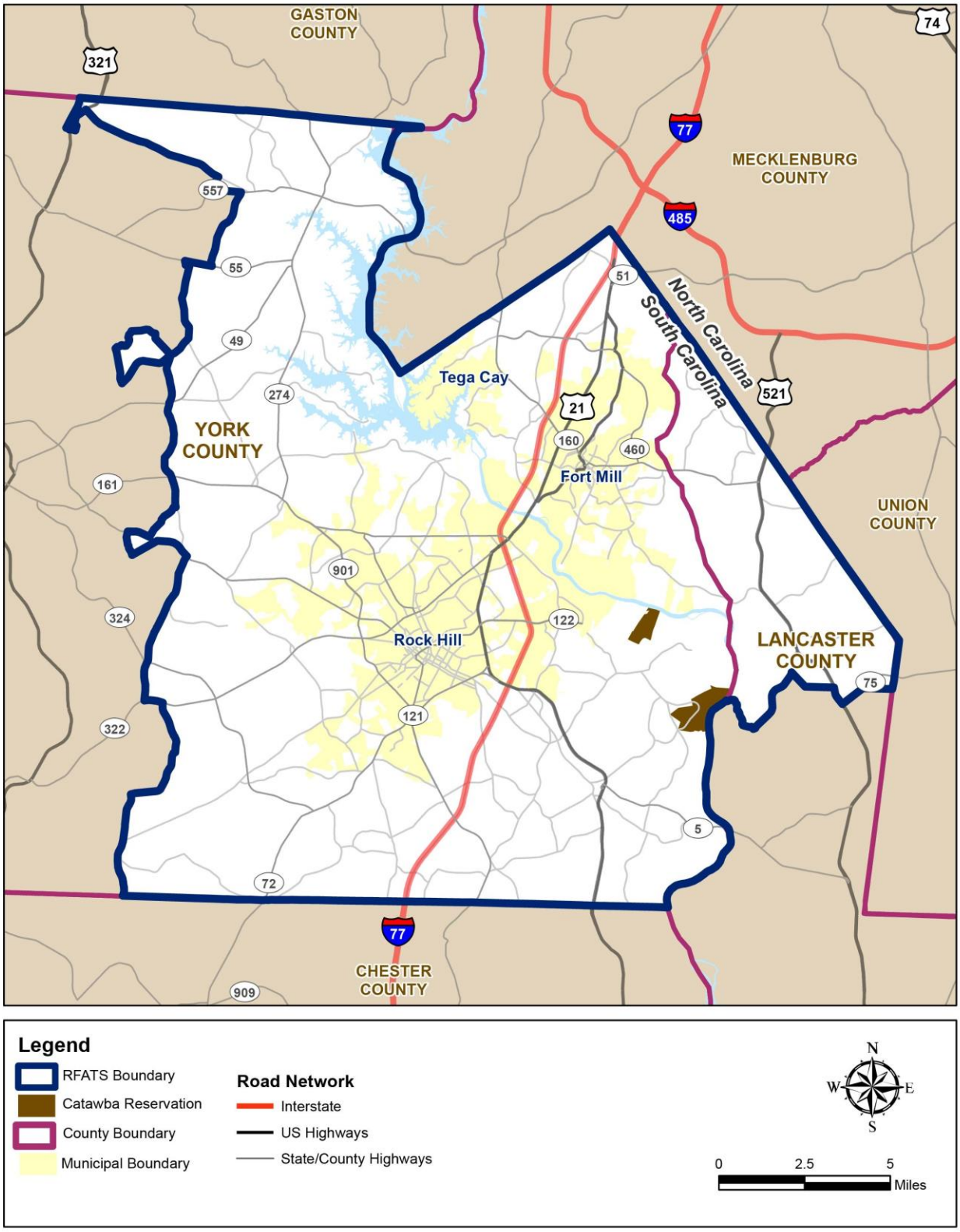
About RFATS

What is an MPO?

RFATS is a Metropolitan Planning Organization (MPO), one of more than 400 such agencies across the country that are responsible for regional transportation planning. In order to remain eligible for federal transportation funds, urbanized areas with a population of 50,000 or greater must maintain a formal metropolitan transportation planning process. The overall aim of these requirements is to ensure continuing, cooperative, and comprehensive transportation planning for urban areas, and MPOs are central to that process. Each MPO is responsible for short- and long-range transportation planning for its region, as well as the programming of all federal transportation funds spent within the area.

Figure 1.1 shows the boundary of the area for which RFATS is responsible. Member communities of RFATS include the cities of Rock Hill and Tega Cay, the Town of Fort Mill, the unincorporated urban areas of York and Lancaster counties, and the Catawba Indian Nation.

Figure 1.1: RFATS Planning Area



The RFATS Planning Area

As shown in **Figure 1.1,** the Interstate 77 corridor runs through the heart of the RFATS planning area. The largest city in the region, Rock Hill, is 20 miles south of Charlotte and approximately 65 miles north of Columbia. The U.S. Census Bureau estimates that Rock Hill is now the fifth-largest city in South Carolina.

I-77 connects the area to Columbia (to the south) and Charlotte (to the north). Nearby, I-85 connects the area to Greenville (to the west) and Atlanta (to the southwest). A major international airport (Charlotte Douglas) and intermodal freight yard are located just north of the planning area on the western edge of Charlotte, NC. To the south, one of the east coast's major ports in Charleston can be accessed via highway links along I-77 and I-26. Freight rail facilities broadly parallel I-77 regionally and run through downtown Rock Hill. One of the state's major river systems, the Catawba, flows through the area as well.

As described above, the RFATS planning area includes the cities of Rock Hill and Tega Cay, the Town of Fort Mill, the Catawba Indian Nation, the eastern urbanized portion of York County as well as the panhandle of Lancaster County – which essentially runs from the state line along US 521 down to Hwy 75 (Waxhaw Hwy). The planning area also includes the communities of Lake Wylie, Newport, Bethel, Leslie and Catawba.

Formal regional transportation planning in the RFATS area began in the early 1960s. At that time, the planning process principally focused only on the eastern urbanized portion of York County – which was essentially Rock Hill. Since this time, RFATS has grown in size and population – as of 2018, the planning area includes a population of 254,000. This growth has led to increasing pressure on many parts of the transportation system, and further growth is projected to continue for the duration of the LRTP through 2050 – though the next ten years are expected to be among the strongest.

RFATS Organizational Structure

The planning process is guided by the RFATS Policy Committee, comprised of 12 voting members who represent each of the region's local governments, the Catawba Indian Nation, the South Carolina Department of Transportation (SCDOT) Commission, as well as legislative representatives from the South Carolina House and Senate. The committee chair is selected annually on a rotating basis among local government members. The vice-chair also serves a one-year term and is selected by vote of the Policy Committee members.

Figure 1.2: RFATS Organizational Structure

The Technical Team includes staff from each of the municipalities, York and Lancaster counties, as well as SCDOT, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Catawba Regional Council of Governments, and the Catawba Indian Nation. The RFATS Administrator serves as chair of the Technical Team.

RFATS also maintains a standing Citizens Advisory Committee which reviews and provides input on the development of programs and projects within the region. Members include representatives from the six RFATS communities and at-large members who represent persons traditionally underserved by the transportation system.

The Transportation Planning Process and the LRTP

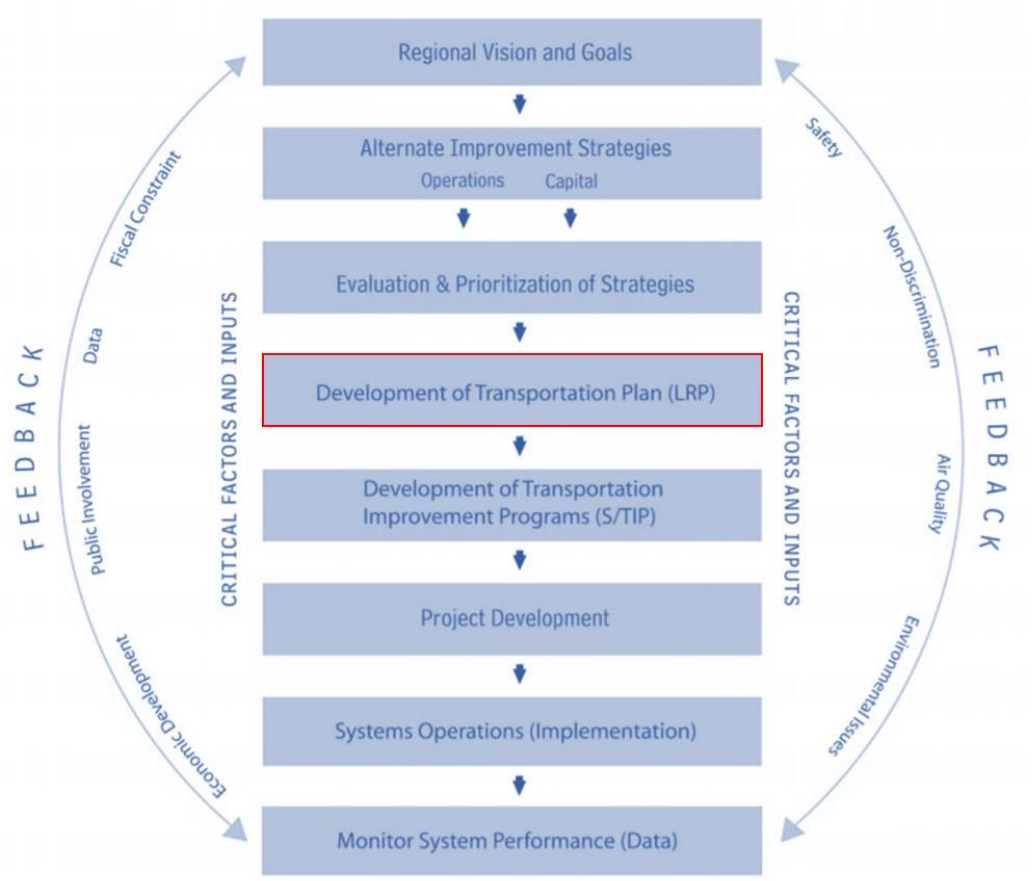
Figure 1.3 presents an overview of the major elements in the transportation planning process, including the development of the LRTP. As shown, the plan summarizes the priority "strategies" that have been identified to help meet regional transportation goals. These strategies include both capital projects and operations (such as roadway maintenance and public transit service). Once the long-range plan has been adopted, the near-term strategies receive funding for implementation by being included in the region's Transportation Improvement Program, or TIP.

After a project has been included in the adopted TIP, the responsible agency may begin formal project development. This typically starts with confirming the purpose and need of the project, securing the necessary environmental agency approvals, and completing the design. If needed, right-of-way is then purchased and then construction begins. This process generally takes several years from planning to construction, particularly in the case of larger projects.

As the region implements strategies from the LRTP, RFATS will continue to monitor the performance of the area's transportation system, as well as track the nature of transportation needs and demands.

The plan must be updated every four to five years. Any necessary changes in regional strategies can be made either through amending the current LRTP, or as part of the next plan update.

Figure 1.3 The Transportation Planning Process



From USDOT's *The Transportation Planning Process: Key Issues*

Public Participation Plan

Transportation plans and decisions affect travel costs and quality of life for every citizen of every community in the RFATS region, and active public participation in the planning and decision-making process is critical to RFATS' goals and mission.

With this in mind, RFATS has established a Public Participation Plan to actively encourage community members to provide input into the transportation planning process. The plan is regularly reviewed for improvement opportunities and was most recently updated in September 2019. One of the principal goals of the plan is to ensure that the planning process is open to all who would participate, including the following populations:

- Work commuters to and from the urbanized areas of York and Lancaster counties to Charlotte, NC.
- Local work commuters within the urbanized areas of York and Lancaster counties and the respective population centers.
- Student populations from local colleges and universities.
- Elderly, handicapped, minority, low-income, and disadvantaged residents.
- Commercial / industrial enterprise activity, including freight.
- All non-commuting travelers.

The type of transportation presently used by the majority of these populations is the single passenger automobile. Other transportation service is offered through commercial trucks, express bus service to and from Charlotte, fixed route service in the City of Rock Hill, more broad demand response transit service, vanpool arrangements, and a developing network of bicycle & pedestrian facilities.

Rapid growth and development within the planning area is generating increased demand across the transportation network, creating a challenging operational environment for both people and goods. This pressure represents an important planning variable for short, intermediate, and long-term development decisions that will impact every community within the RFATS Study Area. Future growth will

require a substantial increase in local transportation investment as well as greater diversity in the planning and funding of various transportation improvement strategies. This approach will protect the area from significant traffic congestion, lower levels of system reliability, diminished quality of life, and decreased economic vitality.

PUBLIC PARTICIPATION PLAN: VISION, GOALS & OBJECTIVES

The RFATS vision for public participation includes providing information on transportation planning services and project development in a convenient and timely manner. To this end, the following goals and policies have been established.

Goal I. To actively engage the public in the transportation planning process according to the policies contained in Federal and State law as well as in the RFATS Public Participation Plan.

A. RFATS will maintain a current database of contacts and/or interested parties that includes:

- Federal, state and local agencies responsible for planned growth, economic development, environmental protection, airport operations, freight movement, land use management, natural resources, and historic preservation
- Elected Officials
- Local Government Staff
- Tribal Governments
- Transportation Agencies (freight, port, airport, transit, etc.)
- Organizations/agencies representing users of public transportation
- Organizations/agencies representing those traditionally underserved by the existing transportation system
- Local Media
- Homeowners Associations
- Libraries (for public display)
- Interested members of the general public

B. RFATS will (when feasible) electronically send meeting notices

to all interested parties (RFATS Contact List and/or targeted group mailing, etc.).

C. RFATS will employ visualization techniques to illustrate transportation plans/projects. Examples of visualization techniques include charts, graphs and maps.

Goal II. RFATS shall keep the public informed of on-going transportation related activities on a continuous basis.

A. RFATS will make publications and work products available to the public.

B. RFATS staff will be available to provide general and project specific information at a central location during normal business hours and after hours when deemed appropriate and with reasonable notice.

C. RFATS will maintain an accurate website with current transportation planning and project activity descriptions/summaries, including:

- Updated list of Policy Committee members
- Current schedule for RFATS meetings and events
- Public display ads and notices
- Copies of the Metropolitan Transportation Plan (MTP), Transportation Improvement Program (TIP), Unified Planning Work Program (UPWP), Public Participation Plan (PPP), and other documents/studies
- Opportunity for public comment
- Opportunity to request updates for notices and announcements
- Civil Rights/Title VI Information
- Glossary of commonly used terms and phrases
- Interactive Mapping available via ArcGIS Online
- Staff Contact Information

D. RFATS will maintain and update social media accounts with current planning and project activity in an effort to broaden public awareness.

Goal III. RFATS shall encourage the participation of all citizens in the transportation planning process.

A. RFATS utilize a "Public Participation Communications Venue" matrix (**Figure 2.1**), which lists the stakeholder groups and communication media (both direct and indirect), to provide the greatest opportunity to influence the transportation/transit choices in the RFATS Study Area.

Figure 2.1: RFATS Public Participation Communication Venues

	RFATS Citizens Advisory Committee	Community town hall meetings	Organization meetings	Newspapers – general circulation & targeted, etc.	Websites (linked to all jurisdictional sites)	Newsletters (Neighborhood Empowerment, etc.)	Mass Media	Targeted Bulk Mailings	Public Facility Contact	Senior Centers	Personal Interviews	Public Events
Residents – General Public	•			•	•				•			•
Historically Underserved	•	•		•	•	•	•		•			
Housing Authorities	•	•	•		•			•				
Neighborhood Organizations	•	•	•	•	•				•			
Churches, Faith-Based Organizations	•	•		•	•				•			
ESL Groups	•	•							•			
Council on Aging/Special Needs	•	•	•	•	•				•	•		
Chamber of Commerce	•		•	•	•				•			
Economic Development Organizations	•		•	•	•				•			
Homebuilders Association	•		•	•	•				•			
Educational Institutions / Organizations	•		•		•	•	•		•			

Freight Movement (i.e. SC Trucking Association)			•								•	

Goal IV. RFATS shall strive to improve public participation by continuously monitoring and evaluating public participation techniques.

A. The Public Participation Plan will be reviewed at least every three (3) years.

PUBLIC PARTICIPATION TECHNIQUES

Public Participation is an ongoing activity of the MPO. An effective public participation process is characterized by techniques and procedures that enable citizens to become and remain well informed. This section contains descriptions of public participation tools that RFATS currently uses and proposes to use in the future:

- Citizens Advisory Committee
- Community Based Public Events/SC Visitors Center
- Community Town Hall Meetings
- Comment Forms
- Consultation
- Direct Mailings/Postcards
- E-mail Notifications/ Announcements
- Flyers
- Legal Advertisements and Display Ads
- Library Distribution
- Limited English Proficiency Populations (Translation Services)
- LRTP Brochure
- MPO and Local Government Websites
- Media/Press Releases
- Personal Interviews
- Public comment period during Policy Committee Meetings
- Responding to comments or questions (written, telephone, meetings)
- Small Group/Public Meetings
- Social Media
- Summary of Comments Received
- Surveys
- Title VI and Environmental Justice
- Visualization

To support participation by persons with limited English proficiency, a translation tool is provided on the RFATS website which translates text on the webpages into more than 70 different languages, including Spanish. RFATS also works with the York County International Center to address other requests for translation.

Public Participation Activities for the 2050 LRTP

Stakeholder Outreach

Comprehensive outreach to all stakeholder groups was undertaken during the development of the 2050 LRTP, beginning in the fall of 2020 and concluding with the final public hearing at the April 23, 2021 Policy Committee meeting. A representative sample of those contacted includes the following:

- Local Governments / CRAFT Planning Partners / SCDOT
- Federal Highway Administration / Federal Transit Administration
- Environmental Protection Agency / SCDHEC
- Freight & Rail Providers / Citizens Advisory Committee
- Employers & Chambers of Commerce
- Transit Agencies / Providers
- Bicycle / Pedestrian Organizations

Outreach Meetings

Given the circumstances with COVID-19 in 2020, most outreach was done online. We advertised our public meeting opportunities through the local newspapers (The Herald and the Carolina Gateway). We reached out to our extensive stakeholder distribution list, accepting comments via phone, email, and through the RFATS website. Ads were ran on the My Ride Transit Service, utilizing their messaging system on the buses. Lastly, we ran ads through social media reaching over 25,000 people in York and Lancaster Counties.

As a part of the stakeholder outreach, a series of virtual meetings were held to provide opportunity to all interested parties to identify transportation needs and priorities. These were held on Tuesday, October 13th, 2020 from 1:30 PM to 3:00 PM and Thursday, October 15th, 2020 6:00 to 7:30 PM. The Tuesday session had 33 attendees including citizens, media, technical staff from within the region. The Thursday session had 12 attendees. Below are some of the common themes that we heard during those meetings and in comments provide online.

- Operations & Maintenance – seemed to be a focus on repaving needs across the region, specifically noted were Dobys Bridge Road, Cel-River Road & Sutton Road
- Road Widenings – specifically focus was on the widening projects planned by Pennies for Progress on US 21 and the needed for widening to continue on US 21 from the Catawba River to SC 160
- Bicycle & Pedestrian Improvements – noted in a number of locations and there is growing emphasis from the public on the

need for improved access & safety as well as improved system connectivity

- Public Transit – there were a number of comments received regarding the need for additional options for public transit across the network, as well as continued desire for access to the LYNX LRS. There was also interest in Commuter rail connecting our region to Charlotte, Columbia, & Raleigh. Some concerns were voiced on how regional transit options may work, and what possible drawbacks there may be.
- Dave Lyle Blvd Extension – there was concern express by some regarding the impact to communities in the eastern parts of the study area by any potential extension of Dave Lyle Blvd
- Funding – concern was express regarding any impact COVID-19 has had on funding levels (SCDOT noted in fall 2020 that they projected a $54M loss in gas tax revenue and a $24M decrease in vehicle sales tax revenue)
- Connected and Autonomous Vehicles – there was interest in how the MPO is considering Connected & Autonomous Vehicles in our Long Range Planning
- Collector Streets – there was extensive interest in the role of Collector Street Planning and the impact collector streets can have on our network connectivity and congestion reduction on arterial roadways.

Review of Comments and Development of Draft Project List

This section to be completed following the public engagement period in April 2021.

RFATS Committees

RFATS has several committees that not only contribute directly to the policy-making process but also serve as a means of public and stakeholder involvement. The committees include:

Policy Committee – The RFATS planning process is guided by a 12-member Policy Committee which sets priorities and provides direction for the RFATS Study Area. This committee is made up of elected officials from each jurisdiction within the MPO Planning Area, the South Carolina Legislature and a representative from the SCDOT Commission. The committee chair is determined through a yearly rotating schedule among members representing the local governments that participate in the process. The vice-chair is also selected by a vote of the members of the Policy Committee and also serves a one-year term.

Technical Committee – This committee includes staff from each of the municipalities within the RFATS Study Area, as well as the South Carolina

Department of Transportation (SCDOT), the Federal Highway Administration (FHWA), the Catawba Regional Council of Governments (CRCOG), and the Catawba Indian Nation. The RFATS Administrator serves as chair of this committee.

Citizen's Advisory Committee (CAC) – The Citizens Advisory Committee provides input and review of the RFATS transportation planning process and activities. Members include representation from the six RFATS communities and at-large members representing those with special needs as well as communities traditionally underserved by the existing transportation system.

Interagency Consultation Committee (IAC) – The primary purpose of the IAC is to promote cooperative coordination and review in ensuring that all transportation plans, programs and projects adopted by RFATS properly conform with the purpose of the State Implementation Plan (SIP) to meet the National Ambient Air Quality Standards in the RFATS region. The Interagency Consultation Committee includes staff representation from RFATS, as well as SCDOT, FHWA, the Federal Transit Administration (FTA), the South Carolina Department of Health and Environmental Control (SCDHEC) and the Environmental Protection Agency (EPA).

LRTP Adoption Process

The adoption process for the 2050 Long Range Transportation Plan involved a multi-stage evaluation and review effort that included Interagency Consultation with a variety of Federal and State partners. During the period from January 2021 through April 2021, the RFATS Technical Team and the IAC reviewed all three LRTP documents (Long Range Plan, Air Quality Conformity Report and Transportation Improvement Program).

On March 26, 2021, the RFATS Policy Committee granted preliminary approval of a public review draft and authorized a 30-day public comment period. Draft LRTP documents were then posted on the RFATS website as well as on the websites of all RFATS communities. Notice of the opportunity for public review was then published in the Rock Hill *Herald, Lake Wylie Pilot, Fort Mill Times and Carolina Gateway* (the general circulation newspapers for the area), providing information regarding the availability of the LRTP documents for public inspection as well as information on how to submit input for presentation to the Policy Committee prior to final approval.

On April 23, 2021 a public hearing was held. This section to be completed following the public hearing on April 23, 2021.

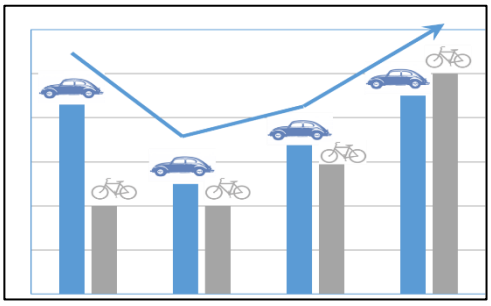
A Performance-Based Planning Framework

The current federal legislation – *Fixing America's Surface Transportation* (FAST) Act, enacted in December 2015 – retains the same performance-based planning frameworks that were enacted under the previous federal legislation - *Moving Ahead for Progress in the 21st Century* (MAP-21). The framework requires MPOs to use performance measures in their planning processes – including the LRTP.

Goals, Objectives and Performance Measures

The terms "goals" and "objectives", used in a variety of settings, have specific meanings in the planning field. *Goals* are broad qualitative or descriptive statements that indicate a general direction for a plan. *Objectives* describe the specific steps or actions that will be taken to reach a given goal. Multiple objectives are typically assigned to one goal to paint a picture of how a goal can be successfully met.

MPOs have always used goals and objectives in the development of LRTPs and other planning activities. There has been a recent increase in the use of *performance measures* to further refine or "operationalize" objectives by providing a means of quantifying and tracking progress. In long-range planning, these measures can be used to compare current performance against future projections.



Most MPOs already use some form of performance measurement in the long range transportation planning process. Common measures include roadway level of service (a measure of how freely traffic is flowing) and volume to capacity ratio (a measure of traffic volume relative to the number of roadway lanes). Regional travel demand models are used to generate these measures in addition to others, such as the number of vehicle-miles traveled, vehicle-hours traveled, and vehicle-hours of delay.

Several of these measures for the RFATS region are presented in Chapter 4. This provides a comparison of how well the roadway system functions under current conditions against projected performance under the conditions that are expected by the year 2050. Proposed transportation improvements can then be evaluated by the degree to which they are expected to improve future system performance.

Performance targets can be used to delineate ideal minimum and/or maximum values for these measures. For example, a city may aim to have sidewalks lining at least 75% of its roads or a transit system may strive to have at least 90% of its buses arrive within 5 minutes of their scheduled time.

The 2050 LRTP includes performance measures that align with anticipated federal requirements for monitoring safety and air quality improvement, which are the measures applicable to the RFATS region based on preliminary federal guidance.

Federal Planning Factors Included in the LRTP

Many investments in the RFATS region use federal funding and therefore must be guided by a long range plan that addresses multiple modes of transportation and specific factors such as economic vitality and safety. These factors, listed in **Figure 3.1**, have remained largely the same in federal legislation over the past decade.

Two additional planning factors were added by the FAST Act: first, the transportation system's resiliency (i.e. its ability to withstand unexpected impacts, including stormwater impacts) and second, its capacity to promote and facilitate travel and tourism.

Other laws that inform the development of the LRTP include Title VI of the Civil Rights Act of 1964, the Americans with Disabilities Act (ADA) of 1990, and the National Environmental Policy Act (NEPA) of 1969. Each of these laws in some way influences the type, location, and design of transportation facilities and services contained in the LRTP.

Figure 3.1: Federal Metropolitan (FAST) Planning Factors

Support the **economic vitality** of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency
Increase the **safety** of the transportation system for motorized and non-motorized users
Increase the **security** of the transportation system for motorized and non-motorized users
Increase the **accessibility** and **mobility** of people and for freight
Protect and enhance the **environment**, promote **energy conservation**, and improve **quality of life**; and promote **consistency** between transportation improvements and State and local planned growth and economic development patterns
Enhance the integration and **connectivity** of the transportation system, across and between modes, for people and freight
Promote efficient **system management** and operations
Emphasize the **preservation** of the existing transportation system
Improve transportation system **resiliency** and **reliability** and reduce or mitigate stormwater impacts on the surface transportation system.
Enhance **travel** and **tourism**.

LRTP Goals and Objectives

The goals of the 2050 LRTP, shown in **Figure 3.2**, encompass the federal planning factors listed above. **Figure 3.3** demonstrates the relationship between the goals of the 2050 LRTP and the federally required transportation planning factors.

Figure 3.2: Goals of the 2050 Long Range Transportation Plan

1	Provide Safe, Secure, Reliable Roadway Travel
2	Manage Congestion
3	Provide Mobility Choices
4	Promote Consistency of the LRTP with Other Regional Plans

Figure 3.3: Relationship of National FAST Planning Factors to 2050 LRTP Goals

FAST Planning Factor	2050 LRTP Goal(s)
Support the **economic vitality** of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency	1, 2
Increase the **safety** of the transportation system for motorized and non-motorized users	1, 3
Increase the **security** of the transportation system for motorized and non-motorized users	1, 4
Increase the **accessibility** and **mobility** of people and for freight	1, 2, 3
Protect and enhance the **environment**, promote **energy conservation**, and improve **quality of life**; and promote **consistency** between transportation improvements and State and local planned growth and economic development patterns	2, 3, 4
Enhance the integration and **connectivity** of the transportation system, across and between modes, for people and freight	1, 2, 3
Promote efficient **system management** and operations	1, 2
Emphasize the **preservation** of the existing transportation system	1, 4
Improve transportation system **resiliency** and **reliability,** and reduce or mitigate **stormwater impacts** on the surface transportation system	1, 2, 3, 4
Enhance **travel** and **tourism**	1, 3, 4

Described on the following pages are specific objectives representing action steps to be taken to implement each 2050 LRTP goal. These objectives do not represent every possible action that could be taken, but they correspond to the issues most relevant to the RFATS region based on analysis, input and other local/regional plans. Performance measures are also given for a number of objectives.

Goal I. Provide Safe, Secure, Reliable Roadway Travel

Objectives

1) Protect public investment by maintaining the existing transportation system, including pavement, bridges, signal equipment and signs, transit vehicles and other transportation system components.
2) Provide a transportation system that enables reliable and efficient movement of passengers and freight to support the region's economic productivity.
3) Improve transportation safety for both motorized and non-motorized users.
    a) Reduce crashes at key intersections.
    b) Reduce crashes involving pedestrians and bicyclists.
4) Improve transportation security and the system's resiliency by developing an interconnected network that offers multiple routes and modes of travel.
5) Address visitor transportation needs through wayfinding, alternative modes in targeted areas, and other improvements.

Performance measures

A. Crash statistics for York and Lancaster counties, based on the most recent five years of data available:

a) Number of fatalities
b) Rate of fatalities per 100 million vehicle-miles traveled (VMT)
c) Number of serious injuries
d) Rate of serious injuries per 100 million VMT
e) Number of non-motorized fatalities and number of non-motorized serious injuries combined

B. Annual hours of delay in the RFATS region, as estimated by the regional travel demand model.

Goal II. Manage Congestion

Objectives

1) Make improvements to fully utilize capacity on the existing road network before constructing new lanes or facilities.
2) Give priority to projects that implement the strategies in the RFATS Congestion Management Process, including operational improvements such as traffic signal timing.
3) Give priority to projects that relate to implementation of the Collector Road plan.
4) Preserve traffic capacity on major corridors through quality development practices.
    a) Require driveway access on collector or local streets, rather than arterial routes.
    b) Increase the level of internal circulation within and between developments by designing more interconnected road networks.
4) Provide additional mobility choices (i.e. bicycle, pedestrian, and transit) along congested corridors.
5) Encourage and support sustainable development along congested corridors.
6) Maintain and improve the natural environment through the implementation of transportation policies, programs, and projects that reduce vehicle emissions to improve regional air quality.

Performance measures

A. Volume / Capacity ratios (V/C ratios): calculated using data from the Metrolina Regional Travel Demand Model (MRTDM).
B. Travel times, speeds, and corridor Level of Service (LOS): obtained through periodic travel time surveys.
C. Transit ridership and transit vehicle route reliability (on-time metrics): provided by the Charlotte Area Transit System and MyRide.
D. Safety: areas of safety concern were identified in the 2019 CMP using crash data provided by the South Carolina Department of Transportation (SCDOT).

Goal III. Provide Mobility Choices

Objectives

1) Incorporate pedestrian and bicycle facilities in planned improvements to roads and corridors, including state and local maintenance and pavement marking projects.
2) Require developments to provide pedestrian and bicycle facilities and connections.
3) Make demand-response service and rideshare opportunities available to all citizens in the RFATS area.
4) Maintain and improve citizens' access to inter-city rail and bus systems.
5) Continue to pursue implementation of local fixed-route transit service for RFATS communities.
6) Promote a transportation system that includes equitable options for low-income and minority persons.
7) Support expansion of existing demand-response services.

Performance measures

A. Percent of federal-aid roads within urban areas of RFATS that have sidewalks.

B. Percent of all workers who commute to work by walking or bicycling.

C. Percent of all workers who commute to work by using transit.

D. Annual ridership and on-time performance of transit service.

E. Transit trips per capita.

Goal IV. Promote Consistency of the LRTP with Other Regional Plans

Objectives

1) Implement strategies to improve regional air quality, including ridesharing, increasing trips made by alternative transportation, and improving traffic flow.

2) Implement the local land use policies needed to maximize the region's existing transportation investments and reach its long-term goals.
   a) Encourage growth and redevelopment in existing urban areas.
   b) Promote compact, walkable development patterns along the proposed future Bus Rapid Transit (BRT) corridor (as referenced in Chapter (as referenced in Chapter 8 – Public Transportation).
   c) Reserve future rights-of-way needed for planned transportation projects, whether affected by public or private development.
   d) Encourage review of development standards that may impede the expansion of transportation infrastructure.
   e) Encourage review of site development plans in relationship to number of driveways, locations of driveways, and opportunities to share access points to reduce increased curb cuts/driveways.

3) Minimize environmental impacts of the transportation system.
   a) Select, locate and design transportation system improvements so as to preserve and protect the area's natural features.
   a) Encourage transportation projects that help mitigate the impacts of stormwater runoff.

4) Ensure consistency with rural LRTPs in surrounding areas that are managed by the Catawba Regional Council of Governments as well as with other plans that affect the regional network, such as each county's Carolina Thread Trail Master Plan.

Performance measures

A. Tons of NOx (ozone) and volatile organic chemicals (VOCs) reduced by CMAQ-funded projects over a two-year and four-year period.

B. *Total coverage of land area converted for new roadway right-of-way.*

C. *Staff hours committed to coordination with other organizations responsible for transportation planning.*

D. *Clean fuels as a share of total fleet fuel use by transit agencies in the region.*

Each of the transportation investments recommended in the LRTP is expected to contribute to the achievement of these goals and objectives. In many cases, a proposed project or service will accomplish multiple goals and objectives. For example, growing the sidewalk system has environmental benefits, expands the availability of transportation choices, and improves safety for pedestrians.

Introduction

This section describes the regional roadway network and the process used to model future roadway conditions based on projected growth in population and employment within and around the RFATS region. Roadways that are currently congested or are projected to be congested in future years are identified. Proposed roadway improvements to address anticipated congestion as well as other operational factors have been developed and tested through a regional travel demand modeling process that takes account of operating conditions within RFATS as well as in adjacent areas. This ensures that all sources of current and projected travel demand are properly considered. These resulting projects, along with proposed timeframes for their implementation, form the basis for the roadway portion of this plan. Additionally, RFATS completed a Collector Street Plan in 2017 for which periodic updates are recommended due to the continued growth within the region.

Beyond the local roadway network in the planning area, it is important to note that additional infrastructure layers such as pavement quality; bridge conditions; and overall network performance / reliability, equally represent important components of the Metropolitan Transportation Planning Process as well and serve as additional reference points in shaping project and/or strategy identification, programming and implementation within the RFATS Study Area.

Existing Conditions and Trends

The roadway system is the principal means of mobility and access within the transportation system. An efficient roadway network allows for operational effectiveness, regional economic competitiveness, and a good quality of life.

There are also important linkages between transportation and land use that should be highlighted. This was true in the 19th century when the area developed with the building of the railroad, and it remains true today, particularly in relation to the highway system. Land use patterns determine travel needs, and the demands ultimately placed upon the road network. The need for transportation improvements — whether road widenings, intersection modifications, or simply a more context-sensitive street design— often reflect changes in adjoining land uses. Roadways in turn have a significant influence on land use. Providing improved access to property often generates new development at that location, which in turn generates additional travel demand, and then additional development, and so on in a circular fashion.

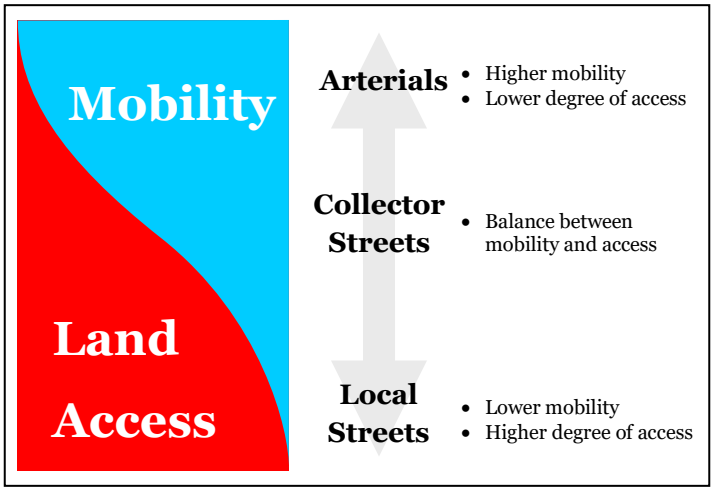
The RFATS roadway system connects the urban areas of Rock Hill, Tega Cay, Fort Mill and portions of York and Lancaster counties, the smaller communities within each urban area, and the wider regional and national transportation networks. Interstate 77, US 21, US 521, and SC 49 connect the RFATS region with Charlotte to the north and with Columbia to the south.

Roadway Functional Classification

Roadways are divided into functional classifications that reflect the balance between their role in providing mobility and their role in providing access to land (see **Figure 4.1** below). The functional classification of the nation's highways, roads and streets provides data that is used in the apportionment of federal funds, such as for the National Highway System (NHS) and Surface Transportation Program (STP). However, functional classification is also used for many other transportation planning and public policy purposes within states, MPOs, and local communities.

Within urbanized areas, roadways are classified into four categories: principal arterials, minor arterials, collector streets, and local streets.

Figure 4.1: Framework for Roadway Classification



Principal arterials carry traffic into and out of the region. Principal arterials (including freeways and expressways) in the RFATS region include:

- I-77
- US 21
- US 521
- Celanese Road / SC 161
- SC 49
- SC 160
- SC 5

Example of a principal arterial: SC 160

Minor arterials connect with the principal arterials and provide access between smaller communities within the urban area. Minor arterials include:

- SC 274 (Hands Mill Highway)
- SC 72
- Marvin Road
- Gold Hill Road / SC 460
- India Hook Road/Herlong Avenue
- Waxhaw Highway

Example of a minor arterial: Gold Hill Road

Collector streets collect traffic from residential areas and channel it to the arterials. Examples of collector streets include:

- Dobys Bridge Road
- Collins Road
- Barberville Road
- Ebinport Road
- Dam Road
- Pole Branch Road

Example of a collector street: Dam Road

Local streets provide direct access to adjacent land. Most streets within residential subdivisions would be classified as local streets, although it is also important to

have collector streets that provide connections within and between neighborhoods.

Figure 4.2 shows the functional classifications for significant roadways in the RFATS region.

Traffic Conditions

Traffic Volumes

Generally, the higher the level of functional classification, the higher the volume of traffic that the roadway carries. **Figures 4.3** and **4.4** show the estimated annual average daily traffic (AADT) volumes in the RFATS region in the year 2019.

I-77 carries the highest number of vehicles per day, with volumes ranging from approximately 53,300 vehicles per day at the southern edge of the region to 176,500 at the North Carolina border. Arterials with the highest traffic volumes include Celanese Road, Gold Hill Road, Cherry Road, SC 160, Carowinds Blvd, US 521, US 21, SC 49, and Dave Lyle Boulevard.

Table 4.1 – Highest Non-Interstate Traffic Volumes by Segment

Roadway	Segment	Length (Miles)	2019 AADT
SC 161 (Celanese Road)	Mt. Gallant Road to US 21 (Cherry Road)	1.2	55,000
SC 161 (Celanese Road)	India Hook Road to Mt. Gallant Road	1.2	44,600
SC 122 (Dave Lyle Boulevard)	I-77 to Galleria Boulevard	0.3	41,500
US 521	SC 160 (Fort Mill Highway) to North Carolina State Line	0.9	39,700
US 21 (Cherry Road)	Aberdeen Road North to I-77	0.4	39,000
Carowinds Boulevard	North Carolina State Line to US 21	1.1	37,600
SC 161 (Old York Road)	SC 274 (Celanese Road) to Trexler Lane	3.0	35,700
SC 49	SC 274 (Charlotte Highway), SC 557 to North Carolina State Line	3.0	35,500

SC 160	SC 460 (Gold Hill Road) to I-77	3.0	32,600
US 521	Shelley Mullis Road to SC 160 (Fort Mill Highway)	3.8	32,000

National Highway System (NHS)

As noted earlier, the roadway network within RFATS is connected to a larger system of roadways and transportation network connectors known as the or NHS. This system includes principal arterial roadways, the Interstate, as well as other strategically important highways and / or intermodal facilitates whose reliability and efficiency are crucial to the National Transportation System. **Figure 4.5** shows the NHS within the RFATS region.

As such, RFATS assembles the latest operational data from the National Performance Management Research Data Set or NPMRDS. This source of information represents the principal tool on which the establishment of appropriate performance targets are developed and monitored overtime. Changes in the operating conditions of this data set are another important reference point in identifying and implementing needed transportation system investments that will preserve and enhance current as well as future operating conditions within the planning area on the National Highway System as well.

Figure 4.2: Roadway Functional Classifications

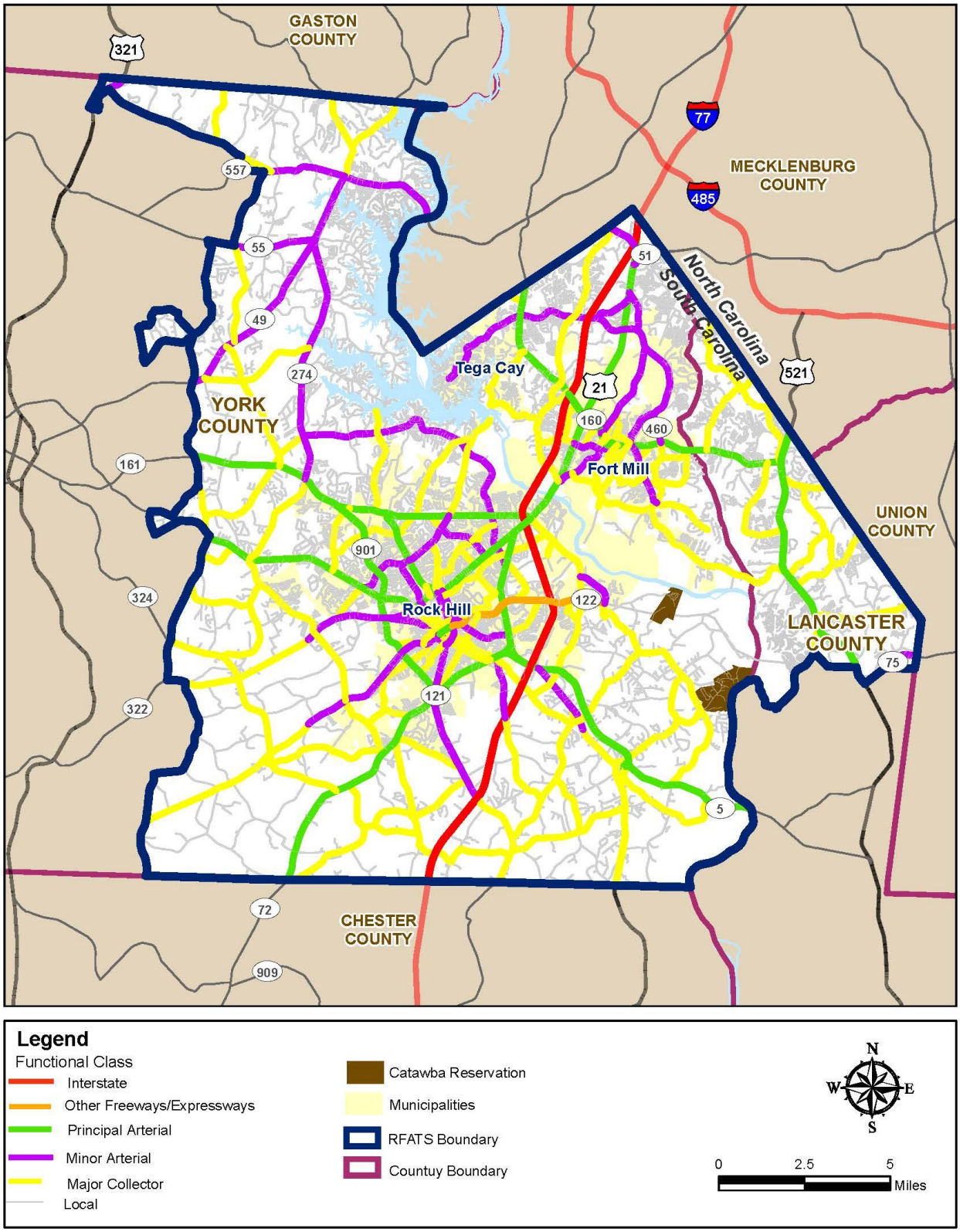


Figure 4.3: Average Annual Daily Traffic, 2019 (Region Overview)

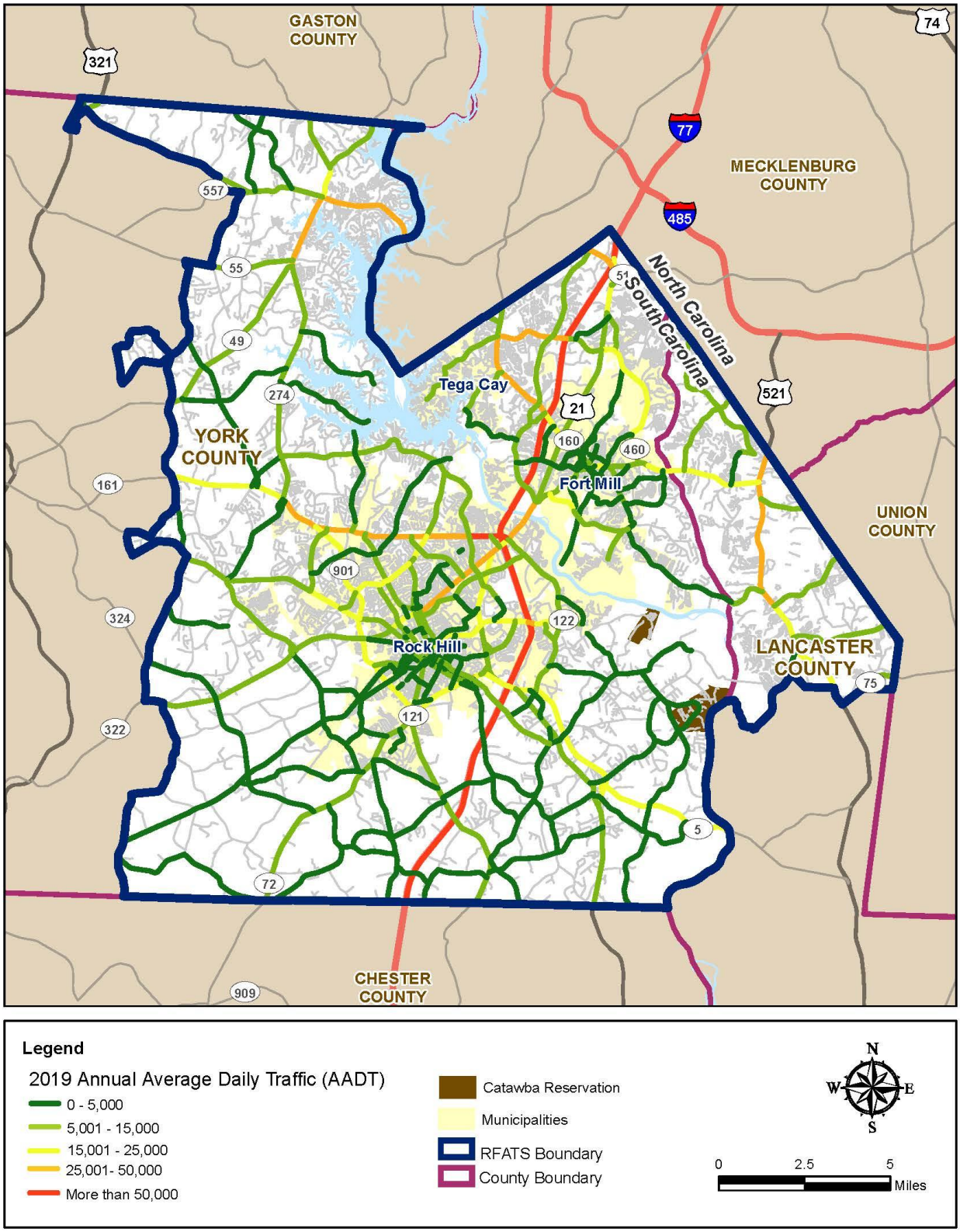


Figure 4.4: Average Annual Daily Traffic, 2019 (Rock Hill and Fort Mill areas)

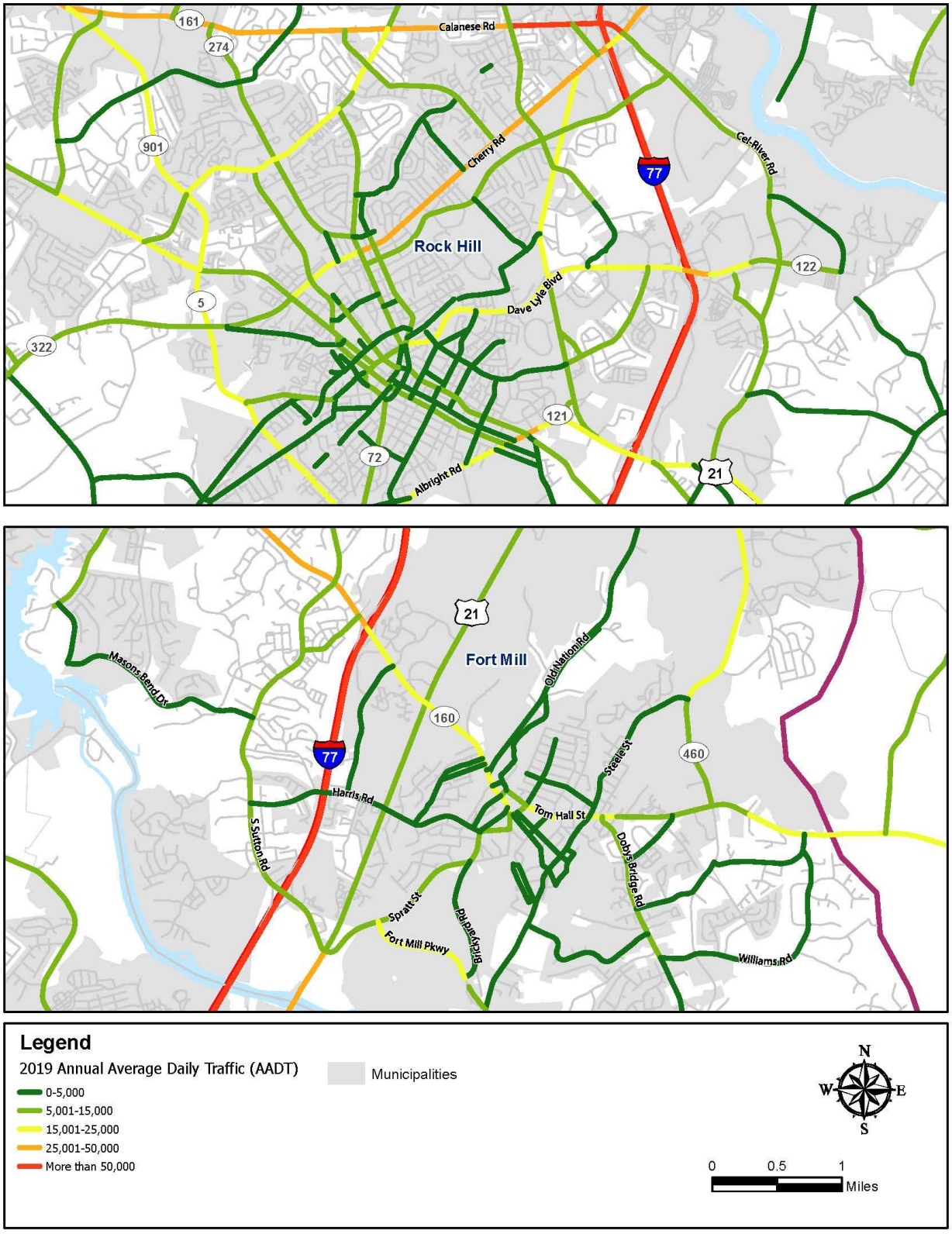
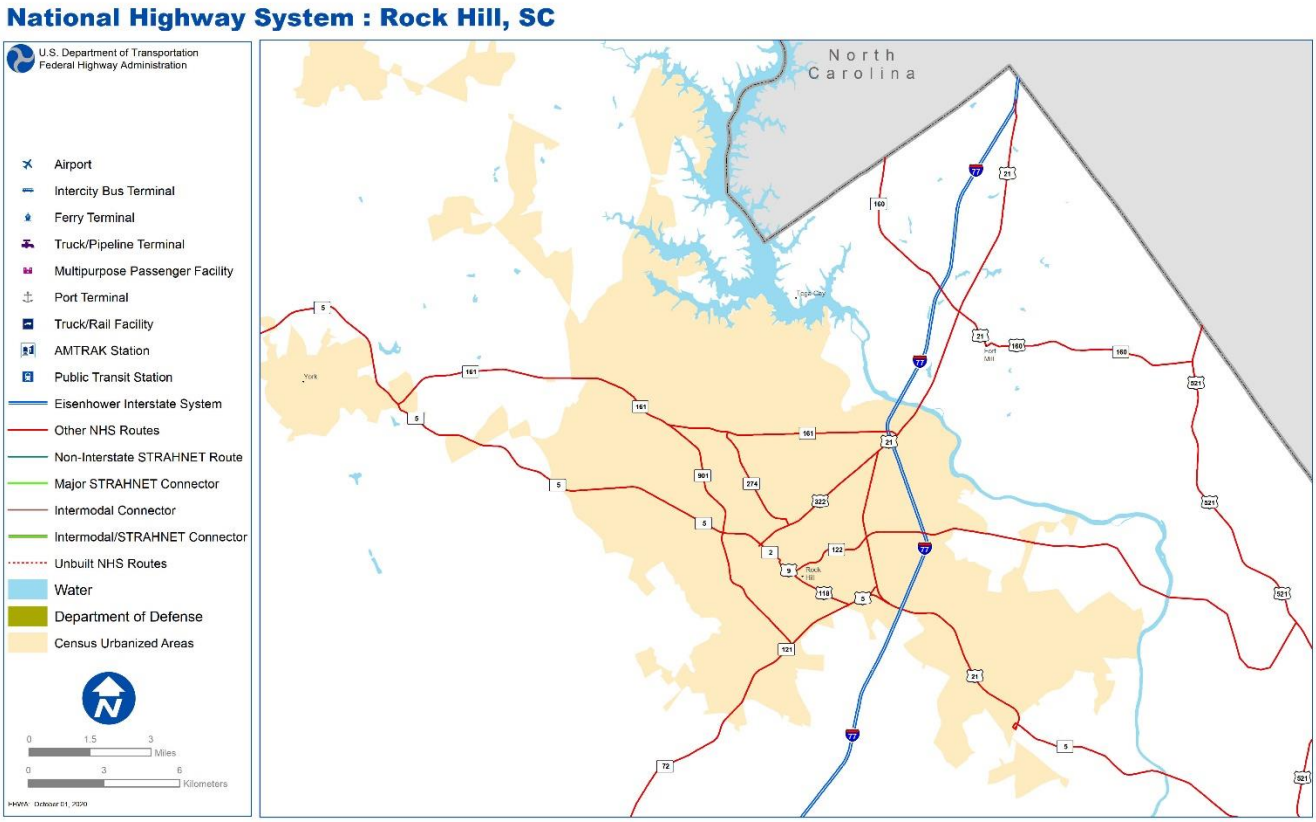


Figure 4.5: National Highway System (NHS) within RFATS Region



Current and Future Traffic Conditions

Traffic flow along a given roadway is often presented in terms of volume-to-capacity ratio (i.e. the volume of traffic that the road is carrying compared to its maximum capacity. A roadway's capacity is based on its functional classification, number of lanes, posted speed limit, percent of truck traffic, and geometric characteristics. Volume-to-capacity thresholds vary by the functional class of the facility and whether it is classified as urban or rural.

Higher V/C ratios indicate there are a higher number of vehicles relative to the road's capacity. For example, a V/C ratio of 0.70 means that about 70 percent of the road's available capacity is being used. As the V/C ratio nears 1, it means that the traffic volume is almost equal to the maximum number of vehicles the road can carry. Locations that have high V/C ratios are therefore almost certain to be experiencing traffic congestion and delay.

As the V/C ratio exceeds 1, reliability diminishes. Users of the roadway network look to find the quickest route to get to their destination, as the V/C and traffic volumes increase, drivers begin to experience less reliability in the roadway network.

The Metrolina Model was used to estimate traffic conditions on RFATS area roadways for a number of scenarios:

- **Existing Conditions (Figure 4.6):** This scenario uses a base year model calibrated to actual 2015 traffic data.

- **2050 LRTP (Figure 4.7):** This scenario shows projected traffic conditions by the year 2050, assuming the implementation of the projects included in this adopted long-range transportation plan.

All results reported here are for the PM peak period (3:30 to 6:30 PM), which shows the highest level of congestion during the 24-hour day that is modeled. It should therefore be noted that a route that appears congested in the following maps may only be congested at certain times of day.

In the Existing Conditions scenario, the arterial roads show the highest levels of congestion, especially in the areas with large retail developments near I-77. Significant PM peak congestion is also indicated along Fort Mill Highway and on I-77 itself; the latter is nearing capacity north of Sutton Road and already at capacity south of Mt. Holly Road.

Figure 4.6: Existing Traffic Conditions (2018)

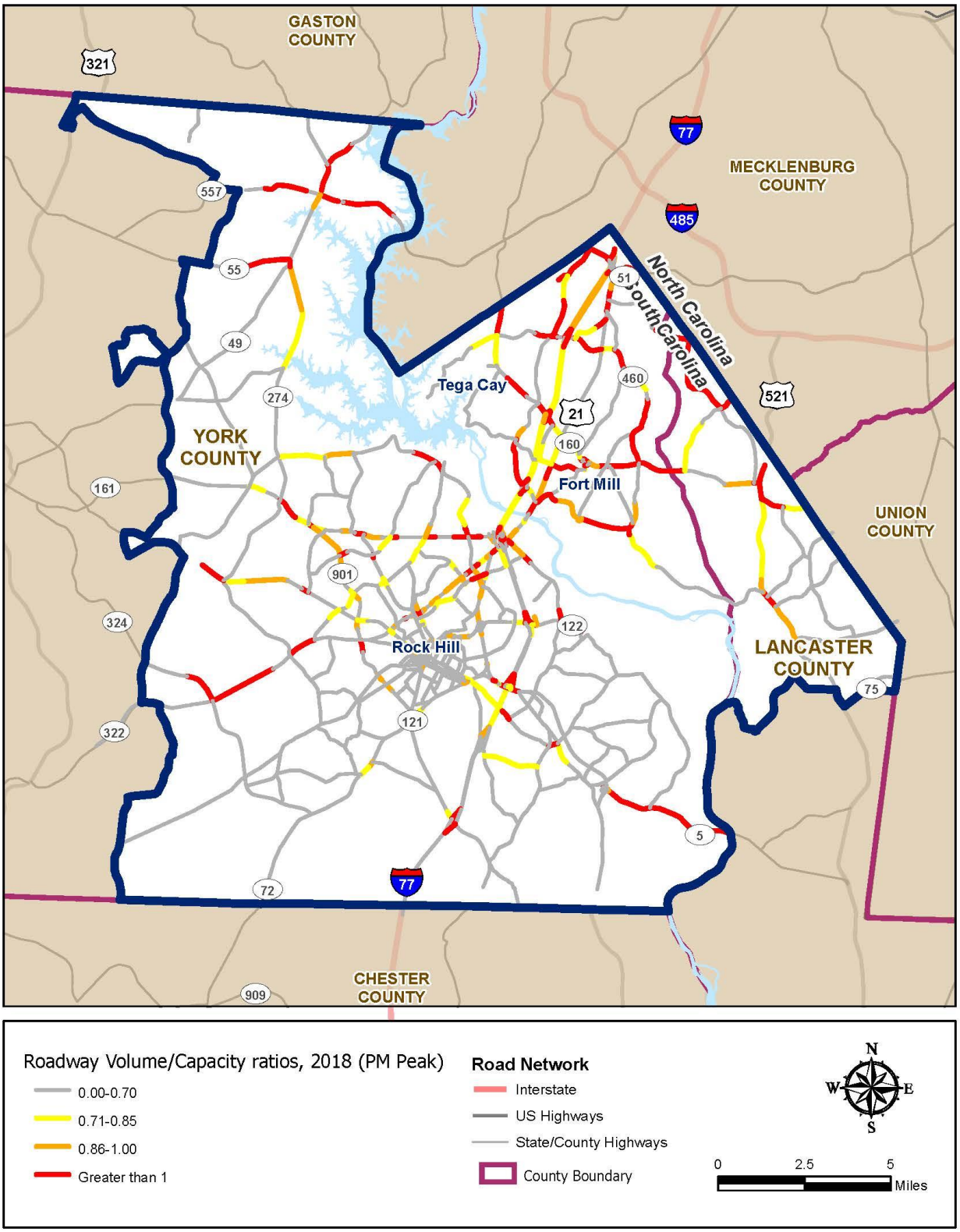
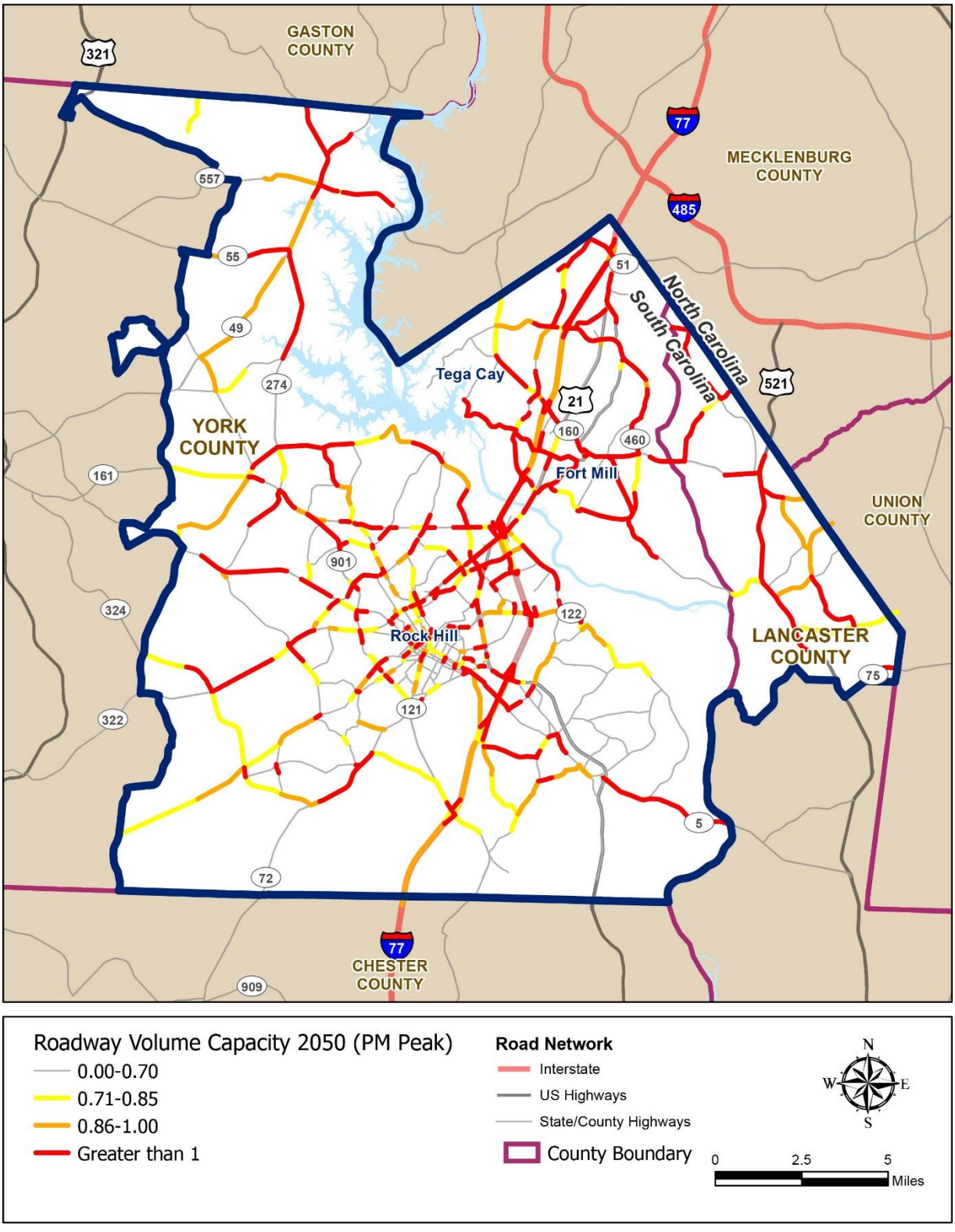


Figure 4.7: Projected Traffic Conditions with Implementation of 2050 LRTP



By the year 2050 – with implementation of the projects for which there is committed funding in the TIP – the model projects PM peak congestion for nearly every major road north of the Catawba River (see **Figure 4.7**). I-77 is expected to be over capacity both north and south of Rock Hill. Dobys Bridge Road, which is relatively uncongested under existing conditions, is projected for major delays for its entire length by 2050.

Traffic conditions are expected to improve somewhat with the implementation of the 2050 LRTP. It should be noted that with the focus on reconfiguring the interchanges at Exit 85 (SC 160 / I-77), at Exit 82 (Celanese & Cherry / I-77), and at Exit 77 (SC 5; US 21), the modeling displays don't fully reflect the benefits to be realized from these types of operational improvements given that they don't alter volume levels – even though the efficiency with which the demand levels are processed has been favorably impacted.

However, despite these significant investments along the I-77 Corridor in the 2050 LRTP, the majority of major roads are projected to continue to carry high demand levels under congested conditions, particularly during the peak periods. Drivers on Celanese Road, Hands Mill Highway (SC 274), Gold Hill Road, SC 160, US 521, and many other routes will continue to experience heavy traffic congestion. Delays on I-77 will likely become more frequent in both time and intensity if no other interstate improvements are undertaken between now and 2050.

In other words, even with the full use of available resources, traffic congestion is expected to become more challenging over time; and therefore, roadway capacity improvements (as important as they are), will need to be combined with a number of additional policies and operational strategies (such as more alternative routes, strengthening the collector street network, continued expansion of transit options, etc.), in order to enable the transportation system to function in a safe, reliable and efficient manner. This is a challenge experienced in many parts of the country, but particularly important in high growth environments like RFATS.

Project Selection Criteria

A number of factors were considered in selecting projects for the LRTP. In response to Act 114 (passed in 2007), SCDOT developed a set of ranking criteria for five types of projects: new locations, intersections, widenings, interstate mainline capacity, and interchanges.

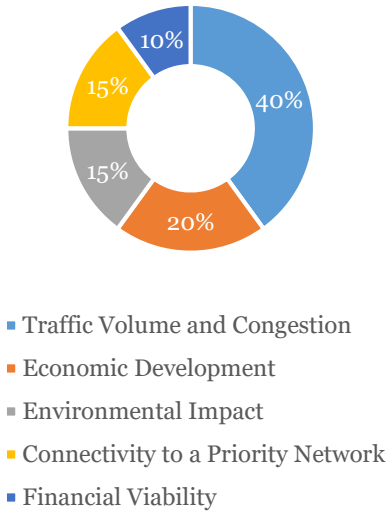
In 2008, the RFATS Policy Committee endorsed SCDOT's project criteria for its own use in the LRTP; further ranking criteria parameters were updated by

SCDOT in 2020. These criteria are broken down and weighted based on the following factors:

For ranking **new location** projects:

- Traffic volume and congestion (40%). Quantified by comparing the number of network hours of delay between build and no-build scenarios.
- Economic Development (20%). Quantified based on an assessment of short-term, intermediate, and long-term development potential as a result of the proposed improvement.
- Environmental Impact (15%). Quantified based on an assessment of potential impacts to natural, social, and cultural resources.
- Connectivity to a priority network (15%). The priority network score is based on the proposed road's relationship to a priority network, as designated at a regional level.
- Financial Viability (10%). Quantified based on estimated project cost in comparison to the ten-year Statewide Transportation Improvement Program (STIP) budget. Additional consideration is given to projects supplemented with local project funding and/or other federal and state funding.
- Alternative Transportation Solutions. Considered independently of ranking.
- Consistency with Local Land Use Plans. Considered independently of ranking. The official designation of a new location option as the project solution will be determined in the alternatives analysis within the environmental process.

Scoring New Location Projects

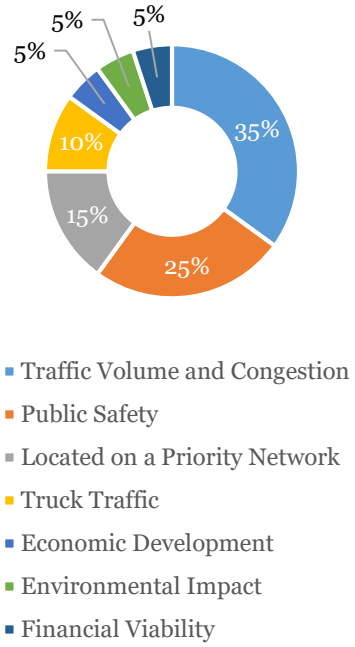


For ranking **intersection** projects:

- Traffic Volume and Congestion (35%). Quantified based on current traffic volumes.
- Public Safety (25%). Quantified based on crash rates.
- Located on a priority network (15%). The priority network score is based on the project's relationship to a priority network.
- Truck Traffic (10%). Quantified based on current volume and average daily truck traffic estimates.

- Economic Development (5%). Quantified based on short-term, intermediate, and long-term development potential as a result of the proposed improvement.
- Environmental Impact (5%). Quantified based on an assessment of potential impacts to natural, social, and cultural resources.
- Financial Viability (5%). The financial viability score is based on estimated project cost in comparison to the ten-year Statewide Transportation Improvement Program (STIP) budget. Additional consideration will be given to projects supplemented with local project funding and/or other federal and state funding.
- Alternative Transportation Solutions. Considered independently of ranking.
- Consistency with Local Land Use Plans. Considered independently of ranking.

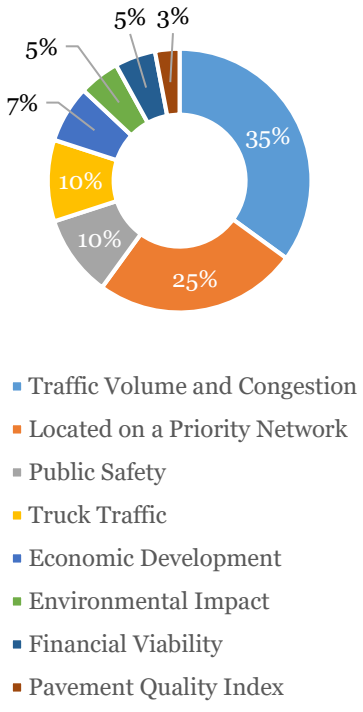
Scoring Intersection Projects



For ranking **corridor improvement/widening** projects:

- Traffic Volume and Congestion (35%). Quantified based on current traffic volumes and the associated level-of-service condition.
- Located on a priority network (national highway system (NHS), freight, and strategic corridors) (25%). The priority network score is based on a project's location in relationship to defined priority networks.
- Public Safety (10%). Quantified based on crash rates.
- Truck Traffic (10%). Quantified based on current volume and average daily truck traffic estimates.
- Economic Development (7%). Quantified based on an assessment of items such as livability, regional economic development, benefit-cost & cost effectiveness, and system performance.
- Environmental Impact (5%). Quantified based on an assessment of potential impacts to natural, social, and cultural resources.

Scoring Corridor Improvement / Widening Projects

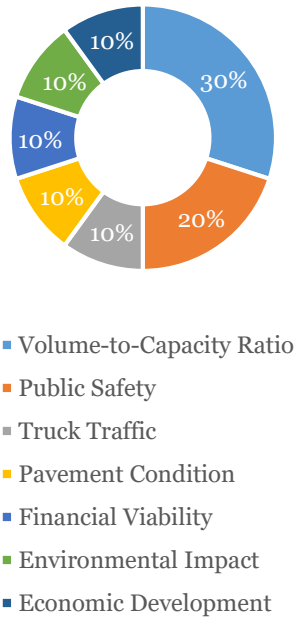


- Financial Viability (5%). Quantified based on estimated project cost in comparison to the six-year Statewide Transportation Improvement Program (STIP) budget. Additional consideration will be given to projects supplemented with local project funding and/or other federal and state funding.
- Pavement Quality Index (PQI) (3%). Quantified based on pavement condition assessments.
- Consistency with Local Land Use Plan (for consideration only). Considered independently of the ranking process. A determination of consistency will be made during the long-range plan development process.
- Alternative Transportation Solutions (for consideration only). Considered independently of the ranking process. Transit propensity is evaluated based on surrounding population and employment characteristics to support transit service as a potential alternative or in addition to a proposed improvement.

For ranking **interstate mainline capacity** projects:

- Volume-to-Capacity Ratio (30%). The volume-to-capacity ratio (V/C) score is based on average annual daily traffic data and capacity thresholds consistent with the Highway Capacity Manual.
- Public Safety (20%). The safety score is based on an accident rate that is calculated by the total number of crashes within a given segment divided by the volume and multiplied by the number of years.
- Truck Traffic (10%). The truck score is based on historical truck classification data that is expressed as a percentage of total daily traffic. The truck percentage is multiplied by the average daily traffic to calculate the truck ADT. Truck ADT is used instead of truck percentage to give greater consideration to higher volume roads.
- Pavement Condition (10%). The pavement score is based on pavement management data collected using video and computer technology.
- Financial Viability (10%). The financial viability score is based on project cost in comparison to the six-year Statewide Transportation Improvement Program (STIP) budget.

Scoring Interstate Mainline Capacity Projects



- Environmental Impact (10%). The environmental impact score is based on an assessment of the project's potential impacts to all known environmental, cultural and social resources.
- Economic Development (10%). The economic development score is provided by the South Carolina Department of Commerce and is based on an assessment of the project's benefit to existing industrial/manufacturing development, as well as its proximity to existing infrastructure.

For ranking **interstate interchange** projects, 80 percent of the total weighted scoring is based on the following criteria, which are included in the Interstate Interchange Management System (IIMS):

- Passenger Vehicle Travel Time
- Truck Vehicle Travel Time
- Passenger Vehicle Delay
- Truck Vehicle Delay
- Passenger Vehicle Distance
- Truck Vehicle Distance
- Truck Vehicle Time
- Truck Detour Distance
- Design-Related Fatal Crashes
- Design-Related Personal Injury Crashes
- Design-Related Property Damage Crashes
- Other Fatal Crashes
- Other Personal Injury Crashes
- Other Property Damage Crashes

The remaining inputs include 10 percent from economic development and 10 percent from environmental impacts, similar to interstate mainline capacity projects.

2050 LRTP Projects

This section presents the major roadway projects to be implemented during the life of the 2050 Long Range Transportation Plan. The projects include road widenings and traffic flow improvements in and around heavily congested interchanges, as well as priority intersection locations. In 2021, RFATS is committing $10 Million of the allocated Guideshare funding towards bicycle and pedestrian facilities. As described in Chapter 9, the RFATS region conducted as survey with more than 90% of area respondents agreeing that tax dollars spent on the transportation system should include pedestrian and bicycle investments. Therefore, RFATS will be working with the local jurisdictions and SCDOT to identify bicycle and pedestrian projects for possible funding within the allocated allotment.

The projects are presented below in two primary categories:

- **Federally Funded Projects**

  Table 4.2 lists the projects that will be funded at least partly with federal sources. This includes projects selected for Guideshare funding allocated to RFATS, as well as statewide programmatic investments that SCDOT will make during the life of the plan. (For more detail on Guideshare and other funding sources, see Chapter 12.)

  A map of the federally funded projects is provided in **Figure 4.8**.

- **Non-Federally Funded Projects**

  Table 4.3 lists projects to be built with non-federal funding sources.

  The primary funding source for these projects is the York County Local Option Sales Tax program (known as 'Pennies for Progress'). The program was initiated by York County to provide citizens with a safer and more efficient roadway system. Projects were chosen by a Sales Tax Commission representing the citizens of York County, and were then approved by the voters. York County was the first county in South Carolina to pass this type of sales tax program to improve the road system. A benefit of this tax is that 99 cents of every sales tax dollar raised in York County stays in the County.

  The first Pennies for Progress referendum was passed in 1997, with subsequent referendums passed in 2003, 2011, and 2017. **Table 4.3** indicates the referendum in which each project was approved.

  A map of the non-federally funded projects is provided in **Figure 4.9.**

Other projects include **Public/Private Partnership Projects**, which are not part of fiscally constrained LRTP projects but are shown in **Table 4.4** and **Figure 4.10**. These projects are a combination of public funds from the United States Department of Transportation Infrastructure for Rebuilding America (INFRA) grant for $34.6 million, local incentives from York County, and private funds from the Carolina Panthers organization. The project proposed is to construct a new

full access interstate interchange on I-77, along with a new boulevard to connect to the parallel local thoroughfares.

Unfunded Needs are not part of the fiscally constrained LRTP but are shown in **Table 4.5** to indicate other transportation needs identified during the development of this plan. This list was developed through input from the local municipalities through their identification of project needs and improvements to assist in mitigation congestion.

Table 4.2 – Federally Funded Projects in the 2050 LRTP

Project ID	Project Description	Funding Source	Cost (millions)	Length (miles)	Horizon Year
1	SC 160 / I-77 Interchange Reconfiguration; 4 to 6 Lane Widening (Sutton Road to US 21) (*)	SIB & Guideshare	$49.6 M + $23.4 M	N/A	2025
2	Celanese / I-77 Interchange Reconfiguration (*)	SIB & Guideshare	$32.5 M + $68.6 M	N/A	2035
3	SC 160 Widening (Rosemont / McMillan to Springfield Parkway) - 5 Lanes	Guideshare	$28.5	2.86	2025
4	Cel-River Road Widening (S. Eden Terrace Extension to Dave Lyle Boulevard) - 5 Lanes	Guideshare	$46.2	2.00	2025
5	I-77 / US 21 / SC 5 Interchange Area (Exit 77) (*)	Guideshare	$5.7	N/A	2025
-	System Improvement Projects (Bridge Replacements, Safety, Road Widenings, Interstate Program)	FHWA, SCDOT	TBD	N/A	Throughout
-	CMAQ (Congestion Mitigation & Air Quality Improvement Program)	FHWA, SCDOT	TBD	N/A	Throughout
-	TAP (Transportation Alternatives Program)	FHWA, SCDOT	TBD	N/A	Throughout
	Total		**$#**		

As dicussed earlier, preserving and enhancing the National Highway System (NHS), in addition to more localized transportation needs is an important component of sound transportation decision-making, and those projects with an asterik * near to their project name simultaneously advance both regional and NHS objectives

Figure 4.8 – Federally Funded Projects in the 2050 LRTP

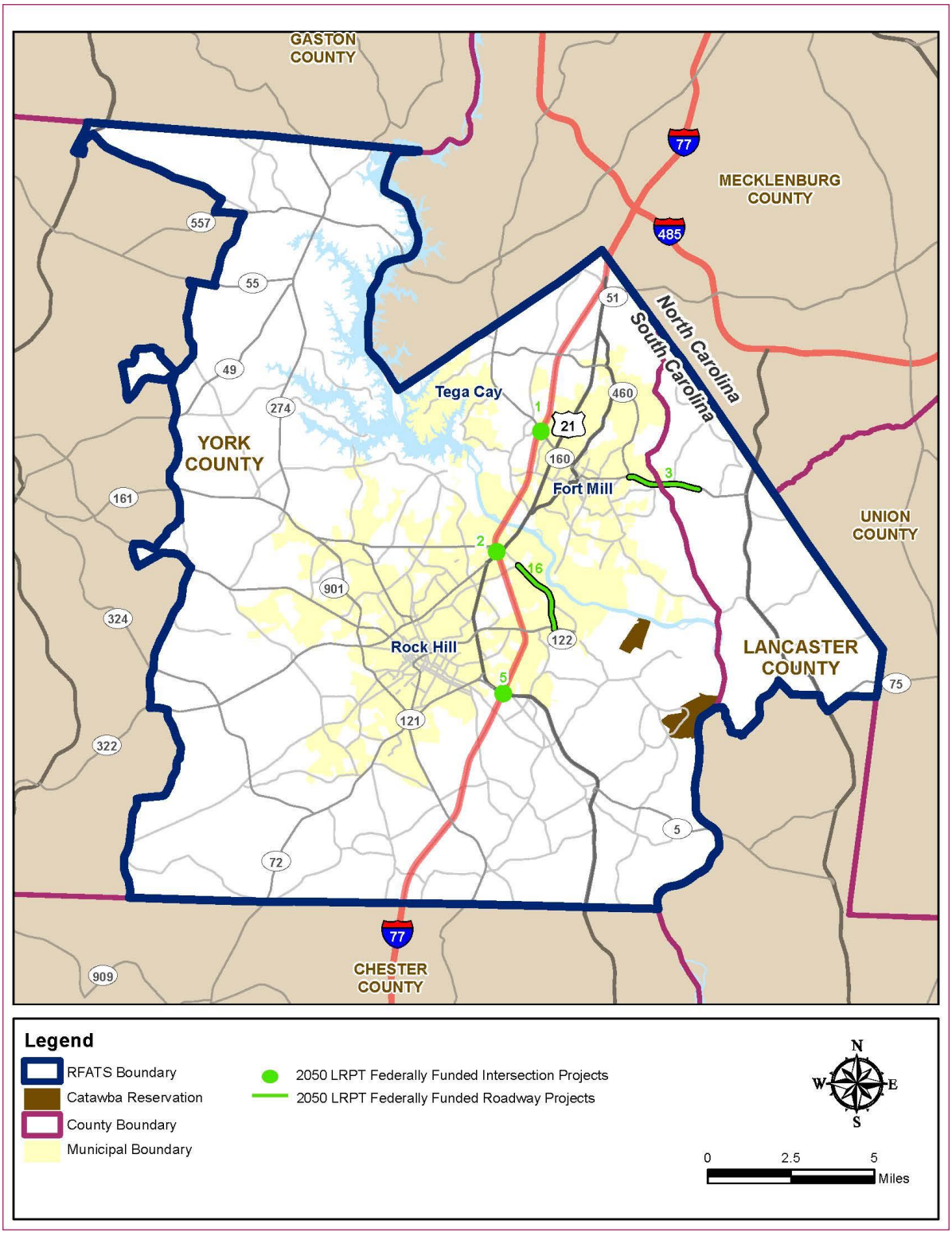
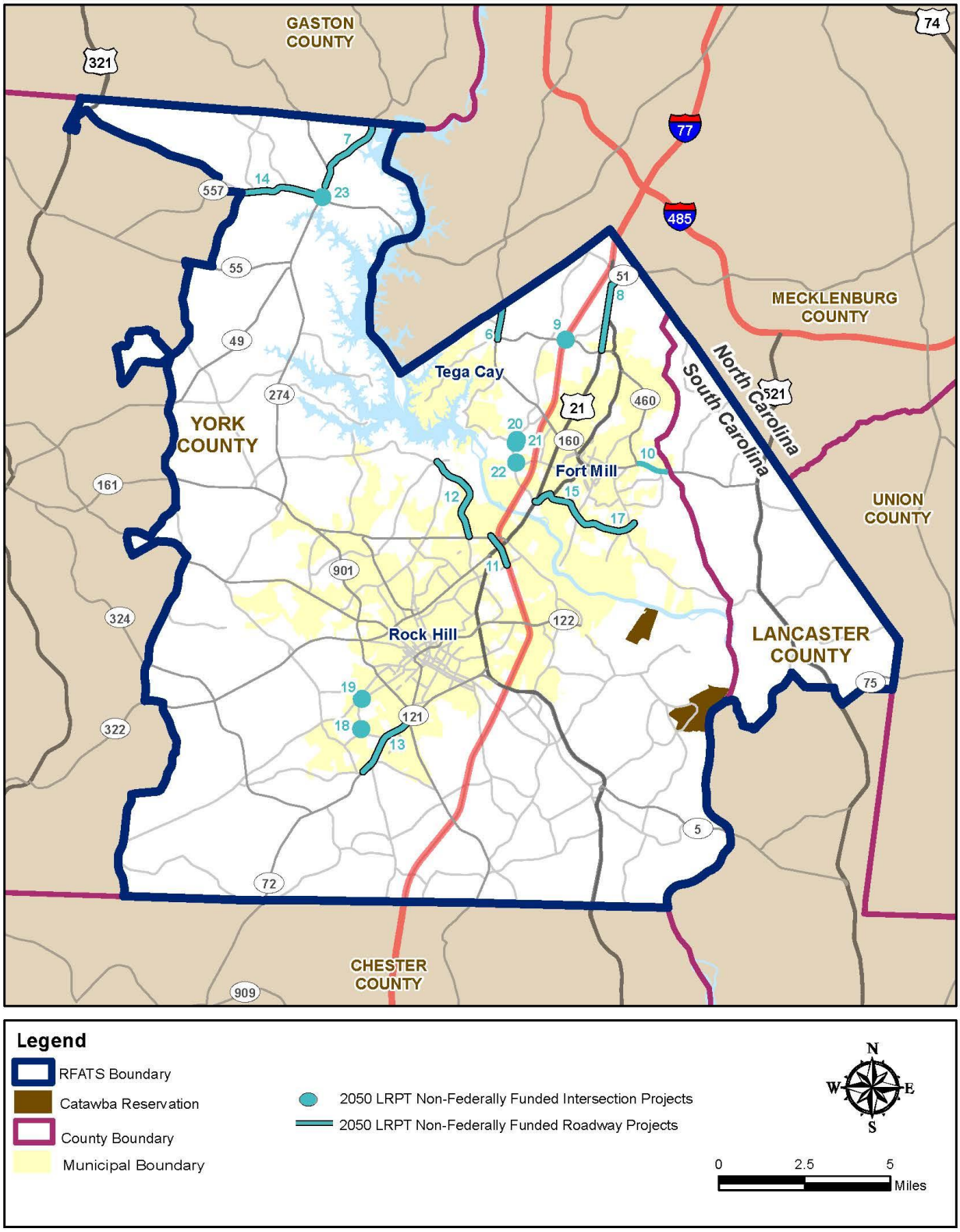


Table 4.3: Non-Federally Funded Projects in the 2050 LRTP (continued from previous page)

Project ID	Project Type	Route	Project Description	Horizon	Pennies Referendum	Cost (millions)
6	Road Widening	SC 160	Gold Hill to Zoar Road; Zoar Road to NC State Line - 5 Lanes	2025	2011	$13.1
7	Road Widening	Highway 274 / 279	Highway 274 at Landing Pointe Dr to Pole Branch Road - 5 Lanes; Pole Branch Road to NC Stateline - 3 Lanes	2025	2011	$37.8
8	Road Widening	US 21 North Phase I & SC 51	Springfield Parkway to NC State Line - 5 Lanes	2025	2011	$40.0
9	Interchange	Gold Hill Road / I-77	Interchange Reconfiguration	2025	2011	$12.5
10	Road Widening	SC 160 East	Springfield Parkway to Lancaster County Line; formerly project in 2003 PFP - 3 Lanes	2025	2011	$4.8
11	Road Widening	Riverview Road	From Eden Terrace to Celanese Road - 3 Lanes	2025	2011	$9.5
12	Road Widening	Mt Gallant Road	Celanese Road to Twin Lakes Road - 3 Lanes	2025	2011	$26.3
13	Road Widening	SC Highway 72	Highway 901 to Rambo Road; formerly in 2003 PFP - 3 Lanes	2025	2011	$20.7
14	Road Widening	Highway 557	Highway 274 to Kingsbury Road - Multilane	2025	2011	$25.0
15	Intersection	Fort Mill Southern Bypass / Spratt / Sutton Connector	Reconfigure intersection	2025	2011	$9.0
16	Road Widening	Cel-River Road	2 to 5 Lane Widening from S-645 (Southern Eden Terrace Extension) to S-122 (Dave Lyle Boulevard)	2025	2017	$40.5

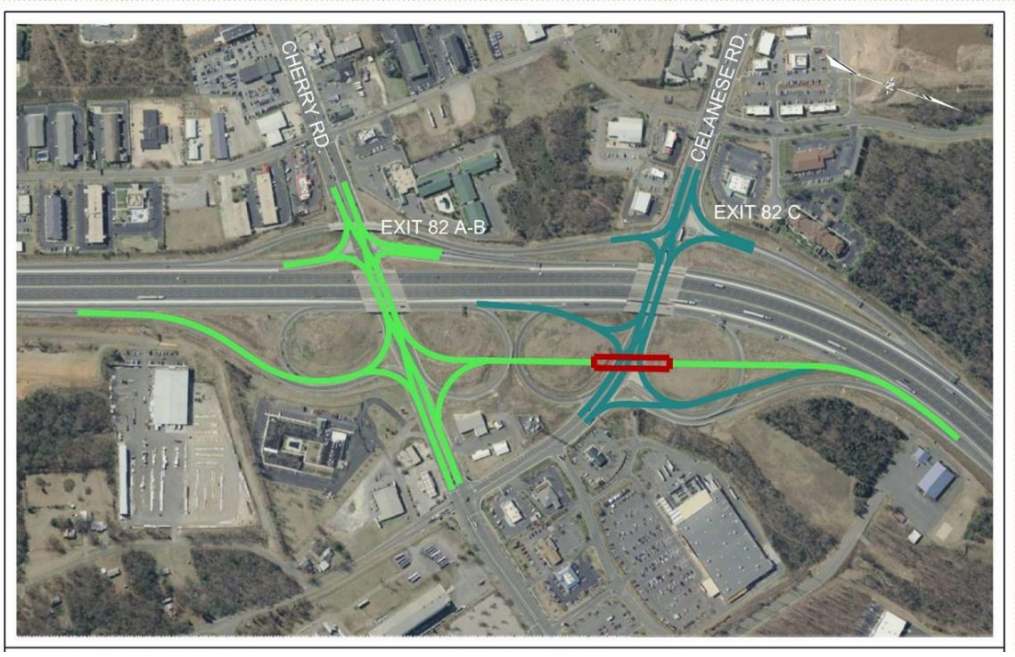
17	Road Widening	Fort Mill Parkway	I-77 to bridge over railroad - 5 Lanes with Sidewalks and Bike Lanes	2035	2017	$23.1
18	Intersection	Neely & Rawlsville Road	Realignment and Improvement	2035	2017	(included in $10.9 million)
19	Intersection	Neely Road & Crawford Road	Realignment and Improvement; Adjustment for Railroad	2035	2017	10.9
20	Intersection	Sutton Road / New Grey Rock Road	Consider Dedicated Left from NB Sutton onto New Gray Rock Road; Dedicated Right from EB New Gray Rock Road onto Sutton Road	2025	2017	$1.0
21	Intersection	Sutton Road / Sam Smith Road	Consider Dedicated Left from SB Sutton Road onto Sam Smith Road	2025	2017	$1.0
22	Intersection	Sutton Road / Harris Road	Consider Dedicated Left from SB Sutton Road onto Harris Road	2025	2017	$1.0
23	Intersection	Highway 274 / 49 / 557	Operational / Capacity Additions	2025	2017	$7.3
	Total					**$283.5M**

Figure 4.9: Non-Federally Funded Projects in the 2050 LRTP



The two projects shown below have also been submitted and approved for potential funding through the State Infrastructure Bank (SIB). SIB funds were awarded in October 2020 and plans will be further refined.

Proposed Interchange Improvements for I-77 at Celanese and Cherry Road (Exit 82 A,B,C)



Proposed Interchange Improvements for I-77 at SC 160

Table 4.4: Public Private Partnerships

Project ID	Location	Project Description
24	New Interchange "Exit 81"	Located Between Celanese / Cherry Road and Dave Lyle Boulevard
25	New Roadway Segment #1	Connection from New Interchange to Paragon Way / Cel-River Road - 3 Lanes
26	New Roadway Segment #2	Connection from New Interchange to Mt Gallant Road - 4 Lanes

Figure 4.10: Public-Private Partnership Projects in the 2050 LRTP

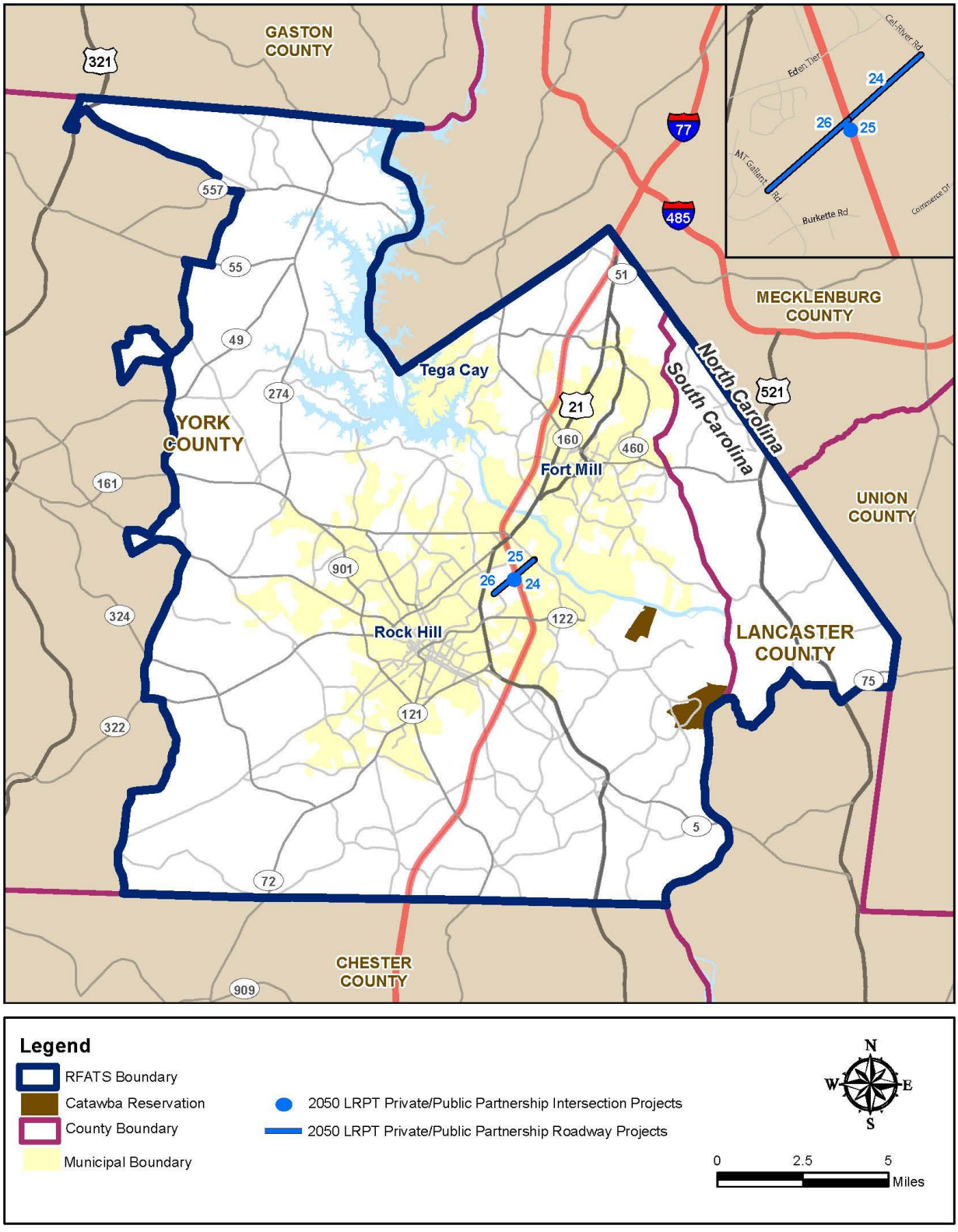


Table 4.5: Unfunded Needs

Location	Project Description
Gold Hill Road / Springfield Parkway (I-77 to SC 160)	5 Lanes with Sidewalks and Shared-Use Bike Lanes
Marvin Road (US 521 to Union County Line)	3 Lanes (Potential 4 lane from US 521 to Henry Harris Road)
Harrisburg Road (Mecklenburg County Line to SC 160)	3 Lanes with Sidewalks and Bike Lanes
Sutton Road (Sixth Baxter Crossing to US 21)	5 Lanes with Sidewalks and Bike Lanes
Cel-River / Red River Road (SC 122 to US 21)	3 Lanes; Consider Interchange Improvement at Exit 77
US 21 Widening (Sutton Road / Spratt Street to SC 160)	5 Lanes with Sidewalks and Bike Lanes
S. Dobys Bridge Road (Fort Mill Southern Parkway to US 521)	5 Lanes with Sidewalks and Bike Lanes
US 521 (Jim Wilson Road to State Line)	6 lanes
Fort Mill Parkway (Holbrook Road to SC 160)	5 Lanes with Sidewalks and Bike Lanes
Fort Mill Parkway (US 21 to Holbrook Road)	5 Lanes with Sidewalks and Bike Lanes
Jim Wilson Road (US 521 to Henry Harris Road)	5 Lanes
Shelley Mullis Road (US 521 to Union County Line)	3 Lanes with Sidewalks and Bike Lanes
Mt Gallant Road	5-Lane widening from end of Panthers widening north to north of Celanese Road

Eden Terrace	3-Lane widening with shared use path
Ebenezer Road	3-Lane widening; address termini intersection to account for 3-lane section
DLB Flyover	3-Lane connection between John Ross Parkway and Galleria Boulevard, including a grade separated bridge over I-77
Ebinport Road	3-Lane widening; with roundabout at Marett Blvd

Catawba Indian Nation Transportation Plan

Catawba Indian Nation Projects

The Catawba Indian Nation coordinates transportation planning with RFATS and has a voting representative on the RFATS Policy Committee.

The Nation also participates in the Tribal Transportation Program (TTP). This is a program addressing the transportation needs of tribes by providing funds for planning, design, construction, and maintenance activities. This program is jointly administered by the Federal Highway Administration's Federal Lands Highway Office and the Bureau of Indian Affairs (BIA).

Projects for the tribe are overseen by the Catawba Indian Nation Department of Transportation.

Currently planned projects include:

- Paving eight gravel roads, including Charley Horse Road, Little Moon Road, Red Hawk Road, Evelyn George Road, Tom Steven Road, Peace Pipe Road, Rebecca Pitcher Road, and Pow Wow Road;
- Construction of the Rivercrest Road extension connecting the existing Rivercrest Road to Sturgis Road;
- Reconstruction of Hagler Drive;
- Reclamation of four roads including Betsy Bob Road, Big Bear Drive, Yesebehena Circle, and Tomahawk Ridge;
- Improving Bike/Pedestrian Trail connectivity to create reservation-wide bikeable and walkability;
- John Brown Road reconstruction.

Introduction

Public safety is one of government's crucial responsibilities. In the context of transportation planning, there are two key elements to consider: *safety* and *security*. *Safety* measures, outlined in this chapter, are aimed at reducing injury and death to users of the transportation system. *Security* pertains to a region's ability to maintain mobility for its citizens, even in adverse conditions, by protecting the transportation system against threats and by providing multiple options for managing travel demand and destination routing.

Safety

The Highway Safety Improvement Program (HSIP) is a core Federal-aid program established to reduce traffic fatalities and serious injuries on all public roads, including non-State-owned roads and roads on tribal land. Additional programs target specific areas of concern, such as work zones, older drivers, and pedestrians, including children walking to school.

The HSIP program requires a data-driven, strategic highway safety planning approach with a focus on results. As mentioned in Chapter 3, state DOTs and MPOs are required to set annual safety performance targets in the HSIP Report. These annual measures include:

- **Number of fatalities**: The total number of persons suffering fatal injuries in a motor vehicle crash during a calendar year.
- **Rate of fatalities per 100 million vehicle miles traveled (VMT)**: The ratio of total number of fatalities to the number of vehicle miles traveled (VMT expressed in 100 Million VMT) in a calendar year.
- **Number of serious injuries:** The total number of persons suffering at least one serious injury in a motor vehicle crash during a calendar year. (The United States Department of Transportation's definition of a serious injury entails one or more of the following: severe laceration resulting in exposure of underlying tissues/muscle/organs or resulting in significant loss of blood; broken or distorted extremity; crush injuries; suspected skull, chest, or abdominal injury other than bruises or minor lacerations; significant burns; unconsciousness when taken from the crash scene; or paralysis.)

- **Rate of serious injuries per 100 million VMT:** The ratio of total number of serious injuries to the number of VMT (VMT expressed in 100 Million VMT) in a calendar year.
- **Number of non-motorized fatalities and number of non-motorized serious injuries combined:** The combined total number of non-motorized fatalities and non-motorized serious injuries involving a motor vehicle during a calendar year.

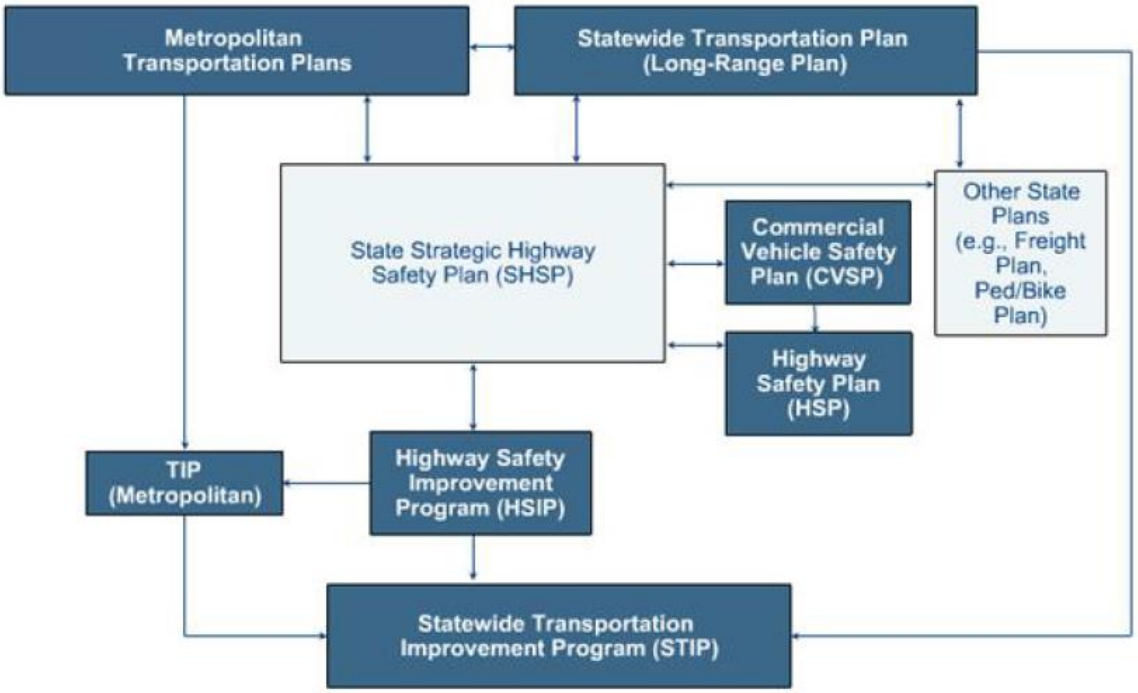
These measures are to be calculated based on the most recent five years of available crash data. While SCDOT's Strategic Highway Safety Plan reports these measures at the statewide level, RFATS coordinates with SCDOT to ensure each measure is tracked and reported at the regional level as well, consistent with applicable federal and state requirements.

Safety in the transportation network was identified as a performance measure in the RFATS Congestion Management Process (CMP); last updated in 2019. The CMP documents and recommends appropriate congestion management strategies and projects – both of which are further examined in the LRTP planning process.

Framework for Safety Planning

The key planning process for highway safety in the RFATS area is the development of the statewide highway safety plan. The most recent edition was published in 2015 as *South Carolina's Strategic Highway Safety Plan: Target Zero*. As **Figure 5.1** shows, the statewide highway safety plan provides the framework for SCDOT's partner agencies and their planning documents, including RFATS and its LRTP.

Figure 5.1 - Relationship between the Highway Safety Plan and Other Plans



Source: Federal Highway Administration

Statewide Conditions and Trends

Since South Carolina's last *Strategic Highway Safety Plan: The Roadmap to Safety*, published in 2008, the state saw an overall 20.4% reduction in roadway deaths between 2006 and 2012. Further goal setting was outlined in the 2015 update to the plan, the *Strategic Highway Safety Plan: Target Zero*. The ultimate goal of this plan is work towards zero traffic-related fatalities in South Carolina, and it outlines a variety of long-term goals, strategies, and coordination to achieve success. The State Highway Safety Report, published in 2018, included updates to various performance measure targets for the 2015-2019 time period. The FY 2020 Highway Safety Plan included data for the 2014-2018 time period.

Goals for 2015 through 2018 included:

- Reduce statewide traffic **fatalities** to a maximum of 575 **persons** per year by 2018, with an annual reduction of 48 fatalities. (In comparison, traffic fatalities numbered 863 persons in 2012.)

  - Preliminary state data compiled by the OHSJP's Statistical Analysis & Research Section (SARS) indicates there were 1,038 traffic fatalities in 2018, with an estimated five-year average of 969 for the 2014-2018 time period. This is an increase of 5.1% from the 988 traffic fatalities in 2017. If this trend continues, the state does not anticipate meeting its goal of 960 traffic deaths in 2019 and an average 988 traffic deaths for the 2015-2019 time period.

- Reduce the statewide number of **fatal crashes** per 100 million vehicle miles travelled to 1.17. (This number, referred to by the South Carolina Department of Public Safety as the mileage death rate, was 1.76 in 2012.)
  - Preliminary state data compiled by SARS indicates there was a mileage death rate of 1.85 in 2018, with an estimated five-year average of 1.81 for the 2014-2018 time period. This is an increase of 3.9% from 1.78 in 2017. If this trend continues, the state does not anticipate meeting its goal of 1.68 in 2019 and an average 1.79 for the 2015-2019 time period.
- Reduce statewide number of **serious injuries** to 2,265 incidents per year by 2018. (Total serious injuries numbered 3,397 persons in 2012.)
  - Preliminary state data compiled by SARS indicates there were 2,627 serious traffic injuries in 2018, with an estimated five-year average of 2,962 for the 2014-2018 time period. This is a decrease of 7.9% from the 2,851 serious traffic injuries in 2017, and the state does anticipate meeting its goal of 2,986 serious traffic injuries average for the 2015-2019 time period.
- Reduce the statewide number of **serious injury crashes** per 100 million vehicle miles travelled to 4.63. (This number was 6.95 in 2012.)
  - In 2017, the number of serious injury crashes per 100 million vehicle miles traveled was 5.38. The five-year average for the 2013-2017 period was 6.00. This is lower than the 5-year target for 2015-2019 outlined in the 2018 South Carolina HSIP report, which was 5.420. Note: this measure was not included in the FY 2020 report, and these numbers reflect the latest information available in the 2018 State Highway Safety Report.

Target Zero, in accordance with federal law, was developed collaboratively by a number of federal, state and local partners. SCDOT is the designated lead for the statewide implementation effort. RFATS participates in implementation by incorporating the relevant safety goals, priorities, countermeasures, and programs for the RFATS area into its own LRTP.

The four "E"s of safety, established by the HSIP, were maintained as guiding principles in the development of *Target Zero*:

- Engineering
- Enforcement
- Education
- Emergency Medical Services (EMS)

Nine emphasis areas were selected by the Strategic Highway Safety Plan Steering Committee to concentrate efforts and monitor performance. Each of these emphasis areas has been identified as a leading cause of traffic fatalities in South Carolina and has its own goals for reduction of fatalities and serious injuries, along with associated objectives and strategies. The following statewide statistics were drawn from 4,503 total fatal crashes and 4,848 total fatalities between 2014 and 2018.

- **Roadway Departure**
  - 2,530 fatal crashes (56% of all fatal crashes) involved a roadway departure.
- **Unrestrained Motor Vehicle Occupants;**
  - 1,588 motor vehicle occupants killed in a crash (33% of all fatalities) were not using a restraint at the time of the crash.
- **Age-Related Crashes** (Young Drivers: 15-20 years of age and Older Drivers: 65 or more years of age)
  - Young drivers led to 579 traffic fatalities (12% of all fatalities). For older drivers, the number was 799 (16%).
- **Speed Related Crashes;**
  - 1,776 crashes leading to fatalities involved excessive speeds (39% of all fatal crashes).
- **Vulnerable Roadway Users** (Motorcyclists, Pedestrians, Moped Operators and Bicyclists)**;**
  - 706 fatalities (15% of all fatalities) were pedestrians, 96 (2%) were pedalcyclists, and 784 (16%) were motorcyclists.

- **Intersection and Other High-Risk Roadway Locations** (Work Zones and Railroad Crossings)**;**
    - 909 fatal crashes (21% of all fatal crashes) occurred at an intersection, and 42 (1%) occurred in a work zone.
- **Impaired Driving** (BAC 0.01+)**;**
    - There were 1,624 incidents of impaired driving leading to a fatality (33% of all fatalities).
- **Commercial Motor Vehicle/Heavy Truck Crashes;**
    - 459 fatal crashes (10% of all fatal crashes) between 2014 and 2018 involved a large truck.
- **Safety Data Collection Access, and Analysis.**

Regional Conditions and Trends

Fatal Crashes

The RFATS region experienced a total of 114 traffic-related fatalities during the period of 2014 to 2018, according to the Fatality Analysis Reporting System (FARS) maintained by the National Highway Traffic Safety Administration.

Based on the reported characteristics of these fatal crashes, the following *Target Zero* emphasis areas have been identified as having particular relevance to the RFATS region. Also detailed in this chapter are potential strategies identified by *Target Zero* to reduce the likelihood of and/or mitigate the severity of each type of crash. RFATS and SCDOT officials should discuss the strategies most likely to be useful in the region as well as which locations exhibit the greatest need based on crash data.

Impaired Driving

More than one in four of the traffic deaths in the RFATS area between 2014 and 2018 resulted from a driver operating under the influence. This type of crash increases significantly over certain holidays and is more likely to involve a male driver.

While the strategies outlined in *Target Zero* to reduce fatalities involving impaired drivers do not involve physical changes to the roadway area, many can be implemented at a low cost within the RFATS region. Measures can be taken to deter drivers from operating vehicles while under the influence as well as to reduce harm to both drivers and passengers in the event of a crash.

STRATEGIES

- Enforce and educate drivers on DUI laws as well as the dangers of drinking and driving, with a special focus on reducing instances of underage drinking and driving.
  → Increase the number of nighttime public safety checkpoints
  → Publicize and enforce zero-tolerance laws for drivers under age 21
  → Conduct aggressive/increased enforcement targeting impaired drivers at high-crash/risk areas
  → Educate parents about the liability of social hosting
- Minimize risk of fatalities and serious injuries related to impaired driver collisions.
  → Implement roadway departure strategies, such as the "Safety Edge"
  → Develop and implement a corridor safety model in high-crash locations where data suggests a high rate of impaired driving collisions

Guidance from the Centers for Disease Control and Prevention (CDC) supports these strategies with low-cost recommendations that include media campaigns and school-based instructional programs to reduce or prevent drunk driving. These programs can also emphasize the importance of not entering a vehicle in which the driver is impaired, which can reduce fatalities for passengers.

Roadway design elements such as the "Safety Edge", which has been promoted by the FHWA and implemented in several states, can be effective in reducing roadway departure crashes – including those caused by impaired driving. With this asphalt paving technique, the road pavement edge is tapered at a 30-degree angle instead of being left as a vertical drop-off. When a driver's wheel drops off the road, the gentler angle helps prevent the driver from losing control when steering back onto the roadway.

Speed-Related Crashes

18 percent of recent fatalities in the RFATS area were related to speeding. Although increased, targeted enforcement is the traditional approach to managing speeding, many communities have begun to assess the impact of roadway design on drivers' speeds. Traffic calming techniques that can be employed on neighborhood streets include narrowing lanes and introducing mild curves into long, straight sections of roadway.

STRATEGIES

- Reduce speeding through enforcement activities and new partnerships.
  → Add high-visibility enforcement in critical areas
  → Expand corridor safety model to high-crash locations where data suggests a high rate of speeding-related fatal or serious injury crashes
- Use engineering measures to effectively manage speed.
  → Add roadway design features to influence speed in critical areas
  → Time and coordinate traffic signals to improve traffic flow, reduce red-light running, and manage speeds
- Increase public awareness of risk of driving at unsafe speeds.
  → Develop public education materials communicating specific concerns related to speeding, targeting both new and experienced drivers

Easing traffic congestion can also reduce speeding in some circumstances. Law enforcement officials note that on some roadways, drivers tend to speed once they get past a significant bottleneck, presumably with the idea of catching up on lost time.

Vulnerable Roadway Users

Pedestrians and bicyclists comprised roughly 15 percent of traffic-related deaths in the RFATS region between 2014 and 2018, with the majority of these deaths being pedestrians. Strategies to improve pedestrian and bicycle safety include expansion of the region's network of sidewalks and bike facilities, as well as raising awareness of traffic laws among motorists and non-motorists. In the past, local bicycle/pedestrian advocacy groups have helped to sponsor training for area law enforcement officers.

STRATEGIES

- Expand and improve bicycle and pedestrian facilities.
  → Install separated/dedicated paths/sidewalks and other pedestrian-friendly road features along corridors and at intersections where supported by crash analysis
  → Consider pedestrian safety and mobility during the needs assessment of all projects
  → Enhance intersection and roadway design to encourage livable communities
- Improve pedestrian and bicyclist safety awareness and behaviors.
  → Continue safety campaigns which promote the use of reflective apparel and/or lights (conspicuous enhancement)
  → Implement an awareness campaign emphasizing the risks to pedestrians and bicyclists on high-volume/speed roadways resulting from disabled vehicle, motorist assistance, crossing multi-lanes, etc.
- Increase the likelihood of pedestrian and bicyclist survival in the event of a collision.
  → Improve response times to rural collision sites

Older Drivers

Nearly one in four traffic fatalities in the region involved a driver 65 years or older. Physical changes to the transportation system, such as increasing visibility and improving legibility of signage, can help. Groups such as AARP may help to sponsor various trainings. Providing and publicizing public transit options is also important so that people feel they can relinquish driving without losing their participation in community life.

STRATEGIES

- Identify older drivers at an elevated risk.
  → Train law enforcement and medical professionals to recognize physical and cognitive deficiencies affecting safe driving in older drivers, including submitting reevaluation referrals to the DMV
- Plan for an aging population.
  → Establish a broad-based coalition to plan for addressing older adults' transportation needs.
- Improve the roadway and driving environment to better accommodate older drivers' special needs.
  → Provide more protected left-turn signal phases at high-volume intersections, where supported by collision data
  → Consider lighting and other engineering countermeasures at intersections, horizontal curves, and railroad grade crossings where supported by collision data
- Improve the driving competency of older adults in the general driving population
  → Provide education and training opportunities to the general older driver population

Regional Safety Performance Measures

Although the Fatality Analysis Reporting System provides data on fatal crashes at the MPO level, information on crash rates and serious injuries is currently available to RFATS only at the county level. To provide consistency in reporting, York and Lancaster counties are therefore the basis for the performance data shown in **Table 5.1**. These numbers represent the average of the most recent available five years of crash data reported as of April 2020.

Table 5.1: RFATS Safety Performance Measures (2013-2017)

Measure	York County 5-Year Avg.	Lancaster County 5-Year Avg.
Number of fatalities	26	14
Rate of fatalities per 100 million vehicle miles traveled (VMT)	1.180	2.010
Number of serious injuries	2,558	951
Rate of serious injuries per 100 million VMT	116.078	137.836
Number of non-motorized fatalities and number of non-motorized serious injuries combined	11.4	2.2

Sources: 2013-2017 fatalities and fatality rate from annual South Carolina Traffic Collision Fact Book. Non-motorized user fatalities from Federal Accident Reporting System (NOTE: 2014 and 2018 pedalcyclist data was not available). Number of non-motorized serious injuries provided by SCDOT (Note: 2015-2019 data was used for this measure).

Stakeholder Input

This section to be completed following the public engagement period in April 2021.

Security

Key considerations in transportation security include "hardening" critical infrastructure against both man-made and natural threats and increasing the system's resiliency, i.e. its ability to resume normal function quickly after a major impact. The resiliency of a transportation network can be improved through pre-coordinated responses, which range from a pre-arranged plan to redirect traffic to streamlined procedures that would allow rapid re-construction of a critical bridge. System resiliency can also be improved by ensuring "redundancy," i.e. having multiple routes or more than one transportation mode serving key destinations.

Roles in Transportation Security

Most states, regions and local governments have a dedicated department or agency that handles emergency planning and response, and transportation agencies such as SCDOT and RFATS play important supporting roles.

The South Carolina Emergency Operations Plan is administered by the South Carolina Emergency Management Division, Office of the Adjutant General. Under the plan, SCDOT is responsible for the management of transportation assets and infrastructure during, or immediately following, a critical emergency or disaster incident. This function includes providing for coordinated plans, policies, and actions of state and local governments to ensure the access and safety of the public traveling on the transportation system during all hazards. Once the threat or hazard no longer exists, SCDOT performs prompt inspections of the transportation infrastructure and facilitates orderly re-entry into the area after an evacuation. Other missions may not involve evacuations but are equally important. These may include responding to severe weather conditions, or re-routing traffic to protect travelers from hazardous material.

Hazards requiring action by SCDOT and partner agencies include hurricanes, winter storms, tornadoes, wildfires, dam failures, flooding, earthquakes, and national security emergencies. They also have responsibilities in incidents involving the potential release of hazardous materials, an issue which received additional attention from Congress in the latest reauthorization of surface transportation funds. As part of the FAST Act, a new grant program was created for training programs related to community preparedness and response to incidents involving hazardous materials.

Regional Conditions and Trends

One of the unique concerns for emergency response in the RFATS area is maintaining an evacuation plan for the area around the Catawba Nuclear Power Station, located on a peninsula in Lake Wylie. Most of the RFATS planning area is within a 10-mile radius of the station. Related security issues include transportation of hazardous materials as well as local evacuation routes to be used in case of an incident.

Planning and response for incidents involving the Catawba station are the responsibility of the York County Emergency Management Office. Many of the designated evacuation routes (**Figure 5.2**) are part of the road system for which RFATS has responsibility to plan and program funds. York County Emergency Management is therefore a critical partner in the RFATS planning process, to help identify routes or areas of the transportation network that may not be adequate for emergency use. RFATS should continue to give funding priority to improving SC 160, US 21 North, and other key routes designated in the Catawba station evacuation plan.

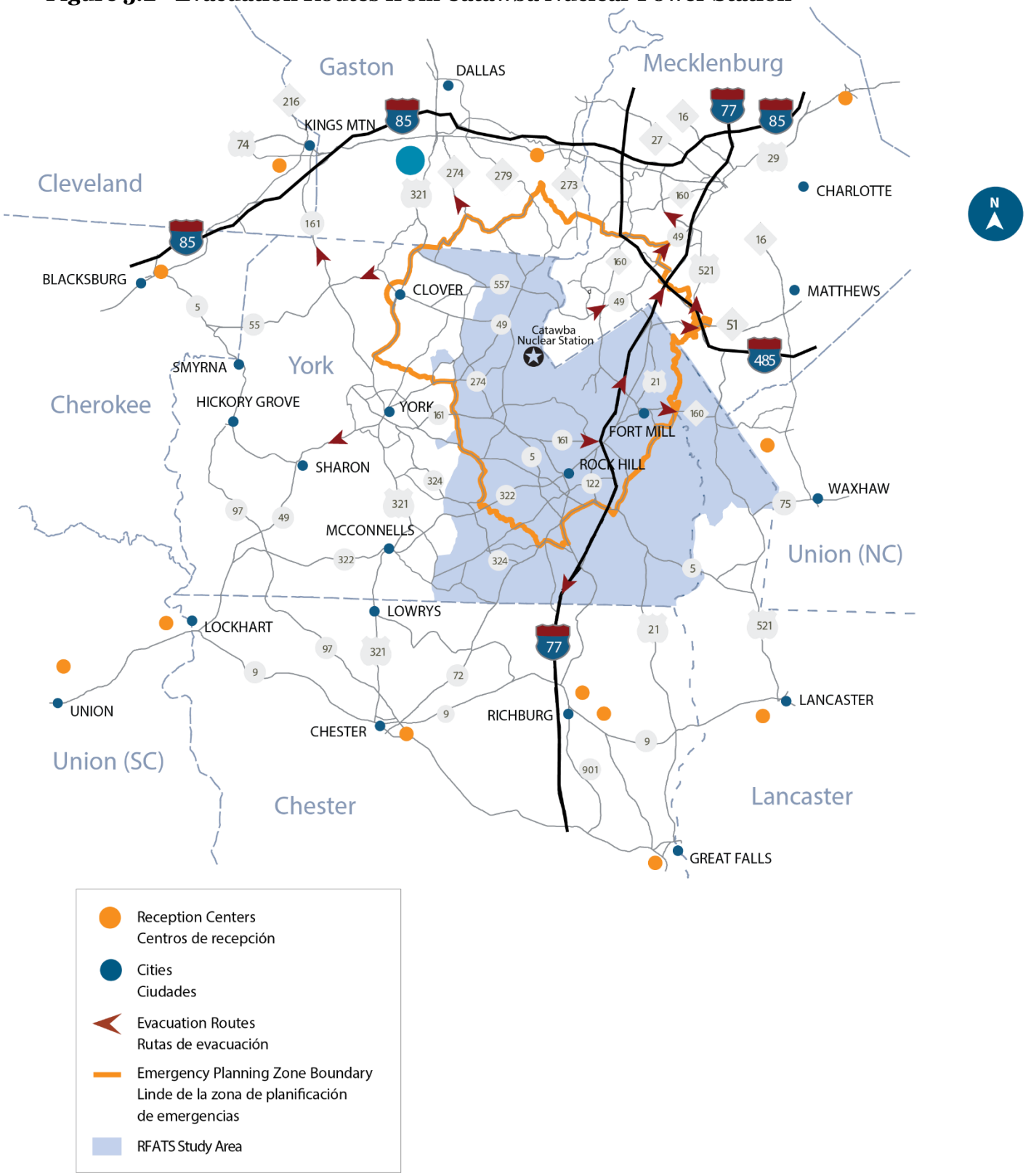
Resiliency

As new residential and commercial development continues, there is some risk that roads that were sufficient a decade ago will no longer have the capacity needed to quickly evacuate an increased number of residents and employees. However, local governments have considerable ability to improve the resiliency of the area's road network through their development policies, and the extent to which they follow the RFATS Collector Street Plan. As noted earlier, security is improved when a community has a more interconnected network; when one route is impacted by an incident, alternate routes are available. This is the reason that many communities require at least two entrances to large subdivisions: in dense areas, too many lives are at risk to rely on only one route for emergency responders to evacuate residents or reach them in case of disaster. The same concept holds true at a larger scale; a region is more secure with multiple connections among its major centers.

Non-Highway Modes

Transit security plans and training in the RFATS region are managed by the local operators (CATS and York County Council on Aging). Rock Hill/ York County Airport (Bryant Field) has its own emergency plan. Railroads must also perform comprehensive safety and security risk analyses to determine the safest routes for moving hazardous goods.

Figure 5.2 - Evacuation Routes from Catawba Nuclear Power Station



Sources: Duke Energy, York County Office of Emergency Management

Public transit is sometimes considered a more likely target for threats because of the concentration of people on vehicles and at stations. Each transit agency maintains security protocols and provides regular training for drivers and other staff. Most systems have also installed cameras and other security equipment such as automatic vehicle location (AVL) on their vehicles and at major facilities.

Public transit typically has a seat at the table for emergency planning because it offers critical resources to help emergency responders evacuate large numbers of people quickly from an area. Transit drivers also have a unique vantage point to help monitor area roadways and alert local officials to potential security concerns, since they are continually driving around the community's major routes. Many local transit agencies have implemented a version of the Federal Transit Administration's "Transit Watch" program, which encourages riders and drivers to report unattended packages or suspicious behavior.

Introduction

As described in Chapter 4, traffic volumes on RFATS area roadways are increasing along with the growing number of people who live and work in the region. Locally, drivers currently spend more than a third of their time in stop-and-go conditions, which is bad not only for regional air quality, but also for economic productivity.

SC 160 and Sutton Road

As growth pressures are expected to continue throughout the region, some roadways in the RFATS network will still experience congestion which will cause below acceptable levels of service. With appropriate federal and state funding support consistent with growth activity, the region could make additional road capacity improvements. However, in some locations the limiting factor is not just funding, but physical constraints that prevent the addition of new lanes. Therefore, the region will need to incorporate a broader range of mitigation strategies for managing congestion. This chapter outlines various tools that are available, and how progress is being tracked.

The Congestion Management Process

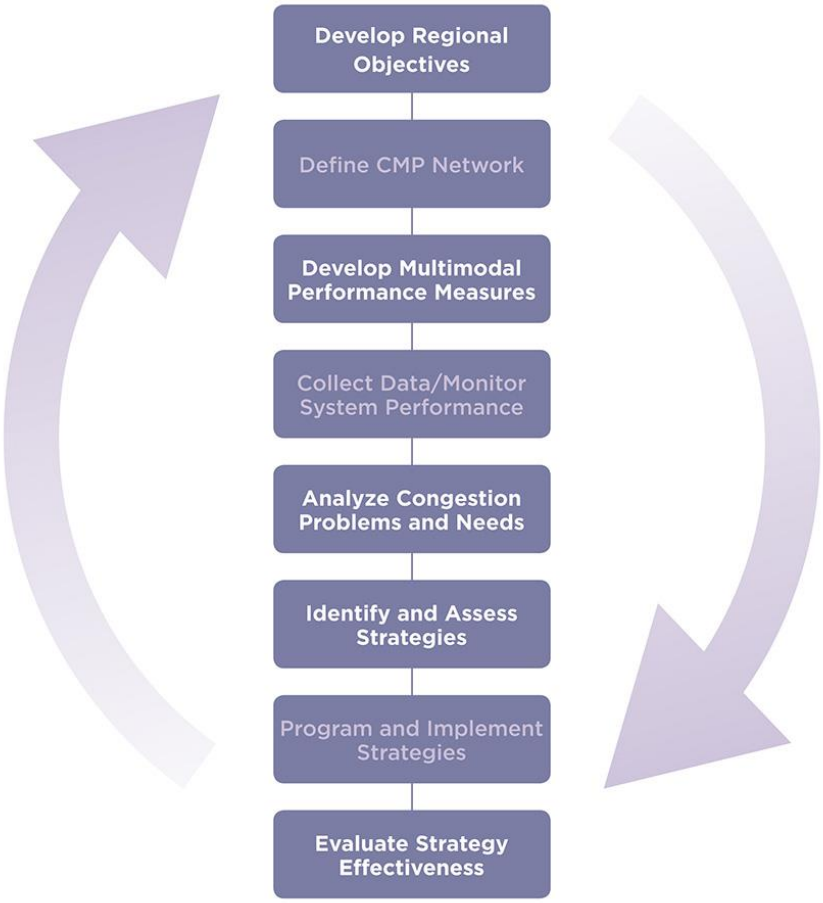
Federal law requires a Congestion Management Process (CMP) to be maintained and used in transportation planning for all urbanized areas like RFATS that have a population greater than 200,000. RFATS is also required to maintain a CMP as it is the only MPO in the state of South Carolina that is designated as a Maintenance Area for Air Quality by the EPA. The intent of the Federal CMP requirement is to ensure that roadway congestion is examined, and identified improvements are developed as an integral part of the MPO transportation planning process. The process provides a framework for these ongoing examination and identification efforts as well as the evaluation of the effectiveness of implementation strategies.

A CMP is a continuous cycle of transportation planning activities designed to provide decision-makers with better information about transportation system performance and the effectiveness of various strategies to deal with congestion. A CMP has four main components:

- Measurement and identification of congestion,
- A matrix of congestion mitigation strategies,
- Monitoring of effectiveness after implementation, and
- An orderly evaluation process.

Figure 6.1 shows these components and highlights the fact that a CMP is not a one-time exercise but an ongoing process of planning, action and review. It is also a learning process. By monitoring the effectiveness of congestion mitigation strategies and evaluating their benefits in an orderly, consistent manner, planners and decision-makers can improve their ability to select the most cost-effective strategies appropriate to their specific local conditions and needs.

Figure 6.1 The Congestion Management Process



Source: FHWA, Congestion Management Process

Like other components of the LRTP, the CMP reflects regional objectives for congestion management that are drawn from the regional vision and goals and are communicated through performance measures such as travel time and delay. The RFATS CMP was most recently updated in 2019 and it provides the framework for evaluating alternative strategies along RFATS' most congested corridors and intersections, in order to generate viable projects and programs for consideration in the LRTP.

Congestion Monitoring Network

The RFATS CMP identifies particular roadways where traffic operations are to be evaluated on an annual basis. This "congestion monitoring network" consists of those core roadways which carry the majority of traffic such as Celanese Road, Cherry Road, SC 160, Gold Hill Road, US 21, Fort Mill Bypass, SC 49, US 521, and Dave Lyle Blvd. Congestion levels on these roadways are

monitored as development pressures and traffic conditions change with time. The Congestion Monitoring Network is shown in **Figure 6.2** and **Table 6.1**.

Performance Measures

A number of different data sources are utilized to monitor changes in congestion levels. These include Annual Average Daily Traffic Volumes, Volume to Capacity Ratios, and Travel Time Surveys. Current average speeds and travel times were collected in 2018 for twelve corridors distributed throughout the RFATS region. The data collected suggested that intersection-related delay continues to be one of the most significant contributors to the peak-hour congestion experienced by area motorists. It is worth noting that due to the extenuating circumstances regarding COVID-19 and the impact seen on travel in 2020, monitoring results from 2018 are utilized for this chapter, as it was used during the 2019 Update to the CMP. Data from 2020 is still being collected, and further analysis is needed to determine the long-term impact of the changes in travel patterns brought on by the events of 2020.

Another source of data available for use in congestion monitoring is the USDOT-sponsored National Performance Management Research Data Set (NPMRDS). This dataset is compiled from various sources such as cell phone locations, in-vehicle navigation systems, and Global Positioning Systems (GPS) devices used by trucking companies. However, this dataset has its limitations as it does not capture information needed for the entire Congestion Monitoring Network as it is based on corridor segments. Thus, for those corridors where NPMRDS data is not available, travel speeds are manually surveyed using the floating car method. Since the NPMRDS data is based on corridor segments, other tools may be needed to properly assess congested conditions in the RFATS region. RFATS will continue to track federal guidance and resources on performance measurement, as well as the experience gained by other MPOs using the new datasets, to help design its next full CMP update.

Figure 6.2: CMP Congestion Monitoring Network (source: 2019 CMP)

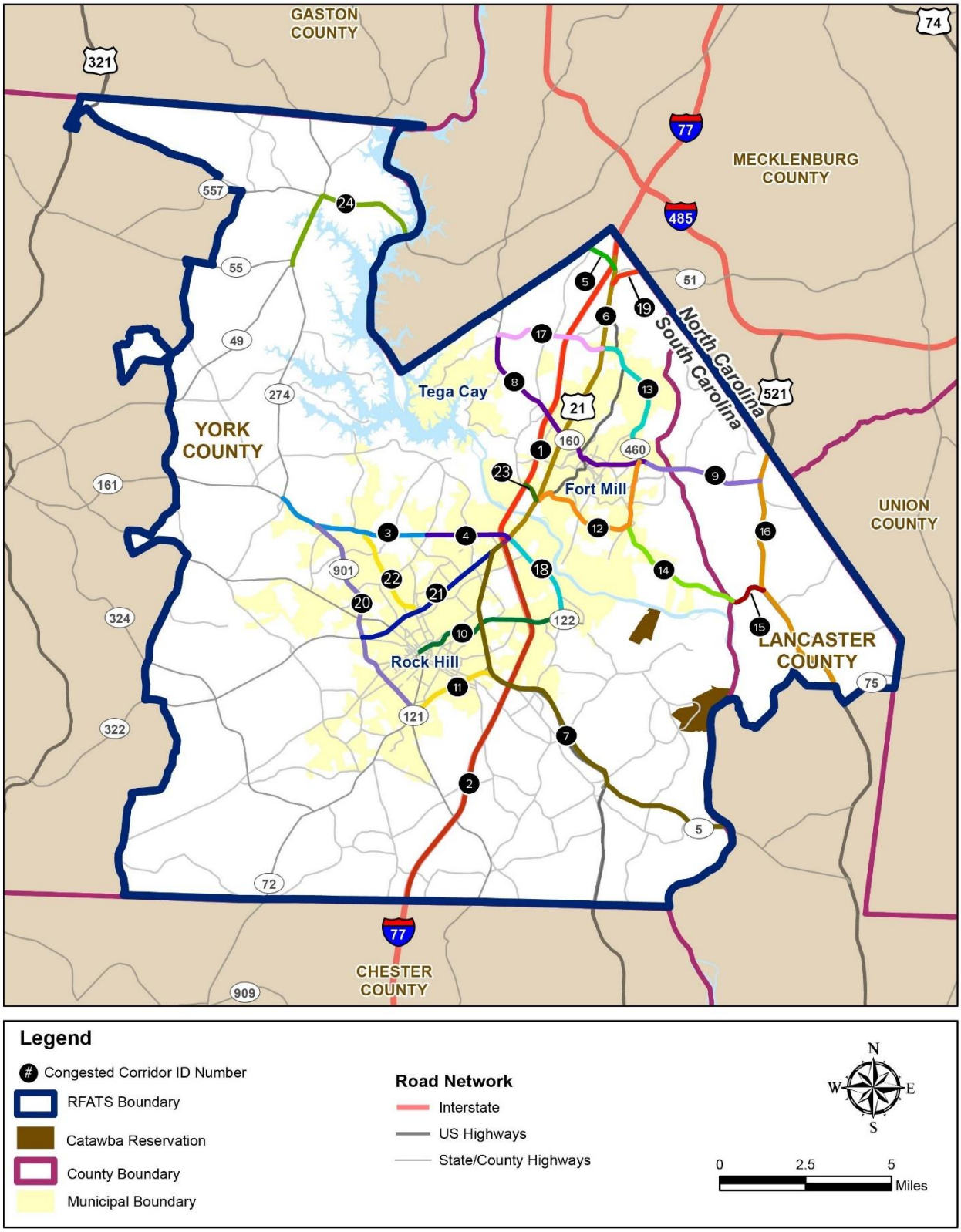


Table 6.1: CMP Congestion Monitoring Network Routes (source: 2019 CMP)

ID	Corridor	Termini	Miles
1	I-77 (north of US 21)	NC State Line to US 21	9.75
2	I-77 (south of US 21)	US 21 to York/Chester County Line	10
3	SC 161 (Old York Road/Celanese Road)	SC 274 to India Hook Road	2.07
4	SC 161 (Celanese Road)	India Hook Road to US 21	2.42
5	Carowinds Boulevard	NC State Line to US 21	1.05
6	US 21 (north of SC 161)	I-77 to SC 161	8.9
7	US 21 (south of SC 161)/SC 5	SC 161 to York/Lancaster County Line	9.7
8	SC 160	NC State Line to York/Lancaster County Line	9
9	SC 160	York/Lancaster County Line to US 521	2.73
10	Dave Lyle Boulevard	Main Street to Cel-River Road/Red River Road	5.74
11	SC 72/Albright Road	Mt. Holly Road to US 21	7.03
12	Fort Mill Bypass	US 21/Sutton Road to SC 160	5.41
13	Fort Mill Bypass	SC 160 to US 21/SC 460	4.21
14	Doby's Bridge Road	Fort Mill Bypass to York/Lancaster County Line	6.06
15	Doby's Bridge Road	York/Lancaster County Line to US 521	1.19
16	US 521	Waxhaw Highway to NC State Line	6.3
17	SC 460	SC 160 to US 21	3.3
18	Cel-River Road/Red River Road	Dave Lyle Boulevard to US 21/Cherry Road	3.61
19	SC 51	US 21 to NC State Line	1.0
20	SC 901 (Heckle Boulevard)	SC 161 to SC 72	6.62
21	Cherry Road	Cel-River Road/Red River Road to SC 901	5.24
22	SC 274 (Hands Mill Highway)	SC 161 to Cherry Road	2.74
23	Sutton Road	I-77 to US 21	0.59
24	SC 49 (Charlotte Highway)	NC State Line to SC 55	5.37

Congestion Management Strategies

Congestion is generally classified as either recurring or non-recurring. Strategies used to manage or mitigate congestion are dependent upon the cause and classification of that congestion. Examples of recurring congestion include peak period travel, bottlenecks, intersection operations, and school related traffic. Examples of non-recurring congestion include traffic accidents and special event traffic. Improving the operational efficiency of the RFATS transportation network relies on the different approaches to managing system resources, user demand, and adjoining development patterns. Selecting the appropriate strategy (or strategies) to manage or mitigate the different causes of congestion is done through detailed evaluation of each congested roadway and intersection. **Figure 6.3** shows the range of tools available.

Figure 6.3: Congestion Management Strategies

Access Management

- Access spacing
- Driveway spacing
- Safe turning lanes
- Median treatments

Transportation Systems Management and Operations

- Managed lanes (such as high-occupancy vehicle/toll lanes)
- Variable speed limits
- Changeable lane assignments
- Ramp metering
- Bicycle and pedestrian crossing improvements
- Adaptive traffic signals
- Dynamic messaging signs
- Real-time traveler information and re-routing systems
- Electronic commercial vehicle clearance and tolls

Incident Management

- Motorist assistance patrols
- Strategies to improve response times
- Strategies to reduce clearance times

Physical Roadway Capacity

- Intersection turn lanes
- Roundabout intersections
- Acceleration / deceleration lanes
- Hill-climbing lanes
- Grade-separated railroad crossings
- Grade-separated intersections
- New or converted HOV lanes
- New SOV travel lanes (widening)
- New location roadways

Travel Demand Management

- Added Park-and-Ride Facilities
- Increased ridesharing, vanpooling
- Flexible work location / telecommuting, shift work
- Alternative commute mode
- Land use management strategies

Access Management

Access Management Improvements at Baxter Village Town Center and SC 160

Many communities are beginning to look more seriously at access management to control the growing congestion on their arterial roadways. Access Management emphasizes the importance of maintaining each road's intended function. Roadways primarily intended to serve through-traffic – such as freeways and major arterial roads – offer only limited direct access to adjoining properties. This helps minimize the number of times that a driver must slow down because the vehicle ahead has either pulled out into the road or has braked to make a turn. In contrast to arterials, local streets are intended primarily for access to adjoining property. Through-traffic flow is less important; in fact, most communities set low speed limits and even implement traffic calming measures on local streets.

Access Management is defined as the management of vehicular operations into and out of land parcels along a given roadway. This includes the allowable number, location, and operational characteristics of both commercial driveways and entry / exit points for residential developments. Thus, access management strategies effectively seek to control all of the central variables influencing how efficiently and reliably a travel stream will operate – this is particularly important along corridors with higher levels of travel demand. Access Management techniques that jurisdictions can utilize include: access spacing, driveway spacing, safe turning lanes, median treatments, and right-of-way management.

As the RFATS region continues to grow at a rapid pace, it is important to consider improving access management strategies in key development areas. While specific access management policies will need to be implemented by the local jurisdictions with the RFATS region, RFATS must still play a role in working towards the implementation of effective access management strategies and coordinating the policy improvements implemented by each jurisdiction so that one locality does not appear to be more lenient than another. Supplemental to incorporating improved access management policies at the local level, specific consideration should be given to key growth areas and the congested corridors identified in the Congestion Monitoring Network.

Access management can be carried out through roadway design, access permitting, subdivision or site plan review, and access management plans and regulations.

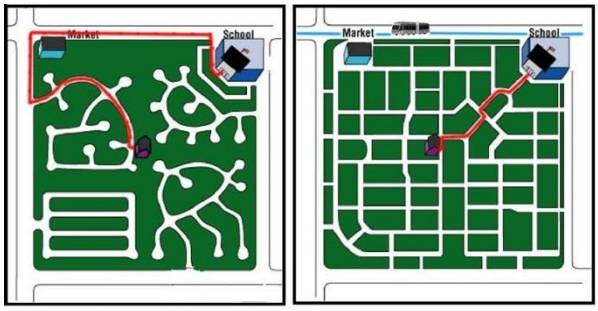
Collector Roads

One important component of Access Management is to continuously improve the collector road network. Collector roads are intended to balance the needs of access and through-movement. The general purpose of a collector road is to fill a gap between high-speed, high-volume arterial roadways and low-speed, low-volume local roads. Collector roads are integral linkages for efficient movement by effectively distributing travel demand across an appropriate network of supporting roads. Operationally, collector roads are characterized by moderate speeds with access to individual driveways. They provide some access to adjoining property, although not as much as a local street. Their function is to "collect" traffic from multiple local streets and then connect either to an arterial road, or to another collector.

Some parts of the RFATS region have a very limited number of collector roads. This situation can contribute to congestion because drivers cannot make most of their trips without first getting onto an arterial road. **Figure 6.4** shows the difference between a road network with a high number of connections, versus a network with many fewer route choices.

Given the growth projections with the RFATS region, the functional importance of identifying needed collector roads will serve an important role for both proper development and operational reasons. Congestion levels are projected to increase into 2050 and in order for the roadway network to function at its highest level of efficiency as a system, improvements to network connectivity such as the proper development of collector roads will be critical.

Figure 6.4: Network Connectivity



Travelers in the more highly connected road network (on the right) have more options to reach their destinations. Those using the network on the left must first drive to the arterial road that borders their neighborhood in order to reach other destinations.

Adaptive Traffic Control Signals

Adaptive Traffic Signal at SC 160 and Sutton Road/Pleasant Road

Another important aspect to managing congestion levels in the RFATS region is optimizing the efficiency with which traffic can flow along a corridor. Traffic signals are a key component to this. Traditional traffic signals are based on timing patterns and each movement at an intersection gets a dedicated amount of time when a signal turns from green to yellow to red. Traffic flow along a corridor can be impacted by these traditional traffic signals if these timing patterns are not adhering to the existing level of traffic at an intersection.

Adaptive Traffic Control Signal Systems allow traffic signals to adapt to the real time operational environment at an intersection. These adaptive systems can monitor traffic patterns and adjust the timing patterns for each phase of a signal cycle. These systems are able to extract further efficiency from a roadway system and enhance the flow of traffic along a corridor with several signals coordinating with one another. This helps to minimize delays, reduce the number of stops along a corridor, and improve travel time reliability. It is important to note that these systems cannot create more time for the signal cycle or add any more capacity to a roadway, however they can allocate time in a more efficient manner at an intersection.

It is important to note that the benefit realized with an adaptive signal system is dependent upon the roadway's capacity levels. Certain roadways may see minimal benefit from any adaptive traffic control signal improvements due to high levels of demand during peak periods. However, adaptive signal systems have helped to address school related congestion, special event related congestion, and corridor congestion during off-peak periods such as the lunch hour.

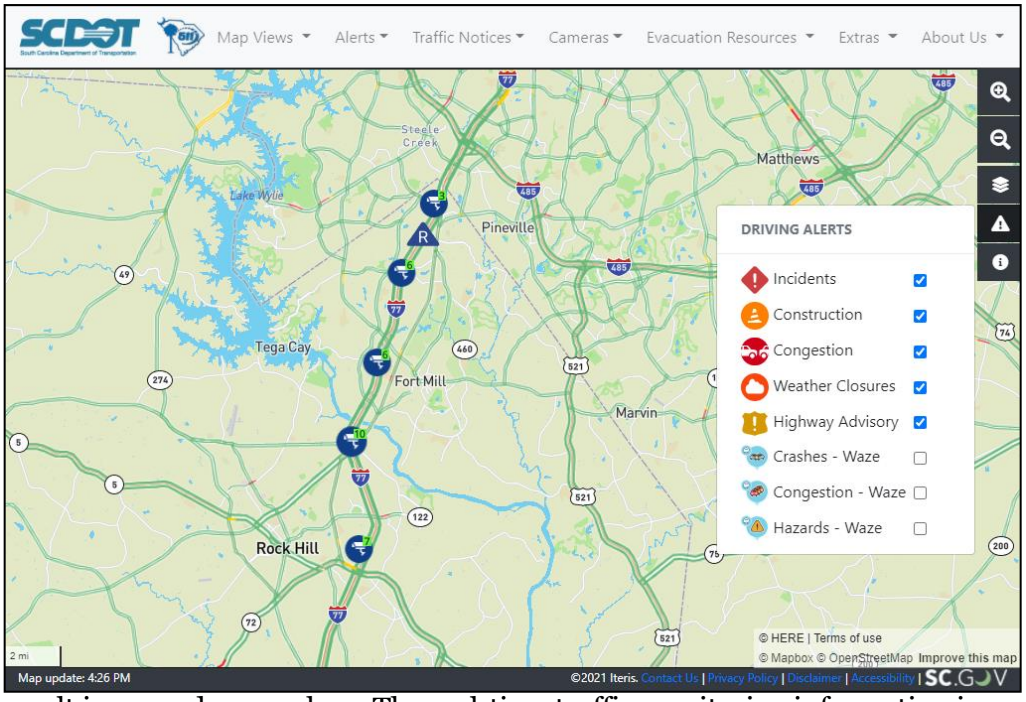
RFATS has recently coordinated with SCDOT to install the first of such projects within the MPO study area. The first system has been installed along Carowinds Blvd and US 21 near the N.C. state line to manage congestion associated with Carowinds Amusement Park. The second system has been installed along SC 160 between Pleasant / Sutton and US 21 to help manage congestion levels associated with the Baxter Village and Kingsley

developments. Further analysis is anticipated to verify that adaptive signal systems would be beneficial along other corridors throughout the region.

Incident Management

FHWA research has shown that more than 60 percent of congestion nationwide is non-recurring, as opposed to being linked with bottlenecks due to limited physical capacity. Much of this non-recurring congestion is related to vehicle crashes or other incidents. Worse, the traffic delays caused by the initial incident often result in secondary collisions due to inattentive or "rubbernecking" drivers.

SCDOT, like many states, has put increased emphasis on detecting incidents early and clearing them quickly before they significantly impact travel or result in secondary crashes. The real-time traffic monitoring information is also being made available to the traveling public so that drivers can learn of potential delays and have the opportunity to plan alternative routes or travel at a different time.



Real-time Traffic Conditions

I-77 through the RFATS region is monitored with video cameras and radar speed detectors to alert operators when a slowdown is occurring. 30 of these cameras are installed along I-77 in the RFATS area, and 2 cameras are also installed on US 21 at SC 160 and at the Catawba River bridge.

The resulting real-time traffic information is provided to the public on the SCDOT website (left) and via 511.

Incident management operations for the area are conducted by SCDOT from the District 4 Traffic Management Center (TMC), where camera and radar operators monitor traffic conditions.

The State Highway Emergency Program (SHEP) plays an important role in managing incidents and congestion on the I-77 corridor. Through this

program, SCDOT helps maintain safe traffic flow by assisting with traffic control and incident response and providing minor assistance to disabled vehicles. SHEP operates seven days a week along I-77 between Mt. Holly Road (Exit 73) and the North Carolina state line, primarily during daytime hours.

Regional Congestion Management Projects

The CMP lists projects that have been prioritized based on their potential to mitigate congestion. These include:

- **Intersection Improvement Analyses**
  - Cherry Road / Mount Gallant Road Intersection Improvement
  - SC 160 / Pleasant Road / Sutton Road Intersection Improvement
  - Marvin Road / Henry Harris Road Intersection Improvement
  - US 21 / Sutton Road / Spratt Street Intersection Improvement
  - Celanese Road / Mt. Gallant Road Intersection Improvement
  - SC 160 / Dave Gibson Blvd Intersection Improvement
  - SC 161 and Heckle Blvd
- **Adaptive Traffic Signals**
  - Cherry Road
  - Celanese Road
  - US 521
  - Dave Lyle Blvd
  - Albright Road
  - SC 160 West
  - SC 160 East
  - SC 460 (Gold Hill Road)
  - SC 49 (Charlotte Hwy)
  - Fort Mill Bypass
- **Access Management**
  - US 21
  - SC 460
  - SC 160
  - Albright Road
  - Celanese Road
  - Carowinds Blvd
  - SC 49
  - US 521
  - Cherry Road
  - Fort Mill Bypass
  - Harrisburg Road
  - Dave Lyle Blvd
- **Safety Audits**
  - Celanese Road and Mt. Gallant Road
  - Anderson Road and Mt. Gallant Road
  - US 521 and Waxhaw Hwy
  - US 21 and Sutton Road / Spratt Street

  - Heckle Blvd and Herlong Avenue
  - SC 160 and Pleasant Road / Sutton Road
  - SC 460 (Gold Hill Road) and Pleasant Road
  - Ebenezer Road and Herlong Avenue
- **Widenings**
  - US 21 (SC 160 to Catawba River Bridge)
  - Cel-River/Red River Road (Dave Lyle Blvd to Anderson Road)
  - Fort Mill Parkway from SC 160 to I-77
  - Sutton Road (6th Baxter to US 21)
  - US 521 from Jim Wilson Road to NC State line

Stakeholder Input

This section to be completed following the public engagement period in April 2021.

Recommendations

- RFATS should continue to apply its Congestion Management Process, including:
    - Collection of vehicle travel time data annually, or at least biennially, on roads in the congestion monitoring network.
    - Before-and-after evaluation of congestion in corridors where improvements have been implemented.
    - Update of the CMP itself on a four-year cycle.
    - Collection of roadway network data (such as geometry and traffic volumes) in the expanded areas of the RFATS boundary as additional roads become regionally significant.
- As additional highly congested locations are identified through monitoring, continue to conduct the detailed studies necessary to recommend appropriate solutions/strategies.
- Implement Travel Demand Management Strategies that reduce the need for travel, increase vehicle occupancy, encourage alternative modes, and/or shift trips to off-peak travel times.
- Share information with local jurisdictions about ways to incorporate access management and network connectivity into their development regulations and reviews.
- Continue to publish the CMP Annual Evaluation Report given to the Policy Committee each year.

http://www.rfats.org/rfats-2019-congestion-management-process-update/

Introduction

Freight movement is a critical element of an advanced industrial economy, and the ease of freight movement is one component of a region's economic competitiveness for attracting and retaining heavy industry, manufacturing, warehousing and other light industrial functions.

This chapter provides the freight element of the RFATS 2045 Long Range Transportation Plan. It describes existing conditions and trends at the national level, at the statewide/regional level and within the RFATS area. It also summarizes findings and recommendations of the recently completed Greater Charlotte Regional Freight Mobility Plan, a planning effort in which RFATS has been an active participant.

Relevance to the Transportation System and the Plan

The FAST Act emphasizes the importance of freight and goods movement in regional transportation planning. Freight must be considered both in its own right and in terms of supporting an area's economic vitality and competitiveness. Building off provisions in MAP-21, the FAST Act continues to stress the importance of freight transportation at a national level through the development of a national freight network, a national multimodal freight policy and national freight strategic plan. The FAST Act also increases funding for freight projects through the formula-based National Highway Freight Program (NHFP), as well as the FASTLANE grant program (Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies).

In addition, the FAST Act requires major metropolitan areas to set performance targets that are consistent with the national performance measures for freight, identify and recommend improvements that meet those targets, and report progress on the freight system's performance. A detailed summary of the performance measures can be found in the Greater Charlotte Regional Freight Mobility Plan.

Existing Conditions and Trends

The RFATS area's relationship to the greater Charlotte region is a key factor influencing the demand and location of freight supportive industries and facilities. However, the RFATS region itself has strong highway and rail connections for freight, including a major north-south interstate connecting Charlotte and Columbia, and main lines of two Class I railroads. These

connections serve a wide range of industries, including distribution centers and automobile component manufacturers. The northern edge of the RFATS region includes light industrial developments along I-77 and is impacted by similar developments along I-485 near Pineville.

Regional Freight Planning

RFATS and other partnering agencies in the 14-county Greater Charlotte Bi-State Region recently sponsored a regional planning effort focused on meeting the current and future needs of freight transportation. The *Greater Charlotte Regional Freight Mobility Plan* (also developed in cooperation with North Carolina and South Carolina statewide transportation planning studies) is intended to:

- Identify ways to effectively and consistently address freight congestion and key bottlenecks;
- Identify freight links that will connect mobility to regional economic development goals; and
- Identify and prioritize improvements for reducing congestion, addressing bottlenecks, and increasing efficiency.

The regional freight mobility plan analyzes movements and commodities in terms of tonnage, mode, direction and quantity, using the 2011 TRANSEARCH dataset (**Figure 7.1**). TRANSEARCH data is developed by IHS Global Insight and is a comprehensive database of North American freight flows, compiled from more than a hundred industry, commodity, and proprietary data exchange sources. TRANSEARCH combines primary shipment data obtained from some of the nation's largest rail and truck freight carriers with information from public, commercial, and proprietary sources to generate a base year estimate of freight flows at the county level.

As of 2011, the latest data available, over 375 million tons of freight moved across South Carolina's freight network. The largest mode share (80 percent) was trucking, followed by rail at 18.7 percent.

Another source of data is the Federal Highway Administration's Freight Analysis Framework (FAF), which examines freight movements for each mode of transportation. Although the database is not detailed enough to give specific data for the RFATS area, it does provide data for the greater Charlotte region.

Figure 7.2 shows the region's top rail freight commodities by weight. The largest commodity transported was cereal grains at 41 percent of the state's tonnage, followed by coal at 30 percent.

Figure 7.1: State Freight Tonnage, by Direction (2011)

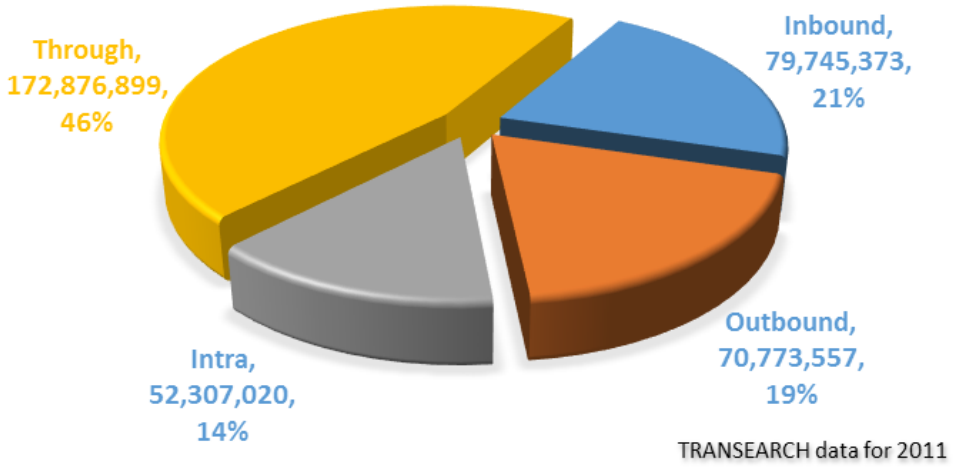
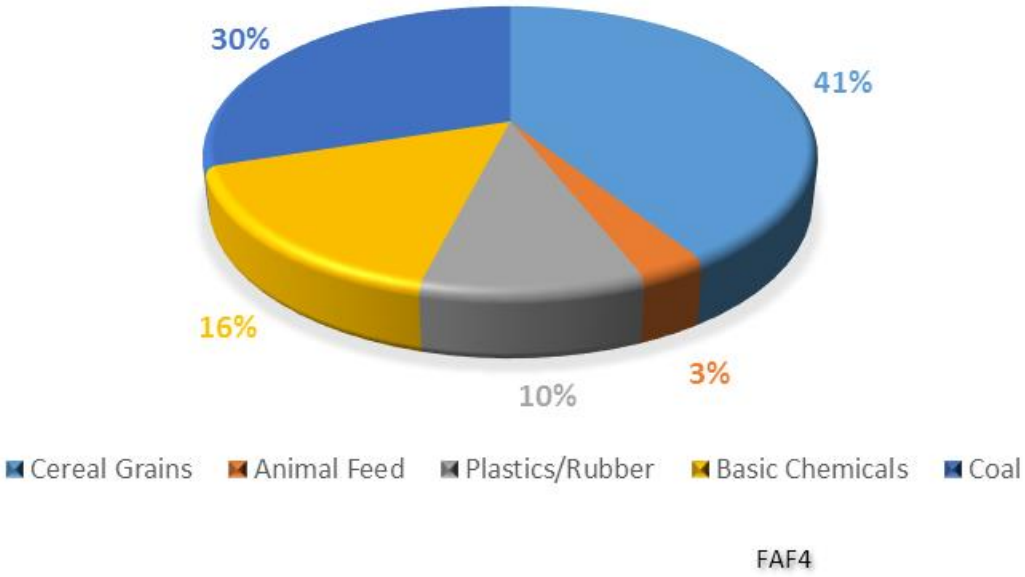


Figure 7.2: Top Commodities Shipped by Rail, by Weight



Figures 7.3 and **7.4** show the total value of regional freight shipments, inbound and outbound, by modal share. As shown, rail carries less than 5 percent of the value of freight, although it carries nearly 19 percent of freight by tonnage. As in other regions, rail tends to be the choice for shipping bulky, heavy goods while air is used for relatively high-value, time-sensitive freight.

Figure 7.3: Inbound Freight Value, by Modal Share

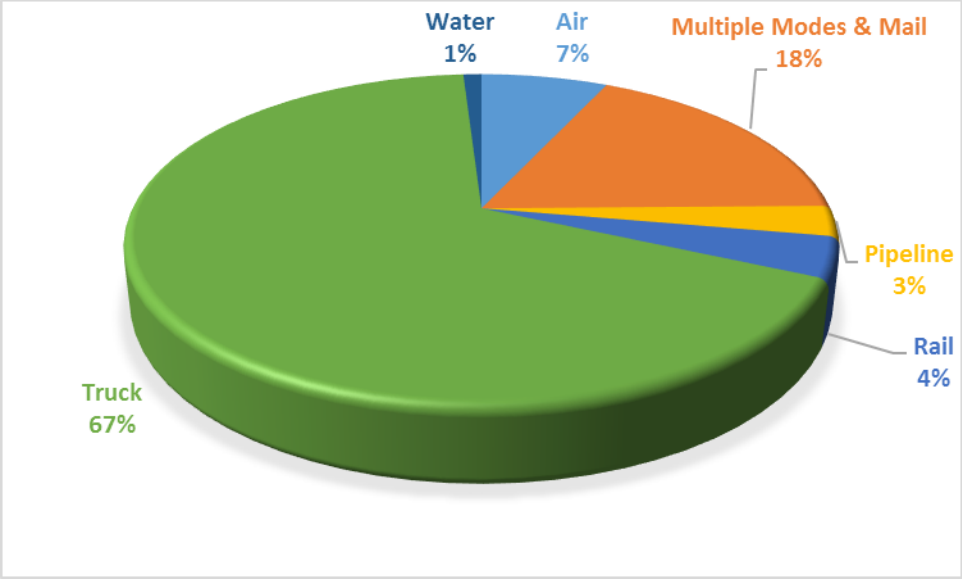
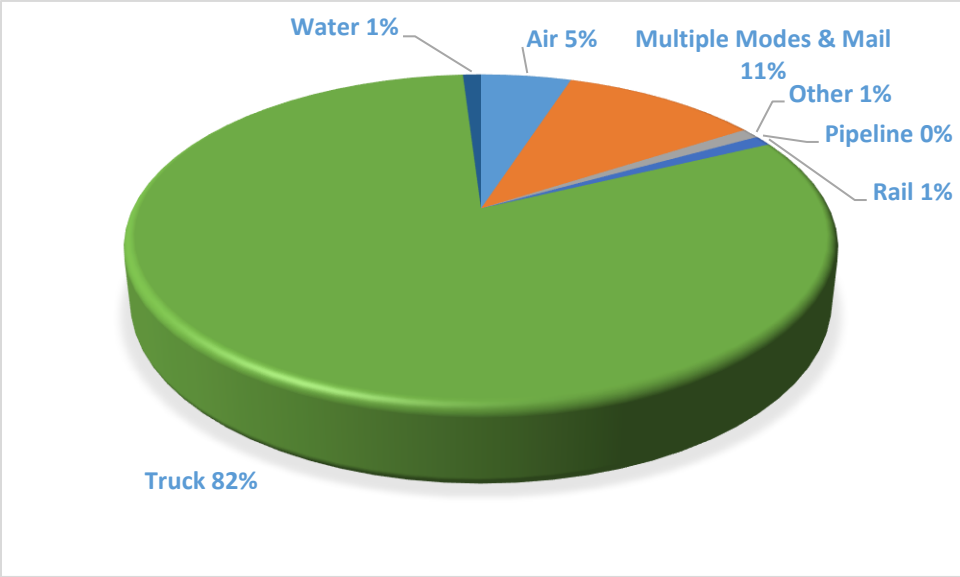


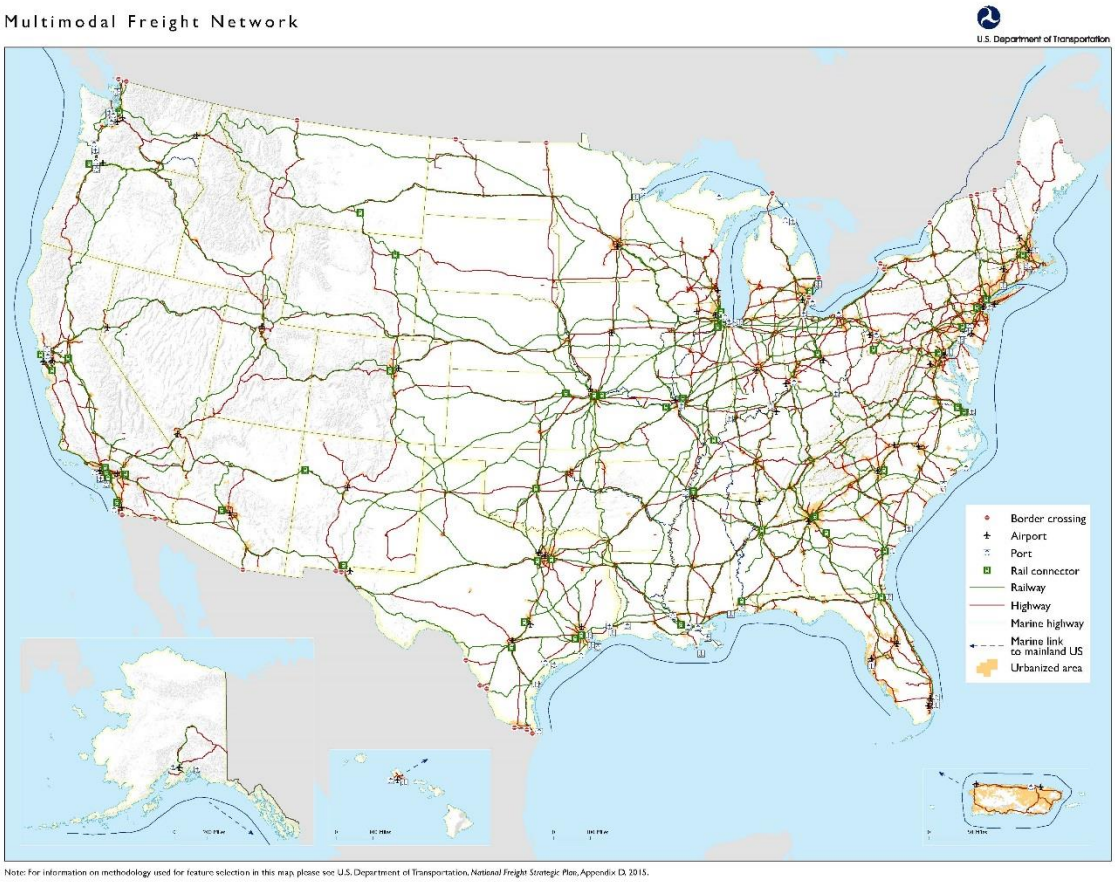
Figure 7.4: Outbound Freight Value, by Modal Share



Freight Strategic Network

The FAST Act directs federal resources and policies to improve freight movements on the nation's transportation system. U.S. DOT has designated a Multimodal Freight Network (**Figure 7.5**) which classifies the critical infrastructure for moving goods across the country.

Figure 7.5: National Multimodal Freight Network



The new Greater Charlotte Regional Freight Mobility Plan also identifies a strategic freight network where improvements are recommended to be focused. Within the RFATS area, the key facilities include I-77, US 521, SC 5 and the Norfolk Southern and CSX rail lines.

Highway Freight

National Conditions and Trends

Highway goods movement has been consistently increasing nation-wide over the past decades. Truck movement transports over 70 percent of all tonnage

in the U.S. The current dominance of this mode results through access and availability. Due to the nature of changing development patterns during the 20th century, the majority of shippers no longer have direct connection to ports or rail.

Urban freeways and arterials continue to become increasingly congested since many states have a hard time improving vehicle capacity at the same rate. Trucks will be affected just as much as commuters, with implications for freight travel times and reliability.

Nationally, issues of expanding capacity are increasingly being supplanted by a recognition that the existing highway network needs to be kept in a state of good repair and that existing funding streams may not be adequate, even without major capacity expansion.

Statewide and Regional Conditions and Trends

The port of Charleston is an important freight origin/destination for the state. However, the RFATS region also has close links to Charlotte and its intermodal terminals. CSX railroad operates a major rail-truck intermodal terminal in Charlotte, and Norfolk Southern relocated its Charlotte terminal to the Charlotte Douglas International Airport in December 2013, making the airport an air-rail-truck intermodal terminal.

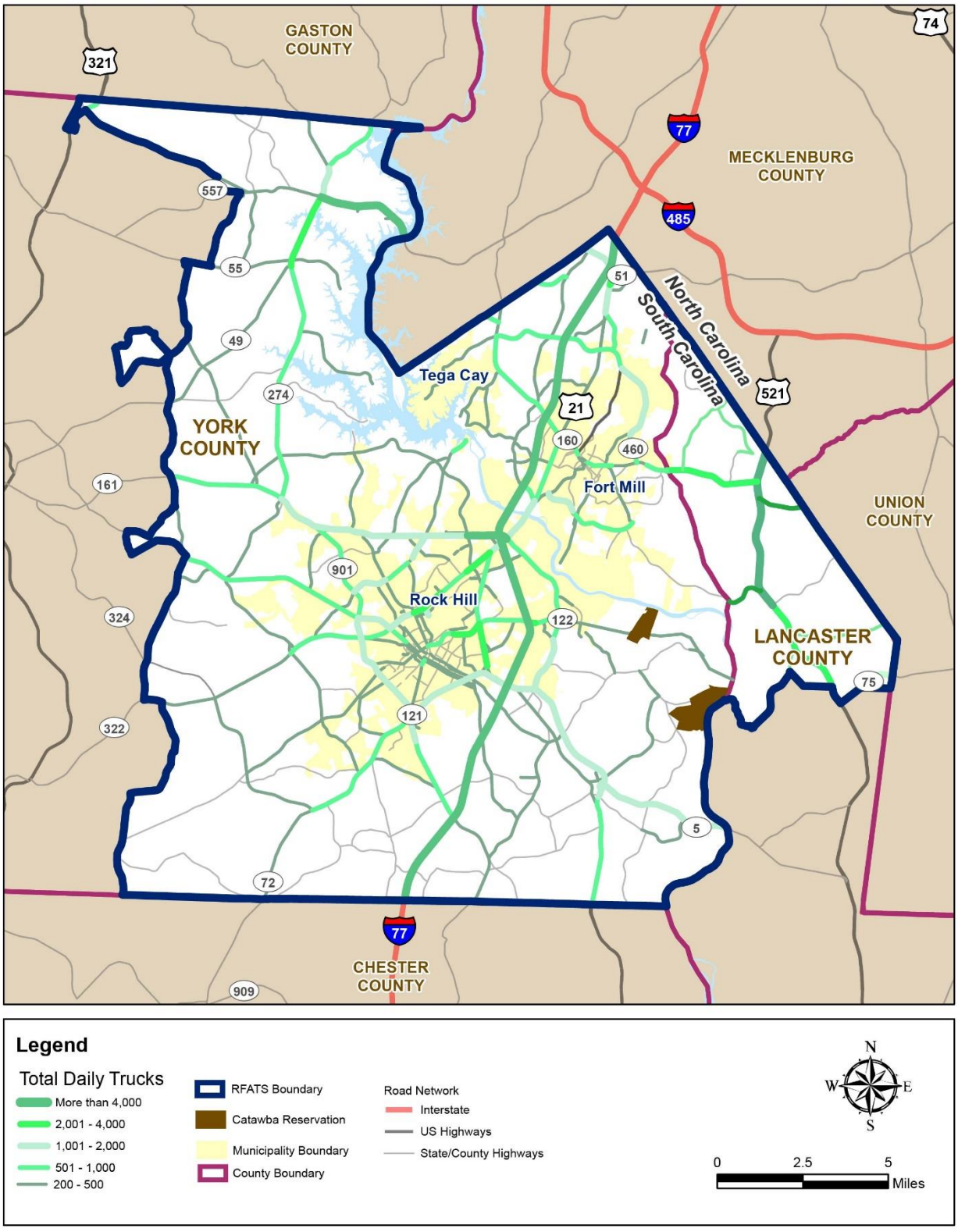
The state is also moving toward construction of a new intermodal facility in Dillon. The inland port would be the second one in South Carolina besides the Inland Port of Greer.

Conditions and Trends in the RFATS Region

Although I-77 carries the bulk of daily truck traffic, other roadways play a critical role to the movement of freight within RFATS, these include US 21, SC 5 and US 521. **Figure 7.6** shows routes within the region that carry higher daily volumes of truck traffic.

Identified truck bottlenecks within the RFATS area include the I-77 / US 21 interchange. It is also worth noting that just outside the RFATS planning area is one of the top 100 freight bottlenecks in the country: the I-77 at I-485 interchange. The prosperity of the RFATS region is strongly connected to the performance of its highway and rail access to the intermodal facilities in Charlotte. Existing and projected congestion on I-77 therefore represents a potential threat to the competitiveness of the RFATS area, as do bottlenecks that lie between area shippers within RFATS and their destinations.

Figure 7.6: Daily Truck Volumes on Area Roadways (2015)



Rail Freight

National Conditions and Trends

The US freight railroad industry is currently in a period of stability and growth following the major structural changes of the 1970s through the 1990s. The economic growth experienced in recent years has particularly benefited some freight flows, such as containers to and from the major ports, with the result that railroads have been adding or reinstating capacity on their main lines. Although there is a strong focus on unit trains (entire trains of a single commodity, such as coal or containers), the more traditional, smaller-scale traffic flows of single cars or small numbers of cars to/from local industries (carload freight) remains an important part of the industry.

Nationwide forecasts suggest that long-term economic growth will create demand for substantial additional capacity on the main rail corridors – and that the railroad industry will not be able to pay for all that capacity on its own. Public-private partnerships are therefore likely to be a key funding mechanism for achieving the necessary capacity, as shown in North Carolina where Norfolk Southern and NCDOT are investing more than $540 million in double tracking between Raleigh and Charlotte. Railroads are increasingly open to partnerships that combine public funding of public benefits (principally reductions in truck traffic) with railroad funding of private benefits. In particular, states and municipalities are increasingly recognizing the public benefit of diverting truck traffic from highways to railroads. Not only does it free up capacity on the highways, but it reduces impacts to the roadway surface itself, thereby extending its service life.

Statewide and Regional Conditions and Trends

Multiple state agencies are involved in activities influencing freight rail movement. SCDOT's Statewide Freight Plan addresses rail freight issues along key corridors. The South Carolina Department of Commerce also has a Division of Public Railways which promotes economic development interests by providing freight rail access to new and existing industries. The division has the authority to acquire rail corridors that may be at risk of abandonment or develop and construct new rail corridors.

As noted in SCDOT's Statewide Freight Plan, rail movements accounted for 70 million tons of freight, with through-state movements accounting for the largest directional movements. CSX Transportation handles the most tonnage through the state due to its larger rail network.

Over the past several years, multiple developments have either been completed or have been initiated that will greatly expand South Carolina's capacity and efficiency in accommodating freight rail movements:

- The Charleston Harbor is proposed to be deepened to accommodate larger ships that can now access the east coast due to the expansion of the Panama Canal. The project won congressional approval in December 2016 and is now awaiting federal funding.
- The Inland Port in Greer, opened in October 2013, connects directly to the Charleston Harbor and is served by rail.
- Plans are proceeding for the development of another inland port in Dillon.
- A new facility, the Navy Intermodal Container Transfer Terminal Facility (ICFT), is currently under construction in North Charleston. With the completion of the ICFT, no location in South Carolina would be more than 100 miles from an intermodal facility.

The RFATS region lies close to two major corridors that have been identified by railroads as potential partnership corridors. Both corridors are likely to involve increased capacity (additional tracks and/or improved signaling and speeds) as well as increasing clearances to allow double-stack container trains.

The **Norfolk Southern** (NS) main line through Blacksburg, west of the RFATS region, is part of its Crescent Corridor that runs from Washington, DC to New Orleans via Charlotte and Atlanta, paralleling I-85 and other congested routes. NS hopes to attract long-haul truck traffic on this corridor, which the railroad industry has historically not developed strongly. A major intermodal terminal was recently opened at Charlotte-Douglas International Airport as part of the corridor plan. **CSX**'s National Gateway corridor includes an axis from the port of Wilmington to Charlotte. Both railroads are currently working with state and municipal governments to develop plans and funding for these corridors.

Conditions and Trends in the RFATS Region

Figure 7.7 shows railroads in the RFATS region. These include routes owned by both Norfolk Southern (NS) and CSX, the two major railroads in the eastern US, as well as the Lancaster and Chester (L & C) Railroad.

The NS secondary main line from Charlotte to Chester and Columbia (known as the 'R' line, part of NS Piedmont Division) passes through Fort Mill and Rock Hill, serving a number of industrial customers with a small switching yard in Rock Hill. SCDOT's *Rail Right-Of-Way Inventory* identifies this as a

potentially important line because it follows the SC 72 highway corridor, and its future appears to be secure. Although a single-track line, it has automatic block signaling and a relatively high density of traffic. Passing sidings exist at the Rock Hill yard and in Fort Mill.

The CSX line from Monroe (NC) to Chester passes through Catawba, as part of CSX's mainline axis from Hamlet (NC) to Atlanta and New Orleans. This line has centralized traffic control and a high traffic density, and its future also appears secure.

NS also operates a local line (the 'SB' line) that connects with the main 'R' line at Rock Hill, extending west to Tirzah and east to meet the CSX line at Catawba. Also serving Catawba is the independent Lancaster and Chester Railroad (L&C), a shortline (minor railroad).

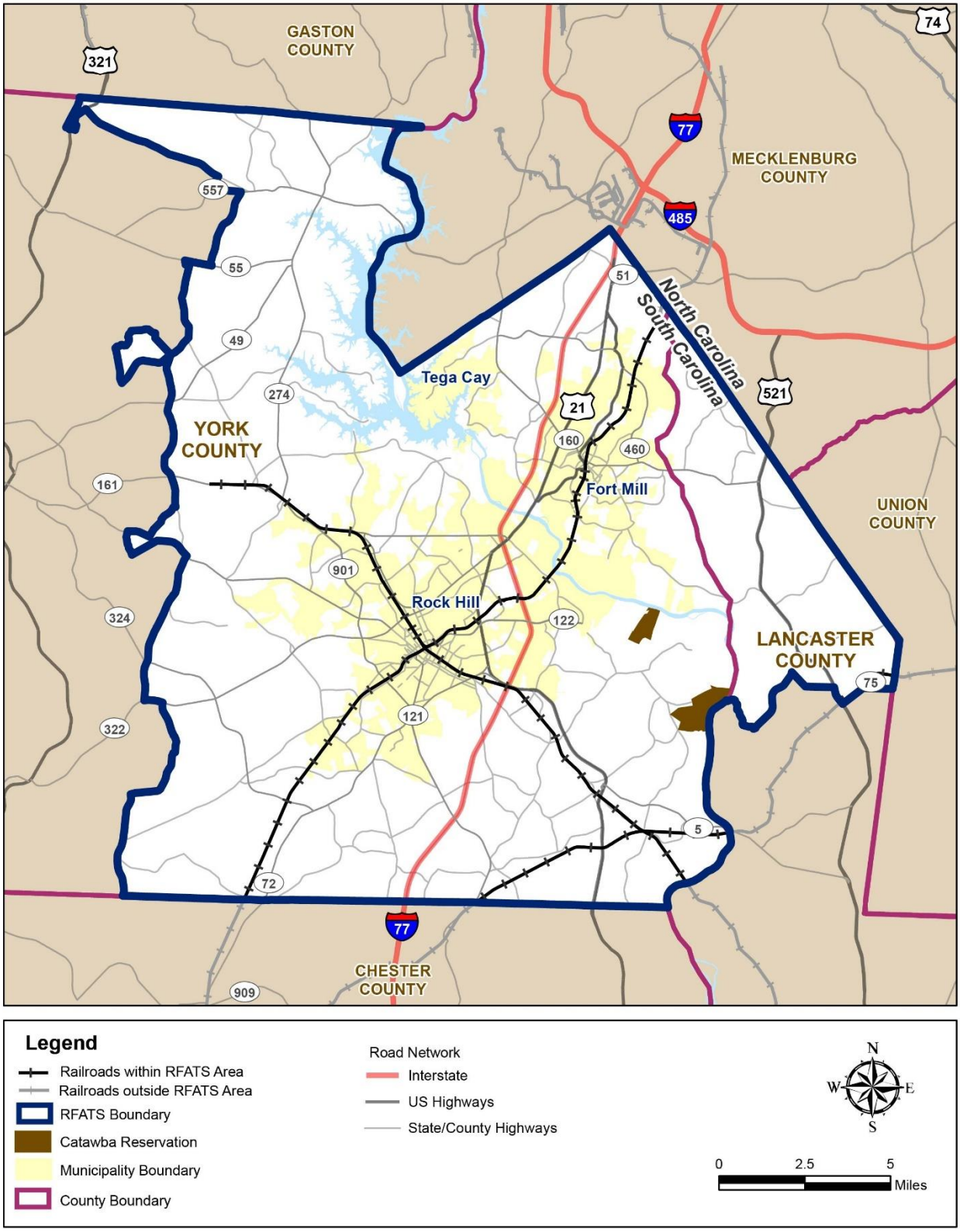
The rail lines within the RFATS region are not major inter-state corridors. Their future remains tied to the overall health of the railroad industry and to the decisions of individual customers along the route. Although the future of the two main lines through the RFATS region appears secure, the NS and L&C lines are, like any local routes, dependent on the presence of small numbers of individual customers, and changes in the industrial base can therefore easily affect those lines.

Highway-Rail Grade Crossings

The region includes a number of grade crossings where railroads and highways meet. Any future increase in train traffic may lead to additional congestion impacts on the highway network. In addition, grade crossings also represent a safety issue and have an impact on adjacent development. When individual crossings or entire corridors become busier, programs to upgrade, close or grade-separate the crossings are often introduced.

RFATS has funded a project to improve the efficient routing of area travel demand at / near several highway-railroad at-grade crossing points within downtown Rock Hill. The project includes a coordinated signal system and supporting electronic signage to alert drivers on preferred routing during train operations and related rail yard activities. Funding for this project came from the Congestion Mitigation and Air Quality Management (CMAQ) program.

Figure 7.7: Rail Corridors in the RFATS Region



Stakeholder Input

This section to be completed following the public engagement period in April 2021.

Summary and Recommendations

Regional freight-related discussions should continue to focus on these goals:

- Identify ways to effectively and consistently address freight congestion and key bottlenecks.
- Identify freight links that will connect mobility to regional economic development goals.
- Identify and prioritize improvements for reducing congestion, bottlenecks, and efficiency.
- Promote effective land uses to support freight mobility, economic development, and job growth.

Recommendations

The Greater Charlotte Regional Freight Mobility Plan recommends a congestion and safety improvement project be undertaken at the freight bottleneck location on US 21 near I-77, as referenced earlier. This project would help mitigate any adverse impacts to freight movement and freight related land use. Other recommendations include:

- Identify areas of needed truck parking and rest areas along the region's Strategic Freight Network.
- Prioritize projects designed to improve freight mobility and eliminate freight bottlenecks.
- Address and prioritize functionally obsolete and structurally deficient bridges on the region's Strategic Freight Network.
- Expand the use of Intelligent Transportation Systems, technology, and innovation to improve the flow of freight.
- Encourage alternative options such as Compressed Natural Gas (CNG)/Liquefied Natural Gas (LNG) for trucks, including fueling stations, and participate in the FAST Act's Alternative Fuel Corridors program.
- Use technological solutions to address truck parking such as real time parking availability, reservation systems, cashless payment, and navigation using smart phone technology.

- Continue to identify and close any first/last mile gaps near major intermodal centers and manufacturing hubs.
- Identify corridors where congestion may be significantly reduced through non-traditional improvements such as Intelligent Transportation Systems, managed lanes, or value pricing.
- Work with the Class I railroads and local stakeholders to develop programs and policies to improve operational efficiencies.
- Retain existing rail corridors and halt track removal.
- Create rail-focused business parks.
- Develop local transportation plans for areas adjacent to freight intermodal facilities.

Introduction

This chapter covers the range of public transportation services currently operating within the RFATS Planning Area as well as recent initiatives to further strengthen overall availability, routing connections, and transportation network efficiency for all users of the system – both within RFATS as well as more broadly with other systems across the Greater Charlotte Region.

As a point of reference - key variables influencing public transportation's capacity to operate with the greatest efficiency and effectiveness include the following:

- **Population Density** - the population of the RFATS region is broadly distributed at relatively low densities. Transit, like other public services, is more cost-effective when it serves a higher number of residents per mile.
- **Bicycle / Pedestrian Infrastructure** - safe, comfortable transit use relies heavily on a network of sidewalks, safe street crossings, and lighting because most regular transit users walk or bike to and from a given stop.
- **Road Network Connectivity** - transit efficiency is improved when the area's road system is interconnected. This makes it easier to design efficient bus routes that do not require turnarounds or back-tracking.

Existing Public Transportation Services

MyRide

In June 2019, the City of Rock Hill began offering free bus service through MyRide, which operates four fixed routes along key corridors within the expanded downtown area of Rock Hill. These routes were based on recommendations outlined in the 2015 *Urbanized Area Transit Implementation Study completed by RFATS.*

As a point of reference – *this study comprehensively evaluated* those areas with the highest potential transit demand as well as the characteristics necessary to support fixed-route transit service. Key elements of the assessment included analysis of demographic characteristics, evaluation of land use and transportation infrastructure, as well as identification of key activity / destination centers.

The study also evaluated other existing transit services in the RFATS Planning Area, including the express bus route and demand response program. Specifically, existing ridership data was analyzed to determine utilization levels as well as the potential for further service expansion and/or initiation of new routing options.

The MyRide operational schedule runs from 7am to 7pm Monday through Saturday, with Sunday service between 9am and 5pm. MyRide is an all-electric system with buses equipped with free Wi-Fi, mobile charging ports, bike racks, and infotainment screens. The four routes have connecting destinations such as Winthrop University, Downtown Rock Hill, Piedmont Medical Center, Rock Hill Galleria, and other locations. While the current transit hub is located on Laurel Street near Family Trust Federal Credit Union headquarters, it will be relocated in the future to the ground floor of a planned parking deck at University Center.

Route information is as follows:

Route 1: Downtown/Knowledge Park Loop

- Loop connecting Winthrop University and Downtown Rock Hill, via Oakland Ave, Main St, Black St, Wilson St, and W. White St.
- Frequency—30 minutes

Route 2: Saluda/Heckle Loop

- Loop serving areas along Saluda St, Heckle Blvd, W. Main St, Herlong Ave, Piedmont Medical Center, Constitution Blvd, and W. Main St.
- Frequency—60 minutes

Route 3: Cherry/Riverwalk Line

- Out and back route connecting Downtown Rock Hill, Winthrop University and Riverwalk, via Cherry Road.
- Frequency—60 minutes

Route 4: Dave Lyle/Galleria Line

- Out and back route connecting Downtown Rock Hill and Galleria Mall, via Dave Lyle Blvd.
- Frequency—60 minutes

Figure 8.1 – MyRide Route 1

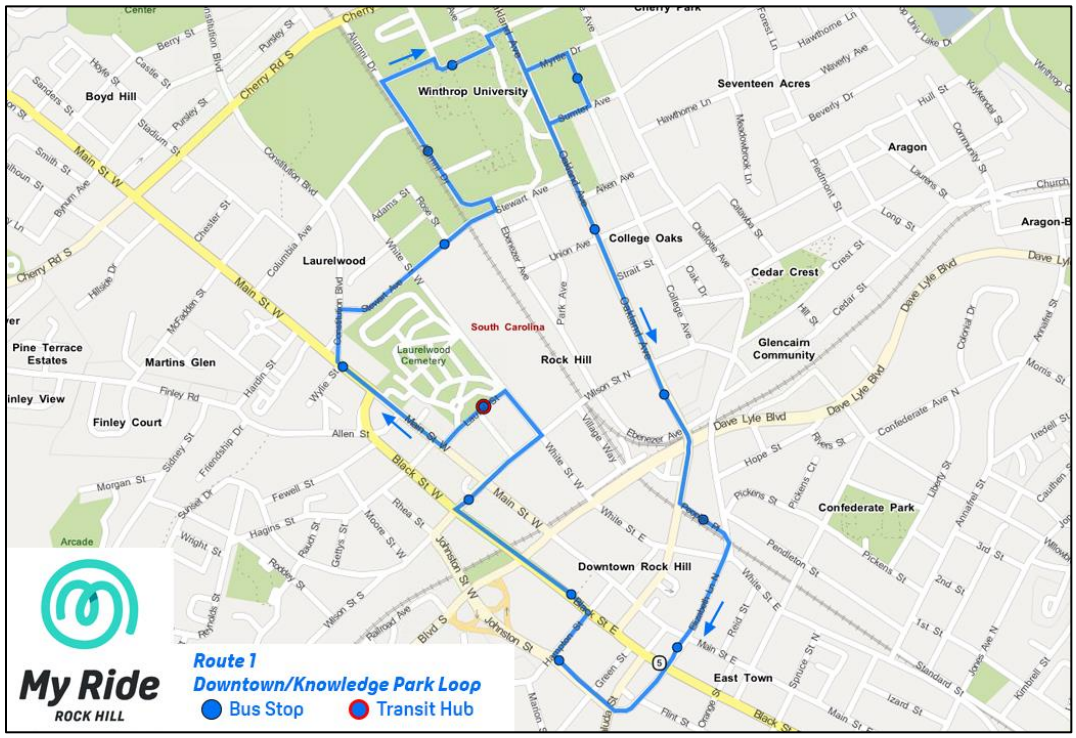


Figure 8.2 – MyRide Route 2

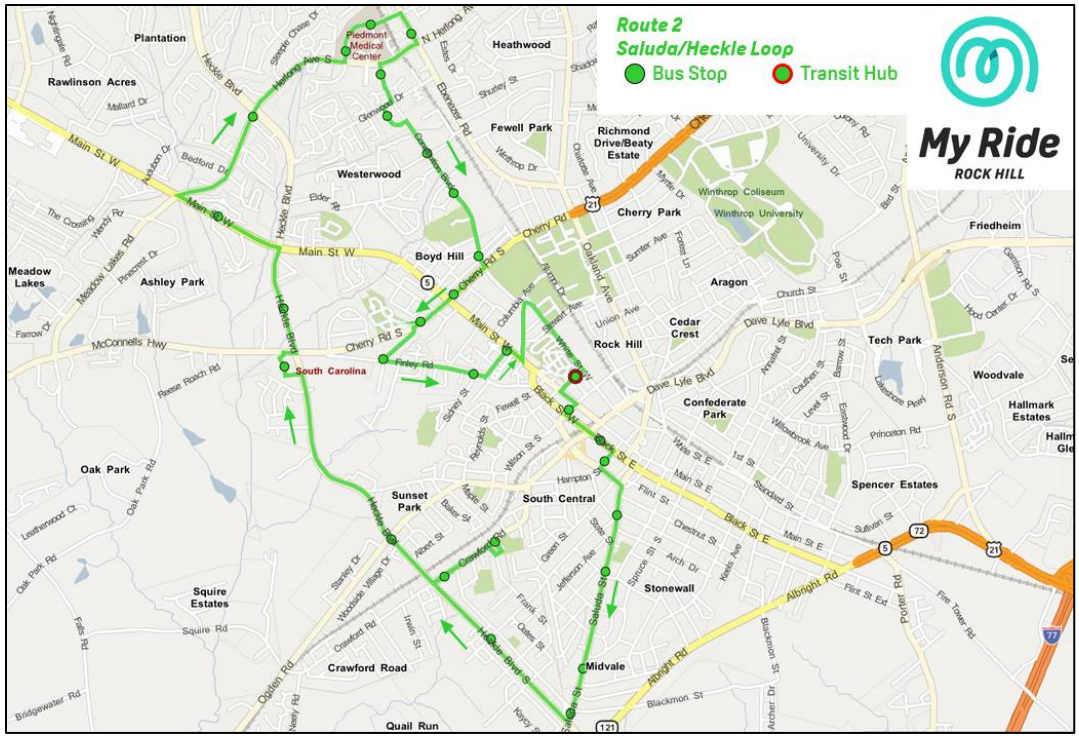


Figure 8.3 – MyRide Route 3

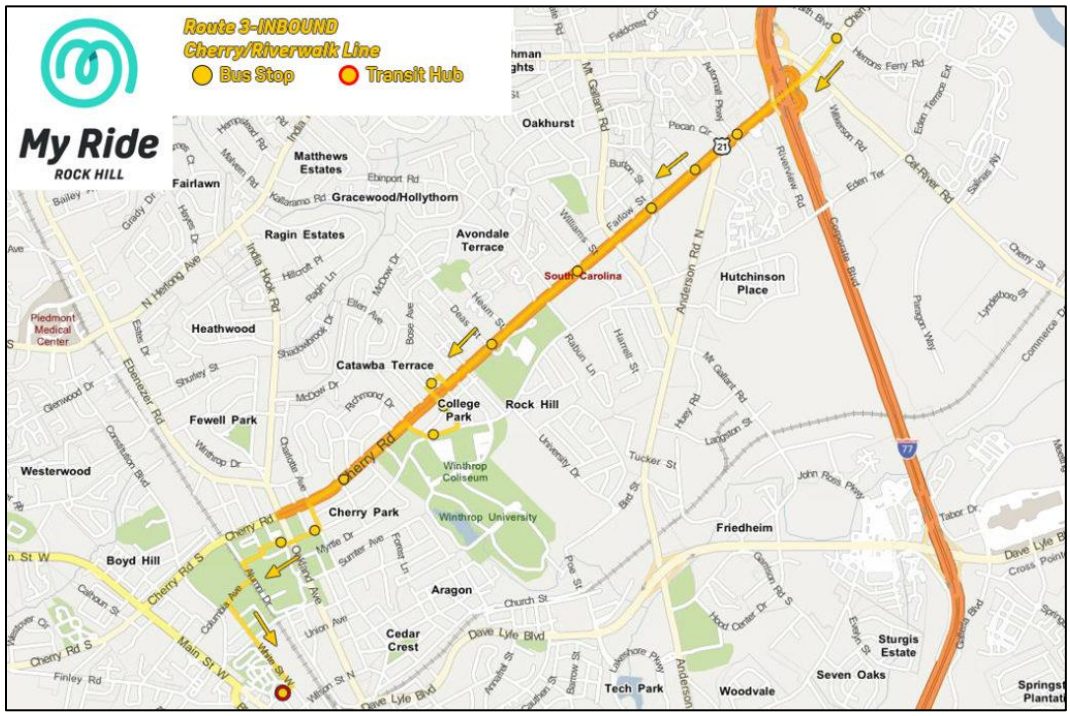
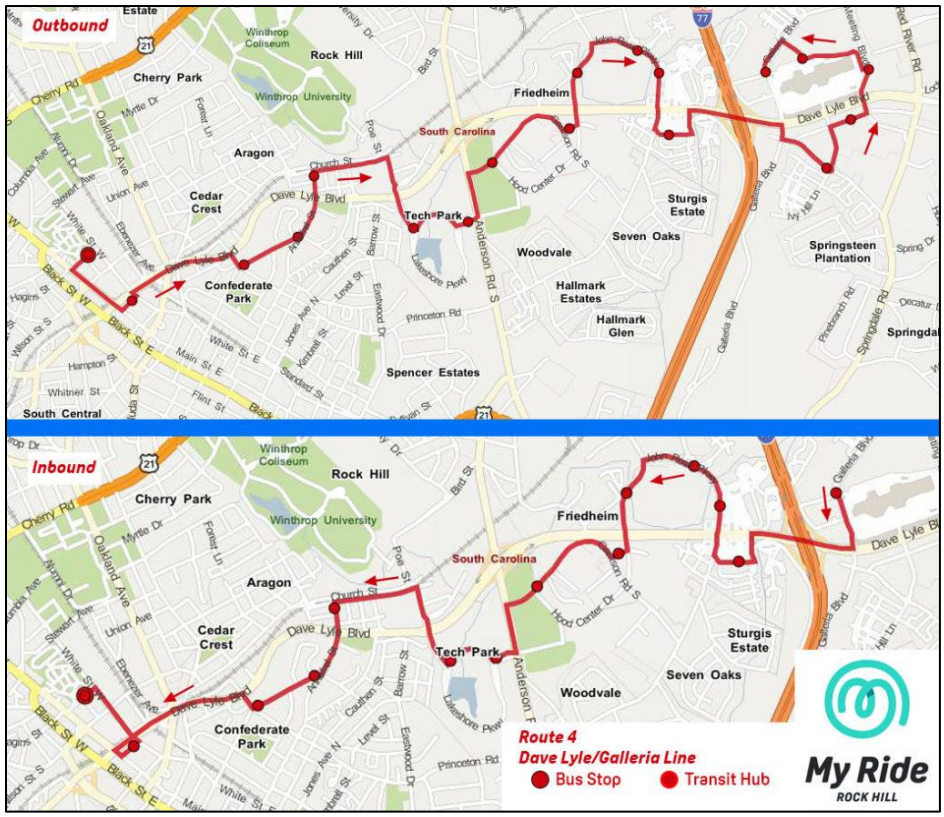
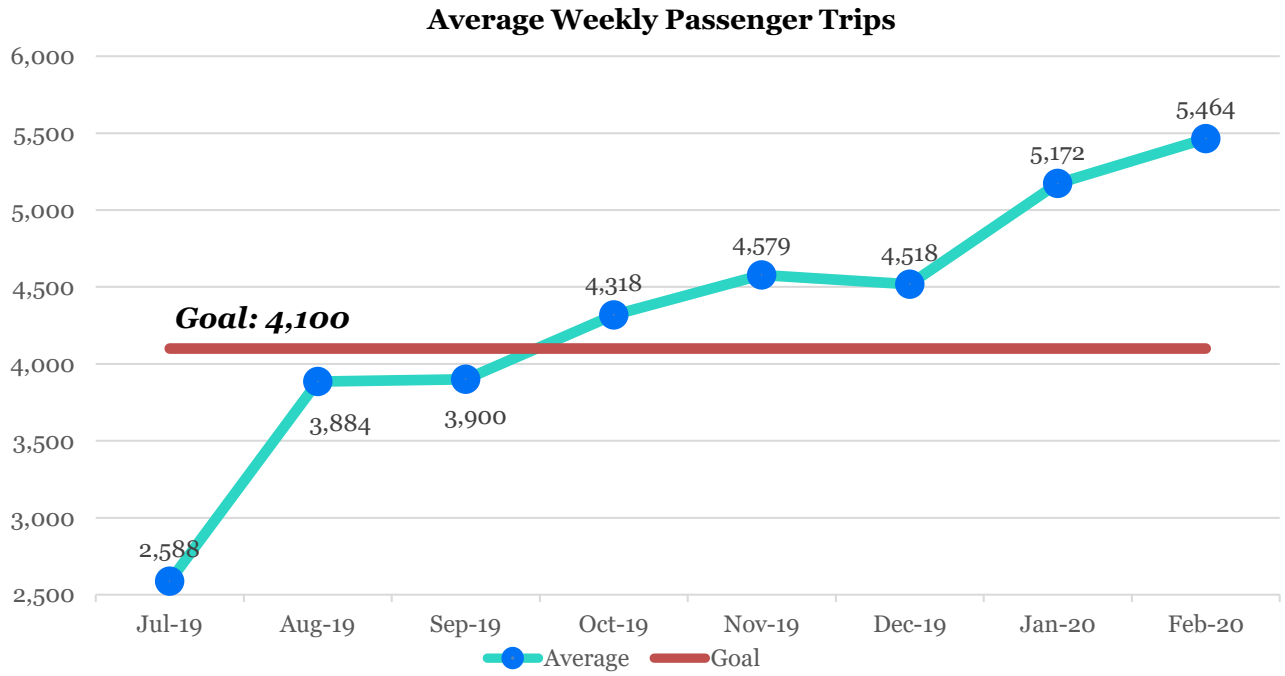
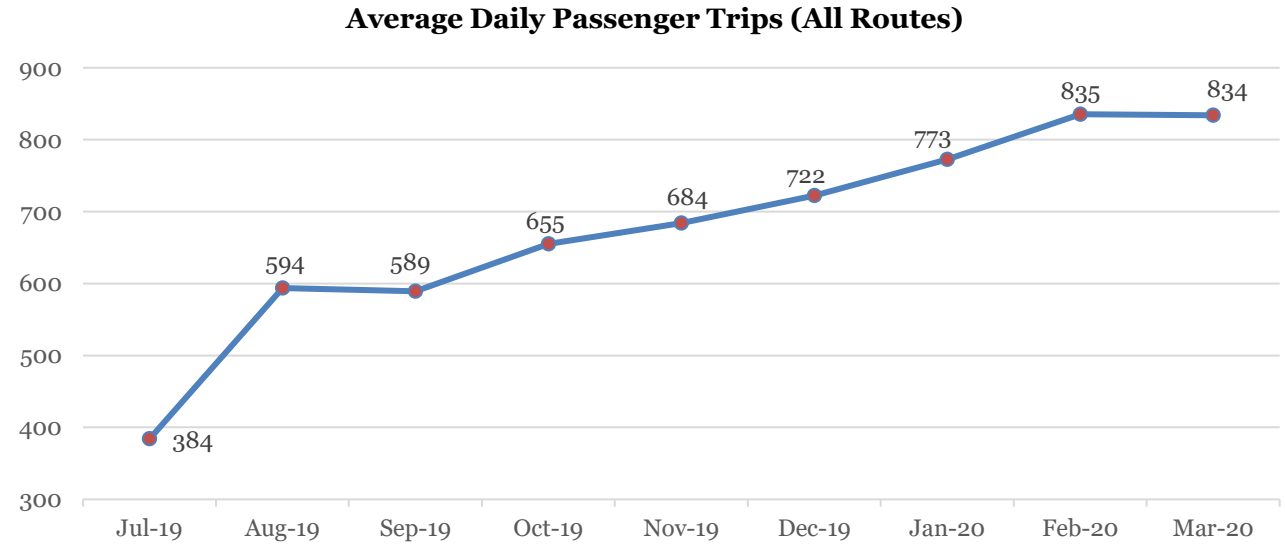


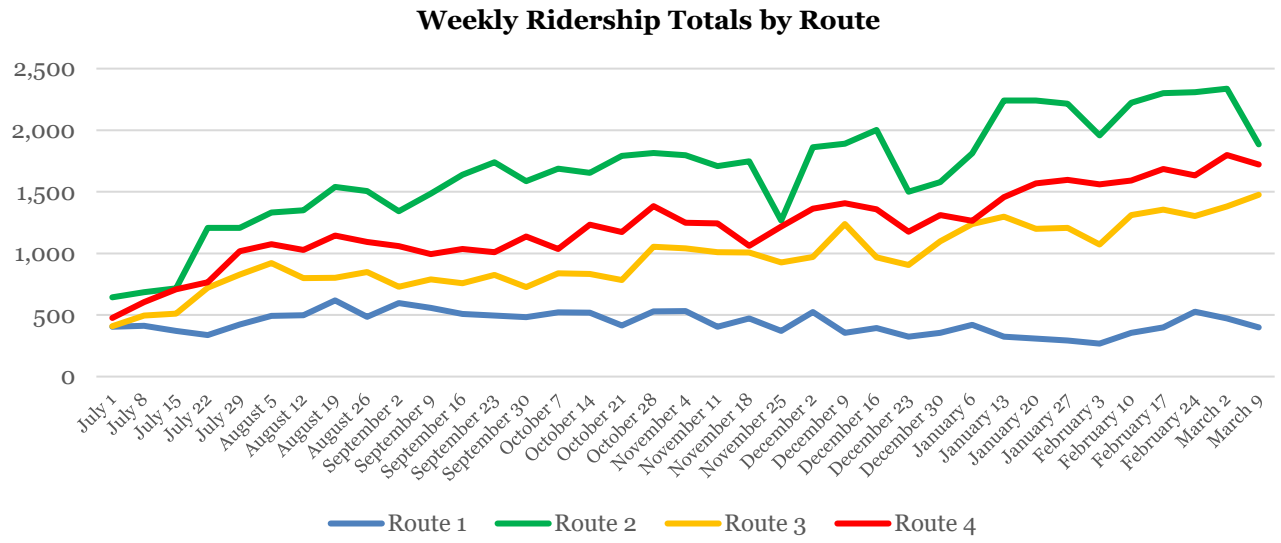
Figure 8.4 – MyRide Route 4



An operating goal averaging 4,100 passenger trips per month was set for this service. This goal was exceeded for the first time in October 2019 and again in each subsequent month in 2020. The graphs below reflect average weekly passenger trips per month, average daily passenger trips (all routes), and weekly ridership by route since the MyRide service began in July 2019.







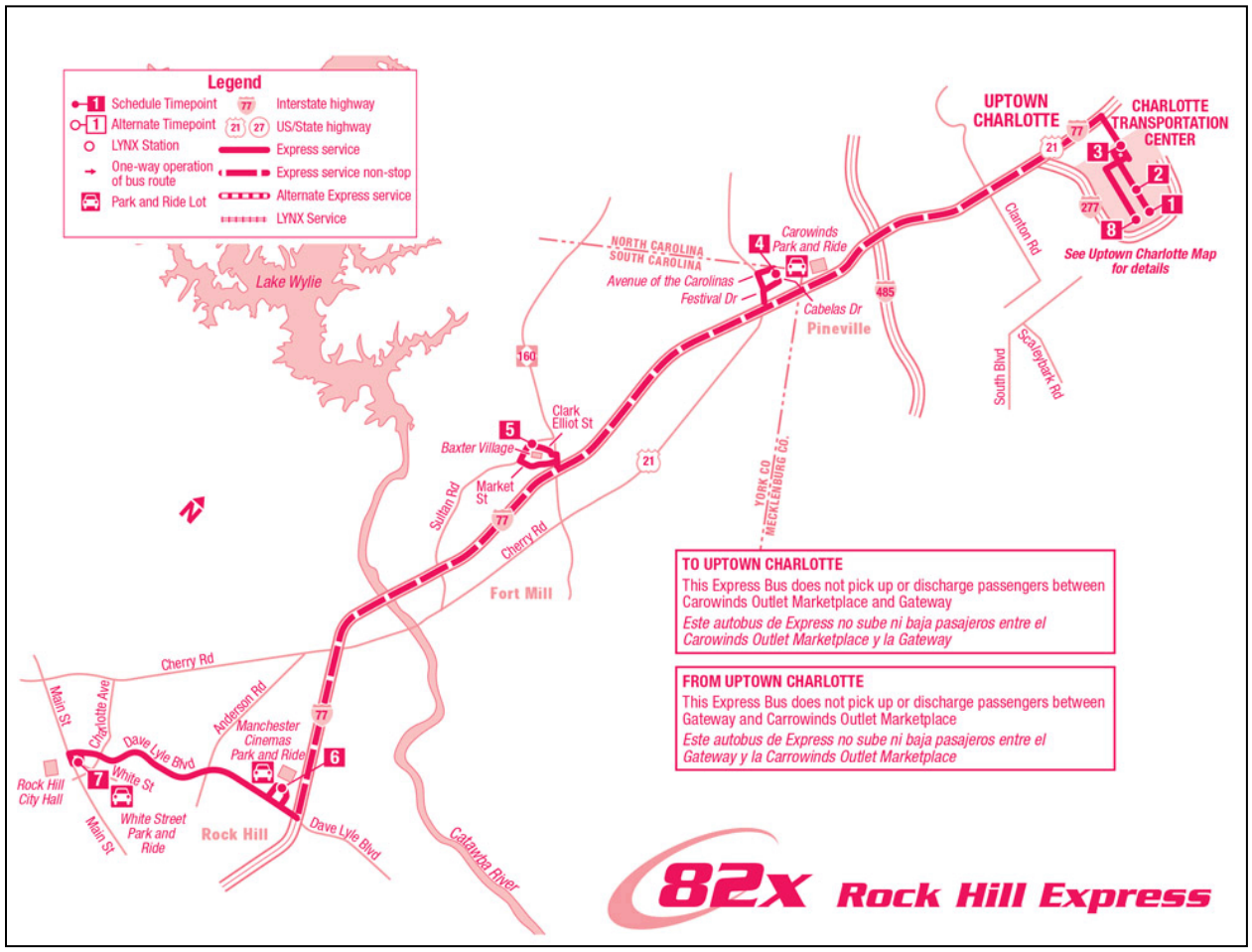
Rock Hill – Charlotte Express Bus Service

The CATS 82X Express Bus Route runs at peak hours on weekdays, connecting uptown Charlotte with several stops in the RFATS Study Area (**Figure 8.5**):

- Rock Hill Park and Ride lot in downtown Rock Hill,
- Manchester Cinemas (a park-and-ride lot adjacent to I-77),
- Baxter Village in Fort Mill, and
- Carowinds/Cabela's.

Established in 2001, this route provides service to area residents who commute to jobs in Charlotte and is funded through a cost-sharing arrangement between CATS and RFATS.

Figure 8.5 - CATS Express Bus Route 82X



To Uptown Charlotte

Weekdays / De Lunes a Viernes

White Street Park and Ride	Manchester Cinema	Baxter Village	Carowinds Park and Ride	Johnson & Wales Way	3rd & McDowell
7	6	5	4	3	8
5:40	5:50	6:04	6:15	6:32•	6:42•
6:10	6:20	6:34	6:48	7:11•	7:21•
6:30	6:42	6:57	7:11	7:41•	7:51•
7:00	7:12	7:27	7:44	8:14•	8:24•

pm times are shown in bold type

NOTES: • Actual times may vary due to changing traffic conditions

From Uptown Charlotte

Weekdays / De Lunes a Viernes

4th & McDowell	Charlotte Transportation Center	Johnson & Wales Way	Carowinds Park and Ride	Baxter Village	Manchester Cinema	White Street Park and Ride
1	2	3	4	5	6	7
4:10	4:15	4:23	4:52•	5:06•	5:19•	5:27•
4:40	4:45	4:53	5:31•	5:45•	5:58•	6:06•
5:10	5:15	5:23	6:01•	6:15•	6:28•	6:36•
5:45	5:49	5:55	6:20•	6:32•	6:44•	6:52•

pm times are shown in bold type

NOTES: • Actual times may vary due to changing traffic conditions

Source: CATS online schedules, as of May 2020

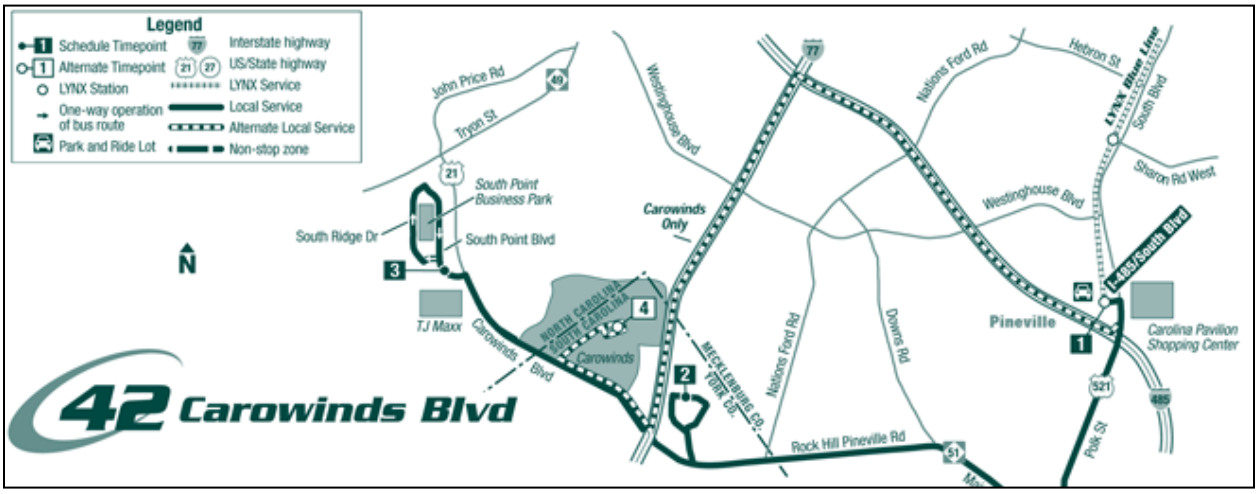
Recent MPO transit planning efforts have identified opportunities to expand the use of Route 82X to serve "reverse commuters." Currently, the AM bus arrives to the RFATS area empty with the sole mission of bringing workers into Charlotte. The reverse commute scenario would have the AM bus leave Charlotte with workers whose destination is within the RFATS region; such as the Kingsley Park area of Fort Mill or downtown Rock Hill. The AM bus would then operate its current route and provide service to RFATS residents who's work destination in uptown Charlotte.

The strategy could also be used in the late afternoon, bringing RFATS residents' home from uptown Charlotte and on the trip back to Charlotte picking up those workers who are heading back to Charlotte. This arrangement could yield increased revenue for the 82X and eliminate additional single-occupant highway trips.

Lynx Blue Line Feeder Bus Route

The northern end of the RFATS region has a bus service connection to the Charlotte LYNX Blue Line light rail system. (**Figure 8.6**). CATS Route 42 operates during weekday peak periods only from the I-485 light rail station to the Wells Fargo Home Mortgage office and South Point Business Park. It also provides service from the I-485 light rail station to the Carowinds amusement park. Service to Carowinds fluctuates based on park operating hours and is suspended when the park is closed during the off-season.

Figure 8.6: CATS Bus Route 42



42-Carowinds - *WEEKDAYS*		
Inbound		
3 Southpoint Business Park	2 Wells Fargo	1 LYNX I-485 Station
3:45 PM	3:59 PM	4:13 PM
4:15 PM	4:31 PM	4:49 PM
5:15 PM	5:31 PM	5:49 PM

42-Carowinds - *WEEKDAYS*		
Outbound		
1 LYNX I-485 Station	2 Wells Fargo	3 Southpoint Business Park
6:30 AM	6:42 AM	6:52 AM
6:45 AM	6:57 AM	7:07 AM
7:18 AM	7:30 AM	7:40 AM

Source: CATS online schedules, as of May 2020

Throughout the LYNX System Update, there was significant interest in adding rapid transit service between Charlotte and the Town of Pineville and community of Ballantyne. In early 2019, the LYNX System Update study was continued in order to evaluate rapid transit options, including a light rail extension, to these areas. These communities are close to the border with South Carolina, and additional service by LYNX would provide more transit connection options for Fort Mill and surrounding areas.

CATS Vanpool Program

CATS sponsors a vanpool program that makes 15-passenger vans and 7-passenger minivans available to commuters who wish to share rides to a common destination that is usually not served by regular CATS service. Riders are charged a monthly fee and CATS supplies the van, fuel, insurance and other administrative expenses.

Vanpool service consists of nine to 15 passengers with one rider agreeing to be the driver and at least one other rider agreeing to be the backup driver. The minivan service consists of four to seven passengers with one rider agreeing to be the driver and at least one other rider agreeing to be the backup driver, but they can be started with three to four passengers. The RFATS area currently has several active vanpools providing service to employment destinations such Duke Energy.

The 2015 *RFATS Urbanized Area Transit Implementation Study* outlines potential steps for a "piggy-back" vanpool program which would provide another option to commuters whose origin and destination are both within the RFATS region. In cases where vanpools originate in northern York and Lancaster counties, vanpool costs not covered by the riders themselves could come from the portion of Charlotte Section 5307 urbanized area funds that are distributed to South Carolina.

York County Access

York County Access is a demand-response service providing public transportation for residents of rural York County and the Rock Hill Urbanized

Area. York County Access is operated by the York County Council on Aging and represents a cooperative effort between York County and the City of Rock Hill. York County Access provides two types of services:

- **Essential Service:** The Essential Service provides transportation countywide for people who need a ride to the doctor, pharmacy, grocery store, or transportation to facilities for medical treatment such as dialysis, chemotherapy, etc. The service is available on weekdays between 6:00 AM and 6:00 PM, and rides must be scheduled 48 hours in advance.
- **Ride-to-Work Service:** Within the City of Rock Hill, a Ride-to-Work service is available and provides transportation to Rock Hill residents who need a transportation to work within the city. Operating hours are Monday-Friday, 5:30am to 9:00am and 3:30pm to 6:00pm, and rides must be scheduled at least 24 hours in advance.

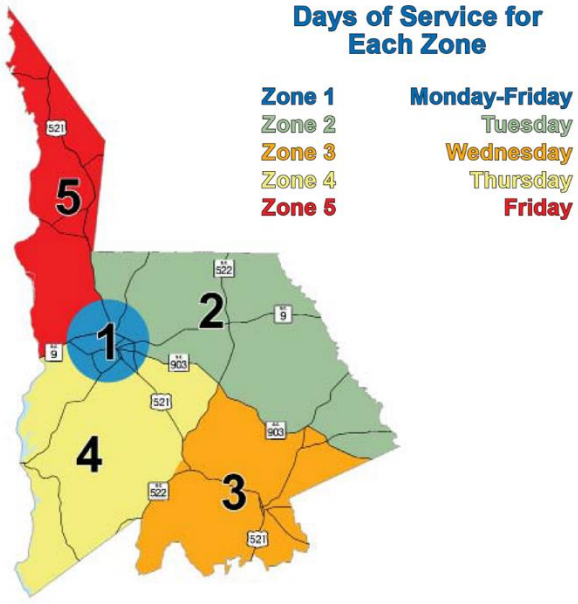
****Fares for both services are $2.50 each way****

While urbanized area designations have previously limited the ability to establish demand response service north of the Catawba River in Fort Mill and Tega Cay, planning steps are active to initiate this type of service consistent with applicable planning and funding requirements. It is expected that this work effort will result in the provision of demand response in the near future.

Lancaster Area Ride Service (LARS)

Similar to York County Access, the Lancaster Area Ride Service, or LARS, operates Monday through Friday from 9:00am to 3:00pm on a rotational basis in five different geographic areas of the county. The service is operated by the Lancaster County Council on Aging with funding from SCDOT and Lancaster County. Fares are charged each way at the following rates:

- Trips within Lancaster County: $2
- To and from Rock Hill: $5
- To and from Columbia or Charlotte: $10



This service provides a "dial-a-ride" option for residents who do not qualify for Medicaid, but do not have transportation alternatives needed for getting to medical appointments. As in the northern section of Lancaster County, prior planning and funding requirements limited the ability to provide federal funding support. With applicable changes in

these provisions having been made, federal funding support can be pursued consistent with changes in area demand levels.

AmbuStar Ambulance and Wheelchair Services

AmbuStar provides wheelchair transport to hospitals, nursing homes, dialysis clinics, doctor's offices and private practices in seven counties in South Carolina, including both Lancaster and York counties. Service is available 24 hours a day, 7 days a week (including holidays). AmbuStar is listed as an Advanced Provider by the SC Department of Health and Environmental Control and accepts Medicare, Medicaid, private insurance, and credit cards.

Inter-City Bus

Within the U.S., inter-city bus service has historically been provided mostly by Greyhound, its subsidiaries and its business partners. Together these services provide a nationwide city-to-city network, including stops at smaller locations that are not served by either air or rail. They are widely recognized as an affordable option for long-distance travel.

In the past few years, Greyhound has restructured many of its service patterns to concentrate on main flows and make fewer stops. Some smaller communities – including Rock Hill – have lost their inter-city transit connections as a result. The closest available service is now in the neighboring communities of Charlotte, Monroe, and Gastonia, NC and Spartanburg, SC.

Other companies such as Megabus have recently entered the Charlotte market, stimulating price competition. The connections currently offered by Megabus from Charlotte are to New York City, Philadelphia, Atlanta, Athens, Durham, Richmond, and Washington, D.C.

Inter-City / Commuter Rail

Inter-city passenger rail service is provided by Amtrak, an arm of the Federal government. Outside the northeastern U.S., the services fall into two kinds: long-distance services, often running once a day, and shorter-distance 'corridor' services, often with several trips per day and usually supported financially by states. Amtrak mostly operates over track owned by freight

railroads ('host' railroads). Although Amtrak's operations and expansion have been hampered by budget restrictions, there is increasing political recognition of inter-city rail's potential contribution to energy independence, offering an alternative to highway congestion, and providing resilience in the event of disruption to civil aviation.

The State makes no contribution to the capital or operating cost of the Amtrak service.

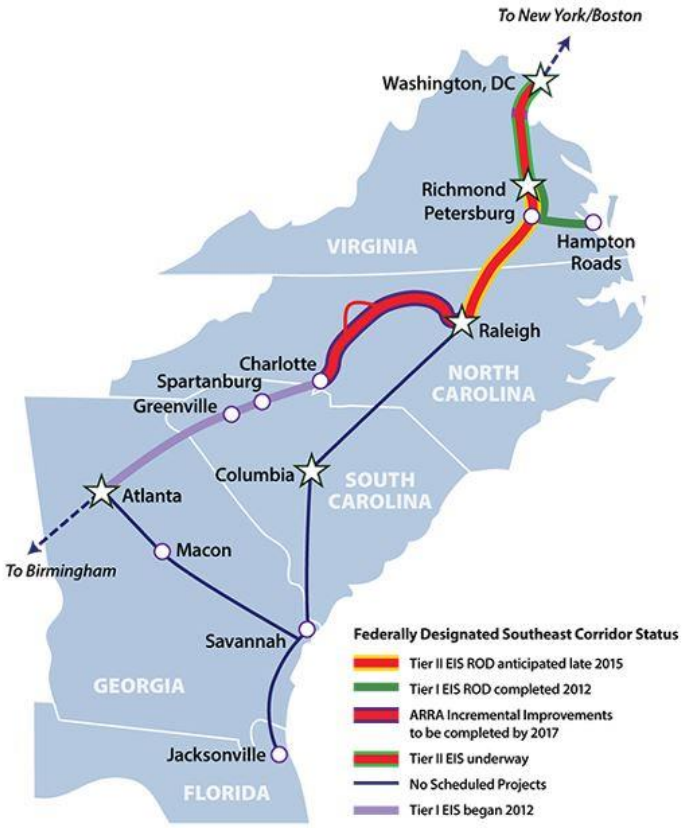
There are currently no passenger rail services within the RFATS region. The nearest Amtrak stations are Charlotte NC, Gastonia NC, Camden SC and Spartanburg SC. (In Charlotte, the new Gateway Station is due to be relocated to a new downtown intermodal center by 2024.) These stations are currently served by the following trains:

- *The Crescent* (serving Spartanburg, Gastonia, and Charlotte) – a long-distance service between New York and New Orleans. One train each way, daily. Other key destinations along this route include Atlanta, Baltimore, and Philadelphia. The schedule for this service is determined by the main points on the route, which leads the timings at the three stations near the RFATS area can be inconvenient; currently the train calls at these stations during the late night/early morning in both directions.
- *The Silver Star* (serving Camden) – a long-distance service between New York and Miami. One train each way, daily. Other key destinations on this route include Washington, DC, Savannah, and Orlando. The schedule for this service is determined by the main points on the route, and so the timings at the Camden Station can be inconvenient; currently the train calls at this station during the late night/early morning in both directions. (Additional services between New York and Florida operate through the eastern part of the state via Florence and Charleston.)
- *The Carolinian* (serving Charlotte) – a long-distance service between Charlotte and New York. One train each way, daily. This is potentially the most useful service for rail passengers living within the RFATS area, as it offers daytime service between Charlotte and the mid-Atlantic states. This train is supported financially by the North Carolina Department of Transportation (NCDOT).
- *The Piedmont (*serving Charlotte) – a short-distance ('corridor') service between Charlotte and Raleigh. This service is supported financially by NCDOT. There are currently three trains each way, daily. NCDOT plans to add a fourth frequency in 2023.

A step-change in inter-city rail service could come from the development of a national **high-speed passenger rail** (HSR) network. This network is similar in scope to the interstate highway system and similar in concept to the high-speed rail networks already in place in other advanced nations and being planned in California. One of the HSR corridors designated by the US Department of Transportation (USDOT) – the Southeast High-Speed Rail Corridor – would serve Charlotte, potentially providing access to RFATS area residents.

The Southeast HSR Corridor broadly shadows the Norfolk Southern (NS) main line and I-85. It was originally designated in a 2002 Tier I study as running from Washington, DC through Richmond, VA and Raleigh, NC to Charlotte, NC with maximum speeds of 110 mph. It is part of an overall plan to extend service from the existing high-speed rail on the Northeast Corridor (Boston, MA to Washington, DC) to points in the Southeast.

Extensions outlined in 1998 included a link from Charlotte through Spartanburg and Greenville, SC to Atlanta, GA and on through Macon, GA to Jacksonville, FL. While this extended corridor passes close to the RFATS region, there are no firm timelines for implementation on any segment for this region to plan around.



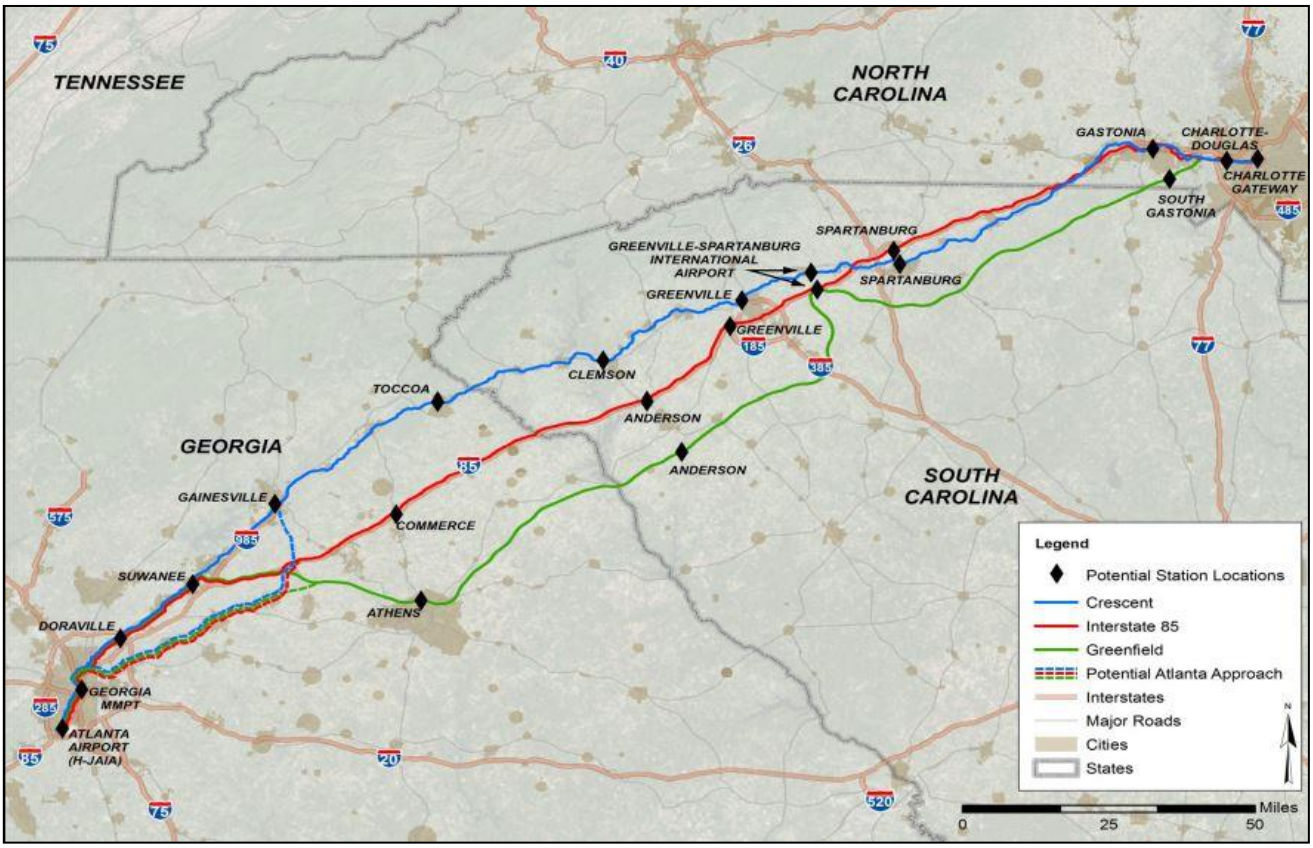
Environmental studies for the Raleigh-Charlotte segment are complete, and incremental improvements along this rail corridor have been completed as part of the Piedmont Improvement Program, which was largely funded through the American Recovery and Reinvestment Act. The initial technical work suggested that high-speed service could be extended from the new Charlotte Gateway station to a new station (and servicing facility) at Charlotte-Douglas International Airport.

The proposed extension through South Carolina to Atlanta was analyzed through a Tier I Environmental Impact Statement (EIS), which assessed potential route alternatives and station locations and was completed in September 2019. Three potential alternatives were studied **(Figure 8.7)**:

- Alternative 1: The Norfolk Southern (NS) railroad corridor (also referred to as the Southern Crescent route);

- Alternative 2: The I-85 corridor; and
- Alternative 3: A "greenfield" corridor which offers the opportunity to define a fully grade-separated route alignment with optimal geometric characteristics for high-speed passenger rail service.

Figure 8.7: Potential High-Speed Rail Routes from Charlotte to Atlanta



Source: GDOT Project Facts Vol. 2, Atlanta to Charlotte Passenger Rail Corridor Investment Plan, Fall 2015.

Although the two HSR alternatives that would link Rock Hill and Columbia were not carried forward into the current study, the SCDOT *State Rail Plan* notes there is interest in connecting Columbia to the expanding passenger rail network being developed in the Charlotte region. The future Tier II study will further define the exact alignments and routes for the termini of the selected preferred alternative.

Additionally, the *Southeast Regional Rail Planning Study* is a fully funded, USDOT-led effort by the FRA that may lead to recommendations for the rail network within the RFATS region. The study, which began in fall 2016 and is

expected to be complete by the end of 2020, is a multi-state planning study designed to explore the potential for a high-performance, multi-state intercity passenger rail network in the Southeast region. The study builds on current rail planning efforts within the six states of Florida, Georgia, North Carolina, South Carolina, Tennessee and Virginia and the District of Columbia, and explores the potential for a fully integrated rail network linking rail passengers and freight with intermodal transit and ports across the region.

In Phase II of the plan, which commenced in Fall 2019, has the potential to recommend changes to the proposed network based on a new model, the Conceptual Network Connections Tool (CONNECT). The study team will then work with project stakeholders to formalize a revised draft passenger rail network for the southeast.

Commuter rail services, which are intended to serve shorter distances within a major metropolitan area, have become increasingly common in recent years. There is now considerable experience in implementing these services on existing railroad corridors, in some cases shared with existing freight services. Typically, these new services are operated by local or state agencies as a part of the regional transit system, rather than by Amtrak.

SCDOT's Statewide Transit Plan (2014) does identify the Rock Hill to Charlotte corridor as having potential for commuter rail. Local support has grown for addition of a commuter light rail line from Rock Hill through Fort Mill ending at the new Gateway Station. This would allow passengers to connect to the Blue Line light rail or the future Silver Line that will extend from Matthews to Belmont in Gaston County, NC. This prospect has gained additional support following the pending move of team headquarters and practice facilities for the Carolina Panthers to Rock Hill.

CATS' Policy Board, the Metropolitan Policy Commission, has embarked on an 18-month study of transit options for the 12-county Charlotte region, which includes the urban areas of York and Lancaster counties.

An interim option could be to create a bus rapid transit (BRT) link between Rock Hill and Charlotte, as previously studied by the MPO and described further below. The BRT service could ultimately be replaced or supplemented by commuter rail service as ridership grows.

Rock Hill-York County-Charlotte Bus Rapid Transit (BRT) Service

In 2007 the MPO completed a study of various alternatives to provide high-capacity transit service to and from Charlotte. The *Rock Hill-York County-Charlotte Rapid Transit Study* proposed a Bus Rapid Transit (BRT) line running from downtown Rock Hill via US-21 to the I-485 CATS LYNX Blue

Line light rail station **(Figure 8.8)**. The BRT line would operate partly on a dedicated bus-way and partly in general traffic.

Starting in downtown Rock Hill, buses would operate in mixed traffic along White Street to Winthrop University. White Street would be extended to Cherry Road, with a station at the intersection of the two streets. From there, buses would operate in a dedicated guide-way along Cherry Road within the existing right-of-way. In locations on Cherry Road where roadway expansion is constrained, buses will operate in the general-purpose lanes, using queue-jump lanes and traffic signal pre-emption to increase bus travel speeds.

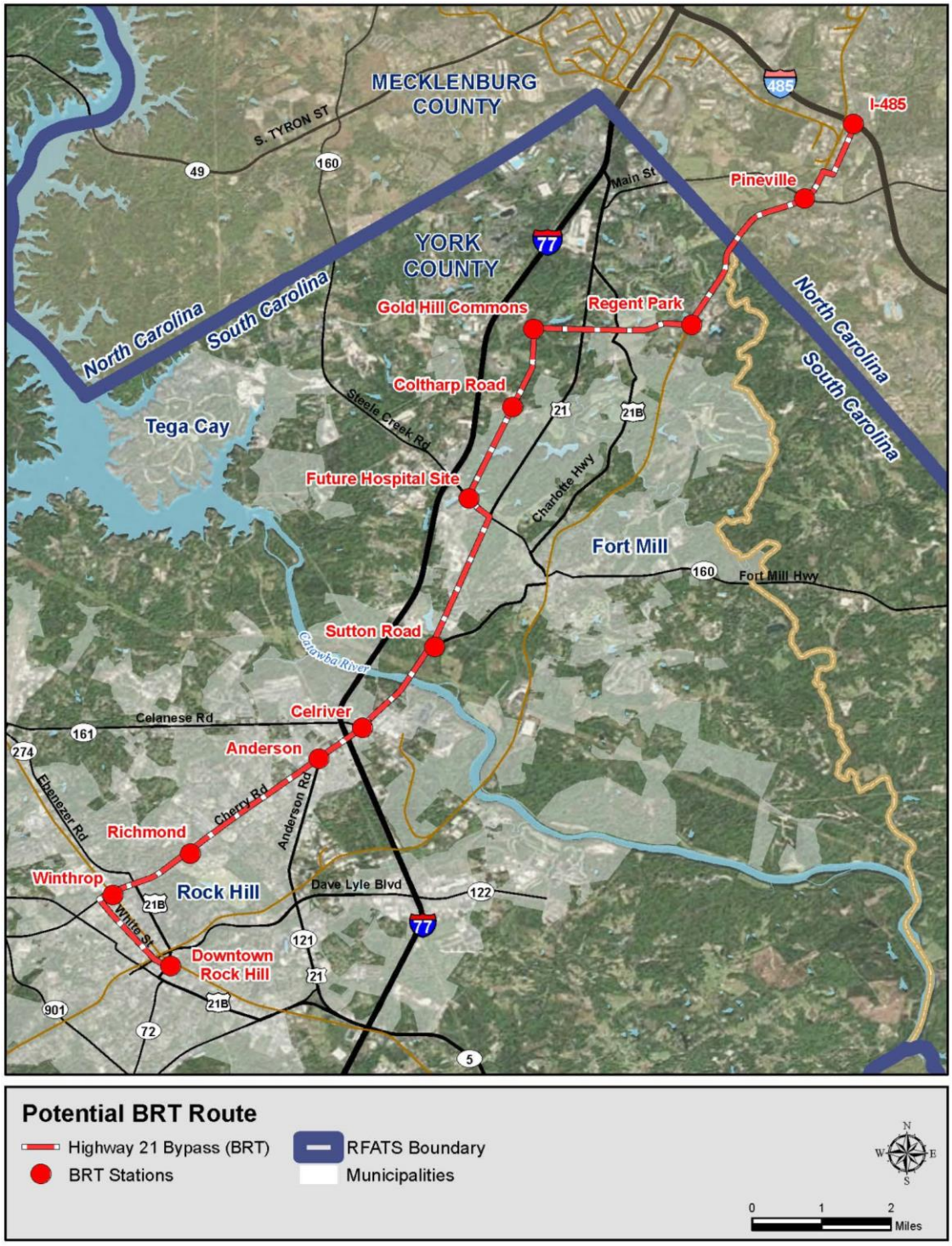
North of the Cherry Road / Anderson Road station, buses would operate in a dedicated guide-way along US-21 to SC-160 in Fort Mill. The service would then travel west a short distance on SC-160 to a new roadway, parallel to US-21 and I-77, extending from SC-160 to Gold Hill Road improving transit access in the Kingsley Park and former Knights Stadium areas.

The service would continue in mixed traffic along York Southern Road from Gold Hill Road toward the Norfolk Southern railroad corridor near Regent Parkway. Here, a dedicated two-lane guide-way would be built parallel to the railroad, extending north to Commerce Drive in Pineville. The service would then operate in mixed traffic along Commerce Drive and South Boulevard to the I-485 station on the CATS LYNX Blue Line.

The BRT scheme also includes a four-mile spur from the Cherry/Anderson station, along Anderson Road and Dave Lyle Boulevard to the Galleria Mall just east of I-77. The spur would have a dedicated two-lane guide-way.

The line would have service every 15 minutes at peak times and every 30 minutes at off-peak times. The hours of operation would match those of the Lynx Blue Line service.

Figure 8.8: Proposed Rock Hill-York County-Charlotte Bus Rapid Transit Service



Source: Rock Hill-York County-Charlotte Rapid Transit Study Locally Preferred Alternative Refined Screening Analysis Report, April 2007.

The study estimated the capital cost of the project between $511 and 516 million. It recommends four phases of implementation:

- Phase 1: start-up phase with all-day limited-stop service connecting the RFATS Study Area with the I-485 light rail station.
- Phase 2: Addition of local bus service to Tega Cay and Fort Mill and new connections to Gold Hill Commons.
- Phase 3: Implement first stage of exclusive BRT right-of-way segments.
- Phase 4: Implementation of the remaining exclusive BRT right-of-way segments.

The study also recommends focusing on appropriate transit supportive land use and development regulations, connecting major corridor destinations, and preserving rights-of-way for the transit alignment where appropriate through new development areas. These land use recommendations mirror Charlotte's initiatives to make land use and zoning policy changes early in the transit development process in order to make transit projects more viable and competitive for federal funds.

Transit planning efforts by RFATS' partners have echoed the long-term goal of operating BRT along this corridor. Multiple elements of the 2014 SCDOT *Statewide Multimodal Plan* address the issue:

- The *State Transit Plan* identifies BRT as a premium transit need for the Rock Hill/York County to Charlotte, NC corridor. In a statewide survey, BRT was one of the top three responses when respondents were asked what would encourage them to use public transit.
- The *Catawba Regional Public Transit and Human Health Service Coordination Plan*, incorporated as part of the SCDOT Statewide Multimodal Plan, proposes the integration of intercity bus service to connect patrons from the Rock Hill area to high speed rail along the I-85 corridor in Charlotte.

Due to continued changes in overall travel demand as well as land use characteristics, the Policy Committee requested that the key planning assumptions of the prior study be updated in cooperation with the Federal Transit Administration as well as other key planning partners. This work effort is being coordinated with the development of a Regional Transit Plan for the Greater Charlotte Area led by CATS and the Centralina Council of Governments. This is discussed in more detail below.

Development of Regional Transit Plan (CATS & CCOG)

In 2020, the Centralina Council of Governments (COG) began a regional transit study for the greater Charlotte area. The Regional Transit Plan (RTP) is intended to evaluate and develop a single, coordinated transit vision for the Metrolina Region. The study will identify rapid transit corridors and modes as extensions to the CATS 2030 plan and in coordination with other regional and local transportation plans. The study will develop action-oriented strategies to support improved mobility and access, effective and coordinated transit investments, and coordinated transit operations to meet the needs of a growing and changing population. The study will also identify key topics and methods for regional coordination as well as implementation strategies. The study should be completed by end of 2021.

2015 Urbanized Area Transit Implementation Plan (RFATS)

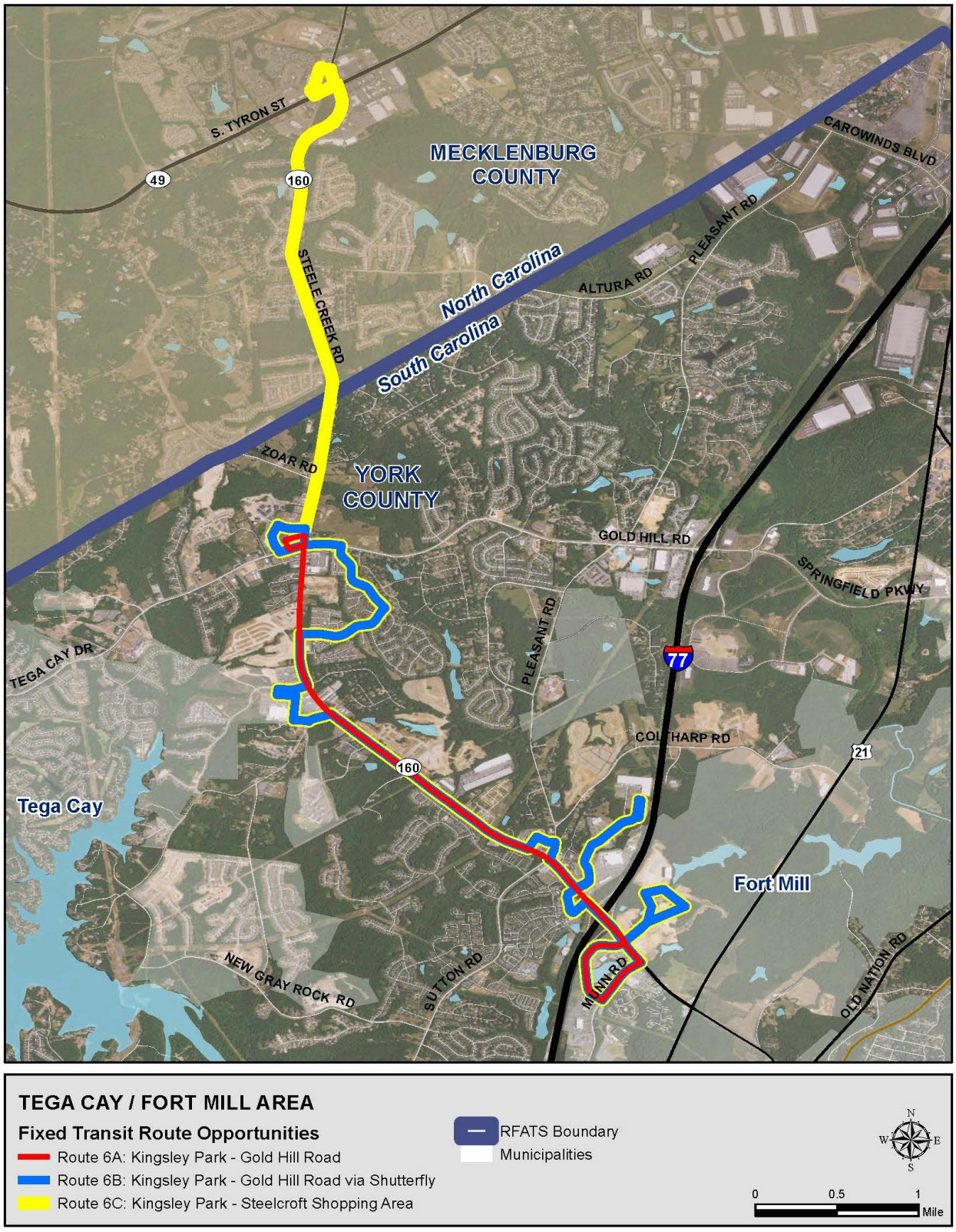
As noted earlier, RFATS completed the Urbanized Area Transit Implementation Plan in 2015 – one key recommendation that has not been covered yet, is the establishment of a circulator service along the SC 160 Corridor. Potential future routes include following (**Figure 8.9**):

Route 6A: Efficiency-Focused Approach (more direct)

Route 6B: Coverage-Focused Approach (less direct to provide easier access by pedestrians)

Route 6C: Regional Connectivity-Focused Approach (less direct, extends into southern Charlotte)

Figure 8.9: Potential Fixed Route Options, Fort Mill & Tega Cay Area



Resiliency of Public Transit Systems

Public transit systems are vulnerable to decreases or stoppages in ridership caused by natural disasters, public health crises, and other unpredictable large-scale events. While this leads to a significant loss of fare revenues for agencies in the short term, a long-term distrust of shared spaces among the public can also arise. Such crises place additional demands on transit staff, who may be required to comply with enhanced safety procedures while protecting their own personal health and continuing to link riders to medical appointments, jobs, and necessary errands. As witnessed in the 2020 outbreak of COVID-19, the rising costs incurred by these events can affect the ability of an agency to provide service as planned in the months or years that follow. They can also delay planned service expansion or improvements to transit facilities, further affecting ridership.

In the wake of COVID-19, transit agencies across the U.S. are reviewing and updating fiscal budgets and deciding how to utilize new CARES Act funds. Agencies must consider existing and potential federal, state, regional and local funding sources, both discretionary and formulaic; future stimulus bills and a possible FAST Act Reauthorization are on the horizon. There are also immediate actions that agencies can take to expedite recovery. Agencies operating within the RFATS area should prioritize financial tracking of all COVID-19-related incremental expenses to ensure eligibility for reimbursement. They should also take advantage of temporary program management changes and administrative relief steps taken by the FTA to ease regulatory burdens in the immediate term.

Lastly, crisis recovery can expedite the process of innovation in transit planning. Areas of innovation that could explored by agencies RFATS area include updating safety policies, revising design criteria/standards, and updating fare payment technology to replace aging systems and incorporate contactless features.

Stakeholder Input

This section to be completed following the public engagement period in April 2021.

Recommendations

- RFATS should continue to assist in interagency negotiations to ensure demand-response service is available in areas where current funding arrangements and boundaries have created gaps in service.

- The region should pursue the options suggested in the *Transit Implementation Study* to make ridesharing programs available to commuters whose trips begin and end within the RFATS region. Ridesharing could help meet some trip needs for residents in areas where fixed-route public transportation is not yet available.
- RFATS should consider sponsoring efforts to raise local leaders' awareness of the role that public transportation and ridesharing play in economic prosperity. People with reliable access to transportation are better able to obtain – and maintain – employment, and workforce availability is important to the region's continued growth. Transit also plays an important role in quality of life, especially for people who do not, or cannot drive.
- RFATS and local jurisdictions should continue to explore opportunities for funding various elements of the *Transit Implementation Study* and the proposed BRT corridor during and after the completion of the update. This should include considering whether, and to what extent, the flexible surface transportation funds (which have traditionally been seen as highway funds) could increasingly also be used for public transportation projects.
- RFATS and local jurisdictions should monitor the extent to which the region is implementing the conditions needed for successful public transportation: higher-density development, a safe sidewalk and bicycling network, and a more interconnected road system.
- RFATS should consider recommendations that will stem from the CCOG Regional Transit Study, specifically relating to high capacity corridors, regional transit collaboration, and connecting to other regional and local transit service.

Introduction

The benefits of cycling and walking have become an integral part of discussions about shaping the built environment. Taking trips by bike or on foot promotes good health, saves money, does not negatively impact the environment, and can even ease some roadway traffic. In addition, cycling and walking can be accessible travel modes for children, persons with disabilities, some elderly persons, users of transit, and those without automobile access.

Road improvement projects that use federal funds are currently required to incorporate reasonable pedestrian and bicycle accommodations into their design and construction. This helps to prepare for future needs; however, the RFATS region has previously experienced decades of auto-oriented development to which such requirements were not applied. It takes a focused effort to increase safe walking and cycling opportunities in areas that were not originally planned to include dedicated facilities.

Due to increased public awareness of the health and economic benefits of living in a walkable, bicycle-friendly community, public support for expenditures for these facilities has grown. In a survey conducted as part of the RFATS Bicycle / Pedestrian Connectivity Study during the summer of 2016, more than 90% of area respondents agreed that tax dollars spent on the transportation system should include pedestrian and bicycle investments. This shift in local mindset has been reflected in the various programs and events in the RFATS area that aim to bring cycling and walking to the forefront of comprehensive, multi-modal transportation planning.

Since the City of **Rock Hill** first adopted its Trails and Greenways Master Plan in 2003, its trail network has significantly grown. In 2017, Rock Hill published the Connect Rock Hill: Bicycle and Pedestrian Master Plan. The 2017 Plan notes that there are now 210 miles of sidewalks, 35 miles of bikeways, and 23 miles of paths in the Rock Hill. The City has also earned designation as a bronze-level Bicycle Friendly Community, one of only five in the state.

Fort Mill's historic core has a grid pattern of streets that is supportive of cycling and walking, and the challenge in this area is connecting newer developments to the historic core and to

community facilities. Currently, Fort Mill has approximately 5 miles of sidewalk and approximately 15 miles of bike routes. The Ann Close Springs Greenway is an award-winning private greenway system which is open to the public and serves as a green belt around the town. The Greenway operates a trail system that is 36 miles long.

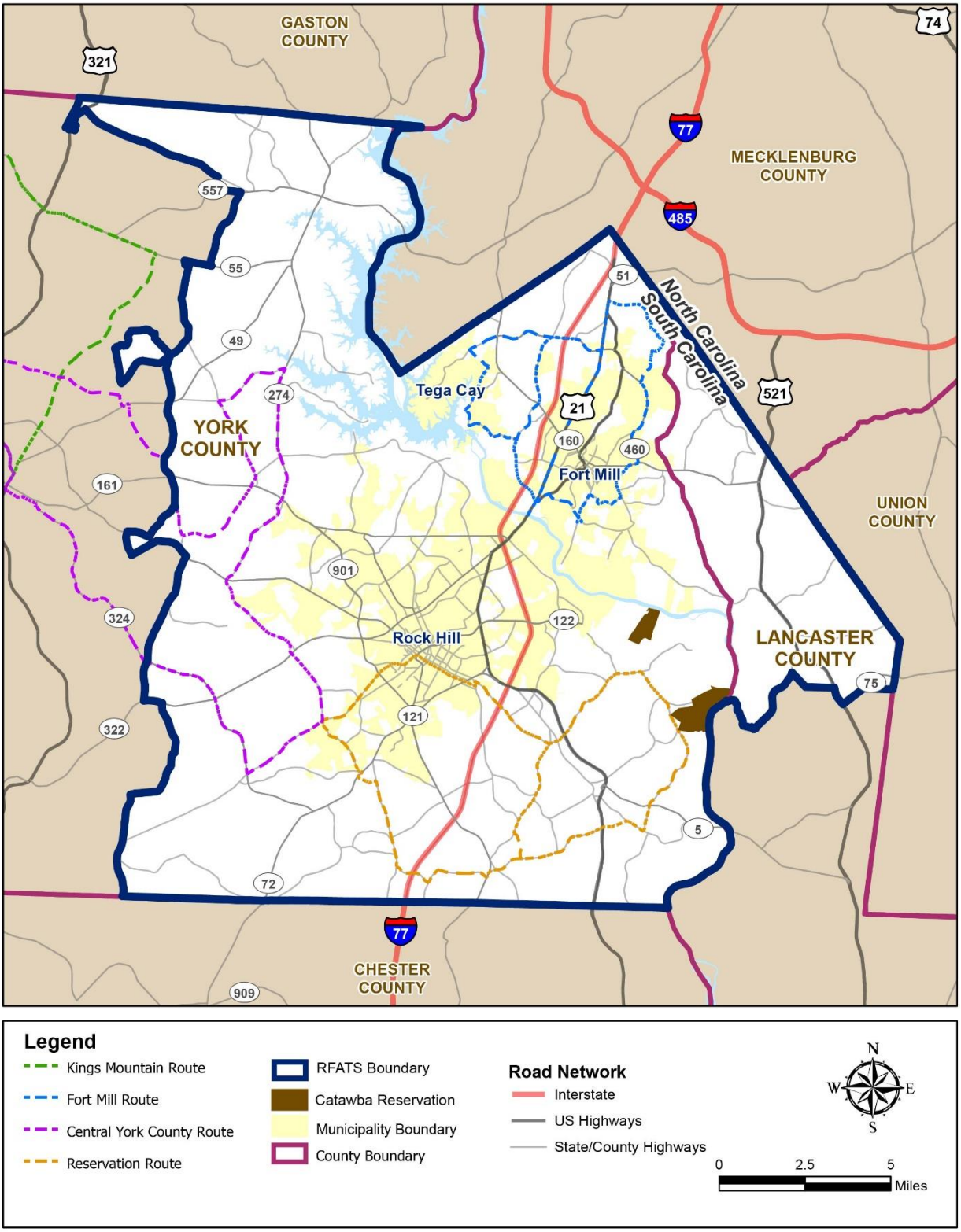
Much of the development in **Tega Cay** took place in the 1970s and 1980s, a time when sidewalks were not always constructed in residential subdivisions. However, all new subdivisions are now required to have bicycle and pedestrian facilities to suit the active lifestyle sought by many of the residents attracted to the lakeside community. The City of Tega Cay currently has approximately 35 miles of sidewalk, 7 miles of trails, and 5 miles of bike routes.

The RFATS Study Area expanded in 2013 to include the northern panhandle of **Lancaster County**. This eastern expansion extends the MPO boundary to areas east of Sugar Creek and the Catawba River, including the rapidly developing area of Indian Land along the US 521 Corridor. Recent plans suggest enhancing non-motorized access to the Catawba River as well as major parks, schools, and commercial nodes. Pedestrian and cyclist facilities should be incorporated into the design of facilities that cross local streams and rivers, including Hwy 5 (one of the only crossings of the Catawba River) and SC 160 (especially at the crossing of Sugar Creek). Lancaster County is also requiring sidewalks to be constructed along their heavier congested corridors within the RFATS boundary, such as US 521 and SC 160.

Multimodal design features that promote east-west connectivity will play an important part of the strategy to improve accessibility between York and Lancaster County destinations. The US 521/SC9 Corridor Study demonstrates a comprehensive multimodal strategy for the panhandle area of the county.

York County's one-cent sales tax program (Pennies for Progress) has been effective in providing funding for sidewalks to be constructed in conjunction with most road improvements. The program has also funded a large number of small-scale sidewalk and bicycle-shoulder projects on existing streets and includes bicycle lanes in some locations. As shown in **Figure 9.1**, there are five bike routes established in York County that were designed to link with other existing and planned routes in Rock Hill, Fort Mill, Tega Cay, and York.

Figure 9.1: York County Bicycle Routes



The Regional Plan: *Bike Walk RFATS*

Although each of the local governments within the RFATS area has some form of individual plan for bicycle and pedestrian facilities, RFATS developed a plan that outlines a regional priority network to better coordinate local investments and ensure an expanded range of connectivity for these facilities. *Bike Walk RFATS* (2016) was developed through collaboration with York and Lancaster counties, the Catawba Indian Nation, City of Tega Cay, City of Rock Hill and the Town of Fort Mill, along with other key local and regional organizations that advocate for active forms of mobility.

Figure 9.2: *Bike Walk RFATS* Vision Statement

> *Bike Walk RFATS* envisions a region of **healthy, vibrant, and prosperous communities** that support residents' daily mobility and access needs efficiently and effectively. A **connected, convenient, and safe network** of sidewalks, shared-use paths, transit, and on-street bicycle connections **link people of all ages and abilities locally and across the region**. The network serves **residents, commuters, students, and visitors** alike. Walking, biking and transit are valued transportation modes, priorities for investment, and integral to regional strategies for congestion reduction, **improved air quality, and economic opportunity**.

The Five E's

To evaluate opportunities for the RFATS region to improve its support for walking and biking, a scorecard was used to rank the area's current standing on the "five E's": engineering, education, evaluation, enforcement, and encouragement. These are the issues that historically have been used to determine whether an area qualifies as a Walk-Friendly or Bicycle-Friendly Community. As shown in **Figure 9.3**, a sixth "E" –equity—has recently been incorporated into the process after planners became familiar with its use as a metric in the Safe Routes to School program.

Figure 9.3: The "E's" in Community Assessment

Source: Bike Walk RFATS

Scorecards identified ***enforcement*** and ***evaluation*** as the RFATS region's greatest strengths. Rock Hill and York County public safety officers have participated in training related to bicycle and pedestrian traffic laws, and some communities have bike patrol officers. The City of Rock Hill has targeted the enforcement of crosswalks and passed local ordinances addressing bicyclists' right to the road. The area also has a number of bicycle/pedestrian and trail plans in place, as well as the Bike Ped Coalition of York County that aims to educate, advocate, and promote the benefits of bicycling and walking.

Education and ***encouragement*** are areas where the region has made progress and should pursue additional activity, according to *Bike Walk RFATS*. Outreach activities are currently being conducted through National Bike Month, children's bicycle rodeos, and similar events.

The region's lowest score was in ***engineering***, largely due to the relative lack of a comprehensive sidewalk and bicycle network, and the policies that would help implement these facilities as part of future construction. In June 2018, the RFATS Policy Committee (described in further detail in Chapter 2) put forth a resolution supporting sidewalks and other pedestrian facilities at all new school locations within the study area.

Additionally, as noted in the chapter introduction, road projects using federal funds are required to incorporate bicycle and pedestrian accommodations. However, there is not a consistent regional or local approach among RFATS jurisdictions to ensure that all road projects incorporate non-motorized facilities.

Equity is an overarching issue that considers whether safe walking and biking access is available to people who may have no other choice but to walk or bike in unsafe conditions to meet their daily needs. These vulnerable populations can include seniors, children, non-white persons, low-income persons, those without access to a motor vehicle, and those who are linguistically isolated.

Recommended Bicycle and Pedestrian Projects

Bike Walk RFATS has identified both linear and "spot" improvements to promote a safer and more connected network for non-motorized travel within the region.

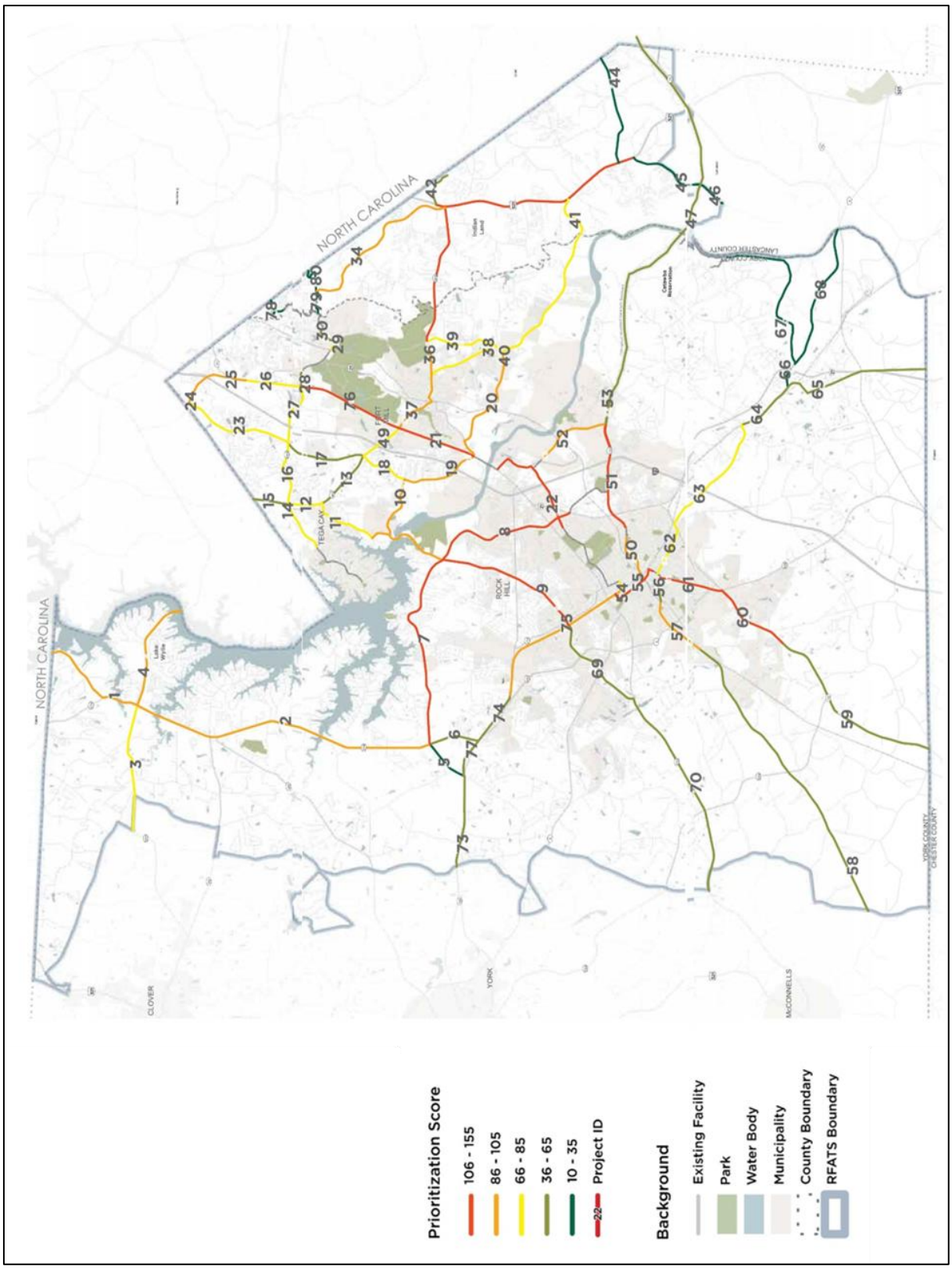
Identified improvements are based on a scoring system that considers factors such as:

- Improving safety
- Opportunity to close a gap in existing bicycle and pedestrian infrastructure, and/or incorporate these facilities into upcoming road projects
- Proximity to regional attractions, downtowns, and local civic facilities
- Level of demand /need in the area
- Proximity to transit

Based on this evaluation, a regional priority network has been identified for making targeted investments over time.

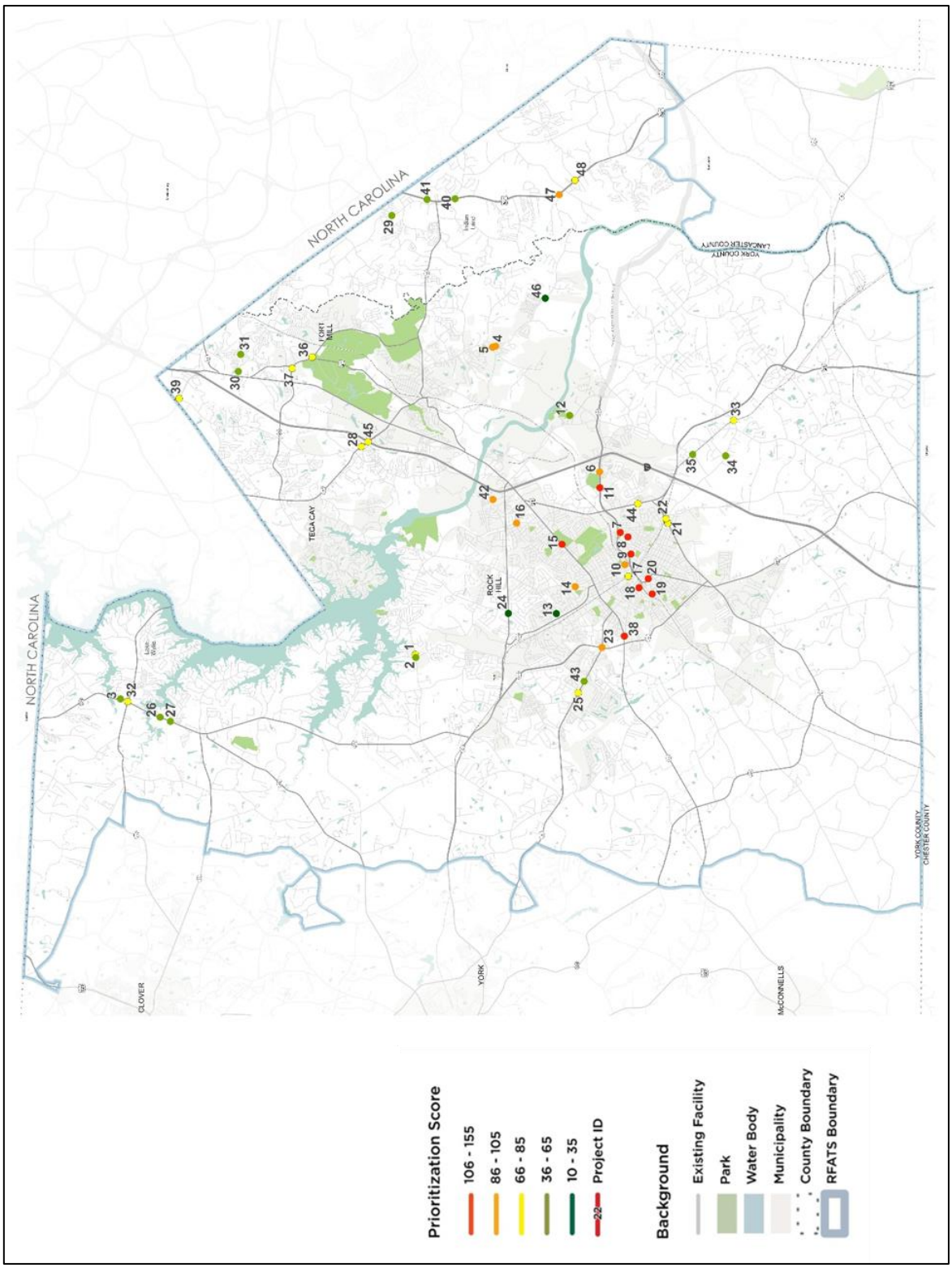
Figures 9.4 and **9.5** show the location of recommended project improvements. More detail for each project is provided in **Tables 9.1** and **9.2.**

Figure 9.4: Recommended Regional Bicycle/Pedestrian Network Projects



Source: Bike Walk RFATS (2016)

Figure 9.5: Recommended Bicycle/Pedestrian Spot Improvements



Source: Bike Walk RFATS (2016)

Table 9.1: Proposed Linear Bicycle and Pedestrian Improvements

Project Id	Score	Project Name	Start	End	Proposed FacilityType	Miles	Est. Cost
22	155	Eden Terrace Trail – Duncan's Ferry Road at Riverwalk	Cherry Road	Nations Ford Road	Shared-Use Path (Bike Lane + Sidewalk west of Cel-River Road)	2.87	$1,722,179
8	140	Mt Gallant Rd	India Hook Road	Celanese	Shared-Use Path + Sidewalk	2.3	$3,189,040
			Celanese	Anderson Rd	Bike Lane (with Shared-Use Path from Eden Terrace to Anderson Rd)	1.28	
55	135	Columbia Av	White Street	Alumni Dr	Sharrows + Sidewalk	0.18	$154,550
		White St E/W	Columbia Ave	Elizabeth Lane	Sharrows	1.11	
21	125	US 21	S Sutton Road	SC 160	Shared-Use Path	2.07	$1,242,618
61	125	Saluda St	Albright Road	Heckle Boulevard	Bike Lane	0.38	$55,234
		Saluda St	Heckle Boulevard	Johnston Street	Sharrows	1.26	
		N Elizabeth Ln	White Street	Main Street (End Of Existing Bike Lane)	Bike Lane	0.12	
76	125	US 21	Springfield Parkway	N White Street	Shared-Use Path	2.78	$1,670,380
9	120	Herlong Av - India Hook Rd	Mt Gallant Road	Rail Trail	Shared-Use Path	3.86	$2,315,989
7	115	Mt Gallant Rd	Hands Mill Highway	India Hook Road	Shared-Use Path	5.29	$3,172,729
51	110	Dave Lyle Blvd	Gateway Boulevard	Apex Drive	Shared-Use Path + Sidewalk	2.87	$3,843,504

Table 9.1: Proposed Linear Bicycle and Pedestrian Improvements (cont. from previous page)

Project Id	Score	Project Name	Start	End	Proposed FacilityType	Miles	Est. Cost
60	110	Albright Rd - Saluda Rd/St	Mt Holly Road	Rambo Road	Shared-Use Path	2.25	$1,350,523
35	105	Fort Mill Hwy	Harrisburg Road	Fort Mill Southern Bypass	Shared-Use Path	3.60	$2,160,845
43	105	Charlotte Hwy (US 521)	Potts Lane	Dobys Bridge Rd	Shared-Use Path	3.46	$2,076,988
48	105	Charlotte Hwy (US 521)	Dobys Bridge Rd	Van Wyck Rd	Shared-Use Path	2.06	$1,236,636
10A	105	New Gray Rock Road	Dam Road	N Sutton Road	Bike Lane + Sidewalk	2.16	$1,753,094
10B	105	India Hook Road	Mt Gallant Road	New Gray Rock Road	Shared-Use Path (with Trail Bridge)	1.76	$7,057,046
37	105	Tom Hall St	Dobys Bridge Road	Main Street	Bike Lane	0.61	$1,428,237
		York SC 160 - White St N	Main Street	US 21	Shared-Use Path	1.11	
		Main St	Tom Hall Street	White Street	Sharrows	0.15	
50	105	Jack White Trail - Northside Trail Ext	E White St	Iredell Street	Shared-Use Path	1.27	$1,527,006
4	100	Charlotte Highway (SC 49)	Pole Branch Road	Buster Boyd Bridge	Shared-Use Path	3.25	$1,948,835
20	100	Spratt St	US 21	Fort Mill Parkway	Shared-Use Path + Bike Lane	0.46	$1,970,314
		Brickyard Rd	Fort Mill Parkway	Dobys Bridge Road	Shared-Use Path	0.32	
		Whites Rd - Fort Mill Pkwy	Spratt Street	Holbrook Road	Shared-Use Path	2.45	
36	100	Tom Hall St	Fort Mill Southern Bypass	Dobys Bridge Road	Bike Lane	0.86	$61,063

Table 9.1: Proposed Linear Bicycle and Pedestrian Improvements (cont. from previous page)

Project Id	Score	Project Name	Start	End	Proposed FacilityType	Miles	Est. Cost
57	100	Ogden Rd	Heckle Boulevard	Squire Road	Sidewalk	1.08	$916,400
		Ogden Rd - Friedheim Rd	Wilson Street	Squire Road	Bike Lane	1.65	
75	100	Ebenezer Rail Trail	Rail Trail (Near Big Oak Lane)	Dave Lyle Boulevard	Shared-Use Path	9.83	$5,897,145
25	95	Carowinds Blvd	Pleasant Road	Regent Parkway	Shared-Use Path	1.86	$1,114,581
52	95	Cel-River Rd - Red River Rd	Dave Lyle Boulevard	Paragon Way (End Of Existing Bike Lane)	Bike Lane + Sidewalk	1.98	$1,600,606
2	90	Hands Mill Hwy	SC 557	Mt Gallant Road	Shared-Use Path	7.98	$4,785,747
1	90	Pole Branch Rd - York SC 274 W	State Border	Landing Pointe Dr	Bike Lane + Sidewalk	2.27	$2,235,795
		York SC 274 W	Landing Pointe Dr	SC 557	Shared-Use Path + Sidewalk	0.54	
19	90	Sutton Rd S	New Gray Rock Rd	US 21	Bike Lane + Sidewalk	1.84	$1,614,104
		Sutton Rd N	Sam Smith Rd	New Gray Rock Rd	Shared-Use Path + Sidewalk	0.09	
34	90	Harrisburg Rd	Carolina Thread Trail	Fort Mill Hwy	Shared-Use Path	4.50	$2,697,827
14	85	Gold Hill Rd – Tega Cay Dr	End of sidepath near Shoreline Pkwy	SC 160	Bike Lane	1.36	$96,721
18	85	Sutton Rd N	New Gray Rock Road	Willowbrook Drive	Shared-Use Path + Sidewalk	0.12	$872,515
		Sutton Rd N - Market St	SC 160	New Gray Rock Road	Shared-Use Path	1.18	
38	85	Dobys Bridge Rd	Tom Hall Street	Fort Mill Southern Bypass	Shared-Use Path	1.86	$1,117,258

Table 9.1: Proposed Linear Bicycle and Pedestrian Improvements (cont. from previous page)

Project Id	Score	Project Name	Start	End	Proposed FacilityType	Miles	Est. Cost
54	85	Stewart Av	W. White Street	Oakland Avenue	Sharrows	0.38	$6,019
63	85	Fire Tower Rd	E Main Street	Porter Road	Enhanced Shared Roadway + Sidewalk	0.12	$2,476,438
		Fire Tower Rd	Porter Road	Castle Heights School	Bike Lane + Sidewalk	1.47	
		Fire Tower Rd - Neelys Creek Rd	Castle Heights School	Lesslie Highway	Shared-Use Path	1.68	
62	85	E Black St	S Elizabeth Ln	Albright Rd	Bike Lane	1.24	$88,155
		Albright Rd – E Main St	E Black St	Firetower Rd	Shared-use Path + Sidewalk	0.23	$309,090
11	80	Dam Rd	New Gray Rock Road	Stonecrest Boulevard	Bike Lane + Sidewalk	0.69	$1,188,444
		Stonecrest Blvd	Dam Road	Hubert Graham Way	Bike Lane + Sidewalk	0.75	
		Stonecrest Blvd	Hubert Graham Way	SC 160	Bike Lane	0.26	
23	80	Pleasant Rd	Gold Hill Road	Carowinds Boulevard	Shared-Use Path	2.91	$1,748,696
39	80	Tom Hall St To Holbrook Rd	Tom Hall Street	Holbrook Road	Bike Lane + Sidewalk	1.87	$1,512,468
12	75	York SC 160	Gold Hill Road	Stonecrest Boulevard	Shared-Use Path	0.87	$522,826
16	75	Gold Hill Rd	Highway 160	Pleasant Road	Shared-Use Path	1.68	$1,006,601
26	75	Carowinds Blvd	Regent Parkway	Springfield Parkway	Shared-Use Path	1.39	$834,268
49	75	York SC 160	Pleasant Road	US 21	Shared-Use Path	1.18	$710,138
3	70	York SC 557 N	Charlotte Highway (SC 49)	Oakridge Road	Shared-Use Path	0.93	$1,969,049
		York SC 557 N	Oakridge Road	Riddle Mill Road	Bike Lane + Sidewalk	1.11	
		York SC 557 N	Riddle Mill Road	Cross Road (RFATS Border)	Wide Paved Shoulder	1.29	

Table 9.1: Proposed Linear Bicycle and Pedestrian Improvements (cont. from previous page)

Project Id	Score	Project Name	Start	End	Proposed FacilityType	Miles	Est. Cost
27	70	Springfield Pkwy – Gold Hill Rd	Pleasant Road	US 21	Shared-Use Path	1.49	$891,526
29	70	Springfield Pkwy	Railroad	A O Jones Blvd	Shared-Use Path	0.24	$144,467
40	70	Fort Mill Southern Bypass	Holbrook Road	Dobys Bridge Rd	Shared-Use Path	0.23	$136,182
41	70	Dobys Bridge Road	Fort Mill Southern Bypass	US 521	Bike Lane + Sidewalk	5.09	$4,120,228
17	65	Pleasant Rd	Gold Hill Road	SC 160	Shared-Use Path	2.10	$1,258,363
28	60	Springfield Pkwy	US 21	Old Nation Road	Shared-Use Path	0.37	$223,562
30	60	A.O. Jones Blvd	Springfield Parkway	Carolina Thread Trail - Nation Ford Greenway	Shared-Use Path	0.50	$300,614
47	60	Dave Lyle Blvd Ext	Current end of Dave Lyle Blvd	End Of Dave Lyle Boulevard Ext	Shared-Use Path	10.88	$6,530,519
53	60	Dave Lyle Blvd	Red River Road	Waterford Park Drive	Shared-Use Path + Sidewalk	1.22	$1,284,072
70	60	McConnells Hwy	Meadow Lakes Road	RFATS Boundary	WidePavedShoulder	5.60	$2,238,191
13	55	York SC 160	Stonecrest Boulevard	Sutton Road	Shared-Use Path	1.65	$987,271
15	55	York SC 160	Gold Hill Road	State Border	WidePavedShoulder	0.94	$375,249
24	55	Carowinds Blvd	Pleasant Road	State Border	Shared-Use Path	0.14	$82,798
58	55	Ogden Rd	Squire Road	Falls Road	Bike Lane + Sidewalk	1.32	$3,836,855
		Mobley Store Rd - Ogden Rd	Falls Road	RFATS Boundary	WidePavedShoulder	6.91	

Table 9.1: Proposed Linear Bicycle and Pedestrian Improvements (cont. from previous page)

Project Id	Score	Project Name	Start	End	Proposed FacilityType	Miles	Est. Cost
59	55	Saluda Rd	Rambo Road	RFATS Boundary	WidePavedShoulder	5.00	$2,000,906
69	55	Meadow Lakes Rd	McConnells Highway	W Main St	BikeLane+Sidewalk	1.15	$1,536,974
		Herlong Av S	W Main St	Heckle Boulevard	BikeLane	0.66	
		Herlong Av S	Heckle Boulevard	Rail Trail	Shared-Use Path	0.93	
65	50	Rail Corridor - Lesslie Hwy - Ole Simpson - Utility Row	Planned Carolina Thread Trail - Old Friendship Trail	RFATS Boundary	Shared-Use Path	3.85	$2,307,477
73	50	Ebenezer Rail Trail - Old York Rd	Mt Gallant Road	RFATS Boundary	Shared-Use Path	2.37	$1,423,404
74	50	Ebenezer Rail Trail	Hands Mill Highway	Rail Trail (Near Big Oak Lane)	Shared-Use Path	1.46	$875,456
77	50	Ebenezer Rail Trail	Mt Gallant Road	Hands Mill Highway	Shared-Use Path	1.04	$622,491
6	45	Hands Mill Hwy	Mt Gallant Road	Old York Road	Shared-Use Path	1.29	$775,116
42	45	Potts Lane	US 521	State Border	Shared-Use Path	0.94	$564,479
64	40	Lesslie Hwy	Neelys Creek Road	Planned Carolina Thread Trail – Old Friendship Trail	Shared-Use Path	1.58	$949,568
44	35	Jim Wilson Rd	US 521	State Border	Shared-Use Path	2.86	$1,718,689
67	35	Catawba River Ext - Six Mile Creek - Turkey Ln	Turkey Lane	Existing Carolina Thread Trail – Catawba Indian Nation - Greenway Trail	Shared-Use Path	4.5	$2,702,414

Table 9.1: Proposed Linear Bicycle and Pedestrian Improvements (cont. from previous page)

Project Id	Score	Project Name	Start	End	Proposed FacilityType	Miles	Est. Cost
5	30	Mt Gallant Rd	Hands Mill Highway	Old York Road	Shared-Use Path	1.24	$742,430
45	30	Van Wyck Rd	US 521	Sun City Boulevard	Shared-Use Path	0.63	$925,603
		Van Wyck Rd	Sun City Boulevard	W Rebound Road	Wide Paved Shoulder	1.37	
66	30	Old Friendship Road - SC 5	Old Friendship Road	Turkey Lane	Shared Use Path	0.72	$434,114
78	25	Little Sugar Creek	Nations Ford Greenway	State Border	Shared-Use Path	0.75	$449,292
46	20	Van Wyck Rd	Sun City Boulevard	W Rebound Road	Wide Paved Shoulder	0.76	$304,129
68	15	SC 5	Turkey Lane	Catawba River	Wide Paved Shoulder	3.82	$1,528,040
79	10	New Trail	Nations Ford Greenway	Harrisburg Road	Shared-Use Path	0.61	$364,031
80	10	McAlpine Creek - New Trail	Harrisburg Road	State Border	Shared-Use Path	0.93	$559,380

Table 9.2: Proposed Spot Bicycle/Pedestrian Improvements

Project ID	Score	Start	End
7	90	Iredell St	150 ft south of Montford Ave
8	90	Iredell St	Dunlap St
20	90	Hampton St	Johnston St
38	90	SC 322	Finley Road
9	85	N Confederate Ave	Willowbrook Ave
11	85	Mt Gallant Road	Dave Lyle Blvd
15	85	N Cherry Road	Deas Street
18	80	N Wilson St	W Johnston St
19	80	S Dave Lyle Blvd	Hampton St
16	70	Mt Gallant Road	Marett Blvd
4	65	Dobys Bridge Road	Dobys Bridge Elementary School
5	65	Ft Mill Southern Bypass	Dobys Bridge Road
10	65	Charlotte Ave	N Wilson St
14	65	India Hook Drive	Glendale Dr
6	60	Dave Lyle Blvd	John Ross Pkwy
23	60	Heckle Blvd	SC 5 W Main St
42	60	Lexington Commons Dr	Lexington Blvd
47	60	Dobys Bridge Road	US 521
17	50	N. Wilson Street	Railroad (near Ebenezer Ave)
22	50	Firetower Road	E Main Street
25	50	SC 5 (York Hwy)	Meadowlark Drive

Table 9.2: Proposed Spot Bicycle/Pedestrian Improvements

Project ID	Score	Start	End
28	50	SC 160	Carolina Place Dr (at Baxter Village)
33	50	Neelys Creek Road	Lesslie Hwy
36	50	US Bus 21 / Old Nation Rd	SC 460
39	50	Carowinds Blvd	Pleasant Road
44	50	Princeton Road	S Anderson Road
45	50	SC 160	I-77 Interchange
48	50	US 521 (Charlotte Hwy)	Shelley Mullis
1	45	Mt Gallant Road	Museum Road
21	45	Albright Road	E Main Street
2	40	Mt Gallant Road	Mt Gallant Elementary School
3	40	Landing Pointe Drive	SC 274
12	40	Red River Road	Carolina Thread Trail (at River Park)
26	40	SC 49	Marlin Drive
27	40	SC 49	Autumn Cove Drive
29	40	Harrisburg Road	Kariker Ct
34	40	Firetower Road	Edenvale Road
35	40	N Springdale Road	Lesslie Hwy
40	40	Charlotte Hwy (US 521)	Marvin Road
43	40	SC 5 (York Hwy)	The Crossing
30	35	Regent Pkwy	Township Drive
31	35	Regent Pkwy	Hadden Hall Blvd
41	35	Charlotte Hwy (US 521)	Potts Lane
13	30	Herlong Drive	Estes Drive
24	25	Twin Lakes Road	Celanese Road
46	25	Dobys Bridge Road	Kingston Way

Recommended Bicycle and Pedestrian Policies and Programs

BikeWalk RFATS recommends several policies and programs (**Table 9.3**) to strengthen the regional foundation for bicycle and pedestrian planning.

Table 9.3: "Top Ten" Priority Program and Policy Recommendations

Active Transportation Summit

- Host an annual, half- to full-day workshop for dialogue related to designing and building Complete Streets, local active transportation initiatives, and funding strategies.

Regional Safe Routes to School Coordination

- Develop a central repository of information about SRTS, from mapping, planning efforts, and funding
- Help jurisdictions build on lessons learned; provide local training to help schools understand the SRTS activities toolkit

Regional Active Transportation Safety Plan

- Develop an action plan that identifies crucial bike and pedestrian safety needs and develops clear actions to improve safety in the RFATS region.

Regional Bicycle & Pedestrian Count Program

- Provide training manuals to communities on how to conduct bicycle and pedestrian counts.
- Collaborate with local organizations to enlist volunteers to perform counts.
- Create funding incentives for communities to include permanent counters as part of implementing projects.

Region-wide User Maps and Guides

- Build on York County's successful effort to promote countywide bicycling routes and promote outdoor recreational attractions (Velodrome, Game On, Riverwalk and others)
- Develop publicly-distributed materials that describe safe and comfortable routes to local and visitor destinations.

Professional Training Opportunities

- Provide webinars, courses and other professional training opportunities to the region's city and county engineers, planners, police and other staff. Topics could include bike and ped design standards, funding opportunities, and interdepartmental coordination on bike/ped issues.

Adopt Regional Design Standards

- Promote adoption of the BikeWalk RFATS active transportation design guidelines by each local government in the RFATS region to promote consistency and efficient coordination of facilities.

Regional Complete Streets Policy

- Adopt a regional Complete Street policy to ensure all roadway users are considered in the planning, design, engineering and funding of capital projects.

Health and Equity-Based Project Prioritization

- Incorporate factors related to health and equity in the scoring and prioritization of RFATS projects.

Regional Target Zero Policy

- Support SCDOT efforts for the Target Zero Plan with a regional Vision Zero which targets the most dangerous corridors and crash hotspots for safety improvements.

Implementation

Funding for pedestrian and bicycle facilities can come from a variety of sources. Federal funds include Transportation Alternatives Program (TAP) grants; South Carolina Department of Parks, Recreation, and Tourism (SCPRT) Recreational Trail grants, safety funds for spot improvements such as pedestrian crossings, as well as Guideshare and CMAQ funds allocated to RFATS. Communities may also continue to use local and private funds to meet pedestrian and bicycle needs.

Federal and State Policies

Some of the proposed network and spot improvements can be built through the roadway projects included in the 2050 LRTP. In accordance with Federal Highway Administration requirements, bicycle/pedestrian facilities will be incorporated into all federally-funded projects in the RFATS area that reconstruct or widen a road. Similar policies exist at the state level, dating from 2003 when the SCDOT Commission directed that accommodating bicycles should be a routine part of the Department's planning, design, construction and operating activities. SCDOT is currently developing a Bicycle Pedestrian Safety Action Plan to enhance regional multimodal planning by MPOs and COGs; revise statewide design policies and provide training; outline strategies for engagement, education, enforcement, and outreach; and reform the Transportation Alternatives Program.

SCDOT's 2020 Comprehensive Multimodal Long Range Transportation Plan recognizes cycling and walking as modes of transportation. The statewide plan notes that SCDOT works collaboratively with local jurisdictions to identify suitable bicycle improvements (such as shoulders or restriping with bike lanes) to incorporate in highway projects, as well as to identify funding for these projects. However, local support from MPOs, particularly in advance of the project design process, is seen as critical to implementing bicycle and pedestrian improvements. The responsibility is therefore on MPOs and municipalities to bring these issues to the table during project discussions.

Local Policies

Local policies are also an essential part of ensuring that the pedestrian and bicycle system expands as the area grows. As noted earlier, many of the area's less "walkable" communities were built at a time when local development regulations did not require sidewalks to be incorporated in new subdivisions or non-residential developments. Localities can disseminate important

information about pedestrian improvement needs in the region to garner public support for funding and other steps necessary for implementation.

In addition, many of the region's important transportation projects are now constructed through locally-generated funds such as the Pennies for Progress program. By adopting Complete Streets design standards, the communities in the RFATS region can ensure that locally-funded transportation projects include facilities to allow safe travel by non-motorized users.

Introduction

The RFATS region benefits from proximity to a major international airport and is fortunate also to have its own corporate/business airport. The region's challenge is to maximize the benefits of both facilities to serve the needs of area residents and businesses.

Commercial aviation allows citizens to travel domestically and internationally for business or leisure. Commercial freight operations — including those carried out by major parcel companies — are a means of delivering commercial goods across the nation. Important niche operations such as medical helicopters also use the two facilities.

Aviation activities can affect many parts of the transportation system. For example, large airports and associated aviation-related businesses are significant generators of roadway travel demand for both customers and employees.

Existing Facilities and Conditions

Charlotte Douglas International Airport

Charlotte Douglas International Airport (CLT) is located just north of the state border in North Carolina. CLT serves as the region's primary commercial airport and offers direct service to 177 destinations. American Airlines uses CLT as a major hub for domestic and international air travel operations.

Between 2009 and 2019, CLT experienced an overall 41 percent increase in passenger traffic. In 2019 it ranked as the nation's 11th busiest airport, with more than 24 million enplanements (passengers boarded).[1]

To meet growing needs, CLT completed airfield and terminal capacity enhancement studies, which together form the airport's master plan. This plan outlines near- and long-term airfield and terminal updates, guiding construction and development at CLT through 2035.

[1] U.S DOT Bureau of Transportation Statistics.

Proposed improvements (shown in **Table 10.1)** include expansion of multiple concourses, terminal renovation and expansion, and addition of a fourth parallel runway.

Table 10.1: CLT Master Plan Projects

Proposed Improvement	Status	Completion
Elevated Roadway and Terminal Curb Front Improvements	Complete	Fall 2019
Concourse A Expansion - Phase I	Complete	Summer 2018
East Terminal Expansion - Phase II	Complete	Summer 2019
Air Traffic Control Tower	Complete – Awaiting Commissioning	Fall 2020
Terminal Renovations	Under Construction	2020
Concourse E Expansion - Phase VIII	Under Construction	Summer 2021
Terminal Lobby Expansion	Under Construction	2025
Concourse A Expansion - Phase II	Design	2023
Fourth Parallel Runway	Planning	2025
Concourse B Expansion	Planning	Spring 2026
Concourse C Expansion	Planning	Spring 2024

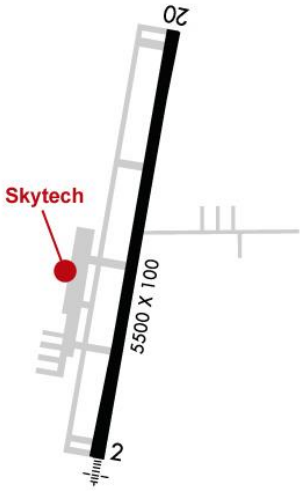
Rock Hill/York County Airport

Rock Hill/York County Airport is a general aviation SCII (corporate/business) classified airport located approximately four miles north of the center of Rock Hill and approximately 17 miles from Charlotte Douglas International Airport **(Figure 10.1)**. The airport property encompasses nearly 500 acres and includes a 5,500-foot runway. According to FAA statistics, it had more than 149 based aircraft and 33,000 aircraft operations for the year 2019.

Day-to-day airport business operations are managed by SkyTech, which leases the facilities on the west side of the airport from the City. Operations include general aviation local aircraft operations, general aviation itinerant operations, and a small number of military operations. Ground transportation includes rental car

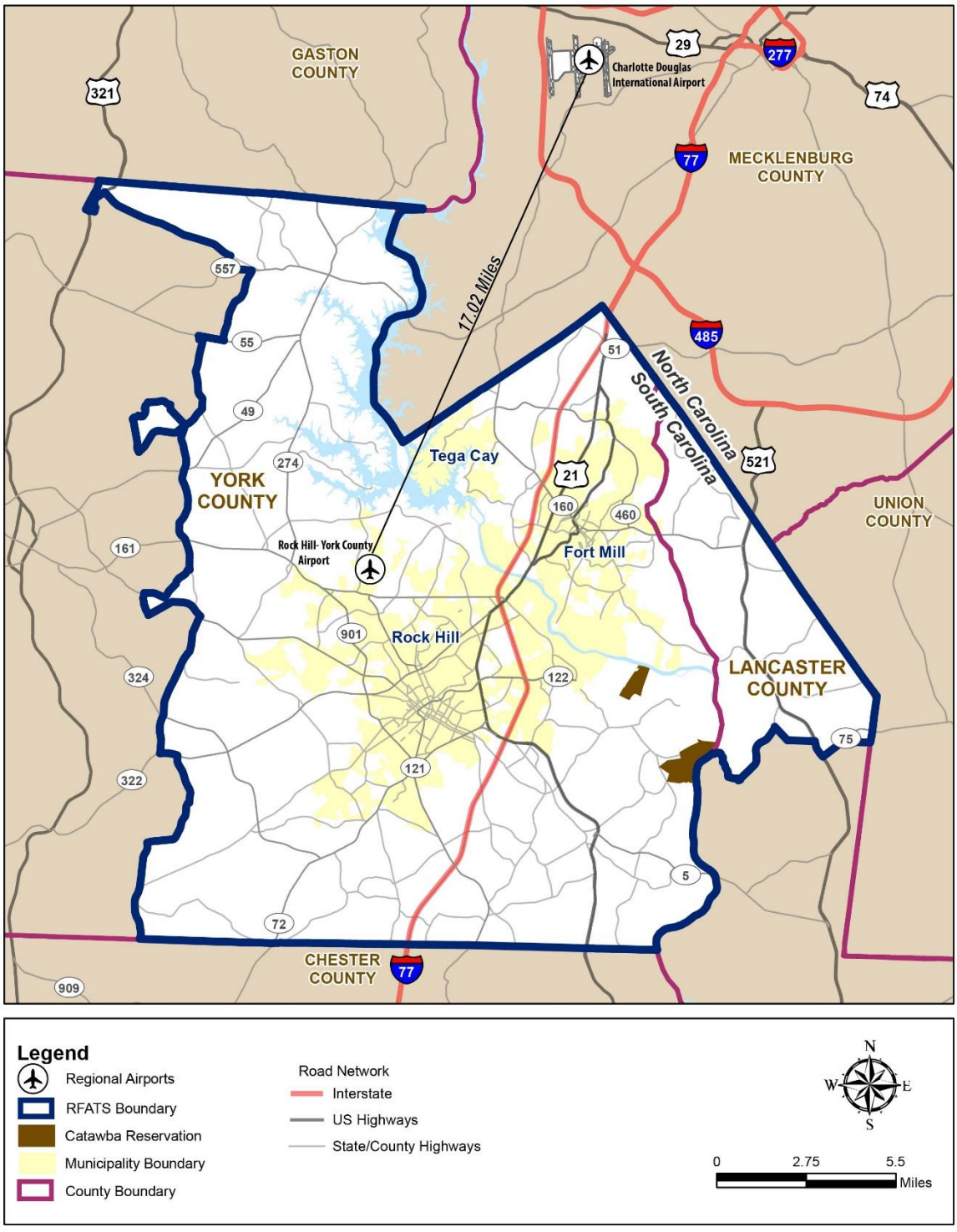
agencies and taxi service. The airport also offers flight training, ground schools, aircraft rental, and sightseeing flights.

Development of an airport to serve the Rock Hill area was first initiated in 1956 with the creation of an Airport Commission. Under a management agreement between the City of Rock Hill and York County, the City remains the official sponsor of the airport with both entities contributing equal funds. The Airport Commission makes recommendations to the City on the airport's policies and operations as well as advising the City and County on planning matters and capital improvements.



The City and County have contracted with SkyTech to handle day-to-day management of the airport.

Figure 10.1 – Physical Relationship of Charlotte-Douglas International and Rock Hill-York County Airports



Rock Hill-York County Airport's SCII classification indicates that it falls within the second of four tiers used to classify airports by level of activity and purpose. As explained in the South Carolina Airport Systems Plan (2008), the state's airports can be grouped into four categories:

- **Commercial Service Airports (SCI)** are airports with scheduled services and at least 10,000 passenger boardings annually.
- **Corporate/Business Airports (SCII)** are urban/multi-jurisdictional airports with a runway of at least 5,000 feet and full services. They are seen as having a high economic impact, and 30 to 50 percent of their activity is in corporate aviation. The Rock Hill-York County Airport falls into this category.
- **Business/Recreation Airports (SCIII)** are rural airports with a runway of at least 3,600 feet and moderate economic impact.
- **Recreational/Local Service Airports (SCIV)** are low-activity airports with a runway of less than 3,600 feet and limited facilities. They have a low economic impact and may have constraints to expansion.

The FAA designates Rock Hill-York County Airport as a "reliever" for Charlotte-Douglas International Airport. This reflects the potential to attract additional general aviation users who wish to avoid growing congestion at CLT as well as on surrounding roadways.

Aerial photo of the Rock Hill/York County Airport with 5,500' runway

Other Aviation Facilities in the Region

The RFATS region includes one privately-owned heliport located at Piedmont Medical Center in Rock Hill.

Lancaster County Airport-McWhirter Field, located outside the RFATS region, is a county-owned, public-use airport with one runway, facilities for fueling and maintenance, and a small terminal building.

Future Plans

Airport Master Plan for Rock Hill-York County Airport

Since its opening in 1960, Rock Hill-York County Airport facilities have expanded under the direction of a series of Master Plans and with the help of a series of federal grants. The airport experienced particularly rapid growth during the 1970s and early 1980s, both in operations and the number of aircraft based there. Subsequent Master Plans in 1983, 1994, and 2003 included further development of the airport infrastructure.

The current Airport Layout Plan was completed in June 2016. Its goal is "to provide guidelines for future airport development which will satisfy aviation demand in a cost-effective, feasible manner, while resolving aviation, environmental, and socioeconomic issues of the community."

Table 10.2 provides a summary of the forecasts for the Rock Hill – York County Airport throughout the 20-year Airport Layout Plan planning period. **Table 10.3** summarizes the airport's facility requirements and lists the phases in which various facilities will be needed, as driven by demand.

Proposed improvements in the 20-year airport improvement program are categorized into one of three development phases:

- Phase I (2016-2021)
- Phase II (2022-2026)
- Phase III (2027-2035)

The airport is not projected to reach its capacity or volume service limits within the 20-year planning period. However, it is anticipated that the composition of the based aircraft will become larger over time, requiring a longer runway and additional hangar space. Additionally, the Carolina Panthers, a professional football team and member of the National Football League, have negotiated a longer runway and other airport improvements. A timeline for these improvements is not currently known.

Table 10.2: Aviation Forecast Summary, Rock Hill-York County Airport

	2015 (Existing)		2016		2021		2026		2035	
	Forecast	TAF	Forecast	TAF	Forecast	TAF	Forecast	TAF	Forecast	TAF
BASED AIRCRAFT										
Single-Engine Piston	133		137		153		170		200	
Multi-Engine Piston	12		12		13		14		15	
Turboprop	0		0		2		3		5	
Jets	5		5		5		6		7	
Helicopters	2		2		3		3		5	
Total Based Aircraft	**152**	**133**	**156**	**133**	**176**	**133**	**196**	**133**	**232**	**133**
AIRCRAFT OPERATIONS										
GA Local	25,015	25,015	25,692	25,015	28,986	25,015	32,279	25,015	38,208	25,015
GA Itinerant	10,500	10,500	10,785	10,500	12,167	10,500	13,550	10,500	16,039	10,500
Air Taxi	400	400	410	400	463	400	516	400	610	400
Military	85	85	89	85	100	85	111	85	132	85
Total Operations	**36,000**	**36,000**	**36,972**	**36,000**	**41,712**	**36,000**	**46,452**	**36,000**	**54,984**	**36,000**
Operations per Based Aircraft	237	237	237	237	237	237	237	237	237	237

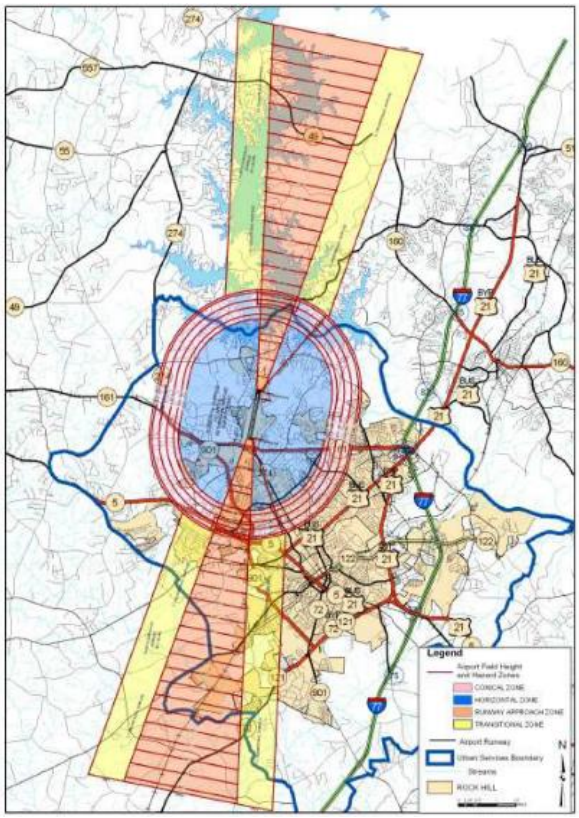
Source: Federal Aviation Administration, "FAA APO Terminal Area Forecast Detail Report," <http://aspm.faa.gov/>, accessed January 14, 2015.
Talbert, Bright & Ellington, Inc., January 2015.

Table 10.3: Facility Requirements Summary, Rock Hill-York County Airport

Facility	Existing	2016	Phase 1 2021	Phase 2 2026	Phase 3 2035
Runway 02/20	5,500' x 100'	5,500' x 100'	6,555' x 100'	6,555' x 100'	6,555' x 100'
Taxiway	1 Full-Parallel	1 Full-Parallel	1 Full-Parallel	1 Full-Parallel	1 Full-Parallel
T-Hangar Units	97	130	149	165	194
Conventional Hangar (sf)	36,900 sf	66,100 sf	84,712 sf	100,859 sf	130,050 sf
Total Apron Area (sf)	410,650 sf	76,478 sf	88,654 sf	98,507 sf	116,766 sf
Terminal (sf)	7,366 sf	7,366 sf	8,679 sf	11,264 sf	12,829 sf

Source: Talbert, Bright & Ellington, Inc., January 2015.

Based on these forecasted operations, the Airport Layout Plan calls for a range of improvements including a 6,555-foot runway and nearly 13,000 square feet of terminal area. The plan also recommends doubling the number of T-hangar units for aircraft storage by 2035.



Future Airport Development

Some additional land may be required to extend the runway as recommended in the 2016 Airport Layout Plan.

The City of Rock Hill and York County have adopted an Airport Overlay District aimed at protecting the interests of the airport and surrounding areas. This includes land use standards and restrictions for areas around the airport.

Stakeholder Input

This section to be completed following the public engagement period in April 2021.

Recommendations

- RFATS should work with the Airport Commission to study whether, and how, the forecast congestion at Charlotte Douglas International Airport (CLT) will affect likely demand on the Rock Hill/York County Airport and its potential for growth.
- RFATS stakeholders should remain involved in the planning of any expansion at CLT. CLT has a major impact on both airspace management and the commercial prospects of Rock Hill-York County's public airport.
- The City of Rock Hill and York County should continue to protect citizens, businesses, and the airport itself from noise-incompatible land uses by approving development in accordance with the adopted Airport Zoning Overlay.

Introduction

This chapter outlines the growth trends and socioeconomic data used to project and evaluate future transportation needs. It also considers the human and natural environmental impacts of the recommended investments in the Long Range Transportation Plan and discusses ways to avoid or address potential adverse impacts.

Socio-Economic Information

Metrolina Model

In an effort to understand the influence of development on transportation needs, the RFATS long range planning process includes the ongoing collection and analysis of socio-economic data and other forecasting information. These data sets are important inputs to the regional travel demand model, which encompasses the RFATS study area as well as several other Metropolitan Planning Organizations (MPOs) and Rural Planning Organizations (RPOs) (specifically a North Carolina designation) in the greater Charlotte region.

The Metrolina Regional Travel Demand Model ('Metrolina model') is divided into Traffic Analysis Zones (TAZs), which are the basic geographic units for which forecasting is conducted. Based on the approximate population and employment in each Traffic Analysis Zone, the model estimates future travel demand within the RFATS area and greater Charlotte region. The model facilitates the generation of "volume/capacity ratios" that are used to identify areas where future traffic volumes may exceed the operating capacity of the roadway.

Data and Sources

As part of the greater Charlotte region, RFATS and the surrounding MPOs and RPOs participated in the development of a regional land use model using the CommunityVIZ application. The application allows planners in the region to better understand future growth and development scenarios within the greater Charlotte region.

The development of the application relies on the collection of various development status, existing and future land use designations, and future growth data. This data includes existing and projected population of MPOs, RPOs, and counties; employment data and household data; land use categories and development status (developed, agriculture, undeveloped,

under-developed, water, and permanent open space); place types (general development characteristics); and community types (urban, suburban, rural). The model allocates future residential and employment throughout each land use category to determine where the future growth will likely occur within each MPO.

For the 2050 LRTP, RFATS staff coordinated with the greater Charlotte region to update the CommunityVIZ data inputs relating to housing availability and occupancy, employment, and school enrollment to develop projections for the plan's "horizon years" of 2025, 2035, 2045, and 2050. RFATS staff also coordinated with the local municipalities to review the outputs for each horizon year to verify that future development and types were in-line with their comprehensive plans and local vision. The tables that follow summarize socio-economic projections as generated by the CommunityVIZ model for each horizon year.

Table 11.1: Subcategories of Socio-Economic Data

Housing	Employment	School Enrollment
• Households • Population • Population in Households • Population in Group Quarters • Mean Household Income	• Total Employment • Employment - Manufacturing, Industrial, Warehouse, Transportation, Communications, Utilities • Employment - Retail • Employment - Highway Retail • Low-Traffic Service Employment • High-Traffic Service Employment • Employment - Office & Government • Employment - Bank • Employment - Education	• Students - Grades K-8 • Students - High School • Students - College

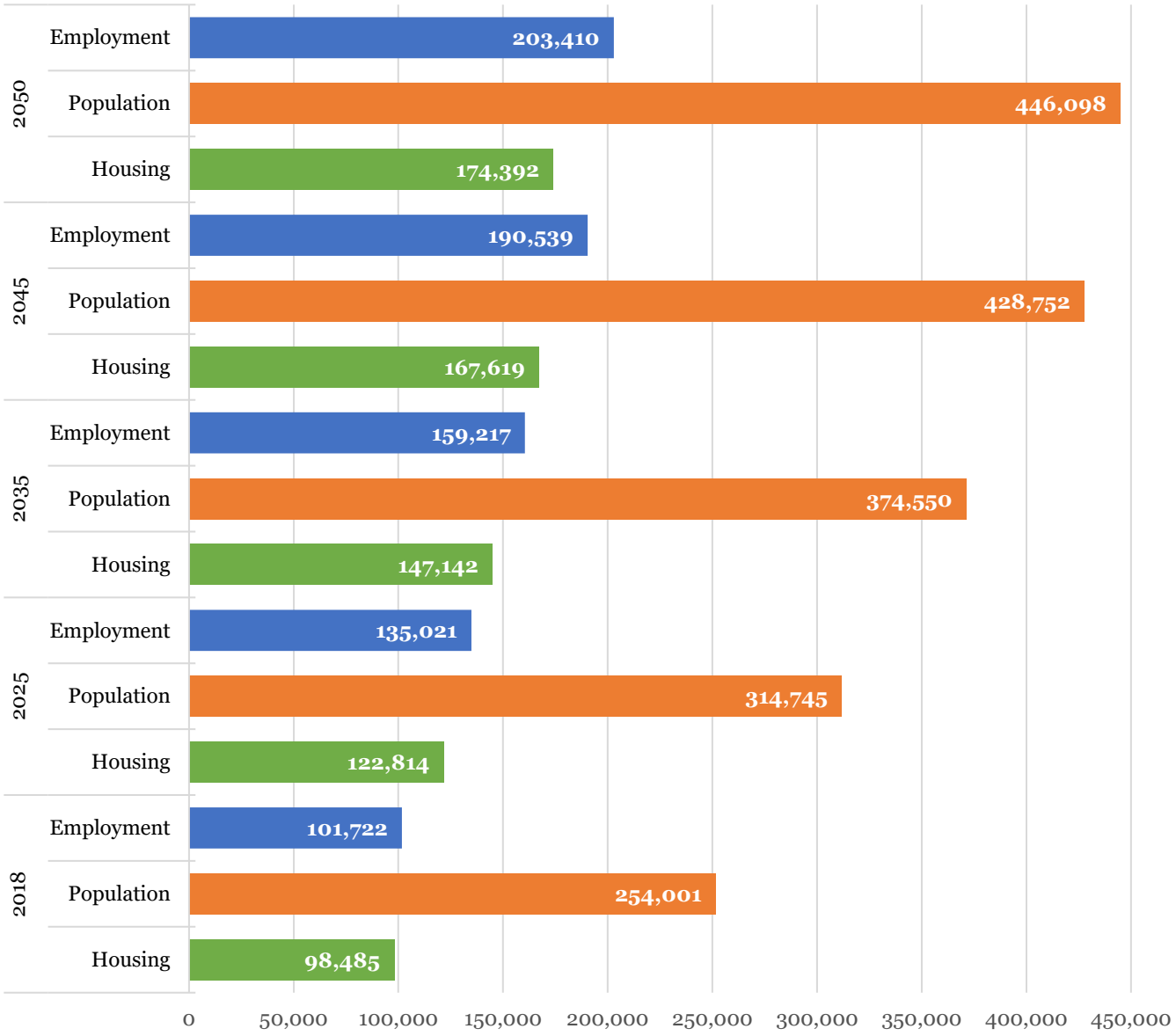
Socio-Economic Forecast

Table 11.**2** summarizes the socio-economic data used in the Metrolina model for the RFATS region. Total population is expected to increase from 254,001 in 2018 to 446,098 by the year 2050, a rise of 76%. Total employment is expected to increase from 101,722 in 2018 to 203,410 in 2050, an increase of nearly 100%. This increase is also shown in **Figure 11.1**.

Table 11.2: RFATS Area Population and Employment Forecasts

Year	Population	Employment
2018	254,001	101,722
2025	314,745	135,021
2035	374,550	159,217
2045	428,752	190,539
2050	446,098	203,410

Figure 11.1: RFATS Area Housing, Population and Employment Forecasts



On the following pages, **Figures 11.2 – 11.5** show the geographic distribution of growth in population and employment in each traffic analysis zone (TAZ) within the RFATS study area between 2018 and 2050. A TAZ is the unit of geography delineated by state and/or local transportation officials to assess traffic-related data – especially commuting and workplace statistics. A TAZ is typically comprised of one or more census blocks, block groups, or census tracts.

Figure 11.2: 2018 Population by Traffic Analysis Zone

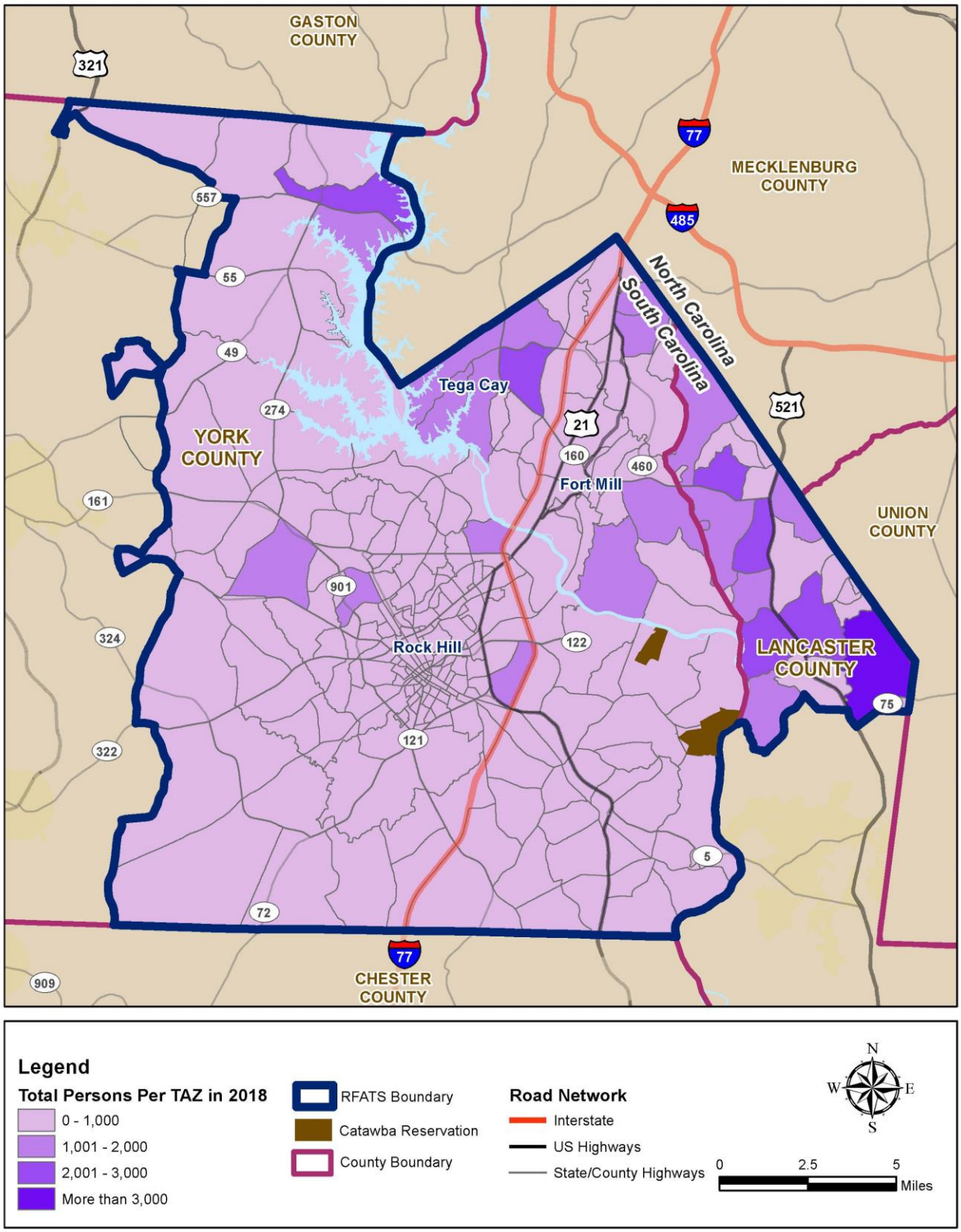


Figure 11.3: 2050 Projected Population by Traffic Analysis Zone

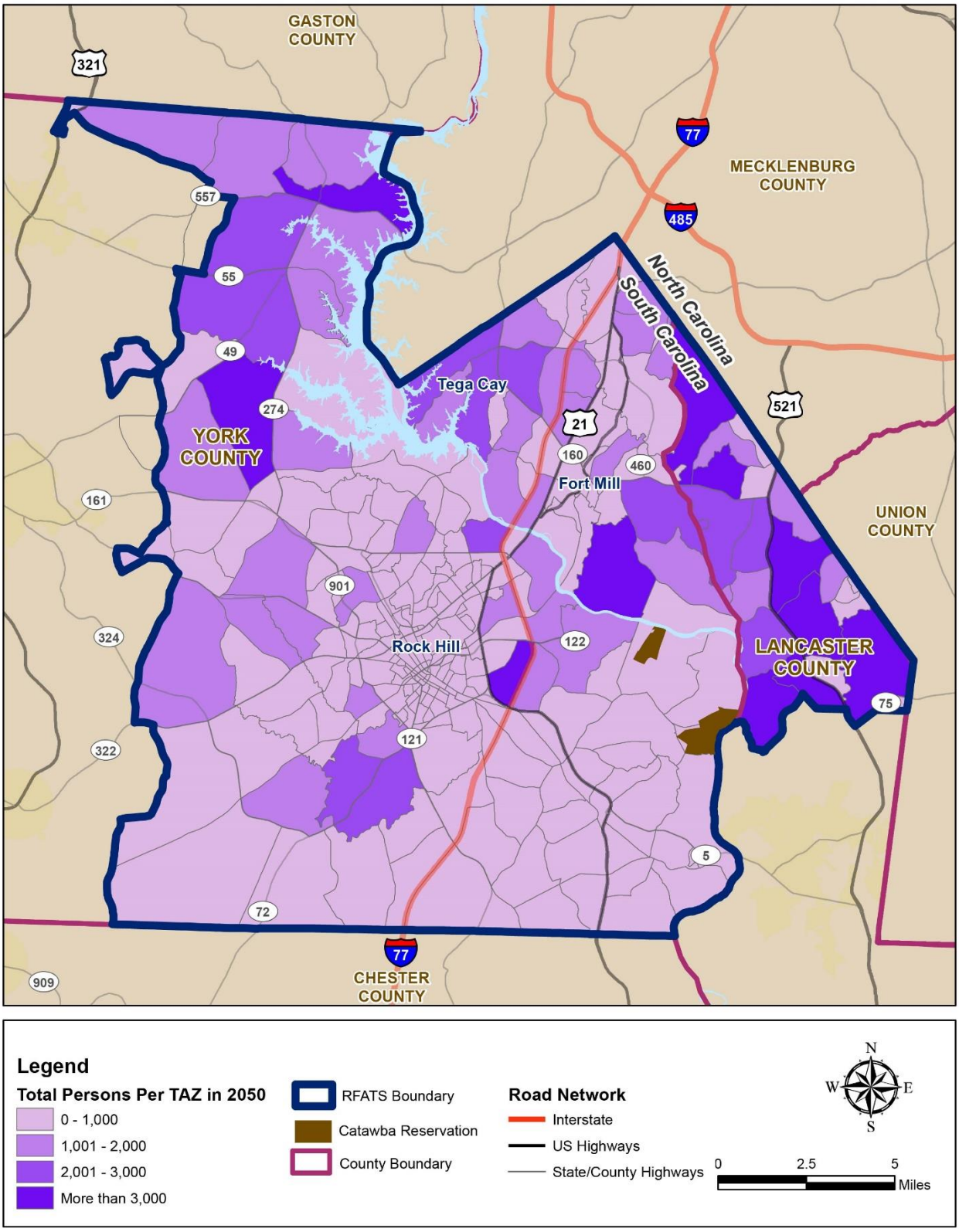


Figure 11.4: 2018 Employment by Traffic Analysis Zone

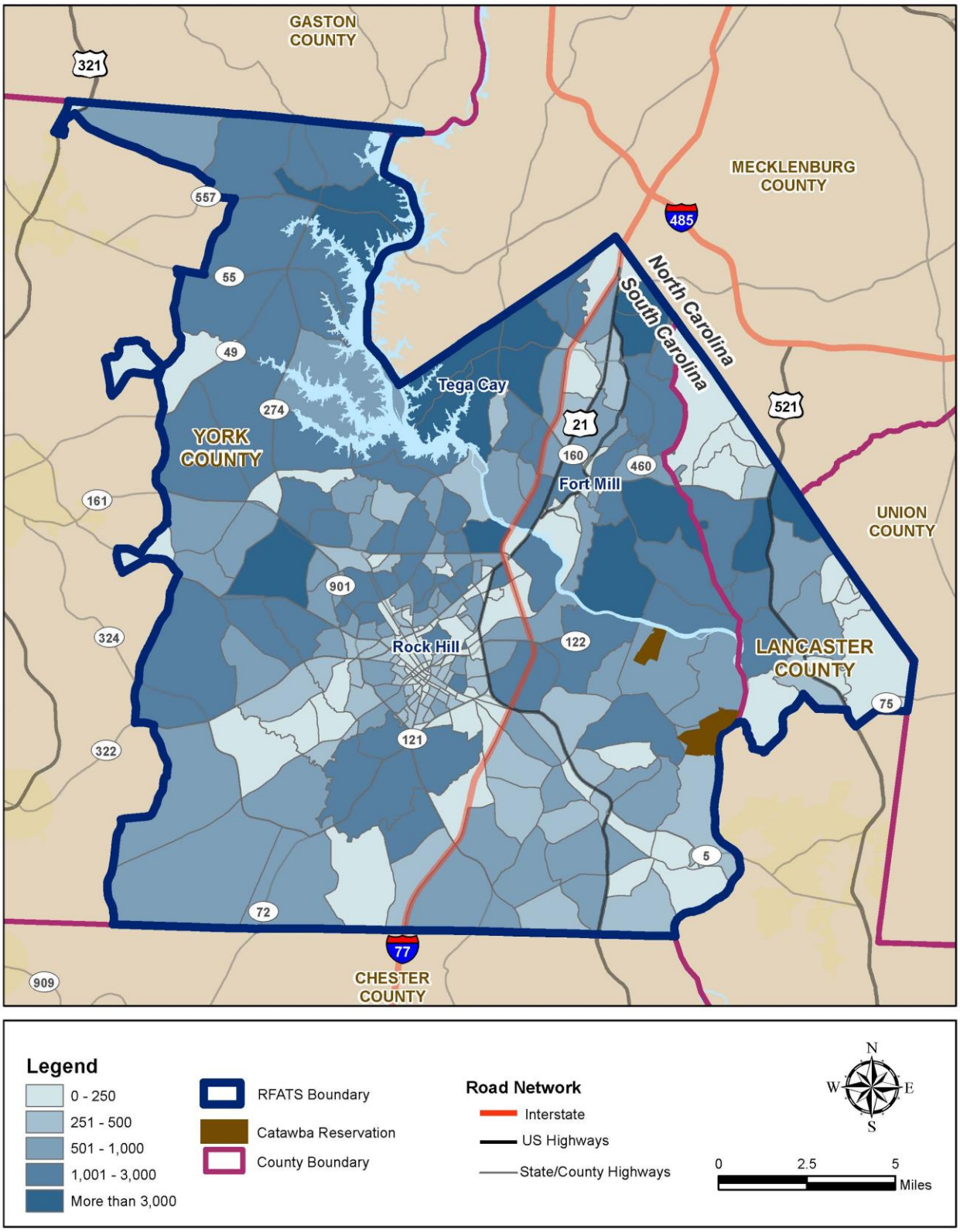
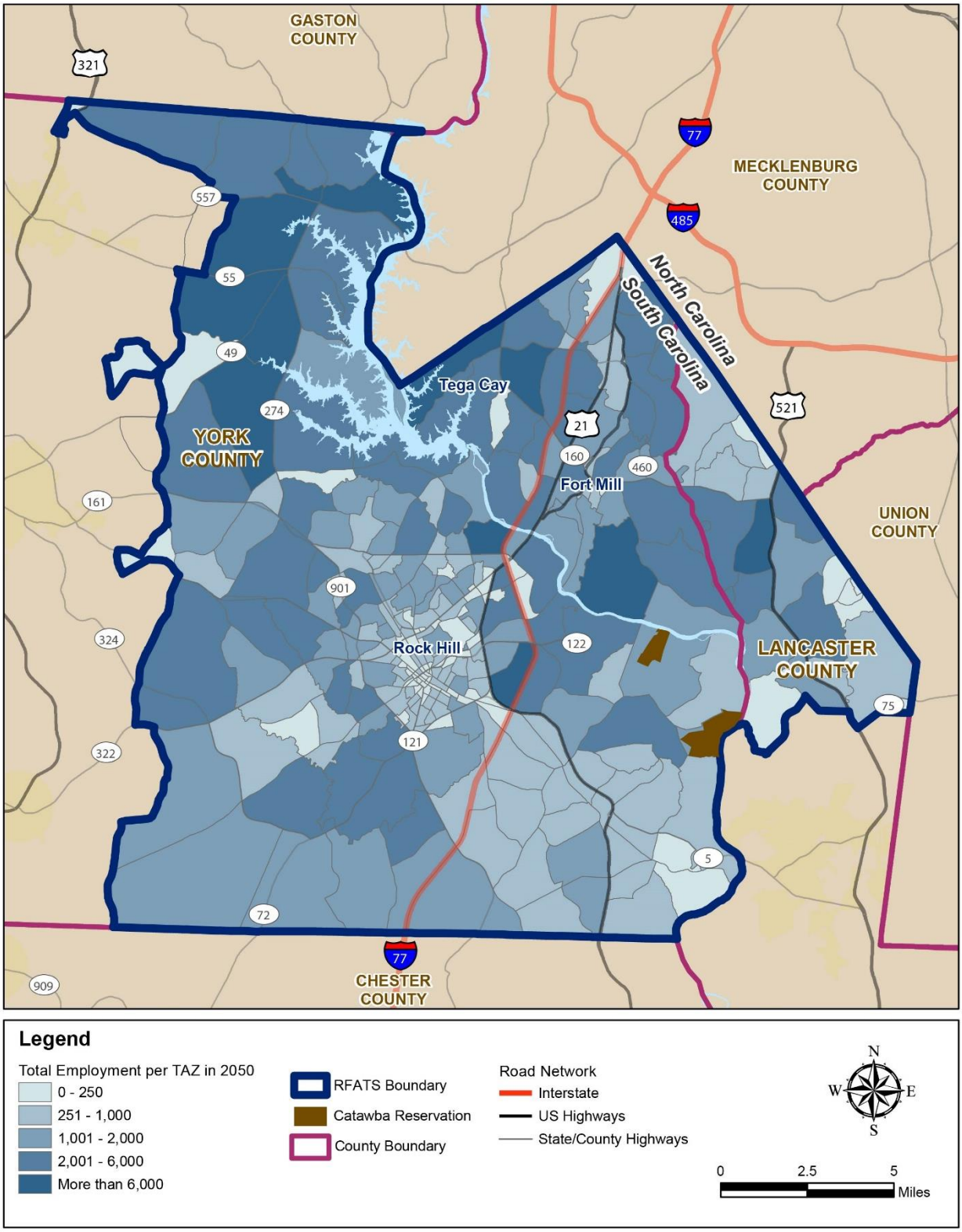


Figure 11.5: 2050 Projected Employment by Traffic Analysis Zone



Potential Impacts of the 2050 Plan

Projects included in the 2050 LRTP vary in scope from minor improvements to widening of major corridors. This section identifies areas where projects may impact sensitive natural and/or cultural resources, outlines potential impact types, and discusses planning-level policies and strategies that can be used to mitigate these impacts.

This section also assesses the extent to which the 2050 LRTP addresses the principles of the U.S. Executive Order on Environmental Justice. Geographic analysis is performed for proposed transportation investments to identify whether they could cause disproportionate impacts to minority or low-income populations through direct effects or due to a lack of transportation investment.

Environmental Screening and Mitigation

This section presents an overview of known environmentally sensitive areas in relation to the proposed projects and programs in the 2050 LRTP. This information can be used to assist in the project development process once a project has moved from the planning stage to the programming stage (the Transportation Improvement Plan, or TIP) for project implementation. Incorporating environmental considerations early in the transportation planning process helps to streamline project development by providing background information about potential impacts and mitigation costs.

As described in Chapter 4 (Roadways), one of the factors used to rank a proposed transportation project is its potential impacts to environmental, social, and cultural resources. This includes identifying major environmental impacts that diminish a project's feasibility.

The screening is not intended to replace a thorough evaluation of each project as it progresses. Most projects will require a more detailed environmental assessment as the project enters the development phase. Some of the projects listed in the LRTP have progressed beyond the design phase. For these projects, necessary environmental reviews and approvals have already occurred.

Air Quality Impacts

A dominant environmental issue for transportation projects across the world is impact to air quality. Vehicles that use fossil fuels produce chemical compounds that contribute to local air pollution. The amount of pollution generated by traffic typically increases with the number of miles being driven in the area as well as by driving conditions (e.g., stop-and-go traffic has been shown to produce higher levels of pollution).

Along with a number of adjacent planning partners within the broader Metrolina region, the RFATS region was designated as a "non-attainment area" for ground level ozone in 2004. In the years that followed, RFATS has implemented a series of targeted improvements to decrease impacts to air quality. In January 2016, the Environmental Protection Agency (EPA) officially recognized these efforts and re-designated RFATS as a "maintenance area" for ground level ozone. This status indicates that progress has been achieved and that there will be continued monitoring of transportation programs and project activity. This is commonly referred to as "transportation conformity", which means that RFATS will complete a comprehensive evaluation of planned improvements to ensure their compliance with applicable air quality standards over the duration of the 2050 Long Range Transportation Plan. This is documented in the "Conformity Demonstration Report", which is available from RFATS upon request.

Other Impacts

Roadway projects also have the potential to produce adverse environmental impacts through land clearing and grading, modification of natural drainage, increasing stormwater runoff, and generation of traffic. In addition, major roads can serve barriers within communities, affecting the way residents can travel and interact. It is also possible for the *absence* of roadway investment to have negative economic impacts within a community.

Sidewalks and bicycle facilities generally have relatively low negative impacts because of their small cross-sections and greater flexibility to avoid problem areas. They often have very positive effects, especially in areas where many people do not have ready access to a vehicle, because they provide safe facilities to make trips on foot or by bicycle.

Transit improvements that require only bus route and service expansions typically have minimal negative impacts. Dedicated fixed-guideway systems, such as the proposed bus rapid transit service, are likely to have greater environmental impacts and are typically evaluated in the same way as roadway projects. Generally, transit projects have a positive impact on the

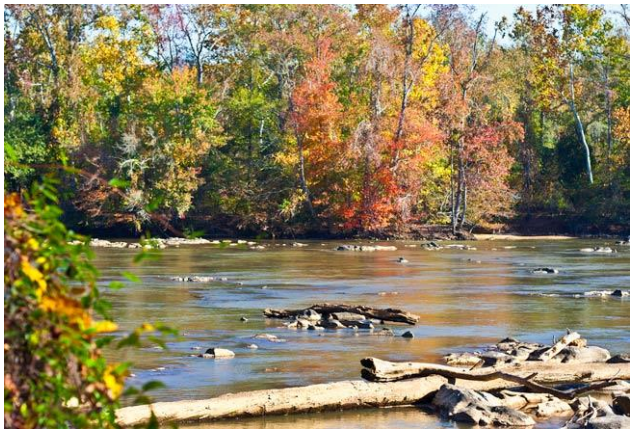
overall system by offering an additional mode choice and increasing the accessibility of the transportation network.

Consultation with Resource Agencies

To prepare this planning-level screening, RFATS staff consulted plans, geographic data, and other information from various agencies responsible for resource management and development. These include the South Carolina Department of Health & Environmental Control (DHEC); SC Department of Natural Resources (DNR); SC Department of Fish & Wildlife Services; SC Department of Archives and History; and EPA.

Items of note reviewed during this process included an environmental summary of natural resources and advisory guidance regarding identified endangered species within the study area. The draft LRTP was also sent to agency representatives to provide an opportunity for comments and additional information.

Natural and Cultural Resources



The planning area includes a variety of natural and cultural resources that should be considered when evaluating transportation projects. The Catawba River corridor and Lake Wylie provide unique natural habitats for a variety of species as well as recreational opportunities for residents and visitors alike. The U.S. Fish and Wildlife Service has not identified any critical habitat within the area, but there are nine species of concern which may be present within the planning region:

- Carolina Heelsplitter clam (endangered)
- Red-cockaded Woodpecker (endangered)
- Northern Long-Eared Bat (threatened)
- Dwarf-Flowered Heartleaf plant (threatened)
- Little Amphianthus plant (threatened)
- Schweinitz's Sunflower plant (endangered)
- Michaux's Sumac plant (endangered)
- Smooth Coneflower plant (endangered)
- Black Spored Quillwort (endangered)

The area is also home to many historic and cultural resources, including parks, several historic districts (such as downtown Fort Mill and Old Town in Rock Hill), and numerous individual historic buildings. The Bi-State Carolina Thread Trail that crosses the area is a burgeoning cultural resource due to the natural and recreational landscapes it traverses.

The presence of the Catawba Indian Nation is also an important cultural asset. The Catawba Cultural Center, located on the Catawba Indian Reservation, presents tours and programs.

The Bethel community in the northwest part of the RFATS planning area is one of the oldest in York County, having developed around Bethel Presbyterian Church (founded in 1764). The church, which is just outside the RFATS study area, was added to the National Register of Historic Places in 1980. Development around Lake Wylie is rapidly changing the rural character of this community. In addition, a 1992 inventory conducted by the South Carolina Department of Transportation identified a number of individual sites which are considered eligible for National Register nomination. These include Hill's Iron Works on Highway 264 at Allison Creek, where weapons were produced during the Revolutionary War. The ore for the iron works was mined at nearby Nanny's Mountain, making this another significant property. This mountain has been purchased by York County for public recreation. There are also several abandoned cemeteries in the area.

Bethel Presbyterian Church
(Photo: Bill Fitzpatrick)

Rock Hill has a variety of cultural resources. These include the Museum of York County, Winthrop University, York Technical College, Clinton Junior College, the Rock Hill Telephone Company Museum, Cherry Park, and the relatively new Center for the Arts. Within or near the City of Rock Hill, there are currently five historic districts, one historic complex, and fifteen individual sites on the National Register. The 1992 survey recommended that additional sites and historic districts be added to the Register and listed other sites as being worthy of additional investigation. This area also includes a number of abandoned cemeteries.

The cultural resources in and around the town of Fort Mill and the City of Tega Cay reflect the recent rapid growth in these areas. In addition to neighborhood parks, Confederate Park serves as a town square for Fort Mill and includes monuments to both the Catawba Indians and soldiers who died in the Civil War. The Anne Springs Close Greenway property, a protected natural area north of Fort Mill, includes several historically-significant buildings. In Fort Mill, National Register listings include the Downtown Historic District, the Unity Presbyterian Church Historic District, and ten individual listings. The 1992 survey recommended adding one additional listing and identified a number of other structures as worthy of further consideration.

Near Fort Mill, the prehistoric and historic site of Spratt's Bottom is located on the Catawba Valley floodplain. Nauvasee, the main village of the

Catawbas, was located less than a mile to the south of Fort Mill. There are also several abandoned cemeteries in this area.

There are a number of historically significant sites within the panhandle of Lancaster County. These include:

- The Old Six Mile Creek Presbyterian Church and Cemetery (circa 1800), located near the intersection of US 521 and Six Mile Creek Road;
- Sumter's Camp at Clems Branch (circa 1780), located on Harrisburg Road near Barberville Road, a Revolutionary War site which is included in the National War Memorial Registry;
- Culp House (circa 1860), located on Harrisburg Road near the intersection of SC 160; and
- Chaney Tavern site (circa 1800), located near the northeast quadrant of the intersection of US 521 and SC 75.

Natural resources in the panhandle area include a branch of Twelve Mile Creek Trail located north of SC 75 which provides connection to the Twelve Mile Creek Greenway in Waxhaw, NC. A 170-foot suspension bridge links the Twelve Mile Creek trail in SC to a segment of the trail in Waxhaw, NC, connecting two states by trail.

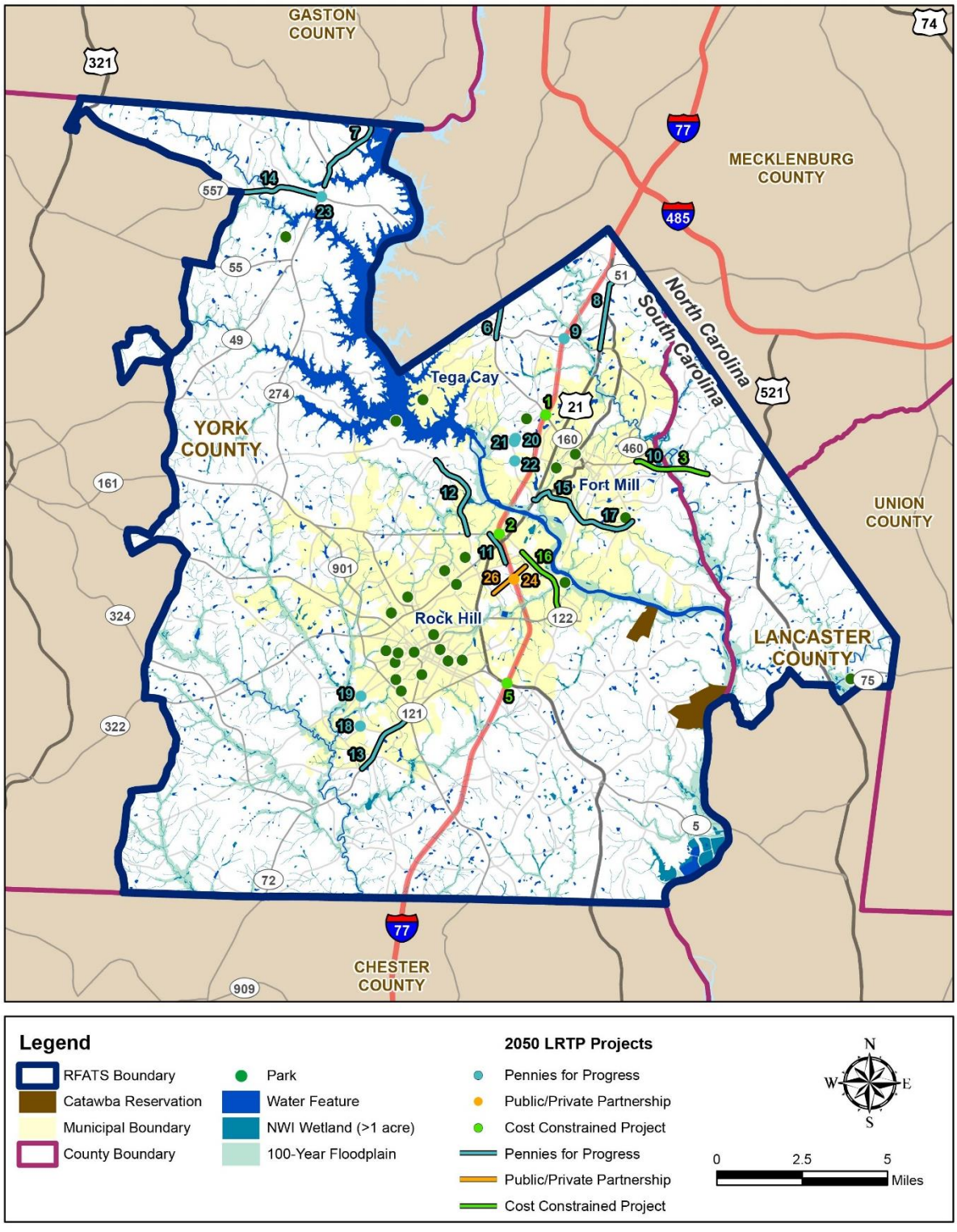
Analysis of Potential Resource Impacts

Figures 11.6 and **11.7** show the location of proposed projects in the 2050 LRTP in relation to known natural and cultural resources that may be sensitive to impacts. Through the high-level environmental screening process, no major project-related impacts to cultural resources were identified; however, further analysis will be required through the National Environmental Policy Act (NEPA) process. Projects with potential impacts to natural resources (primarily floodplains and/or wetlands larger than one acre) are shown in **Table 11.3**.

Table 11.3: Projects with Potential Impacts to Natural Resources

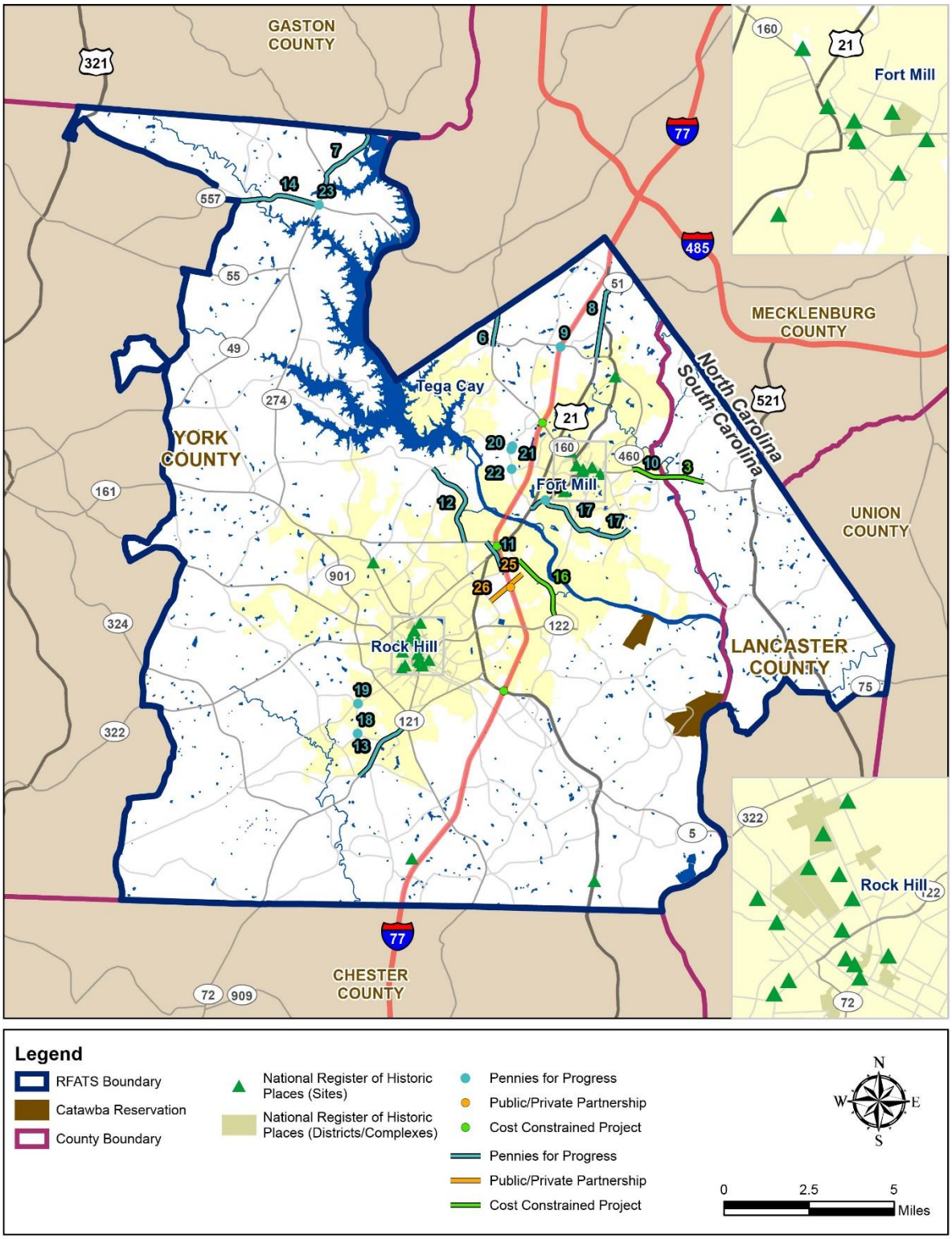
Project ID	Route	Project Description
3	SC 160 Widening	(Rosemont / McMillan to Springfield Parkway) - 5 Lanes
7	Highway 274 / 279	Highway 274 at Landing Pointe Drive to Pole Branch Road - 5 Lanes; Pole Branch Road to NC Stateline - 3 Lanes
10	SC 160 East	Springfield Parkway to Lancaster County Line - 3 Lanes
12	Mt Gallant Road	Celanese to Twin Lakes Road - 3 Lanes
14	Highway 557	Highway 274 to Kingsbury Road - Multilane

Figure 11.6: 2050 LRTP Projects in Relation to Sensitive Natural Resources



Sources: US Fish and Wildlife Service, National Hydrography Dataset, FEMA National Flood Hazard Layer

Figure 11.7: 2050 LRTP Projects in Relation to Sensitive Cultural Resources



Sources: South Carolina Institute of Archaeology and Anthropology, National Parks Service

Potential Mitigation Strategies

Mitigation measures aim to avoid or minimize a project's impact on the environment. These measures can include one or more of the following:

- Avoiding the impact altogether by not implementing a project or a specific element of a project,
- Minimizing impacts by limiting the degree or size of a project element,
- Rectifying the impact by repairing, rehabilitating or restoring an environment that has been affected,
- Reducing or eliminating the impact over time through preservation and maintenance operations during the life of the project, and
- Compensating for the impact by replacing or providing substitute natural resources or environments.

Not every project will require the same level of mitigation. All impacts on environmentally sensitive areas will be analyzed on a project-by-project basis to determine which mitigation strategies are appropriate.

Climate Change

Other environmental concerns relate to the effects of the built environment on the earth's climate. There is general scientific consensus that the earth is experiencing a warming trend and that human-induced increases in atmospheric greenhouse gases (GHGs) are the leading cause. The combustion of fossil fuels is the biggest source of GHG emissions. According to the United Stated States Environmental Protection Agency (EPA), nearly 30 percent of GHG emissions in the United States are from transportation sources.

Because greenhouse gas emissions from transportation sources (fuel combustion and vehicle air conditioning systems) account for a large percentage of the nation's total GHG emissions, the transportation sector will play a large role in the ongoing discussion of GHG reduction goals. Strategies to reduce transportation GHG emissions include:

- **Introduction of low-carbon fuels.** The advantages of using alternative fuels include lower carbon content and the generation of fewer GHG emissions. Currently available alternative fuels include ethanol, biodiesel, natural gas, liquefied petroleum gas, low-carbon synthetic fuels (such as biomass-to-liquids), hydrogen, and electricity.

Transit systems in particular can transition to using electric buses to eliminate emission of greenhouse gases, particulate matter, and other harmful substances. The City of Rock Hill's new MyRide fleet, for example, uses an all-electric system.

- **Increasing vehicle fuel efficiency and use of alternative fuels.** GHG emissions can also be reduced through vehicle improvements that allow less fuel to be used per mile traveled. Fuel efficiency improvements include advanced engine and transmission design, lightweight materials, improved aerodynamic design, and reduced rolling resistance.

- **Improving transportation system efficiency.** This group of strategies seeks to improve the operation of the transportation system through reduced vehicle travel time, improved traffic flow, decreased idling, and other efficiency improvements that result in lower energy use and GHG emissions. The 2050 LRTP recommends continued implementation of projects to improve traffic flow through signal system upgrades and intersection modifications. Efficiency can also be improved by shifting travel to more efficient modes when practical in terms of price and convenience (e.g. passenger vehicle to bus or truck to rail).

- **Reducing carbon-intensive travel activity.** This group of strategies seeks to influence travelers to shift to more efficient modes, increase vehicle occupancy, eliminate the need for some trips, or take other actions to reduce energy use and GHG emissions associated with personal travel. The 2050 LRTP proposes to increase the frequency and availability of public transit and continue to support ridesharing. Projects to improve and expand pedestrian and bicycle infrastructure will also provide more opportunities for sustainable travel.

Adapting to Climate Change Impacts

Climate change is likely to impact transportation infrastructure through increases in severe weather events and extreme temperatures. As a result, the LRTP has considered strategies to mitigate and adapt to these impacts as part of the planning process. The climate change challenges most likely to impact transportation infrastructure are:

- Increases in the number of very hot days and heat waves;
- Increases in Arctic temperatures;
- Increase in air quality issues related to ground-level ozone;
- Increases in the number of intense precipitation events; and

- Increases in hurricane intensity.

The transportation system in the RFATS region will be affected by more intense and longer lasting heat waves as well as by increases in the intensity of precipitation events. Both of these issues are further discussed below.

Managing Stormwater Impacts

The passage of the FAST Act required that Long Range Transportation Plans consider ways to reduce or mitigate stormwater impacts on surface transportation. Rapid flooding can occur when precipitation falls at an elevated rate or quantity. This is particularly common in urban areas where more of the earth's surface is paved and there is less opportunity for runoff to be absorbed, and urban areas across the country are experiencing more frequent flooding and other stormwater issues. Potential strategies for reducing stormwater- or flooding-induced damage include:

- Restricting development of floodplains along rivers and creeks to open space, greenways and other uses that can withstand periodic flooding. For example, the zoning ordinance of Evansville, Indiana, permits only some agricultural and public recreation uses.
- Installing real-time weather and hydrologic data monitoring equipment at area bridges to notify transportation and emergency agencies when they may need to check a particular location for flooding, scouring, or other problems. For example, the National Weather Service currently operates 9 river observation points within the RFATS region, but none of these are currently equipped for forecasting.
- Increasing the resources allocated to critical ongoing road maintenance activities such as street sweeping and clearing of clogged storm drains. Regular maintenance can reduce the risk of road closures or hazards from flooding. For example, the City of Florence, South Carolina has a preventative maintenance plan for its stormwater collection. These activities include ditch maintenance and clearing, routine street sweeping, and regular monitoring of "hot spots".

Flooding on Dave Lyle Boulevard, May 2016
(Photo by Jeff Sochko, Special to The Herald)

Improving Resiliency to Other Transportation System Impacts

Intense heat is damaging to transportation infrastructure, causing kinks in steel rails, placing stress on bridge joints, and softening asphalt. On routes with a large percentage of heavy truck traffic, it is not uncommon to see the roadway become rippled at the approaches to intersections. This damage is caused by the force of braking trucks on hot asphalt, and sustained heat waves could result in the need for more frequent road maintenance.

Under the FAST Act, MPOs are charged with planning for the resilience of transportation infrastructure. This can entail undertaking large-scale efforts to rebuild an important facility that could be impacted by climate change or building a new road or bridge as an alternative to that facility.

There are also relatively small decisions that can be made by individual agencies to increase system resiliency as they replace or upgrade equipment. For example, some traffic signals are activated by loop detectors. These are metal loops embedded in the pavement at an intersection that detect when a vehicle is located directly above. Loops embedded at intersections in an asphalt road can be easily damaged and broken on a hot day when the asphalt partially softens. If local temperatures rise, the region could experience more frequent loop damage. Rather than continue to repair and replace the loops, some cities are switching to alternatives, such as video, radar detection, or adaptive signal control technology.

Environmental Justice and Title VI

Environmental Justice (EJ) legislation originated in Title VI of the 1964 Civil Rights Act. This Act and subsequent legislation aim to ensure that services and benefits are fairly distributed to all people, regardless of race, national origin, or income, and that all people have access to meaningful participation.

Environmental Justice Executive Order (EO) 12898 calls for identifying and addressing disproportionately high and adverse human health or environmental effects of programs, policies and activities on minority and low-income populations. This includes metropolitan transportation plans that use federal funds to accomplish their goals.

A disproportionately high and adverse effect is one that is:

- Predominantly borne by a minority and/or low-income population; or
- Suffered by a minority and/or low-income population more severely or in greater magnitude than the adverse effect suffered by the non-protected population.

Disproportionately high and adverse effects are not determined solely by the size of the population, but rather by the comparative effects on these populations in relation to either non-minority or higher income populations. In this EJ assessment, U.S. Census data was used to identify the demographics of the area in order to recognize potential "communities of concern." Communities of concern are areas where the percentage of low-income households or minorities is greater than that of the entire MPO area.

It is important to note that the determination of what is disproportionately high and adverse human health or environmental effect is context-dependent. All block groups/tracts include some members of protected populations, and the approach used here is based only on Census data and the proportion of protected populations that they contain. As each project enters the development process, additional local knowledge of individual neighborhoods should be used to identify potential communities of concern that may not have been identified through this quantitative analysis.

Understanding the likelihood that a given project will have disproportionately high and adverse effects is crucial to calculating the likelihood that a project will be constructed as well as how and where it will be constructed. For federally funded projects, the design alternatives that avoid and minimize impacts to these populations can advance through the NEPA process and become preferred alternatives that advance to a more detailed level of design and potentially construction. The alternatives that have disproportional impacts will not.

Analysis

Minority Persons

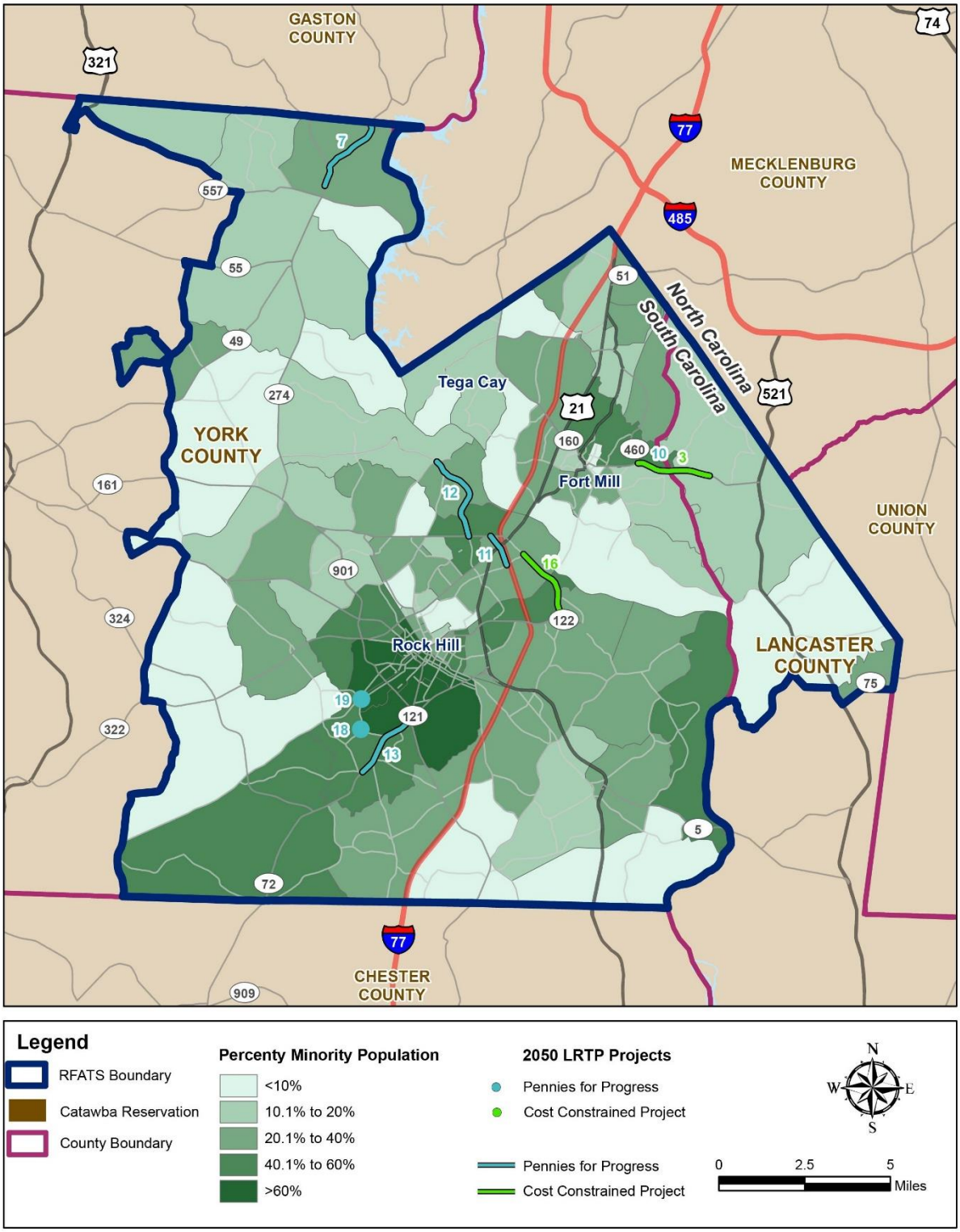
In this analysis, estimates of the minority population were obtained from Census data based on two types of survey responses: (1) persons identifying themselves as African American, Asian American, American Indian and Alaskan Native, Native Hawaiian or Other Pacific Islander; and (2) persons identifying themselves as being of Hispanic or Latino origin. The two categories are not mutually exclusive.

Figure 11.8 shows the distribution of minority populations in the RFATS area in relation to the locations of projects proposed in the 2050 LRTP. A complete list of the projects proposed can be found in Chapter 4. **Table 11.5** lists only the proposed projects within the potential affect areas with a relatively high percentage of minority residents as determined in this analysis.

Table 11.4: Projects with Potential Impact on Minority Communities

Project ID	Location	Project Description	Funding Type
3	SC 160 Widening	Rosemont / McMillan to Springfield Parkway - 5 Lanes	Federally Funded
4	Cel-River Road	S. Eden Terrace Extension to Dave Lyle Boulevard - 5 Lanes	Federally Funded
7	Highway 274 / 279	Highway 274 at Landing Pointe Drive to Pole Branch Road - 5 Lanes; Pole Branch Road to NC Stateline - 3 Lanes	Non-Federally Funded
10	SC 160 East	Springfield Parkway to Lancaster County Line - 3 Lanes	Non-Federally Funded
11	Riverview Road	From Eden Terrace to Celanese Road - 3 Lanes	Non-Federally Funded
12	Mt Gallant Road	Celanese to Twin Lakes Road - 3 Lanes	Non-Federally Funded
13	SC Highway 72	Highway 901 to Rambo Road - 3 Lanes	Non-Federally Funded
16	Cel-River Road	2 to 5 Lane Widening from S-645 (Southern Eden Terrace Extension) to S-122 (Dave Lyle Boulevard)	Non-Federally Funded
18	Neely & Rawlsville Road	Realignment and Improvement	Non-Federally Funded
19	Neely Road & Crawford Road	Realignment and Improvement; Adjustment for Railroad	Non-Federally Funded

Figure 11.8: 2050 LRTP Projects in Relation to Areas of Minority Residents



Source: American Community Survey 5-Year Estimates (Tables B02001 and B01002I, 2018)

Low-Income Persons

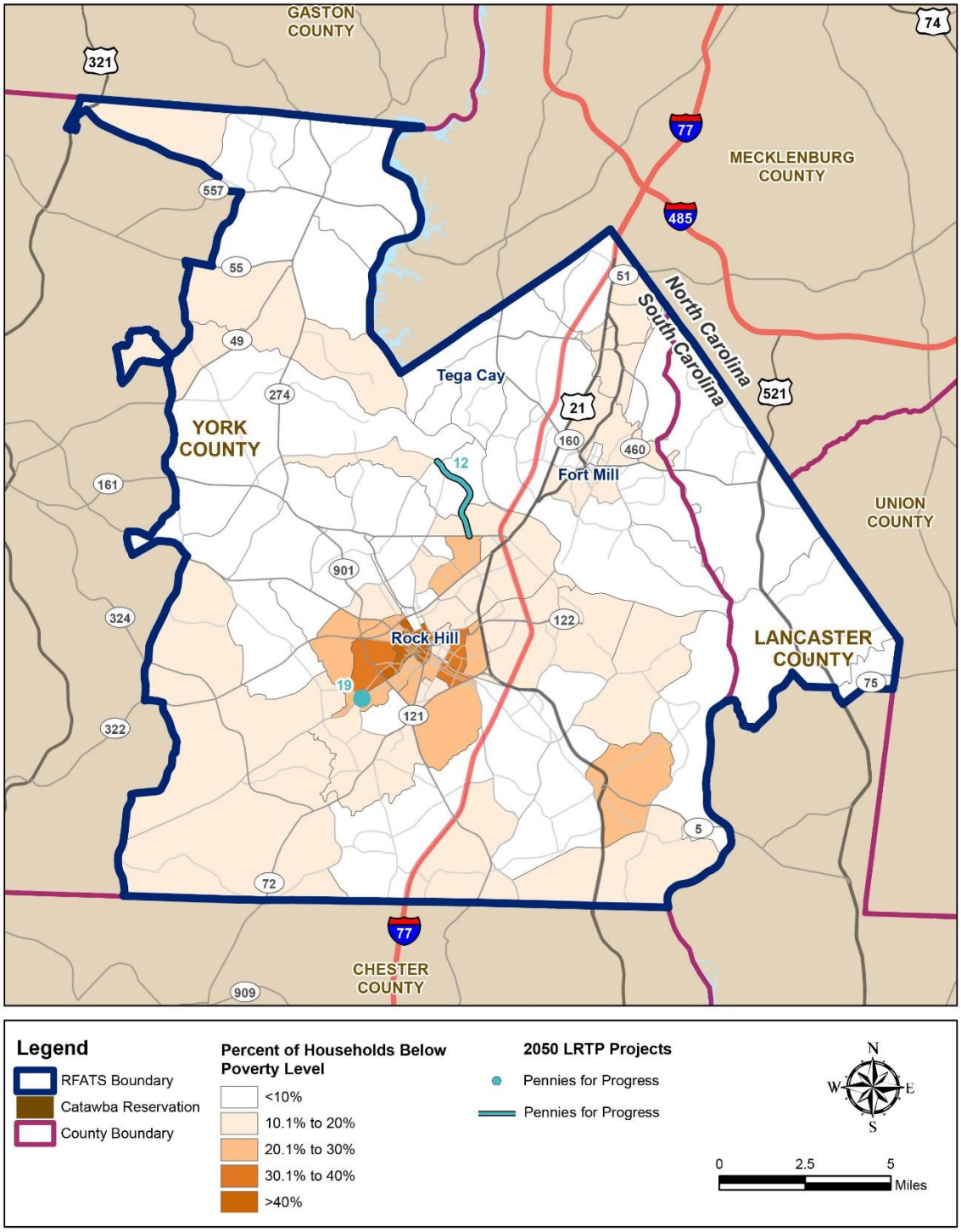
For purposes of this analysis, low-income households are defined as those whose income is at or below the Department of Health and Human Services poverty guidelines. Although these guidelines are referenced in the EJ Executive Order as the standard, they are actually simplified from the U.S. Census Bureau's poverty thresholds on which this plan's analysis is based. The Census Bureau's determination of whether an individual is living at or below the poverty level uses a set of dollar value thresholds that vary by family size and composition.

Figure 11.9 shows the distribution of low-income populations in the RFATS area in relation to the location of projects proposed and/or otherwise included in the 2050 LRTP (e.g., locally funded Pennies projects). **Table 11.5** lists projects with the potential affect areas with a relatively high percentage of low-income residents as determined in this analysis.

Table 11.5: Projects with Potential Impact on Low-Income Persons

Project ID	Location	Project Description
12	Mt Gallant Road	Celanese to Twin Lakes Road - 3 Lanes
19	Neely Road & Crawford Road	Realignment and Improvement; Adjustment for Railroad

Figure 11.9: 2050 LRTP Projects in Relation to Areas of Low-Income Persons



Source: American Community Survey 5-Year Estimates (Table B17017, 2018)

Persons with Limited English Proficiency (LEP)

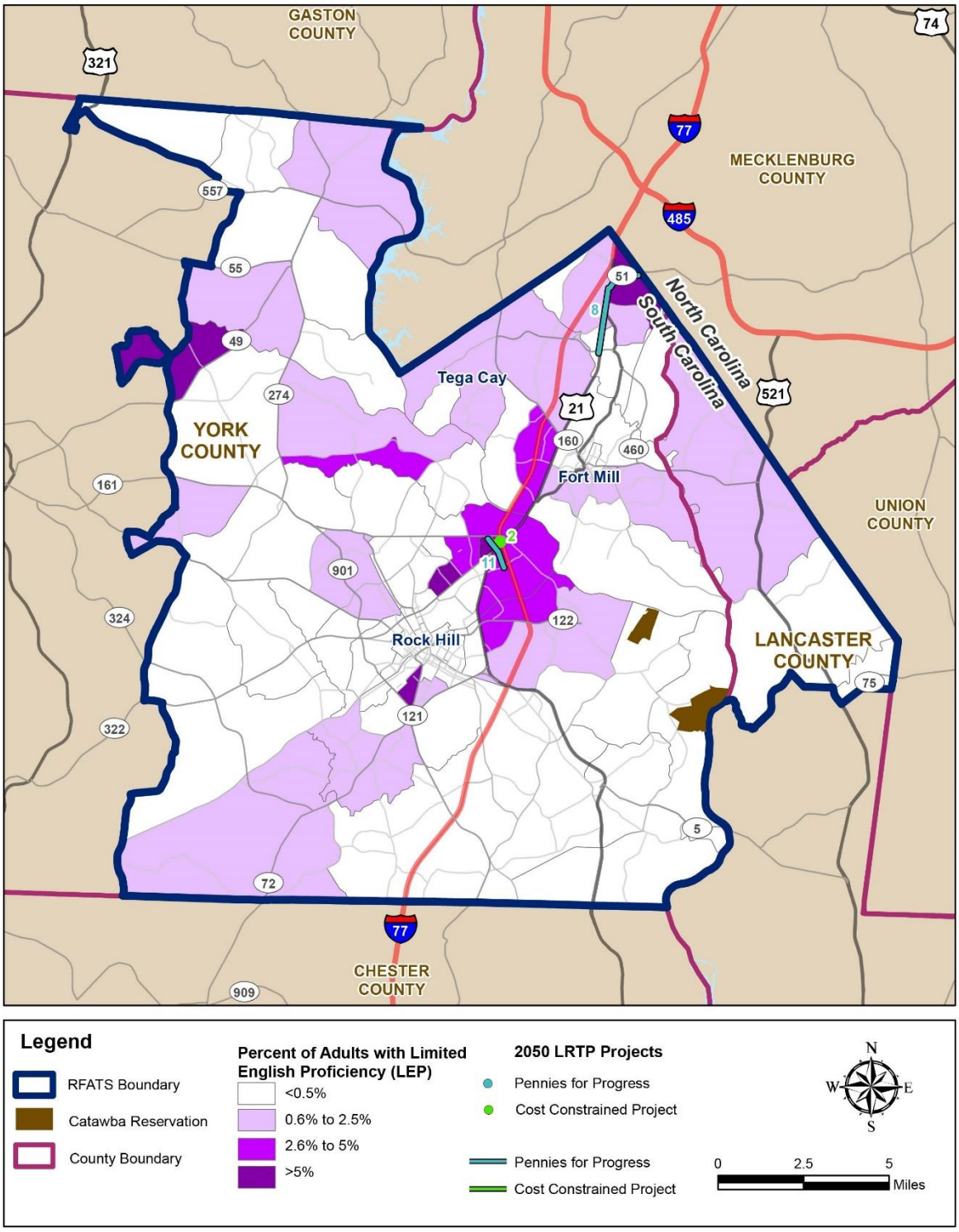
The U.S. Census Bureau definition of Limited English Proficiency applies to adults who indicate they speak English less than 'very well.' Given the low percentage of LEP in the region, broad measures such as translating all documents and providing interpreters for all RFATS public meetings may not be warranted. However, a review of the data does show some locations where adults with LEP make up at least five percent of the total adult population of a given Census block. (**See Figure 11.10**.)

When projects are under development in these areas, RFATS, SCDOT and other responsible agencies could consider targeted outreach requiring that an interpreter attend public meetings. **Table 11.6** lists those projects.

Table 11.6: Projects in Areas with High LEP Populations

Project ID	Location	Project Description
2	Celanese / I-77	Interchange Reconfiguration
8	US 21 North Phase I & SC 51	Springfield Parkway to NC State Line - 5 Lanes
11	Riverview Road	From Eden Terrace to Celanese Road - 3 Lanes

Figure 11.10: 2050 LRTP Projects in Relation to Areas of Persons with Limited English Proficiency



Source: American Community Survey 5-Year Estimates (Table B16004, 2018)

Introduction

Purpose of Chapter

The purpose of the Financial Plan is to demonstrate that the costs of proposed transportation improvements identified in the RFATS 2050 Long-Range Transportation Plan are consistent with projected revenues. Transportation needs in most localities, if not all, far exceed the funding resources available. For this reason, federal legislation requires financial planning to be performed as a component of Long-Range Transportation Plans. Plans must be "fiscally constrained," meaning that the costs of proposed improvements do not exceed the projected revenue stream.

This chapter provides an overview of projected revenues and costs, applicable assumptions (e.g., projected implementation, inflationary assumptions, etc.), and demonstrates that the proposed LRTP is fiscally constrained. Project costs have been developed at the planning level and will likely change as a project enters the formal development process, when more information becomes available about right-of-way, utilities, and other related factors. All project costs and assumptions provided should be re-evaluated in future plan updates.

Federal Funding Sources

Surface Transportation Block Grant Program (Guideshare)

Surface Transportation Block Grant (STBG) funds can be used for a broad range of transportation improvements including roadways, intersection upgrades, intelligent transportation system enhancements, transit, freight, as well as bicycle / pedestrian projects, among others.

A portion of the STBG funds distributed to the South Carolina Department of Transportation (SCDOT) are made available for transportation investments in the state's 11 Metropolitan Planning Organizations (MPOs).

SCDOT sets aside funds each year and then distributes this funding among the state's Metropolitan Planning Organizations (urbanized areas) and Councils of Government (rural areas). The allocation formula is based on the population totals within the urban and rural areas and/or region. RFATS current annual allocation is approximately $6.035 million dollars.

Projects Exempt from the SCDOT Guideshare

Certain projects are funded on a statewide basis through federal programs other than Guideshare. These include improvements on the Interstate

Highway System, for which SCDOT takes the lead to identify and address system needs. Other projects in this category include bridge replacements, resurfacing, safety and other statewide programs. Such projects are described in the RFATS Transportation Improvement Program as "exempt from Guideshare."

Transportation Alternatives

The Transportation Alternatives Program (TAP) or Transportation Alternatives (TA) as it is commonly known, is considered a set-aside of the Surface Transportation Block Grant (STBG) program. The RFATS region receives an annual allocation of TA funds from SCDOT to implement improvements to facilities for bicycles and pedestrians.

MPOs are able to use up to 50% of sub-allocated TA funds to any STBG-eligible purpose so long as a competitive project selection process is maintained. This includes activities that would have been funded under the Safe Routes to School program (since rolled into TA). State DOTs and MPOs produce annual reports detailing the applications for and projects that received TA funding.

Congestion Mitigation and Air Quality Improvement Funds

In 1990, Congress amended the Clean Air Act (CAA) to bolster America's efforts to attain the National Ambient Air Quality Standards (NAAQS). The amendments required further reductions in the amount of permissible tailpipe emissions, initiated more stringent control measures in areas that still failed to attain the NAAQS (nonattainment areas), and provided for a stronger, more rigorous link between transportation and air quality planning. In 1991, Congress adopted the Intermodal Surface Transportation Efficiency Act (ISTEA). This law authorized the Congestion Mitigation and Air Quality (CMAQ) program and provided $6.0 billion in funding for surface transportation and other related projects that contribute to air quality improvements and reduce congestion. The CAA amendments, ISTEA and the CMAQ program together were intended to realign the focus of transportation planning toward a more inclusive, environmentally-sensitive, and multimodal approach to addressing transportation problems.

The CMAQ program was reauthorized in 2015 under the FAST Act and provides funds that can be used by State DOTs, MPOs, and transit agencies for projects that reduce regulated air pollutants from transportation-related sources.

RFATS was designated by EPA as part of the Charlotte/Metrolina region's non-attainment area for ground-level ozone in 2004. Since this time, RFATS

has made a series of targeted improvements at key "hot spots" throughout the transportation network that have yielded favorable results. In 2016 EPA officially reclassified RFATS as being in "attainment" for ground level ozone and changed its air quality status to a "maintenance area." With this designation RFATS will continue to receive CMAQ funding to make further improvements to strengthen regional air quality.

Typical projects that qualify for CMAQ funds include:

- Improved and/or expanded public transit options,
- Traffic flow improvements and high-occupancy vehicle lanes,
- Shared-ride services,
- Bicycle/pedestrian facilities, and
- Flexible work schedules.

State Funding Sources

State Infrastructure Bank

This institution provides financing for a wide variety of highway and transit projects through loans and credit enhancements. The South Carolina State Infrastructure Bank (SIB) is designed to complement the traditional Federal Aid highway and transit grants administered by SCDOT. In 2016 York County submitted an application to the SIB Board for funding towards the I-77 Corridor. The application outlined the importance and need for improving key interchanges along I-77 in York County due to high growth - both residential and employment. These interchanges included:

- Exit 90 – Carowinds Boulevard
- Exit 88 – Gold Hill Road
- Exit 85 – SC 160
- Exit 82 A-C – Celanese Road and Cherry Road

At the time of the application, the interchanges were ranked on the SCDOT Interstate Interchange Management System Program (IMMS) most needed improvements. In 2020, the SIB authorized $82.1M towards two interchange locations:

- I-77 and SC-160 Interchange Reconfiguration and Fort Mill Highway (SC-160) from US 21 to Sutton Road: Widen to 6 lanes ($49.6M)
- Celanese / I-77 Interchange Reconfiguration ($32.5M)

The SIB award at these two locations is critical for improving operating efficiency and safety at critical convergence points within the transportation network; and it is hoped that adverse impacts from COVID-19 will turn out being less burdensome on overall funding availability to the SIB, so that further consideration of Carowinds Blvd / I-77 (Exit 90) can proceed at a later point.

C-Funds

The C-Funds Program is a partnership between SCDOT and the forty-six counties of South Carolina. The program is intended to fund local transportation projects and improvements to state and county roads as well as city streets. These funds are derived from state gasoline tax revenue. Funding amounts are then distributed to each of the 46 counties based on a three-part formula. The formula allocates (1) one third of the C funds based on the ratio of the land area of the county to the land area of the state, (2) one third based on the ratio of the county population to the state population as determined by the latest decennial census, and (3) one third based on the rural road mileage in the county to the rural road mileage in the state.

Local Funding Sources

Pennies for Progress

Pennies for Progress – more formally known as the York County Capital Projects Sales and Use Tax Program – was initiated by York County to provide its citizens with a safer and more efficient roadway system by supplementing other transportation funding sources.

Projects are chosen by a Sales Tax Commission representing the citizens of York County and then approved by York County voters. York County was the first in the State of South Carolina to pass this type of sales tax to improve the road system. A benefit of this tax is ninety-nine cents of every sales tax dollar raised in York County stays in York County.

Since its initial passage in 1997, this program has been renewed three additional times in 2003, 2011, and 2017. The following is a brief overview of the four programs:

	1997 Pennies for Progress	2003 Pennies for Progress	2011 Pennies for Progress	2017 Pennies for Progress
Referendum	November 1997	November 2003	August 2011	November 2017
Tax Expired	6 Years	No later than August 2011	April 2018	1st Quarter 2025
Budget	$185,751,077	$173,000,000	$161,000,000	$277,920,000
Number of Projects	14	25	14	16
Program Duration	1998 to 2009	2004 to 2013	2012 to 2018	2018 to 2025

Other Funding Sources

Private Funds

Since the previous LRTP was adopted, developers have directly completed several new road projects, as well as smaller scale location specific improvements (e.g., dedicated turn lanes, extension of storage capacity, etc.) at different points within the planning area as one component to mitigating operational impacts associated with new development activity. As the region continues to experience elevated growth pressures, partnering with the development community will be a critical element to being able to proactively plan for needed collector roads, protecting future thoroughfare corridors, and securing necessary right-of-way to reduce long term traffic congestion and best address overall transportation network needs. To accomplish this outcome, it will take a cooperative effort between local planning staff, SCDOT, and the development community.

Public/Private Partnerships

One recent successful example of a public-private partnership (P3) is in Rock Hill – where SCDOT, the City of Rock Hill, York County, and the Carolina Panthers partnered in developing a site for a future training facility for the team that will include new interstate access as well as two adjacent roadway connections at Paragon Way and Mt Gallant Road.

The project utilizes funding support from the Infrastructure For Rebuilding America (INFRA) grant program; the South Carolina Department of

Commerce; the Carolina Panthers; the City of Rock Hill as well as coordination with York County on a planned Pennies Project to strengthen the operating capacity of Mt Gallant Road. This project is one example of how public / private partnership as well as coordination at the federal, state and local level can be harnessed to facilitate both economic development and transportation system investments when "developments of regional impact" are conceptualized and built.

Projected Revenues

Guideshare Funding

Table 12.1 identifies projected Guideshare revenue available to RFATS for implementation of the plan. Guideshare funding is projected to increase by roughly 25% following the release and incorporation of the 2020 Census (e.g., 2022). Longer term adjustments reflecting subsequent census changes will be incorporated in future LRTP plan updates.

Debt service shown in Table 12.1 is for SCDOT's "27 in 7" program, through which 27 years of road and bridge work were completed in 7 years. This innovative program used future federal funds to retire state highway bonds. There were five separate bonding programs with one being dedicated to MPOs. The MPOs pay off that debt using future federal funds as shown in **Table 12.1**.

RFATS has committed $10 Million of the allocated Guideshare funding towards bicycle and pedestrian facilities. As described in Chapter 9, the RFATS region conducted as survey with more than 90% of area respondents agreeing that tax dollars spent on the transportation system should include pedestrian and bicycle investments. Therefore, RFATS will be working with the local jurisdictions and SCDOT to identify bicycle and pedestrian projects for possible funding within the allocated allotment.

In addition to the requirement that long-range plans must be fiscally constrained, they are also to take account of inflationary impacts. With this in mind, project costs are shown in year of expenditure or "YOE" dollars, reflecting the fact that project costs will likely be higher for projects that will not be implemented until later in the plan.

Table 12.2 presents current and funding year cost estimates of priority projects identified in the LRTP. Based on these estimates, projected revenues will be sufficient to fund the cost constrained projects of this plan.

Table 12.1: RFATS Guideshare Funding

Year	Guideshare	Debt Service	Available Funding
2021	$6,035,144	$844,925	$5,190,219
2022	$7,543,930	$180,266	$7,363,664
2023	$7,543,930	$180,253	$7,363,677
2024	$7,543,930	$0	$7,543,930
2025	$7,543,930	$0	$7,543,930
2026	$7,543,930	$0	$7,543,930
2027	$7,543,930	$0	$7,543,930
2028	$7,543,930	$0	$7,543,930
2029	$7,543,930	$0	$7,543,930
2030	$7,543,930	$0	$7,543,930
2031	$7,543,930	$0	$7,543,930
2032	$7,543,930	$0	$7,543,930
2033	$7,543,930	$0	$7,543,930
2034	$7,543,930	$0	$7,543,930
2035	$7,543,930	$0	$7,543,930
2036	$7,543,930	$0	$7,543,930
2037	$7,543,930	$0	$7,543,930
2038	$7,543,930	$0	$7,543,930
2039	$7,543,930	$0	$7,543,930
2040	$7,543,930	$0	$7,543,930
2041	$7,543,930	$0	$7,543,930
2042	$7,543,930	$0	$7,543,930
2043	$7,543,930	$0	$7,543,930
2044	$7,543,930	$0	$7,543,930
2045	$7,543,930	$0	$7,543,930
2046	$7,543,930	$0	$7,543,930
2047	$7,543,930	$0	$7,543,930
2048	$7,543,930	$0	$7,543,930
2049	$7,543,930	$0	$7,543,930
2050	$7,543,930	$0	$7,543,930
Total	$236,879,402	$3,246,777	$233,632,625

Table 12.2: RFATS Guideshare Projects

Project	Current Cost Estimate	Funding Year Cost Estimate
Roadway Widenings		
Fort Mill Highway (SC-160) from Springfield Pkwy (SC 460) to Rosemont Drive/McMillian Park Drive: Widen to 5 lanes	$28,500,000	$33,877,544
Interchange Projects		
I-77 and SC-160 Interchange Reconfiguration and Fort Mill Highway (SC-160) from US 21 to Sutton Road: Widen to 6 lanes	$23,400,000	$27,136,826
Celanese / I-77 Interchange Reconfiguration	$68,600,000	$79,554,968
I-77 and Anderson Road (SC 5/US 21) Interchange Reconfiguration	$5,700,000	$6,138,277
TOTAL	$126,200,000	$146,707,615

Federal & State Transit Funding

FTA & SMTF Funding

Transit funding for the RFATS area is provided by the Federal Transit Administration (FTA) and the South Carolina Department of Transportation (SCDOT) Office of Public Transit.

FTA Section 5307 Funding

The FTA administers the Section 5307 Urbanized Area Formula Funding Program. Section 5307 provides funding for planning and capital items at 80% of their cost, and the federal share may not exceed 50% of the net project cost of operating assistance. Funds are apportioned to urbanized areas using a formula based on population, population density, and other factors associated with transit service ridership such as bus revenue vehicle miles, bus passenger miles, fixed guideway revenue vehicle miles, and fixed guideway route miles.

These funds are apportioned annually and remain available for 6 fiscal years (the year of apportionment plus 5 additional years). The federal apportionment must be matched by state and local funds. Local matching funds can be cash or cash-equivalents, depending upon the expenditure. Non-cash shares such as donations, volunteered services or in-kind contributions are eligible to be counted toward the local match only if the value of each is formally documented and supported and represents a cost which would otherwise be eligible under the project.

Within the RFATS Planning Area, there are two 5307 funding allocations available for transit service planning and operations (e.g., the Rock Hill

Urbanized Area and a portion of the Charlotte Urbanized Area that extends into the northern section of the RFATS region). Listed in **Table 12.3** below are estimates of funding availability for each of these areas.

Table 12.3: FTA Section 5307 Transit Funding

Year	Allocations	
	Rock Hill UA	Charlotte UA
2021	$1,362,702	$167,474
2022	$1,382,325	$169,886
2023	$1,402,230	$172,332
2024	$1,422,423	$174,814
2025	$1,442,905	$177,331
2026	$1,463,683	$179,884
2027	$1,484,760	$182,475
2028	$1,506,141	$185,102
2029	$1,527,829	$187,768
2030	$1,549,830	$190,472
2031	$1,572,148	$193,215
2032	$1,594,786	$195,997
2033	$1,617,751	$198,819
2034	$1,641,047	$201,682
2035	$1,664,678	$204,586
2036	$1,688,649	$207,532
2037	$1,712,966	$210,521
2038	$1,737,633	$213,552
2039	$1,762,655	$216,628
2040	$1,788,037	$219,747
2041	$1,813,785	$222,911
2042	$1,839,903	$226,121
2043	$1,866,398	$229,377
2044	$1,893,274	$232,681
2045	$1,920,537	$236,031
2046	$1,948,193	$239,430
2047	$1,976,247	$242,878
2048	$2,004,705	$246,375
2049	$2,033,572	$249,923
2050	$2,062,856	$253,522

SMTF Funding

State Mass Transit Funds (SMTF) are allocated by the South Carolina Department of Transportation to urbanized areas as a portion of the matching funds needed to meet funding requirements to access federal transit funding sources (e.g., 5307 funds, etc). Similar to the two 5307 allocations, there are two SMTF amounts for these same two areas. Eligible assistance categories include capital, administration, and operations. Essentially, these categories correspond to the federal program category which the SMTF funds are matching.

SMTF funds are generated from highway use taxes on motor vehicle fuel. As a general rule, this generates approximately $6 million a year on a statewide basis. Funds are applied for through the Office of Public Transit at SCDOT. Listed below in **Table 12.4** are the SMTF allocation amounts for each of the two urbanized areas.

Table 12.4: State Mass Transit Funds

Year	Allocations	
	Rock Hill UA	Charlotte UA
2021	$145,395	$120,383
2022	$145,395	$120,383
2023	$145,395	$120,383
2024	$145,395	$120,383
2025	$145,395	$120,383
2026	$145,395	$120,383
2027	$145,395	$120,383
2028	$145,395	$120,383
2029	$145,395	$120,383
2030	$145,395	$120,383
2031	$145,395	$120,383
2032	$145,395	$120,383
2033	$145,395	$120,383
2034	$145,395	$120,383
2035	$145,395	$120,383
2036	$145,395	$120,383
2037	$145,395	$120,383
2038	$145,395	$120,383
2039	$145,395	$120,383
2040	$145,395	$120,383
2041	$145,395	$120,383
2042	$145,395	$120,383
2043	$145,395	$120,383
2044	$145,395	$120,383
2045	$145,395	$120,383
2046	$145,395	$120,383
2047	$145,395	$120,383
2048	$145,395	$120,383
2049	$145,395	$120,383
2050	$145,395	$120,383

FTA Section 5309 Funding

In addition, the FTA administers the Section 5309 Fixed Guideway Capital Investment Grants (CIG) program. This program provides assistance for fixed-guideway projects such as new and expanded rapid rail, commuter rail, light rail, streetcars, bus rapid transit, ferries, and bus rapid transit projects that feature qualities of rail.

The CIG has four categories of potential eligible projects:

- New Starts:
    - Eligible projects include the design and construction of new fixed-guideway systems or extensions to existing fixed guideway systems.
    - The total project cost must be equal to or greater than $300 million or total New Starts funding sought equals or exceeds $100 million.
    - New Starts projects are limited to a maximum Section 5309 CIG program share of 60%. The maximum Federal contribution from all Federal sources to a New Starts project is 80%.
- Small Starts
    - Eligible projects include design and construction of new fixed-guideway or extensions to fixed-guideways and the design and construction of corridor-based bus rapid transit projects operating in mixed traffic.
    - Projects must have total estimated capital costs of less than $300 million and be requesting less than $100 million in CIG funds.
    - CIG funds can make up no more than 80% of estimated project costs and total Federal funding may not exceed 80%.
- Core Capacity
    - Eligible projects include the design and construction of corridor-based investment in an existing fixed-guideway system that improves capacity at a minimum of 10% in a corridor that is at capacity or will be in five years.
    - Projects must have a total estimated cost of less than $250 million and be requesting less than $75 million in CIG funds.

  - CIG funds can make up no more than 80% of estimated project costs and total Federal funding can make up no more than 80% of estimated project costs.

- Programs of Interrelated Projects
  - Eligible programs include design and construction of two or more projects that have logical connectivity between them, and projects will have a majority of their construction timelines overlapping. Projects may include any of the eligible projects covered in New Starts, Small Starts, and/or Core Capacity.
  - CIG funds can make up no more than 80% of estimated project costs and total Federal funding may not exceed 80%.

The FAST Act approved a pilot program to streamline the regulatory process for up to eight grants. Federal funds can comprise no more than 25% of estimated total project costs made up of Federal funds. Projects must also feature a public-private partnership funding component and be operated and maintained by employees of an existing public transportation provider. In order for a fixed-guideway project to be recommended by the FTA to Congress for discretionary funding, it must receive favorable ratings on the following "New Starts" criteria:

- Level of mobility improvement provided by the project
- Extent to which land use policies are supportive of rapid transit
- Environmental benefits
- Congestion Relief
- Cost effectiveness (cost per trip)
- Economic Development

The local project must receive a favorable rating on the above criteria in comparison to competing projects seeking federal funds throughout the country. Section 5309 funds must be matched by state and local funds. Local matching funds can be cash or cash-equivalent, depending upon the expenditure. Non-cash shares, such as donations, volunteered services, or in-kind contributions, are eligible as local match only if the value of each share is formally documented. Capital assistance grants made to local agencies are funded up to 80% of net project costs, unless the grant recipient requests a lower federal grant percentage.

Any public body or agency is eligible to apply for "Small Starts" funds as long as it has the legal, technical, and financial capacity to carry out the project. If the grant applicant is not expected to be the project operator, the applicant

must demonstrate how the project will be operated and maintained and provide an executed agreement before a Project Construction Grant Agreement can be finalized.

In addition to the aforementioned cost and funding limits, a "Small Starts" bus project must be a fixed guideway for at least 50% of the project length in the peak period or a corridor-based bus project with the following minimum elements:

- Substantial Transit Stations
- Signal Priority/Pre-emption (for Bus/LRT)
- Low Floor / Level Boarding Vehicles
- Special Branding of Service
- Frequent Service - 10 min peak/15 min off peak
- Service offered at least 14 hours per day

Since the enactment of MAP-21 legislation (and continued in the FAST Act), all projects seeking Section 5309 Capital Program funds must be evaluated and rated according to the criteria specified in law either as a New Starts project, a Small Starts project, or a Core Capacity project. Programs of Interrelated Projects are comprised of any combination of two or more New Starts, Small Starts, or Core Capacity projects. (Under previous authorizing laws, projects seeking less than $25 million in Capital Investment Program funds could be exempt from evaluation and rating if they chose to be, but that option was discontinued in MAP-21.)

As the existing roadway network continues to experience increasing congestion and a reduced level of service (LOS), the need for further discussion about the role and function of a mass transit component continues to increase as one of a range of important strategies for meeting current as well as projected demand levels within the RFATS region.

FTA Section 5310 Funding

The FTA also administers the Section 5310 program. This program provides formula funding to states for the purpose of assisting private nonprofit groups in meeting the transportation needs of older adults and people with disabilities when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs. Funds are apportioned based on each state's share of the population for these two groups. The program aims to improve mobility for seniors and individuals with disabilities by removing barriers to transportation service and expanding

transportation mobility options. Listed below in **Table 12.5** are the Section 5310 allocation amounts.

Table 12.5: Section 5310 Funding

Year	Allocation
2021	$22,300
2022	$22,635
2023	$22,974
2024	$23,319
2025	$23,668
2026	$24,023
2027	$24,384
2028	$24,750
2029	$25,121
2030	$25,498
2031	$25,880
2032	$26,268
2033	$26,662
2034	$27,062
2035	$27,468
2036	$27,880
2037	$28,298
2038	$28,723
2039	$29,154
2040	$29,591
2041	$30,035
2042	$30,485
2043	$30,943
2044	$31,407
2045	$31,878
2046	$32,356
2047	$32,841
2048	$33,334
2049	$33,834
2050	$34,342

Transportation Alternatives Funding

As noted previously, the RFATS region receives an annual allocation of Transportation Alternative (TA) funds from SCDOT to implement improvements to facilities for bicycles and pedestrians. MPOs are able to use up to 50% of sub-allocated TA funds to any STBG-eligible purpose so long as a competitive project selection process is maintained. This includes activities that would have been funded under the Safe Routes to School program (now reflected in TA). Listed below in **Table 12.6** are the TA allocation amounts. Since this funding program is periodically updated per the re-authorization of the federal transportation bill (currently the FAST Act) and assumed funding allocations is unknown, the yearly allocations are identified as a constant value related to the current allocation. This is due to the unknown future funding allocations and federal budgets.

Table 12.6: Transportation Alternatives Program Funding

Year	Allocation
2021	$115,000
2022	$115,000
2023	$115,000
2024	$115,000
2025	$115,000
2026	$115,000
2027	$115,000
2028	$115,000
2029	$115,000
2030	$115,000
2031	$115,000
2032	$115,000
2033	$115,000
2034	$115,000
2035	$115,000
2036	$115,000
2037	$115,000
2038	$115,000
2039	$115,000
2040	$115,000
2041	$115,000
2042	$115,000
2043	$115,000
2044	$115,000
2045	$115,000
2046	$115,000
2047	$115,000
2048	$115,000
2049	$115,000
2050	$115,000

Congestion Mitigation and Air Quality (CMAQ) Program

The use of CMAQ funds is also a permissible source of transit start-up and initial operating funding to enhance area mobility and transportation system efficiency through the use of public transportation. Although a smaller source of funding, it can nonetheless be considered as one element of transitional funding for further transit service development.

Listed below in **Table 12.7** are the CMAQ allocation amounts. Since this funding program is periodically updated per the re-authorization of the federal transportation bill (currently the FAST Act) and assumed funding allocations is unknown, the yearly allocations are identified as a constant value related to the current allocation. This is due to the unknown future funding allocations and federal budgets.

Table 12.7: Congestion Mitigation and Air Quality Program Funding

Year	CMAQ
2021	$2,300,000
2022	$2,300,000
2023	$2,300,000
2024	$2,300,000
2025	$2,300,000
2026	$2,300,000
2027	$2,300,000
2028	$2,300,000
2029	$2,300,000
2030	$2,300,000
2031	$2,300,000
2032	$2,300,000
2033	$2,300,000
2034	$2,300,000
2035	$2,300,000
2036	$2,300,000
2037	$2,300,000
2038	$2,300,000
2039	$2,300,000
2040	$2,300,000
2041	$2,300,000
2042	$2,300,000
2043	$2,300,000
2044	$2,300,000
2045	$2,300,000
2046	$2,300,000
2047	$2,300,000
2048	$2,300,000
2049	$2,300,000
2050	$2,300,000

State Infrastructure Bank

The South Carolina State Infrastructure Bank is an institution established to select and assist in financing major qualified projects by providing loans and other financial assistance to government units as well as private entities for constructing and improving highway and transportation facilities necessary for public purposes. These funds are potentially available for use in transit projects. Transit projects are only eligible for capital expenditures for transit equipment and facilities. Though it is important to note that no transit projects have been funded through the SIB to date.

Summary and Recommendations

Summary of Key Points

- Transportation needs in most, if not all localities far exceed the funding resources available,
- Revenue is provided through Federal, State and Local programs,
- "Year of Expenditure" costs were determined by assuming a 2.5% inflation rate per SCDOT,
- By reviewing revenues versus costs, a cost constrained financial plan can be developed to address transportation system needs in the RFATS Planning Area.

Recommendations

- Assist York County in pursuing a fifth "Pennies for Progress" program,
- Develop plans, regulations, policies, and procedures to protect future thoroughfare and collector street corridors and require contributions from developers,
- Assist City of Rock Hill in operating My Ride bus service,
- Continue to monitor the roadway congestion and evaluate mass transit opportunities,
- Continue the Capital Sales and Use Tax Program as a local funding source to leverage federal and state funds for road improvements,
- Continue to integrate new and/or improved pedestrian and bicycle facilities along with road improvements proposed in the "Pennies for Progress" program,

- Assist York County in supporting the South Carolina State Infrastructure Bank (SIB) for funding of I-77 Exit 90 (Carowinds Boulevard).