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)

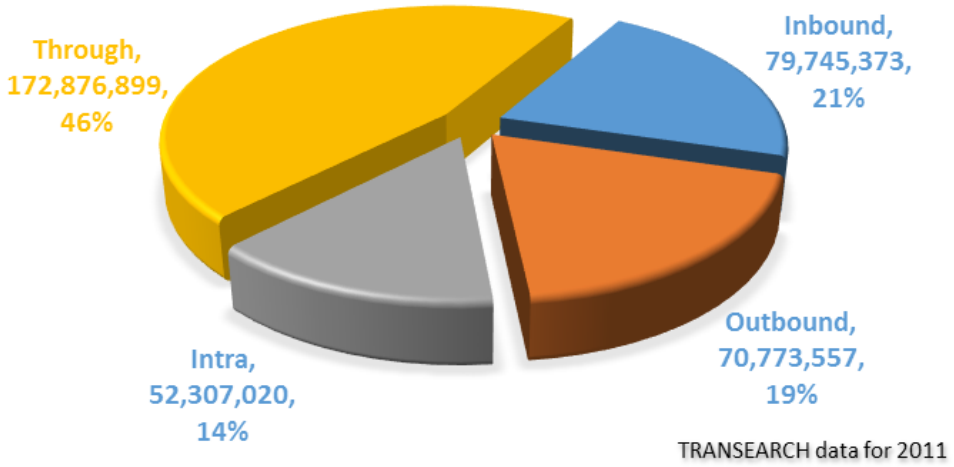
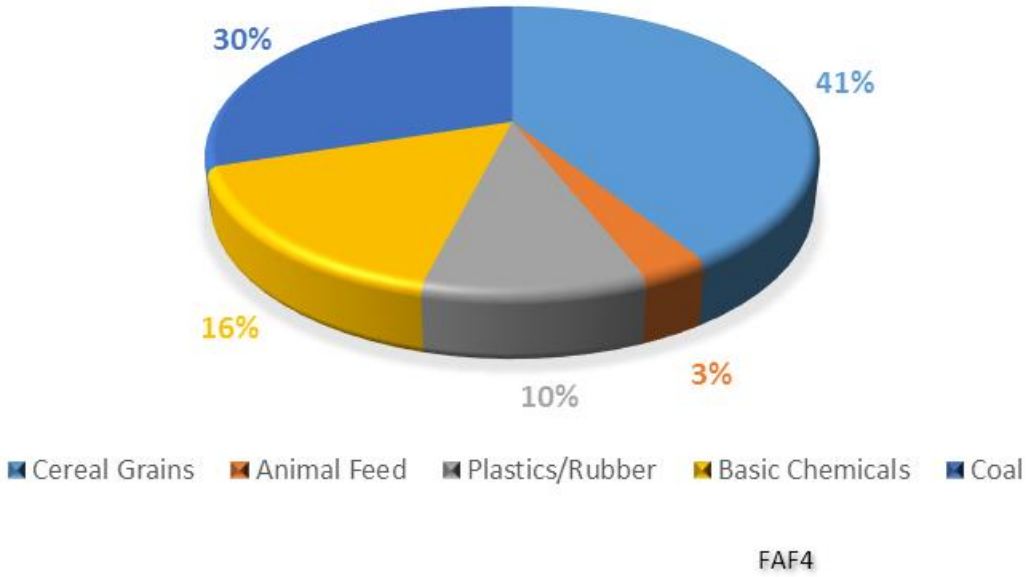


Figure 7.2: Top Commodities Shipped by Rail, by Weight



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

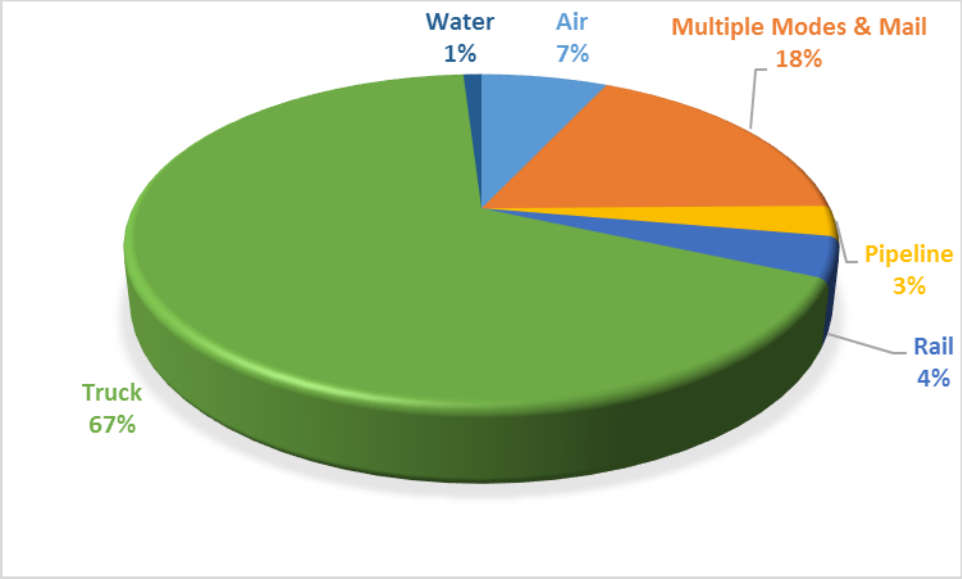
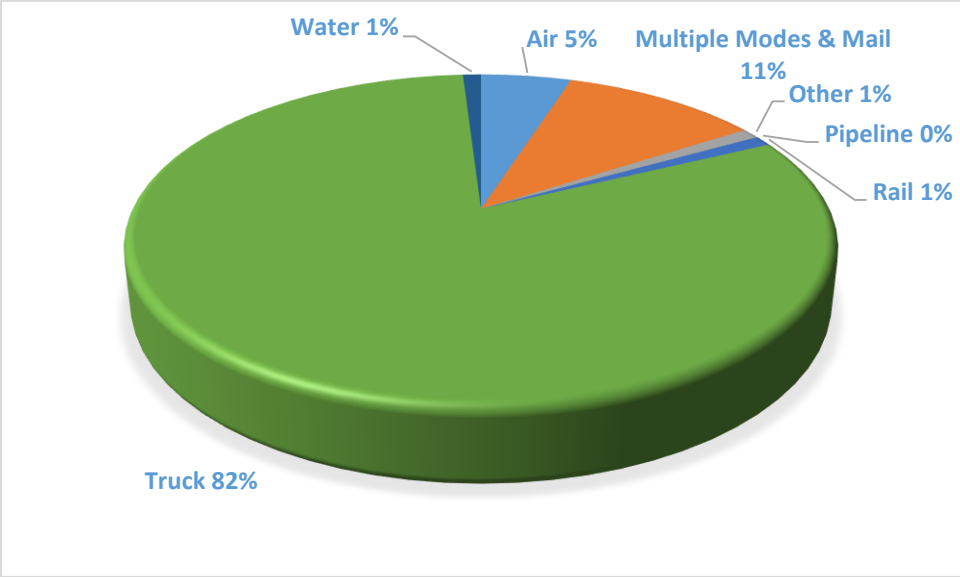


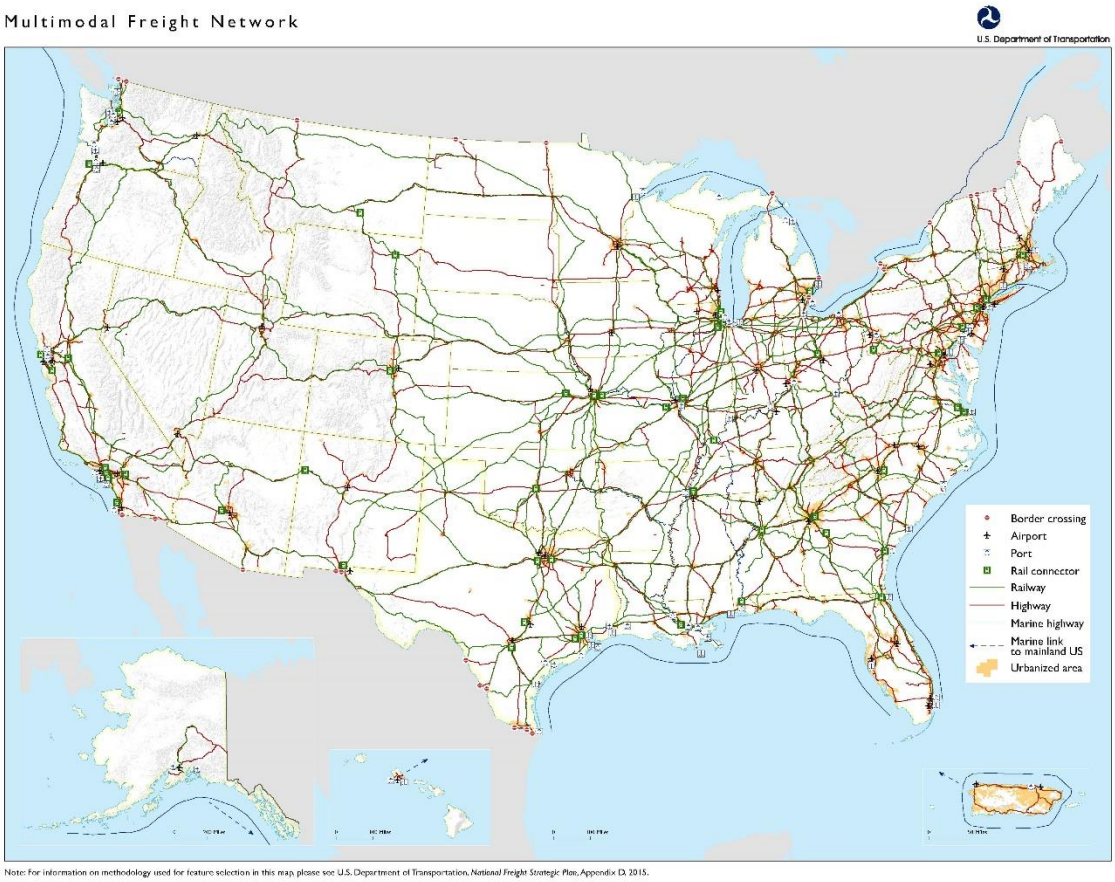
Figure 7.4: Outbound Freight Value, by Modal Share



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 from 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.

Technological advancements in freight movement are being explored, ranging from vehicle-to-vehicle communication systems, vehicle-to-infrastructure communication systems, and autonomous freight trucks. These advancements could improve traffic congestion and safety, and reduce the cost of freight movement. Autonomous trucks could be operating by 2045.

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.

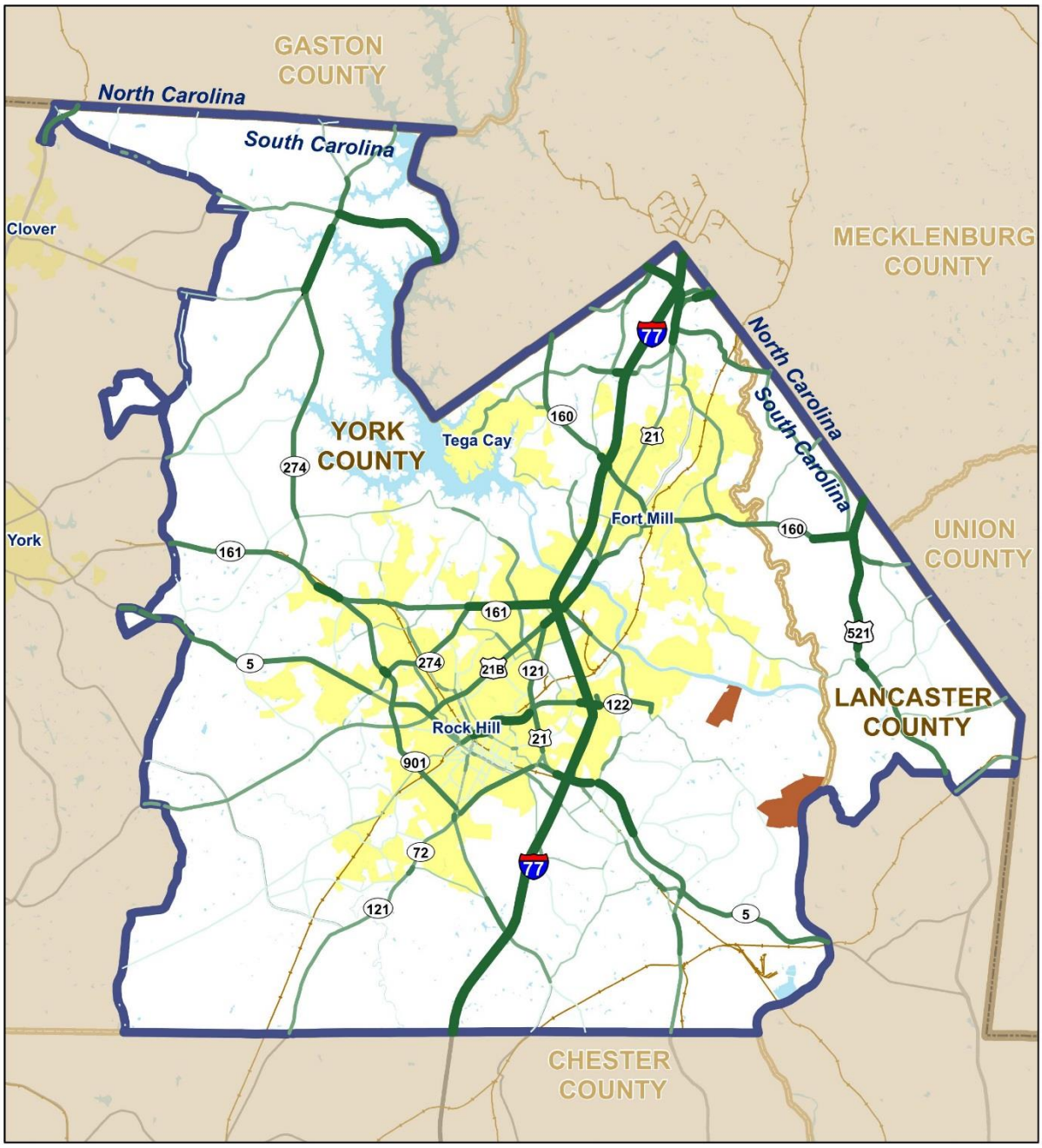
The state of South Carolina is also moving toward construction of a new intermodal facility in Dillon, in addition to the one currently located in Greer.

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)



Source: Metrolina Regional Model

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).

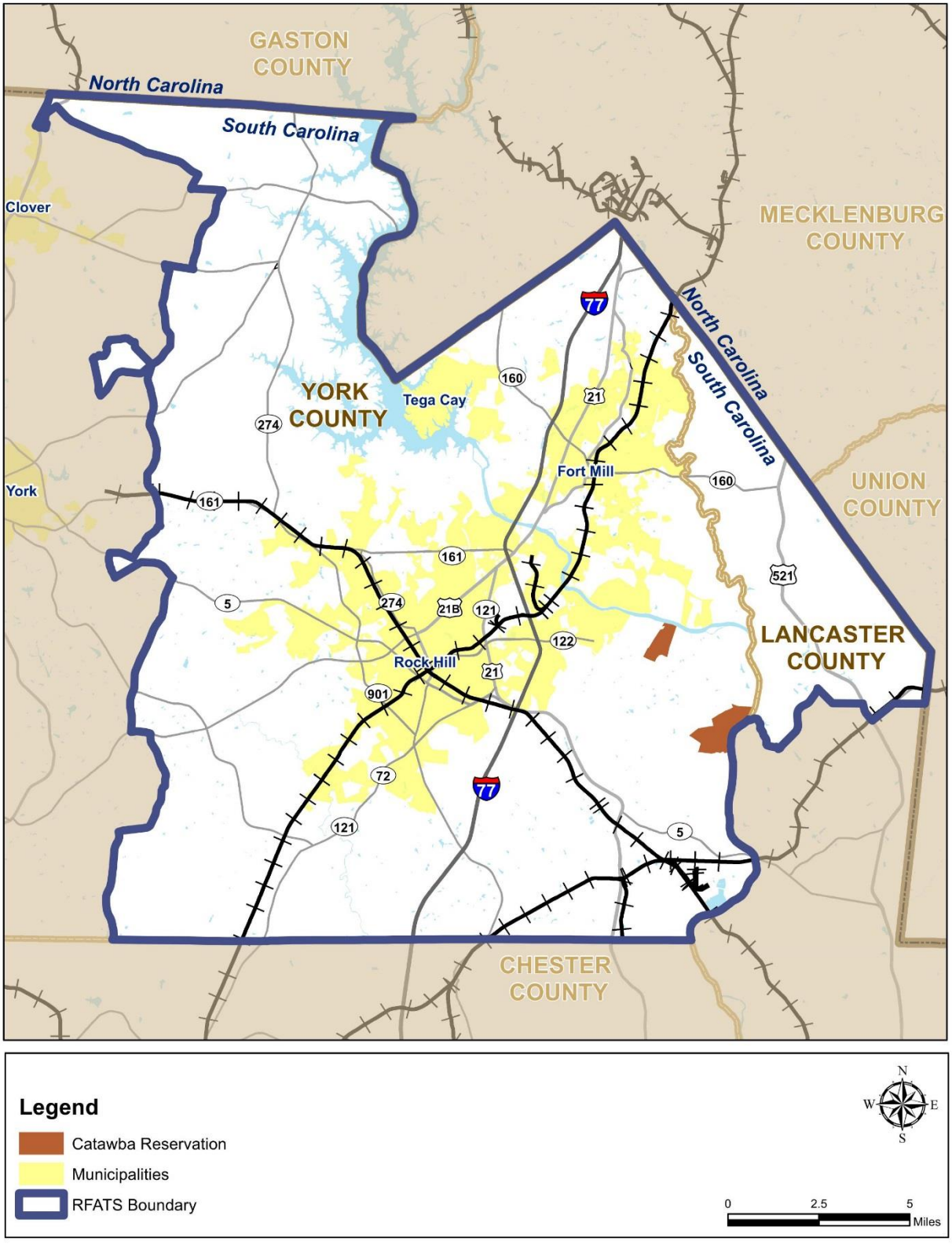
The rail lines within the RFATS region are not major inter-state corridors. Their future remains tied to the overall health of the railroad industry and to the decisions of individual customers along the route. Although the future of the two main lines through the RFATS region appears secure, the NS 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

As part of the Greater Charlotte Regional Freight Mobility Plan, stakeholder meetings, steering committee meetings, and coordinating committee meetings were conducted, as well as establishment of a regional freight advisory committee. RFATS and the Catawba Regional Council of Governments participated in all levels of the stakeholder process. Many of the plan's goals were discussed along with identifying projects and policies that would form the framework for the prioritization of investments found in the Plan.

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.