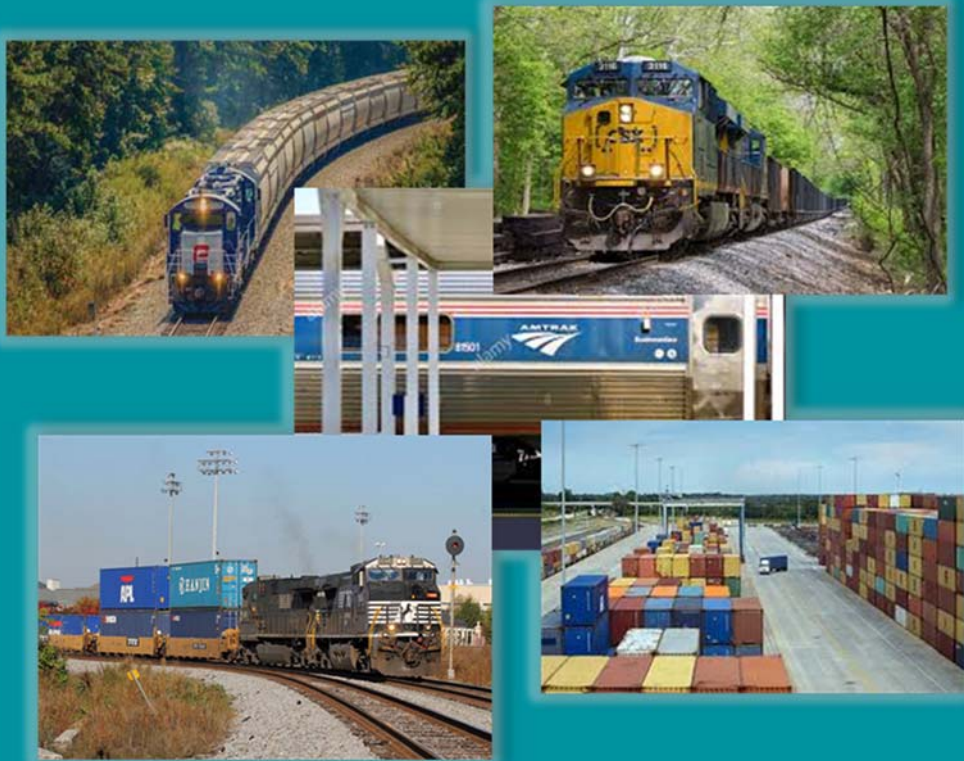


SOUTH CAROLINA STATEWIDE RAIL PLAN UPDATE



2020





U.S. Department of Transportation

Federal Railroad
Administration

1200 New Jersey Avenue, SE
Washington, DC 20590

November 19, 2020

Mr. Doug Frate
Intermodal and Freight Programs
South Carolina Department of Transportation
955 Park Street
Columbia, SC 29202

Dear Mr. Frate,

The Federal Railroad Administration (FRA) has completed its review of the 2020 South Carolina State Rail Plan (also referred to as the State Rail Plan or SRP).

FRA's review of the SRP found that it contained the required elements in accordance with 49 U.S.C. 22705 and FRA's 2013 State Rail Plan Guidance. This letter serves as notice that FRA formally accepts the SRP.

While FRA finds that the SRP meets the minimum requirements, FRA recommends addressing the following points in future updates of the SRP:

- Consider reorganizing section 3.2.1 *Current Southeastern Rail Activity* to clarify the history of the rail governance bodies in the Southeast and how they work together. Pages 81-83 presents the relevant information, but the chronology of the governance bodies and their individual roles within the Southeast are unclear.
- In section 3.4 on page 87 consider clarifying that SCDOT participated in the Southeast Regional Rail Plan and acted as a lead stakeholder. Also, clarify the purpose of the study as the establishment of a long-term vision for the implementation and management of passenger rail in the Southeast. Consider discussing the role of the SE Plan in the development of SCDOT's SRP and in the work underway through the Southeast Corridor Commission.
- In Chapter 5, considering identifying the Atlanta- Charlotte Tier II environmental study as part of South Carolina's Rail Service and Investment Program.

Section 11315(a)(1) of the Fixing America's Surface Transportation Act (P.L. 114-94, December 4, 2015) revised the requirement for State-approved plans to be resubmitted to FRA no less frequently than once every 4 years (previously 5 years). As such, FRA looks forward to working with you on the next iteration of the South Carolina State Rail Plan due in November 2024.

FRA looks forward to a continued partnership with the State of South Carolina to build and maintain a safe, reliable, and efficient U.S. rail network.

Sincerely,

Frances Bourne

Frances S. Bourne
Acting Chief
National Rail Planning Division

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1 THE ROLE OF RAIL IN STATEWIDE TRANSPORTATION

The South Carolina State Rail Plan has been updated in consideration of the following South Carolina statewide plans that were reviewed in parallel and updated as needed in a coordinated effort:

- 2040 Statewide Multimodal Transportation Plan (MTP);
- Interstate Plan and Updates;
- Strategic Corridor Plan;
- Public Transit and Coordination Plans; and
- Statewide Freight Plan.

The Statewide Multimodal Transportation Plan or MTP is South Carolina’s Long-Range Statewide Transportation Plan as required by the current federal transportation funding legislation,

This State Rail Plan is consistent with and contains elements required under Chapter 227 of Title 49, as enacted in the Passenger Rail Investment and Improvement Act of 2008 (PRIIA).

This Plan updates the previous plan of 2014, which was developed to comply with Title 49, Part 266.15 and Requirements for a State Rail Plan.

1.1 South Carolina’s Goals for Multimodal Transportation

The state’s goals for the multimodal transportation system have been identified in South Carolina’s 2040 Statewide Multimodal Transportation Plan. These goals build upon the Multimodal Transportation Plan Vision:

*Safe, reliable surface transportation and
infrastructure that effectively supports a healthy
economy for South Carolina.*

- **MOBILITY AND SYSTEM RELIABILITY GOAL:** Provide surface transportation infrastructure and services that will advance the efficient and reliable movement of people and goods throughout the state.
- **SAFETY GOAL:** Improve the safety and security of the transportation system by implementing transportation improvements that reduce fatalities and serious injuries as well as enabling effective emergency management operations.
- **INFRASTRUCTURE CONDITION GOAL:** Maintain surface transportation infrastructure assets in a state of good repair.
- **ECONOMIC AND COMMUNITY VITALITY GOAL:** Provide an efficient and effective interconnected transportation system that is coordinated with the state and local planning efforts to support thriving communities and South Carolina’s economic competitiveness in global markets.
- **ENVIRONMENTAL GOAL:** Partner to sustain South Carolina’s natural and cultural resources by minimizing and mitigating the impacts of state transportation improvements.

- **EQUITY GOAL:** Manage a transportation system that recognizes the diversity of the state and strives to accommodate the mobility needs of all of South Carolina’s citizens.

Each of these goals has a series of objectives, guiding principles, and performance measures that tie the conceptual elements of the vision and goals to actual program and project implementation.

Since the freight rail mode is an integral part of the state’s freight transport system, the national goals below are incorporated into the State Rail Plan. National goals have been integrated into the above goals established for the SMTP as objectives and guiding principles of the State Rail Plan goals.

Goals in the National Freight Policy established in 23 U.S.C. 167

- 1) Invest in infrastructure improvements and to implement operational improvements on the highways of the United States that-
 - strengthen the contribution of the National Highway Freight Network to the economic competitiveness of the United States;
 - reduce congestion and bottlenecks on the National Highway Freight Network;
 - reduce the cost of freight transportation;
 - improve the year-round reliability of freight transportation; and
 - increase productivity, particularly for domestic industries and businesses that create high-value jobs;
- 2) Improve the safety, security, efficiency, and resiliency of freight transportation in rural and urban areas;
- 3) Improve the state of good repair of the National Highway Freight Network;
- 4) Use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Highway Freight Network;
- 5) Improve the efficiency and productivity of the National Highway Freight Network;
- 6) Improve the flexibility of States to support multi-State corridor planning and the creation of multi-State organizations to increase the ability of States to address highway freight connectivity; and
- 7) Reduce the environmental impacts of freight movement on the National Highway Freight Network.

1.1.1 Rail Plan Goals and Objectives

The South Carolina State Rail Plan fully supports the specific goals, with associated Objectives, Guiding Principles, and Performance Measures shown in **Table 1-1** through **Table 1-6**.

Table 1-1: Mobility and System Reliability Goal

Objective	Potential Measure
Reduce the number of system miles at unacceptable congestion levels ⁽¹⁾	Miles of NHS and state Strategic Corridor System above acceptable congestion levels
Utilize the existing transportation system to facilitate enhanced modal options for a growing and diverse population and economy	% change in tonnage moved by freight rail % change in rail passenger trips
Guiding Principles	
Improve cost efficiency of intermodal goods movement, increasing diversity in modal choice.	
Encourage availability of both rail and truck modes to major freight hubs (ports, airports, intermodal facilities)	
Use advanced technology, performance management, innovation, competition, and accountability in operating and maintaining the freight transportation system. ⁽²⁾	

Notes:

⁽¹⁾ Included in MTP Goals and Performance Measures

⁽²⁾ Included in National Freight Planning goals established under 23 U.S.C. 167

Table 1-2: Safety Goal

Objective	Potential Measure
Improve the safety, security, and resilience of the freight transportation system ⁽²⁾	FRA Reportable Railroad Incidents
Reduce rail grade crossing crashes involving fatality or serious injury. ⁽¹⁾	Fatalities and injuries in rail grade crossing accidents. Percent of crossings with active safety warning devices installed

Notes:

⁽¹⁾ Included in MTP Goals and Performance Measures

⁽²⁾ Included in National Freight Planning goals established under 23 U.S.C. 167

Table 1-3: Infrastructure Condition Goal

Objective	Potential Measure
Maintain or improve the current state of good repair of rail components of the freight transportation system ⁽²⁾	Miles of rail lines identified as out of service due to condition
Guiding Principles	
Improve prioritization of “last mile” infrastructure to intermodal facilities.	
Recognize the importance of infrastructure condition in attracting new jobs to South Carolina by considering economic development when determining improvement priorities. ⁽¹⁾	
Encourage availability of both rail and truck modes to major freight hubs (for example ports, airports and intermodal facilities). ⁽¹⁾	
Continue to coordinate with the Palmetto Railways to consider road and rail improvements needed to support the efficient movement of freight between the Inland Port and the Port of Charleston and between port terminals.	

Notes:

⁽¹⁾ Included in MTP Goals and Performance Measures

⁽²⁾ Included in National Freight Planning goals established under 23 U.S.C. 167

Table 1-4: Economic and Community Vitality Goal

Guiding Principles
Work with economic development partners to identify transportation investments that will improve South Carolina’s economic competitiveness. ⁽¹⁾
Encourage availability of both rail and truck modes to major freight hubs (ports, airports, and intermodal facilities). ⁽¹⁾
Partner with public and private sectors to identify and implement transportation projects and services that facilitate freight movements. ⁽¹⁾
Encourage rail improvements that will improve connectivity and reliability of freight movement to global markets. ⁽¹⁾
Improve the contribution of rail components of the freight transportation system to economic efficiency, productivity, and competitiveness. ⁽²⁾
Increase public awareness of the significance of goods movement and freight transportation infrastructure on SC economic sustainability and growth.
Partner with communities to improve “last mile” planning efforts in urban communities to minimize the impact of goods movement and improve efficiencies.
Raise profile of integrated multi-agency, state level freight planning.
Explore public-private investment in supporting rail transportation infrastructure.
<i>Notes:</i> ⁽¹⁾ Included in MTP Goals and Performance Measures ⁽²⁾ Included in National Freight Planning goals established under 23 U.S.C. 167

Table 1-5: Environmental Goal

Guiding Principles
Reduce adverse environmental and community impacts of rail components of the freight transportation system. ⁽²⁾
Work with environmental resource agency partners to explore the development of programmatic mitigation in South Carolina ⁽¹⁾
Partner to be more proactive and collaborative in avoiding versus mitigating environmental impacts. ⁽¹⁾
<i>Notes:</i> ⁽¹⁾ Included in MTP Goals and Performance Measures ⁽²⁾ Included in National Freight Planning goals established under 23 U.S.C. 167

Table 1-6: Equity Goal

Guiding Principles
Ensure broad based public participation is incorporated into all planning and project development processes related to rail infrastructure improvements, maintenance and operations. ⁽¹⁾
Ensure planning and project selection processes adequately consider rural accessibility and the unique mobility needs of specific groups
<i>Notes:</i> ⁽¹⁾ Included in MTP Goals and Performance Measures

1.2 The Role of Rail Transportation in South Carolina

1.2.1 Rail Freight

Rail freight serves a dual role in the state’s economy by providing efficient transportation of raw materials and goods for industries and businesses located here, as well as a distribution channel for products exported to other states and countries.

The freight rail network in South Carolina serves an equally important role in the regional and national economies with 45.2 percent of rail tonnage and 57.2 percent of rail freight value passing through the state.

South Carolina rail movements in 2016 totaled 63.2 million tons, valued at \$93.6 billion, and carried within 1.4 million units (see **Table 1-7**). On average, total rail commodity movements are valued at \$1,480/ton. Through-State rail movements are the largest directional movements: 45.2 percent of total tonnage, 58.0 percent of units, and 57.1 percent of value. Inbound rail tonnage (21.8 million) is significantly greater than outbound (7.5 million); however, value is closer (\$16.8 billion inbound versus \$11.6 billion outbound) due to the notably higher average value/ton of outbound (\$1,554) versus inbound (\$773).

Table 1-7: South Carolina Rail Freight by Direction (2016)

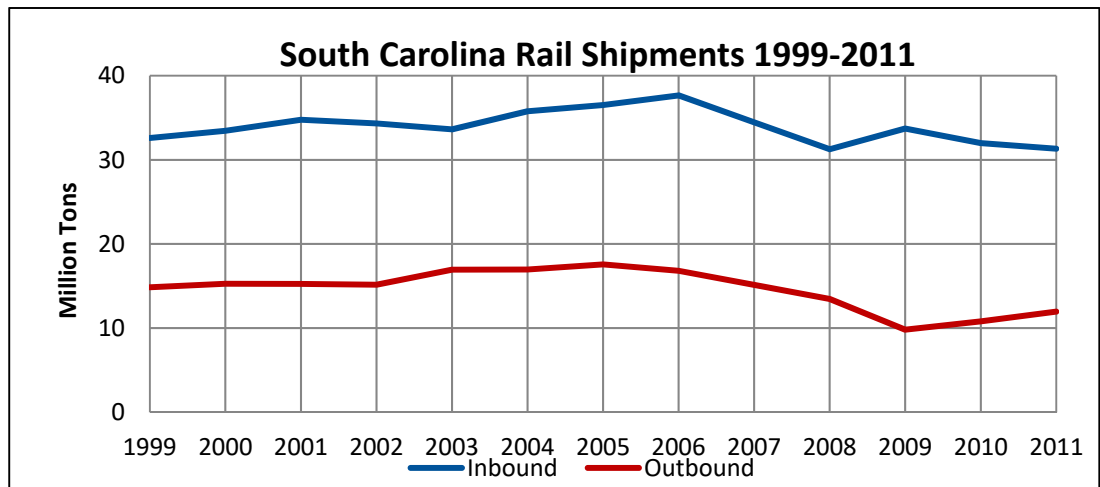
Direction	Tons		Units		Value (in millions)		Average Value/Ton
	Amount	Percent	Amount	Percent	Amount	Percent	
Outbound	7,484,310	11.8%	137,932	9.8%	\$11,629	12.4%	\$1,554
Inbound	21,811,904	34.5%	303,927	21.7%	\$16,867	18.0%	\$773
Intra	5,404,653	8.5%	147,855	10.5%	\$11,712	12.5%	\$2,167
Through	28,539,454	45.2%	812,047	58.0%	\$53,391	57.1%	\$1,871
Total	63,240,321	100.0%	1,401,761	100.0%	\$93,599	100.0%	\$1,480

Source: TRANSEARCH data for 2016

1.2.2 Rail Traffic Growth

Figure 1-1 illustrates the historical trends in inbound and outbound rail tonnages for South Carolina. Inbound traffic has exceeded outbound by a factor that has ranged from 2.0 to 3.4 in the period from 1999 to 2010. Coal has been the most significant inbound commodity in terms of weight throughout this period. For outbound traffic lumber and wood products was the leading commodity for the first five years. Since then chemicals has been the leading commodity by weight in five of the six years from 2004 to 2010.

Figure 1-1: Rail Traffic Growth



*2007 Data are not available. Values shown are average of 2006 and 2008.

Source: United States Dept. of Transportation, Research and Technology Administration, Bureau of Transportation Statistics, State Transportation Statistics

1.2.3 The Rail System's Impact on the State Economy

The significant role played by rail in the state's transportation system is demonstrated by the economic impacts of rail in terms of employment, income, output, and taxes, which span all industries and reach every region of the state. Rail service facilitates business for a wide range of economic activities throughout the state, including manufacturers, dealers, retailers, and others who transport materials, component parts, and products.

Increasingly, the globalization of trade and manufacturing require dependable and efficient access to transport facilities. Rail transport provides cost and/or logistical advantages to South Carolina firms that enable the state to compete efficiently in the global market place. Rail transport is playing an increasingly valuable role in serving the state's major economic growth areas, such as the Charleston region, including the Port of Charleston, and the I-85 corridor in the upstate.

1.2.4 Rail's Increasing Future Role

As discussed elsewhere in this Plan, as well as in the South Carolina Freight Plan, a number of developments already underway in various parts of the state and region will result in an increasingly important role for rail in the state's multimodal transportation network and economy.

These developments include the planned expansion of the Port of Charleston involving harbor deepening, a new three berth container terminal, and a new intermodal container transfer facility with dual access for the State's two Class I railroads. An inland port, which commenced operations in October 2013, has been developed in Greer in the upstate of South Carolina to provide overnight service between the Port of Charleston and the rapidly developing I-85 corridor. The inland port built upon the existing nightly double-stacked container service between Atlanta and the Port of Charleston. Following the success of the Inland Port Greer, the Inland Port Dillon serves the Eastern Carolinas and is located along I-95 in Dillon, South Carolina.

While less advanced in planning than the rail freight projects mentioned above, the federally designated Southeast High Speed Rail Corridor passes through South Carolina. Georgia DOT, in partnership with South Carolina DOT and North Carolina DOT, are leading development of a Tier I EIS for a high speed rail corridor between Charlotte and Atlanta that is recommended to pass through the state's Upstate region roughly parallel to I-85.

1.3 Institutional Governance Structure of the State Rail Programs

The South Carolina Code of Laws, Section 57-3-30 (See **Appendix A**), provides the Office of Intermodal and Freight Programs with the responsibilities and authority to meet the eligibility requirements of 49 U.S.C. Section 22102 for eligibility to receive federal funds. In addition, the State of South Carolina has been participating in the federal rail programs since 1980.

As defined by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), SCDOT is South Carolina's "State Rail Transportation Authority." SCDOT ensures that the State rail plan documents the State's policy on freight and passenger rail transportation – including commuter rail – within the State's boundaries, establishes priorities and implementation strategies to enhance rail service in the public interest, and serves as the basis for Federal and State rail investment.

SCDOT reviews, updates and provides final approval of the State Rail Plan.

There are three state agencies in South Carolina that have a direct involvement with the railroads:

- **Department of Transportation**
 - The Intermodal Planning Division is responsible for preservation of railroad rights-of-way, coordination of high speed and intercity rail passenger planning and development, associated funding, and submittal of plans and annual legislative reports as required. The Division is responsible for preparing, maintaining, coordinating, and administering a comprehensive passenger and freight state rail plan with coordination of infrastructure services with other modes of transportation every five years in that it's the designated state rail planning agency.
 - Traffic Engineering manages federal funds for highway-rail grade crossing improvements.
 - Preconstruction is responsible for crossings involved in construction projects, at-grade or grade-separated.
 - The Intermodal Planning division is also charged with development and coordination of a general mass transit program and policy for the implementation, operation, evaluation, and monitoring of public transit systems, funding of same and preparation of plans (including a five-year plan detailing needs and goals) and annual legislative reports as necessary.

- **Department of Commerce**
 - Works with all the state's rail carriers to attract new business to the state
 - Home to the Division of Palmetto Railways – formerly Public Railways (SCPR)
 - Operates three common carrier railroads in the Charleston area
 - Provides technical assistance and consulting services to South Carolina's governmental bodies

- **Office of Regulatory Staff (ORS)** is responsible for railroad and natural gas pipeline safety oversight. Railroad safety falls under the Transportation Division of the ORS.

1.4 Rail Funding in South Carolina

South Carolina does not have any state revenue source dedicated for passenger or freight rail, nor any grant or loan programs for rail projects. The state does have public-private partnership (P3) legislation for highway projects; however, the current P3 law does not include either passenger or freight rail projects. South Carolina freight rail companies have taken the initiative to recommend P3s for large-scale projects that benefit the public and the railroad and have had a role in highway and bridge P3s in the state.

There are some limited opportunities for state and local financial assistance for Class I and Short Line freight rail companies and passenger rail initiatives that include South Carolina Department of Commerce grants for infrastructure improvements tied to job creation and assistance from the South Carolina Transportation Infrastructure Bank.

1.5 Summary of Freight and Passenger Rail Services

1.5.1 Rail Services

Freight rail services in South Carolina are provided by 11 railroads including two Class I railroads (CSXT and Norfolk Southern). Palmetto Railways, a branch of the South Carolina Department of Commerce,

operates four railroad subdivisions: Charleston Subdivision; North Charleston Subdivision; Charity Church Subdivision; and Salkehatchie Subdivision (Formerly Hampton & Branchville Subdivision).

Existing rail passenger service in South Carolina is provided by Amtrak. Four Amtrak services pass through the state:

- *Silver Star* – New York/Tampa/Miami via Columbia,
- *Silver Meteor* – New York/Miami via Charleston,
- *Palmetto* – New York/Savannah via Charleston, and
- *Crescent* – New York/New Orleans via Greenville.

Amtrak passenger stations are located in 11 cities and towns throughout the state.

1.5.2 Initiatives and Plans

1.5.2.1 SCPA Initiatives

Initiatives considered during development of the Rail Plan include a number being undertaken by the South Carolina Ports Authority (SCPA):

- Rail served inland container ports located in Greer and Dillon both over 100 miles from the Port of Charleston with daily intermodal services, which commenced operations in October 2013 & April 2018;
- Intermodal container transfer facility with dual rail access adjacent to a 280-acre, 3-berth container terminal under construction on the Charleston Naval Complex;
- Port of Charleston Harbor deepening to 50 feet in the harbor and 52 feet outside; and
- Inland Port Greer expansion and Lead Track Expansion (USDOT Better Utilizing Investments to Leverage Development (BUILD) Discretionary Grant award (2018)).

1.5.2.2 Private Sector Initiatives

Private sector railroad initiatives considered in the Plan include Norfolk Southern Railway's joint development of the Inland Container Port with SCPA. Norfolk Southern is investing \$7.5 million in the project and will operate the daily intermodal service to the Port of Charleston.

Under the 2018 BUILD Discretionary Grant Award to SCDOT, and in collaboration with the SCPA, Norfolk Southern will be lengthening the Carlisle siding extension located between Spartanburg and Columbia to accommodate greater current capacity limitations.

1.5.2.3 Commuter Rail Initiatives

Commuter rail or rail-transit efforts have been investigated in five different areas of the state, primarily in urban regions. As a result of the investigations, proposals are being advanced in two urban regions and one has selected Bus Rapid Transit over commuter rail. All five, however, are discussed further in Section 3.4.

1.5.2.4 Other Plans

Numerous other plans were considered during development of the Rail Plan, including this Rail Plan Update, 2040 Statewide Multimodal Transportation Plan, Public Transit and Coordination Plans, Freight Plan, and Strategic Corridor Plan, which are all being updated in parallel with this plan.

2 SOUTH CAROLINA’S EXISTING RAIL SYSTEM

2.1 Existing Rail System Description and Inventory

This section provides an inventory of the existing overall rail transportation system and rail services and facilities within the State.

2.1.1 Existing System, Services, and Performance

The South Carolina rail system, as depicted in **Figure 2-1**, is operated by 11 rail carriers. The carriers range in size from fairly small intrastate railroads to members of large rail systems serving the entire eastern U.S. Of the line haul railroads, two are Class I carriers¹ and the remainder are local carriers or switching and terminal companies². As seen in **Table 2-1**, CSX Transportation's (CSXT) 1,307 route miles represent 54 percent of the statewide rail system of 2,400 miles (includes trackage rights). The Norfolk Southern Railway (NS), with 762 route miles, is the second largest carrier in terms of South Carolina mileage accounting for 32 percent of the state rail system.

All rail lines are single-tracked with the exception of portions of the NS main track in the Upstate and the CSXT “A Line” that lies in the I-95 corridor. Both have double-track segments of various lengths at several locations.

2.1.1.1 CSX Transportation (CSXT)

This Class I railroad, a transportation unit of CSX Corporation (CSX), operates approximately 23,000 route miles and serves 23 states, the District of Columbia and two Canadian provinces. As South Carolina’s largest railroad, it covers much of the state. The railroad has a division office in Florence. In addition to the mileage it owns, it also has trackage rights over NS between Columbia and Charleston. Major South Carolina commodities for CSX include petroleum and coal products, lumber and wood products, chemicals and allied products, coal, and miscellaneous mixed shipments (intermodal). CSX Intermodal is the intermodal arm of CSX Corporation.

¹ As of December 2017, Class I railroads have annual operating revenues of \$447.6 million or more. These limits are updated annually to reflect inflation. - *Association of American Rail Roads*

² Local carriers are non-Class I railroads that perform principally line-haul services while switching and terminal carriers perform those services for other railroads.

Figure 2-1: State Rail Map

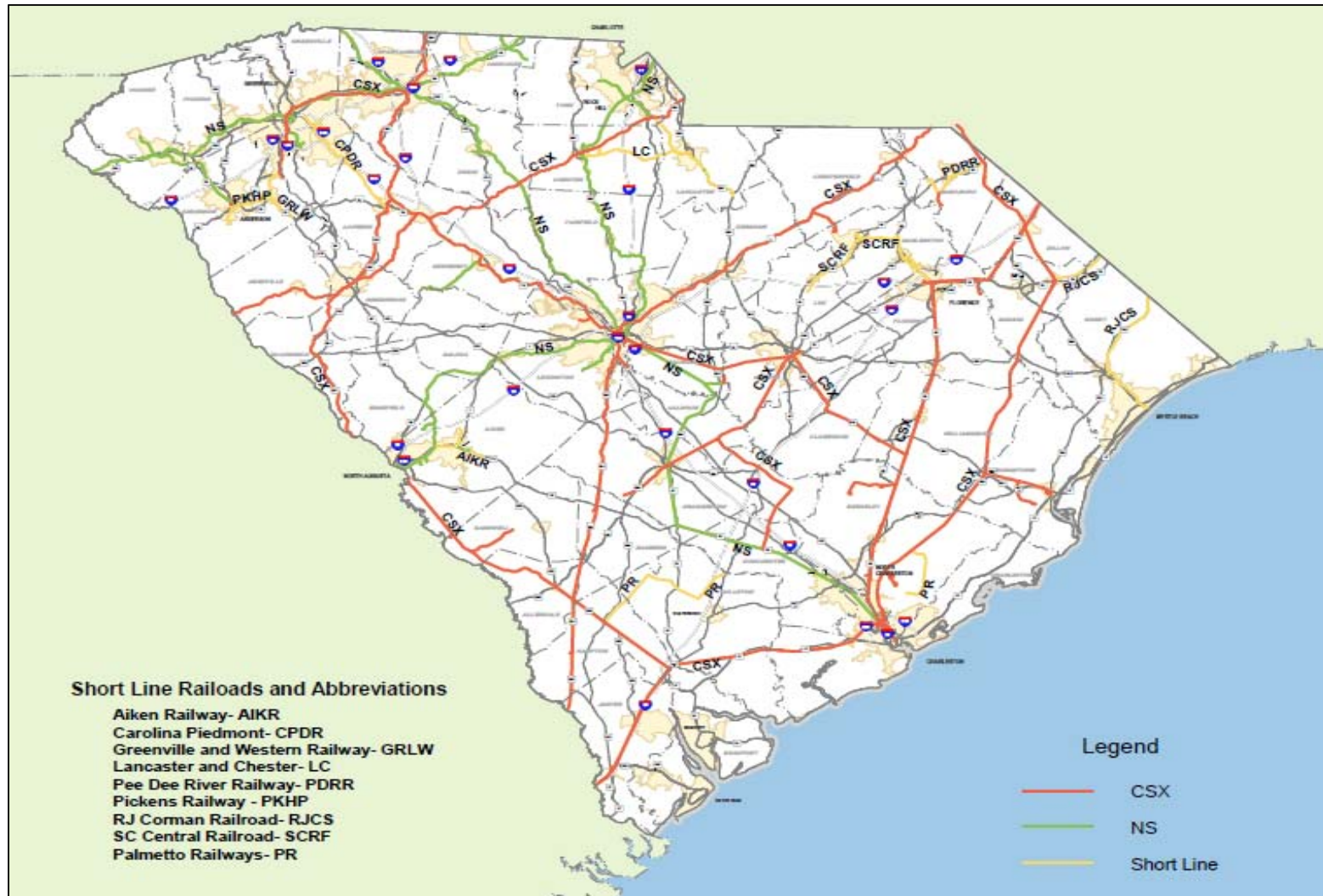


Table 2-1: 2017 South Carolina Freight Railroads

Railroad Type	Miles Operated
Class 1 Railroads	2,069
CSX Transportation	1,307
Norfolk Southern Corp.	762
Regional	0
None	0
Local	277
Aiken Railway Company, LLC	19
Greenville & Western Railway	13
Lancaster & Chester Railway	62
Palmetto Railways (Port Utilities Commission of Charleston) (Port Terminal Railroad)	22
Pee Dee River Railway	24
Pickens Railway Co.	28
R.J. Corman	86
Switching & Terminal	82
Carolina Piedmont Railroad	30
South Carolina Central Railroad	47
Total	2,400

Source: *Association of American Railroads*

Notes:

⁽¹⁾Amtrak also operates over 549 route miles in SC but does not own any mainline trackage in the state. It operates over CSXT main tracks, one through Florence and another through Columbia, from North Carolina to Georgia. Norfolk southern also hosts Amtrak trains in the upstate running between North Carolina and Georgia.

⁽²⁾Owned/Leased lines less Owned/Not Operated and exclusive of trackage rights to prohibit double counting

2.1.1.2 Norfolk Southern Railway (NS)

This Class I railroad operates a total of approximately 21,500 route miles and serves 22 states, the District of Columbia, and one Canadian province. In South Carolina, NS operates 762 route miles and has trackage rights over CSXT from Newberry to Spartanburg. The Norfolk Southern Railway Company is owned by the Norfolk Southern Corporation. The railroad has a division office in Greenville. Major commodities transported over the NS system in South Carolina are coal; lumber and wood products; chemicals; pulp, paper, and allied products; and, transportation equipment.

2.1.1.3 Aiken Railway Company, LLC (AIKR)

The Aiken Railway Company began service in December, 2012, and is a wholly-owned subsidiary of Western Carolina Railway Service Corporation, the same company that owns and operates the Greenville and Western. It leases and operates two NS branch lines in Aiken County – the 12.45-mile line between Warrentonville and Oakwood, and the 6.45-mile line running between Aiken and North Aiken – totaling 19 miles in length.

2.1.1.4 Carolina Piedmont (CPDR)

In 1990, RailTex, Inc. purchased from CSXT and began operating the 30-mile branch line between Laurens and East Greenville as its Carolina Piedmont Division (CPDR). The railroad is now owned by Genesee & Wyoming and is operated as the Carolina Piedmont Railroad. Traffic is interchanged with CSXT at Laurens. Major commodities transported include plastic resin, gas turbines and chemicals.

2.1.1.5 Greenville & Western Railway Company (GRLW)

This railroad commenced operations in late 2006 after acquiring a 13-mile-long CSXT line segment from Pelzer to Belton in Anderson County. The railroad interchanges traffic with CSXT at Pelzer and with the Pickens Railroad Company at Belton, which also provides access to NS. The railway receives unit trains for Kinder Morgan with Belton Industries and Belton Metals other on-line rail users. Principal on-line commodities are ethanol, biodiesel, plastics, scrap metal, limestone, paper, and fertilizer.

2.1.1.6 Lancaster and Chester Railway Company (LC)

Prior to 2001, the railroad ran 62 miles between Chester and Lancaster. This original line segment dates back to an 1873 charter for a three-foot narrow gauge railroad that reached Lancaster from Chester in 1894. In 2001 a NS branch line running from Catawba to Lancaster and continuing east to Kershaw was acquired extending the railroad's total length to almost 62 miles and its presence to four counties - Chester, Kershaw, Lancaster, and York.

The railroad serves a variety of shippers/receivers, including PPG, Guardian Glass, Thyssen-Krupp Steel, Mississippi Lime, ADM, Gerdau Ameristeel, GAF Materials, Circle S Mills, and Boral/Owens Corning among others. Major commodities are chemicals, sand, steel, corn, soybeans, soybean oil and meal, recycled base oil, and building materials. The railroad interchanges traffic with both CSXT and NS at Chester. It became a part of Gulf and Ohio Railways, Inc. in December, 2010.

2.1.1.7 Palmetto Railways

Palmetto Railways, previously known as South Carolina Public Railways (SCPR), provides technical assistance and consulting services in railroad matters to state, local, and municipal governments. As a division of the South Carolina Department of Commerce, Palmetto Railways operates three railroad subdivisions.

The Charleston Subdivision (Port Utilities Commission of Charleston – PUCC) and North Charleston Subdivision (Port Terminal Railroad – PTR) provide switching services to the terminals of the South Carolina State Ports Authority and other various industries in Charleston County, interchanging with CSXT and NS. As terminal switching railroads, PUCC and PTR have no mainline miles of track, but estimates of route miles are contained in **Table 2-1**.

2.1.1.8 Pee Dee River Railway Corporation (PDRR)

In 1987 Marlboro County purchased the CSXT branch line extending from McColl to Marlboro via Tatum and Bennettsville along with a spur from Bennettsville to Breeden and contracted with the Pee Dee Railway Corporation (PDRR) to provide rail service. The PDRR began operations the same year.

A 3.8-mile spur was soon constructed to a new Willamette Industries (now Domtar) pulp, paper, and board (Flakeboard) complex. The PDRR is a subsidiary of the Aberdeen and Rockfish Railroad Company, which has headquarters in Aberdeen, NC

Pulp, paper, chemicals, aggregates, fertilizer, and plastic pellets are the predominate products handled over its current 24-mile length. Its major customers are Domtar, Mohawk, Flakeboard, Hanson Aggregates, and Southern States Cooperative. Traffic is interchanged with CSXT at McColl.

2.1.1.9 Pickens Railroad Company (PICK and PKHP)

The Pickens Railway Company consists of two separate operations located in the Upstate. One is the original Pickens Railroad (PICK), which runs from a connection with the NS main track at Easley to Pickens in Pickens County that began operation in 1898. The other, the railroad's Honea Path Division (PKHP), is a combination of NS and CSXT branch lines located in Anderson County running from Anderson to Honea Path, via Belton. Combined the lines run for approximately 28 miles. Service began over the first of these line segments in 1990.

The railroad's principal shippers include, among others: Owens Corning, Electrolux, Scots, Michelin, Southern States Cooperative, Crop Production Services, Carolina Recycling, PCA, and Tri-County Fertilizer. These customers account for the majority of the railroad's carloadings comprised of limestone, plastics, rubber, carbon black, fertilizer, scrap metal, paper, grain, and borate ore. Traffic is interchanged with NS at Easley and Anderson, as well as with GRLW at Belton and hence to a CSXT connection in Pelzer.

2.1.1.10 R.J. Corman (RJCS)

The R. J. Corman Railroad Group national headquarters is located in Central Kentucky in the City of Nicholasville. There are 67 strategically placed field offices in 22 different states across the US. The company serves all seven Class I railroads, many regional and short line railroads as well as various rail-served industries. R. J. Corman Railroad Company purchased the former Carolina Southern Railroad (approximately 86 track miles) in August 2015, and subsequently invested more than three million dollars to restore freight service. The R. J. Corman Railroad Company Carolina Lines ran its first train on March 25, 2016, however, due to the disrepair of the track prior to the acquisition, the trains are still limited to 5 and 10 miles per hour. In February 2019 R. J. Corman Railroad Company Carolina Lines and Horry County Government (South Carolina) are breaking ground on Moving the Carolinas Forward: A Rural Freight Rail Project, which will significantly improve the value of rail service to the region. The \$17.5 million project, funded by a Federal TIGER Grant as well as significant contributions from South Carolina and R. J. Corman, is expected to be completed over four years. The project will include replacing approximately 60,000 crossties, upgrading nine miles of rail, upgrading nine bridges with a complete rebuild on a 220-foot bridge that spans the Crab Tree Swamp in Conway, SC and rehabilitating 39 at-grade crossings.

2.1.1.11 South Carolina Central Railroad Company (SCRF) (GWR)

In 1987, RailTex, Inc. purchased two disconnected segments of railroad from CSXT located in Florence, Darlington, Chesterfield, and Lee Counties. The SC Central Railroad Company, Inc. (SCRF) began operations over the two line segments in December of that year. Genesee & Wyoming Inc., now owns the railroad and operates 47 miles of mainline. The one operational segment connects and interchanges traffic with CSXT at Florence and extends to Bishopville via Darlington, Floyd, and Hartsville. It has a broad base of customers, with the largest being Nucor Steel, Sonoco Products, and Republic Services. Commodities handled by the railroad are dominated by chemicals, plastics, steel, and waste. The other segment connected and interchanged traffic with CSXT at Cheraw and extended southward to Society Hill. Service is no longer provided on this segment and abandonment has been approved but not yet implemented.

2.1.1.12 Freight Traffic

Rail freight traffic patterns in South Carolina have been summarized in Chapter 1. Additional information is provided in this section, in terms of tonnage and value of major inbound and outbound commodities, as well as total annual tonnage by individual rail line segment.

South Carolina rail movements in 2016 totaled 63.2 million tons, valued at \$93.6 billion, and carried within 1.4 million units, see **Table 2-2**. On average, total rail commodity movements are valued at \$1,480/ton. Through-state rail movements are the largest directional movements: 45.2 percent of total tonnage, 58 percent of units, and 57.1 percent of value. Inbound rail tonnage (21.8 million) is significantly greater than outbound (7.5 million); however, in terms of value inbound and outbound movements are closer (\$16.9 billion inbound versus \$11.6 billion outbound) due to the notably higher average value/ton of outbound (\$1,554) versus inbound (\$773).

Table 2-2: South Carolina Rail Freight by Direction (2016)

Direction	Tons		Units		Value (in millions)		Average
	Amount	Percent	Amount	Percent	Amount	Percent	Value/Ton
Inbound	21,811,904	34.5%	303,927	21.7%	\$16,867	18.0%	\$773
Intra	5,404,653	8.5%	147,855	10.5%	\$11,712	12.5%	\$2,167
Outbound	7,484,310	11.8%	137,932	9.8%	\$11,629	12.4%	\$1,554
Through	28,539,454	45.2%	812,047	58.0%	\$53,391	57.1%	\$1,871
Total	63,240,321	100.0%	1,401,761	100.0%	\$93,599	100.0%	\$1,480

Source: TRANSEARCH data for 2016

As shown in **Figure 2-2**, the short CSXT line segment between Greenwood, SC and Athens, Georgia handles the greatest rail tonnage per line as a result of north-south and east-west CSXT routes crossing in that part of the state. Other notable tonnage movements go through Laurens County, Columbia, and Charleston.

2.1.1.13 Inbound Rail Freight

Table 2-3 presents major inbound rail commodities to South Carolina in 2016. Such movements total 21.8 million tons, via 303,927 units, valued at \$16.9 billion, with an average value/ton of \$773. In tonnage terms, top inbound movements include: *Coal* (8.0 million, 36.9 percent), *Chemical or Allied*

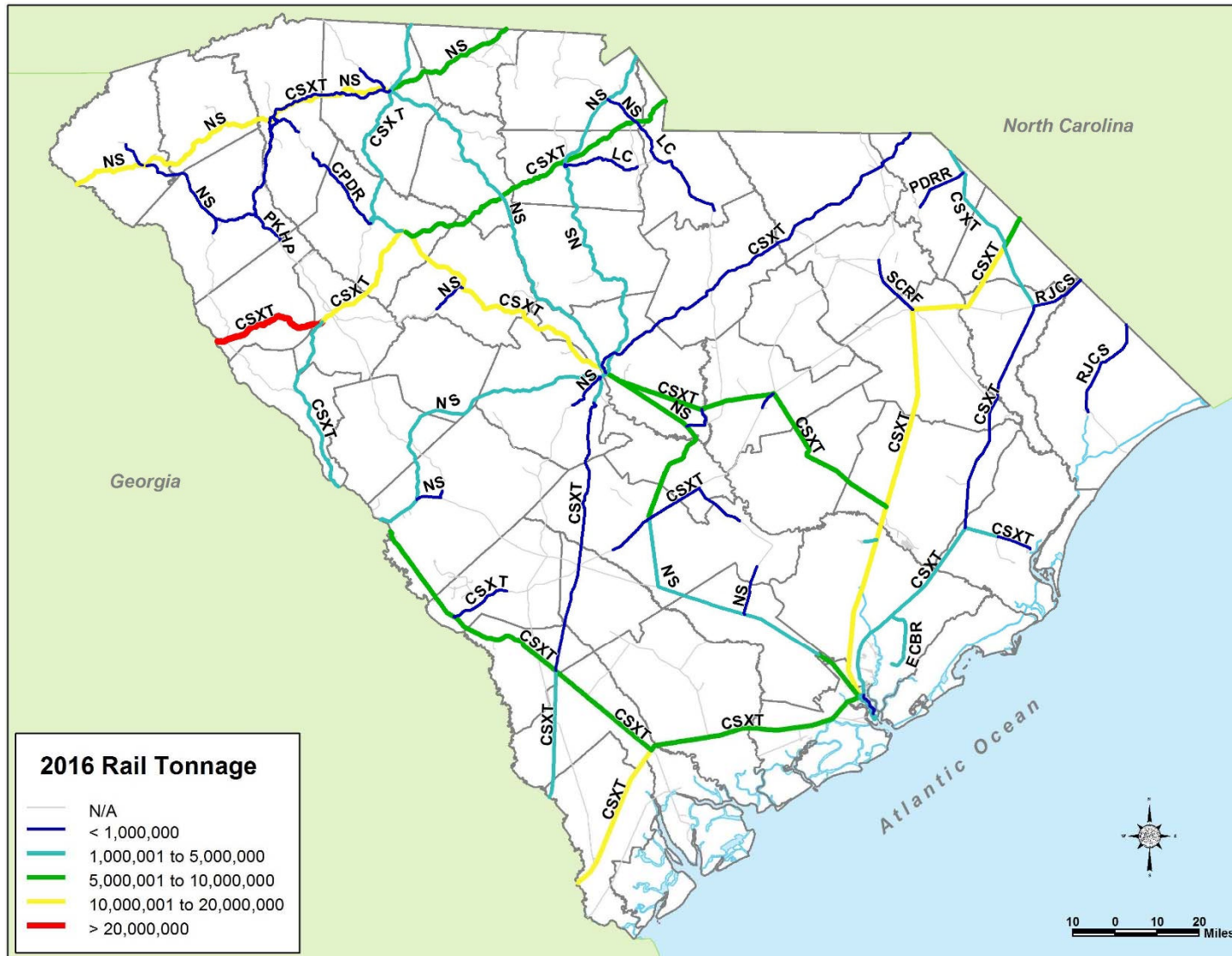
Products (3.8 million, 16.7 percent), and *Nonmetallic Mineral* (2.1 million, 9.7 percent). In unit terms, *Coal* and *Miscellaneous Mixed Shipments* constitute almost half (149,105, 49 percent) of the total 303,927 inbound rail units. In value terms, the top commodities include: *Chemical or Allied Products* (\$5 billion or 29.6 percent), *Miscellaneous Mixed Shipments* (\$5 billion or 29.6 percent), and *Transportation Equipment* (\$3.6 billion or 21.2 percent). *Transportation Equipment* values are included in *Remaining Commodities* in this table.

Table 2-3: South Carolina Rail Inbound Freight by Major Commodities (2016)

STCC2	Commodity	Tons		Units		Value (in millions)		Average
		Amount	Percent	Amount	Percent	Amount	Percent	Value/Ton
11	Coal	8,038,140	36.9%	69,025	22.7%	\$280	1.7%	\$35
28	Chemicals or Allied Products	3,638,412	16.7%	41,320	13.6%	\$5,000	29.6%	\$1,374
14	Nonmetallic Minerals	2,110,293	9.7%	19,272	6.3%	\$22	0.1%	\$11
01	Farm Products	1,376,168	6.3%	13,010	4.3%	\$145	0.9%	\$105
20	Food or Kindred Products	1,141,612	5.2%	13,484	4.4%	\$601	3.6%	\$526
46	Misc. Mixed Shipments	964,240	4.4%	80,080	26.3%	\$4,997	29.6%	\$5,183
40	Waste or Scrap Materials	940,008	4.3%	10,524	3.5%	\$181	1.1%	\$193
26	Pulp, Paper or Allied Products	921,520	4.2%	12,440	4.1%	\$661	3.9%	\$717
32	Clay, Concrete, Glass or Stone	723,396	3.3%	7,980	2.6%	\$124	0.7%	\$172
29	Petroleum or Coal Products	561,996	2.6%	6,852	2.3%	\$415	2.5%	\$740
	Remaining Commodities	1,396,119	6.4%	29,940	9.9%	\$3,515	26.3%	\$4,438
	Total	21,811,904	100.0%	303,927	100.0%	\$16,867	100.0%	\$773

Source: TRANSEARCH data for 2016

Figure 2-2: South Carolina Rail Freight Tonnage (2016)



Source: TRANSEARCH data for 2016

Rail Inbound Tonnage Origin and Destination– Major inbound tonnage in 2016 are shown by county destination in **Figure 2-4**. Rail movements originating from out-of-state are primarily traveling to Berkeley County (4.8 million tons), Charleston County (3.6 million tons), and Richland County (1.7 million tons). Inbound rail tonnage by state of origin is shown in **Figure 2-3**. The major commodity railed into South Carolina in terms of inbound tonnages is *Coal* (8 million tons, valued at \$280 million), chiefly from Kentucky (3.7 million, \$130 million), but also from Indiana (1.8 million, \$62.4 million), and Pennsylvania (1.4 million, \$49.5 million). The second major commodity railed into South Carolina is *Chemical or Allied Products* (3.6 million tons, valued at \$5 billion), led by Louisiana, Texas, Illinois, and Alabama (ranging from 0.3 million tons, \$350 million to 1.0 million tons, \$1.8 billion).

2.1.1.14 Outbound Rail Freight

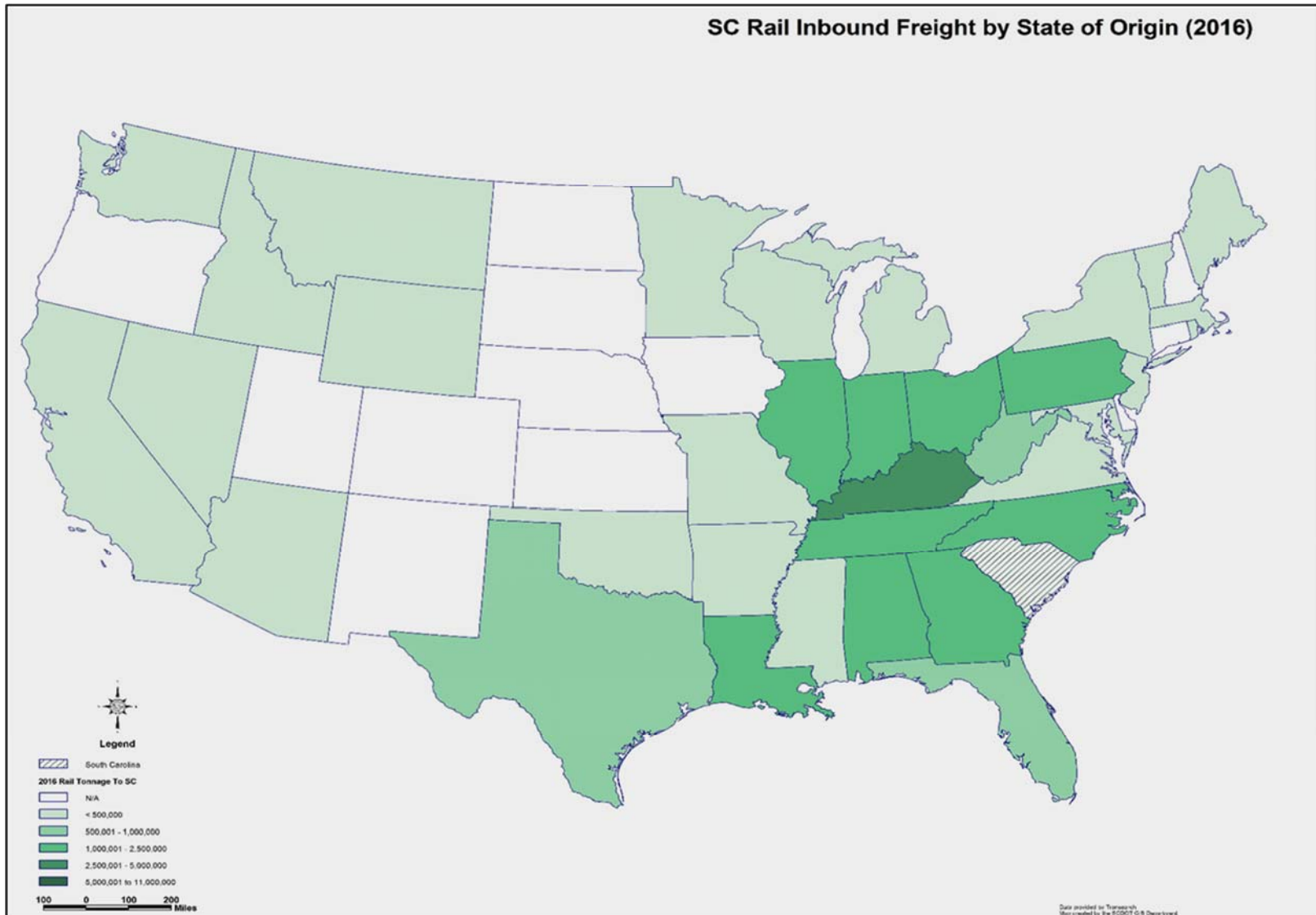
Table 2-4 presents the outbound major commodities by rail from South Carolina in 2016. Such outbound rail movements total 7.5 million tons, via 137,932 units, valued at \$11.6 billion, with an average value/ton of \$1,554. In tonnage terms, top outbound movements include: *Chemicals or Allied Products* (1.4 million, 18.8 percent), *Primary Metal Products* (1.4 million, 18.7 percent), and *Pulp, Paper or Products* (1.3 million, 17.4 percent). In unit terms, *Miscellaneous Mixed Shipments* and *Pulp, Paper or Allied Products* together constitute more than half (72,960, or 52.9 percent) of the total 137,932 outbound rail units. In value terms, the top commodities include: *Miscellaneous Mixed Shipments* (\$3.7 billion or 31.7 percent), *Chemicals or Allied Products* (\$2.9 billion or 24.8 percent), and *Primary Metal Products* (\$2.0 billion or 17.3 percent).

Table 2-4: South Carolina Rail Outbound Freight by Major Commodities (2016)

STCC2	Commodity	Tons		Units		Value (in millions)		Average Value/Ton
		Amount	Percent	Amount	Percent	Amount	Percent	
28	Chemical or Allied Products	1,404,760	18.8%	15,760	11.4%	\$2,882	24.8%	\$2,052
33	Primary Metal Products	1,396,828	18.7%	15,436	11.2%	\$2,014	17.3%	\$1,442
26	Pulp, Paper or Allied Products	1,299,480	17.4%	19,360	14.0%	\$1,417	12.2%	\$1,090
24	Lumber or Wood Products	1,006,364	13.4%	11,660	8.5%	\$263	2.3%	\$261
32	Clay, Concrete, Glass or Stone	764,056	10.2%	7,320	5.3%	\$96	0.8%	\$125
46	Misc. Mixed Shipments	710,720	9.5%	53,600	38.9%	\$3,682	31.7%	\$5,180
40	Waste or Scrap Materials	382,356	5.1%	4,552	3.3%	\$67	0.6%	\$174
14	Nonmetallic Minerals	155,236	2.1%	1,536	1.1%	\$8	0.1%	\$49
20	Food or Kindred Products	137,692	1.8%	1,528	1.1%	\$102	0.9%	\$737
37	Transportation Equipment	109,760	1.5%	5,380	3.9%	\$845	7.3%	\$7,694
	Remaining Commodities	117,058	1.5%	1,800	1.3%	\$257	2.0%	\$2,192
	Total	7,484,310	100.0%	137,932	100.0%	\$11,629	100.0%	\$1,554

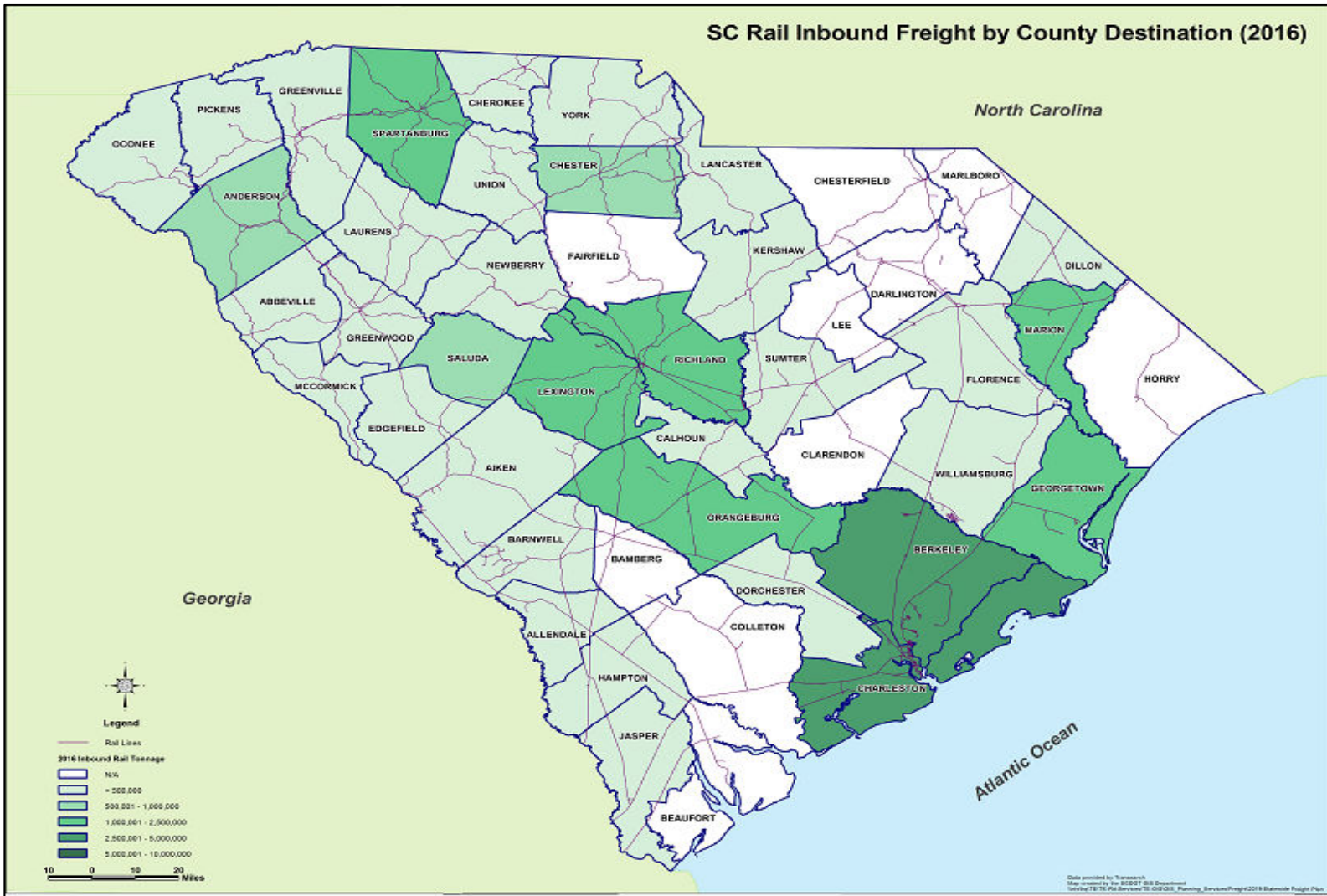
Source: TRANSEARCH data for 2016

Figure 2-3: South Carolina Rail Inbound Freight by State of Origin (2016)



Source: SCDOT GIS Mapping, based on TRANSEARCH data for 2016

Figure 2-4: South Carolina Rail Inbound Freight by County Destination (2016)



Source: SCDOT GIS Mapping, based on TRANSEARCH data for 2016

Outbound Tonnage Origin and Destination – Major outbound tonnages in 2016 are shown by county origin in **Figure 2-5**. Rail movements destined out-of-state primarily originated from Charleston County (1.4 million tons), Berkeley County (1.2 million tons) along with Florence County and Lexington County (0.6 million tons each). More than a quarter of outbound rail went to North Carolina (1.2 million tons, 15.4 percent) and Georgia respectively (1.1 million tons, 15.4 percent) followed by Alabama (0.6 million tons, 8.0 percent) as shown in **Figure 2-6**. North Carolina movements were led by *Clay, Concrete, Glass or Stone* (0.4 million tons, \$44.5 million) and *Lumber or Wood Products* (0.3 million tons, \$63.8 million). Nearly half of Georgia-bound tonnage was led by *Pulp, Paper or Allied Products* (0.3 million tons, \$195 million), and *Lumber or Wood Products* (0.3 million tons, \$45 million). Alabama-bound shipments were primarily *Miscellaneous Mixed Shipment* (0.3 million tons, \$1.5 billion) and *Waste or Scrap Materials* (0.08 million tons, \$14.1 billion).

2.1.1.15 Through Rail Freight

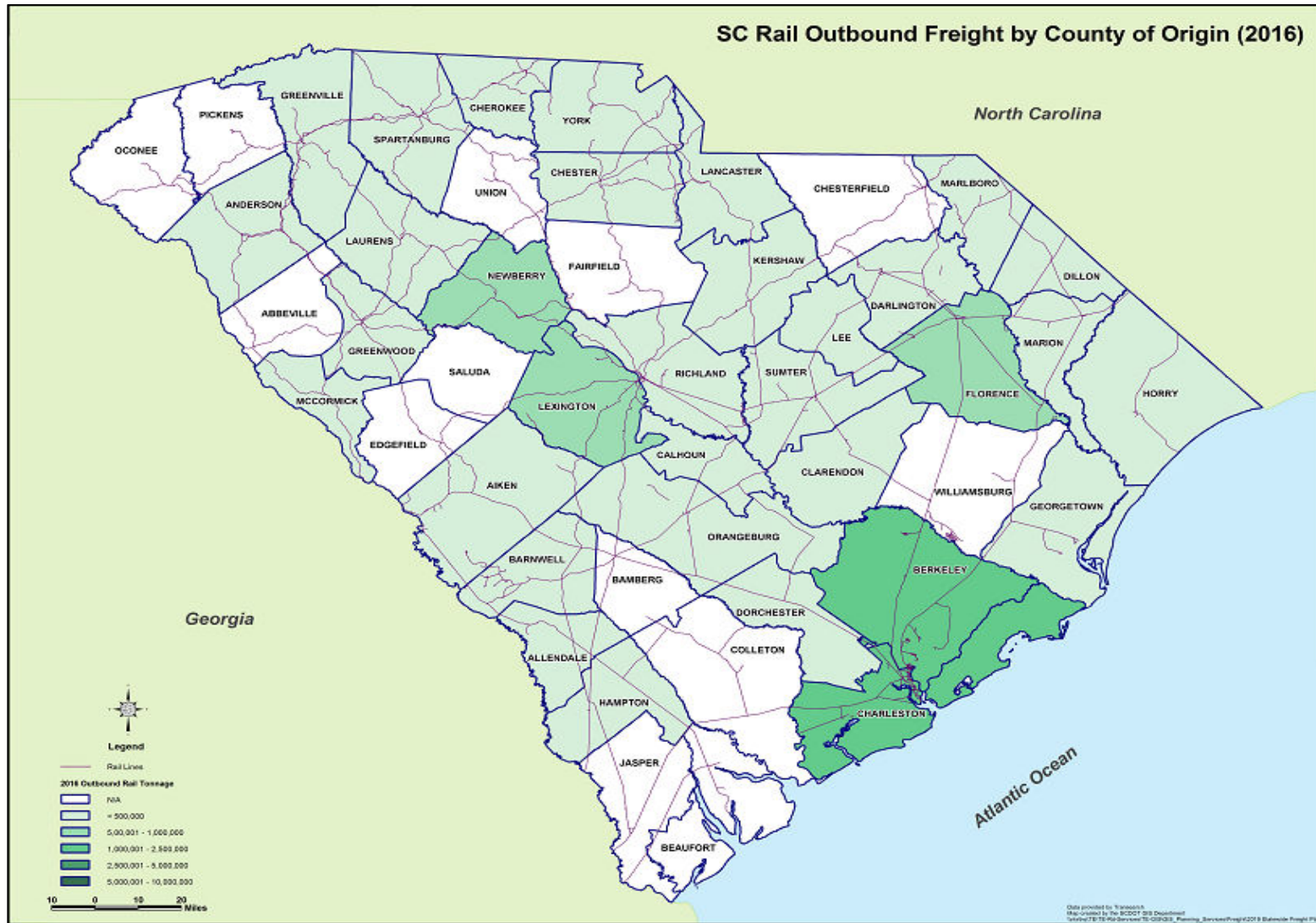
Table 2-5 presents through-state rail commodities in 2016. Such movements total 28.5 million tons, via 812,047 units, valued at \$53.4 billion, with an average value/ton of \$1,871. In tonnage terms, the top through movements include: *Chemicals or Allied Products* (6.2 million, 21.7 percent), *Miscellaneous Mixed Shipments* (4.7 million, 16.3 percent), and *Food or Kindred Products* (3.4 million tons, 12 percent). In unit terms, *Miscellaneous Mixed Shipments* constitute nearly half (355,760 or 43.8 percent) of the total 812,047 through rail units. In value terms, *Miscellaneous Mixed Shipments* and *Chemicals or Allied Products* constitute more than half of the total \$53.4 billion (\$23.9 billion, 44.7 percent and \$10.7 billion, 20.1 percent respectively).

Table 2-5: South Carolina Rail Through-State by Major Commodities (2016)

STCC2	Commodity	Tons		Units		Value (in millions)		Average Value/Ton
		Amount	Percent	Amount	Percent	Amount	Percent	
28	Chemicals or Allied Products	6,194,380	21.7%	81,588	10.0%	\$10,742	20.1%	\$1,734
46	Misc. Mixed Shipments	4,649,360	16.3%	355,760	43.8%	\$23,882	44.7%	\$5,137
20	Food or Kindred Products	3,419,493	12.0%	63,838	7.9%	\$2,757	5.2%	\$806
14	Nonmetallic Minerals	3,369,266	11.8%	30,926	3.8%	\$51	0.1%	\$15
26	Pulp, Paper or Allied Products	2,346,496	8.2%	62,088	7.6%	\$2,302	4.3%	\$981
32	Clay, Concrete, Glass or Stone	2,230,692	7.8%	28,880	3.6%	\$485	0.9%	\$218
11	Coal	1,195,733	4.2%	10,462	1.3%	\$42	0.1%	\$35
01	Farm Products	914,486	3.2%	9,427	1.2%	\$239	0.4%	\$261
24	Lumber or Wood Products	761,372	2.7%	11,752	1.4%	\$321	0.6%	\$422
29	Petroleum or Coal Products	623,570	2.2%	7,726	1.0%	\$371	0.7%	\$596
	Remaining Commodities	2,834,606	9.9%	149,600	18.4%	\$12,198	22.9%	\$4,303
	Total	28,539,454	100.0%	812,047	100.0%	\$53,391	100.0%	\$1,871

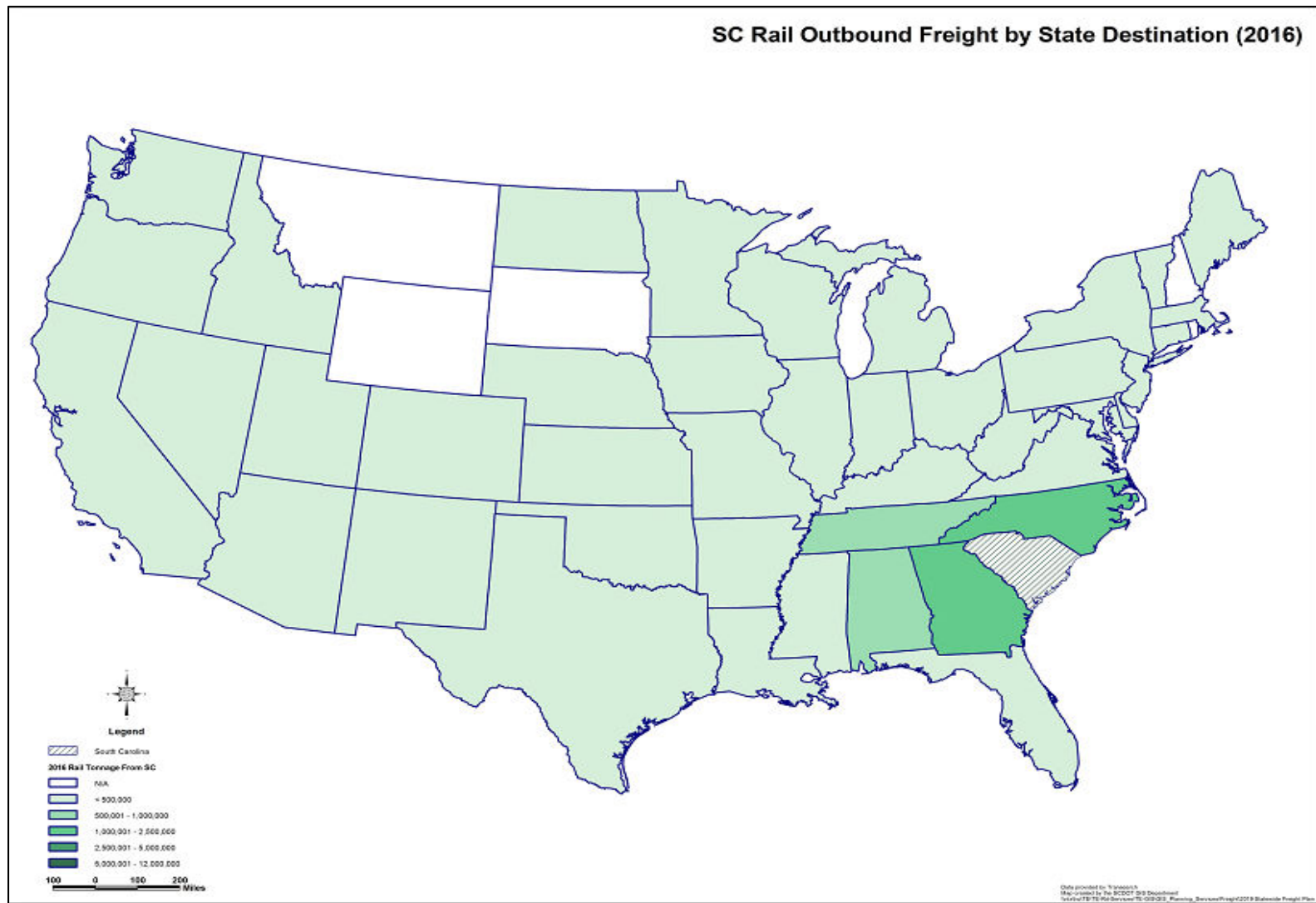
Source: TRANSEARCH data for 2016

Figure 2-5: South Carolina Rail Outbound Freight by County Origin (2016)



Source: prepared by SCDOT GIS Mapping, based on TRANSEARCH data for 2016

Figure 2-6: South Carolina Rail Outbound Freight by State of Destination (2016)



Source: prepared by SCDOT GIS Mapping, based on TRANSEARCH data for 2016

2.1.1.16 Intrastate Rail Freight

Table 2-6 summarizes intrastate rail commodities in South Carolina in 2016. Such movements total 5.4 million tons, via 147,855 units, valued at \$11.7 billion, with an average value/ton of \$2,167. In tonnage terms, top intrastate movements include: *Chemicals or Allied Products* (1.6 million tons, 28.6 percent), *Nonmetallic Minerals* (1.2 million tons, 21.4 percent) and *Miscellaneous Mixed Shipments* (0.8 million tons, 14 percent). In unit terms, *Miscellaneous Mixed Shipments* and *Transportation Equipment* together constitute almost three quarters (105,112, 71.1 percent) of the total 147,855 intrastate rail units. In value terms, the top commodities include: *Transportation Equipment* (\$5.4 billion, 46.2 percent), *Miscellaneous Mixed Shipments* (\$3.9 billion, 33.4 percent) and *Chemicals or Allied Products* (\$1.9 billion or 16.3 percent).

Table 2-6: South Carolina Rail Intrastate by Major Commodities (2016)

STCC2	Commodity	Tons		Units		Value (in millions)		Average Value/Ton
		Amount	Percent	Amount	Percent	Amount	Percent	
28	Chemicals or Allied Products	1,545,880	28.6%	16,360	11.1%	\$1,905	16.3%	\$1,232
14	Nonmetallic Minerals	1,156,333	21.4%	10,779	7.3%	\$12	0.1%	\$10
46	Misc. Mixed Shipments	754,800	14.0%	75,480	51.1%	\$3,912	33.4%	\$5,183
24	Lumber or Wood Products	691,600	12.8%	7,480	5.1%	\$110	0.9%	\$160
37	Transportation Equipment	571,160	10.6%	29,632	20.0%	\$5,407	46.2%	\$9,468
10	Metallic Ores	264,816	4.9%	2,448	1.7%	\$92	0.8%	\$348
26	Pulp, Paper or Allied Products	151,440	2.8%	2,160	1.5%	\$95	0.8%	\$630
33	Primary Metal Products	92,000	1.7%	1,040	0.7%	\$130	1.1%	\$1,414
40	Waste or Scrap Materials	83,640	1.5%	1,040	0.7%	\$15	0.1%	\$173
48	Waste Hazardous Materials	58,600	1.1%	640	0.4%	\$0	0.0%	\$0
	Remaining Commodities	34,384	0.6%	796	0.4%	\$32	0.3%	\$928
	Total	5,404,653	100.0%	147,855	100.0%	\$11,712	100.0%	\$2,167

Source: TRANSEARCH data for 2016

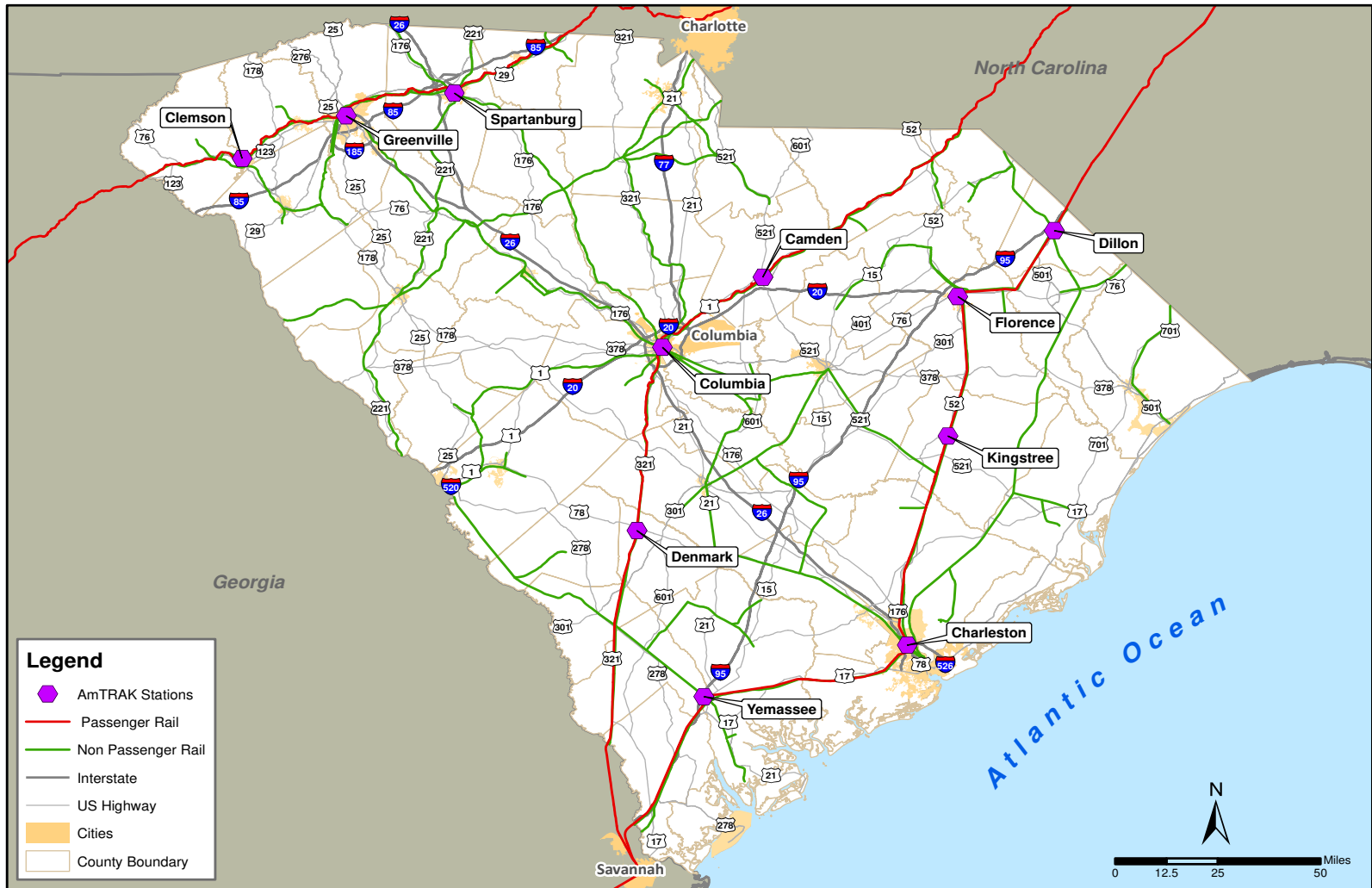
2.1.1.17 Existing Passenger Rail Services

South Carolina Routes – South Carolina is served by eight Amtrak daily trains running north bound and south bound over three routes, all of which connect the South with the Northeast. These routes use lines owned by freight railroads (one NS and two CSXT). **Figure 2-7** illustrates the locations of the three routes, as well as Amtrak stops in the state.

South Carolina Schedules – Amtrak’s South Carolina service consists of the following four daily services. Each service offers one round trip daily with multiple stops in South Carolina:

- *Silver Star* – New York/Tampa/Miami via Columbia,
- *Silver Meteor* – New York/Miami via Charleston,
- *Palmetto* – New York/Savannah via Charleston, and
- *Crescent* – New York/New Orleans via Greenville.

Figure 2-7: South Carolina Rail Passenger Routes and Stops



With the exception of the Palmetto, Amtrak trains pass through the state in evening or early morning hours, which tend to be inconvenient for riders. In addition, Amtrak on-time performance suffers from running over privately-owned freight railroads which can present significant operating conflicts. Current South Carolina schedules are shown in **Table 2-7**.

Table 2-7: Amtrak South Carolina Schedule

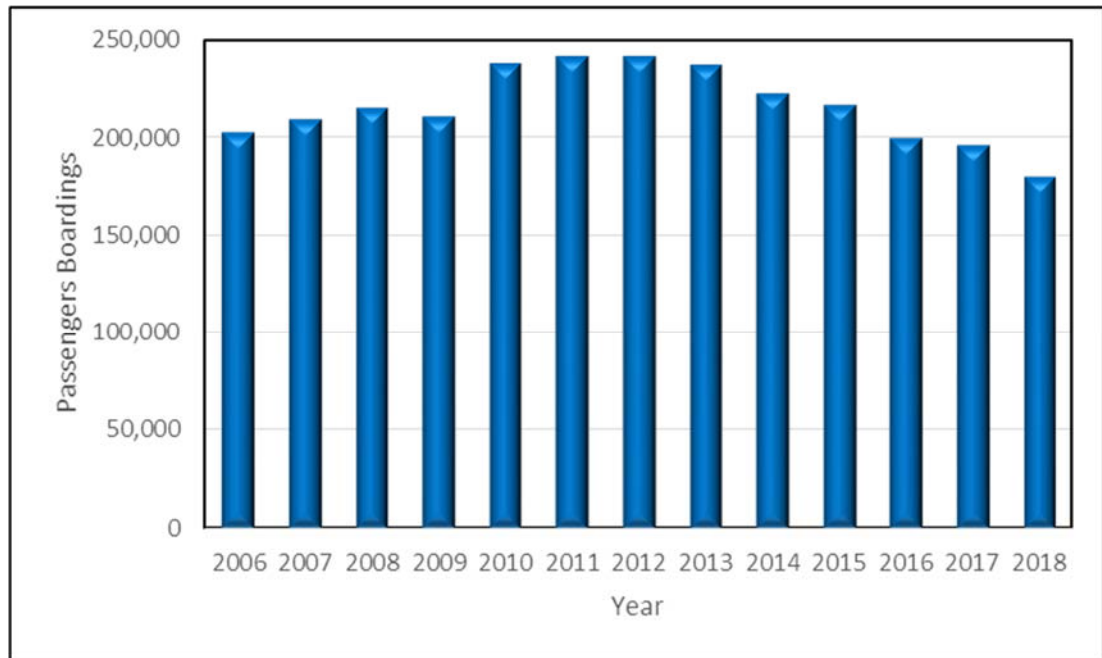
Train Service	Operating Between	SC Stops	Schedule	
			SB	NB
Crescent	New York- Atlanta- New Orleans	Spartanburg	4:14A	11:39P
		Greenville	4:54A	10:53P
		Clemson	5:39A	10:16P
Silver Star	New York- Washington- Miami	Camden	12:47A	4:42A
		Columbia	1:38A	4:01A
		Denmark	2:35A	2:45A
Silver Meteor	New York- Washington- Miami	Florence	3:05A	11:02P
		Kingstree	3:51A	10:11P
		Charleston	4:51A	9:17P
		Yemassee	5:43A	8:20P
Palmetto	New York- Washington- Savannah	Dillon	4:56P	12:14P
		Florence	5:39P	11:34A
		Kingstree	6:20P	10:55A
		Charleston	7:19P	10:00A
		Yemassee	8:08P	9:08A

Source: Amtrak, *Crescent* effective May 1, 2018; *Palmetto*, *Silver Star* and *Silver Meteor*, effective March 4, 2019.

In addition, Amtrak’s *Auto Train* also passes through the state on the easternmost route, but does not stop in South Carolina. The only stops it makes are at its two end points, Lorton, Virginia and Sanford, Florida.

Figure 2-8 shows total Amtrak passenger ridership from 2006 through 2018. Ridership by station for the last six years of record is shown in **Table 2-8**.

Figure 2-8: Amtrak Ridership in South Carolina 2012 - 2018



Sources: SCDOT Statewide Rail Plan (2006–2012 Data); Rail Passengers Association (2012-2015 & 2018 Data); Amtrak State Fact Sheet (2016 & 2017 Data)

Table 2-8: South Carolina Amtrak Patronage (FY 2012 - FY 2018)

City	2012	2013	2014	2015	2016	2017	2018
Camden	3,699	3,584	3,264	3,563	3,483	3,531	3,161
Charleston	83,314	80,198	74,045	70,136	63,880	66,759	61,261
Clemson	5,807	5,597	4,987	4,977	3,127	-	-
Columbia	37,119	35,878	34,873	33,428	32,234	32,695	29,805
Denmark	4,254	4,364	4,094	3,823	3,486	3,604	3,230
Dillon	8,745	9,456	8,601	8,037	7,573	6,692	5,841
Florence	51,561	51,242	49,438	50,033	46,930	43,304	40,187
Greenville	12,565	12,021	12,078	11,913	11,935	14,135	12,172
Kingstree	14,812	14,669	13,684	13,849	12,135	11,187	10,450
Spartanburg	4,452	4,545	4,451	4,143	3,777	3,548	3,870
Yemassee	14,624	14,915	12,437	12,336	10,789	10,451	9,740
Total	240,952	236,469	221,952	216,238	199,349	195,906	179,717

Note: Clemson Station Closed 5/13/2016 for adjacent highway project (reopened Fall 2019)
 Sources: Rail Passengers Association (2012-2015 & 2018 Data); Amtrak State Fact Sheet (2016 & 2017 Data)

Existing Commuter Rail System – There are no commuter rail services currently operating in the state of South Carolina.

2.1.2 Freight and Passenger Terminals

2.1.2.1 Major Freight Intermodal Terminals

The principal freight rail facilities are listed in **Table 2-9**. All of the railroads in the state have yards, and the Class I carriers have additional yards, that are smaller than the ones listed. In addition, all serve

additional facilities, e.g., bulk transfer and commodity-specific reloads and storage facilities that are privately owned and operated.

Table 2-9: Major South Carolina Rail Facilities

Facility	CSXT	NS
Principal Yards	Florence, Charleston	Columbia
Intermodal ¹	Charleston & Inland Port in Dillon	Charleston & Inland Port in Greer
Bulk Transfer ²	Charleston, Greenville ² , Spartanburg	Spartanburg, West Columbia
Automotive Terminal	West Columbia (Dixiana)	Columbia (Kinsler), Charleston
Division Office ³	Florence	Greenville

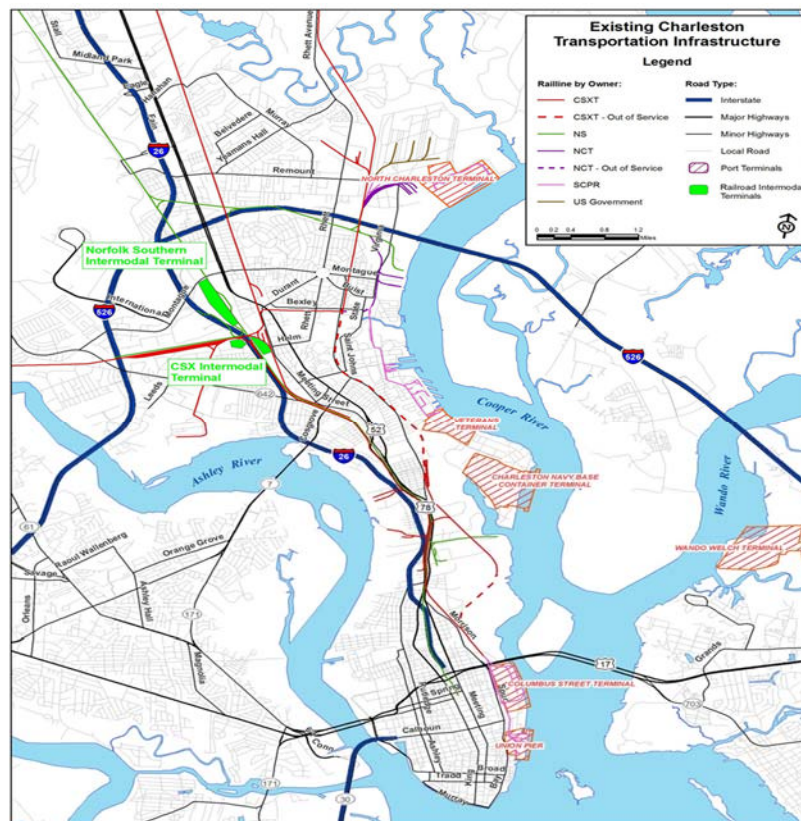
¹ Containers

² Railroad owned – TRANSFLO (CSX); Thoroughbred Bulk Transfer (NS)

³ CSXT – Florence Division; NS – Piedmont Division

The intermodal facilities that are operational in Charleston are shown in **Figure 2-9**. Each terminal is operated by one of the two Class I railroads, CSXT and NS. Trucks dray freight between these terminals and Port of Charleston Terminals.

Figure 2-9: Port of Charleston Facility Locations



2.1.2.1.1 Rail Served Inland Ports

The South Carolina Ports Authority (SCPA) opened a rail-served container terminal at Greer in October 2013 and a second inland port in Dillon in 2018. South Carolina’s Inland Port Greer and Inland Port Dillon are innovative, intermodal rail facilities that deliver the benefits of a coastal marine terminal

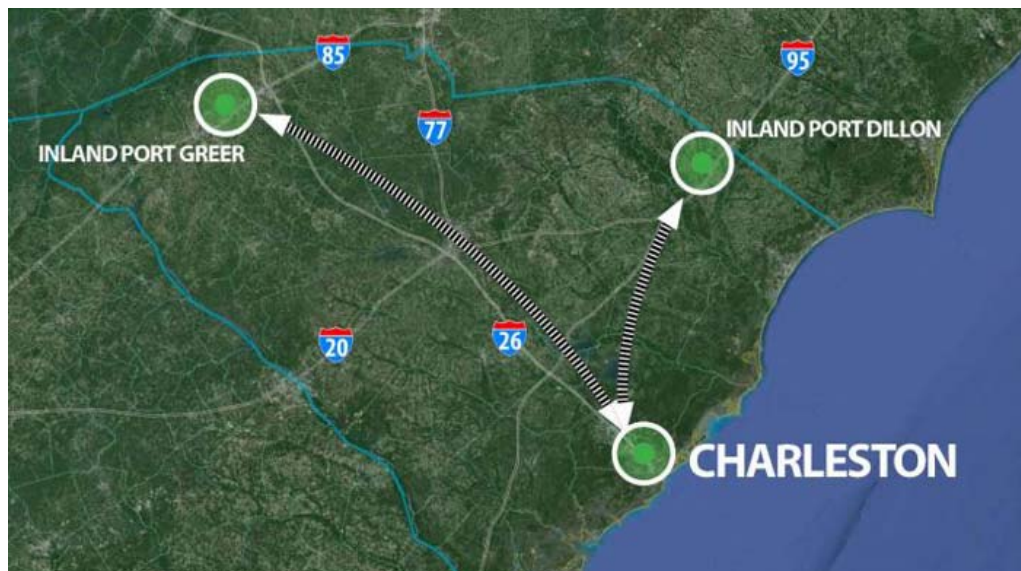
many miles inland. The South Carolina Ports Authority owns and operates these facilities which allows cargo owners to minimize their inland expense while enhancing flexibility and efficiency, and realizing savings on variable costs such as container per diems, chassis rental, and demurrage.

Inland Port Greer is located on I-85 in Greer, S.C., 212 miles inland from Charleston and approximately halfway between Atlanta and Charlotte. More than 94 million people live within 500 miles making sites near the inland port an attractive location for both manufacturing and consumer goods distribution. A dedicated Norfolk Southern train runs 6 days per week and provides overnight service in both directions. In 2017, just its third year of full-scale operation, Inland Port Greer handled 125,000 lifts.

Inland Port Dillon is brand new, having just opened in April 2018. It is located on I-95 near the South Carolina/North Carolina border exit 190 and is positioned within the 3,400-acre Carolinas I-95 Mega Site. In the near-term, Inland Port Dillon will offer importers and exporters in the Eastern Carolinas area an exciting new option. Future connectivity to Charlotte and points north and west could provide tremendous reach for shippers. CSX plans to serve Inland Port Dillon 6 days per week.

The location of both inland ports location is shown in **Figure 2-10**.

Figure 2-10: Inland Port Locations in Greer & Dillon South Carolina



2.1.2.1.2 Hugh K. Leatherman, Sr. Terminal

This new Hugh K. Leatherman Sr. Terminal is under construction on the Charleston Naval Complex. SCPA is currently building the only permitted new container terminal on the U.S. East and Gulf Coasts. Since receiving the final permit approvals in 2007, the Ports Authority has completed demolition, site preparation and containment wall construction. Phase One Wharf construction is ongoing and construction of the Phase One buildings, site package and site access contracts will be underway by the summer of 2019. Phase One of the terminal is expected to open in 2021. At full buildout, the terminal will consist of more than 280 acres and will boost capacity in the port by 50%. A rendering of the new terminal is shown in **Figure 2-11**. An agreement between the state of South

Carolina and the City of North Charleston will permit rail access from both the north and south of a proposed rail yard that will serve the Ports Authority's container terminals and thereby provide dual access to two Class I carriers.

Figure 2-11: Rendering of the Hugh K. Leatherman, Sr. Terminal at Port of Charleston



Source: South Carolina Ports Authority

2.1.2.1.3 Other Rail Served Ports

The Port of Georgetown, a break-bulk and bulk cargo facility with four berths totaling 1,800 feet in length, is located on Winyah Bay in Georgetown. The Port has open and covered storage, specialty cargo handling facilities (metals, cement, chemicals, aggregates, forest products and ore) and on-dock rail. Principal commodities handled are steel, cement, aggregates and forest products. Rail service is provided by CSXT from its Georgetown Subdivision.

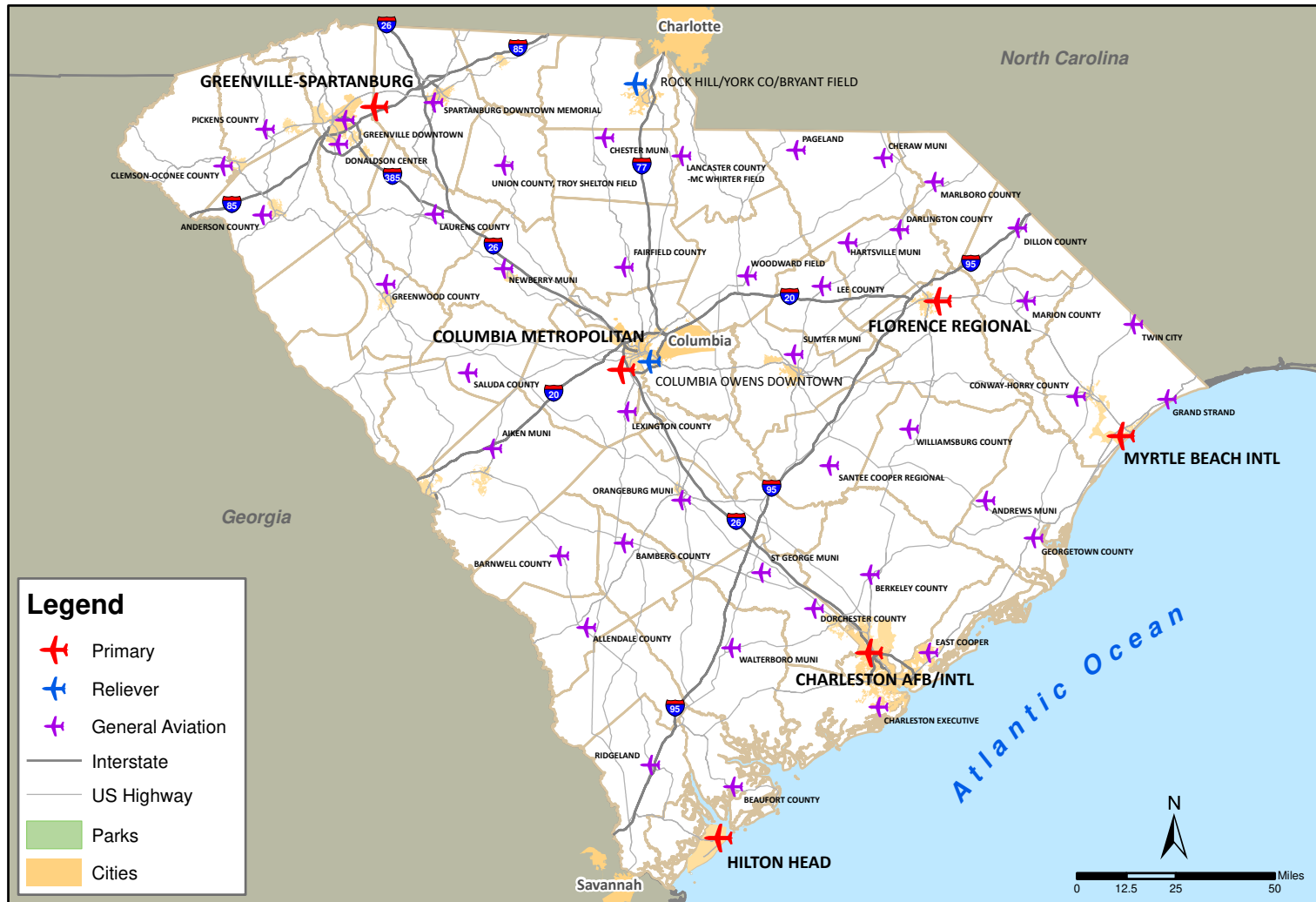
2.1.2.2 Rail Passenger Stations

Rail passenger stations are discussed in Section 2.1.1.17.

2.1.2.3 Intermodal Connections at State Airports

South Carolina has six primary commercial airports, as shown in **Figure 2-12**. None of these airports are directly served by rail for purposes of freight or passenger intermodal services. These airports serve as intermodal hubs for shipping overnight packages and other freight that is brought to the airports by road.

Figure 2-12: Map of Airports in South Carolina



2.1.3 Objectives for Rail Passenger Services

As noted previously all rail passenger services operating in the state are provided by Amtrak over lines owned by private freight railroads. As such, no South Carolina agency has responsibility or control over setting or meeting objectives for minimum service levels, service frequency, capacity or projected ridership. Working with neighboring states and others associated with the Southeast Corridor, South Carolina is collaboratively planning for passenger rail services within and through our state. Sections 3.3 and 3.4 of this plan discuss proposed intercity and passenger rail services involving regions within South Carolina. Chapter 5 of this plan highlights goals, objectives and guiding principles for long range planning and investment opportunities for rail.

2.1.4 Performance Evaluation of Rail Passenger Services

2.1.4.1 Amtrak

Stops in South Carolina are part of long distance services offered by Amtrak on a national service network versus shorter corridor service. In 2008, in response to a dramatic deterioration in on time performance, the Passenger Rail Investment and Improvement Act (PRIIA) gave Amtrak the ability to enforce its right to preference. After PRIIA's passage, Amtrak's long distance on time performance went from 30% in 2006 to over 75% in 2009. By 2014, Amtrak's rights to enforce preference granted in PRIIA were effectively eliminated by a series of legal challenges from the host railroads. Amtrak [National] Monthly Performance Reports are indicating an overall ridership and train miles decline in all sectors (Northeast Corridor, State Supported and Long Distance) over time.

As is indicated by **Figure 2-8** and **Table 2-8**, Amtrak ridership in South Carolina has steadily declined since 2012. Initial research along with discussion with the Rail Passengers Association suggests that ridership is declining due to a number of reasons. These reasons include decreasing on-time performance of the South Carolina services due in part to operating conflicts with the host railroads, and a reduction by Amtrak of select amenities on certain corridors such as those that were reduced or eliminated on the Silver Star long distance service in 2016.

Amtrak operates more than 300 intercity trains a day over 21,000 route miles serving more than 500 communities in 46 states. **Figure 2-13** provides a map of Amtrak's passenger service network throughout the United States. There has been a resurgence of interest in nearly every region of the country for expanded rail passenger service as a means of coping with growing highway and air transportation congestion, and fuel costs.

2.1.4.2 Amtrak On-time Performance

Section 207 of the Passenger Rail Investment and Improvement Act of 2008 (Division B of Pub. L. 110-432) (PRIIA) charged the Federal Railroad Administration (FRA) and Amtrak with jointly developing, in consultation with the Surface Transportation Board, rail carriers over whose rail lines Amtrak trains operate, States, Amtrak employees, nonprofit employee organizations representing Amtrak employees, and groups representing Amtrak passengers, as appropriate, new or improving existing metrics and minimum standards for measuring the performance and service quality of intercity passenger train operations, including cost recovery, on-time performance and minutes of delay, ridership, on-board services, stations, facilities, equipment, and other services.

On-Time Performance (OTP) under the published final PRIIA standard 207 (effective May 12, 2010) is to be discerned on the basis of three tests (only two tests until FY 2012): 1) Change in Effective Speed³, 2) percent on time at the endpoint (Endpoint OTP), and 3) percent on time at all stations served (All-Stations OTP) (Effective as of FY 2012). The final standard makes clear that the effective speed is to be calculated on a rolling four-quarter basis and compared with a fixed FY 2008 baseline.

A train is considered “late” if it arrives at its endpoint terminal more than 10 minutes after its scheduled arrival time for trips up to 250 miles; 15 minutes for trips 251-350 miles; 20 minutes for trips 351-450 miles; 25 minutes for trips 451-550 miles; and 30 minutes for trips of 551 or more miles.

The October 2018 performance for these trains is compared to the PRIIA Section 207 Standard target of 80% OTP for all long distance routes in Amtrak service and 80% end point OTP for Amtrak long distance routes. The on-time performance comparison for all South Carolina Long Distance routes at end-points for the four Amtrak long distance trains serving South Carolina appears in **Table 2-10**.

Table 2-10: South Carolina Amtrak Long Distance Routes End Point & All Stations OTP

	End Point OTP	All Stations OTP
Amtrak System OTP Average Oct 2018	75%	73.1%
Amtrak Long Distance Route	Oct 2018	Oct 2018
Crescent	27.4%	38.8%
Palmetto	71.0%	72.3%
Silver Meteor	75.8%	70.4%
Silver Star	56.5%	46.7%

Source: Amtrak Host Railroad Report (October 2018)

³ Effective speed is defined as a train’s mileage, divided by the sum of (a) the scheduled end-to-end running time plus (b) the average endpoint terminal lateness.

Figure 2-13: Amtrak's National Network



Source: Amtrak Publications, Amtrak System Map (October 2018)

2.1.4.3 Amtrak Host Performance

Amtrak evaluates host performance based on host responsible minutes delay per 10,000 train-miles, which measures how much delay each host railroad causes to Amtrak trains. The measure is normalized by the number of miles traveled by each train (a “train-mile”) so that routes of different lengths, and hosts with different levels of Amtrak service, can be compared to each other.

Table 2-11 shows the minutes of delay per 10,000 train miles and indicates the largest two delay categories for Amtrak trains serving South Carolina followed by the and explanation of delay codes for the report.

Table 2-11: Minutes of Delay per 10K Train Miles by Host for October 2018

Service	Host	Total Minutes Delay	Largest Two Delay Categories				Route Miles
		October 2018	#1		#2		
Long Distance Routes Target		900 minutes					
Crescent	NS	1559	FTI	978	DCS	204	1141
Palmetto	CSX	915	FTI	283	PTI	250	659
Silver Meteor	CSX	695	FTI	253	PTI	130	1152
	Fla DOT	1075	DSR	429	CTI	299	68
	FR	1051	CTI	328	DCS	267	61
Silver Star	CSX	976	DSR	268	FTI	225	1209
	NS	1612	DSR	614	DCS	583	28
	Fla DOT	1358	CTI	521	DSR	463	68
	FR	1065	CTI	498	DSR	318	61

Source: Amtrak Host Railroad Report (October 2018)

Host Railroad Responsible Delay Codes and Explanations

Cod	Code	Explanation
CTI	Commuter Train Interference	Delays for meeting or following commuter trains
DCS	Signal Delays	Signal failure or All Other signal delays, wayside defect-detector false-alarms, defective road crossing protection, efficiency tests, drawbridge stuck open
DMW	Maintenance of Way	Maintenance of Way delays including holds for track repairs or MW foreman to clear
DSR	Slow Order Delays	Temporary slow orders, except heat or cold orders
DTR	Detour	Delays from detours
FTI	Freight Train Interference	Delays from freight trains
PTI	Passenger Train Interference	Delays for meeting or following All Other passenger trains
RTE	Routing	Routing-dispatching delays including diversions, late track bulletins, etc.

Host railroads make all dispatching decisions regarding which trains are allowed to go first and which trains must wait. Federal law requires Amtrak passenger trains to receive preference over freight transportation, but the largest cause of delay to Amtrak trains on host railroads is “Freight Train Interference,” typically caused by a freight railroad requiring an Amtrak passenger train to wait so that its freight trains can operate first.

2.1.4.1 Annual Financial Performance

Amtrak’s fiscal year (FY) begins on October 1. Amtrak reports route revenue and operating costs for its trains on a monthly and year-to-date basis. The figures for its last full fiscal year appear in the *Amtrak Monthly Performance Report for September 2018*⁴. The figures for the four Amtrak long distance trains serving South Carolina appear in **Table 2-12**.

Table 2-12: Financial Performance of Amtrak Trains in FY18

Amtrak Service	Revenue (\$Millions)	Operating Expense(\$M)	Fare Box Recovery
Crescent	\$33.1	\$72.6	45.6%
Palmetto	\$30.9	\$36.3	85.1%
Silver Meteor	\$40.1	\$79.9	50.2%
Silver Star	\$34.8	\$69.7	49.9%
Amtrak Long Distance Trains	\$523.4	\$1066.7	49.1%

The relationship between revenue to operating costs is called the fare box recovery ratio. The ratio shows the degree to which revenues cover operating costs; it is a common measure of the financial success of public transport services. The fare box recovery ratios of the four Amtrak long distance trains that serve South Carolina bracket Amtrak’s overall long distance service fare box recovery ratio of 49.1 percent. The best performer is the *Palmetto*, showing a fare box recovery ratio of 85.1% percent.

2.1.5 Public Financing for Rail Projects

South Carolina does not have dedicated state revenue sources for passenger or freight rail. In addition, the state’s current public-private partnership (P3) legislation does not include passenger or freight rail projects. There are some limited opportunities for state and local financial assistance for Class I and Short Line freight rail companies and passenger rail initiatives from South Carolina’s Department of Commerce and the South Carolina Transportation Infrastructure Bank.

SCDOT, in partnership with Norfolk Southern Railways and the South Carolina Ports Authority, was awarded 2018 Rural BUILD Grant funds in the amount of \$25,000,000 in support of the *Upstate Express Corridor Capacity Expansion Project* located at the SC Inland Port Greer. The project will make freight rail infrastructure improvements in South Carolina. It will expand the Inland Port Greer (IPG), extend the IPG lead track, and lengthen the Carlisle Siding to approximately 15,100 feet. The IPG expansion includes acquiring additional equipment for the handling, loading, and unloading of containers and the paving of up to 40 acres. The project will advance state of good repair by shifting freight transport from truck to rail, thereby reducing vehicle miles traveled and subsequent pavement damage caused by heavy trucks. The project will add inland transportation capacity to accommodate the economic growth that is expected at the port from the nearby automotive manufacturing facility and other manufacturers in the area. Quality of life will be improved by reducing highway congestion on Interstates 26 and 85.

⁴ Amtrak YTD September FY 2018 (Updated to Include Final Audited Financial Data), February 19, 2019

2.1.5.1 South Carolina Transportation Infrastructure Bank

The SCTIB has an independent board comprised of seven members including the SCDOT Commission Chairman, two appointed by the Governor, two appointed by the Speaker of the House, and two appointed by the President Pro Tempore of the Senate. Any state or local agency/district can apply for a SCTIB loan to construct an eligible project.

Eligible projects include major projects which provide a public benefit required by the South Carolina Transportation Infrastructure Bank Act (the Act), SC Code Sections 11-43-110 et seq., are eligible for financial assistance from the Bank. There are two requirements for eligibility:

- Major Projects – Construction of or improvements to highways, including bridges, with at least \$25 million in cost are eligible for financial assistance. This cost includes: preliminary engineering; traffic and revenue studies; environmental studies; rights of way acquisition; legal and financial services associated with the development of projects; construction; construction management; facilities; and other costs necessary for the project. The cost shall not include financial costs or interest on loans used for the project. While the total cost must be at least \$25 million, the final assistance requested may be less than \$25 million. Projects may not be combined to meet the minimum project cost of \$25 million.
- Public Benefit – The proposed project must provide a public benefit in one or more of the following areas: enhancement of mobility and safety; promotion of economic development; or increase in the quality of life and general welfare of the public.

2.1.5.2 House Bill 3516 (Act 40)

On May 10, 2017 the South Carolina House and Senate voted on House Bill H. 3516⁵, otherwise known as the Act 40, establishing SC Code Section 12-28-310(D). The centerpiece of the legislation is the increase in sustained funding for improving and maintaining roads and bridges through a graduated increase in the state gas tax. Key highlights include:

- Establishes the Infrastructure Maintenance Trust Fund for repairs, maintenance and improvements to the existing highway system.
- Effective on July 1, the state gas tax increases two cents per year for the next six years. The total increase will be 12 cents per year after the sixth year.

Act 40 of 2017 provides roughly \$600 million in recurring funds, once fully implemented, to be used solely on the improvements of South Carolina’s roads and bridges. Funding components include:

- Increases the motor fuel user fee by 12 cents over six years (2 cents per year commencing in 2018).
- Increase of biennial registration fees on private passenger vehicles by \$16.
- Imposes an “Infrastructure Maintenance Fee” upon the purchase of a motor vehicle (capped at \$500).

⁵ http://www.scstatehouse.gov/sess122_2017-2018/bills/3516.htm

- Imposes a one-time \$250 registration fee for anyone who transfers a motor vehicle from another state to South Carolina.
- Create new registration fees for alternative vehicles: \$120 for EV's & \$60 for hybrid vehicles.
- Rolls the truck property tax into the IRP for out-of-state IRP-registered fleets.

2.1.6 Rail Safety and Security Programs

Rail safety and security is a high priority for both railroads and the public. Rail security involves protection of the physical rail system, operations, and freight being transported, including the threat posed by terrorists using the rail mode to disrupt transportation in general or harm large numbers of people. Although most rail safety falls under the jurisdiction of the Federal Railroad Administration (FRA), in reality a number of federal and South Carolina agencies work in concert with the railroads to improve both safety and security in the state. South Carolina programs, projects, and participating partners are the subject of this section.

2.1.6.1 Reportable Railroad Incidents

Regulations on reporting railroad accidents and incidents can be found in Title 49 Code of Federal Regulations (CFR) Part 225, Railroad Accidents/Incidents, Reports Classification, and Investigations. FRA collects and analyzes the data from the Nation's railroads and converts this information into meaningful statistical tables, charts, and reports that are found on the [FRA Safety Data site](#). The primary groups of accidents and incidents to be reported monthly by railroads are:

- Highway-rail grade crossing accidents/incidents.
- Rail equipment accidents/incidents.
- Casualties to persons (i.e., death and non-fatal injuries to all types of persons, and occupational illnesses involving railroad employees).

In addition to monthly railroad-reported accidents and incidents, railroads are required to provide FRA with immediate notification of various types of accidents.

Railroad related incidents and casualties for the last full 10-year period 2009-2018 in South Carolina are summarized for freight operations in **Table 2-13** and passenger operations in **Table 2-14**.

Table 2-13: FRA Freight Operations Ten Year Accident/Incident Overview (South Carolina)

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
TOTAL FREIGHT ACCIDENTS/INCIDENTS (1)	81	94	77	100	77	93	86	90	86	95
--- Total fatalities	4	8	7	7	11	6	15	3	9	14
--- Total nonfatal conditions	39	48	39	53	45	52	43	56	35	44
FREIGHT TRAIN ACCIDENTS (Not at Grade-Crossings)	18	9	11	10	8	13	16	15	21	18
--- Train accident deaths	.	.	.	.	1	.	.	.	.	.
--- Train accident injuries	1	.	.	.	.	1	3	2	.	2
FREIGHT HIGHWAY-RAIL INCIDENTS	39	48	31	54	38	46	38	42	39	39
--- Highway-rail incidents deaths	2	2	1	3	5	1	7	.	4	3
--- Highway-rail incidents injuries	16	17	10	21	17	22	12	19	14	15
--- Incidents at public crossings	34	41	28	48	32	43	35	37	29	34
OTHER FREIGHT ACCIDENTS/INCIDENTS (2)	24	37	35	36	31	34	32	33	26	38
--- Other incidents deaths	2	6	6	4	5	5	8	3	5	11
--- Other incidents injuries	22	31	29	32	28	29	28	35	21	27

Source: FRA Office of Safety Analysis

(1) Total Passenger Accidents/Incidents are the sum of Train Accidents, Crossing Incidents, and Other Accidents/Incidents.

(2) Other Passenger Accidents/Incidents are events other than Train Accidents or Crossing Incidents that cause physical harm to persons.

The related report numbers are included in the TOTAL PASSENGER ACCIDENTS/INCIDENTS section numbers.

While there appear to be no significant anomalies or outliers in accident and incidents over the ten-year period, most non-fatal conditions are reported as incidents at public crossings or other incidents not involving train accidents or crossing incidents. *Highway–Rail Crossings* statistics display incidents involving rail equipment at grade crossings (the standard at-grade railroad crossing).

Table 2-14: FRA Passenger Operations Ten Year Accident/Incident Overview (South Carolina)

Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
TOTAL PASSENGER ACCIDENTS/INCIDENTS (1)	23	19	27	25	35	31	32	30	28	25
--- Total fatalities	8	2	3	3	4	1	2	4	5	5
--- Total nonfatal conditions	17	16	24	23	53	25	36	25	43	149
PASSENGER TRAIN ACCIDENTS (Not at Grade-Crossings)	.	.	.	1	1	.	.	.	1	1
--- Train accident deaths	.	.	.	.	.	.	.	.	.	2
--- Train accident injuries	.	.	.	.	21	.	.	.	.	131
PASSENGER HIGHWAY-RAIL INCIDENTS	2	3	5	5	6	6	3	6	7	5
--- Highway-rail incidents deaths	4	2	3	3	.	1	.	3	5	1
--- Highway-rail incidents injuries	.	.	2	4	4	.	9	2	23	1
--- Incidents at public crossings	2	3	5	4	6	5	2	4	6	5
OTHER PASSENGER ACCIDENTS/INCIDENTS (2)	21	16	22	19	28	25	29	24	20	19
--- Other incidents deaths	4	.	.	.	4	.	2	1	.	2
--- Other incidents injuries	17	16	22	19	28	25	27	23	20	17

Source: FRA Office of Safety Analysis

(1) Total Passenger Accidents/Incidents are the sum of Train Accidents, Crossing Incidents, and Other Accidents/Incidents.

(2) Other Passenger Accidents/Incidents are events other than Train Accidents or Crossing Incidents that cause physical harm to persons.

The related report numbers are included in the TOTAL PASSENGER ACCIDENTS/INCIDENTS section numbers.

South Carolina deaths and injuries are generally static over time reflecting variations in incident severity. In August 2013, an Amtrak train traveling from New Orleans to New York, was derailed near Spartanburg. Fortunately there were no fatalities. In February 2018, two people were killed and 116 others injured when an Amtrak train traveling from New York to Miami struck a CSX freight train.

2.1.6.2 South Carolina Strategic Highway Safety Plan

The South Carolina Strategic Highway Safety Plan (SHSP) was updated in 2015 and is currently undergoing another update. The most recent update of the SHSP was entitled Target Zero and covers the years 2015 to 2018 with annual implementation plans developed during this time.

South Carolina's Strategic Highway Safety Plan, or SHSP, is a statewide, comprehensive safety plan that provides a coordinated framework toward eliminating deaths and severe injuries on South Carolina's public roads. This coordination requires combining and sharing resources and focusing efforts on areas with the greatest potential for improvement. The SHSP strategically establishes statewide priorities and identifies critical emphasis areas that were identified through detailed analysis of statewide crash data. The development of the SHSP was also performed in consultation with federal, state, local, and private-sector safety stakeholders. The strategies developed involve the **4 E's of Safety** (i.e., Engineering, Enforcement, Education, and Emergency Medical Services).

In 2011, the Director of the SC Department of Public Safety (SCDPS), who also serves as the Governor's Representative for Highway Safety in South Carolina, announced the Agency's goal of zero traffic-related deaths for the State. This goal, also strongly supported by the South Carolina Department of Transportation (SCDOT) and the South Carolina Department of Motor Vehicles, became the starting point for the State's 2015 update of the SHSP, entitled Target Zero.

The federal transportation act, Moving Ahead for Progress in the 21st Century (MAP-21), established a new requirement for all states to update their respective Strategic Highway Safety Plans (SHSP) every five years in order to continue to qualify for receipt of Highway Safety Improvement Program (HSIP) funds. South Carolina will produce another four or five year plan that should be completed during CY 2019.

Using the same process for the 2015-2018 SHSP, the Steering Committee will use a data-driven approach to identify emphasis areas for the next SHSP. The SHSP Emphasis Areas will not be finalized until the document has been completed; however preliminary analysis reveal the priority traffic safety areas for fatal and severe injury collisions from 2014 to 2018, shown in

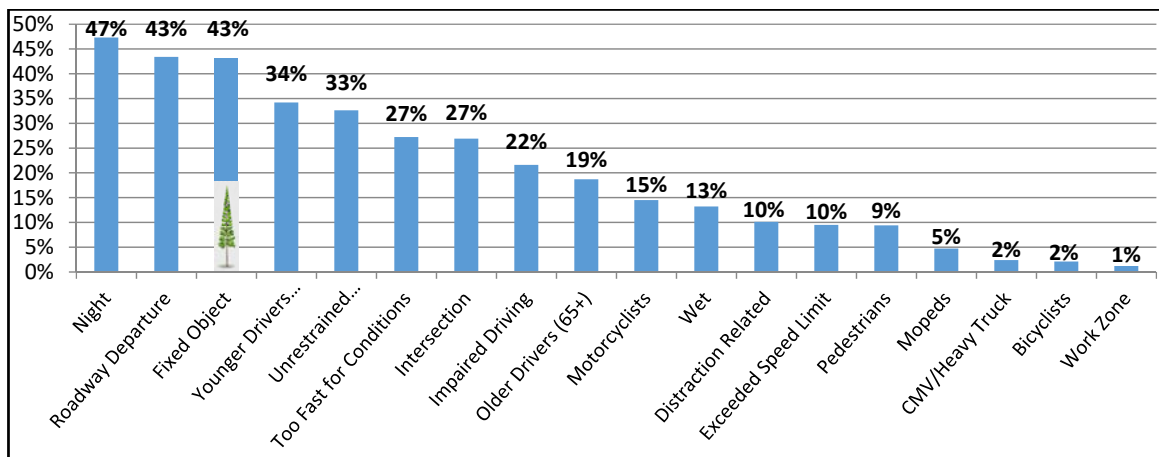
Table 2-15 and **Figure 2-14**. While crash causation factors are often interrelated, the critical areas to target are evident. It is expected that the major focus areas for South Carolina will remain similar to those identified in the 2007 and 2015 SHSP with only slight changes in terminology and a few additions – primarily night time, fixed object, and wet roadway related crashes.

Table 2-15: State Strategic Highway Safety Plan Preliminary Data Analysis, 2014-2018

South Carolina 2014-2018	Fatalities		Severe Injuries		Fatal and Severe Injury Collisions	
	# of People	% of Total	# of People	% of Total	# of People	% of Total
Night Time	2,669	55.5%	6,551	44.5%	7,807	47.30%
Roadway Departure	2,107	43.8%	5,965	40.5%	7,162	43.40%
Fixed Object	2,331	48.4%	6,025	40.9%	7,115	43.10%
Younger Driver (15-24)	1,580	32.8%	5,626	38.2%	5,637	34.20%
Unrestrained MV Occupants	1,574	48.9%	2,656	18.0%	3,685	32.60%
Driving Too Fast for Cond.	1,224	25.4%	4,038	27.4%	4,493	27.20%
Intersection	1,012	21.0%	4,241	28.8%	4,435	26.90%
Impaired Driving	1,537	31.9%	2,887	19.6%	3,564	21.60%
Older Driver (65+)	1,014	21.1%	2,835	19.2%	3,077	18.70%
Motorcyclists	592	12.3%	1,959	13.3%	2,396	14.50%
Wet Related	684	14.2%	1,924	13.1%	2,184	13.20%
Distraction Related	288	6.0%	1,681	11.4%	1,664	10.10%
EASL Related	831	17.3%	1,158	7.9%	1,573	9.50%
Pedestrians	695	14.4%	902	6.1%	1,549	9.40%
Moped Operators	173	3.6%	636	4.3%	778	4.70%
Heavy Related	359	7.5%	589	4.0%	773	4.70%
CMV/Heavy Truck Related	190	3.9%	311	2.1%	395	2.40%
Bicyclists	91	1.9%	254	1.7%	342	2.10%
Work Zone Related	77	1.6%	150	1.0%	195	1.20%
Railroad Crossing Related	14	0.3%	10	0.1%	21	0.10%

*Fatal and severe injury crashes may have more than one factor; however the total figures are representative of total fatalities, severe injuries, and collisions during this time period. Percentages will total more than 100% and individual categories will total more than the 2014-2018 total.

Figure 2-14: Crash Cause Factors



2.1.6.3 Highway-Rail Grade Crossings

The rail safety area most visible to the general public as a whole is the interface between the rail and highway systems at grade crossings. As a result of the railway crossing inventory performed by the Federal Highway Administration in the 1970s, each state could develop engineering projects with the goal of reducing train-vehicle collisions. The Rail grade Safety Program was established to address rail grade and crossing safety nationwide. SCDOT was charged with inspecting every public crossing for appropriate traffic control. MAP-21 continued the annual set-aside for elimination of hazards at railway-highway crossings from the state’s HSIP apportionment. Funds are eligible for projects at all public crossings. Fifty percent of the funds must be used for the installation of protective devices at railway-highway crossings.

In South Carolina, from 2013 to 2017, railway-highway crossing collisions accounted for an average of 2.2 fatalities per year and 7.8 severe injuries per year. The number of fatalities at rail grade crossings had been declining but demonstrated a slight uptick in the most recent five year average, as shown in **Figure 2-15**, which also shows the 5-year rolling average of fatalities. **Figure 2-16** shows serious injuries at railway-highway crossings.

Figure 2-15: Fatalities at Railway-Highway Crossings 5-yr avg. Performance Measure Data

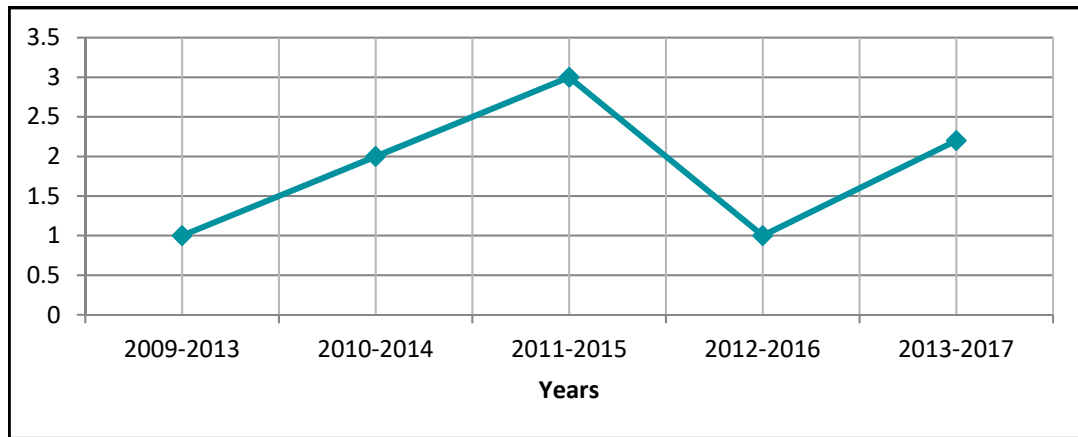
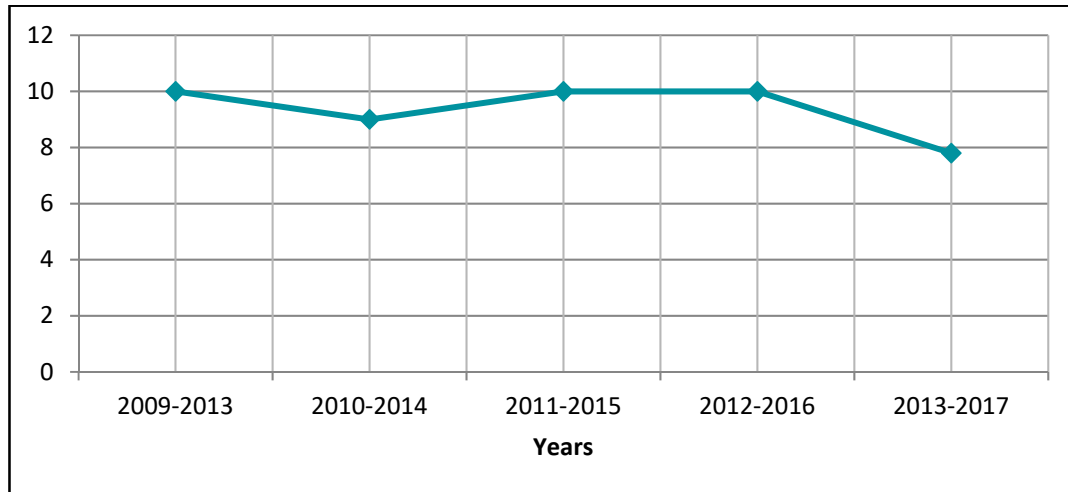


Figure 2-16: Serious Injuries at Railway-Highway Crossings 5-yr avg. Performance Measure Data



In almost 41% of the collisions with fatalities and serious injuries a contributing factor was driver disregarding sign or signals⁶. There are 3,967 highway-rail crossings in South Carolina, with 2,657 located on public roadways, 1,296 crossings on private roads, and 14 pedestrian crossings. The highway-rail safety program in South Carolina is the responsibility of the Traffic Safety arm of the Traffic Engineering Group of the SCDOT Engineering Division. It manages federal funds for grade crossing improvements derived from Section 103 monies. Funding levels total some \$4 million per year, and are used to improve 10-12 crossings annually. Improvements currently consist principally of converting at-grade crossings protected with flashing lights to gated crossings. In the process, each of the 2,700 public crossings in the state is ranked for priority. The rankings are re-evaluated on an annual basis. The SCDOT currently has 22 grade crossing improvement projects underway. The projects listed in **Table 2-16**. Error! No bookmark name given.

2.1.6.4 Rail Safety Inspection

In addition to the grade crossing inspections conducted by SCDOT, the Office of Regulatory Staff (ORS) works in partnership with the FRA to provide routine compliance inspections. The South Carolina Office of Regulatory Staff (ORS) has been directed by the South Carolina General Assembly (S.C. Code Ann. Section 58-17-140 as amended by 2006 S.C. Acts No. 318) to compile information regarding railroad transportation activities in the State on an annual basis. In 2017, ORS continued to share the responsibility for railroad safety oversight with the Federal Railroad Administration (FRA) in two areas: 1) Track and 2) Operating Practices (OP). The FRA Track Division promotes understanding of and compliance with the federal Track Safety standards and provides technical expertise regarding track safety standards, roadway worker standards, and roadway maintenance machine standards, relevant to 49 CFR 213 and 214 disciplines. The OP Division promotes understanding of and compliance with the federal Track Safety standards and provides technical expertise regarding track safety standards, roadway worker standards, and roadway maintenance machine standards, relevant to 49 CFR 213 and 214 disciplines. The OP Division promotes understanding of and compliance with

⁶ Target Zero, South Carolina’s Strategic Highway Safety Plan (Draft)

Table 2-16: FY 2019 Active Railroad Projects

County	Road / Route ID	RR Company	RR Crossing Number	Work Type
Aiken	Gum Swamp Rd.	CSX	633 698G	Std FLS w / Gates
Allendale	Road S-114 (9th Street)	CSX	634 827X	Std FLS w / Gates
Anderson	Ball St (L-8204)	NS	717 257U	Std FLS w / Gates
Charleston	S-58 Virginia Street	PR	721 435K	Cant FLS w / Gates
Charleston	New Rd (L-1774)	CSX	632 411B	Std FLS w / Gates
Chester	SC Route 9 Bypass	L&C	861054G	Cant FLS w / Gates
Dillon	S-50 Minturn Rd.	CSX	634 467C	Std FLS w / Gates
Edgefield	S-101 Riegel Rd	NS	715 697D	Add Gates
Greenville	S-657 Brown St.	NS	717 076P	Std FLS w / Gates
Greenville	Arnold St. (L-1186)	CSX	640 603N	Std FLS w / Gates
Greenville	US 25	NS	717 105X	Upg Cant FLS
Greenville	Tanner Drive (L-3058)	CSX	640 659H	Std FLS w / Gates
Laurens	S-276 Stomp Spring Rd	CSX	638 982R	Std FLS w / Gates
Laurens	U.S. 76 Carolina Ave	CSX	643 244K	Add Gates
Spartanburg	SC-357	CSX	640 686E	Add Gates
Spartanburg	Sims Chapel Rd	CSX	640 920T	Std FLS w / Gates
Spartanburg	Land Grant Road	NS	720726W	Std FLS w / Gates
Sumter	S-528 Kolb Rd.	CSX	633 144D	Add Gates
Sumter	Road S-251 (Starks Ferry Road)	CSX	633 146S	Std FLS w / Gates
Sumter	S-29	CSX	633 155R	Std FLS w / Gates
Sumter	S-507	CSX	632 618H	Add Gates
Williamsburg	Main St. (S-35)	CSX	633 052R	Cant / Std FLS w / Gates

Source: SCDOT Safety Office (May 2019)

federal Operating Practices standards and provides technical expertise regarding railroad carrier operating rules, employee qualification guidelines, and carrier training and testing programs; railroad occupational safety and health standards; the Hours of Service Act; and accident and personal injury reporting requirements.

Through the Staggers Rail Act of 1980, Congress intended to create a competitive economic environment for railroad transportation by deregulating the rates and charges of railroads. The Rail Safety Act and its amendments authorized states to work with the FRA to enforce federal railroad safety regulations. As a result of this legislation, ORS inspectors work in partnership with the FRA to provide routine compliance inspections. ORS inspects approximately 2,600 miles of track and accompanying railroad operations annually. In 2017, ORS reported conducting 229 routine inspections, compiled 263 inspection reports, detected 16 safety violations, and documented 952 safety defects through these inspections.

According to the ORS 2017 Annual Report on Railroad Transportation Activities three challenges face the general public in regard to rail safety. First, blocked railroad crossings are a challenge to South Carolina. S.C. Code Ann. Section § 58-17-4080 (Supp. 2015) states that any railroad that blocks a crossing for more than five minutes is subject to a fine of no more than twenty dollars. A blocked crossing hinders emergency response, slows the flow of commerce and traffic, and can create a dangerous situation for pedestrians. ORS' largest volume of complaints is from blocked crossings.

The second challenge is trespassing. As the population increases in the State, the railroads are facing increasing incidents of trespassing on the tracks and rights-of-way. This situation has led to a general increase in fatalities and injuries on railroad property over the last five years. Third, while collisions at highway-rail grade crossings have decreased over the last five years, motorists continue to disregard crossing arms, cross bucks, signals, and stop signs at grade crossings. Mitigation of these challenges will require legislation to increase penalties for railroad operators whose trains block a crossing and for citizens who trespass or ignore crossing arms and other safety devices at a grade crossing.

2.1.6.4 South Carolina Emergency Management Division

The South Carolina Emergency Management Division, a division of the Adjutant General's Office, is the coordinating agency responsible for the statewide emergency management program. SCEMD's mission is to develop, coordinate, and lead the state emergency management program, enabling effective preparation for, response to and recovery from emergencies and disasters in order to save lives, reduce human suffering and minimize property loss.⁷

To accomplish its mission, the SCEMD established three principal efforts, which are described below:

- Develop plans and procedures to ensure the highest levels of mitigation, preparedness, response, and recovery;
 - Including the South Carolina Emergency Operations Plan, Hurricane Plan, Earthquake Plan, Terrorism Plan and other selected plans.
- Maintain a comprehensive, risk-based, multi-hazard emergency management and training program;
 - Including training of emergency planners and response personnel at the state and county levels, as well as the development and execution of state emergency management exercises.
- Promote public education for citizen preparedness and emergency management issues;
 - Coordinate federal, state and local resources for mitigation, preparedness, response and recovery operations;
 - Maintenance and operation of the State Emergency Operations Center (SEOC) and the Alternate EOC;
 - State assistance in preparedness and response through six emergency management regions;
 - Mitigation programs that focus on the prevention of damage to personal dwellings and state and local infrastructure through technical assistance, including state and local risk assessment, and planning as well as administering the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation Program (PDM) and the Hazard Mitigation Grant Program (HMGP); and
 - Public Assistance (infrastructure) and Individual Assistance (human services) programs, activities and planning to assist citizens during the recovery phase through programs that provide for the repair of damaged infrastructures and the human services programs

⁷ <http://scemd.org/>

administered to the public in the aftermath of a disaster where there is a Presidential disaster declaration.

2.1.6.5 Class I Railroad Homeland Security

CSX has established several public-private partnerships with homeland security officials in 17 states, South Carolina being one, the American Chemistry Council's Chemtrec call-response center, and the Transportation Security Administration. These partnerships provide information, resources and strategies related to the security of the railroad.

Norfolk Southern lists SCEMD as the state contact for Homeland security on their "Protect the Line" website.⁸

2.1.6.6 Strategic Rail Corridor Network

The US Military Surface Deployment and Distribution Command's Transportation Engineering Agency has identified the most important rail lines to national defense in the national Strategic Rail Corridor Network (STRACNET). STRACNET is comprised of a 32,000-mile interconnected network of rail corridors and associated connector lines throughout the country.

The Railroads for National Defense Program (RND) ensures the readiness capability of the national railroad network to support defense deployment and peacetime needs. The Program integrates defense rail needs into civil sector planning affecting the Nation's railroad system. Rail transportation is extremely important to DOD since our heavy and tracked vehicles will deploy by rail to seaports of embarkation. The RND Program, in conjunction with the US Federal Railroad Administration (FRA), established the Strategic Rail Corridor Network (STRACNET) to ensure DOD's minimum rail needs are identified and coordinated with appropriate transportation authorities. STRACNET is an interconnected and continuous rail line network consisting of over 36,000 miles of track serving over 120 defense installations. We work with State DOTs, the Association of American Railroads (AAR), the Surface Transportation Board (STB), the American Railway Engineering and Maintenance of Way Association (AREMA), the FRA, and individual railroad companies to protect this railroad infrastructure. South Carolina's lines included in STRACNET are shown in **Figure 2-17**.

Fort Jackson in Columbia, Shaw Air Force Base in Sumter and two US Navy installations in the Charleston area (North Charleston and Goose Creek) are identified as defense installations requiring rail service. The first two are served from a CSXT line that runs from Columbia through Sumter to Lane. The Naval Weapons Station Charleston, now Joint Base Charleston, is located in Goose Creek and Hanahan in Berkeley County and is served by CSXT. The Naval Weapons Station South, formerly the Charleston Army Depot, in North Charleston is also served by CSXT.

2.1.7 Rail Transportation's Impacts

The impacts of rail transportation on congestion mitigation, trade and economic development, air quality, energy use, and land use in South Carolina are described in this section. Safety impacts are addressed in Section 2.1.6.

⁸ http://www.protecttheline.com/homeland_security.php

2.1.7.1 Congestion Mitigation

Railroads play a double role in roadway congestion. Congestion can result because of railroad operations, but on the flip side, railroads can assist in mitigating congestion.

2.1.7.1.1 Railroad Induced Congestion

The most common induced cause of roadway congestion relates to at-grade highway-rail crossings. The slow passage of long trains over busy roadways, principally in urban areas, creates vehicular backups resulting in delays with loss of the driver’s time combined with additional fuel consumption and emissions, among others. The most common approach to this problem is grade separation, construction of overpasses or underpasses either for individual roadways or as part of a corridor project involving several crossings in the same area. The latter could consist of crossing consolidation involving grade separations combined with selective closures.

Another approach is railroad relocation, or construction of expanded rail sidings. Relocation through new construction on a new alignment is one means, but expensive. Another approach is rerouting trains over another rail line that has fewer crossings and/or less roadway traffic. Often the two are used in combination.

Another induced cause ironically results from mitigation efforts, namely intermodal connection points. A connection between the rail network and other modes typically occurs at ports or intermodal facilities. Proper planning, local commitment and support for improvements are required to ensure proper connectivity with minimal negative impact is in place.

Figure 2-17: South Carolina’s STRACNET Rail Lines



Source: STRATEGIC RAIL CORRIDOR NETWORK (STRACNET) and DEFENSE CONNECTOR LINES (Oct 2018), Military Surface Deployment and Distribution Command Transportation Engineering Agency

2.1.7.1.2 Railroad Mitigation Impacts

Increased demand and continued reliance on auto and air travel for passenger trips and on trucks for freight movement can lead to negative impacts, not only increased congestion, but additional safety and environmental concerns. The most familiar mitigation approach involving railroads is to divert truck transportation to rail for freight, and vehicular and air personal travel to passenger trains. Currently, passenger and freight rail transport face challenges when competing with auto, air, and truck travel. However, perceived rail shortcomings, often due to rail being slower, less convenient and less connected than other modes of travel, can be overcome.

High speed rail offers potential to relieve air transport congestion. For example, travel on the Northeast Corridor between Washington and Boston has attracted a large percentage of former air shuttle passengers between the major cities along the corridor, and the same result is projected for other planned corridors. The status of high speed rail in South Carolina is discussed in Section 2.3.5.

Likewise, commuter trains are effective in mitigating roadway congestion in urban areas during the traditional morning and afternoon rush hours. Rail commuter service does not currently exist in South Carolina, but studies have been conducted in Charleston, Columbia and in the Upstate between Greenville and Spartanburg, the three metro areas that have the most severe rush-hour congestion. Interest remains strong in Charleston.

Mitigation of freight traffic is largely approached using intermodal conversions – rail replacing the line-haul portion of truck movements with the local pick-up and delivery continuing to be performed by the latter. The most common approach considered is rail transport of trailers (piggyback) and containers, but it can also be accomplished with conversion to carload traffic, both point-to-point and transfer between rail and truck. Facilities permitting both forms are located in the state.

An ongoing driver shortage, new regulations that limit a driver's time on the road, such as ELDs (electronic logging devices), as well as spikes in demand due to larger and larger vessels have resulted in an increase in trucking costs and the inability to get trucking services when they're needed. Inland ports have emerged as an important option to counteract the impact of these challenges. Cargo bound for an inland port moves quickly off the marine terminal, onto short haul rail then to the inland port. Such intermodal rail services reduce dependency on the unknown of driver availability, improve operational efficiency via a consistent and forecastable delivery schedule, while at the same time reducing cost. Inland Ports are set-up to be a hub for freight moving to facilities, such as production plants and distribution centers (DC), which are regionally located near the inland port. By using short haul rail, the long truck trip from the marine terminal is eliminated and once the container reaches the inland port, it's only a short dray to the shippers' facility. In addition, shippers achieve operational flexibility at their facilities since the inland port is open for business 24/7.⁹

⁹ <http://www.scspace.com/wp-content/uploads/scspa-10226-whitepages-inland-ports-03.pdf>

As an example, it has been estimated that the inland port at Greer is expected to remove 25,000 trucks from I-26 between Charleston and the Upstate initially and potentially 100,000 in five years.¹⁰ Building upon the success of Inland Port Greer and the increased industry demand for intermodal rail to move containerized freight, SCPA expanded its footprint in FY2018 with the opening of Inland Port Dillon in April 2018. Inland Port Dillon utilizes an existing CSX intermodal train service to handle container movement to and from the Port of Charleston. It is expected to convert an estimated 45,000 container movements from truck to rail in the first year of operation, deepening the Port's reach into markets to the northeast and Midwest. Located within the Carolinas I-95 Mega Site, Inland Port Dillon is a critical transportation artery in the Southeast.

2.1.7.2 Trade and Economic Development

South Carolina's railroads play a major transportation role in the conduct of the state's trade and in the attraction of new industry. They serve all of the major population and commerce centers as well as the Ports of Charleston and Georgetown. In addition to the provision of direct rail service, they serve multimodal facilities throughout the state, some of which they own and operate, providing rail access to shippers and consignees that do not have access to direct rail service at their place of business.

2.1.7.2.1 Early History of South Carolina Trade

To facilitate trade, the Charleston and Hamburg Rail Road was chartered in 1827¹¹ to build and operate a "railed road" between the two cities as well as Columbia and Camden. Its purpose was not only to reach the interior of the state, but to divert steamboat shipments bound for the Port of Savannah to the Port of Charleston, thus the selection of the terminus, which was across the Savannah River from Augusta. Regular operations began on Christmas Day in 1830 between Charleston and Sans Souci (the current location of the Norfolk Southern-Dorchester Road crossing in North Charleston), the first such in the country. The line reached Columbia in 1842, via a line originating in Branchville, and Camden in 1848.¹²

2.1.7.2.2 Economic Development and Rail

Railroads have long been actively involved in economic development to develop business and generate revenue along their lines. Southern Railway, a Norfolk Southern predecessor, established a Land and Industrial Department in 1896 to encourage growth of industrial, agricultural and natural resource development in its Southeastern service area.¹³

Economic development efforts today consist of resident officers that not only work directly with prospects, but also with state and local development organizations, and those of other service companies such as energy and utility providers. Some prospects specifically search for sites suitable for direct rail service, and many others are looking for sites proximate to intermodal facilities.

Rail carriers also offer services such as site selection, planning and engineering related to site development as it pertains to the provision of rail service. Special programs are also being developed

¹⁰ "S.C.'s inland port open for business in Greer" by Bruce Smith, *The State*, p.B4, October 16, 2013

¹¹ In 1828, the charter fell under the control of the much broader South Carolina Canal and Rail Road charter.

¹² Data obtained from *The Charleston and Hamburg*, by Thomas Fetter, History Press, 2008

¹³ <http://www.areadevelopment.com/logisticsInfrastructure/Q1-2013/rail-road-infrastructure-projects-support-LNG-industry-27627.shtml>

such as CSX’s Select Sites -- certified, rail-ready industrial properties with known risk factors identified and potential issues resolved. To receive the CSX Select Site designation, the sites – from one hundred to one thousand acres in size must meet key criteria, “including infrastructure and utility availability, environmental reviews, appropriate zoning and entitlement, air quality permitting, rail serviceability, proximity to highways or interstates and other attributes. CSX has partnered with The Austin Company, a nationally known site selection certification consulting firm, to screen candidate sites and assist communities with the application and certification process.”¹⁴

Short line carriers now operating former Class I branch lines were initially instrumental in preserving service for a number of on-line businesses. Now they are active in promoting economic development as a means of growing traffic bases. Several of the state’s short lines have connections with both Class I carriers offering industrial prospects additional transportation choices.

In addition to the private carriers, the South Carolina Public Railways, operating as Palmetto Railways, a Division of the Department of Commerce, is also active in economic development as it is charged with supporting economic development efforts throughout the state in addition to operating three railroads. In doing so, it provides technical assistance and consulting services in railroad matters to state, local and municipal governments and has the authority to acquire rail equipment, rights of way, operations, and construct and operate rail lines deemed to be in the public interest to promote and foster economic growth.

2.1.7.3 Energy Use and Air Quality

2.1.7.3.1 Energy Use and Costs

Numerous sources from a wide range of perspectives conclusively indicate that rail transport saves energy and, hence, is vastly more cost efficient than truck highway transport.

U.S. Department of Energy – According to the US Department of Energy’s *Transportation Energy Data Book (Edition 37)*, intercity rail passenger service is 6 percent more efficient than commercial aviation and 25 percent more efficient than the automobile¹⁵. Amtrak onboard surveys indicate that the majority of rail passengers are traveling alone. This is largely because rail passenger service tends to be more attractive economically for the solo traveler than the automobile. As a key priority, focusing on shifting solo travelers from auto to rail yields the greatest energy and greenhouse gas savings.

CSX Transportation has noted that in 2015 one gallon of diesel fuel moved a ton of freight by rail approximately 471 miles – three and one-half times the efficiency of trucks. The US Environmental Protection Agency estimates that for every ton-mile, a typical truck emits three times more nitrogen oxides and particulates than a train. Related studies suggest that trucks emit 6 to 12 times more pollutants per ton-mile than railroads, depending on the pollutant measured. The American Society of Mechanical Engineers found that 2.5 million fewer tons of carbon dioxide would be emitted into the air annually if 10 percent of intercity freight now moving by highway were shifted to rail.

¹⁴ www.csx.com

¹⁵ In past years, rail was even more efficient than commercial aviation. The drop has resulted from higher load factors due to flight cuts and retirement of older aircraft. In 2008, for example, the same report showed intercity rail as 18 percent more efficient than the automobile.

The American Association of State Highway Officials (AASHTO) noted that for each 1 percent of long-haul freight currently moving by truck, fuel savings would be approximately 111 million gallons per year if moved by rail instead; and annual greenhouse gas emissions would fall by 12 million tons. If 10 percent of truck traffic went by rail – via intermodal movements involving both railroads and trucks – the cumulative estimated greenhouse gas reductions from 2007 to 2020 would be 210 million tons. Finally, rail lines can be electrified, yielding additional efficiencies from regenerative braking, and creating opportunities for alternative power sources. Thus shifting of traffic to the rail mode can reduce the energy intensity of transportation while somewhat insulating users from dramatic changes in fuel prices.

National Waterway Foundation – This organization found that fuel usage and associated transport costs vary considerably given the various cargo carrying capacities and the different vehicles required to transport goods. For example, one gallon of fuel can transport one cargo ton approximately 150 miles by truck. Rail can transport the same ton of cargo 3.2 times as far, 478 miles (roughly similar to the AAR figure) on a gallon of fuel. As seen in **Table 2-17**, the energy transport costs of rail transport are approximately 30 percent those of truck. The rail transport cost comparisons are even greater when one considers: (1) labor costs; (2) operation and management costs associated with both vehicles and the infrastructure; and (3) safety and environmental costs.

Table 2-17: Modal Ton-Mile and Energy Cost per Gallon of Fuel

Mode	Ton-Miles	\$/Ton-mile
Tug Barge	616	\$0.0065
Rail Locomotive	478	\$0.0084
Truck	150	\$0.027

*National Waterway Foundation and Texas Transportation Institute;
<http://www.nationalwaterwaysfoundation.org/study/public%20study.pdf>
 Assume \$4.00 cost per gallon*

Ongoing Energy Use Improvements – Railroads are working to even further reduce energy consumption and emissions by using more efficient motive power and cleaner fuels.

The Environmental Protection Agency (EPA) initiated a multi-step program in 2008 to reduce diesel locomotive emissions. The EPA’s stringent Tier 4 standards for newly built and remanufactured locomotives will take effect Jan. 1, 2015. The agency estimates 90 percent particulate matter (PM) reductions and 80 percent nitrogen oxide (NOX) reductions from Tier 4 engines meeting these standards compared to engines meeting the current Tier 2 standards. Further, by 2030, it is estimated the program will result in the reduction of annual emissions of NOX by about 800,000 tons and PM emissions by 27,000 tons. In addition, emission reductions will continue to grow beyond 2030 as fleet turnover is completed.¹⁶ Locomotive builders and diesel power plant suppliers are already supplying power meeting Tier 4 standards.

On another front, using LNG (liquefied natural gas) as a locomotive fuel is being tested, or preparations are being made to test, by four Class I railroads – BNSF, UP, CN, and NS. Significant

¹⁶ <http://www.epa.gov/nonroad/420f08004.pdf>

benefits are expected in both costs and emissions. In terms of reduced fuel expenses, based on current LNG costs, a savings of up to \$200,000 per year per locomotive could be reached. And, while not currently supported by data analyses, some national stakeholder's project that greenhouse gas emissions will be lower than diesel fuel capable of meeting Tier 4 standards.¹⁷

Another approach to reduce fuel consumption and thus emissions is the "genset" locomotive. Railroads are currently adopting this form of motive power for use in yard switching, especially where strict air quality standards have to be met, and serving industrial areas. A few carriers are also using them for light work on branch lines. Classic diesel electric locomotives have a large diesel engine that generates electric power for the traction motors turning the axles. A "genset" locomotive, on the other hand, has two or three smaller engine-generators that are programmed to start up only as needed to meet the traction demand at any one time resulting in less overall fuel consumption

2.1.7.3.2 Environmental Impacts

Comprehensive and easily digestible data on environmental impacts and costs by mode are difficult to find. Nonetheless, the various data sources indicate that freight transport by rail and water vessels generate significantly less environmental impacts and costs than truck transport. Such information follows the general efficiency trends regarding trip distance and costs per ton-mile; both rail and water transport are significantly more efficient than truck.

Regarding fine particle matter with a diameter of 2.5 microns or less (PM2.5), the ton impact per million ton-miles of rail and water transport is approximately one-tenth of truck transport (0.0158 and 0.0128 versus 0.1126, respectively). Similarly, the NOX emission tons per ton-mile traveled for rail and water transport approximate a fifth of truck transport (0.5954 and 0.5171 versus 2.8549, respectively), as seen in

2.1.7.4 Noise

Noise generated in rail operations that receive the most attention are those associated with rail facilities, such as yards and components thereof, and trains passing through at-grade highway-rail crossings. Rail facilities generate noise of a longer duration than passing trains which are intermittent in nature with the frequency depending on the use of the rail line involved. The noise associated with passing trains, however, is intensified with the blowing of train horns at grade crossings.

2.1.7.4.1 Rail Facilities

Most rail facilities have been in operation since the railroad was originally constructed or just after, prior to any environmental impact processes and community input, and land uses have adjusted to them over time. The construction of new facilities, however, faces review through the environmental assessment and impact process, which results in rejection, modification and/or prescribed mitigation measures. The most common community objections are noise generation and vehicular traffic impacts, the latter having been discussed previously. Noise generation is typically addressed with various types of noise barriers, berms and walls for example, distance from the source, and facility

¹⁷ <http://www.railwayage.com/index.php/mechanical/locomotives/experts-weigh-in-on-lng.html>

equipment selection, such as on-terminal cranes and transport units using electric power rather than diesel.

Table 2-18: Environmental Damages and Costs per Million Ton-Miles, by Mode

	Trucks	Rail Locomotives	Waterborne Vessels
Ton Miles (Millions) ¹	2,040,000	1,819,633	274,367
PM2.5 Emissions			
Tons (Total)	<u>229,754</u>	<u>28,690</u>	<u>3,520</u>
Tons per Million Ton-Miles	0.1126	0.0158	0.0128
Damages per Ton	<u>\$251,466</u>	<u>\$251,466</u>	<u>\$251,466</u>
Damages per Million Ton-Miles	<u>\$28,320</u>	<u>\$3,960</u>	<u>\$3,230</u>
NOX Emissions			
Tons (Total)	<u>5,824,060</u>	<u>1,083,320</u>	<u>141,865</u>
Tons per Million Ton-Miles	2.8549	0.5954	0.5171
Damages per Ton	<u>\$4,610</u>	<u>\$4,610</u>	<u>\$4,610</u>
Damages per Million Ton-Miles (\$000)	<u>\$13,160</u>	<u>\$2,740</u>	<u>\$2,380</u>
CO2 Emissions			
Tons (Total)	<u>468,702,800</u>	<u>52,690,500</u>	<u>5,286,600</u>
Tons per Million Ton-Miles	229.76	28.96	19.27
Damages per Ton ²	N/A	N/A	N/A
Damages per Million Ton-Miles (\$000)	N/A	N/A	N/A
Summary Damages per Million Ton-Miles²	<u>\$41,480</u>	<u>\$6,710</u>	<u>\$5,610</u>

Source: Surface Freight Transportation; A Comparison of the Costs of Road, Rail, and Waterways Freight Shipments That Are Not Passed on to Consumers; GAO, January 2011; <http://www.gao.gov/new.items/d11134.pdf>

Monetary values in 2010\$

¹Trucks and Locomotives reflect 2007 ton-miles, versus year 2005 for waterborne vessels

²Damages per ton not available

³Excludes CO₂ damages

2.1.7.4.2 At-Grade Crossings

In addition to the potential to create roadway congestion, grade crossings are also noise generators due principally to the blowing of train horns as required by law as a safety precaution. One means to combat train horn noise is the implementation of railroad quiet zones. These are zones involving one or more highway-rail crossings where the locomotive engineer is not obligated to blow his horn approaching the crossing(s)¹⁸.

The procedures whereby a community can implement a quiet zone are specified by the Federal Railroad Administration¹⁹. Typically, improvements need to be made to enhance safety at the crossings as a means to mitigate the absence of the train horn warning. Steps are taken to prevent roadway vehicles from crossing the track(s) and include such measures as four-quadrant gates, medians on approaches along with gates at the crossings, one-way streets, street closures, etc. Once the improvement designs are reviewed and approved by the FRA and the railroad(s) involved, a quiet

¹⁸ Federal regulations specify that trains horns be sounded while trains approach and enter highway-rail crossings.

¹⁹ <http://www.fra.dot.gov/rpd/freight/1318.shtml>

zone can be established. After implementation locomotive engineers will not blow their horns in the zone except when they feel it necessary to rectify an unsafe condition, such as pedestrians traversing the crossing despite the gates and flashing lights. Quiet zones are generally implemented by the impacted communities.

Three quiet zones have been implemented in the state, in North Charleston (CSX), Spartanburg (NS), and Charleston (NS), and others have been studied. Columbia is one of the communities that has expressed interest and prepared a preliminary appraisal of several rail corridors.²⁰

2.1.7.5 Land Use

There are linkages between transportation and land use that support or encourage the development of certain land uses. They exist both for freight and passenger service.

2.1.7.5.1 Compatibility

Freight railroads are best suited to traverse industrial, agricultural, natural resource and other non-residential land uses. In this manner conflicts associated with developed and populated areas are avoided while simultaneously creating opportunities to capture additional revenue-generating traffic. Preservation of such properties, however, requires vigilance, especially in growth communities, to prohibit them from being consumed by urban sprawl. Vacant land with industrial zoning and good rail access should be a priority as well as that with the potential to be zoned industrial.

Passenger trains, on the other hand, need access to stations in developed and populated areas to generate ridership. This holds true for long-distance trains as well as local and regional service. Passenger service, principally local service, also can spur development around station locations resulting in land use that often takes the form of mixed-use development with higher densities, an integrated mobility system, and a more pedestrian-friendly environment. Smart growth and the development around train stations facilitate travel patterns that are more energy efficient than auto-oriented development and contribute to a safer, more livable, sustainable community. However, there is no regional or local service in the state, and although there is some interest, only preliminary studies have been conducted. Thus the only South Carolina rail stations serve as Amtrak stops with most of the stations built by the original railroads serving the community.

2.1.7.5.2 Barriers

Rail lines traversing developed areas can also act as barriers. They have the potential to physically and socially divide neighborhoods, cause traffic congestion and limit access by emergency response services. In addition to the accident potential created at at-grade highway-rail crossings, the temptation for pedestrians to cross the tracks and to use the tracks and rights-of-way as paths generates trespassing safety concerns. In 2013 there were 12 trespassing deaths and 12 injuries in South Carolina, up from 7 and 6, respectively, in 2011.²¹ Continued growth of rail traffic on the state's rail system will intensify the need to improve safety and other community concerns.

²⁰ *Columbia Quiet Zone Feasibility Study*, prepared for the City of Columbia by Wilbur Smith Associates, 2003

²¹ U.S. Department of Transportation, Federal Railroad Administration, *Office of Safety Analysis. Data* available at <http://safetydata.fra.dot.gov/officeofsafety/> as of May 21, 2014 (Excludes highway-rail crossing incidents).

2.2 Existing Rail System: Trends and Forecasts

This section discusses trends and forecasts that may impact rail freight and passenger demand in future years.

2.2.1 Demographic and Economic Growth Factors

2.2.1.1 Population

2.2.1.1.1 Historical Population Trends

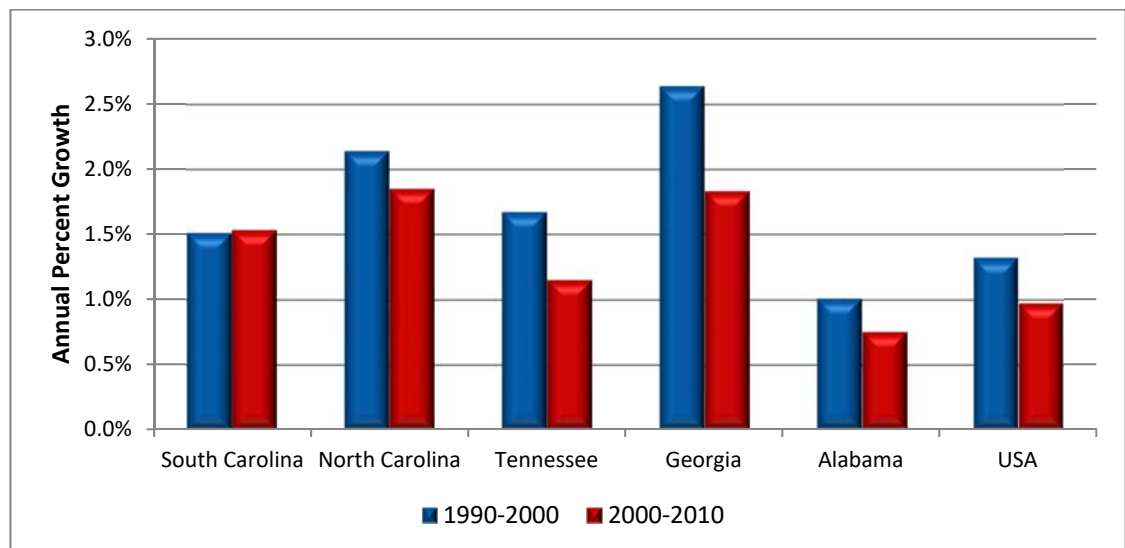
Between 2000 and 2010, the population of South Carolina increased by 15 percent, from 4.012 million to 4.625 million. Compared to the US growth during the same period of 9 percent, South Carolina’s growth was almost 70 percent greater than the nation’s, but comparable to nearby states. Population totals and growth rates in the past two decades are shown in **Table 2-19** and **Figure 2-18** for South Carolina, nearby states and the country as a whole.

Table 2-19: South Carolina Population in 1990, 2000, and 2010

State	Population			Annual Growth Rate	
	1990	2000	2010	1990-2000	2000-2010
South Carolina	3,486,703	4,012,012	4,625,364	1.51%	1.53%
North Carolina	6,628,637	8,049,313	9,535,483	2.14%	1.85%
Tennessee	4,877,185	5,689,283	6,346,105	1.67%	1.15%
Georgia	6,478,216	8,186,453	9,687,653	2.64%	1.83%
Alabama	4,040,587	4,447,100	4,779,736	1.01%	0.75%
United States	248,709,873	281,421,906	308,745,538	1.32%	0.97%

Source: U.S. Census Bureau

Figure 2-18: South Carolina and Nearby States Population Growth Rates



Source: U.S. Census Bureau

South Carolina’s 2010 population placed it 24th in rank compared to other states, compared to 26th in 2000 and 25th in 1990.

2.2.1.1.2 Population Projections

Population projections for South Carolina and nearby states, based on US Census Bureau publications,²² are summarized in **Table 2-20**.

Table 2-20: Population Projections, 2020 – 2040

State	Population ⁽¹⁾	
	2030	2040
South Carolina	5,792,247	6,352,502
North Carolina	11,673,849	12,658,927
Tennessee	7,395,106	7,823,662
Georgia	11,835,126	12,820,271
Alabama	5,029,833	5,056,796
United States	357,975,719	379,392,779

State	Annual Percentage Growth		Total Percent 2020-2040
	2020-2030	2030-2040	
South Carolina	1.2%	1.0%	22.5%
North Carolina	1.1%	0.8%	19.8%
Tennessee	0.8%	0.6%	14.0%
Georgia	1.0%	0.8%	19.5%
Alabama	0.2%	0.1%	3.0%
United States	1.1%	0.9%	14.1%

Source: Weldon Cooper Center for Public Service, Demographics Research "Observed and Total Population for the US and the States, 2010 - 2040"

2.2.1.2 Distribution of Population Growth within South Carolina

The growth in population in South Carolina over the last 20 years has not been evenly distributed throughout the state. Growth in ten regions is shown in **Table 2-21**. Projected populations are also shown to 2040. These regions follow COG boundaries shown in **Figure 2-21: South Carolina Rail Freight Tonnage (2040)**.

All COG regions experienced growth from 1990 to 2010. In seven of the regions, growth was higher during the first decade than the second. Two Coastal COGs, Waccamaw Regional PDC and Lowcountry COG, saw the highest population increases over the two decades with Lower Savannah COG and Pee Dee Regional COG experiencing the lowest.

Based on a report from the Carolina Population Center at UNC-Chapel Hill, it is the counties with metro or micropolitan areas that can expect the majority of the growth forecasted for the state. The latest population estimates that included state-level projections showed that most urban areas were growing on par with what has been expected, with the exception of the Charleston area, which has gained almost twice as many residents as expected. However,

²² U.S. Census Bureau, website at <http://www.quickfacts.census.gov>

more rural counties have lost population--twice as many as originally anticipated (22, up from 11).

Based on the regional population projections from the State Data Center, the Catawba RPC and Waccamaw PDC will be the fastest growing regions from 2010 to 2040. The Upper Savannah, Pee Dee Regional, and Santee-Lynches COGs are projected to have the slowest growth. Based on these projections, the population of South Carolina is expected to reach 6 million by 2035, approximately 30% higher than at the 2010 census, as shown in **Figure 2-20**.

Table 2-21: Population Growth by Council of Government

Council of Government Areas	Population (Thousands)						Annual Growth				
	1990	2000	2010	2020	2030	2040	90-00	00-10	10-20	20-30	30-40
Appalachian COG	888.0	1,028.7	1,144.0	1,302.3	1,426.5	1,575.1	1.5%	1.3%	1.4%	1.0%	1.0%
Berkeley-Charleston-Dorchester COG	506.9	549.0	667.5	827.6	1,001.7	1,106.8	0.8%	1.9%	2.9%	2.1%	1.0%
Catawba RPC	248.5	289.9	365.9	431.1	503.0	564.2	1.6%	2.3%		1.7%	1.2%
Central Midlands	508.8	596.3	710.6	792.4	871.5	974.7	1.6%	1.7%	1.5%	1.0%	1.2%
Lowcountry COG	154.5	201.3	247.7	285.0	327.1	371.5	2.7%	2.1%	1.9%	1.5%	1.4%
Lower Savannah COG	300.7	309.6	316.8	314.0	304.8	310.0	0.3%	0.1%	0 %	-0.3%	0.2%
Pee Dee Regional	307.1	330.9	346.3	338.4	324.0	335.6	0.7%	0.5%	-0.2%	-0.4%	0.4%
Santee-Lynches COG	193.1	209.9	223.4	221.6	215.3	225.6	0.8%	0.6%	0 %	-0.3%	0.5%
Upper Savannah COG	185.2	215.7	218.7	215.7	207.5	217.3	1.5%	0.1%	-0.1%	-0.4%	0.5%
Waccamaw Reg. PDC	227.2	289.6	364.9	447.8	549.2	620.8	2.5%	2.3%	2.7%	2.3%	1.3%
South Carolina	3,486.7	4,012.0	4,635.7	5,175.8	5,730.5	6,301.6	1.4%	1.4%	1.5%	1.1%	1.0%

Sources: U.S. Census Bureau, and SC State Data Center

Figure 2-19: South Carolina MPO and COG Boundaries

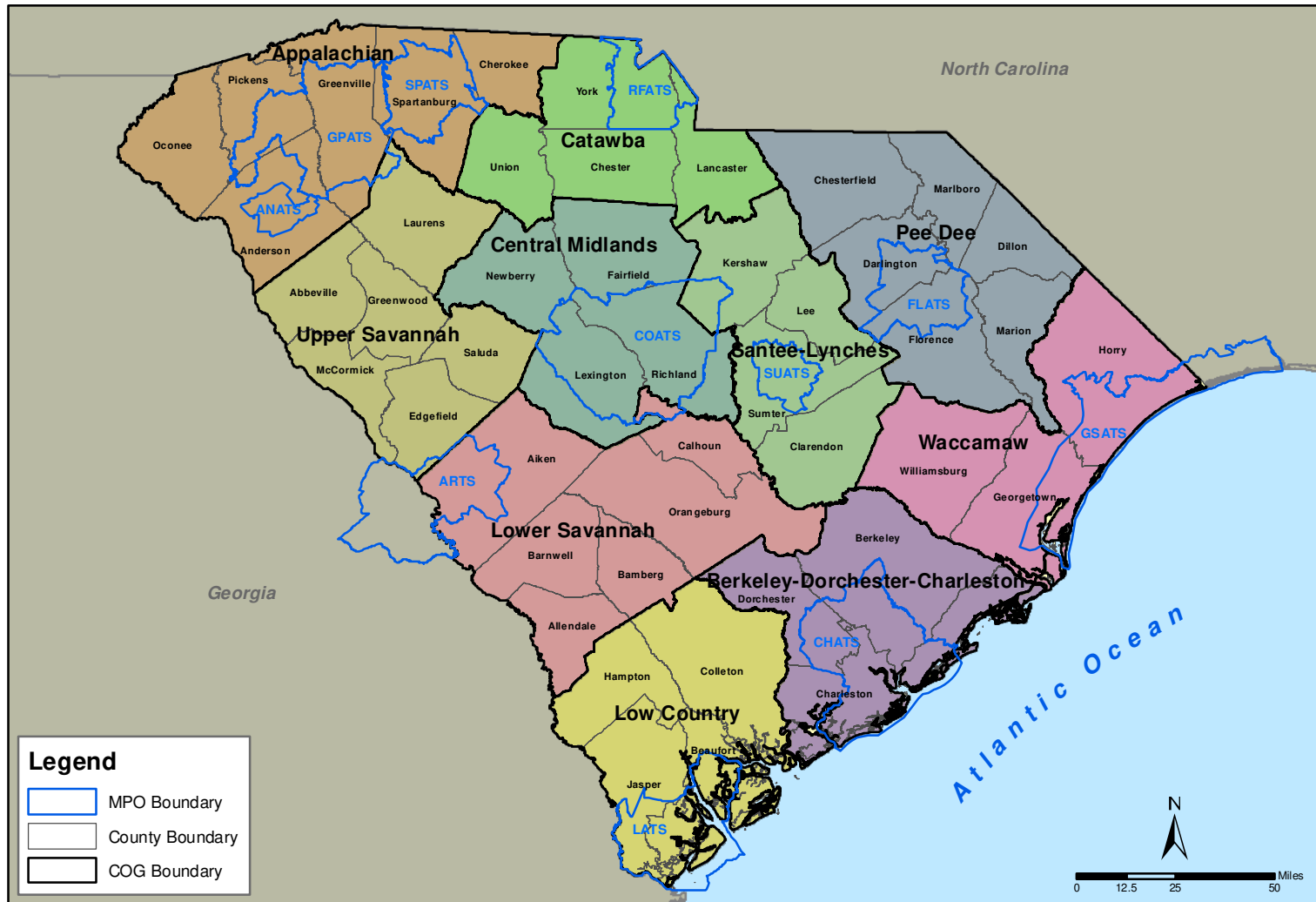
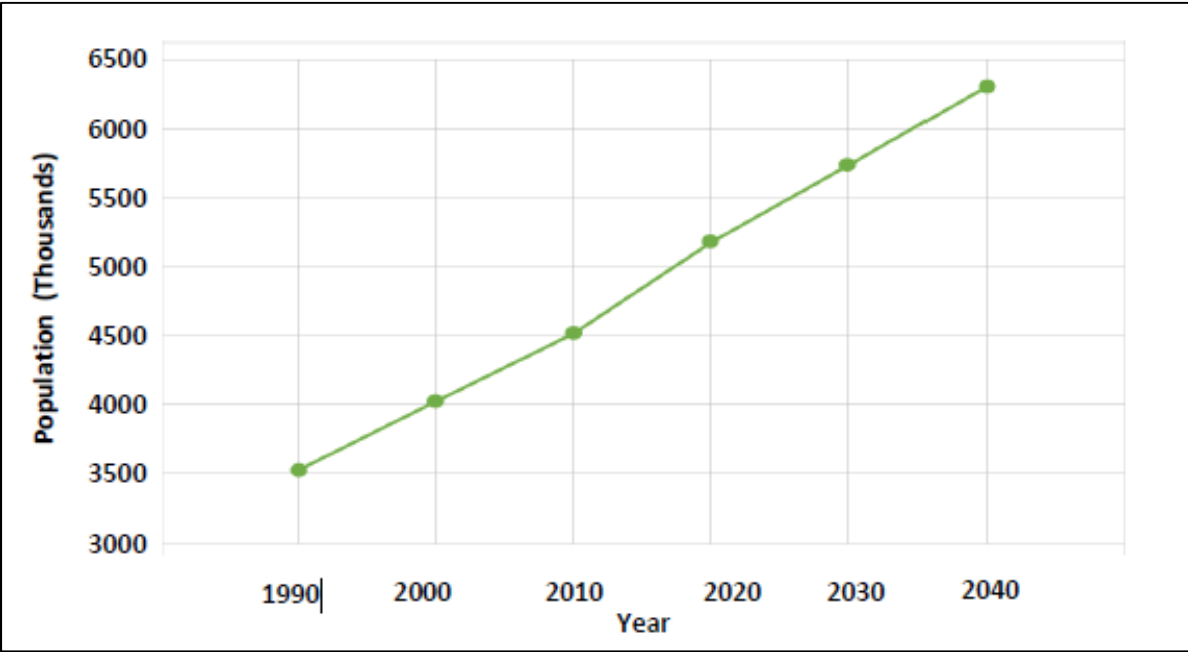


Figure 2-20: South Carolina Population: 1990 to 2040



Source: U.S. Census Bureau, SC State Data Center

2.2.1.3 Employment

South Carolina’s continued economic development depends heavily on transportation infrastructure. The transportation system can also greatly influence the character and impact of development. If the system fails to provide the means for efficient and convenient movement of people and goods, the state’s economy may fail to grow to its potential.

Between 2000 and 2010 South Carolina’s employment rate as a percentage of the employable population (population over 16 years of age in the labor force) decreased from 63.4 percent to 62.9 percent. However the number employed grew by 269,475 or approximately 1.4 percent per year.

Table 2-22 compares employment data for South Carolina, nearby states and the nation. Employment growth in South Carolina was greater than for the rest of the country as a whole, with a rate of 1.1 percent per year. Neighboring states ranged from 0.9 % (Alabama) to 1.6% (Georgia). The employment rate did not grow as fast as the population rate during the 10-year period, as was the case in all neighboring states except Alabama.

2.2.1.4 Employment Projections

Future trends for South Carolina employment are based on data obtained through SC Works' online platform. This site provided Occupational Employment Projections in South Carolina for all occupations using a base year of 2016 and a projected year of 2026. Employment projections are shown in **Table 2-23**.

Table 2-22: Statewide Employment Data for 2016 and 2026

State	2016	2026	Comparison Amongst States		
	Employment	Employment	% Change	Total Change	Avg Openings /Year
South Carolina	2,205,700	2,462,030	11.6%	256,330	284,340
North Carolina	4,610,380	5,073,990	10.1%	463,610	577,660
Tennessee	3,175,450	3,531,210	11.2%	355,760	404,780
Georgia	4,504,560	5,029,480	11.7%	524,920	571,900
Alabama	2,122,970	2,269,940	6.9%	146,970	255,950
United States	156,063,800	167,582,300	7.4%	11,518,500	18,742,000

Source: The Employment and Training Administration of the U.S. Department of Labor

Table 2-23: South Carolina Occupational Employment Projections – All Occupations

	2016 Employment	2026 Projected Employment	Employment Change	Annual Average Percent Change	Total Percent Change
All Occupations	2,205,704	2,462,025	256,321	1.1%	11.6%

Source: SC Works website

2.2.1.5 Household Income

According to the Census ACS 1-year survey²³, the median household income for South Carolina was \$50,570 in 2017, the latest figures available. Compared to the median US household income, South Carolina median household income is \$9,766 lower. The ACS survey shows the median per capita income for South Carolina was \$27,909 in 2017. Compared to the US per capita income of \$32,397, South Carolina per capita income is \$4,488 lower.

2.2.1.6 Industrial Outlook by Sector

Table 2-24 summarizes major commodity tonnage movements by rail in 2040, and the associated commodity tonnage growth from 2016.

- *Total Tonnage – Major rail commodities in 2040 include: Chemicals or Allied Products (26.7 million, 25.1 percent), Misc. Mixed Shipments (14.7 million, 13.8 percent), and Nonmetallic Minerals (11.1 million, 10.4 percent), exhibiting 3.1 percent, 3.1 percent, and 2.1 percent CAGR, respectively.*
- *Tonnage Growth – Commodities with the highest tonnage growth rates between 2016 and 2040 include: Instrument, Photo Equipment, Optical Equipment (7,200 to 31,505, 6.3 percent CAGR), Electrical Equipment (124,080 to 387,702, 4.9 percent CAGR), and Apparel or Related Products (457,280 to 1,384,472, 4.7 percent CAGR).*
- *Value Growth – Commodities with the highest value growth rates between 2016 and 2040 include: Instrument, Photo Equipment, Optical Equipment (6.0 percent CAGR), Apparel or Related Products (4.8 percent CAGR), and Rubber/Misc. Plastics (4.6 percent CAGR).*

²³ <https://www.deptofnumbers.com/income/south-carolina/>

Table 2-24: South Carolina Rail Freight by Major Commodities, 2016

STCC2	Commodity	2016		2040		Percent Change	
		Amount	Percent	Amount	Percent	Total	CAGR
28	Chemicals or Allied Products	12,783,432	20.2%	26,740,277	25.1%	109.2%	3.1%
46	Misc. Mixed Shipments	7,079,120	11.2%	14,730,673	13.8%	108.1%	3.1%
14	Nonmetallic Minerals	6,791,128	10.7%	11,123,794	10.4%	63.8%	2.1%
11	Coal	9,259,507	14.6%	9,328,425	8.8%	0.7%	0.0%
20	Food or Kindred Products	4,702,517	7.4%	8,025,399	7.5%	70.7%	2.3%
32	Clay, Concrete, Glass or Stone	3,741,344	5.9%	6,289,475	5.9%	68.1%	2.2%
26	Pulp, Paper or Allied Products	4,718,936	7.5%	6,285,483	5.9%	33.2%	1.2%
33	Primary Metal Products	2,202,991	3.5%	5,195,923	4.9%	135.9%	3.6%
24	Lumber or Wood Products	2,975,188	4.7%	5,191,573	4.9%	74.5%	2.3%
01	Farm Products	2,358,878	3.7%	3,221,862	3.0%	36.6%	1.3%
	Remaining Commodities	6,627,280	10.6%	10,435,040	9.8%	57.5%	1.9%
	Total	63,240,321	100.0%	106,567,924	100.0%	68.5%	2.2%

Source: TRANSEARCH data for 2016 and 2040

Table 2-25 summarizes major railcar movements (i.e., units) in 2040 by commodity type. Rail movements in 2040 total 106.6 million tons, via 2.7 million units, valued at \$190.2 billion, with an average value/ton of \$1,785:

- Total Units – Miscellaneous Mixed Shipments and Chemicals or Allied Products constitute more than half (930,552, 56.7 percent) of the total 2.7 million 2040 rail units.
- Total Value – Top commodities include: Miscellaneous Mixed Shipments (\$76.0 billion or 39.9 percent), Chemicals or Allied Products (\$45.2 billion or 23.7 percent), and Transportation Equipment (\$21.4 billion or 11.3 percent).

Table 2-25: South Carolina Rail Freight forecast – Tons, Units, and Value by Commodity (2040)

STCC2	Commodity	Tons		Units		Value (in millions)		Average Value/Ton
		Amount	Percent	Amount	Percent	Amount	Percent	
46	Misc. Mixed Shipments	14,730,673	13.8%	1,179,687	44.1%	\$75,959	39.9%	\$5,157
28	Chemicals or Allied Products	26,740,277	25.1%	337,406	12.6%	\$45,160	23.7%	\$1,689
20	Food or Kindred Products	8,025,399	7.5%	143,142	5.4%	\$6,252	3.3%	\$779
26	Pulp, Paper or Allied	6,285,483	5.9%	137,511	5.1%	\$6,129	3.2%	\$975
23	Apparel or Related	1,384,472	1.3%	130,628	4.9%	\$7,810	4.1%	\$5,641
37	Transportation Equipment	2,237,304	2.1%	114,324	4.3%	\$21,442	11.3%	\$9,584
14	Nonmetallic Minerals	11,123,794	10.4%	103,103	3.9%	\$143	0.1%	\$13
11	Coal	9,328,425	8.8%	80,298	3.0%	\$325	0.2%	\$35
32	Clay, Concrete, Glass or Stone	6,289,475	5.9%	76,801	2.9%	\$1,235	0.6%	\$196
24	Lumber or Wood Products	5,191,573	4.9%	64,852	2.4%	\$1,292	0.7%	\$249
	Remaining Commodities	15,231,049	14.3%	306,250	11.4%	\$24,435	12.9%	\$1,604
	Total	106,597,924	100.0%	2,674,002	100.0%	\$190,182	100.0%	\$1,785

Source: TRANSEARCH data for 2040

2.2.2 Freight Demand and Growth

2.2.2.1 Rail Forecast

Table 2-26 depicts the directional composition of rail movements in South Carolina between 2016 and 2040, which is relatively constant over the future analysis horizon. Rail tonnage is forecast to increase from 63.2 million in 2016 to 106.6 million in 2040, a cumulative increase of 69 percent, for a CAGR of 2.2 percent. Rail commodity value is forecast to increase from \$93.6 billion in 2016 to \$190.2 billion by 2040, a cumulative increase of 103 percent, for a CAGR of 3.0 percent.

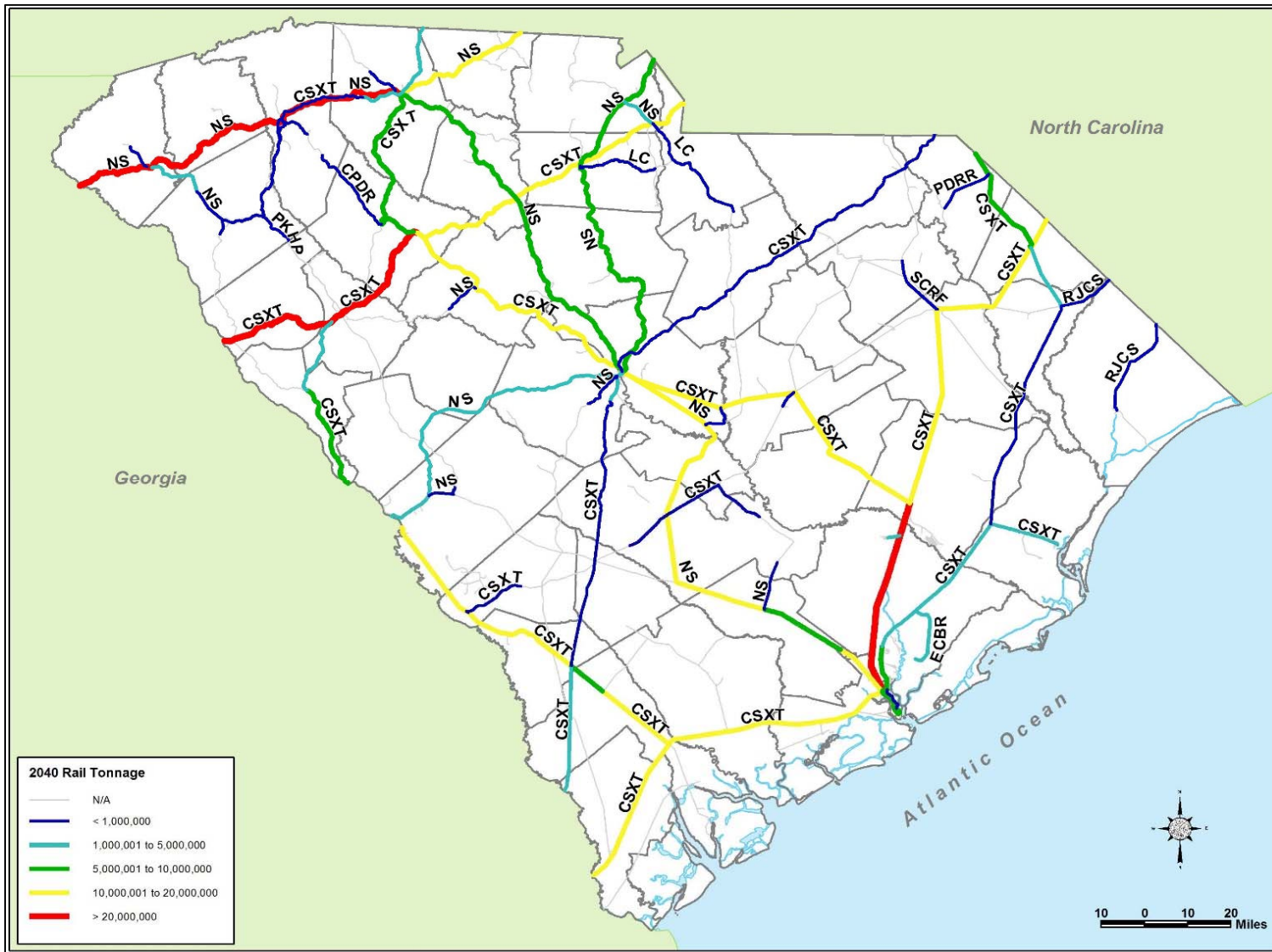
Table 2-26: South Carolina Rail Freight Tonnage and Value by Year and Direction (2016, 2025, 2040)

Direction	Tons		Value (in millions)		Average Value/Ton
	Amount	Percent	Amount	Percent	
Year 2016					
Outbound	7,484,310	11.8%	\$11,629	12.5%	\$1,554
Inbound	21,811,904	34.5%	\$16,867	18.0%	\$773
Intra	5,404,653	8.6%	\$11,711	12.5%	\$2,167
Through	28,539,454	45.1%	\$53,391	57.0%	\$1,871
Total	63,240,321	100.0%	\$93,598	100.0%	\$1,480
Year 2025					
Outbound	9,673,958	12.1%	\$15,677	12.9%	\$1,621
Inbound	26,646,442	33.4%	\$21,759	17.9%	\$817
Intra	8,241,132	10.3%	\$15,345	12.6%	\$1,862
Through	35,292,374	44.2%	\$68,906	56.6%	\$1,952
Total	79,853,906	100.0%	\$121,687	100.0%	\$1,524
Year 2040					
Outbound	13,852,936	13.0%	\$24,095	12.7%	\$1,739
Inbound	31,750,234	29.8%	\$32,644	17.2%	\$1,028
Intra	11,652,371	10.9%	\$23,054	12.1%	\$1,979
Through	49,312,383	46.3%	\$110,388	58.0%	\$2,239
Total	106,567,924	100.0%	\$190,181	100.0%	\$1,785

Source: TRANSEARCH data for 2040

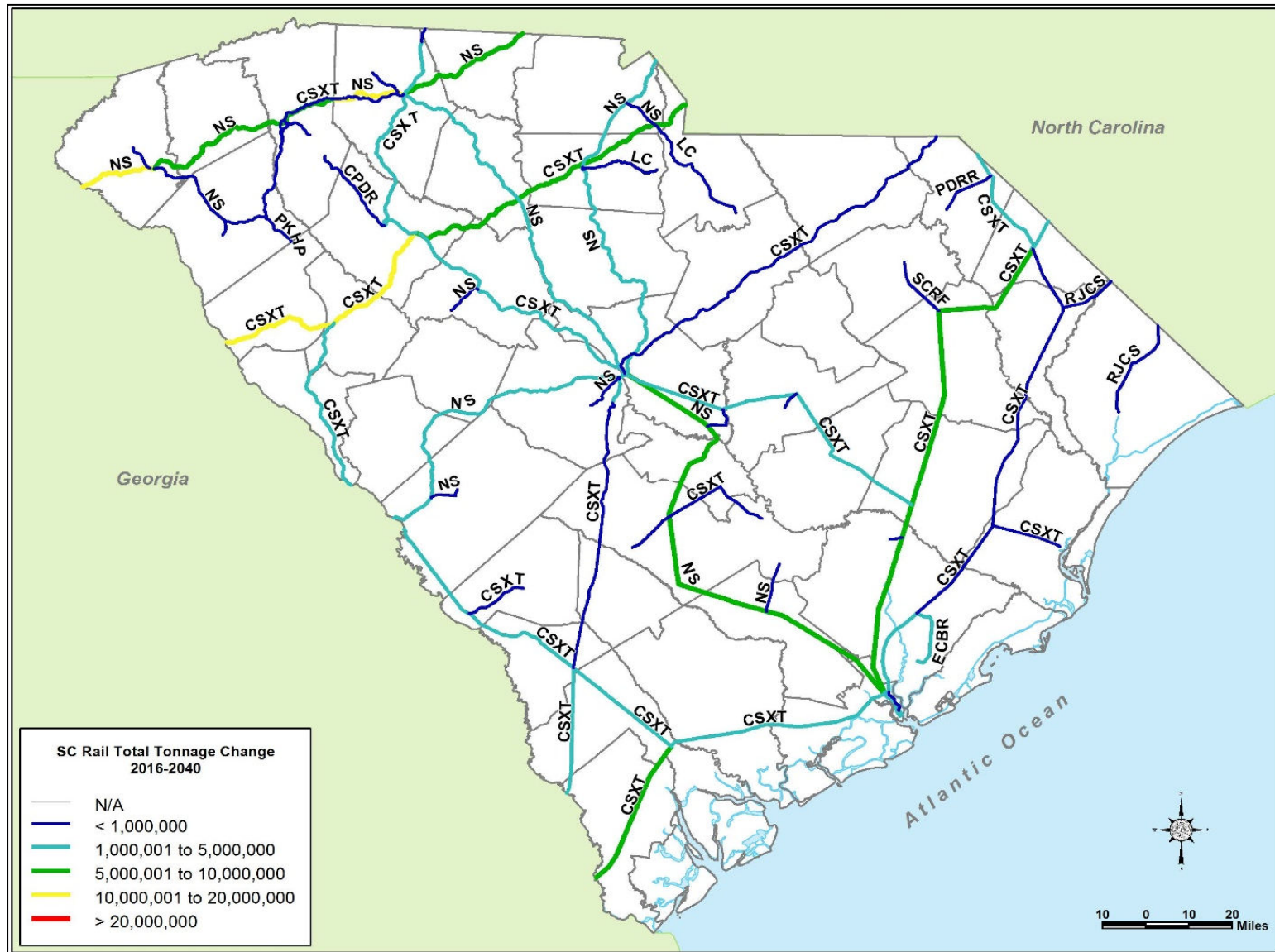
As shown in **Figure 2-21**, the link between Greenwood, SC and Athens, GA continues to handle the greatest rail tonnage per line as it did in 2016 (see **Figure 2-2**). Other notable tonnage movements go through Berkeley, Charleston, Greenville, Pickens and Oconee counties. The greatest rail tonnage growth appears to accrue to the major Class I rail lines (see **Figure 2-22**).

Figure 2-21: South Carolina Rail Freight Tonnage (2040)



Source: TRANSEARCH data for 2040

Figure 2-22: South Carolina Rail Freight Tonnage Change (2016-2040)



Source: TRANSEARCH data for 2016 and 2040

Table 2-27 summarizes major commodity tonnage movements by rail in 2040, and the associated commodity tonnage growth from 2016:

- *Total Tonnage* – Major rail commodities in 2040 include: *Chemicals or Allied Products* (26.7 million, 25.1 percent), *Misc. Mixed Shipments* (14.7 million, 13.8 percent), and *Nonmetallic Minerals* (11.1 million, 10.4 percent), exhibiting 3.1 percent, 3.1 percent, and 2.1 percent CAGR, respectively.
- *Tonnage Growth* – Commodities with the highest tonnage growth rates between 2016 and 2040 include: *Instrument, Photo Equipment, Optical Equipment* (7,200 to 31,505, 6.3 percent CAGR), *Electrical Equipment* (124,080 to 387,702, 4.9 percent CAGR), and *Apparel or Related Products* (457,280 to 1,384,472, 4.7 percent CAGR).
- *Value Growth* – Commodities with the highest value growth rates between 2016 and 2040 include: *Instrument, Photo Equipment, Optical Equipment* (6.0 percent CAGR), *Apparel or Related Products* (4.8 percent CAGR), and *Rubber/Misc. Plastics* (4.6 percent CAGR).

Table 2-27: South Carolina Rail Tonnage Freight Forecast by Commodity (2016, 2040)

STCC2	Commodity	2016		2040		Percent Change	
		Amount	Percent	Amount	Percent	Total	CAGR
28	Chemicals or Allied Products	12,783,432	20.2%	26,740,277	25.1%	109.2%	3.1%
46	Misc. Mixed Shipments	7,079,120	11.2%	14,730,673	13.8%	108.1%	3.1%
14	Nonmetallic Minerals	6,791,128	10.7%	11,123,794	10.4%	63.8%	2.1%
11	Coal	9,259,507	14.6%	9,328,425	8.8%	0.7%	0.0%
20	Food or Kindred Products	4,702,517	7.4%	8,025,399	7.5%	70.7%	2.3%
32	Clay, Concrete, Glass or Stone	3,741,344	5.9%	6,289,475	5.9%	68.1%	2.2%
26	Pulp, Paper or Allied Products	4,718,936	7.5%	6,285,483	5.9%	33.2%	1.2%
33	Primary Metal Products	2,202,991	3.5%	5,195,923	4.9%	135.9%	3.6%
24	Lumber or Wood Products	2,975,188	4.7%	5,191,573	4.9%	74.5%	2.3%
01	Farm Products	2,358,878	3.7%	3,221,862	3.0%	36.6%	1.3%
	Remaining Commodities	6,627,280	10.6%	10,435,040	9.8%	57.5%	1.9%
	Total	63,240,321	100.0%	106,567,924	100.0%	68.5%	2.2%

Source: TRANSEARCH data for 2016 and 2040

Table 2-28 summarizes major railcar movements (i.e., units) in 2040 by commodity type. Rail movements in 2040 total 106.6 million tons, via 2.7 million units, valued at \$190.2 billion, with an average value/ton of \$1,785.

- *Total Units* – *Miscellaneous Mixed Shipments* and *Chemicals or Allied Products* constitute more than half (930,552, 56.7 percent) of the total 2.7 million 2040 rail units.
- *Total Value* – Top commodities include: *Miscellaneous Mixed Shipments* (\$76.0 billion or 39.9 percent), *Chemicals or Allied Products* (\$45.2 billion or 23.7 percent), and *Transportation Equipment* (\$21.4 billion or 11.3 percent).

Table 2-28: South Carolina Rail Freight Forecast – Tons, Units, and Value by Commodity (2040 Units)

STCC2	Commodity	Tons		Units		Value (in millions)		Average Value/Ton
		Amount	Percent	Amount	Percent	Amount	Percent	
46	Misc. Mixed Shipments	14,730,673	13.8%	1,179,687	44.1%	\$75,959	39.9%	\$5,157
28	Chemicals or Allied Products	26,740,277	25.1%	337,406	12.6%	\$45,160	23.7%	\$1,689
20	Food or Kindred Products	8,025,399	7.5%	143,142	5.4%	\$6,252	3.3%	\$779
26	Pulp, Paper or Allied	6,285,483	5.9%	137,511	5.1%	\$6,129	3.2%	\$975
23	Apparel or Related	1,384,472	1.3%	130,628	4.9%	\$7,810	4.1%	\$5,641
37	Transportation Equipment	2,237,304	2.1%	114,324	4.3%	\$21,442	11.3%	\$9,584
14	Nonmetallic Minerals	11,123,794	10.4%	103,103	3.9%	\$143	0.1%	\$13
11	Coal	9,328,425	8.8%	80,298	3.0%	\$325	0.2%	\$35
32	Clay, Concrete, Glass or Stone	6,289,475	5.9%	76,801	2.9%	\$1,235	0.6%	\$196
24	Lumber or Wood Products	5,191,573	4.9%	64,852	2.4%	\$1,292	0.7%	\$249
	Remaining Commodities	15,231,049	14.3%	306,250	11.4%	\$24,435	12.9%	\$1,604
	Total	106,597,924	100.0%	2,674,002	100.0%	\$190,182	100.0%	\$1,785

Source: TRANSEARCH data for 2040

2.2.3 Passenger Travel Demand and Growth

As described previously, Amtrak provides intercity passenger rail service in South Carolina on their *Silver Star*, *Silver Meteor*, *Palmetto*, and *Crescent* routes making stops at 11 different locations in the state. Based on a simplified calculation of boardings and alightings at these stations in 2012 and projected growth in population in the station’s region, the estimate of passenger rail patronage for Amtrak services reflects total growth of 26 percent to 2040 as shown in **Table 2-29**. The actual 2040 figures may be significantly different than forecast.

Table 2-29: Projected Rail Passenger Growth

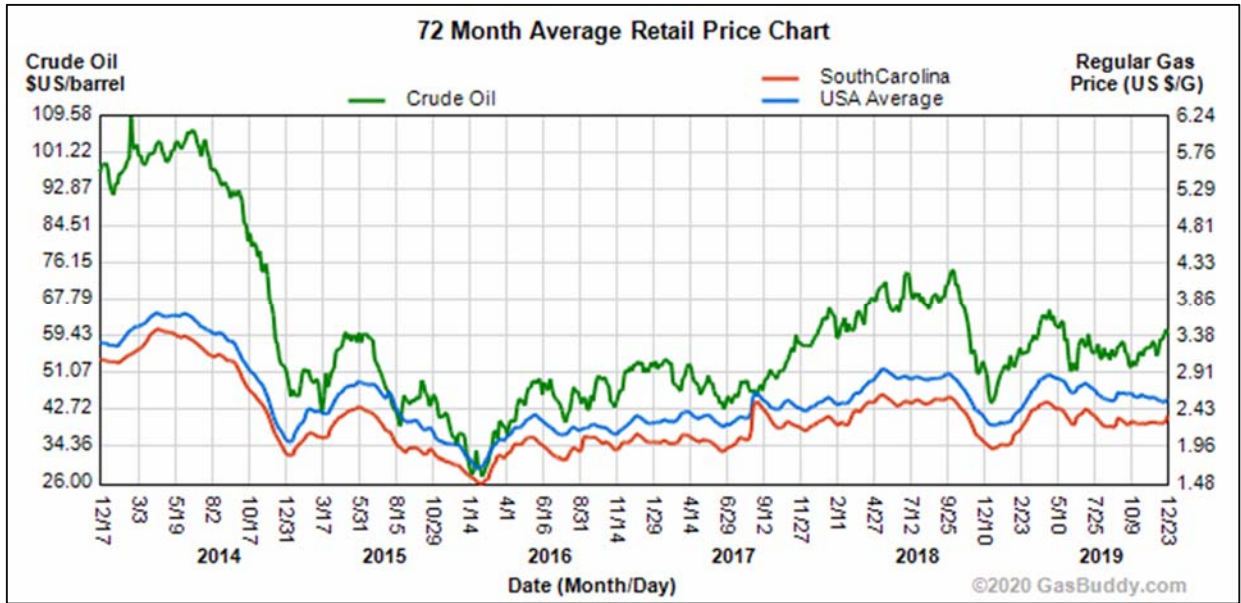
City	Population (AAGR (1))	Boardings + Alightings	
		2012	2040
Camden	0.53%	3,699	4,300
Charleston	0.98%	83,314	111,800
Clemson	0.86%	5,807	7,400
Columbia	0.95%	37,119	48,900
Denmark	0.65%	4,254	5,100
Dillon	0.52%	8,745	10,100
Florence	0.52%	51,561	60,300
Greenville	0.86%	12,565	15,900
Kingstree	1.15%	14,812	20,400
Spartanburg	0.86%	4,452	5,700
Yemassee	1.03%	14,624	19,500
Total		240,952	309,400

Note: Annual Average Growth Rate (AAGR) in Council of Governments (COG) population, from South Carolina Data Center

2.2.4 Fuel Cost Trends

Trends in fuel costs (crude oil and regular gasoline) over the last 5 years are shown in **Figure 2-23**. Gas prices are shown for both South Carolina and the U.S. national average. The regular gas price in South Carolina and the U.S. averages track each other closely, though the South Carolina price is slightly lower consistently over the period, due to the lower than average state motor fuel user fee.

Figure 2-23: Fuel Cost Trends, 2014 - 2019



Source: www.gasbuddy.com (Gas Price Charts)

2.2.5 Rail Congestion Trends

As discussed in Section 2.2.2, rail tonnage is forecast to increase from 70.3 million in 2011 to 101.4 million in 2040, a cumulative increase of 44.3 percent, for an average annual growth rate of 1.3 percent. The short link between Greenwood, SC and Athens, GA is projected to continue to handle the greatest rail tonnage per line as it did in 2011, as a result of north-south and east-west CSXT routes crossing in that part of the state. The greatest rail tonnage growth between 2011 and 2040 appears to accrue to the major Class I rail lines.

2.2.6 Highway and Airport Congestion Trends

2.2.6.1 Highway Congestion Trends

2.2.6.1.1 Interstate Congestion

The ten most congested locations on interstate highways in the state are concentrated in three areas²⁴:

- I-20, Columbia
 - Between Exits 76B (Alpine Rd) and 80 (Clemson Rd)
- I-26, Columbia
 - Between Exits 106 (St Andrews Rd) and 107, northwest of the interchange with I-20
 - Between Exits 104 (Piney Grove Rd) and 106 (St Andrews Rd), northwest of the above segment
 - Between Exit 108 (Bush River Rd) and the interchange with the I/126 spur to downtown Columbia
 - Between Exits 107 (I-20) and 108 (Bush River Rd)

²⁴ Source: INRIX data

- I-85, Greenville
 - Between Exits 51 and 54, east of the interchange with I-385
- I-526, North Charleston
 - Between Exits 17 and 18A (US 52/Rivers Ave), east of the interchange with I-26
 - Between Exits 19 (N. Rhett Ave) and 20 (Virginia Ave)
 - Between Exits 18 (US 52/Rivers Ave) to 19 (N. Rhett Ave)
 - Between Exits 16B (International Blvd) and 17, west of the interchange with I-26

The level of congestion throughout the state during peak-hour conditions is illustrated in **Figure 2-24**.

2.2.6.1.2 Highway Congestion Growth

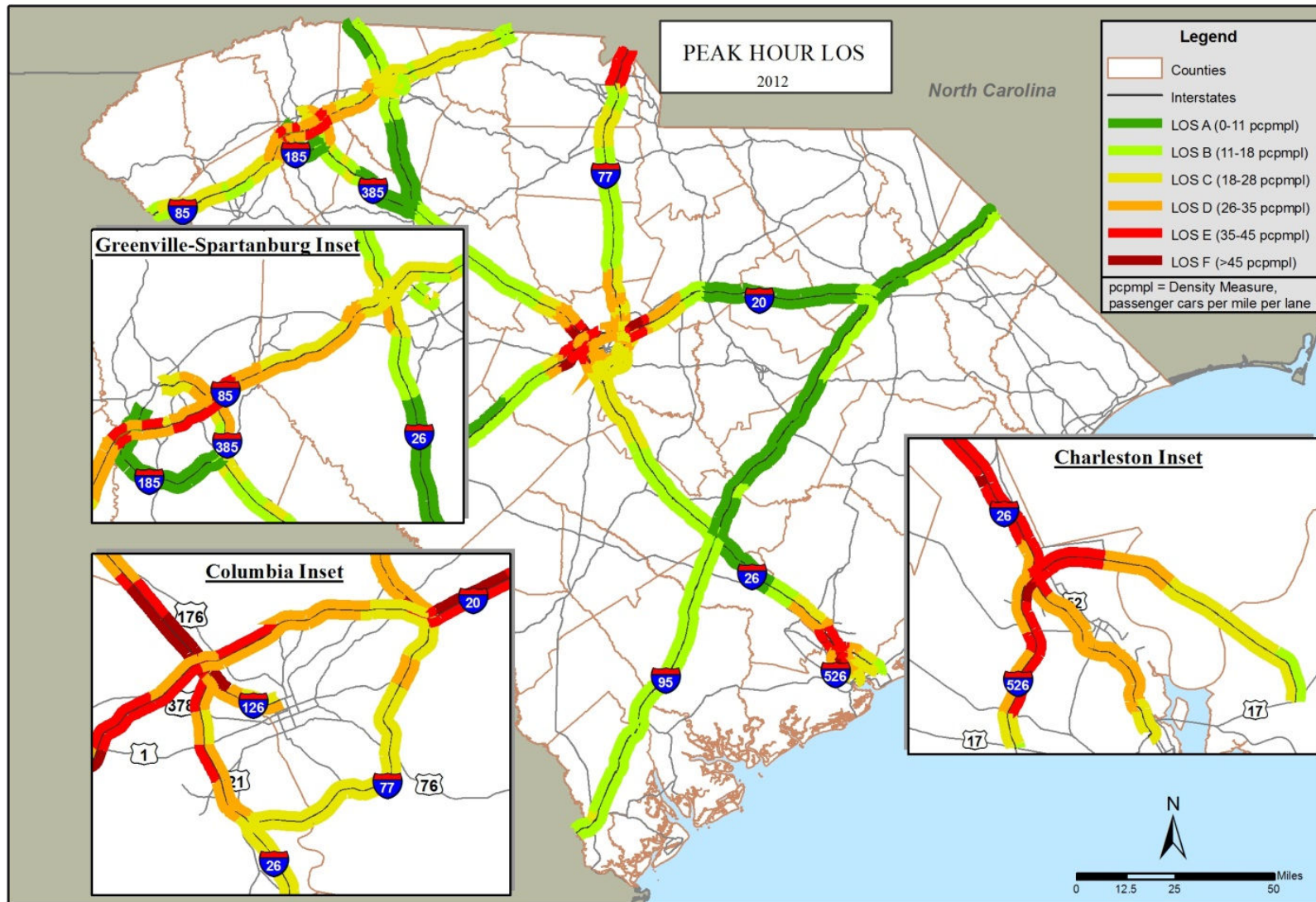
Vehicle miles of travel on the state’s Interstate and Arterials highways are estimated to increase by 58.5 percent between 2011 and 2040, as shown in **Table 2-30**. Future estimates of highway travel were derived from the HERS-ST tool used to estimate highway expansion needs for the state’s 2040 Long Range Multimodal Transportation Plan. Without sufficient improvements in highway capacity on the state’s interstates and arterials increased vehicle miles of travel will result in significant growth in highway congestion.

Table 2-30: Projected Growth in Highway VMT to 2040

Year	Rural Highways			Urban Highways			Statewide Interstates and Arterials
	Interstate	Principal and Minor Arterials	Total	Interstate and Expressways	Principal and Minor Arterials	Total	
2011	7,452	8,760	16,212	5,988	12,054	18,042	34,254
2040	12,347	13,972	26,319	9,721	18,242	27,963	54,282
Growth	65.7%	59.5%	62.3%	62.3%	51.3%	55.0%	58.5%

*Note: Annual VMT in Millions
Source: CDM Smith, HERS-ST*

Figure 2-24: Congestion Levels on Interstate Highways, 2012



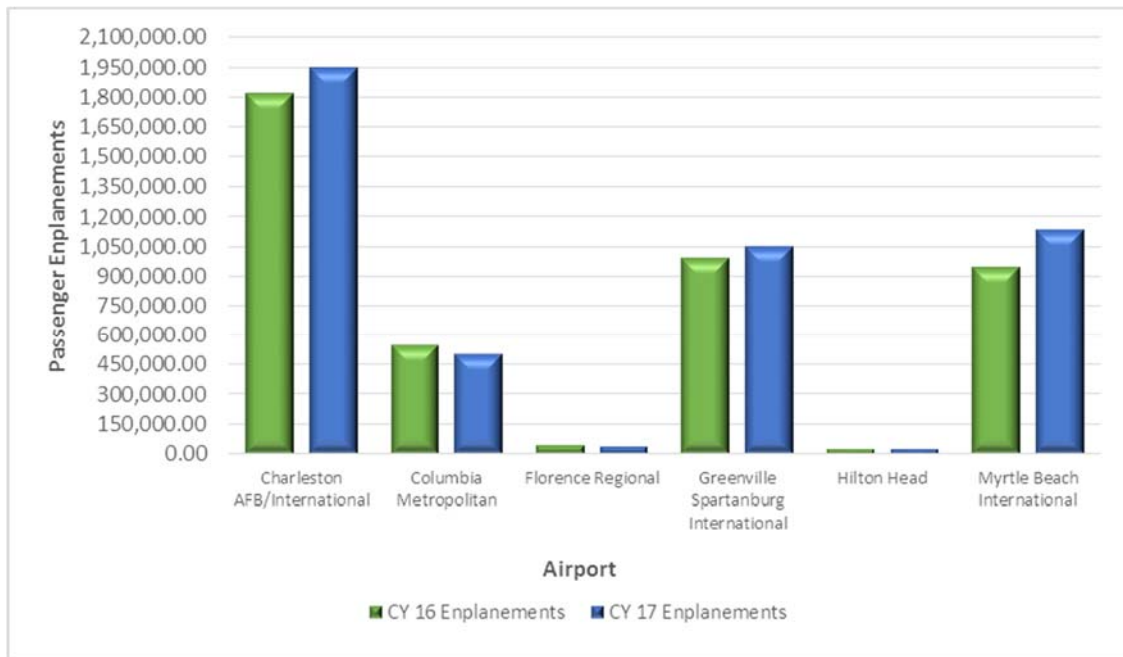
2.2.6.2 Airport Congestion Trends

South Carolina has 53 publicly-owned airports included in the National Plan of Integrated Airport Systems (NPIAS). Of the 53 airports, 6 are Primary Commercial Service airports, 45 are general aviation facilities, and 2 are reliever airports, defined by the FAA as high-capacity general aviation airports in major metropolitan areas that provide pilots with attractive alternatives to using congested hub airports.

Passenger (enplanement) and cargo data is extracted from the Air Carrier Activity Information System (ACAIS), an FAA database that contains revenue passenger boarding and all-cargo data. The U.S. Department of Transportation (DOT) is the main source of enplanement statistics.

In 2017 the six commercial service airports in South Carolina accommodated almost 4.70 million passenger enplanements, up from 4.37 million in 2016. **Figure 2-25** details the 2016 and 2017 enplanements at the six primary commercial airports in South Carolina.

Figure 2-25: South Carolina Passenger Enplanements, 2016/2017



Source: Federal Aviation Administration Passenger Boarding for U.S. Airports (updated November 2018)

2.2.7 Land Use Trends

The importance of maximizing the social and economic impacts of land use through insightful and long range land use/transportation planning and decision-making is well understood in South Carolina.

Two examples have been described in Section 2.1.2.1 of this report. The first is the rail served Inland Container Port in the upstate of South Carolina in Greer just north of the I-85 corridor that connects Charlotte with Atlanta. The inland port, which commenced operations in October 2013, is located

near BMW, Michelin, and numerous other major manufacturers and distributors serving the Piedmont Atlantic Megaregion, as well as other US and international markets. The second is the planned Intermodal Container Transfer Facility in Charleston. The facility will provide rail access to two Class I carriers and be located near the 280-acre, 3-berth container terminal currently under construction on the Charleston Naval Complex.

The high-speed passenger rail corridor currently being evaluated in a Tier I EIS has the potential to provide further opportunities for key land use planning initiatives related to multimodal transportation in South Carolina (see Section 3.1).

2.3 Existing Rail System: Rail Service Needs and Opportunities

2.3.1 Key Issues Impacting Rail Service

This section describes rail issues that cover a broad scope of rail industry and public sector needs. Four principal issues have been identified by statewide rail partners – intermodal traffic, infrastructure and expansion, grade crossings, and funding. Each is discussed in more detail in the following paragraphs.

Intermodal – Intermodal rail traffic is growing significantly for the state’s two Class I railroads. While observations reflect opinions regarding all intermodal facilities in the state (airports, water ports and rail), those applicable to rail or rail-specific have included lack of facilities, capacity, access, and local impacts. Projects such as the Inland Ports at Greer (2013) and Dillon (2018) and the planned North Charleston Intermodal Container Transfer Terminal (ICTF) have added or will add facilities and increase capacity for the handling of containers. Including the two terminals in Charlotte (one for each of the Class I railroads), no part of the state will lie more than 100 miles from such a facility, and much of the state will have more than one option within that radius. However, with the growth of inland terminals, roadway access needs to be addressed in terms of both adequacy and community impacts.

In addition to facilities for containers and trailers, there are a number of terminals throughout the state for the transloading of freight along with cross dock and storage facilities. These terminals can handle dry and liquid bulk commodities such as flour, sugar, and plastic pellets, as well as aggregates, steel, and lumber among others.

Adding to existing facilities, Norfolk Southern operates two Thoroughbred Bulk Transfer (TBT) terminals in Columbia and Spartanburg. TBT terminals are specialized facilities that allow customers to transfer a large array of commodities between rail cars and trucks. TBT terminals are owned by Norfolk Southern and operated by independent contractors that are industry experts in facilitating safe and efficient bulk transfer and distribution. The facilities allow customers without rail sidings to receive the benefits of rail economics and service quality.

Other improvements can consist of capacity increasing projects such as adding passing or second tracks on mainlines, improving train control signal systems, or clearances, for example. Extension of tracks to reach new industries or add connections also fall into the same category.

Grade Crossings – Safety, rail-highway conflicts and need for grade separations comprises grade crossing related issues. Quiet zones have also been a subject of interest in some locales. Improvements can consist of single crossings or several, the latter typically in a corridor of some length. Such a project is common on lines with passenger trains or one with severe rail-highway conflicts. The Assembly Street project in Columbia is an example of the latter.

Passenger Service – The need for commuter service on South Carolina’s major metro areas is more of a public issue than intercity travel.

Funding – Historical lack of adequate highway funding and its impact on the condition of the state’s roadway infrastructure was a common concern as it was for rail. There is no dedicated source of state funding for rail projects. If funding were available, additional comments on the subject suggested expenditures should be subjected to cost-benefit analyses and prioritized. Included in the prioritization process was a suggestion that assistance be directed at system components generating South Carolina rail traffic rather than through traffic.

2.3.2 Opportunities to Address Rail Needs and Issues

There are a number of opportunities to address some of the issues and/or add to the rail system’s effectiveness. Freight opportunities are discussed initially followed by passenger considerations.

2.3.2.1 Freight Rail

Intermodal – South Carolina Ports Authority (SCPA), the State of South Carolina, and other government agencies and partners are currently investing in nearly \$2.6 billion in port-related infrastructure that will enhance operational performance and transportation infrastructure related to the movement of cargo at the Port and throughout the State.

The improved Panama Canal permits larger ships to reach east coast ports, which include Charleston. The Charleston Harbor Deepening Project is on track to achieve a 52-foot depth in 2021 — yielding the deepest harbor on the East Coast — up from the current 45-foot depth. The entrance channel is also being deepened to 54 feet, up from 47 feet. The additional seven feet of depth in Charleston Harbor will enable post-Panamax vessels to call on the Port of Charleston any time of day, regardless of tides. The 52-foot depth will ensure SCPA can handle the growing number of large, cargo-laden vessels calling on Charleston.

Other intermodal investments include (as of October 2019):

- ***New Terminal Development:***
 - Container Terminal & Associated Transportation Infrastructure:
 - Phase 1 of the Hugh Leatherman Terminal, a new 286-acre container terminal located along the west bank of the Cooper River.
 - A Port Access Road is under construction that will connect this terminal directly to I-26.
 - An Intermodal Transfer Facility, to be funded and operated by Palmetto Railways, will be located on a private road adjacent to this facility allowing for near-dock rail.

- ***Rail-served Inland Ports:***
 - Inland Port Greer Commenced operations in November 2013; serves the upstate of South Carolina; served by the Norfolk Southern.
 - Inland Port Dillon Commenced operations in the April 2018; serves the Pee Dee region of the state; served by the CSX.
- ***Wando Welch Terminal Improvements:***
 - SCPA's largest container terminal in both size and volume is currently being upgraded to better handle super-post-Panamax ships and to enhance terminal operations.

Corridor Initiatives – Rail corridor improvement initiatives such as CSX's I-95 Corridor, its "A line" from Florida to the Northeast, and NS' Crescent Corridor, the railroad's main track from the Northeast to New Orleans offer opportunities for rail operating improvements, and for the public, a vehicle to address grade crossing issues and reduce vehicular traffic on paralleling interstates, I-95 and I-85, respectively, by attracting additional rail traffic from the highways.

Development Activity – The improving economy and the state's recent success in recruiting new industry of the type that is expected to increase demand for rail transportation in addition to the expansion of existing industries bodes well for the railroads. It also bodes well for the public in diverting traffic from the highways.

Preservation and improvement of light density lines, principally short line railroads, provide access to additional potential industrial sites, as well as maintaining transportation alternatives for existing businesses.

2.3.2.2 Passenger Rail

Commuter Rail – Implementation of commuter rail service in congested metro areas provides an opportunity to reduce associated highway congestion and adverse impacts such as maintenance and replacement.

Intercity Rail – The location of parts of the state in the predicated 2050 Piedmont Atlantic Megaregion increases opportunities for intercity passenger service by high-speed or other rail technologies, on a regional basis within the Megaregion, as well as long distance travel between Megaregions.

2.3.2.3 Funding

It will not be possible to take advantage of the opportunities identified without funding. South Carolina could benefit from a dedicated source of funding for the facilitation of rail projects including grade crossing improvements (which can receive federal contributions). As demonstrated throughout this report, many public benefits can result as well as benefits to the railroads. Railroad benefits can also result from private project participation.

3 PROPOSED PASSENGER RAIL IMPROVEMENTS AND INVESTMENTS

The opportunities for rail passenger service in South Carolina lie principally in commuter services in its metro regions. Interest in improved intercity service is limited to proposed high-speed passenger operation linking Charlotte, NC to Atlanta, GA, and connectivity between Charlotte and Columbia. There have not been any proposals made in terms of improving existing Amtrak service.

3.1 Proposed Passenger Rail Services

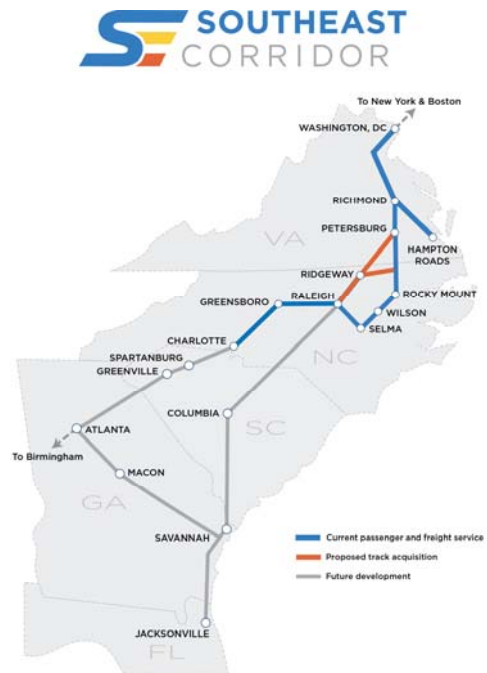
3.1.1 Proposed High Speed Passenger Services

Southeast High Speed Rail Corridor – The federally designated Southeast High Speed Rail Corridor, illustrated in **Figure 3-1**, passes through South Carolina. Georgia DOT (GDOT), in partnership with South Carolina DOT and North Carolina DOT, have partnered in the development of a Tier I EIS for a high speed rail corridor between Charlotte and Atlanta that passes through the state’s Upstate region roughly parallel to I-85. This Passenger Rail Corridor Investment Plan (PRCIP) is part of a larger high-speed rail initiative on the behalf of the Federal Railroad Administration (FRA) that extends north to Washington, DC and is commonly referred to as the Southeast High Speed Rail (SEHSR) Corridor.

PRCIP Purpose and Need – The Purpose of the Project is to improve intercity passenger travel between Atlanta and Charlotte by expanding the region’s transportation system capacity, and improving trip time and reliability through high-speed passenger rail services. The Project will provide transportation system capacity necessary to accommodate current and projected population and economic growth occurring along the SEHSR Corridor network including the following metropolitan areas in the Piedmont Atlantic Megaregion: Atlanta, Charlotte, Greenville, and Spartanburg.

The Atlanta to Charlotte Project supplements the completed and ongoing intercity passenger rail studies along the SEHSR Corridor and supports FRA’s HSIPR Program under USDOT’s 2008 Passenger

Figure 3-1: Southeast Corridor Status



Source: North Carolina DOT.

Rail Investment and Improvement Act (PRIIA). This corridor would ultimately also provide linkages to other metropolitan areas along the East Coast (Washington, DC, New York, and Boston, MA).

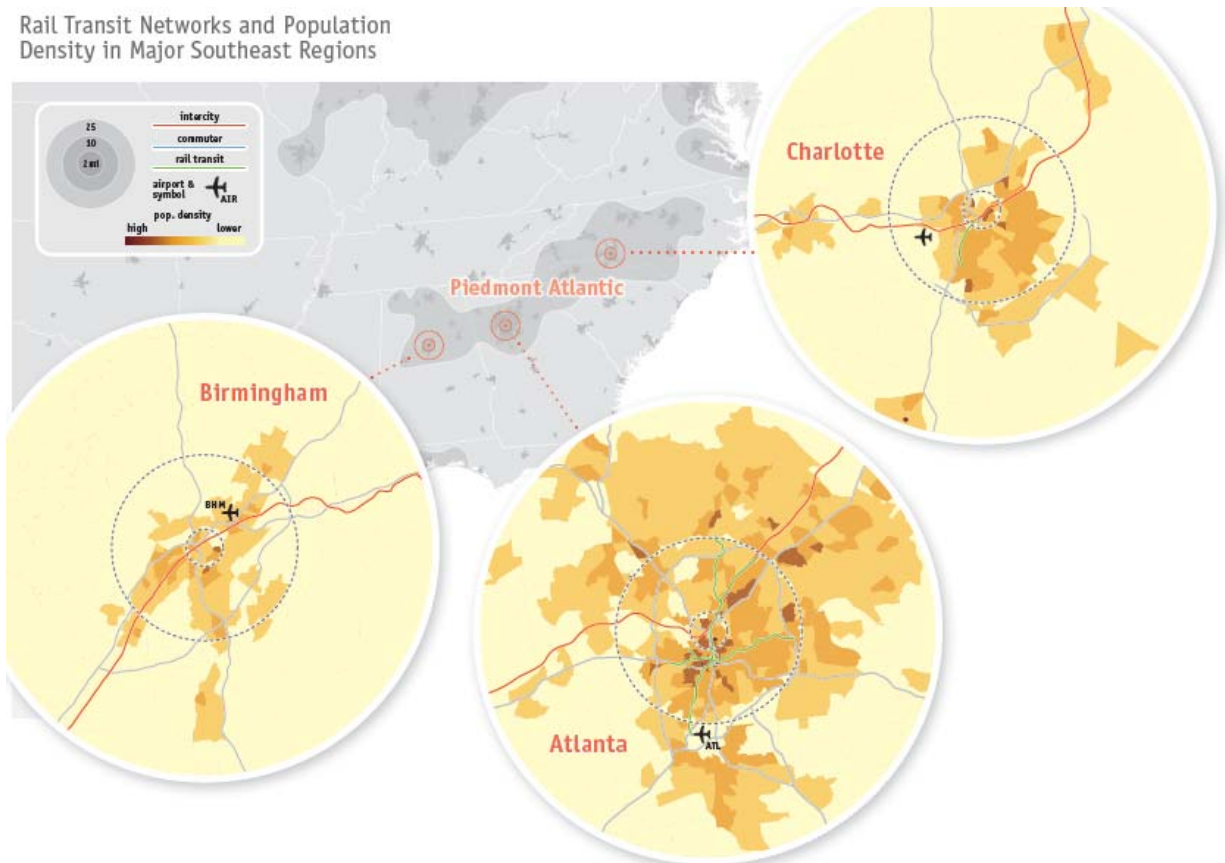
GDOT has identified several transportation system needs relevant to the Study Area, each corresponding to the anticipated population and employment growth with increasing travel demand. The Project would satisfy the following needs:

- Population and Employment Growth
- Improve Regional Transportation System Connectivity
- Increase Transportation System Capacity
- Improve Travel Times and Reliability
- Provide an Alternative Travel Mode
- Traveler Safety
- Improve Energy Efficiency and Air Quality
- Maintain and Enhance Economic Growth and Vitality

The projected increases in population and economic growth for the Piedmont Atlantic Megaregion (**Figure 3-2**) create a need for a carefully planned approach to improving rail infrastructure that will benefit Georgia, South Carolina, North Carolina, the southeastern United States and the nation.

The Atlanta to Charlotte corridor and the region have to contend with serious mobility challenges that will adversely affect local, regional and national economies if left unaddressed. The existing transportation infrastructure in the project area is out dated, lacks connectivity, is congested, and provides few options for reliable passenger travel.

Presently, interstates are operating at or near capacity, therefore alternative modes of transportation are being considered to mitigate congestion. Improving rail infrastructure through the development of this corridor will in turn facilitate the improvement of intercity travel and mobility between Atlanta and Charlotte by expanding the region's transportation capacity and reliable mode choices through improvements in passenger rail services. Evidence of the demand for intercity travel is supported through the frequency of non-stop flights between the two terminal cities (Atlanta and Charlotte) with 18 flights per day, and 9 flights between Greenville and Charlotte. Individuals who for various reasons cannot or choose to not drive, or travelers looking for other options require alternative transportation choices. This corridor will be an important extension to the planned SEHSR Corridor System while developing important linkages to other metropolitan areas along the east coast including Washington D.C., New York and Boston with an Atlanta or Charlotte departure.

Figure 3-2: Piedmont Atlantic Megaregion

Source: <http://www.america2050.org> High-Speed Rail in America

3.1.2 Connecting Atlanta to Charlotte

GDOT started with six Corridor Alternatives identified by a 2008 United States Department of Transportation (USDOT) study. In 2011, the Georgia Department of Transportation (GDOT) received a \$4.1 million grant to complete a service development plan and environmental study for the 250 mile passenger rail corridor between Atlanta and Charlotte. This study will build upon the 2008 feasibility study of high-speed rail on this corridor. Research and assessment of numerous possible routes resulted in GDOT and partner states advancing three routes for further analysis based on their ability to meet the Project Purpose and Need. The three alternatives advancing are the Southern Crescent, I-85, and Greenfield as shown in **Figure 3-3**. GDOT conducted high-level operational and performance analysis of the three Corridor Alternatives and identified potential station opportunities, considered rail technology and speed considerations, and identified two options for approaching metro Atlanta (the Atlanta Approach). Finally, GDOT evaluated potential environmental impacts of the three Corridor Alternatives using high-level measures appropriate for Tier 1 environmental analysis.

3.1.2.1 Southern Crescent Alternative

The proposed Southern Crescent Corridor Alternative is a 268-mile route that primarily follows the Norfolk Southern (NS) Piedmont Division right-of-way (ROW), which hosts the existing Amtrak *Crescent* long-distance service between Atlanta and Charlotte. This Corridor Alternative operates

on shared freight and passenger tracks in certain sections of the corridor and on separate tracks in certain sections. This route could serve three stations in North Carolina at Charlotte Gateway, Charlotte airport (CLT), and Gastonia; four stations in South Carolina in Spartanburg, Greer, Greenville, and Clemson; and six stations in Georgia in Toccoa, Gainesville, Suwanee, Doraville, downtown Atlanta, and Hartsfield– Jackson Atlanta International Airport (H-JAIA).

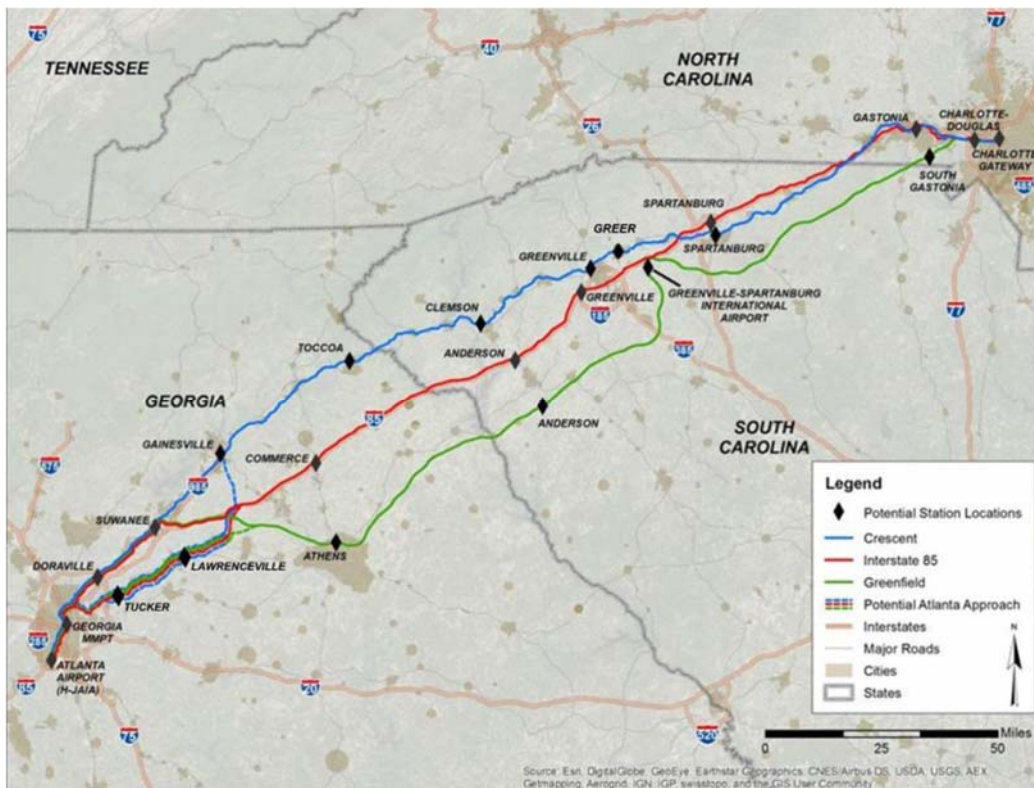
3.1.2.2 Interstate 85 Alternative

The proposed I-85 Corridor Alternative is a 255-mile route located primarily within the interstate highway ROW on a dedicated high-speed passenger rail alignment following I-85 between Gastonia, NC and Suwanee, GA, then following a shared railroad ROW in the approaches to the Charlotte and Atlanta termini. This route could serve three stations in North Carolina at Charlotte Gateway, CLT airport, and Gastonia; three stations in South Carolina in Spartanburg, Greenville, and Anderson; and four stations in Georgia in Suwanee, Doraville, downtown Atlanta, and H-JAIA.

3.1.2.3 Greenfield Alternative

The proposed Greenfield Corridor Alternative is a 274-mile route primarily on a new “greenfield” or land without prior transportation use. This Corridor Alternative proposes a dedicated high-speed passenger rail alignment for a majority of the corridor, then follows shared freight railroad ROW in the approaches to the Charlotte and Atlanta termini. This route could serve three stations in North Carolina at Charlotte Gateway, CLT airport, and South Gastonia; two stations in South Carolina at GSP airport and Anderson; and five stations in Georgia in Athens, Suwanee, Doraville, downtown Atlanta, and H-JAIA.

Figure 3-3: Charlotte to Atlanta Passenger Rail Corridor Proposed Alternatives



Source: Atlanta to Charlotte Passenger Rail Corridor Investment Plan.

For the Southern Crescent proposed route it is assumed that diesel-electric technology with speeds capable of 79-110 mph would be utilized. For the Interstate 85 proposed route diesel-electric technology with a top speed of 125-110 mph would be used. The proposed Greenfield route considered fully electrified technology would assume a top operating speed of 125-220 mph.

Key Terminal Locations – Potential strategically located stations for each of these routes were also identified. Proposed service to the Georgia Multimodal Passenger Terminal, Hartsfield-Jackson Atlanta and Charlotte-Douglas International Airports in addition to the proposed Charlotte Gateway Station multimodal facility have been incorporated into each alternative route along with stations in metropolitan areas.

Overall Performance – Overall performance of the alternatives was assessed by how well the criteria of purpose and need, route length, travel time, population served, employment served, regional and intermodal linkages were met.²⁵ In terms of overall performance, upon an initial evaluation the Greenfield corridor received the best performance rating, followed by the I-85 corridor. The Norfolk Southern-identified corridor received an overall performance rating of Good. The other three alternatives had overall performance ratings of Poor.

3.2 History of the Southeast High Speed Rail Corridor (SEHSR) and Previous Studies

The Southeast Rail Corridor was originally designated as a high-speed corridor in Section 1010 of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. More specifically, it involved the high-speed grade crossing improvement program of the Act to reduce or eliminate the hazards of at-grade highway-rail crossings in the designated corridors. At that time, the Southeast Rail Corridor was one of five so designated, and was to connect the southern end of the Northeast Corridor to Charlotte, NC.

South Carolina Routes – The high-speed rail grade crossing improvement program was carried over into the Transportation Equity Act for the 21st Century (TEA-21) as Section 1103(c). Subsequently, the Southeast High-Speed Rail Corridor (SEHSR) was extended in December 1998 south from Charlotte to Atlanta and Macon, Georgia running 122 miles over the NS main track through the Upstate of South Carolina. Another branch was added running from Raleigh, North Carolina through Columbia to Savannah, Georgia (205 miles over CSXT's "S" Line) and Jacksonville, Florida. The Corridor was further extended in October 2000 from Macon to Jessup, GA, tying the two branches together.

In 2001, a study²⁶ was prepared to examine the two routes through South Carolina and determine infrastructure improvements needed to operate passenger trains at speeds of at least 90 mph with a goal of 110 mph. The evaluation determined that the top speed was in excess of the characteristics of both routes and that improvements in alignment, signal systems, and highway-rail crossing treatments were necessary to increase operating speeds. The study concluded that the degree of development in the Upstate precluded implementation of significant alignment changes

²⁵ Atlanta to Charlotte Passenger Rail Corridor Investment Plan

²⁶ South Carolina Southeast High Speed Rail Corridor Improvement Study

and that the route through the center part of the state held more promise for increasing operating speeds. However, based on a 1997 ridership study²⁷ the Upstate route holds the most promise from a travel demand standpoint.

The Volpe Report²⁸, made available in January of 2009, examined several means of providing “higher-speed” rail passenger service between Charlotte and Macon, GA via Atlanta. Operating scenarios with speeds of 90, 110, and 125 mph with diesel locomotives, both diesel and electric for 150 mph, and electric locomotives for 200 mph were developed. A variety of station stop scenarios were also developed with Spartanburg, Greenville-Spartanburg International Airport (GSP), Greenville and Clemson candidates in South Carolina. The only candidate not presently served by Amtrak is GSP.

The study was predicated upon development of a dedicated track²⁹ for the service, not use of existing freight trackage although freight right of way might be used in places, as well as highway right of way. A dedicated track was selected for reasons of safety, reliability, maintenance, operations, and access control. Demand and associated revenue along with capital, maintenance and operating costs were developed for each scenario.

The Volpe study concluded that the “best case” scenario was either 125 or 150 mph diesel-power³⁰ trains with total capital costs of \$2.06 to \$2.52 billion with revenue-cost break-even in 2031 or 2032. Stops would be made at all stations. Recommendations included the need for the states to develop innovative funding approaches to pay for capital and unified operating deficits, with the latter estimated at \$4 to \$5 million in 2025. Capital route costs³¹ for the Charlotte-Atlanta segment running through South Carolina with the “best case” scenarios were \$1.162 billion and \$1.379 billion for 125 mph and 150 mph operation, respectively. Approximately one-half of the 262 miles between these two points lies in South Carolina.

Richmond to Raleigh Segment – A Tier II Draft Environmental Statement has been approved for the Richmond-Raleigh segment of the SEHSR Corridor as the states of Virginia and North Carolina continue to pursue development of that route segment.

The Passenger Rail Working Group – The Passenger Rail Working Group was established by the National Surface Transportation Policy and Revenue Study Commission (section 1909 SAFETEA-LU). The Group was charged with developing a vision for intercity passenger rail through 2050 including costs, a funding program, and a governance structure.

The Group used an overlay approach to create the system incorporating the existing national passenger rail system (Amtrak) as a base and adding federally designated corridors, corridors in the planning or development stages by states or regional organizations, and potential future routes either in the talking stage or those representing missing links between major population centers.

²⁷ *Southeast High Speed Rail Market and Demand Study*

²⁸ Economic and Industry Analysis Division, Volpe National Transportation Systems, *Evaluation of High-Speed Rail Options in the Macon-Atlanta-Greenville-Charlotte Rail Corridor*, prepared for the Georgia Department of Transportation, August 2008.

²⁹ Two tracks for electrified service

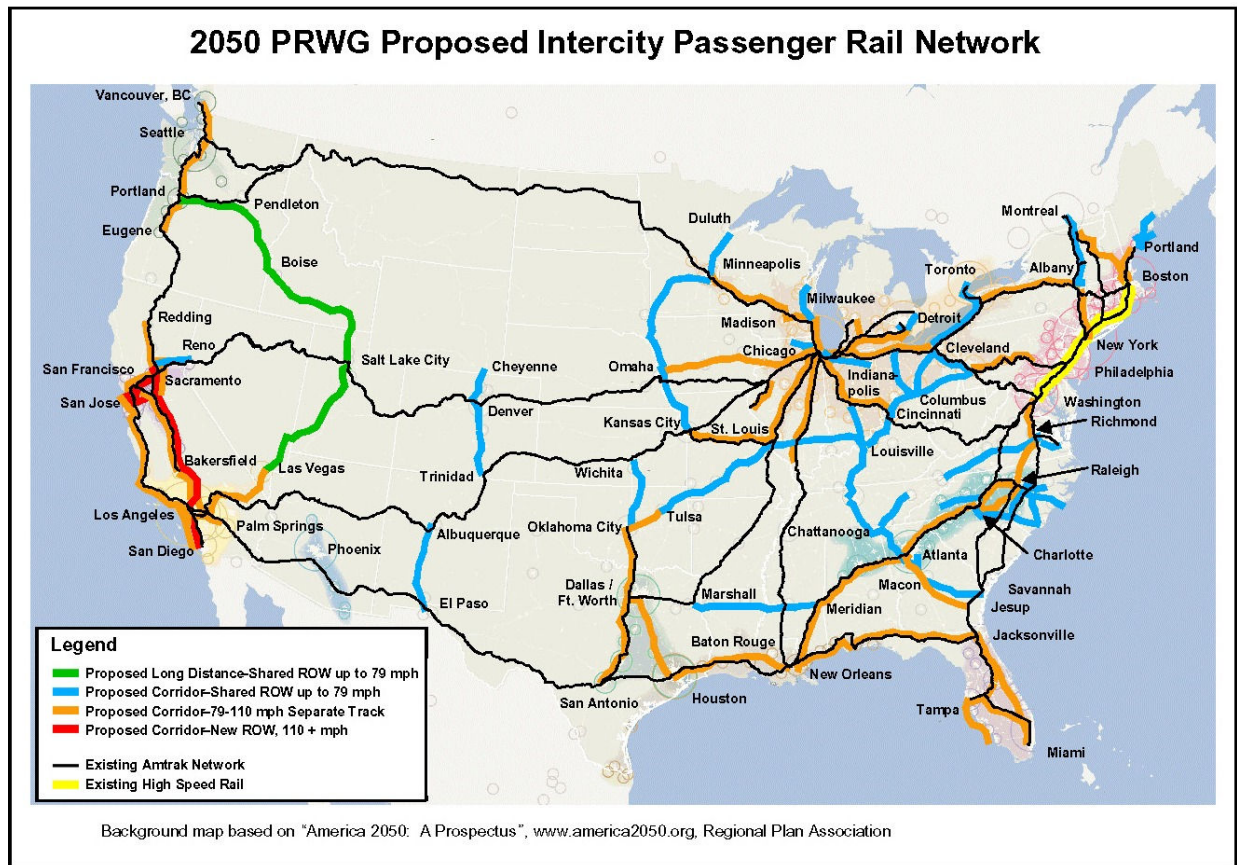
³⁰ Technology to meet U.S. safety standards will have to be developed and speeds in this range require grade separation of highway crossings.

³¹ Not including equipment or operating and maintenance costs.

Special attention was paid to the ten emerging mega regions of the U.S.³² established by the Regional Plan Association. Parts of South Carolina (Upstate and along the North Carolina border) are included in the “Piedmont Atlantic” emerging mega region extending from Raleigh-Durham to Atlanta and Birmingham. This is the only designated mega- region lying between the Northeast (Washington, DC to Portland, ME) and Florida (entire state with exception of the Panhandle).

The group’s proposed intercity passenger rail network in South Carolina for 2015 and 2030 consists of the current Amtrak routes. The 2050 system shown in **Figure 3-4** remains the same with the exception of proposed operations of 79-110 mph³³ passenger trains on a separate track along the current Amtrak route through the Upstate.

Figure 3-4: Passenger Rail Working Group Proposed 2050 Intercity Passenger Rail Network



Source: *Vision for the Future, Passenger Rail Working Group, p. 35*

3.2.1 Current Southeastern Rail Activity

In the FY17 Omnibus Bill, Congress provided the Federal Railroad Administration (FRA) \$1 million in federal funding for the Southeast Corridor Rail Commission (“Commission”). The United States

³² *America 2050: A Prospectus*

³³ Association of American Railroads (AAR) policy specifies separate tracks for freight and passenger service with passenger train speeds of 90 mph or greater.

House of Representatives' Committee on Appropriations submitted a report in explanation of the bill that provided the following recommendation regarding the Commission:

“The Committee’s recommendation includes \$1,000,000 to stand-up the Southeast Corridor Rail Commission. The Commission will develop a regional rail plan and improve mutual cooperation and planning between states and stakeholders.”

Since passage of the bill, several important actions have been undertaken:

- The Southeast states (Virginia, North Carolina, South Carolina, Georgia, Florida and Tennessee) and the District of Columbia have continued to work cooperatively as the Southeast Rail Coalition (“Coalition”) and have remained in communication on the status of various programs and projects through workshops, forums and monthly calls.
- The Virginia-North Carolina Interstate High-Speed Rail Compact (“Compact”), authorized by Congress under 49 U.S.C. §24101 and established through legislation passed by the Commonwealth of Virginia and North Carolina, has continued to meet and has invited the other Coalition states to attend and participate in Compact meetings. At the most recent meeting on November 29, 2017, Compact members agreed to proceed with applying for the federal funding for the Commission, with the North Carolina Department of Transportation (NCDOT) serving as the applicant and Grantee on behalf of the Compact members and the Virginia Department of Rail and Public Transportation (DRPT).
- Under Section 192 of the FY2014 Omnibus Appropriations Act (P.L. 113-76), FRA funded, and is leading, the Southeast Regional Rail Planning Study in coordination with the Coalition members, local transit agencies and MPOs, Norfolk Southern (NS), CSX Transportation (CSXT), and other stakeholder organizations. The purpose of the study is to develop a long-term regional passenger rail vision for the Southeast. The study was initiated in May 2016 and is scheduled for completion in 2019. The study website is located at: <http://southeastrailplan.org/>.

The work of the Coalition, Compact, and the FRA Southeast Regional Rail Planning Study, have highlighted the need for:

- **A Regional Rail Network Vision** – While each state may prepare and maintain a State Rail Plan, these plans do not address the impacts and benefits of improvements across the regional network for both passenger and freight rail. Coordinating passenger rail, commuter rail, freight rail, and rail-related port planning and capital projects to maximize investments and ensure regional rail network viability is essential to guide federal and state investments.
- **Funding Plan** – Identifying and supporting at a regional level a multi-year financially constrained capital program and financially unconstrained plan (documenting unfunded needs) that advances a unified regional rail network vision will help prioritize scarce financial resources and make the region more competitive for federal and non-federal funding sources.

- **Strategic Communication** – Providing information to key stakeholders and the general public to maintain awareness of activities, needs, and progress is important to garnering support for rail planning and investments and educating the community on its importance to economic development, mobility, and safety.
- **Partnering with the Federal Government** - Advising Congress, USDOT, and FRA on federal policies, regulations, and funding that have an impact on the success of the regional rail network is vital to ensuring the creation and implementation of a common vision.
- **Partnering with Railroads** – Coordinating with owning and/or operating passenger and host freight railroads in the regional rail network on planning and project development is essential to ensure public and private investments yield the intended benefits (for both people and freight) and do not diminish previous investments or preclude opportunities for future investments.
- **Training and Technical Assistance** - Sharing project delivery best practices to improve the technical capacity of state partners and other agencies serving as project sponsors will improve project execution and encourage continued investment in the network.

The inaugural meeting of the Southeast Corridor Rail Commission was held on November 14, 2019.

The **Virginia-North Carolina Interstate High Speed Rail Compact (Compact)** was established in 2004 to promote a plan for the finance, design, construction, and operation of interstate rail service through Virginia and North Carolina. Staff from the North Carolina Department of Transportation (NCDOT) Rail Division and VA Department of Rail and Public Transportation (DRPT) have provided technical support for the activities of the Compact. Through a Federal Railroad Administration (FRA) grant, the NCDOT Rail Division will work with the Compact, DRPT, and other southeastern states to establish a broader and more active governance structure for the Southeast Corridor. The new structure will use a three-tiered approach to manage and progress activities to support the SEC. In addition to establishing the broader governance structure and associated vision for rail in the Southeast, activities are anticipated to include the pursuit of funding for corridor acquisition and capital improvements. The tiers of the governance model are anticipated to include the following (as of May 2019):

- **The VA-NC Interstate High Speed Rail Compact:** Established in 2004, the Compact meets regularly to develop and promote plans for financing, design, construction and operation of interstate rail service through Virginia and North Carolina. The Compact is authorized to advocate for federal funding and receive funds for rail development and is anticipated to more regularly meet beginning in 2019. The Compact is a legislative entity and can add member states through changes in state legislation.
- **The Southeast Rail Corridor Commission:** The Commission is being developed to broaden the geographic footprint, align freight and passenger interests in the Southeast, and to position the SEC for directed federal funding. NCDOT, DRPT, and the Compact requested FRA obligate a \$1 million grant to North Carolina to stand-up the Commission. A Statement of Work is currently under review at the Federal Railroad Administration. It is currently anticipated that once the Commission is established, FRA will circulate a draft Southeast

Regional Rail Plan to the Commission for review. Commission members are anticipated to designees of the respective states' executive branches.

- **The Southeast Rail Technical Committee:** The Technical Committee is being suggested to provide a multi-disciplined team of professionals who specialize in rail program development and implementation. This team will meet on a monthly basis and will be responsible for strategically progressing tasks such as right of way appraisals and negotiations, strategic agreement development, stakeholder coordination and public communications. The Southeast Rail Technical Committee is anticipated to replace what has been known as the Southeast Rail Coalition, though the membership may remain the same.

3.3 Intercity Passenger Rail Corridors

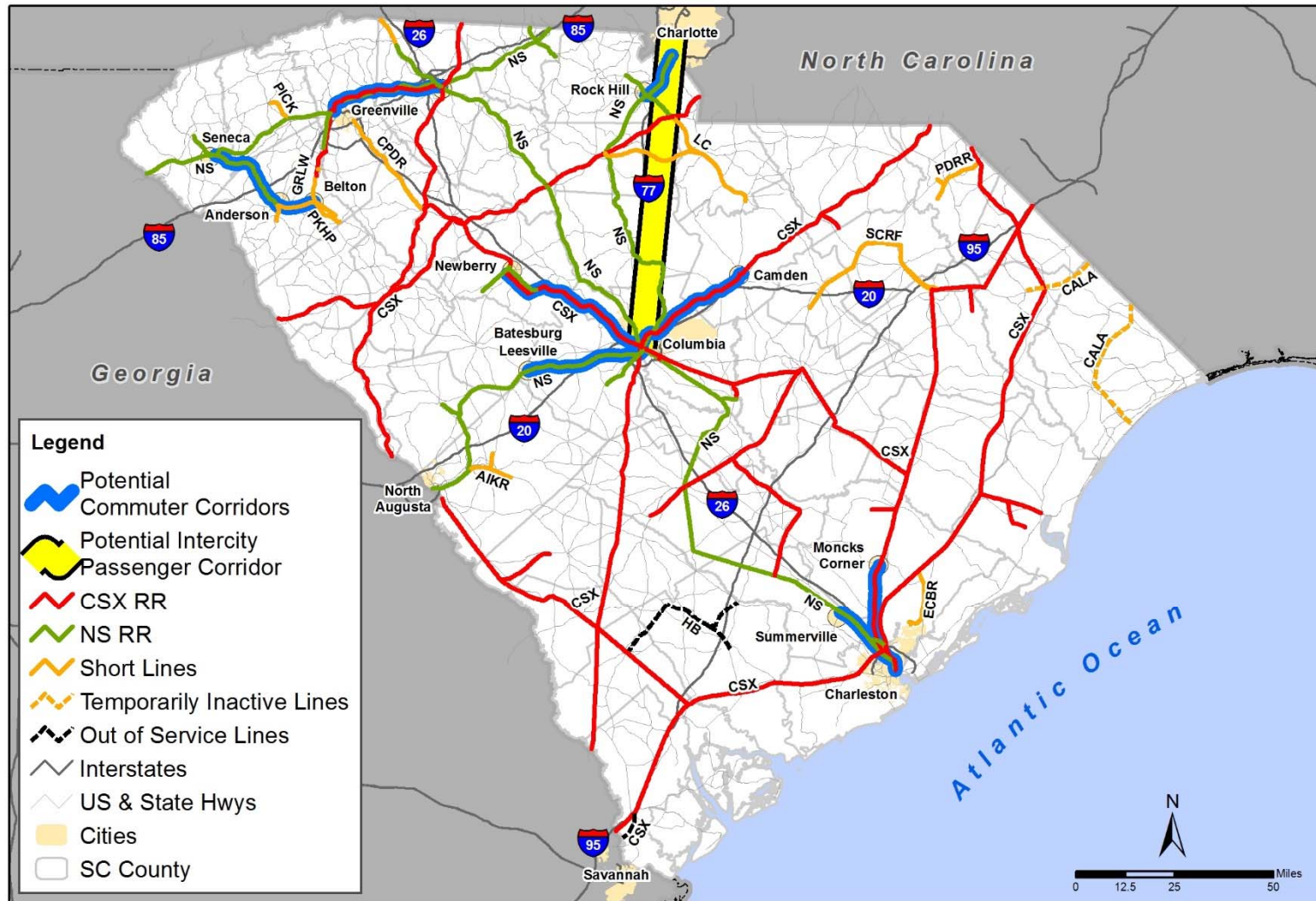
The three routes being evaluated for the Atlanta to Charlotte Passenger Rail service pass through the Upstate (Greenville and Spartanburg) of South Carolina. Regardless of the ultimate feasibility for high-speed rail service, interest and in some cases multi-jurisdictional discussions have occurred for multiple intercity passenger rail corridors in the state.

3.4 Proposed Commuter Rail Services

Commuter rail or rail-transit efforts have been investigated in five different areas of the state, primarily in urban regions. As a result of the investigations, proposals are being advanced in two urban regions and two have selected Bus Rapid Transit over commuter rail. All five, however, are discussed in this section. The commuter corridors in these five areas are shown in **Figure 3-5**.

The proposed commuter rail systems will provide public benefit in a myriad of forms. Congestion during peak hours caused by workers making the daily commute on area highways that not only negatively impact the quality of life for the workers, but also impact potential area economic prosperity by limiting mobility of people and goods.

Figure 3-5: Potential Commuter and Intercity Corridors



Charleston – Many of those living, working, and visiting the Charleston, S.C., region will travel the I-26 Corridor between Summerville and Charleston as it serves as a major commerce route for traffic from the ports of Charleston and is a vital link for commuters and visitors in the region.

Recognizing the need for transit alternatives along this corridor, the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG), initiated the I-26 Regional Fixed Guideway Transit Alternatives Analysis study. The purpose of the I-26 Alternatives Analysis is to enhance regional mobility with transit along the I-26 Corridor between Summerville and Charleston.

Project Background – The Charleston Region has long been recognized as a popular visitor destination for its exceptional natural environment and historic charm. Success in attracting new business investment has also increased due to the tri-county region’s strong competitive assets including the South Carolina Ports Authority; academic, medical and research universities; military installations, and a technically-skilled workforce. The tri-county region is expected to reach 1 million residents by 2027.

Many of those living, working, and visiting the Charleston region will travel the I-26 Corridor between Summerville and Charleston as it serves as a major commerce route for traffic from the ports of Charleston and is a vital link for commuters and visitors in the region.

Initiated by the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG), the **I-26 Regional Fixed Guideway Transit Alternatives Analysis** study considered the effects of transit alternatives on the segment of I-26 between the Town of Summerville and the City of Charleston. The project study area included the areas and communities surrounding the I-26 Corridor and was generally bounded by the Ashley River and Dorchester Road (SC 642) to the west, the Summerville town limits to the north, the Cooper River and the US 52 Corridor and US 176 Corridors to the east, and the Charleston peninsula to the south. The study area also included the Norfolk Southern rail line that operates parallel to I-26 between Downtown Summerville and Peninsula Charleston.

Lowcountry Rapid Transit - The i-26ALT study concluded that a bus rapid transit (BRT) system along the US Highway 78 and US Highway 52 Corridor, running parallel to I-26, was the preferred transit alternative to move forward into project development. As the tri-county planning agency responsible for regional transportation and transit projects, BCDCOG is leading this project. BRT was the selected alternative over rail because the BRT option has a lower cost per rider, supports existing and planned local density and land use, can preserve existing right-of-way and is scalable and flexible to the region. Lowcountry Rapid Transit will provide residents with dependable, frequent transportation and greater access to opportunities throughout the region. Connections between communities and employment centers would be enhanced and would also accommodate other modes such as biking and walking.

Greenville-Spartanburg – The Greenville County Planning Commission and the Spartanburg County Planning Department examined the feasibility of a commuter rail system for the Greenville-Spartanburg area in 1999. The growth in both population and employment with the attendant growth in roadway traffic prompted the investigation of transportation alternatives.

The study involved two rail lines: the NS main track and a CSXT secondary route acquired from the Piedmont and Northern Railway, which originally had been an electric interurban line. Service patronage was forecast to the year 2015 for several rail operating and connecting feeder bus scenarios.

Annual ridership ranged between 240,000 and 650,000 for the 1993 base case and the most service intensive 2015 case. Ridership scenarios were used to develop revenues and operating costs. Capital costs were also developed and the impact of different patronage levels fully considered. Fare box recoveries of 20 to 30 percent were estimated. A peer city system examination was also made. It was concluded that the proposal had a low feasibility level given projected patronage levels. Recommendations were made as to how ridership might be improved.

In 2009, Greenville County Economic Development Corporation (GCEDC) initiated the Multimodal Transit Corridor Alternatives Feasibility Study focused on a 3.42-mile section of inactive freight rail line extending from N. Pleasantburg Road in Greenville to just north of Mauldin. This line segment is owned by GCEDC. The study was completed in March 2010. Four transit alternatives were considered, including commuter rail, light rail transit (LRT), streetcar and Bus Rapid Transit (BRT). The study envisioned a commuter rail option using existing tracks from Fountain Inn to eastern Greenville at Forester Road. The service then would continue on the rail corridor owned by GCEDC into Greenville. Of the four alternatives, BRT was ranked highest and was recommended.

Horizon 2040 - Horizon 2040, the Long-Range Transportation Plan (LRTP) for the Greenville-Pickens Area Transportation Study (GPATS), outlines a regional strategy for a connected transportation system that accommodates the region's existing and future mobility needs. Horizon 2040 is a financially constrained plan, meaning it identifies projects and programs that can reasonably be implemented with anticipated funding levels through the year 2040. In response to federal mandates and the expressed wishes of local residents, the LRTP addresses all modes of transportation in some manner, including automobile, bicycle, pedestrian, transit, air, and rail.

Regional Passenger Rail – Amtrak currently provides passenger rail service to the Greenville region, using the Norfolk-Southern-owned “Crescent Corridor” that stops in Clemson and Greenville. Currently, service is provided at off-peak times with the southbound train passing between 5-6AM and the northbound train between 10-11PM. Current ridership of passenger rail is minimal and so is not modeled or factored into current regional travel patterns. Land uses around the Crescent Corridor have developed independently of the service in the past decades and the Clemson and Greenville stations are isolated from compatible uses, such as higher-density residential and mixed-use commercial development.

Planning for the Future - The prospects for improved regional Passenger Rail service have been explored for decades, but most recently, it was the focus of two major planning efforts:

Georgia Department of Transportation's (GDOT) Passenger Rail Corridor Investment Plan, Tier 1 Environmental Impact Statement (EIS). Initiated in 2013, this environmental study is currently analyzing potential routes for improved passenger rail service between Atlanta, GA and Charlotte, NC. All three of the proposed routes pass through the GPATS region. The analysis is scheduled for completion in 2018, with additional analysis immediately following to analyze alignments and stations. GPATS regional planning for passenger rail will follow suit as the Georgia DOT's (GDOT) efforts progress.

The Federal Railway Administration (FRA) is developing a nationwide passenger rail network for federal funding prioritization, starting with region-wide planning efforts. Throughout 2017, meetings were held

for the Southeast Regional Rail Plan and a report is due in 2018. GPATS has served in a stakeholder capacity for this plan and results will be incorporated into future planning efforts.

As this system will be planned, determined, constructed, and operated by forces outside GPATS and largely beyond its decision-making jurisdiction, no recommendations regarding routes and stations are being made. However, this LRTP fully supports development of improved regional passenger rail systems.

Mobility Options - With potential for improved passenger rail service to connect the GPATS region to Atlanta, Charlotte, and points beyond, GPATS recognizes the need to coordinate transportation systems and land use development to accommodate regional systems. Should improved passenger rail service be implemented throughout GPATS, the intensity of the chosen rail type will have a direct effect on existing infrastructure.

GPATS is committed to actively planning for improved passenger rail service and to adapting to the circumstances as improvements are realized. Fortunately, GPATS and its member jurisdictions will have plenty of time to adapt infrastructure and land use policies once improved passenger rail service is announced, as it will take a number of years to implement. In the interim, GPATS is committed to improving the transportation modes that support regional rail stations.

Columbia – The Central Midland Council of Governments (CMCOG) has been exploring commuter rail service since 2000 when it completed its first study.³⁴ As the Central Midlands region continues to grow in both population and employment, the likelihood of more traffic congestion will continue to rise. Providing transportation options, like transit (and commuter rail in the long run), will help maintain quality of life and lessen the need for investment in roadways.

In 2006, CMCOG adopted the Commuter Rail Feasibility Study for the Central Midlands Region of South Carolina (aka Commuter Rail Plan) for purposes of fostering the establishment of regional land use policies that would play a major role in the future viability of rail transit in the Central Midlands region. The CMCOG Commuter Rail Plan examines three corridors in the region that exhibit characteristics most suitable for some type of commuter rail investment. These corridors are:

Batesburg-Leesville to Columbia, Camden to Columbia, and Newberry to Columbia. The Commuter Rail Plan envisions and encourages the establishment of transit-supportive developments and facilities, in order to reduce the dependence on the use of automobiles and improve air quality; and outlines a series of action steps that can be taken now to build toward high-capacity transit service in the future.

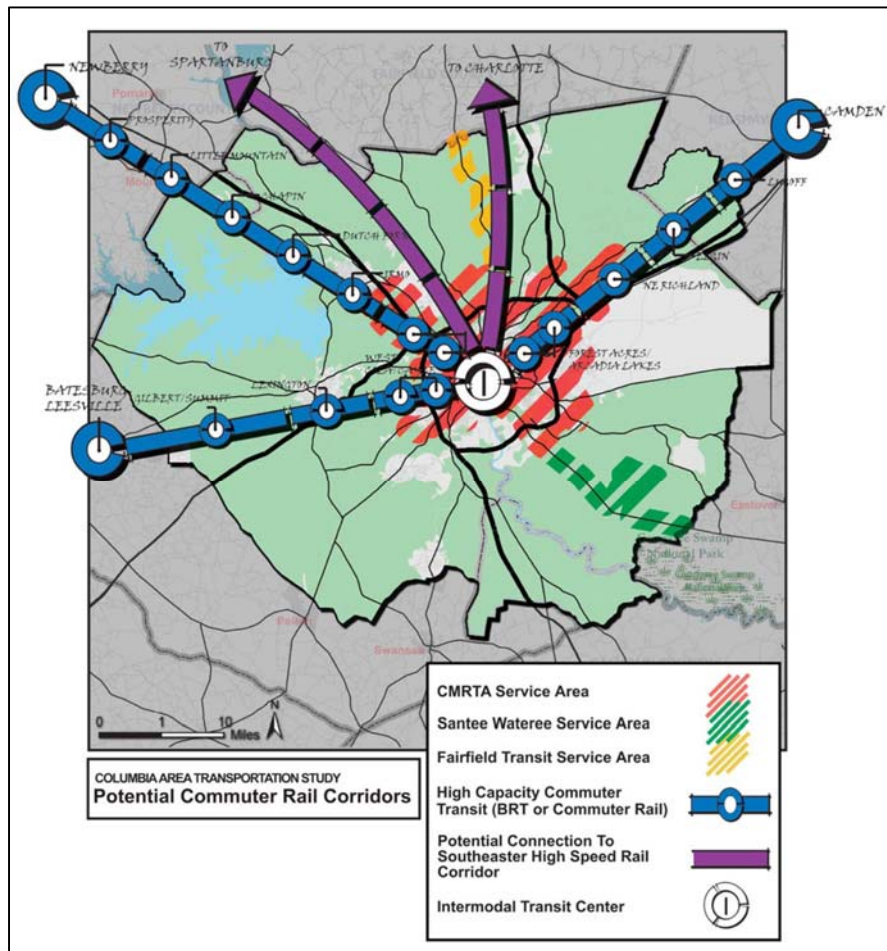
As mentioned earlier, three specific commuter rail corridors were considered in this feasibility assessment: Batesburg-Leesville to Columbia, Camden to Columbia, and Newberry to Columbia. These three corridors are illustrated in **Figure 3-6**. The Commuter Rail Plan evaluated each of these routes as well as provided a description of which modes of transit can be appropriate in various settings. For instance, heavy rail and light rail were determined to be appropriate in densely urban cities that have the population and employment to support these high-capacity modes. While the

³⁴ *Central Midlands Regional Rail Study*

Central Midlands region is experiencing significant growth, the region will not have the population and employment densities necessary to support light or heavy rail for some time. The region’s population density, however, may support other types of high-capacity transit, such as express bus, bus rapid transit (BRT), and commuter rail. The length of the corridors and population density of the service area are the key characteristics that lend support to these specific modes.

Express bus currently operates in two of the three corridors and serves as a base from which further transit enhancements can be developed. As transit ridership grows, more intense levels of express bus can be implemented. Eventually, further enhancements such as BRT services and even commuter rail may become warranted. While all three corridors may warrant high capacity transit sometime in the future, they will all reach that point at different times. Therefore, phased implementation of a menu of transit strategies can be tailored to each specific corridor.

Figure 3-6: Columbia Area Transportation Study Potential Commuter Rail Corridors



Source: Central Midlands Council of Governments 2040 Long Range Plan (2015)

The Commuter Rail Plan indicates that each of the corridors analyzed exhibit characteristics supporting the implementation of high capacity transit and that the Camden corridor should receive priority consideration. Corridor population densities, the strength of downtown Columbia as a regional

destination and employment center, and the proximity of activity centers to the existing freight rail lines create a positive environment for potential rail services. Projected population and employment in each of the three corridors (Camden, Batesburg-Leesville, and Newbury) show that these characteristics will only improve over time and the investment in transit will become more and more cost effective. As a result, these findings present an opportunity for the region to address mobility concerns before they reach critical mass.

Rock Hill – 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. Locally, Charlotte will remain the main access point for area residents to reach the inter-city rail network, at least in the near-term. Rail service interest in the Rock Hill area has been tied to high speed rail efforts between the Charlotte, North Carolina and Atlanta, Georgia metropolitan regions. In 2007 Rock Hill MPO selected Bus Rapid Transit (BRT) as its preferred service alternative.

Rock Hill-York County-Charlotte Bus Rapid Transit (BRT) Service³⁵ - 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* proposes 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 3-7**). 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 US21 and I-77, extending from SC-160 to Gold Hill Road improving transit access in the Kingsley Park and former Knights Stadium areas.

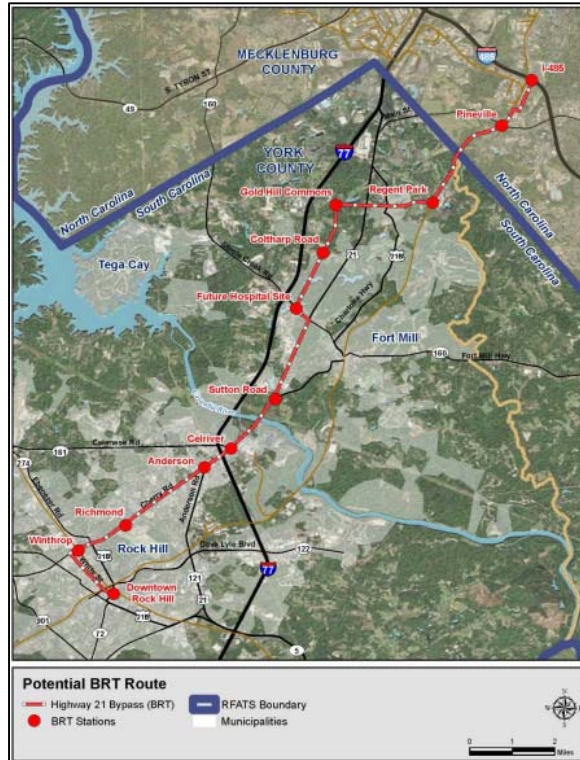
The service would continue in mixed traffic along York Southern Road from Gold Hill Road toward the Norfolk Southern railroad corridor near Regent Parkway. Here, a dedicated two-lane guide-way would be built parallel to the railroad, extending north to Commerce Drive in Pineville. The service would then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

The BRT alternative 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.

³⁵ RFATS 2045 Long Range Transportation Plan Update (June 2017)

Earlier, a commuter rail alternative was the subject of a 1994 analysis, Commuter Rail Transit from Rock Hill, SC to Charlotte, NC, published by the University of North Carolina at Charlotte.

Figure 3-7: Proposed Rock Hill-York County-Charlotte Bus Rapid Transit Service



Source: Rock Hill-Fort Mill Area Transportation Study 2045 Long Range Transportation Plan

Anderson County – A commuter system from Clemson in Pickens County to Belton in Anderson County passing through the town of Anderson has been investigated. The route is some 26 miles long and would use an NS branch line between Clemson and Anderson and a line of the Pickens Railway-Honea Path Division (PKHP) between Anderson and Belton. Existing transit systems (bus) in Anderson and Clemson would be linked. The study effort was intended to provide a level of data suitable for a planned alternatives analysis to meet the Federal Transit Administration’s (FTA) New Starts Planning criteria.

Station locations were developed and travel times for various types of rolling stock were developed and example schedules presented. Ridership was estimated for alternative levels of service and station location scenarios. Annual trips in 2030 were projected to range between a low of 62,000 to a high of 270,000 equating to 117 to 453 daily riders. Capital, as well as operating and maintenance, costs were estimated for system component and service level alternatives and presented in terms of annualized and per trip (per rider) costs.³⁶ The study showed that the build alternatives were too costly relative to the benefits.

³⁶ Discussion based on information contained in *Anderson County Railroad and Street Railway Service*.

4 PROPOSED FREIGHT RAIL IMPROVEMENTS AND INVESTMENTS

This chapter describes the improvements and investments that could address the freight rail needs of the state's Class I and short Line carriers.

4.1 Rail Freight Needs, Class I Railroads

4.1.1 CSX Transportation

CSX Transportation (CSXT) is South Carolina's largest railroad with 1,307 route miles, which cover virtually every area of the state. The railroad has a division office in Florence. In addition to the mileage it owns, it also has trackage rights over NS between Columbia and Charleston.

CSXT needs and improvement projects generally address grade crossings, line capacity additions, and bottleneck issues, as well as industrial development potentials. For purposes of identifying needs and planning rail line improvements, CSXT classifies each of their lines into one of three categories (core, strategic, and non-strategic). Typically CSXT line improvement needs are identified, planned and, in some cases implemented, in a shorter time frame than the five-year cycle for updating state Rail Plans. In the absence of a freight rail funding program in South Carolina, CSXT improvement projects have in the past been privately funded for the most part, with applications for Federal grants being submitted when the improvement projects comply with the necessary federal requirements.

4.1.2 Norfolk Southern

Norfolk Southern (NS) operates 762 route miles in South Carolina and has trackage rights over CSXT from Newberry to Spartanburg. The Norfolk Southern Railway Company is owned by the Norfolk Southern Corporation. The railroad has a division office in Greenville.

NS needs and improvement projects are similar in nature to those of CSXT, including grade crossings, line capacity additions, bottleneck issues, and industrial development potentials. In addition to the planned ICTF project in Charleston, NS is interested in the Assembly Street Corridor project in Columbia. This latter project has not progressed further for lack of funding and coordination problems. SCDOT (on behalf of Norfolk Southern and SC Ports Authority) was awarded a Better Utilizing Investments to Leverage Development (BUILD) Transportation Discretionary 2018 grant for a freight rail infrastructure improvement project in the South Carolina Upstate. The project will expand the Inland Port Greer (IPG), extend the IPG lead track, and lengthen the Carlisle Siding to approximately 15,100 feet. The IPG expansion includes acquiring additional equipment for the handling, loading, and unloading of containers and the paving of up to 40 acres.

4.2 Rail Freight Needs, Short Line Railroads

All short line railroads operating in the state were contacted to update short line needs identified in the 2014 State Rail Plan. These needs, totaling almost \$50 million, were grouped into three types of

improvements, as shown in Table 4-1. Table 4-2 details short line improvement needs as submitted by the railroads.

Table 4-1: Short Line Railroad Needs by Improvement Category

Type of Needs	Needs (Millions)
Rehabilitation	\$41.62
Capacity / Service	\$3.50
Safety	\$2.50
Short Line Total	\$47.62

Table 4-2: Short Line Needs

Short Line Improvement Project	Estimated Cost (\$ millions)
Rehabilitation	
Aiken Railway Company, LLC	
Rehabilitation: Drain improvement, bridge improvements, tie and surface 11.45 miles and 8.45 miles & Relay 8.45 miles to accommodate heavy loads	\$21.2
Pee Dee River Railway	
Rehabilitation: Relay 7.5 miles of rail between McColl & Bennettsville	\$5.0
Rehabilitation: Relay 2.1 miles of rail on the Breeden Spur	\$2.7
Pickens Railway	
Rehabilitation: Relay 10 miles of track from Belton to Anderson	\$5.8
Carolina Piedmont Railroad	
Rehabilitation: Relay 1 track mile, and upgrade track structure with 10,000 cross ties	\$1.88
South Carolina Central Railroad Company, LLC	
Rehabilitation: Relay 4 track miles, upgrade track structure with 10,000 cross ties	\$3.84
Greenville & Western Railway Company, LLC	
Rehabilitation: Tie and Surface 7.39 miles between Cheddar and Honea Path	\$1.2
Subtotal for Rehabilitation	\$41.62
Capacity / Service	
Pee Dee River Railway	
Capacity: Construct additional interchange yard track , and construct yard capacity in various locations	\$3.5
Subtotal for Capacity/Service	\$3.5
Safety	
Pee Dee River Railway	
Safety: Upgrade 3.80 miles of Mohawk Branch	\$.90
Greenville & Western Railway	
Safety: Raise and widen J.P. Gossett Drive overpass near Williamston	\$1.6
Subtotal for Safety	\$2.50
Total for Short Line Projects	\$47.62

These projects, while comparatively modest in scale and cost, can have significant beneficial impacts on the local, regional and state economy – making them candidates for existing or new state funding programs where economic benefits have a high priority among selection criteria.

4.2.1 Palmetto Railways Industrial Rail Line (Camp Hall Commerce Park)

Palmetto Railways is planning for the development of an industrial rail line to serve the Camp Hall Commerce Park in Berkeley County, South Carolina. The new rail line will connect Camp Hall Commerce Park to existing railroad right-of-way located near the Santee Cooper Cross Generating Station in Berkeley County, South Carolina. Palmetto Railways will construct, own and operate the rail line that is expected to open the door to greater economic development efforts to support the state of South Carolina.

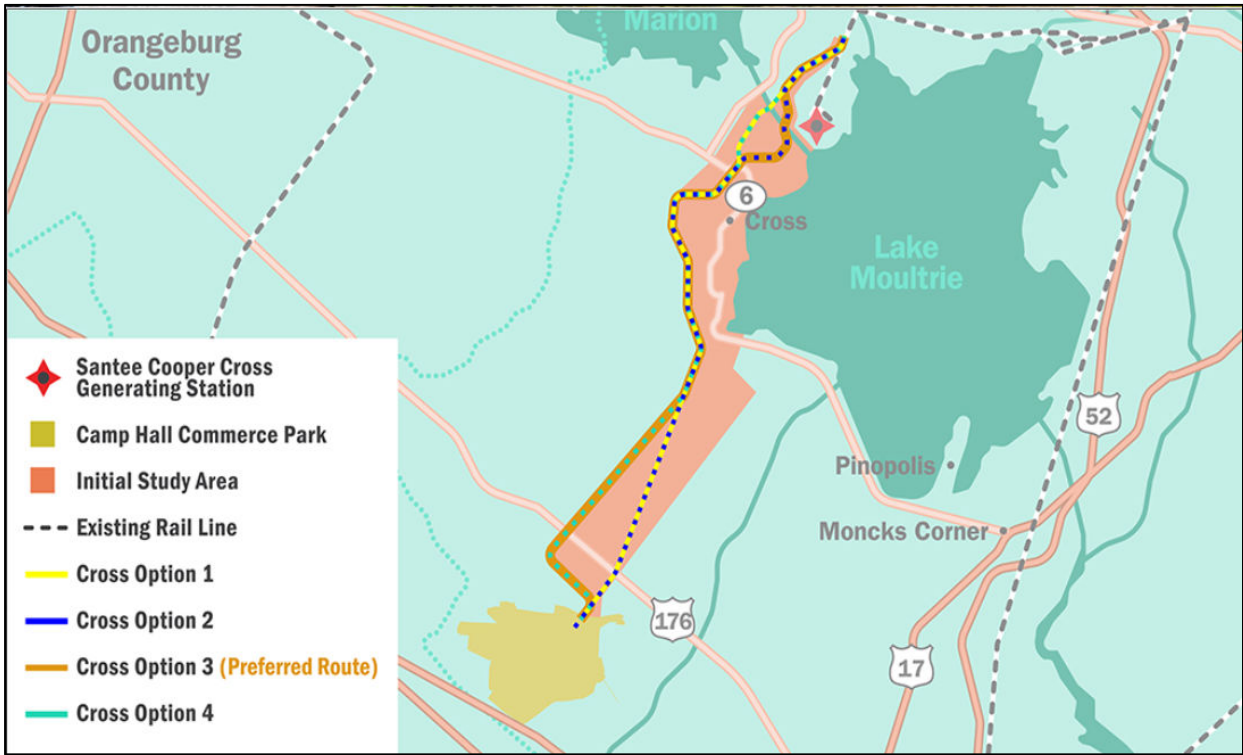
The purpose of the Camp Hall Rail Project is to locate, build, own and operate an industrial rail line that will connect to the existing Class 1 rail line with the Camp Hall Commerce Park. The need for the Proposed Project derives from the development within the Camp Hall Commerce Park, which has increased the demand for rail service to interconnect the commerce park with an existing Class 1 rail network, South Carolina, in a manner that is logistically feasible to better serve the need of the future tenants and industry within the Camp Hall Commerce Park for transportation, distribution, and logistics. These tenants include, but are not limited to, Volvo Cars, as well as any associated support industries that might desire to locate in proximity to Volvo Cars in the future.

The proposed Camp Hall Rail Project (**Figure 4-1**) requires, at a minimum, a rail route that meets the following characteristics and criteria:

- Direct connectivity to a single Class I freight carrier main line, accessing the freight carrier's inland/domestic network, as well as the Port of Charleston.
- Sufficient rail access and capacity to serve both phases of the Volvo Cars site.
- Sufficient rail access and capacity to service future growth and needs of additional industrial sites within the remaining portions of Camp Hall Commerce Park, such that the portion of the proposed rail spur located within Camp Hall Commerce Park does not limit access to the site while in use or require grade separation.

The preferred rail alignment would result in less impact on the surrounding environment compared to other alternatives, has the least impacts on property owners with no home relocations, and does not impact known archaeological sites.

Figure 4-1: Proposed Camp Hall Rail Project



Source: <https://palmettorailwayscamphallrail.com/>

5 THE STATE’S LONG-RANGE RAIL SERVICE AND INVESTMENT PROGRAM

5.1 South Carolina’s Rail Vision

The specific goals of the State Rail Plan, with associated Objectives, Guiding Principles, and Performance Measures are shown in **Table 5-1** through **Table 5-6**. The goals were developed from consideration of the state’s multimodal goals, those of the National Freight Policy established in U.S.C. 167 and the National Rail Plan 2018 progress report, and are fully supported by the South Carolina State Rail Plan 2019 Update.

Table 5-1: Mobility and System Reliability Goal

Objective	Potential Measure
Reduce the number of system miles at unacceptable congestion levels ⁽¹⁾	Miles of NHS and state Strategic Corridor System above acceptable congestion levels
Utilize the existing transportation system to facilitate enhanced modal options for a growing and diverse population and economy	% change in tonnage moved by freight rail % change in rail passenger trips
Guiding Principles	
Improve cost efficiency of intermodal goods movement, increasing diversity in modal choice.	
Encourage availability of both rail and truck modes to major freight hubs (ports, airports, intermodal facilities)	
Use advanced technology, performance management, innovation, competition, and accountability in operating and maintaining the freight transportation system. ⁽²⁾	

Notes:

⁽¹⁾ Included in MTP Goals and Performance Measures

⁽²⁾ Included in National Freight Planning goals established under 23 U.S.C. 167

Table 5-2: Safety Goal

Objective	Potential Measure
Improve the safety, security, and resilience of the freight transportation system ⁽²⁾	FRA Reportable Railroad Incidents
Reduce rail grade crossing crashes involving fatality or serious injury. ⁽¹⁾	Fatalities and injuries in rail grade crossing accidents. Percent of crossings with active safety warning devices installed

Notes:

⁽¹⁾ Included in MTP Goals and Performance Measures

⁽²⁾ Included in National Freight Planning goals established under 23 U.S.C. 167

Table 5-3: Infrastructure Condition Goal

Objective	Potential Measure
Maintain or improve the current state of good repair of rail components of the freight transportation system ⁽²⁾	Miles of rail lines identified as out of service due to condition
Guiding Principles	
Improve prioritization of “last mile” infrastructure to intermodal facilities.	
Recognize the importance of infrastructure condition in attracting new jobs to South Carolina by considering economic development when determining improvement priorities. ⁽¹⁾	
Encourage availability of both rail and truck modes to major freight hubs (for example ports, airports and intermodal facilities). ⁽¹⁾	
Continue to coordinate with the Palmetto Railways to consider road and rail improvements needed to support the efficient movement of freight between the Inland Port and the Port of Charleston and between port terminals.	

Notes:

⁽¹⁾ Included in MTP Goals and Performance Measures

⁽²⁾ Included in National Freight Planning goals established under 23 U.S.C. 167

Table 5-4: Economic and Community Vitality Goal

Guiding Principles
Work with economic development partners to identify transportation investments that will improve South Carolina’s economic competitiveness. ⁽¹⁾
Encourage availability of both rail and truck modes to major freight hubs (ports, airports, and intermodal facilities). ⁽¹⁾
Partner with public and private sectors to identify and implement transportation projects and services that facilitate freight movements. ⁽¹⁾
Encourage rail improvements that will improve connectivity and reliability of freight movement to global markets. ⁽¹⁾
Improve the contribution of rail components of the freight transportation system to economic efficiency, productivity, and competitiveness. ⁽²⁾
Increase public awareness of the significance of goods movement and freight transportation infrastructure on SC economic sustainability and growth.
Partner with communities to improve “last mile” planning efforts in urban communities to minimize the impact of goods movement and improve efficiencies.
Raise profile of integrated multi-agency, state level freight planning.
Explore public-private investment in supporting rail transportation infrastructure.

Notes:

⁽¹⁾ Included in MTP Goals and Performance Measures

⁽²⁾ Included in National Freight Planning goals established under 23 U.S.C. 167

Table 5-5: Environmental Goal

Guiding Principles
Reduce adverse environmental and community impacts of rail components of the freight transportation system. ⁽²⁾
Work with environmental resource agency partners to explore the development of programmatic mitigation in South Carolina ⁽¹⁾
Partner to be more proactive and collaborative in avoiding versus mitigating environmental impacts. ⁽¹⁾

Notes:

⁽¹⁾ Included in MTP Goals and Performance Measures

⁽²⁾ Included in National Freight Planning goals established under 23 U.S.C. 167

Table 5-6: Equity Goal

Guiding Principles
Ensure broad based public participation is incorporated into all planning and project development processes related to rail infrastructure improvements, maintenance and operations. ⁽¹⁾
Ensure planning and project selection processes adequately consider rural accessibility and the unique mobility needs of specific groups

Notes:

⁽¹⁾ Included in MTP Goals and Performance Measures

5.2 Integration of the Rail Vision with Other Transportation Plans

The state’s rail vision is integrated with the state’s Multimodal Transportation Plan, Freight Plan, Interstate Plan, Strategic Corridor Plan, and Transit Plan through use of common goals and objectives.

5.3 Planned Rail Planning Process Changes

The South Carolina Department of Transportation is the designated Rail Planning Agency. The effort is part of the Office of Intermodal & Freight Programs responsibilities as stated in Chapter 1. No organizational changes have been proposed although a source of funding has yet to be identified to permit the Division to meet its rail responsibilities.

5.4 Potential Effects of Rail Program Implementation

There is no dedicated rail improvement program in South Carolina. There are, however, needs as identified in preceding Chapters, primarily in the freight element. These needs are based on preservation and improvement of the state’s existing rail system to maintain and better rail service for the benefit of rail passengers and freight customers, and promote economic development potential.

The projects listed in this discussion do not include any specific Class I railroad needs. Both CSXT and NS advanced general need categories, such as at-grade highway-rail crossings, capacity, and economic development.

As the state has no dedicated rail improvement program, the implementation of, and schedule for projects to meet the known needs is largely problematic.

5.4.1 Proposed Short-Range Passenger Rail Projects

No short-range (next four years) rail passenger projects have been identified. However, SCDOT will continue to partner with Georgia DOT and the Southeastern Corridor Rail Coalition in studying and identifying regional passenger rail routes to support the growing transportation needs in the southeast region.

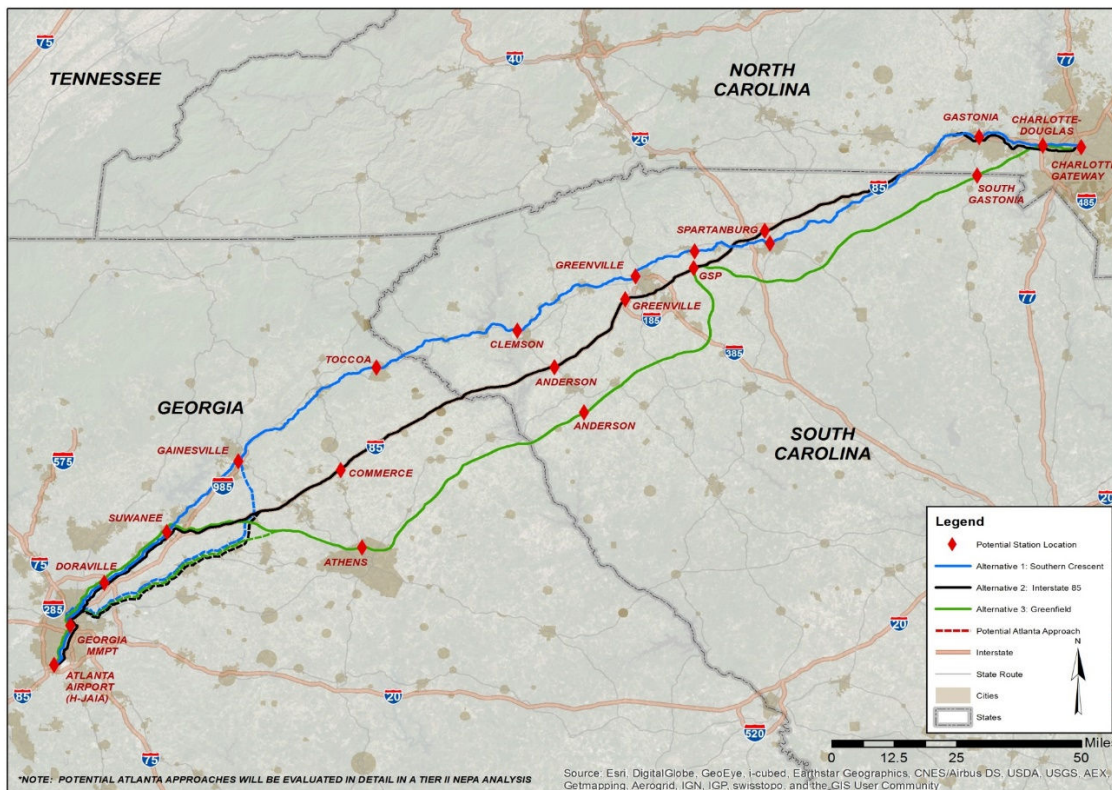
5.4.2 Proposed Long-Range Passenger Rail Projects

Several long-range passenger rail projects (4-20 years) for both intercity and commuter service have been considered as presented in previous Chapters.

5.4.2.1 Charlotte-Atlanta High Speed Rail Service

This project is currently under Draft Environmental Impact Statement (DEIS) review as submitted by Georgia Department of Transportation to the Federal Railroad Administration (April 2019). Three feasible routes have been presented that cross through the Upstate of South Carolina. Future final review and approval of the DEIS will present final costs and proposed implementation. The Tier 1 DEIS was published in the federal register on September 20, 2019 and the public and agency review and comment period occurred between September 20, 2019 and November 4, 2019. FRA, GDOT, SCDOT, and NCDOT held public meetings in each partner state to provide interested parties an opportunity to learn more about the Project, submit comments on the Project, and obtain feedback from the Project team on the Tier 1 DEIS. Following the close of the meeting and public comment period, FRA and GDOT will consider the public and agency input as well as the findings of the Tier 1 DEIS in selecting the Preferred Corridor Alternative. After FRA publishes the Tier 1 DEIS and the public comment period is completed, GDOT will prepare a combined Tier 1 Final EIS (FEIS) and Record of Decision (ROD) wherein the Preferred Corridor Alternative (Greenfield (Alternative 3)) will be presented (**Figure 5-1**). Should funding for further study become available, FRA and GDOT will then evaluate potential alignments (including the Atlanta Approach), stations, facilities, and detailed service characteristics in future Tier 2 analysis.

Figure 5-1: Atlanta to Charlotte Route Alternatives



Source: *ATLANTA to CHARLOTTE PASSENGER RAIL CORRIDOR INVESTMENT PLAN | ALTERNATIVES DEVELOPMENT REPORT (October 2015)*

5.4.2.2 Commuter Rail Projects

Commuter rail proposals in South Carolina’s three largest metro regions have been identified and subjected to very preliminary assessments, but none are currently being pursued. Due to cost and

propensity for implementation of commuter rail solutions, many areas are evaluating the alternative Bus Rapid Transit (BRT) as a viable option for commuting and reduction of congestion on major routes within their regions. Given roadway congestion in these regions, it is anticipated pursuit of BRT will be occurring within the next 20 years.

5.4.2.3 Amtrak

No proposals have been advanced for improvement of or addition to current Amtrak services.

5.4.3 Proposed Short-Range Freight Rail Projects

A number of projects have been advanced by the state's short line rail carriers that total \$47.62 million in costs, as shown in **Table 5-7**. These projects fall in the rehabilitation, capacity/service and safety improvement categories.

Table 5-7: Short Line Railroad Needs by Improvement Category. (Need to update)

Type of Needs	Needs (Millions)
Rehabilitation	\$41.62
Capacity / Service	\$3.50
Safety	\$2.50
Short Line Total	\$47.62

Most of these projects are short-range in nature, or would be, if funding was in place today to implement them.

5.4.3.1 Proposed Long-Range Freight Rail Projects

Palmetto Railways, which is a division of the South Carolina Department of Commerce, is constructing the Navy Base Intermodal Facility (ICTF) on a 118-acre site on the former Charleston Naval Complex. The Navy Base Intermodal Facility will allow the Charleston region to facilitate the movement of goods and commerce over rail within the state and throughout the Southeast region of the United States, stimulating economic development within the region and providing connections to key regional infrastructure.

The location of this facility takes advantage of its close proximity to the region's transportation infrastructure, including major roadways and the South Carolina Ports Authority. In addition, this facility provides equal connectivity to the area for both of the state's Class 1 rail carriers, CSX and Norfolk Southern. The construction of this facility includes six different project elements and is planned to begin construction in 2020 with a two-year development timeline. A number of construction activities will be performed concurrently on the project site. Palmetto Railways is actively working with the USDOT Build America Bureau to secure the Railroad Rehabilitation Infrastructure Funding (RRIF) loan.

5.5 Passenger Element

With the exception of Charlotte-Atlanta High Speed project, no intercity service proposals have been advanced in the state. Others have been discussed but never progressed. The high speed service will provide an alternative means of intercity travel, improve travel times and thus create the potential for

reductions in highway passenger travel. In this case, it also has the potential to provide improved access to airports along the line and at its terminus stations.

Amtrak intercity service in the state consists of long-distance trains for which Amtrak has full fiscal responsibility and no state-supported regional service has been proposed.

Commuter rail service has the potential to partially reduce highway congestion and associated economic and environmental impacts in impacted urban areas. Again, no projects have been advanced to the stage financing is required.

5.6 Freight Element

5.6.1 Financing Plan

There are a number of freight rail projects that need financing, but state funding is not available at this time to establish an implementation program in the short term. Discretionary federal funding opportunities will be evaluated and discussed with statewide freight partners as they become available. However, lack of dedicated state funds for rail projects limits the states opportunity for public partnership and funds matching.

SCDOT (on behalf of Norfolk Southern and SC Ports Authority) was awarded a Better Utilizing Investments to Leverage Development (BUILD) Transportation Discretionary 2018 grant for a freight rail infrastructure improvement project in the South Carolina Upstate. The project will expand the Inland Port Greer (IPG), extend the IPG lead track, and lengthen the Carlisle Siding to approximately 15,100 feet. The IPG expansion includes acquiring additional equipment for the handling, loading, and unloading of containers and the paving of up to 40 acres.

The project will advance state of good repair by shifting freight transport from truck to rail, thereby reducing vehicle miles traveled and subsequent pavement damage caused by heavy trucks. The project will add inland transportation capacity to accommodate the economic growth that is expected at the port from the nearby automotive manufacturing facility and other manufacturers in the area. Quality of life will be improved by reducing highway congestion on Interstates 26 and 85. The project is a public-private partnership between the South Carolina Department of Transportation, the South Carolina Ports Authority, the auto manufacturer and the freight railroad.

5.6.2 Public and Private Benefits

The benefits of the state's freight rail service are substantial. They include provision of transportation alternatives, reduction of highway impacts, improvement of air quality, and expansion of economic development opportunities among others.

5.7 Rail Studies

No specific studies were identified in the outreach process. Expressions of transportation problems and lack of planning, however, were expressed and provide guidance of studies of various levels of scope and detail. The most frequently mentioned were:

- Intermodal connections;
- Prioritization of infrastructure projects;
- Location for additional inland ports;
- Unsafe at-grade rail-highway crossings;
- Last mile freight planning; and
- Continued evaluation of rail to contribute to the reduction of urban highway congestion.

5.8 Rail Capital Program Opportunities

5.8.1 Atlanta to Charlotte Passenger Rail

As was presented in the Atlanta to Charlotte Passenger Rail Alternatives Development Report (October 2015)³⁷ the vision of the Southeast High Speed Rail (SEHSR) Corridor, which is one of eleven USDOT-designated high-speed rail corridors, is to develop an integrated passenger rail transportation solution for the Southeast. The Atlanta to Charlotte corridor spans approximately 280 miles and connects the cities of Atlanta, GA, and Charlotte, NC, in a general northeasterly direction. The boundary of the Study Area for the project generally follows I-20 (between Atlanta and Columbia), I-77 (between Columbia and Charlotte), and the Norfolk Southern rail line (between Charlotte and Atlanta). The Study Area also contains I-85 between Charlotte and Atlanta as well as parts of surrounding metropolitan areas.

The Purpose of the Project is to improve intercity passenger travel between Atlanta and Charlotte by expanding the region's transportation system capacity, and improving trip time and reliability through high speed passenger rail services. The Project will provide transportation system capacity necessary to accommodate current and projected population and economic growth occurring along the SEHSR Corridor network including the following metropolitan areas in the Piedmont Atlantic Megaregion: Atlanta, Charlotte, Greenville, and Spartanburg.

Out of the six route alternatives, GDOT selected three to advance for further evaluation in the Tier 1 EIS, based on how well they addressed the Project goals and Need and Purpose Statement and input from the public. Partner State Departments of Transportation selected the Southern Crescent, I-85, and Greenfield Corridor Alternative to advance. Following public comments and outreach, the Greenfield Corridor was selected as the route to advance (see section 5.4.2.1. of this Plan).

Two sets of travel times and train performance were calculated for the Greenfield Alternative: one with a top speed of 125 mph (Alternative 3A) and one with a top speed of 220 mph (Alternative 3B), on a new greenfield alignment.

The overall cost of the Greenfield Corridor Alternative 3A is approximately \$6.2 billion with an estimated per-mile cost of \$22.6 million, as shown in **Table 5-8**. The majority of the cost is associated with FRA Standard Cost Categories (SCC) 10 (Track Structures and Track), 40 (Sitework, ROW, Land, Existing Improvements) and 50 (Communications and Signaling). SCC 40 accounts for a larger percentage of the overall total because of the need to purchase ROW for a majority of the corridor. SCC 10 and 50 are due to proposing a new two track typical section and structures along with a new signaling system.

³⁷ <http://www.dot.ga.gov/InvestSmart/Rail/Documents/Atl-Char/AtltoCharPRCIPAlternativesDevelopmentReport.pdf>

Table 5-8: Total Capital Cost by Major SCC Category for Greenfield Corridor Alternative 3A (\$2012)

Costing Category		Allocated Cost	Contingency (30%)	Total Cost
10	Track Structures and Track	\$2,176,316,722	\$652,895,017	\$2,829,211,739
20	Stations, Terminals, Intermodal	\$347,500,000	\$104,250,000	\$451,750,000
30	Support Facilities: Yards, Shops, Admin. Buildings	\$143,870,000	\$43,161,000	\$187,031,000
40	Sitework, Right of Way, Land, Existing Improvements	\$531,171,369	\$159,351,411	\$690,522,780
50	Communications and Signaling	\$701,300,160	\$210,390,048	\$911,690,208
60	Electric Traction	\$-	\$-	\$-
70	Vehicles	\$375,700,000	\$112,710,000	\$488,410,000
80	Professional Services	\$608,424,687		\$608,424,687
TOTAL COST		\$4,884,282,938	\$1,282,757,475	\$6,167,040,414
TOTAL COST PER MILE (273.16 MILES)				\$22,576,660

Source: ATLANTA to CHARLOTTE PASSENGER RAIL CORRIDOR INVESTMENT PLAN | ALTERNATIVES DEVELOPMENT REPORT (October 2015)

The overall cost of the Greenfield Alternative 3B is approximately \$8.5 billion with a per-mile cost of \$30.9 million as shown in **Table 5-9**. The increase in cost from Alternative 3A (\$2.3 billion) is primarily due to the addition of electrification along the route. Similar to Alternative 3A, a majority of the cost is associated with SCC 10, 40 and 50; however, SCC 60 electrification also accounts for a large percentage of the total cost.

Table 5-9: Total Capital Cost by Major SCC Category for Greenfield Corridor Alternative 3B (\$2012)

Costing Category		Allocated Cost	Contingency (30%)	Total Cost
10	Track Structures and Track	\$2,176,316,722	\$652,895,017	\$2,829,211,739
20	Stations, Terminals, Intermodal	\$347,500,000	\$104,250,000	\$451,750,000
30	Support Facilities: Yards, Shops, Admin. Buildings	\$143,870,000	\$43,161,000	\$187,031,000
40	Sitework, Right of Way, Land, Existing Improvements	\$531,171,369	\$159,351,411	\$690,522,780
50	Communications and Signaling	\$701,300,160	\$210,390,048	\$911,690,208
60	Electric Traction	\$1,496,752,904	\$449,025,871	\$1,945,778,775
70	Vehicles	\$453,600,000	\$136,080,000	\$589,680,000
80	Professional Services	\$841,918,140		\$841,918,140
TOTAL COST		\$6,692,429,295	\$1,755,153,347	\$8,447,582,642
TOTAL COST PER MILE (273.16 MILES)				\$30,925,401

Source: ATLANTA to CHARLOTTE PASSENGER RAIL CORRIDOR INVESTMENT PLAN | ALTERNATIVES DEVELOPMENT REPORT (October 2015)

5.9 Rail Strategies

5.9.1 Freight Rail Strategies

Strategies related to freight rail that have been incorporated in the Statewide Multimodal Transportation Plan and the Freight Plan, include:

- Explore dedicated rail infrastructure funding program.
- Reduce freight bottlenecks that cause significant freight congestion by investing in rail improvements that improve safety and travel times.

- Coordinate with the South Carolina Ports Authority and the Department of Commerce and identify funding to purchase abandoned rail right-of-way that has been identified as having future freight transportation applications.

5.9.2 Passenger Rail Strategies

Strategies related to passenger rail that have been incorporated in the Statewide Multimodal Transportation Plan, include:

- Coordinate with appropriate federal, state agencies and rail providers to advance passenger rail service from Charlotte to Atlanta through the Upstate of South Carolina.
- Coordinate with MPOs, COGs, state agencies and rail partners to explore initial intercity passenger rail feasibility studies for identified corridors in the state.
- Partner with FTA, MPOs, COGs, and transit providers to implement approved premium transit services in urban areas.
- Continue to coordinate with railroad companies to ensure that no right-of-way is abandoned and lost for future public use.
- Coordinate with the MPOs, COGs, and transit providers to identify funding to purchase abandoned rail right-of-way that has been identified as having future passenger rail transportation applications.

6 COORDINATION AND REVIEW

Stakeholders contributed to the development of the South Carolina Multimodal Plan 2040 Update (2019) through participation in stakeholder and public outreach efforts coordinated for statewide planning initiatives utilizing the MetroQuest Survey tool. Planning documents updated included:

- 2040 Statewide Multimodal Transportation Plan (SMTP) Update (2019);
- Interstate Plan 2019 Update;
- Strategic Corridor Plan 2019 Update;
- Public Transit and Coordination Plan 2019 Updates;
- Freight Plan 2019 Update; and
- State Rail Plan 2019 Update.

6.1 Rail Carrier Input

Short line railroads operating in South Carolina were contacted directly to solicit input to the State Rail Plan on needs. All carrier needs that were received in response to the SCDOT request for input are described in Chapter 4.

6.1.1.1 Freight Surveys

Utilizing the *MetroQuest* online public engagement product, in September 2019 the South Carolina Department of Transportation (SCDOT) launched the South Carolina Freight Mobility Survey specifically targeted at freight industry partners who operate and travel the transportation infrastructure in South Carolina. A link to the survey was provided to various partners including freight and logistics stakeholders, Metropolitan Planning Organizations (MPOs), Councils of Governments (COGs), the South Carolina Freight Logistics/Advisory Council and trucking industry partner outlets.

6.2 Coordination with Neighboring States

Facilities and services crossing state boundaries are currently limited to Amtrak passenger rail services and Class 1 railroad operations. Together with North Carolina, the state coordinates in high speed rail passenger planning through their participated in the Georgia DOT led Passenger Rail Corridor Investment Plan (PRCIP), which is part of a larger high-speed rail initiative on the behalf of the Federal Railroad Administration (FRA) that extends north to Washington, DC and is commonly referred to as the Southeast High Speed Rail (SEHSR) Corridor. SCDOT has informed North Carolina and Georgia DOTs of the State Rail Plan Update.

6.3 Involvement in Preparation of State Rail Plan

The public, rail carriers, local government agencies, and other stakeholders participated in the preparation of the Multimodal Plan, Freight Plan and State Rail Plan updates through the previously described public engagement mechanisms. Following release by the Commission, this plan was made available for public comment consistent with the current SCDOT Public Participation Plan.

6.4 Rail Related Issues

Previous outreach (2014) – The predominant tone of previous interview responses was positive as rail was seen an economical, environmentally friendly way to move freight. In addition, as South Carolina’s Upstate region both sources and consumes a large amount of the state’s TDL freight, the location of the Inland Port Greer was deemed reasonable by the respondents and identified as a way to both grow Greenville-area businesses and help reduce the volume of trucks on the I-26 corridor. However, some respondents feared that the inland port will cause some truck carrier’ business to decline and could cause additional, unwanted traffic issues on the roads that service the inland port’s Greer location. However, from an infrastructure perspective, having the multi-modal option was viewed as necessary and it will provide opportunities for geographic expansion to the west from the Upstate.

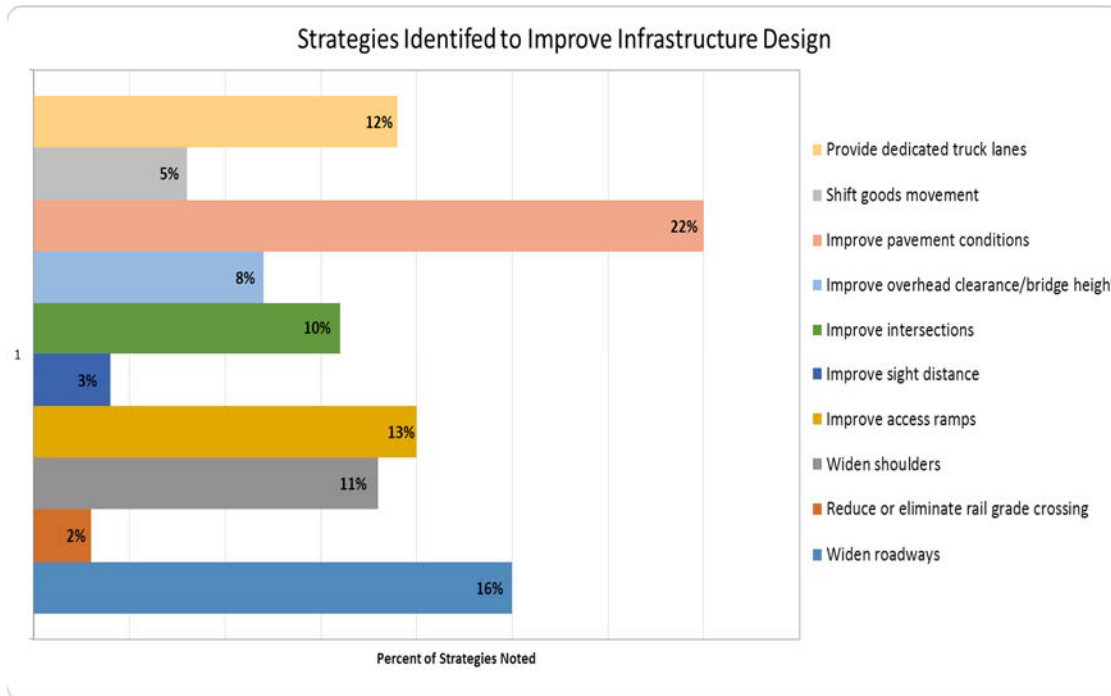
The freight stakeholders interviewed had many positive comments pertaining to the Statewide Multimodal Transportation Plan and the current state of Transportation, Distribution and Logistics in South Carolina. The strengths of South Carolina that were mentioned include the Port of Charleston and its deep water draft and a reliable work force. South Carolina’s outstanding cargo airports were cited for their ease of accessibility, and the state’s truck and rail capabilities were seen as reputable and effective. Finally, many respondents applauded SCDOT for their progressive leadership.

When asked about overall improvement opportunities for South Carolina’s TDL industry, many respondents focused on the state’s transportation infrastructure. Comments focused on areas of roads that have been neglected, needed infrastructure maintenance, and limited resources for our state’s infrastructure. Many of the key stakeholders interviewed suggested that if no solution is found to our state’s current infrastructure issues, there will be no reason for companies to set up businesses in South Carolina. Further, the newly announced inland port’s operations may be hampered if/when companies cannot successfully get to the port due to infrastructure and congestion issues. The general sentiment was that infrastructure repair and maintenance is needed to keep South Carolina TDL firms competitive, especially on our state’s bridges and interstates. Closures, detours, and re-routes can be severely detrimental to business and economic development.

Issues from Online Freight Surveys (2019) - Participants completed the survey in the four-week period that the survey as available through a dedicated link on the SCDOT website.

As shown in **Figure 6-1**, respondents were asked to select their top three strategies for improving infrastructure design (overall) which could result in increased efficiency of freight operations in South:

Figure 6-1: Strategies to Improve Infrastructure Design



Participants were offered an opportunity to utilize an interactive map of the state to identify locations affecting freight mobility and to suggest changes (add/remove) to the proposed 2040 Statewide Freight Network. Responders were asked to drag and drop at least three topical markers onto the map and to provide additional clarifying information when placing a marker by using the comment box following each suggestion.

A total of 168 map markers were placed in the interactive map by participants. The majority of feedback concerned congestion issues/locations (38%) and safety issues/locations (30%). Most congestion issues were predominantly specified on the South Carolina interstates. There was some correlation to the placement of the safety issue markers to congestion markers on interstates or metropolitan locations (Charleston, Columbia and Greenville). Significant congestion and safety concerns were identified in the Charleston region (specifically on the I-526 east and west corridors), the Columbia metropolitan area and the Greenville/Spartanburg region along and adjacent to the I-85 corridor. The other significant area of concern was road design and bridge height issues at various locations around the state.

Results of the 2019 MetroQuest Freight Mobility Survey suggest that there could be value in assessing statewide intermodal opportunities to relieve congestion and improve safety for both goods and passenger movement, particularly in our larger metropolitan regions.

6.5 Stakeholder Input to State Rail Plan

The valuable input provided by stakeholders during Statewide Multimodal Transportation Plan, Freight Plan and Rail Plan 2019 updates was considered and presented in the State Rail Plan in Chapter 4,

Proposed Freight Rail Improvements and Investments. Rail improvement needs identified by individual rail carriers operating in South Carolina were documented, including cost estimates where available.

In other chapters of the State Rail Plan stakeholder input served to:

- Show support for recent or ongoing rail developments, such as the Inland Ports in Greer (2013) and Dillon (2018), Charleston Harbor deepening and the Intermodal Container Transfer Facility in Charleston project;
- Highlight issues, concerns, and challenges for freight and passenger rail, including lack of funding, and highway maintenance/capacity needs;
- Support the need for continuing close coordination in multimodal transportation planning in the future between SCDOT and other agencies.

6.6 Coordination of State Rail Planning

As noted previously the South Carolina State Rail Plan was updated in parallel with other statewide planning initiatives that collectively results in the following long range planning documents:

- 2040 Statewide Multimodal Transportation Plan (SMTP) Update;
- Interstate Plan Update;
- Strategic Corridor Plan Update;
- State Public Transit Plan and ten Regional Transit Coordination Plan Updates; and
- Freight Plan Update.

APPENDIX A: South Carolina Code of Laws (Sec. 57-3-30)

SOUTH CAROLINA CODE OF LAWS

SECTION 57-3-30. Office of Railroads; establishment; responsibilities; comprehensive state rail plan; interagency cooperation.

(A) The Office of Railroads is established within the Division of Intermodal and Freight Programs. The office is principally responsible for:

(1) preserving railroad rights-of-way for future use and coordinating the preparation of a state railroad corridor preservation and revitalization plan;

(2) coordinating high-speed and intercity passenger rail planning and development;

(3) planning, developing, maintaining, and coordinating a comprehensive state rail plan for passenger and freight railroads and infrastructure services with other modes of transportation to help facilitate effective and efficient interstate and intrastate movement of people and freight;

(4) applying for and receiving state, federal, or other funds for passenger and freight rail service and infrastructure needs, high-speed and intercity passenger rail planning and development, and rail corridor preservation and revitalization programs; and

(5) preparing and submitting by February first of each year a full, printed, detailed report to the House Education and Public Works Committee and the Senate Transportation Committee containing an analysis of the:

(a) state railroad corridor preservation and revitalization plan; and

(b) comprehensive state rail plan for passenger and freight railroads and infrastructure services.

(B) Every five years the office must develop and prepare a comprehensive state rail plan for passenger and freight railroads and infrastructure services. The plan must be approved by the United States Department of Transportation. The plan, and any updates, must be submitted to the General Assembly.

(C) All departments, boards, public authorities, or other agencies of the State or its political subdivisions, local government, transportation authorities, and other local public entities must cooperate with the office, provide assistance, data, and advice upon request, and must reimburse any such entity necessary costs in the event of any expense. This authority does not preclude another governmental entity, public or private organization, or individual from entering into a contract or agreement concerning the purposes set forth in this section.

(D) Nothing in this section may be interpreted to subrogate the powers and duties of the Division of Public Railways to the Office of Railroads.

HISTORY: 2010 Act No. 206, Section 5, effective June 7, 2010.

APPENDIX B: South Carolina Port Tonnage

US Army Corps of Engineers
Waterborne Commerce Cargo Data
For South Carolina Ports
CY2018

Data Included for 2018 SC Ports:

Ocean to Goose Creek via Cooper River and Town Creek; to the Standard Wharf on Ashley River; to the Mount Pleasant Memorial Highway Bridge on Shem Creek; to the Airco Alloys Wharf on Shipyard River; Wando River to Cainhoy. Controlling Depth: 47 feet for 800 feet width across the entrance channel; thence 26.7 feet for project widths to head of project (15.7 miles); Shipyard River 28.4 feet to head of project (1.2 miles), Wando River controlling depth 41.6 feet for 400 foot widths to head of project. Project Depth: Charleston Harbor 45 feet; Shem Creek 10 feet; Ashley River 30 feet; Shipyard River 36 feet; Wando River 40 feet.

**US Army Corps of Engineers Waterborne Commerce Cargo Data for South Carolina Ports
CY2018**

2-Digit Code/Commodity	All Traffic Types Domestic & Foreign				Domestic				Foreign			
	All Traffic Directions	Intraport	Receipts	Shipments	All Traffic Directions	Intraport	Receipts	Shipments	All Traffic Directions	Intraport	Receipts	Shipments
10 Coal, Lignite & Coal Coke	16,460	0	15,691	769	14,052	0	13,954	98	2,408	0	1,737	671
21 Crude Petroleum	22,174	0	22,174	0	0	0	0	0	22,174	0	22,174	0
22 Gasoline, Jet Fuel, Kerosene	783,772	0	783,770	2	533,956	0	533,956	0	249,816	0	249,814	2
23 Distillate, Residual & Other Fuel Oils; Lube Oil & Greases	933,306	249,185	623,470	60,651	535,450	249,185	265,082	21,183	397,856	0	358,388	39,468
24 Petroleum Pitches, Coke, Asphalt, Naptha and Solvents	64,102	0	52,085	12,017	9,065	0	9,065	0	55,037	0	43,020	12,017
29 Petroleum Products NEC	39,132	0	35,173	3,959	0	0	0	0	39,132	0	35,173	3,959
31 Fertilizers	85,350	0	76,899	8,451	0	0	0	0	85,350	0	76,899	8,451
32 Other Chemicals and Related Products	4,148,076	0	2,728,494	1,419,582	817,421	0	817,421	0	3,330,655	0	1,911,073	1,419,582
41 Forest Products, Lumber, Logs, Woodchips	1,232,589	0	432,553	800,036	0	0	0	0	1,232,589	0	432,553	800,036
42 Pulp and Waste Paper	903,101	0	17,890	885,211	0	0	0	0	903,101	0	17,890	885,211
43 Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material	736,119	5,025	706,837	24,257	5,025	5,025	0	0	731,094	0	706,837	24,257
44 Iron Ore and Iron & Steel Waste & Scrap	1,325,816	0	1,260,370	65,446	77,195	0	76,920	275	1,248,621	0	1,183,450	65,171
45 Marine Shells	69	0	6	63	0	0	0	0	69	0	6	63
46 Non-Ferrous Ores and Scrap	373,975	0	284,328	89,647	0	0	0	0	373,975	0	284,328	89,647
47 Sulphur (Dry), Clay & Salt	238,315	0	212,295	26,020	0	0	0	0	238,315	0	212,295	26,020
48 Slag	42,083	0	25,181	16,902	14,423	0	0	14,423	27,660	0	25,181	2,479
49 Other Non-Metal. Min.	32,595	0	8,892	23,703	0	0	0	0	32,595	0	8,892	23,703
51 Paper & Allied Products	875,884	198	188,483	687,203	198	198	0	0	875,686	0	188,483	687,203
52 Building Cement & Concrete; Lime; Glass	394,970	0	329,012	65,958	0	0	0	0	394,970	0	329,012	65,958
53 Primary Iron and Steel Products (Ingots, Bars, Rods, etc.)	1,229,146	0	1,105,006	124,140	27,210	0	0	27,210	1,201,936	0	1,105,006	96,930
54 Primary Non-Ferrous Metal Products; Fabricated Metal Prods.	973,037	398	731,468	241,171	3,919	398	398	3,123	969,118	0	731,070	238,048

Source: US Army Corps of Engineers, <http://cwbi-ndc-nav.s3-website-us-east-1.amazonaws.com/files/wcsc/webpub/#/report-landing/year/2018/region/1/location/773>, accessed January 2020

2-Digit Code/Commodity	All Traffic Types Domestic & Foreign				Domestic				Foreign			
	All Traffic Directions	Inraport	Receipts	Shipments	All Traffic Directions	Inraport	Receipts	Shipments	All Traffic Directions	Inraport	Receipts	Shipments
55 Primary Wood Products; Veneer; Plywood	161,269	0	146,606	14,663	0	0	0	0	161,269	0	146,606	14,663
61 Fish	8,825	0	5,922	2,903	0	0	0	0	8,825	0	5,922	2,903
62 Wheat	851	0	34	817	0	0	0	0	851	0	34	817
63 Corn	7,589	0	51	7,538	0	0	0	0	7,589	0	51	7,538
64 Barley, Rye, Oats, Rice and Sorghum Grains	18,729	0	14,690	4,039	0	0	0	0	18,729	0	14,690	4,039
65 Oilseeds (Soybean, Flaxseed and Others)	119,142	0	5,229	113,913	0	0	0	0	119,142	0	5,229	113,913
66 Vegetable Products	287,163	0	190,416	96,747	0	0	0	0	287,163	0	190,416	96,747
67 Animal Feed, Grain Mill Products, Flour, Processed Grains	243,106	0	45,986	197,120	0	0	0	0	243,106	0	45,986	197,120
68 Other Agricultural Products; Food and Kindred Products	1,524,814	0	379,575	1,145,239	0	0	0	0	1,524,814	0	379,575	1,145,239
70 All Manufactured Equipment, Machinery and Products	6,961,489	600	4,942,103	2,018,786	600	600	0	0	6,960,889	0	4,942,103	2,018,786
99 Unknown or Not Elsewhere Classified	1,039,588	0	490,976	548,612	0	0	0	0	1,039,588	0	490,976	548,612
TOTAL	24,822,636	255,406	15,861,665	8,705,565	2,038,514	255,406	1,716,796	66,312	22,784,122	-	14,144,869	8,639,253

Source: US Army Corps of Engineers, <http://cwbi-ndc-nav.s3-website-us-east-1.amazonaws.com/files/wcsc/webpub/#/report-landing/year/2018/region/1/location/773>, accessed January 2020