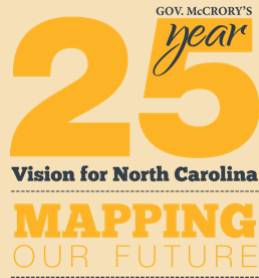


NCDOT Rail Division

COMPREHENSIVE STATE RAIL PLAN



Implementing the 25-Year Vision

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Nick Tennyson, Secretary of Transportation
Keith Weatherly, Interim Deputy Secretary for Transit
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August 2015

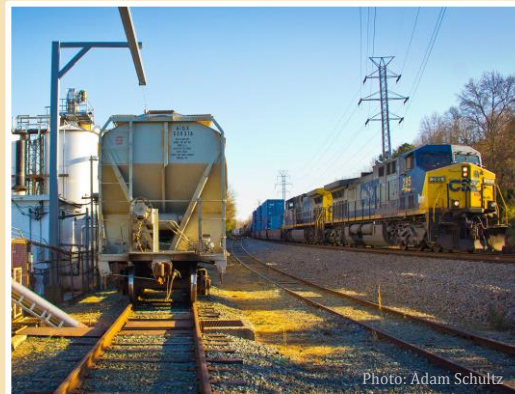


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Introduction

PURPOSE OF THE STATE RAIL PLAN

The purpose of the North Carolina Comprehensive State Rail Plan (State Rail Plan) is to:

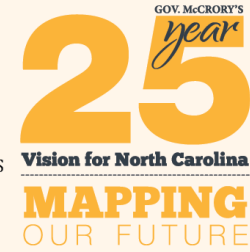
- Establish the public vision for the state rail system and support the State's goals and policies to improve passenger and freight rail transportation.
- Analyze and prioritize rail corridors, programs, and proposed projects.
- Propose future improvements and investments, and assess funding options.
- Provide a current inventory of the rail system and identify trends, markets, and needs.
- Describe how programs managed by the North Carolina Department of Transportation (NCDOT) Rail Division work together with other government agencies, businesses and industries to deliver a comprehensive set of rail services that are integrated in the State's overall transportation system.

The State Rail Plan fulfills all the requirements of the Federal Railroad Administration's (FRA) State Rail Plan guidance and complies with the Passenger Rail Investment and Improvement Act of 2008 (PRIIA). The State Rail Plan also supports the state's long-standing rail planning practice. Since 1977, the North Carolina General Assembly has both encouraged and empowered the NCDOT to adopt and implement a state rail plan consistent with existing state and federal legislation.

The State Rail Plan also supports Governor McCrory's 25-Year Vision for North Carolina, which was unveiled in September 2014 and includes expanded access to passenger and freight rail to all regions of the state to spur economic growth.

The State Rail Plan is a component of the state's long-standing rail planning practice and Governor McCrory's 25-Year Vision for North Carolina, which includes the following rail-related goals:

- Improve rail connections between military bases and ports
- Intermodal facilities to support freight shipping, and scheduled intermodal service to Port of Wilmington
- Improved rail access to Global TransPark and Port of Morehead City
- Economically competitive rail service to inland ports
- Improve rail and seaport connections to I-95 to serve the Eastern US
- Expand mass transit options, including rail
- Expand access to passenger rail options in all regions of the state



USE OF THE STATE RAIL PLAN

This State Rail Plan links to other ongoing statewide transportation plans and initiatives and establishes the public benefits of additional rail investment. The State Rail Plan will be used to help guide decision making as the state invests in enhancements to the passenger and freight rail system in North Carolina. NCDOT will use the prioritization methods in the State Rail Plan to help evaluate projects and corridors. The evaluation prioritization process, as well as the prioritized projects and corridors can be appraised and updated as needed to determine the effectiveness of the state's investments.¹

The State Rail Plan is also linked with NCDOT's new Strategic Transportation Investments (STI) program, which overhauled NCDOT's methodology for prioritizing and selecting capital expenditures. The data and projects listed in the State Rail Plan will be used by NCDOT to help determine which projects will be evaluated and when they are programmed under STI.

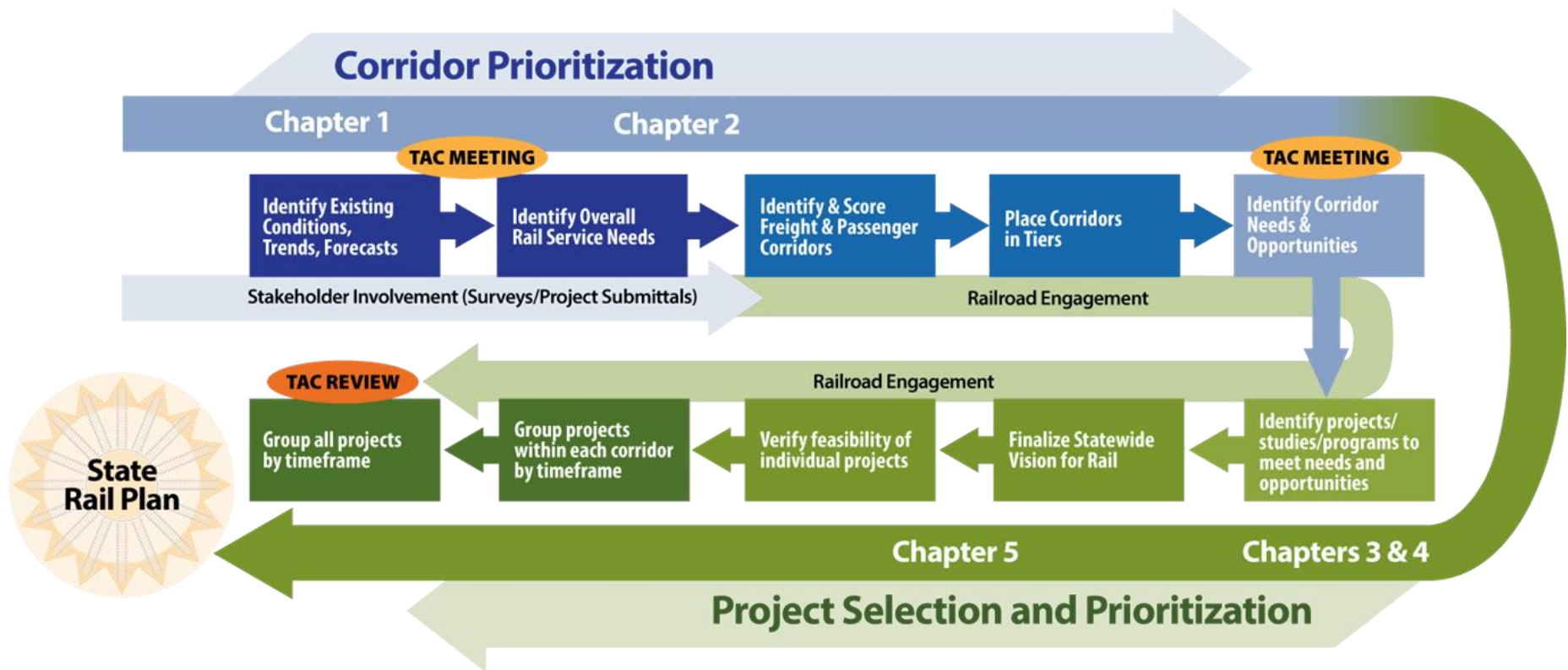
¹ The State Rail Plan includes references to forward-looking trends and commodity forecasts. The trends are based on the State Rail Plan team's current understanding of potential rail developments and are used to identify freight and passenger rail service opportunities.

CONTENTS OF THE STATE RAIL PLAN

The following table describes the chapters in the State Rail Plan, including the key topics included in each chapter. The figure that follows the table outlines the process used to analyze data, identify overall needs, evaluate and prioritize rail corridors, identify projects to meet the needs and opportunities, and rank

and develop timeframes for the rail projects. These processes are detailed in the various chapters in the State Rail Plan.

Chapter/Title	Chapter Topics
Executive Summary	Summary of the State Rail Plan
Introduction	Purpose and contents for the State Rail Plan
1. The Role of Rail in Statewide Transportation	State Rail Plan goals and objectives, and strategies to measure progress; the role of rail transportation in the state's transportation system; an overview of freight and passenger rail services; description of the state's rail programs and funding authority
2. The State's Existing Rail System	Description and inventory of the existing freight and passenger rail system; rail system trends and forecasts; rail service needs and opportunities
3. Proposed Passenger Rail Improvements and Investments	Proposed improvements and investments for passenger rail that meet the goals and objectives of the State Rail Plan and the identified service needs and opportunities, including new services, station improvements, better connections to other modes, and capacity improvements that are coordinated with freight
4. Proposed Freight Rail Improvements and Investments	Recommended freight improvements and investments that meet the State Rail Plan goals and objectives and identified freight needs and market opportunities
5. The State's Rail Service and Investment Program	North Carolina's 20 year vision for rail transportation; coordination efforts to meet the vision; prioritized projects to meet the vision; capital and operating plan; economic benefits; finance plan
6. Coordination and Review	Description of how stakeholders were involved in the development and coordination of the State Rail Plan
Appendices	Documentation of detailed analysis, findings, and methodologies used in preparing the State Rail Plan



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List of Acronyms and Abbreviations

Acronym/ Abbreviation	
AADT	Average Annual Daily Traffic
ACWR	Aberdeen, Carolina and Western Railway
ADA	Americans with Disabilities Act
Amtrak	National Railroad Passenger Corporation
ARRA	American Recovery and Reinvestment Act
BCA	Benefit-cost analysis
BEA	Bureau of Economic Analysis
BRT	Bus Rapid Transit
BTS	Bureau of Transportation Statistics
CAFE	Corporate Average Fuel Economy
CAGR	Compound Annual Growth Rate
CAMPO	Capital Area Metropolitan Planning Organization
CATS	Charlotte Area Transit System
CCU	Cab Control Units
CDIA	Charlotte-Douglas International Airport
CE	Categorical Exclusion
CFR	Code of Federal Regulations
CGS	Charlotte Gateway Station
CIT	Charlotte Intermodal Terminal
Class I	Railway companies having annual carrier operating revenues of at least \$467 million
CMAQ	Congestion Mitigation and Air Quality management program
CNLA	Carolina Coastal Railway
CRTPO	Charlotte Regional Transportation Planning Organization
CSRP	Comprehensive State Rail Plan (State Rail Plan)
CSXT	CSX Transportation

Acronym/ Abbreviation	
DATA	Durham Area Transit Authority
DC	District of Columbia
DOD	Department of Defense
DOT	Department of Transportation
DRPT	Virginia Department of Rail and Public Transportation
EA	Environmental Assessment
EIA	US Energy Information Administration
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAF	Freight Analysis Framework
FAK	A mix of commodities being shipped together, often intended for a particular retailer
FHWA	Federal Highway Administration
FL	Florida
FRA	Federal Railroad Administration
FRRCSI	Freight Rail & Rail Crossing Safety Improvement fund
FTA	Federal Transit Administration
FTE	Full-Time Employee
FY	Fiscal Year
GA	Georgia
GARVEE	Grant Anticipation Revenue Vehicle
GDP	Gross Domestic Product
GHG	Greenhouse Gas
Grade Separation	Elevating a roadway or rail over the other by means of bridging
GSMR	Great Smoky Mountains Railroad
GSP	Gross State Product

Acronym/ Abbreviation	
GTP	Global TransPark
HAZMAT	Hazardous Materials
HSIP	Highway Safety Improvement Program
HSIPR	High-Speed and Intercity Passenger Rail program
HTF	Highway Trust Fund
IBM	International Business Machines
Intermodal	Two or more modes of transportation in conveying goods, such as truck trailers on trains
IRS	Internal Revenue Service
LOS	Level of Service
LOST	Local Option Sales Tax
LPA	Locally Preferred Alternative
LRT	Light Rail Transit
LRTP	Long-Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21st Century Act
MAS	Maximum Allowable Speed
Metrolina	Charlotte region
MHC	Port of Morehead City
MOTSU	Military Ocean Terminal – Sunny Point
MPH / mph	Miles per Hour
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
Multimodal	Two or more modes of transportation for the movement of people, or in conveying goods
NC	North Carolina
NCA&T	North Carolina Agriculture & Technology State University
NCAMPO	North Carolina Association of Metropolitan Planning Organizations
NCDOC	North Carolina Department of Commerce
NCDOT	North Carolina Department of Transportation

Acronym/ Abbreviation	
NCGA	North Carolina General Assembly
NCGS	North Carolina General Statute
NCMIN	North Carolina Multimodal Investment Network
NCRR	North Carolina Railroad Company
NCSPA	North Carolina State Ports Authority
NCSU	North Carolina State University
NEC	Northeast Corridor
NHS	National Highway System
NS	Norfolk Southern
O&M	Operations and Maintenance
OSMB	Office of State Management and Budget
OTP	On-Time Performance
P&N	Piedmont and Northern rail line
PART	Piedmont Authority Regional Transit
PIP	Piedmont Improvement Program
POW	Port of Wilmington
PPP or P3	Public-Private Partnership
PRIIA	Passenger Rail Investment and Improvement Act of 2008
PTC	Positive Train Control
PTI	Piedmont-Triad International Airport
RDU	Raleigh-Durham International Airport
RIAP	Rail Industrial Access Program
ROD	Record of Decision
RPO	Rural Planning Organization
RR	Railroad
RRIF	Railroad Rehabilitation and Improvement Financing
RRRP	Railroad Rehabilitation and Repair Program (disaster assistance)
RSIA	Rail Safety Improvement Act of 2008

Acronym/ Abbreviation	
RTP	Research Triangle Park
RUS	Raleigh Union Station
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SB 402	Eastern Infrastructure Improvement Study, prepared in accordance with NC Senate Bill 402
SC	South Carolina
SEC	Southeast Corridor
SEDS	State Energy Data System
SEHSR	Southeast High Speed Rail
SENC	Southeastern North Carolina
SEROps	Southeast Rail Operations Study
Short Line	Railway companies having annual carrier operating revenues between \$0 and \$37 million
SIAP	Short Line Infrastructure Assistance Program
SIB	State Infrastructure Bank
SIP	Stakeholder Involvement Plan
SMF	Strategic Mobility Fund
SP&R	State Planning & Research
SRP	State Rail Plan
STB	Federal Surface Transportation Board
STI	Strategic Transportation Investments Law
STIP	State Transportation Improvement Program
STP	Surface Transportation Program
STRACNET	Strategic Rail Corridor Network
TAC	Technical Advisory Committee
TAP	Transportation Alternatives Program
TBT	Thoroughbred Bulk Terminal
TEU	Twenty-foot equivalent unit
TIFIA	Transportation Infrastructure Finance and Innovation Act

Acronym/ Abbreviation	
TIGER	Transportation Investment Generating Economic Recovery
TIP	Transportation Improvement Program
TN	Tennessee
TOD	Transit Oriented Development
Triad	Greensboro/Winston-Salem/High Point region
Triangle	Raleigh/Durham/Chapel Hill region
TSS	Traffic Separation Studies
TTI	Texas Transportation Institute
UNC	University of North Carolina
US	United States
US EIA	US Energy Information Administration
USD	US Dollar
USDOT	United States Department of Transportation
VA	Virginia
VMT	Vehicle Miles Traveled
WNC	Western North Carolina
WTRY	Wilmington Terminal Railroad

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1 Chapter One - The Role of Rail in Statewide Transportation

This chapter describes the overall mission and goals for the multimodal transportation system in North Carolina and the role of rail as a component of North Carolina's transportation network.

1.1 NORTH CAROLINA'S TRANSPORTATION SYSTEM GOALS

1.1.1 NCDOT Mission and Goals

The goals and objectives for the State Rail Plan must support the mission and goals of the North Carolina Department of Transportation (NCDOT) and the NCDOT Rail Division.

NCDOT Mission

Connecting people and places safely and efficiently, with accountability and environmental sensitivity to enhance the economy, health and well-being of North Carolina.

NCDOT Goals

- Make our transportation network **safer**.
- Make our transportation network move people and goods more **efficiently**.
- Make our infrastructure **last longer**.
- Make our organization a place that **works well**.
- Make our organization a **great place** to work.

Source: North Carolina Department of Transportation.
www.ncdot.gov/performance/missiongoals

The mission and goals for NCDOT are not specific to any single transportation mode. They apply to all NCDOT programs that impact the state's multimodal transportation network, including rail.

The NCDOT Rail Division's mission is the "...safe and efficient movement of people and goods on North Carolina's railroads through freight, passenger and safety programs, supporting job creation and economic growth."¹

This State Rail Plan was developed to support the mission and goals of both NCDOT and the NCDOT Rail Division, as well as the broader public policy goals for North Carolina.

1.1.2 Governor McCrory's 25-Year Vision for North Carolina

The State Rail Plan is also a component of Governor McCrory's 25-Year Vision for North Carolina, which is a plan to help connect all North Carolinians with jobs, education, healthcare, and each other. The plan will help stimulate job growth and generate an overall positive economic impact for North Carolina.² The 25-Year Vision for North Carolina includes the following rail-related goals:

- Improve rail connections between military bases and ports
- Intermodal facilities to support freight shipping, and scheduled intermodal service to Port of Wilmington
- Improved rail access to Global TransPark and Port of Morehead City
- Economically competitive rail service to inland ports
- Improve rail and seaport connections to I-95 to serve eastern U.S.
- Expand access to passenger rail options in all regions of the state
- Expand mass transit options, including rail
- Expand access to passenger rail options in all regions of the state

The State Rail Plan is also consistent with other statewide plans including the State Transportation Improvement Program, State Long Range Transportation Plan, and State Freight Plan.

¹North Carolina Department of Transportation Rail Division.
<http://www.ncbytrain.org/about/default.html>

² <http://www.ncdot.gov/ncvision25/>

1.2 THE ROLE OF RAIL IN NORTH CAROLINA'S TRANSPORTATION SYSTEM

This section summarizes the role of rail in North Carolina in the context of the state's multimodal transportation system. Detailed descriptions of the existing freight, passenger, and commuter rail systems are provided in Chapter 2.

1.2.1 Rail System

Today there are over 3,200 miles of railroad in North Carolina, serving 86 of the state's 100 counties. North Carolina's Rail System is shown in Figure 1-1.

1.2.1.1 Freight Rail

The state is served by two Class I³ railroads – Norfolk Southern (NS) and CSX Transportation (CSXT) and 20 short line railroads that connect businesses and industries to the Class I network. In addition, the North Carolina Railroad (NCRR) Company owns and manages a 317-mile corridor extending from the Port of Morehead City to Charlotte. NS operates along the corridor through and operating and maintenance agreement.

The freight rail network in North Carolina provides services to ports, power plants, mines, military installations, and industries including, but not limited to, agriculture, forestry, plastics, furniture, food products, and chemicals. Freight railroads support jobs for about 2,600 railroad employees in the state.⁴ The types and percentages of commodities carried by rail originating and terminating in North Carolina are shown Figure 1-2.

³ A Class I railroad is a railway company having annual carrier operating revenues of at least \$467 million. For additional definitions on railroad classifications, see section 2.1 in Chapter 2.

⁴ NC Maritime Strategy Technical Memorandum – North Carolina Railroads Existing and Planned Infrastructure, AECOM May 2012

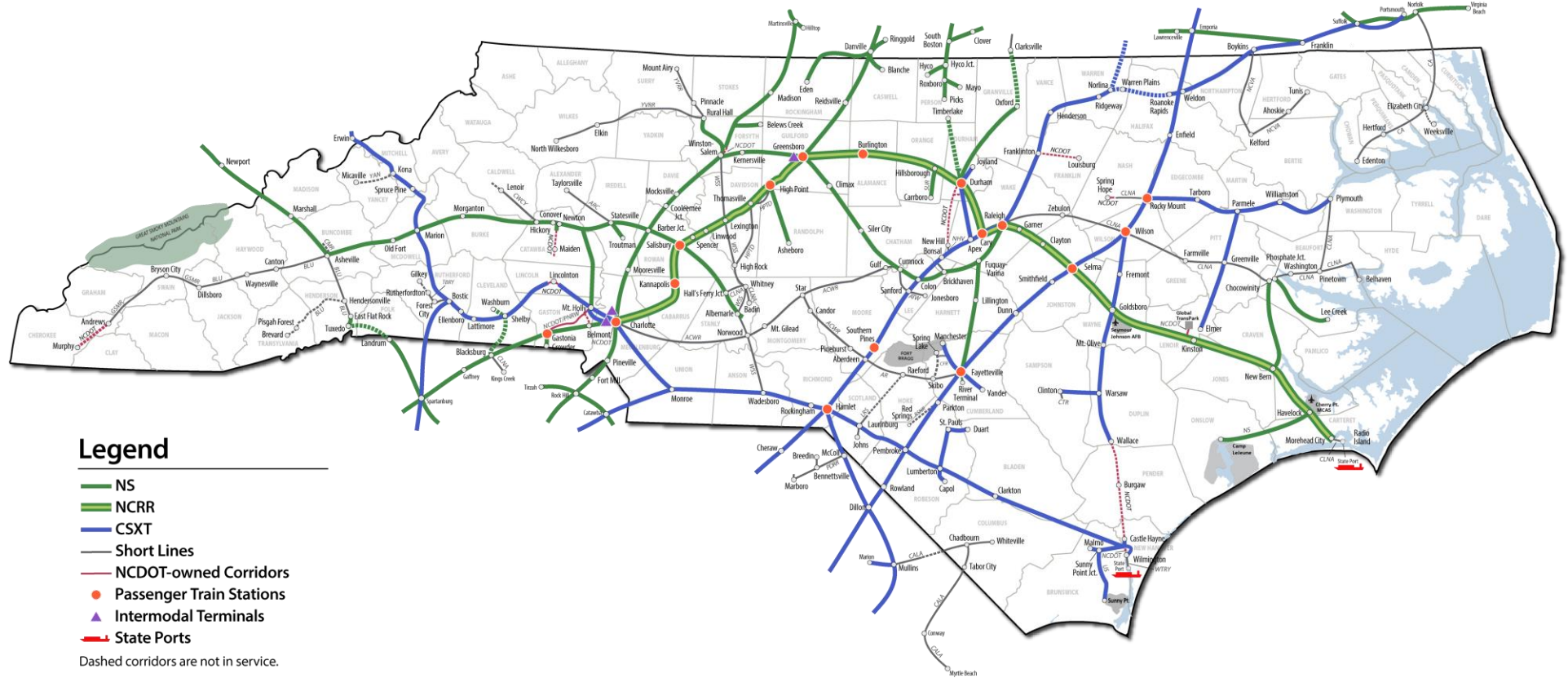


Figure 1-1 North Carolina's Rail System

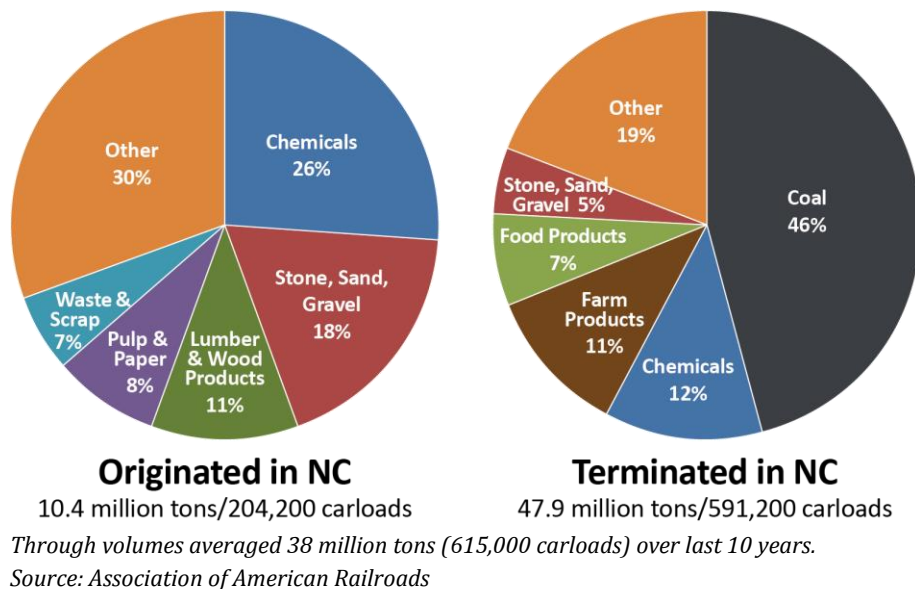


Figure 1-2 STB Waybill Summary – Commodities Carried by Rail Originating and Terminating in NC (2012)

Over the last 10 years, in addition to the tonnage originated or terminated in North Carolina (Figure 1-2), North Carolina’s network has also supported approximately 38 million tons (615,000 carloads) of through traffic, primarily on north-south Class I railroad lines. Generally, lower volume east-west Class I branch lines and short lines help connect NC industries to the primary north-south Class I network. These branch lines-to-Class I-connections provide important national and international economic and transportation linkages for industries located in rural and small urban areas. Freight Analysis Framework (FAF) data compiled by the Federal Highway Administration (FHWA) shows freight movement trends for North Carolina in terms of value and weight. Table 1-1 shows the value of shipments within, from, and to North Carolina by mode. Figures 1-3, 1-4, and 1-5 visually depict the values shown in Table 1-1. Table 1-2 shows the tonnage of shipments within, from and to North Carolina by mode. Figures 1-6, 1-7, and 1-8 visually depict the values shown in Table 1-2. By far, the majority of shipments (by value and tonnage) are by truck.

Table 1-1 Domestic, Import, and Export Shipments within North Carolina, from North Carolina, and to North Carolina - Value by Domestic Mode: 2007, in US million dollars

MODE	WITHIN	FROM	TO
Truck	\$202,548	\$185,790	\$171,168
Rail	\$677	\$3,911	\$9,532
Water	\$0	\$38	\$17
Air (include truck-air)	\$14	\$2,134	\$2,429
Multiple modes & mail	\$6,032	\$24,077	\$44,416
Pipeline	\$0	\$0	\$1,777
Other and unknown	\$3,037	\$5,980	\$2,009
Total	\$212,308	\$221,931	\$231,349

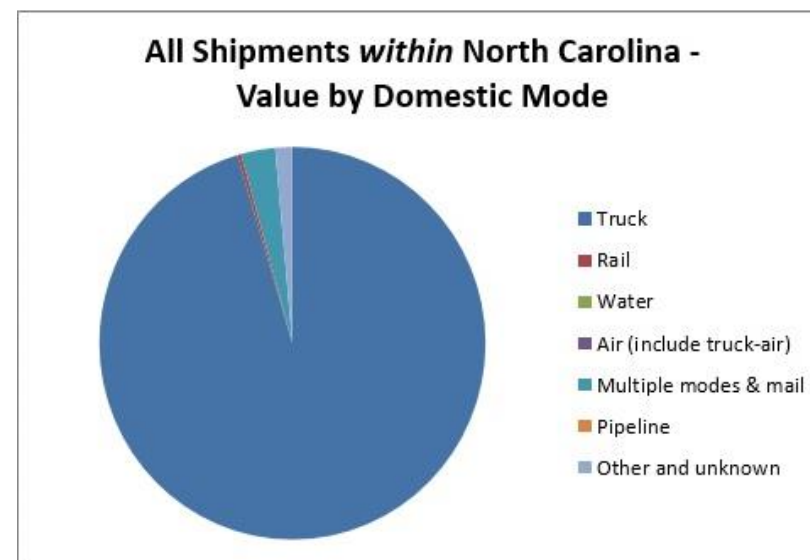


Figure 1-3 Domestic, Import, and Export Shipments within North Carolina - Value by Domestic Mode: 2007

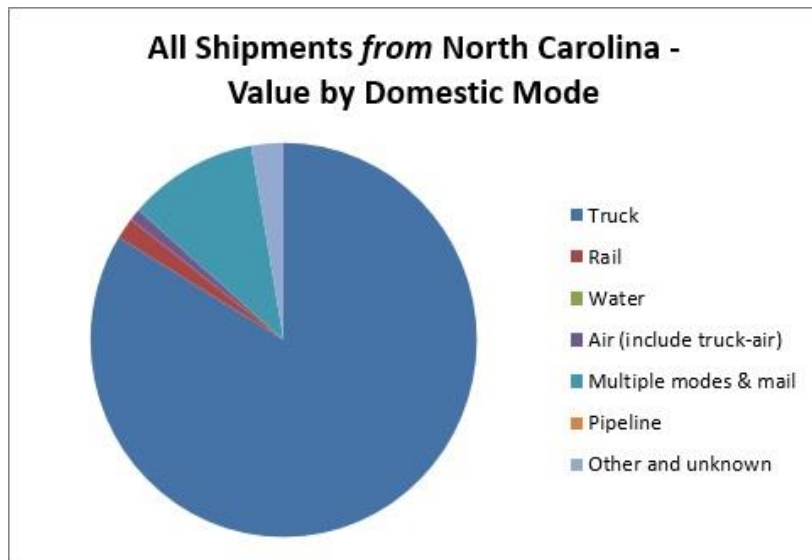


Figure 1-4 Domestic, Import, and Export Shipments from North Carolina - Value by Domestic Mode: 2007

Table 1-2 Domestic, Import, and Export Shipments within, from, and to North Carolina - Tonnage by Domestic Mode: 2007, in thousand tons

MODE	WITHIN	FROM	TO
Truck	289,873	80,838	76,294
Rail	3,607	7,451	60,481
Water	-	1	47
Air (include truck-air)	0	49	85
Multiple modes & mail	1,402	5,101	6,216
Pipeline	-	-	4,929
Other and unknown	1,135	1,532	1,030
Total	296,017	94,971	149,082

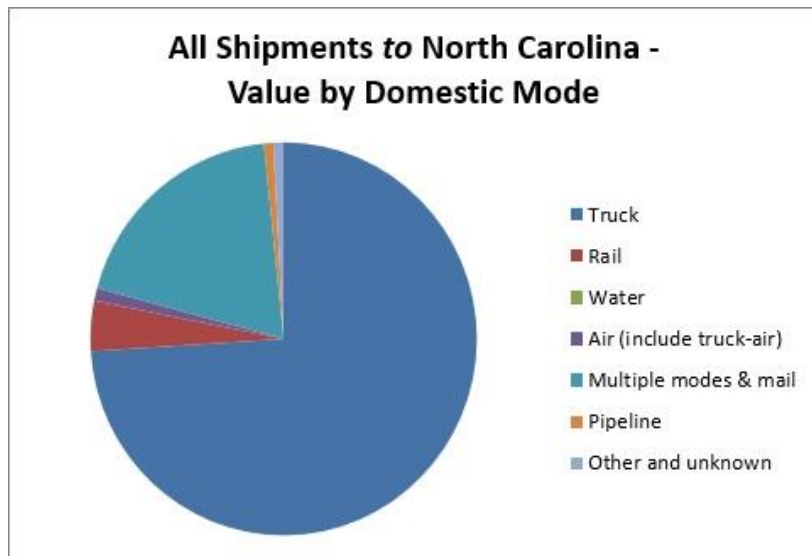


Figure 1-5 Domestic, Import, and Export Shipments to North Carolina - Value by Domestic Mode: 2007

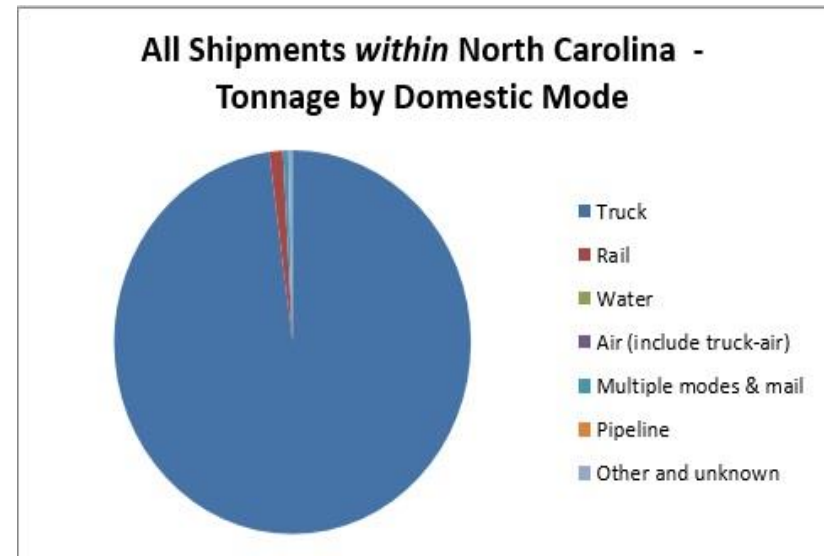


Figure 1-6 Domestic, Import, and Export Shipments within North Carolina - Tonnage by Domestic Mode: 2007

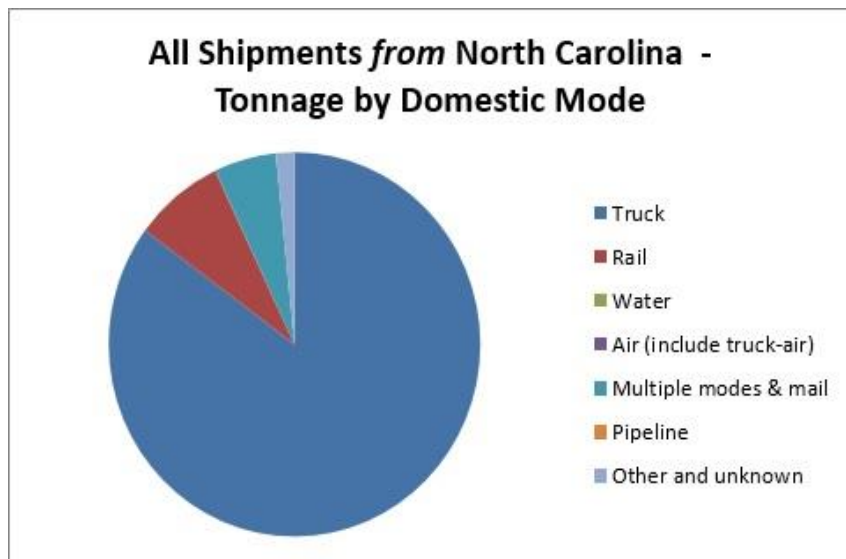


Figure 1-7 Domestic, Import, and Export Shipments from North Carolina - Tonnage by Domestic Mode: 2007

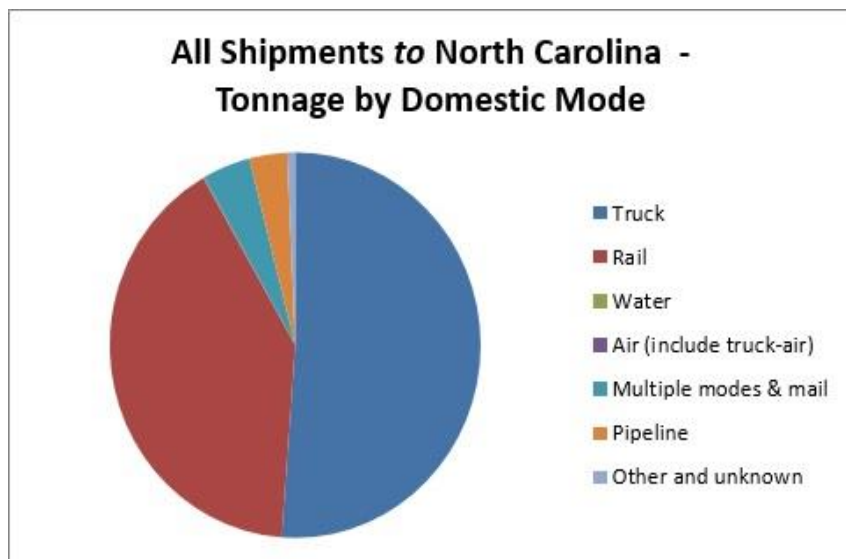


Figure 1-8 Domestic, Import, and Export Shipments to North Carolina - Tonnage by Domestic Mode: 2007

1.2.1.2 Passenger Rail

North Carolina is served by six intercity passenger trains with stops in 16 communities. Amtrak also connects to other communities with its Thruway Bus Service connections. Over 70 percent of North Carolina's population is within a 30-mile radius of a passenger station, with an additional 11 percent of the state's residents within a 30-mile radius of stops served by Amtrak's Thruway Bus Service. Currently there is no commuter or regional rail services in the state. The Charlotte Area Transit System (CATS) does operate a light rail line (Blue Line) and is currently constructing an extension of that line. CATS and the regional transit agencies in the Triad area and Triangle area are also planning for commuter rail systems.

Since 2001, North Carolina intercity rail ridership (boardings and alightings) have nearly doubled, from 500,000 in 2001 to nearly 1 million in 2013. Commute mode share for trips to work in 2012 is shown in Table 1-3. In 2012, most people in North Carolina traveled to work by car, truck, or van (90.6 percent). Only 1.1 percent of people used a form of public transportation.

Table 1-3 Commuting Mode Share in North Carolina

Workers Age 16 years and over	4,237,689
MEANS OF TRANSPORTATION TO WORK	
Car, truck, or van	91.6%
Drove alone	80.9%
Carpooled	10.7%
In 2-person carpool	8.1%
In 3-person carpool	1.4%
In 4-or-more person carpool	1.2%
Workers per car, truck, or van	1.07
Public transportation (excluding taxicab)	1.1%
Walked	1.8%
Bicycle	0.2%
Taxicab, motorcycle, or other means	1.0%
Worked at home	4.3%

1.2.2 Highways

There are about 80,000 miles of state-maintained roads in North Carolina. The major cities, interstates, and United States (US) routes are shown in Figure 1-9. Passenger and freight rail can help to reduce car and truck congestion on state-maintained roads, by moving more people and more freight. The highway system is shown with the rail system in Figure 1-10.

Interstate 85 and I-40 parallel the Amtrak *Carolinian* and *Piedmont* passenger train routes serving the major population centers of Metrolina (Charlotte, Concord, and Gastonia), the Triad (Winston-Salem, High Point, and Greensboro) and Triangle (Raleigh-Durham-Chapel Hill). The *Crescent* parallels I-85 serving stations from Greensboro and Charlotte. The *Silver Star* route parallels US 1 and I-95 serving the Sandhills, the Triangle, Wilson and Rocky Mount. The *Silver Meteor* and *Palmetto* passenger trains follow the I-95 corridor serving Fayetteville, Selma, Wilson and Rocky Mount.

Major freight railroads also parallel interstates and US routes in North Carolina. These corridors include:

- **US 74 Corridor:** CSXT between Charlotte and Wilmington
- **I-77 Corridor:** NS between Pineville and Mooresville
- **I-40 Corridor:** NS between Asheville and Salisbury and NS/NCRR between Greensboro and Raleigh
- **I-85 Corridor:** NS/NCRR between South Carolina, Charlotte and Durham
- **I-95 Corridor:** CSXT between South Carolina, Fayetteville and Virginia
- **US-1 Corridor:** CSXT between Hamlet, Southern Pines and Raleigh
- **US-70 Corridor:** NS/NCRR between Raleigh and Morehead City

As highway congestion continues to increase, provision of alternative modes to move people and goods will be essential to the State's economy.

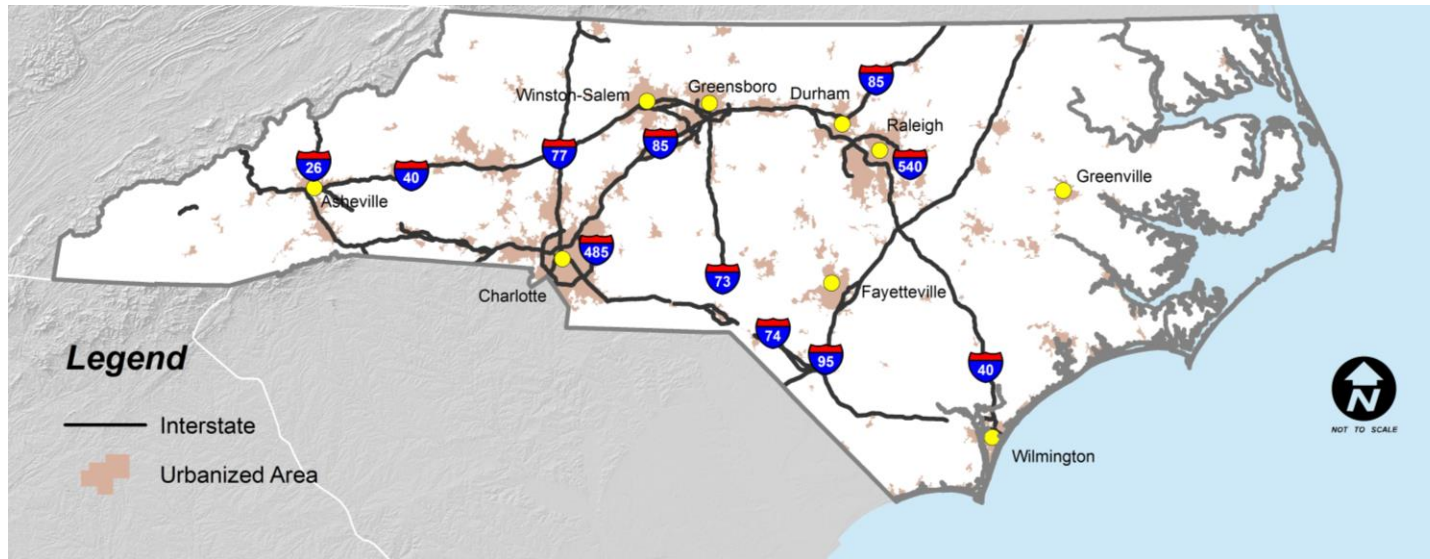


Figure 1-9 North Carolina's Interstates and US Routes

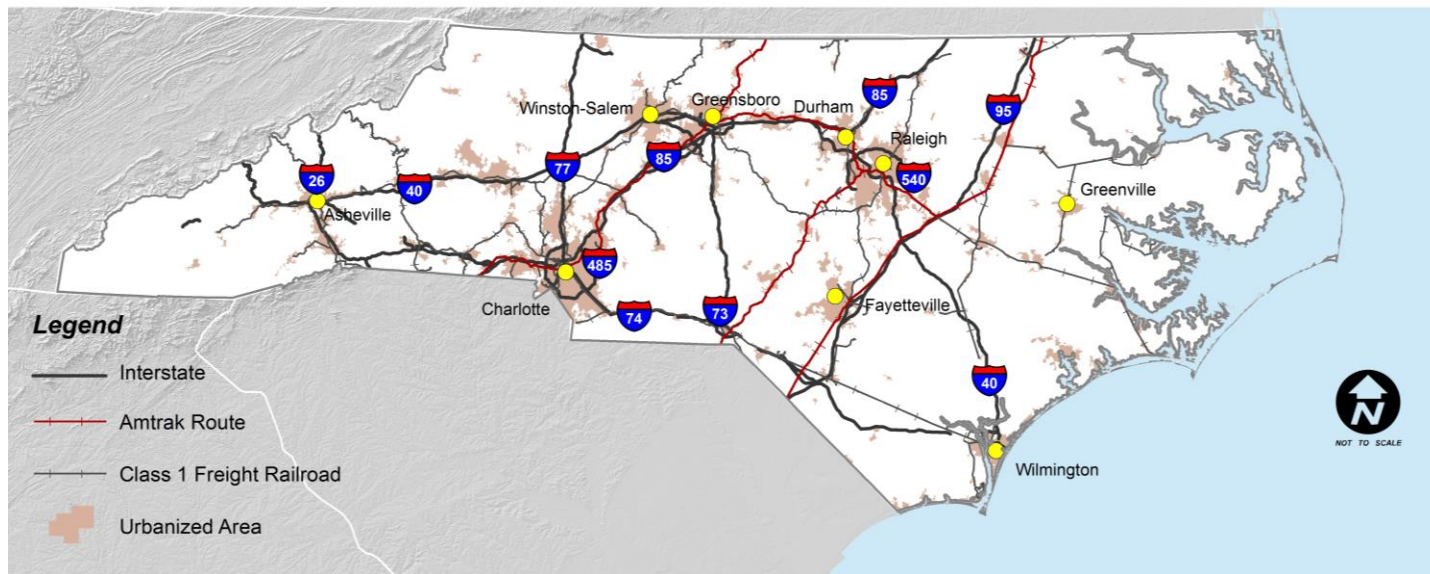


Figure 1-10 North Carolina's Interstates and Class I Railroads

1.2.3 Ports/Marine

North Carolina operates State Ports in Morehead City and Wilmington; both are served by a single class 1 railroad company. The Port of Morehead City is served by Norfolk Southern along the North Carolina Railroad Company (NCR)–owned corridor that connects to Charlotte via the Triangle and Triad. The Port of Wilmington is served by CSXT with a connection to Charlotte that parallels the US 74 corridor. Coastal Carolina Railroad (CLNA) provides switching services at the Port of Morehead City and the Wilmington Terminal Railroad (WTRY) does so at the Port of Wilmington. The Port of Morehead City serves bulk and breakbulk (goods that must be loaded individually, such as heavy equipment) freight and has no container cranes on site. The Port of Wilmington serves bulk and breakbulk freight but also has two berths dedicated to container service. Based on analysis conducted as part of the North Carolina Maritime Strategy (NCDOT 2012), the capacity of the container terminal at the Port of Wilmington is estimated at 530,000 twenty-foot equivalent units (TEUs). Over the last five years (2010-2014), an average of 267,000 TEUs has been moved through the container facility for an approximate 50 percent utilization.⁵ The movement of bulk and breakbulk freight through both ports has varied over time and is explained in detail in Chapter 2 along with trends in the top five imports and exports moving through both ports. The locations of the ports in Morehead City and Wilmington are shown on Figure 1-11.

1.2.4 Aviation

North Carolina is home to nine major airports with regularly scheduled passenger service. These airports include Charlotte-Douglas, Raleigh-Durham, Piedmont Triad, Wilmington International, Fayetteville Regional, Albert Ellis (Jacksonville), Coastal Carolina (New Bern) and Pitt-Greenville and are shown on Figure 1-12. In 2012, Charlotte-Douglas accounted for 75 percent of passenger boardings in North Carolina, followed by Raleigh-Durham (17 percent) and Piedmont Triad (3 percent) with the other six airports accounting for 1 percent or less of enplanements.

Currently, North Carolina has no direct connections between passenger rail facilities and airports. However, future rail and other transit options in some

locations may offer the ability to access airports within North Carolina directly from adjacent passenger rail stations. Charlotte Douglas International is located adjacent to the Amtrak Crescent route which also shares track with the *Piedmont* and *Carolinian* routes a few miles northeast of the airport. The Triad and Triangle are also located along the *Piedmont* and *Carolinian* routes. See Chapter 2 for more information on these regions' plans to link airports to either commuter rail or streetcars.

1.2.5 Multi-modal

In addition to the two State Ports, the North Carolina State Ports Authority operates the Piedmont Triad Inland Terminal and the Charlotte Inland Terminal. Inland terminals offer staging ground venues for transferring cargo between trucks or between modes. The Piedmont Triad Inland Terminal is located in southwest Greensboro, at the interchange of I-40 and I-73, and within 6 miles of Norfolk Southern Greensboro Intermodal Terminal, where there is a Virginia International container station, and Piedmont Triad International Airport. However, it is currently not in use. The Charlotte Inland Terminal is located north of Charlotte Douglas International Airport and one mile from the CSXT Charlotte Intermodal Terminal and eight miles from the new Norfolk Southern Intermodal Terminal. The CSXT Charlotte Intermodal Terminal and the NS Greensboro and Charlotte Intermodal Terminals and intermodal routes through NC are shown on Figure 1-11.

North Carolina has made significant progress in establishing multi-modal transportation centers in the state's large and mid-sized urban areas over the last two decades. These multi-modal transportation centers typically house Amtrak passenger rail stations, intercity bus providers (Greyhound and Carolina Trailways) and city and regional transit agencies bus depots. Figure 1-13 shows the existing multi-modal stations and their connections to intercity passenger rail. See Chapter 2 for detailed information on existing and planned multi-modal transportation centers in North Carolina.

⁵ North Carolina State Ports Authority Cargo Movement History and Forecast, June, 2014



Figure 1-11 North Carolina Marine Ports, Intermodal Facilities and Freight Railroad

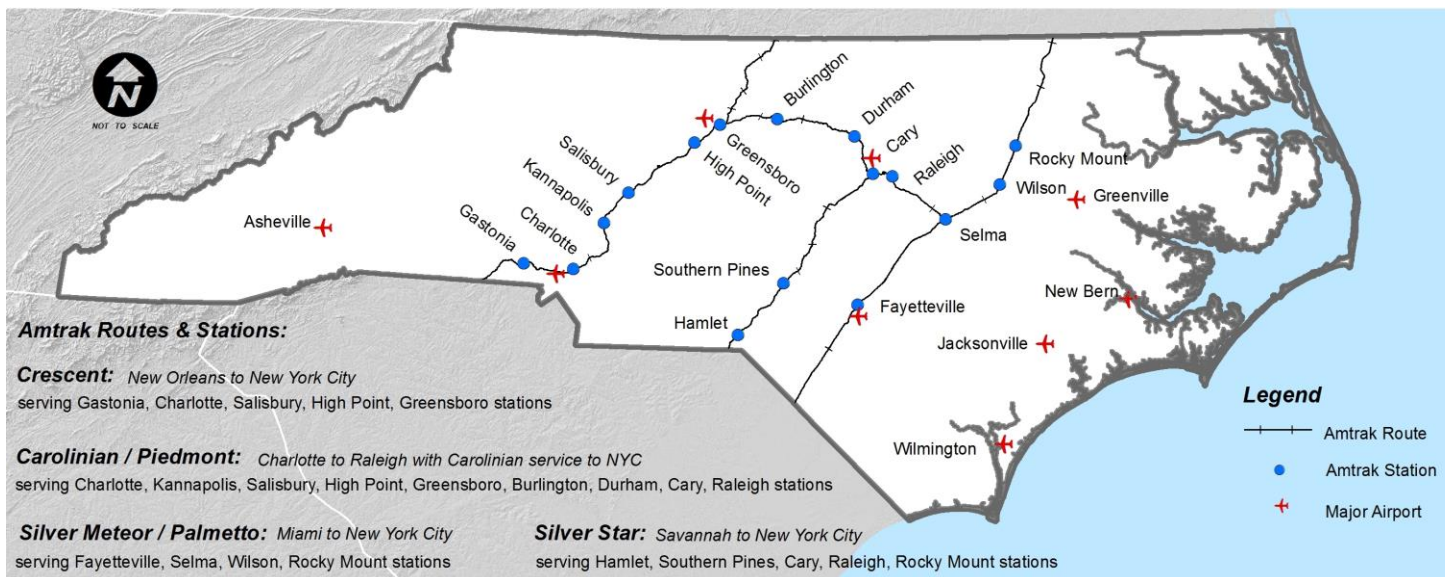


Figure 1-12 North Carolina Airports and Intercity Passenger Rail lines

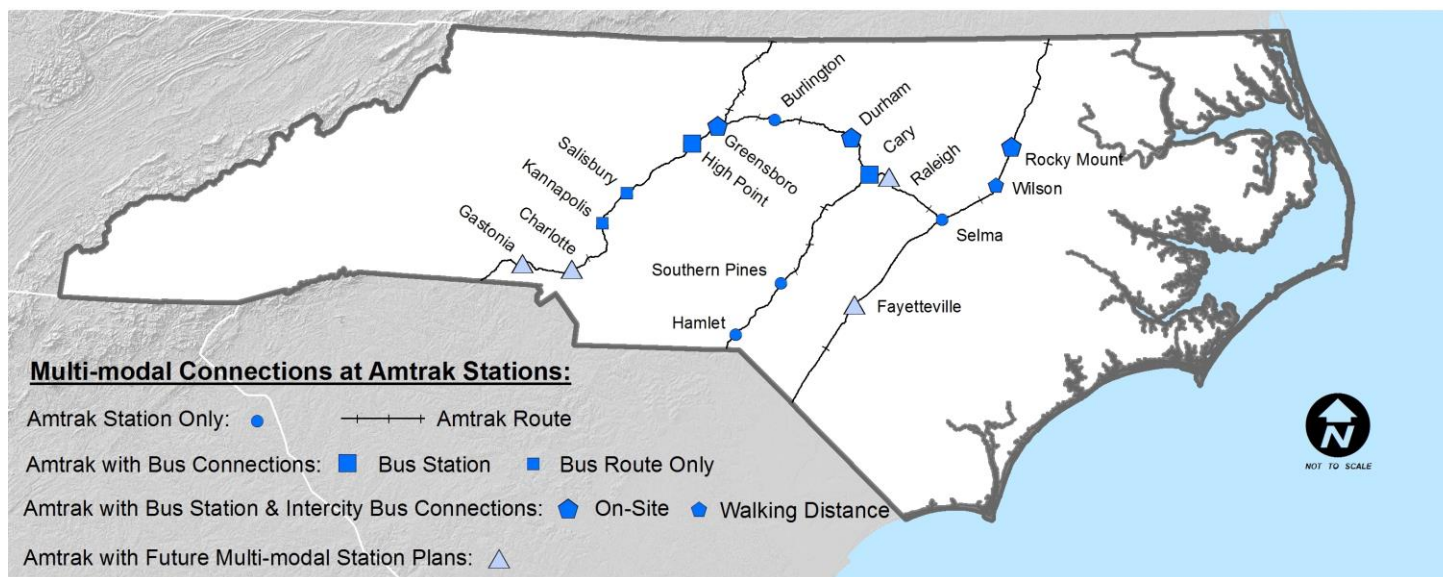


Figure 1-13 North Carolina Multimodal Facilities and Intercity Passenger Rail lines

1.2.6 Long-range Planning

Several NCDOT long range plans have addressed freight and/or passenger rail needs. Recent planning projects include:

- **Eastern Infrastructure Improvement Study (2015)**, which assessed the impacts of strategic infrastructure investments in three of the state's transportation and economic assets: the Global TransPark, Port of Morehead City, and restoring the Wallace to Castle Hayne rail corridor. The risks, opportunities, and impacts of a variety of investments, including rail infrastructure and complementary facilities, were investigated to determine the financial feasibility and potential economic impacts of the investments.
- **NC Maritime Strategy (2012)**, which investigated the role of the ports in the state's economy and the impacts of a range of opportunities that would result from investments in transportation infrastructure. The study also identified improvements for rail that would enhance the transport of goods at the ports and inland.
- **Seven Portals Study (2011)**, which explored transportation infrastructure investments that would encourage economic development in potential logistics villages across the state. The study was aimed at the business community to demonstrate the state's readiness for commerce in a variety of industries to encourage job growth and support economic activity.
- **Statewide Logistics Plan (2008)**, which developed a plan to address long-term statewide mobility needs by identifying priority commerce opportunities, recommending transportation infrastructure that would result in economic growth, and outlined a timeline. Coordinating an economic development plan with transportation infrastructure investments was one of the recommendations.
- **State Rail Plans (2001, 2009)** have previously identified priority rail corridors and recommended projects to improve freight and passenger rail in the state. Under the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), FRA requires updates every five years to remain eligible for federal grant funds.

The NCDOT Rail Division has also studied a potential passenger rail service extension to western North Carolina (Salisbury to Asheville) and to eastern North Carolina (Raleigh to Wilmington) and (Raleigh to Greenville). Additional information on these passenger rail plans and implementation of the Southeast Corridor are provided in Chapter 2.

1.3 GOVERNANCE STRUCTURES

The roles of federal, state, regional, and local governments in shaping rail policy in North Carolina are summarized in this section.

1.3.1 Federal Government

Rail is influenced at the federal level by three modal agencies of the USDOT – the Federal Railroad Administration (FRA), the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA), with primary involvement by FRA in North Carolina rail activities.

The mission of the FRA is “to enable the safe, reliable, and efficient movement of people and goods for a strong America, now and in the future.” The FRA issues and enforces safety regulations, makes select investments in rail corridors across the country, and supports the development of research and technology.⁶ The passage of the Rail Safety Improvement Act (2008), Passenger Rail Investment and Improvement Act (PRIIA) (2008), and the American Recovery and Reinvestment Act (2009), along with subsequent appropriations and initiatives, expanded FRA’s primary focus on safety improvement to encompass both safety and development.⁷ The national oversight of rail safety by FRA, including their role in inspection programs, is addressed in detail in 1.5.3 under Safety Programs. The FRA also oversees compliance with the National Environmental Policy Act (NEPA) and implementing regulations for federally-

funded rail projects. The FRA conducts environmental reviews according to the “FRA Procedures for Considering Environmental Impacts.”⁸

The FTA provides technical and financial assistance to transit authorities operating or planning for commuter rail. As part of this effort, the FTA coordinates with the NCDOT Rail Division and local transit authorities to ensure projects meet the safety standards established under the State Safety Oversight Program for Fixed Guideway and Rail Systems.⁹

The FHWA administers the Railway-Highways (Section 130) Crossings Program. Moving Ahead for Progress in the 21st Century Act (MAP-21) continued the annual funding set aside from the Highway Safety Improvement Program for 23 USC 130 to provide funds for the elimination of hazards at railway-highway crossings.¹⁰ FHWA is also a signatory on the environmental studies conducted for the Southeast Corridor.

1.3.2 State Government

Primary responsibility for coordinating rail programs in North Carolina lies within the NCDOT’s Rail Division. Enabling legislation passed in 1977 established the Rail Division and gave the NCDOT authority to rehabilitate and improve railroads, to construct rail or related facilities, to purchase railroads for maintenance and preservation purposes, to inspect equipment and facilities, and to carry out safety and accident prevention programs.¹¹ The Director of the NCDOT Rail Division is the State Rail Transportation Authority (SRTA), as defined by PRIIA.

The Rail Division is housed in the Division of Transit alongside the Aviation, Bicycle and Pedestrian, Ferry, and the Public Transportation divisions. The five branches of the Rail Division and their respective responsibilities are described below. Figure 1-14 shows the organization of the Rail Division within NCDOT.

⁶ Federal Railroad Administration. “Overview.” Visited 7 April 2014. Available: <http://www.fra.dot.gov/Page/P0351>

⁷ Federal Railroad Administration. “Overview.” Visited 7 April 2014. Available: <http://www.fra.dot.gov/Page/P0351>

⁸ Federal Railroad Administration. “National Environmental Policy Act (NEPA) Procedures.” Available: <http://www.fra.dot.gov/Page/P0215>. Visited 25 April 2014.

⁹ North Carolina Department of Transportation. North Carolina Rail Plan 2009 Executive Summary.

¹⁰ Federal Highway Administration. Railway-Highways Crossing (Section 130) Program. <http://safety.fhwa.dot.gov/xings/>

¹¹ North Carolina Department of Transportation. North Carolina Rail Plan 2000. January 2001.

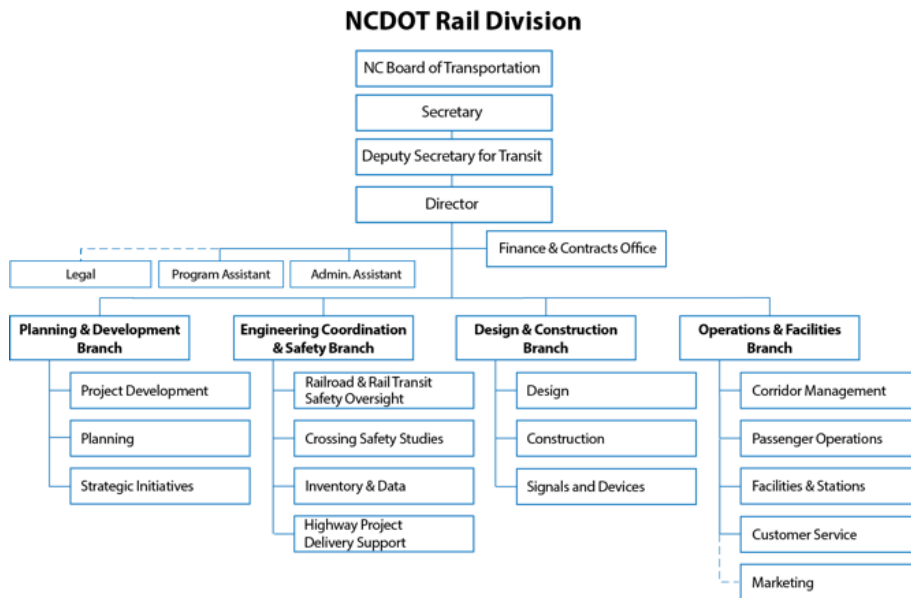


Figure 1-14 Organization of the Rail Division within NCDOT

- **Operations & Facilities Branch** – Plans, finances and markets rail passenger service; oversees passenger rail customer service; works with local governments to plan for station improvements; oversees equipment and facility maintenance; manages station staff in cooperation with Amtrak and trains volunteers
- **Planning & Development Branch** – participates in regional transportation planning processes; plans for future intercity passenger rail; manages the internal grant program; acquires strategic rail corridors for preservation; ensures environmental compliance for rail projects funded in the State Transportation Improvement Program (STIP); coordinates strategic planning efforts with the railroad companies
- **Engineering Coordination & Safety Branch** – implements the statewide crossing improvement program; reviews designs for rail

transit; inspects rail infrastructure and equipment; promotes rail safety awareness

- **Design & Construction Branch** – designs and constructs roadway/rail at-grade crossing and railroad track improvements and coordinates construction activities with railroad companies
- **Finance & Contracts Office** – coordinates with federal transportation modal administrations; contracts with Amtrak for passenger service; coordinates funding agreements with local governments

The North Carolina Board of Transportation develops policies, establishes priorities, and approves contracts and funding for all modes of transportation under the department. The Board also promulgates rules and regulations concerning all transportation functions assigned to the department. In addition, the Board helps develop and approve the department's multi-year STIP. The nineteen members are appointed by the governor, the president of the North Carolina Senate, and the speaker of the North Carolina House of Representatives. The Board of Transportation is the State Rail Plan Approval Authority (SRPAA), as defined by PRIIA.

The General Assembly and Governor can create specialized task forces or request studies be conducted for logistics and other rail-related infrastructure or economic development initiatives.¹² The General Assembly and Governor also work with NCDOT to identify funding needs and develop a budget.

1.3.3 Regional, County, and Local Government

The NCDOT coordinates with state's nineteen Metropolitan Planning Organizations (MPOs) and nineteen Rural Planning Organizations (RPOs) at MPO/RPO board meetings and at project-specific meetings. MPOs are federally-designated regional transportation planning organizations for urban areas of 50,000 people or more. RPOs are state-designated organizations that plan for the remaining portions of the state. MPOs and RPOs are responsible for regional freight planning, intra-city rail planning, and short-term local project

¹²North Carolina Department of Commerce. Governor's Logistics Task Force. April 15, 2011. Accessed March 25, 2014.
<http://www.nccommerce.com/LinkClick.aspx?fileticket=cF2HDx8Hwkc%3D&tabid=1575&mid=4179>

prioritization. MPOs are required to develop a multi-modal Metropolitan Transportation Plan (MTP) that addresses long term needs for freight and transit, including light rail and commuter rail, where applicable. MPOs coordinate with transit agencies, counties, and local governments to include these projects in the MTP so that they may be funded. These entities also work together with NCDOT on other rail projects such as roadway/rail traffic separation studies and individual crossing closings.

In addition to their involvement in NCDOT and regional transportation planning processes, local and regional transit authorities lead transit planning processes in many communities, including regional commuter and light rail development in Metropolitan regions, integration of intercity rail with local and regional transit services, and multimodal station development. In 1997, the General Assembly authorized Mecklenburg County to levy a half-cent sales tax dedicated to transit so that Charlotte could fund their transit expansion plans.¹³ The General Assembly passed similar legislation in 2008 allowing Guilford, Forsyth, Durham, Wake, and Orange counties to levy a half-cent sales tax for transit and enabling 94 other counties to levy a quarter-cent sales tax for transit.¹⁴ Similar to the legislation enabling Mecklenburg County, the 2008 legislation requires county commissioners to vote to put the half-cent sales tax to a voter referendum. Upon a voter majority approval, the sales tax revenues go toward the service recommendations outlined in approved regional transit plans. Voters in Durham and Orange counties have passed these referendums. Local governments then coordinate with regional transportation planning organizations, NCDOT, and federal transportation agencies to implement intra-city passenger rail. The Charlotte Area Transit System (CATS) is the only transit authority in North Carolina that has built and operates a light rail line. Several

other metropolitan areas are planning for future light rail and commuter rail lines (see Chapter 2).

1.4 FUNDING

This section describes the State's authority for grant, loan, and public/private partnership financing, how the State has used these authorities in the past, State revenue sources that are dedicated to rail funding (if any), and how much the State has provided in funding over the past five years. Funding for the past five state fiscal years is shown in Table 1-4.

Many of the funding sources and programs listed below are from state programs that have now been eliminated under the state's new transportation funding law, as well as federal grants under the Passenger Rail Investment and Improvement Act of 2008 and the American Recovery and Reinvestment Act of 2009, which do not reoccur annually. More detail on the programs that help fund Rail Division activities can be found in Section 1.5 below and in Chapter 2.

¹³Flowers, Carolyn. CEO, Charlotte Area Transit System. Charlotte-Mecklenburg Region Rapid Transit and Land-Use Integration Presentation to Legislative Committee on Urban Growth and Infrastructure. March 23, 2010. Accessed March 6, 2014.
<http://www.ncleg.net/documentsites/committees/LSCUGII/2009-2010%20Interim/March%2023,%202010/2010-0323%20C.Flowers%20-%20CATS%20Presentation.pdf>

¹⁴General Assembly of North Carolina. House Bill 148 Legislative Fiscal Note. August 3, 2009. Accessed March 6, 2014.
<http://www.ncleg.net/Sessions/2009/FiscalNotes/House/PDF/HFN0148v4n1.pdf>

Table 1-4 NCDOT Rail Division Funding, 2010-2014

	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Operations & Facilities	\$5,719,828	\$7,275,000	\$1,706,666	\$1,706,666	\$1,706,666
Rail Industrial Access	\$1,750,000	\$700,000	\$119,000	\$119,000	
Engineering & Safety	\$970,971	\$1,200,000	\$1,356,667	\$1,356,667	\$1,356,667
Environmental & Planning	\$1,659,966	\$975,000	\$1,156,667	\$1,156,667	\$1,156,667
Travel Time Improvements/Matching Funds	\$3,082,592	\$2,243,144	\$3,462,153	\$3,462,153	\$1,628,007
Maintenance of Rail Infrastructure	\$1,000,000	\$1,750,000	\$2,400,000	\$2,400,000	\$2,400,000
Rail Capital & Safety	\$2,856,153	\$3,743,144	\$3,000,000	\$2,500,000	\$2,500,000
Streamline Freight Operations-Greenville and Pembroke		\$3,539,865			
Contracted Services			\$8,100,000	\$8,100,000	\$8,517,073
Grants to Short Lines		\$2,000,000	\$400,000	\$400,000	
State Appropriation - Statewide	\$61,473				
Freight Rail & Rail Crossing Safety					\$19,200,000
TOTALS	\$17,100,983	\$23,426,153	\$21,701,153	\$21,201,153	\$38,465,080

1.5 LAWS, POLICIES, INITIATIVES

Sections 1.2 through 1.4 described the current status of rail in North Carolina's overall transportation system and how the NCDOT Rail Division's governance and funding support rail as an integral part of the state's transportation network. Article 2D of North Carolina General Statute 136 addresses railroad revitalization in the state. Chapter 44.36 designates DOT as the agency to administer federal and state railroad revitalization programs.¹⁵ There are also private sector, federal, state, and local legislative and policy initiatives that are guiding the future development of rail in our state, as described below.

1.5.1 Legislative Policy and Initiatives

In recent years there have been fundamental changes in state and federal transportation law that have impacted how North Carolina administers and funds its rail programs.

- The Rail Safety Improvement Act of 2008 (RSIA) mandates that Positive Train Control (PTC) be implemented across a significant portion of the

Nation's rail industry by December 31, 2015. Lines requiring PTC are essentially Class I railroad mainlines that handle any poisonous-inhalation-hazardous materials, and any railroad mainlines over which regularly scheduled intercity passenger or commuter rail services are provided. PTC refers to communication-based/processor-based train control technology that provides a system capable of reliably and functionally preventing train-to-train collisions, overspeed derailments, incursions into established work zone limits, and the movement of a train through a mainline switch in the improper position.¹⁶ The NCDOT Rail Division has been in discussion with both CSXT and NS on how this new rule will impact shared freight/passenger corridors and how it will impact the construction costs of proposed commuter rail lines that might be located on non-Class I railroads.

- In 2008 the Passenger Rail Investment and Improvement Act (PRIIA) was passed, which reauthorizes Amtrak and requires states to sign new agreements with Amtrak on state-sponsored passenger train routes

¹⁵ <http://www.ncga.state.nc.us/gascripts/statutes/StatutesTOC.pl?Chapter=0136>

¹⁶ Federal Railroad Administration. Positive Train Control (PTC) Overview (Railroad Safety). <http://www.fra.dot.gov/Page/P0621>

such as the *Piedmont* and *Carolinian*. The law also establishes new guidelines for federal support for conventional and high speed passenger programs and is the law that establishes the requirements for this State Rail Plan.¹⁷

- In 2009, President Obama signed the American Recovery and Reinvestment Act (ARRA), which included additional funding for speed and capacity improvements along federally designated high speed rail corridors. NCDOT was awarded over \$545 million in competitive grants to fund the Piedmont Improvement Program, a series of projects between Raleigh and Charlotte that will enhance safety, increase capacity, and increase travel speeds for freight and passenger rail. An ARRA grant for \$25 million will be used to install three double cross-overs on double tracked sections of CSXT's A Line to help alleviate freight and passenger traffic congestion along the corridor. Two of the cross-overs are located in Nash County and one in Halifax County. Most of these projects are currently under construction and all must be completed by September 30, 2017.
- In 2013, Governor Pat McCrory signed into law the Strategic Transportation Investment (STI) program, which completely overhauls NCDOT's methods for prioritizing and selecting capital expenditures. STI divides the state's funds into three categories – statewide, regional impact and division. The division category refers to NCDOT's 14 Highway Divisions, or administrative groupings of counties. Priorities in this category consider local rankings. Freight capacity projects on Class I railroads are eligible for statewide funds. Rail service spanning two or more counties (and not funded through statewide funds) are eligible for regional funds, and any non-statewide and non-regional projects are eligible for division funds. All projects – regardless of mode – are evaluated against a 100 point scale that considers factors including congestion, mobility, access, and economic and benefit-cost impacts. It should be noted that some funding programs that have been used for rail projects, such as the Congestion Mitigation and Air Quality (CMAQ), Transportation Alternatives, and roadway/rail crossing

improvements, are evaluated through separate prioritization processes. NCDOT reviews the STI prioritization process as needed. STI results guide the development of the Statewide Transportation Improvement Program (STIP). The STIP is a ten year program of transportation projects that is updated biannually.¹⁸

- The Freight Rail & Rail Crossing Safety Improvement Fund (FRRCSI) was also established under law in 2013. FRRCSI uses dividends paid to the state of North Carolina from the NCRR to fund some freight and rail/roadway crossing safety projects. The dividends fund two state grant programs: The Short Line Infrastructure Access Program (SIAP) and the Rail Industrial Access Program (RIAP), as well as crossing safety improvements. The Rail Division administers the program and funds projects based upon eligibility, needs, and priority. Freight projects are matched by the private partner at 50 percent or more.
- In September 2014, Governor Pat McCrory and Transportation Secretary Tony Tata unveiled the Governor's 25-Year Vision for transportation in North Carolina. The plan's comprehensive solutions to address statewide transportation needs include:
 - Strengthening the maintenance of our existing facilities
 - Improving our public transportation network including passenger rail
 - Expanding bicycle and pedestrian networks statewide
 - Supporting greater broadband connectivity through existing right of way

The vision also addresses the need for alternative funding solutions that will help the state close the gap between infrastructure needs and available funding. The alternative funding solutions include optimizing public-private partnerships, reducing dependency on federal dollars, taking advantage of historically low interest rates, and presenting

¹⁷Federal Railroad Administration. Passenger Rail Investment and Improvement Act of 2008 (PRIIA). <http://www.fra.dot.gov/Page/P0393>

¹⁸North Carolina Department of Transportation Rail Division. Presentation to the NCDOT Rail Planning Forum, November 12, 2013

targeted revenue recommendations to the General Assembly for action during the 2015 legislative session.¹⁹

On July 6, 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law. While this legislation does not directly impact the NCDOT rail programs, it does impact potential light rail and commuter rail projects that might share rights-of-way with freight or intercity passenger rail and the joint development of multimodal transportation centers. The act has also offered some grant funding that could be used for rail projects.

Other recent state legislative programs that have impacted rail include SB-402, which directed the NCDOT, NC Department of Commerce and the NC Department of Agriculture and Consumer Services to study the feasibility of infrastructure improvements to the Global TransPark and the North Carolina State Ports. The SB-402 study was complete as of January 2015 and recommended the establishment of the Secretary of Transportation's Freight Intermodal Advisory Council to help leverage strategic infrastructure investments to foster economic growth.²⁰

1.5.2 Private Sector Initiatives

In 2007, NS initiated planning and construction of major infrastructure improvements along their Crescent Corridor, running from New York to New Orleans and Memphis.²¹ The program consists of a \$2.5 billion investment that will include 300 miles of new passing tracks, sections of double tracks, and new or expanded terminals in 11 markets. A portion of this corridor is part of the NCRP between Greensboro and Charlotte. The Crescent Corridor includes the recently completed \$92 million, 200-acre intermodal facility constructed at the Charlotte Douglas International Airport adjacent to Norfolk Southern's mainline extending to Atlanta.²² Additional information about improvements along the Crescent Corridor is provided in Chapter 2.

CSX Transportation also has a multi-state corridor improvement initiative, known as the National Gateway. This program is an \$850 million initiative to improve CSXT corridors in several states, including North Carolina.²³ National Gateway projects included capacity and efficiency improvements at CSXT's Charlotte Intermodal Terminal and improved access to the Port of Wilmington.²⁴ Further discussion of the National Gateway is also included in Chapter 2.

In the past decade, the NCRP has funded track, bridge, safety, and capacity improvements on its 317-mile corridor between Charlotte and Morehead City. Projects have included multiple grade crossing improvements, bridge and structure upgrades, track tie and rail replacements, signals, new sidings, and expanded yard facilities. NCRP has also contributed to railroad improvement projects constructed by others, such as pedestrian underpasses by Elon University and the University of North Carolina at Greensboro (UNCG).

NCRP's Strategic Plan is focused on capital investments that enable rail freight, expand rail to move passengers, and invest in North Carolina. These investments are geared toward economic development and job creation. An example is the new lead track to the North Carolina Industrial Center (NCIC) in Mebane.

1.5.3 NCDOT Rail Initiatives

North Carolina is a national leader in many rail efforts, including partnerships with Class I and other freight railroads, safety programs, corridor preservation, and passenger rail. Many of these programs have been in place for years, and have been recommended by the United States Department of Transportation (USDOT) and other states as best practices. Below are brief descriptions of these initiatives and programs, and their benefit to North Carolina.

1.5.3.1 Crossing Hazard Elimination Program

A major component of the NCDOT Rail Division's safety efforts go towards eliminating roadway/rail crossing hazards. The Rail Division's Crossing Hazard

¹⁹ <https://apps.ncdot.gov/newsreleases/details.aspx?r=10308>

²⁰ Worley, Paul. Presentation to the NC Board of Transportation, February 5, 2014.

²¹ http://www.thefutureneedsus.com/images/uploads/crescent-corridor-brochure_1.pdf

²² <http://charmeck.org/city/charlotte/Airport/News/Pages/IntermodalFacilityFastFacts.aspx>

²³ <http://www.nationalgateway.org/>

²⁴ http://www.nationalgateway.org/sites/default/files/project/resources/files/CSX_National-Gateway-Fact-Sheet_Charlotte_0.pdf

Elimination Program is responsible for maintaining a crossing inventory and analyzing data to prioritize crossings for closure or upgrade. NCDOT develops funding agreements with local governments and railroads, the projects are programmed in the STIP and move forward to design and implementation.²⁵ The program's goal is to reduce the number of at-grade roadway/rail crossings and add safety enhancements such as signage, gates, bells and flashing lights at crossings. In 1992, only 30 percent of the state's 5,000 public railroad crossings had flashing lights and gates. As of 2014, automatic warning devices are in place at 60 percent of the now 4,025 public crossings in North Carolina.²⁶ Even with increased efforts to improve safety during the past decade, 30 percent of North Carolina's public at-grade roadway/rail crossings remain unprotected by mechanical warning devices. The NCDOT, in cooperation with the FHWA, is working to install active warning devices at those unprotected crossings.²⁷

The NCDOT also conducts Traffic Separation Studies (TSS), which involve a community-wide planning approach to identify issues related to crossings and to determine appropriate short- and long-term crossing improvements. As part of a TSS, the Rail Division coordinates with MPOs, local communities, and affected businesses to develop recommendations.²⁸

An initial component of NCDOT's crossing improvement program is the Sealed Corridor program between Raleigh and Charlotte, which is the busiest rail corridor in the state (for freight rail, passenger rail and roadway traffic) and a component of the Southeast Corridor.²⁹ NCDOT has worked with FRA, NS, the NCRR, and CSXT since 1995 to "seal" the corridor between Raleigh and Charlotte by using enhanced traffic control devices, crossing closures and grade separations to separate all highway and rail traffic.

Since 1995, 68 crossings have been eliminated and more than 145 crossings have been upgraded to in accordance with the Sealed Corridor Program along the Raleigh to Charlotte Corridor. Additionally, 175 crossings have been eliminated and more than 1,300 upgraded in other corridors. Between 1995 and 2012, the annual number of automobile/train crashes in NC has fallen from 135 to 45.

North Carolina is recognized as a national leader for its Sealed Corridor Program, and its efforts continue to improve safety along rail corridors.

1.5.3.2 Railroad Safety Enforcement Program

NCDOT and the FRA staff jointly inspect North Carolina's 3,200 miles of railroad track, as well as thousands of cars and locomotives, plus at-grade crossings and train control signal systems to ensure they meet federal safety standards.

In the 2014 calendar year NCDOT staff completed 111 motive power (locomotives) equipment (rail cars) inspections, 98 signal and train control inspections, and 110 track inspections. Those inspections included 11,910 motive power (locomotives) and equipment (railcars) units, 1,403 signal and train control units, and, 3,927 miles of track.

1.5.3.3 Public Safety Awareness

NCDOT promotes rail safety public awareness through the Rail Division's BeRailSafe program. The program publishes informational materials and offers presentations to community groups, and training to law enforcement, fire departments, EMS and other first responders.³⁰ The NCDOT BeRailSafe program complements ongoing public awareness activities of national groups such as Operation Lifesaver and its North Carolina Operation Lifesaver affiliate.³¹

This program has reached out to at least 20,000 North Carolina residents and members of the general public and more than 2,100 first responders.

²⁵North Carolina Department of Transportation Rail Division. Train Crossing Program. Accessed March 6, 2014. <http://www.ncbytrain.org/safety/crossings.html>

²⁶North Carolina Department of Transportation Rail Division. <http://www.ncbytrain.org/safety/sealed.html>

²⁷Thomas, Drew. North Carolina Department of Transportation Rail Division. Email dated June 16, 2014.

²⁸North Carolina Department of Transportation. North Carolina Rail Plan 2000. January 2001.

²⁹North Carolina Department of Transportation. Sealed Corridor Program. Accessed March 6, 2014. <http://www.ncbytrain.org/safety/sealed.html>

³⁰North Carolina Department of Transportation. BeRailSafe. Accessed March 6, 2014. <http://www.berailsafe.org/>

³¹Operation Lifesaver. Operation Lifesaver – About Us. Accessed March 6, 2014. <http://oli.org/about-us>

1.5.3.4 State Safety Oversight Program for Fixed Guideway Rail Systems

The Rail Division coordinates with the FTA and local transit agencies to ensure existing and proposed light rail projects meet safety standards as part of the State Safety Oversight Program for Fixed Guideway and Rail Systems.³² Currently CATS is the only transit agency operating a rail transit system (CATS Blue Line light rail), with a 9.3 mile extension now under construction.

This program enables NCDOT to help transit agencies develop and follow a Safety and Security Plan that meets MAP-21 and CFR 659 requirements.

1.5.3.5 Inter-city Passenger Rail Service

Since 1990, NCDOT has provided financial, capital and staff support for Amtrak passenger rail services. This support began with partial funding for Amtrak's *Carolinian* between Raleigh and Charlotte, and was expanded to include the *Piedmont* trains in 1995 and 2010. Other intercity passenger rail support includes construction of NCDOT's Capital Yard Maintenance Facility, construction and renovation of stations (described in the next section), and creation of the nation's first and largest volunteer train host program.

Since 1990, ridership on Amtrak in North Carolina has tripled, and ridership since 2001 has doubled - by 2013 there were nearly one million trips originating or ending in North Carolina. NCDOT now supports six trains daily to Raleigh, Greensboro and Charlotte and other cities on the *Piedmont* and *Carolinian*. NCDOT has also partnered with communities to make intercity passenger rail stations a cornerstone for revitalization of city centers. The NC Volunteer Train Hosts Program has trained volunteers who daily ride the *Carolinian* and *Piedmont* trains and serve as ambassadors for North Carolina.

1.5.3.6 Station Improvements

Since 1992, NCDOT has led the effort to restore historic train stations or build new stations served by Amtrak to provide better transportation connections for these communities. Some projects were constructed through federal transportation enhancement funds, some through state funds and local contributions, and others through the Piedmont Improvement Program (PIP)

(described below). Some stations improvements, such as Greensboro and Cary, were constructed as multi-modal stations with local bus connections.

Nine active passenger stations have been renovated and three new stations have been constructed by NCDOT since 1995 (Cary, Durham, Fayetteville, Greensboro, Hamlet, High Point, Kannapolis, Rocky Mount, Salisbury, Selma, Southern Pines and Wilson). Additionally, the NCRR redeveloped the Burlington station using approximately \$3 million of their own funding. Previously, several of these communities had no staffed stations, forcing patrons to wait outside for the train without the availability to purchase tickets, check baggage, or be sheltered from the elements. Today, nearly every North Carolina town with Amtrak service has a modern station with a waiting area and ticket kiosks. All of the active intercity passenger rail stations are staffed by Amtrak or contract employees. Most of the stations have connecting local bus transit and taxi services.³³

1.5.3.7 Piedmont Improvement Program (PIP)

This is an effort by NCDOT to modernize the Raleigh to Charlotte corridor, which is the state's main passenger and freight rail corridor, through a series of railroad and highway construction projects and enhancements. These projects are largely funded through federal stimulus money through the ARRA, as well as with funds from NCRR. The FRA awarded the state a \$545 million grant from that program in 2010, and a cooperative agreement with the agency specifies that \$520 million of the money goes directly to PIP. The remainder of the funds is helping to improve reliability of existing freight and passenger service from Raleigh to Virginia. The program includes 13 new bridges (grade separations), 32 miles of second track and passing sidings, 12 miles of new roadway, and closure of up to 23 public at-grade rail/roadway crossings. The program has also renovated or improved train stations in Cary, High Point, Burlington and Kannapolis. The program also funded improvements to the Capital Yard Maintenance Facility and the first phase of the Charlotte Locomotive and Railcar Maintenance Facility. In addition to the construction projects, the program also

³²North Carolina Department of Transportation. North Carolina Rail Plan 2009 Executive Summary.

³³North Carolina Department of Transportation Rail Division. Station Locations. <http://www.ncbytrain.org/destinations/default.html>

funded the purchase and refurbishment of additional passenger rail cars and locomotives to support additional frequencies between Raleigh and Charlotte.

The PIP is an extension of previous track and signal improvements that NCDOT has completed in concert with NS, CSXT and NCRR along the Charlotte to Raleigh corridor. Since 1990, the passenger rail travel time has been reduced by more than 34 minutes in this corridor.³⁴

The program will make train travel safer and more reliable, enhance opportunities for greater job growth and commercial development, and better connect the economic regions of Raleigh and Charlotte and the communities in between. By eliminating 23 at-grade crossings, the program will improve safety. It will also remove at least six bottlenecks by adding capacity along the busy Raleigh to Charlotte corridor by constructing additional track, track realignments, and new railroad bridges, reducing delays for both freight and passenger rail. Finally, the program will allow for two additional daily Amtrak trains between Raleigh and Charlotte, bringing the total to five daily round trips.

1.5.3.8 Other Track Improvements

NCDOT has also worked with local governments, CSXT, NS and the short line railroads on rail relocation projects in three communities: Elkin, Greenville, and Pembroke. The Elkin switching/siding relocation will relocate the Yadkin Valley Railroad freight switching outside of downtown. The Greenville project (completed in 2010) constructed a new connector track and a new CSXT rail yard north of the city limits that removed switching and other freight rail activities out of downtown Greenville, eliminating long blockages at several at-grade crossings. The Pembroke project will construct a new connector track that will improve access between CSXT's north-south A-line and their east-west Charlotte to Wilmington line, reducing the traffic impacts in downtown Pembroke caused by trains switching between the two lines.³⁵

³⁴Historic train travel time taken from news article "New Train Won't Start on Schedule", Wilmington Morning Star, November 28, 1994
<http://news.google.com/newspapers?id=17ksAAAAIbAJ&sjid=DRUEAAAAIbAJ&pg=3271,5272817&dq=amtrak+carolinian&hl=en>

³⁵North Carolina Department of Transportation Rail Division. PowerPoint presentation to the North Carolina General Assembly Joint Legislative Transportation Oversight Committee, February 10, 2012.

These rail relocation projects have benefitted both freight rail operators and their customers through more efficient and safer switching and storage operations, and have benefited local communities and motorists through reduced noise, vibration and fewer blocked crossings in their downtowns.

1.5.3.9 Freight Rail and Rail Crossing Safety Improvement Fund (FRRCSI)

FRRCSI is a program established in 2013 that uses a portion of the NCRR cash dividend to fund eligible freight and roadway/rail crossing safety projects -- including projects on short lines -- via two Rail Division grant programs: the Short Line Infrastructure Assistance Program (SIAP) and the Rail Industrial Access Program (RIAP). (Prior to 2013, these two initiatives were funded through a separate but now-superseded state program.) The Rail Division staff uses quantitative analysis to determine funds per category (track improvements, crossing improvements, rail access improvements) and then to prioritize the projects in each category.³⁶

The program has funded safety improvements at several at-grade crossings, as well as improvements to short lines that have served industries especially in rural areas. Since 1994, the RIAP has helped fund over 70 projects that have helped create over 5,700 jobs.³⁷ Also in the past nine years, NCDOT has obligated \$13.6 million via 74 grants for SIAP.

1.5.3.10 Corridor Preservation

The Rail Corridor Preservation Act, passed by the NC General Assembly in 1988, gave NCDOT authority to purchase railroads and preserve rail corridors, and declared it a public purpose for NCDOT to reassemble critically important lost portions of rail corridors by condemnation.

The Rail Division also provides technical assistance to local governments and economic development groups to preserve freight-rail service to customers along light-density branch lines. In addition, state and federal funds are used to assist short line railroads in making improvements to tracks and bridges,

³⁶Worley, Paul. Presentation to the NC Board of Transportation, February 5, 2014.

³⁷ North Carolina Department of Transportation Rail Division.
<http://www.ncbytrain.org/projects/industrial/summary.html>

thereby helping to keep these lines active (see FRRCSI program description under Funding).

NCDOT now holds title to more than 100 miles of rail corridors to be preserved for future use. The first line to be acquired in 1988 under the law was the 67-mile Murphy branch, which was later sold to the Great Smoky Mountains Railroad for use as a rail excursion tourism line. In 2011, the Rail Division completed a major upgrade of the Piedmont and Northern rail corridor between Mt. Holly and Gastonia. A combination of State and Gaston County funds paid for the \$5 million refurbishment, and Patriot Rail is now providing freight service along the Mount Holly to Gastonia portion of the corridor.³⁸

1.5.3.11 Rail Planning

Program Description: NCDOT has undertaken several planning initiatives, but perhaps none are more important than the plans for implementing the Southeast Corridor. Beginning in 1994, North Carolina, Virginia, South Carolina and Georgia joined to form a four-state coalition to facilitate development of the Southeast Corridor (SEC). After studies were completed showing that the SEC was both warranted and feasible, North Carolina and Virginia began a Tier I Environmental Impact Statement (EIS) for alternatives from Washington, DC to Charlotte. A final Tier I EIS was completed in June 2002, with FRA issuing a Record of Decision (ROD) in October 2002. Since then, a Tier II EIS for alternatives from Raleigh to Richmond, VA has been undertaken; the Draft EIS is complete and the Final EIS and ROD should be completed by the end of 2014.³⁹ The FRA and Georgia DOT are currently undertaking a Tier I EIS to study the proposed Atlanta to Greenville-Spartanburg, SC to Charlotte Passenger Rail Corridor Investment Plan.⁴⁰ The FRA and Virginia Department of Rail and Public Transportation are currently undertaking a Tier II EIS to study passenger rail from Richmond, Virginia to Washington, DC.⁴¹ Other planning initiatives have included study of extending passenger rail services to Western North

Carolina (Asheville) and Eastern North Carolina (Wilmington). The NCDOT planning staff has also completed several other environmental studies for track improvement projects, and applications for federal grants. A table listing the many environmental documents completed as part of the planning efforts by NCDOT over the past 12 years is provided in Appendix A. Overall, there have been 44 studies approved and there are 11 studies underway.

Program Benefits: The planning and environmental work for the Southeast Corridor have helped identify the need for intercity rail in the Raleigh to Charlotte corridor and connecting to Washington, DC. These efforts have led NCDOT to invest in constructing or renovating seven rail station improvements in the Charlotte to Raleigh corridor, and over \$300 million in track and signal improvements that have improved travel time, capacity, and the overall passenger rail service in North Carolina.⁴² Ultimately, ridership on the *Carolinian* and *Piedmont* trains has increased over 70 percent in the last 9 years. The Rail Division has been awarded over \$545 million in competitive federal funds for rail improvements, in large measure because of the planning and project implementation efforts that have documented the needs and illustrated the benefits of the various rail projects in North Carolina.

1.5.3.12 Multimodal and Intermodal Planning

The NCDOT Rail Division's efforts for multimodal connections include working with local governments, local transit agencies and intercity bus providers such as Greyhound and Trailways to develop multimodal connections when planning and constructing intercity rail stations. Examples include joint bus/rail facilities in Greensboro, Salisbury, High Point and Cary, as well as plans for major multimodal stations in Raleigh and Charlotte. NCDOT has also supported connecting bus service from the Greensboro station to Winston-Salem, and Amtrak now has Thruway Bus Service to several communities in eastern North Carolina.

With regards to intermodal freight initiatives, the NCDOT has worked with NS on their new Charlotte intermodal freight center (opened in 2013), worked with CSXT on the National Gateway project including improvements at the Charlotte

³⁸North Carolina Department of Transportation Rail Division. <http://www.ncbytrain.org/projects/preservation.html>

³⁹Southeast High Speed Rail Corridor. <http://www.sehsr.org/history.html>

⁴⁰ US DOT, Federal Railroad Administration. Atlanta to Charlotte Passenger Rail Corridor. <https://www.fra.dot.gov/Page/P0657>

⁴¹ Virginia Department of Rail and Public Transportation. DC to Richmond Southeast High Speed Rail. <http://www.dc2rvr.com/about/project-history/>

⁴²North Carolina Department of Transportation Rail Division. Future Service. <http://www.ncbytrain.org/projects/future.html>

Intermodal Terminal, and is currently investigating rail access and other infrastructure improvements to the Global TransPark and the NC State Ports Authority.⁴³

In 2007, NCDOT began development of the NC Multimodal Investment Network (NCMIN), a tool used to stratify all the components, facilities and modes of the state's transportation system. All transportation facilities are classified into tiers that define how facilities function, the type of travel they serve, and other measures like connectivity and usage.⁴⁴ As part of this initiative, the NCDOT Rail Division classified various rail corridors according to their level of importance for passenger and freight.⁴⁵ This program allows NCDOT to classify entire corridors by their relative importance to the state, and see where certain modal corridors are parallel, which helps guide investments.

1.5.4 Local Initiatives

Local transit agencies in North Carolina are planning for light rail, commuter rail and other transit improvements that have required coordination and planning with the Rail Division's programs.

Charlotte region: The Charlotte-Mecklenburg 2030 Transit/Land Use Plan includes several projects that have required coordination with the NCDOT Rail Division. These include the CATS Blue Line (opened 2007) and the Blue Line Extension light rail (under construction), which uses portions of NS/NCRR right-of-way, including portions that will be part of the SEC, as well as planning for commuter rail on the NS 'O' Line (CATS proposed Red Line). CATS has also been working with NCDOT on planning for the new Charlotte Gateway Station that will connect intercity passenger rail, commuter rail, bus and streetcar services in downtown Charlotte.⁴⁶

Piedmont region: The Piedmont Authority for Regional Transit (PART) has undertaken plans for commuter rail services to connect the communities of Winston-Salem, Greensboro and Burlington, which will include portions of the NS/NCRR corridor shared with freight rail and intercity passenger rail.⁴⁷

Triangle region: Triangle Transit has been planning for commuter rail and light rail in the NS/NCRR and CSXT corridors in the Triangle region. The most recent studies include recommendations for commuter rail and light rail along the NCRR corridor linking Durham, Cary, Raleigh and Garner, and light rail on the CSXT corridor from downtown Raleigh to North Raleigh (which would parallel existing and proposed intercity passenger rail services).⁴⁸ The Durham-Orange Light Rail Project is a proposed 17 mile corridor from Chapel Hill to Durham, 2 miles of which are proposed in the NCRR right-of-way. Triangle Transit is in the project development phase of this project. The City of Raleigh has been developing plans for a new Raleigh Union Station, which will connect intercity passenger rail, commuter rail, light rail and bus in downtown Raleigh. The region's two Metropolitan Planning Organizations are also embarking on a freight study in Fiscal Years 2015 and 2016 that will be incorporated into the MPO's joint Long Range Transportation Plan update.⁴⁹

⁴³Worley, Paul. Presentation to the NC Board of Transportation, February 5, 2014.

⁴⁴North Carolina Department of Transportation. North Carolina Multimodal Investment Network. http://www.ncdot.gov/download/performance/NCMIN_Definitions.pdf

⁴⁵North Carolina Department of Transportation. North Carolina Railroad System Map. <http://www.ncdot.gov/download/performance/NCMINmaps/RailMap.pdf>

⁴⁶Charlotte Area Transit System. <http://charmeck.org/city/charlotte/cats/planning/Pages/default.aspx>

⁴⁷Piedmont Authority for Regional Transit. http://www.partnc.org/images/PnR_Lot%20Map_101507.pdf

⁴⁸Triangle Transit. Our Transit Future. <http://ourtransitfuture.com/projects/>

⁴⁹Capital Area Metropolitan Planning Organization. 2014-2015 Unified Planning Work Program. Adopted March 19, 2014. <http://www.campo-nc.us/UPWP/FY-2015/FY15-UPWP-2014-03-19-ADOPTED-SIGNED.pdf>

2 Chapter Two - The State's Existing Rail System

This chapter provides an overview and inventory of the state's existing rail system, and describes the trends and forecasts that illustrate the need for rail in North Carolina. It also describes the criteria used to evaluate and prioritize the rail corridors and projects that could meet the needs and service gaps identified in the State Rail Plan.

2.1 RAIL SYSTEM DESCRIPTION AND INVENTORY

This section describes the existing rail system in North Carolina, including its impact on North Carolina's economy and environment.

2.1.1 Existing Rail System

North Carolina has over 3,200 miles of railroad, serving 86 of the state's 100 counties. This section describes North Carolina's Class I and short line railroads as well as Amtrak's passenger service.

2.1.1.1 Freight Rail System

The rail network in North Carolina provides services to ports, power plants, mines, military installations, and industries including, but not limited to, agriculture, forestry, plastics, furniture, food products, and chemicals. Freight railroads support jobs for about 2,600 railroad employees in the state.¹ The freight rail system carries almost any product grown or produced in a global economy in a wide variety of service alignments. Bulk goods, such as coal, may be carried in unit trains of uniform car types with dedicated loading and unloading facilities. Intermodal trains may be comprised entirely of containers yet the individual destinations and contents of the containers are widely varied. Mixed freight and manifest trains may contain a single or multiple cars of the same product.

The individual train movements are based on a number of operating factors from overall customer demand to the US Department of Transportation (USDOT) shipping requirements. The railroads may schedule daily departures and arrivals of refrigerated cars and intermodal trains to meet predictable schedules for customers.

2.1.1.2 Railroad Classifications and Definitions

US railroads are grouped by size classifications established by the Surface Transportation Board and based on annual operating revenues. The Class II minimum size is adjusted from time to time by the Board while the Class I minimum is indexed annually for inflation. The class definitions are significant in that the regulatory and annual reporting requirements are considerably greater for the Class I railroads.²

- A Class I railroad is a railway company having annual carrier operating revenues of at least \$467 million. There are seven Class I freight carriers in North America. Amtrak is also a Class I carrier under this definition. Class I railroads Amtrak, Norfolk Southern (NS), and CSX Transportation (CSXT) operate within North Carolina.
- A Class II railroad is a railway company with annual operating revenues of less than \$467 million and more than \$40 million. No Class II railroads operate in North Carolina. A number of Class II railroads have emerged by creating operating divisions of acquired Class III railroads. For example, the Genesee & Wyoming Inc., a \$1.6 billion company in 2013, operates 116 railroads in 11 regions including four in North Carolina with over 180 track miles.
- A Class III railroad is a railway company with annual operating revenue of less than \$37 million. In North Carolina there are two types of Class III railroad companies: *Short Line* and *Switching and Terminal*.
 - Short line railroads are independent railroad companies that operate over a short distance, usually fewer than 350 miles.

¹ NC Maritime Strategy Technical Memorandum – North Carolina Railroads Existing and Planned Infrastructure, AECOM May 2012

²American Short Line and Regional Railroad Association. http://www.aslrra.org/about_aslrra/faqs/

- Switching and Terminal railroads are defined by the American Short Line and Regional Railroad Association as railroads that are either jointly owned by two railroads for the purpose of transferring cars between railroads or operate solely within a facility or group of facilities. All Switching and Terminal companies are Class III, regardless of revenue.

Twenty Class III railroads operate in North Carolina ranging from 3 to 173 miles in length.

Two federally-owned railroads are also located in North Carolina, providing access to Camp Lejeune and Military Ocean Terminal – Sunny Point. NS and CSXT operate across each of these federally-owned rights-of-way, respectively. Figure 2 - 1 identifies railroad owners and operators in North Carolina.

Within the overall classification of railroads is the types and volumes carried by each of the railroads. For the Class I and II railroads, the traffic routing is often based on North Carolina customers as well as the overall traffic and conditions on their North American network. Class III railroads are typically directly influenced by the customers along their respective lines, although in some cases they may be operating as a connecting line between Class Is or from a port to a Class I railroad.

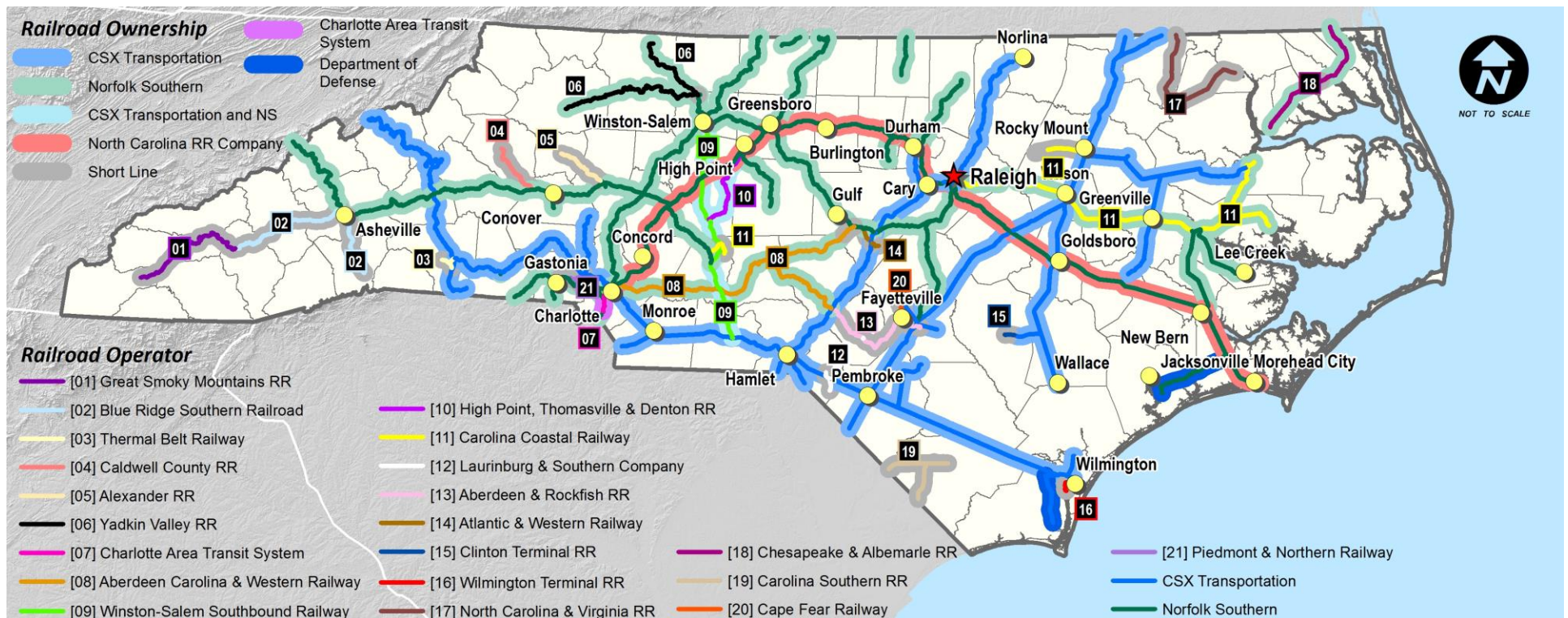


Figure 2 - 1 Track Ownership and Railroad Operators in North Carolina

2.1.1.3 Freight – Class I Railroads

Two Class I freight railroad companies, CSX Transportation (CSXT) and Norfolk Southern Railway (NS), operate approximately 70 percent of the state's rail system. Short lines and switching companies operate the remainder of the system.

2.1.1.3.1 CSX Transportation

CSX Corporation is headquartered in Jacksonville, Florida. It provides rail transportation services over its 21,000 route mile network to 23 states east of the Mississippi River and two Canadian Provinces.³

CSXT operates approximately 1,111 miles of track in North Carolina. In 2013, CSXT handled more than 872,000 carloads of freight along its network in North Carolina.⁴ It operates along three primary corridors. An east-west line runs from Charlotte to the Port of Wilmington and passes through Pembroke and Hamlet. The north-south A Line is CSXT's busiest in North Carolina and traverses the eastern part of the State, paralleling I-95. The A Line is part of CSXT's Florida to New York Corridor; an average of 32 freight trains per day operate along this line.⁵ CSXT also has a major north-south corridor in the western part of the State that connects Tennessee to South Carolina and is a major conduit for coal from Appalachia to power plants in North Carolina and the Southeast. CSXT has major rail yards at Hamlet, on the Charlotte to Wilmington route, and at Rocky Mount on the A Line. CSXT also has a recently expanded intermodal terminal in Charlotte and bulk transfer terminals at Charlotte, Raleigh, Wilmington and Winston-Salem. CSXT is developing its National Gateway Corridor, which is an initiative that will improve intermodal service between Mid-Atlantic ports and the manufacturing and consumer centers in the Midwest. The A Line, the CSXT Charlotte Intermodal Terminal and the Port of Wilmington are all components of the National Gateway Corridor. CSXT's network is shown in Figure 2 - 1.

³ CSXT Company Overview, <http://csx.com/index.cfm/about-csx/company-overview/>

⁴ CSXT State Information, <http://www.csx.com/index.cfm/about-csx/company-overview/state-fact-sheets/north-carolina/>

⁵ Based on NCDOT SARAH GIS database.

2.1.1.3.2 Norfolk Southern

NS operates 20,000 route miles in 22 states and Washington, DC. NS's corporate headquarters are located in Norfolk, VA.

In North Carolina, NS operates approximately 1,213 miles of track. NS' primary corridor parallels I-85 through the central part of the State connecting Charlotte and Greensboro with Atlanta, Georgia and the Northeast. On average, 35 freight trains per day operate along this line.⁶ NS also operates two major east-west lines; one connecting Greensboro to Durham, Raleigh, and the state port in Morehead City and the other connecting Asheville and western North Carolina to their main north-south corridor in Salisbury. NS' Charlotte to Greensboro and Greensboro to Morehead City lines are operated under an operating and maintenance agreement with the North Carolina Railroad Company (NCR).⁷ NS has a major classification yard, at Linwood, just north of Salisbury. NS also operates two intermodal facilities in North Carolina; one in Greensboro and a recently opened a new, much larger facility at Charlotte-Douglas International Airport. NS also operates two bulk transfer terminals located just south of Charlotte and east of Winston-Salem. In addition, NS maintains an auto distribution terminal east of Winston-Salem. The eastern leg of NS' Crescent Corridor Initiative utilizes the NS corridor paralleling I-85 through North Carolina. The Crescent Corridor is an initiative to improve intermodal service between New Orleans and Memphis in the Southeast and the Northeast by constructing new terminals and improving track capacity and speeds. The recently opened Charlotte Intermodal Terminal is a major component of the Crescent Corridor Initiative. NS' network is also shown in Figure 2-1.

2.1.1.3.3 Characteristics of the Class I Network

Figure 2 - 2 presents gross tonnage carried by the Class I freight network in North Carolina. As expected, higher volumes are carried on north-south routes, though in addition to those routes, CSXT's Pembroke to Charlotte route carries greater than 20 million gross tons. Through traffic across the spectrum of commodities contributes significantly to the volumes shown. Such traffic arises

⁶ Based on NCDOT SARAH GIS database.

⁷ NS operates over NCR under an operating and maintenance agreement. The operating and maintenance agreement covers all 317 miles of the NCR. While the State of North Carolina owns 100% of the stock of the NCR, it does not directly own the properties nor control the operating and maintenance agreement.

in part from North Carolina's central position relative to activities up and down the eastern seaboard. In addition, hazardous material carloads can be transported by rail. Hazardous materials are generally shipped as part of a manifest train that includes a mix of commodities and goods in a wide variety of rail cars appropriate to each type of freight. Four of the corridors are indicative of connections to ports and key industries in North Carolina (Raleigh-Morehead City, Norlina-Pembroke, Monroe-Pembroke, and Pembroke-Wilmington).

Both Class I railroads are also part of the Strategic Rail Corridor Network (STRACNET). STRACNET is an interconnected and continuous rail line network consisting of over 38,000 miles of track serving over 170 defense installations across the nation. Figure 2 - 3 shows this network.

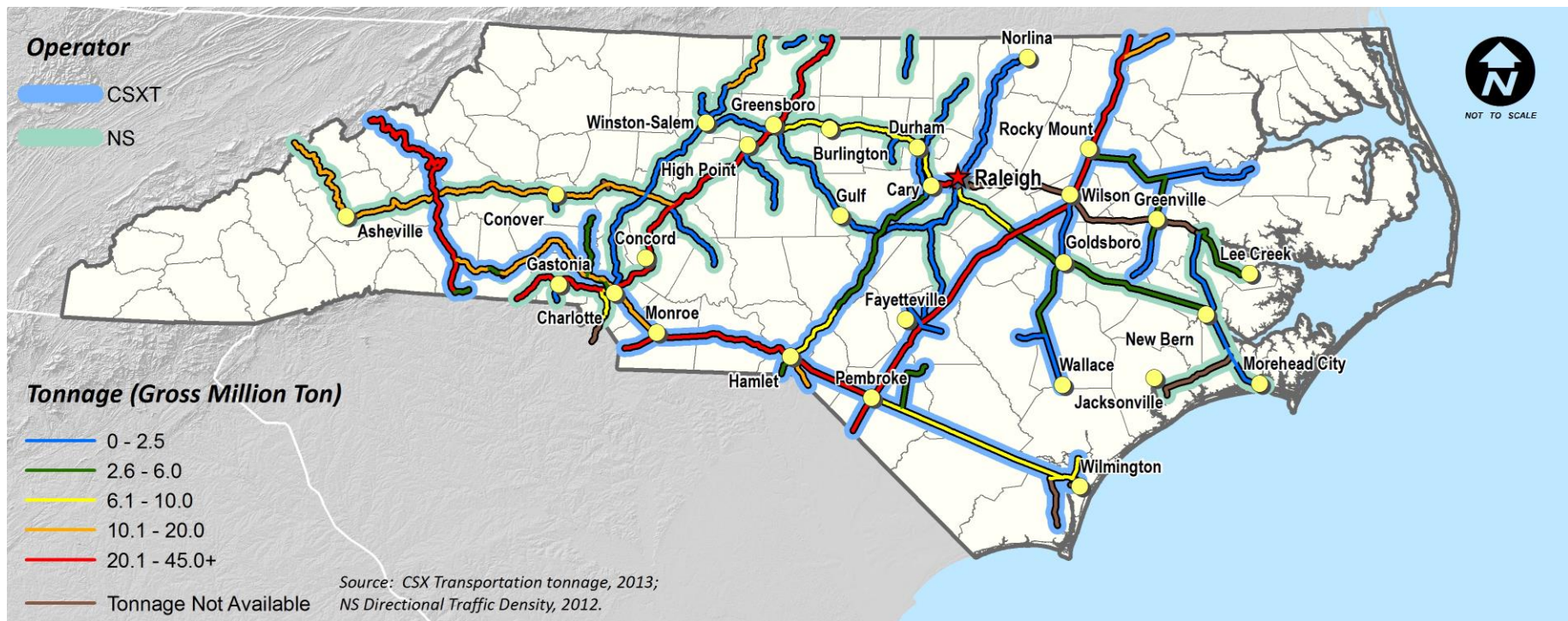


Figure 2 - 2 Annual Tonnage Hauled on North Carolina's Class I Freight Network

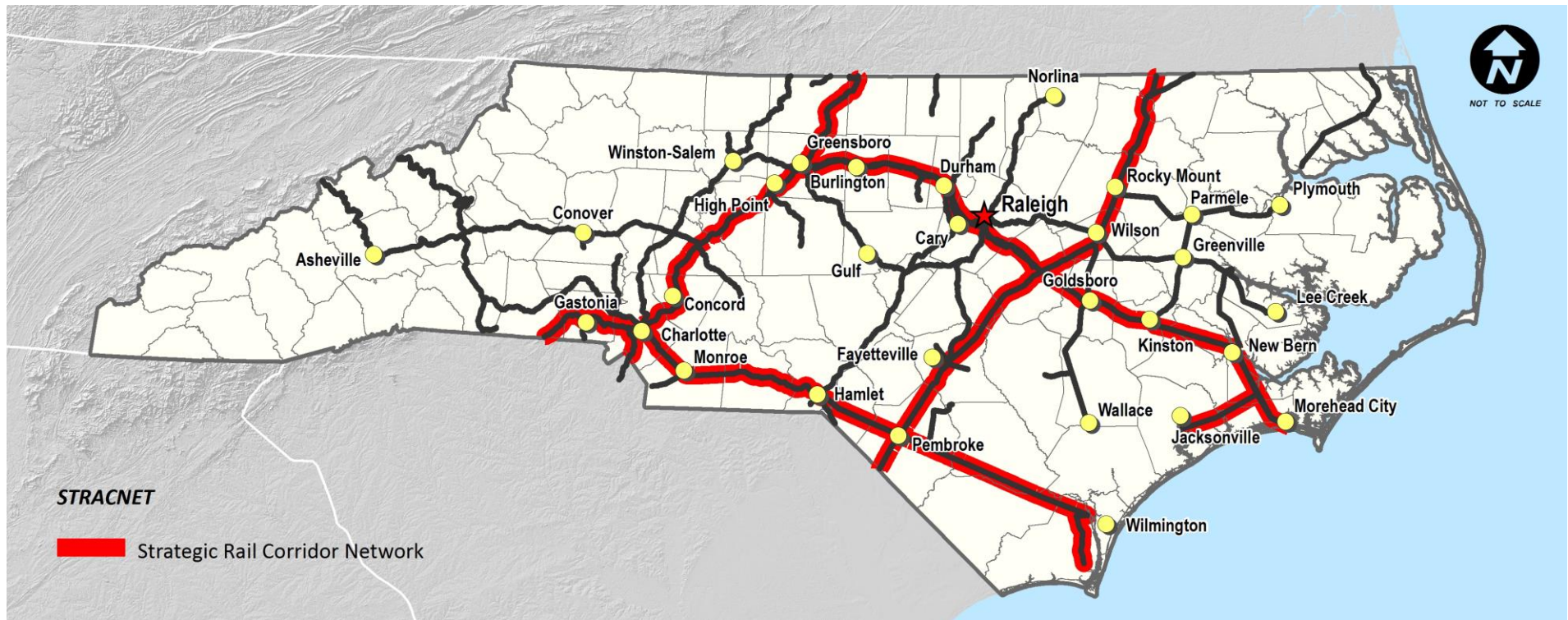


Figure 2 - 3 Strategic Rail Corridor Network in North Carolina

Lengths of double track, sidings, and numbers of yards along Class I-operated freight corridors are presented by corridor in Table 2-1 (based on existing GIS data, not adjusted for ongoing projects). The length, number, and placement of double track segments, passing sidings and other rail network improvements add to overall capacity. The effect on capacity is difficult to measure and is directly impacted by the freight mix and operating practices along the line.

Five classes of tracks, defined by operating speed limits for freight and passenger trains, are established by the Surface Transportation Board in 49 CFR 213.9. Higher class tracks have higher operating speed limits. As noted in the Southeast Rail Operations Study (SEROps)⁸ the majority of the Class I system

⁸ SEROps was funded by the I-95 Corridor Coalition with the initial goal of examining the rail transportation system in the southeastern states (northeastern and mid-Atlantic states were done

can accommodate 286,000 lb. rail cars. The majority of Corridors 6, 9, and 15 are Class 4 track (Corridor 6 from Charlotte to the Virginia State line, Corridor 9 from Greensboro to Raleigh, and Corridor 15) rated for maximum speeds of 60 mph and 80 mph for freight and passenger trains, respectively.⁹ These corridors carry the *Crescent*, *Silver Meteor*, *Palmetto*, *Piedmont*, and *Carolinian* passenger services. Corridor 13, the S Line, carries the *Silver Star* but the corridor is rated for maximum operating speeds of 60 mph. Some segments may be rated between 15 and 30 mph. Actual speeds will vary with the traffic mix and overall operating conditions for the segment and near network conditions. Traffic may

in NEROps and MAROps, respectively). Next the study developed corridor-level information for rail initiatives with a short list of projects mutually beneficial to the states and railroads to focus ongoing multi-state planning and funding activities. [paraphrased from i95coalition.org]

⁹ FRA Class 4 track is 80 mph for passenger services. Both freight and passenger services typically operate at top speeds less than the maximum permitted.

at times move at lower speeds in the range of 6 to 15 mph and are reported as the minimum encountered. Average speeds and the frequencies or percentage of time traveled at lower speeds can also provide an insight as to how rail traffic moves along a segment or corridor. The balance of the system is comprised of

Class I, II, and III tracks. Most of the system is single track with associated sidings. The Piedmont Improvement Program is adding 32 miles of second track which will complete double-tracking of the NS mainline between Greensboro and Charlotte (Corridor 06).

Table 2 - 1 North Carolina Rail Corridor Characteristics Summary

CORRIDOR	OPERATOR	OWNER	BRANCH	TRACK LENGTH	DOUBLE TRACK		SIDINGS			YARDS
				Mileage	Mileage	Percent	Total Count	Mileage	Percent of Miles	Total Count
01	NS	NS	S	45.9	8.5	18.6%	4	4.5	10%	1
02	CSXT	CSXT	SF, Z	173.4	0.0	0.0%	22	25.1	14%	1
03	NS	NS	S	148.2	0.0	0.0%	24	28.7	19%	2
04	NS	NS	O, L, R	129.2	0.0	0.0%	19	10.9	8%	3
05	NS	NS	K	39.4	0.0	0.0%	7	5.9	15%	2
06	NS	NCRR/NS*	MAIN	186.2	83.3	44.7%	21	50.7	27%	5
07	CSXT	CSXT	SF, Z	28.9	0.0	0.0%	7	5.7	20%	1
08	NS	NS	R	25.1	0.0	0.0%	3	4.2	17%	1
09	NS	NCRR/NS*	H	114.9	0.0	0.0%	16	20.3	18%	3
10	NS	NS	CF	43.0	0.0	0.0%	9	2.7	6%	1
11	CSXT	CSXT	SF, SE	84.2	0.0	0.0%	12	23.1	27%	2
12	CSXT	CSXT	S	57.6	0.0	0.0%	5	4.0	7%	1
13	CSXT	CSXT	S	101.7	0.0	0.0%	12	19.0	19%	2
14	NS	NS	NS, VF	62.8	0.0	0.0%	7	3.0	5%	2
15	CSXT	CSXT	A	182.0	0.0	0.0%	17	105.1	58%	3
16	CLNA	NS	NS	81.2	0.0	0.0%	7	5.7	7%	2
17	NS	NCRR/NS*	EC, H	113.5	0.0	0.0%	13	5.8	5%	3
18	CSXT	CSXT	AC	70.7	0.0	0.0%	10	12.6	18%	5
19	CSXT	CSXT	SE	73.0	0.0	0.0%	9	8.0	11%	2
20	CLNA	NS	NS	45.4	0.0	0.0%	4	4.6	10%	0
21	CSXT	CSXT	ABC, AB	65.1	0.0	0.0%	4	3.1	5%	1
22	CSXT	CSXT	AA	38.8	0.0	0.0%	6	3.0	8%	0
23	CSXT	CSXT	Z	18.8	0.0	0.0%	0	0.0	0%	1
24	NS	NS	S, HG	2.9	0.0	0.0%	1	0.5	18%	0

CORRIDOR	OPERATOR	OWNER	BRANCH	TRACK LENGTH	DOUBLE TRACK		SIDINGS			YARDS
				Mileage	Mileage	Percent	Total Count	Mileage	Percent of Miles	Total Count
25	NS	NS	HG	7.9	0.0	0.0%	0	0.0	0%	0
26	CSXT	CSXT	SFE	24.0	0.0	0.0%	1	1.6	7%	0
27	NS	NS	N	28.7	0.0	0.0%	4	1.0	4%	0
28	NS	NS	M	26.9	0.0	0.0%	5	2.7	10%	1
29	NS	NS	L	11.9	0.0	0.0%	3	1.7	14%	0
30	NS	NS	L	14.4	0.0	0.0%	1	0.2	1%	0
31	NS	NS	J	10.7	0.0	0.0%	0	0.0	0%	0
32	NS	NS	D	31.1	0.0	0.0%	0	2.5	8%	2
33	NS	NS	NS, CF	38.4	0.0	0.0%	5	2.3	6%	0
34	CSXT	CSXT	SH	11.3	0.0	0.0%	1	0.9	8%	0
35	CSXT	CSXT	AE	7.9	0.0	0.0%	0	0.0	0%	2
36	CSXT	CSXT	AF	7.6	0.0	0.0%	2	0.8	11%	2
37	CSXT	CSXT	SE	21.5	0.0	0.0%	0	0.0	0%	0
38	CSXT	CSXT	SA	17.7	0.0	0.0%	2	2.0	11%	0
39	CSXT	CSXT	ACA	9.9	0.0	0.0%	2	0.4	5%	1
40	CSXT	Federal	AC	21.8	0.0	0.0%	2	1.6	8%	3
41	NS	NS	NB	31.7	0.0	0.0%	2	2.0	6%	2
42	CSXT	CSXT	SDS	19.6	0.0	0.0%	8	3.7	19%	2
44	NS	Federal	CL, CK	29.1	0.0	0.0%	1	1.0	3%	1
TOTAL				2,303.7	91.9	4.0%	278.0	381.0	17%	60

* NCRRT owns the corridor from Charlotte to Greensboro to Morehead City; it leases operating rights to NS. NS owns the mainline corridor south of Charlotte and north of Greensboro.

Railroad operation on proprietary networks and connections are governed by adopted operating rules and communication protocols. The railroads have adopted operating rules often modified to fit their individual circumstances. The operating rules are complemented and modified by schedules and special notices, as well as requirements proposed by the Federal Railroad Administration (FRA), the Pipeline and Hazardous Materials Safety Administration and the Transportation Security Administration. The Norfolk Southern System Timetable, Timetable Number 1 (Effective Date January 1, 2012) System Wide Instruction 444-1 is a speed and block protection for

passenger trains operating on the NS system. The additional empty block spacing for passenger trains may be available for scheduling with technology improvements such as those proposed with Positive Train Control (PTC). The potential improvement will be particularly important for bi-directional and overtaking traffic. The operating rules are coded and applied to segments of the respective railroad system as in Table 2 - 2, and the rules are briefly defined in Table 2 - 3. The signal control rules that apply to each corridor are shown in Figure 2 - 4.

Table 2 - 2 Train Signals

SIGNAL CONTROL	RAILROAD		LENGTH (miles)	PERCENTAGE OF TRACK
	CSXT	NS		
Rule 261 (WHITE)	435.4	365.8	801.3	36.5%
Rule 171 (PINK)	0.9	526.5	527.4	24.0%
DTC (RED)	421.5	0.1	421.7	19.2%
Rule 271 (GREY BLUE)	0.0	139.6	139.6	6.4%
Rule 193 (BLUE)	27.2	0.0	27.2	1.2%
Rule 93 (PURPLE)	0.0	17.5	17.5	0.8%
Rule 96 (GREEN)	12.2	0.0	12.2	0.6%
Rule 105 (YELLOW)	8.4	0.0	8.4	0.4%
Not Identified	153.0	85.2	238.3	10.9%
TOTAL	1,058.7	1,134.8	2,193.5	100.0%

Table 2 - 3 Train Signal Control Rules

SIGNAL CONTROL RULE	DEFINITION
271	Track Authority rules authorize train and engine movements and ABS rules apply. ABS signals indicated condition of the block.
171	Use of the main track is authorized by issuance of a Mandatory Directive, under the direction of the Train Dispatcher/Control Operator.
DTC	Direct Traffic Control is a verbal authorization system that divides the line into fixed DTC blocks. Trains are authorized to occupy only specific DTC blocks.
193	An Authority must not be considered in effect by the Train Dispatcher/Control Operator until acknowledgment of the "OK" is received.
261	Signal indication will be the authority for trains and engines to operate in either direction on the same track and ABS rules apply.
96	Movement on a siding other than controlled sidings must be made at restricted speed.
105	When an engine is to be detached, equipment left standing must be properly secured with a sufficient number of effective hand brakes. Air brakes must not be depended upon to hold cars or an unattended engine.
93	All trains and engines within yard limits must move at restricted speed unless main track is known to be clear by automatic block signal indication. A train or engine must not move against the current of traffic within yard limits until provision has been made for the protection of the movement.
System Wide Instruction 444-1	The Train Dispatcher/Control Operator must maintain at least 1 unoccupied block between non-passenger trains and occupied uses as identified in the schedule, while noting exceptions and conditions.



Corridors Designated by Train Signal Rules

2.1.1.4 Freight –Class III (Short Lines)

The state also has 20 short line railroads that serve businesses and industries in North Carolina. Refer to Figure 2 - 1 and Table 2-4 for locations and route miles. Generally, short lines along with lower volume Class I branch lines, provide access from industries, transload facilities, and ports in NC to the higher volume north-south Class I network. According to the Southeast Rail Operations Study, much of the short line network in the southeast is not capable of handling 286,000 pound rail cars. This is often due to needed bridge and rail upgrades.

Railroad freight movements are directly affected by the ease of connections and switching operations at State ports, barge and ocean terminals and transload facilities, as well as connections with short lines and their industrial customers. Transload facilities and short lines are shown in Figure 2-7. Continued efforts to monitor performance can build upon Class I railroad, short line programs, and port utilization studies that have been undertaken. These operations are also important to the shippers and carriers for schedule reliability.

Table 2 - 4 Railroad Mileage in North Carolina

RAIL OPERATOR	LENGTH (miles)	% OF NC RAIL NETWORK
<i>Class I Operators</i>	<i>2,323.4</i>	<i>70.4%</i>
CSXT	1,081.7	32.8%
NS	1,241.7	37.6%
<i>Short Line Operators</i>	<i>956.4</i>	<i>29.0%</i>
Aberdeen & Rockfish RR	45.8	1.4%
Aberdeen Carolina & Western Railway	138.8	4.2%
Alexander RR	18.5	0.6%
Atlantic & Western Railway	11.0	0.3%
Blue Ridge Southern Railroad	71.5	2.2%
Caldwell County RR	22.1	0.7%
Cape Fear Railways	10.5	0.3%
Carolina Coastal Railway	172.2	5.2%
Carolina Southern Railroad	35.8	1.1%
Chesapeake & Albemarle RR	52.7	1.6%
Clinton Terminal RR	3.4	0.1%
Great Smoky Mountain RR	52.2	1.6%
High Point, Thomasville & Denton RR	31.8	1.0%
Laurinburg & Southern Company	27.9	0.8%
North Carolina & Virginia RR	54.7	1.7%
Piedmont & Northern Railway	14.7	0.4%
Thermal Belt Railway	8.4	0.3%
Wilmington Terminal RR	3.6	0.1%
Winston-Salem Southbound Railway	86.8	2.6%
Yadkin Valley RR	94.0	2.9%
<i>Non-Class I, Non-Short Line Operators</i>	<i>18.9</i>	<i>0.6%</i>
Charlotte Area Transit System (CATS)	18.9	0.6%
Total NC Mileage	3,298.7	100.0%

Source: NCDOT Rail Track shapefile, 2014

2.1.1.5 Intercity Passenger Rail Services

North Carolina is served by six intercity passenger routes (14 daily trains) with stops in 16 communities. Five of the routes are interstate services and the other route provides two daily roundtrips along the Raleigh to Charlotte Piedmont corridor. Table 2 - 5 and Figure 2 - 5 provide an overview of intercity passenger services. An additional Amtrak train, the *Auto Train* runs from Lorton, VA to

Sanford, FL along the CSXT A Line, passing through North Carolina without stopping.

These passenger services can be grouped into two categories:

- The state-supported *Piedmont* and *Carolinian* services connecting the state's most heavily populated corridor between Raleigh and Charlotte, and
- Other interstate passenger rail services, consisting of the Amtrak operated *Crescent*, *Silver Star*, *Silver Meteor* and *Palmetto*.

The *Carolinian* (trains 79 and 80) operates between Charlotte and New York and began revenue service in 1990. In 1995, NCDOT and Amtrak began the *Piedmont* (trains 73 and 74) as a complementing service to the *Carolinian* between Raleigh and Charlotte. Starting in 2010, NCDOT and Amtrak added a second *Piedmont* train pair (trains 75 and 76) between Charlotte and Raleigh as a mid-day service. The current North Carolina service schedule for these trains is available at ncbytrain.org or Amtrak.com.

NCDOT funds the *Piedmont* through a state subsidy and passenger revenues. NCDOT also finances the *Carolinian* service between Washington, DC and Charlotte not covered through passenger revenues (ticketing, food service). For the *Piedmont* trains, NCDOT provides financial support as well as rolling stock (locomotives, baggage cars and coaches), layover operations in Charlotte (refueling, cleaning, and crew base) and a layover operations and NCDOT's Capital Yard Mechanical Facility in Raleigh. Amtrak provides funds for costs that are not covered by revenues, including overhead and capital expenses.

Amtrak's *Crescent* (trains 19 and 20) serves the same corridor as the *Carolinian* and *Piedmont* trains between Greensboro and Charlotte. The *Palmetto* (trains 89 and 90) operates daily along the CSXT A Line with North Carolina stops in Rocky Mount, Wilson, Selma and Fayetteville. Amtrak's *Silver Star* (trains 91 and 92) serves Rocky Mount on the CSXT A Line and Raleigh, Cary, Southern Pines and Hamlet along the CSXT S Line. The *Silver Meteor* (trains 91 and 90) provides stops in Rocky Mount and Fayetteville on the CSXT A Line in North Carolina.

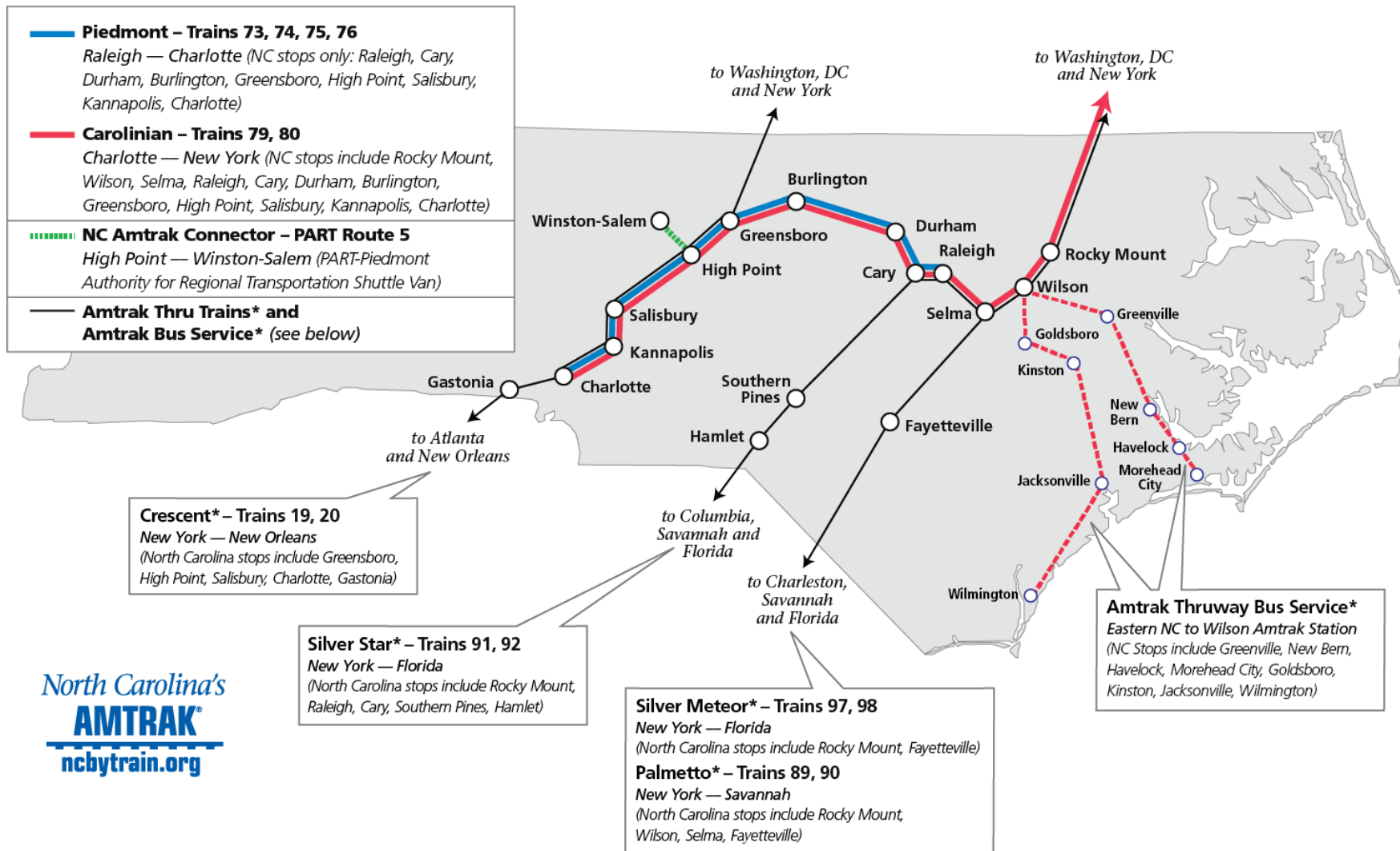
Table 2 - 5 shows the existing services of these trains in North Carolina. The schedules for these trains are available at Amtrak.com and ncbytrain.org. Figure 2 - 5 shows the existing passenger train services in North Carolina.

Table 2 - 5 **Characteristics of Amtrak Services in North Carolina**

ROUTE NAME (Train Nos.)	SERVICE TYPE	NC STATIONS SERVED	HOST RAILROADS	RIDERSHIP 2013*	ON TIME PERFORMANCE 2013	CORRIDORS SERVED
<i>Carolinian</i> (79/80)	Daily, New York City – Charlotte	Rocky Mount, Wilson, Selma, Raleigh, Cary, Durham, Burlington, Greensboro, High Point, Salisbury, Kannapolis, Charlotte	CSXT, NS, NCRR	317,550	65.2%	I-95, I-40, I-85
<i>Piedmont</i> (73, 74, 75, 76)	Twice Daily, Raleigh-Charlotte	Raleigh, Cary, Durham, Burlington, Greensboro, High Point, Salisbury, Kannapolis, Charlotte	CSXT, NS, NCRR	170,266	90.5%	I-40, I-85
<i>Crescent</i> (19, 20)	Daily, New York City – New Orleans, LA	Greensboro, High Point, Salisbury, Kannapolis, Charlotte, Gastonia	NS, NCRR	306,733	67.8%	I-85, US-29
<i>Palmetto</i> (89, 90)	Daily, New York City – Miami, FL (via Savannah)	Rocky Mount, Wilson, Selma, Fayetteville	CSXT	207,915	71.2%	I-95
<i>Silver Star</i> (91, 92)	Daily, New York City – Miami, FL	Rocky Mount, Raleigh, Cary, Southern Pines, Hamlet	CSXT	414,077	55.3%	I-95, US-1
<i>Silver Meteor</i> (97, 98)	Daily, New York City – Miami, FL	Rocky Mount, Fayetteville	CSXT	373,162	49.2%	I-95

*Except for *Piedmont*, ridership is for all stations, including those outside North Carolina
Source: Amtrak

North Carolina Passenger Train Service



North Carolina's
AMTRAK
ncbytrain.org

Source: NCDOT Rail Division

Figure 2 - 5 North Carolina Passenger Rail Service

Amtrak currently serves 16 cities across North Carolina. During the North Carolina State Fair in Raleigh (held 10 days in October) both the *Piedmont* and the *Carolinian* make a special stop for fairgoers. NCDOT also adds a special stop in Lexington during the Barbeque Festival (held one Saturday in October) for the *Piedmont* and *Carolinian* trains. Since 1990, ridership on Amtrak in North Carolina has tripled and ridership since 2001 has doubled. In 2013, there were nearly one million trips originating or ending in North Carolina. Over the past three years (2011-2013), passenger rail activity at North Carolina stations has increased 8.3 percent. This includes a 9.1 percent increase in ridership on the state sponsored *Carolinian* and *Piedmont* services during this same time period. Nearly every station had an increase during this period, with the exception of Raleigh, Fayetteville and Selma and the two seasonal stops (Lexington and North Carolina State Fair). The large decrease in Raleigh and the increase in Cary between 2011 and 2013 are due primarily to the Cary station expansion which was completed in 2011. These two stations are only 8 miles apart and many passengers choose to use the Cary station which now has better amenities than the Raleigh station; the existing Raleigh station also suffers from a parking shortage and overcrowding during peak periods. The largest ridership gains were seen in the Charlotte to Raleigh corridor, which is the state's most populated corridor, has the most frequent service, and is the terminus for the *Piedmont* trains. Table 2 - 6 shows the station totals and ridership changes from 2011 to 2013.

NCDOT has plans to introduce additional frequencies along the Charlotte to Raleigh corridor within the next five years, as well as long-term plans for upgrading the corridor to accommodate additional service frequencies. In addition, NCDOT has been studying options to extend services to western and eastern portions of the state currently without passenger rail service. More detail on these future plans are described in Section 2.1.3.

Table 2 - 6 Annual Ridership by Station in North Carolina

CITY	2011	2012	2013	PERCENT CHANGE, 2011-2013
Burlington	22,476	25,851	25,452	13.2%
Cary	44,962	78,278	88,669	97.2%
Charlotte	181,566	193,144	201,481	11.0%
Durham	74,783	79,292	83,232	11.3%
Fayetteville	55,758	53,510	53,590	-3.9%
Gastonia	1,664	1,565	1,741	4.6%
Greensboro	124,396	134,888	139,869	12.4%
Hamlet	4,820	4,826	4,882	1.3%
High Point	33,744	38,358	40,302	19.4%
Kannapolis	16,951	18,748	19,205	13.3%
Lexington*	580	608	542	-6.6%
NC State Fair*	2,788	3,010	2,672	-4.2%
Raleigh	192,434	163,698	159,584	-17.1%
Rocky Mount	56,400	53,779	52,631	-6.7%
Salisbury	26,109	27,606	31,539	20.8%
Selma	13,248	13,388	13,222	-0.2%
Southern Pines	7,234	7,092	7,554	4.4%
Wilson	43,845	44,158	52,692	20.2%
TOTALS	903,758	941,799	978,859	8.3%

* Special Seasonal Stop
Source: Amtrak & NCDOT

2.1.1.6 Connecting Bus Services

Amtrak operates daily Thruway Bus Connections to Morehead City and Wilmington from the Wilson station. These connections allow passengers to connect with both the *Carolinian* and *Palmetto* trains. In addition, the Piedmont Authority for Regional Transit (PART) operates Route 5 (marketed as the NC Amtrak Connector) between downtown Winston-Salem and High Point, allowing patrons to connect to the *Piedmont* and *Carolinian* trains. NCDOT subsidizes this service in a partnership with PART. Figure 2 - 5 shows the existing passenger train services in North Carolina.

2.1.1.7 Proposed Rail Services

The NCDOT has studied and planned for additional passenger rail services across the state and with adjoining states. These planned enhancements include reducing travel times and increasing frequencies along the *Piedmont* corridor (connecting the Charlotte, Triad and Triangle regions), extending passenger rail to western and southeastern North Carolina and other metropolitan areas, and implementing the federally-designated Southeast Corridor. More details on these proposed services are provided in Section 2.1.3 below and in Chapter 3.

2.1.1.8 Rail Stations

The NCDOT has played an instrumental role in building and renovating North Carolina rail stations over the past two decades. A brief summary of NCDOT's program of building and enhancing stations, along with improvements planned and underway, is provided in this section.

In the 1990s, after partnering with Amtrak to start the *Carolinian* and *Piedmont* routes, NCDOT began partnering with local governments to plan station improvement and multi-modal transportation centers. NCDOT utilized various resources to fund these projects including federal transportation Enhancement Funds, federal Congestion Mitigation and Air Quality Funds, Federal Transit Authority (FTA) discretionary formula funds and the portion of the State Highway Trust Fund set aside for economical alternatives to highway construction. MPOs and local transit authorities are also partners in funding stations, especially when a station is part of a multi-modal transportation center. Major renovations and new station construction began in the 1990s with a large number of projects completed in the early 2000s. A second wave of station improvements, including renovations, occurred in Cary, High Point, Burlington and Kannapolis as part of the 2009 American Recovery and Reinvestment Act (ARRA) funded Piedmont Improvement Program for projects along the Raleigh to Charlotte "Piedmont" corridor. An overview of North Carolina rail station characteristics is provided in Table 2 - 7 along with summaries of major station renovations.

2.1.1.8.1 Existing Active Stations

There are 16 active passenger stations in North Carolina. Most active passenger stations are housed in original train stations. These include the stations in Fayetteville, Greensboro, Hamlet, High Point, Raleigh, Rocky Mount, Salisbury, Selma, Southern Pines, and Wilson. The remaining stations are either in modern buildings (Cary, Charlotte, Gastonia, and Kannapolis) or reuse existing structures such as a tobacco warehouse in Durham and the North Carolina Railroad Company Shops building in Burlington.¹⁰

2.1.1.8.2 Station Planning for Existing Service

Plans are underway to move three existing Amtrak stations into new multi-modal transportation centers, which will consolidate a variety of transportation options in a central facility. The Charlotte Amtrak station will be moved from its current location, roughly a mile north of downtown, to the Charlotte Gateway Station in downtown Charlotte. The new multi-modal center will house the new intercity passenger rail station in addition to Charlotte Area Transportation System (CATS) buses, Greyhound intercity bus service, the proposed Red Line commuter rail, the Center City Streetcar and future transit connections to West and Southeast Charlotte. The station is expected to be funded using federal funds, state funds, and possibly private sector funds.

Plans are also underway for a new multi-modal transit center in the City of Raleigh. The first phase of the Raleigh Union Station (RUS) is set to open in 2017 and will include a new train station in a renovated downtown warehouse. The first phase is funded using federal Transportation Investments Generating Economic Recovery (TIGER) grants, FRA planning grants, American Recovery and Reinvestment Act (ARRA) funds, local funds, and NCDOT funds. Subsequent phases will add accommodations for buses, parking, commuter and light rail and possibly intercity bus service.¹¹

¹⁰Amtrak. The Great American Stations Project – Station Listing. Accessed March 6, 2014. <http://www.greatamericanstations.com/Stations/station-listing>

¹¹City of Raleigh. Union Station: Raleigh's Multi-Modal Transit Center. February 24, 2014. Accessed March 6, 2014. <http://www.raleighnc.gov/business/content/PlanUrbanDesign/Articles/UnionStation.html>

The City of Gastonia has begun the planning process for a new multi-modal transportation center in its downtown. The multi-modal transportation center will house Amtrak, Greyhound, local and regional bus service, and include accommodations for a possible future commuter rail line to Charlotte.¹² A master plan for the center was developed in 2012 and was awaiting adoption by the City at the time of release of the Draft 2014 Metropolitan Transportation Plan.¹³

The Town of Hillsborough is actively planning for an Amtrak station along the existing passenger rail route. In 2010 Hillsborough identified a location and small area plan for the proposed station. In 2014 the rail station and surrounding developments were selected by the American Architectural Foundation for participation in its 2014 Sustainable Cities Design Academy.¹⁴

In 2010 the Town of Lexington received a grant from the National Infrastructure Investment Grant Program to use toward planning and development of a passenger rail station.¹⁵ The primary goal identified for the City Council in 2014 is to work with NCDOT on the planning and development of the rail station.¹⁶ Both the Town and NCDOT have pursued grants for this purpose.

2.1.1.8.3 Station Planning for Future Service

Station planning has also occurred along potential future intercity passenger rail corridors from Raleigh to Wilmington and from Salisbury to Asheville. Several stations along the Salisbury to Asheville route, including Conover, Marion, Morganton, Old Fort, and Statesville; have already been renovated and

are housing other uses until the new passenger service comes online.¹⁷ In Asheville, Valdese, and Black Mountain, future station sites have been identified and preliminary planning has been completed.¹⁸

Similarly, station planning is underway in eastern North Carolina to complement future passenger service in the region. Wilmington included space for a future train station at their multi-modal transportation center in the north part of downtown.¹⁹ Goldsboro also designed their multi-modal transportation center to accommodate future potential passenger rail service.²⁰ NCDOT has an unfunded project that will evaluate various alternative track alignments to serve the Goldsboro Station. The 2005 study to determine the feasibility of passenger rail service between Raleigh and Wilmington evaluated a corridor that included Goldsboro multi-modal transportation center. The study will need to be updated to determine the final corridor alignment.²¹ A Transportation Enhancement program grant and local funds have been used to preserve the historic stations in Wallace and Burgaw.

Additionally, the (PART) has acquired land for a future multi-modal transportation center between Greensboro and Winston-Salem adjacent to a potential commuter rail corridor. Development of the multi-modal center is on hold until new project phasing and funding are finalized.²²

¹²Gaston Urban Area Metropolitan Planning Organization. Gastonia Multi-Modal Center Executive Summary. May 2009. Accessed March 6, 2014.

<http://www.gastonmpo.org/documents/execsummary.pdf>

¹³Gaston Cleveland Lincoln Metropolitan Planning Organization. "The Way Forward: 2014 Metropolitan Transportation Plan." February 2014. Available: <http://www.gclmpo.org/documents/DRAFT2040MTP.pdf>. Visited 23 April 2014.

¹⁴City of Hillsborough. "Hillsborough's Proposed Boone/Collins/Train Station Plan Selected for Expert Design Help." Available: Hillsborough's Proposed Boone/Collins/Train Station Plan Selected for Expert Design Help. Visited 23 April 2014.

¹⁵Sullivan, Ryan. "City Awarded \$700,000 to Develop Railway Station." FOX 8 News. Available: <http://lexington.myfox8.com/content/city-awarded-700000-develop-railway-station>. Visited: 23 April 2014.

¹⁶City Council Goals and Accomplishments Fiscal Year 2013-2014. City of Lexington. Available: <https://www.lexingtonnc.net/index.aspx?page=579>. Visited 23 April 2014.

¹⁷North Carolina Department of Transportation Rail Division. Web Archive Version September 18, 2013.

<http://web.archive.org/web/20130918175506/http://www.bytrain.org/istation/default.html>

¹⁸City of Asheville. Asheville Transit Master Plan. October 2009. Accessed March 6, 2014.

<http://www.ashevillenc.gov/Portals/0/city-documents/Transit/Transit%20Master%20Plan%20-%20Final.pdf>

¹⁹Transit Needs Study for the Wilmington Multi-Modal Transportation Center. Martin Alexiou Bryson. May 2009. Accessed March 6, 2014. [http://www.wmpo.org/PDF/2009-05_WMTC_TransitNeedsStudy\[FINAL\].pdf](http://www.wmpo.org/PDF/2009-05_WMTC_TransitNeedsStudy[FINAL].pdf)

²⁰Tuner, Walter R, North Carolina Transportation Museum Historian. "The Future is Arriving." July 2012. Accessed March 6, 2014.

<http://charmec.org/city/charlotte/cats/planning/red/Documents/TheFutureisArriving.pdf>

²¹North Carolina Department of Transportation. Southeastern North Carolina Passenger Rail Feasibility Study. July 2005.

²²Piedmont Authority for Regional Transportation. Request for Qualifications – Update of the PART Intermodal Facility Project Management Plan. October 31, 2013. Accessed March 6, 2014. http://www.partnc.org/documents/Intermodal_Facility_RFQ.pdf

Table 2 - 7 North Carolina Rail Station Characteristics^{23,24,25}

RENOVATIONS							
STATION	RIDERSHIP (FY 13)	YEAR BUILT	YEAR COMPLETED	PROJECT	FUNDING AMOUNT AND SOURCE	ROUTES SERVED	MULTI-MODAL CONNECTIONS
Burlington	25,452	1868	2003	Building renovation	\$3,000,000 (NCRR)	Carolinian, Piedmont	No
			2003	Uplift of waiting room	\$20,000 (NCDOT)		
			2011	Platform extension	\$337,000 (ARRA)		
Cary	88,669	1996	2006	Platform construction	\$270,000 (NCDOT) \$30,000 (Town of Cary)	Carolinian, Piedmont, Silver Star	Regional and local bus hub
			2011	Station expansion	\$1,700,000 (ARRA)		
Charlotte	201,481	1964	2002	Station renovations	Not available (NCDOT, Amtrak)	Carolinian, Piedmont, Crescent	Bus route <i>Future: streetcar, commuter rail, bus hub, Greyhound</i>
			2018	Planned Gateway Station			
Conover	None			Building purchase, renovation, platform construction	\$8,100,000 (Federal, State, Local, private)	None - Preserved for future use	
Durham	83,232	1897	2009	New station construction	\$1,250,000 (FHWA) \$1,150,000 (State funds)	Carolinian, Piedmont	Bus hub (nearby), Greyhound (nearby) <i>Future: light rail, commuter rail</i>
Fayetteville	53,590	1911	2006	Platform reconstruction, ADA compliance, waiting room renovation	\$626,400 (NCDOT) \$69,600 (City of Fayetteville)	Silver Meteor/ Palmetto	Greyhound (nearby), bus hub (nearby)
Gastonia	1,741	1987	Planning underway	New multimodal center to replace current building		Crescent	No <i>Future: Greyhound, Bus hub, commuter rail</i>
Goldsboro	None	1909	2007	NCDOT purchase and stabilization of the historic building.	\$2,309,600 (FHWA, State, City of Goldsboro)	None – studies underway	No
Greensboro	139,869	1927	2005	Depot renovation and conversion to a multi-modal center	\$32,000,000 (FHWA, FTA, State, City of Greensboro)	Carolinian, Piedmont, Crescent	Local and regional bus hub, Greyhound
Hamlet	4,882	1900	2004	Move of building to new location, renovations	\$9,708,000 (FHWA, NCDOT, HUD, Cole Foundation, Great American Station Foundation, private funds)	Silver Star	No

²³ Amtrak. 2013 Amtrak Fact Sheet for North Carolina. November 2013. Accessed March 6, 2014. <http://www.amtrak.com/pdf/factsheets/NORTHCAROLINA13.pdf>

²⁴ Amtrak. The Great American Stations Project – Station Listing. Accessed March 6, 2014. <http://www.greatamericanstations.com/Stations/station-listing>

²⁵ McBrayer, Sharon. "Conover's rail depot gets more Funding." *Hickory Daily Record*. 10 October 2012. Available: http://conoverstation.com/pdfs/hickoryrecord10_11_12.pdf. Visited 24 April 2014.

RENOVATIONS							
STATION	RIDERSHIP (FY 13)	YEAR BUILT	YEAR COMPLETED	PROJECT	FUNDING AMOUNT AND SOURCE	ROUTES SERVED	MULTI-MODAL CONNECTIONS
			2012	Parking expansion	Not available (ARRA)		
High Point	40,302	1907	2003	Complete station rehabilitation	\$5,458,640 (Federal Enhancement funds) \$682,330 (State) \$682,330 (local)	Carolinian, Piedmont, Crescent	Regional and local bus hub
			2012	Slope stabilization, landscaping, parking	\$2,036,500 (ARRA)		
Kannapolis	19,205	2004	2013	Canopy	\$300,000 (ARRA)	Carolinian, Piedmont	Bus routes
Marion	None	1868	2005	Not available	\$1,604,700 (FHWA, NCDOT, and Town of Marion)	None – preserved for future use	
Morganton	None	1886	2004	Not available	\$970,000 (FHWA, NCDOT, and Town of Morganton)	None – preserved for future use	
Old Fort	None	1881	2005	Not available	\$1,370,000 (FHWA, NCDOT, and Town of Old Fort)	None – preserved for future use	
Raleigh	159,584	1950	1986	Not available	Not available	Carolinian, Piedmont, Silver Service/ Palmetto	Future: light rail, regional rail
			2000	Expanded waiting room, parking	\$580,000 (Not available)		
			2017	Planned new station	\$15,000,000 (ARRA) \$36,500,000 (TIGER) \$6,000,000 (TIGER match from Raleigh) \$9,000,000 (TIGER match from NCDOT)		
Rocky Mount	52,631	1893	2000	New entryway, station rehabilitation, ADA compliance projects	\$6,300,000 (Federal Enhancement funds) \$630,000 (State) \$1,435,000 (Local) \$630,000 (FTA)	Carolinian, Silver Service/Palmetto	Bus hub, Greyhound
Salisbury	31,539	1908	1984	Building restoration	\$3,000,000 (Private) \$1,000,000 (NCDOT)	Carolinian, Piedmont, Crescent	Bus routes
			1999	Park, parking lot and waiting room improvement	\$4,033,653 (FHWA, NCDOT, City of Salisbury)		
			2009	New platform and canopy	Not available		
Selma	13,222	1924	1981	Curved connection track	Not available	Carolinian, Silver Service/Palmetto	No
			2002	Renovated waiting room	\$2,734,400 (Federal) \$341,800 (State) \$341,800 (Local)		

RENOVATIONS							
STATION	RIDERSHIP (FY 13)	YEAR BUILT	YEAR COMPLETED	PROJECT	FUNDING AMOUNT AND SOURCE	ROUTES SERVED	MULTI-MODAL CONNECTIONS
Southern Pines	7,554	1948	2004	Station restoration and modernization	\$800,000 (State)	Silver Star	No
Wilson	52,692	1924	1998	Rebuilding and modernization	\$1,342,000 (Enhancement funds)	Carolinian, Silver Service/Palmetto	Bus, Greyhound (nearby)
			2003	Parking, landscaping renovations to adjacent building	\$1,150,000 (Enhancement funds)		

2.1.1.9 Tourist Railroads

Excursion trains and tourist railroads offer patrons the chance to ride the train along scenic routes or to simply experience older railroad equipment. These trains are often part of a museum or other attractions and scenic areas. North Carolina is home to four tourist railroads.

1. The Great Smoky Mountain Railroad (GSMR), which operates in western North Carolina along the Great Smoky Mountains, runs two routes along the Nantahala Gorge and the Tuckasegee River, both departing from Bryson City. The excursions are approximately four hours long and include layovers at the Nantahala Outdoor Center and Dillsboro, respectively, where passengers can explore the area, shop, and dine before returning to Bryson City. The tours are particularly popular during the fall to see the colorful foliage and beautiful mountain scenery.
2. The New Hope Valley Railroad operates in New Hill, south of Raleigh, over a former Southern railway branch line and is home to the North Carolina Railroad Museum.
3. An excursion railroad that operates at the North Carolina Transportation Museum in Spencer.
4. The Tweetsie Railroad, which operates within a theme park in Blowing Rock.²⁶

2.1.1.10 Out of Service and State-Owned Corridors

The railroad network in North Carolina has seen significant consolidation and change in the 20th century, which has led to abandonment of over 990 miles of track, or 27 percent of the system since 1977. Prior to abandonment, the rail corridor is sometimes “out of service” – meaning that the railroad still owns the corridor, but is not operating traffic on the corridor. Railroads often stop using corridors – or portions of corridors – when there is a lack of traffic that warrants the costs of operating and maintaining the tracks and structures. It should be noted two out of service corridors have been designated for statewide importance under the NC Transportation Network (NCTN) – the CSXT S Line north of Norlina to the VA-NC state line due to plans to use this line for the federally-designated Southeast Corridor and the Wallace to Castle Hayne corridor which could be used for future passenger rail service to Wilmington and as a second freight rail route to the State Port in Wilmington. Figure 2 - 6 illustrates which corridors are currently out-of service.

The Rail Corridor Preservation Act, passed by the NC General Assembly in 1988, gave NCDOT authority to purchase railroads and preserve rail corridors, and declared it a public purpose for NCDOT to reassemble critically important lost portions of rail corridors. The Rail Division also provides technical assistance to local governments and economic development groups to preserve freight-rail service to customers along light-density branch lines. In addition, state and federal funds are used to assist short line railroads in making improvements to tracks and bridges, thereby helping to keep these lines active.

²⁶ http://www.touristrailways.com/namerica/NORTH_CAROLINA/. Accessed September 2014.

NCDOT has acquired more than 100 miles of rail through the state's Corridor Preservation program. Some are out of service while others have freight business through trackage rights agreements. Others have been developed as rail-trail corridors. Table 2 - 8 lists these state-owned corridors.

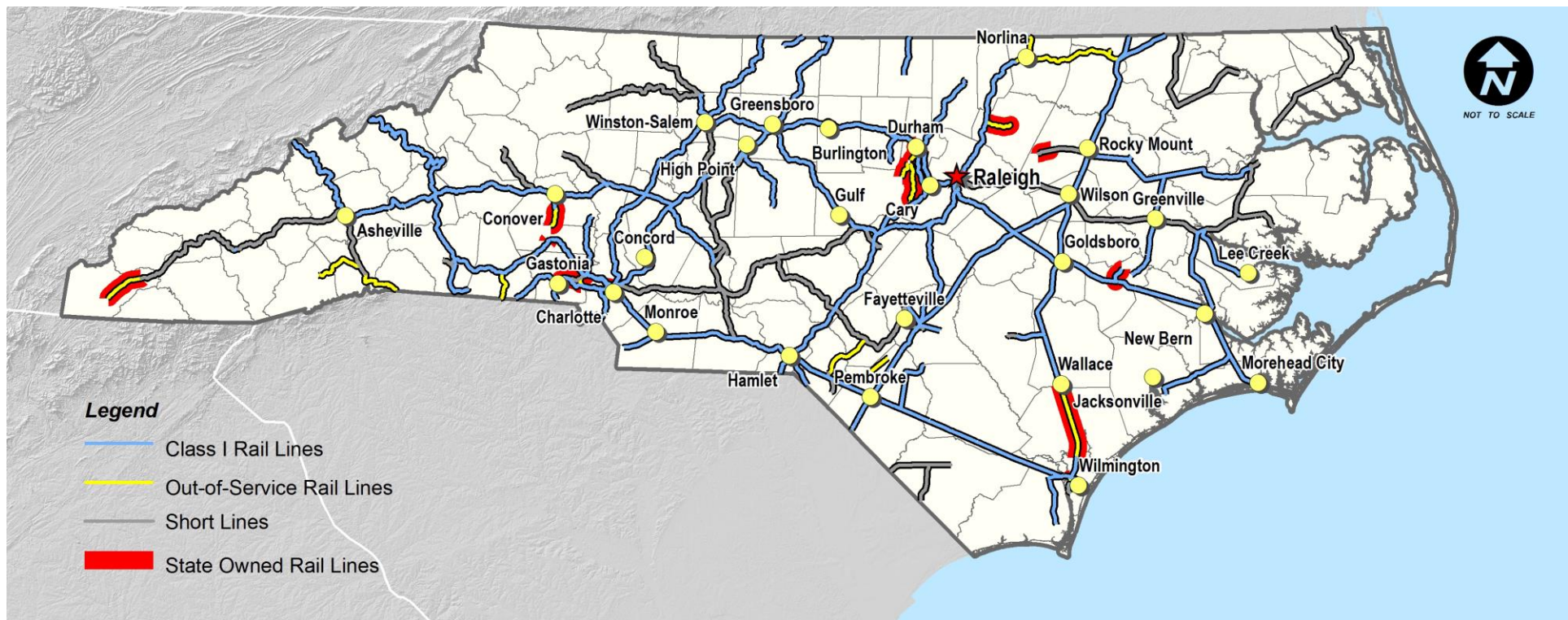


Figure 2 - 6 NCDOT-Owned and Out-of-Service Rail Corridors

Table 2 - 8 NCDOT-Owned Rail Corridors

CORRIDOR	LOCATION	DATE ACQUIRED	LENGTH (miles)	USES
Murphy Branch	Andrews to Murphy	7-18-1988	14.23	Reserved for future transportation purposes
Franklin County	Franklinton to Louisburg	11-2-1990	9.6	Reserved for future transportation purposes
Piedmont & Northern (Charlotte)	Charlotte	11-27-1991	0.77	Temporary trail
Piedmont & Northern (Mt. Holly, Gastonia, & Belmont)	Mt. Holly to Gastonia & Belmont	12-5-1991	10.6 (main) 3.0 (spur)	Temporary trail (partial) / Leased for freight service
Maiden Branch	S. Newton to Lincoln Co. line	4-13-1993	6.3	Reserved for future transportation purposes
Wilmington & Weldon	Wallace to Castle Hayne	8-4-1994	26.3	Reserved for future transportation purposes
Durham & South Carolina	Durham to NC 54	8-18-1995	5.07 (main) 3.07 (spur)	Temporary trail
Durham & South Carolina	Chatham-Wake Co. line to New Hill	8-18-1995	7.35	Temporary trail
Lincolnton (C&NW)	Lincolnton	1-27-1997	0.61	Temporary trail
Durham & South Carolina	Fayetteville Street to Chatham-Wake Co. line	8-6-1998	6.44	Temporary trail
Wilmington Lead	Fourth Street to McRae Street	6-12-2002	0.25	Reserved for future transportation purposes
Nash County Railroad	Momeyer to Spring Hope	11-02-2005	4.7	Leased for freight service
Winston-Salem R-Line	Downtown Winston-Salem	12-26-2006	2.0	Temporary trail
Global Trans Park (GTP)	Kinston, NC	9-30-2012	5.7	Freight service to GTP (currently inactive)

Source: NCDOT Rail Division

2.1.2 Major Freight and Passenger Terminals and Intermodal Connections

This section describes the major freight and passenger terminals and intermodal/multimodal centers in North Carolina.

North Carolina's rail network includes two major classification yards, three intermodal terminals, two deep-water ports, and numerous transload facilities. The rail served sites include proprietary industrial facilities and third-party for-

hire terminals that may have their respective waterfront facilities, as well as more concentrated operations at inland locations. The traffic associated with the diverse mix of industries as railroad customers leads to more intricate supply chains, less transparent due to the number of participants involved. Figure 2 - 7 displays the locations of these facilities with respect to the rail network.

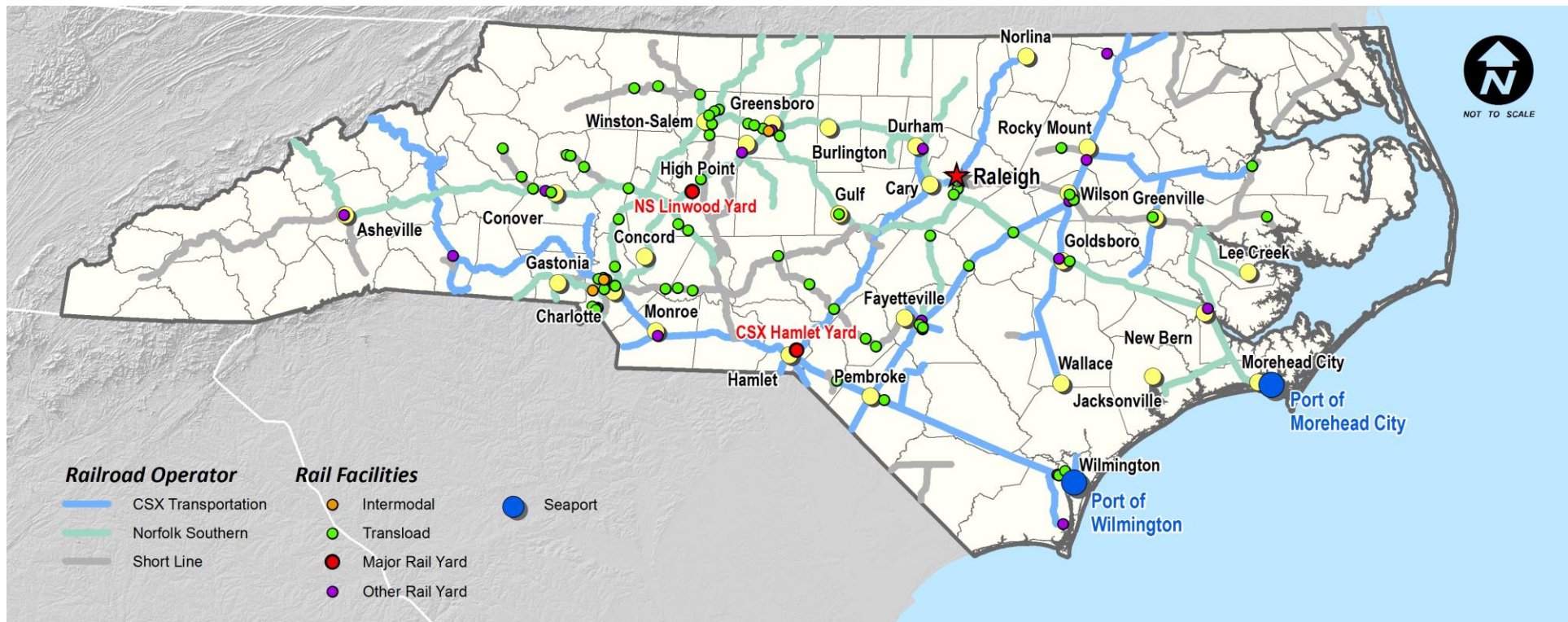


Figure 2 - 7 Major Rail Facilities Across North Carolina

2.1.2.1 Major Rail Yards

Rail classification yards are facilities where freight cars are sorted and made into trains based on their origin and destination.

CSXT's primary rail classification yard in North Carolina is located in Hamlet near the intersection of the Charlotte to Wilmington line and the Hamlet to Raleigh S Line. Other CSXT classification yards in North Carolina include the Rocky Mount Yard and Fayetteville's Milan Yard along the busy A Line, Pinoca Yard serving the Charlotte area, the Raleigh Yard along the local route serving Hamlet to Norlina, and Davis Yard which serves the Wilmington area.

Linwood Yard, on the busy Atlanta, Georgia to Washington, DC mainline, is the hub for NS' operations in North Carolina. Other NS classification yards include

Asheville, Charlotte, Pomona Yard serving Greensboro, Glenwood Yard serving the Raleigh area, and Selma, which serves eastern North Carolina.

2.1.2.2 Intermodal Facilities

Intermodal facilities are locations where containers and trailers are transferred between trains and some other form of transportation, usually trucks or ships.

Norfolk Southern (NS) operates two of the three intermodal facilities in North Carolina – one in Greensboro, and a new facility located on the Charlotte-Douglas International Airport property in Charlotte. CSXT also operates an intermodal terminal located in Charlotte. Figure 2 - 8 presents the locations of these intermodal facilities and how they are situated within the core intermodal networks of both Class I railroads. Table 2 - 9 presents their current lift

capacities and locations. Intermodal facilities in neighboring states can provide North Carolina industries additional access to interstate and global commerce. In particular, the intermodal terminals in the Norfolk area and in Greer, South Carolina provide access to and support future development for North Carolina industries which are located closer to those facilities than the ones in Charlotte or Greensboro. By supporting rail and highway infrastructure investments that maintain or increase the accessibility to intermodal facilities, North Carolina's industries are better able to take advantage of transportation efficiencies and be competitive in the greater economy.

Norfolk Southern intermodal services from Charlotte provide access to the ports of Savannah and Charleston. The Greensboro terminal provides intermodal service to the Virginia ports. Both NS terminals provide direct intermodal service to the New York and Chicago markets. Intermodal service to Los Angeles is provided through their partnerships with western railroads. CSXT also provides intermodal service to the Chicago market. CSXT's intermodal service from Charlotte provides access to the southeastern ports of Charleston, Savannah, Jacksonville, and Miami. Access to west coast ports and markets is also provided through partnerships with western railroads.

Table 2 - 9 Capacities of Existing Intermodal Terminals in NC

INTERMODAL TERMINAL	CLASS I RAIL NETWORK	LOCATION	CAPACITY (container lifts per year)
Charlotte	CSXT	5430 Hovis Road, Charlotte, NC	122,000 ¹
Charlotte	NS	5710 West Boulevard, Charlotte, NC	200,000 ²
Greensboro	NS	1105 Merritt Drive, Greensboro, NC	44,000 ³

Sources: 1. CSXT Intermodal Facility Expansion – Twenty-year Impact Analysis – Analysis of Economic, Employment, and Tax Revenue Impact, Insight Research Corporation, January 2014; 2. Rail Yard at Charlotte Douglas to Move 200,000 a Year, Ely Portillo, Charlotte Observer, January 9, 2014; 3. Derived from Rail STI Comprehensive Scoring Matrix, NCDOT.

Though Figure 2 - 8 shows the core infrastructure used to carry intermodal trains in the eastern US, a review of NS and CSXT intermodal schedules associated with the North Carolina facilities helps to illustrate the reach that these services provide to shippers in the state.

Developed using the online schedules,²⁷ Figure 2 - 9 through Figure 2 - 12 show the available intermodal facility destinations for goods originating and terminating in North Carolina. Intermodal service to western US markets is provided through partnerships with western US railroads.

²⁷ <http://www.nscorp.com/content/nscorp/en/ship-with-norfolk-southern/shipping-options/intermodal/terminals-and-schedules.html>

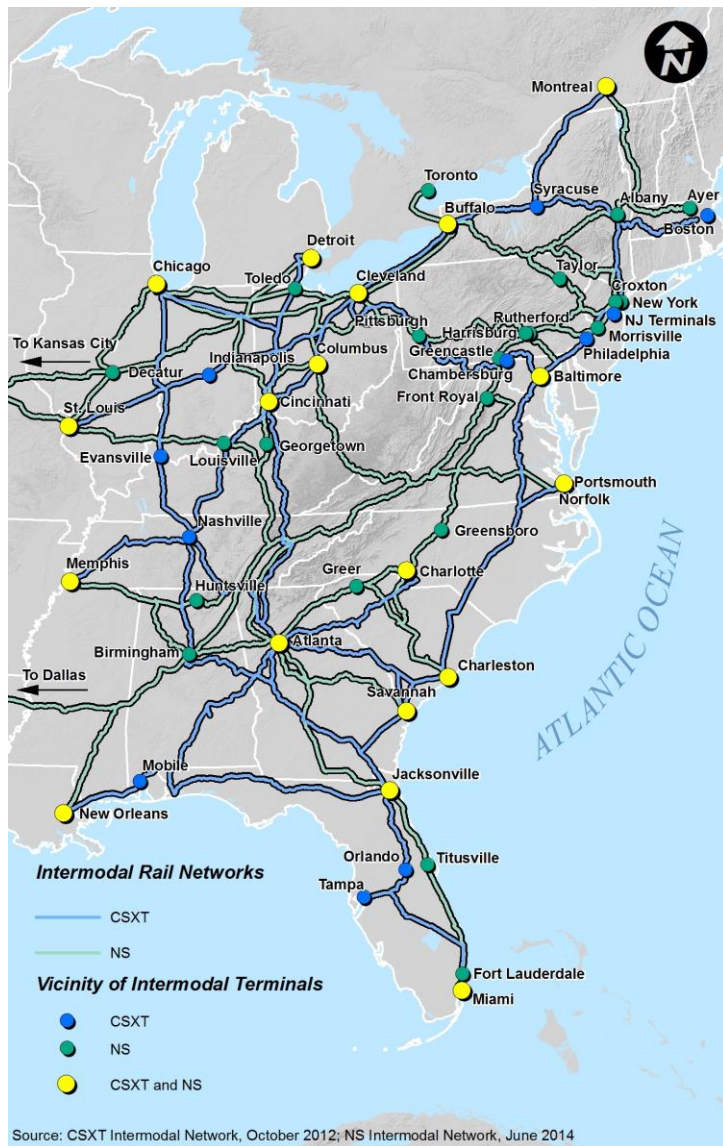


Figure 2 - 8 Existing Intermodal Rail Networks & Facilities of CSXT and NS

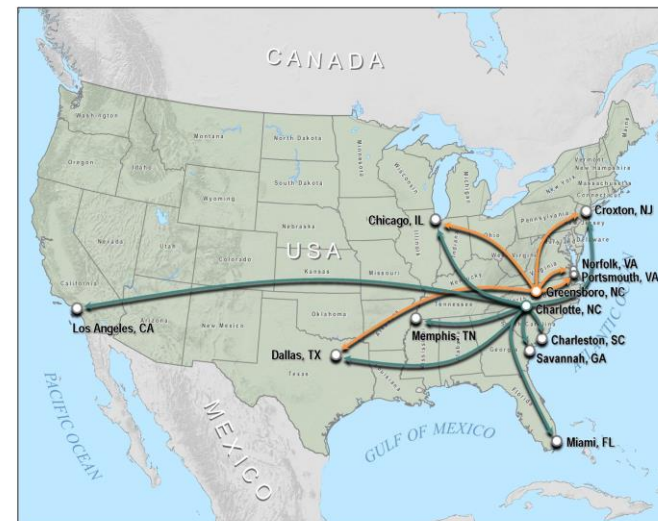


Figure 2 - 9 NS Outbound Intermodal from Charlotte and Greensboro

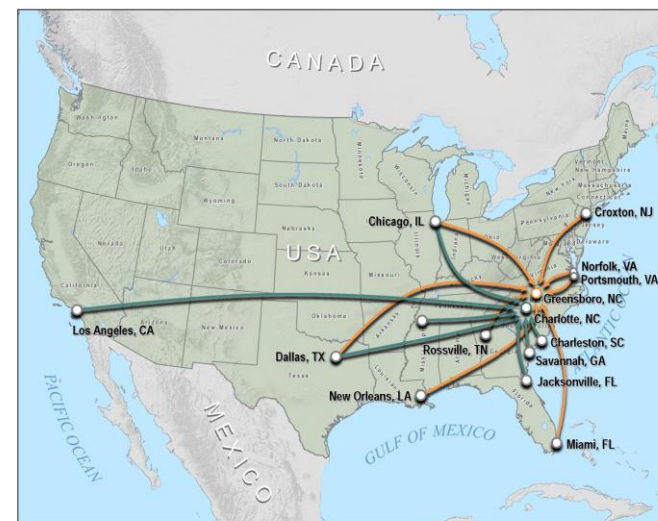


Figure 2 - 10 NS Inbound Intermodal to Charlotte and Greensboro

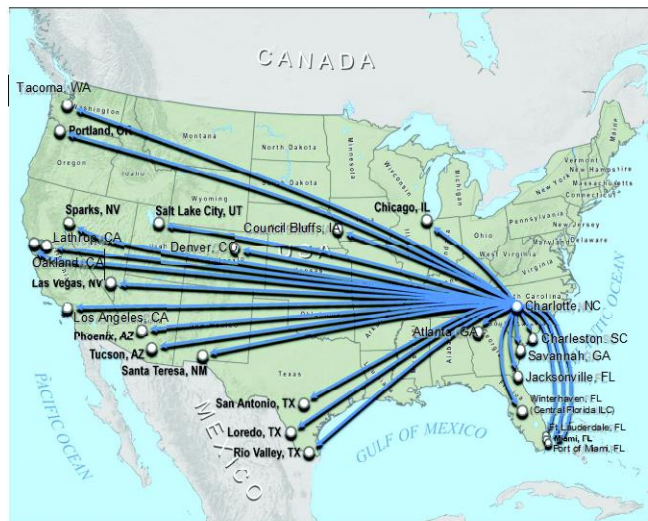


Figure 2 - 11 CSXT Outbound Intermodal from Charlotte

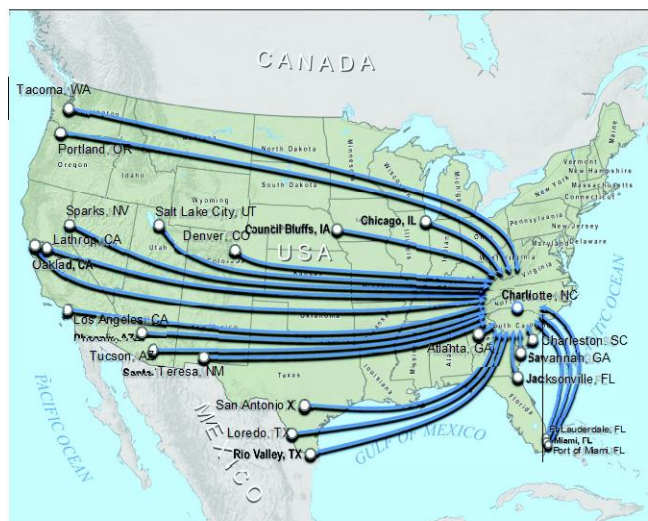


Figure 2 - 12 CSXT Inbound Intermodal to Charlotte

2.1.2.3 Port Facilities

The North Carolina State Ports Authority (NCSPA) operates two facilities, located in Wilmington and Morehead City. Figure 2 - 7 shows the location of the Port of Wilmington (POW) and the Port of Morehead City (MHC) with respect to the existing rail network in North Carolina. CSXT provides rail service to the Port of Wilmington and terminal switching on the port property is conducted by the Wilmington Terminal Railway. NS provides rail service to the Port of Morehead City and terminal switching is conducted by Carolina Coastal Railway (CNLA).

The Port of Morehead City primarily handles bulk and breakbulk freight and has no container cranes on site. The Port of Wilmington also serves bulk and breakbulk commodities. Moreover, it has two berths dedicated to container service.

The capacity of the container terminal at the Port of Wilmington is estimated at 530,000 twenty-foot equivalent units (TEUs). Over the last five years, an average of 267,000 TEUs has been moved through the container facility for an approximate 50 percent utilization. By 2022, container volumes are anticipated to increase to 421,000 TEUs. Although it has container ship service, the Port of Wilmington does not currently have dedicated intermodal rail service. It should be noted that the rail corridor from Charlotte to Wilmington has been cleared for double-stack containers and has been designated as part of CSXT's future National Gateway Corridor.

As noted previously, CSXT's and NS' intermodal terminals in Charlotte and Greensboro provide access to container port facilities in Norfolk, Charleston, Savannah, Jacksonville, and Miami.

The capacity of port facilities for bulk and breakbulk goods is more difficult to estimate. Both the Ports of Wilmington and Morehead City have room to expand and dedicate to the handling of bulk and breakbulk goods. Depending on port configuration and equipment implemented, the bulk and breakbulk capacity can be fluid. Figure 2 - 13 presents volumes of goods moved in the last five years and the projected volumes anticipated through the year 2022.

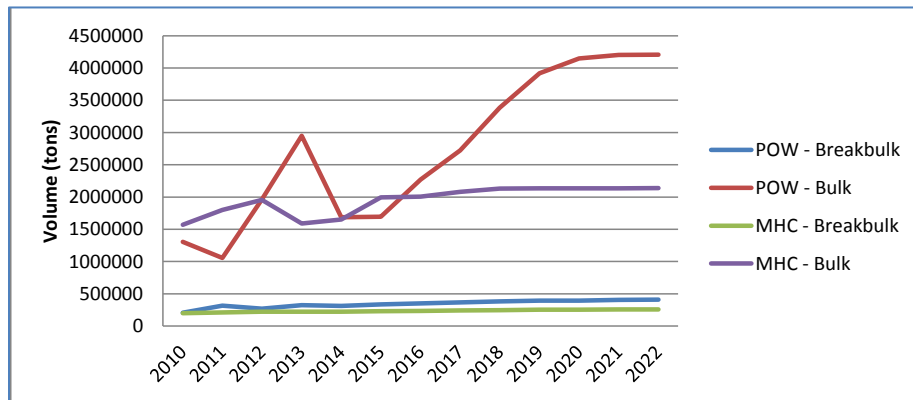


Figure 2 - 13 Historical and Projected Bulk and Breakbulk Tonnage at NC Ports

The spike in bulk goods moving through the Port of Wilmington in 2013 was due to the import of approximately 1.5 million tons of grain. The growth in bulk goods at the Port of Wilmington is due to modest increases in chemicals, cement, woodchips, direct reduced iron, and fertilizer products. Grain and wood pellet volumes are anticipated to have more substantial increases. The growth in breakbulk goods at the Port of Wilmington is due to increases in commodities that are currently shipped through the port: metal products, wood pulp, and forest products. Figure 2 - 14 through Figure 2 - 17 present the top five commodities moving through the Ports of Morehead City and Wilmington over the last eleven years of available data (2003-2013).

The NCSPA plans to continue to service a growing container business at the Port of Wilmington, but anticipates targeting bulk and breakbulk markets for capture. To date, however, only a small percentage of volumes processed through the ports are being moved by rail. As cited in the North Carolina Maritime Strategy, only 0.3 percent of goods by weight that are being exported from North Carolina ports are moved by rail only. Much of the bulk phosphates being exported are barged to the Port of Morehead City. The percentage of goods moving only by rail being imported through North Carolina ports is 4.6 percent.

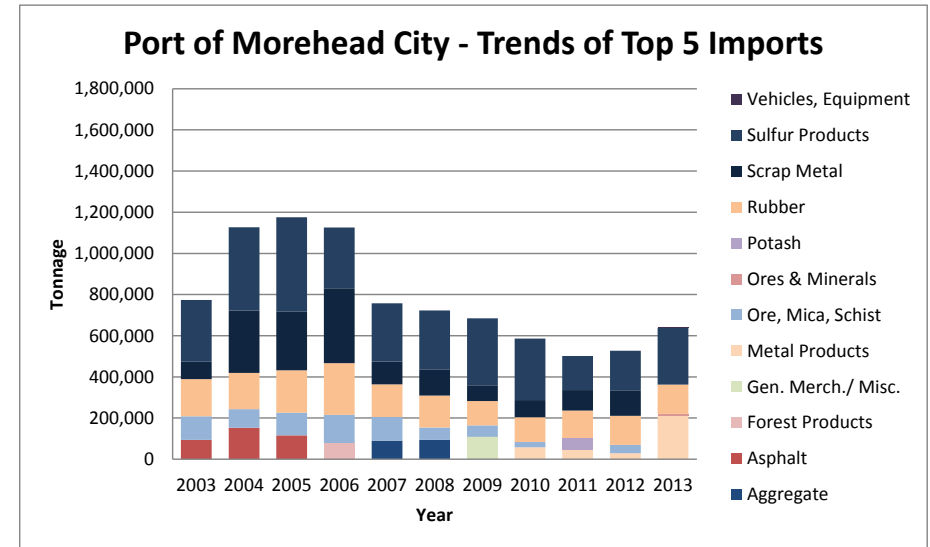


Figure 2 - 14 Top Five Imported Commodities by Year - Morehead City

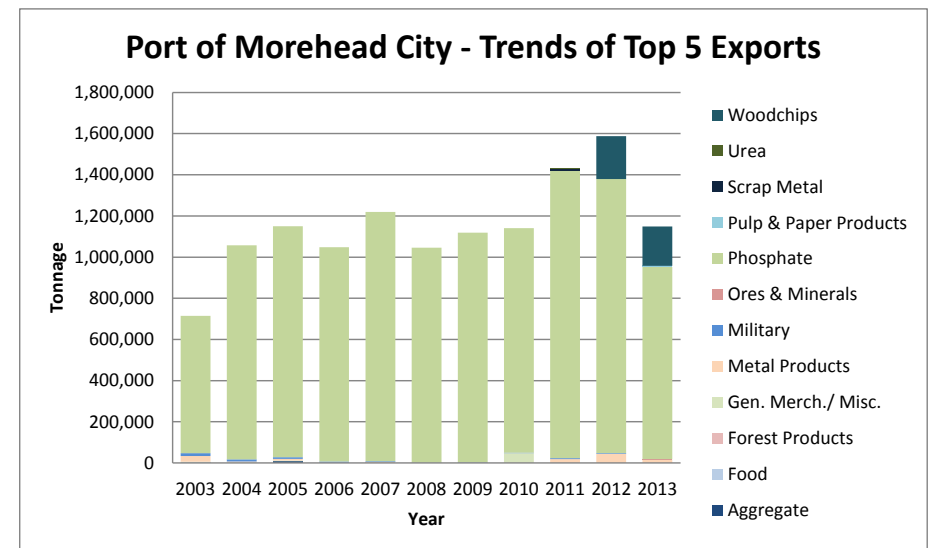


Figure 2 - 15 Top Five Exported Commodities By Year - Morehead City

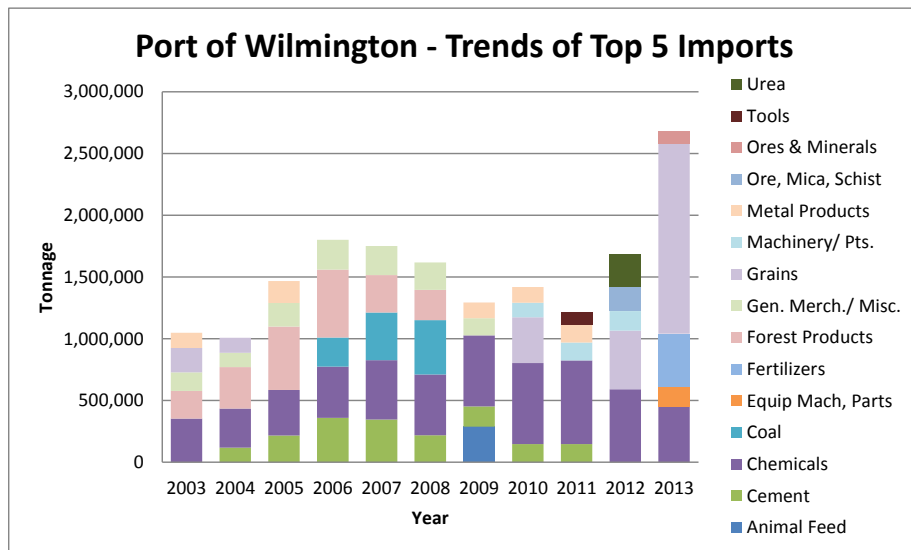


Figure 2 - 16 Top Five Imported Commodities By Year – Wilmington

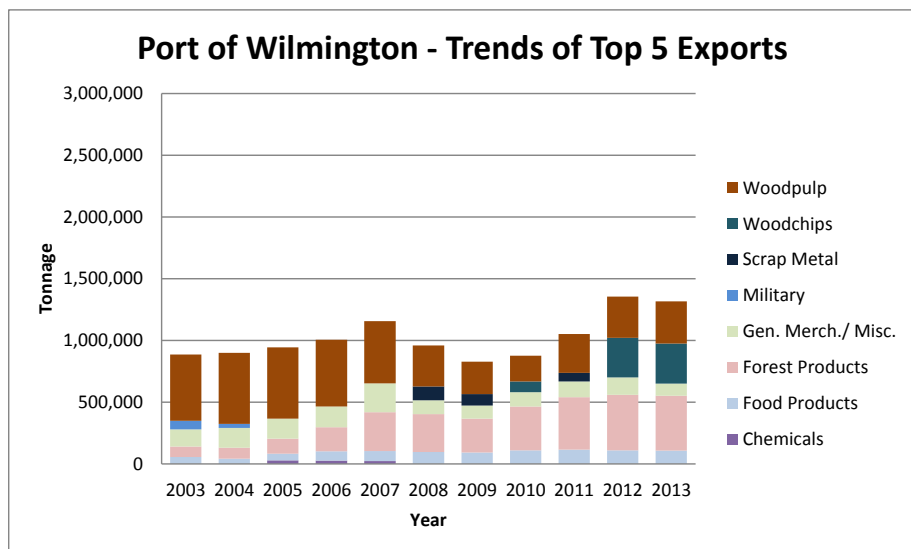


Figure 2 - 17 Top Five Exported Commodities By Year – Wilmington

2.1.2.4 Passenger Multimodal Terminals

The characteristics of intercity passenger rail stations were discussed in Section 2.1.1.8. Figures 1-12 and 1-13 presented the location of the rail stations, major airports, and multimodal facilities. The NCDOT has been working with local governments, transit agencies, and intercity bus operators (Greyhound and Carolina Trailways) to develop multimodal centers whenever possible, particularly in large cities that have a number of possible connecting services. At this time North Carolina has no commuter rail service or stations.

Currently, Greensboro has the only major multimodal transit center in North Carolina. The historic Greensboro Southern Railway Station located in downtown Greensboro was reopened in 2005 as the J. Douglas Galyon Depot after a \$32 million rehabilitation that created a multimodal center that includes an Amtrak station, a Greyhound station, and the main bus transfer center for the Greensboro Transit Authority. The new transit center is also served by the Piedmont Authority for Regional Transportation (PART). The pedestrian tunnels that lead to the intercity rail platforms were also designed to allow for an eventual extension to serve commuter rail platforms if needed.

The Charlotte Area Transit System (CATS) and NCDOT have been planning for a new multimodal transit center in downtown Charlotte for several years. This new station – known as the Charlotte Gateway Station – would replace the existing Charlotte Amtrak station located within the NS freight yard on North Tryon Street. Charlotte Gateway Station would also serve the proposed CATS Red Line commuter rail and other commuter rail services for the Charlotte region, as the station will be at the convergence of all five rail corridors in Mecklenburg County. The site will also house a second bus transfer center for CATS and will be serviced by the proposed CATS CityLYNX Streetcar line to be constructed on Trade Street. As of 2014, an Environmental Assessment for the center has been completed and NCDOT has secured nearly all of the real estate for the station.

NCDOT and the City of Raleigh have recently completed plans for the new Raleigh Union Station, which will replace the current Raleigh Amtrak station downtown and serve as a true multimodal hub connecting bus, intercity rail, future commuter rail and light rail, and possible streetcar and intercity bus

services. The station has also been designed to accommodate restored intercity passenger rail services on the CSXT S Line, which is part of the Southeast Corridor plans. The project's Environmental Assessment was completed in 2014. Currently, NCDOT and the City have secured \$66 million of the \$73 million needed for phase 1 of the project.²⁸ The first phase of the project will construct the main intercity rail (Amtrak) station and platform, parking and public space. Subsequent phases will construct bus connections as well as future commuter rail and light rail connections, and a second intercity/commuter rail platform.²⁹ The first phase is anticipated to be opened in 2017.

The recently expanded suburban Cary station includes an enclosed bus passenger waiting room and bus loading area that serves Cary Transit and Triangle Transit. The recently completed downtown Durham Station is across the street from a new (2008) Durham Transportation Station, which serves Durham Area Transit Authority (DATA) buses, Triangle Transit buses, and Greyhound. As noted in Section 2.1.1, other intercity passenger rail stations in North Carolina also have local bus connections, including Salisbury, High Point, Rocky Mount and Wilson. The City of Gastonia is studying the feasibility of a new downtown multimodal center that will serve CATS, Gastonia Transit, and Amtrak.

Wilson and High Point also serve as important connector stations. High Point is the connection for the van service provided by PART between the High Point station and downtown Winston-Salem and includes a pedestrian bridge across the tracks to the Hi-Tran facility. Wilson is the connector for two Amtrak Thruway motor coach services to Morehead City and Wilmington.

2.1.3 Passenger Rail Service Objectives

The NCDOT's long-term passenger rail goals are to implement the Federally-Designated Southeast Corridor through incremental steps of improved

²⁸North Carolina Department of Transportation. April 2014.
<http://www.ncdot.gov/projects/raleighunionstation/>

²⁹City of Raleigh. May 2014.
<http://www.raleighnc.gov/business/content/PlanUrbanDesign/Articles/UnionStation.html>

infrastructure and service frequencies while also expanding services to population centers in North Carolina that currently do not have rail service. Specifically, the objectives to meet these goals are:

1. Increase ridership and revenue on the *Piedmont* and *Carolinian* services and reduce the operating assistance provided to Amtrak by NCDOT.
2. Improve On-Time Performance (OTP) to FRA standards for passenger service trains serving the state, with particular attention for the state-supported *Carolinian* and *Piedmont* services. Once the Piedmont Improvement Program is completed, the objective for OTP is 80 percent.
3. Increase the service along the Charlotte to Raleigh corridor from the existing three daily round trip trains to as many as six to eight round trips, depending on market demand.
4. Increase the number of daily round trips from Charlotte to Raleigh and Washington DC from one daily round trip to five daily round trips. This includes restoring service on the CSXT S Line between Raleigh and Collier, VA to allow for additional frequencies connecting to the Northeast Corridor and reduced travel times between Raleigh and Richmond, VA as recommended in the Southeast Corridor plan.
5. Reduce travel time between Charlotte and Raleigh from the current 3 hours 15 minutes to less than 3 hours.
6. Extend new daily passenger rail services to western North Carolina and to southeastern North Carolina, with service that will connect to other intercity passenger rail trains.
7. Work with local communities to enhance and develop multimodal connections that will expand the rail service markets by linking bus, light rail and commuter rail services to the intercity rail stations.

2.1.3.1 Improving Services

The NCDOT Rail Division was awarded ARRA funding in 2010 to increase passenger rail services between Charlotte and Raleigh. These corridor improvements (Piedmont Improvement Program) will allow NCDOT to increase the number of daily round trips between the two largest cities in North Carolina from three to five over the next few years. The Piedmont Improvement Program (PIP) will increase the capacity and improve safety along the Charlotte to

Raleigh corridor, refurbish and add new rail cars, improve reliability and allow for the introduction of a third and fourth *Piedmont* frequency. Once the PIP is completed, per the Definitive Services Outcomes Agreement between the NCRR, NS, FRA and Amtrak, the minimum end-point on-time performance should be 80 percent. Starting in 2018, NCDOT will add a third *Piedmont* train (fourth daily frequency). A fourth *Piedmont* train (fifth daily frequency) will be added sometime when demand warrants. These additional frequencies will provide multiple departures connecting North Carolina's largest metropolitan areas. With the fourth and fifth frequencies, ridership is in North Carolina projected to increase by 50 percent.

While the state's long-term objective is implementation of the Southeast Corridor services, the state's more immediate objectives are to increase ridership and revenue on the state-supported services *Piedmont* and *Carolinian* services. This objective is partially needed because under the PRIIA, the NCDOT and Amtrak were required to negotiate a new cost-sharing agreement with new formulas mandated by the Act. These new pricing formulas came into effect in October 2013 and now require the states to reimburse Amtrak for capital expenses in addition to operating and overhead expenses. Under this new agreement, the direct costs prescribed to the *Piedmont* and *Carolinian* will increase approximately 20 percent or \$6.7 million over the next two fiscal years.³⁰ These increases do not include additional costs for implementing the fourth and fifth frequencies.

NCDOT is currently investigating other ways to improve revenue and ridership through other short- and intermediate-term service and amenity improvements. These include adding wireless internet to the *Piedmont* trains, adjusting fares, crew and staffing levels, revising ticket reservation and sales strategies, and looking at liability insurance options.

NCDOT will also need to construct a maintenance facility in the Charlotte region to service, clean and refuel trains that terminate or turn in Charlotte. Currently *Piedmont* and *Carolinian* trains are serviced on a spur within the existing

Amtrak station, adjacent to the NS Charlotte yard. NCDOT has acquired property for a new maintenance facility in Charlotte, and will use ARRA funds to construct the first phase of the facility that will allow existing trainsets to be cleaned and refueled.

2.1.3.2 Implementing the Southeast Corridor

As part of the planning efforts for the Southeast Corridor, the NCDOT has completed extensive ridership and revenue projections for enhanced services along the Charlotte-Raleigh-Richmond, VA corridor. These projections include new services proposed by the Commonwealth of Virginia that connect with the Southeast Corridor, since the services require scheduling coordination and will be part of a future passenger rail network in the southeast.

The Southeast Corridor services assume speeds up to 90 MPH Maximum Allowable Speed (MAS) between Charlotte and Raleigh, 110 MPH MAS service on the restored S Line from Raleigh to Petersburg, and 90 MPH MAS from Petersburg to Richmond.

Ridership and revenue are projected to increase significantly once the Southeast Corridor is operational, with additional frequencies, reduced travel times and increased connections to the Northeast Corridor. A 1997 FRA study projected that the revenue generated by the Southeast Corridor would cover annual operating costs. NCDOT's projections also indicate that ticket revenues would be greater than annual operating costs once the entire Charlotte to Richmond Southeast Corridor were constructed and operating. More detail on the ridership and revenue projections for the Southeast Corridor are provided in Chapter 3. The Commonwealth of Virginia is leading the effort for the development of the Richmond to Washington, DC corridor. And a Tier II EIS for that section is anticipated for completion in 2017.

As noted above, North Carolina is taking an incremental approach to implementing the Southeast Corridor, by first adding frequencies, and reducing travel times and improving on-time performance (OTP) along the current Charlotte to Raleigh corridor. Extending additional North Carolina trains to markets north of Raleigh (Richmond, Washington, DC and New York) is dependent upon restoring service on the CSXT S Line north of Raleigh. NCDOT and Virginia's Department of Rail and Public Transportation (DRPT) have

³⁰Worley, Paul. NCDOT Rail Division. Presentation to the NC General Assembly Joint Legislative Transportation Oversight Committee, February 7, 2014.

completed a Tier II EIS for the Raleigh to Richmond segment of the Southeast Corridor, and anticipate receiving a Record of Decision (ROD) from USDOT by 2015.

North Carolina and South Carolina are cooperating with the Georgia Department of Transportation's study of improved passenger rail connections between Atlanta, Georgia and Charlotte, which is also part of the federally-designated Southeast Corridor. The alternatives analysis and Draft EIS are currently underway, with a ROD anticipated by 2015.

2.1.3.3 Expanding Rail Service to Unserved Markets in North Carolina

Another major passenger rail goal is to extend service to the most populated areas of North Carolina currently not served by rail – including to Asheville and to Wilmington. In March 2001, NCDOT adopted a phased plan to extend passenger rail service to Asheville and other points in western North Carolina. The plan includes renovating or building train stations that incorporate other community uses; several of these station sites have been secured (see Rail Stations under Section 2.1.1 above). The department continues to work with communities on station and highway-railroad crossing safety improvements while working to identify funding to restore passenger rail service to Western NC.³¹

In May 2001, NCDOT released results of a feasibility study that indicated there is a feasible passenger rail market to and from Wilmington. In July 2005, the department released the results of more detailed studies that identified costs and some needed improvements for re-establishing service to Southeastern North Carolina. Studies such as these should be updated to ensure the greatest accuracy given current conditions. The study recommended implementing passenger rail service from Raleigh to Wilmington via either Fayetteville or Goldsboro in phases as funding becomes available.³² Additional information, including ridership and revenue projections for these services, are provided in Chapter 3.

As part of its long-range passenger rail planning efforts, NCDOT modeled the ridership and revenue impacts of implementing daily round trip conventional passenger rail service from Asheville to Salisbury (Western North Carolina) and from Wilmington to Raleigh (Southeastern North Carolina). NCDOT also partnered with NS to complete a capacity modeling exercise that identified capacity and safety improvements along the Salisbury to Asheville corridor. Projected ridership and revenue from the implementation of the Southeast Corridor and new western and southeastern North Carolina services are shown in Table 2 - 10. Note that the introduction of additional intrastate services to eastern and western North Carolina may cause a shift in traffic from Amtrak's long-distance trains to connections to the Southeast Corridor trains. However, overall, the additional services not only provide passenger rail service to communities that currently do not have service, but the additional connecting service would have a net positive effect on ridership and revenue for all passenger rail services in North Carolina.

³¹ NCDOT Rail Division, April 2014. <http://www.ncbytrain.org/projects/future.html>

³²North Carolina Department of Transportation Southeast North Carolina Passenger Rail Study, July 2005.

Table 2 - 10 Projected Services, Additional *Piedmont* / *Carolinian* Frequency, Southeast Corridor, Southeastern NC (SENC) and Western NC (WNC) Services

	5 FREQUENCIES* 2017	5 FREQUENCIES* with SENC and WNC 2017	FULL BUILD* 2025	FULL BUILD* with SENC and WNC 2025
RIDERSHIP				
<i>Piedmont</i> / <i>Carolinian</i> Trains	733,900	767,100	1,866,700	1,911,200
Amtrak Long Distance Trains**	199,900	201,400	224,000	222,300
Raleigh-Wilmington Trains	--	28,900	--	37,000
Salisbury-Asheville Trains	--	23,800	--	29,700
TICKET REVENUES				
<i>Piedmont</i> / <i>Carolinian</i> Trains	\$29,829,000	\$31,138,000	\$126,215,000	\$129,038,000
Amtrak Long Distance Trains**	\$25,375,000	\$25,534,000	\$28,303,000	\$28,228,000
Raleigh-Wilmington Trains	--	\$426,000	--	\$665,000
Salisbury-Asheville Trains	--	\$360,000	--	\$508,000
PASSENGER MILES				
<i>Piedmont</i> / <i>Carolinian</i> Trains	149,550,000	157,910,000	495,310,000	507,820,000
Amtrak Long Distance Trains**	89,490,000	90,400,000	99,940,000	100,270,000
Raleigh-Wilmington Trains	--	2,530,000	--	3,230,000
Salisbury-Asheville Trains	--	2,060,000	--	2,610,000

*5 frequencies = 1 *Carolinian* round trip train, Charlotte to New York via the CSXT A Line plus 4 *Piedmont* round trip trains, Charlotte to Raleigh, with 79 MPH Maximum Allowable Speed (MAS). Full Build = Federally-Designated Southeast Corridor service for 8 round trips Charlotte to Raleigh, with 3 continuing to New York via S Line between Raleigh and Petersburg (and a 4th round trip that operates only Raleigh to New York via S Line between Petersburg & Raleigh), and 1 (the *Carolinian*) continuing to New York via the A Line. Full Build assumes up to 90 MPH MAS operations between Charlotte and Raleigh, up to 110 MPH MAS between Raleigh and Petersburg via the S-Line, and 90 MPH MAS between Petersburg and Richmond, and premium fares.

**Amtrak Long Distance Trains: *Crescent*, *Palmetto*, *Silver Meteor*, and *Silver Star*

Sources: NCDOT and AECOM, September 2013

The NCDOT is also evaluating the feasibility of adding additional stops along both the *Piedmont* and *Carolinian* routes. Communities such as Hillsborough, Lexington, Gastonia and Greenville have all expressed interest in having new or expanded intercity passenger rail service, with many of these communities conducting studies that have identified sites for stations and constructing local transit centers in locations that also can be served by intercity rail. While a major goal of NCDOT is to increase average speeds and reduce travel times along the future Southeast Corridor, adding stops may be appropriate to serve emerging or untapped markets and increase ridership and revenue. The new stops will be evaluated to ensure that they do not interfere with freight operations, are spaced appropriately, and do not substantially impact the overall schedule of the trains serving them.

2.1.4 Passenger Rail Performance Evaluation

Under Section 207 of the PRIIA, the State Rail Plan must include a performance evaluation of the passenger services operating in the state according to metrics established under PRIIA and by the FRA. The FRA publishes quarterly performance and service quality reports for all Amtrak routes using metrics established under Section 207 of PRIIA.³³ For the purposes of the evaluation of the routes serving North Carolina, most of the analysis will compare the *Carolinian* and *Piedmont* separately (state-supported services that serve most of the major population centers in the state) and other Amtrak train services (*Crescent*, *Palmetto*, *Silver Meteor* and *Silver Star*).

2.1.4.1 Passenger Miles/Train Miles

The first measure of train performance is passenger miles (where a passenger traveling one mile equals one passenger mile) and train miles (where a train traveling one mile equals one train mile). This acts as a measure of efficiency – the greater the number of passenger miles per train mile, the more efficient the service. The result of this calculation represents average load factor. As seen in Figure 2 - 18, all the passenger trains serving North Carolina have seen improvement in passenger mile per train mile efficiency over the past four years. The *Carolinian* is the most efficient train in the group, with the *Piedmont* showing the lowest figures in the group due in part to its shorter service market. It is important to note that the *Carolinian* statistic also includes all passenger miles that occur over the non-state supported Northeast Corridor, but does not include the train miles for this segment. Therefore, adjusted performance would be somewhat lower. In addition, the *Carolinian*'s efficiency has remained flat in recent years due largely to capacity constraints during peak travel periods.

³³ The Federal Railroad Administration in 2010 began publishing quarterly reports on Amtrak's performance and service quality pursuant to Section 207 of PRIIA.

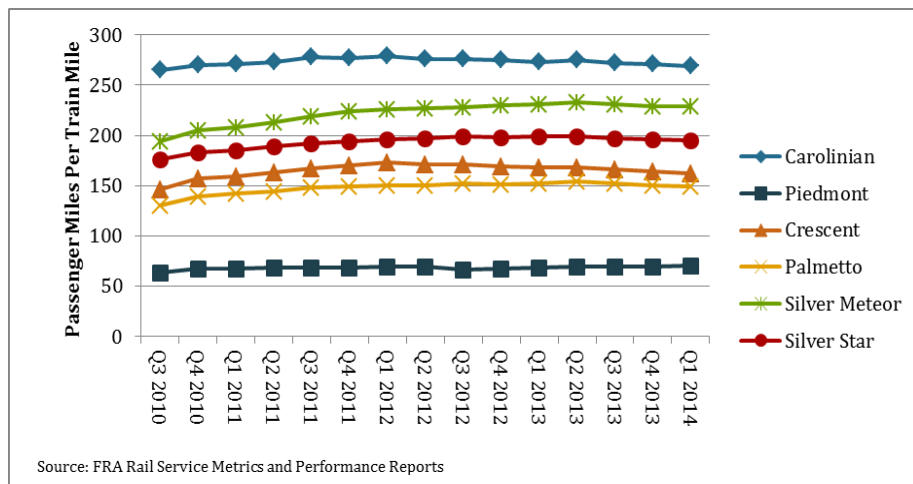


Figure 2 - 18 Passenger Miles Per Train Mile, NC Trains, 2010-2014

2.1.4.2 On-Time Performance

On-Time Performance for both the *Carolinian* and *Piedmont* are below the industry standard of 80 percent. The *Carolinian's* performance has seen improvement over the past four years, while the *Piedmont's* on-time performance has decreased (see Figure 2 - 19). The other long distance trains serving the state have also seen decreases in end-point on-time performance over the past four years (see Figure 2 - 20). These decreases in end-point on-time performances may be due to recent increases in freight traffic, which is creating additional scheduling conflicts between the passenger and freight trains in the CSXT and NS corridors. These declines in on-time performance are also due to the construction of the Piedmont Improvement Plan (PIP), which will continue through 2017. Once the PIP is completed, per an agreement with the NCR, NS, FRA and Amtrak, the minimum end-point on-time performance should be 80 percent. Table 2 - 11 includes all of the quarterly on-time performance data published to-date for all of the trains serving North Carolina.

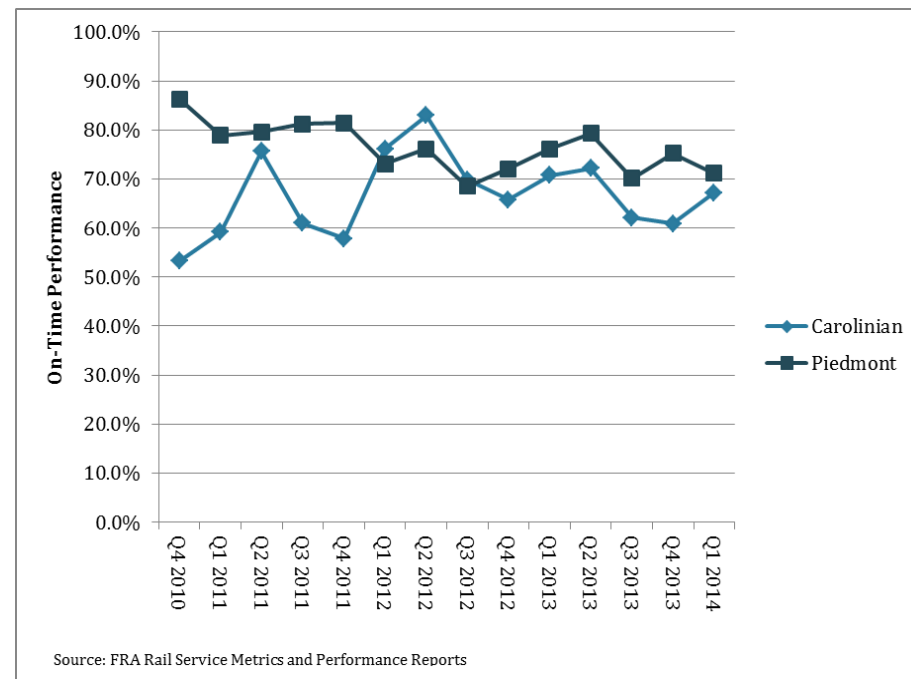


Figure 2 - 19 On-Time Performance, Carolinian and Piedmont Trains

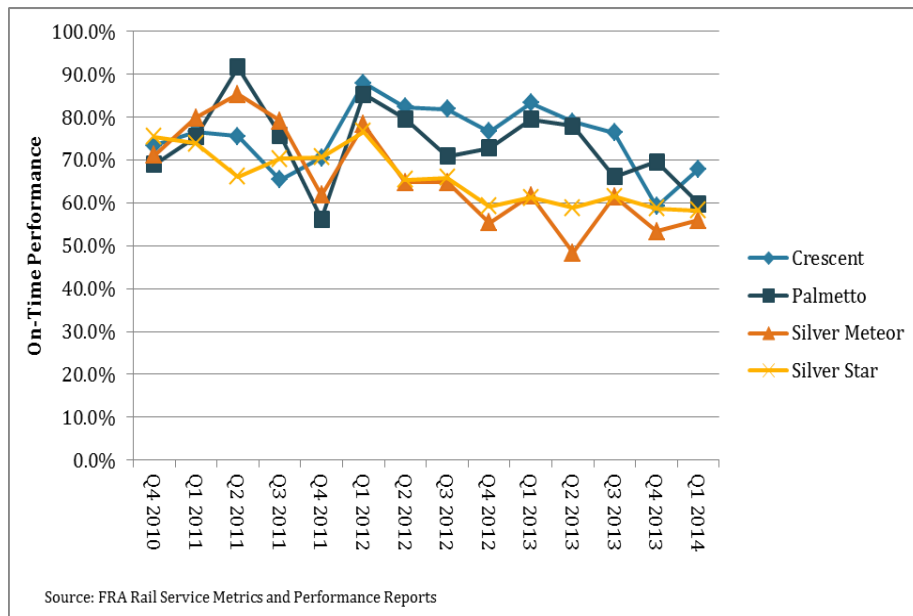


Figure 2 - 20 On-Time Performance, Long Distance Trains Serving North Carolina

FRA and Amtrak also collect data on average overall operating speed and nearly all of the passenger trains serving North Carolina have seen no decrease in overall operating speed since 2008. This indicates that the passenger trains are not traveling more slowly, but have become less consistent in keeping to their end-point schedules. These schedules include a recovery time (e.g., 10 minutes, 30 minutes, depending on the train's route miles).

Looking more closely at the data, a vast majority of the delay for all of the interstate passenger trains serving the state occurs south of the Northeast Corridor (NEC). The data for the *Carolinian* also indicate that most of the delays for this train occur between Richmond and Raleigh on the CSXT A Line (see Figure 2 - 21).

Table 2 - 11 Average Quarterly End-Point On-Time Performance, All Trains Service North Carolina

	Q4 2010	Q1 2011	Q2 2011	Q3 2011	Q4 2011	Q1 2012	Q2 2012	Q3 2012	Q4 2012	Q1 2013	Q2 2013	Q3 2013	Q4 2013	Q1 2014
<i>Carolinian</i>	53.3%	59.2%	75.6%	61.0%	57.8%	76.1%	83.0%	69.8%	65.8%	70.7%	72.2%	62.1%	60.9%	67.2%
<i>Piedmont</i>	86.3%	78.9%	79.6%	81.2%	81.4%	73.1%	76.1%	68.5%	72.1%	76.1%	79.3%	70.1%	75.2%	71.2%
<i>Crescent</i>	73.4%	76.6%	75.6%	65.4%	70.5%	88.0%	82.4%	81.9%	76.6%	83.3%	78.9%	76.4%	59.2%	67.9%
<i>Palmetto</i>	69.0%	75.5%	91.7%	75.8%	56.2%	85.3%	79.6%	70.9%	72.8%	79.5%	77.9%	66.1%	69.6%	59.8%
<i>Silver Meteor</i>	71.2%	79.9%	85.4%	79.1%	61.8%	78.3%	64.8%	64.8%	55.4%	61.7%	48.3%	61.5%	53.3%	56.0%
<i>Silver Star</i>	75.4%	73.9%	66.1%	70.3%	70.7%	76.6%	65.4%	65.9%	59.2%	61.2%	58.9%	61.5%	58.7%	58.2%

Source: FRA Rail Service Metrics and Performance Report

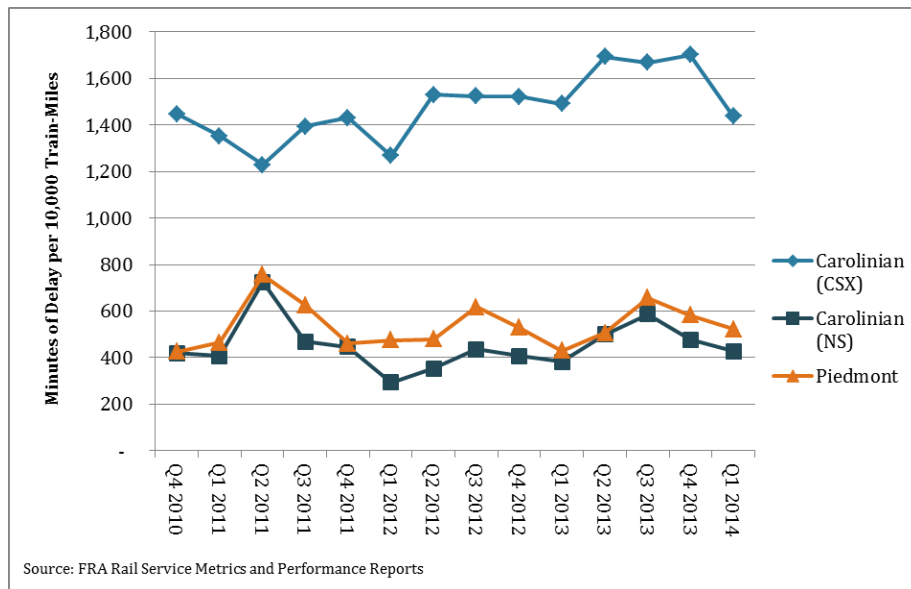


Figure 2 - 21 Off-NEC Host Responsible Delays, Carolinian and Piedmont Trains

FRA's quarterly reports state that conflicts with freight traffic is the most frequent cause and creates the longest delay for the *Carolinian* between Raleigh and Washington, DC. Between Raleigh and Charlotte, however, the largest contributor to delay for the *Carolinian* was loading and unloading passengers. This mirrors the delay data for the *Piedmont*, where passenger loading and unloading is the largest delay category, followed by slow orders, signal work and maintenance of way. The last three categories are likely due in part to the Piedmont Improvement Program work underway that will improve speeds and capacity in the Raleigh to Charlotte corridor. The passenger loading delays are most likely to due to these trains using high-level equipment serving low-level platforms that require passengers to navigate steps and use wheelchair lifts to enter and exit the trains, compounded by the dramatic growth in ridership on these services.

2.1.4.3 Customer Satisfaction

Amtrak conducts regular surveys of passengers, asking them to rate their satisfaction of the train travel experience in areas including overall service, on-board comfort, food, cleanliness, Amtrak personnel, and information given. The FRA standard for overall customer satisfaction is an overall score of 82 out of 100. As seen in Figure 2 - 22, most of the trains serving North Carolina are just below this threshold, with only the *Piedmont* consistently scoring 90 or more. During the most recent customer satisfaction survey, the lowest scores for the *Carolinian* were for on-board cleanliness (62) and on-board food service (75).³⁴

As required under Section 210 of PRIIA, Amtrak has developed a service improvement plan for the *Crescent* and *Silver Service* (*Silver Star*, *Silver Meteor* and *Palmetto*) to boost customer satisfaction, ridership and revenue. Plan recommendations include adding an additional coach to the *Silver Meteor* during the peak travel seasons and adding Thruway bus services in eastern North Carolina (which began in 2012), and adding stops in Virginia. Other recommendations include a greater focus on customer service through improvements such as cleaner facilities in coaches and stations and better signage.³⁵

³⁴ Federal Railroad Administration, Quarterly Report on the Performance and Service Quality of Intercity Passenger Train Operations (First Quarter Fiscal Year 2014).

³⁵ Amtrak. PRIIA Section 210 FY11 Performance Improvement Plan., *Crescent*, *Lake Shore Limited*, and *Silver Service*, September 2011.

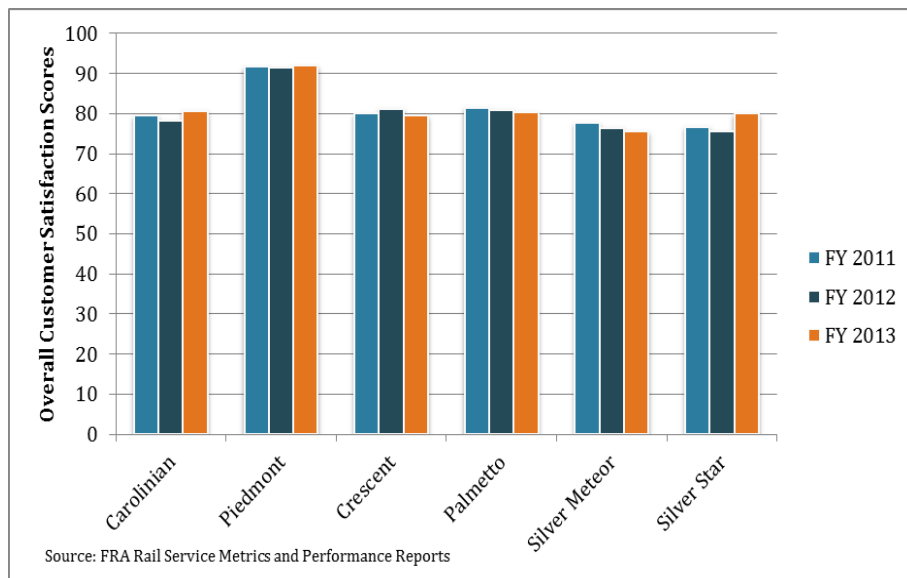


Figure 2 - 22 Annual Overall Customer Satisfaction Scores for NC Trains

2.1.4.4 Financial Evaluation of State-Supported Services

The NCDOT provides financial support for the *Carolinian* and *Piedmont* trains. Table 2 - 12 shows the state's level of financial support over the past five years. It should be noted that starting in 2012 North Carolina began a new operating contract with Amtrak for the *Carolinian* and *Piedmont* trains, which altered the state's accounting for these services.

Table 2 - 12 State Support for *Carolinian* and *Piedmont* Services (2014 dollars)

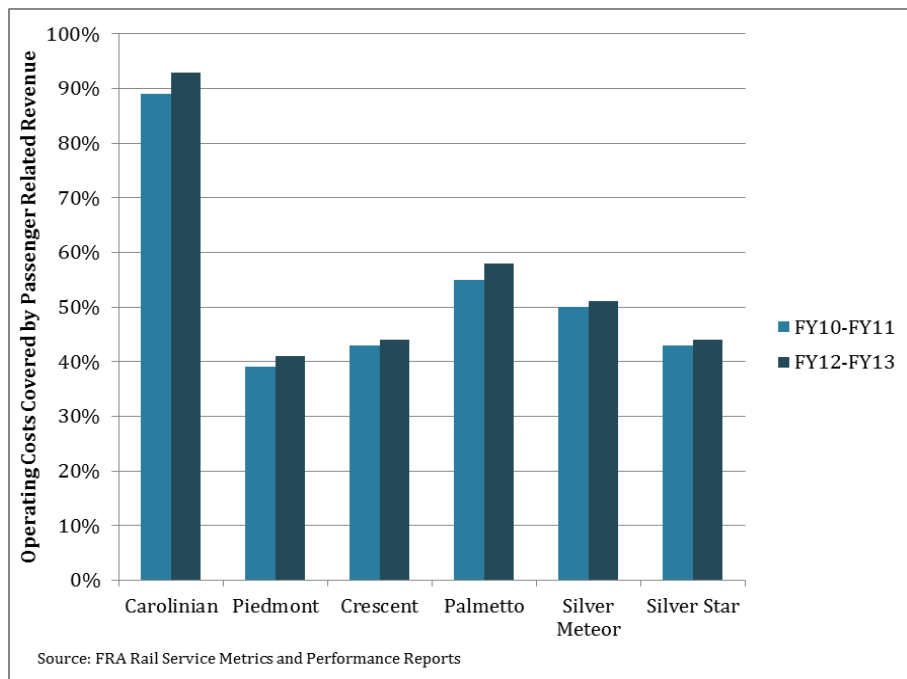
	2010	2011	2012	2013	2014
Operations & Facilities	\$5,719,828	\$7,275,000	\$1,706,666	\$1,706,666	\$1,706,666
Contracted Services			\$8,100,000	\$8,100,000	\$8,517,073

Source: NCDOT Rail Division

Under PRIIA, the NCDOT and Amtrak were required to negotiate a new cost-sharing agreement with new formulas mandated by the Act. These new pricing formulas came into effect in October 2013 and now require the states to reimburse Amtrak for capital and overhead expenses in addition to operating expenses.

For the past three years, the *Carolinian* has consistently been one of the most financially successful non-Acela Amtrak routes in the US. As seen in Figure 2 - 23, the *Carolinian* currently recovers approximately 93 percent of its operating costs from passenger revenue (farebox recovery ratio). The *Piedmont* currently recovers approximately 40 percent of its costs from passenger revenue. The lower cost recovery for the *Piedmont* is due to the shorter trips offered, which are less lucrative than longer haul trips. It should be noted however that the *Piedmont's* cost recovery ratio is similar to those of the other long distance trains serving North Carolina (see Figure 2 - 23). As a comparison, the national farebox recovery ratio was 56 percent for Amtrak state corridors in 2011.³⁶

³⁶ "Long Distance Trains are Federal Responsibility," Amtrak News Release, May 21, 2013, Accessible at: <http://www.amtrak.com/ccurl/605/21/Amtrak-Operates-LD-Trains-Direction-of-Congress-ATK-13-044.pdf>



* The *Piedmont* currently recovers approximately 40 percent of its costs, which include payments to Amtrak by NCDOT, from passenger revenue.

Figure 2 - 23 Percent of Fully Allocated Operating Costs Covered by Passenger Related Revenue

Because North Carolina does not have commuter rail services, no operating subsidy is available.

2.1.5 Public Financing of Rail Projects and Services

With the passage of the Passenger Rail Investment and Improvement Act (PRIIA) and the development of the Transportation Investment Generating Economic Recovery (TIGER) discretionary program, for which freight and passenger rail projects are eligible, federal options for rail funding expanded. In particular, PRIIA, enacted in 2008, provided a multi-year capital funding framework which emphasized the role of the states in national passenger rail development.

This section highlights the major federal funding programs as well as the other selected federal funding programs available for freight and passenger rail projects in North Carolina. Existing state funding programs that have been used to fund state rail projects and to match available federal funding are also described and summarized below.

2.1.5.1 Federal Rail Funding Programs

Since 2008, the United States federal government has taken a greater role in investing in the nation's passenger rail network. The passage of the Passenger Rail Investment and Improvement Act (PRIIA) in 2008 established the framework and authorized funding for a national passenger rail program. It was the first major passenger rail reauthorization since the Amtrak Reform and Accountability Act in 1997. In the subsequent span of time, a significant amount of funding has been made available for passenger rail projects, both through ARRA and PRIIA. With one of the most developed state rail programs in the U.S., North Carolina has succeeded obtaining funding through these programs to support both incremental corridor improvements and station redevelopment. As many federal rail programs available to states are a comparatively new element of the surface transportation program, they are evolving and undergoing changes as the national rail program matures. Each federal program is described below.

It should be noted that if any federal rail project or program requires either a state match on a project application or future operation and maintenance costs are expected to exceed \$3,000,000, a report must be provided to the North Carolina Joint Legislative Oversight Committee or the NC House Appropriations Subcommittee on Transportation and the NC Senate Committee on Appropriations for the Department of Transportation. If either the match on the project application or the future operation and maintenance expenditures are expected to exceed \$5,000,000, then legislative approval is required for acceptance of the grant. For most programs that require a local or state match, those funds may be secured through the State Highway Trust Fund; however, the matching funds now must be secured through North Carolina's Strategic Investment Act prioritization process (STI). This process and state funding sources are described in Section 2.1.5.3. Notes regarding eligibility for matching funds are described in each federal program section.

2.1.5.1.1 The Passenger Rail Investment and Improvement Act of 2008 (PRIIA)
Congress passed PRIIA in October 2008. This legislation reauthorized and reformed Amtrak, but notably, it provided a new statutory framework for a federal/state partnership to fund and develop United States high-speed and intercity passenger rail service using 80/20 federal/state capital grants. PRIIA legislation authorized \$3.4 billion in capital grants over five years. This legislation required Congressional action each year to appropriate the amounts authorized. Section 301 of the Act provided grants for Intercity Passenger Rail Service Capital Assistance. Section 501 provided capital grants for High-speed Rail Corridor Development for federally-designated corridors with planned speeds of 110 mph or more. Section 302 Congestion Grants focused on relieving rail congestion bottlenecks. Section 303 required each state develop and maintain a State Rail Plan to be eligible for the funding provided in Sections 301 and 501.

A five-year bill, the 2008 PRIIA legislation is now overdue for reauthorization in 2014. As the bill came up for consideration in 2013, the House and Senate committees with jurisdiction over the legislation agreed to address PRIIA as part of the overall surface transportation reauthorization scheduled for 2014, allowing the surface transportation bill to be more multimodal in its approach. As of mid-2014, however, it appears that reauthorization of the surface transportation bill may be delayed beyond 2014.

2.1.5.1.2 Transportation Investment Generating Economic Recovery (TIGER)
Congress passed the American Recovery and Reinvestment Act (ARRA) in February 2009. ARRA included an appropriation of \$8 billion in 100 percent federal funding providing “capital assistance for high-speed rail corridors and intercity passenger rail service.” ARRA also provided \$1.5 billion in 100 percent flexible multi-modal funding to be distributed through a discretionary grant program. Since then, there have been five subsequent rounds of this discretionary grant program. The TIGER grant program provides funding for both passenger and freight rail projects. As the program has evolved, typical grant amounts have not exceeded \$20 million in recent years. A local match is required; 20 percent is the minimum non-federal share (which may be waived by DOT for rural areas). Raleigh Union Station has received funding from this program. The TIGER program is authorized annually as part of USDOT’s

appropriation legislation; this may change as part of the reauthorization of the five-year surface transportation bill.

2.1.5.1.3 The FRA High-Speed and Intercity Passenger Rail Program (HSIPR)
In developing guidance for ARRA grants as well as grants offered under subsequent PRIIA appropriations, an initial program structure was created. The program was revised in subsequent notices of funding availability. The program was last active in 2011 but the Federal Railroad Administration continues to list this program with the description that the program “periodically solicits applications and proposals.” Based on the 2011 guidance, a minimum 20 percent non-federal share would be required although new notices of funding availability could change this requirement. Eligible activities include service development programs (a set of inter-related capital projects that will result in the introduction of new or substantially improved high-speed or intercity passenger rail services) and individual projects (discrete capital projects that will result in service or other tangible improvements). While this program has historically had no predetermined minimum or maximum dollar threshold for awards, FRA has sought to make multiple awards from the funding available and has prioritized those applications whose match percentage exceeded the minimum.

2.1.5.1.4 FRA Rail Line Relocation and Improvement Capital Grant Program
Section 9002 of SAFETEA-LU authorized \$350 million per year for the purpose of providing financial assistance for local rail line route and infrastructure improvement projects. From FY 2008 through FY 2011, Congress appropriated just over \$90 million for the program through both Congressionally-directed spending and competitive grant opportunities. Congress did not appropriate any funding for the Rail Line Relocation program in FY 2012 or subsequent years. The status of this program is uncertain in 2014.

2.1.5.1.5 FHWA Highway Safety Improvement Program (HSIP) and Section 130 Highway-Rail Grade Crossing Program

The Federal Highway Administration (FHWA) Section 130 Highway-Rail Grade Safety Crossing program provides grants for the improvement of highway-railroad grade crossings that enhance safety. FY2014 funding for this program was \$220 million across the U.S. Of this amount, North Carolina received \$6.4

million. Funds from the FHWA Section 130 program can be used for freight and passenger rail projects, provided that the projects improve safety at grade crossings. The amount of federal funds available for Section 130 is dependent on annual appropriations. Federal funds for grade-crossing safety improvements are available at a 90 percent federal share, with the remaining 10 percent to be paid by state and/or local authorities and/or the railroad. The federal share may amount to 100 percent for the following projects: signing; pavement markings; active warning devices; the elimination of hazards; and crossing closures. The decision on whether to allow 100 percent federal funding rests with the individual states. The local match is not subject to the STI prioritization process, though the funds committed are accounted for in the total funding allocations by region and division.

Most funding programs controlled by the FHWA focus on roadway projects, however, several programs have funds may be used for rail projects under special conditions.

- The Congestion Mitigation and Air Quality Management (CMAQ) program pays for transportation projects or programs that will contribute to attainment of national ambient air quality standards. CMAQ funds may be used for intercity passenger rail projects located in a nonattainment or maintenance area if they reduce emissions and meet the program's other eligibility criteria. Capital costs as well as operating expenses, are eligible as long as the project contributes to the attainment or maintenance of the air quality standard through reduction in vehicle miles traveled, fuel consumption or through other factors. North Carolina has seven counties in non-attainment status, all part of the Charlotte-Gastonia-Rock Hill, NC-SC metropolitan area. Local matching funds can be secured from the State Highway Trust Fund, provided they are secured through STI.
- The Surface Transportation Program (STP) provides flexible funding that can be used for rail highway grade crossings and selected other project elements, typically as part of a larger program.
- The Transportation Alternatives Program (TAP) provides funding that can be used for the historic preservation and/or enhancement of rail stations. It can also be used to convert abandoned railroad corridors to

trails for pedestrians, bicycles, and other non-motorized transportation. It typically requires a 20 percent local match. After June 30, 2015, state funds cannot be used to provide these matching funds.

- State Planning and Research (SP&R) funds consist of set asides from four programs: the National Highway Performance Program, the Surface Transportation Program, HSIP, and the CMAQ program. Rail projects are eligible for all but the National Highway Performance Program. Typically, this program requires a 20 percent local match. The 20 percent local matching funds can be secured from the State Highway Trust Fund, provided they are secured through STI.

2.1.5.2 Federal Loan Programs

There are also two federal programs that provide loans for projects, although they do not provide direct funding. These loans must be collateralized and paid back by a local funding source.

2.1.5.2.1 Railroad Rehabilitation and Improvement Financing (RRIF)

The Railroad Rehabilitation and Improvement Financing (RRIF) program provides direct federal loans and loan guarantees to finance development of railroad infrastructure. Under this program, the FRA can authorize direct loans and loan guarantees to acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, track components, bridges, yards, buildings and shops. It can be used to refinance outstanding debt incurred for the purposes listed above as well as for developing or establishing new intermodal or railroad facilities. While the program has been used largely for freight rail projects, it can be used for passenger rail and transit projects. In the case of passenger rail projects, RRIF funding would require investment grade revenue and operating cost forecasts that demonstrate that the project has the potential to provide a substantial revenue stream typically after a significant public investment is made in infrastructure and/or equipment. As the reauthorization of MAP-21 is being debated in 2014, there are proposals to revise the RRIF program to make it applicable to a wider range of rail projects. NCDOT assisted the Great Smoky Mountain Railroad in obtaining a RRIF loan of \$7,500,000 in 2005.

2.1.5.2.2 Transportation Infrastructure Finance and Innovation Act (TIFIA)

The Transportation Infrastructure Finance and Innovation Act (TIFIA) administered by the Federal Highway Administration, authorizes credit assistance on flexible terms in the form of secured loans, loan guarantees, and standby lines of credit. TIFIA financial assistance is provided directly to public/private sponsors of surface transportation projects of national significance. TIFIA was created because state and local governments that sought to finance large-scale transportation projects with tolls, other forms of user-backed revenue, or innovative revenue sources such as tax increment financing, often faced high borrowing rates due to the uncertainties associated with such revenue streams. The TIFIA's credit assistance helps borrowers obtain more favorable rates, allowing many projects to advance. TIFIA credit program may be used by States, localities, or other public authorities, as well as private entities undertaking projects sponsored by public authorities. The TIFIA credit program's fundamental goal is to leverage federal funds by attracting substantial private and other non-federal investment in critical improvements to the nation's surface transportation system. It can be used for both freight and passenger rail projects. A wide variety of intermodal and rail infrastructure projects are eligible and can include equipment, facilities, track, bridges, yards, buildings and shops. Though not a rail program, North Carolina has experience with the TIFIA program as it utilized TIFIA for the Triangle Expressway project.

Many of the eligible rail uses are present in North Carolina including:

- Intercity passenger bus or rail facilities and vehicles, including those owned by Amtrak.
- Public freight rail projects
- Private freight rail projects that provide public benefit for highway users by way of direct highway-rail freight interchange (this is modification of the SAFETEA-LU eligibility criterion)
- Intermodal freight transfer facilities
- Projects providing access to, or improving the service of, the freight rail projects and transfer facilities described above

- Surface transportation infrastructure modifications necessary to facilitate direct intermodal interchange, transfer and access into and out of a port

2.1.5.2.3 Grant Anticipation Revenue Vehicle (GARVEE)

Grant Anticipation Revenue Vehicle (GARVEE) bonds can be issued by states for transportation projects receiving federal funding and the project details must be approved by the FHWA. States repay the funds using anticipated federal funds. Grant Anticipation Bonds are useful when it is desirable to bring a project to construction more quickly than otherwise would be possible. North Carolina has experience with this program having utilized GARVEE on several occasions including the Monroe Connector Bypass as well as numerous smaller projects bundled together into a program of investments. GARVEEs have seldom been used to fund rail projects, but in 2006 Rhode Island issued GARVEE bonds for constructing a freight-dedicated track along Amtrak's Northeast Corridor.

2.1.5.2.4 Railroad Track Maintenance Credit Program

This program was authorized within the Internal Revenue Code to provide tax credits to qualified entities for an amount equal to 50 percent of qualified railroad maintenance expenditures on railroad tracks owned or leased by Class II or Class III railroads. The maximum credit amount allowed was \$3,500 per mile of track. Legislation was enacted in December 2010 to extend the tax credit program for an additional two-year period through December 2013, maintaining the credit limitation at \$3,500 per mile. The program was recently extended through 2014.³⁷

2.1.5.2.5 Railroad Safety Technology Grants Program

Under the Rail Safety Improvement Act of 2008 (RSIA), the program was authorized to provide grants to passenger and freight carriers, railroad suppliers, and public sector projects that improve railroad safety and efficiency. The program aimed to facilitate technology advancements and safety systems in

³⁷ Tax Increase Prevention Act of 2014, H.R. 5771, Sec. 116, <https://www.govtrack.us/congress/bills/113/hr5771/text>

the railroad industry such as “the deployment of train control technologies, train control component technologies, processor-based technologies, electronically controlled pneumatic brakes, rail integrity inspection systems, rail integrity warning systems, switch position indicators and monitors, remote control power switch technologies, track integrity circuit technologies, and other new or novel railroad safety technology.”³⁸ In 2013, \$550,000 became available but the application period ended in February 2014. The private match requirement is a minimum of 20 percent.

2.1.5.2.6 Railroad Rehabilitation and Repair Program (Disaster Assistance)

The Railroad Rehabilitation and Repair Program (RRRP) provides up to \$20 million in grant assistance for repairs for Classes II and III railroad infrastructure that are the result of natural disasters in areas declared a major disaster by the President. Awarded competitively, the grants can be used to cover up to 80 percent of the repair costs but other state and federal sources must be exhausted before applying for RRRP grants. Eligible infrastructure includes track, signals, bridges, and any other infrastructure used to move freight. To date, there have been three solicitations for applications. Under the first solicitation in 2009, the NCDOT was awarded \$11,101 for CLNA repairs to washouts and debris removal.

2.1.5.3 North Carolina State Rail Funding Programs

2.1.5.3.1 North Carolina Highway Fund

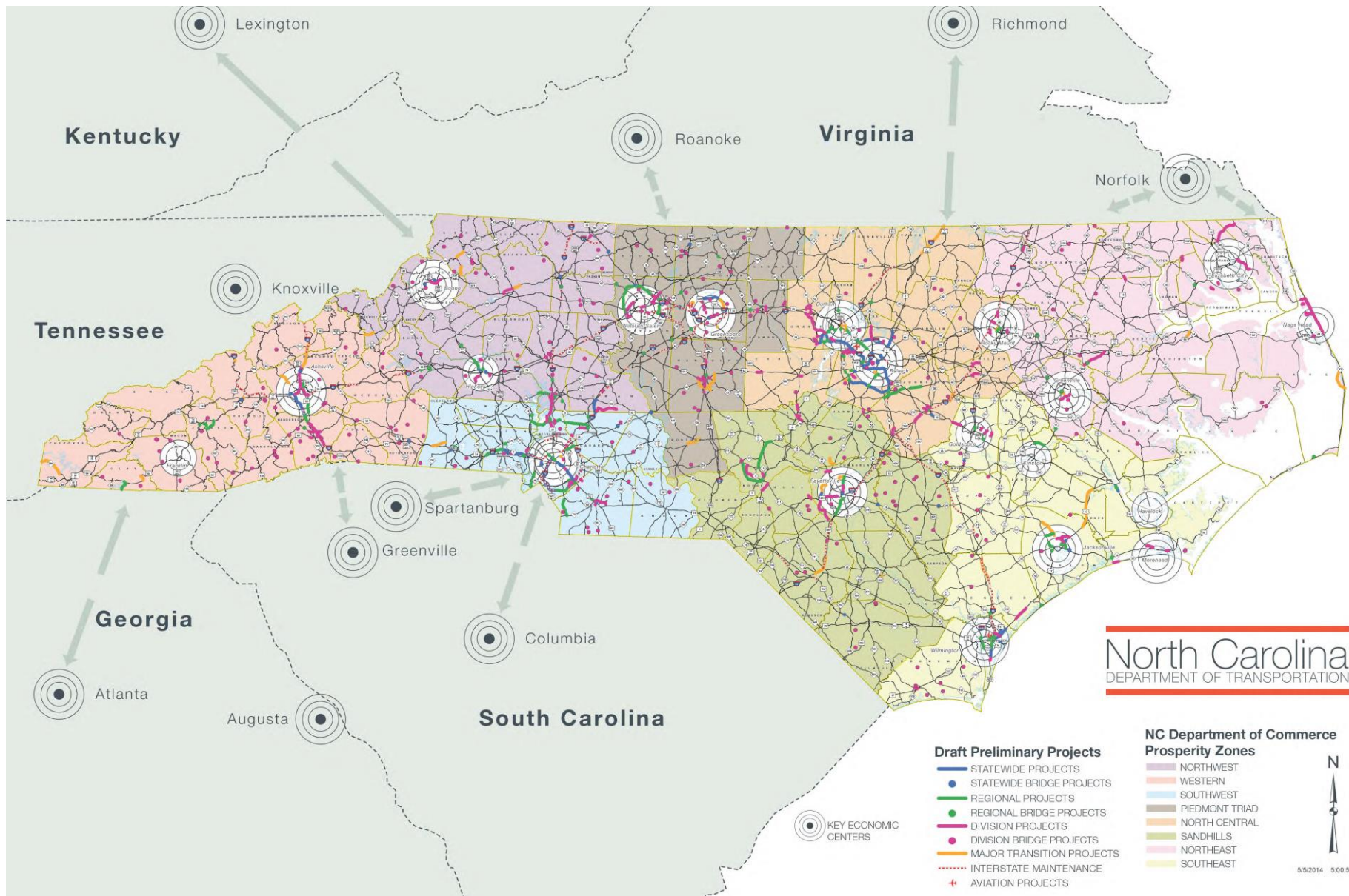
North Carolina’s Highway Fund is used to maintain the state road network, fund NCDOT and Division of Motor Vehicles administrative costs, and support multimodal programs such as public transportation, rail, bicycle/pedestrian, and ferry programs. The Highway Fund dates back to 1921, when the North Carolina General Assembly first imposed the gasoline tax of .01 cents per gallon on all motor vehicles fuels sold or distributed in the state. Revenue for the Highway Fund comes from a variety of sources, including the state gas tax, motor vehicle registration fees, title fees and federal-aid reimbursements.

Though originally created to fund highway construction and maintenance, the State Highway Patrol and the Division of Motor Vehicles, in the 1990s, the fund also began supporting public transportation and rail programs.

2.1.5.3.2 Annual Legislative Appropriations

In 2013, the North Carolina General Assembly passed the Strategic Transportation Investments Law (STI) to direct investment of capital into the state’s infrastructure. STI funds projects within three tiers or categories: statewide, regional, and division. Forty percent of revenues are distributed to statewide mobility projects, 30 percent to projects of regional impact, and 30 percent to projects representing division needs. North Carolina is divided into 14 multi-county divisions for NCDOT administrative purposes. Economic regions consist of pairs of divisions. Figure 2 - 24 depicts the draft preliminary projects within the three tiers.

³⁸ Federal Railroad Administration, Railroad Safety Grants Program, <http://www.fra.dot.gov/Page/P0553>



Source: NCDOT STI 2015 Draft State Map

Figure 2 - 24 Strategic Transportation Investments

Through a Strategic Mobility Formula (SMF), STI provides access for non-highway modes to the State Highway Trust Fund. A workgroup comprised of representatives of Metropolitan Planning Organizations (MPO's), Rural Planning Organizations (RPO's), NCDOT planning staff, Division Engineers, and transportation advocacy organizations provided recommendations for scoring methodologies to support the law. *Board of Transportation – Prioritization 3.0: Scoring Criteria, Weights, and Normalization for All Modes*,³⁹ and *Prioritization 3.0: Rail Division Scoring Criteria Summary Report* (May, 2014)⁴⁰ fully describe the criteria used. Projects funded at the statewide level are prioritized wholly by the data and criteria established. Regional and division levels still use data-driven criteria, but afford local input into project rankings. The following table (Table 2 - 13) outlines the types of rail projects that are eligible for each tier within STI. Short lines are not eligible for funding under STI.

Scoring for the statewide mobility projects has been completed and the new scoring formula is scheduled to be fully implemented after July 1, 2015. Based on the established criteria, no rail projects received funding at the statewide level. Ranking of projects for the regional and division tiers are ongoing as of this draft, so a final determination of the level of funding for rail through STI has not been established. A minimum floor for funding of non-highway modes was established. In 2013-2014, the \$1.105 billion in the Highway Trust Fund was distributed by allocating \$937 million to SMF, \$73 million for debt service, and \$46 million to administration. The floor for non-highway modes is calculated as \$37,480,000 and is distributed through the SMF. It should also be noted that the SMF associated with STI is being reviewed and could be modified for future funding cycles.

³⁹ Available at <http://www.ncdot.gov/download/strategictransportationinvestments/Prioritization.pdf>

⁴⁰ Available at https://connect.ncdot.gov/projects/planning/STIData/Rail_CriteriaSummaryReport.pdf

Table 2 - 13 Rail Project Types by STI Category

STI FUNDING CATEGORY	PROJECT TYPES			
	FREIGHT TRACK AND STRUCTURES	FREIGHT INTERMODAL	INTERCITY PASSENGER TRACK AND STRUCTURES	INTERCITY PASSENGER SERVICE AND STATIONS
Statewide (100% Criteria Score)	Class I sidings, double-track, grade separations, new improved access	Not eligible	Not eligible	Not eligible
Regional (70% Criteria Score)	Same as Statewide	Not eligible	Rail lines crossing a county line: sidings, double-track, grade separation, curve realignment	Rail lines crossing a county line: intercity passenger service
Division (50% Criteria Score)	Same as Statewide	Class I intermodal or transload facilities	Same as Regional	Same as Regional plus intercity passenger stations

Source: NCDOT, Prioritization 3.0: Rail Division Scoring Criteria Summary Report (May, 2014)

2.1.5.3.3 North Carolina Railroad Dividends

An additional funding source available is the Freight Rail and Rail Crossing Safety Improvement Fund (FRRCSI). The fund was established under North Carolina General Statute (NCGS) 124-5.1 and is funded by annual North Carolina Railroad Company dividends. In 2014, FRRCSI received a one-time dividend of \$19.2 million. There is \$3.5 million budgeted for FRRCSI in state fiscal year 2015. Eligible freight and rail-highway crossing safety projects include: track and associated infrastructure projects, grade crossing protection, elimination, hazard removal, signalization improvements, and rail access improvements to industrial, port, military, and intermodal facilities. Class I and short lines that carry freight are eligible for FRRCSI. The Great Smoky Mountain Railroad is not eligible for either STI or FRRCSI as it does not carry freight.

Historically, North Carolina has been recognized as a national leader in working with private railroads and other public agencies to expand the transportation system by leveraging state and federal grants with private investments. The establishment of FRRCSI will help continue two of these programs – the Rail Industrial Access Program (RIAP) and the Short line Infrastructure Assistance Program (SIAP).

- **Rail Industrial Access Program (RIAP):** This program was traditionally funded by annual state legislative action at a level ranging from \$119,000 to \$1 million annually. It has invested over \$9 million to leverage over \$2.6 billion in projects since its creation in 1994. FRRCSI will provide funding in 2014 and 2015. NCDOT began the Rail Industrial Access Program to provide an incentive to locate or expand their facilities in North Carolina. This funding helps ensure that companies have the railroad tracks needed to transport freight and materials. The program uses state funds to assist in constructing or refurbishing tracks required by a new or expanding industry to encourage economic development. Funding for the projects is contingent upon application approval prior to the industry making their decision to locate or expand their facility in North Carolina and a private and/or local source providing matching funds.
- **Short Line Infrastructure Assistance Program (SIAP):** This program was also previously funded by an annual state legislative allocation. Allocations ranged from zero to \$2 million annually. FRRCSI will fund the program in 2014 and 2015. This program requires a 50 percent match by the private railroads for improvements to short line railroad infrastructure.

In May 2014, forty FRRCSI projects estimated at a combined \$16,596,108 were approved by the Board of Transportation. The balance of the \$19.2 million will be available as other economic development and safety opportunities arise.

Additional innovative transportation funding solutions employed by NCDOT and local agencies include the following options:

- **North Carolina Railroad Capital Projects:** The operating and maintenance agreement payments from Norfolk Southern to the North Carolina Railroad Company (NCRR) have historically been used by the NCRR to upgrade infrastructure, improve economic development, and protect the railroad corridor for future uses. While this continues, a portion of lease payments are also applied to support the FRRCSI Program, as described above.
- **Value Capture:** For major transit capital investments such as commuter rail projects, NCDOT is working with local governments and regional transit agencies to create new mechanisms that capture public revenues from increased private land values resulting from public investment. For projects like commuter rail, “value capture” could provide a portion of the project costs, demonstrating how station-area investments can result in significant impacts when used as catalysts for public and private development.
- **Tax Incentives for Railroad Intermodal Facilities:** Intermodal railroad facilities are eligible for tax credits. These credits are against sales and use taxes (§105-164.13) and up to 50 percent of construction cost or lease (§105-129.96). The credits are eligible until 2038 unless extended and have provided savings for CSXT and NS intermodal facilities. The program should be reviewed to determine whether additional private investment by the freight railroads can be leveraged.

The continued public investment in the state’s intercity passenger rail services, as well as long-term investment in high-speed rail, will improve mobility across the state. The NCDOT Seven Portals Study noted the importance the new passenger routes would have on logistics in the state. Improved passenger rail services should also benefit freight rail through added network capacity and enhanced safety.

2.1.5.3.4 Local Option Fuel, Sales or Property Tax

Counties and cities have limited financial resources for making capital improvements, but still may be able to contribute modestly to project funding. North Carolina allows counties (but not cities) to levy four local option sales taxes (LOST) upon the approval of public referendum. The four LOST are the

Article 39 one-cent tax, the Article 40 half-cent tax, the Article 42 half-cent tax, and the Article 44 half-cent tax. The 100 North Carolina counties now levy the full amount -- 2.5 percent. As the state levies a 4.5 percent sales tax, the total sales tax rate is now 7 percent statewide (except in Mecklenburg, Durham and Orange Counties which levy an additional 0.5 percent LOST for mass transit). The North Carolina General Assembly has recently considered legislation that would restrict local government's ability to levy LOST for transit. The local option fuel tax has a transportation nexus and the advantage that a portion of the tax burden can be exported to tourists and visitors to the coastal counties. As other transportation needs are ongoing in these counties, one possibility would be to dedicate a portion of the tax to stations or rail projects for a period of time. An alternative option would be to raise the tax and dedicate all or part of the additional tax to rail projects. Depending on the size of the increase, the additional revenues could be split among other needs in the counties such as education, in order to gain broader support for the project. Legislative action would be required to raise the tax. North Carolina's fuel tax is a combination of a fixed and variable rate. The fixed portion is 17.5 cents; the remainder is variable – indexed to 7 percent of the wholesale rate of fuel with a minimum yield of 3.5 cents. There is similarly a ceiling on the top rate—the combined total fixed and variable rate is 37.5 cents. Given that fuel prices are expected to hold at a rate that maxes out the top variable rate, North Carolina's fuel taxes are effectively flat going forward.

2.1.5.4 Opportunities For Private Sector Investment

This section describes potential strategies to attract and link private sector funding for rail projects. In most cases the unique project and business opportunity will determine the most effective strategy available to the participants if a consensus can be reached. Participants may include each of the three railroad classes, as well as other infrastructure investors and operators.

There are three considerations when negotiating funding shares for rail-related improvements: ability to contribute, receipt of benefits in return for contribution, and willingness to pay. In terms of ability to contribute, both of the Class I railroads that operate in the state have large capital investment budgets and have partnered nationally with public sponsors to secure federal funding, such as for Transportation Investment Generating Economic Recovery (TIGER)

funding. In terms of willingness to pay, this is a matter of negotiation rather than a stand-alone analysis. There may be instances where a project yields operational savings to the railroad and other identified stakeholders, thereby enabling a proportional contribution by the railroad and other stakeholders.

2.1.5.4.1 User Fees

In some instances, an intermodal transfer facility for example, fees can be charged to the users. These fees can then be used to cover the cost of operating and maintaining the facility, with the balance applied to repaying construction debt. An advantage of the user fee approach is that railroads can transfer at least some of this cost to shippers, who are also beneficiaries of the improved rail service afforded by the improved rail line.

2.1.5.4.2 Sale/Leaseback of Rail Assets

The railroads own numerous assets within the state, including but not limited to track, intermodal facilities, and land. The utilization of these assets may decline with the railroads' evolving network patterns and changing traffic volumes. Also, some railroads may lack the short-term investment capital that may be needed to upgrade and sustain roadbed, structures, and equipment for optimal operation. In such cases, the railroad could sell the asset to the state who could then repurposes it or lease the right to use it, to perhaps a short line, providing a revenue stream to the state (after accounting for the capital expense). Because the state would enter into a contractual agreement with the lessee for a set period of time, the rental income would help to offset the expense of the railroad purchase. Over time, the state could cover its expenses and may even link the sale/leaseback effort to other grant and public purposes to further leverage the investment. For example, the North Carolina Railroad Company leases track to Norfolk Southern, whose lease revenues are used to support improvements along the corridor as well as fund the FRRCSI program.

Another example of a sale/leaseback arrangement with NCDOT as the owner was with the Great Smoky Mountains Railroad, which leased a segment of the Murphy Branch from NCDOT starting in 1988 for \$40,000 per year for 25 years.

⁴¹ In the end the lease payments to the state reduced the incentive for the Great Smoky Mountains Railroad to invest more in infrastructure. Thus, NCDOT sold a portion of the line back to them in 1996, which helped spur new investment and, later, a stock sale of the company.⁴²

2.1.5.4.3 Public-Private Partnerships

Public-Private Partnerships (P3s) have become more readily utilized over the past decade as another tool in the project development and delivery toolbox, as well as providing financing options. NCDOT's public-private partnership legislation (October 2012) applies to the planning, development, design, construction, operation or maintenance of roads, bridges, highways, or other Department of Transportation infrastructure. The state legislature provided additional clarification in subsequent acts, but P3s are not authorized for rail purposes. However, P3 legislation could be amended to include rail, thereby allowing rail partnerships for station area development projects. The absence of P3 authority prevented NCDOT from entering into an agreement to complete the Charlotte Gateway Station and developing the air rights of the surrounding NCDOT-owned property.

The P3 approach for railroad projects in North Carolina will prove effective where project attributes align with the short- and long-term interests of the participants. The Class I railroads, operating $\pm 2,290$ miles, 70 percent of the state system, will retain ownership and control of their existing infrastructure. However, there may be innovative means to commit future public funds for the public sector share of joint improvements, such as those seen with grade crossing upgrades. There may exist other P3 opportunities in the state with the $\pm 1,130$ miles of track owned and operated by the state's Class II and III railroads. Projects with the Class II and III railroads may be more localized and have specific private and public benefits that can be attributable to the results of the project implementation. Large traffic generators may also be candidates for public-private projects in participation with state and local agencies. Ports and large industrial companies with significant rail freight traffic volumes are

candidates. Each project would still be required to meet the state's solicitation and procurement requirements.

With or without formal P3 approaches to project delivery, collaboration and partnership between the public and private sectors in providing rail service in North Carolina will benefit both parties due to the overlapping participation in project approval and implementation. The state's Rail Industrial Access Program provides funds to local governments, economic development agencies, railroad companies and industries seeking to improve rail access. Dividend payments from the NCRR to the State of North Carolina are used to improve railroad infrastructure and support railroad improvements in the state. The state has an active State Infrastructure Bank (SIB) which has supported rail investment in the state (the City of Greensboro rail depot for example). In North Carolina, municipal borrowers may have debt limits and SIB loans can fulfill a unique credit assistance niche by lending funds to accelerate project delivery in advance of the required local project match.

North Carolina's Department of Transportation has the ability to enter into contractual agreements with private companies to construct, operate and/or maintain public infrastructure such as roads, bridges, and other assets. Separately, other elements of the state's freight network such as the Ports and the Global TransPark also have this capability. Expanding this ability to include rail would allow for greater development potential.

Public-Private Partnerships can offer project sponsors several benefits when administered carefully. Among the key potential benefits are:

Risk Transfer: The P3 arrangement can be structured to transfer risk from the public sector to the private sector. Risks include revenue shortfall, construction cost overruns, greater than expected growth in O&M costs. This risk transfer can be accomplished because the private sector has the flexibility to manage complex risks. Also, the multiparty transaction (banks, concessionaire, and public sponsor) all work to identify, quantify and mitigate risk—ensuring a disciplined financial risk approach and a comprehensive review of project assumptions and details.

⁴¹ Poole, Cary Franklin. A History of Railroading in Western North Carolina, 1995, p. 43.

⁴² Great Smoky Mountain Railroad Website, Accessed on 1/30/15: <http://www.ncrailways.org/railroads/great-smokey-mountain>

Timely Delivery of Projects: Data from the UK National Audit Office found that a higher percentage of privately financed projects were delivered early or on-time at the agreed upon price, compared with pure public projects.

Preservation of Public Borrowing Capacity: By privately financing a project, the public sector can leverage its finite bonding capacity and apply this bonding capacity to other projects. In implementing a P3, framing the Concession Agreement is essential to having a successful project. A concern for the public and for public agencies, for example, is that the public authority or agency will lose control over pricing policy once the asset is operated by a private concessionaire. The Concession Agreement can cover details of how the facility will be operated. For example it can include Operating Standards that describe minimum levels of service, minimum asset condition, and intervention times for snow removal, accidents and other events. The public agency can retain the ability to resume full control in the event of default.⁴³

2.1.6 Safety and Security Programs

NCDOT's Rail Division coordinates safety efforts through their Engineering Coordination and Safety Branch. Safety initiatives include planning and implementing crossing safety programs, inspecting and overseeing infrastructure, and promoting rail safety through public awareness and education. An overview of these efforts is provided in this section along with a brief explanation of the Federal Railroad Administration's (FRA) national oversight of railroad safety.

2.1.6.1 National Railroad Safety Oversight

The FRA has authority over rail safety across the nation. In this role, the FRA partners with the NCDOT to inspect rail infrastructure in five safety disciplines: hazardous materials, motive power and equipment, operating practices, signal and train control, and track. The NCDOT participates in the safety program and exercises inspections through a multi-year agreement with FRA. In addition, the

FRA supports rail safety programs through grants and loans, collects and maintains safety-related data, investigates incidents, conducts training and education, develops and shares safety-related information, and develops and enforces safety regulations.⁴⁴ Training is a major component of FRA's safety program. FRA training helps States to develop rail safety programs and helps inspectors to maintain technical proficiency.⁴⁵

The NCDOT's safety programs conform to rules and regulations implemented by FRA including 49 CFR Part 234, *Grade Crossing Safety, Including Signal Systems, State Action Plans, and Emergency Notification Systems* and 49 CFR Part 212 *State Safety Participation Regulations*. In 2008, Congress passed the Rail Safety Improvement Act (RSIA), the first authorization of FRA's safety programs since 1994. The RSIA directs FRA to issue safety regulations for different areas related to railroad safety such as hours of service requirements for railroad workers, positive train control implementation, standards for track inspections, certification of locomotive conductors, and safety at highway-rail grade crossings.⁴⁶

In July 2010, FRA released a Bridge Safety Standards Final Rule requiring railroad track owners to adopt and follow specific procedures to protect the safety of their bridges and to strengthen federal oversight of railroad bridge programs. The final rule requires rail carriers to:

- Implement bridge management programs that include at minimum annual inspections of railroad bridges
- Conduct special inspections if the weather or other conditions warrant such inspections
- Maintain an inventory of all railroad bridges and know their safe load capacities

⁴⁴ Federal Railroad Administration. "Railroad Safety". Available: <http://www.fra.dot.gov/Page/P0010>. Visited: 24 April 2014.

⁴⁵ Federal Railroad Administration. State Rail Safety Participation. Available: <http://www.fra.dot.gov/Page/P0014>

⁴⁶ Federal Railroad Administration. "Rail Safety Improvement Act of 2008 (RSIA)." Available: <http://www.fra.dot.gov/Page/P0395>. Visited: 24 April 2014.

⁴³ The next session of the NCGA is expected to review NC's PPP authority and consider changes.

- Maintain design documents and document all repairs, modifications, and inspections of each bridge
- Ensure bridge engineers, inspectors, and supervisors meet minimum qualifications
- Make sure bridge inspections are conducted under the direct supervision of a designated railroad bridge inspector
- Conduct internal audits of bridge management programs and inspections⁴⁷

The FRA has a number of grants and loans to support state safety programs. For example, the Railway-Highway Crossing Hazard Elimination Program provides funding for safety improvements at both public and private highway-rail grade crossings along federally-designated high-speed rail corridors. The FRA also supports a dedicated grant for Operation Lifesaver, a national not-for-profit rail safety organization.

2.1.6.2 Planning and Implementing Crossing Safety Programs

The Rail Division's Crossing Hazard Elimination Program is responsible for maintaining a crossing inventory and analyzing data to identify the state's most pressing needs for crossing safety improvements. The program takes into account factors such as train volume, train speed, average daily vehicle traffic, school bus frequency, existing warning devices, the number of main-line tracks and side tracks in use, and the crossing's 10-year accident history (which is available from FRA Office of Safety Analysis)⁴⁸. Information on each crossing is updated annually. The crossings with the highest indices are selected as candidates for improvement. Available funding dictates how many crossings are selected and assigned priorities for improvements. After the selected crossings have been added to the Crossing Hazard Elimination Program, the new projects

are submitted to the North Carolina Board of Transportation for approval as additions to the State Transportation Improvement Program (TIP).⁴⁹

Traffic Separation Studies (TSS) is a nationally recommended practice in which NCDOT coordinates with Metropolitan Planning Organizations (MPOs), local communities, and affected businesses to develop recommendations for railroad-highway crossings. Short-term improvements (1-2 years) may include installing traffic control devices, realigning roadways or closing crossings. Mid-term recommendations (2-5 years) might include building connector roads, realigning roadways, closing crossings or relocating crossings. Long-term recommendations may include building bridges, underpasses or connector roads and closing crossings.⁵⁰

The NCDOT continues to make significant headways to improve crossing safety along the Federally-Designated Southeast Corridor from Raleigh to Charlotte. NCDOT partnered with Norfolk Southern to implement the Sealed Corridor Initiative in 1995 between Raleigh and Charlotte.⁵¹ Together, the organizations have been working to install traffic control devices and implement crossing closures. In addition, in 2010 approximately \$520 million American Recovery and Reinvestment Act (ARRA) funds were secured for the Piedmont Improvement Program, a series of planned rail and roadway investments between Raleigh and Charlotte aimed at improving safety and passenger rail travel times. The program is funding 23 crossing closures and 12 grade separation projects, in addition to other improvements.⁵² All projects are planned to be completed by 2017.⁵³

The NCDOT also uses funds from the Freight Rail and Rail Crossing Safety Improvement Fund (FRRCSI) to implement safety improvements on eligible

⁴⁷ United States Department of Transportation. "Federal Railroad Administration Railroad Bridge Safety Fact Sheet." February 2013.

⁴⁸ Federal Railroad Administration Office of Safety Analysis. Accessed June 5, 2014. <http://safetydata.fra.dot.gov/OfficeofSafety/default.aspx>

⁴⁹North Carolina Department of Transportation Rail Division. Train Crossing Program. Accessed March 6, 2014. <http://www.ncbytrain.org/safety/crossings.html>

⁵⁰North Carolina Department of Transportation. North Carolina Rail Plan 2000. January 2001.

⁵¹North Carolina Department of Transportation. Sealed Corridor Program. Accessed March 6, 2014. <http://www.ncbytrain.org/safety/sealed.html>

⁵²North Carolina Department of Transportation. Piedmont Improvement Program. Accessed March 6, 2014. <http://www.ncdot.gov/projects/pip/>

⁵³ North Carolina Department of Transportation. "Piedmont Improvement Program." Available: <http://www.piedmontrail.biz/>. Accessed 24 April 2014.

rail/highway safety projects that are not funded by other programs. The Rail Division staff uses quantitative analysis to determine funding and to prioritize the projects.⁵⁴

Crossing closure and crossing signalization projects are paying off in reducing the number of crashes between trains and automobiles. Between 2002 and 2013, NCDOT implemented 1,090 crossing signalization projects. As of 2013 NCDOT had completed 189 rail-highway crossing closure projects since 1992.⁵⁵ These projects and increased public awareness have led to substantial crash reductions. The number of annual crashes decreased 79 percent from 244 in 1988 to 51 in 2014 (Figure 2 - 25); in contrast, the State population increased by 49 percent over the last 23 years, from 6.6 million people in 1990 to 9.8 million people in 2013 (see Figure 2 - 32 for population and Figure 2 - 68 for a comparison to vehicle miles traveled). Train accident casualties have also decreased over time and appear to have leveled off over the past few years. The Piedmont Improvement Program and other planned projects will continue to improve safety conditions.

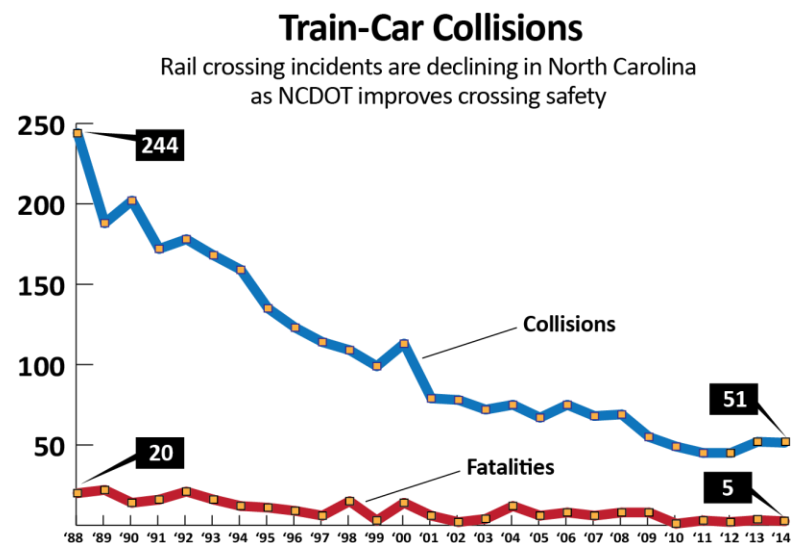


Figure 2 - 25 North Carolina Train-Car Crashes: 1988 - 2014⁵⁶

2.1.6.3 Inspection and Oversight

In addition to promoting railroad-highway crossing safety, the Rail Division promotes safety through inspecting rail infrastructure and vehicles. The Rail Division's Railroad Safety Enforcement Program partners with the FRA to inspect traffic control devices, thousands of rail cars and locomotives, and over 3,300 miles of railroad tracks in North Carolina. The Division also coordinates with the Federal Transit Administration (FTA) and local transit agencies to ensure existing and proposed local rail projects meet safety standards as part of the State Safety Oversight Program for Fixed Guideway and Rail Systems.⁵⁷ Currently the Charlotte Area Transit System (CATS) is the only transit agency operating a rail transit system (CATS Blue Line light rail), with an extension under construction.

⁵⁴Worley, Paul. Presentation to the NC Board of Transportation, February 5, 2014.

⁵⁵ North Carolina Department of Transportation – Paul Worley. North Carolina Projects Update NCAMPO Presentation. May, 17, 2013.

⁵⁶ Federal Railroad Administration. Office of Safety Analysis Website.

<http://safetydata.fra.dot.gov/OfficeofSafety/default.aspx>

⁵⁷North Carolina Department of Transportation. North Carolina Rail Plan 2009 Executive Summary.

2.1.6.4 Public Awareness and Education

NCDOT promotes rail safety public awareness through the Rail Division's BeRailSafe program. The program publishes informational materials and offers presentations.⁵⁸ BeRailSafe materials address safety around railroad tracks and it stress the message that railroads are not a shortcut, a trail, or a resting place. Presentations are typically targeted to school bus drivers, commercial drivers, sportsmen, adults, and children. NCDOT also promotes rail safety awareness through training law enforcement and emergency responders in railroad emergency and passenger equipment safety procedures.⁵⁹ The NCDOT BeRailSafe program complements ongoing public awareness activities of national groups such as Operation Lifesaver and its North Carolina Operation Lifesaver affiliate. Similar to BeRailSafe, Operation Lifesaver is a public information program dedicated to reducing injuries and fatalities at highway-rail crossings and on active rail lines. Operation Lifesaver maintains and publishes statistics about rail trespassing and crossing collisions and offers materials, videos, presentations, and training about education, enforcement, and engineering to promote rail safety.⁶⁰ NCDOT is an active Board member of Operation Lifesaver. NCDOT also conducts safety blitzes at crossings to advise motorists and trucking companies prior to implementing MAS (train control and monitoring system) increases.

Figure 2 - 26 shows the number of trespasser incidents over the last 15 years.

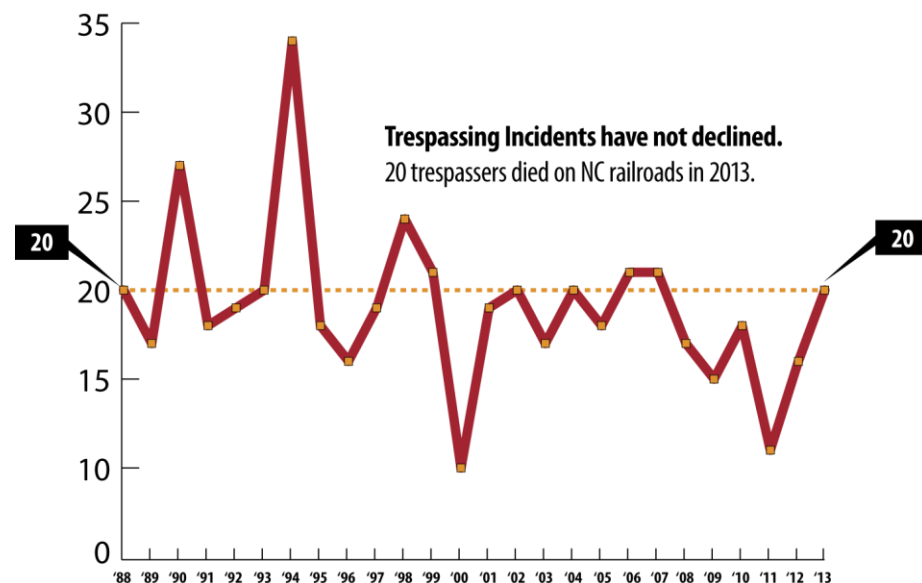


Figure 2 - 26 Trespassing Incidents in North Carolina 1988 - 2013⁶¹

2.1.7 Economic and Environmental Impacts of Rail

This section provides a general analysis of rail transportation's economic and environmental impacts in the State including congestion mitigation, safety impacts, trade and economic development, air quality, land use, energy use, resiliency to climate change impacts, and community impacts.

Public investment in rail offers North Carolina travelers a cost effective and environmentally friendly means to move people and products that enhance quality of life and support economic growth. On the passenger side, rail transportation offers a reliable and efficient alternative in congested travel corridors that fosters commerce. On the freight side, rail transportation offers a cost effective means to move large cargoes and diverts trucks from highways—benefiting both freight and passenger travelers that remain. Strategic rail investment allows NCDOT to maximize the economic growth, job creation and

⁵⁸North Carolina Department of Transportation. BeRailSafe. Accessed March 6, 2014. <http://www.berailsafe.org/>

⁵⁹North Carolina Department of Transportation – Paul Worley. North Carolina Projects Update NCAMPO Presentation. May, 17, 2013.

⁶⁰Operation Lifesaver. Operation Lifesaver – About Us. Accessed March 6, 2014. <http://oli.org/about-us>

⁶¹ Federal Railroad Administration. Office of Safety Analysis Website. <http://safetydata.fra.dot.gov/OfficeofSafety/default.aspx>

quality of life benefits associated with investments to enhance the state's multimodal transportation network, consistent with the Strategic Transportation Investments (STI) Law (NCGS Chapter 136 Article 14(b)).

2.1.7.1 Economic Impacts of Rail

North Carolina's passenger and freight traffic have increased with the growing demands of its economy. As the state's economy evolves with this growth, prioritizing and selecting the best suited modes of travel for the state's key corridors is critical to fostering the state's economic competitiveness over the long-term. Transportation infrastructure is an investment with a long life that plays an important role in shaping the state's future economy. Careful and selective investments now have the potential to yield economic benefits for decades.

The state's dominant population centers are leading the state's economic expansion and account for a disproportionate share of the state's economy. Between April 2010 and July 2012, North Carolina's population grew by 2.2 percent, Greensboro by 2.9 percent, Raleigh by 4.8 percent, and Charlotte by 5.3 percent⁶². The majority of the state's economic growth has occurred along the routes connecting those three major metropolitan areas as a result of being along important highway and rail corridors and home to the state's largest populations. The cost of congestion is of concern as these economies not only contain nearly half of the state's population, but a similar share of the state's employment (45.7 percent in 2012)⁶³, and delays and costs impose economic inefficiencies. When the state's transportation infrastructure investments are not maintained, performance on those assets deteriorates contributing to decreased productivity, and tempering economic growth, because businesses must spend resources on mitigating rising operating costs instead of increasing wages and employment⁶⁴.

⁶² Census State & County QuickFacts

⁶³ Bureau of Economic Analysis tables CA30 Regional Economic Profiles

⁶⁴ The Boston Foundation, The Cost of Doing Nothing: The Economic Case for Transportation Investment in Massachusetts, January 2013, <http://www.abettercity.org/docs/The%20Cost%20of%20Doing%20Nothing%20Final%20with%20TOC.pdf>

Existing rail corridors connect the state's economic centers to one another and major economic centers beyond the state's borders, creating a vital travel alternative for shippers and passengers. The recent success of Charlotte's new light rail system, with ridership significantly over projections, shows that North Carolinians welcome transportation alternatives. Similarly, Amtrak ridership in the state is up nearly 90 percent between 2005 and 2013, according to Amtrak and NCDOT statistics. In fact, FRA states that the *Piedmont* route from Charlotte to Raleigh has seen ridership increase by nearly 240 percent since 2007⁶⁵, further emphasizing the importance passenger rail plays in residents' transportation choices.

The state's major population centers are readily accessible to each other as well as Washington, DC and to a more limited degree, Atlanta, Georgia via passenger rail service provided by state-supported services and Amtrak. Amtrak spent \$76 million on goods and services in North Carolina in FY2013 and employed 172 North Carolinians with average wages totaling \$70,210⁶⁶. To compare, the freight railroads in North Carolina employed 2,900 in 2013⁶⁷ at an average wage of \$104,050⁶⁸ in 2011. In addition to passenger rail, freight rail operated by Norfolk Southern connects the state's three main population centers as well as the Port of Morehead City, and CSXT connects the Port of Wilmington, Raleigh, and Charlotte to national and international markets. The state's rail network offers a relief to highway traffic by providing an alternative route for passengers and freight.

North Carolina has the largest state-maintained highway network in the country at nearly 79,000 miles in 2012⁶⁹. Rapid and concentrated economic expansion is straining highway networks that are rapidly approaching the end of their

⁶⁵ Kanady, Robin, Nation's Top Railroad Official Visits Harrisburg as Rail Construction Continues, Fox 46 Carolinas, August 14, 2014, <http://www.myfoxcarolinas.com/story/26284148/nations-top-railroad-official-visits-harrisburg-as-rail-construction-continues>

⁶⁶ Amtrak Fact Sheet, Fiscal Year 2013 State of North Carolina, <http://www.amtrak.com/pdf/factsheets/NORTHCAROLINA13.pdf>

⁶⁷ U.S. Railroad Retirement Board, Active Employees and Railroad Retirement Act Beneficiaries by State, 2013, <http://www.rrb.gov/pdf/act/statedataCY2013.pdf>

⁶⁸ American Association of Railroads, 2011, State Snapshot

⁶⁹ NCDOT State Maintained Mileages, <http://www.ncdot.gov/travel/statemapping/NCDOTMileageBySystem/OfficialStateMileage.pdf>

useful life and require expensive infrastructure improvements. Transportation budgets are stretched to maintain the existing assets in a state of good repair while building new capacity to support the state's expansion.

Added highway capacity from shifting trucks to rail would be particularly beneficial in the Piedmont region (I-40/I-85 corridor) of North Carolina, where most of the population is located and the highways are already congested with trucks. Shifting trucks to rail would also be beneficial along the I-95 corridor. Though North Carolina's population along this corridor is not as high as in the Piedmont region, I-95 carries a significant amount of through truck and vehicular volumes that add to the congestion and contribute to pavement deterioration. Moreover, the state has a number of freight-dependent industries that rely on the efficiency of the transportation network to access international markets through the state's ports as well as other domestic and international markets. The state's agriculture and wood products industries—industries that anchor the non-metropolitan portion of the state—depend heavily on the rail and highway networks to stay competitive.

The freight and passenger rail networks contribute approximately \$1.88 billion in direct economic impacts per year for North Carolina. The impacts are calculated based on the additional economic costs that would result if rail were no longer an option for freight or passengers in the state. For freight, this means that all rail freight would be diverted to trucks, resulting in additional shipping costs (rail is cheaper than truck), pavement costs (i.e. wear and tear on the roads), and congestion costs (travel time impacts for other vehicles from the increased number of trucks on the road). For passenger rail, Amtrak and the Great Smoky Mountain Railroad service would no longer be available in North Carolina, resulting in the loss of direct operator jobs, purchases of goods and services, and tourist spending in the state (for those passengers who only take the trip with rail), as well as pavement and congestion savings from increased auto vehicle miles traveled (VMT). Table 2 - 14 summarizes the annual direct economic impacts associated with freight and passenger rail in North Carolina.

Table 2 - 14 Direct Economic Impacts of Rail Services in North Carolina (\$2014M)

	FREIGHT	PASSENGER
User Cost Savings (Shipper)	\$ 1,496M	\$ -
Amtrak Wages and Purchases	\$ -	\$ 89M
Incremental Tourist Spending	\$ -	\$ 2M
Great Smoky Mountains Railroad (GSMR) Direct Wages and Purchases	\$ -	\$ 6M
GSMR Tourist Direct Spending	\$ -	\$ 16M
Pavement Savings**	\$ 96M	\$ 4M
Congestion Savings**	\$ 162M	\$ 4M
Total	\$ 1,754M	\$ 121M

Source: AECOM analysis of Class I 2011 Waybill, Amtrak 2012 and 2014, Southeast Corridor, and GSMR 2007 data.

Tourist spending, pavement savings, congestion savings, auto emissions, and safety for passenger rail are based on trips to North Carolina that would not have been made without rail.

** Excludes GSMR impacts.

The direct economic impacts of freight rail are estimated using a methodology similar to that applied by NCRR in a 2014 study⁷⁰ that estimated its impacts to the North Carolina economy, with a few important differences. The primary difference is that the NCRR estimate only reflects the impacts for NCRR, while the impacts shown in Table 2 - 14 are for the entire state. In addition, the statewide estimate of shipper savings utilizes more conservative assumptions on cost savings than those applied in the NCRR report. The NCRR report estimates a cost savings of 58 percent per ton-mile for shipping intermodal freight via rail rather than truck and an overall cost savings of 78 percent per

⁷⁰ RTI International, Measuring the North Carolina Railroad Company's Impact on North Carolina, 2014, http://www.ncrr.com/wp/wp-content/uploads/2011/11/1030-am_RTI.pdf

ton-mile for rail freight compared to truck. The shipper savings shown in Table 2 - 14 assumes a 20 percent savings for rail shipped via rail instead of truck, based on discussions with railroads and analyst findings that railroads charge between 10 percent and 30 percent less for rail services than trucks in the same shipping lanes.⁷¹ In addition, the statewide estimates include pavement savings (reduced wear and tear on the state's roadways resulting in O&M savings for the state) and congestion savings (time savings experienced by other roadways users) in the direct impacts. The methodology used to estimate the statewide economic impact of rail in North Carolina is included in Appendix G.

In addition to the direct economic impacts, broader social impacts generate approximately \$311 million in emissions and safety impacts. The additional emissions and safety impacts are generated as a result of the truck and auto VMT avoided in North Carolina due to the use of freight and Amtrak passenger rail in the state. These emissions and safety impacts are monetized using recommended economic values or proxies associated with avoiding these negative externalities. These broader social impacts are different from the direct impacts shown in Table 2 - 14 because they do not translate into spendable dollars in the North Carolina economy. Table 2 - 15 summarizes the annual broader social impacts avoided due to the use of freight and Amtrak passenger rail in North Carolina.

Table 2 - 15 Broader Social Economic Impacts of Amtrak Passenger Rail Services in North Carolina (\$2014M)

	FREIGHT (2011)	Amtrak¹ PASSENGER (2012)
Auto and Truck Emissions	\$ 118M	\$ 2M
Auto and Truck Safety	\$ 173M	\$ 18M
Total	\$ 291M	\$ 20M

¹ Passenger emissions and safety impacts exclude GSMR trips avoided

Source: AECOM analysis

The broader social impacts of rail were estimated using a methodology based on truck and auto VMT avoided within North Carolina due to the presence of rail. The methodology based on VMT avoided was applied for the statewide impacts so that comparable savings for both Amtrak passenger and freight rail could be obtained, based on estimates of the number of vehicles removed from North Carolina's roadways and the miles they travel within North Carolina.

The presence of rail in North Carolina also contributes to direct jobs, employing residents who work for freight and passenger railroads. The total estimated direct employment in the state is 2,800 as shown in Table 2 - 16, resulting from approximately 2,600 in freight railroads and over 200 in passenger and excursion railroads. These impacts are estimated independently of the dollar values in Tables 2 - 14 and 2 - 15.

⁷¹ Schoonmaker, Keith, "UP produced record revenue and operating income in 2013, and we expect the trend to continue," July 1, 2014, <http://analysisreport.morningstar.com/stock/research?t=UNP®ion=USA&culture=en-US&productcode=MLE>

Table 2 - 16 Direct Jobs from Rail in North Carolina

	FREIGHT (2012)	AMTRAK (FY 2014)	GSMR (2007)	NCRR (2015)
Estimated Direct NC Employment	2,600	162	65	13

Note these impacts are estimated independently of the dollar values in Tables 2 - 14 and 2 - 15.

Sources:

Freight: NC Maritime Strategy Technical Memorandum – North Carolina Railroads Existing and Planned Infrastructure, AECOM May 2012 (for Class Is and short lines).

Amtrak: Amtrak Fact Sheet, Fiscal Year 2014,

<http://www.amtrak.com/pdf/factsheets/NORTHCAROLINA14.pdf>

GSMR: Inhyuck “Steve” Ha, Hillary M. Sherman, and Jessica Hollars, “Smoky Mountain Host Highway 19 Corridor Study Phase 1,” March 2009.

NCRR: NCRR, 2015.

2.1.7.2 Freight Rail

The freight rail system in North Carolina comprises more than 3,200 miles of rail trackage owned by 22 railroads, including two Class I railroads (CSXT and Norfolk Southern). The system provides services to ports, power plants, mines, military installations, and to industries including agriculture, forestry, plastics, furniture, coal, food production, and chemicals. By providing services to many important industries in the state, the railroad supports employment in those industries as well as employs about 2,600 in the railroads itself⁷². Wages and salaries for rail transportation in 2009 totaled \$192 million, or an average of about \$74,500 per job in the industry⁷³. Freight-dependent industries⁷⁴ contributed \$185,238 million in Gross Domestic Product (GDP) for the state in 2013, up 36 percent from 2004⁷⁵. These industries represent nearly 40 percent of the state’s GDP in total, and a higher proportion in the rural areas. On a national scale, each \$1 billion in rail investments supports over 17,000 jobs and

each job in freight supports another 4.5 jobs⁷⁶. Demonstrating the value of freight infrastructure investments, the new NS intermodal facility at the Charlotte Douglas International Airport, capable of 200,000 lifts per year, opened recently, where it is expected to result in \$7.6 billion in economic development over the next 20 years in addition to 7,000 jobs by 2030⁷⁷. The freight network allows goods to move more efficiently and at a lower cost than by trucking.

An important impact of investments in freight rail, particularly for short lines and operators in small urban and rural areas in the state, is the opportunity for balancing growth in those locations. Investments in freight tend to be prioritized based on the locations of the Class Is and the population centers, but small investments in short lines can ensure stable employment in areas of the state that have been experiencing declines in both jobs and population. Without these short lines, existing customers could be forced to relocate their facilities either within the state, to other states, or even internationally. Relocating the facility, likely to an urbanized area, could therefore contribute to continued employment loss in the rural parts of the state and increased highway congestion in the already-congested parts of the state.

2.1.7.3 Passenger / Freight Rail and Quality of Space

Passenger rail has afforded North Carolina’s residents with a more affordable transportation alternative on a cost per mile basis. According to an NCRR report from 2007, passengers saved \$35 million by using rail and an additional output of \$223 million was produced by the state’s industries⁷⁸. These cost savings result in increases in economic competitiveness and thereby provide better opportunities for employment in the state. In addition to the lower costs of transportation, passengers switching from autos to rail also avoid emitting pollutants into the air. Assuming that without Amtrak, passengers would have

⁷² NC Maritime Strategy Technical Memorandum – North Carolina Railroads Existing and Planned Infrastructure, AECOM May 2012 (for Class Is, shot lines, and NCRR)

⁷³ Bureau of Economic Analysis, Table SA07N Wages and salaries by NAICS industry 802

⁷⁴ Agriculture, Forestry, Fishing, and Hunting; Mining; Construction; Manufacturing; Wholesale Trade; Retail Trade; Transportation and Warehousing

⁷⁵ Bureau of Labor Statistics Gross Domestic Product

⁷⁶ American Association of Railroads, 2011, State Snapshot

⁷⁷ Charlotte Douglass International Airport, Fast Facts: Charlotte Regional Intermodal Facility at CLT, <http://charmeck.org/city/charlotte/Airport/News/Pages/IntermodalFacilityFastFacts.aspx>

⁷⁸ RTI International, The Economic Impact of the North Carolina Railroad: Summary of Findings, May 2007, http://cai-dev.com/~ncrr/wp/wp-content/uploads/2011/10/Exec-Summary-final_printing1.pdf

driven an automobile for the trip⁷⁹, 175 million vehicle miles traveled (VMT) were avoided in FY2013⁸⁰ which averages to approximately 251 miles per rider. These VMT avoided also result in reductions of the pollutants associated with automobile travel including 3,236 short tons of carbon monoxide (CO), 176 short tons of nitrogen oxide (NOx), 116 short tons of volatile organic compounds (VOCs), 2 short tons of particulate matter (PM2.5), and 93,115 metric tons of carbon dioxide (CO2)⁸¹. The reduction in pollutants and emissions in the state improves the quality of life for residents and makes the state a more attractive, safer, and healthier place to live.

As a vital part of the supply chain and an economic driver for the state, North Carolina has had great success in attracting and retaining highly-educated and skilled workers, which are necessary to attract high value-added and knowledge-based industries. The success of Research Triangle Park (RTP), as well as the state's university and community college systems, is emblematic of the state's strength in these industries. RTP, located between Raleigh and Durham, is a hub of human capital and expertise in specialized industries including life sciences, information technology, business services, engineering, and financial firms. Some of the largest employers conducting business in the park include Cisco Systems, GlaxoSmithKline, and IBM Corporation, as well as national agencies including the National Institute of Environmental Health Sciences and the United States Environmental Protection Agency⁸². RTP has been successful in attracting highly educated employees, with 46 percent of the Research Triangle Region employees having a bachelor's degree or higher compared to the national average of 36 percent⁸³, and the nation's highest concentration of PhDs.⁸⁴

⁷⁹ Auto occupancy rate of 1.40 persons per vehicle from National Household Travel Survey data from 2009

⁸⁰ Amtrak

⁸¹ Using MOVES 2010a emissions rates for current year autos based on VMT avoided

⁸² RTP 2014 Company Directory, http://www.rtp.org/sites/default/files/RTP_Directory_2014.pdf

⁸³ ResearchTriangle.org, 2013 State of the Research Triangle Region, May 2013, http://files.www.researchtriangle.org/sor2013event/RTRP_SOR_2013_Book_for_Web.pdf

⁸⁴ RTP.org, <http://www.rtp.org/choose-rtp/triangle-region/workforce-education>

The employees who take positions here are highly sought by industry and can readily obtain jobs in other states because of their education and skill. Quality of life, which includes an efficient transportation network, a clean environment and access to recreational and leisure options, is an important factor in retaining skilled workers and the firms that recruit them. The ability of the state's rail network to support lower costs of living and additional transportation options assists in attracting these highly-skilled employees, which in turn increases the economic strength and productivity of the region.

Young professionals, in particular, are part of the generation that has reversed the trend of suburban living and instead prefers city living, with the access to restaurants, shopping, and other entertainment that a downtown location offers. A survey of Millennials (born between 1982 and 2003) reported that this generation values access to a variety of transportation options while simultaneously aspiring to be less reliant on automobiles: over half (54 percent) would consider moving to another city if it had better options to get around⁸⁵. As a result, rail service and rail/transit-oriented development are becoming increasingly important for providing housing and transportation options for these groups of young professionals that represent a growing share of the labor force.

Station-area projects have also contributed to quality of life improvements across the state. NCDOT has invested millions in passenger rail station improvements over the past decade. Typically located in central urban locations, revitalized stations can serve as a catalyst for private development in the adjacent properties. For example, the Town of Hillsborough is investing to reestablish service and connect to the town's bus network. The station plan for Hillsborough will provide enhanced connectivity and walkability to an area of the town that will provide space for new developments between downtown and the river. The town aims for the station to be a new gathering space that provides a social benefit for residents⁸⁶. Stations including Raleigh Union

⁸⁵ Streetsblog USA, "Survey: Millennials Willing to Relocate for Better Transportation Options," April 23, 2014, <http://usa.streetsblog.org/2014/04/23/survey-millennials-willing-to-relocate-for-better-transportation-options/>

⁸⁶ Hillsborough Capital Improvement Plan, http://www.ci.hillsborough.nc.us/sites/default/files/images/Capital_Improvement_Plan_FY14.pdf

Station, Rocky Mount, Lexington, Durham, Cary, Salisbury, Greensboro, Burlington, and Hamlet, among others, have found success with leveraging public and private investments at or adjacent to station projects. Investing in station area improvements will provide better passenger access to more of the state for town residents, as well as renew the sense of pride in downtown areas and hopefully encourage economic growth and a greater sense of community.⁸⁷

Supply chains among industries and ultimate consumers are enhanced by improvements in connectivity. Proximity of the stakeholders often provides favorable connectivity, yet investment along the railroad networks may provide as great an improvement. Investment in rural areas will enable industries to stay or locate in these areas while rebalancing their respective factors of production while avoiding known congestion in more urban areas. Rural and regional employment is also enhanced. Changing patterns of energy production and distribution, agricultural production and yields, population migration and similar events in adjacent states provide an increasing number of locational choices for industries. Taken together, the rail freight improvements can add to community and regional quality of life metrics.

2.1.7.4 An Additional Transportation Option

With access to passenger rail service comes increased accessibility and mobility for passengers, particularly those who have limited transportation options available. Low-income and elderly riders, also called the transportation disadvantaged, typically depend on transit to get from place to place on a daily basis, including work, school, errands, and to make recreational trips. The state's elderly population is expected to increase from 13.8 percent in 2012⁸⁸ to 17 percent of the population being 65 or older by 2020. Some counties will have up to 31 percent of the population as 65 or older, and 76 of the 100 counties will have a proportion higher than the state average⁸⁹. With the

⁸⁷ Station investments help leverage adjoining public and private investments. This is most successful in communities that have adopted this as a framework. See also BNC, Cary, DNC, GRO, HAM, LEX, RMT, RUS, SAL, and more.

⁸⁸ Census State & County QuickFacts

⁸⁹ UNC: Carolina Population Center, "Population Growth & Population Aging in North Carolina Counties," October 14, 2013, <http://demography.cpc.unc.edu/2013/10/14/population-growth-population-aging-in-north-carolina-counties/>

passenger rail services, transportation disadvantaged populations are able to access locations outside of the cities and towns where they live, which benefits them by increasing their access to employment, educational, and recreational opportunities.

2.1.7.5 Tourism and Recreation

Rail supports an efficient travel network, which is important for attracting and maintaining the tourism industry. With so many other choices of destinations, tourists will not return to places that waste their valuable leisure time in travel snarls and delays. One of the most important industries in the state, tourists spent \$20 billion in 2013, thereby supporting nearly 200,000 jobs and contributing \$3 billion to state taxes⁹⁰. With six intercity passenger rail routes serving 16 stations across the state, rail tourists can visit a variety of cities and towns in North Carolina. While traveling, visitors can enjoy the local sights, restaurants, shopping, and other recreational activities that result in local spending and support jobs. Expanding passenger services to connect Wilmington and Asheville to the state's largest population centers would provide those popular tourist destinations with another transportation alternative.

2.1.7.6 Environmental Impacts of Rail

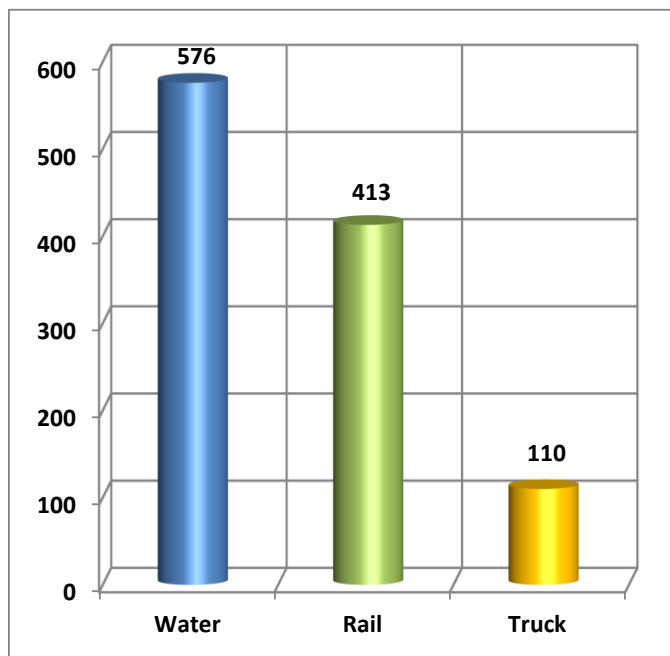
Rail is one of the most fuel efficient modes for both freight and passenger. One study estimated that freight rail is as much as four times more fuel efficient than trucks.⁹¹ In 2010, US freight railroads on average move one ton of freight an average of 413 miles per gallon of fuel.⁹² Freight rail has also doubled its fuel

⁹⁰ NC Department of Commerce, Fast Facts: 2013 Impact of Visitor Spending, <http://www.nccommerce.com/LinkClick.aspx?fileticket=UgSNdkfheFw%3d&tabid=636&mid=4669>

⁹¹ Federal Railroad Administration. Comparative Evaluation of Rail and Truck Fuel Efficiency on Competitive Corridors. November 2009. http://www.ontrackamerica.org/files/Comparative_Evaluation_Rail_Truck_Fuel_Efficiency.pdf

⁹² USDOT, FRA National Rail Plan Moving Forward, September 2010, <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0CFUQFjAB&url=http%3A%2F%2Fwww.fra.dot.gov%2Felib%2FDocument%2F1336&ei=1kFqU4fPJ8PHoAST6oHIDw&usg=AFQjCNFn6FfsrJk1ekc6w3ovNV9MlhxB6g&sig2=sFlcQIDwqK7EtTJEW-3ZPw&bvm=bv.66111022,d.cGU>

efficiency in the past 30 years.⁹³ Intercity passenger rail uses less energy per passenger mile than air, private automobile and transit buses.⁹⁴



Source: FRA National Rail Plan Progress Report, September 2010

Figure 2 - 27 Ton Miles per Gallon by Mode

As cited in the FRA 2010 Progress Report, on one gallon of fuel, railroads can move one ton of freight 413 miles compared to 110 miles by truck⁹⁵ as seen in Figure 2 - 27. The fuel savings results in transportation cost savings for shippers and manufacturers, who in turn can pass a portion of those savings along to consumers as well as expand operations and thereby providing additional employment. Further, freight demand in North Carolina will increase

as population increases. The FRA 2010 Progress Report indicates that, on average, Americans require the freight system to move 40 tons of freight per person, annually. Fuel efficient movements can keep pricing competitive for shippers and customers.

Shifting freight from truck to rail contributes to environmental quality as well as economic competitiveness. By switching from truck to rail, shippers can utilize a mode that emits fewer pollutants per ton moved and thus results in cleaner air. Greenhouse gases (GHG) that contribute to climate change have been tied to fuel consumption. GHG production is reduced when goods travel by rail because trucks consume more fuel per ton-mile than rail.

The US Environmental Protection Agency (EPA) has also recently issued stringent new locomotive emission standards. The EPA estimates that these new standards will cut particulate matter emissions by as much as 90 percent and nitrogen oxide emissions by as much as 80 percent when fully implemented.⁹⁶ The NCDOT Rail Division and Amtrak have already begun to use these new stringent Tier 3 and Tier 4 compliant locomotives.

Increased rail traffic for both freight and passenger helps North Carolina with meeting air quality standards. Portions of North Carolina are in non-attainment for 8-Hour ozone and particulate matter, as well as in maintenance for carbon monoxide.⁹⁷ Figure 2 - 28 and Figure 2 - 29 illustrate the locations for these air quality non-attainment and maintenance areas.

⁹³ Association of American Railroads. The Environmental Benefits of Moving Freight by Rail. June 2012.

⁹⁴ Table 2.12, Transportation Data Energy Book, Edition 32. US Department of Energy. July 2013. See also Table 1.1, Updated Comparison of Energy Use & CO₂ Emissions from Different Transportation Modes, April 2014.

⁹⁵ USDOT, FRA National Rail Plan Moving Forward, September 2010.

⁹⁶ United States Environmental Protection Agency. <http://www.epa.gov/otaq/locomotives.htm>

⁹⁷ North Carolina Department of Transportation. <https://connect.ncdot.gov/projects/planning/Pages/AirQualityTransportationConformity.aspx>. Accessed June 2014.

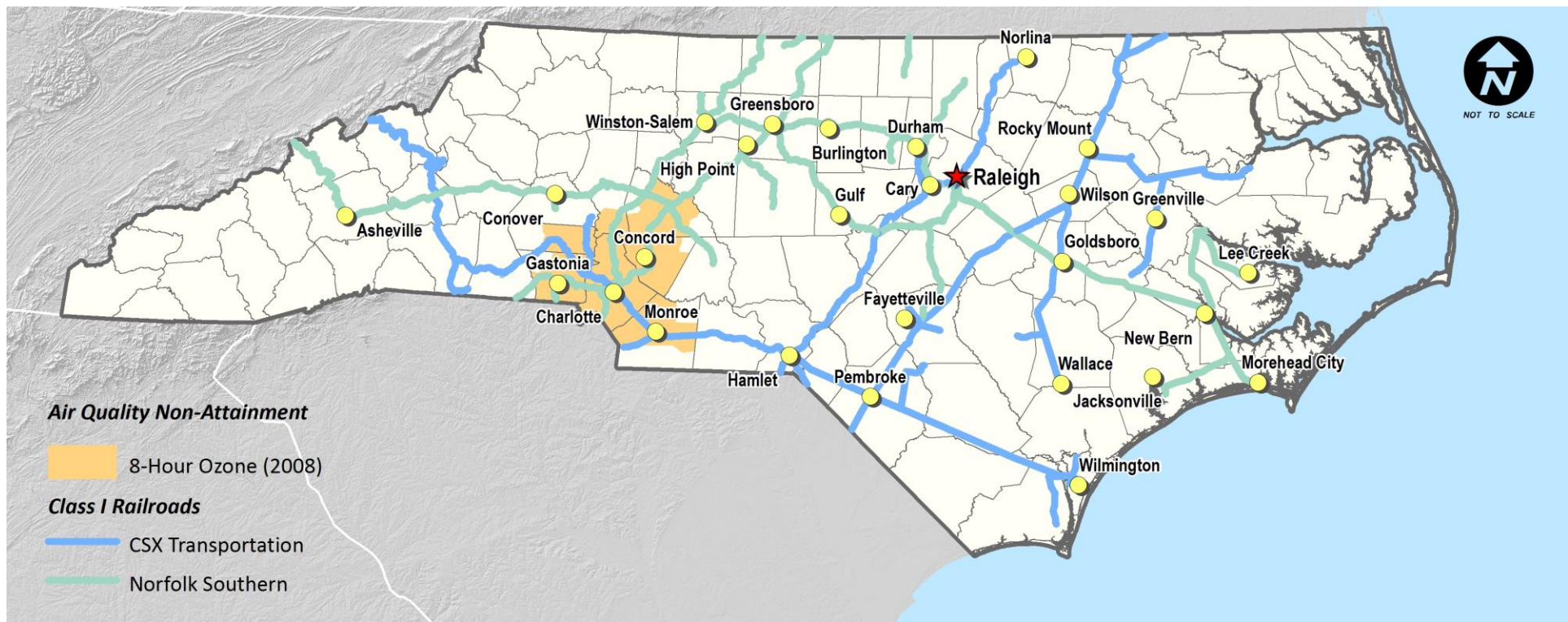


Figure 2 - 28 Air Quality Non-Attainment Areas

The possible environmental impacts from rail include noise and vibration from trains, as well as noise from trains blowing their horns when passing at-grade crossings as required by federal law. Other possible impacts include noise and vibration as well as emissions from train activity at rail freight and intermodal yards.⁹⁸

Most future changes in rail traffic (volume, speed, etc.) occur along existing railroad corridors and yards, and thus impacts are typically minor increases above existing levels. Emissions and some noise and vibration impacts can be

mitigated by the transition to Tier IV EPA-mandated locomotives. There are other mitigations that can be implemented, if warranted in specific locations. In the Tier II Environmental Impact Statement for the Raleigh to Richmond segment of the Federally-Designated Southeast Corridor, possible mitigation strategies include relocation of specific trackwork away from sensitive areas, and special ballast and ties, or other infrastructure that can minimize impacts⁹⁹.

⁹⁸ . Environmental Defense Fund, The Good Haul: Innovations that Improve Freight Transportation and Protect the Environment, Chapter 5.

⁹⁹ Tier II Draft Environmental Impact Statement and Draft Section 4(f) Evaluation, Chapter 4. May 2010.



Figure 2 - 29 Air Quality Maintenance Areas

With regards to land use, businesses served by freight rail will likely continue to be adjacent to existing rail corridors, in locations zoned for commercial or industrial use. Most likely any new industry that might warrant new rail service would be along existing rail corridors, or could be within larger vacant site being proposed for a new manufacturing plant, separated from other non-compatible land uses. Passenger rail usually has positive land use impacts, since most stops are within existing urbanized areas where passenger rail traffic supports higher density and more intensive land uses. Most if not all cities and towns with existing passenger rail service reference and support passenger rail service in their local land use plans.

2.1.7.7 Health Impacts of Rail

Passenger rail can contribute to a healthier lifestyle, by having stations in more mixed-use environments that promote walking and transit. A recent study in the American Journal of Preventive Medicine found that individuals in Charlotte who started using the light rail system when service began had lower odds of obesity and higher odds of meeting recommended guidelines for physical activity than those who did not switch travel modes.¹⁰⁰ The more passenger rail can support connections to non-motorized transportation choices such as transit and walking, the greater the health benefits. Other research has shown

¹⁰⁰ John M MacDonald., PhD et.al. The Effect of Light Rail Transit on Body Mass Index and Physical Activity. American Journal of Preventative Medicine, August 2010.

that obesity rates are inversely related to the use of alternative transportation modes, such as walking, cycling and transit, including rail.¹⁰¹ A 2005 study found that subjects who recently switched from driving to using commuter rail showed reduced signs of stress and other benefits.¹⁰²

2.2 TRENDS AND FORECASTS

This section identifies various trends and forecasts (demographic, economic, transportation,) that will help establish future passenger and freight rail markets and unmet needs in North Carolina, which in turn will help the State Rail Plan determine projects and future service to meet these unmet needs and emerging markets.

2.2.1 Demographic and Economic Trends

Understanding existing demographic and economic conditions and projected trends is an essential step in evaluating how North Carolina's rail system currently supports passenger and freight movement, identifying where there are gaps in rail service, and anticipating future needs. The following sections provide the foundation for the identification of rail service needs and opportunities in Section 2.3.

2.2.1.1 Demographics

Demographic trends and projections including growth trends, density, race and ethnic composition, age, and other demographic variables are described in the context of how they relate to North Carolina's rail system.

2.2.1.1.1 Population Trends

North Carolina continues to experience substantial population growth and urbanization. The State population increased by 49 percent over the last 23 years, from 6.6 million people in 1990 to 9.8 million people in 2013. The State

population is expected to grow an additional 22 percent, to 12 million people, in 2033.¹⁰³ All regions of North Carolina have grown in population over the same time period, with the most dramatic growth in the Triangle (Raleigh-Durham-Chapel Hill) and Charlotte. Counties home to North Carolina's other urban centers have experienced moderate growth and include Asheville, Winston-Salem, Greensboro, Fayetteville, Wilmington, and Jacksonville. Slow growth or population loss is projected for several rural counties across the state, particularly those in the northeast. Historic regional and statewide population trends are shown in Figure 2 - 30. The geographic extent of North Carolina's regions is shown in Figure 2 - 31. Projected population changes between 2012 and 2033 for each county are shown in Figure 2 - 32.

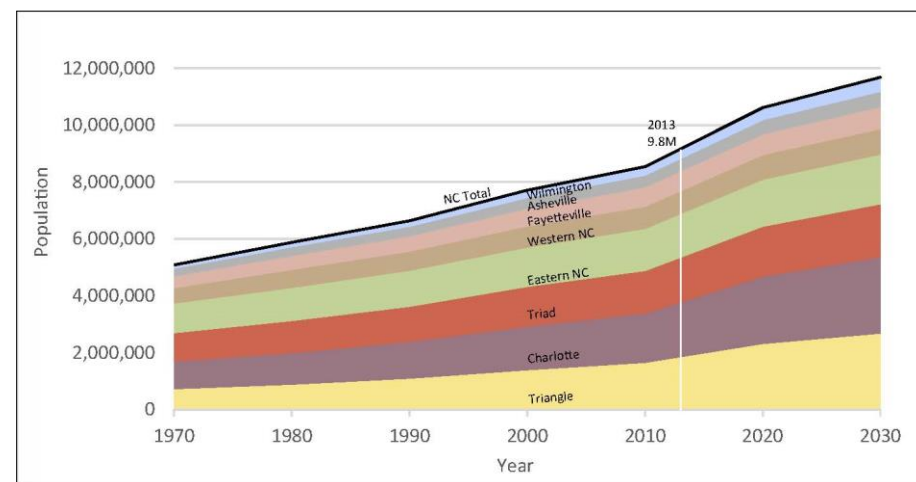


Figure 2 - 30 North Carolina and Regional Population Trends and Projections (1970-2030)¹⁰⁴

¹⁰¹ Todd Litman. Evaluating Public Transportation Health Benefits. Victory Transport Policy Institute. June 14, 2010; Rail Transit in America: A Comprehensive Evaluation of Benefits. Victory Transport Policy Institute. January 16, 2012.

¹⁰² Richard Werner, et al. Commuting Stress: Psychophysiological Effects of a Trip and Spillover into the Workplace. Transportation Research Record: Journal of the Transportation Research Board, Volume 124. 2005.

¹⁰³ NC Office of State Management and Budget. 2033 County Population Projections. Accessed April 2, 2014.

http://www.osbm.state.nc.us/ncosbm/facts_and_figures/socioeconomic_data/population_estimates/demog/countytotals_2030_2033.html

¹⁰⁴ North Carolina Office of State Management and Budget, North Carolina Population Estimates and Projections.

http://www.osbm.state.nc.us/ncosbm/facts_and_figures/socioeconomic_data/population_estimates.shtm

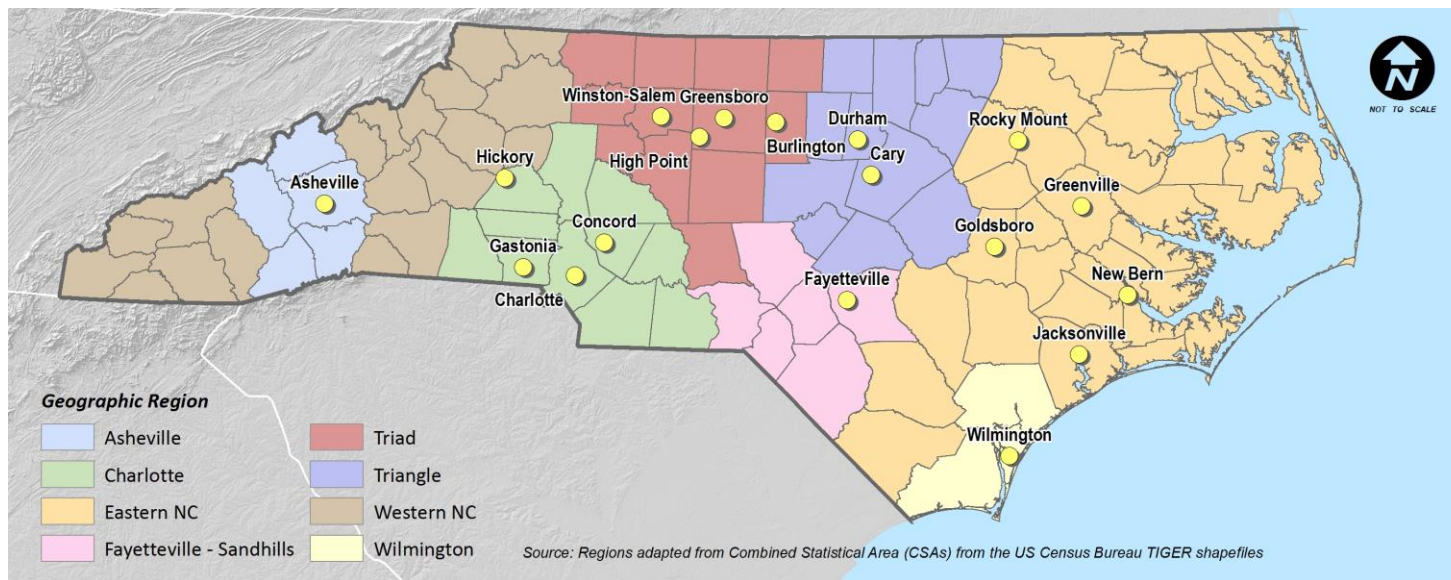


Figure 2 - 31 Geographic Extent of North Carolina Regions

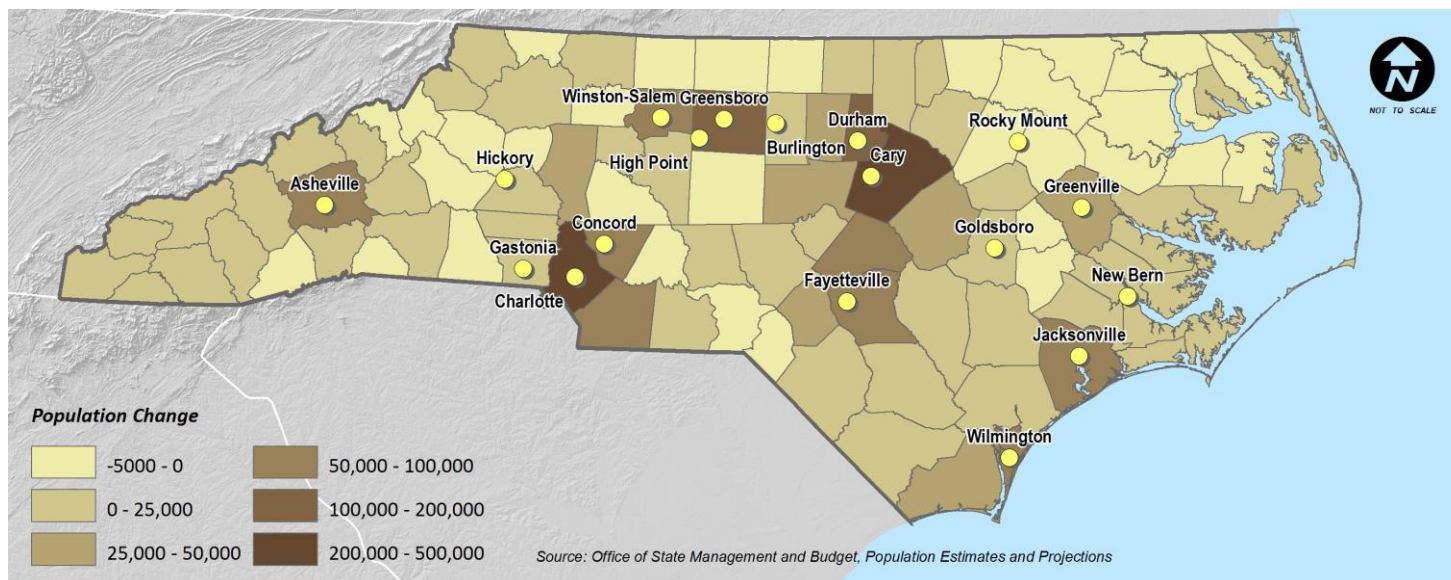


Figure 2 - 32 Projected Change in County Population (2012-2033)

2.2.1.1.2 Population Density

North Carolina's population is concentrated in the "Piedmont Crescent," the urbanized arch that follows Interstates 40 and 85 as they connect Charlotte, the Triad (Greensboro, Winston-Salem, and High Point) and the Triangle. These three regions account for 60 percent of the state's population.¹⁰⁵ Populations are also concentrated in and around the cities of Fayetteville, Asheville, Wilmington, Hickory, Greenville, and Jacksonville. Figure 2 - 33 shows 2012 population by square mile and Figure 2 - 34 shows 2012 population by county, as well as passenger rail ridership by station. The Amtrak stations with the greatest ridership numbers are located in areas with the highest population densities.¹⁰⁶

Existing intercity and commuter rail systems are shown in Figure 2 - 35 with projected county populations for 2033.

¹⁰⁵ US Census. American Community Survey 5 Year Estimates, 2008-2012. Total Population, Table B01003. Data analyzed to calculate percentage.

¹⁰⁶ Amtrak. North Carolina 2013 Amtrak Fact Sheet.
<http://www.amtrak.com/pdf/factsheets/NORTHCAROLINA13.pdf>

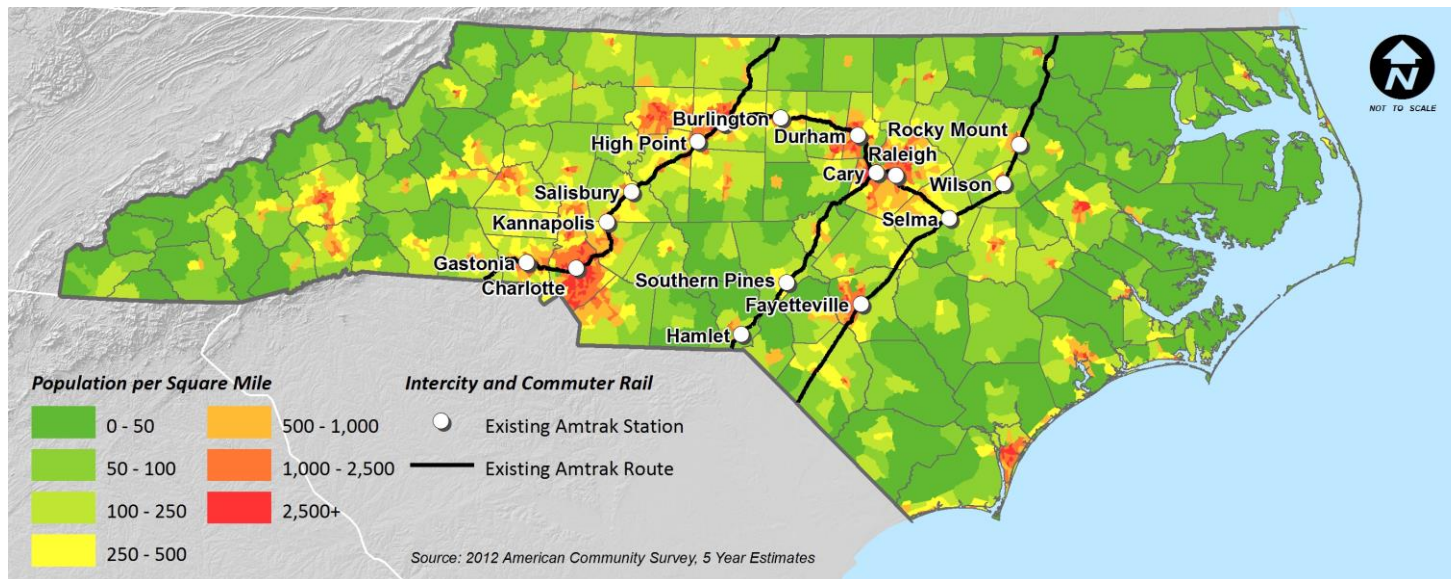


Figure 2 - 33 North Carolina Population Density by Square Mile (2012)

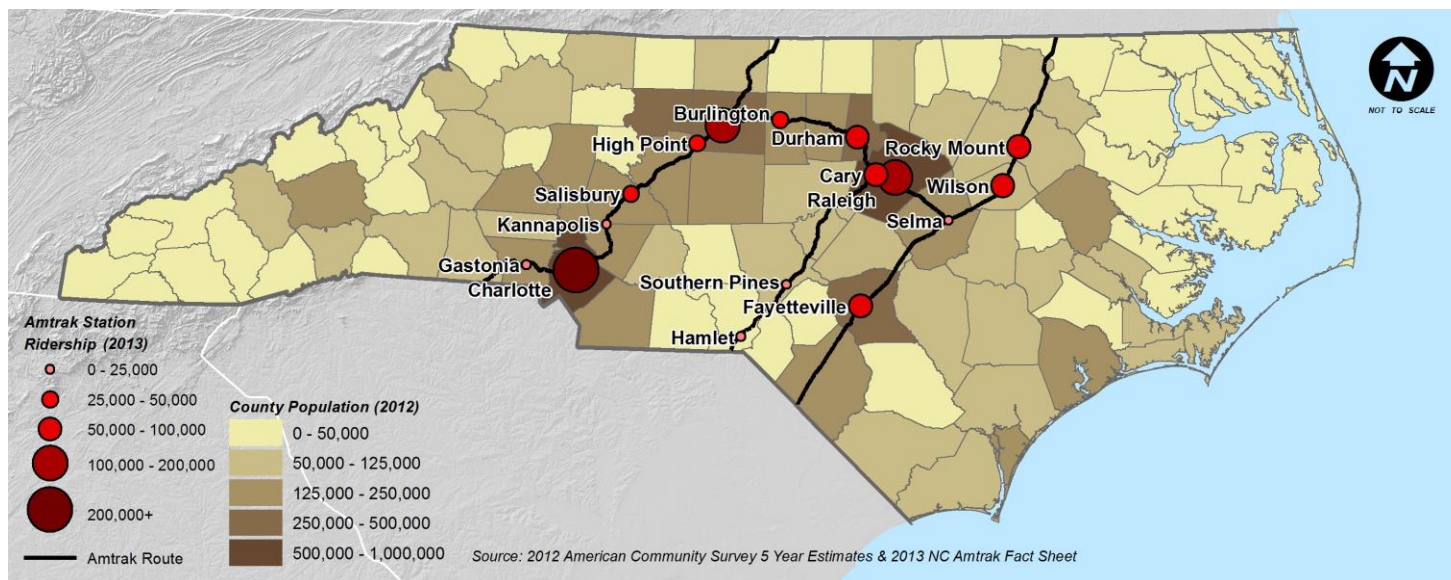


Figure 2 - 34 Population Density (2012) and Passenger Rail Ridership (2013)

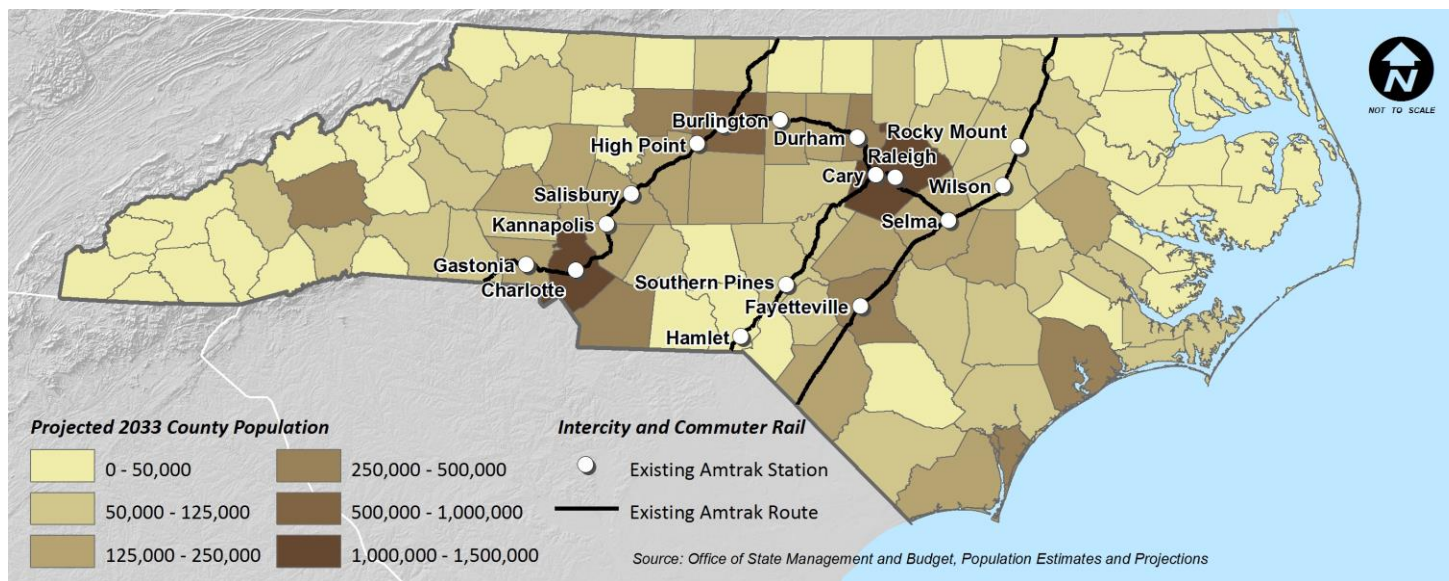


Figure 2 - 35 Projected Population by County (2033) and Passenger Rail Facilities

2.2.1.1.3 Commuting Patterns

Figure 2 - 36 shows the average travel time for each county in North Carolina. The greatest average travel times are in the northeast, especially in the counties belonging to the Virginia Beach – Norfolk metropolitan area. The other noticeable pattern is that the suburban counties of the Triad, the Triangle, and Charlotte regions have relatively longer average commute times than the urban counties of their regions. This is likely due to the longer distances traveled and congestion encountered to access the employment centers in each region's urban counties. Lastly, there are some rural counties with relatively longer average commutes likely due to the need to drive further to access employment opportunities.

A review of census data from the state's largest metropolitan areas show that more workers are commuting across county and state boundaries. Over the past 20 years, the number and percent of workers who cross county lines and state lines in their daily commutes has increased. Table 2 - 17 shows the percent

of employees who work outside of the state and county of residence in the Charlotte, Triad and Triangle regions since 1990.

Table 2 - 17 Percent of Employees Working Outside County of Residence ¹⁰⁷

	1990	2000	2011
Triangle Region	22.1%	27.6%	27.8%
Triad Region	23.8%	27.9%	30.0%
Charlotte Region	20.7%	25.1%	27.7%

Source: US Census Data compiled by the North Carolina Department of Commerce

¹⁰⁷ Analysis of 1990, 2000 and 2011 Census Data for the Council of Governments boundary areas for Centralina, Triangle and Triad. North Carolina Department of Commerce AccessNC website. September 2014. <http://accessnc.commerce.state.nc.us/EDIS/demographics.html>

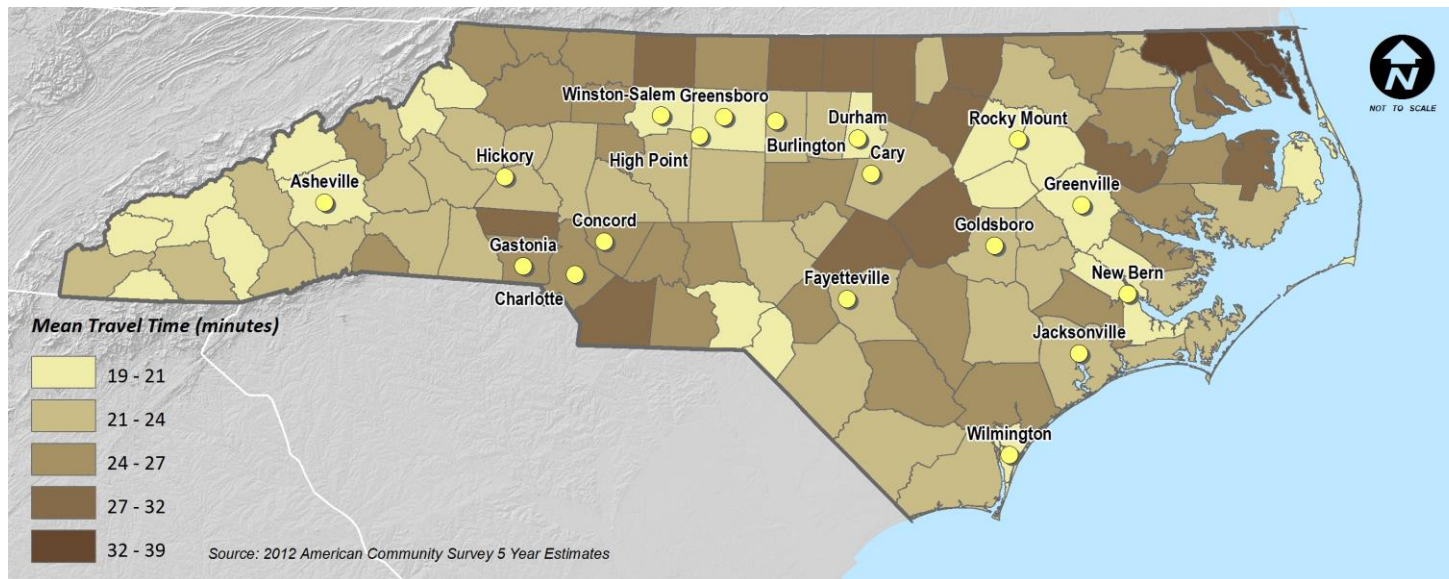


Figure 2 - 36 Mean Travel Time by County (2012)

2.2.1.1.4 Population Characteristics

Trends in North Carolina's population characteristics contribute to the State's rail needs and opportunities. Certain characteristics may indicate a greater demand for passenger or commuter rail services. For example, older populations, disadvantaged populations (low-income and minority), and limited English proficiency populations may be more likely to depend on rail due to health, cost, convenience, or language barriers to owning and operating a personal vehicle. This section examines some of the population characteristics that may indicate a higher need or demand for rail services.

Similar to national trends, North Carolina has become more diverse over the last two decades. Table 2 - 18 shows the Hispanic, Asian and the Other Race population percentages increased the most between 1990 and 2010. Minority residents are primarily concentrated in urban areas and in the rural areas in the south-central and northeastern portions of the state (Figure 2 - 37). Trends of increased ethnic and racial diversity are expected to continue as North Carolina's population continues to grow.

Table 2 - 18 Race Percentage Trends¹⁰⁸

RACE/ETHNICITY	1990	2000	2010	CHANGE (%)
White	75.6	72.1	68.5	- 7.1
African American	22.0	21.6	21.5	- 0.5
Asian	0.8	1.4	2.2	+ 1.4
Native American	1.2	1.2	1.3	+ 0.1
Other Race	0.5	2.3	4.3	+ 3.8
Hispanic ¹⁰⁹	1.2	4.7	8.4	+ 7.2

Approximately 8.4 percent of North Carolina residents identify as ethnically Hispanic (2012).¹¹⁰ An estimated 6.5 percent of North Carolina's adult population speaks Spanish. Roughly 3.9 percent speak English "less than very well" as estimated by the 2012 American Community Survey. Figure 2 - 38 shows that most of this population is in urban areas or in the piedmont and coastal plain agricultural and manufacturing areas.¹¹¹

An estimated 16.8 percent of North Carolina's population is below the federal poverty threshold.¹¹² While poverty is more concentrated in urban areas, the counties with the highest overall percent of residents below poverty thresholds are in rural counties in the mountains and in the south-central and eastern counties of North Carolina (Figure 2 - 39).

¹⁰⁸ US Census, Summary File 1 for 1990, 2000 and 2010 Censuses.

* The US Census identifies five race categories (White, African American, Asian, Native American, Other) and identifies Hispanic as an ethnicity that can belong to any of the five race categories.

¹¹⁰ US Census. 2012 American Community Survey 5 Year Estimates, 2008-2012. Demographic and Housing Estimates, Table DP05.

¹¹¹ US Census. 2012 American Community Survey 5 Year Estimates, 2008-2012. Table B16004 Age by language spoken at home by ability to speak English for the population 5 years and over.

¹¹² US Census. American Community Survey 5 Year Estimates, 2008-2012. Table C17002 Ratio of Income to Poverty Level in the Past 12 Months.

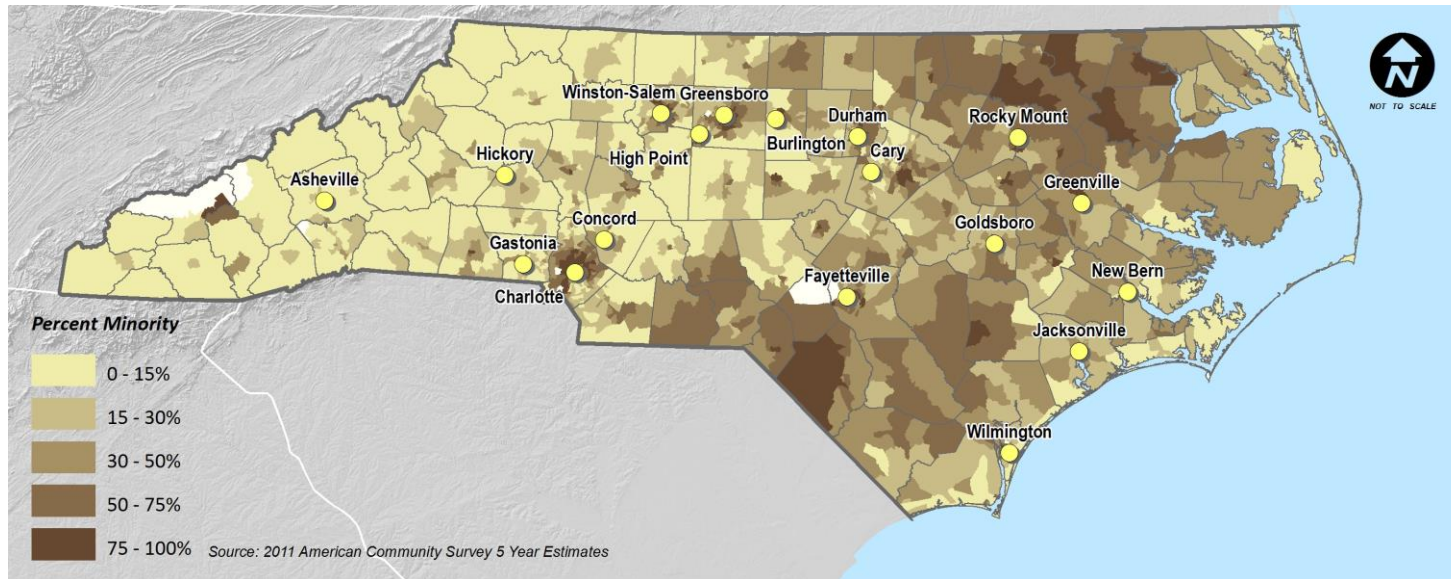


Figure 2 - 37 Minority Populations in North Carolina shown by US Census Tracts

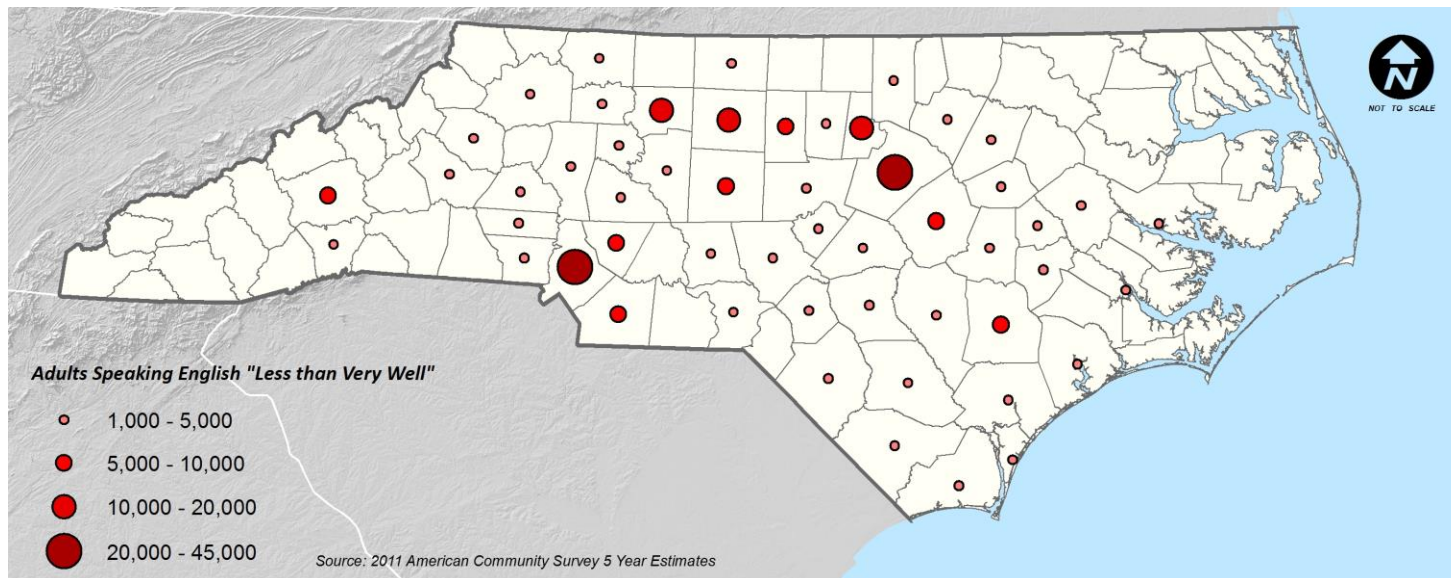


Figure 2 - 38 Adults Speaking English "Less than Very Well"

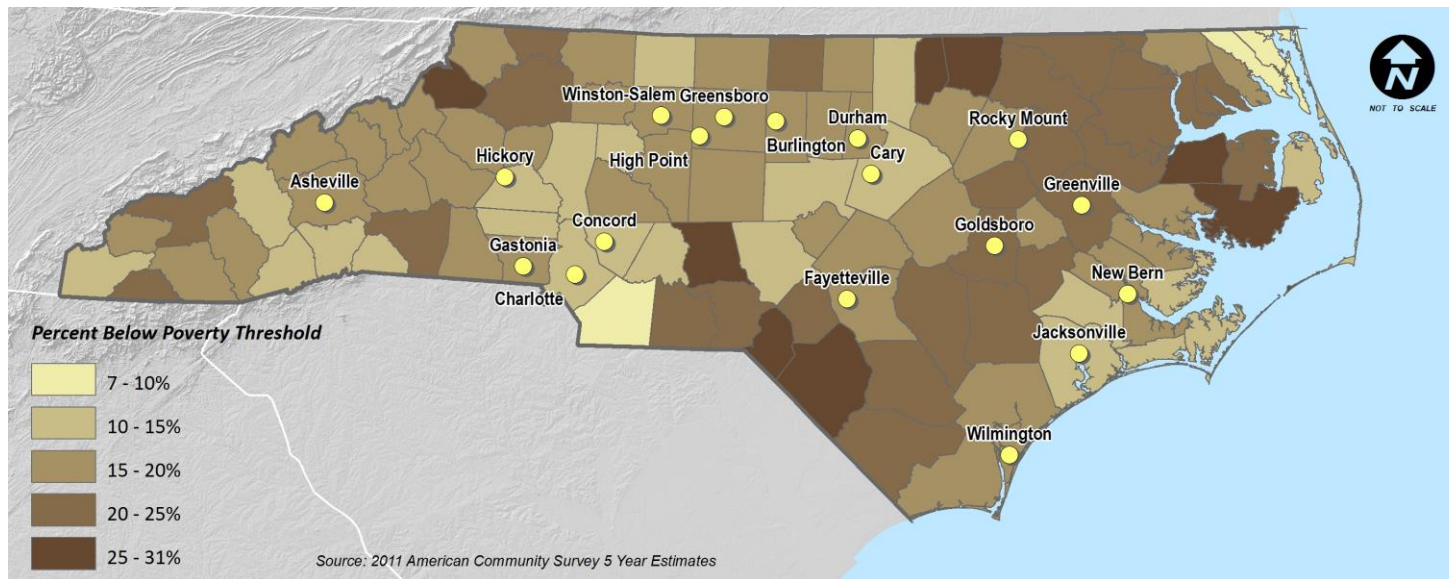


Figure 2 - 39 Percent of Population below Poverty Thresholds by County

Figure 2 - 40 shows that median household income in North Carolina has steadily increased from 1990 to 2012 with some fluctuations that mirror national economic trends. Census-estimated median household income in North Carolina adjusted to 2012 dollars (Figure 2 - 41) has been relatively constant over the last two decades.¹¹³

The population pyramid of North Carolina (Figure 2 - 42) shows the percent of the population over 65 will increase substantially in coming years given the large proportion of middle-aged residents in North Carolina. Older adults are less likely to drive in their later years and stand to benefit from increased mobility options provided by intercity passenger rail.

¹¹³ US Census. Estimated Household Income 1984 – 2012.
<https://www.census.gov/hhes/www/income/data/statemedian/>

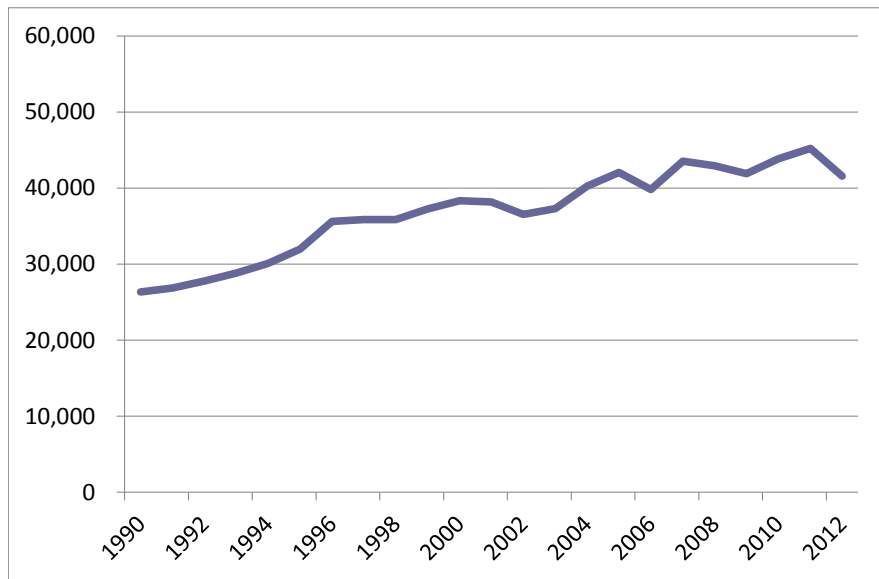


Figure 2 - 40 Median Household Income 1990 – 2012

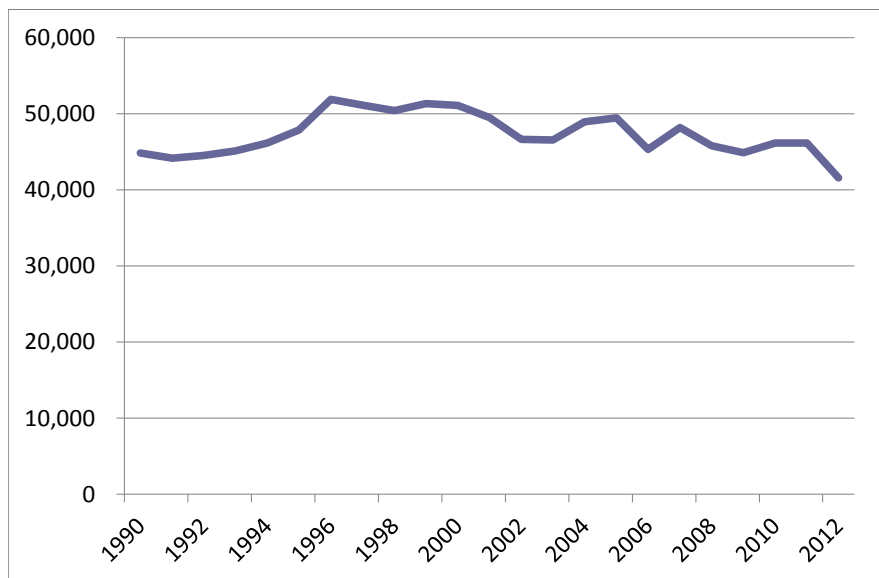


Figure 2 - 41 Adjusted Median Household Income 1990 – 2012 (2012 dollars)

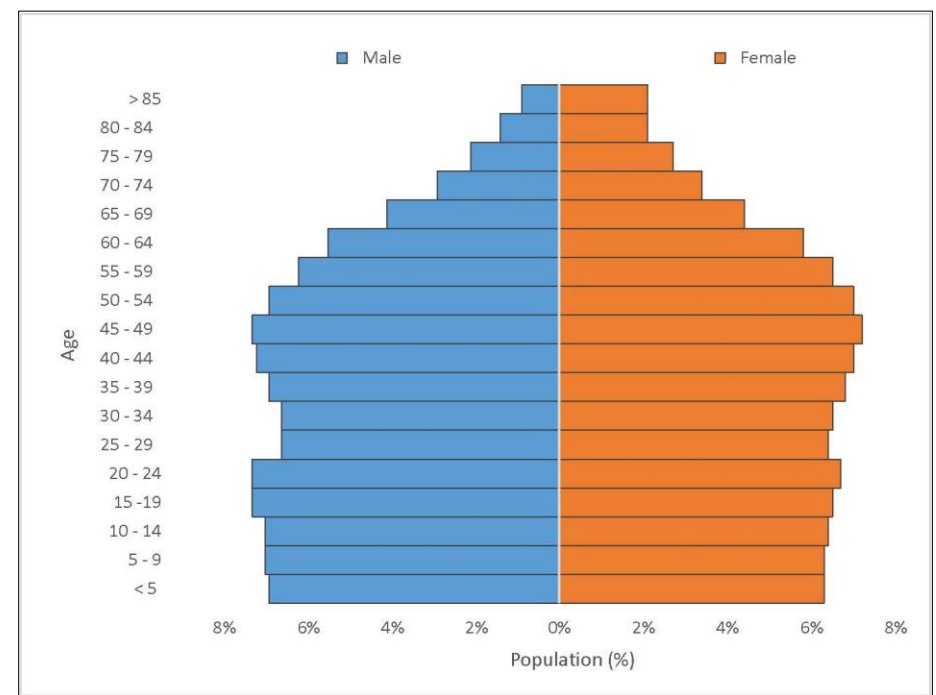


Figure 2 - 42 Population Pyramid showing Age and Gender for North Carolina's Population in 2012

2.2.1.2 Economics

Employment trends and projections for economic sectors in North Carolina as well as analysis of economic conditions in North Carolina between 2013 and 2014 are addressed in the next sections.

2.2.1.2.1 Employment by Sector

A comparison of employment by sector for North Carolina and the nation is provided in Table 2 - 19. North Carolina has higher employment in industries that potentially use rail such as construction, manufacturing, trade/ transportation/ utilities and leisure and hospitality. The only potential rail-dependent industry where North Carolina is below the national percentage is mining and logging.

Table 2 - 19 NC and US Industry Sector Comparison¹¹⁴

INDUSTRY SECTOR	PERCENT OF TOTAL EMPLOYMENT	
	NC %	US %
Mining and Logging	0.1%	0.6%
Construction	4.4%	3.9%
Manufacturing	10.8%	8.2%
Trade, Transportation, and Utilities	18.6%	17.5%
Information	1.7%	1.8%
Financial Activities	5.1%	5.4%
Professional & Business Services	13.7%	12.3%
Education & Health Services	13.9%	14.0%
Leisure & Hospitality	10.5%	9.5%
Other Services	3.7%	4.2%
Government	17.5%	15%

Figure 2 - 43 shows trends in North Carolina's Gross Domestic Product (GDP) by industry sector. Manufacturing continues to be the top industry by GDP. Trends in other potential rail-dependent industries include modest increases in construction and agriculture after the economic recession. Mining output is relatively stable over the last decade. It should be noted that certain industries are captured by more than one of these sectors. For instance, agriculture would be reflected in the agriculture sector for commodities grown, manufacturing for any food processing, manufacturing, and trade. Figure 2 - 46 includes another way to look at industries' link to the economy through the number of jobs.

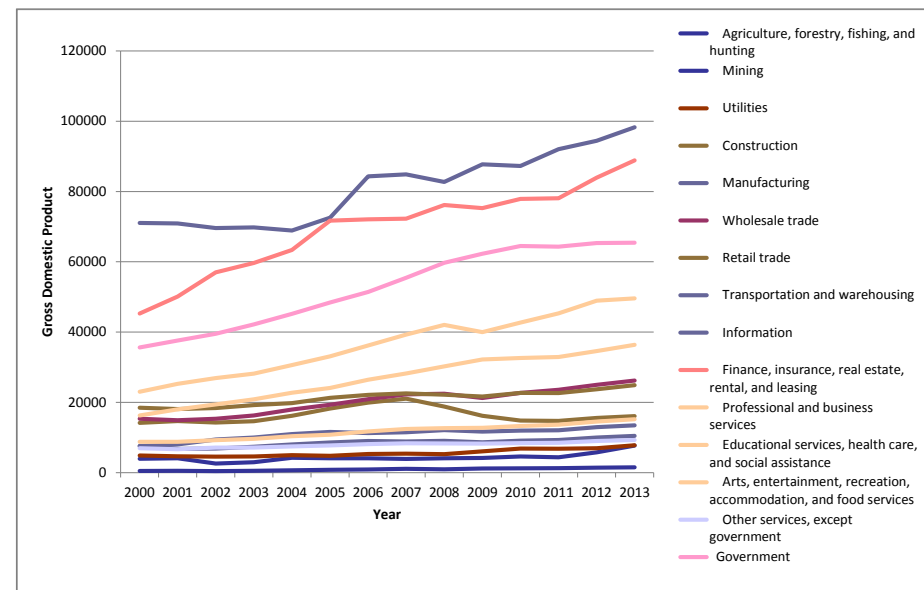


Figure 2 - 43 Trends in North Carolina's Gross Domestic Product (GDP)

Looking at the state's metropolitan areas demonstrates that each region has one or more industries that are substantially higher than the state average. Charlotte and the Triangle lead the state in Professional and Business Services. The Triad, the Triangle, and Asheville all have large Education and Health Services employment percentages. Asheville and Wilmington's thriving tourism industries explain their region's larger percentages in the Leisure and Hospitality sectors. Other industry sector concentrations include Government in Fayetteville due to Fort Bragg, Financial Activities in Charlotte due to the banking industry, and Manufacturing in the Triad due to its historic manufacturing industries of furniture, tobacco, and textiles among other manufactured goods.¹¹⁵

A notable change in the state's employment over the past two decades is the transition from manufacturing employment to service and professional

¹¹⁴ Bureau of Labor Statistics. North Carolina Economy at a Glance. January 2014. Accessed March 31, 2014. <http://www.bls.gov/eag/eag.nc.htm>

¹¹⁵ Bureau of Labor Statistics. Economy at a Glance for select NC Metropolitan Areas. <http://www.bls.gov/eag/eag.nc.htm>

industries. In 1990, North Carolina was the most manufacturing-intensive state, with this sector employing 26 percent of all workers. North Carolina currently ranks 12th in the country for manufacturing employment, with 10.8 percent of the state's workers employed in manufacturing.¹¹⁶ Manufacturing remains important to North Carolina's economy, constituting 20 percent of the state's Gross Domestic Product.¹¹⁷

Figure 2 - 44 shows employment trends in North Carolina over the last decade.¹¹⁸ Manufacturing employment continued declining until leveling off around 2010. Several sectors were negatively impacted during the economic recession, particularly Construction; Professional and Business Services; and Trade, Transportation and Utilities sectors. Of these sectors, the Professional and Business Services sector has seen the most growth since 2009 and has surpassed pre-recession employment levels. Most of the sectors appear to have either surpassed or have almost returned to pre-recession levels except for Manufacturing and Construction. Manufacturing is less apt to fully recover due to outsourcing and manufacturing trends that favor high-skill, capital-intensive manufacturing.¹¹⁹ Construction will likely continue to improve at a slow rate as the state's economy continues recovering.

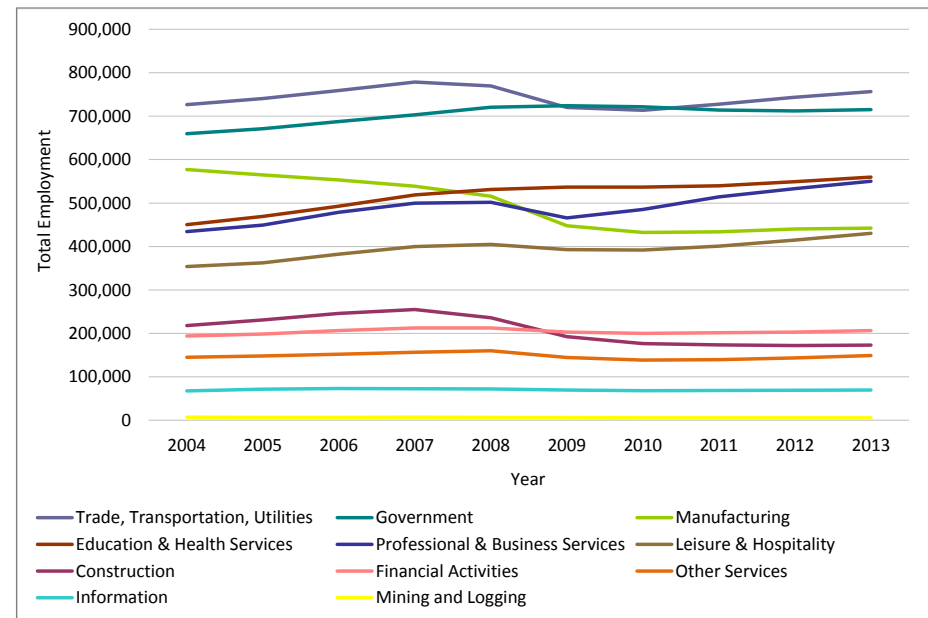


Figure 2 - 44 North Carolina Employment Trends by Industry (2004-2013)

Despite years of manufacturing job losses, North Carolina is beginning to see modest manufacturing growth. More than 40 new manufacturing facilities were announced during 2013. Many of the announcements were for western North Carolina. Manufacturing still employs 18.4 percent of all workers in this region despite losses to furniture and textiles in recent years. While the high-skill and capital-intensive jobs are not a substitute for jobs lost, they are still important for maintaining the region's manufacturing economic base. North Carolina's future manufacturing growth will likely continue to be in high-skill, capital-intensive industries such as chemicals and polymers, pharmaceuticals, aviation equipment, computers and electronics, and industrial machinery.¹²⁰

Other potential rail-dependent industries are seeing recoveries as well. Construction employment is beginning to rise due to increased commercial and

¹¹⁶ National Association of Manufacturers. Manufacturing Employment by State. Accessed April 10, 2014.
http://www.nam.org/~media/B8256B00DE1E48BAADC4A24166BF8B67/MFG_employment_NO_V2013.pdf

¹¹⁷ North Carolina Economic Development Board. North Carolina Jobs Plan. December 2013. Accessed April 9, 2014.
http://www.nccommerce.com/Portals/0/Documents/AboutOurDepartment/BoardsCommissions/NC%20Jobs%20Plan%20Report_Final.pdf

¹¹⁸ Bureau of Labor Statistics. Economy at a Glance employment data from 2004-2013.
<http://www.bls.gov/eag/eag.nc.htm>

¹¹⁹ Wells Fargo Securities. North Carolina Economic Outlook: April 2014. April 3, 2014. Accessed April 9, 2014.

¹²⁰ Wells Fargo Securities. North Carolina Economic Outlook: April 2014. April 3, 2014. Accessed April 9, 2014.

residential building activities. The majority of new construction is concentrated in Charlotte and the Triangle where there has been recent growth in multi-family housing and to a lesser extent, single-family homes. The Greensboro and Winston-Salem regions are challenged with past manufacturing losses and have not returned to post recession employment levels. As the overall economic climate continues to recover in North Carolina, growth will continue to spill over to residents' discretionary income and boost employment in the Trade, Transportation and Utilities and the Leisure and Hospitality sectors.¹²¹

Figure 2 - 45 shows the projected economic trends until 2040.

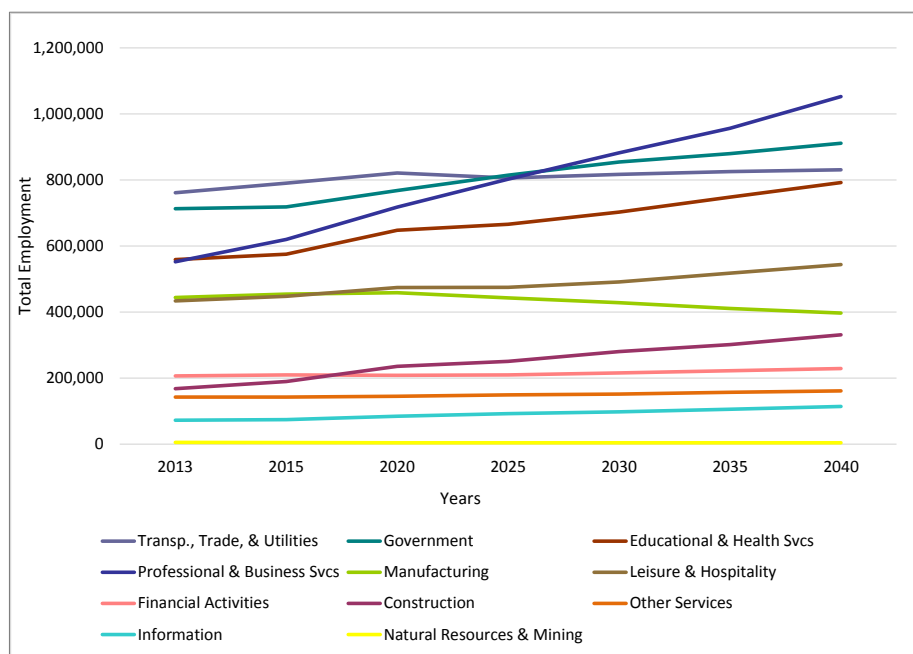


Figure 2 - 45 North Carolina Employment Projections by Industry (2015-2040)

¹²¹ Wells Fargo Securities. North Carolina Economic Outlook: April 2014. April 3, 2014. Accessed April 9, 2014.

2.2.1.2.2 Geographic Distribution of Rail-Dependent Sectors

Manufacturing is a major generator of rail freight. As Figure 2 - 46 shows, manufacturing employers are located throughout the state, with the greatest concentrations in Hickory, Charlotte, the Triad and the Triangle. Manufacturers are responsible for generating the majority of commodities within and from North Carolina. The top commodities by value produced in North Carolina include machinery, tobacco, textiles, pharmaceuticals, electronics, gasoline, and plastics/rubber.¹²² Additionally, manufactured foodstuffs, nonmetal mineral products, and wood products are top manufacturing commodities shipped within or from North Carolina by weight. Freight rail typically ships a number of these commodities or their product inputs, particularly machinery, chemicals, and minerals.¹²³

The Agriculture, Forestry, Fishing and Hunting sector and Mining and Quarrying sector are other industries that utilize rail.¹²⁴ The map of Agriculture, Manufacturing, and Mining jobs in Figure 2 - 46 shows a concentration of employers in the eastern part of the state where logging, hog farming, chickens, fishing and crop production are present. Several of the top commodities shipped to, within, or from North Carolina by weight include agricultural products such as timber, wood pellets, soybeans, cereal grains, animal feed and meat and seafood.¹²⁵ Freight rail typically transports bulk agricultural products such as grains and lumber as well as meats, prepared food, and other farm products.¹²⁶ Figure 2 - 46 shows the concentration of mining and quarrying employers in North Carolina. Gravel is the top commodity shipped within North Carolina by weight. Several mining operations are located on rail lines.

¹²² NCDOT Rail Division Presentation to State Rail Plain Technical Advisory Committee. April 17, 2014. Data from Bureau of Transportation Statistics, Freight Data and Statistics.

¹²³ Federal Railroad Administration. Freight Rail Background. March 1, 2012. <http://www.fra.dot.gov/eLib/Details/L03011>

¹²⁴ National Cooperative Freight Research Program. Freight Trip Generation and Land Use Report. Table 9 - NAICS Codes for freight-related sectors. 2012. http://onlinepubs.trb.org/onlinepubs/ncfrp/ncfrp_rpt_019.pdf

¹²⁵ NCDOT Rail Division Presentation to State Rail Plain Technical Advisory Committee. April 17, 2014. Data from Bureau of Transportation Statistics, Freight Data and Statistics.

¹²⁶ Union Pacific Railroad. Commodities Shipped website. Accessed April 11, 2014. <https://www.uprr.com/customers/businessgroups.htm>

The energy market is one of the shifts underway that will directly affect the current petrochemical and petroleum resource / production / processing alignment. Crude oil by rail is only one dimension of the change. The emergence of Québec and Louisiana as trading partners with North Carolina is due to the major shifts underway in crude oil and natural gas markets. The well-documented, long-term supply sources are now coming online at stable to increasing product prices. Reduced energy costs related to more domestically-produced energy are anticipated to help drive growth in manufacturing in NC.

North Carolina is home to a niche chemicals industry, principally manufacturing packaging film converters and rigid packaging. Other products include synthetic fibers. Some of the plastics manufacturing is located in Asheville at Printpack, which manufactures rigid plastics packaging; CMI Plastics at Ayden which manufactures plastics for consumer products; Arclin in Moncure which manufactures building and construction plastic products, agriculture products and floor surfaces. These are some of the many plastics manufacturers in North Carolina, and each of them has a good rail connection.

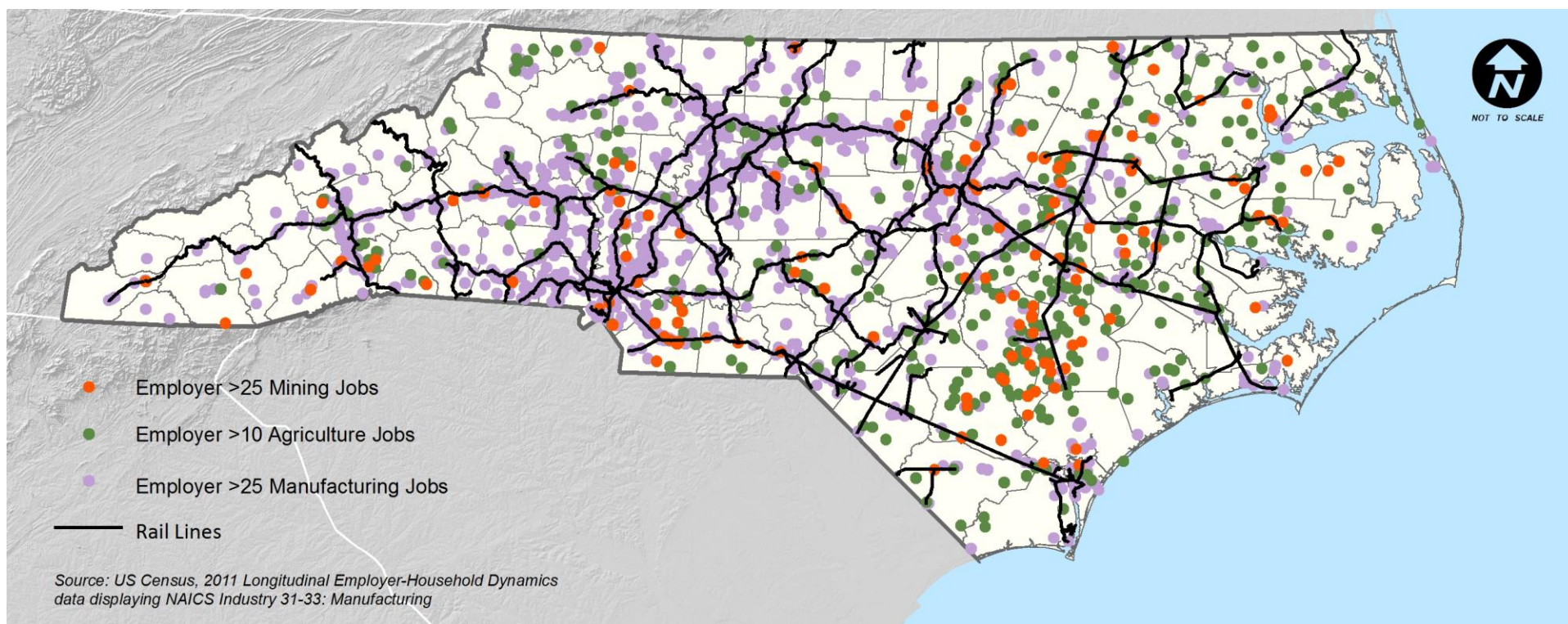


Figure 2 - 46 **Employers in North Carolina (Manufacturing, Agriculture, and Mining)**

For intermodal container traffic, California and Illinois are the two most significant trading partners¹²⁷ for North Carolina by volume and value. Each represents significant rail network connections. We also see the growth in importance for North Baltimore, Maryland; Columbus, Ohio; Nashville, Tennessee; Memphis, Tennessee; and Atlanta, Georgia that are cities with strategic rail facilities and network connections.

The needs and opportunities in freight rail arise from the supply chain focus associated with goods movement. The infrastructure conditions affect how much and how fast. The freight supply chain necessitates the State monitor the effectiveness of Origin - Destination pairs, both railroad and industry perspectives, by velocity, timeliness and efficiency. Outbound rail freight movements are important to distinguish whether the move is ultimately to ports or industrial sites. The distinction helps to develop closer ties to attraction and retention for industrial companies in the State.

Rail offers a mix of volume, speed and value for transporting goods long distances across networks with a well-defined operational history. Many of the raw materials required to produce energy, supply food, and construction rely on rail for at least one step of the resource to consumption production cycle. North Carolina is in a position to verify potential changes in freight flows with the Class I, regional and short line railroads, as well as potential adaptive strategies for handling the volumes.

Chemicals constitute an important share of non-container freight, especially when measured by value (accounting for approximately 10 percent of the total value). North Carolina plays an important role in chemical supply chains as a consumer of chemical feedstocks for manufacturing inputs (e.g., plastics, packaging and fertilizer).

North Carolina can also explore opportunities for expanding high-value chemicals manufacturing. The overall energy market contributes significantly to the shifts in petrochemical and petroleum resource / production / processing. Crude oil by rail has received substantial attention but is only one dimension.

2.2.2 Freight Trends

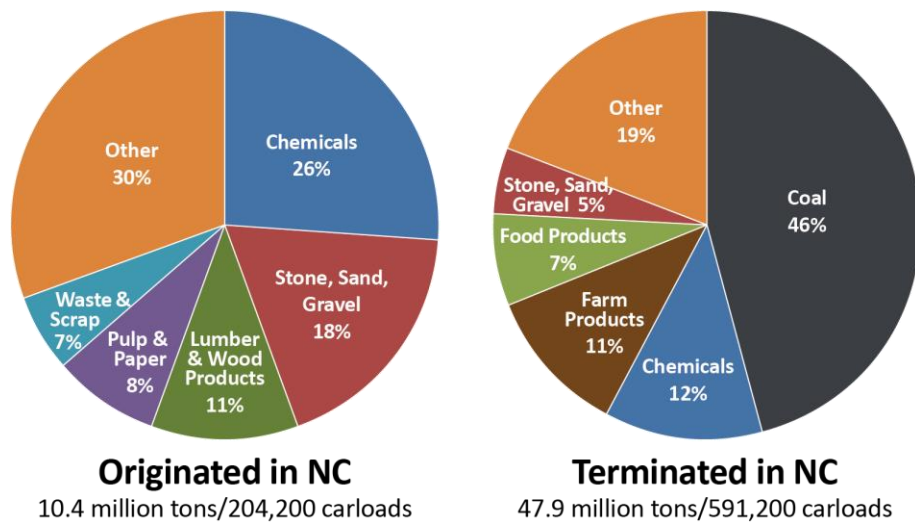
Existing freight flows, inclusive of trucks, were researched via the Freight Analysis Framework (FAF); this is discussed in Section 2.2.2.1. Following on from this is a discussion in the Sections 2.2.2.2 and 2.2.2.3 on the overall rail freight trends with respect to North Carolina as researched by IHS Global Insight for the project team. The time period of year 2011 to year 2040 was examined. Based on the trend analysis, some emerging markets are also noted.

The rail freight trend analysis was divided into intermodal flows (containers) and non-intermodal flows (carloads) since these two segments are served by distinct facilities and markets. Within these segments, rail traffic flows traveling through or across North Carolina (through), into NC (inbound), out of NC (outbound), and within NC (local) are distinguished.

2.2.2.1 Existing Freight Flows

A review of Freight Analysis Framework data compiled by the Federal Highway Administration and the 10-year Waybill sample provided by the Surface Transportation Board shows general freight movement trends for North Carolina. The volume and types of commodities originating and terminating in North Carolina are presented below.

¹²⁷ Includes through-traffic



Through volumes averaged 38 million tons (615,000 carloads) over last 10 years.
 Source: Association of American Railroads, 2012.

Figure 2 - 47 STB Waybill Summary - Commodities Carried by Rail Originating and Terminating in NC (2012)

Figure 2 - 2 presented approximate volumes on each corridor of the network, and Figure 2 - 43 presented trends in North Carolina's Gross Domestic Product. Figure 2 - 48 through Figure 2 - 51 present North Carolina's top trading partners (inclusive of all modes). A quick review of trading partner data by weight (most likely inclusive of rail-served commodities) shows that North Carolina's top trading partners for goods originating in the state are in the southeast, though Pennsylvania and Texas are also high on the list. It should be noted that the highest volumes remain within the state when considering all modes. For trade to North Carolina, top partners, besides intrastate commerce, also include nearby states. Evaluating trading partners by weight shipped is an important metric since trade by weight can be translated into truckloads and used to identify corridors where truck-to-rail diversion might be studied to relieve highway congestion.

A review of trading partners by value still shows the southeastern state dominance. But, additional states included are Texas, California, and some Midwest and Northeast states.

As noted previously in Chapter 1 and Section 2.1, in addition to the tonnage originating or terminating in North Carolina, North Carolina's network has also supported approximately 38 million tons (615,000 carloads) of through traffic, primarily on the north-south Norfolk Southern Crescent Corridor and CSXT's A Line. Generally, lower volume east-west Class I branch lines and short lines help connect NC industries to the primary north-south Class I network. These branch lines-to-Class I-connections provide important national and international economic and transportation linkages for industries located in rural and small urban areas. The balance of Section 2.2.2 describes freight trends in North Carolina and includes figures that compare existing and projected flows (Figures 2 - 61 through 2 - 63).

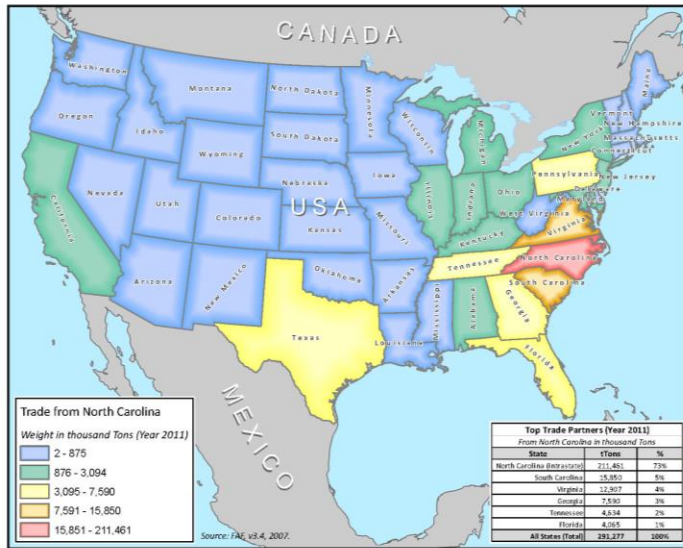


Figure 2 - 48 Top Trading Partners – Trade from NC by Weight

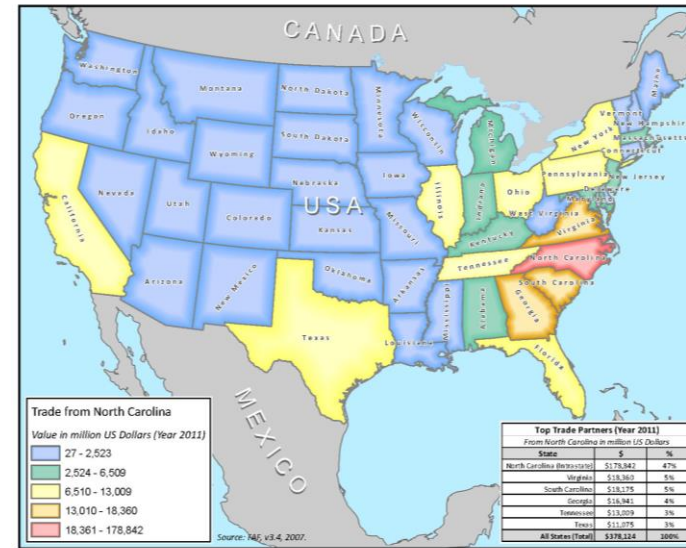


Figure 2 - 50 Top Trading Partners – Trade from NC by Value

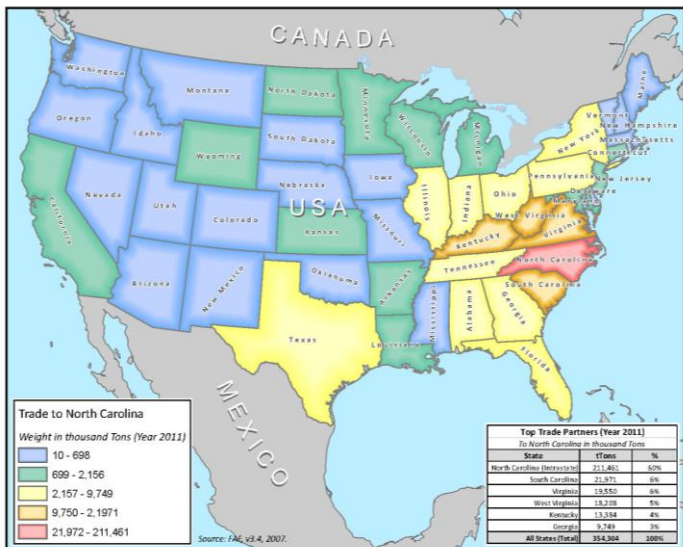


Figure 2 - 49 Top Trading Partners – Trade to NC by Weight

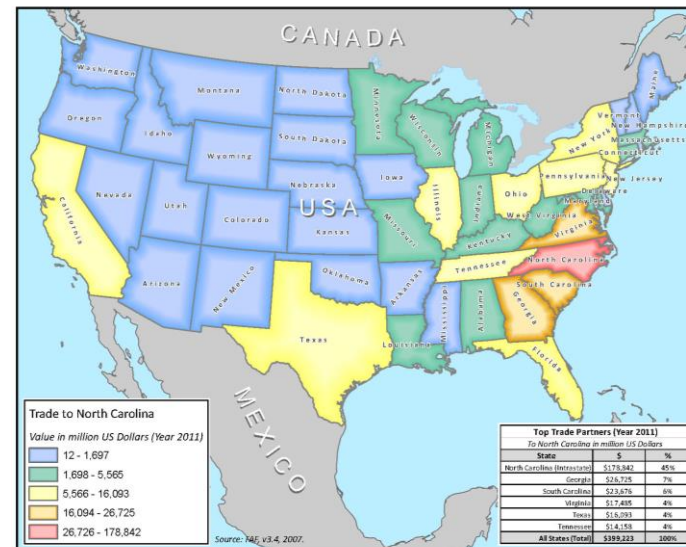


Figure 2 - 51 Top Trading Partners – Trade to NC by Value

Currently there is a strong base in North Carolina for plastics and rigid packaging manufacturing. Due to natural gas developments in Marcellus shale, especially in very active area at the southern tip of the area closest to West Virginia and developments in Utica markets, North Carolina will enjoy benefits of cheaper natural gas in close proximity. This will help fuel up the development in chemical manufacturing with the low cost of operating facilities and nearby supplies, sometimes displaced from newly producing areas.

Similarly, across the United States scrap metal exports via West Coast ports to Asia (e.g., China, Japan and South Korea) are increasing. A number of factors contribute to an increasing use of re-engineered steel from energy, emissions and sustainability considerations to shortening the production and supply chain schedules. Nucor is based in North Carolina with several plant sites and operations. There is a potential to follow the manufacturing trend with more direct scrap steel exports as Asian manufacturing continues to move south and west to Indonesia and India, creating more Suez Canal traffic over cross-Pacific routes.

NCDOT is in a position, as are many of their state peers, to align the public and private sector response to freight transportation growth and changes. Higher volume corridors concentrate a focus on freight and passenger joint operations. Lower volume corridors may raise a state of good repair focus due to the balancing of revenue, cost and rate of return. Overall, a corridor prioritization approach with an allowance for adaptability to change may be the most effective means to balance the analysis of traffic and rail served freight movements.

The intermodal market is growing faster than GDP in the United States. Historical bulk products, such as corn and soybeans, are moving to intermodal containers adding to the containers used to ship manufactured goods and products consumed by the growing population. Figure 2 - 52 shows California and Illinois by volume and it is also borne out in value as well. Port facilities and rail networks across North America are important for North Carolina's inbound and outbound freight movements. Through traffic depicts the importance of Chicago, North Baltimore, and Columbus.

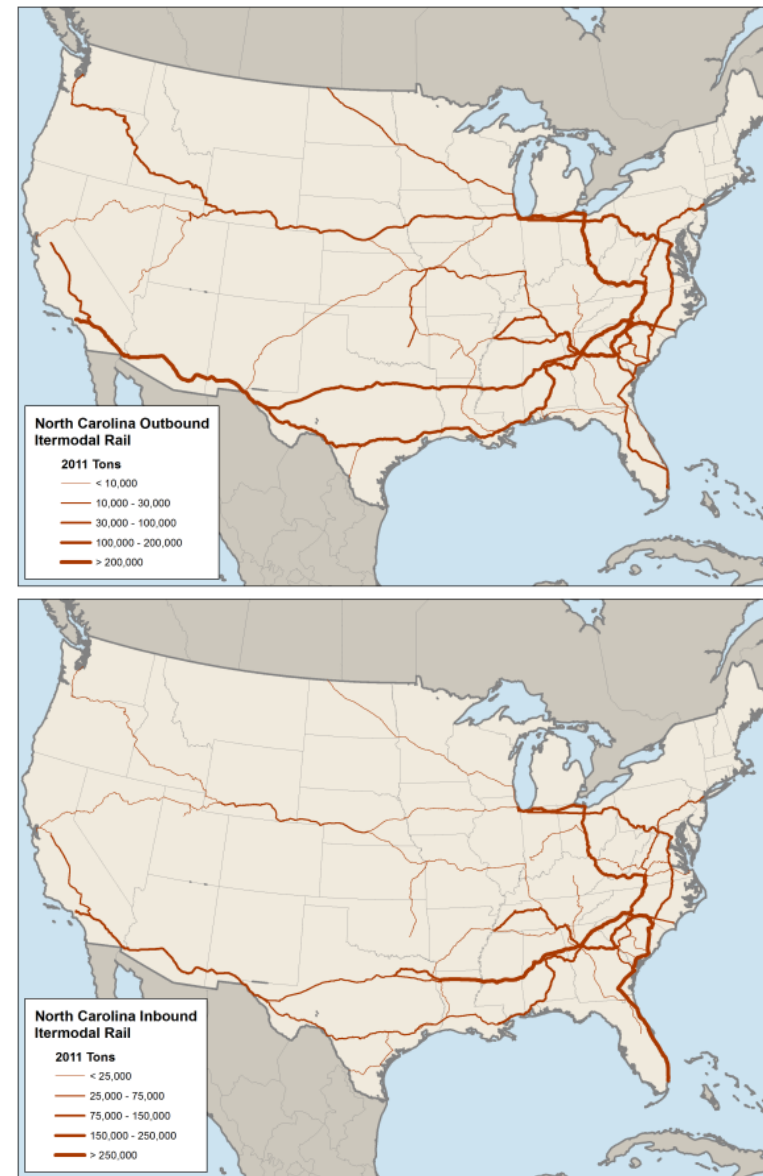


Figure 2 - 52 NC Outbound and Inbound Flows across the US

The following figure (Figure 2 - 53) displays the outbound rail tonnage from North Carolina in 2011.

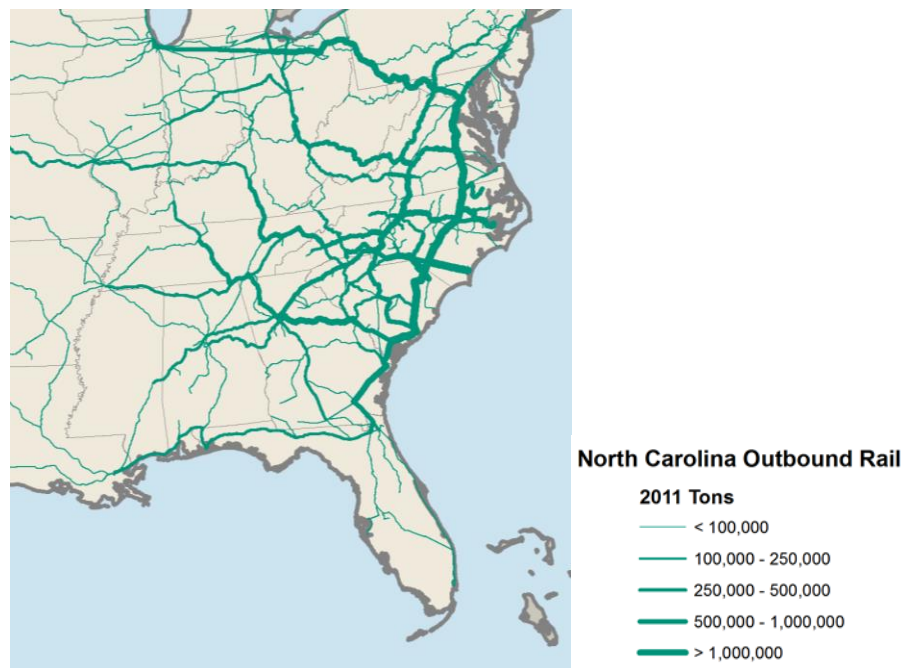


Figure 2 - 53 Outbound Rail Flows from North Carolina, 2011

2.2.2.2 Rail Freight: Non-Intermodal Flows versus Intermodal Flows

Overall, non-container freight flows are expected to increase in North Carolina from 84.462 million tons in 2011 to 105.327 million tons in 2040 (Figure 2 - 54) or on average 0.8 percent per year with the dollar value increasing at a faster rate of 1.8 percent per year (Table 2 - 20). Intermodal rail flows are expected to grow from 6.138 million tons in 2011 to 10.549 million tons in 2040 (Figure 2 - 56) – an average rate of 1.9 percent per year which closely matches the growth in value of 2.1 percent per year (Table 2 - 21).

Inbound traffic makes up the largest share of rail freight movement within North Carolina, accounting for almost two-thirds of non-container tonnage (Figure 2 - 54). However, outbound traffic is expected to grow much faster than inbound non-container traffic, and only slightly faster than container inbound

traffic over the next twenty-nine years. Outbound tonnage will grow by 2.4 percent per year between 2011 and 2040 (total value will grow by 2.2 percent); while inbound tonnage remains relatively flat (but the value climbs at approximately 1.7 percent annually). Container outbound tons will grow faster than inbound tons, especially in terms of value at 2.5 percent compared to 2.2 percent for inbound value, as shown in Table 2 - 21. This is due to significant amounts of heavy-weight coal moved in 2011, which is forecasted to decline significantly by 2040. Coal traffic is expected to decline in part because of emissions constraints on power plants impacting CSXT's route over the North Carolina mountains and NS routes; hence, this is partly why they are moving to capture more intermodal business. Reduction in coal shipments passing through and terminating in North Carolina provides network capacity to accommodate growth in other commodities.

Through traffic makes up about one-third of non-container traffic, both in terms of tons and value (Table 2 - 20), and just under 50 percent of container traffic (Table 2 - 21). Through traffic will grow at about 1.7 percent both in terms of tons and value for container and non-container traffic. Most of the container traffic is north-south or south-north in North Carolina and that will continue with future infrastructure developments such as the Crescent Corridor and the National Gateway Corridor.

Development of intermodal traffic in North Carolina will likely intensify with the development of these two corridors. The Crescent Corridor is more than a \$2.5 billion rail infrastructure project that spans 11 states (Figure 2 - 58) and was proposed by NS in 2007, as a means of reducing truck traffic on I-81. In its initial stages NS had to build intermodal terminals along the corridor so that it could handle increases in intermodal traffic. Charlotte Regional Intermodal Facility was built in 2014, and it is capable of handling 200,000 lifts per year. Similarly, the National Gateway Corridor (Figure 2 - 59) on CSXT's network is an \$850 million project that will enable the use of double-stack trains to connect Mid-Atlantic ports, including, but not limited to, the Port of Wilmington with Midwestern markets. It will also reduce transit times for freight coming to NC from the West Coast via Chicago. CSXT is also planning to expand their intermodal terminal in Charlotte to accommodate 246,000 lifts per year.

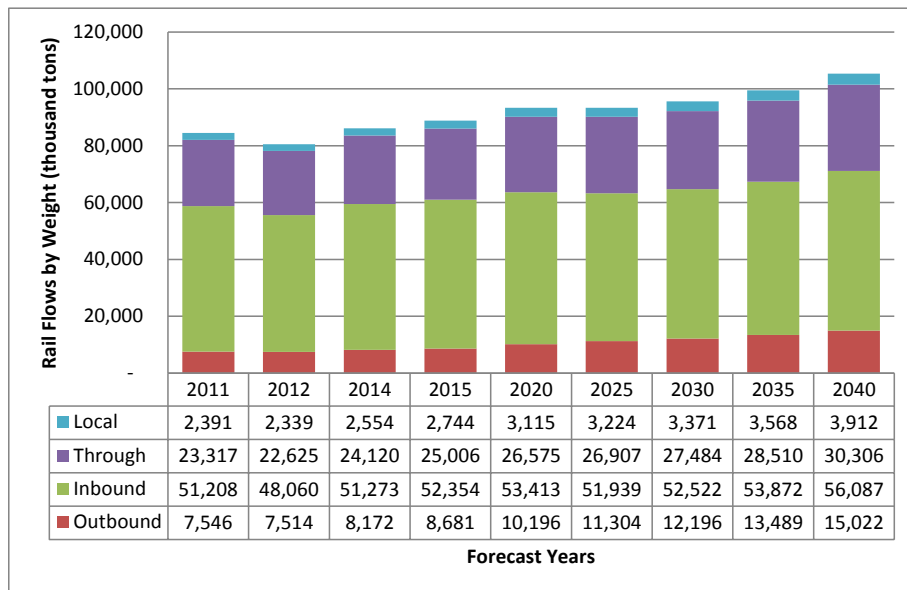


Figure 2 - 54 North Carolina Rail Flows by Weight

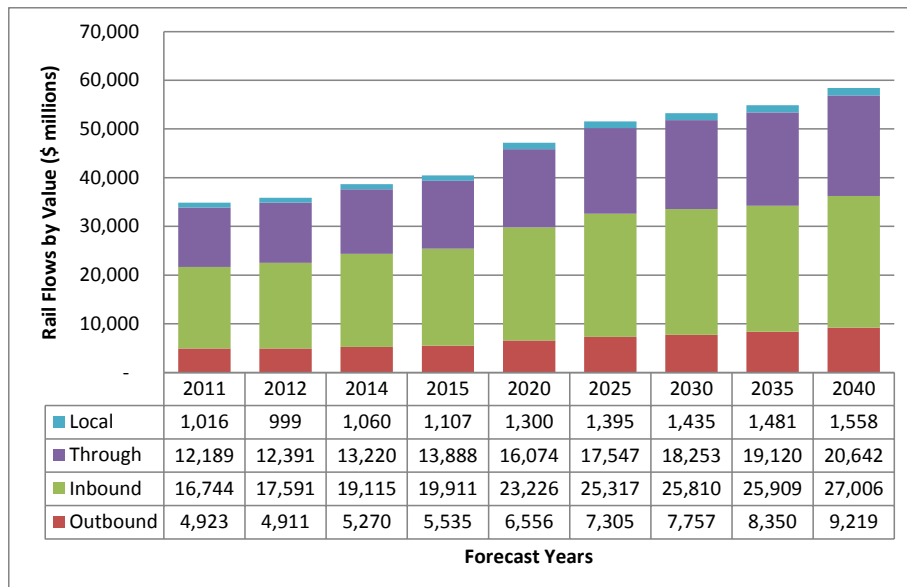


Figure 2 - 55 North Carolina Rail Flows by Value

Table 2 - 20 Summary of North Carolina Rail Flows

North Carolina Traffic Totals for 2011

	THOUSAND TONS	% TONS	THOUSAND UNITS	% UNITS	MILLION USD	% VALUE
Local	2,391	2.8%	27	3.2%	1,016	2.9%
Through	23,317	27.6%	240	28.3%	12,189	35.0%
Inbound	51,208	60.6%	496	58.5%	16,744	48.0%
Outbound	7,546	8.9%	85	10.0%	4,923	14.1%
Total	84,462		847		34,871	

Rail Flow Forecast

CAGR 2011-2040	By Weight	By Value
Local	1.7%	1.5%
Through	0.9%	1.8%
Inbound	0.3%	1.7%
Outbound	2.4%	2.2%
Total	0.8%	1.8%

CAGR – Compound Annual Growth Rate

Note: For Figures 2 - 54 through 2 - 57, 2013 data are unavailable.

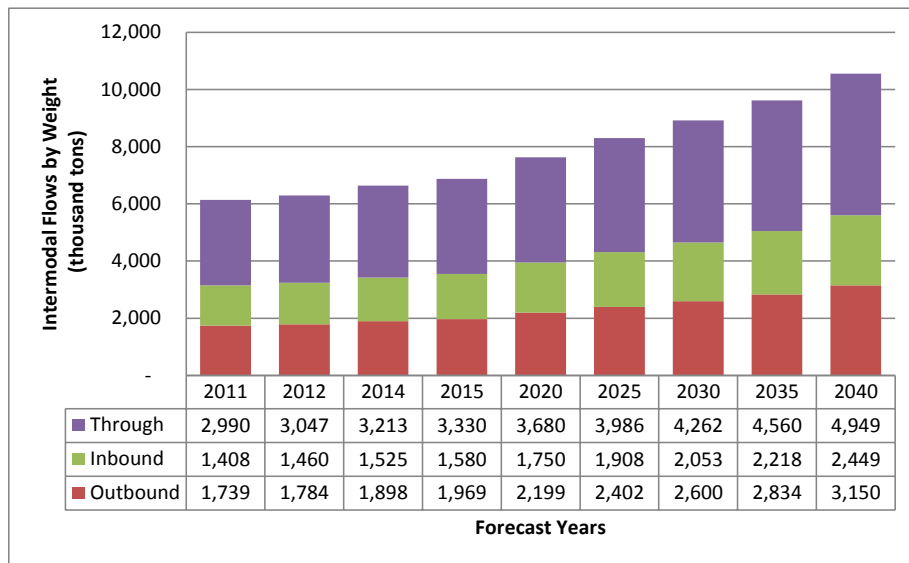


Figure 2 - 56 North Carolina Intermodal Rail Flows by Weight

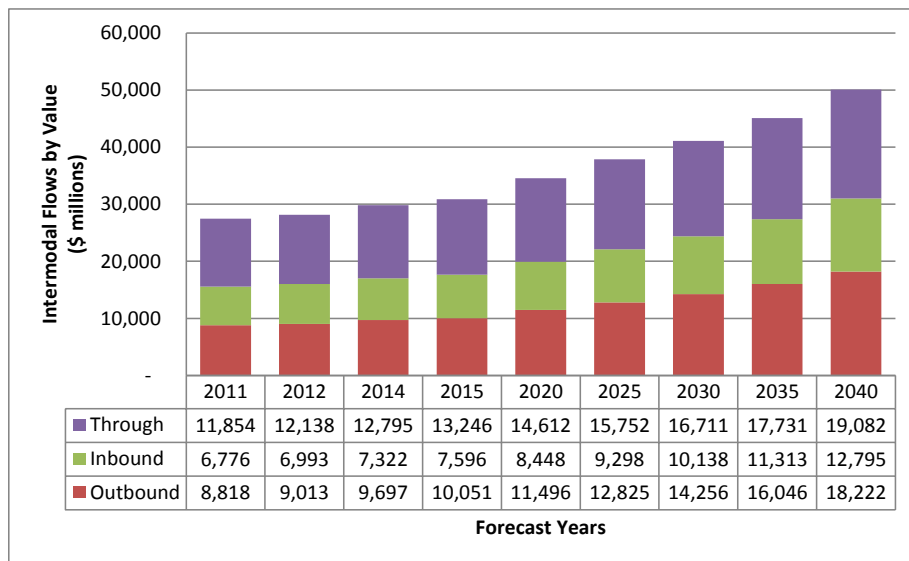


Figure 2 - 57 North Carolina Intermodal Rail Flows by Value

Table 2 - 21 Summary of North Carolina Intermodal Rail Flows

Intermodal Traffic Totals for 2011

	THOUSAND TONS	% TONS	THOUSAND UNITS	% UNITS	MILLION USD	% VALUE
Through	2,990	48.7%	252	50.6%	11,854	43.2%
Inbound	1,408	22.9%	118	23.6%	6,776	24.7%
Outbound	1,739	28.3%	128	25.7%	8,818	32.1%
Total	6,138		498		27,448	

Intermodal Forecast by Weight

CAGR 2011-2040	By Weight	By Value
Through	1.8%	1.7%
Inbound	1.9%	2.2%
Outbound	2.1%	2.5%
Total	1.9%	2.1%

CAGR – Compound Annual Growth Rate

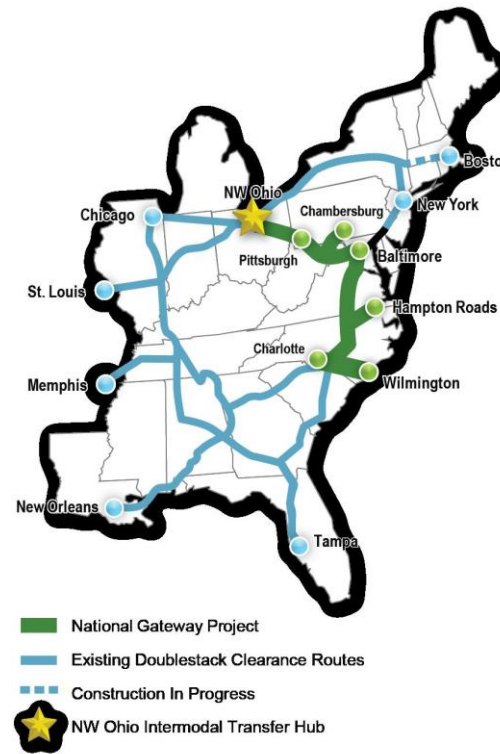
Note: For Figures 2 - 54 through 2 - 57, 2013 data are unavailable.

As Norfolk Southern and CSX Transportation invest more money into the Crescent Corridor and National Gateway Corridor, respectively, with rehabilitation of rail tracks to achieve faster delivery times, improve capacity, and run more efficient trains, North Carolina will experience growth in intermodal traffic. Currently intermodal traffic is forecasted to grow at approximately 2 percent CAGR from 2011 to 2040.



Source: <http://www.nscorp.com>

Figure 2 - 58 Norfolk Southern's Crescent Corridor



Source:
http://www.mdot.maryland.gov/sebin/d/a/National_Gateway_Map.jpg

Figure 2 - 59 CSX Transportation's National Gateway Corridor

2.2.2.3 Emerging Freight Trends

Over the course of the next 25 or more years, there are spatially-related and commodity-related trends emerging for North Carolina. Spatially, changes in rail flows are presented in Figure 2 - 61, Figure 2 - 62, and Figure 2 - 63. Outbound rail flows are expected to grow on rail lines across the state with significantly more tonnage traversing the Greensboro to Charlotte corridor as well as most major corridors in the western part of the state (Figure 2 - 61). Outbound intermodal flows are high and continue to increase along the two primary north-south routes in NC (Figure 2 - 61). Inbound flows increase mainly from the Virginia border to Greensboro and between Greensboro and Raleigh; whereas inbound intermodal flows are expected to increase on the Greensboro to Charlotte corridor (Figure 2 - 62). Through rail traffic is not

expected to change significantly in terms of routes; however, there is growth in flow between Asheville and Salisbury (Figure 2 - 63). Overall there is an expected increase in freight volumes originating in NC destined for locations outside of the State.

In terms of commodity flows, Illinois, Louisiana and Canada grow in importance for plastics and chemical products shipped to support a growing plastics and packaging industry.

North Carolina rail freight will experience increased rail flows to South Carolina and Georgia. Some of these flows, such as plastics, dyes, metal scrap and broken stone relate to increased production in North Carolina.

With the exception of coal, most other inbound non-container traffic originates from nearby states in the Northeast and Southern states, while non-container outbound cargo follows a different pattern. More proximate States are still among the most important destinations, especially South Carolina, Georgia and Virginia, but other large international trade centers such as ports in Virginia and Midwest states receive substantial flows originating in North Carolina. The top outbound goods, respectively to these destinations, are metal scrap, plastics, chemicals, dyes and wood products.

One of the near-term examples of commodity trends taking place is seen for natural gas and crude oil fracking in areas previously passed by due to the information available on formations, as well as technological and economic limitations. Shale formations are most likely present in several North Carolina formations, including the Deep River Basin, a 150-mile long fault in central North Carolina. The following figure (Figure 2 - 60) depicts these potential formations in North Carolina. Legislation was passed in North Carolina in 2012 and 2014 to allow hydraulic fracturing. The potential exists for further investments in rail and pipelines to move North Carolina and Marcellus/Utica gas to markets in the Southeast. Significant investments are underway now and in the near future centered on upgrading/ extending/ reversing interstate gas pipelines to allow north-to-south flows. Several extensions are targeting North Carolina in particular. The fracking development techniques utilized for these formations often brings a significant change to the existing land use, transportation and economic base for the development zones. North Dakota has

seen a 17 percent growth in the state's population in the past 12 years largely attributable to the growth from the petroleum sector expansion. The equivalent growth, were it to be seen in North Carolina, would add 1.6 million residents. Quickly comparing the two states in Table 2 - 22, the significant natural gas developments will create different uses for existing infrastructure and create additional planning and investment requirements, particularly for freight transportation.

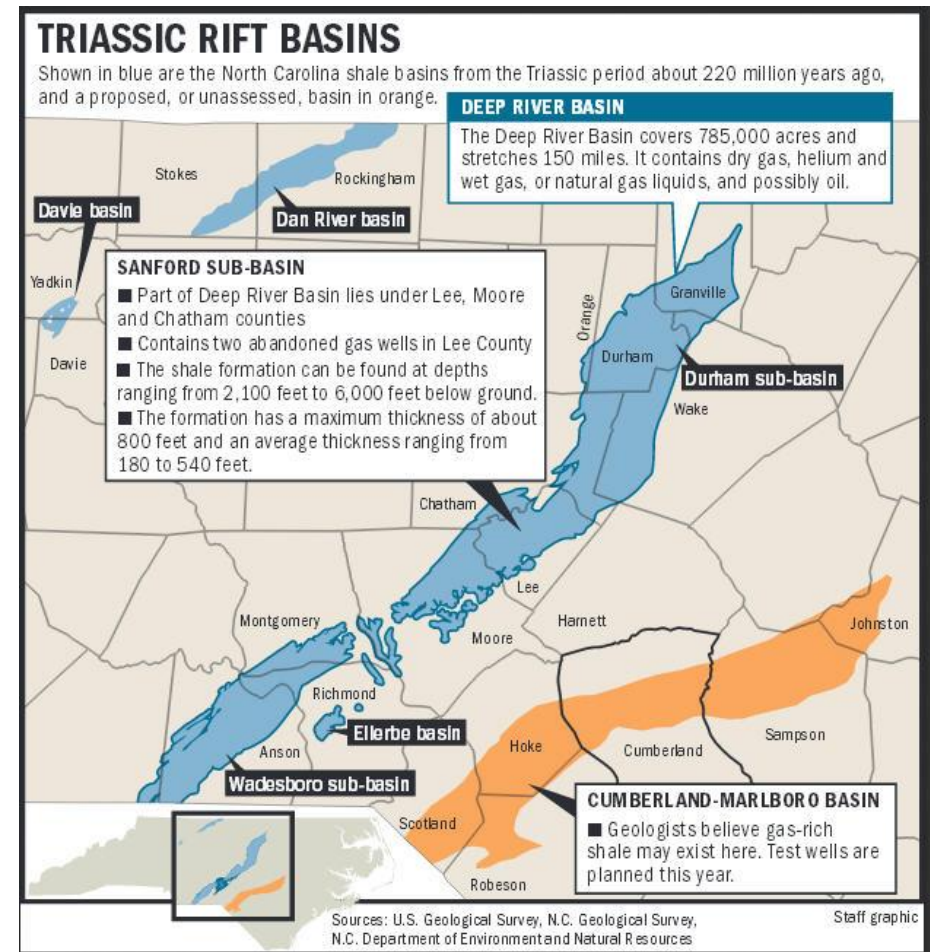


Figure 2 - 60 Triassic Rift Basins in North Carolina

Table 2 - 22 Comparison of North Carolina and North Dakota

STATE	AREA (sq. mi.)	2013 POPULATION	HOUSING UNITS	DENSITY (pop./sq. mi.)
North Carolina	48,618	9,850,000	4,400,000	202.6
North Dakota	69,000	723,000	339,000	10.5

Complementing the freight trends is the overall railroad network performance as the traffic volumes are carried on the network. The impact is equally important for Class I and Class III railroads. The 286,000 pound loaded railcar is the industry standard, though the industry is shifting to the 312,000 pound loaded railcar. It is important for industry to have shipments delivered the full trip reinforcing the importance of the “first and last mile” of freight movement. With the average Class III line length of ± 45 miles, the service track speed is far less important than the ability to schedule frequent service for a fully loaded railcar. The Railway Association of North Carolina estimated the cost to bring their collective system up to industry standards was approximately \$120 million for track and bridges.

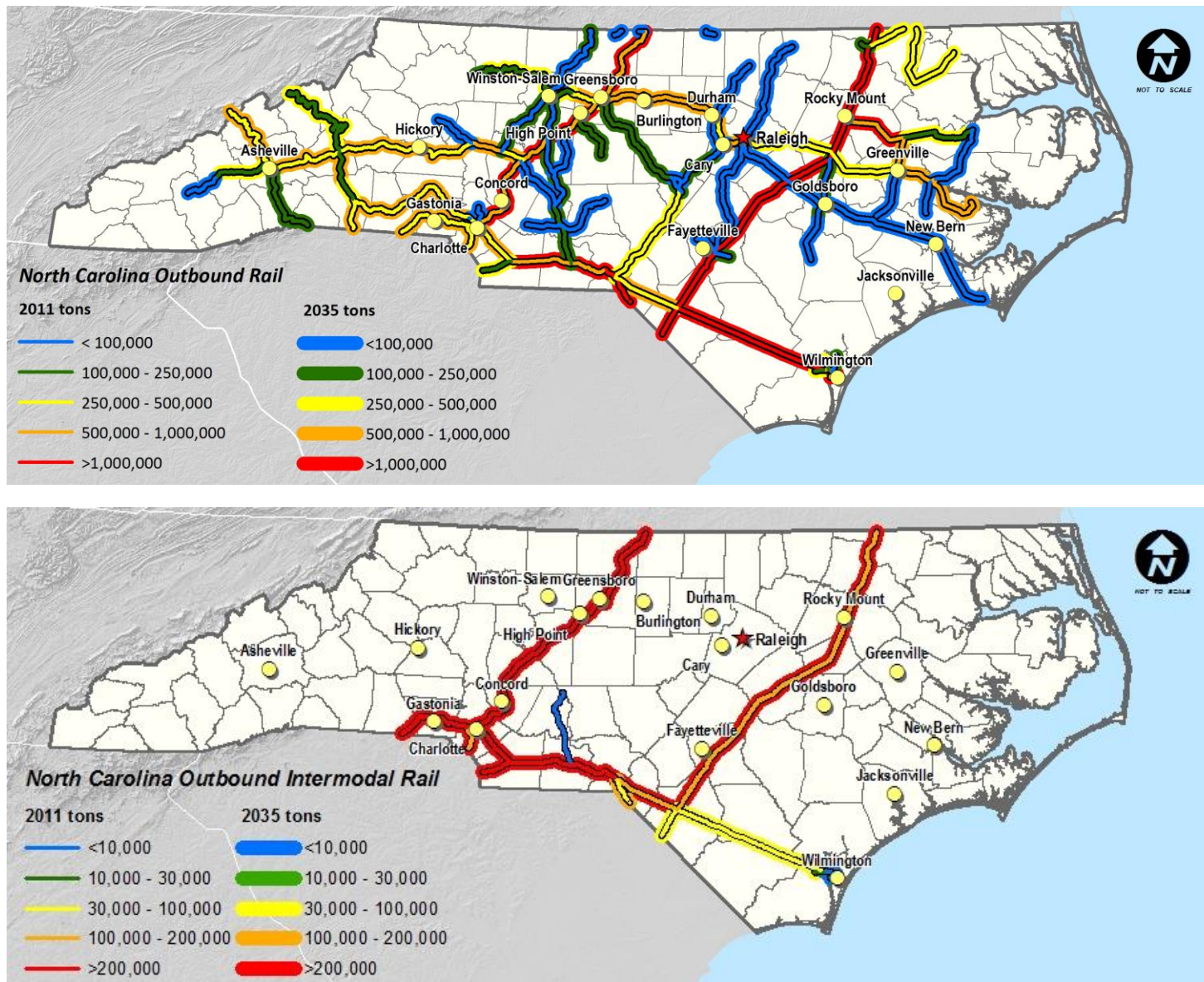


Figure 2 - 61 North Carolina Outbound Rail Flows, Carload and Intermodal (top, bottom), 2011 and 2035

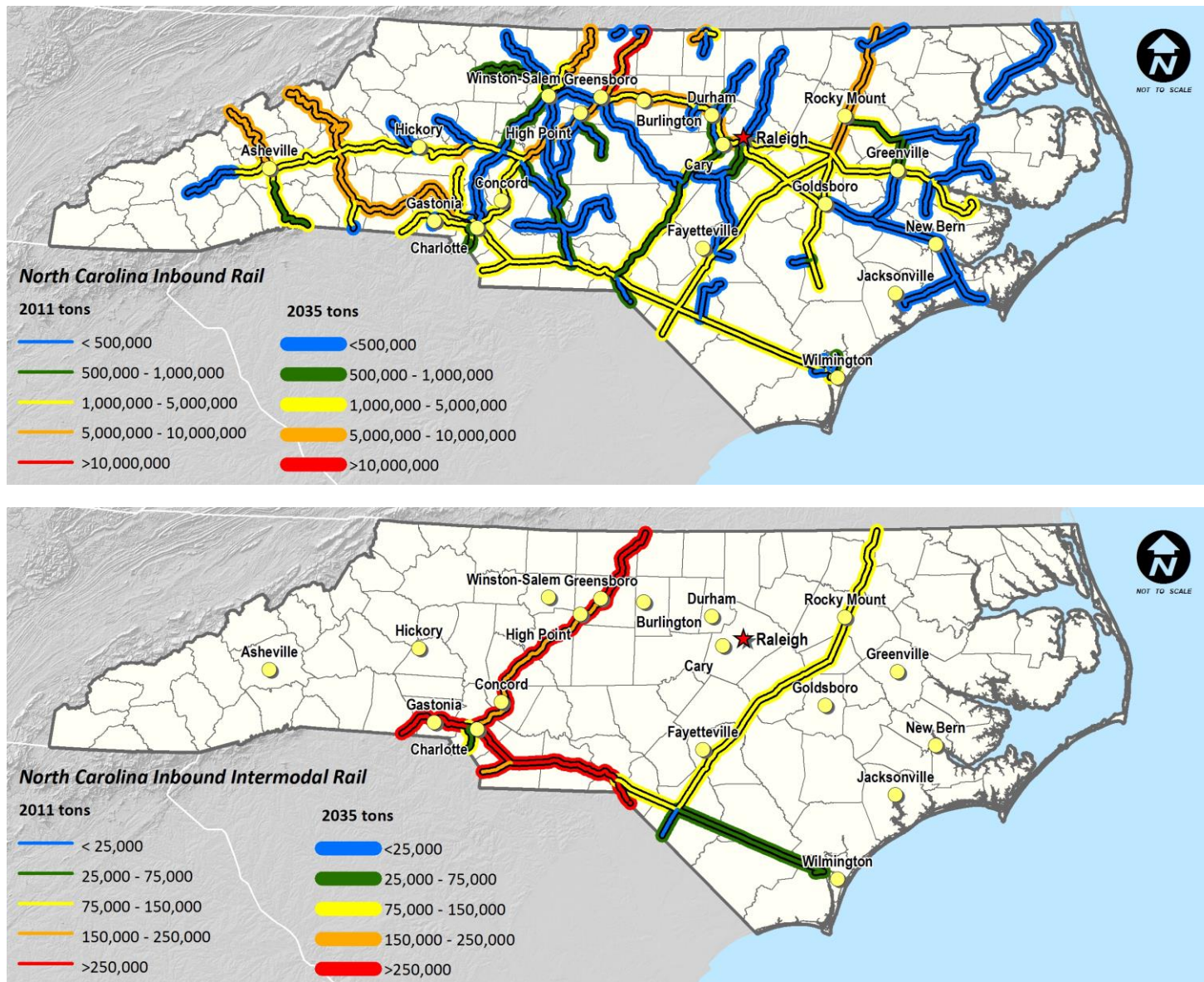


Figure 2 - 62 North Carolina Inbound Rail Flows, Carload and Intermodal (top, bottom), 2011 and 2035

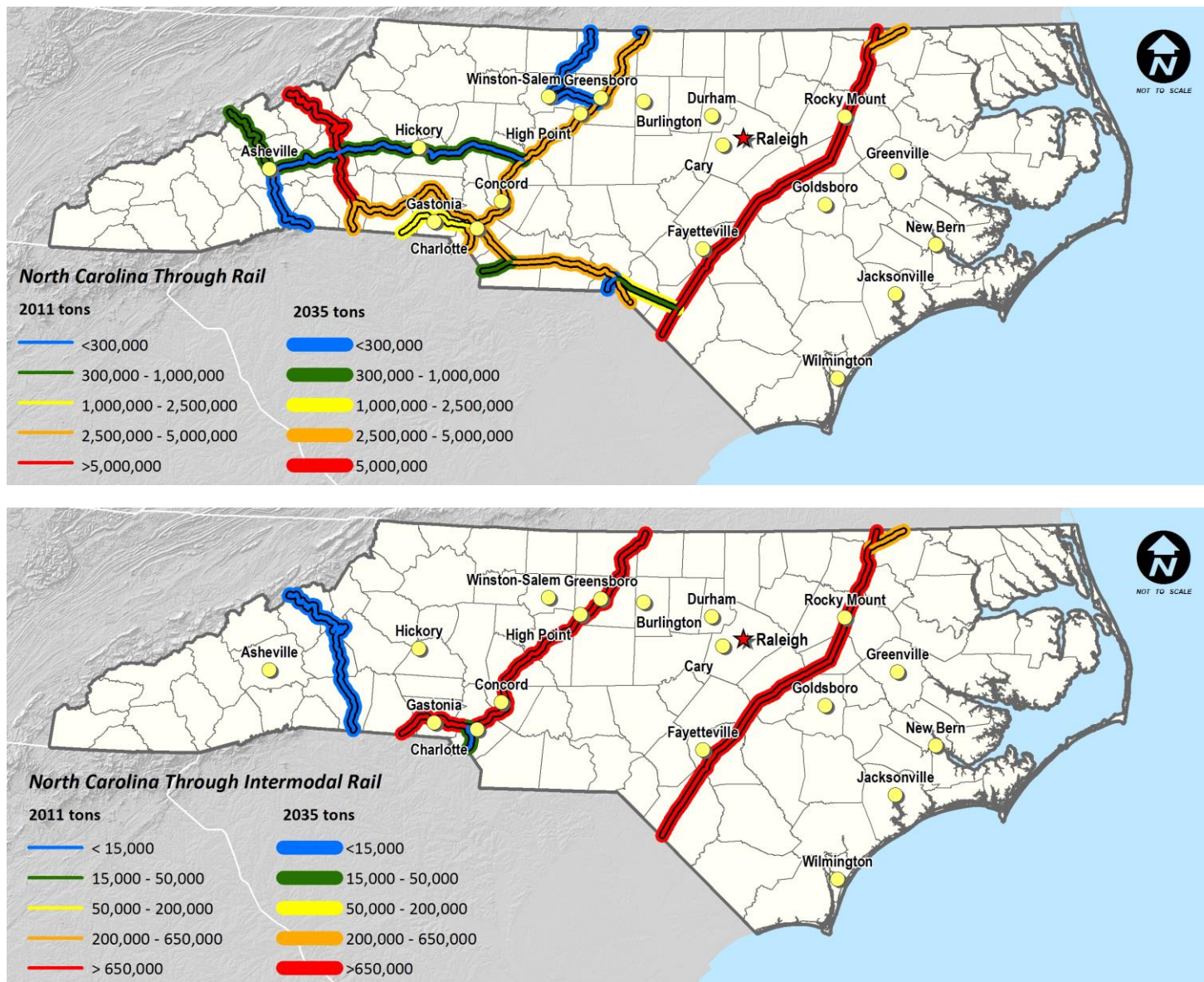


Figure 2 - 63 North Carolina Through Rail Flows, Carload and Intermodal (top, bottom), 2011 and 2035

Chemicals constitute an important share of non-container freight, especially when measured by value (accounting for approximately 10 percent of the total value). North Carolina plays an important role in chemical supply chains as a consumer of chemical feedstocks as manufacturing inputs (e.g., plastics, packaging and fertilizer).

North Carolina can also explore opportunities for expanding high-value chemicals manufacturing. Currently there is a strong base in North Carolina for plastics and rigid packaging manufacturing as can be seen in Figure 2 - 64 showing where to and how many tons of chemical-related commodities are flowing. Due to natural gas developments in the Marcellus and Utica shale formations, as well as North Carolina's potential resources in the Deep River and Dan River Basins, North Carolina will enjoy benefits of cheaper natural gas in close proximity to existing and future state industries and consumers. This will help fuel the development in chemical manufacturing with the low cost of operating facilities as natural gas prices are currently low.

Coal ash is expected to be transported by rail within or out of the state, but no specific site has been designated; as such, no improvements or projects have been identified to support the future traffic flows.

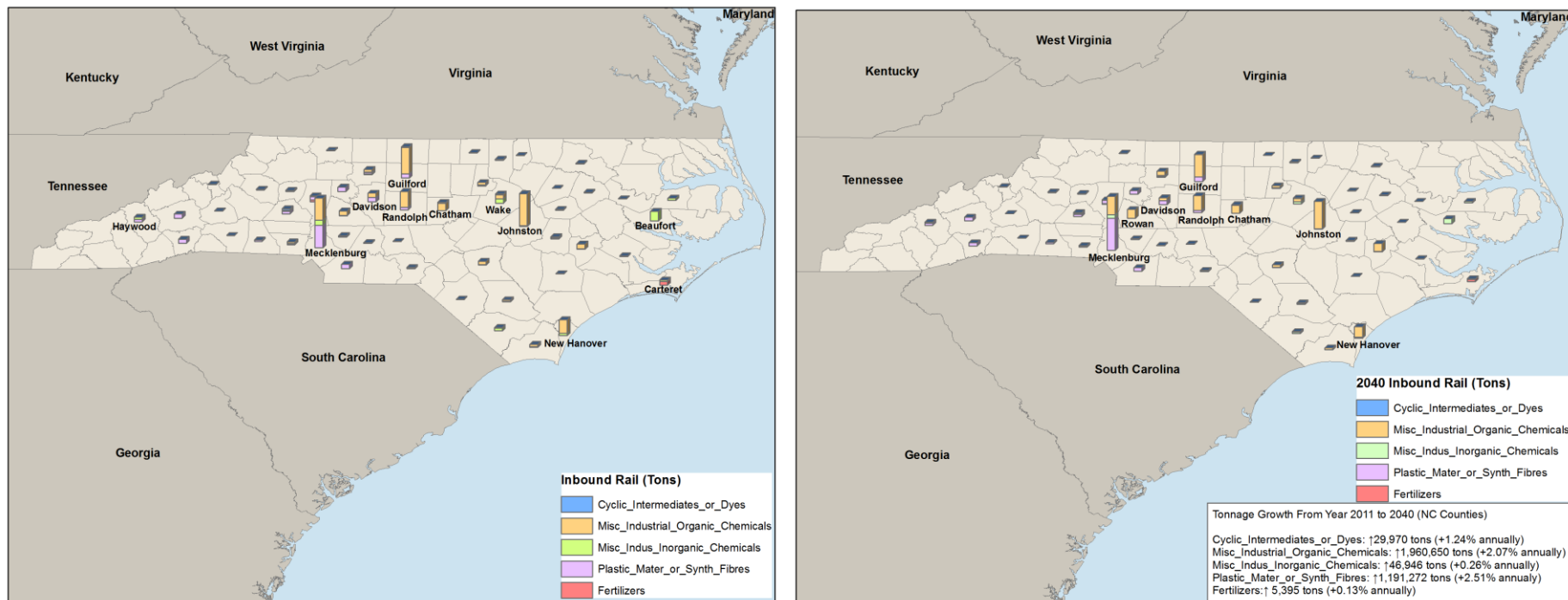


Figure 2 - 64 Destinations of NC Chemical/Plastic-Related Inbound Rail Flows, 2011 and 2035

Inbound and outbound coal shipments will likely decline with the growth in natural gas energy production and decreasing coal usage from retiring and converted coal fired power plants. There is currently a drop forecast in total coal shipments on rail at 1.0 percent CAGR up to 2040 inclusive of the remaining coal plants.

Shale formations are most likely present in North Carolina's Deep River Basin, a 150 mile long fault in central North Carolina. Legislation was passed in North Carolina in 2012 and 2014 to allow hydraulic fracturing. The potential exists for further investments in rail and pipelines to move North Carolina and Marcellus/Utica gas to markets in the Southeast. A lot of activity now and in the near future will be centered on upgrading/extending/reversing interstate gas pipelines to allow north-to-south flows. Several extensions are targeting North Carolina in particular.

Scrap metal rail flows in North Carolina are increasing, due to an increased need for scrap metals to feed steel production. Nucor has its corporate office in Charlotte and plants in three other locations in North Carolina. Other locations with scrap metal concentrations in the state include Wilmington and Raleigh. Increasing demand for scrap metal is associated with auto manufacturing, principally in the Southeast and Midwest. Scrap exports to Asia will account for a smaller share of overall outbound flows. Metal scrap rail flows are forecast to grow at 5.5 percent CAGR from 2011 to 2040.

Many of the recent investments in wood pellet capacity in the U.S. have occurred along the Atlantic coast, with Enviva and Fram Renewables expanding production in North Carolina, Georgia and Virginia. Wood pellet industry expansion is primarily driven by demand for biomass in Europe, as a means to find alternatives to coal. In 2013, Europe imported about 3 million tons of wood

pellets, and by 2020 that number is expected to grow rapidly to 20 million tons. Wood pellet production levels are, however, subject to uncertainties such as raw material supply. Wood pellets for energy use are closely interlinked with other industries whose outputs comes from sawmill and forestry production. For example, US wood pellet production is strongly led by the country's demand for timber to generate wood residuals and biomass, which is subject to construction industry activity. Enviva and International Wood Fuel are expanding wood pellet production terminal capacity at the ports of Wilmington and Morehead City. Wood pellet rail flows in North Carolina are expected to grow at 2.1 percent CAGR from 2011 to 2040 (Appendix, B).

Auto manufacturing is currently growing in South Carolina, Georgia, Alabama, Tennessee, and other southern states. According to the North Carolina Department of Commerce (NCDOT), NC continues to actively pursue opportunities with the automotive industry and related products. An increasing percentage of motor vehicles (by total value) are expected to be shipped into North Carolina between now and 2025 after which the percentage drops sharply off through year 2040 (Appendix, B).

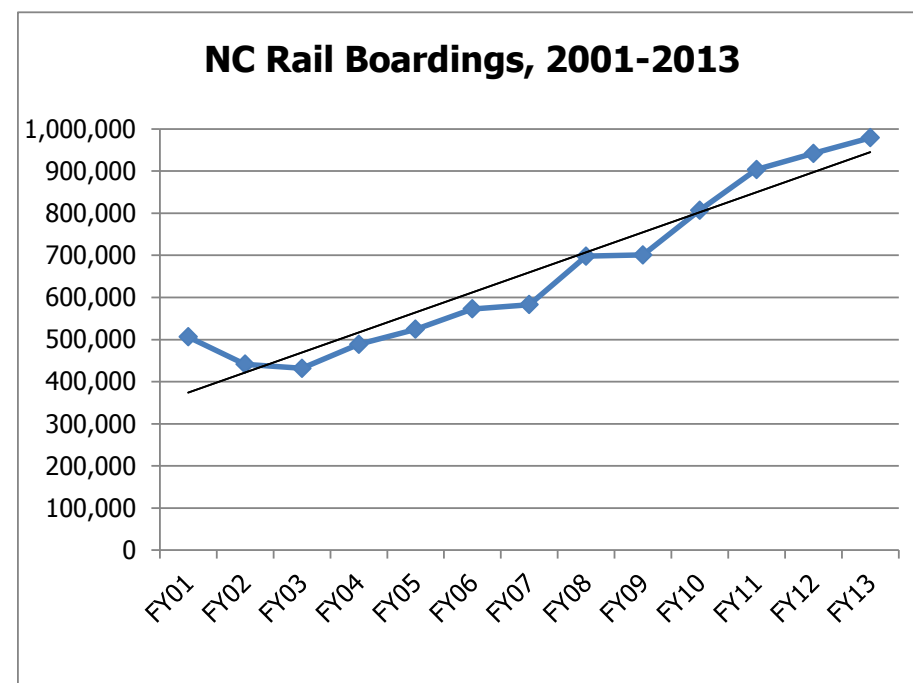
The role for intermodal terminals continues to grow as more products are shipped via container, including agricultural products and other materials previously shipped in bulk. Bulk products may be loaded and unloaded at customer facilities or with dedicated purpose built connections for transloading. Coal, petroleum, chemicals, plastics and paper, pulp and paper products each fall into this category of freight products. Minerals and project cargoes, such as military equipment and machinery, will be transported as well. Intermodal commodities can be difficult to tease apart; FAK, or Freight All Kinds is by far the largest category. FAK is a mix of commodities being shipped together. Often FAK shipments are intended for a particular retailer (eg. Lowe's, Wal-Mart). Beyond this general intermodal category, pharmaceuticals are the major outbound commodity by value, now and through 2040. Growth for inbound freight flows includes such commodities as necessary textile goods, missile or space vehicle parts, and liquor (See Appendix B for more detail).

2.2.3 Passenger Rail Trends

This section discusses the overall passenger rail trends in North Carolina, as well as specific trends gleaned from data from the state-supported trains, the *Piedmont* and *Carolinian*, and other transportation related trends in North Carolina, such as transit ridership and automobile driving trends.

2.2.3.1 North Carolina Passenger Rail Ridership Trends

North Carolina has seen tremendous growth in the demand for passenger rail. In the past 12 years, Amtrak boardings in North Carolina grew by 93 percent, from just over 500,000 boardings in 2001 to nearly 979,000 in 2013 (see Figure 2 - 65). Charlotte has almost consistently been the busiest station during that timeframe, with the other large metropolitan areas of Raleigh, Greensboro, Cary and Durham rounding out the top five stations (Table 2 - 23).



Note: Ridership includes ons and offs for 14 daily passenger trains in North Carolina. Mid-day Piedmont service added June 5, 2010.
Source: NCDOT and Amtrak

Figure 2 - 65 Total North Carolina Passenger Rail Boardings, 2001-2013

Table 2 - 23 North Carolina Rail Boardings by Station (2001-2013)

	FY2001	FY2013	Change, 2001-2013
Burlington	12,524	25,452	103%
Cary	16,690	88,669	431%
Charlotte	115,132	201,481	75%
Durham	32,650	83,232	155%
Fayetteville	28,072	53,590	91%
Gastonia	2,544	1,741	-32%
Greensboro	58,107	139,869	141%
Hamlet	3,237	4,882	51%
High Point	14,444	40,302	179%
Kannapolis	8,500	19,205	126%
Lexington (Special Stop)	149	542	264%
State Fair (Special Stop)	2,312	2,672	16%
Raleigh	111,623	159,584	43%
Rocky Mount	39,696	52,631	33%
Salisbury	18,973	31,539	66%
Selma-Smithfield	6,810	13,222	94%
Southern Pines	3,025	7,554	150%
Wilson	31,951	52,692	65%

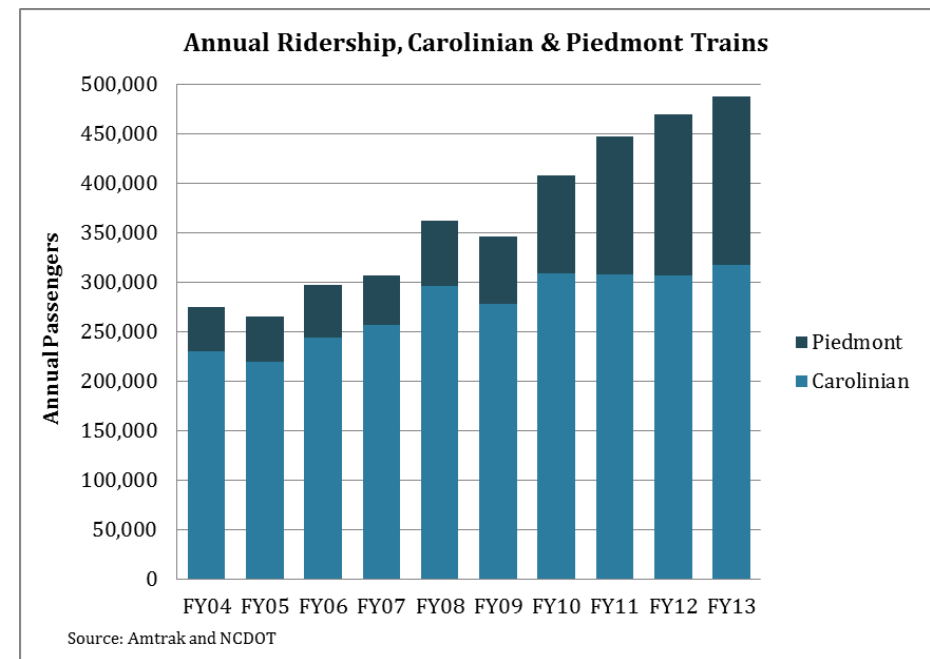
Note: Ridership includes ons and offs for 14 daily passenger trains in North Carolina. Mid-day Piedmont service added June 5, 2010.
Data Source: Amtrak and NCDOT

The stations with the largest growth in ridership over the past 12 years consist of Cary, High Point, Durham, Southern Pines, Greensboro, and Kannapolis. All of these stations have had substantial renovations in the past 10 years. High Point and Cary were also at one time unstaffed stations, and are now full service stations (ticket agents, baggage check, etc.) since their renovations. These operating and service enhancements have contributed to the substantial increase in patronage. It should also be noted that the recent improvements at Kannapolis and Cary have allowed some patrons to use these stations in lieu of Charlotte and Raleigh, both of which have experienced overcrowding and over or at-capacity parking lots in the past few years.

2.2.3.2 Piedmont and Carolinian Trends

The stations with the highest usage (and most of the stations with the highest growth) are served by the two NCDOT supported trains, the *Carolinian* and

Piedmont. Ridership on the *Carolinian* is up 40 percent since 2005, outpacing growth in population and VMT. *Piedmont* ridership is up 280 percent since 2004. There are likely two factors that contributed to the higher percent ridership increase for the *Piedmont*. NCDOT and Amtrak introduced a mid-day *Piedmont* train in 2010, which effectively increased available service by 50 percent in the corridor. Moreover, the average train travel time in the Charlotte to Raleigh (*Piedmont*) corridor has decreased in the past 10 years, making the *Piedmont* train more competitive with automobile travel time. Figure 2 - 66 shows the total annual ridership on the *Piedmont* and *Carolinian* over the past 10 years, which has increased from over 274,000 to almost 500,000.¹²⁸



Note: Mid-day Piedmont service added June 5, 2010.

Figure 2 - 66 Annual Ridership, Carolinian and Piedmont Trains, 2004-2013

¹²⁸ All historic ridership data from NCDOT and Amtrak.

The ridership trends for the *Carolinian* indicate that North Carolina plays a critical role in supporting this route. The *Carolinian* serves 24 stations and runs 704 miles from Charlotte to New York City. Nearly half of the stations and route miles are within North Carolina, yet North Carolina stations make up at least one part of 18 of the top 25 station pairs for the *Carolinian*, both for ridership and revenue. Six of the top ten station pairs for ridership and eight of the top ten station pairs for revenue are from North Carolina to Washington, DC and points north.

2.2.3.3 Amtrak Thruway Bus Trends

Amtrak offers Thruway Bus services between Wilson and Morehead City (with stops in Greenville, New Bern, Havelock) and between Wilson and Wilmington (with stops in Goldsboro, Kinston, Jacksonville). Both of these buses connect in Wilson with Amtrak's *Palmetto*, which provides service between New York City and Savannah, GA. According to FY 2014 ridership data from Amtrak, both bus routes average approximately 430 monthly riders, with stops in Greenville and Jacksonville having the largest share.

2.2.3.4 Other Rail Trends

While North Carolina does not have any commuter rail services, Charlotte is served by a light rail line that opened in 2006. The CATS Blue Line currently has 16,100 daily riders,¹²⁹ almost doubling ridership since opening, which is ahead of projections. And the 9.3-mile LYNX Blue Line Extension is to open for service in 2017.¹³⁰ The Charlotte region is encouraging transit-oriented development via the *2030 Transit Corridor System Plan* and the *Transit Area Joint Development Principles and Policies Guidelines*¹³¹ which can be models for future NC urban development. The Triangle region is the other area working toward light rail implementation. NCDOT had considered commuter rail as an alternative to highway re-construction for the I-440 Fortify project. Moreover, Triangle Transit received notice from the FTA in February 2014 to develop the Durham-Orange Corridor LRT plan; Triangle Transit has until 2016 to complete the EIS to

enter the FTA's full-funding grant agreement pipeline.¹³² Related to this plan, the Wake-Durham commuter rail plans to use bus service to connect RDU airport to a nearby rail station until further demand warrants a direct connection.¹³³

2.2.3.5 Other Statewide Travel Trends

Given the substantial growth in passenger rail ridership from 2001 to 2013 (93 percent), a further analysis was undertaken to determine if the growth was due in part to population growth and mirrored other travel trends in the state.

North Carolina's population has increased 20.1 percent during the same period (2001 to 2013), or less than one-fourth of the growth seen by passenger rail. Population growth in the counties served by Amtrak grew at a slightly faster rate, reflecting a trend towards greater population growth and density within the Charlotte-Greensboro-Raleigh corridor. Therefore, passenger rail ridership growth is far outpacing growth in North Carolina's population.

Next, the rail ridership trends were compared to trends in Vehicle Miles Traveled (VMT) and other vehicle use trends for the state. In the last 12 years, per capita VMT has decreased 4.3 percent. These North Carolina figures mirror a national trend, which shows that "peak driving" leveled off in the 1990's and began to decline prior to the recession of 2008-2010, and is showing no immediate sign of increasing, even with improving employment.¹³⁴

The decline in per capita VMT also reflects a trend in changing driver behavior among young people, who are less likely to obtain their driver's license, and are more likely to use transit and other modes of transportation than previous generations. For example, in the last 12 year, North Carolina licensed drivers under the age of 25 have increased by 4.6 percent.¹³⁵ This reflects a national

¹²⁹ American Public Transportation Association, Fourth Quarter 2013 Ridership Report. <http://www.apta.com/resources/statistics/Documents/Ridership/2013-q3-ridership-APTA.pdf>

¹³⁰ charmec.org/city/charlotte/cats/planning/ble/Pages/default.aspx

¹³¹ charmec.org/city/charlotte/cats/planning/Pages/LandUse.aspx

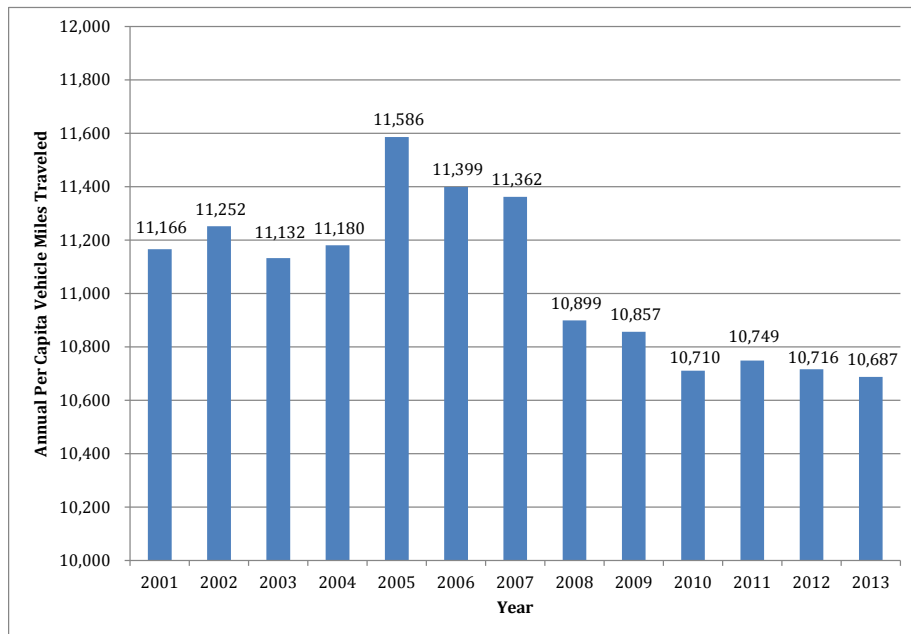
¹³² ourtransitfuture.com/projects/durham-orange

¹³³ Raleigh-Durham International Airport. Triangle Transit Rail Link to RDU. Accessed May 15, 2014. <http://www.rdu.com/airportdev/ttrailink.html>

¹³⁴ See nationwide per capita VMT analysis from Doug Short, <http://www.businessinsider.com/population-adjusted-vehicle-miles-2012-11#ixzz2DLsSBIKO>

¹³⁵ Federal Highway Administration, Highway Statistics Series Publications <http://www.fhwa.dot.gov/policyinformation/statistics.cfm>

trend that Millennials are more likely to use transit, ride share, or walk/bike.¹³⁶ While there is uncertainty if these downward trends in driving will continue, the figures are evidence that any growth in VMT will likely be at the rates seen in previous decades.



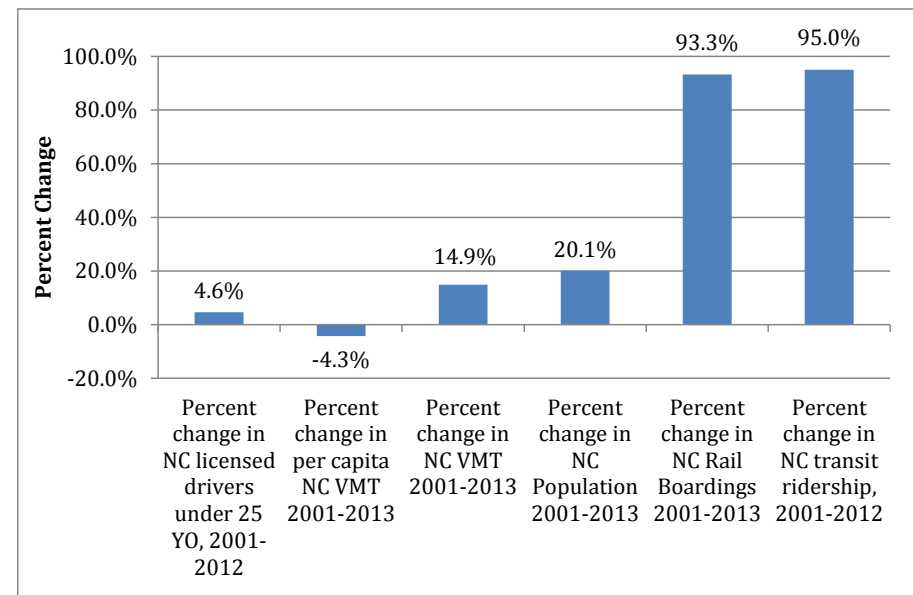
Source: NCDOT and US Census

Figure 2 - 67 North Carolina per Capita Driving Trends, 2001-2013

It should be noted that the growth in North Carolina rail ridership is nearly identical to the growth in transit ridership across North Carolina. While statewide passenger rail ridership grew by 93 percent in the period from 2001 to 2013, North Carolina transit ridership grew by 95 percent during almost the

same time period.¹³⁸ Transit and passenger rail are growing at a faster rate than driving and population in North Carolina. During this nearly identical time period, North Carolina's population only grew by 20 percent, and VMT grew by only 14 percent – meaning that per capita VMT actually decreased, as discussed above.¹³⁹

Figure 2 - 68 shows various transportation trends in North Carolina since 2001. Transit ridership and licensed drivers data shown is only to 2012, since 2013 data are not yet available.



Source: NCDOT, US Census, Amtrak

Figure 2 - 68 North Carolina Transportation Trends, 2001-2013

¹³⁷ *How Millennials Move: The Car-less Trends. National Association of Realtors, August 2, 2012. <http://www.realtor.org/articles/how-millennials-move-the-car-less-trends>. Millennial Generation Desires Multi-Modal Transportation System. American Public Transportation Association, October 1, 2013. http://www.apta.com/mediacenter/pressreleases/2013/Pages/131001_Millennials.aspx

¹³⁸ AECOM analysis of North Carolina transit data from National Transit Database, <http://www.ntdprogram.gov/ntdprogram/data.htm>

¹³⁹ AECOM analysis of data from the following sources: NC passenger rail ridership, Amtrak/NCDOT; NC transit ridership, National Transit Database; Vehicle Miles Traveled, NCDOT and US Census; NC licensed drivers, FHWA

North Carolina's tourism economy hit a record level of visitor spending in 2013. Of the overnight visitors, an estimated 30 percent were from North Carolina. The states with the next highest percentages of visitors were: South Carolina (8 percent), Florida (8 percent), Virginia (7 percent) and Georgia (7 percent). Eighty percent of overnight visitors arrived by car, 11 percent by plane and 5 percent by rental car. Passenger rail has potential to increase the overnight visitor mode share given the majority of visitors come from North Carolina or surrounding states. Several communities along the proposed western North Carolina passenger rail service have also noted the service's potential to boost tourism in those communities.¹⁴⁰

2.2.4 Fuel Cost Trends

Fuel cost and consumption trends in North Carolina, along with potential implications for NCDOT program revenues and on passenger and freight rail, are examined in this section.

2.2.4.1 Fuel Cost

As shown in Figure 2 - 69 fuel costs in North Carolina gradually increased between 2001 and 2007, spiked in 2008, then decreased during the economic recession. While decreased consumer demand lowered fuel costs at the beginning of the recession, costs have since exceeded pre-recession levels and have not varied as much over the past three years.¹⁴¹ The general trend of rising fuels costs is due to many factors including the declining value of the US dollar, declines in petroleum production, and concerns over peak oil and oil price speculation. Figure 2 - 69 also shows North Carolina ridership and fuel consumption.

¹⁴⁰ NC Department of Commerce. 2013 Visitor and Trip Profile <http://www.nccommerce.com/LinkClick.aspx?fileticket=dkaK6ipfX8o%3d&tabid=636&mid=4669>
¹⁴¹ U.S. Department of Energy. Historical Gas Prices 1929-2011. August 20, 2012. Visited 18 February 2014. Available: https://www1.eere.energy.gov/vehiclesandfuels/facts/2012_fotw741.html

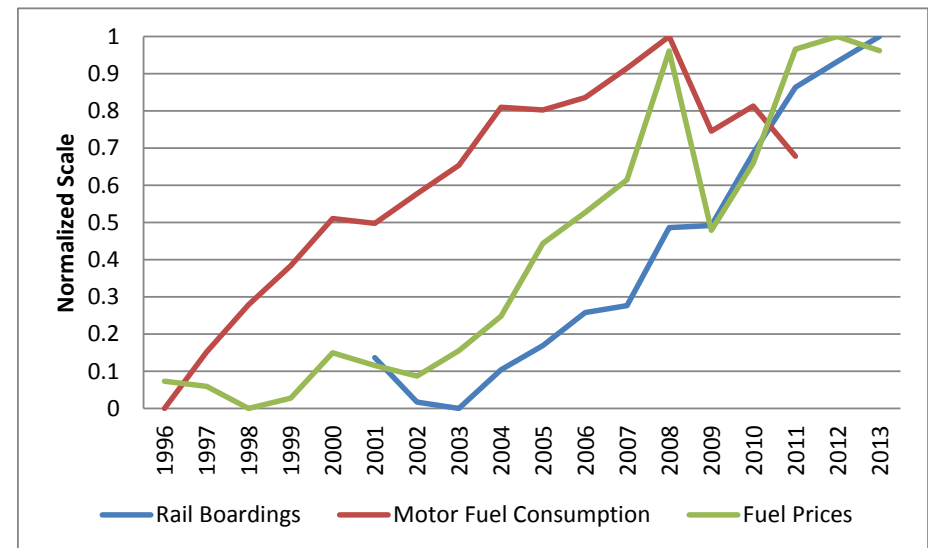


Figure 2 - 69 North Carolina Ridership, Motor Fuel Consumption, and Fuel Cost Trends¹⁴²

2.2.4.2 Fuel Consumption

Trends in fuel consumption are shown in Figure 2 - 69. The US Energy Information Administration (EIA) tracks fuel consumption data in the State Energy Data System (SEDS). The figure shows available information for the Transportation Sector in North Carolina between 1996 and 2011 (the most recent year available). Values in SEDS for Distillate Fuel Oil and Motor Gasoline were summed to create the chart. The trends demonstrate a steady increase in fuel consumption prior to 2008, and a general decline since that time.

While motor fuel consumption projection data is not available from the EIA for North Carolina, the August 2012 "Financial Plan and Strategies" report prepared for the North Carolina Statewide Transportation Plan used national fuel consumption projections as a proxy. These projections show a decline in fuel

¹⁴² North Carolina Department of Transportation. Asphalt and Fuel Prices. Visited 18 February 2014. Available: https://connect.ncdot.gov/projects/construction/Pages/Pavement-Construction-Prices.aspx?&p_Date=20130201%2005%3a00%3a00&&PageFirstRow=1&&View={5961DD43-0AEC-4136-B9F5-3C24C0D08A27}

consumption due to the Corporate Average Fuel Economy (CAFE) standards, which require improved motor vehicle fuel efficiency.¹⁴³

2.2.4.3 Motor Fuel Tax

The federal motor fuel tax is levied on every gallon of gasoline, diesel, and other special fuels, and is deposited into the Federal Highway Trust Fund (HTF). Current federal motor fuel tax rates are shown in Table 2 - 24. The tax rates on gasoline and diesel fuel have remained unchanged since 1993.¹⁴⁴ In North Carolina the tax levied on each gallon of motor fuel (gasoline and diesel) is capped at 37.5 cents.¹⁴⁵

Table 2 - 24 Federal Motor Fuel Tax Rate and Distribution¹⁴⁶

TYPE OF EXCISE TAX	TAX RATE (CENTS)	HIGHWAY ACCOUNT	MASS TRANSIT ACCOUNT
Gasoline	18.3 per gallon	84%	16%
Diesel	24.3 per gallon	84%	12%
Gasohol	18.3 per gallon	84%	16%
Liquefied petroleum gas	13.6 per gallon	84%	16%
Liquefied natural gas	11.9 per gallon	84%	16%
M85 (from natural gas)	9.15 per gallon	84%	16%
Compressed natural gas	48.54 per thousand cubic feet	80%	20%

¹⁴³ NCDOT 2040 Plan from Policy to Projects, North Carolina Statewide Transportation Plan. "Financial Plan and Investment Strategies." Prepared by The PFM Group and Atkins. Visited: 8 April 2014. Available: http://www.ncdot.gov/download/performance/2040_financereport.pdf

¹⁴⁴ American Association of State Highway and Transportation Officials. "AASHTO Center for Excellence in Project Finance. Federal Motor Fuel Taxes." Visited: 8 April 2014. Available: http://www.transportation-finance.org/funding_financing/funding/federal_funding/motor_fuel_taxes.aspx

¹⁴⁵ Foster, Mark L. "NCDOT Revenues Future Revenue Options." Presentation given to the North Carolina Board of Transportation Finance and Programming Committee. 7 August 2013. Visited: 8 April 2014. Available: <http://www.letsgetmoving.org/images/uploads/pages/NJT-revenues-slides-for-Tri-MAP-081613.pdf>

¹⁴⁶ American Association of State Highway and Transportation Officials. "AASHTO Center for Excellence in Project Finance. "Federal Motor Fuel Taxes." Visited: 8 April 2014. Available: http://www.transportation-finance.org/funding_financing/funding/federal_funding/motor_fuel_taxes.aspx

2.2.4.4 Implications for Revenue

Seventy percent of NCDOT's revenue (from Federal and State sources) is dependent on motor fuel consumption.¹⁴⁷ Revenue from motor fuel taxes is expected to decrease. At the same time, the increased cost of fuel drives up the cost of construction (asphalt is a by-product of crude oil), meaning every dollar of revenue has less buying power.¹⁴⁸ An unaudited report showed that in 2013-2014, 9.6 percent of NCDOT appropriations were allocated to "Other Modes," including \$171.3 Million to rail.¹⁴⁹ All modes of travel, including rail, would be impacted by revenue shortfalls. NCDOT is actively considering alternative sources of revenue.

2.2.4.5 Implications for Rail

The implications of increased fuel costs and decreased revenue from motor fuel taxes on the demand for rail is complicated and is affected by many factors. Because freight rail is about four times more efficient than tractor-trailer trucking,¹⁵⁰ a logical assumption is that increasing fuel costs and decreasing revenue for transportation projects will make movement of goods and people by rail increasingly popular. In fact, some freight railroads have already seen companies shift from tractor-trailer trucking to rail as a result of fuel prices rising.¹⁵¹ However, a study conducted by Norbridge, Inc. in March of 2009 found that, during the first half of 2008, when fuel costs drastically increased, domestic intermodal growth of rail only equaled that of truck — and rail carload's market share declined. To find out why, Norbridge conducted a survey

¹⁴⁷ Foster, Mark L. "NCDOT Revenues Future Revenue Options." Presentation given to the North Carolina Board of Transportation Finance and Programming Committee. 7 August 2013. Visited: 8 April 2014. Available: <http://www.letsgetmoving.org/images/uploads/pages/NJT-revenues-slides-for-Tri-MAP-081613.pdf>

¹⁴⁸ North Carolina Department of Transportation, Fiscal Research Division. "Q&A: North Carolina Motor Fuels Taxes." January 2013.

¹⁴⁹ Foster, Mark, Chief Financial Officer. North Carolina Department of Transportation Financial Update. 3 April 2014. Visited: 8 April 2014. Available: <http://www.ncdot.gov/about/board/bot/>

¹⁵⁰ Association of American Railroads. "The Environmental Benefits of Moving Freight by Rail." June 2012. Visited: 11 March 2014. Available: <https://www.aar.org/keyissues/Documents/Background-Papers/The-Environmental-Benefits-of-Rail.pdf>

¹⁵¹ New York Times. "Shippers May Raise Fuel Prices." April 26, 2011. Visited: 18 February 2014. Available: <http://www.nytimes.com/2011/04/27/business/27surcharge.html?pagewanted=all&r=1&>

of 40 major transportation buyers across bulk, industrial, and consumer products and found that there were non-price inhibitors, including service offerings and supply chain issues.¹⁵² While rising fuel costs have the potential to increase the use of rail for freight movement, there are non-price factors that will influence the extent of growth.

In another analysis, Dr. Jean Paul Rodrigue and Dr. Claude Comtois of Hofstra University, concluded that rail

...is set to benefit substantially from higher energy prices as it is the most energy efficient land transportation mode...The level of substitution for passengers and freight remains uncertain and will depend on the current market share and level of service they offer. In North America, passenger rail has limited potential while in Europe and Pacific Asia passenger rail already assume a significant market share. For rail freight, North American freight distribution has an advantage since rail account for a dominant share of tons-km while this figure is less significant for other regions of the world, mainly due to the distances involved and the fragmentation of the system...Thus, growing energy prices are likely to affect long distance rail transportation differently depending on the geographical setting and the conditions of the existing system.¹⁵³

Increasing fuel costs may have the most significant implications for passenger rail in the more congested areas of North Carolina, particularly the Piedmont. As North Carolina continues to experience rapid growth in the Piedmont region, congested highways and increasing fuel costs could lead more residents to use intercity passenger rail. This trend is especially likely since continued track

¹⁵² Norbridge Incorporated. "Study: The Impact of Higher Fuel Costs on Rail Carload and Intermodal Marketshare." Progressive Railroading. March 2009. Visited: 8 April 2014. Available: http://www.progressiverailroading.com/rail_industry_trends/article/Study-The-Impact-of-Higher-Fuel-Costs-on-Rail-Carload-and-Intermodal-Marketshare--19844

¹⁵³ Rodrigue, Dr. Jean Paul and Dr. Claude Comtois. *The Geography of Transport Systems, Third Edition*. "Chapter 8: Transportation and Energy." ISBN# 978-0-415-82254-1. New York: Routledge. 2013. Visited: 9 April 2014. Available: <https://people.hofstra.edu/geotrans/eng/ch8en/conc8en/ch8c2en.html>

improvements will make travel times faster than driving between Raleigh and Charlotte.¹⁵⁴

The main lesson that can be drawn from current trends and studies is that rising fuel costs provide an opportunity for rail to be used as an efficient alternative to other modes of transportation, but other factors including the level of service and location and availability of stations will need to be addressed.

2.2.5 Rail Congestion Trends

There are a number of factors that drive freight movement and will shape the changes in rail volumes over time. Changes in port capacities, from draft of vessels served to the mix of intermodal and bulk traffic, will have implications for the rail service to and from North Carolina and across the east and Gulf coasts. One emerging factor is the shift for Asian freight movements to use the Suez Canal and Atlantic routes to the US and Canada rather than trans-Pacific routes. Two additional rail congestion trends are anticipated. The overall congestion on railroad networks may affect North Carolina. Both of the Class I railroads continually examine their respective networks to adapt and improve capacity as freight movements grow and change in response to market conditions and trade flows, as demonstrated by the Crescent Corridor and National Gateway initiatives. Responding to these changes takes time, and may be further complicated by cost and complexity. The second source of potential congestion is a result of shared use with passenger services that require freight and passenger movements to be coordinated and separated temporally. As demand continues to grow for intercity and commuter rail services, there is the potential for more congestion along the freight rail network. The congestion may be complicated by the fact that many industrial customers served by railroads are located in cities and counties that also house their workforce, thus shaping competing land use demands in the future.

Section 2.1.4.2 presented On-Time Performance (OTP) data for both the *Carolinian* and *Piedmont* for each quarter between the fourth quarter of 2010

¹⁵⁴ Southeast High Speed Rail Corridor. Frequently Asked Questions. February 2010. Visited: 11 March 2014. Available: <http://www.sehsr.org/faq.html>

and the first quarter of 2014. These services travel along the busiest freight corridors in North Carolina. The *Carolinian* travels along the CSXT A Line and then along the NCRR corridor between Selma, Raleigh, Greensboro, and Charlotte, a portion of which is part of Norfolk Southern's Crescent Corridor (Greensboro to Charlotte). The *Piedmont* travels exclusively on the corridor that connects Raleigh, Greensboro, and Charlotte. Though this On-Time Performance data is gathered by Amtrak for passenger services, it can be used to help identify areas where conflicts between passenger and freight trains occur and result in delay. Though not exclusively a capacity issue, the conflicts can indicate potential congestion issues. Figures 2 - 19, 2 - 20, 2 - 21 and Table 2 - 11 present average quarterly end point OTP data for state-supported and long-distance trains. This information is derived from quarterly reports provided by Amtrak to FRA in accordance with Section 207 of PRIIA. Table 2 - 25 summarizes the causes of host railroad delays encountered by state-supported passenger services over the same 14 quarters described in Section 2.1.4.2. The table presents the number of times a host railroad-responsible delay occurred as a top 2 delay cause and the average minutes of train delay per 10,000 train-miles.

As noted in Section 2.1.4.2, On-Time Performance for both the *Carolinian* and *Piedmont* is below the industry standard of 80 percent. The *Carolinian's* performance has seen improvement over the past four years, while the *Piedmont's* on-time performance has decreased (see Figure 2 - 19). The other long distance trains serving the state have also seen decreases in end-point OTP over the past four years (see Figure 2 - 20). These decreases in end-point OTP may be due to recent increases in freight traffic, which is creating additional scheduling conflicts between the passenger and freight trains in the CSXT and NS corridors.

Table 2 - 25 Summary of Top Two Host Railroad-Responsible Delays for Passenger Services by Quarter (Q4 FY 2010 through Q1 FY 2014)

		<i>Carolinian</i> (CSXT)	<i>Carolinian</i> (NS)	<i>Piedmont</i> (NS)
Commuter Train Interference (CTI)	Average Delay	0	0	0
	Count	0	0	0
Signal Delays (DCS)	Average Delay	343	106	123
	Count	2	3	8
Slow Order Delays (DSR)	Average Delay	299	162	205
	Count	4	13	14
Debris (DBS)	Average Delay	0	0	0
	Count	0	0	0
Freight Train Interference (FTI)	Average Delay	453	146	106
	Count	11	1	6
Passenger Train Interference (PTI)	Average Delay	314	150	0
	Count	11	11	0

Note: Average Delay measured as minutes per 10,000 train-miles

The data for the *Carolinian* indicates that most of the delays for this train occur between Richmond and Selma on the CSXT A Line, rather than along the portion of the route between Selma and Charlotte. Table 2 - 25 shows that conflict with freight traffic is the most frequent cause and creates the longest delay for the *Carolinian* between Selma and Washington, DC. Interference with other passenger trains is also heavily reported. Between Selma and Charlotte, however, the largest contributor to host-railroad related delays for the *Carolinian* were slow orders. This mirrors the delay data for the *Piedmont*, where slow orders are the largest contributor of host railroad delays. The latter is likely due in part to the construction related to the Piedmont Improvement Program (PIP) which will ultimately improve speeds and capacity along the Raleigh to Charlotte corridor. There are three additional ARRA-funded projects to install double cross-overs on the double-tracked portions of CSXT's A Line in Halifax, which will help to alleviate some freight-passenger conflicts along that corridor. However, more detailed study of capacity needs along the A Line should be conducted.

2.2.6 Highway and Airport Congestion Trends

Highway and airport congestion and how these modes interact with freight and passenger rail are addressed in this section, including general airport passenger and cargo trends as well as how future plans will stimulate growth. Existing and projected highway congestion and the location of planned passenger rail projects within congested corridors are identified.

2.2.6.1 Highway Congestion

Highway congestion is an important variable in planning for rail, as freight and passenger rail both have the capacity to alleviate highway congestion in certain circumstances. This section examines existing and projected highway congestion and looks at how freight and passenger rail might complement

planned capacity improvements to help reduce the exclusive use of congested highway corridors.

2.2.6.2 Existing and Projected Highway Congestion

Highway congestion in North Carolina is generally concentrated in the state's urban areas. The state's growing population and vehicle miles traveled (VMT) contribute to increasing road delays, fuel costs, and congestion which are measured by the Texas A&M Transportation Institute (TTI). North Carolina's three major population centers, as shown in Table 2 - 26, were all included in the 101 cities and towns in TTI's report, and Charlotte had the worst overall total cost of congestion in the state amounting to \$653 million in 2011. That represents an annual drain on North Carolina's economy.

Table 2 - 26 What Congestion Means to the Local Economy, 2011

	Travel Delay		Excess Fuel Consumed		Truck Congestion Cost		Total Congestion Cost	
	(1,000 Hours)	Rank	(1,000 Gallons)	Rank	(\$ million)	Rank	(\$ million)	Rank
Charlotte, NC-SC	28,974	38	14,599	37	\$ 168	30	\$ 653	37
Raleigh-Durham, NC	17,923	54	8,407	55	\$ 96	50	\$ 396	55
Greensboro, NC	6,625	84	3,005	84	\$ 35	82	\$ 146	83

Source: TTI's 2012 Urban Mobility Report¹⁵⁵

Note: Rank is out of 101 listed areas; 498 areas analyzed in total.

¹⁵⁵ TTI's 2012 Urban Mobility Report Table 2. What Congestion Means to Your Town, 2011, <http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/ums/congestion-data/national/national-table2.pdf>

Figure 2 - 70 shows peak travel time congestion on all state-maintained interstate highways and US and NC highway routes in North Carolina. Volume-to-capacity ratios are calculated for these roadways to indicate congestion. On a regional level, Charlotte is the most congested followed by the Triangle and then the Triad. Smaller concentrations of congestion are visible in Asheville, Fayetteville, Wilmington and Jacksonville.

Figure 2 - 71 through Figure 2 - 73 include volume-to-capacity congestion maps for the Charlotte, Triad and Triangle regions which appear to have the most substantial concentrations of roadway congestion. Table 2 - 27

Table 2 - 27 includes Travel Time Index and Total Peak Period Travel Time measures and rankings. The Travel Time Index is the ratio of travel time in the peak period to the travel time at free-flow conditions. For example, Charlotte's value of 1.20 indicates that on average a 45 minute trip would take 54 minutes during peak hours. The Table 2 - 27 Travel Time Index rankings and Peak Period Travel Times are fairly consistent with the map of volume to capacity ratios and MSA populations.

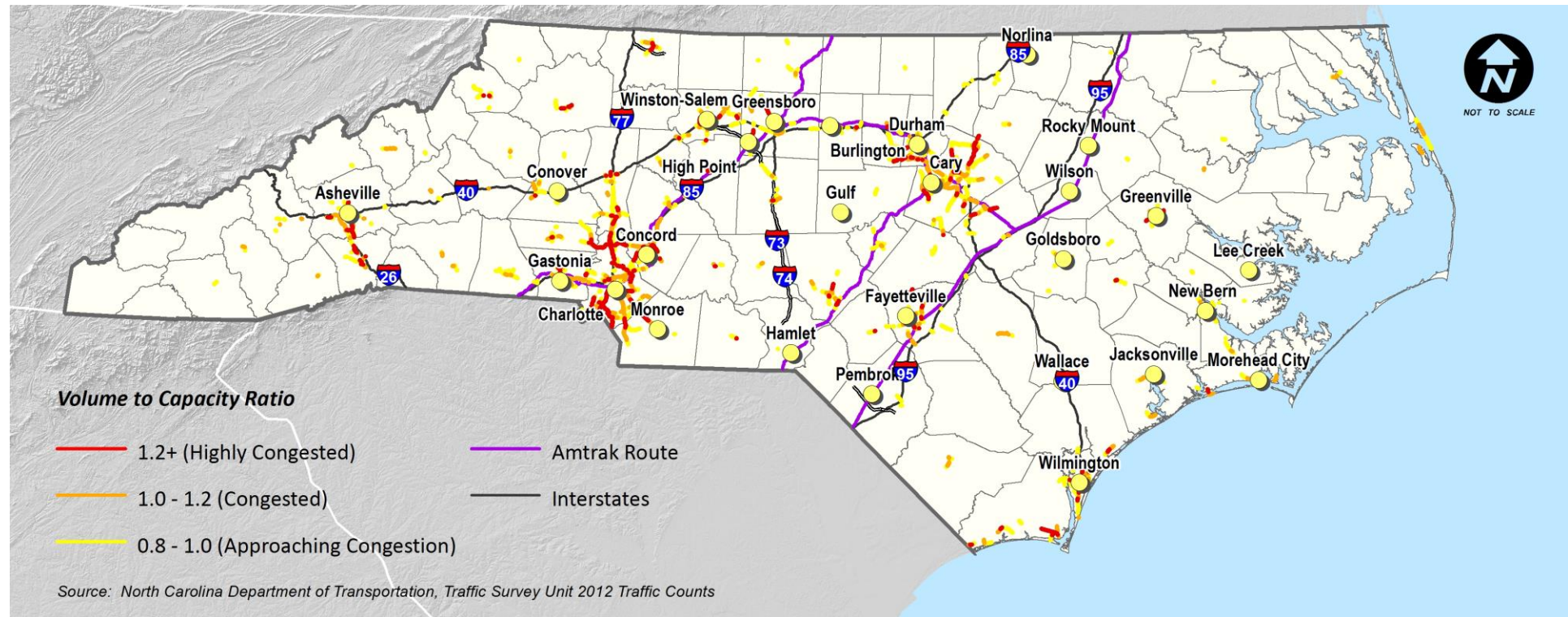


Figure 2 - 70 Statewide Highway Congestion Map

Table 2 - 27 Regional Congestion Measures¹⁵⁶

REGION	TRAVEL TIME INDEX	TRAVEL TIME INDEX RANK	TOTAL PEAK PERIOD TRAVEL TIME	TOTAL PEAK PERIOD TRAVEL TIME RANK	METROPOLITAN STATISTICAL AREA POPULATION RANK ¹⁵⁷
Charlotte	1.20	27	45 min	18	23
Raleigh-Durham	1.14	61	43 min	30	38
Greensboro	1.10	87	43 min	30	41
Winston-Salem	1.11	79	39 min	52	41

The North Carolina State Demographers Office estimates that these regions will continue to grow with a resulting effect of increased congestion. The geographic regions for these estimates are taken from Figure 2 - 32 in the Demographic and Economic Factors section.

Figure 2 - 71 shows congested highways in the Charlotte region. The interstates and other highways connecting Charlotte to its suburbs are most congested. These facilities include I-85 in Gaston, Mecklenburg and Cabarrus Counties, I-77 in Iredell and Mecklenburg Counties and I-485 in southeastern Mecklenburg County. Congestion is also heavy on US 74 in Mecklenburg and Union Counties, NC 16 in Mecklenburg and Union Counties and NC 73 in Mecklenburg and Cabarrus Counties.

Figure 2 - 72 shows congested highways in the Triad region. Congestion in the Triad is both contained within Greensboro, Winston-Salem and High Point and along portions of interstate connecting the region. Congestion in Winston-Salem is concentrated along US 52, NC 67 (Silas Creek Parkway) and portions of US 421 and I-40. Congestion in Greensboro is concentrated along US 220, I-40, West Wendover Avenue and NC 68 between Greensboro and High Point. The Greensboro Urban Area Metropolitan Planning Organization's Long Range

¹⁵⁶ Texas Transportation Institute. 2012 Urban Mobility Report. December 2012. <http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/mobility-report-2012.pdf>

¹⁵⁷ U.S. Census. Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2013. Metropolitan and Micropolitan Statistical Area: 2013 Population Estimates. <http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>

Transportation Plan shows congestion worsening on interstates in the Greensboro and High Point region.¹⁵⁸

Table 2 - 28 Regional Projected Growth: 2013-2033¹⁵⁹

METROPOLITAN REGION	PROJECTED GROWTH INCREASE FROM 2013 TO 2033	PROJECTED GROWTH RATE
Asheville	63,065	13.0%
Charlotte	596,739	27.5%
Eastern NC	213,582	13.6%
Fayetteville/Sandhills	114,501	16.7%
Triad	226,371	13.6%
Triangle	735,090	35.7%
Western NC	67,961	8.2%
Wilmington	135,191	35.2%
State	2,152,500	21.9%

Note: congestion measures for these regions taken from the Texas Transportation Institute's 2012 Urban Mobility Report. The table follows the report's convention of grouping Raleigh-Durham but separating Greensboro and Winston-Salem. Metropolitan Statistical Area (MSA) population was added to the table to give a population reference point to the congestion indicator rankings. For MSA rankings, Greensboro and Winston-Salem are combined to give a better sense of the region's population influence.

Figure 2 - 73 shows congested highways in the Triangle region. Congestion is heaviest on the roadways linking the Triangle communities (I-40, US 70, US 15-501, NC 54, NC 55) and on the highways linking Raleigh to suburban areas (I-40, I-440, NC 50, US 1, US 70, US 401). The commuting congestion reflects the region's scattered employment hubs centered in Raleigh, Cary, Research Triangle Park, Durham and Chapel Hill. The joint Long Range Transportation Plan for the region shows congestion persisting into 2035 with the most congested corridors being I-440 and interstates connecting to I-440.¹⁶⁰

¹⁵⁸ Greensboro Urban Area Metropolitan Planning Organization. 2035 Long Range Transportation Plan – Roadway Chapter.

<http://www.greensboro-nc.gov/modules/showdocument.aspx?documentid=18313>

¹⁵⁹ North Carolina State Demographers Office. Population Projections for 2033. http://www.osbm.state.nc.us/ncosbm/facts_and_figures/socioeconomic_data/population_estimates/demog/countytotals_2030_2034.html

¹⁶⁰ Durham-Chapel Hill-Carrboro Metropolitan Transportation Organization. 2035 LRTP PM Peak Hour V/C Ratio Map. <http://www.dchcmptpo.org/dmdocuments/2035LRTPVoverCMap.pdf>

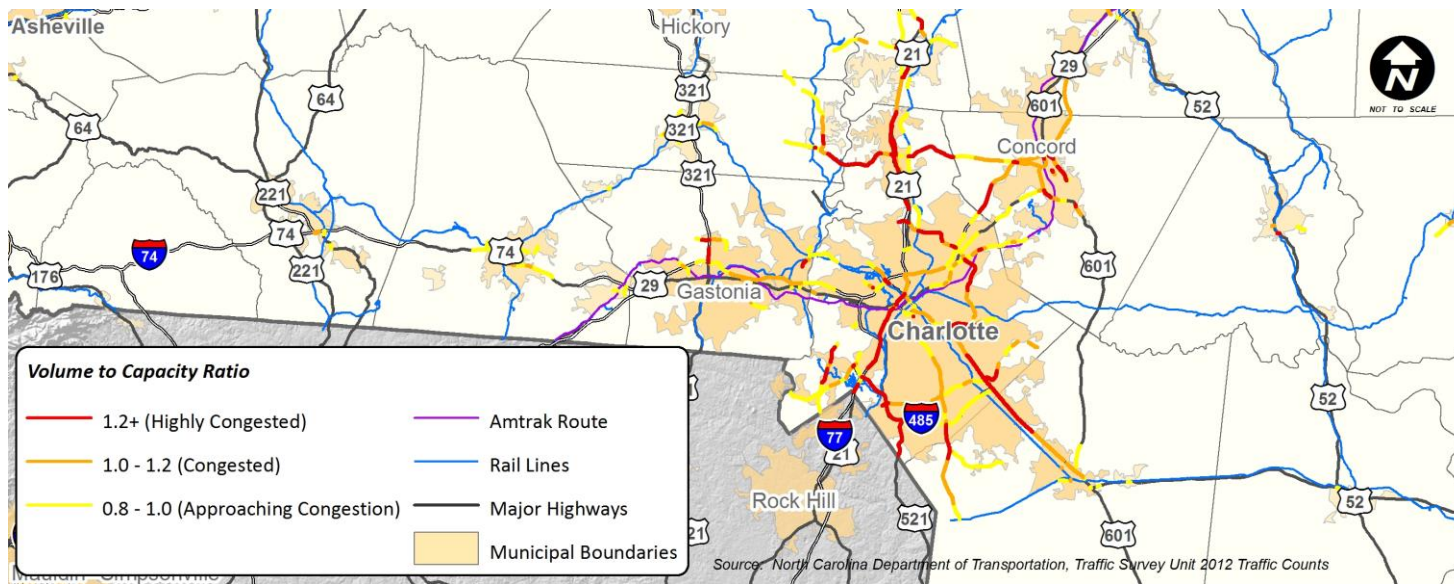


Figure 2 - 71 Charlotte Region 2012 Congestion Map

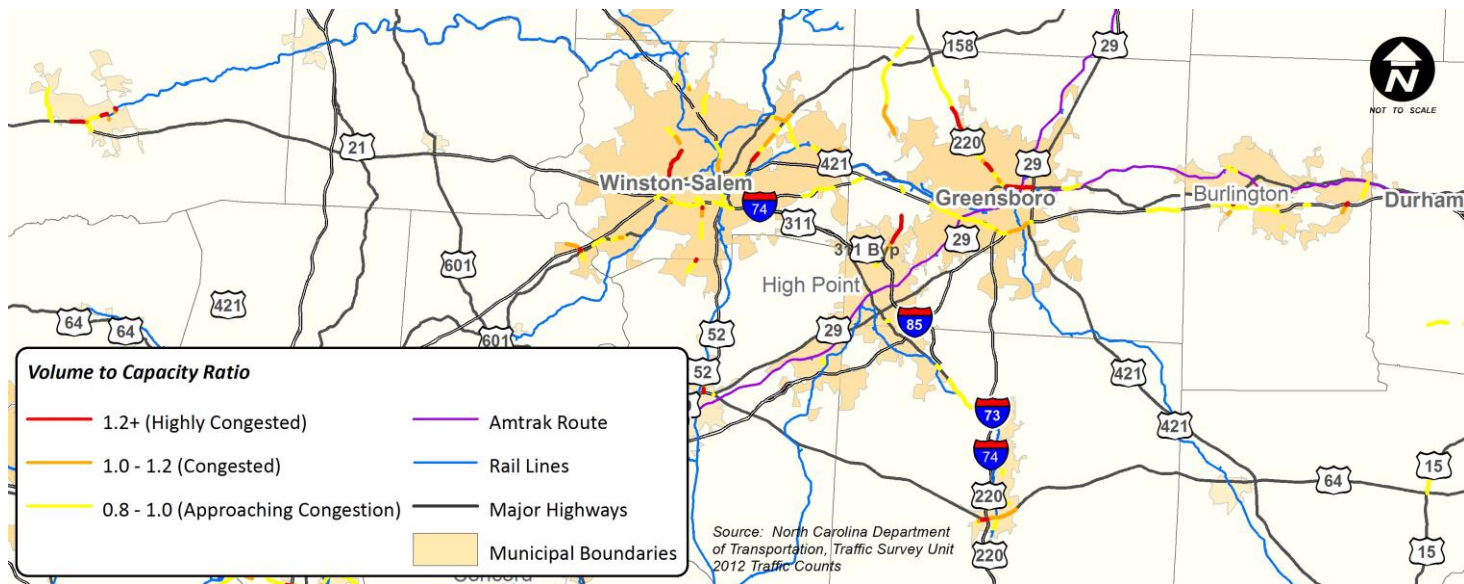


Figure 2 - 72 Triad 2012 Congestion Map

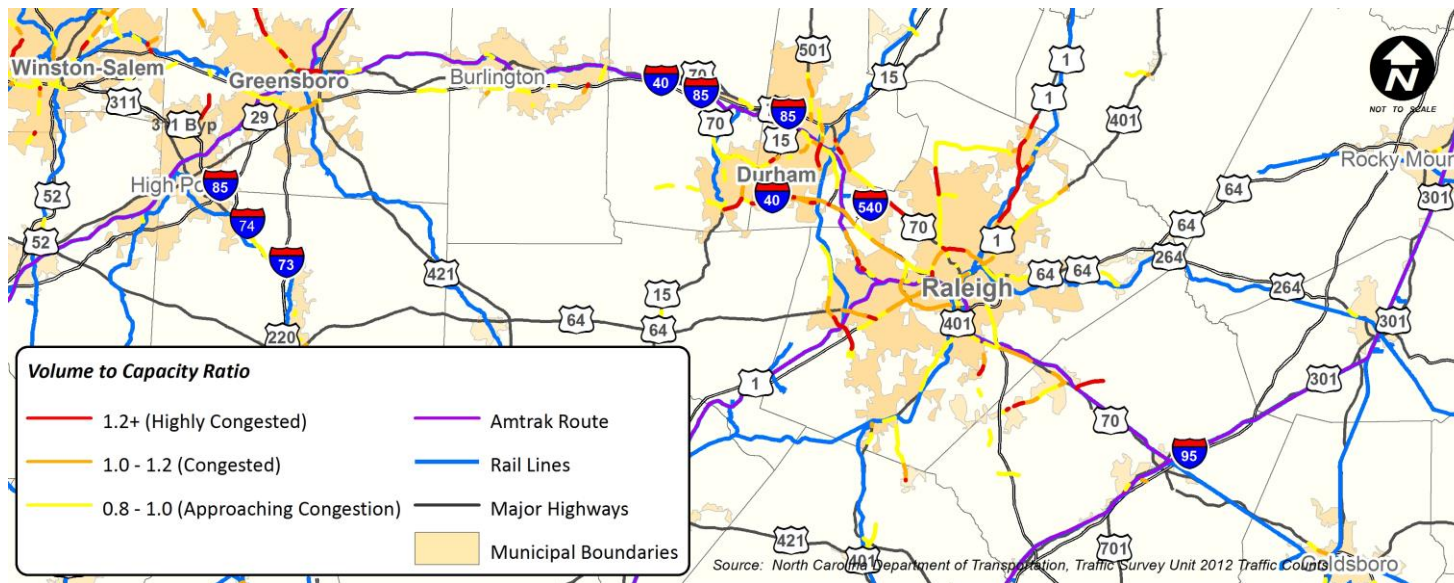


Figure 2 - 73 Triangle 2012 Congestion Map

Travel congestion is anticipated to remain a challenge to North Carolina's competitiveness in the future. Expanding the state's highway network in these rapidly urbanizing corridors will become increasingly costly and difficult as the surrounding area becomes more and more developed.

2.2.6.3 Highway Congestion and Passenger Rail

Intercity passenger rail has the opportunity to divert automobile trips to passenger rail in congested corridors and when train travel times are competitive. The Piedmont Crescent I-40/I-85 corridor contains the state's most congested regions (Charlotte, Triad, and Triangle) and the state's most frequent passenger train service, the *Piedmont* and *Carolinian* routes. These two routes provide the corridor with three trips per day total, with five additional daily trips planned by 2020. These routes travel between Raleigh and Charlotte, also serving Cary, Durham, Burlington, Greensboro, High Point, Salisbury and

Kannapolis with future stations proposed for Lexington and Hillsborough.¹⁶¹ The train currently takes between 3 hours and 10 minutes and 3 hours and 22 minutes to travel between Raleigh and Charlotte depending on the departure time (Table 2 - 29). Driving between downtown Raleigh and downtown Charlotte takes roughly 2 hours and 40 minutes without congestion.¹⁶² There are several traffic bottlenecks along that corridor that could lengthen driving times including I-85 in Mecklenburg County and Cabarrus County (Figure 2 - 71), I-40 in Greensboro and Burlington (Figure 2 - 72) and I-40 in the Triangle (Figure 2 - 73). Congestion delay and the ability to relax or be productive on the

¹⁶¹ News and Observer, Bruce Siceloff, "520 M puts fast trains on fast track," January 28, 2010. Accessed June 26, 2014. <http://www.newsobserver.com/2010/01/28/308621/520m-puts-fast-trains-on-fast.html>

¹⁶² Google Maps. Directions between Raleigh, NC and Charlotte, NC.
<https://www.google.com/maps/dir/Raleigh,+NC/Charlotte,+NC/@35.7869205,-79.7049938,10z/data=!4m13!4m12!1m5!1m1!1s0x89ac5a2f9f51e0f7:0x6790b6528a11f0ad!2m2!1d-78.6381787!2d35.7795897!1m5!1m1!1s0x88541fc4fc381a81:0x884650e6bf43d164!2m2!1d-80.8431267!2d35.2270869>

train still makes the longer passenger rail travel time competitive for many travelers.

The target travel time between Raleigh and Charlotte is under 3 hours, with some future routes making limited stops between Raleigh and Charlotte. The target travel time is competitive with the current highway travel time of 2 hours and 40 minutes, even without considering existing and future highway congestion.

Table 2 - 29 Amtrak *Piedmont* and *Carolinian* Travel Times

CURRENT TRAVEL TIMES	
Raleigh to Charlotte	
6:45 am – 9:55 am	3 hours 10 minutes
11:45 am – 2:55 pm	3 hours 10 minutes
4:50 pm – 8:12 pm	3 hours 22 minutes
Charlotte to Raleigh	
7:00 am – 10:17 am	3 hours 17 minutes
12:00 pm – 3:11 pm	3 hours 11 minutes
5:15 pm – 8:26 pm	3 hours 11 minutes

2.2.6.4 Highway Congestion and Freight Rail

Congested highway corridors may create conditions for commodities to be more effectively shipped by freight rail in cases where the commodity, rail capacity and rail travel times permit. Figure 2 - 74 and Figure 2 - 75 show interstate freight truck volumes in 2007 and projected for 2040, respectively. Truck volumes are heaviest along I-40/I-85 in the Piedmont Crescent, I-40 in western North Carolina, I-77 and I-95. The projected truck volume increases for 2040 are in the same corridors. There are long range plans to expand the highway capacity of all of these corridors.¹⁶³ Several states have undertaken studies to examine how truck to rail diversion might accommodate existing and future freight growth. The Virginia Department of Transportation conducted this type

of analysis for the I-81 Corridor Improvement Analysis – Freight Diversion and Forecast Report. I-81 is the heavily trafficked truck route located northwest of North Carolina in Figure 2 - 74 and Figure 2 - 75.¹⁶⁴ Figure 2 - 76 presents 2040 volume-to-capacity ratios on major highway corridors. Future congestion on highways could serve to incent more movement of goods on rail; however, it should be noted that highway congestion can also negatively affect truck movements associated with intermodal systems. As all three intermodal facilities in North Carolina are located in Charlotte and Greensboro, the state must consider the impact of future congestion on I-40 and I-95 on the Triangle's and Eastern North Carolina's access to the intermodal system.

Utilizing rail is a cost-effective way to gain travel capacity in high-use corridors and helps diminish the depreciation of highway assets by removing trucks from the highway network. The option of transferring goods from truck to rail for transporting within North Carolina and among its neighboring states provides a means to reduce truck VMT and the associated costs of congestion, maintenance, fuel, and emissions. By removing some trucks from the roads, highway capacity increases without spending state funds for the construction of additional lane-miles, which is often not feasible or desirable, and also saves money on highway maintenance because trucks cause more damage than automobiles.

¹⁶³ North Carolina Department of Transportation. Strategic Transportation Initiative Results Map. <https://connect.ncdot.gov/projects/planning/Pages/STI-Results.aspx>

¹⁶⁴ Virginia Department of Transportation. I-81 Corridor Improvement Study – Freight Diversion and Forecast Report. <http://www.virginiadot.org/projects/resources/freight.pdf>

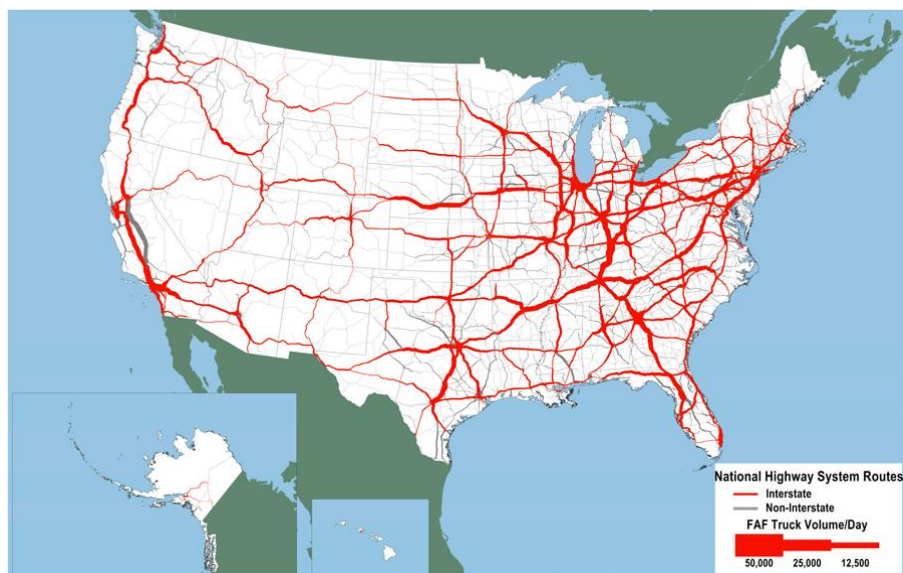


Figure 2 - 74 Average Daily Long-Haul Interstate Freight Truck Traffic (2007)¹⁶⁵ (Figure Source: FHWA)

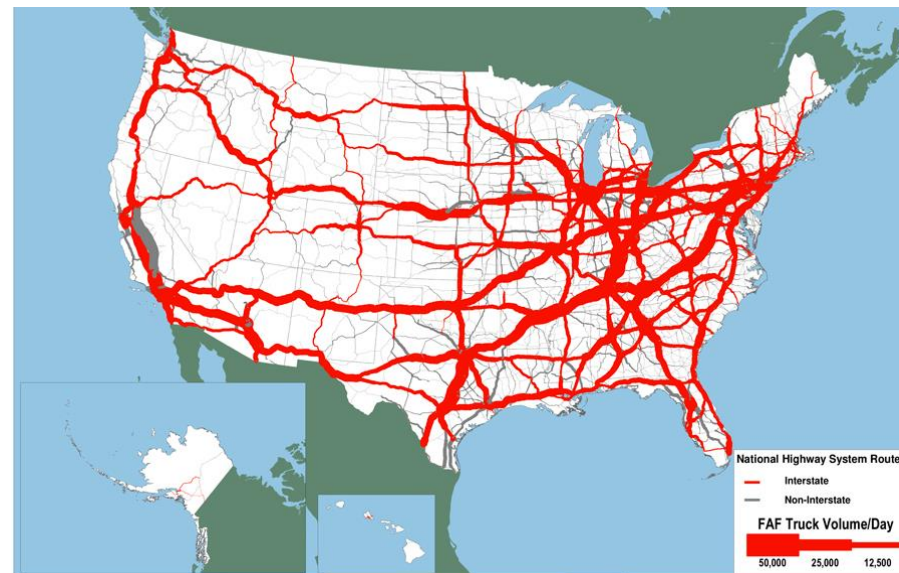
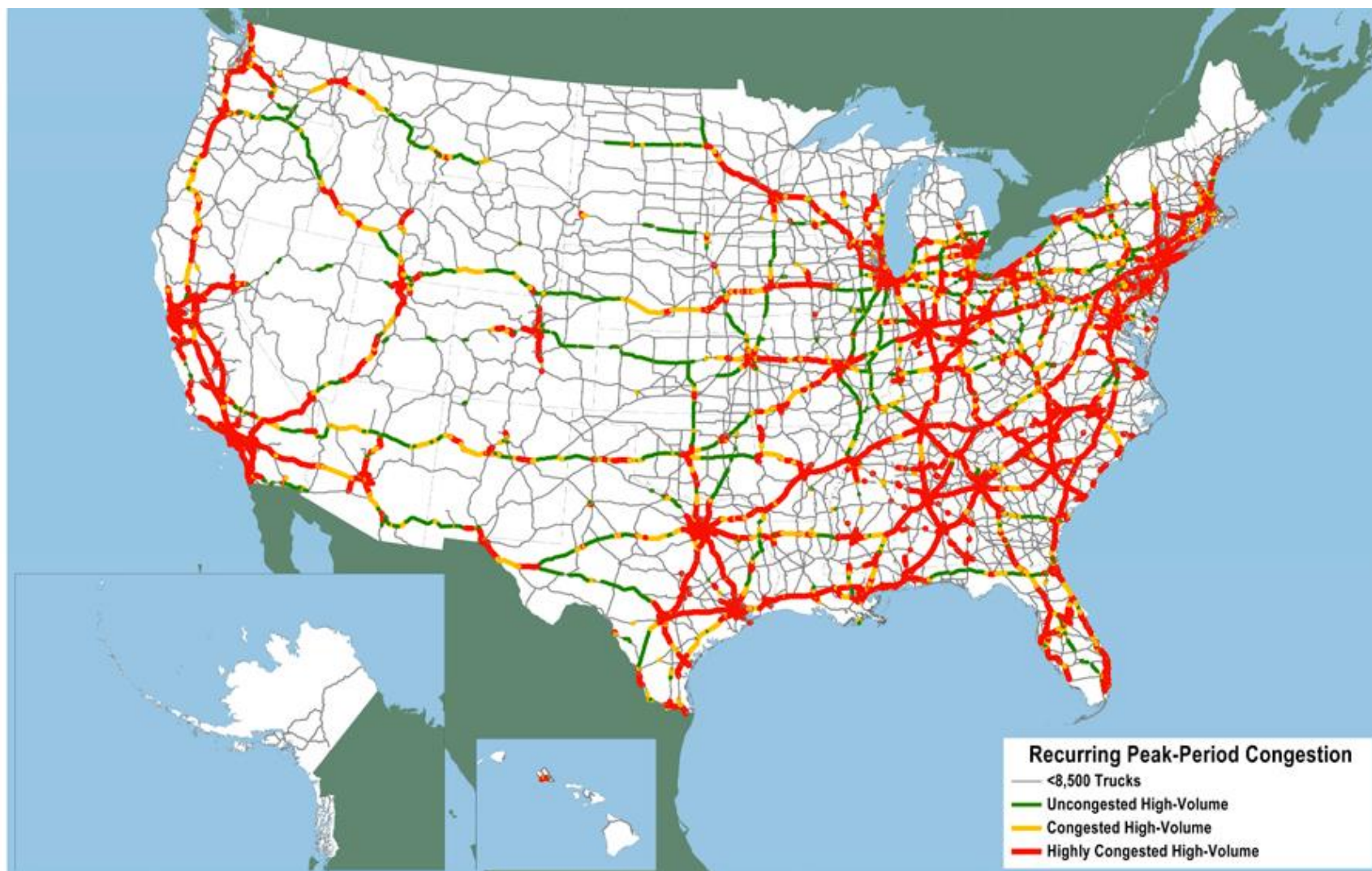


Figure 2 - 75 Projected Average Daily Long-Haul Interstate Freight Truck Traffic (2040)¹⁶⁶ (Figure Source: FHWA)

¹⁶⁵ Federal Highway Administration – Freight Management and Operations. Average Daily Long-Haul Freight Traffic on the National Highway System: 2007 Map. Accessed June 26, 2014. http://www.ops.fhwa.dot.gov/Freight/freight_analysis/nat_freight_stats/nhsavglhft2007.htm

¹⁶⁶ Federal Highway Administration – Freight Management and Operations. Average Daily Long-Haul Freight Traffic on the National Highway System: 2040 Map. Accessed June 26, 2014. http://www.ops.fhwa.dot.gov/Freight/freight_analysis/nat_freight_stats/nhsavglhft2040.htm



Notes: High-volume truck portions of the National Highway System carry more than 8,500 trucks per day, including freight-hauling long-distance trucks, freight-hauling local trucks, and other trucks with six or more tires. Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95. The volume/service flow ratio is estimated using the procedures outlined in the HPMS Field Manual, Appendix N

Source: U. S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012

Figure 2 - 76 Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2040

2.2.6.5 Airport Passenger Service

North Carolina is home to 72 publicly-owned and operated airports. Nine of these airports have regularly-scheduled passenger service (Charlotte-Douglas, Raleigh-Durham, Piedmont Triad, Wilmington International, Fayetteville Regional, Albert Ellis (Jacksonville), Coastal Carolina (New Bern) and Pitt-Greenville).¹⁶⁷ Charlotte-Douglas accounted for 75 percent of all enplanements (total number of passengers boarding aircraft) in North Carolina in 2012 (Figure 2 - 77), followed by Raleigh-Durham (17 percent) and Piedmont Triad (3 percent).¹⁶⁸ Other airports each account for 1 percent or less of enplanements. Charlotte-Douglas is also routinely ranked one of the busiest airports in the United States, partly due to it being a US Airways hub, and for having one the lowest costs per enplaned passenger in the United States.¹⁶⁹

Charlotte-Douglas International Airport is a top destination for Wilmington, Greenville, Jacksonville, and New Bern and the second most popular destination for Raleigh-Durham, Fayetteville, Asheville and Greensboro.¹⁷⁰

Intercity passenger rail has potential to capture some of the Raleigh-Durham and Piedmont Triad transfer flights to Charlotte-Douglas given Amtrak lines run in front of the airport. This is more likely for the Greensboro to Charlotte train trips since it is roughly a one and one-half hour trip and Raleigh to Charlotte train trips are double that time. Table 2 - 30 includes a comparison of rail and air travel for NC destinations.

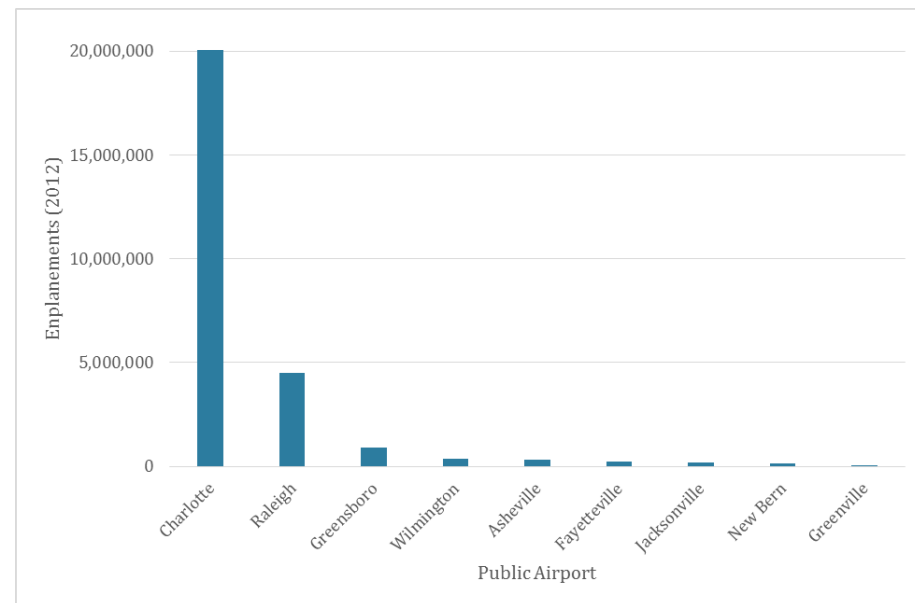


Figure 2 - 77 Enplanements by Airport (2012)

Table 2 - 30 Comparison of Rail and Air Travel for NC Destinations

DEPARTURE	DESTINATION	LOWEST RAIL TICKET PRICE (round trip)	TRAIN TIME (fastest)	FLIGHT TIME (non- stop)
Raleigh	Charlotte	\$58	3 hr 10 min	58 min
Raleigh	Greensboro	\$27	1 hr 31 min	NA
Greensboro	Charlotte	\$36	1 hr 37 min	50 min
Greensboro	Raleigh	\$27	1 hr 37 min	NA
Charlotte	Greensboro	\$36	1 hr 32 min	45 min
Charlotte	Raleigh	\$58	3 hr 11 min	49 min

¹⁶⁷ North Carolina Department of Transportation. Division of Aviation. General Aviation Airport Development Plan. October 2006.

¹⁶⁸Federal Aviation Administration. Enplanements at All Airports by State and Airport. CY 2012. http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/media/CY12AllEnplanements.pdf

¹⁶⁹City of Charlotte. Charlotte Airport Governance Study. May 6, 2013. <http://charmeck.org/city/charlotte/documents/airport%20governance%20study/airport%20governance%20presentation%20c1t%2020130506.pdf>

¹⁷⁰Research and Innovative Technology Administration. Bureau of Transportation Statistics. Top 10 Destination Airports data as of May 14, 2014. <http://www.transtats.bts.gov/airports.asp>

Table 2 - 31 Comparison of Rail and Air Travel for Atlanta, Georgia and Washington, DC¹⁷¹

DEPARTURE	DESTINATION	LOWEST RAIL TICKET PRICE (round trip)	EXISTING TRAIN TIME (future time)	FLIGHT TIME (non-stop)
Charlotte	Atlanta, Georgia	\$58	5 hr 28 min (TBD)	1 hr 8 min
Raleigh	Washington, DC	\$27	6 hr 20 min (3 hr 50 min – 4 hr)	1 hr 4 min

The federally-designated Southeast Corridor will likely provide alternatives to persons considering flying from North Carolina to Atlanta, Georgia and Washington, D.C. Passenger rail would not be time effective for eliminating transfer flights but would be a feasible alternative to flights where Atlanta, Georgia and Washington are the final destinations from North Carolina.

2.2.6.6 Airport Passenger Expansion Plans

Charlotte’s passenger traffic has nearly doubled from 11 million enplanements in 2002 to almost 20 million enplanements in 2012. The airport has several projects underway to keep up with increased demand including new parking and rental car facilities, improved roadway connections, additional lanes at the pick-up – drop off area, a taxiway extension and an expansion to the westside terminal.¹⁷² The airport also has plans over the next few years to add approximately 24 additional gates to Concourses A, B, and E.¹⁷³ Longer-term

¹⁷¹ NCDOT Rail Division. <http://www.ncbytrain.org/tickets/>
Estimated Flight Travel Times: Kayak.com
South East High Speed Rail FAQ:
<http://www.sehsr.org/faq.html>
Amtrak.com for Rail Travel Times

¹⁷² Charlotte-Douglas International Airport. CLT 2015 Underway. Accessed May 15, 2014. <http://charmeck.org/city/charlotte/airport/pages/clt2015.aspx>

¹⁷³ Charlotte-Douglas International Airport. Upcoming Construction Projects. Accessed May 15, 2014. <http://charmeck.org/city/charlotte/Airport/Pages/CLT2015UpcomingProjects.aspx>

projects include expanding the terminal lobby, constructing a new international terminal building and building a fifth runway.¹⁷⁴

Raleigh-Durham International Airport recently completed an expansion and renovation project for Terminal 2 in 2011 and completed a modernization project for Terminal 1 in 2014. Plans to add a fourth runway were tabled after air traffic slowed following the terrorist attacks of September 11, 2001.¹⁷⁵ The Piedmont Triad, Wilmington, Asheville and Fayetteville airports currently have excess capacity so future plans tend to focus on modernizing facilities rather than expansion.^{176, 177, 178}

2.2.6.7 Airport-Transit Expansion Plans

The three largest commercial airports in the state all have plans for high capacity transit that will link up to their airports. The Wake – Durham Commuter Rail will use bus service to connect the airport to a nearby rail stop until future demand warrants a direct connection.¹⁷⁹ Charlotte’s 2030 Transit Corridor System Plan calls for a high capacity transit connection between downtown Charlotte and Charlotte-Douglas.¹⁸⁰ The Piedmont Authority for Regional Transit (PART) has studied Bus Rapid Transit and commuter rail for connecting Greensboro and Winston-Salem. The proposed routes call for

¹⁷⁴ Charlotte-Douglas International Airport. Proposed Future Construction Projects. Accessed May 15, 2014. <http://charmeck.org/city/charlotte/Airport/Pages/CLT2015FutureProposedProjects.aspx>

¹⁷⁵ Raleigh-Durham International Airport. RDU History. Accessed May 15, 2014. <http://www.rdu.com/authority/history.html>

¹⁷⁶ Fayetteville Regional Airport. Fayetteville Regional Airport Master Plan (2007). Accessed May 15, 2014. <http://www.flyfay.com/Files/FAYExecSummary.pdf>

¹⁷⁷ Asheville Regional Airport. Asheville Regional Airport Master Plan (2003). Accessed May 15, 2014. <http://flyavl.com/media/PDFs/Master%20Plan.pdf>

¹⁷⁸ Piedmont Triad International Airport. Airport Master Plan Update and Strategic Long Range Vision (2010). Accessed May 15, 2014. http://airportmasterplan.homestead.com/Executive_Summary_Final.pdf

¹⁷⁹ Raleigh-Durham International Airport. Triangle Transit Rail Link to RDU. Accessed May 15, 2014. <http://www.rdu.com/airportdev/ttrailink.html>

¹⁸⁰ Charlotte Area Transit System. 2030 Transit Corridor System Plan. November 2006. <http://charmeck.org/city/charlotte/cats/planning/2030plan/Pages/default.aspx>

connections at PART's proposed regional transit facility, located between PTI and the proposed passenger rail line.¹⁸¹

2.2.6.8 Conclusion

Airport and highway congestion will continue to occur in North Carolina given the state's projected population increases and the projected future freight traffic expected for the United States and North Carolina. Improvements to passenger and freight rail offer opportunities to complement the highway and airport network.

2.2.7 Land Use Trends

The relationship between land use and rail is explored in this section – particularly how passenger and freight rail can shape surrounding land uses and what land uses support the use of rail. This analysis provides a foundation for the assessment of rail service needs and opportunities in Section 2.3.

2.2.7.1 The Role of Rail in Shaping North Carolina's Land Use

To understand the role of rail in shaping North Carolina's land uses, it is important to take a brief look at the history of railroad development in the state. The first railroads were built in the United States during the 1830s with the majority of the rail network built during the second half of the 19th Century.¹⁸² Several of North Carolina's larger cities, such as Durham and High Point originated as railroad stops and went from being small outposts to growing manufacturing cities because of the railroad.^{183,184} The existing cities of Charlotte, Greensboro, Winston-Salem, Wilmington, Raleigh, and Asheville also experienced growth after the arrival of the railroad. The railroad's role in city

development is especially important for North Carolina since navigable rivers played only a minor role in the development of the state's cities.¹⁸⁵

Approximately 83 percent of North Carolina municipalities incorporated before 1900 have railroads intersecting their current-day municipal boundaries.¹⁸⁶ The cities of Charlotte, Greensboro, and Wilmington were important railroad hubs at this time. In 1900 a large number of small towns were evenly spaced along railroads throughout North Carolina. Many of these towns remain important commercial and civic land uses to this day. The arrival of the railroad also changed the land uses of the areas surrounding early North Carolina cities and towns as they adapted to producing cotton, tobacco, timber, and other profitable commodities that could be easily shipped by rail to markets and manufacturers.¹⁸⁷

2.2.7.2 Freight Rail Traffic Generators

Some of the early industries that relied on rail are still present in North Carolina. Figure 2 - 78 shows the primary rail freight traffic generators in each metropolitan planning organization (MPO) region.

Land uses that are current or potential freight rail generators, including manufacturing, agriculture, forestry, fishing, and mining and quarrying, are mapped in Figure 2 - 79. The figure shows employers in these sectors with greater than the indicated number of employees.¹⁸⁸ Manufacturing employers are generally concentrated in urban areas, particularly in the western Piedmont. Agriculture and forestry operations are spread throughout the state but are most heavily concentrated in the fertile Coastal Plain. Mining and quarrying operations are scattered throughout the state.

¹⁸¹ Piedmont Authority for Regional Transportation. Request for Qualifications – Update of the PART Intermodal Facility Project Management Plan (2013). http://www.partnc.org/documents/Intermodal_Facility_RFQ.pdf

¹⁸² Association of American Railroads. A Short History of U.S. Freight Railroads. April 2013. <https://www.aar.org/keyissues/Documents/Background-Papers/A-short-history-of-US-Freight.pdf>

¹⁸³ City of Durham. Durham History at a Glance. Accessed April 15, 2014 http://www.durham-nc.com/about/overview-facts-history/history_glance.php

¹⁸⁴ High Point Museum. High Point and Furniture. Accessed April 15, 2014. <http://highpointmuseum.org/furniture-history/>

¹⁸⁵ Burke, James. North Carolina's First Railroads, A Study in Historical Geography. 2008. http://libres.uncg.edu/ir/uncg/f/Burke_uncg_0154D_10006.pdf

¹⁸⁶ Analysis on municipality data from North Carolina Department of Transportation GIS and railroad data from US DOT National Transportation Atlas Database.

¹⁸⁷ Association of American Railroads. A Short History of U.S. Freight Railroads. April 2013. <https://www.aar.org/keyissues/Documents/Background-Papers/A-short-history-of-US-Freight.pdf>

¹⁸⁸ National Cooperative Freight Research Program. Freight Trip Generation and Land Use Report. Table 9 – NAICS Codes for freight-related sectors. 2012. http://onlinepubs.trb.org/onlinepubs/ncfrp/ncfrp_rpt_019.pdf

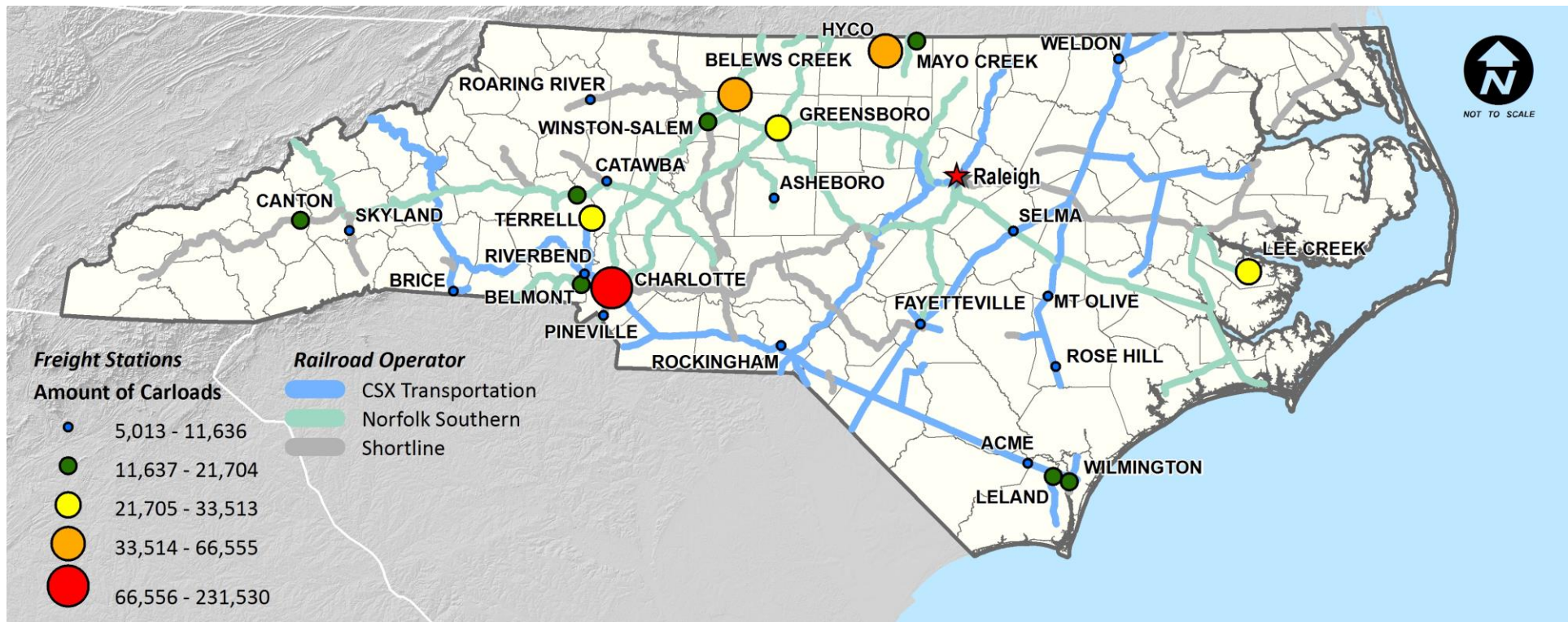


Figure 2 - 78 Primary Freight Rail Traffic Generators

Figure 2 - 79 also shows that the state's intermodal facilities, ports, transloads, and military installations are located along rail lines.

North Carolina's major military bases are all connected to the Strategic Rail Corridor Network (STRACNET), the coordinated network of railroads and military installations needed for moving heavy vehicles to seaports for defense deployment and peacetime needs.^{189,190} Fort Bragg, Camp Lejeune, Seymour

¹⁸⁹ Military Surface Deployment and Distribution Command – Transportation Engineering Agency. Railroads for National Defense. Accessed May 12, 2014. <http://www.tea.army.mil/DODProg/RND/default.htm>

¹⁹⁰ Federal Railroad Administration. FRA's GIS Application – Rail STRACNET layer. Accessed May 12, 2014.

Johnson Air Force Base, Military Ocean Terminal—Sunny Point and Cherry Point Marine Corps Air Station are all sited along the network.

2.2.7.3 Passenger Rail Traffic Generators

At a state level, urbanized areas that are current or potential passenger rail traffic generators are mapped in Figure 2 - 80. Two-thirds of Amtrak stations in the state are located within the Piedmont Crescent urbanized area that stretches from Charlotte to Raleigh. The Piedmont Crescent's population and employment densities (see Section 2.2.1) currently support three daily intercity passenger rail routes. The other third of the stations are in small- to mid-sized cities in the Sandhills and Eastern North Carolina. Potential future intercity passenger rail routes may connect the remaining urban areas in Western North

Carolina (Asheville, Conover) and Eastern North Carolina (Goldsboro, Wilmington) to the existing network.¹⁹¹ The map also shows that there are a number of land uses within the urbanized areas that are typically associated with supporting public transit and passenger rail including airports and colleges.

A survey of MPOs and RPOs support the findings that the existing urban areas are the key generators for current passenger rail traffic. Survey responders also indicated strong support for extending passenger rail service to Western North Carolina and Eastern North Carolina, as well as some type of passenger rail service to Winston-Salem. Others recommended additional stops along existing routes in growing communities such as Lexington and in Orange County, and support for commuter rail connecting to existing Amtrak stops. In order to be considered for near-term projects or studies, locations can receive higher scoring in future rounds of STI by identifying and securing local funding matches.

¹⁹¹ North Carolina Department of Transportation. Future Service. Accessed April 15, 2014. <http://www.ncbytrain.org/projects/future.html>

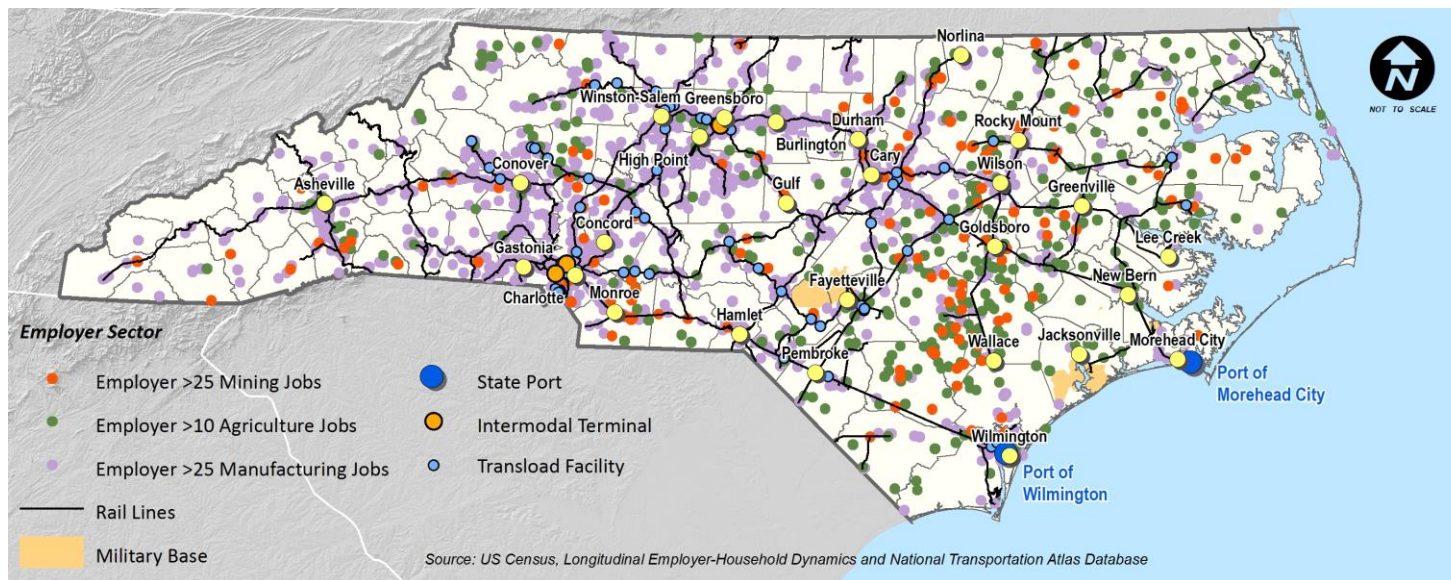


Figure 2 - 79 Map of Freight Rail-Oriented Land Uses

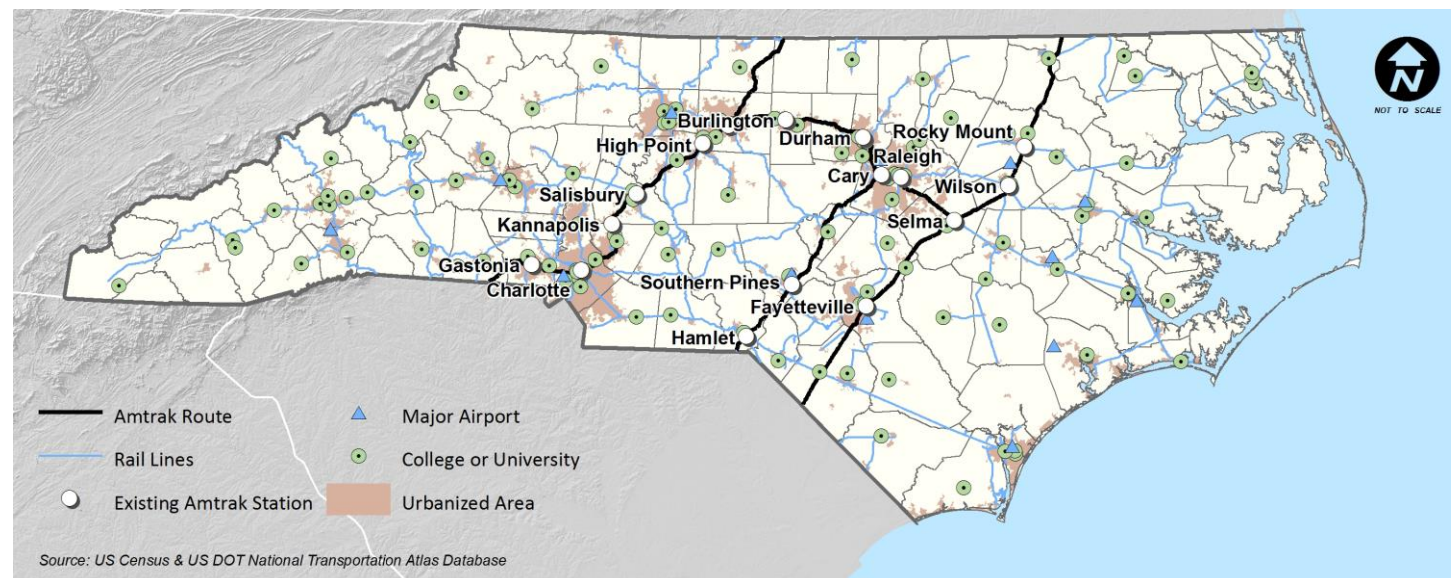


Figure 2 - 80 Map of Urbanized Areas

2.2.7.4 Land Use Patterns and Trends

Railroads continue to have a significant relationship with land uses and settlement patterns in North Carolina, especially since railroads intersect over two thirds of the state's municipalities.¹⁹² The most visible relationship is the active industrial and agricultural land uses centered along railroads. Another noticeable land use pattern is the many historic manufacturing buildings that have been repurposed as residential and commercial buildings, often contributing to downtown revitalizations, and located near rail lines.

Less obvious is the role that railroads played in influencing development patterns of North Carolina's cities. Rail led to the development of streetcars and the formation of mill villages. Streetcars operated in roughly a dozen North Carolina cities in the first half of the 20th Century.¹⁹³ Streetcar suburbs and mill villages were typically walkable and had street grids and commercial main streets. Today, their infrastructure and integrated land uses make them attractive for new mixed-use developments, which are occurring on large scales in Charlotte's Dilworth, North Davidson, and Plaza-Midwood neighborhoods and Durham's Ninth Street/Old West Durham neighborhood. With much of North Carolina's future population growth anticipated for urban areas, infill development and redevelopment of this kind will play an important role in shaping future land use patterns.

Projections of future land use from the US Forest Service indicate that between 2010 and 2040 urbanized area in North Carolina will increase by approximately 50 percent from about four million acres to about six million acres, with corresponding decreases in the acreages of cropland, pasture land, and forested land.¹⁹⁴ The Piedmont will experience the greatest transition to urbanized area, with nearly ten percent of the region's acreage being converted to urban uses.

¹⁹²Analysis on municipality data from North Carolina Department of Transportation GIS and railroad data from US DOT National Transportation Atlas Database

¹⁹³Turner, Walter. NC Transportation Museum Foundation Historian. Development of Streetcar Systems in North Carolina. <http://www.nctrans.org/About-Us/History/Streetcar-Systems.aspx>

¹⁹⁴Wear, David N. Forecasts of County-Level Land Uses Under Three Future Scenarios: A Technical Document Supporting the Forest Service 2010 RPA Assessment. Gen. Tech. Rep. SRS-141. Asheville, NC: US Department of Agriculture Forest Service, Southern Research Station. Available at: http://www.srs.fs.usda.gov/pubs/gtr/gtr_srs141.pdf

Cities in this region, including Charlotte, Raleigh, and Greensboro, have land use provisions in place to encourage economic development, redevelopment, and densification around existing and proposed investments in passenger rail as this transition occurs. For example, Charlotte's Integrated Transit/Land Use Plan and Centers, Corridors, and Wedges Framework promote redevelopment using a "corridors and wedges" concept that focuses density in activity centers and transit corridors. Already, the completion of Charlotte's Blue Line light rail has led to considerable redevelopment and densification along its corridor, particularly in the South End neighborhood.¹⁹⁵ Charlotte is also exploring the use of Tax Increment Financing to pay for a portion of its future proposed commuter rail system. This financing approach uses tax revenues resulting from increased development activity at commuter rail stations, much of which would not occur in the absence of commuter rail.¹⁹⁶

The projections for rail-oriented land uses in North Carolina are mixed as shown in the Appendix. Manufacturing is expected to experience a slight decline whereas construction and related aggregate industries are expected to increase over the next 25 years. Fuel costs and other variables will also factor into the future of freight-oriented land uses across the state. Stakeholders participating in the development of this plan have noted the importance of preserving sites along existing rail corridors for freight rail-oriented industries. It has been noted that a program to work with regional and local land use regulators to optimize use of increasingly scarce rail-served sites is needed.

Raleigh, Durham, and Chapel Hill have land use provisions in place to encourage transit-supportive land uses in existing and proposed station areas.^{197,198,199}

¹⁹⁵Frazier, Eric. Charlotte Observer. City officials tout South End as model for rail-oriented development. May 14, 2013. <http://www.charlotteobserver.com/2013/05/14/4041411/city-officials-tout-south-end.html#.U02dQBbUCgc>

¹⁹⁶Charlotte Area Transit System. Transit Funding Working Group – Recommendations to the Metropolitan Transit Commission. May 6, 2013. <http://charmeck.org/city/charlotte/cats/about/CATSBoard/tfwg/Presentation%20Materials/Transit%20Funding%20Working%20Group%20Report%205-20-2013.pdf>

¹⁹⁷Triangle Transit. Durham-Orange Light Rail New Starts Application. Chapter 8 – Transit Supportive Land Use and Economic Development.

¹⁹⁸Town of Cary. Comprehensive Plan – Land Use Element Maps. Amended August 13, 2009. <http://www.townofcary.org/Assets/Planning+Department/Maps/Land+Use+Plan+Map.pdf>

Other areas are undertaking broad land use planning projects that also promote planning principles that may further support freight or passenger rail. These efforts include federal funding planning projects such as the Piedmont Triad Sustainable Communities Planning Project and the Regional Plan for Sustainable Development in the Wilmington region.^{200 201} These plans, coupled with the station expansion and renovation plans mentioned in Section 1.2.2, will support existing and planned passenger rail initiatives. At the same time, increased densities in urbanized areas will undoubtedly lead to increased freight rail congestion from greater market demands.²⁰²

2.3 RAIL SERVICE NEEDS AND OPPORTUNITIES

Using the data described in Sections 2.1 and 2.2 above, Section 2.3 evaluates the improvement needs, services gaps and deficits for three types of rail services: freight, commuter rail, and intercity passenger. After an analysis of the needs for these three rail services areas, Section 2.3.4 also evaluates and prioritizes the needs of the various rail corridors for freight, passenger and commuter rail to further geographically refine the needs. Finally a more detailed list of opportunities and needs for freight rail (Section 2.3.5) and passenger rail and commuter rail (Section 2.3.6) is developed from the data and corridor prioritization analysis. The service opportunities and needs as well as prioritized corridor needs were then used to develop a list of projects for passenger rail in Chapter 3 and freight rail in Chapter 4. Figure 2 - 81 illustrates the prioritization and selection process for the State Rail Plan.

¹⁹⁹ City of Raleigh. 2030 Comprehensive Plan – Future Land Use Map. October 7, 2009 http://www.raleighnc.gov/content/PlanDev/Documents/LongRange/ComprehensivePlan/Land_Use-Hi_Res.pdf

²⁰⁰ Lower Cape Fear Sustainable Communities Consortium. FOCUS Project Website. <http://www.focussenc.org/about-focus/>

²⁰¹ Piedmont Triad Regional Council and Piedmont Authority for Regional Transportation. Piedmont Triad Sustainable Communities Project website. <http://piedmonttogether.org/about>

²⁰² Federal Railroad Administration. Freight Rail Future. Accessed April 15, 2014. <https://www.fra.dot.gov/Page/P0362#TheFuture>

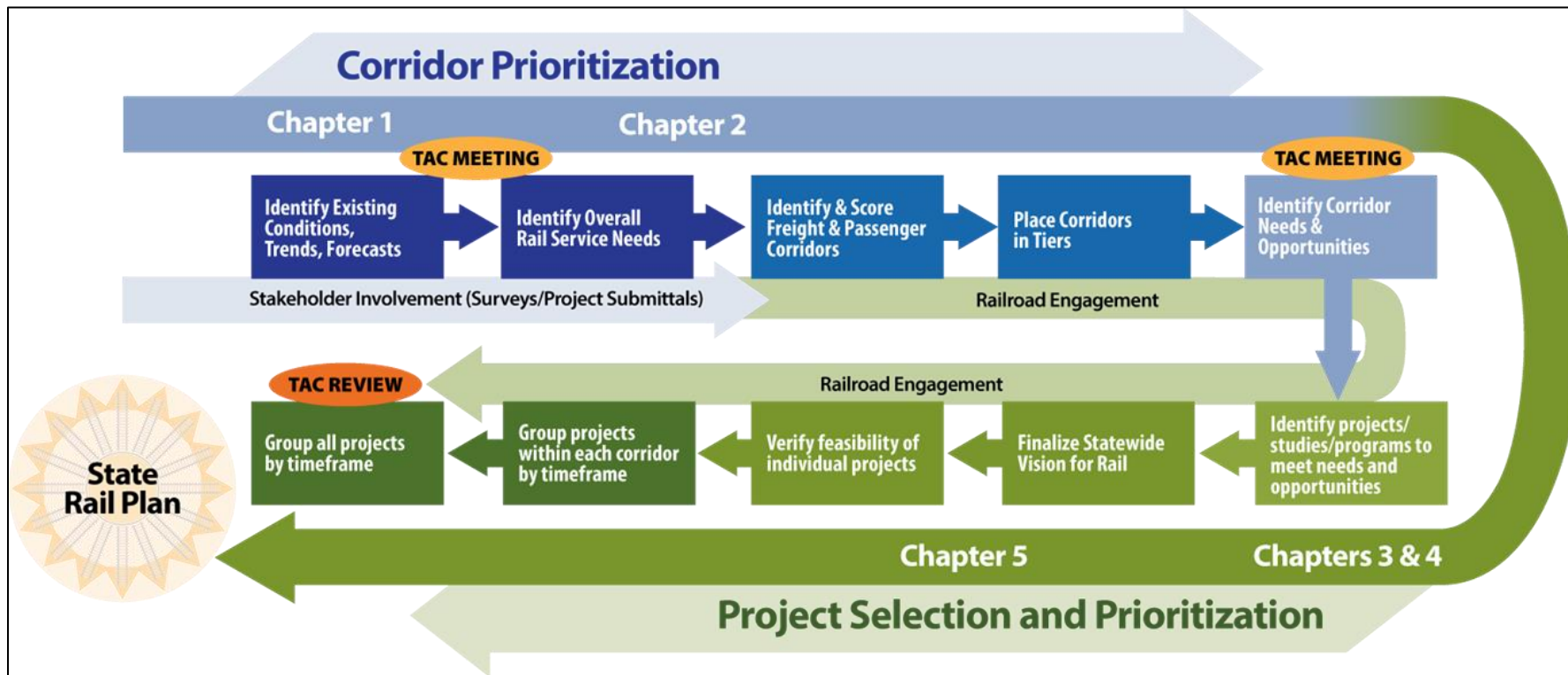


Figure 2 - 81 State Rail Plan Prioritization and Selection Process

2.3.1 Rail Service Needs – Freight

From the freight traffic perspective for the railroad industry, the rail service needs are most often shaped by specific customer and location requirements. For example, the 2013 North Carolina Rail Forum identified an estimated 25 percent of the Class I railroad traffic begins and ends on short line railroads. In North Carolina, the agricultural and restored manufacturing markets are where regional railroads can add fluidity to the Class I railroad network. The short line railroads are able to preserve and upgrade their respective state-of-good-repair conditions with sufficient traffic volumes. However, when volumes decline, often train speed and car weight are reduced while preserving safety in operations. Hence, it remains important to aid industry locations along existing short lines to preserve and maintain traffic where commercial and logistics decisions align. To this end, the recent Railway Association of North Carolina 2014 annual meeting estimated costs to upgrade existing infrastructure to current market expectations at \$120 million.

Moreover, there are some instances where adjacent state(s), particularly for the supplier/customer linked to a North Carolina industry, and nationwide factors, come into effect. With these broader factors considered, specific freight rail needs in North Carolina are as follows:

1. Maintain and improve track capacities, especially on Class II and III systems, for existing and future high flow corridors. The available maximum allowable gross weight for 286,000 pound loaded cars (the industry is considering 315,000 pounds) is becoming more important for industries as they manage productivity and transportation costs. Limitations may arise with the track or with structures along the route. Individual industries served by Class II or III railroads may only have one route to their respective facilities and may become stranded if capacities fail to keep pace with market demands or conditions deteriorate.
2. Improve safety and strive to minimize delays. The increases in roadway and rail traffic will continue to lead to greater congestion and delay at at-grade crossings. As freight trains become longer and movements of unit trains increase, the delay hours at crossings will continue to grow. In addition, the movement of hazardous materials creates

additional concerns at rail-highway crossings. Therefore, the second rail service area centers on roadway and rail at-grade crossings, including separations and closures. The selective evaluation of activity patterns for roadway transportation in connection with railroad freight traffic may present candidate sites for improvement.

3. Expand freight rail infrastructure, and/or add redundancy, in select locations across the state to support economic development aligned with rail-based markets as well as supply chain reliability. This third area arises from the continued development of the Class I railroad networks. As the NS and CSXT volumes grow and shift across the respective origin and destination pairs they will move traffic across their networks in the most effective manner. The new intermodal facilities built by CSXT in North Baltimore (OH) and by NS in Rossville (TN) and Charlotte are examples that demonstrate the continual growth of their respective networks. The changes on other segments of their networks affect how supply chains function for North Carolina industries.

NCDOT's evaluation and prioritization of programs and corridors to meet these needs are described in greater detail in Sections 2.3.4 and 2.3.5 as well as in Chapter 4.

2.3.2 Rail Service Needs – Commuter Rail

Because commuter rail primarily serves the travel needs of a specific region and metropolitan area, local transit agencies have taken the lead in evaluating and planning commuter rail in North Carolina. Plans for commuter rail are underway in North Carolina's most populated regions. Both the Charlotte region and the Triangle region have selected commuter rail in at least one corridor; while the Triad region has investigated commuter rail alternatives. These commuter rail efforts, including plans and development of projects, are discussed below.

2.3.2.1 Charlotte Region

The Charlotte Area Transit System (CATS) is the primary transit provider in the Charlotte region. CATS operates local bus routes in Charlotte and provides express service to surrounding counties. CATS also operates the LYNX light rail

Blue Line and is constructing a streetcar downtown. These rail projects and CATS's Red Line Regional Rail were recommendations in the 2030 Transit Corridor System Plan (2006).²⁰³ The Charlotte Red Line Regional Rail is proposed to run from the planned Gateway Station in downtown Charlotte to Mooresville using the Norfolk Southern Railroad O Line. The 25 mile commuter rail line and 11 stations would serve downtown Charlotte, north Charlotte and the suburban municipalities of Huntersville, Cornelius, Davidson and Mooresville. The Charlotte Red Line Regional Rail project is unique in that the proposed funding sources include increased tax revenues from freight and transit oriented development.²⁰⁴ Project development is currently on hold while CATS negotiates agreements with NS to use the corridor. If negotiations cannot be reached, separate right-of-way would have to be acquired, and the feasibility of the project would need to be reevaluated. There are no other commuter rail projects recommended in CATS' 2030 Transit Corridor System Plan.²⁰⁵

The Gaston-Cleveland-Lincoln Metropolitan Planning Organization explored high capacity transit connections to Charlotte in the Gastonia Rapid Transit Alternatives Study (2005). Commuter rail was studied as an option since the North Carolina Department of Transportation owns the Piedmont and Northern (P&N) line in Gaston County and a portion within the City of Charlotte. However, the study ruled out this alignment in favor of either bus rapid transit or light rail transit since these technologies could travel in corridors that would connect with CATS West Corridor which will terminate at Charlotte Douglas International Airport.²⁰⁶

While the Charlotte region only has one planned commuter rail line, there may be the need for additional commuter rail services in the future. Census data show an increase in the number and percent of workers who commute across

county lines in the Charlotte region, including an increase in workers who cross state lines.²⁰⁷ Currently there is no multi-county transit authority in the area, and CATS' primary local transit funding option (sales tax) is only collected within Mecklenburg County. These factors limit the amount of cross-county transit services and possibilities for developing services such as commuter rail that could serve cross-county commuters. Future funding agreements between counties without a dedicated funding source for transit would need to be reached to advance such projects. Potential congested roadway corridors with rail access from downtown Charlotte to suburban counties include US 74 from downtown Charlotte to Monroe (Union County), downtown Charlotte to Rock Hill, SC (York County) and downtown Charlotte to Salisbury (Cabarrus and Rowan Counties). These corridors are mapped and described in greater detail in Chapter 3 (Section 3.8).

2.3.2.2 Triangle Region

Triangle Transit is the regional transit provider for the Triangle region of North Carolina. The transit agency provides regional and express bus service between the region's core cities and suburbs. Triangle Transit and the region's two Metropolitan Planning Organizations have refined plans for future increases in bus service and rail investments over the last decade. Triangle Transit has selected preferred alternatives for light rail connecting Durham and Chapel Hill, light rail connecting Raleigh and Cary, and commuter rail connecting Durham and Wake Counties. The 37-mile commuter rail line and 12 proposed stations would serve Duke University Medical Center, downtown Durham, Research Triangle Park, Cary, North Carolina State University, downtown Raleigh and Garner. The commuter rail line would overlap with the light rail projects in downtown Durham and between downtown Cary and downtown Raleigh.²⁰⁸ The project's status depends on funding from dedicated transit sales tax referendums. Durham County passed a dedicated ½ cent sales tax in 2011 and

²⁰³ Charlotte Area Transit System. 2030 Transit Corridor System Plan. November 2006. <http://charmeck.org/city/charlotte/cats/planning/2030plan/Pages/default.aspx>

²⁰⁴ Charlotte Red Line Regional Rail. Accessed June 5, 2014. <http://redlineregionalrail.org/>

²⁰⁵ Charlotte Area Transit System interview, Brian Nadolny interviewed by Drew Spiliotis. June 11, 2014.

²⁰⁶ Gaston-Cleveland-Lincoln Metropolitan Planning Organization. Gastonia Rapid Transit Alternatives Study: Corridor and Modal Options. December 2005. <http://www.gastonmpo.org/documents/FinalReport-GRTASwithcover.pdf>

²⁰⁷ Analysis of 1990, 2000 and 2011 Census Data for the Centralina Council of Governments boundary area. North Carolina Department of Commerce AccessNC website. September 2014. <http://accessnc.commerce.state.nc.us/EDIS/demographics.html>

²⁰⁸ Triangle Transit. Durham-Wake County Corridor Alternatives Analysis. July 2011. <http://ourtransitfuture.com/wp-content/uploads/2011/07/D-W-Vol-1-Detailed-Definition-of-Alternatives1.pdf>

Orange County passed a dedicated ½ cent sales tax in 2012.²⁰⁹ The Durham-Chapel Hill-Carrboro MPO adopted the Durham-Wake Commuter Rail as the Locally Preferred Alternative. The Capital Area MPO has not adopted the Durham-Wake Commuter Rail as the Locally Preferred Alternative and Wake County commissioners have not put a referendum to voters. Both MPOs must adopt the project as the Locally Preferred Alternative for the project to move forward in the planning process.²¹⁰ Wake County is currently leading a partnership that includes CAMPO and key municipal, transit agency and other stakeholders to develop the Wake County Transit Strategy, which will update plans to develop new and enhanced transit service in the region and inform decision-making by the county on future transit investments.

While the Triangle region is planning for commuter rail and light rail connecting portions of Orange, Durham and Wake Counties (which are the boundaries for Triangle Transit), there may be the need for additional commuter rail services beyond these three counties, given the projected employment and population growth in the region, and the increase in the number of commuters who regularly cross county lines in the Triangle region.²¹¹ Triangle Transit and NCR completed a capacity study in 2015 to evaluate multiple commuter rail operating scenarios between Mebane and Selma, and one scenario between West Durham and Greenfield (Garner). Congested highway corridors with parallel rail lines and a growing population with the potential for commuter rail service include US 1 between downtown Raleigh and Wake Forest (northeast Wake County), US 401 between downtown Raleigh and Fuquay-Varina (southern Wake County) and US 1 between downtown Raleigh and Sanford (southwest Wake County and Lee County). These corridors are mapped and described in detail in Chapter 3 (Section 3.8).

2.3.2.3 Triad Region

The Piedmont Authority for Regional Transportation (PART) is the regional transit provider for the Piedmont Triad region. The transit agency provides express bus service throughout the Piedmont Triad region connecting suburban towns to major activity centers in Greensboro, High Point and Winston-Salem. PART also provides Amtrak Connector bus service between the Winston-Salem Transit Authority hub in downtown Winston-Salem and the nearby High Point Amtrak station. PART completed the Federal Transit Administration (FTA) analysis Alternatives Analysis process and selected commuter rail as the preferred alternative between Greensboro and Winston-Salem in 2005. The proposed commuter rail would have used the Norfolk Southern K Line corridor between North Carolina Agricultural and Technical State University (NC A&T) in Greensboro and Hanes Mall in Winston-Salem.²¹² FTA analysis suggested that commuter rail was not feasible when evaluated in 2009 primarily due to existing transit ridership numbers in the corridor. PART completed a Regional Transit Development Plan in 2010 that calls for bus rapid transit to connect Greensboro and Winston-Salem. The plan's proposed Gold Line bus rapid transit would serve the same activity centers as the proposed commuter rail. These activity centers include NC A&T University, downtown Greensboro, the University of North Carolina at Greensboro, the Greensboro Coliseum, the Piedmont Triad International Airport, Kernersville, Winston Salem State University, downtown Winston-Salem, Baptist Medical Center and Forsyth Medical Center. PART has indicated they will continue to evaluate the potential for future commuter rail. The proposed Gold Line, if implemented, would build ridership in the corridor until commuter rail is feasible. PART is also working to locate their new regional transit center on a strategic site between the Piedmont Triad International Airport and the studied commuter rail line corridor.^{213,214}

²⁰⁹ Triangle Business Journal. "Triangle Transit approved sales tax increase for Durham, Orange counties." December 14, 2012.

²¹⁰ Triangle Transit interview, Juanita Shearer-Swink interviewed by Drew Spiliotis. June 13, 2014.

²¹¹ Analysis of 1990, 2000 and 2011 Census Data for the Triangle J Council of Governments boundary area. North Carolina Department of Commerce AccessNC website. September 2014. <http://accessnc.commerce.state.nc.us/EDIS/demographics.html>

²¹² Piedmont Authority for Regional Transportation. Heart of the Triad - Existing Conditions Summary. March 2007. <http://www.partnc.org/images/existingconditions03-29-07.pdf>

²¹³ Piedmont Authority for Regional Transportation. Forsyth and Guilford Counties Transit Vision for 2025. November 2010.

http://www.partnc.org/documents/RTDP_Forsyth_Guilford%20Final%20Report_Reformatted.pdf

²¹⁴ Piedmont Authority for Regional Transportation interview, Mark Kirstner interviewed by Ann Steedly and Drew Spiliotis. June 17, 2014.

Similar to the data evaluated for the Charlotte and Triangle regions, an analysis of Census data for the Triad region show an increasing number of commuters who work outside of their county of residence, which indicates a growing market for cross-county transit services such as regional bus and commuter rail.²¹⁵

2.3.2.4 Hampton Roads Region

Northeastern North Carolina has an increasing number of residents who commute to the Hampton Roads region in Virginia. The Hampton Roads Transit Vision Plan recommends the study of express bus and eventual commuter rail service from the Town of Edenton in Chowan County to Hampton Roads as demand warranted, perhaps after 2026.²¹⁶ The Chesapeake and Albemarle Railroad could serve as a future commuter rail corridor, connecting Edenton and Elizabeth City to Chesapeake and Norfolk, in Virginia.

2.3.3 Rail Service Needs – Intercity Passenger Rail

As noted in Section 2.1, NCDOT's objectives are to continue to improve the on-time performance of the existing intercity passenger rail services in North Carolina, reduce travel times and frequencies, improve the financial and customer service performance of the state-supported services, extend services to new markets, and implement the Federally-Designated Southeast Corridor program. Specific rail service needs in North Carolina are as follows:

1. Improve service along the *Piedmont* corridor, which connects the state's largest metropolitan areas, through additional frequencies, reduced travel times, and improved stations and additional stations in the corridor.
2. Improve On-Time Performance (OTP) to FRA standards for passenger service trains serving the state, with particular attention for the state-supported *Carolinian* and *Piedmont* services.

²¹⁵ Analysis of 1990, 2000 and 2011 Census Data for the Triad Council of Governments boundary area. North Carolina Department of Commerce AccessNC website. September 2014. <http://accessnc.commerce.state.nc.us/EDIS/demographics.html>

²¹⁶ Transit Vision Plan for Hampton Roads. March 2009. http://www.hrp.org/Site/docs/ResourceLibrary/Transit_Vision_Plan_Hampton_Roads_with_intentionally_blank_040109.pdf

3. Implement the Southeast Corridor, both within North Carolina and through improved connections with the Northeast Corridor and Atlanta, Georgia.
4. Extend passenger rail services to additional metropolitan areas, specifically western North Carolina and to eastern North Carolina, with service that will connect to other intercity passenger rail trains.
5. Expand rail service markets by working with local communities to enhance and develop multimodal connections to intercity rail stations, including commuter rail.

NCDOT's evaluation and prioritization of programs and corridors to meet these needs are described in greater detail in Sections 2.3.4 and 2.3.5 as well as in Chapter 3.

2.3.4 Corridor Prioritization

After evaluating the existing conditions data, and trends for rail, and developing the general service needs for commuter, passenger, and freight rail, the State Rail Plan team conducted a more specific evaluation and analysis of the various rail corridors in the state.

The first step in this corridor prioritization process was to define the various rail corridors across North Carolina. The corridors were defined by reviewing their ownership and end points of freight services within the state. Short lines were not included in the evaluation unless they were known to be under consideration for new passenger services or were the primary connection to a port, intermodal facility, etc.

The corridor prioritization program serves two purposes. First it allows the rail needs to be further refined and spatially defined within corridors. For example, serving emerging freight markets has been identified as a need, and the corridor prioritization process accounts for which emerging markets are most significant for the state and are served by specific corridors. Secondly, the corridor prioritization process helps define more specific programs and projects that are opportunities to meet those needs. For example, once key passenger and commuter rail corridors are identified, specific studies or improvement programs for those corridors are identified and evaluated in Chapter 3. Table 2 - 32 lists the corridors evaluated. The corridors are also shown in Figure 2 - 82.

Each of the rail corridors were analyzed using a variety of data to determine the overall significance of their needs for both freight and passenger service. The data used were based upon the FRA State Rail Plan Guidance and upon readily available data that could help differentiate conditions along each corridor. Different data were used to prioritize freight and passenger corridors, as seen in Table 2 - 33. A relative score was assigned for each corridor within each

category, where 1 represented the lowest score and 5 represented the highest score. The scores help to show the importance of the freight or passenger corridor to the State. More detail on the data used and the scoring methods are included in Appendix D.

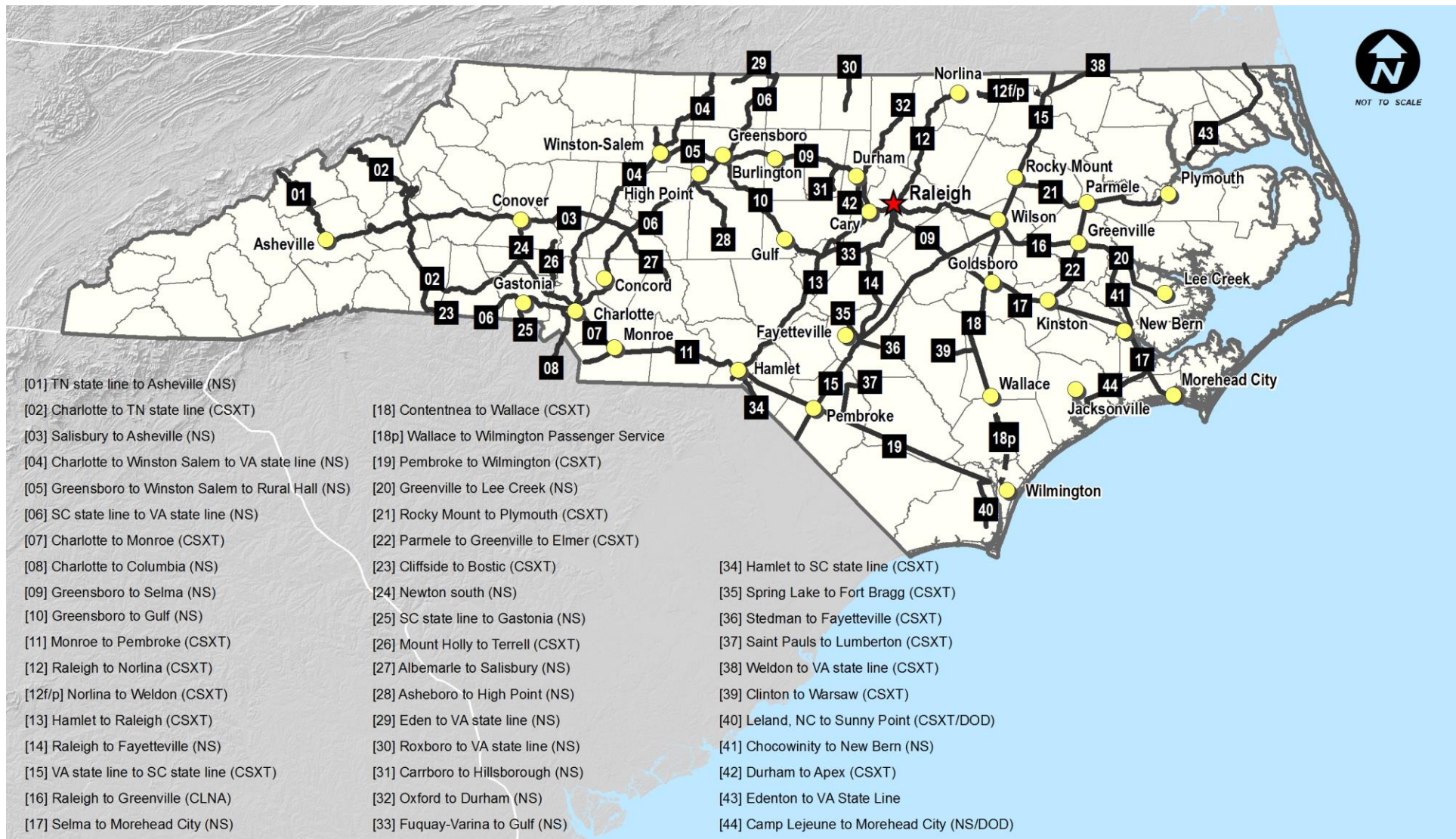


Figure 2 - 82 North Carolina Rail Corridors

Table 2 - 32 Rail Corridors in North Carolina

Corridor	Route	Railroad	Parallel Highway Route	Length (miles)
01	Tennessee state line to Asheville	NS	I-40	46
02	Tennessee state line to Charlotte	CSXT	I-85, US 74, US 221, US 321	173
03	Asheville to Salisbury	NS	I-40, US 70	148
04	Charlotte to Winston-Salem to VA state line	NS	I-40, I-77, US 311	129
05	Rural Hall to Winston-Salem to Greensboro	NS	I-40, US 52	39
06	SC state line to VA state line	NCRR/NS*	I-85, US 29	188
07	Charlotte to Monroe	CSXT	I-277, US 74	29
08	SC state line (from Columbia) to Charlotte	NS	I-77	25
09	Greensboro to Selma	NCRR/NS*	I-40, US 70	115
10	Greensboro to Gulf (Sanford)	NS	US 421	43
11	Monroe to Pembroke	CSXT	I-74, US 74	84
12	Raleigh to Norlina	CSXT	US 1	58
12f/p	Norlina to Weldon	CSXT	US 158	30
13	SC state line to Hamlet to Raleigh	CSXT	US 1, I-440, NC 177	102
14	Raleigh to Fayetteville	NS	US 401	63
15	SC state line to VA state line	CSXT	I-95	182
16	Raleigh to Greenville	CLNA	I-495, US 64, US 264	81
17	Selma to Morehead City	NCRR/NS*	US 70	113
18p	Contentnea (Wilson) to Wallace	CSXT	I-795, US 117, US 13	105
19	Pembroke to Wilmington	CSXT	I-74, US 74	73
20	Greenville to Lee Creek	CLNA/NS	NC 33	45
21	Rocky Mount to Plymouth	CSXT	US 13, US 64	65
22	Parrale to Greenville to Elmer	CSXT	NC 11, US 13	39
23	Cliffside to Bostic	CSXT	US 221	19

Corridor	Route	Railroad	Parallel Highway Route	Length (miles)
24	Newton south	NS	US 321	3
25	SC state line to Gastonia	NS	US 321	8
26	Mount Holly to Terrell	CSXT	I-485, I-77, NC 150, NC 16	24
27	Albemarle to Salisbury	NS	US 52	29
28	Asheboro to High Point	NS	I-73 I-74, US 220, US 311, US 64	27
29	Eden to VA state line	NS	NC 14, NC 49, S 87, US 220, US 58	12
30	Roxboro to VA state line	NS	US 158, US 501	14
31	Carrboro to Hillsborough	NS	US 15, US 501	11
32	Oxford to Durham	NS	I-85, US 15, US 70	31
33	Fuquay Varina to Gulf	NS	NC 55, US 1, US 421	38
34	Hamlet to SC state line	CSXT	NC 79, US 74	11
35	Spring Lake to Fort Bragg	CSXT	NC 87	7
36	Stedman to Fayetteville	CSXT	NC 24	8
37	Saint Pauls to Lumberton	CSXT	I-95, US 301, NC 87	22
38	Weldon to VA state line	CSXT	NC 186, US 158	18
39	Clinton to Warsaw	CSXT	NC 24	10
40	Leland NC to Sunny Point	CSXT/DOD	US 17, US 421, US 74	22
41	Chocowinity to New Bern	NS	US 17	32
42	Durham to Apex	CSXT	I-40, NC 147, NC 55, NC 540	20
43	Edenton to VA state line	C&A	US 17, NC 168	56

*NCRR owns the corridor from Charlotte to Greensboro to Morehead City, and has an operating and maintenance agreement with NS. NS owns the mainline corridor south of Charlotte and north of Greensboro.

Table 2 - 33 Data Used to Prioritize Corridor Needs

Freight Corridors	Passenger Corridors
<i>Current Data</i>	<i>Current Data</i>
• Truck volumes on parallel highways	• Population within 10 and 30 miles of corridor
• Train volumes on corridor – inbound, outbound and through	• Volumes on parallel highways
• Commodities important to NC economy	• Congestion on parallel highways
• Connections to intermodal facilities, ports, major transloads	• Connections to major activity centers
• Connections to major activity centers	• Passenger trains volumes in corridor
• Location within Strategic Corridor network (STRACNET)	
<i>Future Data</i>	<i>Future Data</i>
• 2040 truck volumes on parallel highways	• 2030 population within 30 miles of corridor
• Future train volumes on corridor – inbound, outbound and through	• 2040 volumes on parallel highways
• Emerging commodities important to NC economy	• 2040 congestion on parallel highways
	• Inclusion along federally-designated Southeast Corridor

The corridors were then grouped into three Tiers, based upon their comparative scores.

- Investment Program (“Tier” cell shown in green) –corridors with the highest relative ranking
- Stewardship Program (“Tier” cell shown in orange) –corridors with a medium relative ranking
- Active Monitoring Program (“Tier” cell shown in crimson) –corridors with the lowest relative ranking

The Investment Program category indicates those corridors with existing and proposed traffic that will likely see a sustained commitment for maintenance and capital investments, by either the railroad and/or the state. Continued investments may include expansion of intermodal services and networks and ensuring North Carolina industries have access to these high capacity corridors, and capacity improvements for congestion. These are also the passenger rail corridors that are along the federally-designated Southeast Corridor, or which show the highest scores for investigation of future commuter rail services.

The Stewardship Program level is indicative of those corridors where existing and future traffic has the potential to grow and may be advanced by joint railroad and state strategies. These strategies should capitalize on public-private partnerships to ensure that infrastructure health is maintained and corridors are ready to capitalize on economic opportunities. These are also the corridors that show promise for connecting metropolitan areas, either through commuter rail or new intrastate services (motor coach and rail).

The Active Monitoring Program level is established to actively watch how current conditions track over time. Freight movement is very dynamic, reacting to price changes and supplier / customer choices as seen by North Carolina industries. Passenger rail is not as feasible in the near-term to mid-term for these corridors, though further study and active monitoring may show a combination of these Active Monitoring Program tiered corridors might connect important passenger markets for future expansion.

Figure 2 - 83 shows the results of the freights needs prioritization, and Figure 2 - 84 shows the results of the passenger needs prioritization.

It should be noted that this prioritization is only of possible needs, and not feasibility. A corridor that scores within the Investment tier or Stewardship tier for passenger only means that the corridor shows promise for passenger rail or commuter rail improvements, and does not necessarily determine the feasibility or cost-effectiveness of such services. Likewise, a lower corridor score does not necessarily mean that the State should forego the opportunity to seek projects with economic development potential along those corridors. Additional analysis of the possible projects or programs to address each corridor’s need, and the feasibility of improvements, is included in Chapters 3 and 4.

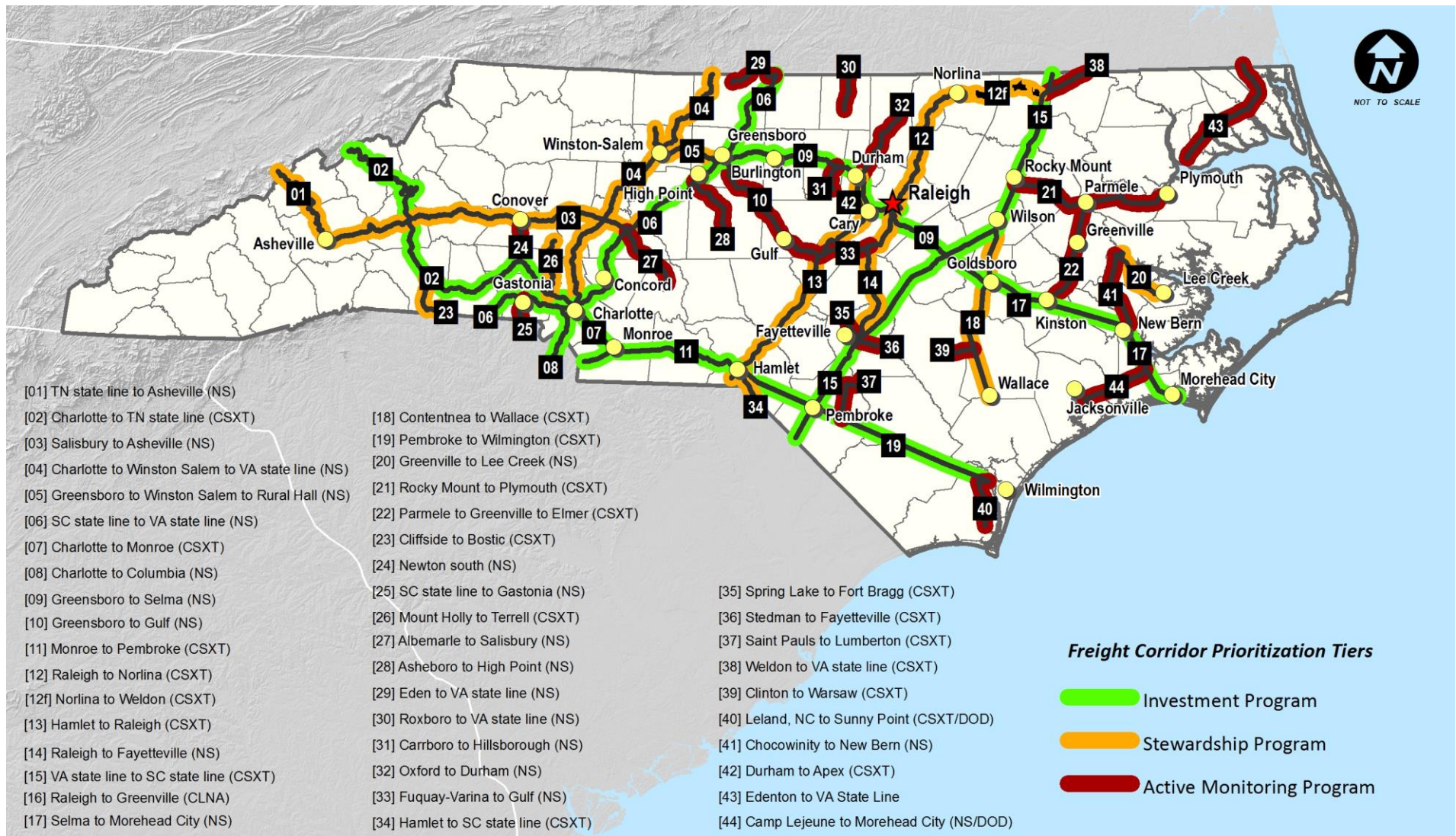


Figure 2 - 83 Prioritized Freight Corridor Needs

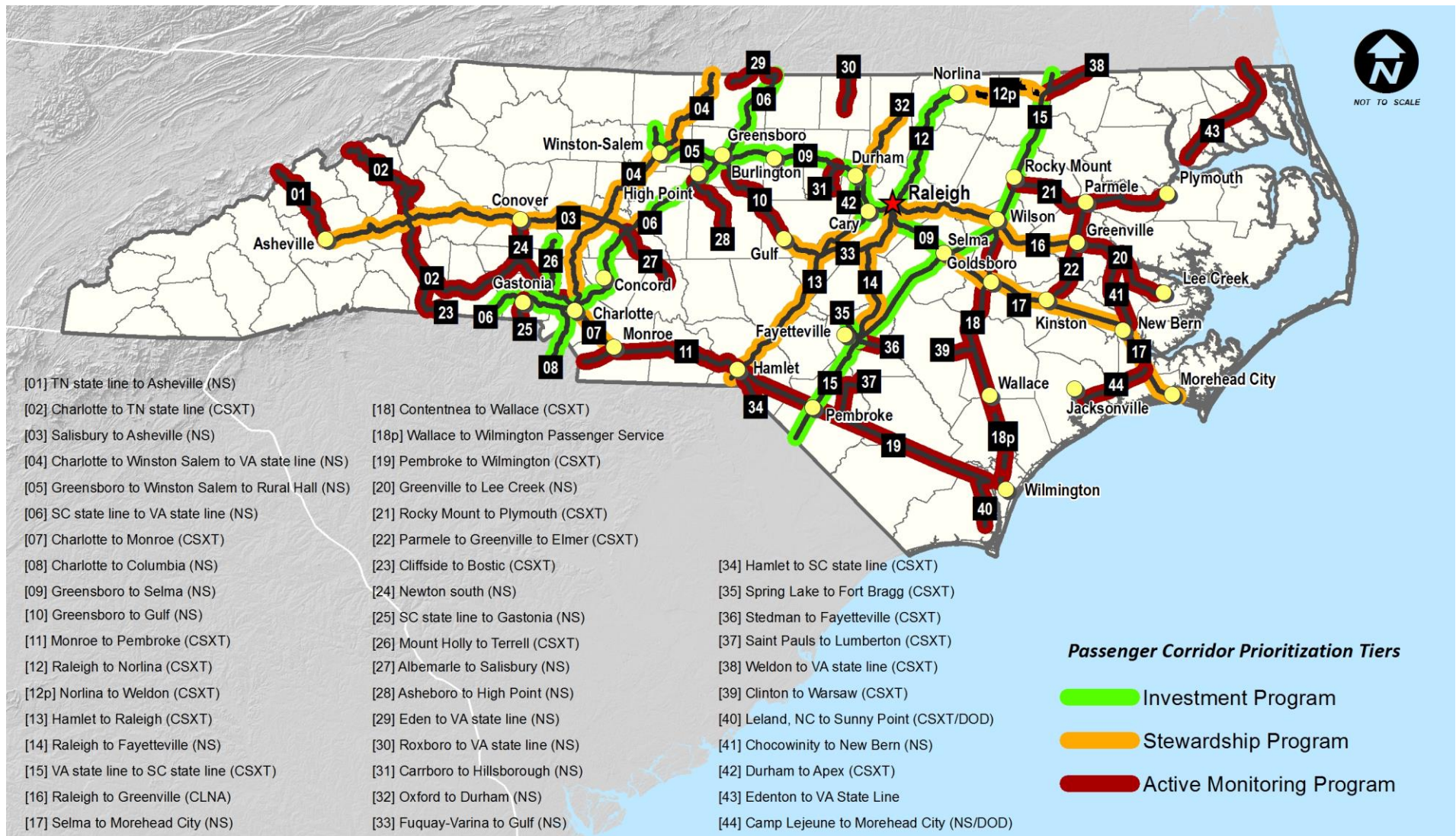


Figure 2 - 84 Prioritized Passenger Corridor Needs

2.3.4.1 Freight Corridor Prioritization

The freight rail corridors in the Investment Program Tier mostly consist of the primary interstate corridors for the two Class I railroads in North Carolina, the A Line (Corridor 15), Z Line and SF Line (Corridor 02) for CSXT, and the NS Mainline (Corridor 06) as well as the NS/NCRR corridor (Corridor 09) between Raleigh and Greensboro, the NS R Line (Corridor 08) that connects Columbia with the NS intermodal yard in Charlotte, and the NS/NCRR corridor H and EC lines between Raleigh and Morehead City (Corridor 17). These Investment Tier Program corridors best exhibit characteristics that could merit public investments: they currently support freight movement and are expected to continue to move large quantities of freight, are located near existing or future activity centers, and some support existing or future intermodal activity.

The Stewardship Program Tier corridors carry less freight traffic, but still connect to the state's ports, major intermodal yards, and/or are on the STRACNET network. These corridors should continue to be considered for projects that will improve these important connections.

The Active Monitoring Program Tier corridors carry less freight, and are often corridors that only connect to areas with less intermodal traffic, and/or only key connections on one end. These corridors should continue to be actively monitored for possible changes in freight services, and emergence of new key markets that could signal the need for additional improvements.

Specific considerations for all of the identified railroad corridors included future public investment and economic changes. Planned public investments that influence the viability of a freight rail corridor include:

- Grade crossings
- Grade separations
- Structures and right-of-way
- Industrial sidings

On the private side, economic changes influence local changes. For example, if fracking occurs in North Carolina it may impact the type and quantity of freight moved along Corridors 10 and 13, which are located near potential fracking

sites. Improvements or changes at North Carolina ports were also considered for their impacts on the freight rail corridors.

The assessment of the freight rail corridors balanced existing conditions with projected future freight movement. For future conditions, consideration was given to future events with a higher degree of certainty, the expected significance and magnitude of future events, and the ability for future corridor implementation strategies to be executed, monitored and adapted.

Each Class I railroad operates across multiple states and changes influencing the freight rail corridors extend beyond North Carolina's boundary. Bi- and multi-state collaborations continue to affect freight rail traffic traveling through, in, out and within North Carolina. Inbound and outbound traffic are focused around network centers in North Carolina. The freight rail corridors connect these network centers to other major freight centers including Chicago, Illinois; Columbus, Ohio; North Baltimore, Maryland; and Atlanta, Georgia.

While the relative rankings were developed with the freight considerations described above, these rail corridors do not exclusively serve freight movement. Future assessment could include aggregating the freight scoring with the passenger rail measures to help identify corridors that can support both freight and passenger rail. This may involve refining the population measurement to include a freight component or balancing service and schedule considerations for freight movements.

The relative rankings may also further drive the economic development discussion of the freight rail corridors. Expected population growth to support economic growth is as important as understanding the workforce and industry sector representation of that population growth. In addition to the population growth, acreage for industrial sites and activity centers to support freight movement is also needed along the corridors. More specifically, an understanding of industrial land use areas will influence economic development discussions, including industrial acreage and floor space, occupancy rates, industry sectors, and zoning characteristics.

2.3.4.2 Passenger Corridor Prioritization

The passenger rail corridors in the Investment Program Tier are those corridors that have the greatest population and employment densities, as well as have the highest levels of vehicular traffic and congestion. The corridors are also of varied length, which will help shape the type of possible passenger service investments to be considered. For example, Corridors 09 and 06 (each over 100 miles) are served by the *Piedmont* and *Carolinian*, are within the Federally-Designated Southeast Corridor, and are the corridors that are receiving the bulk of the state's current PIP capacity, safety and speed improvements. Corridor 08 is currently served by the CATS Blue Line light rail, which is seeing record ridership. Long-term this corridor could be part of a commuter rail service between Charlotte and Rock Hill, SC. Corridors 07 (29 miles in length) and 05 (39 miles) have been evaluated in the past for future commuter rail service, as have portions of Corridor 04, both within Charlotte and Winston Salem. Other Investment Program Tier Corridors such as 35 (near Fayetteville) could be candidates for local transit improvements, including bus rapid transit. The shorter Investment Program Tier corridors show the highest promise for future commuter service, or as portions of future regional intrastate service, and should have priority in future studies.

Corridors listed in the Stewardship Program Tier should be analyzed for expanding passenger rail and/or evaluated for commuter rail. Indeed, most of these corridors are already under consideration for either expanded intrastate/intercity passenger rail or commuter rail. Corridor 03 is on NCDOT's long-range plan for expanded intrastate passenger rail service, and Corridor 12 has been evaluated for light rail/commuter rail by Triangle Transit and is a critical link for the future Southeast Corridor. Portions of Corridor 02 parallel the Piedmont and Northern railroad between Charlotte and Gastonia, which has been under consideration for future commuter rail in the Charlotte region. Corridor 15 is an important link that carries several Amtrak trains, including the *Carolinian*; Amtrak also operates the *Silver Star* service over Corridor 13. Continued investment in this corridor should help improve on-time performance for these passenger trains as well as reduce travel times between stops.

The Active Monitoring Program Tier represents the lowest-rated corridors for passenger rail service. Based upon the prioritization criteria used, these corridors have lower existing and future populations, lower parallel traffic volumes and highway congestion, and fewer connections to activity centers. However, portions of some corridors should be actively monitored and evaluated for expanded intrastate passenger rail; specifically, parts of Corridors 17, 18 and 19 will continue to be analyzed for future passenger rail service connecting Raleigh and Wilmington.

2.3.5 Freight Rail Needs and Opportunities

After evaluating economic, freight and population data and trends, reviewing related studies, and conducting stakeholder outreach efforts, the following freight rail service needs and opportunities were identified.

As recommended in the Eastern Infrastructure Improvement Study (prepared in accordance with Senate Bill 402 Section 34.23 (2013 General Assembly)), the State of North Carolina should establish the Secretary of Transportation's Freight Intermodal Advisory Council to help leverage strategic infrastructure investment to foster economic growth and create jobs. The Freight Intermodal Advisory Council should include, but not be limited to, representatives from the NC Board of Transportation and the boards of the NC Department of Agriculture and Consumer Services, Department of Commerce, the Global TransPark, and NC State Ports Authority. Private entities with State interest will be invited to join the Council, such as representative trucking companies or associations, the North Carolina Railroad Company, and shippers.

The Secretary's Intermodal Advisory Council can lead efforts to:

1. Cultivate ongoing partnerships between metropolitan planning organizations/rural planning organizations and railroad companies serving each region to build understanding and improve economic development through coordinated transportation and land-use planning.
2. Develop a program to restore and add customers to existing lines where volumes have declined, yet some customers remain.
3. Increase transload opportunities on congested corridors to potentially divert more truck traffic to railroads by developing a state-level grant

program for transload facility development, operation, and maintenance to optimize siting based on evolving market needs and transport network congestion.

Additional freight rail needs and opportunities are described below.

- Prepare for the emergence of the energy industry in North Carolina that will add freight traffic.
- Continue leading and investing in our nationally-recognized best practice safety program that improves at-grade highway-rail crossings and builds new grade-separated crossings. The program has helped reduce the number of train-car crashes from 244 in 1988 to 51 in 2014.
- Implement the short-term solutions and plan for the long-term recommendations presented in the Eastern Infrastructure Study for GTP, the Port of Morehead City, and the Port of Wilmington. These solutions include, but are not limited to the following:

Port of Wilmington and Wallace to Castle Hayne

- Continue to preserve the right of way for and seek Department of Defense funding to restore the Wallace to Castle Hayne corridor.

Port of Wilmington

- Continue efforts to work with CSXT to identify actions that will lead to regular rail intermodal service to the Port of Wilmington.
- Pursue implementation of recommendations from the ongoing Wilmington Traffic Separation Study of rail crossing consolidation and safety upgrades to improve safety and efficiency of rail and vehicular flow into the Port of Wilmington.
- Pursue environmental, planning and conceptual design studies for the construction of a highway-railroad grade separated access at the North Gate of the Port of Wilmington. Separated access would improve safety, reduce vehicular congestion, and significantly increase rail capacity.

- As future traffic volumes grow at the Port of Wilmington, investigate the feasibility of a new rail bridge across the Cape Fear River from the port area connecting to the rail network in Brunswick County. This would remove port rail traffic from Wilmington.

Global TransPark

- Lease the GTP spur (owned by NCDOT) to a private rail operator.
- Examine GTP's authority to optimize its competitiveness for state and federal grant funds for capital improvement projects.
- Investigate retaining State ownership of the North Carolina Railroad Company's water access property in New Bern as a potential barge transload facility for oversized cargo loads.
- To prepare for the long term, conduct the environmental analysis for a CSXT spur from the GTP to railroad point "Elmer" in Kinston and obtain the advance right-of-way.

Port of Morehead City

- In the short term, pursue a super-street style advanced and coordinated traffic plan to reduce rail and truck Port traffic conflicts with vehicle and pedestrian traffic on US-70 Arendell Street.
- Implement an on-port loop track to build/break unit trains.
- Establish the GTP to Morehead City Highway and Rail Mobility Corridor and continue to evaluate a potential Northern Carteret Rail and Highway Bypass as market conditions evolve

Additional Freight Rail Needs and Opportunities:

- Maintain short line support programs such as the Rail Industrial Access Program and Short Line Industrial Access Program via Freight Rail & Rail Crossing Safety Improvement funds (FRRCSI) to aid NC industries in accessing Class I rail networks.
- Continue efforts to partner with railroads to evaluate placing an intermodal facility in Eastern NC or Eastern Piedmont to help mitigate

future highway congestion's impacts on the Triangle region's access to intermodal service(s) that are currently located in Charlotte and Greensboro. A facility may also support agriculture and related industries in eastern North Carolina and enhance the ability of goods to reach domestic and international markets through North Carolina and/or regional ports. Also, support the expansion of existing CSXT and NS intermodal facilities in Charlotte and Greensboro.

- Leverage private sector rail capacity investments and augment them to foster truck-to-rail mode shifts. For example, mobilize collateral efforts as appropriate, such as rail training programs to offset the declining numbers of truck drivers.
- Support the Secretary of Transportation's initiative to identify rail industry workforce education and training needs and meet them through the community college system.

2.3.6 Passenger Rail Needs and Opportunities

2.3.6.1 Passenger Rail Needs Assessment

After evaluating the rail, highway, air, transit trends, land use, population, and employment trends and evaluating the various rail corridors in North Carolina, the following passenger rail needs and opportunities were developed. The needs were placed in these categories: existing markets, emerging markets, and operational/financial.

2.3.6.1.1 Existing Passenger Rail Market Needs

1. There is a need for additional rail services in North Carolina, as seen in the nearly doubling of rail ridership in the past 12 years. This growth in passenger rail ridership was nearly five times greater than growth of the state's population during this same time period. Moreover, during this same timeframe, per capita VMT declined in North Carolina and the US. The area with the highest ridership and greatest increases in ridership continues to be along the state's urbanized areas in the Piedmont corridor.
2. Better service to the Charlotte region which continues to be a top destination for interstate and intrastate air and rail travel for North Carolina. This is reflected in the air travel, which shows Charlotte as the first or second ranked destination for all commercial airports in North

Carolina. Data from the *Carolinian* and *Piedmont* also show that Charlotte and the Triangle region (Durham, Cary, and Raleigh) are the top city pairs for ticket sales.

3. Rail ridership growth is placing a strain on some existing passenger rail services. Often trains are full during peak travel periods and station overcrowding is becoming common in Charlotte and Raleigh (see operational and financial needs below for more detail).
4. Improved connections with the Northeast Corridor are needed, as cities along the Northeast Corridor continue to be top rail trip origins and destinations for North Carolinians. This is reflected in a review of the most popular rail trip pairs for the *Carolinian*, as well as a review of top destinations for air travelers in North Carolina. This growth in the North Carolina-Northeast Corridor rail market is despite the fact that passenger rail travel times between North Carolina cities and the Northeast Corridor (Washington, DC, New York, etc.) are currently not competitive with flying and driving. This concurs with the findings that this is an under-served travel market for rail, as reflected in the ridership and revenue studies conducted by both NCDOT and FRA.

2.3.6.1.2 Emerging Passenger Rail Market Needs

1. Most of the state's population growth outside of the Charlotte-Raleigh corridor will be in other urban areas currently without passenger rail service. Metropolitan areas such as Winston-Salem, Asheville and Wilmington are projected to capture a significant share of the state's population growth. Corridors serving these growing regions should be investigated for possible passenger rail service or motor coach connections.
2. There is a need to address growth in North Carolina's urban corridors served by I-40, I-85 and I-95 that contributes to the traffic congestion along key highways, and trains are often full during peak periods. While growth in per capita VMT may be flat, these critical highway corridors will see the lion's share of future growth in employment, residents, and traffic congestion.
3. There is a growing travel market between Charlotte and Atlanta, Georgia, as seen in a review of air travel data. More frequent and faster passenger rail service to Atlanta is also part of the Federally-Designated Southeast Corridor long-term plan.

2.3.6.1.3 Passenger Rail Operational and Financial Needs

1. The state's most popular stations – Charlotte and Raleigh – often face overcrowding. Charlotte and Raleigh have the highest ridership numbers in the state but are also the only two stations served by the *Carolinian* that have not seen a substantial renovation or construction of a new station. Raleigh will begin construction on the first phase of a new station in 2015. As of 2014, there is no funding available for construction of a new Charlotte station.
2. There is a clear need for better transit connections at stations. Parking shortages at stations illustrate the need for better overall connections – including pedestrian and bicycle, and transit, including commuter rail. As North Carolina's cities look to implement transit improvements, these should include multimodal connections with current or future intercity rail services.
3. On-Time Performance (OTP) has dropped nationally and for all passenger trains serving the state. This drop in OTP is due to a variety of factors, including capacity issues along key corridors, limited parking at overcrowded stations and longer dwell times at stations.
4. There is no long-term dedicated rail funding at the federal or state level for passenger rail improvements and operations.
5. Equipment expansion will be needed to meet long-term growth. NCDOT purchased and refurbished used passenger rail equipment to operate the *Piedmont* services. After starting service with the planned fourth and fifth Charlotte-Raleigh trains, NCDOT will have no spare equipment. Moreover, a larger maintenance facility will be needed in Charlotte to clean, service, and refuel trains that terminate and originate in the Charlotte area.

2.3.6.2 Passenger Rail Opportunities

After evaluating the passenger rail needs, the following opportunities were developed to address the above needs. Each opportunity represents one or more potential projects, and each opportunity can help meet more than one need identified above.

1. Partner with local governments, Amtrak and others to extend bus services and explore new commuter and regional rail service to existing and emerging urban/suburban corridors. Metropolitan areas currently not

served by passenger rail such as Winston-Salem, Asheville and Wilmington are projected to have a significant share of North Carolina's population growth. Extending rail services will help ensure the economic vitality of these regions.

2. Improve infrastructure in the Raleigh to Greensboro corridor to increase average speed and capacity, and construct a new Charlotte station (with associated track improvements) to increase capacity.
3. Add the 4th and 5th frequencies (3rd and 4th *Piedmont* trains) and stations at points including Hillsborough, Lexington and Harrisburg to serve the growing population in the I-40/I-85 corridors.
4. Continue to work, through regional partnerships, towards implementing the federally-designated Southeast Corridor, including the Virginia-North Carolina Interstate Rail Compact and investigating joint operations or expansion of each state's existing state-supported services. A fully operational Southeast Corridor (Charlotte-Raleigh-Richmond, Virginia-Washington, DC) is projected to have annual revenues that will exceed operating costs – which would provide a basis for a concession or franchise to operate and maintain the line.
5. Develop new multimodal stations in Charlotte and Raleigh. The Raleigh Union Station is currently under design and will start construction in 2015, and has an opportunity to be a true transportation and economic catalyst for the state's capital. NCDOT must also explore options with the Charlotte Area Transit System to develop Charlotte Gateway Station to meet projected demand. Completion of these “book-end” stations will generate a significant increase in the state's overall rail passenger ridership.
6. Evaluate service operations and collaborate with stakeholders to improve customer service, reduce costs, and find other efficiencies.
7. Cultivate station development public-private partnerships to reduce capital and operating costs to the state and evaluate new financial sources through potential local municipal, MPO, RPO, and private partnerships to fund existing and future expansion of passenger services. Partnerships with local and regional transportation agencies can help ensure that multimodal

stations continue to provide the regional connectivity that is needed for economic growth

8. Assess near-term service improvements on existing services and at existing stations to increase ridership and revenue including new marketing opportunities.
9. Evaluate recent federal and state funding programs for passenger rail to see which have been most effective.
10. Implement a variety of improved connections at stations including transit, pedestrian and bicycle connections, and taxi.
11. With Charlotte's emergence as a major air hub, investigate extending and operating intercity passenger rail service or commuter rail service to Charlotte Douglas International Airport.
12. Invite other state within the federally-designated Southeast Corridor (South Carolina, Georgia and Florida) to join the Virginia-North Carolina Interstate Rail Compact. To join the compact, these states must adopt the identical legislation adopted by North Carolina and Virginia, and both North Carolina and Virginia would need to pass legislation to accept the new members.

3 Chapter Three – Proposed North Carolina Passenger Rail Improvements and Investments

This chapter describes the proposed passenger rail improvements, including the service plans and financial components of some programs. It also describes how each proposal will address gaps in service, the benefits of the services, and financial needs identified in Chapter 2.

3.1 CORRIDOR AND PROJECT ANALYSIS

Governor McCrory's 25-Year Vision identified improving the public transportation network, including improving passenger rail service as a major component. Two goals in particular speak directly to the passenger rail improvements and investments identified in the Comprehensive State Rail Plan. The vision calls for the expansion of access to passenger rail options in all regions of the state to accommodate a changing demographic, address congestion issues and meet regional transportation needs. The vision also calls for expanding access to mass transit options in high-growth areas to accommodate a changing demographic and address existing and future congestion. The prioritization methodology used in Chapter 2 ensures harmony between the Governor's Vision and the recommendations for improvements and investments in our passenger rail network.

The corridor prioritization results from Chapter 2 were analyzed and each corridor – or a combination of corridors – was analyzed to determine what potential passenger rail programs and projects could be implemented to help meet the transportation needs and opportunities for the state.

Of the corridors in the Investment Tier (top tier), Corridors 09 and 06 are already served by Amtrak as the Piedmont corridor and are parts of the federally designated Southeast Corridor. NCDOT has invested in these corridors as part of the Piedmont Improvement Program and other programs, and will continue to do so to help implement the Southeast Corridor. Corridor 15 is an important link for both the state-supported *Carolinian* and Amtrak's Silver Service trains that run from the Northeast Corridor to Florida. This corridor

also scored in the top Tier for freight as well, as it is an important north-south link paralleling I-95 (see Chapter 4). Portions of Corridor 06 in the Charlotte region should also be considered a candidate for commuter rail or other high capacity transit services. Corridor 09 has also been selected for future commuter rail in the Triangle region (see section 3.8). The remaining Investment Tier corridors are shorter in length and should be considered candidates for commuter rail or other improved transit services (Corridors 05, 08, 12, 26, 35, and 42).

Of the Stewardship Tier corridors, some have either existing Amtrak service or Amtrak Thruway bus service (Corridors 13, 14, 16, and 17) and have been or are planned for evaluation for passenger rail service expansion, or are part of corridors that have been or will be studied for service expansion for either motor coach service, passenger rail, or both.

The purpose of the proposed passenger rail improvements and investments is to address the passenger rail needs identified in Chapter 2. Moreover, the projects selected for inclusion in this State Rail Plan were identified because of their potential to support North Carolina's mission and objectives for a successful multimodal transportation system. Many of the projects, particularly those that expand the passenger rail network and transit options, are also consistent with the Governor's 25-Year Vision to transform our state's transportation system.

As stated in Chapter 2, the Passenger Corridor Prioritization Tiers analysis is primarily based upon data showing existing or projected needs, and not feasibility or cost-effectiveness. The feasibility of some projects and programs are evaluated here and in Chapter 5. In addition to evaluating the passenger corridors, the State Rail Plan evaluated the passenger rail needs and opportunities from Chapter 2 to develop possible programs, projects and studies described in this Chapter.

Figure 3-1 shows the tiered passenger rail corridors. Table 3-1 summarizes the passenger rail recommendations, and notes which rail corridors are included in the recommended projects, programs, and studies. The remaining sections of Chapter 3 describe these projects, programs and studies in greater detail.

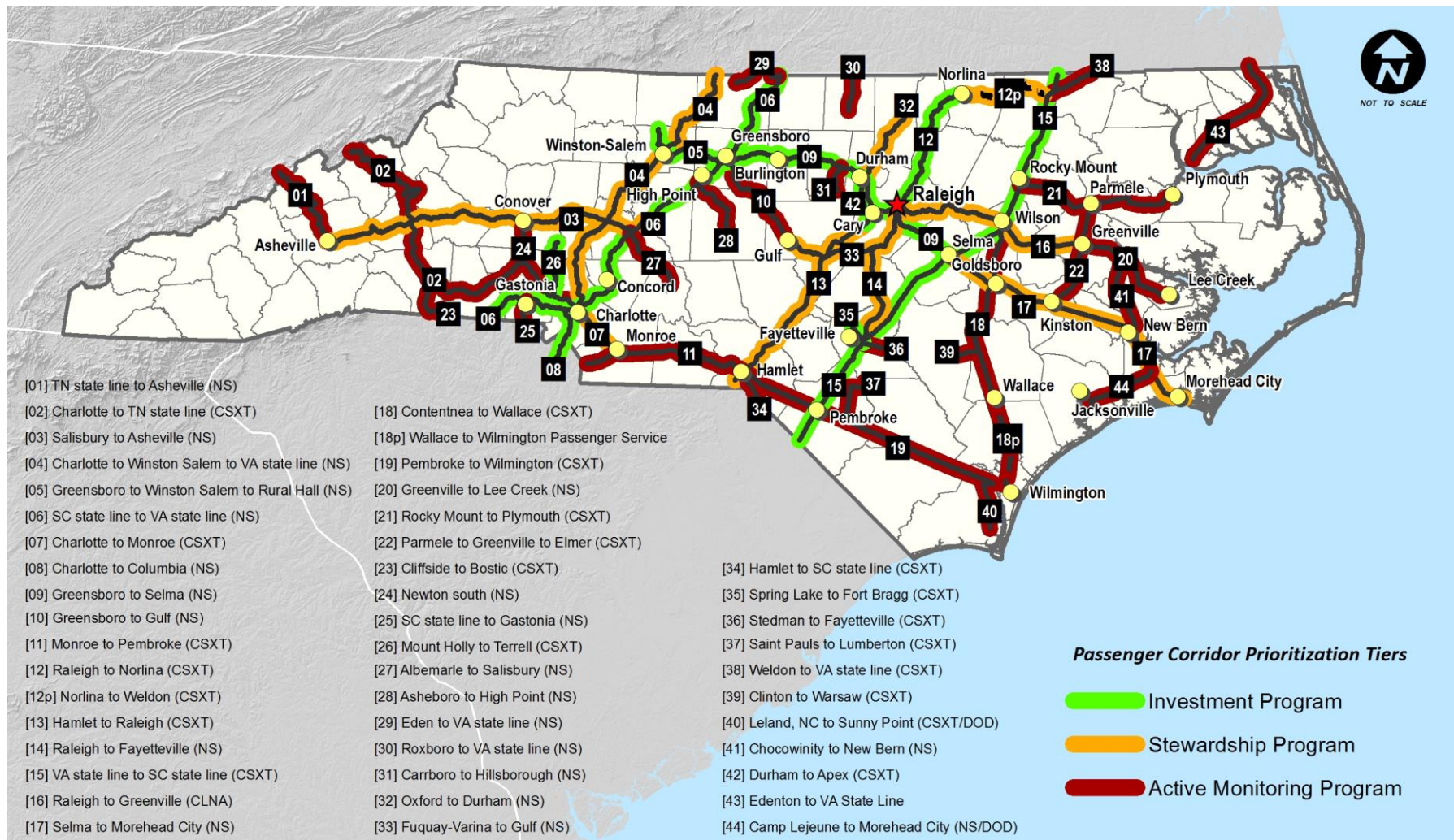


Figure 3-1 Prioritized Passenger Rail Corridors

Table 3-1 Passenger Rail Corridor Tiers and Potential Projects

Passenger Program	Segment Description	Corridor Included	Corridor Route	Railroad	Parallel Highways	Passenger Tier	Potential Passenger Rail Projects
3.2.1 Piedmont Corridor	Charlotte to Greensboro	06	SC state line to VA state line	NCRR/NS	I-85, US-29	Investment	Travel time improvements, new stops, station improvements
	Greensboro to Raleigh	09	Greensboro to Selma	NCRR/NS	I-40, US-70	Investment	Travel time improvements, new stops, station improvements
3.2.2 Washington, DC-Charlotte (Southeast Corridor)	Raleigh to Richmond, VA	12	Raleigh to Norlina	CSXT	US-1	Investment	Re-introduce passenger rail service
	Charlotte to Greensboro	06	SC state line to VA state line	NCRR/NS	I-85, US-29	Investment	Travel time improvements, station improvements
	Greensboro to Raleigh	09	Greensboro to Selma	NCRR/NS	I-40, US-70	Investment	Travel time improvements, station improvements
3.3 Statewide Thruway Service	Asheville, Western NC to Salisbury	03	Asheville to Salisbury	NS	I-40, US-70	Stewardship	Motorcoach service expansion (connects to <i>Piedmont/ Carolinian</i> service)
	Asheville to Winston Salem to Greensboro	05	Rural Hall to Winston-Salem to Greensboro	NS	I-40, US-52	Investment	Motorcoach service expansion (connects to <i>Piedmont/ Carolinian</i> service)
	Columbia, SC to Rock Hill, SC to Charlotte	08	SC state line (from Columbia) to Charlotte	NS	I-77	Investment	Motorcoach service expansion (connects to <i>Piedmont/ Carolinian</i> service)
	Raleigh to Fayetteville	14	Raleigh to Fayetteville	NS	US-401	Stewardship	Motorcoach service expansion (connects to <i>Piedmont/ Carolinian</i> service)
	Raleigh to Richmond, VA	12	Raleigh to Norlina	CSXT	US-1	Investment	Motorcoach service expansion (connects to <i>Piedmont/ Carolinian</i> service)
	Raleigh to Wilmington Raleigh to Morehead City	17	Selma to Morehead City	NCRR/NS	US-70	Stewardship	Motorcoach service expansion (connects to <i>Piedmont/ Carolinian</i> service)
	Raleigh to Wilmington	18p	Contentnea (Wilson) to Wallace	CSXT	US-117, US-13	Active Monitoring	Motorcoach service expansion (connects to <i>Piedmont/ Carolinian</i> service)
3.4 SENC Service Extension	Raleigh to Selma	09	Greensboro to Selma	NCRR/NS	I-40, US-70	Investment	Southeastern NC service expansion
	Selma to Goldsboro	17	Selma to Morehead City	NCRR/NS	US-70	Stewardship	Southeastern NC service expansion
	Goldsboro to Wilmington	18p	Contentnea (Wilson) to Wallace to Wilmington	CSXT	US-117, US 13	Active Monitoring	Southeastern NC service expansion

Passenger Program	Segment Description	Corridor Included	Corridor Route	Railroad	Parallel Highways	Passenger Tier	Potential Passenger Rail Projects
3.4 SENC Service Extension	Raleigh to Selma	09	Greensboro to Selma	NCRR/NS	I-40, US-70	Investment	Southeastern NC service expansion
	Selma to Pembroke (via Fayetteville)	15	SC state line to VA state line	CSXT	I-95	Investment	Southeastern NC service expansion
	Pembroke to Wilmington	19	Pembroke to Wilmington	CSXT	I-74/US-74	Active Monitoring	Southeastern NC service expansion
3.5 WNC Service Extension	Asheville to Salisbury	03	Asheville to Salisbury	NS	I-40, US-70	Stewardship	Western NC service expansion
3.6 Eastern NC Service	SC state line to VA state line	15	SC state line to VA state line	CSXT	I-95	Investment	Existing Amtrak service improvements
	SC state line to Hamlet to Raleigh	13	SC state line to Hamlet to Raleigh	CSXT	US-1, I-440	Stewardship	Existing Amtrak service improvements
3.7 Potential Intercity Corridors (Studies)	Raleigh to Greenville	16	Raleigh to Greenville	CLNA	US-64, US-264	Stewardship	Study corridor – extend <i>Piedmont</i> service
	Charlotte to Wilmington	07	Charlotte to Monroe	CSXT	US-74, I-277	Stewardship	Passenger rail study corridor
		11	Monroe to Pembroke	CSXT	I-74/US-74	Active Monitoring	Passenger rail study corridor
		19	Pembroke to Wilmington	CSXT	I-74/US-74	Active Monitoring	Passenger rail study corridor
	Charlotte to the Northeast via Lynchburg, VA	06	SC state line to VA state line	NCRR/NS	I-85, US-29	Investment	Passenger rail study corridor
	Raleigh to Hampton Roads, Virginia	12/	Raleigh to Norlina	CSXT	US-1	Investment	Passenger rail study corridor
		12p	Norlina to Weldon	CSXT	US 158	Stewardship	Passenger rail study corridor
		38	Weldon to VA state line	CSXT	NC 35, US-158	Active Monitoring	Passenger rail study corridor
	Raleigh to Morehead City	17	Selma to Morehead City	NCRR/NS	US-70	Stewardship	Passenger rail study corridor
	Charlotte to Mooresville	04	Charlotte to Winston-Salem to VA state line	NS	I-40, I-77, US-311	Stewardship	Commuter rail
3.8 Commuter Rail	Winston-Salem to Greensboro	05	Rural Hall to Winston-Salem to Greensboro	NS	I-40, US-52	Investment	Commuter rail
	Charlotte to Monroe	07	Charlotte to Monroe	CSXT	US-74, I-277	Stewardship	Commuter rail
	Charlotte to Rock Hill, SC	08	SC state line (from Columbia) to Charlotte	NS	I-77	Investment	Commuter rail

Passenger Program	Segment Description	Corridor Included	Corridor Route	Railroad	Parallel Highways	Passenger Tier	Potential Passenger Rail Projects
	Durham to Garner	09	Greensboro to Selma	NCRR/NS	I-40, US-70	Investment	Commuter Rail
	Raleigh to Youngsville	12	Raleigh to Norlina	CSXT	US-1	Investment	Commuter Rail
	Sanford to Raleigh	13	SC state line to Hamlet to Raleigh	CSXT	US-1, I-440	Stewardship	Commuter Rail
	Raleigh to Fuquay-Varina	14	Raleigh to Fayetteville	NS	US-401	Stewardship	Commuter Rail
	Mt-Holly to Charlotte (via Corridor 02)	26	Mt. Holly to Terrell	CSXT	I-485, I-77, NC 150, NC 27	Investment	Commuter rail
	Durham to Apex	42	Durham to Apex	CSXT	I-40, NC 147, NC 55, US-1	Investment	Commuter rail
	Edenton, Elizabeth City to Hampton Roads	43	Edenton to VA state line	C&A	US-17, NC 168	Active Monitoring	Commuter rail
		35	Spring Lake to Fort Bragg	CSXT	NC 87	Investment	None*
		02	Tennessee state line to Charlotte	CSXT	I-85, US-221, US-321	Stewardship	None
		01	Tennessee state line to Asheville	NS	I-40	Stewardship	None
		33	Fuquay Varina to Gulf	NS	NC 55, US-1, US-421	Stewardship	None
		32	Oxford to Durham	NS	I-85, US-15, US-70	Stewardship	None
		31	Carrboro to Hillsborough	NS	I-85, US-15, US-501	Stewardship	None
		21	Rocky Mount to Plymouth	CSXT	US-13, US-64	Active Monitoring	None
		20	Greenville to Lee Creek	NS	NC 33	Active Monitoring	None
		10	Greensboro to Gulf (Sanford)	NS	US-421	Active Monitoring	None
		22	Parrale to Greenville to Elmer	CSXT	NC 11, US-13	Monitoring	None
		41	Chocowinity to New Bern	NS	US-17	Active Monitoring	None (existing Amtrak Thruway motor coach service)
		27	Albemarle to Salisbury	NS	US-29, US-52	Active Monitoring	None

Passenger Program	Segment Description	Corridor Included	Corridor Route	Railroad	Parallel Highways	Passenger Tier	Potential Passenger Rail Projects
		28	Asheboro to High Point	NS	I-73, US-220, US 311, US-64	Active Monitoring	None
		37	Saint Pauls to Lumberton	CSXT	I-95, US-301, NC 87	Active Monitoring	None
		40	Leland NC to Sunny Point	CSXT/DOD	US-17, US-421, US-74	Active Monitoring	None
		23	Cliffside to Bostic	CSXT	US-221	Active Monitoring	None
		30	Roxboro to VA state line	NS	US-158, US-501	Active Monitoring	None
		29	Eden to VA state line	NS	NC 14, NC 49, NC 87, US-220, US-58	Active Monitoring	None
		34	Hamlet to SC state line	CSXT	NC 79, US-74	Active Monitoring	None
		39	Clinton to Warsaw	CSXT	NC 24	Active Monitoring	None
		25	SC state line to Gastonia	NS	US-29, US-321	Active Monitoring	None
		36	Stedman to Fayetteville	CSXT	NC 24	Active Monitoring	None
		24	Newton south	NS	US-321	Active Monitoring	None
		38	Weldon to VA state line	CSXT	NC 35, US-158	Active Monitoring	None

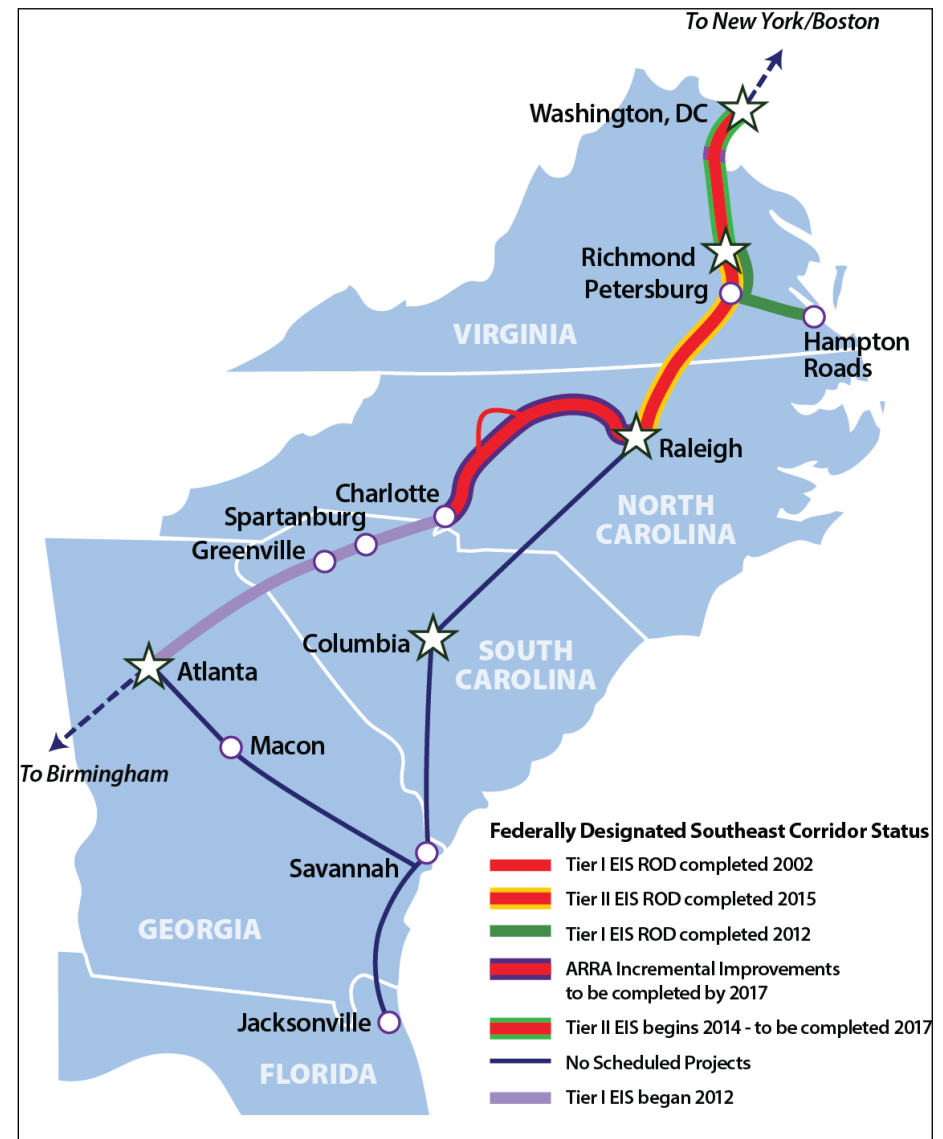
*This railroad is only approximately seven miles, and is too short for commuter rail. The corridor might support other transit services such as bus rapid transit or light rail. See Appendix D for further information.

Sections 3.2 through 3.8 describe the proposed passenger rail programs and services, including potential operations costs (if known). Section 3.9 summarizes these future services and programs and includes the capital costs.

3.2 SOUTHEAST CORRIDOR

The Southeast Corridor is a federally-designated passenger rail corridor that connects major cities in Virginia, North Carolina, South Carolina, Georgia and Florida. The Southeast Corridor serves the growing cities in the southeastern United States, as well as connects these markets to the Northeast Corridor, Amtrak's existing high speed rail corridor.

As described in Chapter 2, through the Virginia-North Carolina Interstate High-Speed Rail Compact both North Carolina and Virginia have been working with the Federal Railroad Administration (FRA), Amtrak, and others to increase average speeds, improve reliability, reduce travel times and add frequencies to meet the growing travel demand in this corridor. Once the corridor is fully operational with maximum operating speeds and with six to eight daily round trips, the North Carolina-Virginia portion of the Southeast Corridor is projected to have annual operating revenues exceed annual operating expenses by 2025. Figure 3-2 shows the Southeast Rail Corridor.



Source: NCDOT

Figure 3-2 Federally Designated Southeast Corridor

The sections below describe the steps needed to implement the Southeast Corridor and meet the needs and opportunities for this corridor identified in Chapter 2.

3.2.1 Piedmont Corridor: Raleigh to Charlotte

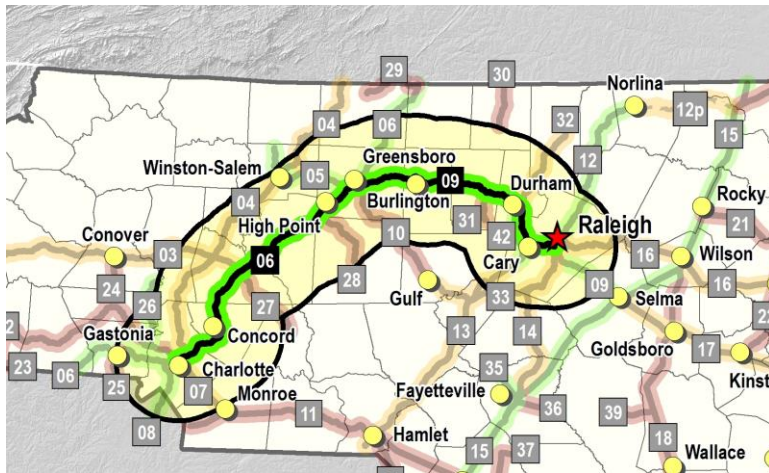


Figure 3-3 Piedmont Improvement Corridor

The service improvements for the Southeast Corridor include upgrades to the Raleigh to Charlotte segment, known as the Piedmont corridor, which is the most densely populated segment in North Carolina. These service improvements are key elements needed to implement the North Carolina portion and the overall vision of the federally-designated Southeast Corridor.

3.2.1.1 Fourth and Fifth Frequencies

The Piedmont corridor (connecting the Charlotte, Triad and Triangle regions) is the most densely populated portion of the Southeast Corridor in North Carolina. The Piedmont corridor is currently served by three daily round trip trains via one *Carolinian* and two *Piedmont* trains. Ridership on these trains has increased around 8 percent annually from 274,000 in 2004 to 488,000 in 2013. As described in Chapter 2, the Piedmont corridor consists of two corridors (Corridors 06 from Charlotte to Greensboro, and Corridor 09 from Greensboro to Raleigh) within the top rated Tier for passenger rail needs.

To meet the growing demand in this corridor, NCDOT and FRA have funded the Piedmont Improvement Program (PIP) to improve safety, capacity and speed in the Piedmont corridor. The PIP began in 2009 and includes station enhancements, infrastructure improvements and new passenger rail equipment to support additional passenger rail services in the Piedmont corridor. As part of the PIP, NCDOT has entered an agreement with the FRA, Norfolk Southern (NS) Railway, the North Carolina Railroad (NCR) Company and Amtrak to add a fourth and fifth daily round trip frequency between Charlotte and Raleigh. When completed in 2017, the PIP will allow NCDOT to increase the daily passenger rail frequencies in the corridor from three to five, with maximum allowable speeds at 79 mph for much of this corridor.

Station improvements are also being undertaken as part of PIP. These include an enlarged station at Cary, extended platforms and canopies at Kannapolis, Salisbury and Burlington, and parking improvements at High Point. All of these station improvements have been completed. The PIP also includes partial funding for the first phase of the Raleigh Union Station (RUS), which will replace the existing undersized Raleigh Amtrak station.

Because of the capacity improvements under the PIP, the fourth and fifth frequencies will operate without interference with NS freight operations and have a higher degree of reliability. The fourth and fifth frequencies will help meet the growing demand for service in the corridor, as evidenced by the rapid growth in ridership. By having morning, noon, afternoon and evening departures, the additional frequencies will provide a “shuttle” service that will be especially attractive for business travelers, college students and others and better connect the major urban centers in the Piedmont corridor. The additional frequencies will provide an alternative to driving the state’s busiest interstates, and will service several counties that are in non-attainment for air quality.

NCDOT plans to begin operating the fourth frequency in 2017, when the PIP is completed. The fifth frequency is scheduled to be implemented in 2019. Depending on the projected ridership levels and when the fifth frequency may begin service, NCDOT may need to acquire additional equipment and even expand parking and station facilities at some locations. As noted in Chapter 2, NCDOT projections indicate that adding the fourth and fifth frequency will

increase ridership on the state-sponsored trains from approximately 483,000 to over 864,000 within the next 10 years. Table 3-2 shows the projected ridership and revenue for these additional services.

Table 3-2 Projected Ridership and Revenue, Fourth and Fifth Frequencies

	EXISTING (3 FREQUENCIES)* - 2013	4 FREQUENCIES* 2018	5 FREQUENCIES* 2024
RIDERSHIP			
<i>Piedmont/Carolinian Trains</i>	482,700	626,700	864,100
Amtrak Long Distance Trains**	129,100	202,400	221,200
TICKET REVENUES			
<i>Piedmont/Carolinian Trains</i>	\$22,746,000	\$27,382,000	\$34,427,000
Amtrak Long Distance Trains**	\$19,170,000	\$25,663,000	\$27,961,000
PASSENGER MILES			
<i>Piedmont/Carolinian Trains</i>	114,220,000	137,280,000	173,020,000
Amtrak Long Distance Trains**	66,910,000	90,520,000	98,790,000

*3 Frequencies = 1 *Carolinian* round trip train, Charlotte to New York via the CSXT A Line, plus 2 *Piedmont* round trips trains, Charlotte to Raleigh. 5 frequencies = 1 *Carolinian* round trip train, Charlotte to New York via the CSXT A Line plus 4 *Piedmont* round trip trains, Charlotte to Raleigh. All services assume 79 mph Maximum Allowable Speed (MAS)

Carolinian ridership is for all trips,

**Amtrak Long Distance Trains: *Crescent*, *Palmetto*, *Silver Meteor*, *Silver Star* activity from NEC through NC only; includes connecting buses

Source: AECOM, Full year projections from reports produced in September 2013 and March 2014

The fourth frequency (to begin service in 2017) will be funded through a combination of ticket revenues, federal Congestion, Mitigation and Air Quality (CMAQ) funds, and Rail Division operating funds. The addition of a fourth Charlotte to Raleigh frequency will increase ridership and revenues, but will also require additional state operating and CMAQ funds. Chapter 5 includes a more information on the operating and finance plan for the four frequencies. Funding for operations for the fifth frequency is unknown at this time. Section 3.9 below describes the capital needs for the fifth frequency.

3.2.1.2 New Stops and Improved Stations

As part of an agreement entered by NCDOT and the railroads under PIP, the state is investigating adding new stops within the Piedmont corridor at Hillsborough, Lexington, and Harrisburg. The intent of adding stations is to increase ridership and revenue by serving growing markets in the corridor. The new stops would include associated track speed and reliability improvements so that the overall service quality between Charlotte and Raleigh is maintained. Once these three new stations are constructed, stations will be spaced approximately 17 miles along the Piedmont corridor. Adding these stations and frequencies are consistent with the Governor's 25-Year Vision for improving transit options within high growth areas and expanding access to passenger rail options to additional regions.

In 2014, the Hillsborough Station was selected to be funded under the Strategic Transportation Investments (STI) program. The benefit-cost of the other proposed stations will be evaluated to determine if they qualify for funding through the STI program. .

To accommodate the growing ridership at the state's busiest station, NCDOT (in coordination with the City of Charlotte) has also been planning for a new multimodal center to replace the existing Charlotte Amtrak station. The new Charlotte Gateway Station will also serve Charlotte Area Transit System (CATS) buses, and streetcar service. The long-term vision for the Charlotte Gateway Station is to also provide connections to future commuter rail service. The Environmental Assessment for the Gateway Station was completed in 2006, with NCDOT scheduled to complete the EA for the associated track improvements in 2015.

3.2.2 Washington, DC to Charlotte

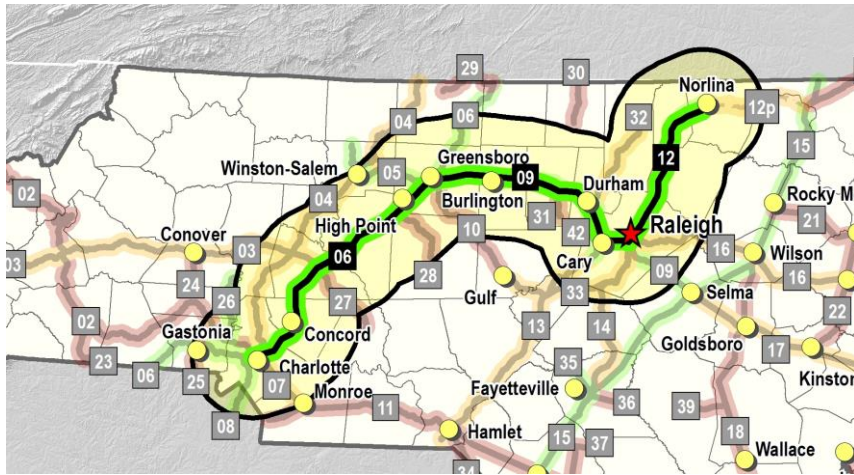


Figure 3-4 Federally Designated Southeast Corridor in NC

Through the Interstate High-Speed Rail Compact, North Carolina and the Commonwealth of Virginia are coordinating on studies and on steps to implement improvements along the Washington, DC to Charlotte segment Southeast Corridor.

Within Virginia, the primary passenger rail market for the Southeast Corridor is the Richmond to Washington, DC segment. The Virginia Department of Rail and Public Transportation (DRPT) recently completed \$377 million in projects within the Washington, DC-Richmond portion of the corridor improving capacity and on-time performance which benefits freight, intercity (Amtrak) and commuter rail. In 2012, Virginia extended improvements south and implemented a state-supported extension of a Northeast Corridor Regional roundtrip from Richmond to Norfolk via Petersburg. These capacity improvements help with future Southeast Corridor services. In 2012, DRPT

began a Tier II Environmental Impact Statement (EIS) for the Richmond to Washington, DC corridor.¹

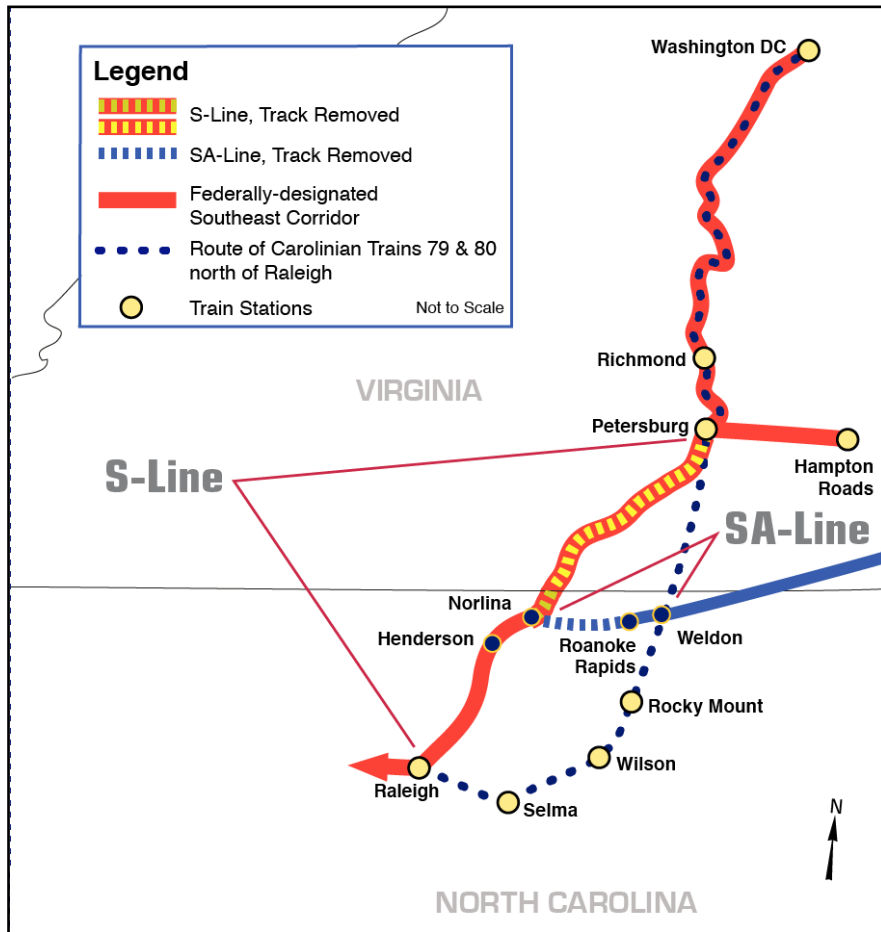
3.2.2.1 Raleigh to Richmond

A major portion of implementing the Southeast Corridor is to restore passenger rail service between Raleigh and Richmond, VA via the CSXT S Line (portions of which are unused or out of service). The CSXT S Line is shown as Corridor 12 in the State Rail Plan. Reconstructing the S Line to support 90 to 110 mph passenger rail speeds will provide a faster, more direct route (32 miles shorter) between Raleigh and Richmond. The restored S Line will provide the necessary capacity for Charlotte-Raleigh trains to continue north of Richmond to various Northeast Corridor destinations. This will meet the documented need to serve the growing North Carolina-Northeast Corridor travel markets. Without the restored S Line, additional capacity would need to be added to the NCR between Raleigh and Selma and the CSXT A Line between Selma and Petersburg in order to extend additional trains connecting the lucrative North Carolina-Northeast Corridor travel markets. Routing the additional passenger trains via the A Line would limit their maximum authorized speed to 79 mph versus 90 or 110 mph along the S-line, increase the conflicts with freight trains, and result in greater environmental impacts due to the additional tracks required.

The S Line right-of-way will need to be acquired and the line reconstructed along a majority of the route to support the faster passenger trains. The Raleigh Union Station will also require a second platform and track to allow passenger trains to serve the station via the S Line. A new station would also be constructed at Henderson. Figure 3-5 shows the location of the future S Line services. The reactivation and upgrade of the S Line for Southeast Corridor service will provide the opportunity for existing passenger services connecting portions of the North Carolina Piedmont Corridor to the Northeast Corridor to be re-routed to reduce travel times and help in reducing congestion along the A Line. The reactivation and upgrade of the S Line would also provide redundancy in the passenger rail network connecting the Northeast Corridor to the

¹ Virginia Department of Rail and Public Transportation. Virginia Statewide Rail Plan, chapter 5, November 2013.

Southeast in case of an emergency. The right-of-way and capital costs for restoring service on the S Line are included in Section 3.9.

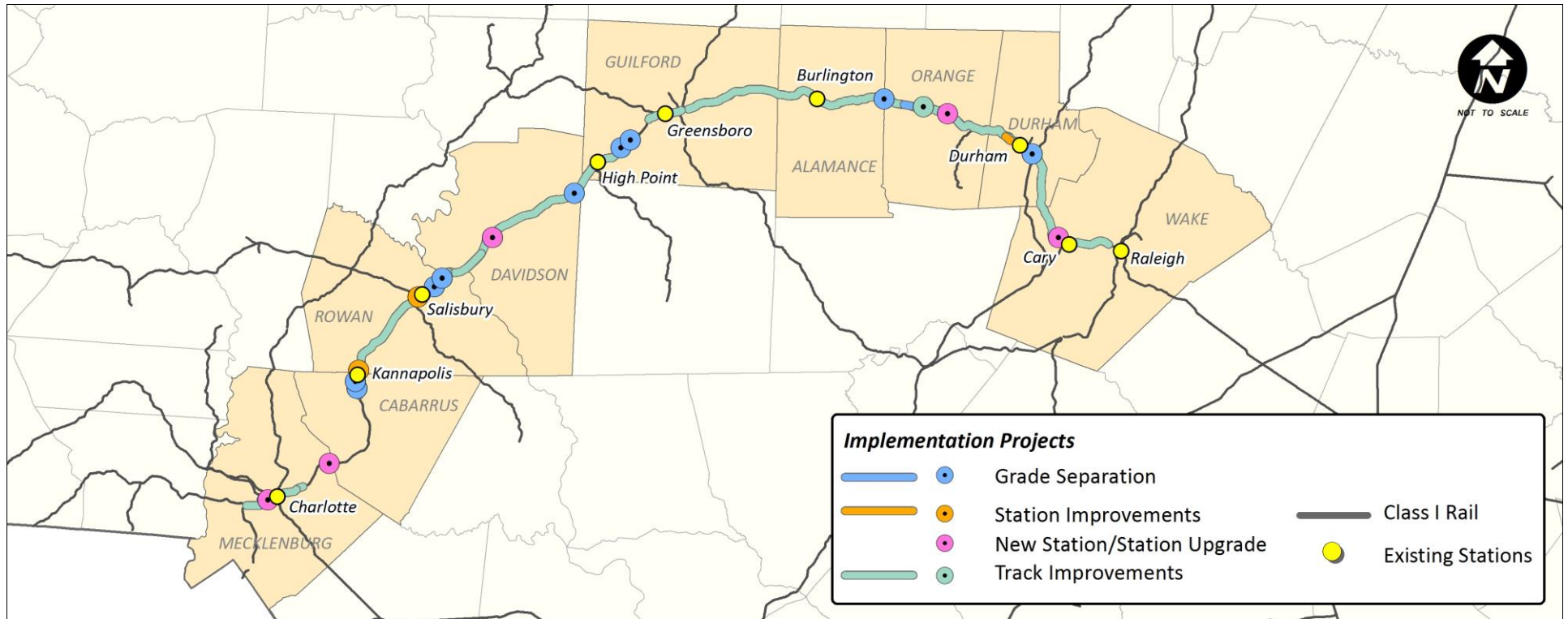


Source: NCDOT

Figure 3-5 Future S Line Segment of Southeast Corridor

3.2.2.2 Raleigh to Charlotte Capacity Improvements

Upon restoration and reactivation of the S Line, some of the Charlotte-Raleigh trains would be extended north to connect with the Northeast Corridor. However, additional capacity improvements between Greensboro and Raleigh are needed to support more than five frequencies and other infrastructure improvements are needed between Charlotte and Greensboro to support more than six frequencies. The necessary projects to support six or more frequencies include track speed and capacity improvements, grade separations, station upgrades, and the Phase 2 Expansion of the rail maintenance facility currently under construction in Charlotte. New passenger car and locomotives also are needed. The station upgrades needed include new platforms in Kannapolis, Salisbury, Durham, and Cary, as well as construction of the Charlotte Gateway Station and associated track improvements. Figure 3-6 shows the implementation projects for the corridor.



Source: NCDOT

Figure 3-6 Improvement Projects for Southeast Corridor

The funding for capital to implement the improvements and to operate the additional frequencies is still undetermined at this time. Furthermore, any additional corridor improvements and frequencies are dependent upon further negotiations with NS, NCRR, and Amtrak.

As noted in Chapter 2, the fully implemented Southeast Corridor is projected to produce annual passenger revenues that will exceed annual operating costs. Table 3-3 shows the projected ridership and revenue for the full Southeast Corridor.

Table 3-3 Projected Ridership and Revenue, Fully-implemented Southeast Corridor

	EXISTING* 2013	FULL BUILD* 2025	FULL BUILD* 2040
RIDERSHIP			
<i>Piedmont/Carolinian</i> Trains	482,700	1,866,700	2,526,900
Amtrak Long Distance Trains**	129,100	224,000	282,400
TICKET REVENUES			
<i>Piedmont/Carolinian</i> Trains	\$22,746,000	\$126,215,000	\$165,575,000
Amtrak Long Distance Trains**	\$19,170,000	\$28,303,000	\$35,277,000
PASSENGER MILES			
<i>Piedmont/Carolinian</i> Trains	114,220,000	495,310,000	654,510,000
Amtrak Long Distance Trains**	66,910,000	99,940,000	124,900,000

*Existing = 1 *Carolinian* round trip, Charlotte to New York via the CSXT A Line, plus 2 *Piedmont* round trips, Charlotte to Raleigh. Full Build = Southeast Corridor service for 8 round trips Charlotte to Raleigh, with 3 continuing to New York via CSXT S Line between Raleigh and Petersburg (and a 4th round trip that operates only Raleigh to New York via S Line between Petersburg & Raleigh), and 1 (the *Carolinian*) continuing to New York via the A Line. Full Build assumes up to 90 mph Maximum Allowable Speed (MAS) operations between Charlotte and Raleigh and up to 110 mph MAS between Raleigh and Richmond, and premium fares.

Carolinian ridership is for all trips,

**Amtrak Long Distance Trains: *Crescent*, *Palmetto*, *Silver Meteor*, *Silver Star* Activity from NEC through NC only; includes connecting buses

Sources: Full year projections from NCDOT and AECOM, September 2013

3.2.2.3 Carolinian Improvements

Within the next five to seven years, the existing equipment used on the *Carolinian* will have gone through its useful lifecycle and will require

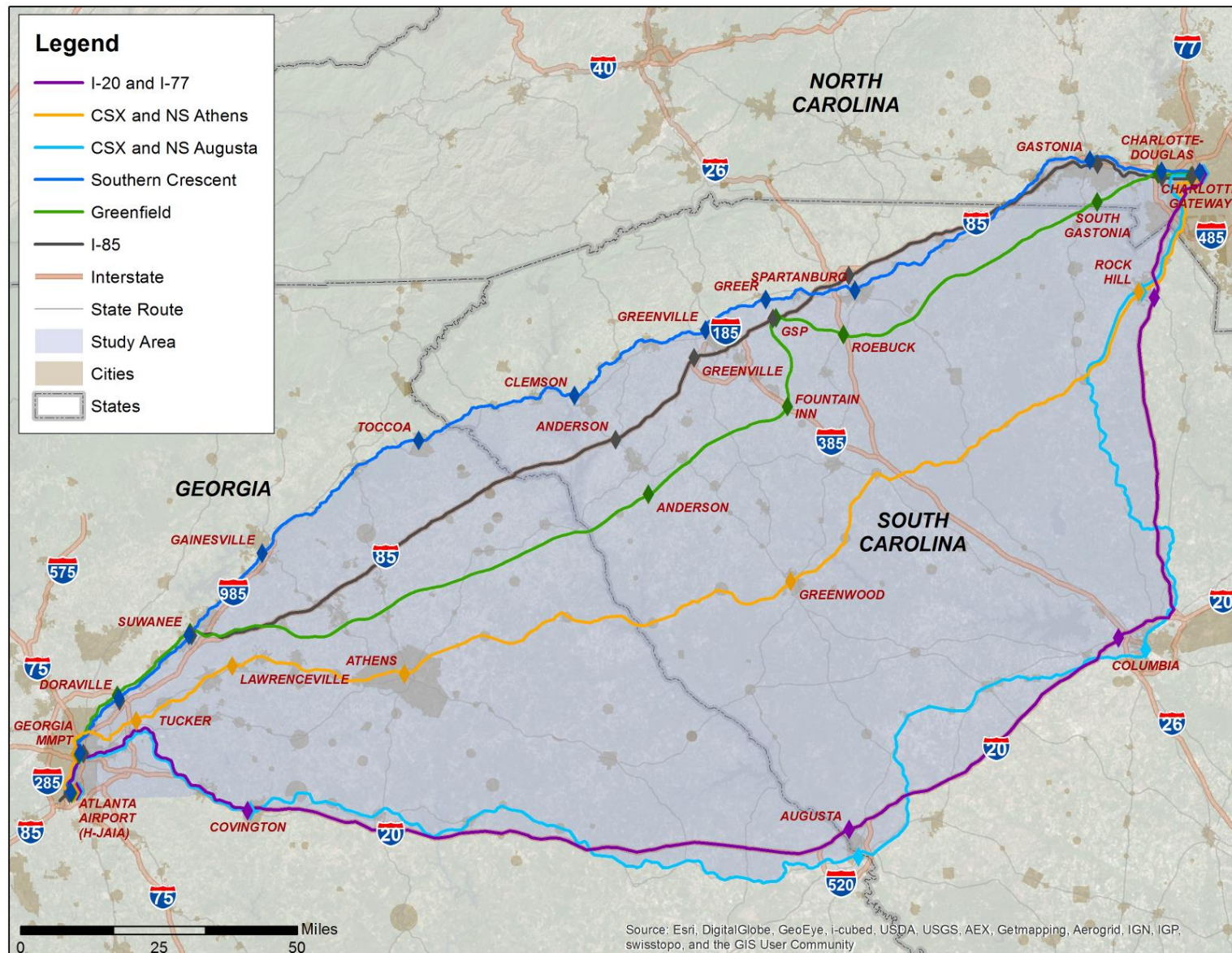
replacement. This new equipment will likely be funded by both the NCDOT and Amtrak.

3.2.3 Charlotte to Atlanta



Figure 3-7 Charlotte to Atlanta Portion of Southeast Corridor

As noted in Chapter 2, Atlanta is one of the top destinations for air travel from North Carolina airports. The Georgia Department of Transportation is currently undertaking a Tier I EIS for the Charlotte to Atlanta rail corridor. The EIS includes an analysis of travel markets (to determine the project need, including potential ridership) and a project implementation plan. The draft EIS is scheduled to be completed by mid-2015, with a Final EIS and Record of Decision completed by early to mid-2016. Figure 3-8 shows the study area and possible alignments for the Charlotte to Atlanta passenger rail corridor.



Source: Georgia Department of Transportation, Atlanta to Charlotte Passenger Rail Corridor Investment Plan

Figure 3-8 Charlotte to Atlanta Passenger Rail Corridor Study Area

3.3 STATEWIDE THRUWAY SERVICE

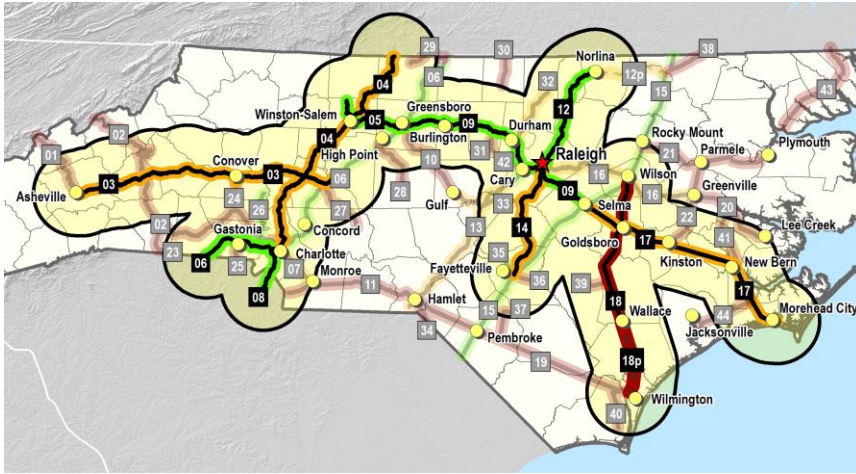


Figure 3-9 Corridors for Potential Thruway Service Extensions

As described in Chapter 2, North Carolina currently has two intercity bus connectors sponsored by Amtrak or NCDOT that serve rail passengers. The first is a dedicated Amtrak Thruway Service that operates twice daily along two routes stopping at eight locations in eastern North Carolina. The Thruway buses connect with Amtrak services in Wilson. The first route connects Wilson to Morehead City, stopping in Greenville, New Bern, and Havelock; the second route connects Wilson and Wilmington, with stops in Goldsboro, Kinston, and Jacksonville.

The other connector service is provided by the Piedmont Authority for Regional Transportation (PART) and the NCDOT. Marketed as the NC Amtrak Connector, the bus is also known as PART Route 5 that serves the general public with an agreement that allows ticketed Amtrak passengers to also reserve seats on the bus while making train reservations. The buses operate six times daily and connect Winston-Salem and High Point, providing connections to/from the *Carolinian* and *Piedmont* trains at the High Point station.

Similar bus feeder and connections operate across the US and provide an effective transportation service when the extensions or passenger rail routes are not financially feasible or when the projected ridership does not warrant expansion.

The NCDOT is evaluating extending Thruway Services (motor coach services) on the following routes that would connect to the *Piedmont* and *Carolinian* passenger rail services. These include routes that have been identified for potential passenger rail services in previous studies, and connect metropolitan areas that currently have no passenger rail service but are along corridors that were rated high for prioritized passenger rail services in Chapter 2.

- Greensboro-Winston-Salem-Asheville-Western, NC (or Salisbury-Asheville-Western, NC)
- Raleigh-Henderson-Richmond
- Charlotte-Greenville/Spartanburg
- Raleigh-Goldsboro
- Raleigh-Wilmington
- Charlotte-Rock Hill-Columbia
- Raleigh-Fayetteville

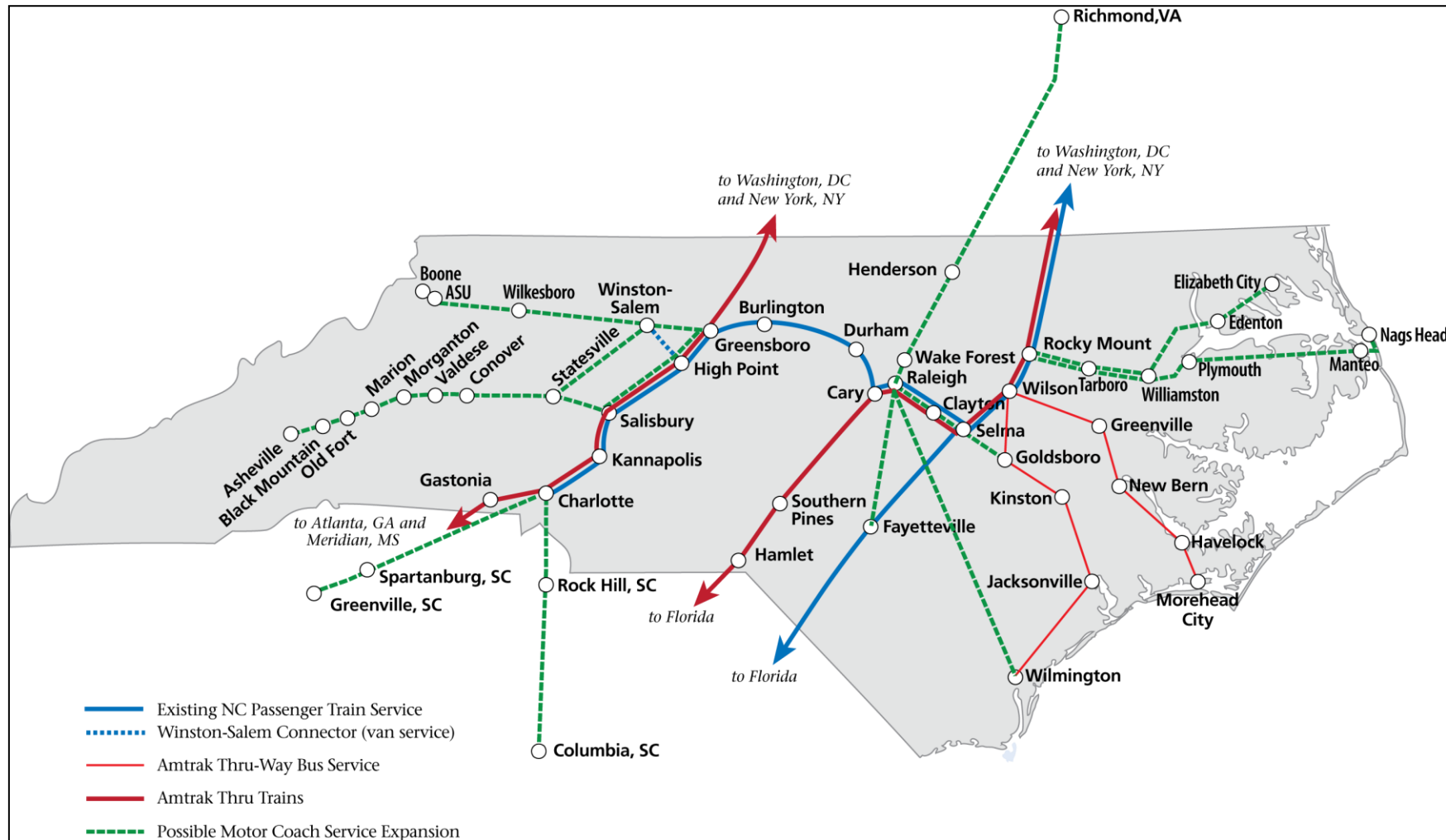
For all of the above routes, intermediary stops will be evaluated as well. It should be noted that these Thruway Services will both increase ridership on the existing state-sponsored *Piedmont* and *Carolinian* trains, and build ridership for future expansion of passenger rail service along new corridors. Most Thruway services are funded and operated by Amtrak, although some connector services are partially funded through state and local funds. The costs of these connector services are unknown at this time. NCDOT will look at the feasibility of an integrated ticket for customers traveling to and from destinations connected by combined use of bus and rail modes. The expanded Thruway Bus network is consistent with Governor McCrory's 25-Year Vision for expanding access to passenger rail options to additional regions.

In addition to the rail corridors studied as part of the State Rail Plan, the NCDOT Rail Division is evaluating the following routes for potential expansion of Thruway Service:

- Rocky Mount to Elizabeth City
- Rocky Mount to Nags Head
- Greensboro to Boone

It should be noted that there are no active rail corridors serving Nags Head or Boone, and no rail corridor connecting Rocky Mount and Elizabeth City; therefore, these potential Thruway Services would not be candidates for conversion to passenger rail service in the future.

Figure 3-10 shows the potential routes for these Thruway Services.



Source: NCDOT

Figure 3-10 Potential Thruway Service Extension

3.4 SOUTHEASTERN NC SERVICE EXTENSION

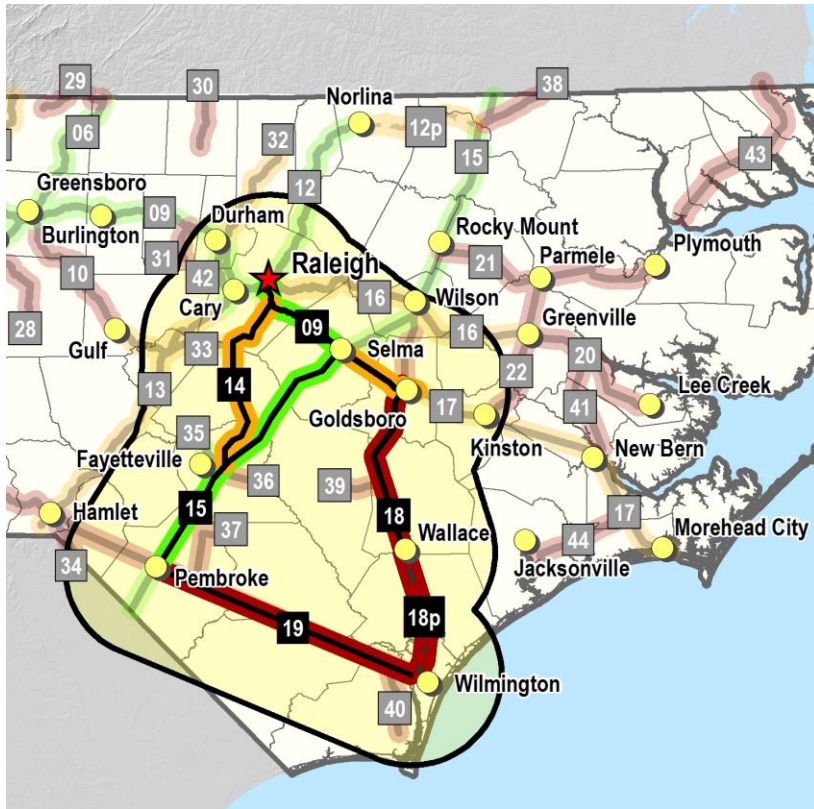


Figure 3-11 Southeastern NC Service Extensions

Since 2001 NCDOT has been evaluating expanding passenger rail services to Wilmington, as Wilmington is one of the larger metropolitan areas in North Carolina currently without passenger rail service. Also, Wilmington and the Southeastern North Carolina Beaches are major tourist destinations.

3.4.1 Proposed Operations

Based upon the 2001 and 2005 feasibility studies, this new service will consist of one daily round trip train leaving Wilmington in the morning and arriving in Raleigh mid-morning, allowing passengers to connect with either the current

Carolinian or *Piedmont* trains, future Southeast Corridor trains, as well as with the *Silver Star*, *Silver Meteor* or *Palmetto* trains. The return service would begin from Raleigh in the later afternoon/early evening, allowing connections from the current *Carolinian* and *Piedmont* services (and with other future Southeast Corridor trains). Travel time would be approximately between 3 hours 30 minutes and 2 hours, 30 minutes, depending on the level of track improvements and the maximum track speeds. Two potential routes are still under consideration: one would connect via Goldsboro, with potential intermediate stops at Selma, Goldsboro, Wallace, and Warsaw, and the other would connect via Fayetteville, with potential intermediate stops in Selma, Fayetteville, Pembroke and Lumberton.²

3.4.2 Proposed Infrastructure Needs

Necessary infrastructure improvements for the service via Goldsboro include upgrading the track between Selma, Goldsboro and Wallace, constructing a series of tracks connecting the NCCR (Corridor 17) to CSXT (Corridor 18) in Goldsboro, and restoring the track between Wallace and Castle Hayne. Track from Castle Hayne to downtown Wilmington would also need to be upgraded. New stations will need to be constructed in Wilmington and Warsaw. Historic stations in Wallace and Goldsboro will need to be upgraded. Positive Train Control (PTC) will also be required along the entire corridor. If this alignment is selected, these improvements would be completed in conjunction with restoring freight service in the Wallace to Castle Hayne corridor and other access improvements to the Port of Wilmington as described in Chapter 4. Alternatively, if the preferred route is via Fayetteville, the line between Wilmington and Pembroke would need to be upgraded since the corridor currently has a maximum speed of 40 mph due to track and signal conditions. Some of the improvements needed along this route include the currently programmed track connection at Pembroke to allow trains to move from the east-west line onto the CSXT A Line that runs through Fayetteville, Selma, and Rocky Mount and on to the Northeast. A second track connection would be

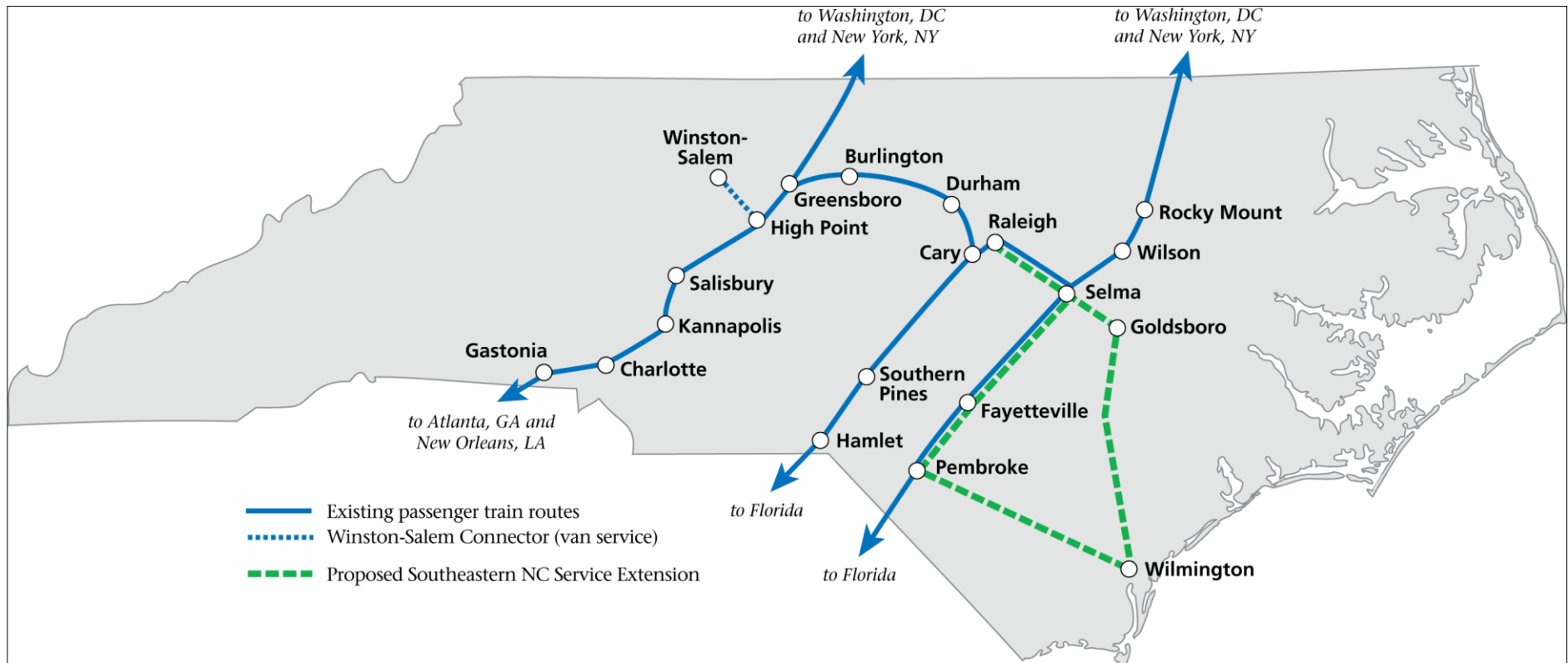
² North Carolina Department of Transportation Rail Division. Southeastern North Carolina Passenger Rail Feasibility Study Summary Report, May 2001. Southeastern North Carolina Passenger Rail Summary Report, July 2005.

needed at Selma to permit trains to leave the A Line and proceed west over the NCRR to Raleigh. The crossings between Wilmington and Raleigh would need to be upgraded to include flashing lights, crossing gates and modern warning devices³³.

As described in Chapter 2, the restored Raleigh-Goldsboro-Wilmington service is projected to have annual ridership of approximately 29,000 in the first year of operation. There are no current ridership projections for the route via Fayetteville. Currently Amtrak operates Thruway Service buses connecting Goldsboro and Wilmington to Wilson. As described in Section 3.3, NCDOT is evaluating implementing new Thruway Service connecting Raleigh-Goldsboro-Wilmington as a first phase.

A revised study should be undertaken to calculate potential ridership, revenue and costs since the most recent study was completed nearly 10 years ago. This updated study must also consider the feasibility and capital needs to ensure that the existing and projected freight rail traffic is not negatively impacted with the introduction of new passenger rail service. Figure 3-12 shows the possible routes for this new service.

³³ North Carolina Department of Transportation Rail Division. Southeastern North Carolina Passenger Rail Summary Report, July 2005.



Source: NCDOT

Figure 3-12 Potential Southeastern NC (Raleigh-Goldsboro-Wilmington) Service

3.5 WESTERN NC SERVICE EXTENSION

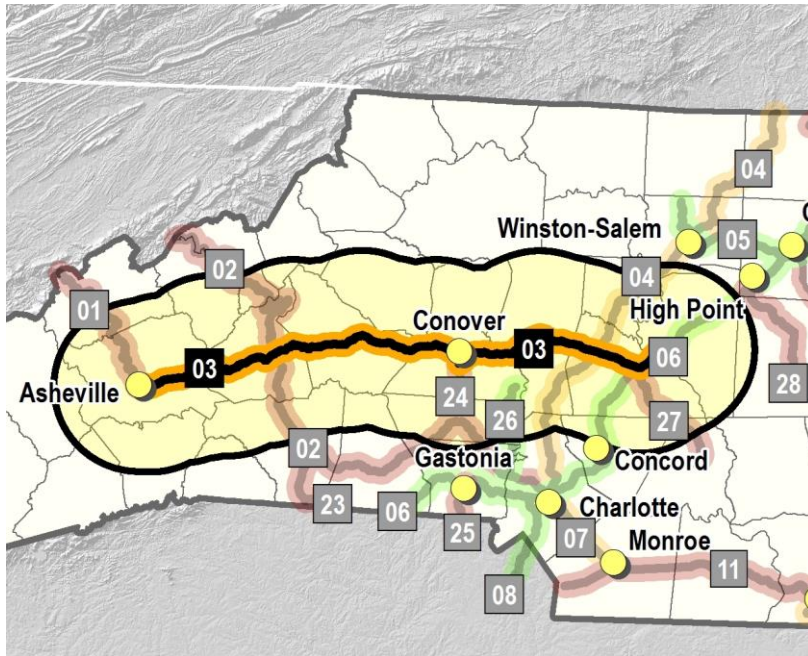


Figure 3-13 Western NC Service Extension

In 2001 NCDOT began evaluating the extension of passenger rail service to Asheville, which is one of North Carolina's top tourist destinations and one of the larger metropolitan regions without passenger rail service. The Salisbury-Asheville corridor (Corridor 03, see Figure 3-13) was noted for potential passenger rail expansion in the prioritization analysis completed in Chapter 2.

3.5.1 Proposed Operations

Based upon previous studies, the proposed Western North Carolina service would include two daily round trips between Salisbury and Asheville, with additional stops in Statesville, Conover, Valdese, Morganton, Marion, Old Fort and Black Mountain. The first eastbound train would leave Asheville in the early morning, arriving in Salisbury mid-morning. The second eastbound train would leave Asheville mid-afternoon and arrive in Salisbury late afternoon.

Westbound services from Salisbury to Asheville would depart mid-morning and evening. The schedules would allow for connections with the *Piedmont* and *Carolinian* trains, both northbound and southbound.⁴

3.5.2 Proposed Infrastructure Needs

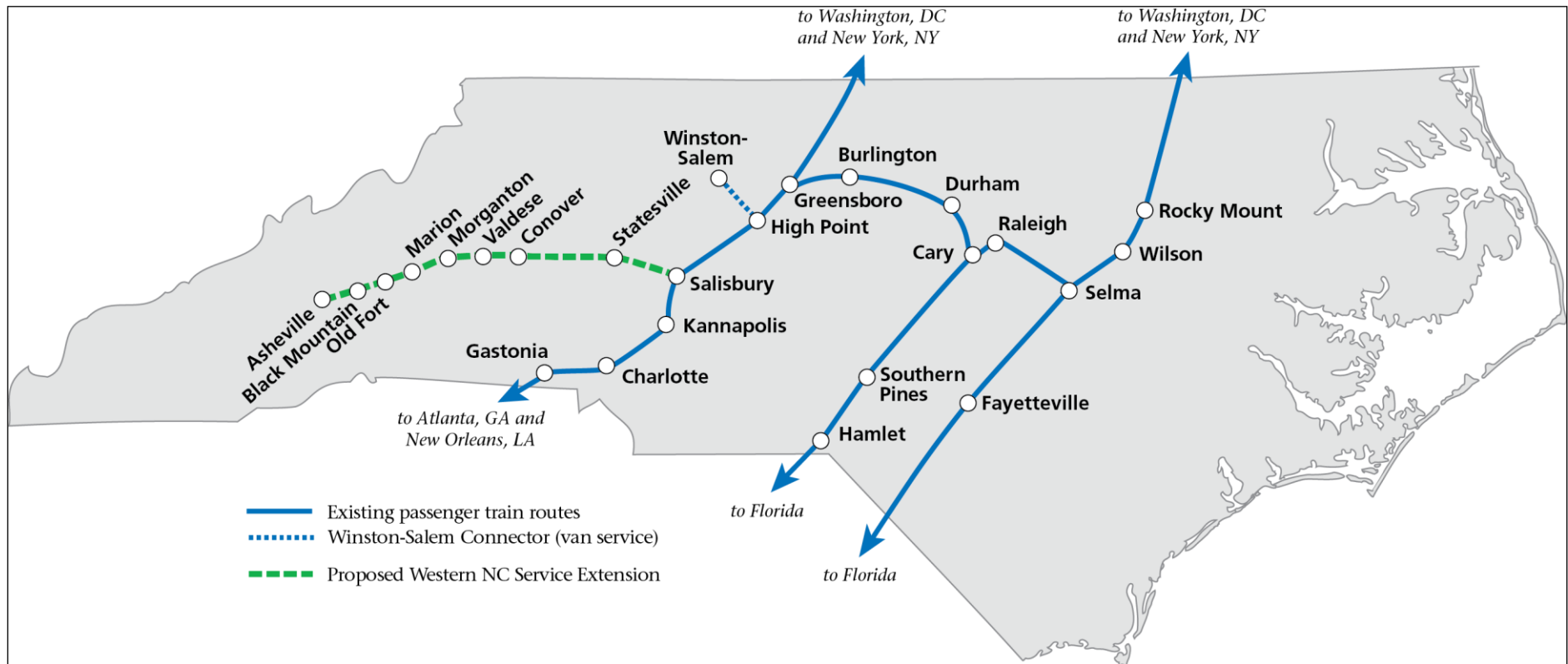
Necessary infrastructure improvements to complement the service include upgrading the track between Salisbury and Asheville to accommodate the passenger trains. NS will install Positive Train Control (PTC) along the corridor by late 2015 to meet FRA requirements, and NCDOT will need to equip their locomotives with PTC technology for the service extension. Several historic stations along the line have been renovated but would require upgrades when service resumes. A new multimodal station and a maintenance facility are needed in Asheville. Construction of a station in Valdese was recommended in previous studies.

As described in Chapter 2, the Salisbury-Asheville service is projected to have annual ridership of approximately 24,000 in the first year of operation. As described in Section 3.3, NCDOT is evaluating implementing new Thruway Service connecting Asheville and other communities along the route with Salisbury or Winston-Salem and Greensboro as a first phase.

A revised study should be undertaken to calculate potential ridership, revenue and costs since it is nearly 15 years since the most recent study was completed. This updated study must consider the feasibility and capital needs to ensure that the existing and projected freight rail traffic is not negatively impacted with the introduction of new passenger rail service.

Figure 3-14 shows the proposed route for this new service.

⁴ North Carolina Department of Transportation Rail Division. Report on Western North Carolina Rail Operations and Station Right-of-Way Acquisition. April 2002.



Source: NCDOT

Figure 3-14 Potential Western NC (Asheville-Salisbury) Service

3.6 EASTERN NORTH CAROLINA SERVICE

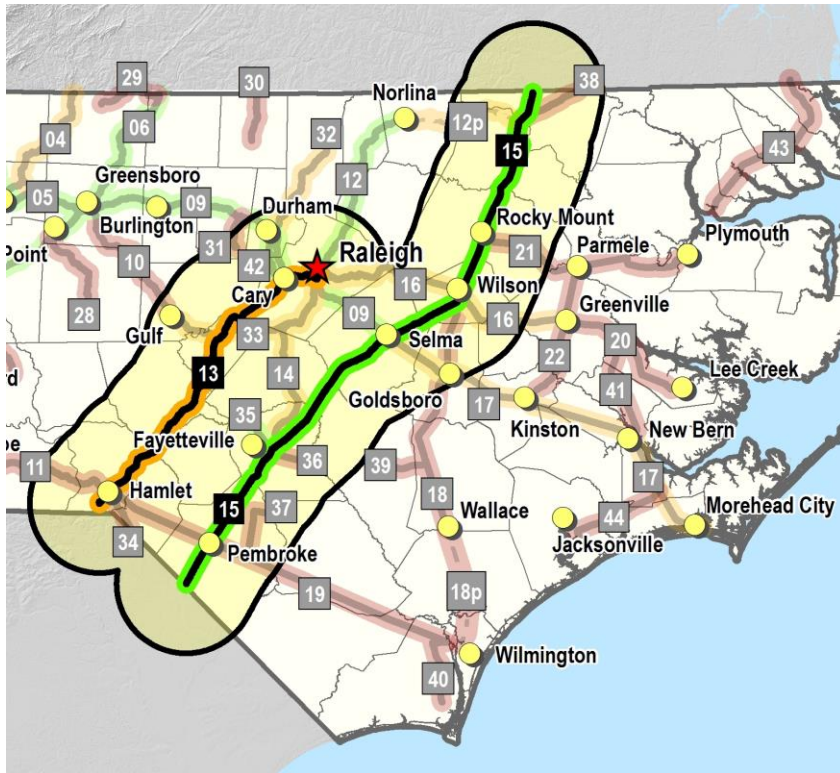


Figure 3-15 Improvements to Address Passenger / Freight Interoperability on the A Line and S Line

In addition to the improvements to the Southeast Corridor and extending service in new corridors, there are improvements needed to help serve the growing ridership in other North Carolina corridors served by Amtrak, particularly on the CSXT A Line. The CSXT A Line (Corridor 15, shown in Figure 3-15) was rated within the Investment Tier and serves an important passenger rail link for the eastern areas of the state. Four of the six Amtrak trains serving North Carolina (*Carolinian*, *Palmetto*, *Silver Meteor* and *Silver Star*) use the CSXT A Line for at least a portion of their route in North Carolina. Although it does

not stop in North Carolina, Amtrak's Virginia to Florida *Auto Train* also uses the CSXT A Line.

On the CSXT A Line, proposed improvements to meet this demand include station enhancements at Fayetteville and Wilson, which have the highest ridership outside of the Charlotte-Raleigh corridor, as well as canopy and platform extensions in Selma to accommodate longer trains. Wilson also serves as the hub connecting rail passengers with the current Amtrak Thruway bus services to Wilmington and Morehead City. Moreover, the on-time performance (OTP) analysis of the *Carolinian* indicates congestion along the CSXT A Line and the need for improvements to reduce scheduling conflicts between freight and passenger rail. ARRA-funded double crossovers are being constructed in Nash and Halifax Counties to address current congestion along the corridor and should improve on-time performance for the *Carolinian*, as well as for freight traffic. Finally, NCDOT is investigating adding a station in Weldon, which would serve the northeastern area of the state with potential stops for the *Carolinian* and the *Palmetto*. These specific projects are listed in Section 3.9 below.

Corridor 13 (shown in Figure 3-15) is ranked within the Stewardship Program Tier and is currently served by the *Silver Star* with stops in Raleigh, Cary, Southern Pines and Hamlet. The Triangle Area Rural Planning Organization (TARPO) has requested that Sanford be considered for an additional stop for the *Silver Star*. The *Silver Star* is an Amtrak-funded long distance train. Thus, Amtrak would need to evaluate the feasibility and schedule impacts of the proposed Sanford stop before it could be added to the *Silver Star* route. However, Sanford could be a stop along a future Triangle regional commuter rail corridor paralleling US 1 and serving Lee, Chatham, and Wake Counties.

3.7 POTENTIAL INTERCITY CORRIDORS

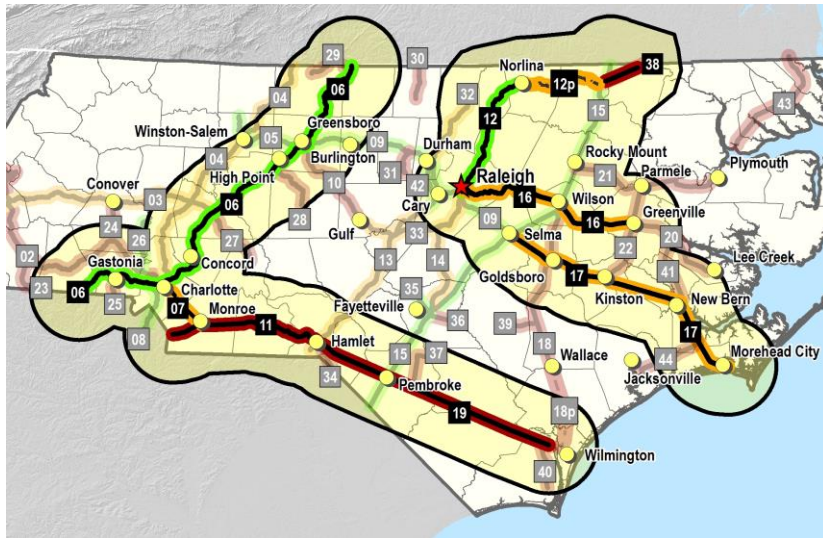


Figure 3-16 Potential Intercity Passenger Rail Corridors

Based upon the corridor prioritization and needs assessment completed in Chapter 2, there are other corridors that should be evaluated for future passenger rail connections.

3.7.1 Charlotte to the Northeast via Lynchburg, VA

A new service connecting Charlotte to the Northeast Corridor via Lynchburg, VA is undergoing preliminary evaluation. The new service would be provided by extending an additional Amtrak Northeast Regional passenger train from Lynchburg south to serve Greensboro and Charlotte. This service would use Corridor 06 for its entirety before entering Virginia near Danville. The service extension would serve two needs. First, it would provide an additional route for the underserved Northeast Corridor-North Carolina travel market, complimenting Southeast Corridor service that would utilize the reactivated CSXT S Line between Raleigh and Richmond. Second it would provide an additional service between Charlotte and Greensboro, two of the state's largest metropolitan areas.

It should be noted that under the state's current agreement with NS, NCDOT may operate up to six daily round trip passenger trains in the Charlotte to Greensboro corridor once the PIP is completed in 2017. This service would likely be introduced after the sixth frequency is added along the Piedmont Corridor, possibly requiring additional infrastructure improvements along this section of the NCRR. Also, additional track capacity upgrades will be needed between Greensboro and Lynchburg, VA to support the additional passenger train.

3.7.2 Charlotte to Wilmington

This potential service would connect the state's largest metropolitan area with the growing Wilmington region, which is a key tourist destination. Depending on the schedule, this new service could also allow passengers from Wilmington and Charlotte connect in Hamlet with the *Silver Star* heading to points south. Long-term, this service could also provide connections to Southeast Corridor trains traveling between Charlotte and Atlanta, thereby connecting the communities in this corridor to additional points south. (Those connecting to the Northeast Corridor would likely use the future Wilmington-Raleigh service, described in Section 3.4 above).

3.7.3 Raleigh to Greenville

This potential corridor would likely be served by extending one of the Charlotte-Raleigh trains east to Greenville, or via a regional commuter rail. Passengers could connect with Southeast Corridor trains in Raleigh, and *Silver Star*, *Silver Meteor* and *Palmetto* trains in Wilson.

3.7.4 Raleigh to Morehead City

The potential Raleigh to Morehead City service would connect Selma, Goldsboro, Kinston and New Bern. Passengers could connect with future Southeast Corridor trains in Raleigh as well as to the *Carolinian* and *Palmetto* in Selma. Passengers might also connect in Goldsboro with the future Southeastern NC services to Wilmington, depending on the preferred route for the service to Wilmington.

3.7.5 Raleigh to Hampton Roads

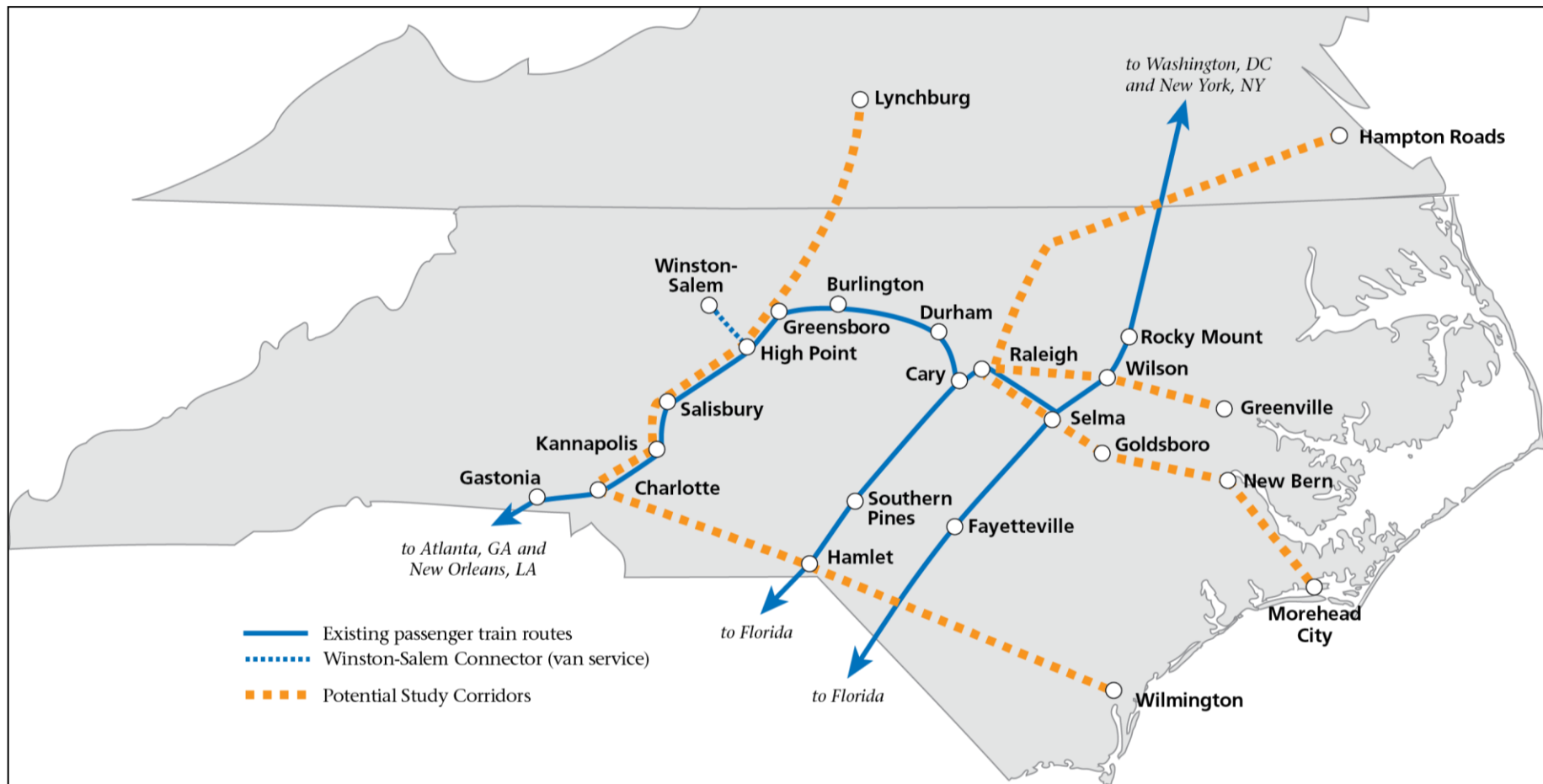
An additional service that should be studied is the potential connection of the Triangle region to the Hampton Roads region of Virginia (Virginia Beach, Portsmouth, and Norfolk).

The Hampton Roads area is Virginia's second largest metropolitan area, with a population of over 1.7 million people and could be a lucrative travel market for intercity passenger service to and from North Carolina. The study would investigate the market for rail service from the Triangle region to Hampton Roads, as well as this new service's ridership, revenue and cost implications to the entire Southeast Corridor passenger rail service network.

The service would run from Raleigh via a reconstructed CSXT S Line (Corridor 12) and the out of service CSXT SA Line (Corridor 12p) between Norlina the Roanoke Rapids/Weldon area. From there it would run up Corridor 38 into Virginia.

Reinstituting service on the CSXT SA Line between Norlina and Roanoke Rapids/Weldon would provide a number of benefits. It would enable the passenger service between Raleigh and the Hampton Roads region without having to add additional passenger trains the CSXT A Line. It would also add network redundancy for passenger trains operating along the East Coast between Florida and the Northeast by providing a connection between the parallel CSXT A and S Lines.

Figure 3-17 shows these study corridors.



Source: NCDOT

Figure 3-17 Potential Passenger Rail Study Corridors

3.8 POTENTIAL COMMUTER RAIL

While commuter rail primarily serves a local transportation need, commuter rail corridors often overlap with intercity passenger rail services. The corridor prioritization process described in Chapter 2 noted several corridors that were rated in the Investment and Stewardship Tiers for passenger rail. These corridors would also be candidates for commuter rail. The NCDOT has identified these corridors in the State Rail Plan as the corridors most likely to receive support from NCDOT for analysis and possible coordination and cooperation of infrastructure and services. Evaluating and developing these potential commuter rail corridors correspond with the Governor's 25-Year Vision for improving transit options within high growth areas. As of 2014, only two of these corridors are under active planning for commuter rail: Corridor 04 in the Charlotte region, and Corridor 09 in the Triangle.

In Charlotte, CATS is studying a commuter rail service that shares the Norfolk Southern O Line connecting downtown Charlotte to Mooresville. (The Red Line would use a portion of Corridor 04.) CATS is exploring alternative funding sources such as freight oriented development and Tax Increment Financing since the project is not competitive for FTA New Starts funding. The project is currently delayed because Norfolk Southern has a new shared use policy that would limit CATS' ability to use the corridor without constructing a parallel track. CATS has stated double tracking the O line and purchasing right-of-way would triple project costs, making the project considerably less feasible.

Several other corridors in the Charlotte region present opportunities for commuter rail and have been studied for high capacity transit at different levels (Figure 3-18). Corridor 26 (Mt. Holly to Terrell), which parallels Corridor 04, has potential as commuter rail corridor, but would need to connect with a main CSXT line (Corridor 02) to serve Charlotte. The Piedmont and Northern Railroad connects Gaston County to downtown Charlotte. NCDOT owns most of this abandoned rail corridor. The Gaston-Cleveland-Lincoln MPO studied this corridor for commuter rail potential. The study considered all high capacity transit technologies and ruled out commuter rail using the Piedmont and

Northern Railroad.⁵ The Norfolk Southern line runs parallel to I-85 between Gastonia and downtown Charlotte (Corridor 06) offering another potential commuter rail corridor to consider between Gaston and Mecklenburg Counties. The rail line parallels I-85 serving Gastonia, Lowell, Cramerton, Belmont, Charlotte-Douglas International Airport and downtown Charlotte.

Several other congested highway corridors have parallel rail lines that offer commuter rail potential in the Charlotte region. US 74 parallels the CSXT SF Line (Corridor 07) between downtown Charlotte and Monroe. Commuter rail could relieve congestion on a road with numerous traffic lights that is the primary connection between Charlotte and Monroe. The CATS 2030 Transit Plan recommends bus rapid transit for this corridor in Mecklenburg County. CATS recently noted their intention to reexamine the transit technology for this corridor and would include rail as an option.

The Norfolk Southern R line (Corridor 08) is another potential corridor, running parallel to I-77 from downtown Charlotte south to Rock Hill. This potential corridor could relieve congestion on I-77 by connecting the York County, South Carolina suburbs of Fort Mill and Rock Hill to downtown Charlotte. A potential commuter rail line would share an alignment with CAT's LYNX Blue Line in south Charlotte.

The North Carolina Railroad corridor running parallel to I-85 from Charlotte to Cabarrus and Rowan Counties (Corridor 06) is another potential commuter rail corridor. The corridor currently includes the *Piedmont* and *Carolinian* Amtrak routes which serve the Charlotte, Kannapolis and Salisbury stations. The route would also share a small portion of the corridor with the CATS Blue Line extension northeast of downtown Charlotte. Commuter rail in this corridor would relieve congestion on I-85 while serving Harrisburg, Concord, Kannapolis and Salisbury.

⁵ Gaston-Cleveland-Lincoln MPO. 2040 Metropolitan Transportation Plan. March 27, 2014. <http://www.gclmpo.org/documents/MTP2040COMPLETEPLAN.pdf>



Figure 3-18 Potential Commuter Rail Corridors, Charlotte Region

The planning effort for the environmental document for the Durham-Wake Commuter Rail is currently on hold. The commuter rail would connect Duke University, Downtown Durham, Research Triangle Park, Cary, Raleigh and Garner. (The Durham-Wake Commuter Rail project would use a portion of Corridor 09.) Triangle Transit completed the Alternatives Analysis for the project in July of 2012. The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (MPO) adopted the Locally Preferred Alternative (LPA). The Capital Area MPO has not formally taken any action on the alternative. Once the LPA is adopted, Triangle Transit can go to the federal government under NEPA to get a notice to develop the environmental document. The project cannot proceed until both MPOs formally adopt the project since it is located in both MPO planning boundaries. However, Triangle Transit and NCRR are conducting a capacity study for future commuter rail between Mebane and Selma in the corridor in conjunction with NS.

Congested highway corridors in the Raleigh area with parallel railroads present potential opportunities for commuter rail (Figure 3-19). These projects are conceptual in nature given Triangle Transit is currently focused on moving forward light rail projects in the region. A potential future commuter rail project might utilize the CSXT S line which runs parallel to US 1 (Corridors 12 and 13). Highway 1 is a congested limited access freeway in southwest Wake County that becomes a boulevard north of I-440 in Raleigh. A potential project

might utilize the entire corridor or just run north from downtown Raleigh to Wake Forest or south from downtown Raleigh towards Sanford in Lee County. Segments of this corridor would overlap with the Durham-Wake Commuter Rail and the Raleigh-Cary Light Rail. Corridor 42 (Durham to Apex) also parallels a portion of the planned Durham-Wake commuter rail line, and perhaps should be explored as a second commuter rail line or other high capacity transit service.

A second potential commuter rail corridor or corridor offshoot would be the Norfolk Southern VF line (Corridor 14) which travels parallel to US 401 from downtown Raleigh to Fuquay-Varina in southern Wake County. This route might be considered as a standalone route or in combination with the CSXT S line.



Figure 3-19 Potential Commuter Rail Corridors, Triangle Region

The Piedmont Authority for Regional Transportation (PART) completed the Alternatives Analysis for a commuter rail connecting North Carolina Agricultural and Technical University in Greensboro to Hanes Mall in Winston Salem, paralleling I-40 (Corridors 04 and 05). The analysis showed the existing transit ridership was not sufficient in 2009 to pursue the project. PART has not ruled out commuter rail in the corridor at a later date. Figure 3-20 shows the approximate alignment of the commuter rail line studied for the Triad.



Local funding is a key component for implementing commuter rail plans. Mecklenburg County voters passed a dedicated half cent sales tax for transit that helps CATS fund major transit projects such as their LYNX Blue Line Light Rail Transit (LRT) and its extension. Any future commuter rail projects from Charlotte into neighboring counties would likely require a funding agreement with CATS and ongoing financial support from the neighboring jurisdiction(s). Durham and Orange County voters passed an additional half-cent sales tax levy for transit which will help fund their proposed Durham-Orange LRT project. Triangle Transit is currently preparing environmental documents for this project. To-date Wake County Board of Commissioners have not chosen to put the transit half cent sales tax increase on the ballot. Local funding from Wake County will be necessary to build the Durham-Wake Commuter Rail and the Wake County LRT project connecting Cary and Raleigh. Similar to the Charlotte region, any future commuter rail projects extending outside of the Triangle Transit service area would likely require a funding agreement with Triangle Transit and ongoing financial support from the neighboring jurisdiction(s). To

As noted in Chapter 2, northeastern North Carolina has an increasing number of residents who commute to the Hampton Roads region in Virginia. The Hampton Roads Transit Vision Plan recommends the study of express bus and eventual commuter rail service from the Town of Edenton in Chowan County to Hampton Roads as demand warranted, perhaps after 2026. The Chesapeake and Albemarle Railroad could serve as a future commuter rail corridor, connecting Edenton and Elizabeth City to Chesapeake and Norfolk, in Virginia. Any future interstate transit services (including commuter rail) will require coordination and an agreement between NCDOT and VDRPT. Figure 3-21 shows the possible alignments for this corridor.



Table 3-4 summarizes the passenger rail programs described above, and includes the capital costs.

⁶North Carolina Department of Transportation. North Carolina Rail Plan 2009 Executive Summary.

The findings from this chapter are developed further in the project prioritization and capital finance plans in Chapter 5. Generally, the corridor priorities identified in Chapter 2 are used to determine the level of potential benefit to the State, which begins to outline priorities. But, additional criteria are used in Chapter 5 to determine the timing of projects in the plan. Those criteria include identification of whether or not projects leverage existing infrastructure, whether or not they leverage existing passenger or intermodal services, and whether or not planning studies have been conducted and railroad partnerships have been identified in principle.

Table 3-4 Projected Passenger Rail Program Capital Costs

Program	Funding Needs
<i>Southeast Corridor – Fourth and Fifth Frequencies</i>	
WiFi on <i>Piedmont</i>	\$630,000
Hillsborough Station	\$8.4M
5 th Frequency - New equipment, Capital Yard Mechanical Facility expansion	\$35.4M
Positive Train Control (PTC) equipment	\$2.125M
<i>Southeast Corridor – New Stops and Improved Stations</i>	
New Stations at, Lexington and Harrisburg, associated track improvements, station expansions	\$237.4M
Charlotte Gateway Station (and associated track improvements)	\$210M
<i>Southeast Corridor – Full Implementation</i>	
Full Southeast Corridor Implementation (Raleigh-Richmond)	\$3.8B
<i>Carolinian Improvements</i>	
New equipment to replace existing <i>Carolinian</i> trainsets that are nearing their end of their service life	\$76.6M
<i>Statewide Thruway Service</i>	
Connector bus services (Amtrak)	N/A
<i>Potential Connecting Services</i>	
Western NC Passenger Service (Salisbury to Asheville, potential connection to Andrews to Murphy) *	\$405.3M
Southeastern NC Passenger Service (Raleigh to Wilmington) *	\$262.5M
Charlotte to the Northeast via Lynchburg, VA**	\$35.6M
<i>Eastern North Carolina Service</i>	
Station improvements (e.g., Fayetteville, Wilson, Selma) to accommodate growing ridership	\$2.5M
<i>Planning Studies</i> New Thruway Bus services Alternatives analysis for new stops (Weldon) and other service and revenue enhancements Evaluation of additional intercity corridors (Charlotte-Wilmington, Raleigh-Greenville, Raleigh-Morehead City, Weldon to Hampton Roads, VA) Updated feasibility and costs analyses for Western NC and Southeastern NC connecting passenger services Analysis of capacity and economic potential of existing stations to accommodate uses for next 25 years	\$4.4M (estimate)

NOTE: Costs are in 2014 dollars.

*Costs from previously completed studies and will be updated under proposed planning studies.

**Preliminary costs subject to further coordination with Amtrak, NCRR, and NS.

4 Chapter Four – Proposed Freight Rail Improvements and Investments

This chapter presents the proposed freight rail improvements identified as part of this Comprehensive State Rail Plan (State Rail Plan). It also describes the process for selecting these proposed improvements and the benefits associated with them. In North Carolina, the freight and passenger systems largely share the same track and Rights-of-Way (ROW). As a result, many projects with a freight or passenger focus may have complementary benefits for the alternative service.

The freight projects described in this chapter include those identified by freight stakeholders and those where benefits, costs, and impacts are largely centered on freight carriers and industrial clients.

North Carolina's economic growth, competitiveness, and employment are shaped by reliable freight rail transportation connections within the state, as well as with the North American freight rail network. Freight rail projects help the state meet current and future freight demand, ensure safety, improve mobility, expand connectivity, and reduce highway congestion. Because of the importance of the freight railroad network, it is in the public interest to preserve rail capacity and ROW for future transportation needs.

The Governor's 25-Year Vision identified region-specific economic solutions directly related to the freight rail component of the State Rail Plan. For the Western Region, emphasis should be placed on providing industrial access to freight lines to accommodate expanding agribusiness and economic development needs. The Central Region is home to two privately-developed megasites. The Governor's 25-Year Vision recommends ensuring that the plan supports the megasites' ability to attract targeted businesses and industry clusters by identifying the infrastructure needs and planning for them. For the Eastern Region, the Governor's 25-Year Vision advocates supporting economically competitive rail access to the Global TransPark (GTP) and the Port of Morehead City, improving rail connections between the state's military bases and the ports, and improving connections to the Interstate 95 corridor from the

state ports to serve markets throughout the eastern United States. Finally, for the Coastal Region, the Governor's 25-Year Vision calls for the development of intermodal train service to the Port of Wilmington and the development of an intermodal facility to serve the eastern part of the state.

Chapter 3 identified a number of passenger rail projects and issues managed in the passenger rail program in North Carolina. The state has a long history of balancing the passenger and freight traffic for existing conditions and movement towards the respective growth opportunities. The privately-held freight railroads plan and implement long-term capacity improvements in a manner different from the public sector. Investments are often centered in the near term, focusing on existing clients and known operating needs that are consistent with a long-term vision. Improvements to the freight rail system are being planned jointly by the railroads and the passenger rail service providers due to the shared infrastructure.

4.1 PURPOSE AND NEED

Chapter 2 of this plan provided detailed information on demographic, economic, freight, and transportation trends influencing the existing and projected movement of freight to, from, and within North Carolina.

As population and employment increase in North Carolina, as is projected to occur through the current planning horizon of 2040, so will the volume and value of freight movements. This will place increased demand on existing rail infrastructure and services, also resulting in increased highway congestion that will adversely affect the movement of goods and highway access to intermodal yards, and lead to potential safety conflicts. Based on these trends, and discussions with the Class I and short line railroads, Metropolitan Planning Organizations (MPOs), Regional Planning Organizations (RPOs), North Carolina State Ports Authority, and other stakeholders, needs in railroad infrastructure and operations were identified. These needs include, but are not limited to, the need for increased capacity, upgraded short line tracks to support a higher maximum allowable gross weight, and the removal of highway/rail at-grade crossings.

The purpose of the proposed freight rail projects is to address these identified needs in the freight rail system. The projects selected for inclusion in this State Rail Plan were identified because of their potential to support North Carolina's mission and objectives for a successful multimodal transportation system. The North Carolina Department of Transportation (NCDOT) Rail Division's mission is the "...safe and efficient movement of people and goods on North Carolina's railroads through freight, passenger and safety programs, supporting job creation and economic growth."¹ Many of the projects, particularly those that strengthen connections to North Carolina's ports, also support the Governor's 25-Year Vision to transform the state's ports and strengthen infrastructure that provides access to military installations.

In addition to being consistent with the NCDOT Rail Division's mission, the proposed freight rail improvements meet one or more of the following NCDOT goals:

- Make our transportation network **safer**
- Make our transportation network move people and goods **efficiently**
- Make our infrastructure **last longer**

4.2 LEVERAGING MODAL TRANSPORTATION INVESTMENTS

Projects involving rehabilitation of railroad tracks may result in faster delivery times, improved capacity, and more efficient train operations. Improvements to the freight rail system may also provide benefits such as helping with job creation, reducing long-haul truck movements, and reducing congestion on the highways.

Freight rail improvement projects can also involve and benefit multiple modes of transportation. Coordinating improvements to the freight rail system with improvements to the highway, transit, maritime and inland ports, CSXT- and NS-operated intermodal terminals, and airport facilities can have a larger impact than completing non-complementary projects. For example, the removal of a highway/rail at-grade crossing results in the elimination of a

conflict point for highway vehicles and trains and can improve the flow of traffic on the roadway and rail facilities, as well as the safety performance of each mode. In turn, these improvements to the efficiency of the transportation network benefit the freight facilities they are serving, be it an intermodal facility, marine port, or airport. These facilities may be able to use the freight rail improvements as a springboard for complementary improvements, such as capacity expansion projects or supporting new business opportunities. Improvements at these facilities can also be leveraged to justify the need for improvements to rail infrastructure to respond to increased demand (e.g. additional track construction to provide increased capacity).

4.3 PROGRAM STRATEGIES

This section provides an overview of new program and policy needs to support North Carolina ports and industries. Where project requirements necessitate additional considerations, reviews of national best practices are identified and may serve to augment the state's efforts. In certain instances, the freight rail system's needs are consolidated into general improvements and/or recommended studies where specific projects have not been identified yet.

Federal transportation policy places a greater systematic emphasis on freight traffic, and with the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) -authorized congestion relief efforts, has raised the profile of freight rail investment in infrastructure and operations. The linkage of freight rail access to economic development has received greater attention, in part as a response to sustaining the economic recovery and as a basis for securing major manufacturing plants. The combined Federal and State legislative efforts have placed a greater emphasis on transportation's performance metrics and tracking over time. Traditional factors such as speed and delays are considered, as well as contributions to carbon footprint reductions and other public policy goals. The Class I railroads also manage their respective multi-state networks to sustain cost competitive, long-distance freight movements. Each of these elements has been a contributing factor in the project definition and inclusion in the plan.

¹ North Carolina Department of Transportation Rail Division.
<http://www.ncbytrain.org/about/default.html>

4.3.1 Emerging Rail Freight Needs

Trends affecting freight rail were discussed in detail in Chapter 2. Of particular note, nationwide shifts in coal volumes and the emergence of natural gas development and other energy industries are two trends anticipated to change traffic volumes and shape railroad project needs. The trend in energy supply may also drive growth in certain types of manufacturing, including plastics and chemicals. The state's growing population, as a part of the Piedmont Atlantic Megaregion,² will continue to increase demands on the existing infrastructure system. At a regional level, east coast ports are facing a dual competitive threat from increases in container vessel size and the improved Panama Canal at the same time that shifts in industrial capacity move to new areas of the globe.

Specific to North Carolina, freight issues and opportunities include the following:

- Congestion on lines that carry both passenger and freight traffic that lead to interoperability and performance issues for both passenger and freight service providers
- Increased need for investment in transload facilities
- Need for investment in the intermodal network to continue to efficiently serve industries and also provide consumable goods to the growing population
- Improved access and service to North Carolina's ports is needed to better serve North Carolina industries and consumers

Investments are needed on both the Class I and short line networks. As noted in Chapter 2, a corridor prioritization method was developed to help identify the levels of importance of Class I corridors to the state's economy. Short line railroads often provide last mile connectivity to the Class I network and also provide public benefits.

4.3.2 Investment Programs

The proposed projects indicate the nature and scope for rail freight infrastructure investments. These investments will support short- and long-

range goals that will guide freight rail planning as discussed in Chapter 5. The broad investment program categories include:

- **Maintenance & Preservation:** Maintaining the existing system capacity, as well as preserving future service options
- **Safety & Impact Mitigation:** Improving safety while reducing conflicts and incidents, and minimizing community and environmental impacts, particularly for sensitive receptors such as schools, and reducing emissions of criteria pollutants PM2.5 and NOx, as well as greenhouse gases (GHGs)
- **Railroad Capacity & Operations:** Adding capacity to existing lines and enhancing operations that result in increased freight volume, velocity, and performance
- **Yards & Terminals:** Investing in railroad-centered operations in the yards supporting rail car movement, as well as the mix of origins and destinations for rail freight traffic
- **Modal Transfer Facilities:** Investing in intermodal yards and transload facilities
- **Ports:** Maintaining and growing the role and competitive position of North Carolina's ports
- **Industry:** Maintaining viable rail service for industries in North Carolina, as well as access to competitive supply chains and consumers

Several of the identified projects may add to more than one investment program. Grade crossings have been listed as safety related projects. In some instances the grade separations and the corresponding infrastructure and operational improvement benefit Railroad Capacity & Operations, as well as Yards & Terminals. Table 4-1 presents the freight related projects.

Additionally, the corridor prioritization process should be used as a tool, but projects, such as Rail Industrial Access Projects funded by FRRCSI, should be assessed using existing methods that identify the number and value of carloads

² Piedmont Atlantic Megaregion, America 2050, http://www.america2050.org/piedmont_atlantic.html

that are introduced to the system and the number of jobs supported by the investment. A project that helps build volumes on an otherwise low volume branch line that is rated in a lesser category should be evaluated based on its merits rather than being overridden by the corridor process. An economic development project on any corridor should be viewed favorably. In some instances, coordination of efforts with the Department of Commerce should be made to site projects along corridors where volumes are low and higher volumes could result in improvements to frequencies of service or potentially better available rates to all shippers on the corridor.

4.4 FREIGHT PROJECTS: PRIVATE AND PUBLIC SECTOR INFRASTRUCTURE AND OPERATIONS

4.4.1 Process of Identifying Projects

The proposed projects are based on iterative input from public and private sources, including NCDOT, MPOs/RPOs, Class I railroads, and short line railroads. The projects represented the railroads' internal and client discussions for service and infrastructure. Not every North Carolina freight rail corridor is captured. Infrequently used Class I branch lines, short line corridors, and military operated corridors may not be represented or have identified projects.

The process also was informed by previous studies and reports, and existing state programs. As such, the benefits, costs, and impacts are largely centered on freight corridors and industrial clients.

4.4.2 Estimated Construction Costs

For many projects, construction costs were obtained from previous studies or efforts conducted by either the NCDOT, MPOs, RPOs, or railroads. For projects which did not already have an estimated construction cost, a high-level construction cost estimate was prepared. Costs and associated benefits of projects are included in Chapter 5. Because these projects are in the early stage of development assumptions, information is not available for formulating a detailed cost estimate. Pending additional detailed information on the projects, a mid-range potential cost for the improvement was used along with the assumption that the project is free of severe site constraints/conditions and free of mitigation costs.

Projects may be funded through a variety of sources and a mix of public and private funds. The project cost estimates do not include information on potential funding or in-kind assets and services.

4.4.3 Class I Corridors and Projects

Figure 4-1 presents the prioritization of freight corridors in the state, and Table 4-1 presents projects and studies categorized numerically by Class I corridor for corridors with identified projects.³ The projects that coincide with recommendations in the Governor's 25-Year Vision are bolded and italicized in Table 4-1.

³ Specific projects have not been identified for Corridors 01, 03, 08, 16, 20, 23-26, 29-31, or 33-42.

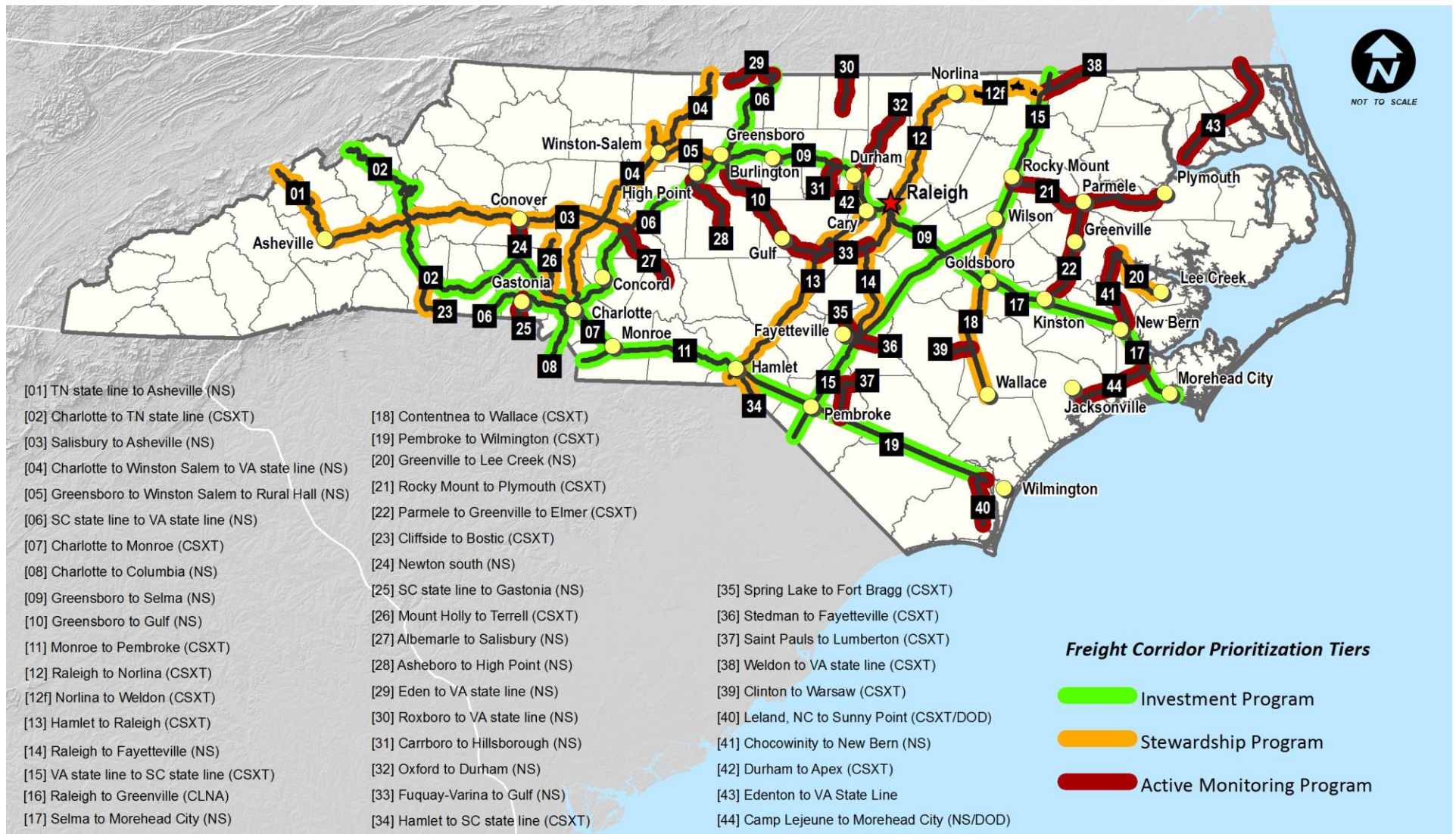


Figure 4-1 North Carolina Freight Corridors Prioritized

Table 4-1 Freight Rail Corridor Tiers and Potential Projects

CORRIDOR	CORRIDOR ROUTE	RAILROAD	PARALLEL HIGHWAYS	FREIGHT TIER	POTENTIAL FREIGHT RAIL PROJECTS
02	TN state line to Charlotte	CSXT	US 74/US 221	Investment	<ul style="list-style-type: none"> Phase III Expansion, Charlotte Intermodal Terminal and supporting rail infrastructure. Increases capacity from 122,000 lifts per year to 246,000 per year. Evaluate operational improvements to the CSXT freight and intermodal network on Corridors 02, 07, and 11.
04	Charlotte to Winston-Salem to VA state line	NS	I-40/I-77 US 311	Stewardship	<ul style="list-style-type: none"> Evaluate separation of freight rail line from local streets in Mooresville and/or planning for at-grade crossing separation along corridor in order to relocate traffic movement from existing substandard crossings.
05	Greensboro to Winston-Salem to Rural Hall	NS	I-40	Stewardship	<ul style="list-style-type: none"> Construct a rail spur at Piedmont Triad International Airport, Greensboro, Guilford County.
06	SC state line to VA state line	NS	I-85/US 29	Investment	<ul style="list-style-type: none"> Grade separate Old Dowd Rd in Charlotte, Mecklenburg County. Grade separate MLK Blvd in Charlotte, Mecklenburg County. Traffic Separation Study from Galyon Depot in Greensboro, Guilford County, north towards Rockingham County or VA. Traffic Separation Study along Corridor 05 (K Line) from Corridor 06 (NS Mainline) west towards Forsyth County. Extend Jamestown siding in Jamestown, Guilford County, to improve switching operations. Establish a new Thoroughbred Bulk Transfer (TBT) facility in the NS Charlotte Yard for servicing non-ethanol traffic anticipated to move from Pineville to the new facility which will enable the Pineville facility to service 1,440 carloads of ethanol. Extend NS tracks for operational efficiencies in Linwood Yard in Davidson County. Convert the NS "Roundhouse" property adjacent to the Greensboro Intermodal Facility into a parking lot with 140 spaces for international containers to accommodate growing container volumes. Extend Kimberly Clark lead in Lexington, Davidson County, to increase network fluidity for freight & passenger traffic. Extend Pomona Yard auxiliary track and add power turnouts in Greensboro, Guilford County. Grade separate Rogers Lake Road crossing (724408Y) in Kannapolis, Cabarrus County. Construct grade separated crossing at or near 22nd Street, in coordination with two at-grade crossing closures (724399C and 724398V), to increase safety of rail and highway traffic in Kannapolis, Cabarrus County. Extend Clanton Road with grade separated crossing of NS Mainline between West and Wilkinson Boulevards. Close NS Mainline crossing of Donald Ross Road. Evaluate grade separations at Hilltop and Mackay Roads in Guilford County. Provide access to the I-85 Corporate Center, a 1,000-acre megasite in Davidson County, which has the potential to be developed as an automotive manufacturing center.
06, 07	SC state line to VA state line, Charlotte to Monroe	CSXT, NS	US 74/I-277, I-85/US 29	Investment	<ul style="list-style-type: none"> Grade separate Corridor 07 (CSXT SF Line) and Corridor 06 (NS Mainline) in Charlotte, Mecklenburg County.

CORRIDOR	CORRIDOR ROUTE	RAILROAD	PARALLEL HIGHWAYS	FREIGHT TIER	POTENTIAL FREIGHT RAIL PROJECTS
07	Charlotte to Monroe	CSXT	US 74/I-277	Investment	<ul style="list-style-type: none"> • Construct a siding extension at Stouts in Union County. Creates a passing siding in the middle of a 30-mile segment of single track and improves network fluidity. Section serves carload and intermodal traffic. • Phase III Expansion, Charlotte Intermodal Terminal and supporting rail infrastructure. Increases capacity from 122,000 lifts per year to 246,000 per year. • Replace Campus Ridge Road, at-grade crossing (631-931A, SF 317-30) with an overpass to improve safety. • Evaluate operational improvements to the CSXT freight and intermodal network on Corridors 02, 07, and 11. • Identify access needs for the Project Legacy megasite in Union County.
09	Greensboro to Selma	NS	I-85/I-40	Investment	<ul style="list-style-type: none"> • Replace existing grade separation along the NCR and Mainline at Aycock Street, in Greensboro, Guilford County, to improve safety. • Grade separate Ellis Road (735236Y) in Durham, Durham County, to improve safety. • Grade separation at Ward Road crossing (722962H) in Greensboro, Guilford County and close Maxfield Road (722964W) to improve safety. • Grade separate Franklin Boulevard crossing (722959A) in Greensboro, Guilford County and close O'Ferrell Street (722961B) to improve safety. • Grade separate Wagoner Bend Road crossing (722966K) in Greensboro, Guilford County and close Buchanan Church Road (722965D) to improve safety. • Grade separate Walker Street in Cary, Wake County, to improve safety. • Grade separate Harrison Avenue crossing (734755X) in Cary, Wake County, to improve safety and mobility. • Grade separate South West Street in Raleigh, Wake County and close West Cabarrus Street (735488A) to improve safety and mobility. • Extend East Durham siding in Durham, Durham County, to improve safety and mobility. Includes a combination of grade separations and closure at three crossings: Ellis Road - south end (734737A), Glover Road (734735L), and Wrenn Road (734736T). • Evaluate the development of an intermodal facility to serve the Triangle Region and eastern North Carolina either along Corridor 09, 15, or 17.

CORRIDOR	CORRIDOR ROUTE	RAILROAD	PARALLEL HIGHWAYS	FREIGHT TIER	POTENTIAL FREIGHT RAIL PROJECTS
10	Greensboro to Gulf (Sanford)	NS	US 421	Active Monitoring	<ul style="list-style-type: none"> Monitor shale gas exploration and potential infrastructure needs in the Piedmont region to support the developing market and associated transportation needs. Evaluate the installation of crossing signals and gates on West Dolphin Street, and West Elk Streets in Siler City. Evaluate pedestrian crossings at W. Raleigh Street, W. Second Street and West Third Streets in Siler City. Evaluate infrastructure needs required to support industries targeted for the 1,800-acre Chatham-Siler City Advanced Manufacturing Site. This includes identifying improvements that would be required for a potential automotive manufacturing facility. Evaluate infrastructure needs required to support industries targeted for the Randolph County (Liberty) Megasite.
11	Monroe to Pembroke	CSXT	I-74/US 74	Investment	<ul style="list-style-type: none"> Expansion of Carolinas ReLoad - Transload a CSXT-served facility in Anson County. New warehouse and expansion from 3.26 acres to 13.26 acres. Study operational improvements to the CSXT freight and intermodal network on Corridors 02, 07, and 11.
12	Raleigh to Norlina	CSXT	US 1	Stewardship	<ul style="list-style-type: none"> Grade separate Rogers Road Extension crossing (633905Y) in Wake Forest, Wake County, to increase safety and use for future passenger rail service. Grade separate Northside Loop (Harris Road) in Wake Forest, Wake County, and close Brick St. crossing (630582V).
12f	Norlina to Roanoke Rapids / Weldon	-	US 158	Stewardship	<ul style="list-style-type: none"> Evaluate the feasibility of returning service to the SA Line between Norlina and Roanoke Rapids. The corridor would provide a connection between Corridors 12 and 15. Acquire right of way to re-establish rail service. Would provide redundancy in the freight network and future passenger opportunities.
13	Hamlet to Raleigh	CSXT	US 1	Stewardship	<ul style="list-style-type: none"> Construction of an approximately 40 acre automotive terminal facility in close proximity to the Piedmont area of North Carolina to handle 60 railcars and 2,000 vehicles. Grade separate Apex Peakway at South Salem Street in Apex, Wake County, and close Tingen Rd crossing (630696H) to provide connectivity and increase safety. Grade separate Walker Street in Cary, Wake County, to improve safety. Monitor shale gas exploration and potential infrastructure needs in the Piedmont region to support the developing market and associated transportation needs.
14	Raleigh to Fayetteville	NS	US 401	Stewardship	<ul style="list-style-type: none"> Monitor shale gas exploration and potential project needs in the Piedmont region to support the developing market and associated transportation needs.

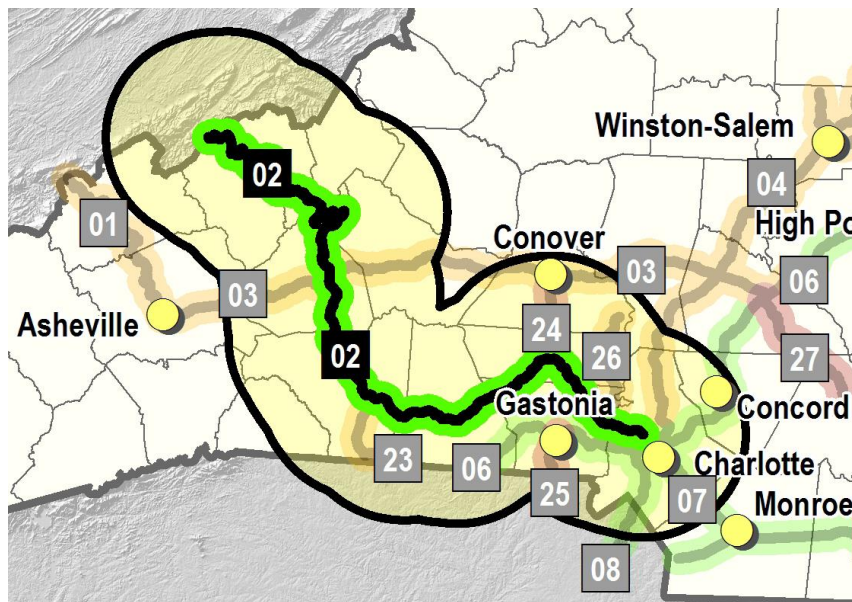
CORRIDOR	CORRIDOR ROUTE	RAILROAD	PARALLEL HIGHWAYS	FREIGHT TIER	POTENTIAL FREIGHT RAIL PROJECTS
15	SC state line to VA state line	CSXT	I-95	Investment	<ul style="list-style-type: none"> • Evaluate the development of an intermodal facility to serve the Triangle Region and eastern North Carolina either along Corridor 09, 15, or 17. • In partnership with CSXT, evaluate capacity improvements to Corridor 15 (A Line) that would increase freight capacity and efficiencies and help address interoperability issues with passenger services. • Evaluate the feasibility of returning service to SA Line (Corridor 12f) between Norlina and Roanoke Rapids. Would provide a connection between Corridors 12 and 15. •
17	Selma to Morehead City	NS	US 70	Investment	<ul style="list-style-type: none"> • Evaluate the development of a Global TransPark (GTP) to Morehead City Mobility Corridor. Studied improvements are anticipated to allow higher speed and safer operation of the route as freight moves to and the Port of Morehead City. • As part of the GTP to Morehead City Mobility Corridor, as market conditions demand, relocate the NCRS along a new alignment between Morehead City and Havelock. This would allow trains to enter the port and access Radio Island from the east. • Support implementation of frontage roads and/or super-street intersections to reduce highway-rail conflicts in Morehead City. • Develop a loop track at the Port of Morehead City to facilitate the building and disassembly of larger trains, potentially unit trains. • As part of the GTP to Morehead City Mobility Corridor, study a rail bypass of New Bern. • Evaluate the development of an intermodal facility to serve the Triangle Region and eastern North Carolina either along Corridor 09, 15, or 17.
18	Contentnea to Wallace	CSXT	I-40/I-795/US 117	Stewardship	<ul style="list-style-type: none"> • Monitor market conditions and seek Department of Defense funding for the Wallace to Castle Hayne rail corridor from Wilmington, New Hanover County, to Wallace, Duplin County, to provide corridor connectivity and multiple access points to the Port of Wilmington.
19	Pembroke to Wilmington	CSXT	I-74/US 74	Investment	<ul style="list-style-type: none"> • US 421 / CSXT crossing safety improvements south of I-140 / Dan Cameron Bridge. • Identify capacity and safety needs along CSXT and WTRY in Wilmington. • Evaluate the feasibility of a new rail crossing of the Cape Fear River to eliminate the need for trains to traverse through town to access the Port of Wilmington. • Evaluate the potential extension of rail service from its current terminus at US 421 in New Hanover County to the Pender Commerce Industrial Park (approximately 1.5 miles). • Provide rail access to the Mid-Atlantic Industrial Rail Park, a 1,025-acre CSXT-Select Site in Leland, Brunswick County. • Evaluate at-grade rail crossing improvements in Wilmington on CSXT.
21	Rocky Mount to Plymouth	CSXT	US 64	Active Monitoring	<ul style="list-style-type: none"> • Provide rail access to the Kingsboro Industrial Site, a CSXT-Select Site near Tarboro, Edgecombe County.
22	Parrale to Greenville to Elmer	CSXT	NC 11	Active Monitoring	<ul style="list-style-type: none"> • Construct rail line from Global TransPark in Kinston to CSXT line parallel with NC 11, in Lenoir County to provide additional access to GTP.

CORRIDOR	CORRIDOR ROUTE	RAILROAD	PARALLEL HIGHWAYS	FREIGHT TIER	POTENTIAL FREIGHT RAIL PROJECTS
27	Albemarle to Salisbury	NS	US 52	Active Monitoring	<ul style="list-style-type: none"> Upgrade the rail on Corridor 27 (NS N Line) along US 52 to allow for freight. The upgrade is anticipated to allow for 4.5 trucks diversions to rail per day.
28	Asheboro to High Point	NS	I-74	Active Monitoring	<ul style="list-style-type: none"> Construct new siding at Sophia, Randolph County for mobility and system fluidity.
32	Oxford to Durham	NS	I-85	Active Monitoring	<ul style="list-style-type: none"> Upgrade of the Oxford - Durham line to 286-lb rail that can accommodate heavier locomotives thereby improving customer service.
multiple				Program Level	<ul style="list-style-type: none"> Preservation of threatened rail lines to preserve system connectivity and transportation options for local business. Maintenance program for rail bridges and structures on NCDOT-owned rail corridors. Maintenance program for bridges on low volume Class I branch lines. NCDOT-owned rail corridors funding mechanism to address maintenance and returning corridors to service. Develop rail projects, as needed, to support the growing wood pellet market.

Note: Projects bolded and italicized will help implement the Governor's 25-Year Vision

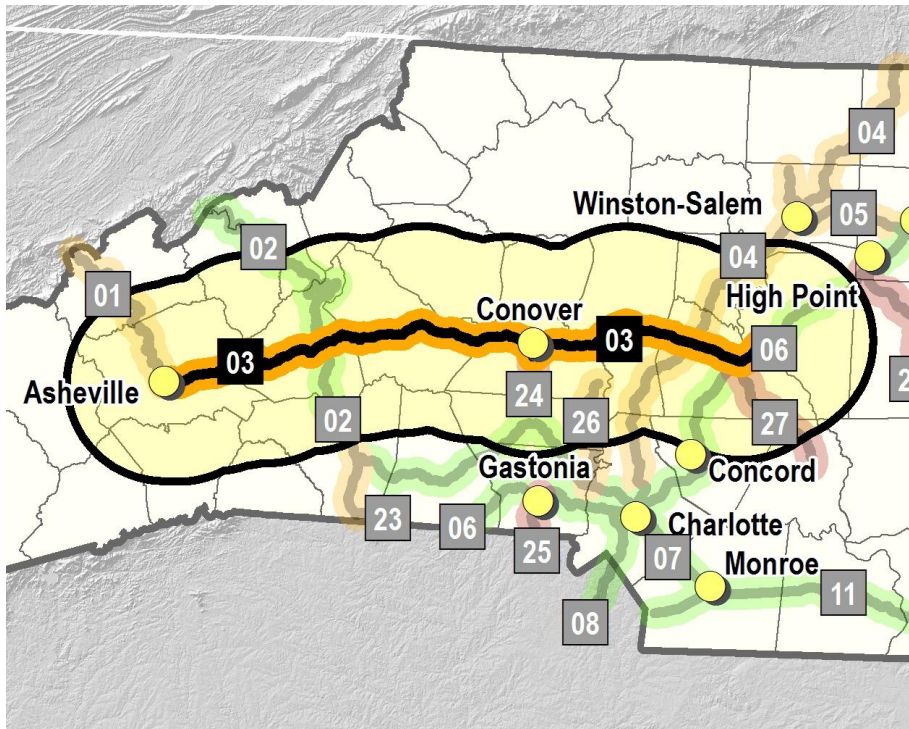
Select corridors that have been identified as either Investment or Stewardship Tiers are discussed in additional detail below by numerical order.

4.4.4 Corridor 02- CSXT - Charlotte to TN state line



Corridor 02 is the approximately 173-mile section of CSXT track connecting Erwin and Johnson City, Tennessee to Charlotte, North Carolina. It covers portions of the CSXT Blue Ridge Subdivision from the Tennessee border to Bostic and the Charlotte Subdivision from Bostic to Charlotte. Corridor 02 is ranked as an investment corridor as a result of the methodology using existing and projected freight volumes to rank the corridors. Historically, the corridor has been a major conduit for coal from Appalachia to southern power plants. However, as many older coal-fired plants have been retired or converted to gas, the volume of coal traffic has reduced significantly. The line is still expected to continue to serve through traffic and a number of wood chipping operations in Rutherford County, fiber glass and paper producers in Shelby, and a number of transload facilities in west Charlotte. The line also services unit grain train service supporting the agricultural and food processing industries in the state. Economic trends show that western North Carolina will experience growth in the plastics and chemical industries. Due to the reduction in coal volumes along the corridor, there should be sufficient capacity to support traffic growth for through and North Carolina freight. However, expansion of CSXT's Intermodal facility and growth in freight may necessitate a study to look at operational improvements along the eastern portion of this corridor (from Bostic to Charlotte).

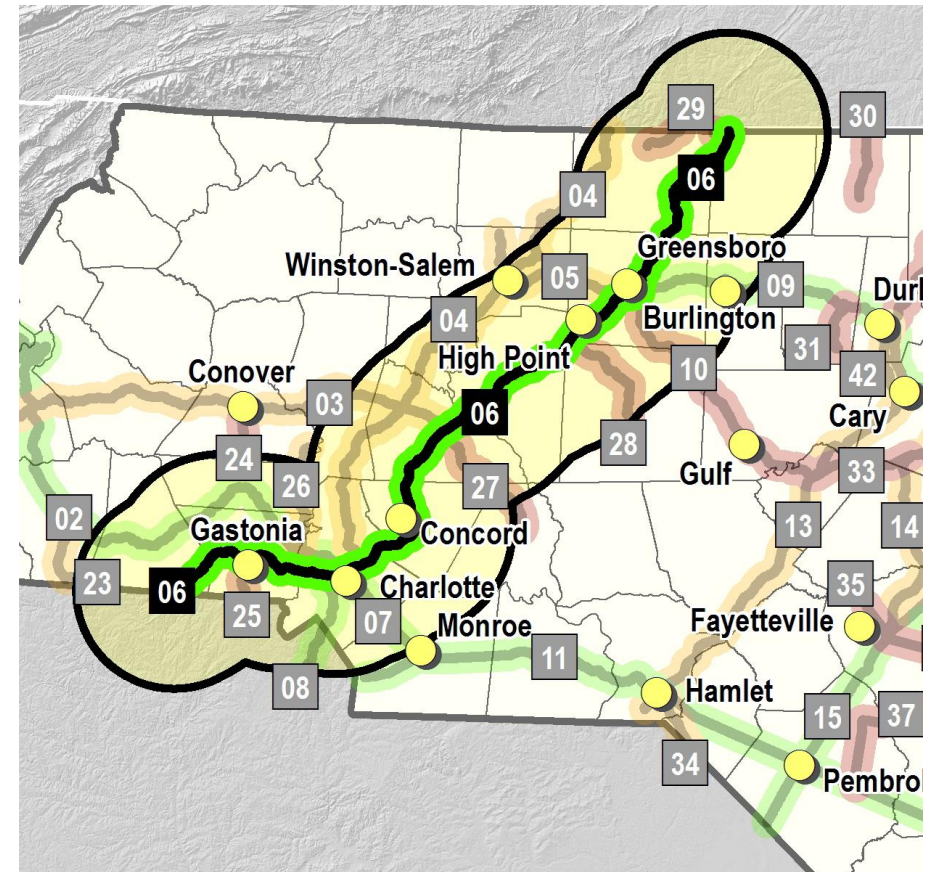
4.4.5 Corridor 03- NS - Salisbury to Asheville



Corridor 03 runs from Salisbury to Asheville, running concurrently with the NS S Line. The line also connects the Hickory/Conover area and Statesville to the state's rail network. The primarily single track line is approximately 148 miles in length. The corridor carries a moderate volume of freight traffic with the majority of the freight originating in or destined for North Carolina industries. As such, the corridor connects industries in the western piedmont and mountain region of North Carolina to the rest of the national rail network via Corridor 06 at Salisbury and Corridor 01 which extends to Knoxville, Tennessee. These industries include a large polyester fibers manufacturer in Salisbury and a number of food producers and a large paper mill in Canton via connections to short line railroads. The corridor also acts as a conduit for coal destined for a number of North Carolina and southeastern power plants. The corridor ranked in the Stewardship Tier.

Projections show that plastics, chemicals, and manufacturing facilities are expected to develop along this corridor. As volumes grow, it is suggested that the corridor be studied and monitored. No freight projects are currently identified along Corridor 03. Interoperability and the mountainous topography are concerns for future track and facilities necessary to reinstate passenger service as a long-term goal.

4.4.6 Corridor 06- NS - SC state line to VA state line



Corridor 06 is operated by NS from the Virginia state line northeast of Greensboro to the South Carolina state line southwest of Gastonia; it is approximately 188 miles long and parallels portions of I-85 and US 29. The

section between Greensboro and Charlotte is trackage owned by the NCRR Company. In North Carolina, the corridor is split between two NS operating districts; the Danville District which runs between Lynchburg, Virginia and the large classification yard in Linwood, and the Charlotte District that runs from the Linwood classification yard to Spartanburg, South Carolina.

This important north-south route is NS' primary east coast corridor and is the busiest freight corridor in North Carolina. It connects the manufacturing and distribution centers of Charlotte and Greensboro to southeastern and northeastern markets. Important points along the route include NS's Linwood Yard and an intermodal facility at the Charlotte Douglas International Airport. The I-85 Corporate Center, a 1,000-acre megasite in Davidson County, which has the potential to be developed as an automotive manufacturing center, is located along this corridor. Also, the 1,800-acre Chatham-Siler City Advanced Manufacturing Site and Randolph County (Liberty) Megasite are connected to Corridor 06 via a connection to Corridor 10 in Greensboro. By 2037, NS projects an additional 22 daily intermodal trains on the corridor. Due to its importance to the state and national rail network, Corridor 06 is ranked in the Investment Tier.

In terms of freight flows, both intermodal and bulk commodities are hauled on Corridor 06. Both intermodal and bulk commodity flows have experienced growth in recent years and as the economy continues to grow, expectations for continued growth in these areas remain high. To support the expected intermodal traffic growth, NS is proposing to convert its former Roundhouse Property adjacent to its Greensboro intermodal facility, to storage space, thereby increasing capacity for international containers. This will enhance the existing intermodal service between the Triad and the Port of Norfolk. The project is included in the Transportation Improvement Program (TIP) as TIP Project P-5700. In Charlotte, NS is proposing to convert its former intermodal yard property to a new Thoroughbred Bulk Transfer (TBT) facility (TIP Project 5702) with the expectation of growth in the ethanol market.

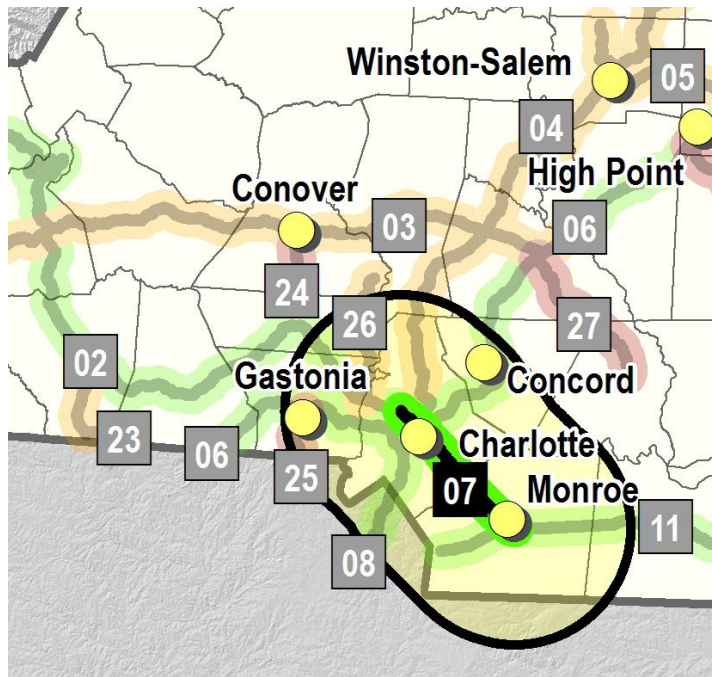
The corridor serves both passenger (4 round trips per day) and freight flows, thus network fluidity and capacity are of particular importance due to the widely varying train lengths, speeds, and operating characteristics. As part of the Piedmont Improvement Program (PIP) double track capacity is being

restored to the corridor that was removed in the 1980s; the additional capacity will support future intercity passenger and freight growth. Under PIP and the Sealed Corridor Project, safety improvements have been and continue to be made along Corridor 06. As such, capacity and safety improvement projects that support the proposed Charlotte Gateway Station will further improve freight and passenger operations for the corridor. Yard, siding, and track extensions increase capacity throughout the corridor for longer freight trains. For example, an additional 165 rail cars per day could be processed at Linwood Yard (near Salisbury) if the track extension projects are implemented.

Due to the urban nature of a large portion of Corridor 06, the high volume of freight and passenger train volumes, and the varied types of freight carried, improving safety along this corridor is a priority. As such, nine grade separations or separation studies in and around Greensboro and Charlotte were identified. Traffic separation studies identify redundant and unnecessary at-grade crossings, future potential grade separation locations, and connections to industries. The PIP program of projects already includes 13 new grade separations and numerous grade crossing closures in addition to the Sealed Corridor crossing treatments and closures, some of which will be implemented on Corridor 06.

Corridor 06 is part of the NS Crescent Corridor, a multi-state corridor program extending from New Orleans and Memphis in the Southeast to Philadelphia and Harrisburg, Pennsylvania, and New York City and Mechanicville, New York, in the Northeast. The Crescent Corridor will target truck traffic, potentially lowering truck volumes along I-85.

Corridor 06 is the spine for NS' east coast operations. Thus, it too connects the majority of NS' secondary and branch lines in North Carolina. It also connects to a major CSXT east-west line in Charlotte, and as a result, any investments in this corridor will have positive impacts on freight passing through, originating in, and destined for North Carolina.

4.4.7 Corridor 07- CSXT - Charlotte to Monroe

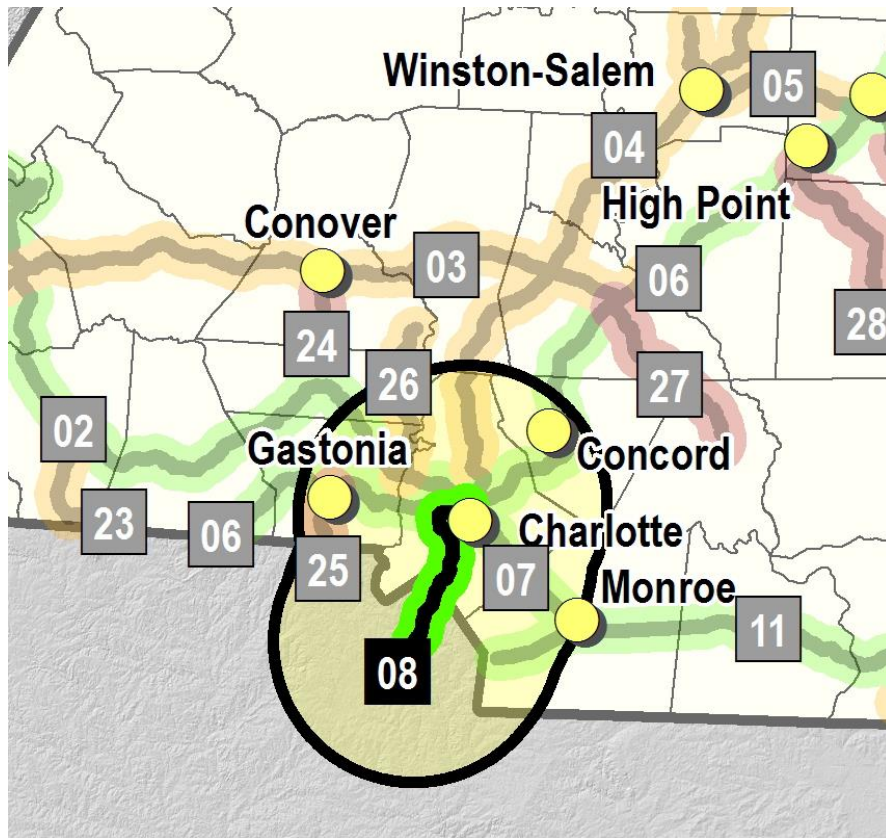
Corridor 07 is a 30-mile long CSXT line connecting Charlotte to Monroe. The corridor includes CSXT's Pinoka classification yard which serves Charlotte area freight traffic and the Charlotte Intermodal Terminal. The corridor connects Charlotte to the Port of Wilmington and the CSXT A Line via Corridor 11, which is CSXT's primary north-south corridor along the east coast. The corridor also connects Charlotte with CSXT lines in western North Carolina. As a result of the corridor's location in CSXT's North Carolina network, it carries a wide variety and substantial amount of freight traffic. The corridor is the only connection between CSXT's intermodal terminal in Charlotte and the remainder of its intermodal network. Due to its position in CSXT's intermodal network, Corridor 07 has been included in CSXT's National Gateway Initiative. The corridor also serves a number of medium-size manufacturers in Union County.

CSXT has proposed two projects along Corridor 07. The 10,000 foot long passing siding at Stouts will improve capacity along the corridor by enabling trains to pass each other. This project is funded in STI and identified as TIP

Project P-5704. CSXT is also proposing to construct Phase III of the Charlotte Intermodal Terminal (CIT) which will more than doubles the terminal's container handling capability. The improvements at the CIT are a component of the National Gateway Initiative. A grade separation between Corridors 07 and 06 was proposed to improve the flow of freight traffic at the at-grade crossing of the two corridors near Uptown Charlotte; however, that project is currently on hold.

Improving safety by reducing vehicular conflicts will be addressed with the grade separation of Campus Ridge Road and Corridor 07. From an economic development perspective, long-term investments in Corridor 07 should be considered because of the expected growth in the plastics and chemical-related industries in Charlotte and western North Carolina. Enhanced access to the Port of Wilmington and CSXT's intermodal network via Corridor 07 should benefit these industries as they experience growth.

4.4.8 Corridor 08- NS - Charlotte to Columbia

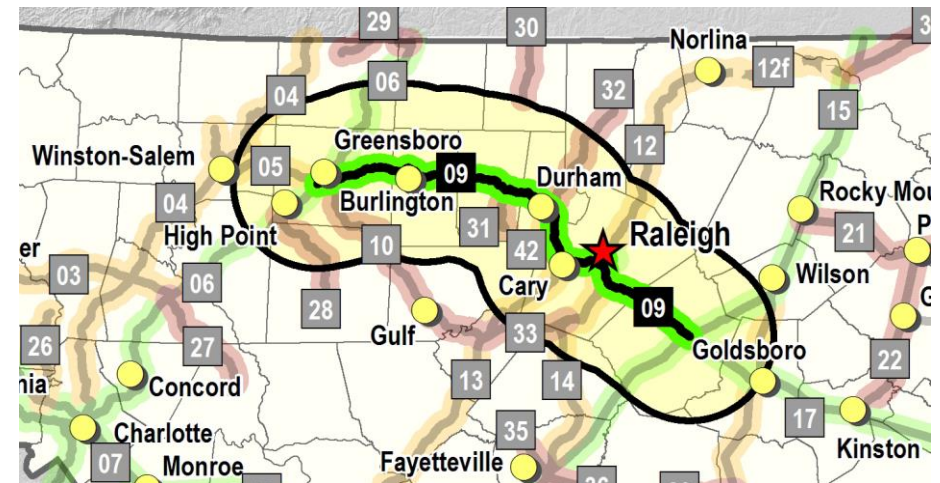


Corridor 08 consists of the NS R line and it connects Charlotte to Rock Hill and Columbia, South Carolina. The corridor parallels I-77 from Charlotte to South Carolina. Relative to other freight corridors in North Carolina, Corridor 08 carries a moderate volume of traffic, yet the type of freight it carries varies tremendously. The corridor serves a large industrial park in south Charlotte which includes a number of transload facilities. The corridor also serves a large quarry adjacent to the south Charlotte industrial park. With the opening of the new NS intermodal facility at Charlotte-Douglas International Airport, intermodal flows to Charlotte have grown. As such, Corridor 08 funnels container traffic between the intermodal facility at the airport and the ports at Charleston, South Carolina and Savannah, Georgia. Corridor 08 ranked in the

Investment Tier due to its role in providing connections to intermodal facilities, ports, and major transloads, and the current and future volume of truck traffic that can be potentially diverted from I-77.

No projects have currently been identified along Corridor 08.

4.4.9 Corridor 09- NS - Greensboro to Selma



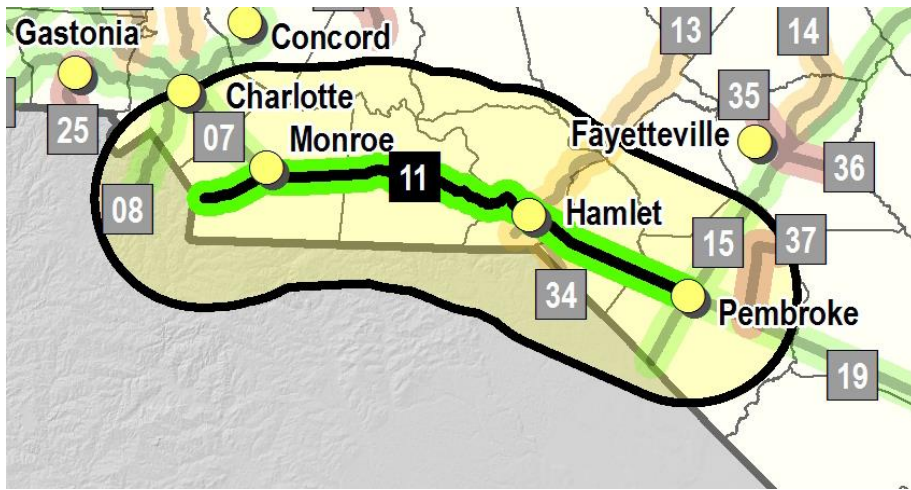
Corridor 09 is concurrent with the 115 mile long, NS H Line. The corridor parallels I-40, I-85 and US 70, running from Greensboro to Selma in Johnston County, connecting the Triangle to the NS Mainline (Crescent Corridor) at Greensboro. Through a connection with Corridor 17 at Selma and Corridor 06 in Greensboro, the corridor connects the state's primary economic centers ultimately to the Port of Morehead City. Though the corridor carries a moderate amount of freight traffic, its importance in connecting North Carolina's economic growth regions places it in the Investment Tier.

Due to the urbanized nature of the corridor, at-grade crossing safety is a major concern. As such, ten grade separation projects between Greensboro and Raleigh were identified. In addition to the grade separations, a number of crossing closures were identified to further reduce vehicle/train conflicts along the corridor. The reduction in crossings will also increase average speeds on the corridor, benefiting freight movement and passenger service as the corridor carries three daily Amtrak round trips. With future passenger frequencies and

commuter service proposed along the corridor, a number of passing sidings are also proposed to provide increased capacity.

Additionally, as the Triangle Region's population continues to grow, and highway congestion increases, access to intermodal services will be impacted. Thus, a study to identify the need for a future intermodal facility either along the eastern end of Corridor 09, or along Corridors 15 and/or 17 will be conducted. This is consistent with the Governor's 25-Year Vision to develop an intermodal facility along the I-95 corridor.

4.4.10 Corridor 11- CSXT - Monroe to Pembroke

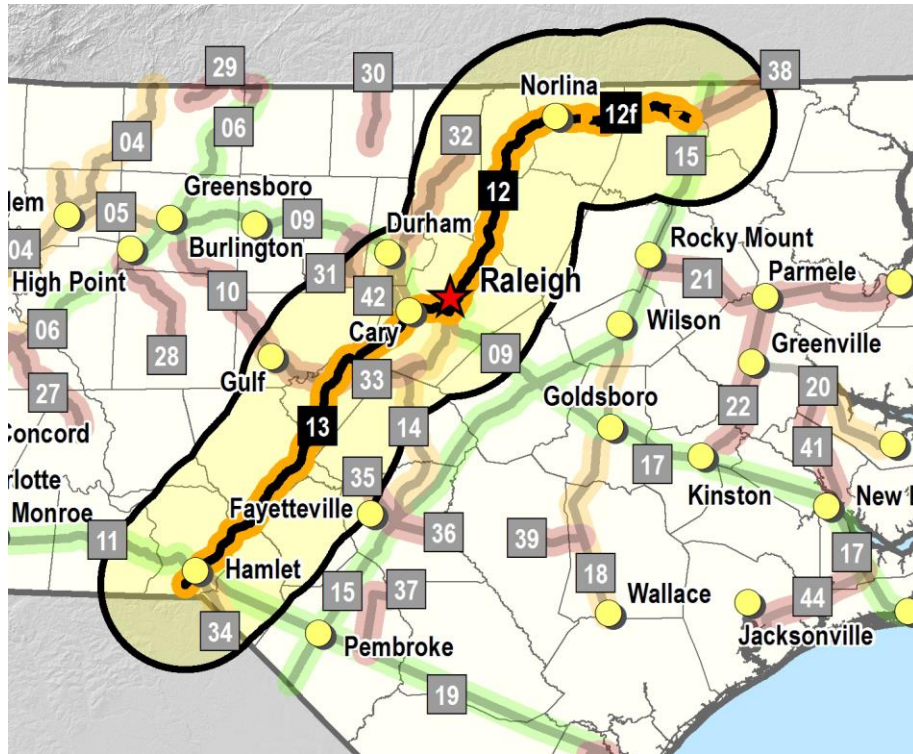


Corridor 11 is approximately 84 miles of east-west CSXT track running from Pembroke to South Carolina west of Monroe. This corridor is a major component of CSXT's North Carolina network, connecting the Charlotte area with the large classification yard in Hamlet, the north-south running A Line (Corridor 15), and the Port of Wilmington. It also provides a direct connection to CSXT routes throughout the southeast via Atlanta. As such, Corridor 11 is among the top gross tonnage routes in North Carolina, carrying a wide variety of mixed freight. This includes grain destined for feed mills in Union County, the ADM flour mill in Charlotte, and chemicals destined for the Wilmington area. The corridor is a major component of the CSXT intermodal network, linking the Charlotte Intermodal Terminal to the remainder of the CSXT network via

Atlanta. The corridor is included as a component of CSXT's National Gateway Initiative, which seeks to improve intermodal connections between the Mid-Atlantic ports and markets and the Upper Midwest. The corridor ranks in the Investment Tier due to its role as a strategic link between the Port of Wilmington, the CSXT A Line (Corridor 15), the Charlotte area, and other Southeast markets.

Economic growth in the region has resulted in a project request to expand a transload facility in Wadesboro, in Anson County. Also, CSXT is proposing a number of improvements to enhance freight operations along the corridor. They include a track extension at the Monroe Yard to support more efficient yard operations and the track and signal improvements in Anson County. These proposed improvements will also be beneficial to the Port of Wilmington as much of the rail freight destined to and originating from the port utilizes the corridor. Any improvements along Corridor 11 are in accord with the Governor's 25-Year Vision to develop intermodal train service to the Port of Wilmington. Also, as the North Carolina Ports Authority pursues initiatives to grow freight at Wilmington, continual investments in Corridor 11 will be necessary to support increased freight volumes.

4.4.11 Corridor 12, 12f, and 13— CSXT - Hamlet to Raleigh, Norlina, and Weldon



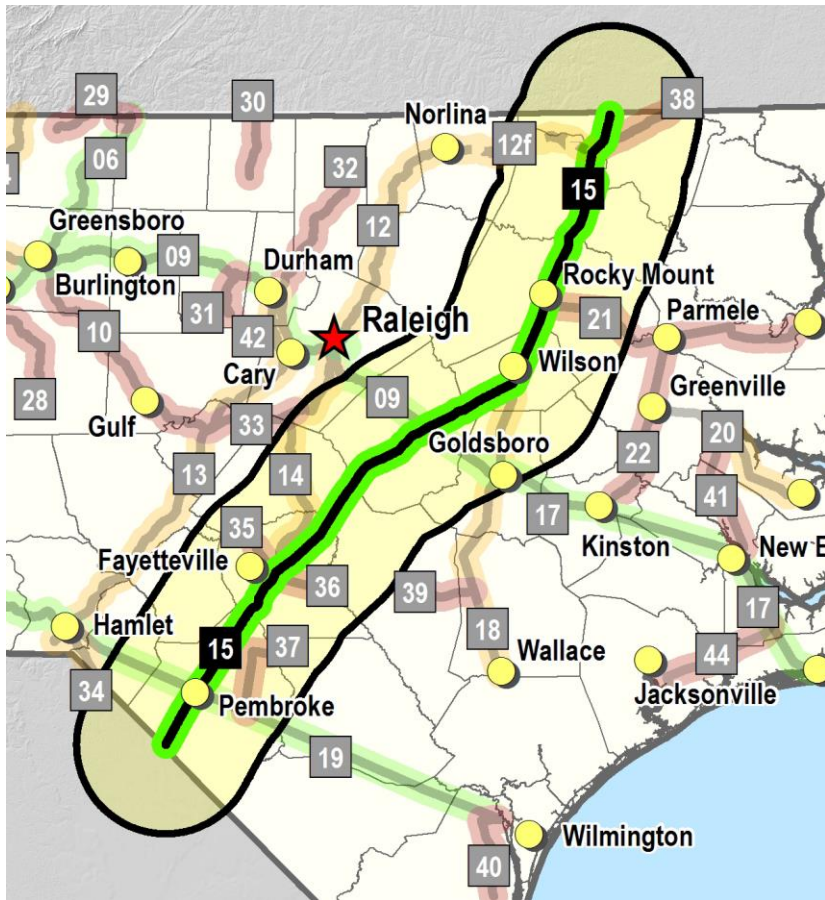
The CSXT S Line (Corridors 12 and 13) parallels the CSXT A Line (Corridor 15) to the west. The S Line is made up of the Norlina Subdivision which runs from Norlina to Raleigh and the Aberdeen Subdivision which runs from Raleigh to Hamlet. .

Corridor 13 consists of the 102 mile long section of the S Line running from Raleigh through the major classification yard at Hamlet and on to the South Carolina border. The primary rail connections are located in Raleigh, Cary, and Hamlet. Corridor 13 carries a relatively low volume of freight. However, it does serve a number of medium-sized manufacturers and a large quarry near Sanford. Corridor 13 is also CSXT's only direct connection to the Triangle Region, making it an invaluable resource as the freight needs of the region continue to grow.

Corridor 12 consists of the 65 mile long segment of the S Line running from Raleigh to Norlina. The corridor includes CSXT's Raleigh Yard and adjacent Trans-flo transload facility, both located in downtown Raleigh. Corridor 12 is a primarily single track route due to its relatively low train volumes. Despite the low volumes, the corridor serves a number of industries including a pharmaceutical plant in Raleigh, a number of medium-sized manufacturers and a quarry in Henderson, and a wood chipping operation in Ridgeway. Improvements to Corridor 12 are proposed as part of the Southeast Corridor Raleigh to Richmond segment. This would include restoration and reactivation of service along the abandoned portion of the S Line from Norlina to Petersburg, VA.

Corridor 12f consists of the approximately 30 mile long abandoned CSXT SA Line between Norlina and Roanoke Rapids and the approximately six mile long CSXT Roanoke Rapids Spur between Roanoke Rapids and the A Line in Weldon. A large paper mill and coal-fired power plant are served by the Roanoke Rapids Spur.

The combined Corridors 12, 12f, and 13 are ranked in the Stewardship Tier primarily for two reasons. First, there are two market-driven initiatives on the corridor. CSXT has proposed a new 40-acre automotive distribution terminal to serve the Piedmont region of North Carolina. The other initiative would add capacity and construct facilities to support shale gas exploration in this part of the state. Secondly, the combined Corridors 12, 12f, and 13 could provide significant congestion relief to the CSXT A Line (Corridor 15), by providing additional north-south freight (and passenger) capacity to supplement the A Line and provide network redundancy in case of an emergency. The combined corridor intersects rail lines connecting the Piedmont to North Carolina's two seaports. Also, the restored SA Line would provide a direct connection between central North Carolina and the ports at Hampton Roads. To support safety goals and improve roadway congestion in urban areas, three grade separation projects have been identified; one each in Apex, Cary, and Raleigh. The Amtrak *Silver Star* operates one daily round trip along Corridor 13 and any safety or capacity improvements will benefit existing and future passenger operations.

4.4.12 Corridor 15- CSXT - VA state line to SC state line

Corridor 15 parallels I-95, running from the South Carolina border to the Virginia border. It is part of the CSXT A Line, the primary north-south rail corridor between the Northeast and Florida. In North Carolina, it is split between two CSXT operating subdivisions, the North End Subdivision which runs between Richmond, Virginia and Rocky Mount, North Carolina and the South End Subdivision which runs between Rocky Mount, North Carolina and Florence, South Carolina. Corridor 15 ranked in the Investment Tier due to the volume of rail traffic it carries, the volume of truck traffic that could potentially

be diverted to the corridor, and its role in connecting North Carolina industries to the national rail network.

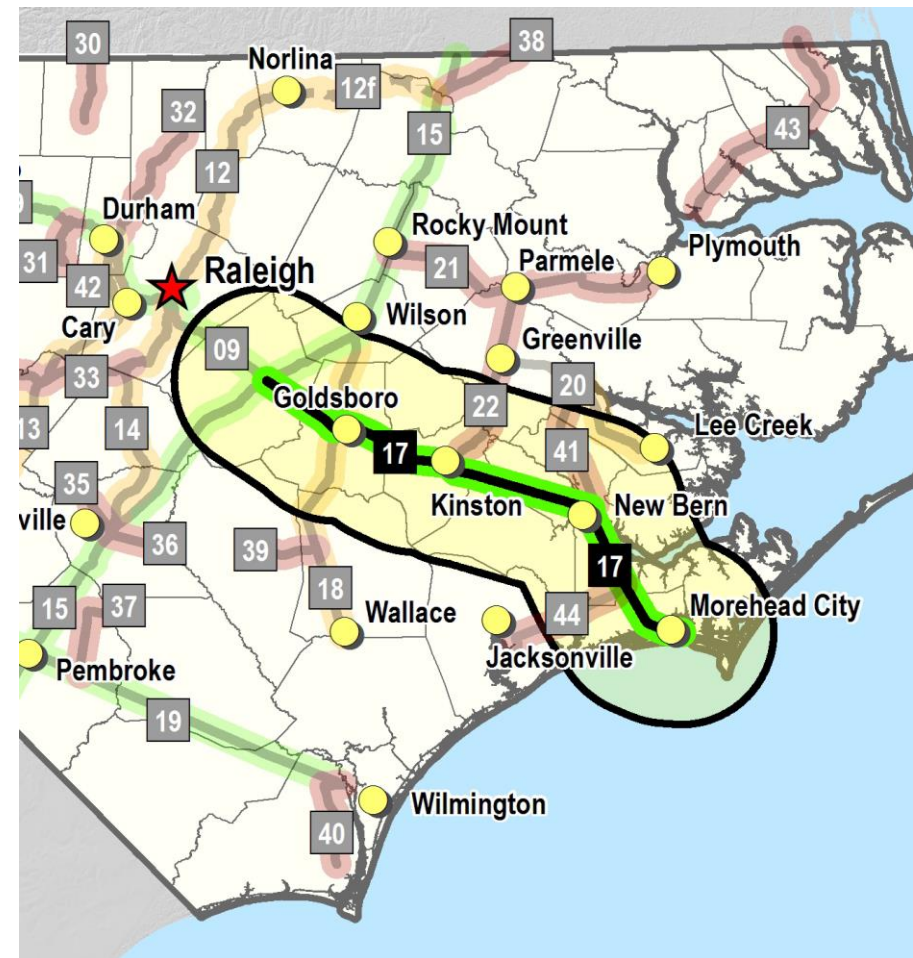
Corridor 15 is CSXT's primary east coast north-south route, thus it carries a significant amount of through intermodal and mixed freight. This includes dedicated trains carrying fruit raised in Florida to Northeastern distribution centers. Corridor 15 intersects two Investment Corridors, 17 and 19, which provide connections to the State Ports at Morehead City and Wilmington, respectively. As the global economy continues to shift and deepened navigational channels and port investments enable North Carolina's ports to accommodate a wider variety of vessels and types of cargoes, Corridor 15 will continue to be a conduit for freight traffic, connecting North Carolina's ports to the national rail network. This corridor also provides connections to the ports at Hampton Roads, Charleston, and Savannah, giving North Carolina manufacturers and shippers additional import/export options. This fact is why Corridor 15 was selected as a major component of CSXT's National Gateway Initiative, as it would funnel intermodal traffic from Charlotte and the Port of Wilmington to Midwestern markets.

Its geographic location and connections to other rail corridors make Corridor 15 a major route for freight originating and terminating in eastern and central North Carolina. In particular, freight supports the agricultural industry with products such as feed grain, phosphate, and fertilizer. Also, the vast amount of forest resources in the eastern part of the state will continue to make this corridor a major route supporting the paper and wood pulp industry and the growing export wood chip industry. The corridor is also a component of the Strategic Rail Corridor Network (STRACNET), connecting Fort Bragg to the national rail network.

In compliance with the Governor's 25-Year Vision, a study to evaluate the need for a future intermodal facility either along this corridor or Corridors 09 and/or 17 will be conducted. A new intermodal rail terminal could also stimulate the need for intermodal train service to the Port of Wilmington, which was also identified in the Governor's 25-Year Vision as a means to growing the state's economy.

Although there were no specific projects identified in the State Rail Plan for this corridor, NCDOT will partner with CSXT to identify any additional operational improvements that may be needed along the corridor to ensure freight movements to and from the eastern part of the state are accommodated. The major Class I corridors in North Carolina are already cleared for double stack intermodal operations, but considering that Corridor 15 carries ten passenger train roundtrips per day, which is the highest number of any corridor in the state, any additional capacity or operational improvements will also have positive benefits on passenger service. Additionally, the potential restoration and reactivation of the SA Line from Norlina to Roanoke Rapids (Corridor 12f) could provide some additional connectivity and redundancy in the rail network, having positive impacts along the entirety of Corridor 15.

4.4.13 Corridor 17– NS - Selma to Morehead City



Corridor 17 is concurrent with the A & EC District of NS, running 113 miles between Selma and Morehead City. The corridor parallels US 70 for its entirety, connecting Goldsboro, Kinston, and New Bern to the rest of the state's rail network. Though the corridor currently carries a relatively low volume of freight traffic compared to other Class I lines in the state, it still plays a major role in supporting the economy of North Carolina due to its connection to the Port of Morehead City. With agriculture being an essential component of the region's economy, Corridor 17 serves two large grain elevators, Goldsboro

Milling and Sanderson Foods in Kinston. Via a connection to Corridor 41, Corridor 17 also connects to a large paper mill north of New Bern and acts as a conduit for chemicals and phosphate produced at the Potash Corporation mine in Aurora (Lee Creek). The corridor is also on the STRACNET, connecting Cherry Point Marine Corps Air Station, Camp Lejeune (through connections to Corridor 44), and the Port of Morehead City. The corridor's connection to the Global TransPark in Kinston and the Port of Morehead City puts the corridor in a position to support current and future economic initiatives at both of these valuable state assets. Thus, Corridor 17 ranked in the Investment Tier.

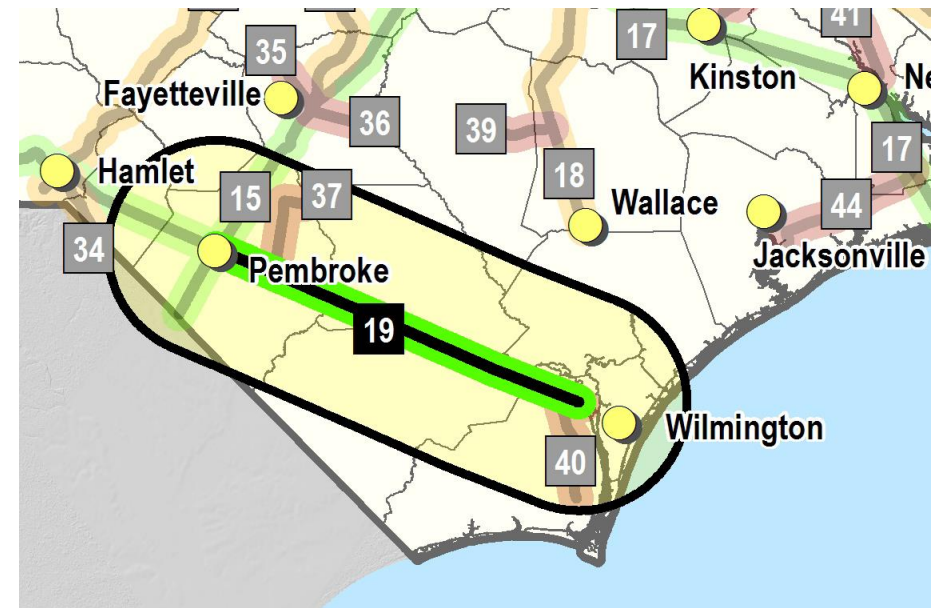
As in the case of Corridors 09 and 15, a study to look at the possibility of siting a new intermodal facility to serve eastern North Carolina and the Triangle Region will be conducted. This facility could help support the area's agricultural industry and provide valuable connections to the Port of Morehead City and the GTP. As previously stated, this aligns with the Governor's 25-Year Vision to seek opportunities to develop an intermodal facility along the I-95 corridor.

Community impacts associated with the line running down the center of streets in the business districts of Goldsboro, New Bern, and Morehead City are a major concern along this corridor. As such, a Traffic Separation Study was recently completed, making crossing closure and improvement recommendations in Goldsboro. The need to study the relocation of railroad tracks through downtown New Bern along a new alignment south of the city was identified. Also, a study is underway evaluating how to reduce the number of vehicle/train conflicts and improve traffic flow in downtown Morehead City.

Supporting freight traffic growth at the Port of Morehead City is also a concern. The Eastern Infrastructure Improvement Study (SB 402) recommended several potential improvements. In the short term, the study recommended developing a loop track at the Port of Morehead City, and using frontage roads and super-street highway intersection improvements to help reduce highway-rail conflicts through Morehead City. The Eastern Infrastructure Improvement Study recommended establishing a GTP to Morehead City Mobility Corridor. This corridor would include the relocation of the NCRR between Havelock and Morehead City. This relocation has been studied previously and is not fiscally feasible based on current port and rail volumes, but it is included as a long-term improvement that can be implemented when market conditions change. Also,

as previously noted, the feasibility of a rail bypass around New Bern should also be examined. . The improvements and studies described above will help to deliver on the Governor's 25-Year Vision to transform North Carolina's Ports. As this corridor is owned by the NCRR, any studies to analyze bypasses or track relocations will be conducted in partnership with the NCRR.

4.4.14 Corridor 19– CSXT - Pembroke to Wilmington



Corridor 19 is the approximately 73 mile long CSXT SE Line connecting Wilmington to Pembroke. The corridor parallels I-74 and US 74 for its entirety. At its western terminus, it connects to the CSXT A Line (Corridor 15), the primary east coast north-south rail corridor. The corridor is the only rail access to the Port of Wilmington via the Wilmington Terminal Railway, underscoring its importance to North Carolina's economy, placing it in the Investment Tier. Also noteworthy, CSXT has included the corridor as a component of its National Gateway Initiative and has provided double-stack clearances along the corridor as a part of that initiative. Currently, no rail intermodal service exists to the port. The North Carolina State Ports Authority will continue to partner with CSXT to respond to growing market demands for intermodal service to the Port of Wilmington, which is consistent with the Governor's 25-Year Vision to

transform North Carolina ports. A current project will construct a new connector track between Corridors 19 and 15, in the Town of Pembroke, improving connections between the two lines and significantly reducing the number of vehicle/train conflicts in the Town. Corridor 19 provides access to a number of large industries, including a paper mill in Riegelwood and chemical plants in the Wilmington area. The 1,025-acre Mid-Atlantic Industrial Park, which is a CSXT-Select Site, is adjacent to the corridor in the town of Leland. The corridor is also on the STRACNET providing access to the Sunny Point Military Ocean Terminal, the world's largest military ocean terminal, and connecting Fort Bragg to the Port of Wilmington.

At its eastern end, Corridor 19 passes through a mix of industrial and urban land uses. The projects submitted for this corridor reflect this. In Pender County, north of Davis Yard, an economic development project was submitted to provide access to the Pender Commerce Park, which currently does not have rail access. To address the potential vehicle/train conflicts as the corridor passes through Wilmington, a Traffic Separation Study is underway and will make recommendations to improve crossing safety.

Any proposed investments in the corridor will be beneficial to the Port of Wilmington, as much of the rail freight destined for and originating from the port utilizes the corridor. As the North Carolina Ports Authority pursues initiatives to grow freight at Wilmington, additional investments in Corridor 19 will be necessary to support increased freight volumes. These efforts range from studying upgrades of at-grade crossings through Wilmington, grade separations at the port gates, and a recommendation to evaluate the need for a new rail crossing of the Cape Fear River, south of downtown Wilmington.

4.4.15 Improvements to Short Line Railroads

As noted in Section 4.4.1, potential improvements to short line railroads were identified through their input, and input from MPOs, RPOs, and NCDOT units. This section presents needs for the short line railroads across the state. Figure 4-2 shows the location of rail operators and owners in the state. It should be noted that short lines often provide “last mile” access between industries and the Class I railroad network. The Aberdeen Carolina and Western Railway (ACWR) was identified as a strategic rail corridor in the North Carolina Transportation Network (NCTN) due to its potential to support economic development in central North Carolina. In particular, the ACWR serves the Heart of North Carolina MegaPark in Moore and Montgomery Counties. As the plans for the mega park continue to develop, an evaluation of the rail infrastructure required to support the megapark should be conducted. Additionally, connections to North Carolina’s ports are operated by short lines: Wilmington Terminal Railway (WTRY) at the Port of Wilmington and Carolina Coastal Railway (CLNA) at the Port of Morehead City. In some cases, specific projects have been enumerated. The City of Charlotte identified the need to relocate the Aberdeen Carolina and Western Railway, and the Wilmington MPO identified the need for grade separations at the Port of Wilmington gates and Front Street signalization. An ongoing study within NCDOT is looking at reestablishing rail service from Andrews to Murphy, in the western part of the state. However, the majority of the needs were developed through a short line survey and are grouped into the major categories of bridges, rail, ties and surfacing, additional capacity, rail yards, and transloads. Not every short line

railroad provided specific project level input. The generalized needs were compiled from 11 responses received from short lines following a request to identify aggregate needs. For all short lines, upgrading tracks and bridges to accommodate 286,000 lb. rail cars is essential to retaining industries in the state, particularly the rural and small urban areas where short lines predominantly operate.

Historically, short line railroads have received funding from NCDOT either through the Rail Industrial Access Program or the Short Line Infrastructure Assistance Program. Both of these projects are now funded by the Freight Rail and Rail Crossing Improvement Program. Projects are awarded through a grant system that evaluates projects based on factors including, but not limited to, the number of carloads that would benefit from the proposed improvements. Thus, the needs are presented in order to show the level of funding needed, but short line projects will still compete through those grant processes. Table 4-2, on the following page, presents the freight projects and needs on North Carolina’s short line network.

In addition to the projects and needs identified in Table 4-2, the Northwest Piedmont RPO requested an investigation of the feasibility of constructing a railroad line along the western side of I-77 from the Iredell-Yadkin County line to the Yadkin Valley Railroad in Surry County.

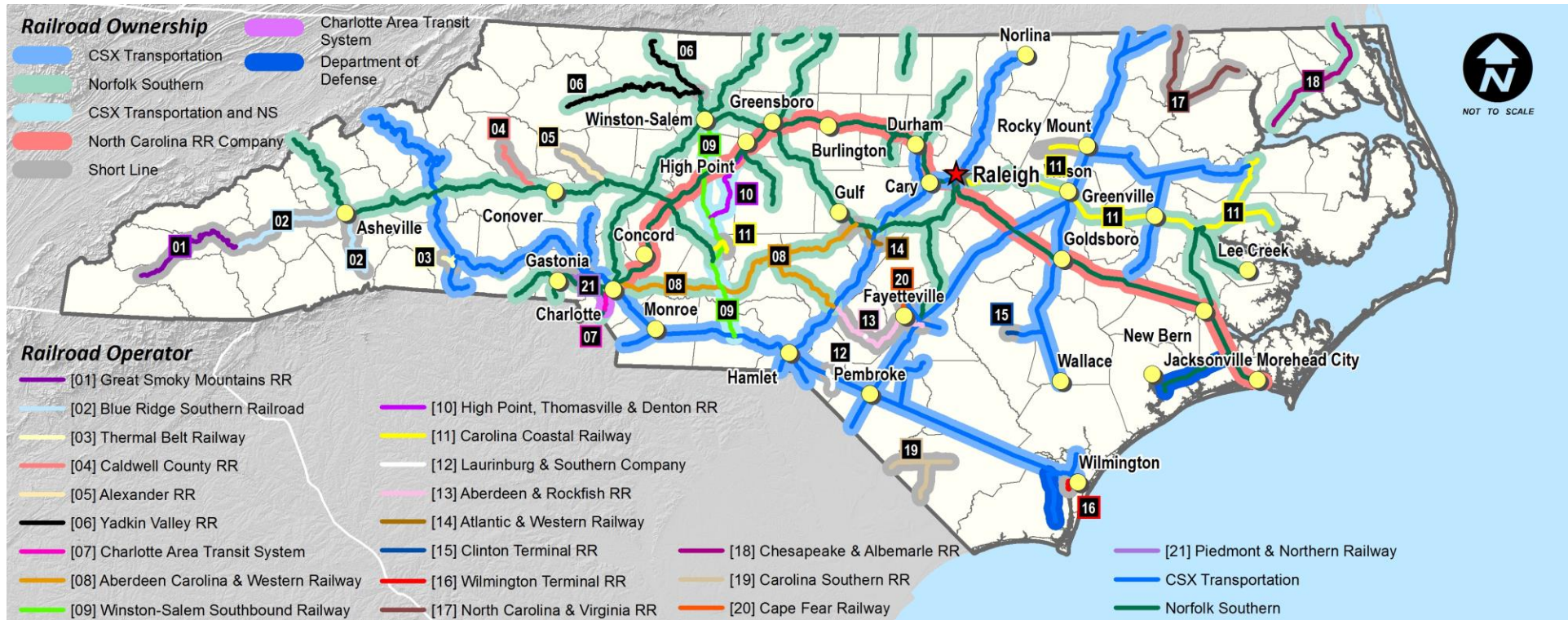


Figure 4-2 Railroad Operators

Table 4-2 Short Line Potential Projects and Funding Needs

SHORT LINE PROJECTS AND NEEDS – ELIGIBLE FOR FUNDING BY FRRCSI	FUNDING NEEDS BY TIME PERIOD		
	NEAR TERM 2015--2019	MID TERM 2020-2024	LONG TERM 2025-2040
Bridges <i>(Based on 11 short line survey responses)</i>	\$3,524,000	\$3,200,000	\$21,692,000
Rail <i>(Based on 11 short line survey responses)</i>	\$4,837,500	\$11,412,500	\$27,600,000
Ties and Surfacing <i>(Based on 11 short line survey responses)</i>	\$13,834,000	\$14,072,000	\$29,544,000
Additional Capacity <i>(Based on 11 short line survey responses)</i>	\$15,500,000	\$4,650,000	\$1,300,000
Rail Yards <i>(Based on 11 short line survey responses)</i>	\$1,100,000	\$1,600,000	
Transloads <i>(Based on 11 short line survey responses)</i>	\$2,360,000	\$500,000	
Other <i>(Based on 11 short line survey responses)</i>	\$2,370,000	\$1,135,000	\$2,070,000
Relocate ACWR <i>(Mecklenburg County)</i>		\$16,500,000	
Front Street Lead Track Signals and Gates <i>(New Hanover County)</i>	\$900,000		
Andrews to Murphy Reactivation <i>(Cherokee County)</i>		\$16,400,000	
Loop Track at the Port of Morehead City <i>(Carteret County)</i>		\$5,000,000	
Grade Separations and Port of Wilmington Gates <i>(New Hanover Co.)*</i>	\$50,000,000		
Total – Short line Project Needs	\$94,425,500	\$74,469,500	\$82,206,000
<i>* If identified by a Traffic Separation Study, could potentially be funded by highway-rail grade separation funds</i>			

5 Chapter Five – State Rail Service and Investment Program

This chapter describes the improvements and investments that address the passenger and freight rail needs identified in earlier chapters. The proposed improvements and investments described in Chapters 3 and 4 are evaluated using the objectives developed as part of the overall rail vision for the state, and analyzed for their public and private benefits and costs. This chapter also lists the proposed studies and other recommendations needed to improve rail services in the state. This Rail Service and Investment Program and State Rail Plan fulfills all of the requirements of the Federal Railroad Administration's (FRA) State Rail Plan guidance and complies with the Passenger Rail Investment and Improvement Act of 2008 (PRIIA). The State Rail Plan also supports the state's long-standing rail planning practice.

5.1 VISION

An important step in development of the State Rail Plan recommendations was to develop a list of goals and objectives. The goals and objectives for the State Rail Plan must support the mission and goals of the North Carolina Department of Transportation (NCDOT) and the NCDOT Rail Division. The NCDOT Rail Division's mission is the "...safe and efficient movement of people and goods on North Carolina's railroads through freight, passenger and safety programs, supporting job creation and economic growth."

The North Carolina Governor's 25-Year Vision, the NCDOT mission and goals, the Rail Division mission, the goals and objectives from the 2009 State Rail Plan, and input from the Technical Advisory Committee (TAC) were used to develop goals, vision, and objectives for this State Rail Plan.

The State Rail Plan supports the state's long-standing rail planning practice and the Governor's 25-Year Vision for North Carolina, which includes the following rail-related goals:

- Expand access to passenger rail options in all regions of the state
- Expand mass transit options, including rail
- Regular intermodal rail service to the Port of Wilmington

- Intermodal facilities along the I-95 corridor to support freight shipping
- Improve rail and seaport connections to I-95 to serve eastern U.S.
- Competitive rail access to Global TransPark and Port of Morehead City
- Public-private partnerships to complete Radio Island
- Improve rail connections between military bases and ports
- Economically competitive rail service to inland ports around Charlotte
- Expand rail capabilities to support Triad Logistics hub
- Support access to privately developed megasites
- Industrial access to freight rail lines for agribusiness and economic development in western NC

The goals, vision, and objectives for the State Rail Plan were categorized as follows:

- **State Rail Plan Goal Area:** Goal areas are a way of organizing NCDOT's objectives for the state rail system. Goal areas are: Safety and Security, Stewardship, Preservation, System/Interoperability, Freight, Passenger, Commuter, Planning.
- **Vision Statement:** Vision statements capture a shared understanding for the direction of planning and policies in each goal area. All objectives should support the overall vision for the goal area.
- **Objective:** Objectives describe the desired outcomes or progress under each goal area.

Table 5-1 shows how initiatives identified in the State Rail Plan will help implement the Governor's 25-Year Vision. Table 5-2 lists the Goal Areas, Vision Statements and Objectives of the State Rail Plan. Processes and strategies were also developed for each objective in the table to describe specific actions to be taken to achieve each objective, as well as possible success criteria to help NCDOT measure progress. These additional details are provided in Appendix E. Projects, studies, and initiatives needed to implement the Governor's 25-Year Vision and to meet the goals and objectives in Table 5-2 are provided in Figure 5-1 and Figure 5-2.

Table 5-1 The Governor's 25-Year Vision and the State Rail Plan

Region	Regional Solution	Next Steps
Coastal	Develop Intermodal Train Service to the Port of Wilmington	<ul style="list-style-type: none"> Identify capacity and safety needs along CSXT and WTRY railroad corridors in Wilmington In partnership with CSXT, study capacity improvements to the CSXT system in Eastern NC that would increase freight capacity Construct bridges at the north gate and container terminal to separate railroad and truck traffic at the Port of Wilmington
	Seek opportunities to develop intermodal facilities along the I-95 Corridor to support freight shipping	<ul style="list-style-type: none"> Evaluate the development of an intermodal facility to serve the Triangle Region and Eastern NC Consider the potential roles for North Carolina state ports and regional ports to support intermodal service
	Leverage public-private partnerships to complete the development of Radio Island and support enhanced rail access to the Port of Morehead City	<ul style="list-style-type: none"> Evaluate economic feasibility of relocating the NCRR along a new alignment between Morehead City and Havelock, allowing trains to access Radio Island from the east Work with the North Carolina State Ports Authority and Carolina Coastal Railway to develop a loop track at the port Support development of other frontage roads or superstreet intersections to help reduce highway-rail conflicts in Morehead City
Eastern	Support economically competitive rail access to the Global TransPark (GTP) and Port of Morehead City	<ul style="list-style-type: none"> Construct a rail line from GTP in Kinston to the CSXT line parallel to NC 11 in Lenoir County
	Improve connections to the I-95 corridor from rail and seaports to serve markets throughout the Eastern US	<ul style="list-style-type: none"> Provide access to the Mid-Atlantic Industrial Rail Park, a 1,025-acre CSXT-Select Site in Leland, Brunswick County Evaluate feasibility of a new rail crossing of the Cape Fear River to eliminate the need for trains to traverse through Wilmington to access the Port of Wilmington
Central	Improve highway connections and seek economically competitive rail service to inland ports in and around Charlotte and Greensboro	<ul style="list-style-type: none"> Construct siding extension at Stouts in Union County Support the Phase III Expansion of CSXT's Charlotte Intermodal Terminal Study operational improvements along the CSXT rail line between Charlotte and Pembroke Relocate the Aberdeen Carolina & Western Railroad in Mecklenburg County
	Improve highway connections and expand airfreight and rail capabilities to support the Triad Logistics Hub	<ul style="list-style-type: none"> Construct rail spur at Piedmont Triad International Airport Convert NS "Roundhouse" property adjacent to Greensboro Intermodal facility into parking and container storage
	Ensure infrastructure plans recognize the development	<ul style="list-style-type: none"> Provide access to the 1,000-acre I-85 Corporate Center megasite in Davidson County

Region	Regional Solution	Next Steps
	of megasites in the region and support their ability to attract new businesses in targeted industry clusters.	<ul style="list-style-type: none"> • Conduct a study to identify infrastructure needs required to support industries targeted for the 1,800-acre Chatham-Siler City Advanced Manufacturing Site • Support access to the Project Legacy megasite in Union County • Identify infrastructure needs required to support industries targeted for the Heart of North Carolina MegaPark
	Support the expansion of mass transit options in high-growth areas to address the needs of changing demographics, congestion and land development concerns	<ul style="list-style-type: none"> • Plan to accommodate potential commuter and light rail in the Triangle, Triad and Metrolina regions. NCDOT will work with the regional agencies as they develop their plans.
Western	Provide industrial access to freight rail lines to accommodate expanding agribusiness and economic development while fully utilizing our multimodal transportation system	<ul style="list-style-type: none"> • Evaluate operational improvements to the CSXT freight and intermodal network from TN to Charlotte • Reactivate Andrews to Murphy line to accommodate potential freight movement
Comprehensive	Expand access to passenger rail options in all regions of the state to accommodate changing demographics, address congestion issues and meet regional transportation needs	<ul style="list-style-type: none"> • Continued development of the Southeast Rail Corridor • Work with project sponsors to evaluate intrastate passenger rail for commuter and light rail in existing and emerging urban/suburban corridors • Statewide Thruway Bus service expansion • Analysis of capacity and potential of existing stations to accommodate needs, and potential positive economic impacts to surrounding land uses

Table 5-2 State Rail Plan Goals, Vision, Objectives

Goal Area/ Vision Statement	Objectives
Goal Area 1. Safety & Security Vision: A rail system that safely moves people and products	1.1 Reduce the number of rail-related crashes, including pedestrian trespassers 1.2 Maintain safety and mobility during emergencies 1.3 Prevent harm from train crashes and incidents and, when incidents occur, address them safely and efficiently 1.4 Improve the security of North Carolina’s rail system 1.5 Maintain equipment properly
Goal Area 2. Stewardship Vision: A rail system that is operated and improved with the greatest benefit and the least impact feasible to the human and natural environment	2.1 Minimize the negative impacts of rail operations and new rail projects on the natural and human environment 2.2 Maximize positive impacts of new rail projects on the natural and human environment 2.3 Increase the understanding and support of rail among policy makers and the public as a mode of transportation that supports growth while limiting the impact of increased transportation demand on air quality, energy use, and safety
Goal Area 3. Preservation Vision: A rail system that is preserved for current and future use	3.1 Maintain and improve the viability of short line railroads and associated industries 3.2 Preserve opportunities for future passenger or freight rail service to leverage existing corridor assets and capacity 3.3 Preserve railroad corridors for future use
Goal Area 4. System/Interoperability Vision: A rail system with connecting corridors and facilities that promotes the efficient movement of people and goods and supports economic growth and development	4.1 Move people and goods more efficiently 4.2 Maintain and improve connectivity of the rail system, supporting economic growth 4.3 Ensure intercity, commuter, and transit services act as a cohesive system and are planned in a manner that accommodates existing and future freight movement
Goal Area 5. Freight Vision: A rail system that provides safe, reliable, efficient, and well-used rail freight service	5.1 Increase the efficient use of freight rail service 5.2 Increase the freight customer base 5.3 Promote economic development
Goal Area 6. Passenger Vision: Provide a system of intercity passenger services connecting North Carolina's major metropolitan areas and other communities to destinations within the state and along the East Coast	6.1 Increase ridership and enhance the economic performance of the state’s passenger rail network 6.2 Provide passenger service, or connections to intercity passenger service, from large growth areas to major East Coast destinations and feeder stops
Goal Area 7. Commuter Vision: A rail system that connects suburbs and bedroom communities of major employment centers with commuter rail service	7.1 Support local plans and policies to implement commuter rail service
Goal Area 8. Planning Vision: State rail planning addresses the collective needs of the State, its citizens, industries, traveling public, and transportation providers	8.1 Provide a comprehensive plan that incorporates the needs of today and addresses the demands of a growing State and region

Prioritization Criteria

- Population within 10 and 30 miles of corridor
- 2030 population within 30 miles of corridor
- Current and 2040 volumes on parallel highways
- Current and 2040 congestion on parallel highways
- Connections to major activity centers
- Passenger trains volumes in corridor
- Inclusion along federally-designated Southeast Corridor



Figure 5-1 Passenger Rail Corridor Priorities to Implement the Governor's 25-Year Vision

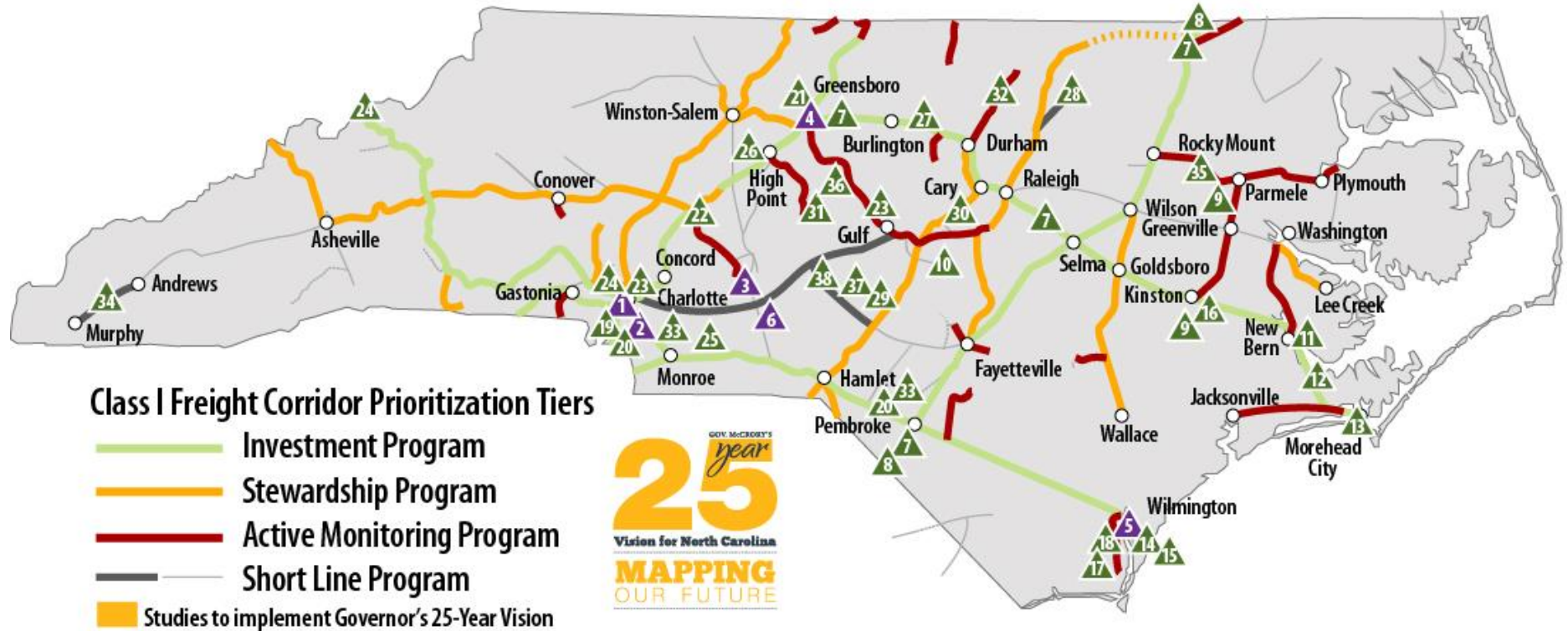


Figure 5-2 Freight Corridor Priorities to Implement the Governor's 25-Year Vision

Freight Program – Near-Term Improvements

1. NS Thoroughbred Bulk Transfer (TBT) Facility in Charlotte
2. CSXT-10,000 ft. Siding Extension at Stouts in Union County
3. Upgrade NS along US 52 in Albemarle in Stanly County
4. Container Parking/Storage Adjacent to NS Greensboro Intermodal Facility (Converts former roundhouse)
5. Grade separation at Port of Wilmington Gates; Front Street Crossing Improvements
6. Expand transload facility in Anson County

Studies to Implement the Governor's 25-Year Vision and Other Identified Needs

7. Eastern Intermodal – Identify location (along CSXT or NS Corridors) for a potential new intermodal facility that supports agriculture, food manufacturing and industry in Eastern NC, and supports Triangle Region's access to intermodal service as highway congestion impacts terminals in Charlotte and Greensboro
8. CSXT Capacity Studies in Eastern NC – Freight Movement Passenger Interoperability
9. Emerging Market Needs – e.g. wood pellets
10. Emerging Market Needs – e.g. hydraulic fracturing
11. As part of the GTP to Morehead City Mobility Corridor, assess a rail bypass of New Bern, parallel to proposed US 70 New Bern Bypass in conjunction with NCRR
12. As part of the GTP to Morehead City Mobility Corridor, in conjunction with NCRR, relocate NCRR from Port of Morehead City to Havelock (dependent on substantial increases in port traffic)
13. Implement short-term projects identified in SB 402 studies to reduce highway railroad conflicts in Morehead City and add loop track on port terminal
14. At-grade crossing improvements – WTRY and CSXT accessing the Port of Wilmington
15. Identify capacity needs through Wilmington to enhance connectivity to the Port
16. New rail line from GTP in Kinston to the CSXT line parallel to NC 11 in Lenoir County
17. Provide access to the Mid-Atlantic Industrial Rail Park, a 1,025 acre CSXT-Select Site in Leland, Brunswick County
18. Evaluate feasibility of a new Cape Fear River crossing.
19. Phase III expansion of CSXT's Charlotte Intermodal Terminal
20. Study operational improvements along CSXT between Charlotte and Pembroke
21. New rail line to serve the Triad Logistics Hub at Piedmont Triad International Airport
22. Provide access to the 1,000 acre I-85 Corporate Center Megasisite in Davidson County
23. Identify infrastructure needs required to support industries targeted for the 1,800 acre Chatham-Siler City Advanced Manufacturing Site
24. Identify operational improvements to the CSXT freight and intermodal network from Tennessee to Charlotte; Grade separate CSXT SF Line and NS Mainline in Charlotte
25. Identify infrastructure needs required to support the Project Legacy Megasisite in Union County
26. Improvements to Linwood Yard, Pomona Yard, Jamestown siding, Kimberly Clark lead track, and multiple grade separations between Charlotte and Greensboro
27. Multiple grade separation projects between Greensboro and Raleigh
28. Two grade separation projects between Raleigh and Norlina
29. CSXT Automotive Distribution Terminal in Lee County
30. Multiple grade separation projects in Apex and Cary
31. Improve NS siding in Sophia
32. Upgrade NS Corridor from Durham to Oxford
33. Relocate Aberdeen Carolina & Western Railroad in Mecklenburg County
34. Reactivate the Andrews to Murphy line for freight movement and excursions
35. Kingsboro/Rose Megasisite, a CSXT-Select Site east of Rocky Mount
36. Identify infrastructure needs to support Randolph County (Liberty) Megasisite
37. Identify infrastructure needs to support Heart of NC MegaPark
38. Support Rail Industrial Access and Short Lines through FRRCSI

Figure 5-3 Freight Corridor Priorities to Implement the Governor's 25-Year Vision (Map Key)

5.2 PROGRAM COORDINATION

The 2015 State Rail Plan was coordinated with various planning efforts in the public and private sector, at the local, regional, statewide and multi-state and national levels.

A review of the 2009 North Carolina Rail Plan was conducted to identify and update previously proposed projects and rail programs. The State Rail Plan was also coordinated with the State Transportation Improvement Program (STIP) as well as with the NCDOT's new Strategic Transportation Investments (STI) program, as described Section 2.1.5.3.1. The STIP and STI were reviewed to identify projects and possible funding sources. The Governor's 25-Year Vision for North Carolina was consulted to ensure that recommended short- and long-term transportation investments were consistent with the plan's regional and statewide visions. A review of Rail Division programs, including the crossing safety program, the industrial access program, and the passenger rail and station program was also undertaken to identify their benefits, funding sources, and future needs so that they could be incorporated into this State Rail Plan.

Statewide plans that were consulted include:

- Seven Portals Study (2011)
- Governor's Logistics Task Force Final Report (2011)
- NCDOT 2040 Transportation Plan (2012)
- North Carolina Maritime Strategy Final Report (2012)
- North Carolina Jobs Plan (2013)
- North Carolina Regional Study Summary (2013)
- North Carolina Transportation Network (2014)
- Governor McCrory's 25-Year Vision (2014)
- Eastern Infrastructure Improvement Study (2015)

The State Rail Plan was also developed through coordination with a Technical Advisory Committee (TAC) that included representatives from NCDOT, NC Department of Agriculture and Consumer Services, NC Department of Commerce, NCRRC Company, CSX Transportation, Norfolk Southern Railway, Amtrak, the NC Center for Global Logistics, and the Railway Association of North Carolina. The TAC met several times during the plan's development and was afforded the opportunity to review materials, data, methods, and recommendations presented in the plan. This coordination is discussed in more detail in Chapter 6.

The State Rail Plan efforts were also coordinated with the on-going planning efforts and studies associated with the Southeast Corridor and the work underway by the Virginia-North Carolina Interstate Rail Compact. This review of Southeast Corridor program efforts included a review of the Piedmont Improvement Program (PIP) and other improvements funded under the American Recovery and Reinvestment Act of 2009 (ARRA). The Plan also coordinated with the 2013 Virginia Statewide Rail Plan. The Georgia Department of Transportation was contacted to ensure that the planning efforts for the Atlanta to Charlotte segment of the Southeast Corridor were considered.

A critical component of the stakeholder engagement efforts included outreach to the various Metropolitan Planning Organizations (MPOs) and Rural Planning Organizations (RPOs) to ensure that regional and local needs were addressed in the Plan. This outreach was accomplished via surveys, telephone interviews, a Rail Planning Forum, and through a session at the 2014 North Carolina MPO conference. Interviews were also conducted with planning staff at the transit agencies in the Metrolina (Charlotte and surrounding metropolitan area communities), Triad and Triangle regions to gather input on their proposed and planned rail projects.

Direct coordination was conducted with CSXT and NS to ensure that the State Rail Plan was consistent with their national planning efforts. Representatives from these two railroads also served on the TAC, which gave input and reviewed components of the State Rail Plan. In addition, the NCDOT Rail Division has strategic planning meetings with both railroads on a regular and on-going basis. These meetings can be used as a tool to ensure that projects that evolve out of the studies included in the State Rail Plan and additional initiatives that the railroads are interested in, can be coordinated and programmed as market conditions change and more information is available. Surveys and project requests were also distributed to the short line railroads. The President of the Railway Association of North Carolina, an advocacy group for the short line railroads, was included as a member of the TAC to ensure their participation in the development of the plan. The NCRRC Company was also included as a member of the TAC and their recently completed economic impact study was reviewed during the development of the State Rail Plan. Through a meeting with NCRRC, the principles of their strategic plan were discussed, but the plan was not available for review. Their plan is anticipated to concentrate

on economic development, though it does not wholly exclude other initiatives. Finally, Amtrak's plans for improving *Silver*-service trains, routing, on-time performance, and customer satisfaction were considered during plan development.

5.3 RAIL AGENCIES ORGANIZATION AND POLICY CHANGES

NCDOT recently completed a review of the Rail Division organization and staffing requirements, and a reorganization of the Division was completed in 2013 (see Figure 1-14). Therefore, the State Rail Plan does not recommend changes to the structure or organization of the NCDOT Rail Division. As the Rail Division's programs continue to grow, there may be the need for additional staff to oversee efforts such as expanded passenger operations, economic development, and safety oversight. The Rail Division can address these additional staffing needs through the Department's systematic organizational and staff reviews.

Rail helps support North Carolina's economy. Freight rail operations offer a cost competitive mode for the state's shippers and reduce emissions, congestion, and highway maintenance. Passenger rail provides an alternative to using congested highway corridors and improves safety for travelers who divert from auto travel while increasing the accessibility for the state's populations to jobs, education, and recreational opportunities. These benefits are built on cumulative past investments in rail infrastructure projects and are realized through strategic partnerships with public and private entities. Recognizing the value of rail service to North Carolina's economy, a variety of local communities and stakeholders have identified candidate investments to maintain and foster future growth. Given this interest, an exploration of whether changes to existing rail funding programs could make them more flexible, as well as potential sources of new funding for rail investment, may be warranted.

5.3.1 Existing Federal Programs

- Support reauthorization of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), which includes grants for safety improvements along rail corridors, passenger rail corridor development, and addressing congestion bottlenecks.
- Support long-term reauthorization of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and appropriations for associated funding programs such as the Congestion Mitigation and Air Quality

(CMAQ) program, Railway/Highway Crossing Hazard Elimination grants, and Rail Line Relocation and Improvement Capital Grants, which have provided North Carolina with funding for relocating freight lines that eliminate congestion and rail/street at-grade conflicts within downtowns and urban areas.

- Support expansion of the Transportation Investment Generating Economic Recovery (TIGER) grant program and annual appropriations.
- Support reauthorization of the Rail Safety Improvement Act, which includes grants for rail safety technology.
- Support action on the National Freight Network Trust Fund bill, proposed under the US House Bill 5101.
- Support reauthorization of the federal tax credit for short line maintenance.

5.3.2 Existing State Programs

- Continue to identify projects to be considered in future iterations of the Strategic Transportation Investments (STI), which is described in Section 2.1.5.3.1.
- Continue the Freight Rail and Rail Crossing Improvement Fund (FRRCSI) funding of the Short Line Infrastructure Assistance Program and Rail Industrial Access Program.
- Alter FRRCSI eligibility requirements to include short lines that do not carry freight. The Great Smoky Mountain Railroad is a tourist/excursion railroad providing economic benefits in Western North Carolina. However, since it does not have a freight customer it is not eligible for FRRCSI funds, the only source of state funding for short line railroads.
- Create an ongoing and available funding mechanism for purchasing abandoned or inactive rail corridors or right of way required to preserve the option for future freight or passenger service. Rail corridors are difficult, if not impossible to reassemble if they are not

preserved. North Carolina needs a source of funding to secure inactive corridors such as the CSXT S line, which is needed for the Raleigh to Richmond portion of the Southeast Corridor Passenger Service, and others that provide transportation alternatives.

- Allow greater funding flexibility for NCDOT to match federal grants.
- Support the use of tax incentives for railroad intermodal facilities.
- Explore potential to revise the state's public-private partnerships legislation to better allow for passenger rail projects. Private developers have expressed interest in partnerships for constructing new train stations in Charlotte and other cities.
- Where appropriate, explore the use of just-in-time bond strategies and other mechanisms described in the Governor's 25-Year Vision.

5.3.3 Illustrative Funding Programs from Other States

- Virginia has expanded its passenger rail program using a portion of the state's sales tax dedicated to passenger rail operations and maintenance (\$44M annually in 2014) and a three percent vehicle rental tax to fund rail capital improvements (\$27M annually).
- Wisconsin operates a revolving loan fund for private rail infrastructure improvements.
- Georgia proposed the creation of a Goods Movement Investment Fund, to have three revenue sources: diesel fuel tax paid by the railroads, railroad property lease income, and a penny gas tax.

5.3.4 Other Potential Funding Sources

- Parking and station use fees.
- Local funding to support extensions to passenger rail services.
- Local (municipal) funding to cover operating costs of new/extended passenger services.

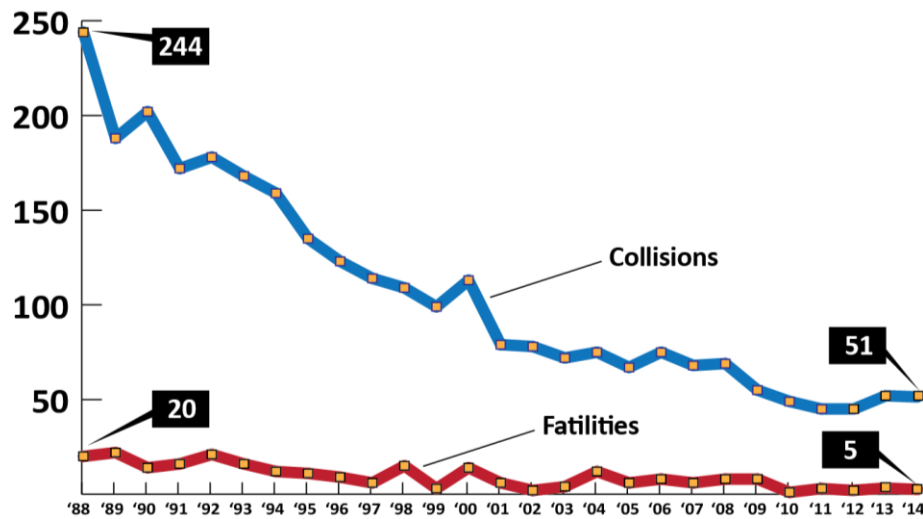
- Tax increment funding based on increased property values resulting from the additional Raleigh to Charlotte train frequencies to fund operations and maintenance of these services.
- Exemption of railroads from state gross earnings tax, or tax credits, if money saved is used for capital expenditures in North Carolina.

5.4 PROGRAM EFFECTS

Existing freight and passenger rail networks and services contribute approximately \$1.88 billion in direct economic impacts per year to North Carolina. For freight, this reflects savings in shipping costs (rail vs. truck), pavement costs (i.e. wear and tear on roads), and congestion costs (travel time impacts for other vehicles based on the number of trucks on the road). For passenger rail, this includes direct operator jobs, purchases of goods and services, and tourist spending, as well as pavement and congestion savings from trips that would otherwise be made by automobile.

In addition to the direct economic impacts, broader social impacts generate approximately \$311 million in emissions and safety impacts annually as a result of the truck and auto vehicle miles traveled (VMT) avoided due to the use of freight and passenger rail in the state. Further, rail supports approximately 2,800 direct jobs in the state. The statewide impacts of rail services in North Carolina are discussed in detail in Chapter 2 (Section 2.1.7).

Beyond the direct jobs associated with the rail industry, improvements to access and enhancements to the network support indirect jobs, increase volumes on the rail network, and can help support job creation, though there are other factors in the economy that also play a role. As an example, from 1994 to 2013, the Rail Industrial Access Program provided grants to 71 companies; these grants have helped support industries that employ 6,105 people. The Rail Industrial Access Program is now funded through FRRCSI. FRRCSI also funds the Short Line Infrastructure Assistance Program, and safety projects that help reduce train-car collisions, as shown in Figure 5-3. These positive safety benefits are also a result of additional safety funding through the Federal Highway Administration Highway Safety Improvement Program (HSIP) and Section 130 Highway-Rail Grade Crossing Program.



Source: NCDOT

Figure 5-4 Train-Car Collisions and Fatalities, 1988-2014

This section presents the expected benefits of the program of rail projects presented in Chapters 3 and 4. Potential effects include benefits to the rail network and other transportation modes, increased rail capacity, reduced congestion, improved safety, improved environmental quality, modal diversion and regional economic development benefits. Program effects are described in detail for near-term (short range) projects encompassing the first five years of the program (2015-2019) and summarized for mid- to long-term (long range) projects (2020-2040).

Tables 5-3 and 5-4 show the program effects for the short-range and long-range passenger rail programs. The effects from the short-range program and information presented previously on existing rail programs are used to approximate the expected effects of the long-range program. Freight rail near- and long-term program effects are presented in Tables 5-5 and 5-6. More details on project costs are presented in subsequent sections in Tables 5-7 through 5-10.

Where practicable, a quantitative analysis comparing the benefits of each near-term project to its capital and operating costs. In some cases, a qualitative analysis was done. A benefit-cost analysis (BCA) ratio is provided in Table 5-3

and Table 5-5 for near-term projects where necessary data was available. A BCA is a ratio that compares the sum of a project or program's benefits to its cost. Typically, a BCA ratio of 1.0 indicates the benefits and costs are equal over the analysis period, and a BCA ratio over 1.0 demonstrates that there are more quantifiable benefits than costs for the project or program. Alternately, a BCA ratio of less than 1.0 may indicate that there are not enough benefits to outweigh the costs, or that all of the benefits are not quantifiable at this time. As markets and conditions change, some projects may need to be reevaluated to capture all available benefits. Capital costs and BCAs are highlighted in this chapter, but more detailed information regarding the capital costs, operating costs, and estimated benefits used to calculate the BCAs are available in an associated technical memorandum included in Appendix F.

Passenger Rail

The NCDOT Rail Division anticipates implementing a number of projects on key passenger rail service corridors within the next five years including additional frequencies and amenities on the *Piedmont*, maintenance yard improvements, a new station, improvements at existing stations, and additional Amtrak Thruway Bus service. The remaining passenger rail program elements, which include full implementation of the Southeast Corridor in North Carolina and Virginia, Western and Southeastern North Carolina service extensions, are projected for implementation over the mid- to long-term (2020-2040). Program effects and timeframes for near-term projects are shown in Table 5-3. Similar information for mid- to long-term projects is shown in Table 5-4.

In addition to the projects identified in the tables, NCDOT is in the final stages of implementing the Piedmont Improvement Program (PIP), which will add capacity, improve safety, and reduce travel time between Raleigh and Charlotte on the NCR corridor. These improvements have been fully funded under the ARRA and will be completed by 2017, at which time the fourth frequency (which is included in Table 5-3) can be implemented.

Benefit-cost ratios were calculated for adding the fourth and fifth frequencies on the *Piedmont* corridor, adding Wi-Fi to the *Piedmont* equipment, and construction of a new station and platform in Hillsborough.

Operating the fourth frequency of the *Piedmont* and *Carolinian* services in North Carolina would result in additional ridership and revenues. The capital investment required for the fourth frequency is in place and was excluded from the analysis. The additional frequency would allow more riders to access passenger rail and reduce vehicle trips in the state.

The service is expected to attract ridership of 144,000 additional *Piedmont* and *Carolinian* riders per year compared to the third frequency. Ridership is conservatively assumed to be constant throughout the analysis period. The new riders would avoid trips by auto, resulting in reduced VMT and the associated benefits including safety, emissions, congestion, and pavement costs avoided. The average trip length for fourth frequency riders is estimated to be 239 miles,¹ and it is assumed each rider would have driven alone if not for the additional Amtrak service. Annual operation and maintenance (O&M) costs were estimated to be \$7.3 million per year and offset by the annual ticket revenue estimated at \$4.6 million per year;² O&M and revenues were held constant throughout the analysis period. The annual O&M was estimated by taking the difference between the operating costs for the fourth frequency compared to the current O&M of the 3rd frequency, and the revenues consider only the *Piedmont* and *Carolinian* services. While ticket revenues are not a benefit, they help recover some of the O&M costs for the project, and therefore, are included as a cost offset.

In total, the 30-year benefit stream of the fourth frequency at 7 percent and 3 percent discount rates total \$129 million and \$234 million, respectively, and when compared to the additional O&M costs, the project provides over five times more benefits than costs.

The fifth frequency would attract additional ridership and revenues beyond those of the fourth. Operating the fifth frequency depends on two projects: extending the lead track in Capital Yard and acquiring new equipment (a locomotive, communications control unit, baggage/luggage cars, and coach cars).

The fifth frequency is expected to attract ridership of 237,400 additional *Piedmont* and *Carolinian* riders per year compared to the fourth frequency. Ridership is conservatively assumed to be constant throughout the analysis period. The new riders would avoid trips by auto, resulting in reduced VMT and the associated benefits including safety, emissions, congestion, and pavement costs avoided. The average trip length for fifth frequency riders is estimated to

be 200 miles,³ and it is assumed each rider would have driven alone if not for the Amtrak service. Annual O&M costs were estimated to be \$7.3 million per year⁴ and offset by the annual ticket revenue estimated at \$7 million per year;⁵ O&M and revenues were held constant throughout the analysis period. Because the annual O&M cost for the fifth frequency has not yet been determined, it was assumed to be equal to the O&M cost for the fourth frequency, and the revenues consider only the *Piedmont* and *Carolinian* services. While ticket revenues are not a benefit, they help recover some of the O&M costs for the project, and therefore, are included as a cost offset. Finally, the additional frequencies would yield greater utilization of physical plant and rolling stock and the potential for greater labor efficiency, depending on scheduling and regulations concerning crew changes. Some of these savings would be offset by incremental increases in operating costs associated with the additional service.

In total, the 30-year benefit stream of the project at a 7 percent and 3 percent discount rates total approximately \$140 million and \$289 million, respectively, and when comparing to the incremental costs from the fourth to fifth frequencies, the project provides over six times more benefits than costs.

The Hillsborough Station project would include constructing a platform, passenger rail station building, site access, utilities, and parking on the Town of Hillsborough-owned site. The station will synergize with the adjacent planned transit-oriented development (TOD). The station would allow more riders to access passenger rail and reduce vehicle trips in the state. The facility is expected to attract 12 riders per day and ridership was assumed to conservatively grow by 1 percent per year as a result of the increased connectivity and reliability of the service. The new riders would avoid trips by auto, resulting in reduced VMT and the associated benefits including safety, emissions, congestion, and pavement costs avoided. Annual O&M costs were estimated to be 5 percent of the capital costs, or \$400,000 per year, and because the facility would have a useful life longer than 30 years, the project has a residual value benefit.

¹All trips are one-way trips. See Table 3-2 for projected daily ridership and revenues of the fourth and fifth frequencies. Average trip length is found from *Piedmont* and *Carolinian* Passenger Miles divided by *Piedmont* and *Carolinian* Ridership.

² See Table 3-2 for projected daily ridership and revenues of the fourth and fifth frequencies. The difference of ticket revenues for *Piedmont* and *Carolinian* trains from 3 to 4 frequencies totals \$4.636 million.

³ See Table 3-2 for projected daily ridership and revenues of the fourth and fifth frequencies. Average trip length is found from *Piedmont* and *Carolinian* Passenger Miles divided by *Piedmont* and *Carolinian* Ridership.

⁴ Operating costs estimated as part of the State Rail Plan

⁵ See Table 3-2 for projected daily ridership and revenues of the fourth and fifth frequencies. The difference of ticket revenues for *Piedmont* and *Carolinian* trains from 4 to 5 frequencies totals \$7.045 million.

In total, the BCA ratios of the project at 7 percent and 3 percent discount rates are 0.52 and 0.69, respectively, which means that the project is anticipated to have more costs than benefits that can currently be quantified in the analysis period. However, as station planning progresses, the impact of the proposed station on surrounding land values will be able to be better-estimated which may lead to a more favorable BCA.

While benefits have been presented for individual projects, the near-term projects, including PIP projects, will collectively create additional passenger benefits for the Piedmont corridor. The station, capacity, operating speed and amenity improvements will increase the efficiency, convenience and quality of passenger rail service in North Carolina. When implemented as a coordinated program, they will result in statewide system capacity improvements, congestion relief, environmental and economic benefits.

Substantial benefits will accrue from implementing the Southeast Corridor. Major travel time savings will foster economic development opportunities near stations. Modal diversion from trucking and vehicle trips to passenger and freight rail will also contribute to environmental benefits in the Southeast Corridor. Implementing passenger service to Western North Carolina and Southeastern North Carolina will create an interconnected passenger rail network across the state improving mobility options. Another potential service could connect Charlotte to the Northeast Corridor via Lynchburg, Virginia. These services will also create new economic development and tourism opportunities in these regions.

Freight Rail

Similar to the passenger rail projects, the near-term freight rail projects will produce collective benefits beyond those individual project benefits identified. The grade separation projects will enhance overall corridor safety and capacity, resulting in congestion relief, economic and air quality benefits. The Port of Wilmington and intermodal facility projects will leverage private investment and enhance rail's attractiveness for intermodal shipping, creating environmental and economic benefits to shippers and the public.

The NCDOT Rail Division has coordinated with the freight railroads and local planning organizations to identify projects to enhance the state's freight rail network and anticipates implementing several freight rail oriented projects within the next five years. These are projects that primarily have funding identified under current available programs. Some projects, such as grade

separations, will benefit passenger rail travel as well as freight and highway traffic. The projects include intermodal facility improvement projects, track upgrades and siding extensions, one signalization project, bridge improvement projects for both Class I and short line railroads, industry-specific economic development projects and numerous grade separation projects, including two at the Port of Wilmington.

Over 30 freight rail capital projects are identified for implementation over the mid- to long-term (2020-2040). The program effects of the near-term projects are shown in Table 5-5. Similar information for mid- to long-term projects is shown in Table 5-6.

There are three general types of freight rail projects included in the mid- to long-term. The associated benefits for each category of project are described below:

- **Track Improvements/New Access:** projects that provide new or upgraded rail lines may result in higher train speeds and/or more reliable schedules, thereby reducing transit time for shipments, increasing capacity of the line, and saving shipping costs. In addition, because new tracks can provide new access to industries or populations, resulting in increased accessibility between shippers and consumers. This access can divert truck traffic from highways to rail, resulting in enhanced safety, reduced emissions and congestion, and pavement savings. In addition, the new track will require lower maintenance costs as it is brought up to a state of good repair. Track improvements can be prioritized in part by the volumes and types of commodities carried on corridors and connectivity to major freight activity centers and networks, as noted in the corridor prioritization process in Chapter 2. Because they affect higher volumes of freight, these types of projects are anticipated to have good benefit-cost ratios.
- **Intermodal Terminal and/or Rail Yard Improvements:** projects that create or improve rail yards and intermodal/transload facilities aid in diverting shipments from the state's highways, resulting in safety, emissions, congestion, and pavement savings. Shippers also save by using a more cost-efficient mode. These types of projects are consistent with the Governor's 25-Year Vision and benefit North Carolina's economy by linking industry to the overall rail network. As a result, these types of projects are anticipated to score well within STI and have good benefit to cost ratios.

- **Safety, Crossing Safety Improvements, and/or Grade Separations:** projects that reduce train-car conflicts result in improved safety at crossings. Train-car conflicts increase the likelihood of collisions that result in injuries and the loss of lives. In addition, autos idle at crossings, incurring travel time delays, increased emissions, and vehicle operating costs. Grade separations also allow for faster train speeds, resulting in increased capacity and reliability for rail shipments.

Fourteen (14) of the 42 corridors shown in Figure 4-1 have proposed freight projects between 2020 and 2040. These corridors are geographically diverse and located throughout the state. Projects on several of these corridors will also benefit existing or future passenger rail service. The corridors with the most substantial proposed investments are corridors 06, 07, 09, 13 and 18. The investments in these corridors will improve freight rail capacity in the Piedmont region (06, 07, and 09), promote economic development and enhance safety between Raleigh and Hamlet (13), and support intermodal movement of freight and economic development through track reconstruction to Wilmington (18). The Statewide Freight Investments program includes projects across the state that will serve corridors not included in the fourteen numbered corridors in Table 5-5 and Table 5-6.

Benefit-cost ratios were calculated for near-term projects where required data was available or could be easily estimated. These projects include construction of the NS Thoroughbred Bulk Terminal in Charlotte, conversion of the former NS Roundhouse property into container parking/storage for the NS Greensboro Intermodal Facility, construction of a 10,000-foot siding on CSXT's corridor in Stouts, Union County, upgrading the NS rail corridor along US 52 in Albemarle, adding signals and gates to the Front Street lead track in Wilmington, and construction of grade separations at the Port of Wilmington gates.

The BCA ratios are presented in Tables 5-5 and 5-6 and are discussed in detail in Appendix F. All of the freight projects included in STI have BCA ratios greater

than 1.0 indicating benefits exceed costs. Some of the projects have ratios as high as 10.22. Construction of a grade separation at the North Gate to the Port of Wilmington also had a BCA greater than 1.0. The grade separation would eliminate numerous conflicts between the freight car switching operations at the port on the Wilmington Terminal Railroad and the highway entrance to the bulk goods facilities at the port. When trains are in operation, a flagger must stop truck traffic entering the port at the gate. This project is an excellent candidate for FRRCSI and/or a federal TIGER grant application.

Two freight projects – gates and signals at the Front Street crossing and a grade separation at the Container Gate to the Port of Wilmington had BCA ratios less than 1.0 based on current information and train volumes. However, as volumes at the Port of Wilmington continue to increase, these projects should be considered to enhance highway, intermodal, and carload access to the port. FRRCSI and potential federal grants are the most likely source of funding for these projects, though partnerships with the Wilmington MPO and port will be explored.

Projects that coincide with recommendations in the Governor's 25-Year Vision are denoted by an asterisk in Tables 5-3 through 5-8.

In addition to the passenger and freight projects identified in Tables 5-3 through 5-6, the NCDOT Rail Division completes approximately 15 to 25 safety projects per year through their nationally-recognized safety program. The number of projects varies depending on the level of funding received. Funding ranges for the Federal Highway Administration Highway Safety Improvement Program (HSIP) vary from \$0 to \$500,000 per year. The Section 130 Highway-Rail Grade Crossing Program is typically funded at \$6.5 million per year. Other additional associated safety funds range from \$0 to \$1,000,000 per year.

Table 5-3 Near-Term (Short Range) Passenger Rail Program Effects

Corridor	Project*	Costs (2014 dollars)	Program Effects	Timing and Benefit Cost Ratio
Southeast Corridor/ <i>Piedmont</i> Service				
06, 09 <i>Piedmont</i>	*WiFi on <i>Piedmont</i> service - Add Wi-Fi to 20 cars	Total: \$630,000 NCDOT:\$630,000 Partners:\$0 Annual O&M: \$30,000	<i>The State's Transportation System:</i> Provides an amenity to riders to encourage the use of passenger rail instead of single occupancy vehicles <i>Public and Private Benefits:</i> <i>Public:</i> Provides an amenity for passengers to increase satisfaction with service and attract new riders <i>Rail Capacity and Congestion:</i> NA <i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> NA <i>Environmental, Economic, Livability and Employment Conditions:</i> Having WiFi on trains can attract riders to rail and away from cars, reducing auto emissions in the state and creating a healthier environment. It enhances the rider's experience <i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users on the <i>Piedmont</i> service which operates in central North Carolina	2015-2016 2.44 @ 7% discount 3.15 @ 3% discount
06, 09, 15 <i>Piedmont</i>	*Positive Train Control (PTC) – installed on 8 locomotives, 5 cab control units (CCUs), and 4 spares, plus infrastructure to support PTC	Total: \$2,125,000 NCDOT: \$2,125,000 Partners: \$0 Annual O&M: TBD	<i>The State's Transportation System:</i> Provides safety devices on trains that will improve the network within the state <i>Public and Private Benefits:</i> <i>Public:</i> Improves safety by allowing trains to be centrally controlled and monitored, enhances line capacity by allowing for reduced headways, reduces delays as communications are enhanced and incidents can be avoided, supports additional frequencies <i>Private:</i> Supports FRA requirement for railroads to implement PTC <i>Rail Capacity and Congestion:</i> To the degree that it prevents incidents, PTC can increase capacity and reduces congestion by allowing for reduced headways <i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> PTC provides monitoring and control of train movements that will improve safety for passenger and freight rail users and reduce the likelihood of conflicts at highway grade crossings across the state <i>Environmental, Economic, Livability and Employment Conditions:</i> Increased safety results in better livability for the state's residents; reduction in safety incidents means greater economic viability through improved train reliability, and increased economic activity in the state can result in more jobs <i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users statewide	2016 NA @ 7% discount NA @ 3% discount

Corridor	Project*	Costs (2014 dollars)	Program Effects	Timing and Benefit Cost Ratio
06, 09 <i>Piedmont</i>	*Fourth and Fifth frequencies – New equipment (locomotive, CCU, baggage/lounge cars, and coach cars) to add a 5 th frequency and expand Capital Yard, including extending north and south lead tracks	Total: \$35,400,000 NCDOT: \$35,400,000 Partners: \$0 Annual O&M: \$7,316,000	<i>The State's Transportation System:</i> Provides additional services on the <i>Piedmont</i> route, which serves more of the state's residents on the passenger network and potentially removes single occupancy vehicles from the roads <i>Public and Private Benefits:</i> <i>Public:</i> Accommodates ridership growth and enhances mobility options with additional arrival and departure times for travelers. The 4th and 5th frequencies are anticipated to attract 144,000 and 237,400 additional riders, respectively which would reduce vehicle-miles traveled (VMT) in the state. <i>Rail Capacity and Congestion:</i> NA <i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The additional frequencies attract riders to rail, reducing the number of vehicles on the road and thereby decreasing highway demand; attracting passengers to rail improves safety because rail is a safer mode than single occupancy vehicles <i>Environmental, Economic, Livability and Employment Conditions:</i> The additional frequencies attract riders to rail and away from cars, reducing auto emissions in the state and creating a healthier environment <i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users on the <i>Piedmont</i> service which operates in central North Carolina	2017-2018 (4 th) 2019 (5 th) 4th: 5.44 @ 7% discount 5.16 @ 3% discount 5th: 6.63 @ 7% discount 9.25 @ 3% discount
9 <i>Piedmont</i>	*Hillsborough Station, track and crossings – Construct station and platform	Total: \$8,400,000 NCDOT:\$7,680,000 Partners: \$720,000 Annual O&M: \$400,000	<i>The State's Transportation System:</i> Provides a new station that offers riders the option of using passenger rail instead of single occupancy vehicles <i>Public and Private Benefits:</i> <i>Public:</i> Expands access to passenger service. Adjacent to planned 20-acre transit oriented development. <i>Rail Capacity and Congestion:</i> NA <i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The new passenger station can attract riders to rail, reducing the number of vehicles on the road and thereby decreasing highway demand; attracting passengers to rail improves safety because rail is a safer mode than single occupancy vehicles <i>Environmental, Economic, Livability and Employment Conditions:</i> The new station can attract riders to rail and away from cars, reducing auto emissions in the state and creating a healthier environment; the new station provides greater accessibility for Hillsborough residents to the rest of the state, possibly resulting in increased educational or employment opportunities <i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users accessing the <i>Piedmont</i> service at the station	2018 0.52 @ 7% discount 0.69 @ 3% discount

Corridor	Project*	Costs (2014 dollars)	Program Effects	Timing and Benefit Cost Ratio
Western NC Service				
3 NS	*Western NC Thruway Bus Service- Partner with Amtrak to implement Thruway bus service between the Piedmont area of NC, Asheville, and western NC	N/A	<p><i>The State's Transportation System:</i> Provides an a connecting service to riders to encourage the use of passenger rail instead of single occupancy vehicles</p> <p><i>Public and Private Benefits:</i></p> <p><i>Public:</i> Amtrak Thruway bus service will build ridership in the future rail corridor and provide connecting service along the <i>Piedmont</i> rail corridor. Near-term benefits include improved travel accessibility and tourism opportunities.</p> <p><i>Rail Capacity and Congestion:</i> NA</p> <p><i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The connecting service to passenger trains attracts riders to rail, reducing the number of vehicles on the road and thereby decreasing highway demand; attracting passengers to rail improves safety because rail is a safer mode than single occupancy vehicles</p> <p><i>Environmental, Economic, Livability and Employment Conditions:</i> The service can attract riders to rail and away from cars, reducing auto emissions in the state and creating a healthier environment</p> <p><i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users in western North Carolina</p>	<p>2018</p> <p>NA @ 7% discount</p> <p>NA @ 3% discount</p>
Eastern / Southeastern NC Service				
13, 15 <i>Carolinian</i>	*Station Improvements (Fayetteville, Wilson, Selma)	Total: \$2,500,000 NCDOT: \$2,500,000 Partners: \$0 Annual O&M: \$250,000	<p><i>The State's Transportation System:</i> New stations provide amenities to riders to encourage the use of passenger rail instead of single occupancy vehicles and expands service areas in the state</p> <p><i>Public and Private Benefits:</i></p> <p><i>Public:</i> Station improvements will enhance passenger experiences through improved amenities and add capacity for growing ridership at these stations</p> <p><i>Rail Capacity and Congestion:</i> NA</p> <p><i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The station improvements attract riders to rail, reducing the number of vehicles on the road and thereby decreasing highway demand; attracting passengers to rail improves safety because rail is a safer mode than single occupancy vehicles</p> <p><i>Environmental, Economic, Livability and Employment Conditions:</i> Expanded and improved stations can attract riders to rail and away from cars, reducing auto emissions in the state and creating a healthier environment; provides greater accessibility for residents to the rest of the state, possibly resulting in increased educational or employment opportunities</p> <p><i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users on the <i>Carolinian</i> service which operates in central North Carolina</p>	<p>2018-2025</p> <p>NA @ 7% discount</p> <p>NA @ 3% discount</p>

Corridor	Project*	Costs (2014 dollars)	Program Effects	Timing and Benefit Cost Ratio
9,18 NS, CSXT	*Southeastern NC Thruway Bus Service- Partner with Amtrak to expand Thruway bus service to Wilmington and other markets	N/A	<p><i>The State's Transportation System:</i> Provides an a connecting service to riders to encourage the use of passenger rail instead of single occupancy vehicles</p> <p><i>Public and Private Benefits:</i></p> <p><i>Public:</i> Amtrak Thruway bus service will build ridership in the future rail corridor and provide connecting service along the <i>Piedmont</i> rail corridor. Near-term benefits include improved travel accessibility and tourism opportunities.</p> <p><i>Rail Capacity and Congestion:</i> NA</p> <p><i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The connecting service to passenger trains attracts riders to rail, reducing the number of vehicles on the road and thereby decreasing highway demand; attracting passengers to rail improves safety because rail is a safer mode than single occupancy vehicles</p> <p><i>Environmental, Economic, Livability and Employment Conditions:</i> The service can attract riders to rail and away from cars, reducing auto emissions in the state and creating a healthier environment</p> <p><i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users in southeastern North Carolina</p>	<p>2018</p> <p>NA @ 7% discount NA @ 3% discount</p>

* Projects that will help implement the Governor's 25-Year Vision

Note: Annual operating and maintenance (O&M) costs for near-term projects are noted in the costs category and contribute to the projects maintaining a state of good repair. They are assumed to be 5 to 10 percent of total capital costs except for the 4th and 5th Frequencies where specific data was available. Please see Appendix F for more detailed information.

Table 5-4 Long-Term (Long Range) Passenger Rail Program Effects

Corridor/ Location	Project*	Costs (2014 dollars)	Program Effects			Timing
Southeast Corridor – Service Improvements						
6	*Charlotte Gateway Station – new/relocated station and associated track improvements	Total: \$210,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to Charlotte region</i>	2020-2035

Corridor/ Location	Project*	Costs (2014 dollars)	Program Effects			Timing
06, 09, 15 <i>Piedmont</i>	*Harrisburg and Lexington Stations - new stations and associated track improvements	Total: \$237,400,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: NA</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to Harrisburg and Lexington</i>	2020-2035
06, 09, 15	*Carolinian Equipment - New equipment to replace existing Carolinian trainsets	Total: \$76,600,000	<i>The State's Transportation System: NA</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: NA</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to central North Carolina</i>	2020-2035
Southeast Corridor – Full implementation						
06, 09, 12	*Southeast Corridor – Full Implementation of service (Raleigh-Richmond)	Total: \$3,800,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to areas between Raleigh and Richmond, but extend as far as the Northeast Corridor</i>	2035
Western NC Passenger Service						
3	*Western NC Passenger Service – Add new connecting rail service between Salisbury and Asheville	Total: \$405,300,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: NA</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to western North Carolina</i>	2020-2035

Corridor/ Location	Project*	Costs (2014 dollars)	Program Effects			Timing
Eastern/Southeastern NC Service						
09, 18	*Southeastern NC Passenger Service – Add new rail service between Raleigh and Wilmington	Total: \$262,500,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion:</i> NA <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions:</i> Mostly attributable to areas between Raleigh and Wilmington	2020-2035
Charlotte to the Northeast via Lynchburg, Virginia						
06	*Charlotte to Lynchburg Passenger Service – New service to connect Charlotte to the Northeast via Lynchburg, VA	Total: \$35,600,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion:</i> NA <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions:</i> Mostly attributable to Charlotte and Greensboro	2020-2035

Notes: ✓ indicates that long-term projects are expected to have program effects similar to those experienced in the near-term projects list;
 Costs for Southeastern and Western NC services are from previous studies and will be updated under proposed planning studies;
 Costs for Charlotte to the Northeast via Lynchburg costs are preliminary and subject to additional study by Amtrak and coordination with the host railroads

Table 5-5 Near-Term (Short Range) Freight Rail Program Effects

Corridor	Project*	Costs (2014 dollars)	Program Effects	Timing and Benefit Cost Ratio
06	*Convert NS "Roundhouse" property adjacent to intermodal facility into parking / storage for containers (Greensboro) – 4 acres, 150 spaces, security fencing, lighting, new paved entrance. 50% capacity increase.	Total: \$1,695,000 NCDOT: \$847,500 Partner: \$847,500	<i>The State's Transportation System:</i> Will provide additional parking and storage of containers, allowing for increased intermodal freight <i>Public and Private Benefits:</i> <i>Private:</i> Increase capacity at the intermodal facility thus reducing the number of long-haul trucking events, reducing congestion, improving air quality and supporting economic growth and development <i>Rail Capacity and Congestion:</i> Will provide additional storage, thereby enhancing operation of the intermodal facility <i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The property would attract long-haul truck freight to rail, reducing the number of vehicles on the road and thereby decreasing highway demand; attracting freight to rail improves safety because rail is a safer mode than truck <i>Environmental, Economic, Livability and Employment Conditions:</i> Better and larger storage space can attract shipments from truck to rail, reducing emissions in the state and creating a healthier environment; if shippers can save money by switching to rail, they may expand operations and thereby provide additional jobs in the state <i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users in central North Carolina and the greater region served by the facility	2019 10.22 @ 7% discount 13.11 @ 3% discount
06	New NS Thoroughbred Bulk Terminal Facility (Charlotte)	Total: \$2,125,000 NCDOT: \$2,125,000 Partners: \$0	<i>The State's Transportation System:</i> Provides a new bulk terminal in Charlotte <i>Public and Private Benefits:</i> <i>Private:</i> Converts the former intermodal facility to accommodate bulk transfer. NS will transfer all non-ethanol bulk traffic from their Pineville facility, which will enable the Pineville facility to handle 1,440 ethanol carloads. The expansion of the terminal allows for the movement of additional carloads that might otherwise use the trucks for transport <i>Rail Capacity and Congestion:</i> NA <i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The property would attract truck freight to rail, reducing the number of vehicles on the road and thereby decreasing highway demand; attracting freight to rail improves safety because rail is a safer mode than truck <i>Environmental, Economic, Livability and Employment Conditions:</i> Better and larger storage space can attract shipments from truck to rail, reducing emissions in the state and creating a healthier environment; if shippers can save money by switching to rail, they may expand operations and thereby provide additional jobs in the state <i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users in central North Carolina and South Carolina	2020 1.7 @ 7% discount 1.97 @ 3% discount

Corridor	Project*	Costs (2014 dollars)	Program Effects	Timing and Benefit Cost Ratio
07	*Stouts Siding Extension (Union County) – 10,000 foot siding extension at Stouts.	Total: \$10,600,000 NCDOT: \$5,300,000 Partner: \$5,300,000	<p><i>The State's Transportation System:</i> Provides a siding that relieves congestion and increases freight capacity</p> <p><i>Public and Private Benefits:</i></p> <p><i>Public/Private:</i> Improve flow of rail and intermodal traffic, reducing congestion, improving air quality and supporting economic growth and development</p> <p><i>Rail Capacity and Congestion:</i> The siding will add capacity and relieve congestion, allowing freight to move faster through the region</p> <p><i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The siding would increase train speeds and potentially attract truck freight to rail, reducing the number of vehicles on the road and thereby decreasing highway demand; attracting freight to rail improves safety because rail is a safer mode than truck</p> <p><i>Environmental, Economic, Livability and Employment Conditions:</i> Faster shipments and better capacity can attract shipments from truck to rail, reducing emissions in the state and creating a healthier environment; if shippers can save money by switching to rail, they may expand operations and thereby provide additional jobs in the state</p> <p><i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users of the CSXT intermodal networks in North Carolina, South Carolina, and Tennessee</p>	<p>2018</p> <p>9.87 @ 7% discount 14.77 @ 3% discount</p>
Connects to 19	*Front Street Lead railroad signalization and gates (Wilmington)	Total: \$900,000 NCDOT: \$900,000 Partner: TBD	<p><i>The State's Transportation System:</i> Provides better signalization and safety at a grade crossing in Wilmington</p> <p><i>Public and Private Benefits:</i> Improves vehicle and pedestrian safety by providing signals and gates at the railroad crossing</p> <p><i>Rail Capacity and Congestion:</i> NA</p> <p><i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The improved crossing will help reduce the number of rail/auto/pedestrian incidents</p> <p><i>Environmental, Economic, Livability and Employment Conditions:</i> A safer crossing improves livability for pedestrians using the intersection</p> <p><i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users in southeastern North Carolina</p>	<p>2016-2020</p> <p>0.76 @ 7% discount NA @ 3% discount</p>

Corridor	Project*	Costs (2014 dollars)	Program Effects	Timing and Benefit Cost Ratio
Connects to 19	*Grade Separation at Port of Wilmington – Construct grade separation at container yard gate	Total: \$25,000,000** NCDOT: \$25,000,000 Partner: TBD	<i>The State's Transportation System:</i> Provides a grade separation that will increase safety at a grade crossing at the Port of Wilmington Container Yard <i>Public and Private Benefits:</i> <i>Public:</i> Improve safety by eliminating a conflict point between trains and vehicle and trucks at the container yard. Improve flow of goods, alleviating congestion, improving air quality and supporting economic development and growth <i>Private:</i> Improve roadway and rail traffic flow and safety. Enhanced capacity at the Port of Wilmington <i>Rail Capacity and Congestion:</i> Trucks will no longer have to wait for trains to clear the intersection, reducing congestion on port <i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The improved crossing will help reduce the number of rail/auto/pedestrian incidents <i>Environmental, Economic, Livability and Employment Conditions:</i> A safer crossing improves livability for pedestrians using the intersection <i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users in southeastern North Carolina	2016-2020 0.15 @ 7% discount NA @ 3% discount
Connects to 19	*Grade Separation at Port of Wilmington – Construct grade separation at port's north gate	Total: \$25,000,000** NCDOT: \$25,000,000 Partner: TBD	<i>The State's Transportation System:</i> Provides a grade separation that will increase safety at a grade crossing at the Port of Wilmington North Gate <i>Public and Private Benefits:</i> <i>Public:</i> Improve safety by eliminating a conflict point between trains and vehicle and trucks at the port. Crossing is immediately adjacent to yard. Traffic must be frequently flagged due to numerous switching moves. Improve flow of goods, alleviating congestion, improving air quality and supporting economic development and growth <i>Private:</i> Improve roadway and rail traffic flow and safety. Enhanced capacity at the Port of Wilmington <i>Rail Capacity and Congestion:</i> Trucks will no longer have to wait for trains to clear the intersection, reducing congestion on port <i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The improved crossing will help reduce the number of rail/auto/pedestrian incidents <i>Environmental, Economic, Livability and Employment Conditions:</i> A safer crossing eliminates the bottleneck and will enhance the port's ability to accommodate new clients and may help spur economic growth <i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users in southeastern North Carolina	2016-2020 3.37 @ 7% discount NA @ 3% discount

Corridor	Project*	Costs (2014 dollars)	Program Effects	Timing and Benefit Cost Ratio
27	Albemarle Rail Line Upgrades – Upgrade rail parallel to US 52 in Albemarle (Stanly County) to allow for freight.	Total: \$2,126,000 NCDOT: \$1,913,000 Partner: \$213,000	<p><i>The State's Transportation System:</i> Upgrading the rail line to accommodate freight will allow for greater rail utilization</p> <p><i>Public and Private Benefits:</i></p> <p><i>Public/Private:</i> Improved economic development opportunities from upgrading rail line.</p> <p><i>Rail Capacity and Congestion:</i> The upgraded rail provides rail capacity, which could alleviate some congestion from other competing highway or rail routes</p> <p><i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The upgraded facility could attract shipments from truck to rail, reducing the number of vehicles on the road and thereby decreasing highway demand; attracting shipments to rail improves safety because rail is a safer mode than truck</p> <p><i>Environmental, Economic, Livability and Employment Conditions:</i> The upgraded rail can attract shipments from truck to rail, reducing emissions in the state and creating a healthier environment; if shippers can save money by switching to rail, they may expand operations and thereby provide additional jobs in the state</p> <p><i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users in central North Carolina</p>	<p>2020</p> <p>1.1 @ 7% discount 1.39 @ 3% discount</p>
multiple	Bridges on Class I Branch Lines	TBD	<p><i>The State's Transportation System:</i> Upgrading bridges to accommodate freight allows for more efficient freight movements in the state and keeps the bridges in a state of good repair</p> <p><i>Public/Private Benefits:</i> Supports safety and economic competitiveness through maintaining bridges in a state of good repair along Class I branch lines</p> <p><i>Rail Capacity and Congestion:</i> To the degree that the bridges do not allow for freight traffic today, the improvements could relieve bottlenecks in the system and open up more destinations to rail freight</p> <p><i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> The upgraded bridges could attract shipments from truck to rail, reducing the number of vehicles on the road, decreasing highway demand; attracting shipments to rail improves safety because rail is a safer mode than truck</p> <p><i>Environmental, Economic, Livability and Employment Conditions:</i> The upgraded rail can attract shipments from truck to rail, reducing emissions in the state and creating a healthier environment; if shippers can save money by switching to rail, they may expand operations and thereby provide additional jobs in the state</p> <p><i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users across the state</p>	<p>2016-2020</p> <p>NA @ 7% discount NA @ 3% discount</p>

Corridor	Project*	Costs (2014 dollars)	Program Effects	Timing and Benefit Cost Ratio
multiple	Short Line bridge and infrastructure needs• (Bridges, rail, ties and surfacing, capacity, yard improvements, transloads based on 11 short line railroads responding to survey)	Total: \$43,526,000 NCDOT: \$21,763,000 Partner: \$21,763,000	<p><i>The State's Transportation System:</i> Upgrades to accommodate freight allows for more efficient freight movements in the state and keeps the bridges in a state of good repair</p> <p><i>Public and Private Benefits:</i></p> <p><i>Public/Private:</i> Support safety and economic competitiveness through maintaining bridges in a state of good repair along short line railroads and providing opportunities for truck to rail transloads</p> <p><i>Rail Capacity and Congestion:</i> To the degree that the bridges do not allow for freight traffic today, the improvements could relieve bottlenecks in the system and open up more destinations to rail freight.</p> <p><i>Transportation System Capacity, Congestion, Safety, and Resiliency:</i> New transload facilities and upgraded system could attract shipments from truck to rail, reducing the number of vehicles on the road and thereby reducing highway demand; attracting shipments to rail improves safety because rail is a safer mode than truck</p> <p><i>Environmental, Economic, Livability and Employment Conditions:</i> The upgraded rail can attract shipments from truck to rail, reducing emissions in the state and creating a healthier environment; if shippers can save money by switching to rail, they may expand operations and thereby provide additional jobs in the state</p> <p><i>Distribution of Benefits to Regions:</i> Benefits of the improvement will be felt by users across the state</p>	<p>2016-2020</p> <p>NA @ 7% discount</p> <p>NA @ 3% discount</p>

Table 5-6 Long-Term (Long Range) Freight Rail Program Effects

Corridor/ Location	Project*	Costs (2014 dollars)	Program Effects			Timing
02	*Charlotte to TN state line (CSXT) <ul style="list-style-type: none"> • Phase III Expansion, Charlotte Intermodal Terminal 	Total: \$49,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: North Carolina, South Carolina, and Tennessee</i>	2020-2024
05	*Greensboro to Winston Salem to Rural Hall (NS) <ul style="list-style-type: none"> • PTI rail spur 	Total: \$1,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to Greensboro region</i>	2020-2024
06	SC state line to VA state line (NS) <ul style="list-style-type: none"> • Extend Jamestown siding • Linwood yard improvements • Extend Kimberly Clark lead track. • Extend Pomona yard auxiliary track and add turnouts • Grade separations at Old Dowd Road, MLK Blvd. in Charlotte • Clanton Road Extension / Grade Separation to facilitate closing Donald Ross Rd crossing in Charlotte • Grade separation near 22nd St. in Kannapolis to facilitate closing two crossings • Grade separation at Rogers Lake Road in Kannapolis 	Total: \$77,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to central North Carolina</i>	2020-2035

Corridor/ Location	Project*	Costs (2014 dollars)	Program Effects			Timing
06, 07	*SC state line to VA state line (NS) Charlotte to Monroe (CSXT) <ul style="list-style-type: none"> Grade separate Corridor 7 (CSXT SF Line) and Corridor 6 (NS Mainline) in Charlotte 	Total: \$257,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to central North Carolina, but potential for statewide benefits</i>	2020-2024
07	*Charlotte to Monroe (CSXT) <ul style="list-style-type: none"> Phase III Expansion, Charlotte Intermodal Terminal Grade separate Campus Ridge Road 	Total: \$5,501,988 (These are only the costs for the grade separation. The costs for the intermodal expansion are included under Corridor 2	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: North Carolina, South Carolina, and Tennessee</i>	2020-2024
09	Greensboro to Selma (NS) <ul style="list-style-type: none"> Replace existing grade separation at Aycock Street in Greensboro Grade separations at Ward Road, Franklin Blvd., and Wagoner Bend Road in Greensboro Grade separate Ellis Road (735236Y) and a combination of grade separations and closings at Ellis Road (734737A), Glover Road, and Wrenn Road Grade separate Walker Street and Harrison Ave. in Cary Grade separate South West Street in Raleigh 	Total: \$210,478,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to central North Carolina</i>	2020-2035

Corridor/ Location	Project*	Costs (2014 dollars)	Program Effects			Timing
11	Monroe to Pembroke (CSXT) • Expansion of Carolinas ReLoad/Transload warehouse and expand site from 3 to 13 acres.	Total: \$3,600,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to central North Carolina</i>	2020-2035
12	Raleigh to Norlina (CSXT) • Grade separate Rogers Road Extension and Northside Loop (Harris Road) in Wake Forest	Total: \$21,780,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to central North Carolina</i>	2020-2035
13	*Hamlet to Raleigh (CSXT) • *Construct 40-acre automotive terminal facility • Grade separation at Apex Peakway at South Salem Street and close Tingen Road • Grade separation at Walker Street	Total: \$25,100,000 (Does not include costs for Walker Street. Those costs are included in Corridor 9)	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to central North Carolina</i>	2020-2035
17	*Selma to Morehead City (NS) • As part of GTP to Morehead City Mobility Corridor, relocate the NCRS from Havelock to Morehead City	Total: \$200,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to eastern North Carolina</i>	2025-2040

Corridor/ Location	Project*	Costs (2014 dollars)	Program Effects			Timing
18	*Contentnea to Wallace (N/A) • Restore Wallace to Castle Hayne Corridor	Total: \$160,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to southeastern North Carolina</i>	2025-2035
19	*Pembroke to Wilmington (CSXT) • US 421 / CSXT Improvements at the I 140 Dan Cameron Bridge	Total: \$400,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to southeastern North Carolina</i>	2020-2024
22	*Parmele to Greenville to Elmer (N/A) • GTP – CSXT Connector	Total: \$27,400,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to eastern North Carolina</i>	2025-2035
28	Asheboro to High Point (NS) • Sophia siding	Total: \$3,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to central North Carolina</i>	2020-2024
32	Oxford to Durham (NS) • Upgrade Oxford-Durham line	Total: \$7,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to central North Carolina</i>	2020-2024

Corridor/ Location	Project*	Costs (2014 dollars)	Program Effects			Timing
Multiple	Wood Pellet & Hydraulic Fracturing Projects – support developing market	Total: \$36,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Various locations across the state</i>	2020-2024
Short Line	*Aberdeen Carolina & Western Railway • Relocation in Mecklenburg County	Total: \$16,500,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to Charlotte region</i>	2020-2024
Short Line	*Andrews to Murphy Reactivation	Total: \$16,400,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to western North Carolina</i>	2020-2024
Short Line	*Port of Morehead City Loop Track	Total: \$5,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Mostly attributable to eastern North Carolina</i>	2020-2024
Multiple Short Lines	Short line bridge and infrastructure needs • Bridges, rail, ties and surfacing, capacity, yard improvements, transloads based on 11 short line railroads responding to survey	Total: \$118,776,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Various locations across the state</i>	2025-2035

Corridor/ Location	Project*	Costs (2014 dollars)	Program Effects			Timing
Multiple	Preservation of threatened rail lines	Total: \$12,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Various locations across the state</i>	2025-2035
Multiple	Bridge and structure repairs on NCDOT-owned corridors	Total: \$12,000,000	<i>The State's Transportation System: ✓</i> <i>Public and Private Benefits: ✓</i>	<i>Rail Capacity and Congestion: ✓</i> <i>Transportation System Capacity, Congestion, Safety, and Resiliency: ✓</i>	<i>Environmental, Economic, Livability and Employment Conditions: ✓</i> <i>Distribution of Benefits to Regions: Various locations across the state</i>	2025-2035

5.5 PASSENGER ELEMENT

This section describes assumptions, outlines the capital and operating financing plans, and summarizes key benefits for the passenger rail program. More detailed information on project costs, funding sources and potential partners is provided for near-term (short range) projects and information is summarized for long range projects.

5.5.1 Description of Analysis Approach

The passenger rail projects and programs listed in Chapter 3 were evaluated for their potential ridership, revenue, expenses and how well they meet the NCDOT goals and vision. The projects included are consistent with the Governor's 25-Year Vision's goals to improve the passenger rail network, expand mass transit options and relieve congestion. All of the passenger rail projects included in the State Rail Plan have been evaluated by the NCDOT Rail Division staff to determine their eligibility for funding under STI and other state and federal funding programs.

The following model and forecasting methods were employed to develop project information for near-term projects:

- Fourth & Fifth Frequencies – The operating, ridership and revenue modeling for these additional frequencies were completed as part of the modeling to incrementally implement the Southeast Corridor and were refined under the agreement developed by FRA, NCDOT, NCR, Amtrak, and NS under the ARRA in 2009.
- Western NC Thruway Bus Service – Since 1995 NCDOT has been working with the local communities along the Salisbury-Asheville line (Corridor 03) and NS to implement passenger service. Amtrak and NCDOT are evaluating the costs and benefits of adding Thruway Bus service, to build ridership for eventual rail passenger service in this corridor.
- Hillsborough Station Ridership – NCDOT has studied adding Hillsborough and other stations to meet the growing demand in the Piedmont Corridor. Ridership and revenue studies and coordination and planning with the Town of Hillsborough have been undertaken. This station was selected for funding under the NCDOT's new STI program.
- Station Renovations (Selma, Fayetteville, Wilson) – These stations were renovated approximately 20 years ago. The Rail Division has been

actively monitoring the increasing ridership at these stations, which have some of the highest ridership outside of the Piedmont Corridor. Since these stations primarily serve longer trains, platform and canopy extensions are required.

The remaining short term project costs are based on 2014 capital cost quotes or preliminary design estimates for facilities and improvements.

For several years the Rail Division has been studying plans to incrementally implement the long range plans for the Southeast Corridor, as well as how best to implement new services to metropolitan areas currently without services. This primarily has been through regular updates to ridership and revenue studies based upon new demographic and travel demand data, as well as new ridership and revenue data from existing services. Through these studies and other information NCDOT has identified the long range passenger rail projects, as well as additional studies needed to assess environmental impacts, and refine the costs and benefits of these new services. The Record of Decision for the Raleigh to Richmond portion of the corridor is anticipated in 2015.

North Carolina's current system for funding transportation projects, Strategic Transportation Investments (STI), was described in Section 2.1.5.3. Passenger rail capital projects were identified in Chapter 3 based on needs previously identified by NCDOT, MPO and RPO project submissions for the State Rail Plan and from NCDOT Division and MPO/RPO projects submitted for STI funding analysis. The STI funding analysis is a quantitative approach to evaluating project benefits and local and Division project priorities to determine what future projects will be considered for funding. Passenger projects presented in the near-term have funding identified. The funds appropriated by STI are anticipated to leverage other federal funding sources, such as USDOT grants.

Under the STI program, scoring for statewide mobility projects has been completed and the new scoring formula is scheduled to be fully implemented after July 1, 2015. Based on the established criteria, \$7,680,000 of funding has been programmed over the next five years for passenger rail capital projects through STI. Those dollars are being used to leverage additional local investment. A minimum floor for funding of non-highway modes was established. The floor for all non-highway modes is 4 percent of State Highway Trust Fund revenues. In 2013-2014, the \$1.105 billion in the Highway Trust Fund was distributed by allocating \$937 million to the Strategic Mobility Formula (SMF), \$73 million for debt service, and \$46 million to administration. The floor for non-highway modes is calculated as \$37,480,000. It should also be

noted that the SMF associated with STI is being reviewed and could be modified for future funding cycles.

Future projects and services are anticipated to be funded by a combination of federal, local, and state funds appropriated either through specific legislation or future iterations of STI. State funds needed to match federal grants will either compete through STI or require specific legislative actions. It is anticipated that a mix of local and private partnerships will be sought to supplement funding that can be secured through STI and federal grants. Project sponsors should strategically partner with local public and private entities in order to secure matching funds and thereby be eligible for greater matching federal funding.

Effects on livability were identified qualitatively. Projects that have positive effects on livability are often projects that enhance or encourage walkability in communities. As such, many of the projects identified with livability effects include new stations, station improvements, and projects that add frequencies to services that enhance access to alternative modes of transportation.

5.5.2 Capital Financing Plan

Passenger rail capital projects were identified in Chapter 3 based on needs previously identified by NCDOT, MPO and RPO project submissions for the State Rail Plan and from NCDOT Division and MPO/RPO projects submitted for STI funding analysis. The STI funding analysis is a quantitative approach to evaluating project benefits and local and Division project priorities to determine what future projects will be considered for funding. The STI quantitative scoring is considered alongside the completion of environmental and engineering plans and corridor spending caps to create the STIP. The STIP programs federal and state transportation funds on projects over the next 10 years. Passenger rail in North Carolina also leverages other federal funding sources, such as USDOT grants.

Future projects and services are anticipated to be funded by a combination of federal, local, and state funds appropriated either through specific legislation or future iterations of STI. State funds needed to match federal grants will either compete through STI or require specific legislative actions. It is anticipated that a mix of local and private partnerships will be sought to supplement funding that can be secured through STI and federal grants. Project sponsors should strategically partner with local public and private entities in order to secure matching funds and thereby be eligible for greater matching federal funding.

Table 5-7 identifies near-term projects by key passenger service corridors and presents information on costs, annual operating and maintenance costs to maintain a state of good repair, potential funding sources, and timeframes. Projects included in the STI are identified.

Capital needs and potential funding sources for passenger rail projects scheduled for implementation in the mid-term (2020-2024) or long-term (2025-2040) are presented in Table 5-8. As shown in the table and noted in Section 5.4, substantial investments are planned in the mid and long-term planning horizons for the Southeast Corridor, along with investments in passenger rail service extension to eastern and western North Carolina.

Table 5-7 Near-Term (Short Range) Passenger Rail Projects and Benefits

Corridor	Project*	Costs (2014 dollars)	Funding Source	Benefits	Benefit Cost Ratio		Timing	In STI?
					7% Discount	3% Discount		
Southeast Corridor/ <i>Piedmont</i> Service								
06, 09 <i>Piedmont</i>	*WiFi on <i>Piedmont</i> service - Add Wi-Fi to 20 cars	Total: \$630,000 NCDOT:\$630,000 Partners:\$0 Annual O&M: \$30,000	State Rail Program	<i>Public:</i> Provides an amenity for passengers to increase satisfaction with service and attract new riders.	2.44	3.15	2015-2016	N
06, 09, 15 <i>Piedmont</i>	*Positive Train Control (PTC) – installed on 8 locomotives, 5 cab control units (CCUs), and 4 spares, plus infrastructure to support PTC	Total: \$2,125,000 NCDOT: \$2,125,000 Partners: \$0 Annual O&M: TBD	State Rail Program	<i>Public:</i> Improves safety by allowing trains to be centrally controlled and monitored, enhances line capacity by allowing for reduced headways, reduces delays as communications are enhanced and incidents can be avoided, supports additional frequencies. <i>Private:</i> Supports FRA requirement for railroads to implement PTC	N/A	N/A	2016	N
06, 09 <i>Piedmont</i>	*Fourth and Fifth frequencies – New equipment (locomotive, CCU, baggage/lounge cars, and coach cars) to add a 5 th frequency and expand Capital Yard, including extending north and south lead tracks	Total: \$35,400,000 NCDOT: \$35,400,000 Partners: \$0 Annual O&M: \$7,316,000	Federal, CMAQ, State Rail Program	<i>Public:</i> Accommodates ridership growth and enhances mobility options with additional arrival and departure times for travelers. The 4 th and 5 th frequencies are anticipated to attract 144,000 and 237,400 additional riders, respectively which would reduce vehicle-miles traveled (VMT) in the state.	4 th : 5.44 5 th : 6.63	4 th : 5.16 5 th : 9.25	2017-2018 (4 th) 2019 (5 th) 2019 (5 th frequency)	N
09 <i>Piedmont</i>	*Hillsborough Station, track and crossings – Construct station and platform	Total: \$8,400,000 NCDOT:\$7,680,000 Partners: \$720,000 Annual O&M: \$400,000	STI, State Rail Program, Local	<i>Public:</i> Expands access to passenger service. Adjacent to planned 20-acre transit oriented development.	0.52	0.69	2018	Y

Corridor	Project*	Costs (2014 dollars)	Funding Source	Benefits	Benefit Cost Ratio		Timing	In STI?
					7% Discount	3% Discount		
Western NC Service								
03 NS	*Western NC Thruway Bus Service- Partner with Amtrak to implement Thruway bus service between the Piedmont area of NC, Asheville, and western NC	N/A	Amtrak	<i>Public:</i> Amtrak Thruway bus service will build ridership in the future rail corridor and provide connecting service along the <i>Piedmont</i> rail corridor. Near-term benefits include improved travel accessibility and tourism opportunities.	N/A	N/A	2018	N
Eastern / Southeastern NC Service								
13, 15 <i>Carolinian</i>	*Station Improvements (Fayetteville, Wilson, Selma)	Total: \$2,500,000 NCDOT: \$2,500,000 Partners: \$0 Annual O&M: \$250,000	Federal, State	<i>Public:</i> Station improvements will enhance passenger experiences through improved amenities and add capacity for growing ridership at these stations.	N/A	N/A	2018-2025	N
9,18 NS, CSXT	*Southeastern NC Thruway Bus Service- Partner with Amtrak to expand Thruway bus service to Wilmington and other markets	N/A	Amtrak	<i>Public:</i> Amtrak Thruway bus service will build ridership in the future rail corridor and provide connecting service along the <i>Piedmont</i> rail corridor. Near-term benefits include improved travel accessibility and tourism opportunities.	N/A	N/A	2018	N
		Total: \$49,055,000 NCDOT: \$48,335,000 Partners: \$720,000	State funding assigned to passenger projects through STI for the next five years is \$7,680,000 for the Hillsborough Station. The local government will also contribute to that project. Projects identified with funding as State may compete in future iterations of STI. Projects whose funding is identified as State Rail Program include projects and services subject to annual budget appropriation by the legislature. Federal CMAQ funding is used to fund operation of passenger rail services. Additional funding sources will be sought through federal PRIIA and TIGER grant applications.					

* Projects that will help implement the Governor's 25-Year Vision

Note: Annual operating and maintenance (O&M) costs for near-term projects are noted in the costs category and contribute to the projects maintaining a state of good repair. They are assumed to be 5 to 10 percent of total capital costs except for the 4th and 5th Frequencies where specific data was available. Please see Appendix F.

Table 5-8 Mid- to Long-term (Long Range) Passenger Rail Projects and Benefits

Corridor/ Location	Project*	Costs (2014 dollars)	Funding Source	Benefits	Timing
Southeast Corridor – Service Improvements					
06	*Charlotte Gateway Station – new/relocated station and associated track improvements	Total: \$210,000,000	FTA grant, STI, Local	<p><i>Public:</i> Supports increased passenger service frequencies and allows for longer passenger trains in support of increasing ridership. Will attract additional riders due to improved location and station condition as well as connectivity to other transit modes. Current station is adjacent to the freight yard. Proposed CATS commuter rail service, planned streetcar service, intercity bus service and 90+ local buses will serve the new location that is close to center city Charlotte and passenger destinations. Upon completion of station, 5 city blocks of state owned property will be available adjacent to the station for transit oriented development.</p> <p><i>Private:</i> Reduces passenger/freight train conflicts by improving capacity. A relocated station eliminates passenger tracks and facilities in the middle of NS freight yard.</p>	2020-2035
06	*Harrisburg and Lexington Stations - new stations and associated track improvements	Total: \$237,400,000	Federal, STI, Local	<i>Public:</i> Increase access to stations within the urbanized Piedmont corridor. Resulting increased ridership will create air quality, accessibility and economic development benefits.	2020-2035
06, 09, 15	*Carolinian Equipment - New equipment to replace existing <i>Carolinian</i> trainsets	Total: \$76,600,000	Federal (Amtrak), State (payments funded through capital agreement with Amtrak)	<i>Public:</i> Replacing the <i>Carolinian</i> train cars and equipment will improve the passenger experience and reduce long-term maintenance costs.	2020-2035
Southeast Corridor – Full implementation					
06, 09, 12	*Southeast Corridor – Full Implementation of service (Raleigh-Richmond)	Total: \$3,800,000,000	Federal State	<i>Public/Private:</i> Full implementation of the Southeast Corridor will create substantial benefits to travel time savings. Full implementation will result in sizable benefits to air quality, congestion reduction and economic development.	2035

Corridor/ Location	Project*	Costs (2014 dollars)	Funding Source	Benefits	Timing
Western NC Passenger Service					
03	*Western NC Passenger Service – Add new connecting rail service between Salisbury and Asheville – Reactivate Andrews to Murphy	Total: \$405,300,000	Federal STI, State, Local	<i>Public/Private:</i> The Western NC passenger rail service will create accessibility, tourism and economic development benefits for communities between Salisbury and Asheville.	2020-2035
Eastern/Southeastern NC Service					
09, 18	*Southeastern NC Passenger Service – Add new rail service between Raleigh and Wilmington	Total: \$262,500,000	Federal STI, State, Local	<i>Public/Private:</i> The Eastern NC passenger rail service will create accessibility, tourism and economic development benefits for communities between Raleigh and Wilmington.	2020-2035
Charlotte to Northeast via Lynchburg, Virginia					
06	*Charlotte to Lynchburg Passenger Service – New service to connect Charlotte to the Northeast via Lynchburg, VA	Total: \$35,600,000	Federal STI, State, Local	<i>Public/Private:</i> This new service would provide an additional route / connection for the North Carolina to Northeast travel market. It would also provide an additional frequency between Charlotte and Greensboro. The service will create accessibility, tourism and economic development benefits for communities with stations along the corridor.	2020-2035
		Total: \$5.03 billion	Future projects and services are anticipated to be funded by a combination of federal, local, and state funds appropriated either through specific legislation or future iterations of STI. State funds needed to match federal grants will either compete through STI or require specific legislative actions. It is anticipated that local partnerships will be sought to supplement funding that can be sought through STI and federal grants.		

* Projects that will help implement the Governor's 25-Year Vision

Notes: Updated studies, Service Development Plans, and/or NEPA documentation is needed to select the Southeastern Corridor route.

Costs for Charlotte to Lynchburg are preliminary and subject to additional study by Amtrak and coordination with host railroads.

The near-term and long-term investments are consistent with the Governor's 25-Year Vision and range from the addition of amenities and convenience to enhance riders' experiences, and adding frequencies to existing services that can help connect people to jobs to full implementation of the Southeast Corridor, establishing Amtrak Thruway Bus service to build ridership, and future expansion of service into southeastern and western North Carolina.

Additional capital projects may be identified from the anticipated planning studies listed in Section 5.7. The implementation costs of those projects are not included in Tables 5-13 and 5-14.

5.5.3 Operating Financing Plan

NCDOT fully funds the operations of the *Piedmont* service and the *Carolinian* service between Washington, DC and Charlotte via a state operating funds subsidy, CMAQ funds and passenger revenues. These sources also will be used to fund the additional fourth frequency when it is implemented (SFY 2018). The projected annual ridership, revenues by source and costs for operating the *Carolinian* and the *Piedmont* services over the near-term are presented in Table 5-9. CMAQ funds will only be available to fund the first three years of the fourth frequency and an additional funding source will need to be identified to support mid- to long-term operations. Amtrak has fiscal responsibility for the other long-distance routes that serve North Carolina (*Crescent*, *Palmetto*, *Silver Meteor* and *Silver Star*). Therefore, the operating costs for these trains are not included.

Table 5-10 shows the projected ridership and revenue for the fully operational NC/VA segment of the Southeast Corridor, as well as for the proposed Western and Southeastern North Carolina service extensions. According to NCDOT estimates, the passenger revenues from the fully operational Southeast Corridor are projected to cover the annual operation costs. Thus, the Southeast Corridor may provide a private-partnership concession opportunity.

A new service connecting Charlotte and Greensboro to the Northeast via Lynchburg is not within the near term, thus operating costs of that service are not reflected in Table 5-9. However, based on preliminary information prepared by Amtrak, North Carolina expects its share of Section 209 payments supporting the service to be approximately \$5.2 million per year. More detailed operation costs for this service and additional operating needs may be identified from the anticipated planning studies listed in Section 5.7.

Table 5-9 Operating Finance Projections, *Piedmont* and *Carolinian* Services, State Fiscal Years 2015-2019 (2014 dollars)

	SFY 2015	SFY 2016	SFY 2017	SFY 2018*	SFY 2019
Program Costs**	\$37,556,032	\$38,682,414	\$39,842,586	\$47,239,717	\$48,656,606
Passenger Revenue	\$19,943,000	\$20,541,290	\$21,157,529	\$23,392,000	\$24,093,760
CMAQ Revenue	\$3,700,000	\$3,700,000	\$3,700,000	\$7,640,000	\$7,657,000
State Revenue	\$13,913,032	\$14,441,124	\$14,985,058	\$16,207,717	\$16,905,846
Passengers	517,700	534,000	550,020	630,020	648,921
Train Miles	600,790	600,790	600,790	726,350	726,350

CMAQ: Congestion Mitigation and Air Quality funds

*State Fiscal Year 2018: Begin Fourth Raleigh to Charlotte round trip

**Costs include items such as Amtrak contract payments, station and facility rent, marketing and administration, train fuel and insurance.

Source: NCDOT/PB, April 2014

Table 5-10 Projected Ridership and Revenue, all NC Passenger Train Services, 2025 (2014 dollars)

	Full Build* 2025	Full Build* with Southeastern NC and Western NC Services 2025	Full Build* with Southeastern NC and Western NC Services 2040
TICKET REVENUES			
<i>Piedmont/Carolinian</i> Trains	\$126,215,000	\$129,038,000	\$169,148,000
Amtrak Long Distance Trains**	\$28,303,000	\$28,228,000	\$35,172,000
SENC Raleigh-Wilmington Trains	--	\$665,000	\$927,000
WNC Salisbury-Asheville Trains	--	\$508,000	\$712,000
RIDERSHIP			
<i>Piedmont/Carolinian</i> Trains	1,866,700	1,911,200	2,586,300
Amtrak Long Distance Trains**	224,000	222,300	2800,100
SENC Raleigh-Wilmington Trains	--	37,000	50,100
WNC Salisbury-Asheville Trains	--	29,700	41,700
PASSENGER MILES			
<i>Piedmont/Carolinian</i> Trains	495,310,000	507,820,000	670,490,000
Amtrak Long Distance Trains**	99,940,000	100,270,000	125,280,000
SENC Raleigh-Wilmington Trains	--	3,230,000	4,580,000
WNC Salisbury-Asheville Trains	--	2,610,000	3,660,000

*Full Build = Federally-Designated Southeast Corridor service for 8 round trips Charlotte to Raleigh, with 3 continuing to New York via S Line between Raleigh and Petersburg (and a 4th round trip that operates only Raleigh to New York via S Line between Petersburg & Raleigh) and 1 (the *Carolinian*) continuing to New York via the A Line. Full Build assumes 90 to 110 MPH MAS operations along the Federally-Designated Southeast Corridor and premium fares. Capacity studies in partnership with NS and CSXT may be needed to verify speeds and capacities on the impacted routes.

**Amtrak Long Distance Trains: *Crescent*, *Palmetto*, *Silver Meteor*, and *Silver Star*

Sources: NCDOT and AECOM, September 2013

5.5.4 Passenger Rail Public and Private Benefits

Projects in the near-term, 5-year, passenger rail program focus on enhancements and increased access to existing passenger rail service corridors. These improvements are anticipated to result in further mobility, transportation capacity, congestion relief, environmental and economic benefits along these corridors. In the long term, major investments in these corridors will contribute to even greater benefits in the state's core population areas, while new services introduced will provide multimodal access, mobility and economic development opportunities to western and eastern North Carolina. Individual project and corridor level benefits in the short range and long range are further described in Section 5.4.

5.6 FREIGHT ELEMENT

This section includes information on investments needed, funding and key benefits for the freight rail projects identified in Chapter 4 and Section 5.4. As with the passenger rail program, more detailed information on project costs, funding sources and potential partners is provided for near-term (short range) projects (see Table 5-11) and information is summarized for long range projects (see Table 5-12).

5.6.1 Finance Plan

The list of near-term freight projects shown in Table 5-11 was generated using projects submitted for STI by the railroads and needs identified by Metropolitan and Rural Planning Organizations (MPO/RPO's). Funding for capital costs of these projects is identified.

The projects included are consistent with the Governor's 25-Year Vision's goals to expand industrial access to freight rail, enhance access to inland and coastal ports, relieve congestion, and maintain existing infrastructure. The majority of near-term projects are track improvement projects that will either enhance movement on the intermodal network or provide transload opportunities. The list of mid- and long-term projects predominantly consist of projects submitted for STI that did not receive funding in the initial round of evaluations and projects identified as needs by MPO's and RPO's. Many of the mid- and long-term projects are grade separations, but there are additional intermodal terminal, yard improvements, track improvements, and access projects. Track improvements, new access, transloads, and intermodal terminal improvements are anticipated to score well in future iterations of STI.

Table 5-12 summarizes the long range freight rail projects and potential funding sources by the rail corridor identifications presented in Chapter 4 (Figure 4.1). Proposed mid and long-term projects have been totaled for each corridor. Fourteen (14) of the 42 corridors shown in Figure 4.1 have proposed projects between 2020 and 2035. These corridors are spread throughout the state and may also benefit highway and passenger projects.

Additional freight needs may be identified from the anticipated planning studies listed in Section 5.7. It is anticipated that studies including, but not limited to, the Eastern Intermodal Study and the capacity / interoperability study on CSX Transportation's A-Line (Corridor 15) could identify high investment needs that would have positive benefits on the state's economy. In addition, continued coordination with railroads on their capital programs in North Carolina will be conducted to ensure projects that are mutually beneficial to the railroad companies and the State are included in future iterations of this plan.

Future projects and services are anticipated to be funded by a combination of federal, local, and state funds appropriated either through specific legislation or future iterations of STI. State funds needed to match federal grants will either compete through STI or require specific legislative actions. Project sponsors should strategically partner with local public and private entities to align priorities for future STI scoring. State funding assigned to freight rail projects through STI for the next five years totals \$8,549,000. Assuming similar funding levels are maintained in the following 20 years, approximately \$34 million will be available from STI to secure matching private, local, or federal funds. Assuming FRRCSI is funded at \$4 million per year, \$80 million will be available over the mid- and long-term period of this plan to leverage matching private investments or serve as matching funds for federal grants and loans. Federal programs such as TIGER and the currently unfunded Rail Line Relocation and Improvement Program provide 80% funding and require a 20% state or local match. Project sponsors should aim to leveraging local public and private matches to secure the largest Federal match possible. In the competitive transportation marketplace, it is important to be cognizant that private capital investments can only be justified when there is sufficient demand to earn a return on the investment, no matter whether projects are funded entirely by private enterprise or partially through public private partnerships. Alternately, public funds are considered justified for an investment when there are private and public benefits that exceed the investment.

Table 5-11 Near Term (Short Range) Freight Rail Projects and Benefits

Corridor/Location	Project*	Costs (2014 dollars)	Potential Funding Source(s)	Benefits	Benefit Cost Ratio		Timing	In STI?
					7% Discount	3% Discount		
06	*Convert NS "Roundhouse" property adjacent to intermodal facility into parking / storage for containers (Greensboro) – 4 acres, 150 spaces, security fencing, lighting, new paved entrance. 50% capacity increase.	Total: \$1,695,000 NCDOT: \$847,500 Partner: \$847,500	STI, Partnership with the railroad	<i>Private:</i> Increase capacity at the intermodal facility thus reducing the number of long-haul trucking events, reducing congestion, improving air quality and supporting economic growth and development.	10.22	13.11	2019	Y
06	New NS Thoroughbred Bulk Terminal Facility (Charlotte)	Total: \$976,000 NCDOT: \$488,000 Partner: \$488,000	STI, Partnership with the railroad	<i>Private:</i> Converts the former intermodal facility to accommodate bulk transfer. NS will transfer all non-ethanol bulk traffic from their Pineville facility, which will enable the Pineville facility to handle 1,440 ethanol carloads. The expansion of the terminal allows for the movement of additional carloads that might otherwise use the trucks for transport.	1.70	1.97	2020	Y
07	*Stouts Siding Extension (Union County) – 10,000 foot siding extension at Stouts.	Total: \$10,600,000 NCDOT: \$5,300,000 Partner: \$5,300,000	STI, Partnership with the railroad	<i>Public/Private:</i> Improve flow of rail and intermodal traffic, reducing congestion, improving air quality and supporting economic growth and development.	9.87	14.77	2018	Y
connects to 19	*Front Street Lead railroad signalization and gates (Wilmington)	Total: \$900,000 NCDOT: \$900,000 Partner: TBD	FRRCSI, Rail- highway safety	<i>Public/Private:</i> Improve vehicle and pedestrian safety by providing signals and gates at the railroad crossing.	0.76	N/A	2016- 2020	N

Corridor/Location	Project*	Costs (2014 dollars)	Potential Funding Source(s)	Benefits	Benefit Cost Ratio		Timing	In STI?
					7% Discount	3% Discount		
connects to 19	*Grade Separation at Port of Wilmington – Construct grade separation at container yard gate	Total: \$25,000,000** NCDOT: \$25,000,000 Partner: TBD	FRRCSI and/or Federal, Rail- highway safety	<p><i>Public:</i> Improve safety by eliminating a conflict point between trains and vehicle and trucks at the container yard. Improve flow of goods, alleviating congestion, improving air quality and supporting economic development and growth.</p> <p><i>Private:</i> Improve roadway and rail traffic flow and safety. Enhanced capacity at the Port of Wilmington.</p>	0.15	N/A	2016-2020	N
connects to 19	*Grade Separation at Port of Wilmington – Construct grade separation at port's north gate	Total: \$25,000,000** NCDOT: \$25,000,000 Partner: TBD	FRRCSI and/or Federal, Rail- highway safety	<p><i>Public:</i> Improve safety by eliminating a conflict point between trains and vehicle and trucks at the port. Crossing is immediately adjacent to yard. Traffic must be frequently flagged due to numerous switching moves. Improve flow of goods, alleviating congestion, improving air quality and supporting economic development and growth.</p> <p><i>Private:</i> Improve roadway and rail traffic flow and safety. Enhanced capacity at the Port of Wilmington.</p>	3.37	N/A	2016-2020	N

Corridor/Location	Project*	Costs (2014 dollars)	Potential Funding Source(s)	Benefits	Benefit Cost Ratio		Timing	In STI?
					7% Discount	3% Discount		
27	Albemarle Rail Line Upgrades – Upgrade rail parallel to US 52 in Albemarle (Stanly County) to allow for freight.	Total: \$2,126,000 NCDOT: \$1,913,000 Partner: \$213,000	STI, Partnership with the railroad	<i>Public/Private:</i> Improved economic development opportunities from upgrading rail line.	1.10	1.39	2020	Y
multiple	Bridges on Class I Branch Lines	TBD	FRRCSI	<i>Public/Private:</i> Support safety and economic competitiveness through maintaining bridges in a state of good repair along Class 1 branch lines.	N/A	N/A	2016-2020	N
multiple	Short Line bridge and infrastructure needs	Total: \$43,526,000 NCDOT: \$21,763,000 Partner: \$21,763,000	FRRCSI	<i>Public/Private:</i> Support safety and economic competitiveness through maintaining bridges in a state of good repair along short line railroads.	N/A	N/A	2016-2020	N
		Total: \$109,823,000 NCDOT: \$81,211,500 Partners: \$28,611,500	State funding assigned to freight projects through STI for the next five years is \$8,549,000. For this State Rail Plan, it is assumed that FRRCSI will be funded through the NCRR dividend to the state at approximately \$4 million per year over the next five years. The NCDOT share of near-term project costs (\$81,211,500) exceeds the funds identified through STI and estimated for FRRCSI (a total of \$28,549,000). Typically, both STI and FRRCSI are used to leverage equal private investments. Alternatively, the funds could be used to leverage federal grants and loans that can provide 80% matching funds. Rail-highway safety funds may also be used for grade separations that have been identified in traffic separation studies. In order to deliver more of the projects identified in the near-term, NCDOT Rail Division will work with the NCSPA to re-apply for a federal TIGER grant for one or more of the port gate projects, work with the Wilmington MPO to identify potential funding for the Front Street crossing upgrade, and work to identify additional funding sources for projects that support hydraulic fracturing and wood pellet projects as needs are more fully identified.					

* Projects that will help implement the Governor's 25-Year Vision

** The project is estimated to cost between \$15 and \$25 million. The BCA ratio is based on \$15 million, but \$25 million is a more conservative capital cost estimate.

Table 5-12 Mid- and Long-Term (Long Range) Freight Rail Projects and Benefits

Corridor /Location	Project*	Costs (2014 dollars)	Potential Funding Source(s)	Benefits	Timing
02	*Charlotte to TN state line (CSXT) <ul style="list-style-type: none"> Phase III Expansion, Charlotte Intermodal Terminal 	Total: \$49,000,000	STI, Partnership with the railroad, Federal	<i>Public/Private:</i> Phase III Expansion of the Charlotte Intermodal Terminal and supporting rail infrastructure will increase capacity at the intermodal facility thus reducing the number of long-haul trucking events, reducing congestion, improving air quality and supporting economic growth and development.	2020-2024
05	*Greensboro to Winston Salem to Rural Hall (NS) <ul style="list-style-type: none"> PTI rail spur 	Total: \$1,000,000	FRRCSI, STI, Partnership with the railroad	<i>Public/Private:</i> The PTI Rail Spur project will connect the PTI Airport to Corridor 05 providing additional economic development opportunities at the airport.	2020-2024
06	SC state line to VA state line (NS) <ul style="list-style-type: none"> Extend Jamestown siding Linwood yard improvements Extend Kimberly Clark lead track. Extend Pomona yard auxiliary track and add turnouts Grade separations at Old Dowd Road, MLK Blvd. in Charlotte Clanton Road Extension / Grade Separation to facilitate closing Donald Ross Rd crossing in Charlotte Grade separation near 22nd St. in Kannapolis to facilitate closing two crossings Grade separation at Rogers Lake Road in Kannapolis 	Total: \$77,000,000	FRRCSI, STI, Partnership with the railroad, Rail-highway safety	<i>Public/Private:</i> Multiple grade separation projects are planned for Corridor 06. Additional projects include track extensions and improvements to train clearance capabilities. These improvements will benefit freight and passenger trains traveling between the Charlotte region and the VA state line. Collectively the projects will reduce congestion, improve air quality and reduce rail freight transport times.	2020-2035
06,07	*SC state line to VA state line (NS) Charlotte to Monroe (CSXT) <ul style="list-style-type: none"> Grade separate Corridor 7 (CSXT SF Line) and Corridor 6 (NS Mainline) in Charlotte 	Total: \$257,000,000	STI, Partnership with railroads, Federal, Rail-highway safety, local	<i>Public/Private:</i> Grade separating the two railroads will enhance safety and reduce conflicts / delays that affect freight movements on two high volume corridors and passenger train movements on the NS Mainline. The corridors are also part of both railroads' intermodal networks. .	2020-2024

Corridor /Location	Project*	Costs (2014 dollars)	Potential Funding Source(s)	Benefits	Timing
07	*Charlotte to Monroe (CSXT) <ul style="list-style-type: none"> Phase III Expansion, Charlotte Intermodal Terminal Grade separate Campus Ridge Road 	Total: \$5,501,988 (These are only the costs for the grade separation. The costs for the intermodal expansion are included under Corridor 2)	STI, Partnership with the railroad, Federal, Rail Highway safety	<i>Public/Private:</i> Phase III Expansion of the Charlotte Intermodal Terminal and supporting rail infrastructure will increase capacity at the intermodal facility thus reducing the number of long-haul trucking events, reducing congestion, improving air quality and supporting economic growth and development. <i>Public:</i> The grade separation will improve safety by eliminating a conflict point between trains and vehicles and/or pedestrians.	2020-2024
09	Greensboro to Selma (NS) <ul style="list-style-type: none"> Replace existing grade separation at Aycock Street in Greensboro Grade separations at Ward Road, Franklin Blvd., and Wagoner Bend Road in Greensboro Grade separate Ellis Road (735236Y) and a combination of grade separations and closings at Ellis Road (734737A), Glover Road, and Wrenn Road Grade separate Walker Street and Harrison Ave. in Cary Grade separate South West Street in Raleigh 	Total: \$210,478,000	FRRCIS or Federal, Rail Highway safety	<i>Public/Private:</i> Multiple grade separation projects between Greensboro and Raleigh will improve safety by eliminating conflict points between trains and vehicles and/or pedestrians. Improve highway and rail traffic flow, alleviating congestion and improving air quality.	2020-2035
11	Monroe to Pembroke (CSXT) <ul style="list-style-type: none"> Expansion of Carolinas ReLoad/Transload warehouse and expand site from 3 to 13 acres. 	Total: \$3,600,000	FRRCIS	<i>Public/Private:</i> Increase capacity at the transload facility thus reducing the number of long-haul trucking events, reducing congestion, improving air quality and supporting economic growth and development.	2020-2035
12	Raleigh to Norlina (CSXT) <ul style="list-style-type: none"> Grade separate Rogers Road Extension and Northside Loop (Harris Road) in Wake Forest 	Total: \$21,780,000	FRRCIS or Federal, Rail-highway safety	Grade separation projects will improve safety by eliminating conflict points between trains and vehicles and/or pedestrians. Improve highway and rail traffic flow, alleviating congestion and improving air quality.	2020-2035
13	*Hamlet to Raleigh (CSXT) <ul style="list-style-type: none"> *Construct 40-acre automotive terminal facility 	Total: \$25,100,000 (Does not	FRRCIS, STI, Partnership with the	<i>Public/Private:</i> Two grade separation projects in Wake County will improve safety by eliminating conflict points between trains and vehicles	2020-2035

Corridor /Location	Project*	Costs (2014 dollars)	Potential Funding Source(s)	Benefits	Timing
	<ul style="list-style-type: none"> Grade separation at Apex Peakway at South Salem Street and close Tingen Road Grade separation at Walker Street 	include costs for Walker Street. Those costs are included in Corridor 9)	railroad, Federal, Rail-highway safety	and/or pedestrians. Improve roadway and railroad traffic flow. A new automotive terminal facility in Moncure will reduce the lengths of truck trips used to bring new automobiles to the central and eastern NC market and will enhance economic development in Lee County.	
17	*Selma to Morehead City (NS) <ul style="list-style-type: none"> As part of GTP to Morehead City Mobility Corridor, relocate the NCRR from Havelock to Morehead City 	Total: \$200,000,000	Federal, Partnership with the railroad	<i>Public/Private:</i> The relocation of the railroad would eliminate the highway-rail conflicts in Morehead City and provide enhances access to the Port of Morehead City.	2025-2040
18*	*Contentnea to Wallace (N/A) <ul style="list-style-type: none"> Restore Wallace to Castle Hayne Corridor 	Total: \$160,000,000	STI, State, Federal	<i>Public/Private:</i> Restoration of the Wallace to Castle Hayne Rail Corridor from north of Wilmington to Wallace will provide potential economic development benefits and allow for future air quality and travel accessibility benefits if the corridor is used for passenger rail service between Raleigh and Wilmington.	2025-2035
19	*Pembroke to Wilmington (CSXT) <ul style="list-style-type: none"> US 421 / CSXT Improvements at the I-140 Dan Cameron Bridge 	Total: \$400,000	FRRCIS or Federal, Rail-highway safety	<i>Public/Private:</i> Crossing safety improvements will increase pedestrian and vehicle safety in the Wilmington area. Also, in conjunction with other at-grade and grade separation improvements, enhances access to the Port of Wilmington.	2020-2024
22*	*Parmele to Greenville to Elmer (N/A) <ul style="list-style-type: none"> GTP – CSXT Connector 	Total: \$27,400,000	STI, State, Federal	<i>Private:</i> Constructing a rail line connecting the Global TransPark into the CSXT line will provide access to a second Class I rail line. The connection could provide economic development opportunities and provide additional shipping options.	2025-2035
28	Asheboro to High Point (NS) <ul style="list-style-type: none"> Sophia siding 	Total: \$3,000,000	FRRCIS, STI, Partnership with the railroad	<i>Private:</i> This siding extension project will increase freight capacity and alleviate congestion at the High Point Yard.	2020-2024
32	Oxford to Durham (NS) <ul style="list-style-type: none"> Upgrade Oxford-Durham line 	Total: \$7,000,000	FRRCIS, STI, Partnership with the railroad	<i>Private:</i> Upgrading the Oxford-Durham Line to 286,000-lb rail that will preserve and potentially enhance economic development through increasing the corridor's ability to accommodate	2020-2024

Corridor /Location	Project*	Costs (2014 dollars)	Potential Funding Source(s)	Benefits	Timing
				6 axle locomotive trains that existing on the corridor industry needs.	
Multiple	Wood Pellet & Hydraulic Fracturing Projects – support developing market	Total: \$36,000,000	FRRCSI	<i>Public/Private:</i> Advance economic development and growth through projects supporting emerging energy industries in North Carolina.	2020-2024
Short line	*Aberdeen Carolina & Western Railway <ul style="list-style-type: none"> Relocation in Mecklenburg County 	Total: \$16,500,000	FRRCSI, Partnership with the railroad, Federal	<i>Public/Private:</i> Increase capacity and reduce train and vehicle conflicts by relocating the ACWR in Mecklenburg County.	2020-2024
Short line	*Andrews to Murphy Reactivation	Total: \$16,400,000	FRRCSI, Federal	<i>Private:</i> Reactivating the railroad line will create economic development opportunities in this rural area in the mountains.	2020-2024
Short line	*Port of Morehead City Loop Track	Total: \$5,000,000	FRRCSI, Partnership with the railroad, Federal	<i>Public/Private:</i> The loop track enables longer trains and potential unit trains to be built and disassembled at the port facility. Supports NC industries shipping through the port.	2020-2024
Multiple short lines	Short line bridge and infrastructure needs <ul style="list-style-type: none"> Bridges, rail, ties and surfacing, capacity, yard improvements, transloads based on 11 short line railroads responding to survey 	Total: \$118,776,000	FRRCSI	<i>Public/Private:</i> Support safety and economic competitiveness through maintaining bridges in a state of good repair along short line railroads.	2025-2035
Multiple	Preservation of threatened rail lines	Total: \$12,000,000	State	<i>Public/Private:</i> Preserve railroad corridors that would otherwise be abandoned for future market opportunities.	2025-2035
Multiple	Bridge and structure repairs on NCDOT-owned corridors	Total: \$12,000,000	State	<i>Public/Private:</i> Statewide investment projects focus on bridge and structure repairs to NCDOT owned corridors that may provide access to potential future rail markets. Expected benefits are broad and primarily center on system maintenance and preservation.	2025-2035
		Total: \$1,266,000,000 Total on Class I network: \$1,109,000,000 Total on Short line network: \$157,000,000		State funding assigned to freight projects through STI for the next five years is \$8,549,000. For this State Rail Plan, it is assumed that FRRCSI will be funded through the NCRR dividend to the state at approximately \$4 million per year. These funds will be used to match and leverage private investments from the railroads and	

Corridor /Location	Project*	Costs (2014 dollars)	Potential Funding Source(s)	Benefits	Timing
		<p>potential federal grants to deliver projects. Typically, FRRCSI and STI require a 50% match by the railroads. Federal programs such as TIGER and the currently unfunded Rail Line Relocation and Improvement Program provide 80% funding and require a 20% state or local match. Additional programs that should be considered include intermodal tax credits and Railroad Rehabilitation and Improvement Financing Loans. Rail-highway safety funds may also be used for grade separations that are recommended in traffic separation studies. As these mid- and long-range projects are further developed, more detailed economic analyses will be conducted to identify the projects with better returns on investment.</p>			

* Projects that will help implement the Governor's 25-Year Vision are denoted by an asterisk in the Project column.

Table 5-13 Potential Passenger Rail Studies

Study	Description	Estimated Cost / Funding Source(s) (2014 dollars)	Projected Completion
<i>Charlotte Gateway Station Technical & Feasibility Study</i>	Phase 1 of a multi-phased study on the multi-modal Charlotte Gateway Station and TOD component	\$250,000 (TIGER and match)	Early 2016
<i>Passenger Rail Service Extension Studies</i>	Evaluate intrastate passenger rail for commuter and light rail in the existing and emerging urban/suburban corridors	\$1.5 million (State Rail Planning funds)	Fall 2020
<i>Passenger Rail /Airport Connectivity Study</i>	Analyze improved connections between passenger rail and commercial airports, including, but not limited to, Raleigh Durham International and Charlotte Douglass International	TBD	TBD
<i>Service Development Plans for Southeast Corridor segments</i>	Prepare SDPs to incrementally implement the full Southeast Corridor	TBD	TBD
<i>Commuter and Light Rail Studies</i>	Evaluate potential for commuter and light rail in the Triangle, Triad, and Metrolina Regions	\$400,000	TBD
<i>Wilmington Multi-Modal Terminal</i>	Environmental document for future Wilmington multi-modal terminal	\$200,000	2017
<i>Station Analysis</i>	Analyze capacity and economic potential of existing stations to accommodate projected uses	\$250,000	2020
<i>Southeastern and Western NC Service</i>	Update previous studies for Southeastern and Western, NC passenger service extension. Use capacity information obtained through CSXT Eastern NC Capacity Studies listed in Table 5-14.	\$400,000	2020

Note: Projects bolded and italicized will help implement the Governor's 25-Year Vision

Table 5-14 Potential Freight Rail Studies

Study	Description	Estimated Cost (2014 dollars)	Projected Completion
Short Range Studies			
Best Practice for Land Uses Adjacent to Freight Rail Corridors	Memorandum or short report with links to federal or other industry guidelines on local zoning and land use planning around freight rail lines	To be completed by Rail Division staff	Mid-2016
N. Guilford County Traffic Separation Study	Evaluate and develop recommendations for rail-highway crossings along the main line from Galyon Depot towards Rockingham County or Virginia	\$250,000	2016-2020
Guilford County K-Line Traffic Separation Study	Evaluate and develop recommendations for rail-highway crossings along the K Line from the NS Mainline west towards Forsyth County	\$75,000	2016-2020
<i>Wilmington CSXT, WTRY Line Traffic Separation Study and Safety</i>	Study and identify capacity and safety needs along CSXT and WTRY in Wilmington and eastern North Carolina	\$400,000	2016-2020
Hilltop Rd. and Mackey Rd. Study	Determine potential safety improvements for these crossings in Greensboro	\$300,000	2016-2020

Study	Description	Estimated Cost (2014 dollars)	Projected Completion
New Hanover County/Pender County Short Line Extension	Evaluate extending existing short line 1.5 miles from US 421 in New Hanover County to the Pender Commerce Industrial Park on the Pender County Line	\$250,000	2016-2020
CSXT Freight and Intermodal Operational Improvements	Study operational improvements along the CSXT rail line between Charlotte and Pembroke	\$400,000	2016-2020
Morehead City Highway-Rail Operational Improvements	Support development of other frontage roads or superstreet intersections to help reduce highway-rail conflicts in Morehead City	\$250,000	2016-2020
Wilmington Beltline CSXT Capacity Study	Study capacity needs along the CSXT corridor through Wilmington to provide enhanced access to the port and customers	\$400,000	2016-2020
CSXT Capacity Studies – Eastern NC	Studies of freight movement and passenger interoperability	\$400,000	2016-2020
Eastern NC Intermodal Connections	Study the development of an intermodal facility to serve eastern North Carolina and the Triangle region	\$400,000	2016-2020
Operational Improvements to CSXT from Tennessee to Charlotte	Identify operational improvements from Tennessee to Charlotte	\$400,000	2015-2019
Shale Gas	Monitor shale gas exploration discussion and identify potential needs	\$250,000	2015-2019
Wood Pellets	Study and develop projects as needed to support the growing wood pellet industry	\$250,000	2015-2019
Access to I-85 Corporate Center	Provide access to the 1,000-acre I-85 Corporate Center Megasite in Davidson County	\$250,000	2015-2019
Access to Chatham-Siler City Advanced Manufacturing Site	Conduct a study to identify infrastructure needs required to support industries targeted for the 1,800 acre Chatham-Siler City Advanced Manufacturing Site	\$250,000	2015-2019
Access to Randolph County (Liberty) Megasite	Conduct a study to identify infrastructure needs required to support industries targeted for the Randolph County (Liberty) Megasite	\$250,000	2015-2019
Access to Mid-Atlantic Industrial Rail Park	Provide access to the Mid-Atlantic Industrial Park, a 1,025 acre CSXT-Select Site in Leland, Brunswick County	\$250,000	2015-2019
Access to Kingsboro/Rose Industrial Site	Identify needs for potential development of the CSXT-Select Site near Tarboro, NC	\$250,000	2015-2019
Access to Project Legacy Megasite	Identify needs for access to the Project Legacy Megasite in Union County	\$250,000	2015-2019
Freight Oriented Land Use Study	Prepare memorandum of best practices / guidelines on local zoning and land use planning around freight rail lines to protect potential sites for future rail-served industries and maintain compatible adjacent land uses	\$75,000	Mid-2016
Low Volume Class I Corridors Infrastructure Needs Class I	Identify infrastructure health needs along lower volume Class I corridors	\$250,000	2016-2018

Study	Description	Estimated Cost (2014 dollars)	Projected Completion
Freight Investment Plan			
Corridor Preservation Needs	Assess corridor preservation needs across the state	\$75,000	On-going
Long Range Studies			
SA Line Service Restoration	Study SA Line from Norlina to Roanoke Rapids / Weldon for potential freight and passenger connections to the Norfolk area. Also, would enable the S Line to provide additional capacity to supplement the A Line.	\$1,050,000	2021-2025
Investigate previous Yadkin Co Rail Feasibility Study	Evaluate feasibility of construction of a railroad line running parallel to I-77 from the Iredell County line to the Yadkin Valley Railroad in Surry County	\$250,000	2026-2030
Siler City Crossing Improvements Study	Study potential for installation of crossing signals and gates on W. Elk and W. Dolphin Streets and pedestrian crossing improvements along W. Raleigh, W. Second and W. Third Streets.	\$50,000	2021-2025
<i>Cape Fear River Crossing</i>	Study feasibility of a new crossing of the Cape Fear River to eliminate the need for trains to traverse through Wilmington to access the Port of Wilmington	\$1,530,000	2021-2025
<i>NCRR Relocation Studies</i>	Study economic feasibility of relocating the NCRR to bypass New Bern	\$500,000	2021-2025
Mooresville Traffic Separation Study	Study crossings for closing, grade separation and safety enhancements along freight rail corridor in Mooresville	\$250,000	2021-2025

Note: Projects bolded and italicized will help implement the Governor's 25-Year Vision

5.8 PASSENGER AND FREIGHT RAIL CAPITAL PROGRAM

All near-term passenger rail and freight rail capital projects presented in Sections 5.4 through 5.6 are shown in Table 5-7 and 5-11, respectively, along with information on costs, potential funding sources, impact on operating subsidy requirements, if applicable, and timeframes. The passenger projects in the near-term will help increase ridership and revenue with the existing and proposed *Piedmont* and *Carolinian* services, as shown in Table 5-10. Table 5-15 summarizes the capital needs for the freight and passenger projects identified in Tables 5-7 through 5-12. Table 5-16 summarizes operational, maintenance, and associated overhead and program costs for the Rail Division over the next five years. The table is inclusive of the *Piedmont* and *Carolinian* operating costs, and CMAQ and passenger revenues presented in Table 5-10.

For the passenger projects, the costs sharing arrangement between NCDOT and its partners will depend upon the funding programs that are in place when these projects are underway, and the funding available in those programs. The

passenger, freight, and safety projects described within the plan all provide benefits to North Carolina. In order to realize the benefits, state, private and local funds must be used to leverage federal grant and loan programs.

Table 5-15 Summary of Freight, Passenger, and Safety Needs (2014 dollars)

Program	Near-Term	Mid- and Long-Term	Total
Freight (Class I system)	\$15M	\$1,109M	\$1,124
Freight (Short line system)	\$94M	\$157M	\$251
Freight Subtotal	\$109M	\$1,266M	\$1,375M
Passenger	\$49M	\$5,027M	\$5,076M
Safety	\$40M	\$160M	\$200M
Total	\$198M	\$6,453M	\$6,651M

Table 5-16 Operation and Maintenance Summary of the Near Term (2015-2019)

Unit	Operation and Maintenance Costs by State Fiscal Year (2014 dollars)					
	2015	2016	2017	2018	2019	Total
Design and Construction	\$1.6M	\$1.8M	\$2.1M	\$2.2M	\$2.3M	\$10.0M
Engineering Coordination and Safety	\$0.7M	\$0.7M	\$0.7M	\$0.7M	\$0.7M	\$3.5M
Finance and Contracts	\$1.7M	\$1.7M	\$1.7M	\$1.8M	\$1.8M	\$8.7M
Planning and Development	\$2.5M	\$2.5M	\$2.6M	\$2.6M	\$3.2M	\$13.4M
Rail Facilities and Properties	\$2.4M	\$0.5M	\$7.2M	-	-	\$10.1M
Rail Operations	\$13.7M	\$14.2M	\$14.7M	\$16.2M	\$17.4M	\$76.2M
Total	\$22.6M	\$21.4M	\$29.0M	\$23.5M	\$25.4M	\$121.8M

Source: NCDOT Rail OM Summary SFY2014-2020 (April 23, 2014)

6 Chapter Six – Coordination and Review

The public participation approach for the Comprehensive State Rail Plan (State Rail Plan) engaged a broad cross-section of railroads, rail user and agency stakeholders and the general public throughout the plan development process. The outreach activities, feedback from stakeholders obtained through the process, and issues and projects identified for development of the State Rail Plan are summarized in the following sections.

6.1 PUBLIC PARTICIPATION APPROACH

A Stakeholder Involvement Plan (SIP) was developed at the outset of State Rail Plan development outlining the goals and approach to stakeholder and public outreach. Outreach activities conducted to help develop the draft State Rail Plan are described in the following sections and included technical advisory and oversight committees, targeted stakeholder group meetings and interviews, surveys, briefings, and a project web page. Following compilation of an administrative draft, additional stakeholders, interest groups, and the public were notified of the availability of the draft plan on NCDOT's website for comment.

6.1.1 Stakeholder Involvement Plan

The SIP was created early on to identify stakeholders and outline how stakeholders and the public would be engaged throughout the development of the State Rail Plan. The SIP outlined the stakeholder groups, outreach methods, project schedule and milestones for the project. The SIP established goals and objectives for outreach including: engaging a broad range of stakeholders; educating public and private stakeholders; developing support for the State Rail Plan; collecting feedback and recommendations to address in the plan; reviewing assumptions and evaluation results with industry/expert stakeholders; integrating stakeholder feedback into the State Rail Plan; and facilitating broad public input into the State Rail Plan.

6.1.2 Stakeholder Groups and Participation Opportunities

Various stakeholder groups were identified within the SIP along with targeted outreach approaches for each group based on their information and input

needs. A Rail Planning Forum held on November 12, 2013 provided the first opportunity for stakeholder engagement during the State Rail Plan process. Invitees included participants from the business community, the railroads, local government planners and state officials. The forum provided participants an opportunity to learn about the State Rail Plan process and to share their interests and needs with NCDOT.

Several committees were formed to involve key stakeholders in providing input and reviewing recommendations. Their membership and overall objectives were as follows:

Executive Board - The Executive Board was composed of high level NCDOT staff tasked with promoting State Rail Plan agency awareness, providing policy direction and feedback on the plan, coordinating with the full NCDOT Board of Transportation, and approving the final State Rail Plan.

NC Delegation of the VA-NC Interstate High Speed Rail Compact - The NC Delegation of the VA-NC Interstate High Speed Rail Compact included legislators from the North Carolina General Assembly were tasked with examining and discussing strategies to advance multi-state high speed rail initiatives. Members of the group were engaged during the vision-development process as described further in Section 6.3.1.

Technical Advisory Committee - The Technical Advisory Committee (TAC) was comprised of representatives from NCDOT, North Carolina Department of Commerce, North Carolina Department of Agriculture & Consumer Services, FRA, Norfolk Southern Railway (NS), CSX Transportation (CSXT), the Railway Association of North Carolina, the North Carolina Railroad Company (NCRR), Amtrak, and the North Carolina Center for Global Logistics. A specific list of members is included in Appendix H. These stakeholders were tasked with providing critical input into the State Rail Plan process, sharing specific data and assumptions, and reviewing drafts of technical evaluations and the plan. Information on TAC meetings held during development of the State Rail Plan is provided in Section 6.3.2. The TAC was also given the opportunity to review the State Rail Plan prior to its release for public review.

In addition to the committees described above, the SIP also identified rail-related industry groups for targeted outreach through small group meetings, interviews and/or surveys. These industries are shown in Table 6-1. The project team reached out to industry representatives to provide a more detailed assessment of rail needs and user groups in North Carolina, gathering input on their experience with rail in North Carolina, needs that can be served by rail, and barriers to use of rail. More information on outreach to the industry groups in Table 6-1 are provided in Section 6.3.6.

Table 6-1 Industry Groups

INDUSTRY GROUPS	
Agriculture/Forestry/Food Processing	Metropolitan and Rural Planning Organizations
Class 1 Railroads, Short lines, Intermodal and Transload Operators	Mining and Aggregates
Coal and Energy	Trucking and Logistics
Department of Defense	Regional and Local Transit Authorities
Economic Development Regions	Other Transportation Advocacy/Interest Groups
Manufacturing & Chemical Producers	

6.1.3 Communication and Feedback Tools

The following communication and feedback tools were employed to engage the public and stakeholders:

State Rail Plan Website - NCDOT hosts a website for the State Rail Plan (<http://www.ncbytrain.org/projects/rail-plan.html>). The website includes background on the plan and explains outreach opportunities for the public and stakeholders. Links are provided to surveys for short line railroads, Metropolitan and Regional Planning Organizations (MPOs, and RPOs) and to a form for interested parties to submit a rail project request. The website also includes the project timeline, links to social media and web tools (MindMixer) for providing feedback on rail programs and NCDOT Rail Division contact

information. The Draft State Rail Plan was made available for public review via the website on February 21, 2015 and advertised through email, social media, and outreach to governmental organizations, advocacy groups, and railroad publications on February 25. Web tools (MindMixer) and project contact email addresses were used to receive comments. The web tool included some leading survey questions, but allowed for free-form comments as well. The public comment process is described in Section 6.3.6.8.

MPO/RPO and short line surveys - The project team developed surveys to solicit input on passenger and freight rail needs from MPOs and RPOs and needs of short line railroads. Survey feedback has been incorporated by the project team in development of the State Rail Plan and is reflected in Sections 6.4 and 6.5 summarizing those issues and recommendations identified by stakeholders.

Project submission form - The project team developed a project submission form to solicit freight and passenger rail, intermodal, transload and other rail-related infrastructure projects that stakeholders wanted to see considered in the State Rail Plan. A discussion of stakeholder feedback via project submission forms and how submitted projects were considered in the plan is provided in Section 6.5.

Legislative briefing and summary - The project team developed a briefing packet and summary for NCDOT leadership and the North Carolina General Assembly.

6.2 COORDINATION WITH NEIGHBORING STATES

NCDOT works with neighboring states on an ongoing basis regarding rail issues including existing and planned passenger services and corridor development. The US Congress and the state legislatures of Virginia and North Carolina authorized the Virginia-North Carolina Interstate High Speed Rail Compact to advance the Southeast Corridor rail project. North Carolina Compact members were briefed and provided the opportunity for input on the State Rail Plan during development of the plan. The project team reached out to the neighboring states of Virginia, Tennessee, and South Carolina, as well as Georgia, to inform them of the State Rail Plan and to solicit input on the draft plan.

6.3 STAKEHOLDER INVOLVEMENT IN THE DEVELOPMENT OF THE STATE RAIL PLAN

The stakeholder groups identified in Section 6.1.2 provided important input throughout the planning process. Involvement of each group is described further in this section.

6.3.1 NC Delegation of the VA-NC Interstate High Speed Rail Compact

North Carolina members of the VA-NC Interstate High Speed Rail Compact were provided a briefing on March 12, 2014. The briefing summarized key findings of the planning process and described the efforts required to complete the State Rail Plan by June 2015. It contained information about the goals of the State Rail Plan, trends in passenger rail travel and freight rail, detailed expansion and preservation plans and described key partnerships in delivering programs and services. Importantly, it provided recommendations on policy and funding actions.

6.3.2 Technical Advisory Committee

As noted in Section 6.1.2, the Technical Advisory Committee includes representatives from NCDOT, other state agencies, FRA, and freight and passenger railroads, and the NC Center for Global Logistics. These agency representatives had an important role of providing expert input on assumptions and recommendations at key points throughout the planning process. Table 6-2 outlines the TAC input provided on plan elements at each meeting.

Table 6-2 TAC Meeting Schedule and Tasks

TAC MEETING	MEETING OBJECTIVES
Meeting #1 – April 17, 2014, NCDOT Transportation Building, 1 S. Wilmington St., Raleigh	State Rail Plan planning process orientation Provide input on the plan's vision Identify emerging markets and issues Identify potential performance measures
Meeting #2 – September 19, 2014, NCDOT Transportation Building, 1 S. Wilmington St., Raleigh	Discuss draft findings for freight and passenger rail trends Review and provide input on prioritization methods, corridors and potential projects

TAC MEETING	MEETING OBJECTIVES
Electronic distribution – January 6, 2015	TAC members review draft State Rail Plan and provide comments
Meeting #3 – Spring 2015	Review and consider public comments on draft State Rail Plan

6.3.3 Coordination with Railroads, Ports and Intermodal Terminals

Coordination with the freight and passenger rail interests was achieved through TAC meetings, individual stakeholder meetings, and a survey to short line railroads in North Carolina. The TAC includes representatives from the state's Class 1 railroads including NS CSXT and Amtrak. A representative of the NCRRT was also a member of the TAC. Individual meetings were also held with NS, CSXT, and NCRRT representatives. The short line railroads were directly engaged via participation in the Railway Association of North Carolina (RANC) annual conference. The short line railroads were sent a survey soliciting input on their freight volume and trends, track agreements, infrastructure conditions, economic development opportunities and transloading trends. Short line railroads were also sent the project submission form. Meetings were held with leadership and staff from both the Port of Wilmington and the Port of Morehead City. Additionally, the railroads were afforded the opportunity to provide comments on the draft statewide rail plan prior to its release for public review, as were all TAC members.

6.3.4 Coordination with Transit Authorities

Transit agencies that have formally considered commuter rail plans were interviewed to gauge where the transit authorities were in terms of commuter rail planning. Detailed information on commuter rail plans for Triangle Transit, Charlotte Area Transit System (CATS) and the Piedmont Authority for Regional Transportation (PART) have been included in Section 2.3.1.

6.3.5 Coordination with Metropolitan and Rural Planning Organizations (MPOs/RPOs)

Nineteen MPOs and nineteen RPOs conduct multi-modal transportation planning in North Carolina. All MPOs and RPOs were sent the MPO/RPO survey and project submission form. The survey asked MPOs and RPOs questions about their region's key rail corridors, rail-dependent industries and major rail

generators, rail infrastructure needs, freight and passenger rail plans, and rail-related economic development plans. The project submission form allowed MPOs and RPOs to submit rail projects including freight and passenger rail projects, intermodal facilities, transload projects and other associated rail infrastructure projects. The form solicited information on each project's description, project type, purpose and need, expected benefits, and previous planning done for the project. The MPO/RPO surveys informed the existing conditions and recommendations sections of the State Rail Plan as reflected in Section 6.4 and 6.5. The submitted projects were included in the State Rail Plan's long term project inventory and funding analysis. The MPOs and RPOs across the state were also briefed on the State Rail Plan in separate business meetings held at the annual North Carolina Association of MPOs Conference on May 14, 2014 in Wilmington. The project team provided a presentation on the State Rail Plan and emphasized the input needed from the MPOs and RPOs, including the survey and the project submission form.

6.3.6 Industry Group Outreach

Interviews and small group meetings were conducted with industries that utilize rail in North Carolina. The purpose of these meetings and contacts was to involve stakeholders and solicit their input on the State Rail Plan. Industries were asked how they utilize rail and to share their existing and anticipated rail infrastructure needs. Industry groups were also asked to confirm State Rail Plan data and assumptions where appropriate. An overview of the industry working group discussions follow.

6.3.6.1 Mining

Two national aggregate companies and one local aggregate company were interviewed regarding how they utilize rail in North Carolina. The National Stone, Sand and Gravel Association and the North Carolina Aggregates Association were also interviewed. In general, the aggregates industry does not utilize rail much due to the high shipping cost for aggregates and because dump trucks are typically needed to transfer aggregates to the needed site. Estimates of 10 to 20 percent of aggregate materials in North Carolina were provided for the amount of aggregate moved by rail. The percentage share has increased over the past few years. Rail is most often used in eastern North Carolina where

geology does not allow for quarries and therefore aggregate must be shipped in by rail or barge.

6.3.6.2 Trucking

Over a dozen trucking and transportation logistics firms were contacted to inquire whether they utilize rail or intermodal facilities, gather input on needs associated with rail and intermodal facilities, and gather input on any barriers to using rail or intermodal facilities. Most of the trucking firms contacted indicated that they do not use rail because their business model is built on utilizing long haul trucking. Several firms noted they have used rail and associated intermodal facilities when clients requested. The North Carolina Trucking Association was contacted and confirmed that there is little use of rail by trucking and logistics companies in North Carolina.

6.3.6.3 Manufacturing

Fifty manufacturing firms were contacted through email and through information distributed by the Manufacturers and Chemical Industry Council of North Carolina. Manufacturing firms attended a meeting on June 3, 2014 where they provided information on what commodities they ship by rail, barriers for rail shipment and potential opportunities for rail shipment. The North Carolina Department of Commerce conducted additional follow up to manufacturing firms that could not participate in the meeting.

6.3.6.4 Agriculture/Forestry/Food Process Industry

Staff from the NC Department of Agriculture and Consumer Services was interviewed regarding rail-related agricultural needs in May, 2014. This interview was also informed by ongoing stakeholder outreach conducted as part of the Eastern Infrastructure Study looking at markets and infrastructure needs associated with GTP, the Port of Morehead City, and the restoration of the Wallace to Castle Hayne corridor, which could enhance access to the Port of Wilmington.

A primary concern is the ability to receive grain at competitive prices to support North Carolina's hog and poultry industries. It was also indicated that there is an opportunity to ship agricultural products in refrigerated containers. In particular, opportunity to ship North Carolina's pork and poultry, sweet potatoes, cucumbers, blueberries, and other products. There is a need to

develop a concentration of refrigerated containers in North Carolina that a service would be interested in moving. In addition, it was noted that increasing the amount of food manufacturing / processing facilities in North Carolina could lead to increased volumes or margins on products.

It was also noted that the wood pellet industry will likely expand to locations west of I-95, which may increase the need to ship wood pellets via rail to future terminals at the Ports of Morehead City and Wilmington.

It was indicated that the agricultural industry could be supported by the restoration of the Wallace to Castle Hayne corridor, the GTP to CSXT connection, and the Pembroke turn.

6.3.6.5 Department of Commerce

A listening session was held with the Department of Commerce on March 19, 2014. In addition to representatives of the NC Department of Commerce, representatives of the Lenoir County Economic Development Council and of the Carteret County Economic Development Council participated. Topics ranged from economic opportunities and challenges at GTP, wood pellet projects coming online in eastern North Carolina, opportunities at the Ports of Morehead City and Wilmington, and the re-shoring of industry. It was noted that industries returning to North Carolina may gravitate to areas that have interstate access nearby and established populations. The 2013 Jobs Plan was also discussed.

6.3.6.6 Department of Defense

Input from the Department of Defense was incorporated into the State Rail Plan through coordination with the project team that was working concurrently on the Eastern Infrastructure Study, published in January 2015. That study investigated the demands and infrastructure needs at the Port of Morehead City, GTP, and restoration of the Wallace to Castle Hayne corridor that would provide redundant access to the Port of Wilmington and Military Ocean Terminal – Sunny Point (MOTSU). The Eastern Infrastructure Study included outreach to the Military Surface Deployment and Distribution Command, MOTSU, Fort Bragg, and several military associations, such as, but not limited to, the North Carolina Military Business Center. It was indicated as a part of the Eastern Infrastructure Study outreach that the Department of Defense is supportive of

the restoration of the Wallace to Castle Hayne corridor as it would enhance deployment capabilities from Camp Lejeune and Fort Bragg. In addition, the corridor provides redundant access to MOTSU. This support was voiced previously in a February 21, 2012 letter to the NCDOT Rail Division. The Pembroke turn project was also cited as a need. However, at this time, no funding is available from the Department of Defense for the projects.

6.3.6.7 Other Transportation Advocacy/Interest Groups

The Western NC Passenger Rail Organization advocates for extending intercity passenger rail service to Western North Carolina. The organization was interviewed to obtain input on the organization and how communities in Western North Carolina view potential intercity rail. Many municipalities with proposed stations already have buildings or land acquired that would host future train stations. The Western NC Passenger Rail Organization has been advocating for rail service for the past fifteen years. Many of the local communities have expressed interest in seeing this service implemented because it may boost tourism while also offering alternative transportation options.

In addition, rail plan team representatives attended meetings held by the Triangle Mainline Forum and Carteret County Technical Advisory Committee.

6.3.6.8 Public Involvement

In addition to the stakeholder outreach described previously, the Draft State Rail Plan was published on the NCDOT website at (<http://www.ncbytrain.org/projects/rail-plan.html>) for review by the general public. The plan was posted on February 21 and an email notification and social media update was circulated on February 25 informing people of the plan's availability. Social media was circulated to all that follow NCDOT. A direct email was sent to approximately 245 people, including state and regional governmental and transit agencies, representatives of adjacent states, parties that had expressed interest in the rail plan through the publicly advertised Rail Planning Forum (described in Section 6.1.2), shippers with manufacturing, aggregate / mining, and agricultural interests identified through the Rail Planning Forum and other ongoing freight related studies, rail advocacy and industry groups, including, but not limited to the Association of American

Railroads and American Short Line and Regional Railroad Association, and publications such as *Trains* and *Progressive Railroading*. Comment topics are incorporated and generally described in Section 6.4.

6.4 ISSUES IDENTIFIED DURING THE RAIL PLAN PROCESS

Stakeholder input received through the meetings, interviews, surveys, and other mechanisms as described identified a host of broad issues, as well as specific considerations, for the State Rail Plan. The issues raised by stakeholders during development of the State Rail Plan have been organized into freight, passenger, and other issues and include:

Freight Rail

- From a review of the global logistics issues, the trucking industry is facing several constraints – thousands of trucking jobs were lost during the last recession, and today, finding drivers to enter or re-enter the trucking workforce is becoming difficult. This will have a large impact on freight for all modes.
- Coal shipments are projected to decrease as North Carolina power plants convert from coal to other energy sources, possibly natural gas. Much of the state's coal is shipped by rail, and natural gas extraction is expected to increase in North Carolina. There is opportunity for rail service providers in North Carolina to serve the emerging wood pellets and hydraulic fracturing industries.
- Recent trends have shown increases in the shipment of livestock feed to NC and increases of the production of chemicals and plastics in North Carolina.
- Highway-rail grade crossings at the Port of Wilmington and along the Wilmington Terminal Railway and CSXT through Wilmington create a bottleneck and challenge for freight movements navigating the "last mile" to and from the port.
- Improved rail access is needed to Radio Island at the Port of Morehead City.
- The Port of Wilmington is predicting bulk growth, which will likely result in more rail traffic.
- New intermodal and transload facilities are needed to meet the growing needs. These facilities should be multi-use, multi-mode and serve

multiple companies. Future markets include the resurgence in furniture and textiles and other local manufacturing and the agricultural market (grain to farms, and produce and animals shipped from farms).

- The air quality benefits of rail should be considered when building new intermodal sites.
- State of good repair should be considered especially for near-term improvements.
- Short line railroads have considerable bridge, track and modernization needs.
- Global economic trends, energy trends and emerging markets in North Carolina will shape North Carolina's future freight rail needs.
- Projected population growth will create potential land use challenges for freight rail. There needs to be an awareness campaign for local officials on best-practices for land uses and zoning around active freight railroads. Land use planning often conflicts with freight railroads' safety and economic development goals when development is located adjacent to freight corridors. Some land uses, such as residential, should not be encouraged adjacent to active freight rail lines.
- Agricultural needs include competitive rail prices for grain / feed, opportunities to ship goods in refrigerated containers, and identified infrastructure needs in eastern North Carolina.
- Through the public review process, the priority of several freight corridors in central North Carolina was questioned. Due to the potential development of the natural gas industry and several megasites being marketed, it was suggested that importance of the ACWR, CSXT S-Line, and NS' Greensboro to Gulf Corridor be elevated.
- Through the public review process, it was noted that transportation improvements that enhance connections to intermodal facilities in other states should be highlighted. Specifically, the new inland port in Greer, South Carolina was identified with the potential to support western NC.
- The public noted the importance of investing in industrial access, transload and intermodal facilities, track capacity, and infrastructure maintenance.

- The public identified the greatest freight needs as access to industrial clients, facilitate diversion of truck trips to rail, intermodal, capacity, grade crossing improvements and separations, access to ports, and minimizing passenger service interference with freight movement.

Passenger Rail

- Intercity passenger rail has doubled in the past twelve years and continues to increase. Riders are taking advantage of new and existing services and renovated stations.
- Expanding to additional markets/cities should be evaluated along with reducing travel time along existing corridors.
- There is uncertainty from stakeholders and the public over the timeline and plans for extending passenger rail to Western North Carolina or Eastern North Carolina.
- Improved multimodal connections (bus, light rail) at stations and air/rail connections should be evaluated. Parking needs at existing stations needs to be evaluated.
- Evaluate the changing demographics in the state and how they might impact travel markets.
- Projected population growth will grow the intercity passenger rail market, especially in the Piedmont.
- Evaluate commuting patterns and labor markets, where new intrastate and commuter corridors might emerge.
- Determine how passenger services can be added without unduly impacting freight services.
- Funding and institutional barriers have made it difficult to advance commuter rail projects in the Triangle and Charlotte regions.
- The air quality benefits of rail should be considered when looking to invest in bus relocation/expansion.
- The public expressed support for the proposed *Southeast Corridor* service.
- The public advocated for additional *Piedmont* and / or *Carolinian* frequencies and for additional services to Birmingham, Alabama and Fort Worth, Texas.

- Support for the *Western NC* and *Southeastern, NC* services was expressed by public respondents. Additional frequencies for the *Piedmont* service and additional stops were requested. Service to Lynchburg, Virginia was also noted.
- A request to consider a route that passes through Fayetteville be considered for the *Southeastern* service.
- It was noted that the studies for service expansions need to be updated.
- Several public respondents advocated to accelerate plans to construct a new station and associated track improvements to serve Lexington, NC.
- A new station in Sanford, NC along the *Silver Star* long distance service was requested.

Other Issues

- The Military Surface Deployment and Engineering Command is supportive of the restoration of the Wallace to Castle Hayne corridor.
- Positive Train Control (PTC) and signalization should be addressed. PTC will be required in the future including along new passenger rail corridors.
- Reviving abandoned corridors and preserving at-risk corridors remains a key concern.
- There is a need for continued state funding to acquire abandoned or unused corridors.
- Rail is a key component for achieving statewide multi-modal, environmental, economic development and tourism goals.
- The environmental benefits of rail transportation should be emphasized and marketed.
- Improving existing infrastructure and quality of service is a top priority of railroads and agencies
- Respondents during the public comment period supported several potential funding sources, including parking fees at stations and local funding to help support capital, operating, and maintenance of passenger service extensions, property taxes on locations benefited by additional Raleigh to Charlotte frequencies, exemption of railroads from gross state taxes if money is used for infrastructure maintenance, and a 3% vehicle tax.

6.5 CONSIDERATION AND INCORPORATION OF STAKEHOLDER INPUT

The outreach process was designed to incorporate input along with data considerations in assessing existing conditions, evaluating passenger and freight rail corridors and services, and developing plan recommendations. Input from the interviews, surveys, and early meetings was used to verify data and inform the assumptions for the plan, as well as to identify issues for consideration in the plan. The TAC served as a key mechanism for industry experts to review the specific technical analyses and sections of the plan through activities during the meetings and review assignments leading up to and following meetings. The project submissions were used in development of the draft list of proposed projects for consideration by the project team and TAC. Public comment provided on the draft State Rail Plan was used to revise the plan prior to approval by FRA and adoption by the North Carolina Board of Transportation.

6.6 STATE RAIL PLANNING COORDINATION

The mission and goals of the NCDOT and the Rail Division guided the development of the State Rail Plan. Coordination of rail planning activities within NCDOT and with metropolitan areas is described in Section 1.3 of the plan. The NCDOT Rail Division is authorized to carry out a number of activities associated with rail planning, construction, equipment inspection, and ongoing safety programs. The NCDOT Rail Division is housed in the Division of Transit and planning activities are undertaken by the Rail Division Planning & Development Branch. The Rail Division participates along with other multimodal divisions in the NCDOT Strategic Transportation Investments (STI) project prioritization process and projects are programmed into the State Transportation Improvement Program (STIP) once funding is identified. Representatives from other Divisions within NCDOT have been involved in the State Rail Plan process through TAC meetings and individual and small group meetings, and the project team has conducted briefings to the Board of Transportation Multi-modal Committee. The NCDOT Rail Division coordinates with CSXT, NS and NCRR on projects and planning efforts along their respective rail corridors. As noted in Section 6.3.3, representatives of these railroads were members of the TAC and conversations were held with NCRR, NS and CSXT to discuss the State Rail Plan. The NCDOT coordinates with MPOs through board and committee meetings and direct coordination as needed to support

identification and inclusion of rail-related projects in MPO regional planning and local project prioritization.