North Carolina Statewide Multimodal Freight Plan

FINAL Report

Prepared for
North Carolina
Department of Transportation

Prepared by
HNTB Corporation

With
SASI World
Clearbox Forecasting

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LIST OF ACRONYMS

AADT	Average Annual Daily Traffic	FAST Act	Fixing America's Surface Transportation Act	NHS	National Highway System
APP	Areas of Persistent Poverty	FHWA	Federal Highway Administration	NHFP	National Highway Freight Program
BIL	Bipartisan Infrastructure Law	FTI	Freight Train Interference	NPMRDS	National Performance Management Research Data Set
BTI	Buffer Time Index	FY	Fiscal Year	NS	Norfolk Southern Railway
CAMPO	Capital Area Metropolitan Planning Organization	GSO	Piedmont Triad International Airport	RDU	Raleigh Durham International Airport
CAV	Connected and Automated Vehicles	HDC	Historically Disadvantaged Communities	ROW	Right-of-Way
CBRE	Global Commercial Estate Services	IIJA	Infrastructure Investment and Jobs Act	RPO	Rural Planning Organization
CCX	Carolina Connector Intermodal Rail Terminal	ITS	Intelligent Transportation Systems	SMFP	Statewide Multimodal Freight Plan
CIT	Charlotte Inland Terminal	LOS	Level of Service	STIP	State Transportation Improvement Program
CLT	Charlotte Douglas International Airport	MARD	USDOT Maritime Administration	TEU	Twenty-Foot Equivalent Unit
CRFC	Critical Rural Freight Corridors	MHD	Medium and Heavy Duty	THD	Truck Hours of Delay
CRTPO	Charlotte Regional Transportation Planning Organization	MPO	Metropolitan Planning Organization	TNC	Transportation Network Companies
CSX	CSX Transportation	NCDOT	North Carolina Department of Transportation	TSM&O	Transportation Systems Management and Operations
CTP	Comprehensive Transportation Plan	NCFN	North Carolina Freight Network	U.S.	United States
CUFC	Critical Urban Freight Corridors	NCHFN	North Carolina Highway Freight Network	USDOT	United States Department of Transportation
DMS	Dynamic Message Signs	NCPHFN	North Carolina Priority Highway Freight Network	V/C	Volume-to-Capacity Ratio
DoD	U.S. Department of Defense	NCRR	North Carolina Railroad	VMT	Vehicle Miles Traveled
FAC	Freight Advisory Committee	NCSPA	North Carolina State Ports Authority	WIM	Weigh-in-Motion
FAK	Freight All Kinds	NEVI	National Electrical Vehicle Infrastructure	ZEV	Zero Emission Vehicles

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NORTH CAROLINA STATE FREIGHT PLAN COMPLIANCE

FAST ACT - Requirement	Freight Plan Reference(s)
Plan contents – a statewide freight plan shall include, at minimum:	
Identification of significant statewide freight **trends, needs, and issues**	Chapters 3, 5, and 6
Description of **freight policies, strategies, and performance measures** that will guide freight-related transportation investment decisions	Chapters 6, 7, and 8
Critical multimodal **rural freight facilities and rural and urban freight corridors**	Chapter 4
Link to **national multimodal freight policy and highway freight program goals**	Chapter 2
Description of how **innovative technologies and operational strategies** (including ITS) that improve the safety and efficiency of freight movements were considered	Chapters 6, 7, and 8
Description of improvements to **reduce roadway deterioration by heavy vehicles** (including mining, agricultural, energy cargo or equipment, and timber vehicles)	Chapters 6, 7, and 8
Inventory of facilities with **freight mobility issues** and a description of the strategies the state is employing to address the freight mobility issues	Chapters 3, 6, 7, and 8
Description of **significant congestion or delay caused by freight movements** and any mitigation strategies	Chapters 3, 6, 7, and 8
Freight investment plan that includes a list of **priority projects** and describes **investment and matching funds**	Chapter 8
Consultation with the state **freight advisory committee**	Ongoing throughout plan development. Presented at 3 meetings (see Chapter 1)

BIL Freight Plan Requirements		
Requirement		**Freight Plan References**
Update plan every four years rather than five years		The plan update timeframe addresses this.
Plans must have an 8-year forecast period, instead of a 5-year forecast period		The plan was already meeting this requirement
The most recent commercial motor vehicle parking facilities assessment conducted by the state		The truck parking study update addresses this requirement
The most recent supply chain cargo flows in the state, expressed by mode of transportation		The Commodity Flow Profile and the other modal profiles address this requirement.
An inventory of commercial ports in the state		This is addressed in the Maritime profile and is mentioned in Chapter 3 of the Final Report
If applicable, consideration of the findings or recommendations made by any multi-state freight compact to which the state is a party		This is not currently applicable
The impacts of e-commerce on freight infrastructure in the state		This is covered in the modal profiles as well as Chapters 5 and 6 of the Final Report
Considerations of military freight		This is covered in the Military Profile and Chapter 3 of the Final Report
Impact Strategies and Goals	Equity Impacts	White paper: • Climate Change • Emissions • Equity • Habitat Fragmentation
	Extreme Weather and Natural Disaster Impacts (Climate Change)	
	Local Air Pollution Impacts	
	Flooding and Stormwater Runoff Impacts	
	Wildlife Habitat Loss Impacts	
Truck Parking Assessment	The capability of the state, to provide adequate parking facilities	The truck parking study update addresses this requirement
	The volume of commercial motor vehicle traffic in the state	This is covered in the Highway Profile, truck parking study, and Chapter 3 of the Final Report
	Whether there exist any areas within the state with a shortage of adequate truck parking facilities	The truck parking study update addresses this requirement

NORTH CAROLINA'S STATEWIDE MULTIMODAL FREIGHT PLAN

North Carolina's freight system plays a critical role for its residents and businesses daily. The freight system is responsible for a wide range of services including keeping store shelves stocked, allowing manufacturing plants to operate, transporting fuel to keep vehicles moving and providing an efficient, reliable way for the United States (U.S.) military to move troops and equipment.

The state's freight infrastructure faces continually changing demands due to changing freight trends and developments, including:

- Significant population growth in the state's urban areas;
- Adoption of new technologies such as autonomous and connected trucks;
- Concentration of manufacturing facilities along major trade corridors;
- Shortage of adequate truck parking facilities; and
- Increasing demand for same-day and next day deliveries due to the continually growing e-commerce market, which will continue to stress the capacity and operations of the state's highways, rail, and port facilities.

As North Carolina adapts to these changing conditions in an era of constrained resources, the N.C. Department of Transportation (NCDOT) must continue to balance freight mobility needs with passenger needs, environmental, social and financial concerns while addressing rapidly rising maintenance costs on aging infrastructure.

NCDOT developed the state's first Statewide Multimodal Freight Plan (SMFP) in 2017. This effort is to update the initial SMFP within the five-year update window to meet federal requirements.

The approach to updating this SMFP, links together various analyses – freight system, commodity flow, trade/economic, industry supply chain and institutional (e.g., regulations and public policies) – in a way that identifies the most critical infrastructure, operational, institutional and market-related issues and chokepoints impacting the state's freight transportation system. The SMFP addresses both current and future needs and opportunities. It allows North Carolina to consider investments under a variety of plausible futures to ensure the most robust and effective recommendations moving forward.

Federal Legislation

The Bipartisan Infrastructure Law (BIL) of 2021, also known as the Infrastructure Investment and Jobs Act (IIJA) and to be referred to as BIL throughout this plan, is a five-year, $550 billion transportation bill providing funding for the nation's transportation planning and infrastructure investments. The BIL includes several provisions specifically geared to improving the performance of the national freight network and supporting investment in freight-related surface transportation projects. At the national level, this includes the development of a National Multimodal Freight Policy, National Freight Strategic Plan, and designation of a National Multimodal Freight Network. On the funding side, it also includes $7.2 billion in formula funding for freight projects on the National Highway Freight Network (NHFN) and a $10.9 billion discretionary, freight-focused grant program for states, metropolitan planning organizations (MPOs), local governments, and other entities.

The North Carolina SMFP update was developed in compliance with BIL requirements for state freight plans to ensure the state has access to Federal funding opportunities and competitive grant opportunities. The 2017 SMFP was developed to meet the Fixing America's Surface Transportation Act (FAST Act) of 2015, the predecessor to the BIL. The updated SMFP also meets freight plan requirements included in the FAST Act. A table summarizing this SMFP's compliance with the BIL and FAST Act requirements is included as cover page.

Freight Plan Methods and Data Overview

Completing a comprehensive SMFP requires transforming data from a myriad of sources into information that is reliable and meaningful to accomplishing the goals of the SMFP. Key sources of data used in the SMFP included stakeholder input, previous studies, and numerous statistical and modeling datasets and tools.

Stakeholder Outreach

Outreach to industry and key stakeholders was a critical component in updating North Carolina SMFP. In order to better understand the needs and issues faced by producers, shippers/receivers and carriers, as well as the regional planning organizations and economic development organizations throughout North Carolina, thoughtful stakeholder outreach and engagement was structured to receive targeted feedback through the development of the Plan. There are four critical elements of this outreach: the State Freight Advisory Committee (FAC), MPOs and Rural Planning Organizations (RPOs), freight and industry stakeholder interviews, and N.C. Board of Transportation final plan approval.

NCDOT convened the NC FAC to advise on freight-related priorities, issues, projects and funding needs; act as forum for discussion of transportation decisions affecting freight mobility; communicate and coordinate regional priorities with other organizations; and promote sharing of information between sectors. The FAC members are reflective of the diverse range of stakeholders that own, operate, plan, maintain, and conduct business utilizing North Carolina's freight infrastructure. Its members include both the public and private sectors. The project team interviewed over 30 freight and industry stakeholders that helped inform the freight system profile and needs assessment. These stakeholders included: freight shippers and receivers, carriers, freight terminal/facility operators, industry associations, government agencies such as the Department of Agriculture and the Department of Commerce, regional and statewide economic development organizations and NCDOT.

The project team engaged numerous North Carolina MPOs and RPOs through the stakeholder interview process. Multiple MPOs and RPOs are also representatives on the NC FAC.

Data and Previous Studies

The 2022 North Carolina SMFP draws from a variety of proprietary and publicly- available data sources to analyze freight demand, commodity flows, business climate, freight transportation network performance, assets and infrastructure and demographic and socioeconomic statistics. This final plan document is compiled from a series of detailed technical reports available at [NCDOT Freight Plan](#).

STAKEHOLDER ENGAGEMENT HIGHLIGHTS

Freight and Industry Stakeholder Interviews

- Shippers and Receivers
- Carriers
- Ports and Airports
- Railroads
- North Carolina Railroad Company
- Industry Associations
- NCDOT
- NC State Agencies
- Regional Economic Development Organizations
- Metropolitan Planning Organizations
- Military Bases
- Trucking Industry and Truck Parking Interests
- Neighboring States

North Carolina Freight Advisory Committee Meetings

- Formally met 3 times during the Freight Plan update development

Regional Forums

- Metropolitan Planning Organizations (MPOs)
- Rural Planning Organizations (RPOs)
- 2 virtual meetings - May 17 & 19
- 120 attendees

Electronics Survey

- Promoted through email distribution blasts, social media and newsletters
- Available June 3-20
- 100 comments provided

NORTH CAROLINA FREIGHT ADVISORY

DATA SOURCES USED IN NORTH CAROLINA STATEWIDE MULTIMODAL FREIGHT PLAN

Category	Data Source	Data Type
Freight System Demand and Commodity Flows	FHWA Freight Analysis Framework Version 5	Origin-Destination commodity flows
	U.S. Bureau of Trade Statistics	Imports and exports statistics
	U.S. Energy Information Administration	Petroleum product stocks and shipments
	N.C. Department of Transportation	Truck counts
	N.C. State Ports Authority	Port traffic and forecast
	Surface Transportation Board Confidential Carload Waybill Sample	Rail freight origin-destination commodity flows
	Bureau off Transportation Statistics TransStats Database	Air cargo by airport
	Boeing World Air Cargo Forecast	Air cargo demand forecast
	N.C. Department of Public Safety Emergency Management	Hazardous material flows
Establishment Data	Data Axle	Business establishments employment, area, and location
Transportation Cost	TranzAct Freight Waybills	Freight billing data
Network Performance	National Performance Management Research Data Set	Truck travel times
	North Carolina Department of Transportation Statewide Travel Demand Model	Truck demand and Level of Service (existing and forecast)
Safety	N.C. Department of Transportation	Truck-involved crashes
	Federal Railroad Administration Office of Safety Analysis	At-grade crossings inventory, crashes, and incidents
Assets and Infrastructure	Federal Highway Administration Office of Planning, Environment, and Realty	Freight intermodal connectors
	N.C. Department of Transportation	Highway network, rail network, weigh stations, at-grade rail crossings, bridges, tunnels, work zones, truck size and weight, Statewide Transportation Improvement Program
	U.S. Pipeline and Hazardous Materials Administration	Pipeline network
	U.S. Energy Information Administration	Hazardous material terminals
	North Carolina State Ports Authority	Port infrastructure characteristics
	Oak Ridge National Laboratory	Rail network
	National Transportation Atlas Database	Transportation facilities
Demographic and Socioeconomic Data	U.S. Census Bureau	Population, longitudinal employer household dynamics
	U.S. Bureau of Labor Statistics	Industry employment and wages
	U.S. Bureau of Economic Analysis	Gross Domestic Product
	U.S. Energy Information Administration	State energy prices and expenditures
	North Carolina Office of Management and Budget	Population projections

Past planning efforts that contributed to the development of this plan include:

- 2015- North Carolina Transportation Network and Strategic Transportation Corridors
- 2016 – Greater Charlotte Regional Freight Mobility Plan
- 2017 – North Carolina Statewide Multimodal Freight Plan
- 2017 – North Carolina Truck Parking Study
- 2018 – North Carolina Ports Economic Contribution Study
- 2018 – Triangle Regional Freight Plan
- 2019 – Eastern North Carolina Regional Freight Mobility Plan
- 2019 – North Carolina Division of Aviation Strategic Plan
- 2020 – North Carolina Truck Parking Study, Phase II
- 2021 – North Carolina Moves 2050 Plan
- 2021 – Strategic Plan of the North Carolina State Ports Authority
- 2022 – Comprehensive State Rail Plan (Draft)

NORTH CAROLINA FREIGHT VISION, GOALS AND OBJECTIVES

As part of the 2017 SMFP, NCDOT developed a freight vision, goals and objectives to meet that vision which drives performance measures and freight investment decision-making. The vision, goals, and objectives were re-evaluated as part of the 2022 SMFP update. The vision, goals, and objectives are informed by:

- FAC;
- NCDOT's Moves 2050 Plan and the Strategic Transportation Corridors; and
- National freight policy goals defined in the 2012 MAP 21Bill, 2015 FAST Act and 2021 BIL.

To achieve this vision, goals and objectives were defined. The goals primarily focus on enabling economic growth and competitiveness, with a significant focus on trade and access to markets and population centers. Another focus is on system performance goals from the perspective of passengers, shippers, carriers and stakeholders who are impacted by the operational performance, reliability and resilience of the freight system. In addition, the plan goals and objectives ensure environmental stewardship through minimization of freight-induced negative impacts on natural, cultural and environmental resources, and promote deployment of advanced technologies, and fostering public-private partnerships.

NCDOT and the FAC agreed on maintaining the eight strategic goals for North Carolina's freight transportation system that were part of the 2017 SMFP as part of the 2022 SMFP update. These strategic goals are intended to guide current and ongoing freight-related transportation planning efforts and serve as a touchstone by which to gauge the success of these efforts. In addition to articulating goals for the state's freight transportation system, several objectives are identified for each goal. These objectives remained largely the same in the 2022 SMFP update with a few exceptions related to BIL requirements and input from stakeholders. Accomplishment of these objectives will make concrete, measurable progress toward the attainment of the freight transportation system goals and ultimate realization of the North Carolina freight transportation system vision.

2022 SMFP Goals Comparison with Past Plans and Federal Policies

<table>
<tr><th>2017 NC Freight Plan</th><th>Economic Competitveness</th><th>Mobility & Reliability</th><th>Safety & Security</th><th>Innovative Technology</th><th>Asset Management</th><th>Environmental Sustainability & Livability</th><th>Collaboration & Partnership</th><th>Sustainable Funding</th></tr>
<tr><td rowspan="2">MAP-21 and FAST Act</td><td>Economic Competitiveness</td><td colspan="3">Innovation & Advanced Technology</td><td>State of Good Repair</td><td>Environmental</td><td>Multistate Connectivity</td><td rowspan="2"></td></tr>
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<tr><td rowspan="3">NC Moves 2050 Plan</td><td rowspan="2">Support a strong economy</td><td>Provide transportation access for all</td><td>Ensure safety and security</td><td rowspan="2"></td><td colspan="3">Maintain a high-quality system</td><td rowspan="3"></td></tr>
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NORTH CAROLINA FREIGHT GOALS AND OBJECTIVES

Economic Competitiveness
Enhance economic development opportunities and competitiveness

- Support the state's freight economy sectors to attract quality growth and high paying jobs
- Invest in the ports and the airports to increase exports to key trading partners and to fully participate in the global markets
- Leverage state-owned logistical assets such as the maritime ports to accommodate increased cargo flow from the introduction of mega-container vessels and the opening of the expanded Panama Canal
- Improve access to freight-related industries, and potential industrial or mega development sites
- Improve mobility and access to intermodal operations and facilities
- Expand access to competitive multimodal transportation options
- Develop strategic highway and rail connections with regional trading partners
- Collaborate with local government in improving the "last mile" freight operations and urban area logistics

Mobility and Reliability
Improve freight system efficiency, reliability, and resiliency

- Enhance integration and connectivity across and between freight modes
- Strategically expand system capacity where existing infrastructure can longer be optimized
- Improve mobility and travel time reliability by managing traffic congestion
- Improve system productivity by lowering transportation costs
- Improve incident management system by partnering with emergency response and law enforcement agencies
- Reduce road closures during peak season and peak hours for construction and maintenance
- Coordinate traffic signals on U.S. and North Carolina routes to improve flow of through traffic
- Monitor and evaluate system performance to assess truck travel time reliability, operational conditions, and effectiveness of congestion management strategies
- Expand multimodal access to ports, airports, and other intermodal and logistics hubs
- Maintain alternate access routes and redundancy in the system for rapid recovery from weather or other disaster events

Safety and Security
Enhance freight transportation safety and security

- Reduce death, injury, and crash/incident rates on all modes to improve public health
- Reduce economic losses due to transportation crashes and incidents
- Eliminate safety hazards by proactively working with stakeholders and agencies responsible for the freight transportation system
- Improve system security to protect people, cargo, and critical infrastructure assets

Innovative Technology
Support adoption and deployment of new freight technologies

- Promote the adoption of safety, fuel efficiency, telematics, alternative fuel, electronic logging device, and other technologies for the trucking industry
- Implement adaptive signal control and other Intelligent Transportation System safety solutions on key freight transportation corridors and freight facilities
- Foster safe future use of autonomous vehicles and drones in freight transportation
- Foster the adoption of Mobility as a Service or similar last mile freight delivery operations through freight-focused planning and projects

Asset Management
Improve freight infrastructure conditions and preservation

- Maintain, preserve, and extend the service life of existing and future freight transportation infrastructure serving all modes
- Monitor infrastructure conditions and prepare an annual freight state-of-the-system report covering all modes

Environmental Sustainability and Livability
Protect and enhance the natural environment

- Support affordable electric vehicles for an equitable clean energy freight economy
- Reduce and/or mitigate the adverse environmental and community impacts of multimodal freight and passenger rail strengthen the resilience of the multimodal freight network against extreme weather events
- Support expanded multimodal freight rail services as a means of reducing carbon emissions and fuel consumed per ton and per passenger-mile and increasing the resiliency and redundancy of the system against extreme weather events
- Enhance resiliency and develop redundancy for the multimodal freight system
- Reduce the multimodal freight impacts on areas of persistent poverty
- Provide equitable opportunities for workforce development to low income and minority groups

Collaboration and Partnership
Foster public-private partnerships and collaboration with freight stakeholders

- Develop and nurture partnerships with private industries with significant role in the state's economy
- Provide a forum for public agencies, industry groups, U.S. military, and local business chambers to coordinate and integrate freight movements
- Provide a forum for participation by freight shippers and carriers in the state
- Improve access to data and information such as traffic speed, incidents, and construction management information
- Expand external communication through social media and mobile apps

Sustainable Funding
Ensure good fiscal management and sustainable funding for the state's freight network

- Secure funding for projects with long-term benefits or high benefit-cost ratio
- Leverage federal funding in freight projects
- Maintain high standards in management of public assets and resources

FREIGHT RESOURCES

The movement of goods is a major contributor to the North Carolina economy. North Carolina's freight assets are the backbone of the state's economic vitality, enabling the movement of millions of tons of freight each year. The state's freight transportation system is an important component of business retention and attraction. According to the Area Development 36th Annual Corporate Survey, several site selection factors identified in the survey were related to transportation.[1]

An inventory of the state's freight assets and an assessment of the role those assets play in supporting statewide freight transportation is the foundation of conducting the needs assessment and developing the most effective freight investment plans.

[1] https://www.areadevelopment.com/Corporate-Consultants-Survey-Results/q1-2022/36th-annual-corporate-survey.shtml

HIGHWAY FREIGHT ASSETS

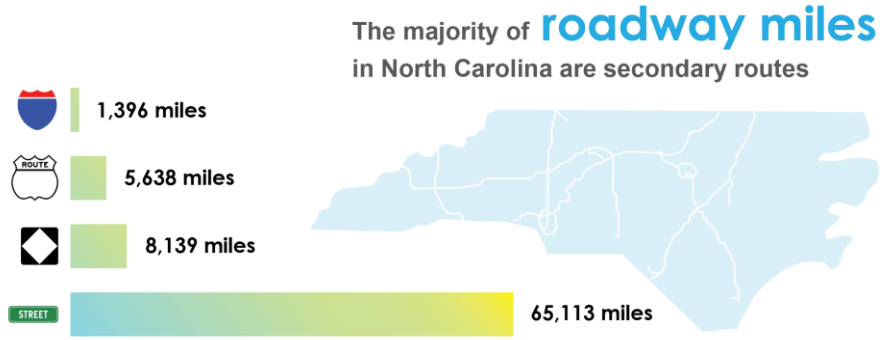
Highway transport is the primary mode of goods movement in North Carolina. By far, it accounts for the largest share of overall tonnage by mode representing nearly 83% of total inbound, outbound, internal and pass-through flows for all modes combined in North Carolina. The highway system is a critical element of the multimodal freight system as the majority of goods transported in the state utilize the highways for at least one leg of their trips.

Inventory

North Carolina maintains approximately 80,286 miles of roadway. Secondary roads account for the largest share of the state-maintained system, accounting for over 81% of all roads. State roads (i.e., North Carolina routes) are a distant second, comprising about 10% of the system. U.S. routes and interstate highways comprise the remainder of the state-maintained system at 7% and 2%, respectively.

Demand

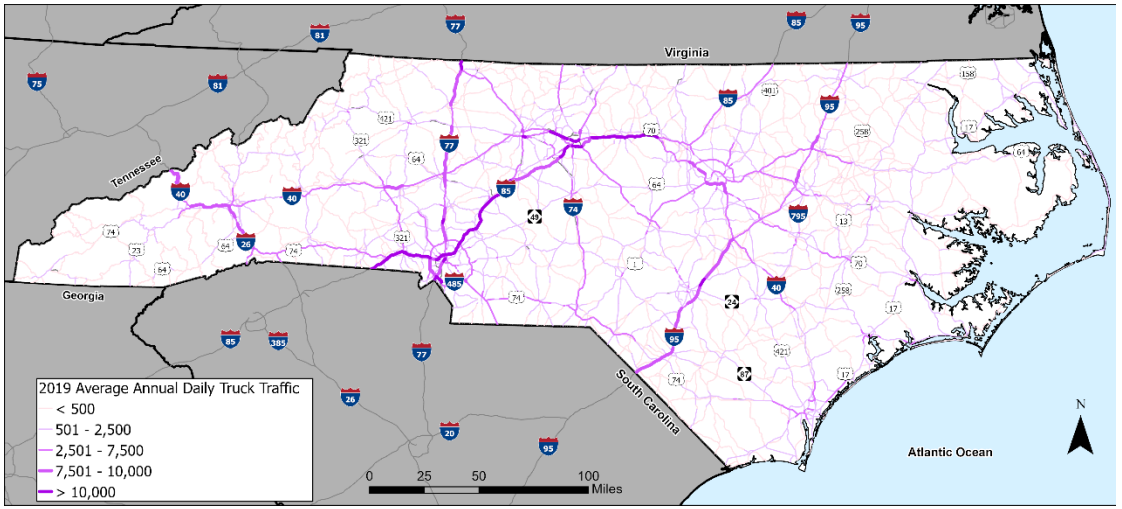
Most of North Carolina's truck flows occur on the interstate highway system. In general, I-40/I-85 is the heaviest utilized freight corridor in North Carolina based on truck volumes. Truck volumes on I-40/I-85 range from 10,000 to 16,000 trucks per day. In particular, the highest truck volumes occur on I-85 north of Charlotte as more than 16,000 trucks per day utilize this corridor.



As large numbers of freight-intensive industries are located along this corridor, I-85 is important to freight movements in which the state has a potential economic interest as local shippers are likely heavy users of the highway. Other interstate highways with particularly high truck volumes include I-77, I-40, I-26 and I-95, with portions carrying between 8,000 to 11,000 trucks daily.

There also are non-interstate highways that are important freight corridors as indicated by daily truck volumes. Some of these highways achieve daily truck volumes that are comparable to those experienced by portions of the interstate highway system.

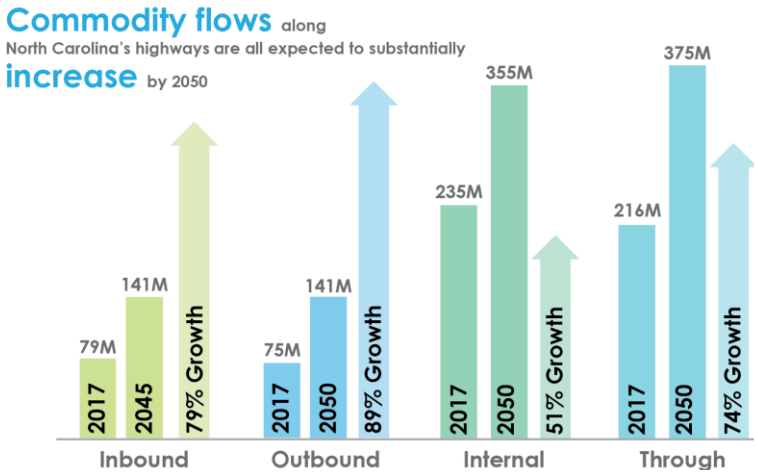
Among the largest non-interstate highway freight corridors are U.S. 74 and U.S. 70. Portions of U.S. 74 transport nearly 5,000 trucks per day. U.S. 70 carries nearly 3,000 trucks daily on its busiest segments.

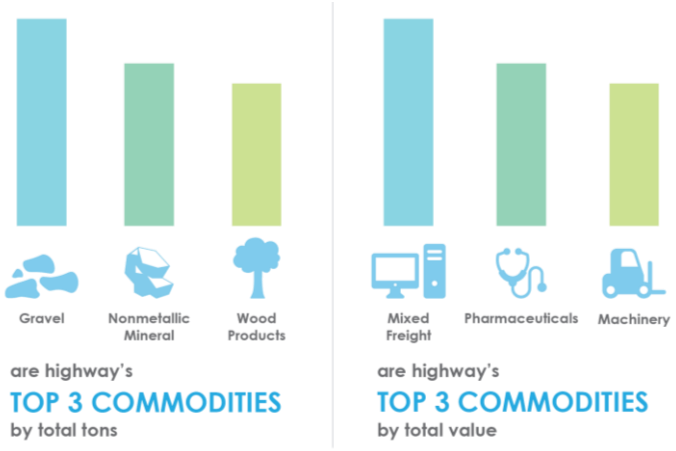


In 2017, nearly 605 million tons of cargo worth $794 billion were transported over North Carolina's highways. Nearly 43% of total truck tons began and ended within North Carolina. Truck flows inbound to North Carolina and outbound from the state had nearly equal shares of total truck flows, which allows carriers to provide more competitive truck rates for the region's shippers since they have more opportunities to reduce empty hauls. Through truck flows, those traveling through North Carolina without stopping to make a pick-up or delivery, comprised about 29%.

The top commodities, by weight, traveling on North Carolina's highways are bulk goods such as gravel, non-metallic mineral products and wood products. However, the highest-value goods transported include mixed freight (i.e., consumer products and other miscellaneous products), pharmaceuticals and machinery.

Demand for highway freight is expected to increase to over 1.011 billion tons of cargo by 2050. This represents an increase of nearly 42% over 2017 flows. Truck flows traveling through North Carolina without stopping has the highest projected share of the total trips at 37% (74% increase from 2017). A large portion of truck flows, about 35%, are expected to continue to be internal to North Carolina, and is expected to have a growth rate of 51% over the next 33 years. Inbound and outbound flows are expected to maintain balanced shares of truck flows with both claiming 14% each of the total.





A 42% increase in total tonnage over the next 33 years, especially in bulk commodity groups, will place significant pressure on North Carolina's highway system. It is expected that many of the truck trips associated with the highway commodity flows will travel on non-interstate roadways for some portion of the trip. In the absence of a modal shift, motor carriers will be forced to accommodate demand with heavier and more frequent trucks. This will contribute to congestion in the state's urban areas as heavy trucks compete with commuters for highway capacity. It will also further strain pavements and bridges.

Conditions and Performance

Overall, pavements are in good condition across the state. Secondary routes have the highest percentage of route mileage in "Good" condition with 87%, and U.S. routes have the highest percentage of route mileage in "Poor" condition with 24%.

Poor to Fair pavement conditions are observed on several high truck volume routes. For instance, the U.S. 64, U.S. 264 and U.S. 70 corridors, which connect Eastern Carolina to the Triangle Region, all have stretches in Fair or Poor condition. This directly affects the performance of truck trips to the Port of Morehead City and the CSX rail intermodal facility in Rocky Mount should conditions worsen.

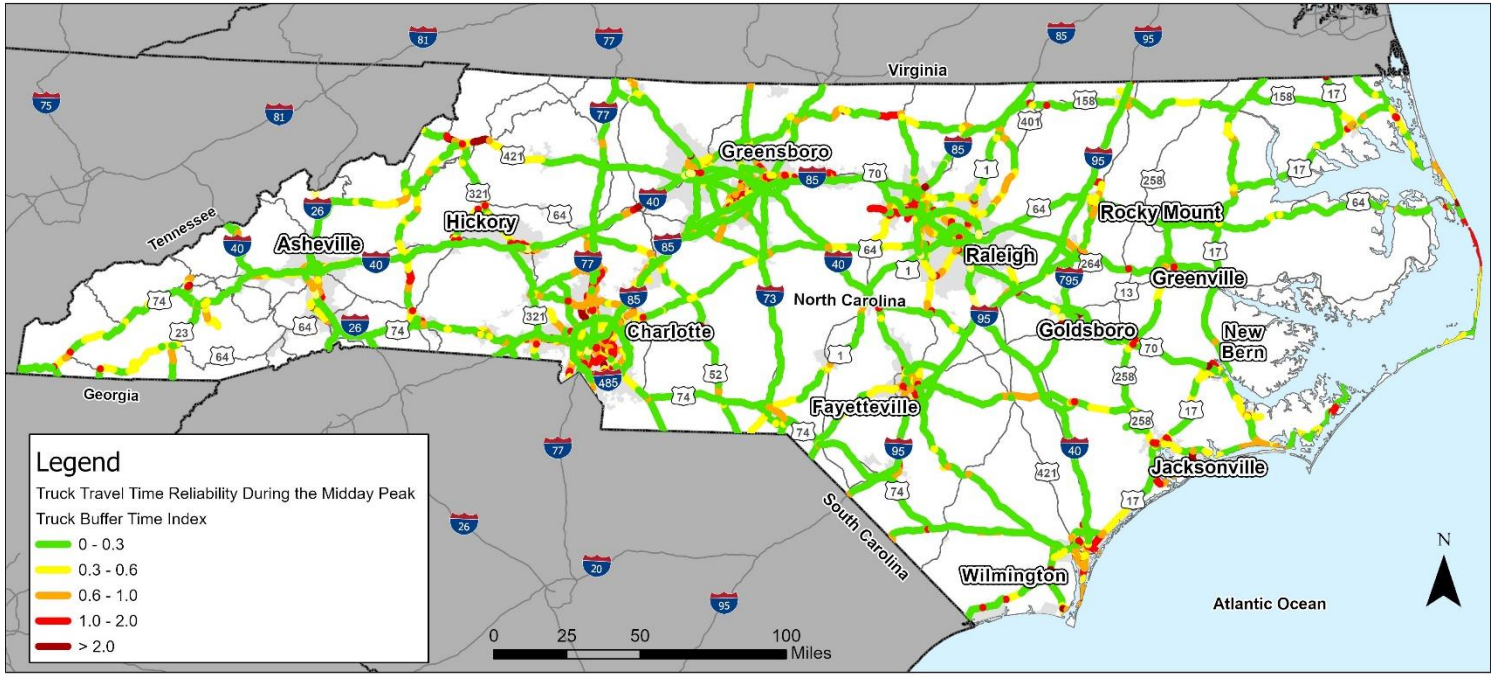
U.S. 74, which links the Port of Wilmington to the Charlotte Region, also has long stretches in Fair or Poor pavement conditions throughout that entire corridor.

For the most part, truck congestion is limited to the state's largest metropolitan areas – the Raleigh-Durham area, the Greensboro/Winston-Salem/High Point area and the Charlotte metropolitan area. These urban areas also have the least reliable truck travel time. These areas all have significant commuter activity on the interstate highway system, which competes with truck traffic.

Pavement Condition	Interstate Highways	U.S. Routes	N.C. Routes	Secondary Routes
Poor	13%	24%	8%	3%
Fair	22%	18%	19%	10%
Good	65%	58%	73%	87%
Total	**100%**	**100%**	**100%**	**100%**

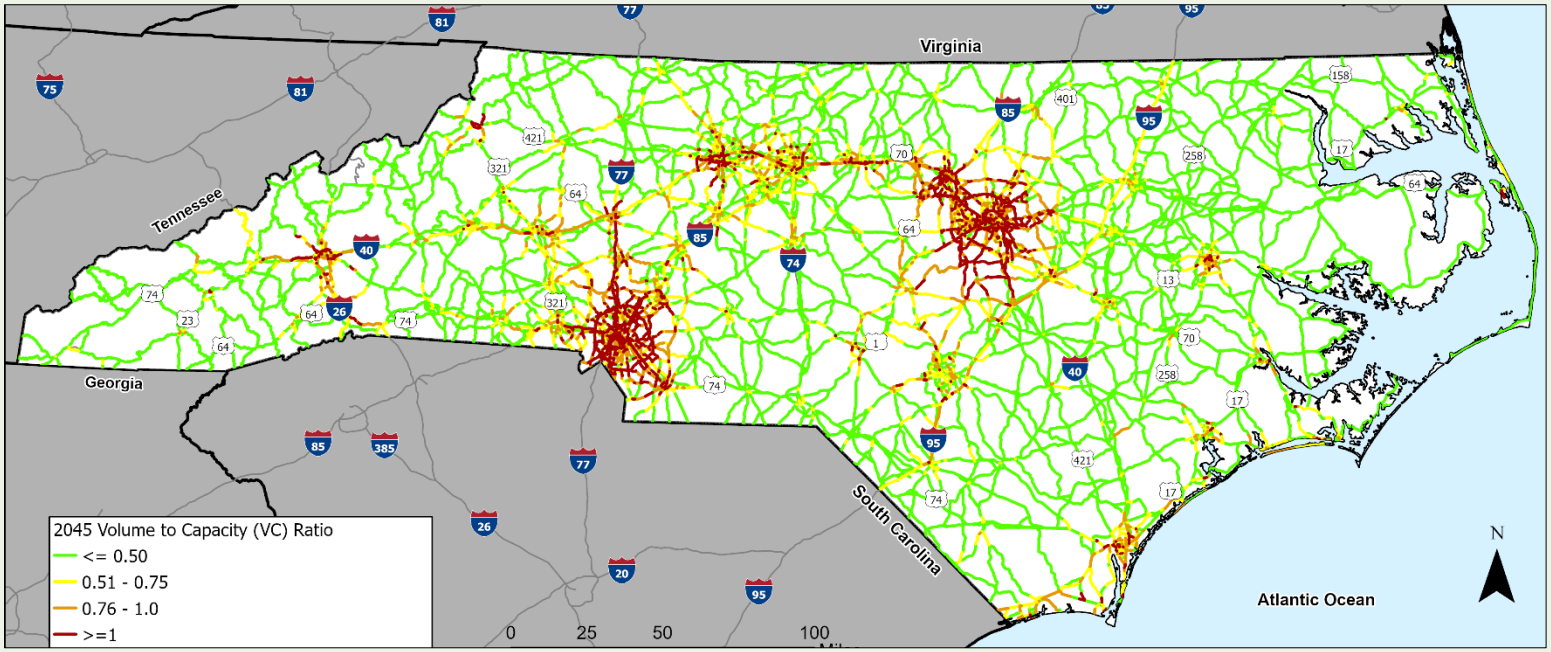
North Carolina Pavement Conditions (2019)

Buffer Time Index (BTI) is the ratio of the difference between the 95th percentile truck travel time and average travel time to the average travel time. Thus, the BTI represents the extra time (i.e., buffer) that must be factored into scheduling to ensure an on-time arrival for 95% of truck trips. For example, a BTI equal to 0.5 indicates that a trip that on average takes 30 minutes would need 50% more time or an extra 15 minutes (for a total scheduled travel time of 45 minutes) to reach its destination on time with confidence.



- **Triangle Region**: Truck congestion is most pronounced near Raleigh and Durham, along the I-40 and I-440 corridors. There also is significant congestion along I-540 near its interchange with I-40.
- **Charlotte Region**: Truck congestion is heaviest along I-77 through the core of the region and north of the I-485 perimeter. The southwest portion of I-485 (between U.S. 74 and I-85) and I-85 west of I-485 also exhibit heavy truck congestion.
- **Triad Region:** Truck congestion is most pronounced along I-40 Business, U.S. 220 and the portion of I-40 bounded by U.S. 421 in Winston-Salem. Like truck congestion, truck travel time is least reliable in these same urban areas.
- **Triangle Region:** Poor travel time reliability is most pronounced along I-40 and I-440 through the City of Raleigh. Along the I-40 corridor, poor reliability also extends west from Raleigh to Durham and south towards the I-40/U.S. 70 interchange.
- **Charlotte Region:** Truck travel time reliability is poorest along I-77 through the core of the region and north of the I-485 perimeter. The southwest portion of I-485 (between U.S. 74 and I-85) and the portions of I-85 northeast and west of I-485 also exit poor reliability.
- **Triad Region:** Travel time reliability is poorest along I-40 Business, U.S. 220 and the portion of I-40 bounded by U.S. 421 in Winston-Salem.

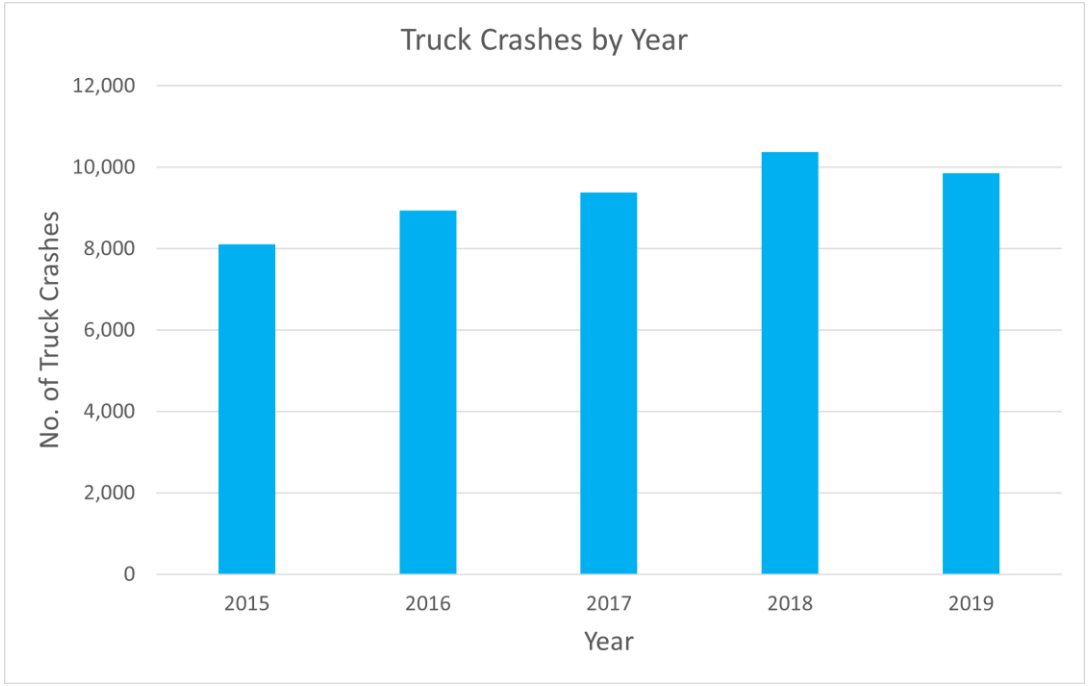
Volume-to-Capacity Ratio (V/C) is a measure that reflects mobility and quality of travel of a facility or a section of a facility. V/C is a conventional level-of-service measure for roadways, calculated by dividing the total volume of traffic on a roadway by its capacity. V/C ratio is generally reported as a decimal, for example, a V/C of 1.00 indicates the roadway facility is operating at its capacity and a V/C of 0.5 indicates the roadway facility is operating at 50 percent of its capacity. The 2045 V/C ratio shows the projected mobility conditions and congestion on the roadways by 2045.



Truck-involved crashes also are a major concern to North Carolina. Between 2015 and 2019, over 46,600 truck-involved crashes occurred in the state, with the total number of crashes increasing nearly each year. Ten counties accounted for nearly half of all truck crashes in the state, all of which are located within one of the state's major metropolitan regions: Charlotte, Raleigh/Durham, Winston-Salem/High Point/Greensboro, Asheville and Fayetteville regions.

Though most of the state system provides for uncongested and reliable truck travel, there are portions of the system where performance is challenged, particularly major metropolitan areas. Traffic volumes on North Carolina highways are predicted to grow by a substantial amount, which will result in capacity-constrained conditions on several corridors that are important to freight mobility. Furthermore, the highway system will remain the predominant mode by which freight is moved through and within the state. Mitigating the effects of growth, especially on corridors with existing challenges, is important for moving forward.

Corridors that may be exacerbated by growth include: in the Triangle Region, I-40, I-440 and I-540 near its interchange with I-40; in the Charlotte Region, I-77 through the core of the region and north of the I-485 perimeter and I-485 (between U.S. 74 and I-85); and in the Triad Region, Future I-285 and I-40 corridors. The Asheville and Wilmington regions are also expected to experience large amounts of growth that will impact the roadways in those areas.



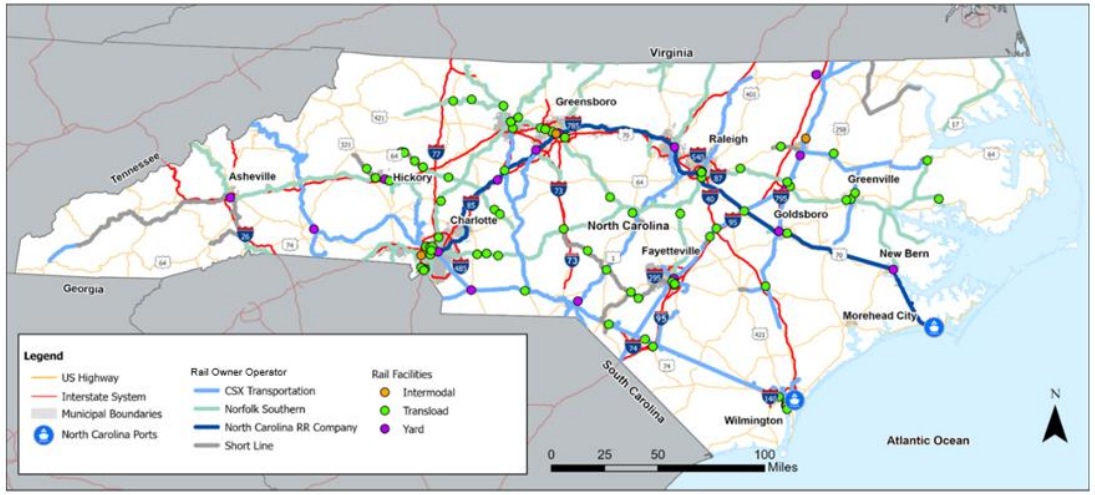
FREIGHT RAIL ASSETS

Rail transport is one of the most cost-effective means of moving freight and it is vital to many of North Carolina's key exporting industries.

Inventory

In North Carolina, there are approximately 3,200 miles of railroad serving 86 of the state's 100 counties. The state's network features two Class I railroads, Norfolk Southern Railway (NS) and CSX Transportation (CSX) and 24 short line railroads that connect businesses and industries to the Class I network. CSX and NS operate approximately 70% of the State's rail system. 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 an exclusive operating and maintenance agreement.

North Carolina's rail network includes two major classification yards, four 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 waterfront facilities or more concentrated operations at inland locations. 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.



The freight rail network in North Carolina provides services to ports, power plants, mines, military installations and industries including agriculture, forestry, plastics, furniture, food products and chemicals.

Demand

Over 81 million tons of cargo were transported on North Carolina's rail network in 2019. Of that tonnage, nearly 10% was intermodal. Over half of rail flows traveled inbound to North Carolina, while just 14% traveled outbound from the state. This leads to an imbalance in rail flows and potentially higher costs for rail services.

Through-traffic makes up 31% of total rail traffic tonnage, and more than half of the intermodal container traffic. Through-traffic is primarily on the north-south NS Crescent Corridor and CSX A Line. Generally, lower volume east-west Class I branch lines and short lines help connect North Carolina 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 top commodities moved by rail carload are coal, hazardous materials and chemicals.

COAL

HAZARDOUS MATERIALS

CHEMICALS

Top 3 Carload Commodities

by total tons

FREIGHT-ALL -KINDS

FARM PRODUCTS

PETROLEUM PRODUCTS

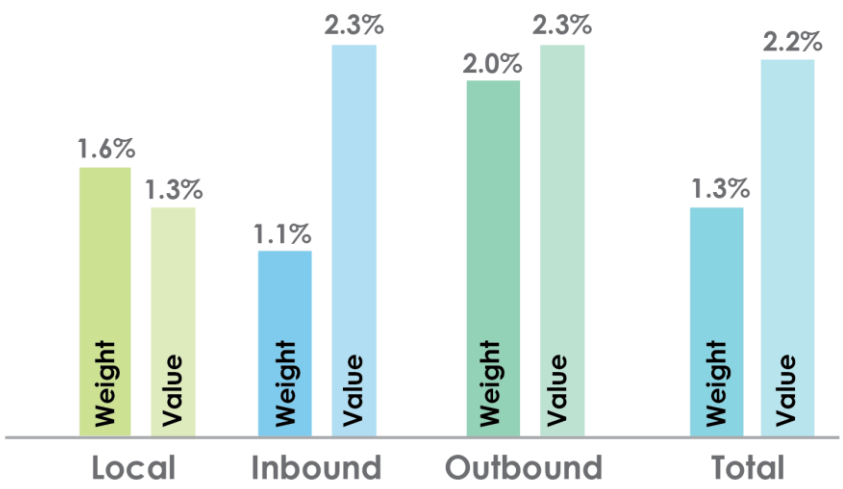
Top 3 Intermodal Commodities

by total tons

Intermodal commodities, such as consumer goods, can be difficult to tease apart and are referred to as FAK or Freight All Kinds. FAK is a mix of commodities being shipped together and are by far the largest category. Often FAK shipments are intended for a particular retailer (e.g., Lowe's or Wal-Mart). Beyond this general intermodal category, petroleum products and farm products are top commodities.

Most of North Carolina's rail carload trade is inbound, mainly due to coal from West Virginia, Pennsylvania and Kentucky, though Illinois and Ohio are also notable trading partners. 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.

2020-2050 Annual Growth Rates of NC Rail Freight Flow



By 2050, rail freight flows are expected to increase in North Carolina an average 1.3% per year with the dollar value increasing at a faster rate of 2.2% per year. Outbound traffic is expected to grow much faster than inbound non-container traffic over the next 33 years. This is primarily due to the projected decrease in coal usage in the state by 2050.

In response to the expected decline of coal traffic, the rail operators 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 will grow at about 0.9% and 2.3% annually in terms of tons and value respectively. As NS and CSX 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.

Conditions and Performance

The 2017 SMFP showed that Class I rail mainline network in the state is operating below capacity – which allows for the system to be able to accommodate maintenance work and recover quickly from incidents such as weather delays, equipment failures, and minor accidents. This performance level can be assumed to still apply as there has been a slight decrease in total tonnage moved from 2014 to 2019.

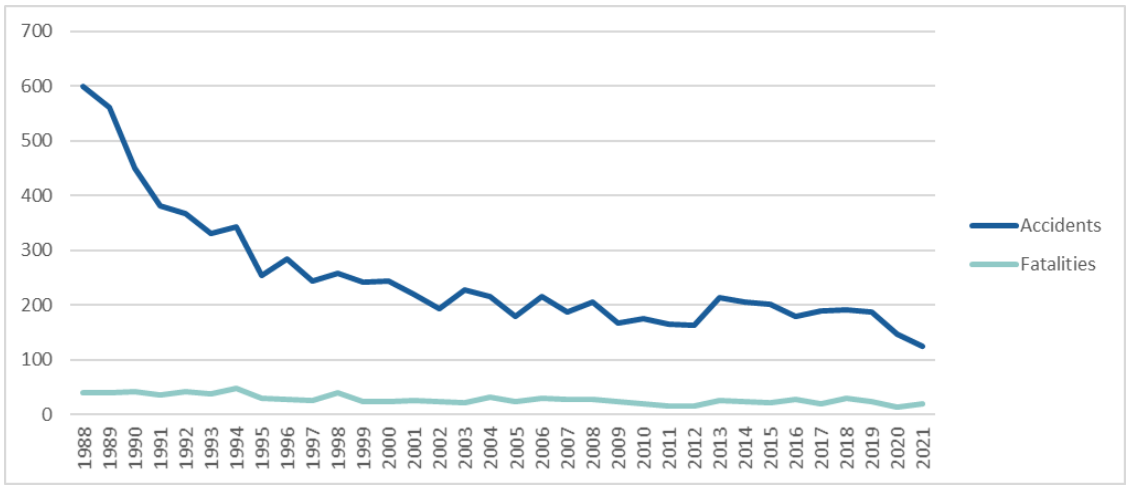
Norfolk Southern's (NS) "R-line" between Charlotte, North Carolina – Pineville, North Carolina is expected to be the most congested rail segment in the state. CSX's "A-line" between Pleasant Hill, North Carolina and Pembroke, North Carolina, and NS's "H-line" between Raleigh, North Carolina and Greensboro, North Carolina and between Greensboro, North Carolina and Danville, Virginia also experience congestion.

These segments will also be affected by increases in Amtrak (passenger rail) services. In addition, CSX's new Carolina Connector Intermodal Rail Terminal (CCX) near Rocky Mount brings a high-capacity facility to the I-95 corridor in the eastern part of the state, and is able to support local shippers as well as the Port of Wilmington. This yard is expected to handle 260,000 container lifts by the 5th year of operation, resulting in potentially 65,000 additional rail cars on the "A-line."

Currently, CSX's "A-line" between Pleasant Hill, North Carolina and Pembroke, North Carolina has several breaks in double-track sections, and in some cases there are differences in maximum speeds on second tracks. Also, CSX's "SE-line" between Pembroke, North Carolina and Hamlet, North Carolina has a low rail capacity due to single track operated without a signal. The siding on the "SE-line" is also not long enough to accommodate local trains, causing conflicts on the mainline. Freight trains from/to the CCX Carolina Connector Intermodal Rail Terminal will increase train use on these lines. Active plans to increase passenger service will also impact freight capacity. This includes the Piedmont Corridor service expansion presently underway, as well as the Southeast High Speed Rail initiative that envisions vastly increased service between Washington D.C., Richmond and stops in North Carolina, on a combination of dedicated and joint use rail lines.

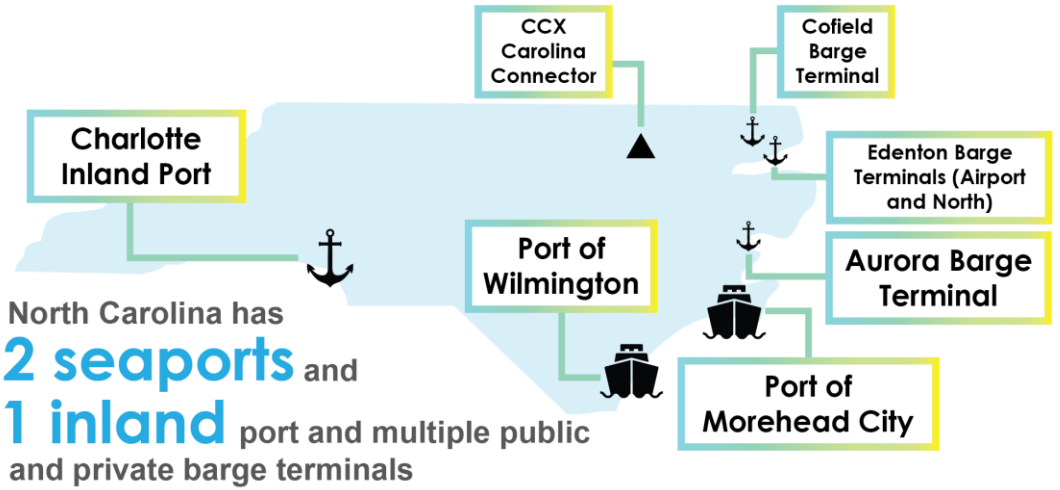
NCDOT's Rail Division safety efforts include planning and implementing crossing safety programs, inspecting and overseeing infrastructure, and promoting rail safety through public awareness and education. Total rail accidents/incidents have remained fairly steady over the last decade averaging 189 events per year. On average, 13% of these events resulted in a fatality.

North Carolina Highway-Rail Incidents and Fatalities



MARINE FREIGHT ASSETS

North Carolina's marine freight network comprises more than its marine terminals and extends well beyond the State's coastal counties. State infrastructure supporting maritime trade includes its ports, waterways, highways, rail network, as well as inland production, logistics, and distribution centers that serve maritime and other freight modes.



Inventory

There are two deep-water ports in North Carolina, the Port of Wilmington and the Port of Morehead City, which are operated by the North Carolina State Ports Authority (NCSPA). These ports are also both Strategic Seaports meaning they are capable of simultaneously handling commercial and military requirements. The state's southern facility located on the Cape Fear River is the Port of Wilmington. This port terminal provides container operations in addition to dry bulk and breakbulk cargos. Wilmington has a channel draft of 42 feet (MLLW). In 2020 it widened its turning basin in the Cape Fear River to 1,524 feet allowing new Post Panamax 14,000-Twenty-foot equivalent unit (TEU) vessels to safely and efficiently navigate in Wilmington Navigational Harbor. NCSPA also raised power lines on the Cape Fear River increasing the vessel clearance air draft to 212 feet reducing hindrances for larger container vessels entering or leaving the port.

The Port of Wilmington recently added three ship-to-shore rail container cranes with 203 feet reach across 22 containers, bringing the total to seven rail-mounted gantry cranes. These infrastructure improvements included with bulkhead and wharf improvements provide needed upgrades to support existing customers while positioning growth opportunities for NCSPA to remain competitive in the global supply chain. Deepening the shipping channel in the Cape Fear River to 47 feet remains a priority of NC Ports, however, careful piloting has proven the port capable of handling New Post-Panamax vessels.

The Port of Morehead City is located on a multimodal 128-acre terminal accessed via water, rail, and truck and is well equipped to provide bulk, breakbulk, and Ro/Ro services. The port is located approximately four miles from the Atlantic Ocean with a 45-foot Mean Low Lower Water (MLLW)deep access channel, with no air draft restrictions, and is on the USDOT Maritime Administration's, or MARAD's, Marine Highway M-95. The port has 5,366 linear feet of bulkheads including nine berths. The port also owns approximately 150 acres across Newport River on Radio Island that is ready for freight and maritime business development opportunities.

NCSPA owns and operates an inland port, the Charlotte Inland Port (CIP) located at 1301 Exchange Street Charlotte in the northwest industrial area of Charlotte. It provides customers broad access to I-85 and I-77 corridors. CIP has ten paved acres dedicated for intermodal services with the capability to accommodate 2,000 stacked or wheeled (on-chassis) containers.

CIP terminal has expansion capacity with an additional ten acres ready for development as needed. Serving as a staging area for loaded and empty containers the terminal provides ocean carriers with yard operations and provides on-site maintenance and repair services as well. The terminal has U.S. Customs-Trade Partnership against Terrorism or C-TPAT certification and is bonded by U.S. Customs and Border Protection. NCSPA offers "Sprint" container service via truck as well as the Queen City Express via rail to and from the Port of Wilmington and Charlotte and for further distribution. Although the terminal is adjacent to a spur track, it is not directly accessible by rail, however, CSX's Charlotte Intermodal Terminal is one mile away and the NS intermodal facility is eight miles away.

BASIC CHEMICALS

FERTILIZERS

BASE METALS

are North Carolina's top 3 Commodities **by total tons**

MACHINERY

BASIC CHEMICALS

FERTILIZERS

are North Carolina's top 3 Commodities **by total value**

Demand

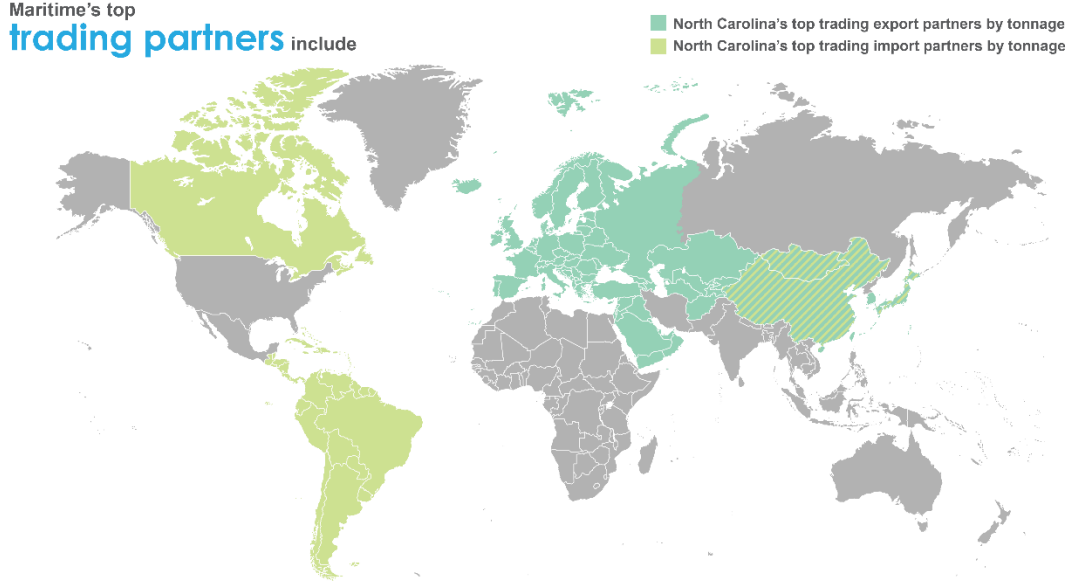
Nearly 7 million tons of cargo worth $8.3 billion were imported and exported by North Carolina ports in 2017. Of that tonnage, 57% was imports. Imports are down 8% from 2015 to 2017. The two North Carolina Ports, located at Wilmington and Morehead City, offer services for a variety of commodity types. Whether it is containers, bulk, break-bulk, or Ro/Ro, one of the ports can handle all goods.

The Port of Morehead City sees a ship approximately once every three days and a barge daily. Top imports include sulfur, rubber, metal products, scrap metal and ores and minerals. Regarding exports, phosphate, woodchips, metal products and military materiel are the top commodities. Total tonnage through the Port of Morehead City has remained relatively steady ranging from 800,000 tons to 1.13 million tons from 2017-2020. Over the past five years, the total tonnage has hovered around 1 million tons. The tonnage is all bulk and breakbulk, as containers are not handled at Morehead City.

The Port of Wilmington sees an average of one ship per day. Imports include chemicals, grains, fertilizers and cement. The top exports are forest products, woodchips, wood pulp, food and general merchandise. Total tonnage through the Port of Wilmington went from 2.1 million tons in 2017 to 2.8 million tons in 2020 and experienced a slight drop again in 2021. In 2013, tonnage hit a record high of 5.3 million. Most tonnage is accounted for in containers. Bulk peaked in 2018 and again in 2020 at around 2.9 million tons.

North Carolina's trading partners are geographically diverse. Major export regions include Europe, Eastern Asia and southwest and Central Asia. The mix is similarly diverse for imports, led by the Rest of Americas and Canada. This diversity is favorable as it shields the State from an economic downturn in a particular region of the world economy. The top 6 regions of the world North Carolina trades with for imports and exports are the same regions in a different order. Mexico and Africa remain the last two destinations for trading imports and exports. This suggests that North Carolina shippers choose to use an out-of-state port to reach some of their leading trade

Maritime's top **trading partners** include



partners due to the availability of ship calls, storage/equipment availability, or other factors.

Conditions and Performance

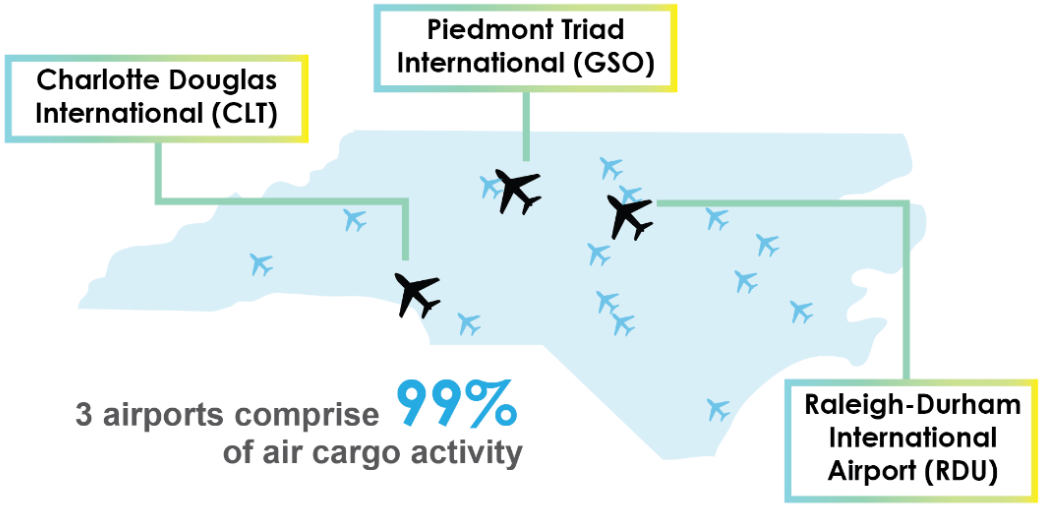
The operation and level-of-service, or efficiency possible within the current state of each port, depends on a number of moving pieces. The activities at each port rely on physical constraints of facilities, policy decisions on commodities served and operating hours, worker and equipment productivity, weather, and numerous other factors that may or may not be controllable.

At-grade crossings are inconvenient at the Port of Wilmington, where switching activities cause backups frequently near the port's north entrance. It is not uncommon to see several trucks bound to/from the port lined up on access roads as they wait for trains to move over the crossings.

Traditionally, attacks on marine vessels have included piracy, boarding, theft, and/or destruction. However, a newer threat includes cyber-attacks. The NC Ports have made major investments in security, technology, training, and cyber-security to protect the ports from ongoing and future security threats.

AIR CARGO ASSETS

North Carolina has 72 publicly owned airports and nearly 300 privately-owned airports throughout the state, though just 17 airports handle air cargo, including both dedicated all-cargo operations and commercial passenger belly cargo. However, three airports comprise over 99% of air cargo activity in North Carolina: Charlotte Douglas International Airport (CLT), Piedmont Triad International Airport (GSO) and Raleigh Durham International Airport (RDU).



Inventory

CLT, GSO and RDU each have critical air cargo processing infrastructure, as well as connections to highway, rail, and maritime modes.

CLT's Air Cargo Center has a total of 570,000 square feet of available space and roughly 2.2 million square feet of aircraft ramp space. The Air Cargo Center is able to link freight between air, rail, water, and truck modes. Rail connection is available to Norfolk Southern Railway (NS) which operates an intermodal container facility on the southwest side of CLT. CSX has an intermodal terminal and bulk transfer terminal in Charlotte, east of CLT, but does not connect directly to CLT.

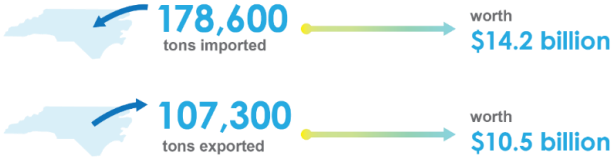
GSO's multimodal cargo facility connects to major trucking lines operating terminals near the airport. It hosts FedEx Express' Mid-Atlantic Air Hub, which is a 1 million square foot facility able to sort up to 24,000 packages per hour for freight destined for various East Coast locations. There are four apron areas at GSO dedicated to air cargo services, totaling nearly 227,000 square feet of air cargo apron space. UPS operates both express overnight cargo and ground cargo out of the airport in two separate facilities. An NS track runs along the south of the perimeter of GSO, along W. Market Street, but does not connect directly with the airport.

RDU's North Cargo and South Cargo areas of the airport have over 469,000 square feet of cargo space. The North Cargo facilities house RDU's two all-cargo carriers, FedEx and UPS. The South Cargo facilities, reserved for cargo shipped via commercial airlines, are located near Aviation Pkwy. Although there is no direct rail connection to either CSX or NS at RDU, both rail lines pass through Raleigh and near to RDU.

Demand

In 2017, North Carolina airports handled nearly 205,000 tons of cargo worth $24.7 billion. Inbound cargo totaled over 178,600 tons worth $14.2 billion, while outbound traffic totaled nearly 107,300 tons worth $10.5 billion.

Compared to other modes, air cargo is a relatively small amount (<1%) of the State's overall freight activity. However, it has a substantially higher value per ton at over $91,300 per ton compared to $1,300 per ton (highway), $300 per ton (rail) and $250 per ton (water).

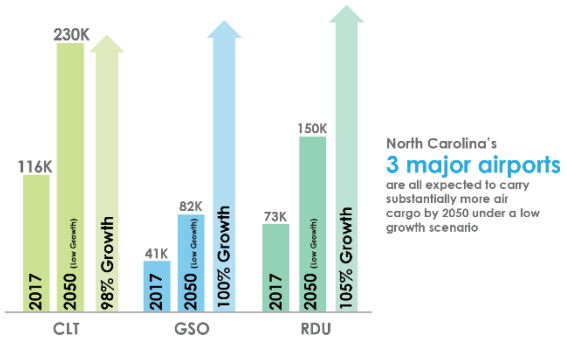


North Carolina traded air cargo with over 200 airports in the U.S. and across the world, including 43 international airports in 2019. Memphis, Louisville and Cincinnati international airports are

North Carolina's top air trade partners, together these comprise 52% of the State's air cargo. Both FedEx and UPS have hubs in each of these cities.

Air freight modes tend to transport the highest proportion of high-value, low-weight commodities due to the high cost of air transport when compared to surface modes. In 2017, the top transported commodity by tonnage and air at North Carolina airports was machinery, comprising 19% of total tonnage ($4.3 billion). Electronics was the second-most transported commodity by tonnage, comprising 13% of total tonnage ($4.9 billion).

To better understand the potential growth in air cargo activity at North Carolina airports through 2050, both a low growth scenario and a high growth scenario were developed. Although the low-growth scenario is more realistic in predicting future demand for air cargo in North Carolina, the potential growth under the high growth scenario is substantial and mostly driven by growth in international markets and could result in intense pressure on the state's air cargo network and supporting multimodal infrastructure.



Conditions and Performance

Although capacity exists at North Carolina's top 3 airports in North Carolina, it will be important to expand access to reach more areas of the state and provide service for highly time-sensitive commodities produced in North Carolina, such as pharmaceuticals. These products are well suited for air cargo transport, and could take advantage of increased air cargo access to grow its manufacturing and distribution base within North Carolina and across the U.S.

Air cargo carriers are experiencing price competition from other freight modes such as trucks, container ships, and railroads, while demand for expedited services (i.e., UPS and FedEx) has exploded in recent years with the latest e-commerce trends.

During the COVID-19 pandemic, the public relied upon e-commerce to obtain goods instead of brick-and-mortar stores. The increase in e-commerce increased the demand in air cargo as this mode of freight transports goods quickly. The increased trend in e-commerce at the beginning of the pandemic in 2020 accelerated the publics' shopping preferences; relying on e-commerce compared to previously relying on big box stores in person. In North Carolina, FedEx and UPS have consistently been the top air cargo carriers.

Air cargo access is critical to economic vitality, particularly for high-value commodities. Consumer markets tied to e-commerce have increased the demand for express package services over the last 5 years, which have been traditionally fulfilled by air cargo jets. However, because advances in ground logistics have made trucks a viable option for express service, North Carolina airports must ensure seamless access to air cargo facilities via the roadway net- work to stay competitive with other freight modes.

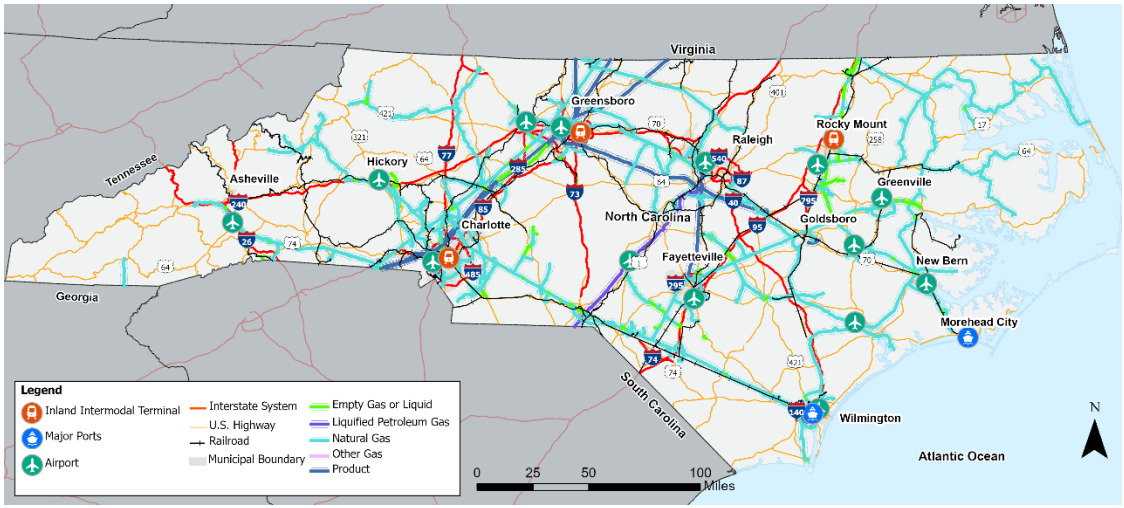
HAZARDOUS MATERIAL AND PIPELINE ASSETS

Hazardous Material (HazMat) freight movement has an enormous impact on North Carolina's transportation infrastructure. With communities growing, land-use increasingly congested and development costly, and the demands on all parts of the aging infrastructure increasing, it is important that the State consider critical investments in the transportation infrastructure that will support the safe and timely delivery of HazMat freight to local markets and to destinations outside of North Carolina.

HazMat includes any chemical, in any form, that has one or more hazardous properties and that is in transportation. HazMat, in some form, is in transportation everywhere in the state all of the time, as it is essential to the state's economy. Almost everything we drink, grow, wear, or drive, the roads we drive on and what we use to build our homes is transported at some point as HazMat freight. HazMat is routinely transported in commerce in all modes of transportation, including ship or barge, pipeline, rail, and truck.

Inventory

North Carolina imports all of its petroleum based fuel and natural gas, as well as, significant quantities of biofuels, such as ethanol. The transportation network used for transportation of fuel consists of:



- 5,451 miles of pipeline for the movement of petroleum fuel, non-fuel products, propane and natural gas,
- 38 inland motor fuel terminals,
- 12 aviation fuel terminals,
- Two propane terminals – Sylva in western North Carolina and Apex in east central North Carolina,
- Two Transload Facilities – Star, North Carolina and Midland, North Carolina,
- Private marine terminals receive petroleum ships and barges,
- Truck tank trailer fleets and support services to enable the transport and local delivery of all fuels but natural gas and
- One ethanol production facility.

NC is the **12th highest** value producer and shipper of chemicals in US with over **$3.2 Billion** shipped in 2020 by the chemical manufacturing industry.

Demand

Fuel

North Carolina imports fuel by ship, pipeline and rail, and it is then distributed to local markets within the State by pipeline, rail and truck. The demand for fuel products is projected to increase by 27% by 2050 annually in North Carolina. The demand for non-fuel petroleum products is projected to increase by 68% by 2050 annually in the state.

Selected Extremely Hazardous Substances and non-Extremely Hazardous Substances

Extremely Hazardous Substances (EHS) and Non-EHS HazMat chemicals are present on nearly every major highway, all of the interstate highway system, the entire length of both Class I railroads and many of the short line railroads in significant volumes. Volumes of over a billion pounds per year or more are represented on some parts of the transportation system. Charlotte, Winston-Salem, Raleigh and Wilmington are major HazMat hubs.

Conditions and Performance

Following are the key performance challenges for HazMat and fuel transportation in North Carolina:

- **Fuel Pipeline System Capacity**. The pipelines are operating at or near peak capacity creating a vulnerability for disruption. While there appears to be some additional capacity to import fuel via the private marine terminals, this would only be sufficient for emergency needs and surge capacity as there would be a higher cost to transport fuel to markets around the state. Consequently, the state is highly dependent on the pipelines.

- **Fuel Terminal Access and Multimodal Connectivity**. Connections to local road networks from fuel terminals need to be improved to allow for safe integration of trucks into traffic. All of the inland and marine fuel terminals are only supported with two lane roads to connect to main arterial roads, highways and the interstate system, which creates opportunities for a serious incident and HazMat event as these trucks turn or merge into traffic.

- **Splash Fuel Blending**. Both butane and ethanol are primarily shipped into the state in rail tank cars but only 4 of the inland terminals have rail access to receive them. The ones that do not have rail facilities have to pay for ethanol and butane delivery or meet in the middle somewhere and blend directly into the tanker trucks before they deliver fuel to the gas stations. Often this splash blending is done in back lots, without adequate safety processes and systems, and no community awareness. Rail connections need to be established with all fuel terminals in the State that distribute gasoline.

- The **Concurrent Line Use** of the two Class I railroad mainlines for passenger, freight and HazMat service is a deficiency. These trains have different maximum allowable speeds over the same track and have different infrastructure needs that are not compatible with each other.

- All parties to work through the Local Emergency Planning Committee in their county to develop **land-use planning** policies that prevent incompatible land-uses relative to HazMat storage, use, or transportation.

- Railroads should consider not using **siding storage** within city limits to store HazMat rail cars.

Non-EHS Chemicals	EHS Chemicals	
• Phosphoric Acid	• Anhydrous Ammonia	• Phenol
• Toluene Diisocyanate	• Chlorine	• Cycloheylamine
• Butane	• Formaldehyde	• Ethylene Oxide
• Toluene	• Hydrogen Fluoride	
	• Hydrogen Chloride	
	• Sulfuric Acid	
	• Sulfuric Dioxide	
	• Bromomethane	
	• Hydrogen Peroxide	
	• Vinyl Acetate Monomer	

FOCUSING ON PRIORITY FREIGHT ASSETS

Purpose and Role

North Carolina has extensive multimodal freight transportation assets including highways, rail lines, waterways, airports and pipelines, as well as inter change points between the modes, such as airport terminals, seaports, rail terminals, pipeline terminals and warehouse/distribution centers.

The requirement for designating a North Carolina Priority Freight Network (NCPFN) was twofold:

- Designation of a subsystem that is responsible for carrying the majority of freight moving in the state allows NCDOT to focus limited resources on the portion of the system that impacts the greatest number of users and the majority of the total tonnage being moved. In turn, this will maximize the statewide return on NCDOT's investments. The designated network becomes a freight transportation and economic development asset for the state.
- The FAST Act established the National Highway Freight Network which is to be supplemented by the designation of additional critical freight corridors by each of the states and large Metropolitan Planning Organizations (those having populations greater than 500,000). This program has continued under the BIL. No additional lane miles have been added to the networks during this Plan update.

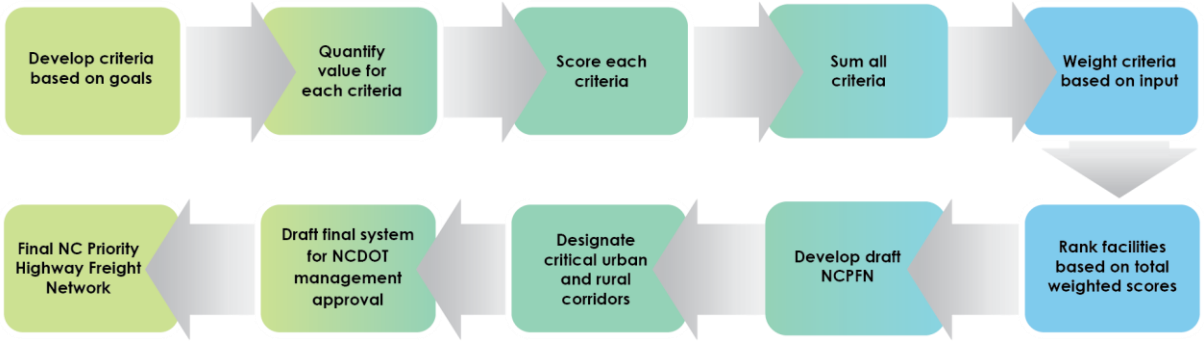
North Carolina Priority Highway Freight Network

The North Carolina Priority Highway Freight Network (NCPHFN), or the state's highway network that is most critical to freight transportation, was designated using metrics that measure economic activity, goods movement, market access and connectivity and support to key industries' supply chains.

The evaluation process, completed in 2017, scored every highway segment based on criteria measuring the role of the highway in supporting:

- **Economic competitiveness** (10% of total score) measures economic activities that interact with transportation investments with the goal of supporting economic growth, such as support of freight intensive employment and supporting facilities such as military bases.
- **Goods movement** (30% of total score) measures the role of the facilities in the physical movement of goods using criteria such as tonnage, value, truck volume and percentage and projected truck freight growth.
- **Strategic supply chains** (25% of total score) examine how highway facilities support key freight intensive businesses and their global supply chains. Twelve target supply chain industry sectors were identified as key freight-intensive export industries in the state and metrics such as the number of supply chains served, the number and size of businesses in key supply chains served and the volume of commodities associated with these industries carried.
- **Market access and connectivity** (35% of total score) evaluates intermodal connectivity and connectivity to trading partners and international gateways.

NCPFN EVALUATION AND DESIGNATION PROCESS

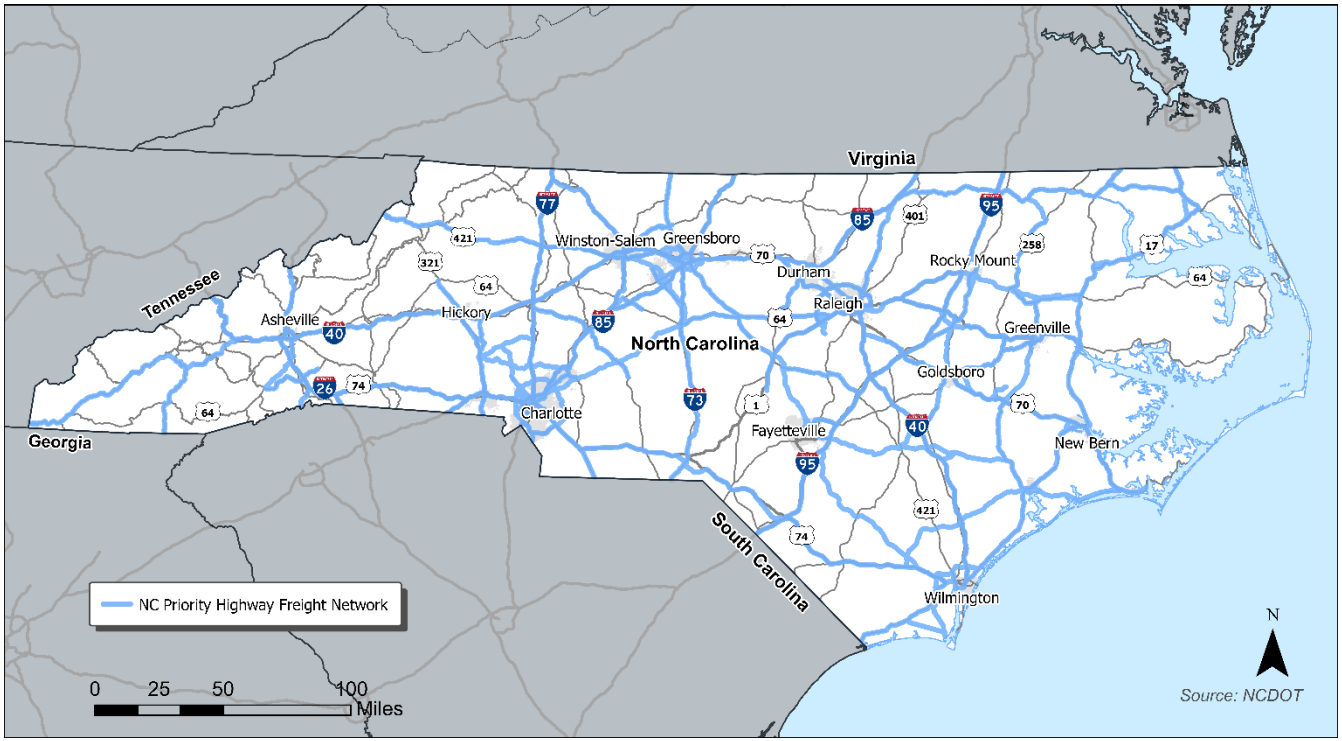


The National Highway Freight Network (NHFN) is the starting point for the designation of the North Carolina Priority Highway Freight Network (NCPHFN). The NHFN, defined by the United States Department of Transportation, includes:

- **Primary Highway Freight System (PHFS)**– The PHFS was designated by the Federal Highway Administration (FHWA) based on eight factors, including freight tonnage and value, truck traffic, access factors, and network connectivity. North Carolina's portion of the Primary Highway Freight System totals 1,011.06 miles.
- **Non-PHFS Interstates** – The BIL included the entirety of the Interstate the NHFN. The BIL restricts National Highway Freight Program (NHFP) funding on Non-PHFS Interstates in states deemed high mile-age states, defined as containing more than two percent of the National PHFS. North Carolina is classified as a high mileage state and thus, can-not use NHFP funding on Non-PHFS Interstate.

Next, the highway facilities that scored above average in terms of their role in supporting statewide freight movement as measured by the FSD score were added. Input from NCDOT, the State Freight Advisory Committee (FAC), and the MPOs and RPOs was reviewed and helped shape the final NCFN.

NORTH CAROLINA PRIORITY HIGHWAY FREIGHT NETWORK



THE ROLE OF THE NCPHFN

- Drive policy and investment of statewide funds
- Serve as the foundation from which the Critical Urban Freight Corridors and Critical Rural Freight Corridors are designated

CRITICAL RURAL AND CRITICAL URBAN FREIGHT CORRIDORS

As part of the BIL, U.S. DOT allocated additional miles to each state, based on its PHFS mileage, to designate to the NHFN. These miles are eligible for NHFP funds and are referred to as:

- **Critical Urban Freight Corridors (CUFCs)** are defined as freight highways located within urbanized areas. They are part of the NHFN and are eligible for the NHFP funding. In an urbanized area with a population of 500,000 or more individuals, the MPO, in consultation with the State, may designate a CUFC. According to Federal Highway guidance, North Carolina may designate a maximum of 150 miles as CUFCs. Charlotte Regional Transportation Planning Organization (CRTPO) and Capital Area Metropolitan Planning Organization (CAMPO) led approval on designation within their respective Census-defined urbanized areas – NCDOT led the designation process for all other urbanized areas in 2017.

- **Critical Rural Freight Corridors (CRFCs)** are defined as freight highways located outside of urbanized areas. They are part of the NHFN and are eligible for the NHFP funding. According to Federal Highway guidance, North Carolina may designate a maximum of 300 miles as CRFCs.

For the designation of the CUFCs and CRFCs, NCDOT used the scores from the NCHFN as the starting point to rank corridors that provided connectivity to the NHFN and met the FAST Act requirements. Additionally, the projects that were on the latest State Transportation Improvement Program (STIP) were used to determine which corridors could potentially use funds from the NHFP. CAMPO and CRTPO approved the CUFCs in the Raleigh and Charlotte urbanized areas respectively. The CUFCs, CRFCs, and the NCHFN will be reviewed and updated a minimum of once every five years.

BIPARTISAN INFRASTRUCTURE BILL REQUIREMENTS/FAST ACT FOR DESIGNATING CRITICAL URBAN AND RURAL FREIGHT CORRIDORS

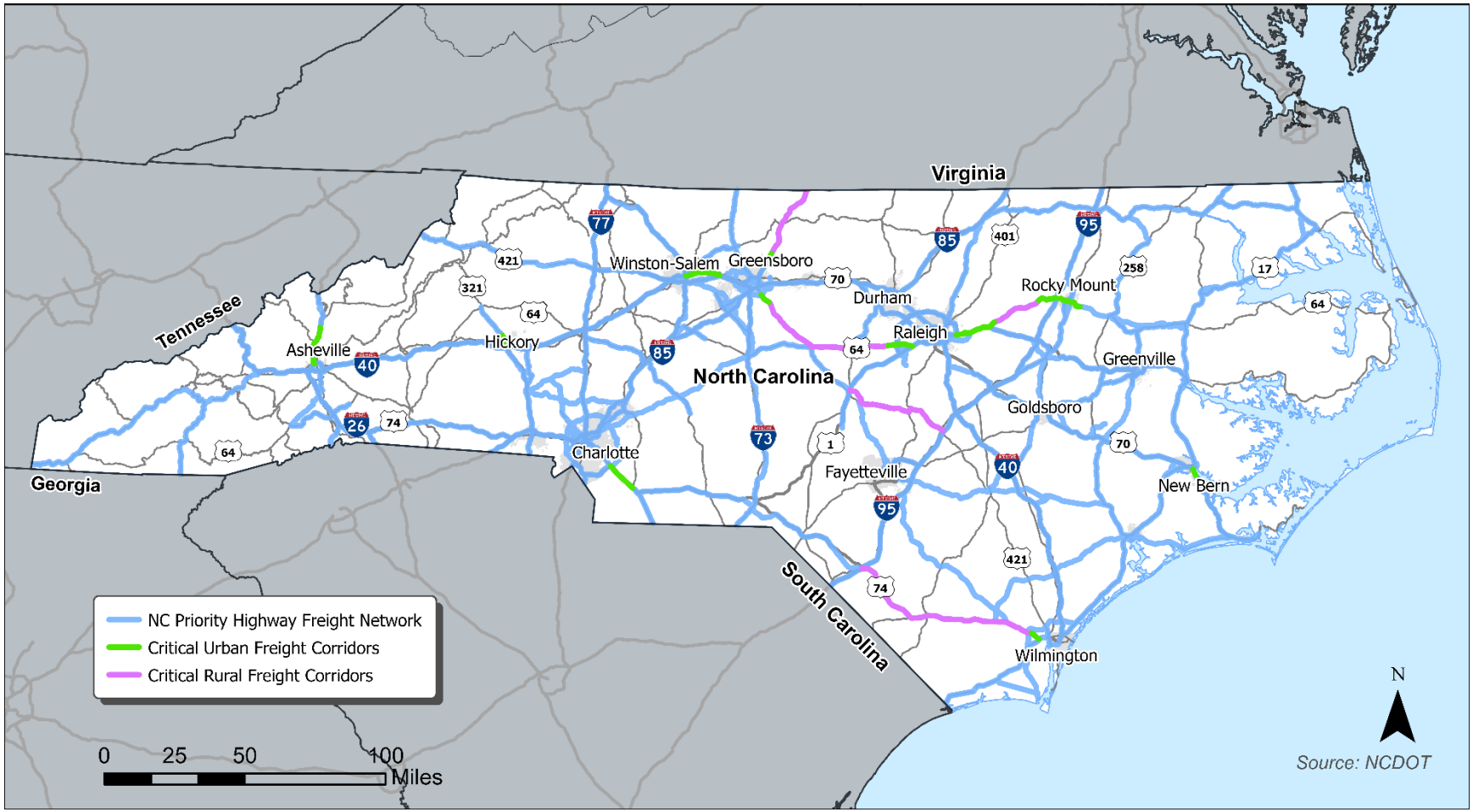
A CUFC must meet one or more of the following four criteria:

- is in an urbanized area, regardless of population; and
  - connects an intermodal facility to-
  - the primary highway freight system;
  - the Interstate System; or
  - an intermodal freight facility;
- is located within a corridor of a route on the primary highway freight system and provides an alternative highway option important to goods movement;
- serves a major freight generator, logistic center, or manufacturing and warehouse industrial land; or
- is important to the movement of freight within the region, as determined by the metropolitan planning organization or the State.

A CRFC must meet one or more of the following seven criteria:

- is a rural principal arterial roadway and has a minimum of 25 percent of the annual average daily traffic of the road measured in passenger vehicle equivalent units from trucks (Federal Highway Administration vehicle class 8 to 13);
- provides access to energy exploration, development, installation, or production areas;
- connects the primary highway freight system, a roadway described in subparagraph (A) or (B), or the Interstate System to facilities that handle more than-
  - 50,000 20-foot equivalent units per year; or
  - 500,000 tons per year of bulk commodities;
- provides access to-
  - a grain elevator;
  - an agricultural facility;
  - a mining facility;
  - a forestry facility; or
  - an intermodal facility;
- connects to an international port of entry;
- provides access to significant air, rail, water, or other freight facilities in the State; or
- is, in the determination of the State, vital to improving the efficient movement of freight of importance to the economy of the State.

CRITICAL URBAN AND RURAL FREIGHT CORRIDORS



Priority Rail Freight Assets

Rail is a key component of freight movement in North Carolina and the network is expanding. The Interim National Multimodal Freight Network includes all Class I railroads and their major terminals. The rail network that is served by the Class I railroads, including intermodal terminals, major classification yards, and transload facilities are part of the NCFN. North Carolina's rail system includes two Class I railroads, CSX and Norfolk Southern; two major classification yards; three intermodal terminal and one future intermodal terminal and rail hub; and numerous transload facilities. All of these facilities are included on the North Carolina Priority Freight Network. The rail portion of the Interim NMFN in North Carolina consists of 2,341 miles of multimodal rail freight network routes and four primary highway freight system intermodal connectors.

Priority Maritime Freight Assets

North Carolina ports and waterways play a key role in the efficient movement of freight and are important drivers of the North Carolina economy. The Interim National Multimodal Freight Network, was established as part of the FAST Act, was used to designate the priority maritime freight assets in North Carolina, which include: the Port of Wilmington, the Port of Morehead City, the M-95 marine highway corridor, inland and coastal waterway routes, the Pasquotank River, and Great Dismal Swamp Canal.

Priority Air Cargo Assets

North Carolina is home to three of the top 50 cargo airports in the U.S. in terms of landed weight in 2020 These air gateways are located near the largest metropolitan areas in the state, which provide better connections to other freight infrastructure, and the industries that require fast shipment of high-value/time-sensitive products. The three airports – Charlotte/Douglas International, Raleigh-Durham International and Piedmont Triad International – are on the National Multimodal Freight Network and the NCFN.

Contributions of Freight Transportation

All goods consumed or manufactured in North Carolina are, at some stage in the supply chain, considered freight, needing to be transported and stored several times from production to consumption. Freight transportation, therefore, is vital to a state's economy. It plays an important role by allowing businesses to stay competitive, by connecting regions to domestic and international trading partners and by supporting thousands of jobs and driving economic activity.

In 2019, there were approximately 313,000 people in freight-related jobs in North Carolina, ranging from truck drivers to couriers to wholesale workers. Most of these employees are related to the wholesale trade sector, with 203,000 jobs, or 65% of the total freight-related jobs. The truck transportation sector provides the second largest number of jobs, amounting to approximately 70,800 or 23% of the total freight-related jobs. Using the broad definition of the transportation sector, the sector supports nearly 581,000 jobs, including direct, indirect, and induced jobs. The sector also adds nearly $81 billion to North Carolina's economy annually. From 2015-2019, roughly 10,000 freight-related jobs have been added in North Carolina with truck transportation and warehousing and storage remaining the top two sectors providing the greatest number of freight-related jobs. The total number of freight-related jobs has grown by roughly 150,000 jobs, resulting in a 30% increase in gross state product from 2015-2019.

Supporting the State's Strategic Export Industry

North Carolina is home to a vibrant economy built in part on the effective movement of goods both to consumers as well as between businesses. This transportation of freight is organized into supply chains that combine gateways such as ports and airports, corridors, including highways and rail, and transfer and distribution centers. These gateways are used to link modes and consolidate goods and first and last mile connectors to facilitate pick-ups and deliveries of goods. The reliability of the freight transportation network is critical when planning raw material sources and the distribution of finished products. Unexpected delays can result in slowing or halted manufacturing processes and decreasing productivity, which increases manufacturing costs and prices for the end consumer.

To enhance future economic growth, North Carolina must invest and implement strategies to support the increasing demand for a safe and reliable multimodal transportation infrastructure. Eleven strategic supply chains were identified as key freight intensive export industries in the state. In 2017, these industries combined for over 727 million tons and over $956 billion worth of freight moving into, out of and within North Carolina, an increase of 22% from the 594 million tons of freight in 2012. Despite the increase in tonnage, total value of freight on the network declined 4.6% from $1 trillion in value in 2012.

Automotive, truck and heavy equipment and agriculture, food, processing and distribution sectors had the highest tonnage in 2019 while energy and the agriculture, food, processing and distribution sector had the highest tonnage in the 2017 SMFP. Distribution and logistics for consumer goods and automotive, truck and heavy equipment sectors had the highest value in 2019 while the automotive, truck and heavy equipment and aerospace and aviation sectors had the highest value in the 2017 SMFP.

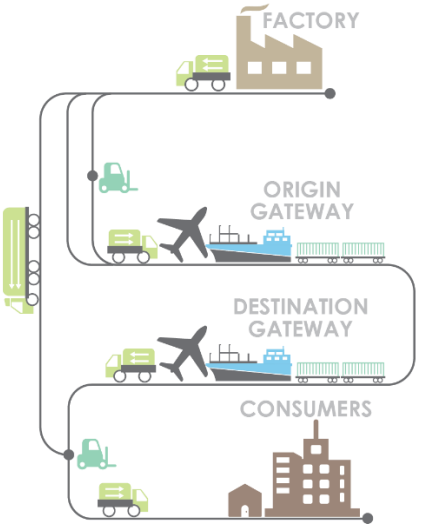
Understanding the concept of a supply chain provides a better grasp of freight transportation's impact on the North Carolina economy. A supply chain is a network between a company and its

	JOBS	LABOR INCOME	GROSS STATE PRODUCT
Direct	**313,449**	**$22.2**	**$41.8**
Indirect + Induced	**268,505**	**$20.1**	**$39.1**
Total	**581,954**	**$42.3**	**$80.9**

Note: Dollar values in 2019 billions.

suppliers to produce and distribute a specific product and the supply chain represents the steps it takes to get the product or service to the customer. Typical nodes in a supply chain include the following:

- **Gateways** include rail terminals, seaports, commercial border ports of entry and airports. These facilities handle large volumes between North Carolina, the nation and the world.
- **Corridors** include highways and rail lines that serve both long- and short-haul freight traffic.
- **Distribution and En-Route** facilities include warehouses and distribution centers, transload facilities where cargo can move efficiently between railroads and trucks or from truck to truck. These facilities are often concentrated in and around large population centers and gateways.
- **First and Last Mile** is an industry term for the facilities used to move cargo from distribution centers to consumers in the urban and suburban core and from manufacturers to gateways.



FREIGHT INTENSIVE INDUSTRIES CRITICAL TO NORTH CAROLINA'S ECONOMY

- Aerospace and Aviation
- Agriculture, Food Processing and Distribution
- Automotive, Truck, and Heavy Equipment
- Biotechnology, Pharmaceuticals, and Life Sciences
- Chemicals, Plastics and Rubber
- Distribution/Logistics for Consumer Goods
- Energy/Green Energy
- Forestry and Wood Products
- Furniture
- Military/Defense
- Textiles, Apparel, and Textile Machinery

TOTAL TONNAGE AND VALUE FOR ALL INDUSTRIES

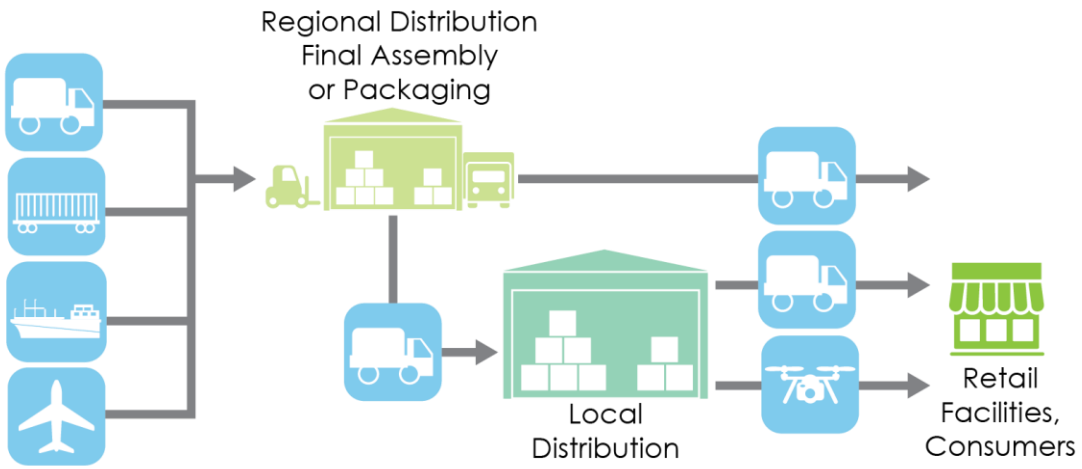
INBOUND, OUTBOUND AND INSTRASTATE FLOWS 2019

Industry	Tonnage	% of Total	Value ($M)	% of Total
Aerospace and Aviation	21,829,652	3%	$132,749	14%
Agriculture, Food Processing and Distribution	139,840,505	20%	$98,880	10%
Automotive, Truck and Heavy Equipment	221,016,587	32%	$156,635	16%
Biotechnology, Pharmaceuticals and Life Sciences	3,373,383	0%	$91,193	10%
Chemicals, Plastics and Rubber	37,306,013	5%	$97,689	10%
Distribution and Logistics for Consumer Goods	37,915,832	5%	$193,076	20%
Energy/ Green Energy	105,696,418	15%	$39,835	4%
Forestry and Wood Products	111,782,472	16%	$51,992	5%
Furniture	4,950,065	1%	$27,405	3%
Textiles, Apparel and Textile Machinery	7,883,317	1%	$64,464	7%
Total Commodity Flow	**691,594,242**	**100%**	**$953,918**	**100%**

Note: Due to some commodities overlapping in industries and not all commodities being included in an industry, the Total Commodity Flow is not the sum of all industries but rather the sum of all commodities. Aviation commodity flow movement was used as advanced manufacturing. Military commodity flow movements are tied to fuel which is categorized as energy.

Supply Chain Focus: Consumer Goods, Trade and Distribution

Goods desired and needed by North Carolina households and businesses enter the North Carolina state's trade, distribution and logistics supply chain after being produced domestically or abroad. Imported goods enter the state through land, sea, or airports of entry. Bulk shipments of goods are delivered from these points of origin to large distribution centers closer to or more strategic to the final market than the product's origin. In some cases, final assembly or packaging may also occur at these distribution centers. From regional distribution centers, goods may be delivered to retailers and consumers, or they may pass through an additional local distribution center before delivery. Final deliveries are predominantly made by truck to retail outlets or increasingly to the consumer's front door. However, emerging technologies in autonomous deliveries may change how the last mile transportation is accomplished, particularly in dense, urban areas.



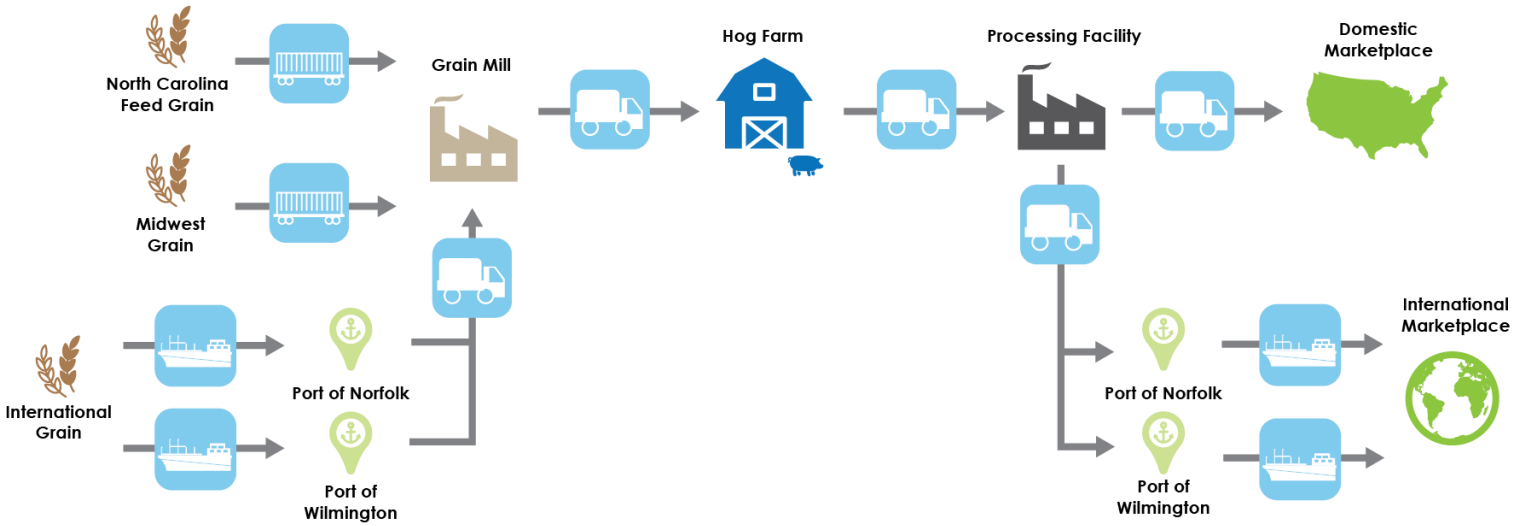
Supply Chain Focus: Agriculture, Food Processing and Distribution

The agriculture sector comprises crop production and livestock and poultry breeding. The crop production industry includes establishments that grow crops at farms, orchards, nurseries and greenhouses for human or animal consumption. The food processing and manufacturing sector transforms livestock and agricultural products into products for intermediate or final consumption. The industry groups are distinguished by the raw materials (generally of animal or vegetable origin) processed into food products. The food products manufactured in these industries are typically sold to wholesalers or retailers for distribution to consumers.

In addition to being one of the largest industries in North Carolina, agriculture, food processing and distribution establishments are found throughout the state, with concentrations in eastern North Carolina. Food manufacturing enjoys a legacy in North Carolina – including companies like Pepsi in New Bern, Winston-Salem-based Krispy Kreme Donuts, Snyder's-Lance snack and chip giant headquartered in Charlotte, poultry and meat processing companies such as Butterball, Smithfield, Tyson and Sanderson Farms, as well as Mt. Olive Pickles Company, Campbell's Soup Company, Bimbo Bakeries, Sierra Nevada Brewing Company and numerous others.

The industries within the agriculture and food processing sector require a wide range of transportation and logistics services to move raw agricultural commodities (e.g., grains, vegetables, fruits, livestock), agricultural inputs (e.g., fertilizer, pesticides) and foods products for intermediate or final consumption. Some products such as grain are bulky and low-value commodities that are mostly transported at lower unit costs by water and rail modes. Other commodities, such as fresh fruits, vegetables and meats, are highly perishable and high-value items and therefore, rely on refrigerated trucks and railcars, refrigerated cargo ships as well as air cargo to protect the integrity of the shipments. Cold chain logistics has transformed the farming industry by providing facilities with several storage areas with different temperature settings to handle regular grocery goods at ambient temperature, produce, dairy meat and frozen products, where significant amount of perishable food products can be received, stored, sorted, and assembled into loads, bound to respective grocery stores.

The most common crops and livestock in North Carolina are tobacco, soybeans, sweet potatoes, peanuts, corn, hay, cotton, cut Christmas trees, broilers, chicken, turkey, and hogs.



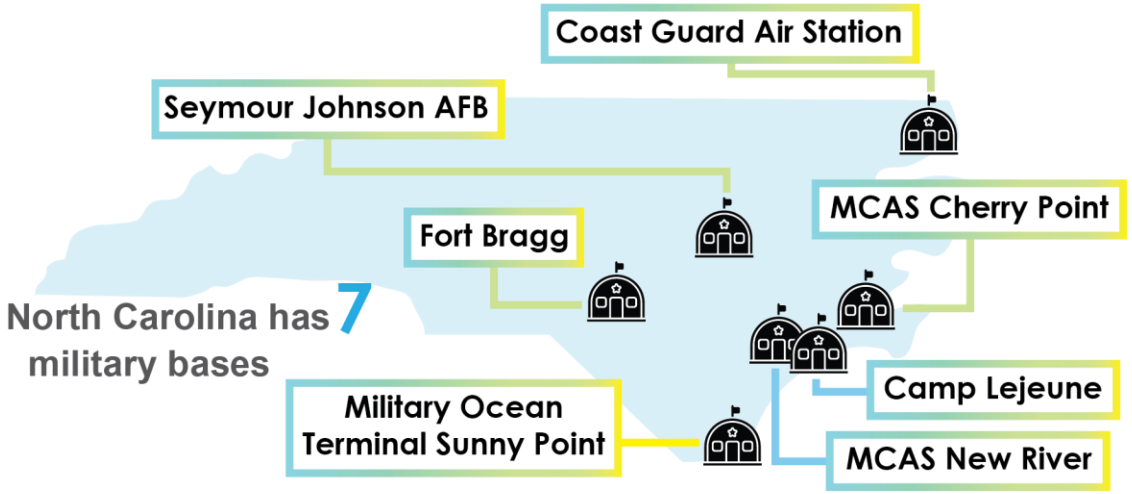
Supply Chain Focus: Military Freight

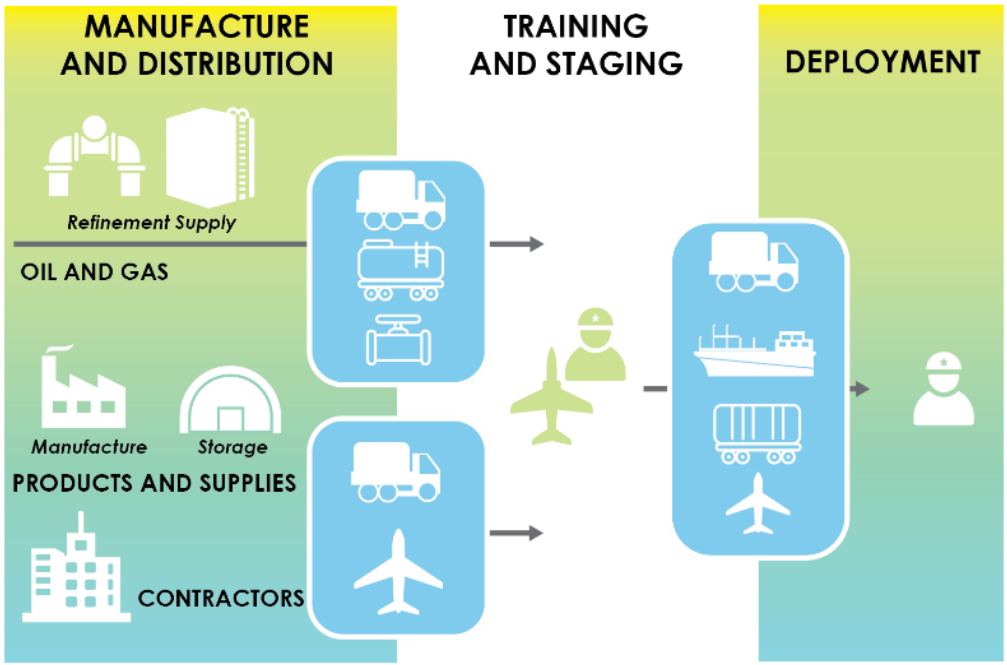
The military is a critical economic driver for the state of North Carolina. It also is a driver of freight and cargo movements, especially in the eastern portion of the state. This includes the movement of military personnel, supplies and equipment around North Carolina, the United States and throughout the world. In North Carolina, military facilities and activities consist of U.S. Department of Defense (DoD) operations and the North Carolina National Guard, with branches of the U.S. military represented, including the U.S. Army, Navy/Marines, Air Force and Coast Guard. These bases range from training facilities to military terminals and are primarily located on the eastern side of the state, along the coastline.

All of the military facilities cited freight transportation assets as a contributing factor in base expansion and realignments. Some of the key challenges and bottlenecks identified are:

- Limited rail cargo opportunities for most of the military bases due to lack of access and requirements for minimum loads, particularly in the case of heavy equipment.
- Bridge conditions can restrict movements of some of the large equipment, resulting in the need to make the moves by rail, which significantly increases the cost.

Military Bases





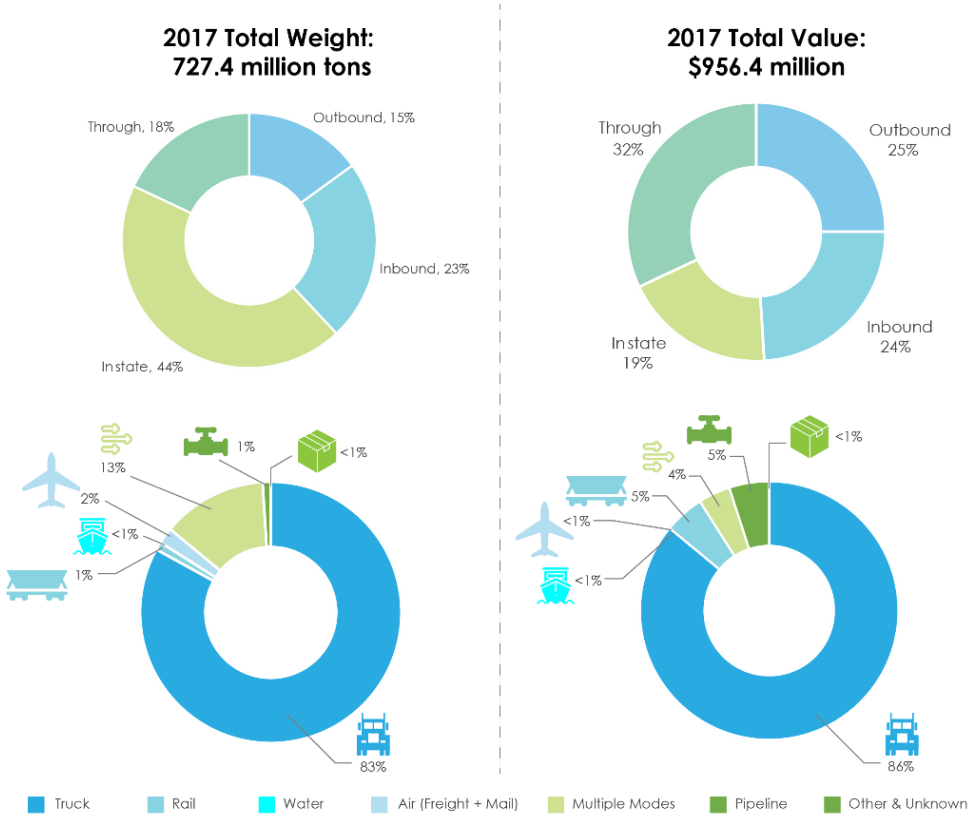
Tracking Economic and Freight Demand and Growth Forecasts

The statewide commodity flows summarize the total freight flows moving to, from, within and through North Carolina currently and in the future. It provides insight into modal dependence, route choice and equipment and service required to meet the needs of the state's businesses and residents

In 2017, 727 million tons of freight valued at $956 billion moved over North Carolina's transportation system. This is up 22% from the 594 million tons of freight and down 4.6% from $1 trillion in value in 2012. By 2050, North Carolina's transportation system is projected to carry more than 1.14 billion tons of freight valued at $1.86 trillion annually, an increase of 57% by weight and 94% by value from 2017. The weight of shipped commodities is important to understanding how freight vehicles use the transportation system. This understanding is critical when addressing factors such as bridge stress, pavement consumption and congestion. Shipment weights for different commodity types are also crucial when assessing the impacts of certain commodities and industries (including consumer goods, coal and non-metallic minerals) on the transportation system. However, it is also important to consider the value of the products being transported. It is particularly important in understanding the impacts of value-added manufacturing and service-related industries. These industries tend to generate and ship lower-weight, higher-value commodities.

Every freight shipment can be categorized as moving in one of four directions-imports, exports, interstate, or pass-through. By volume, the largest component of the state's freight movements is intrastate, accounting for 44% of the 727 million tons moved in 2017. The direction of goods movement by weight and value are in line with the 2017 SMFP. Most of these flows constitute movement of heavy bulk commodities (e.g. gravel, non-metallic mineral products, gasoline, logs and wood products) associated with construction and allowing for balanced trade lanes. This is important because it allows carriers a better opportunity to reduce empty hauls which leads to more competitive transportation rates for the region's shippers.

Trucks are the dominant mode utilized for carrying these goods, transporting 86% of the total weight and just over 83% of the total value of goods in 2017.



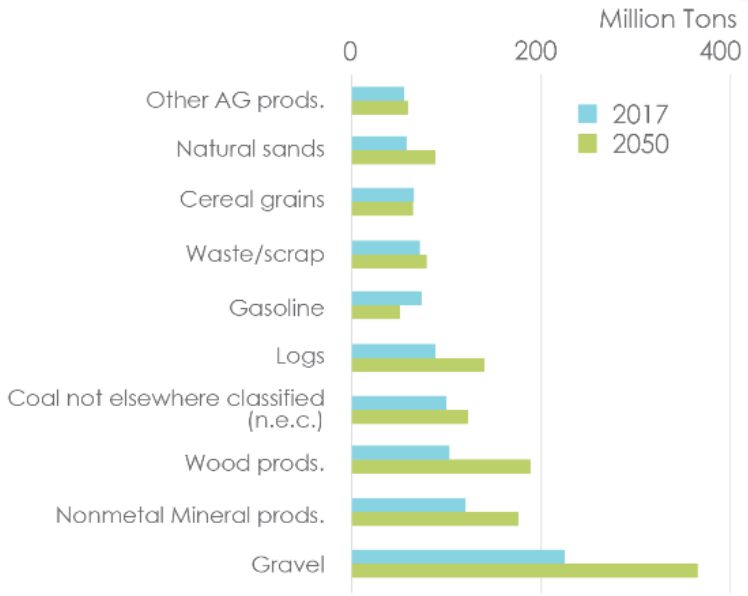
Note: 2050 data is shown in the Commodity Flow report.

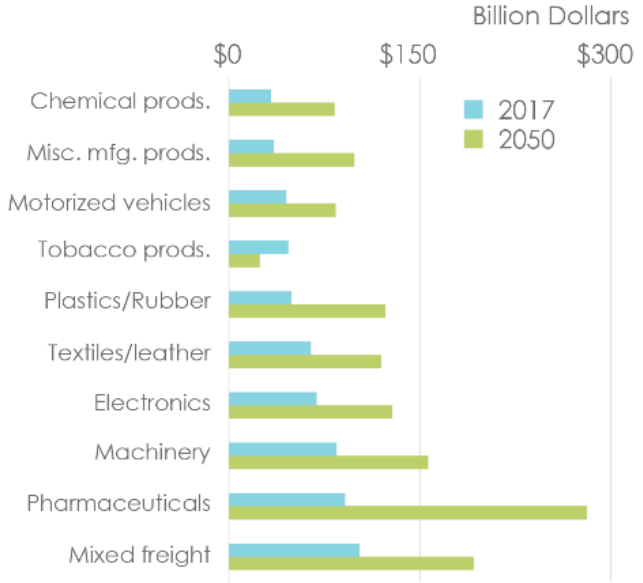
Total weight carried by trucks is up 7% from 2012 and the total value of goods moved by truck is up 1% from 2012.

Rail and pipeline moved the second highest weight of freight, each carrying 5% of the state's freight volumes compared to 15% of freight weight carried by rail in the 2017 SMFP. The second highest modal share measured by value was multiple modes carrying 13% of the total value of goods. Multiple modes include commodities that were imported, exported, intrastate or through movement of goods that used multiple modes of transportation. The heavy reliance on trucks to move freight has cascading impacts on infrastructure (i.e., roads and bridges), air quality and the cost to businesses and consumers.

Most of North Carolina's top trading partners are concentrated in the Southeast and Mid-Atlantic regions. It is not surprising that North Carolina relies heavily on trucks for moving its goods, when its largest trading partners are accessible by truck within a day of travel – extending from north Florida to eastern Pennsylvania along the Eastern Seaboard, as far west as Nashville in the Southeast and as far north as Cleveland in the Midwest. This footprint also contains several freight assets outside of North Carolina that are valuable to the state's shippers, such as the Ports of Jacksonville, Savannah, Charleston and Norfolk. Other important trading partners that are not within a day of travel are key rail lanes for intermodal shipments connecting to terminals in Florida, Texas, California and some nearby in Georgia and Tennessee.

COMMODITY FLOW FORECASTS OVER THE NEXT 30 YEARS





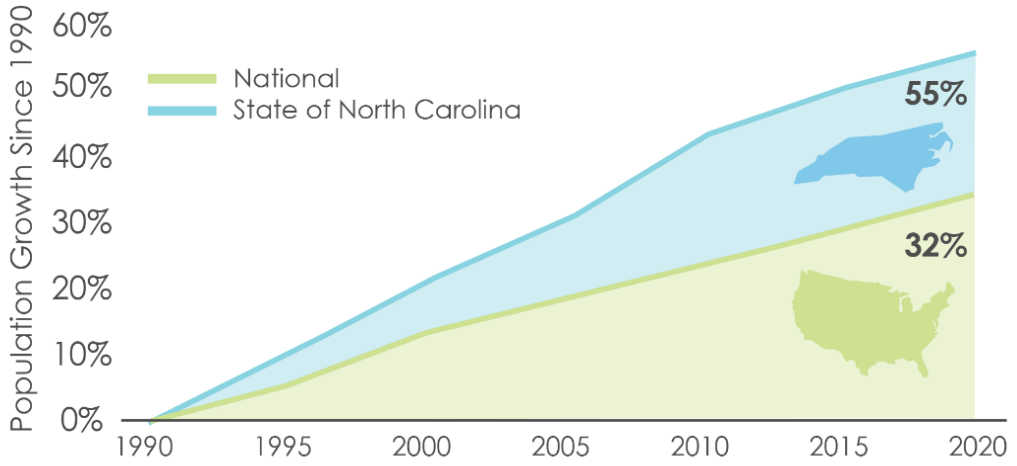
Trends Shaping our Future

There are several global, national and statewide trends that will continue to drive the demand for and performance of North Carolina's freight transportation system. Leading trends impacting future freight flows include continued statewide population growth, technology innovations in transportation such as the advent of autonomous vehicles, increased new business and consumer practices such as the emergence of e-commerce fulfillment centers, containerization and intermodal growth and global shifts in manufacturing.

Population and Urbanization on the Rise

North Carolina's demographics are changing. The population of North Carolina has grown from 6.7 million people in 1990 to 10.4 million people in 2020, a total growth rate of 55%. The state has added 400,000 residents since the 2017 SFMP. Over the same time period, the population of the U.S. has increased by 32%. Population change is a key contributor to economic growth and transportation demand, as increases in population create demand for goods and services. In conjunction with the expanding demand for goods and services, population impacts the number of passenger and freight trips through the North Carolina transportation system. As the number of passenger vehicles and trucks continue to multiply, competition and trucks continue to multiply, competition will rise for the increasingly scarce capacity remaining on the highway system, straining existing roadway capacity and resulting in more severe congestion. As highway congestion increases, freight rail will be increasingly in demand to meet the needs of those industries that are particularly reliant on freight.

U.S. Census data indicates that a share of the Nation's population is shifting from Northeastern and Midwestern states to Southeastern states such as North Carolina. The trend of urbanization has slowed down in the past five years, largely due to the COVID-19 pandemic. Urbanized areas are still increasing in size but at a slower rate. The slower rate of urbanization combined with people moving out of city centers to more rural areas has contributed to a smaller net positive number of people moving into urban areas.



Much of this growth will be centered in North Carolina's and other states', major metropolitan areas. The urbanization, or concentration of the nation's population in metropolitan areas, will lead to the emergence of megaregions which will influence the movements of goods, people and capital. These regions will act as semi-unified entities as their economies become increasingly linked. This linking of economies necessitates a corresponding linking of freight and other infrastructure assets to support economic and population growth. For the Piedmont Atlantic megaregion (which includes North Carolina), much of the impact of an emergent megaregion will be concentrated along the I-85 corridor.

Effective freight planning will need to address goods movement within the mega-region and to neighboring mega-regions and how the future freight network will serve the state's rural communities and connect them to the mega-region. With the slowdown of the growth of urbanized areas and people moving to rural areas, the movement of freight will be more crucial than ever to ensure goods are reaching the larger population base in less dense areas of the state. This heightens the importance of addressing connectivity between rural and urban areas.

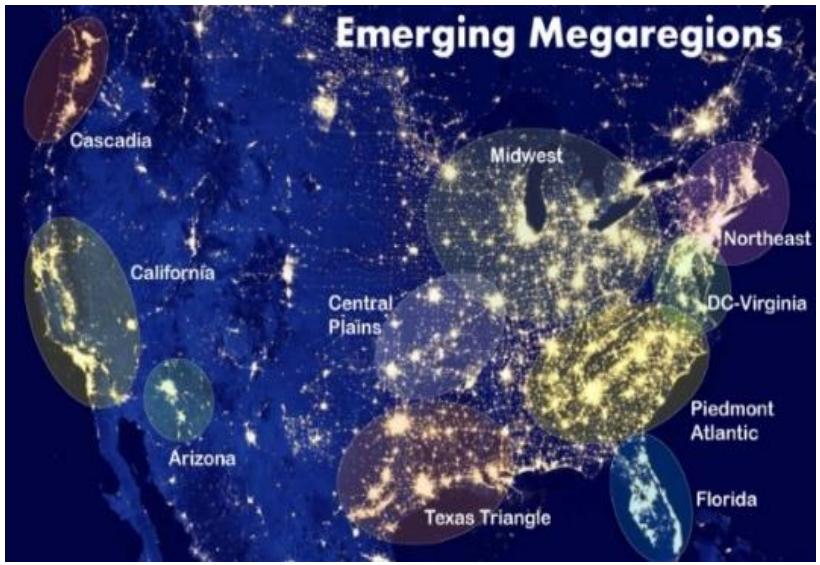
The Piedmont Atlantic region is one of the ten emerging megaregions identified by USDOT in the United States. Since trucking is currently, and predicted to remain, the predominant freight mode, much of the corresponding increase in freight activity will occur on North Carolina's highways. The I-85 corridor will become even more important as it forms the backbone of the Piedmont Atlantic megaregion.

Technology – Changing the Way Freight Moves

Technology innovations have the potential to optimize and improve the transportation network. These innovations include the freight portion of the broader trends in autonomous and connected vehicles. Researchers have predicted that when the majority of the fleet is both connected and automated, there will be significant decreases in crashes, resulting in significant increases in safety and reliability. It will also lead to significant decreases in non-recurring congestion (i.e., incidents, work zones, weather and special events), which accounts for about 50% of total congestion.[1] Decreased congestion provides the opportunity to get more capacity out of the existing system, lessening the need for expensive, time consuming capacity expansion solutions.

Commercial vehicles will likely be the earliest adopters of connected and automated vehicle technology given the intense pressures faced by the transportation industry. These include a shortage of commercial vehicle drivers that is likely to worsen over time[2], pressure from shippers to reduce costs and increase reliability and increasing demand that is expected to continue well into the future as the tonnage of freight moved on the multi- modal freight system steadily grows.[3]

The truck driver shortage has been increasing across the United States. New drivers will be needed to due to retirements in the industry and industry growth. The COVID-19 pandemic has increased the need of industries for truck drivers to move e-commerce products.



Source: USDOT Volpe Center

Regulatory issues that would allow for widespread use of relevant technologies could be realized in the next decade. Meanwhile, alternate delivery systems such as drones and freight shuttles have the potential for overhauling "last mile" approaches and pilot programs both in the U.S. and Europe are testing such deliveries. Another source of technology is the potential evolution of transportation network companies (TNC) to expand into freight delivery beyond some of the current last-mile systems such as meal delivery. A more expansive TNC approach could have implications for costs (and thus driver earnings and retention), congestion reduction and modal shift.

[1] FHWA, Office of Operations.

[2] American Trucking Association. Driver Shortage Update, 2021

[3] Bureau of Transportation Statistics. "Weight of Shipments by Transportation Mode: 2017, 2022, and 2050

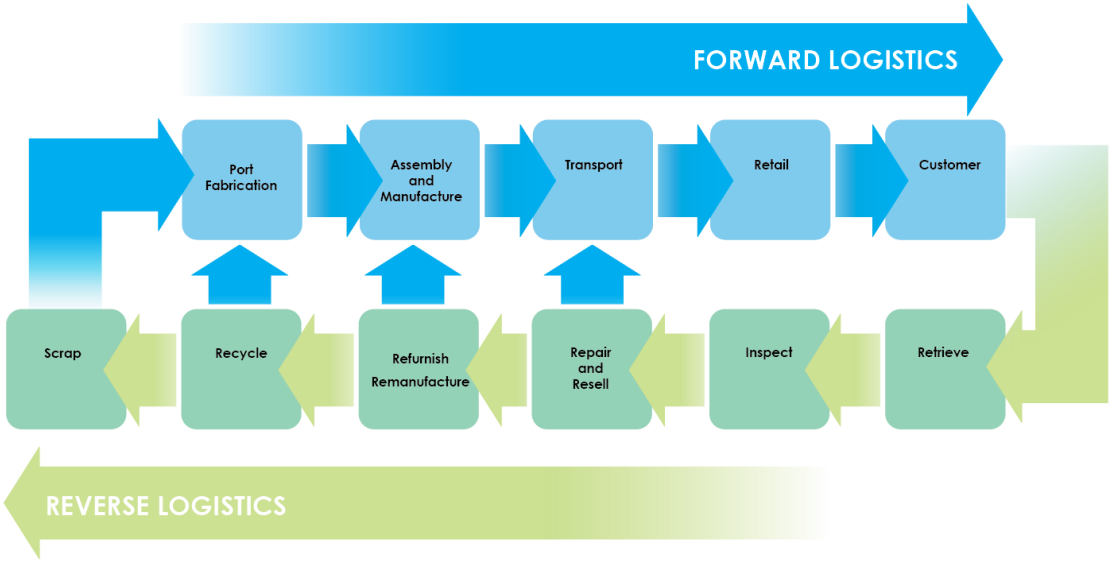
Business and Consumer Practices

Evolving business and consumer practices include changes in sourcing, advances in manufacturing and e-commerce. Manufacturing advances have increased the amount of heavy-haul transport in sectors such as energy, as more complex pieces are manufactured and shipped whole as opposed to assembled on site. Conversely, 3D printing innovations may reduce the size and distance of shipments and enable production closer to assembly or retail.

The COVID-19 pandemic has increased demand for e-commerce due to pandemic-related lockdowns. E-commerce saw the steepest increase in total sales in 2020[4]. As same-day and next-day delivery has become the norm for e-commerce transactions, retailers have begun to reposition regional distribution centers and smaller distribution centers closer to urban areas – the centers of demand. Delivery on such a short timeframe is expensive, though it has become necessary, as customers have come to expect this level of service. Strategically placed fulfillment centers allow firms to deliver the level of shipping service that consumers demand while maintaining relatively affordable costs.

E-commerce continues to grow and evolve, including changes in "omni-channel[5]" marketing, home delivery and alternate centralized parcel facilities and private fleets of delivery vehicles and coordination with TNCs. The impact of increased e-commerce and its supporting infrastructure on the North Carolina freight system is likely to be an increased importance on freight system reliability and more frequent truck trips in urban regions that utilize smaller vehicles and alternative delivery methods.

The portion of the highway network serving rail intermodal facilities, such as those in Charlotte, Greensboro and the proposed facility in Rocky Mount, will also be impacted as many e-commerce shipments with longer delivery times utilize rail intermodal service. To support the coordination of intermodal facilities with e-commerce fulfillment centers, the highway network linking these freight terminals must provide reliable performance if shippers are to develop schedules based on the level of service provided by these highway links. Reliability directly affects shipping costs and the ability of retailers to meet consumer demand.



Reverse Logistics

Reverse logistics involves all supply chain activities – returns, recalls, withdrawals, recycling, refurbishment and disposal – connected with products after the point of sale. When a product cannot move forward in the supply chain or requires backward motion, reverse logistics practices work to recover lost value and determine the product's final destination. A Mastercard Spending Pulse report released in late December 2021 estimated that online holiday retail sales in 2021 jumped 11% compared to 2020. E-commerce made up almost 21% of total retail sales, up from 10% in 2020 and 14% in 2019, Mastercard said. The reported quoted a Global Commercial Estate Services (CBRE) estimate that $66.7 billion worth of online holiday purchases would be returned and pushed back into the

[5] Omnichannel is e-commerce that uses multiple platforms/ websites to each consumers.

strained supply chain[6]. That's up 13% from last year, and nearly 46% above the previous five-year average. The return rate for e-commerce sales can be as high as 30% compared to 10% for brick-and-mortar sales, according to reverse logistics company Optoro. A report from the National Retail Federation a year ago showed that online returns more than doubled in 2020 from 2019[7]. Factoring in transportation, processing and other losses, holiday returns will cost retailers two-thirds the price of the original item, Optoro estimates. The returns process is a complicated affair involving assessments, transportation, distribution centers and factories.

The continued expansion of this element of e-commerce trade will impact the freight transport system in North Carolina. As the volume grows, the existing flows, which are typically accommodated in delivery assigned trucks and vans could overwhelm the existing capacity and lead to an increase in the number of trucks and delivery vans on the road. Companies including Happy Returns and Optoro are expanding their footprint within customer facilities to handle product returns. As their networks expand, they will expand the number of facilities in North Carolina which will contribute to increased truck volumes associated with the collection of returned products and the dispatch of sorted shipments to the next step of the return process. In a search to reduce the costs of handling product returns, other elements of the freight transport system impacted by return traffic will have to evolve. This will include lower cost transport options including rail and rail-truck intermodal services. As an increased volume of the returned products are sent to overseas markets, the number of containers associated with this traffic volume will also increase, creating additional volumes at ports including the Port of Wilmington.

Containerization and Intermodal Shipments

The use of shipping containers was initiated in the late 1950s, but it was not until the 1980s that fully functional container terminals began to take hold. The use of containers to import and export goods was a true revolution in freight handling. Containers offered security of transport and logistical efficiencies that had not previously existed.

The efficiency of intermodal – ship to rail – container cargo is even more dramatic, cutting dwell times in the port by 50% or more. Due to efficiency of handling, the use of containers has expanded beyond use for consumer goods.

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. Intermodal commodities are typically reported as a mix of commodities being shipped together and are often intended for a particular

[6] TIS THE STRESSFUL SEASON FOR HOLIDAY GIFT RETURNS, CBRE, DEC., 2021

[7] $428 BILLION IN MERCHANDISE RETURNED IN 2020, NATIONAL RETAIL FEDERATION, JANUARY, 2021

retailer (e.g., Lowe's or Wal-Mart). Intermodal growth in North Carolina will be impacted by the CCX terminal construction in Rocky Mount. CCX primarily serves Raleigh and the Eastern North Carolina freight market. The terminal also acts as a hub for the railroad's southeast and mid-Atlantic intermodal operations. It provides the Port of Wilmington with rail intermodal service. The facility is consolidates shipments and shipping lanes to serve the growing demand both in the region and nationally. The facility also diverts long-haul truck traffic to rail, with most being through-traffic.

Reshoring of Domestic Manufacturing

The combination of a growing wages in China and Southeast Asia and higher transportation costs has led to a number of firms shifting manufacturing back to the United States, a trend known as reshoring. An advantage of reshoring includes allowing supply chains to be more responsive to changing consumer tastes and the ability to better manage disruptions. As a result, the U.S., and the Southeast in particular, has become a more attractive location for high-value manufacturing. Not only has this spurred U.S. companies to bring back certain manufacturing activities, but it has also increased the attractiveness of the U.S. for foreign direct investment from international firms.

In 2020, over 109,000 jobs were created in the United States as a result of the reshoring efforts of companies. North Carolina ranked third as a host of 9,977 jobs. Foreign direct investment is increasing. The number of foreign firms which are selecting Southeast U.S. locations, such as VinFast and Toyota Battery, is rising.

The trend of reshoring and foreign direct investment has created an opportunity for North Carolina to leverage its freight assets to improve its competitiveness in high-value manufacturing. The expansion of the state's interstate highway system along with improved rail service and connectivity to the Port of Wilmington and the operation of the CCX terminal at Rocky Mount makes North Carolina more desirable to these types of investments. With the planned increased investments in the highway system, especially the interstate system and roadways that provide access to major freight terminals (e.g., the Port of Wilmington, the CCX terminal at Rocky Mount, Charlotte-Douglas, Piedmont Triad and Raleigh Durham International airports, etc.); North Carolina could surpass its southeast competitors.

US Manufacturing Jobs/Year 2021

	2016	2021	~ % Change
New Offshoring	~50,000*	NA****	~80%
New Reshoring and FDI	77,000*	~ 261,000**	~ 70%
Net Jobs Gained	~ +25,000	~ + 261,000***	N/A

Source: Reshorenow.org

*Estimated

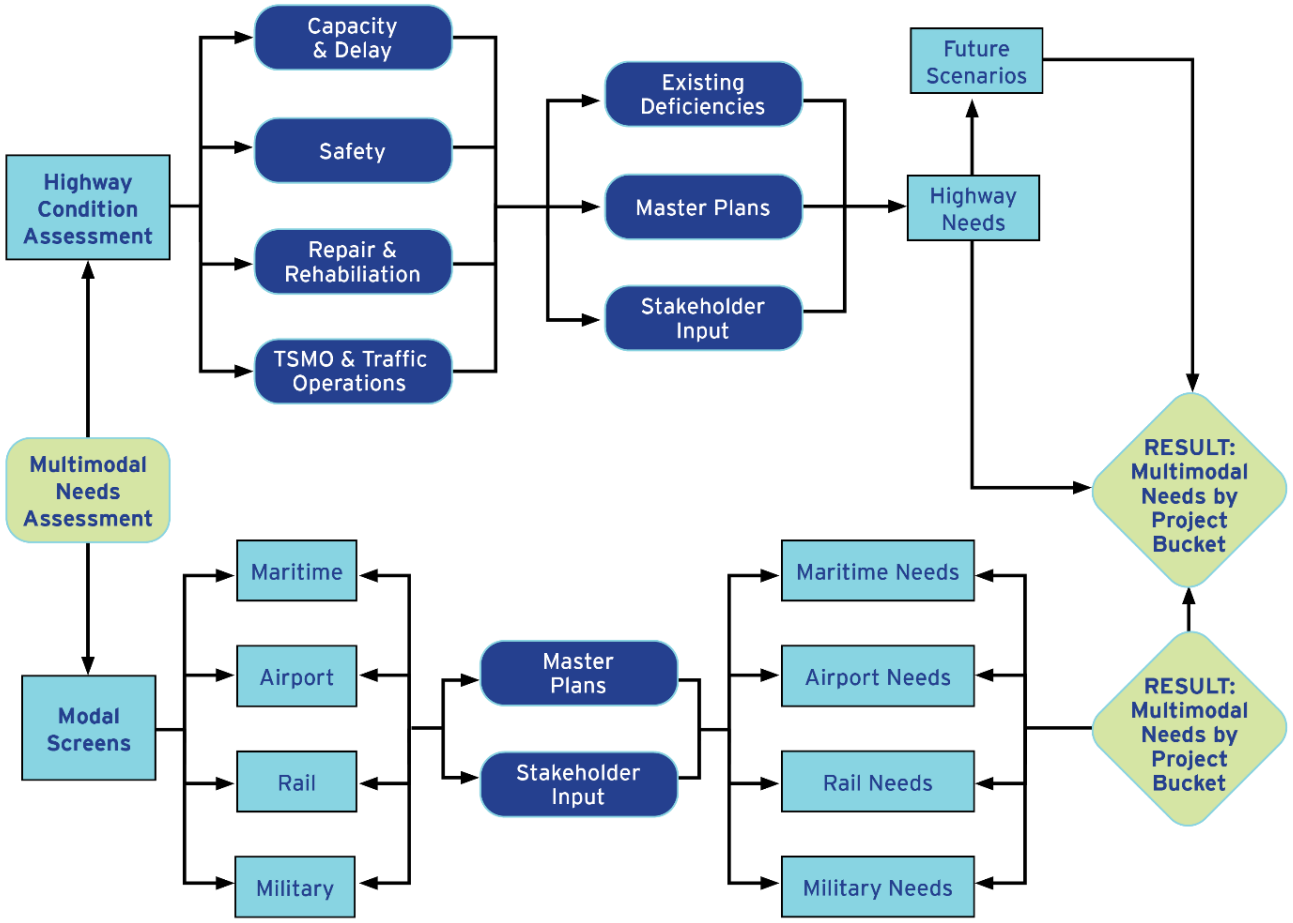
Between 2010-2021, North Carolina was 5th in the nation attracting over 16,700 reshoring manufacturing jobs in 155 companies.

MULTIMODAL NEEDS ASSESSMENT

The multimodal needs assessment involved a multi-faceted approach to identify needs and deficiencies on the North Carolina Multimodal Freight Network. The initial highway freight network condition assessment focused on a quantitative analysis of the North Carolina Highway Freight Network (NCHFN) to identify needs and deficiencies in the areas of capacity and delay; safety; repair and rehabilitation; and Transportation Systems Management and Operations (TSM&O) and traffic operations. The condition assessment criteria were specifically developed to be quantitative whenever possible to provide a direct quantifiable link between needs, prioritization criteria and future performance measure development and monitoring.

Additionally, a policy and plans review that included extensive stakeholder input was conducted to provide a qualitative needs assessment that focused on needs related to the North Carolina Multimodal Freight Network as well as future-facing needs related to connected and autonomous vehicles (CAV), technology and alternative fuels. The results and input provided during the multimodal needs assessment efforts will be used to aid in the prioritization of freight projects during future State Transportation Improvement Program (STIP) development activities.

NORTH CAROLINA FREIGHT NETWORK NEEDS ASSESSMENT PROCESS



Stakeholder Input

Input on freight-related needs, issues and projects was solicited from and provided by a range of North Carlina public and private sector stakeholders through presentations to the Freight Advisory Committee, Regional Forums and an online web-based survey. The results of these outreach efforts were documented and analyzed to identify general statewide multimodal freight needs that were used to inform the multimodal needs assessment, project prioritization process and performance measures developed for this plan.

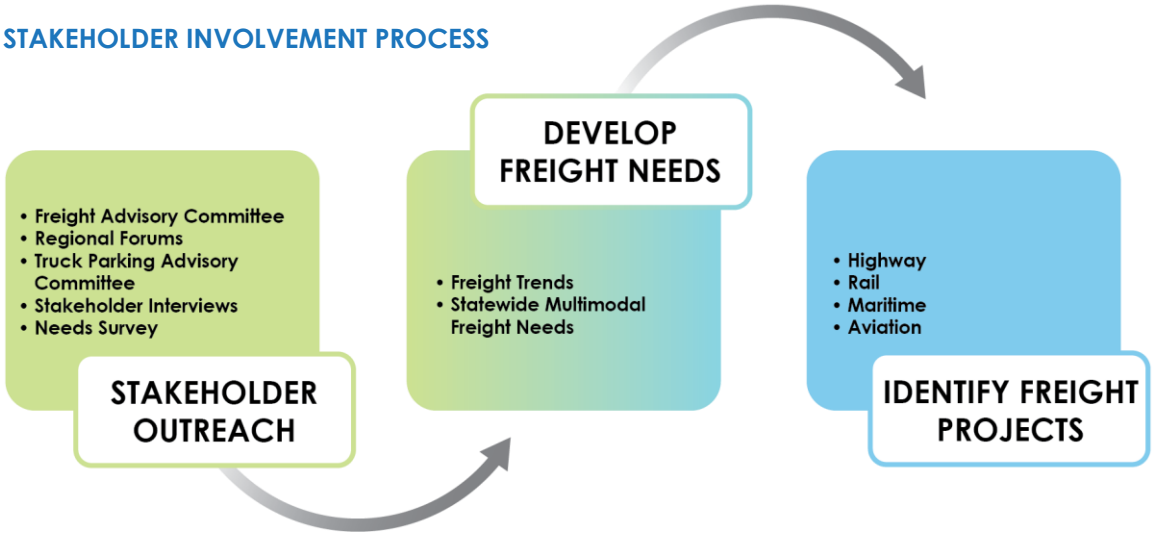
Specific needs and projects identified thorough Stakeholder input were incorporated into the update of the comprehensive statewide unfunded needs list, which includes Prioritization 6.0 Projects (the current round of NCDOT Project Prioritization). These projects can be incorporated into the project development process of NCDOT and its partner agencies for possible inclusion in future STIP and work planning activities. This list can be found in the project screening section of this chapter.

The following sections provide an overview and summary of the stakeholder coordination and input activities that were conducted to identify statewide multimodal freight trends, needs, issues and projects.

Stakeholder Outreach Activities

Stakeholder outreach was conducted throughout the development of the strategic plan utilizing numerous methods to reach a wide range of public and private freight stakeholders in North Carolina included presentations at statewide meetings, regional forums, online surveys and one-on-one interviews. The results of these outreach activities were used to support the development of the Plan through the identification of specific freight trends, needs and projects to improve and enhance freight movement on the North Carolina Multimodal Freight Network.

STAKEHOLDER INVOLVEMENT PROCESS



North Carolina Freight Advisory Committee

Presentations were given to the North Carolina Freight Advisory Committee (FAC) periodically during the development of the Multimodal Freight Plan to provide updates to key statewide freight stakeholders, solicit feedback and discuss trends, issues and needs affecting freight and goods movement in North Carolina.

Many of the attendees were interested to know how COVID-19 has impacted freight movement overall and how the effects of a possible recession look for the future of freight. It was also discussed how the development of distribution areas within the state has increased significantly within the last two years and will affect the demand of the freight system as well. All these topics will be taken into consideration under the updated Multimodal Freight Plan.

Overall, the most common challenge faced is the need for better multimodal connectivity. A majority of respondents voted that there is a need for rural connectivity in the highway system to provide freight mobility to the less populated parts of the state. The ports are also in need of highway and rail connectors. Additional modal challenges include:

- **Highway:** Congestion; significantly reduced travel speeds from posted conditions
- **Rail:** Cost of railroad services and a need for intermodal bulk and container transfer facilities (especially in the western portions of the state)
- **Air Cargo:** Timeliness of air cargo service
- **Pipeline:** Permitting processes, regulatory and state government support

Freight Plan Update Regional Forums

A series of two Freight Plan Regional Forums were held as online public meetings to provide an opportunity for partner agencies and the general public to hear about the update to the Freight Plan and provide input on freight needs, issues and projects through an interactive survey and chat box function. Attendees included NCDOT employees, MPO employees, RPO employees, municipal employees, neighboring states employees and private sector employees. Most of the attendees were from the highway industry with attendees representing all regions of North Carolina.

Key themes that were carried throughout the various topics discussed were modal connectivity challenges and safety. Multimodal connectivity was discussed as a need, especially in connections to the ports via rail. Safety was cited frequently within each freight mode but was cited as the main freight highway challenge when it comes to crashes and safe parking for truck drivers. Rail safety concerns include reducing at-grade rail crossing incidents.

Truck Parking Workshop

A separate online Multimodal Freight Plan Update meeting was held for stakeholders specifically for Truck Parking. An overview of the 2017 Truck Parking Plan was presented including the 2020 parking inventory and implementation plan. It was noted by the attendees that nighttime parking is still an ongoing issue along the interstate ramps and shoulders as well as in distribution areas.

As part of the 2022 update, the attendees were asked to identify truck parking locations that have come online since the 2017 truck parking plan and where truck parking is needed. Needs were identified around the north and south gate of Port of Wilmington, near Port of Morehead City, west of Charlotte, Salisbury, east of Burlington and north of Rocky Mount. One new location was identified near I-85 and Peeler Road interchange. Additionally, the majority of the attendees responded that hours of service (HOS) demands, and limited access to truck parking and/or pickup and delivery areas are the main reasons for unauthorized parking.

Freight Needs Survey

As a follow-up to the Regional Forums, an online survey was developed and sent out to participants to provide an opportunity for stakeholders and the public to provide additional input to the Freight Plan. The online survey asked respondents to provide feedback on the current state of the North Carolina freight network, areas for improvement, challenges and barriers, policy, investments, performance measures and freight bottlenecks.

The majority of respondents were part of the trucking industry with representation across the entire state and neighboring states. Respondents voted roads, highways and truck parking as the areas in North Carolina's freight system that needed the most work. Overall, the current challenges to freight logistics movement are travel time reliability due to congestion and inadequate intermodal connectivity. These same challenges are also believed to continue to be barriers throughout the next 10 years. The advancement of technologies is also expected to have the biggest impact on freight movement including electrification of vehicles, autonomous trucks/connected trucks, and automation in ports. As seen in the Regional Forum responses, connectivity to the ports and truck parking availability are the most pressing issues currently for North Carolina's freight system.

HIGHWAY FREIGHT NETWORK CONDITION ASSESSMENT

The NCHFN needs and condition assessment conducted for this Freight Plan was developed to provide a quantitative analysis to identify existing deficiencies on the NCHFN. The quantitative needs assessment is organized into general analysis groups consisting of capacity and delay; safety; repair and rehabilitation; TSM&O; and C/AV and alternative fuels. Individual needs assessment criteria and data analysis are defined for each group. The following sections provide an overview of each quantitative needs assessment metric; the methodology and data used in each calculation; and an assessment of the identified deficiencies or needs.

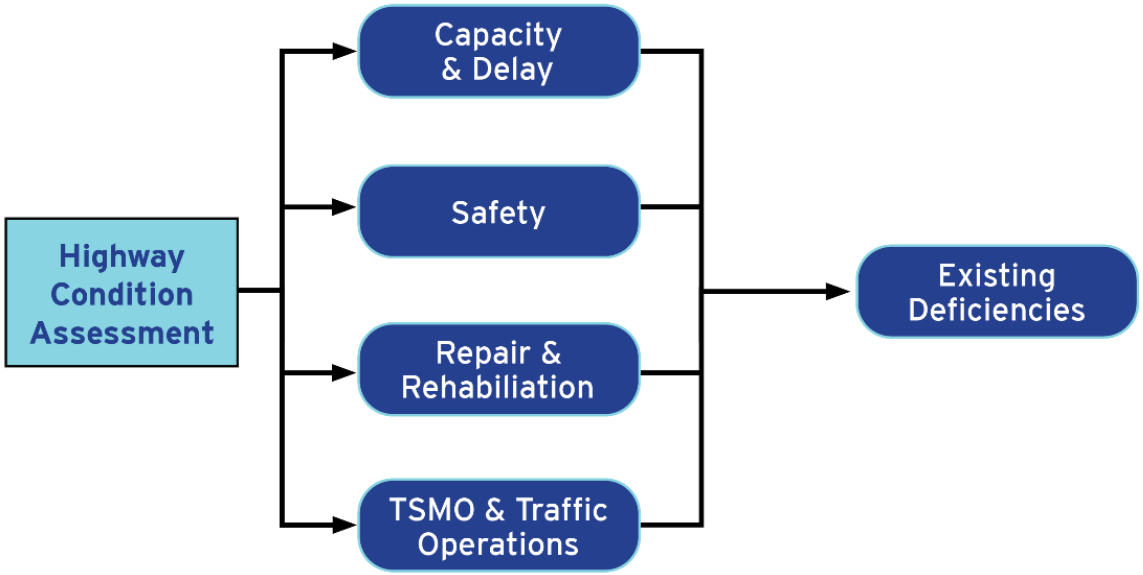
Data Sources

Data sources for the highway needs assessment activities were identified through a variety of sources that included NCDOT roadway and route data, crash data, pavement and bridge condition, statewide travel demand model, third-party probe data and other relevant data sources developed by or available to NCDOT.

HIGHWAY CONDITION ASSESSMENT PROCESS

Data Points	Source
Truck Hours of Delay	Regional Integrated Transportation Information System
Truck Travel Time Reliability	Regional Integrated Transportation Information System
Volume-to-Capacity Ratio	NCDOT Statewide Model
Truck Crashes	NCDOT
AADT	NCDOT
Bridge Condition	NCDOT
Pavement Condition	NCDOT
Road Characteristics	NCDOT
Routes	NCDOT

CONDITIONS ASSESSMENT DATA SOURCES



HIGHWAY CONDITION ASSESSMENT MEASURES

The following sections provide an overview and summary of the highway needs assessment that was conducted using data-driven quantifiable measurements for the identification and analysis of needs on the NCHFN.

Capacity & Delay Analysis

The capacity and delay analysis focus on metrics that identify potential needs and deficiencies on the NCHFN. The National Performance Management Research Data Set (NPMRDS) provides segment-level data on speed, travel time and AADT for the National Highway System (NHS). NPMRDS data was used to develop two metrics for the NCHFN: include Truck hours of Delay and Truck Travel Time Reliability (also known as Buffer Time Index). The NPMRDS defines trucks as Classes 8-13 for purposes of analysis. These metrics help to identify locations with excessive delay. Additionally, a volume-to-capacity ratio has been developed for the NCHFN. Areas with excessive truck delay may be used for future project prioritization to identify capacity needs, improve congested segments and increase NCHFN travel time reliability.

Truck Hours of Delay

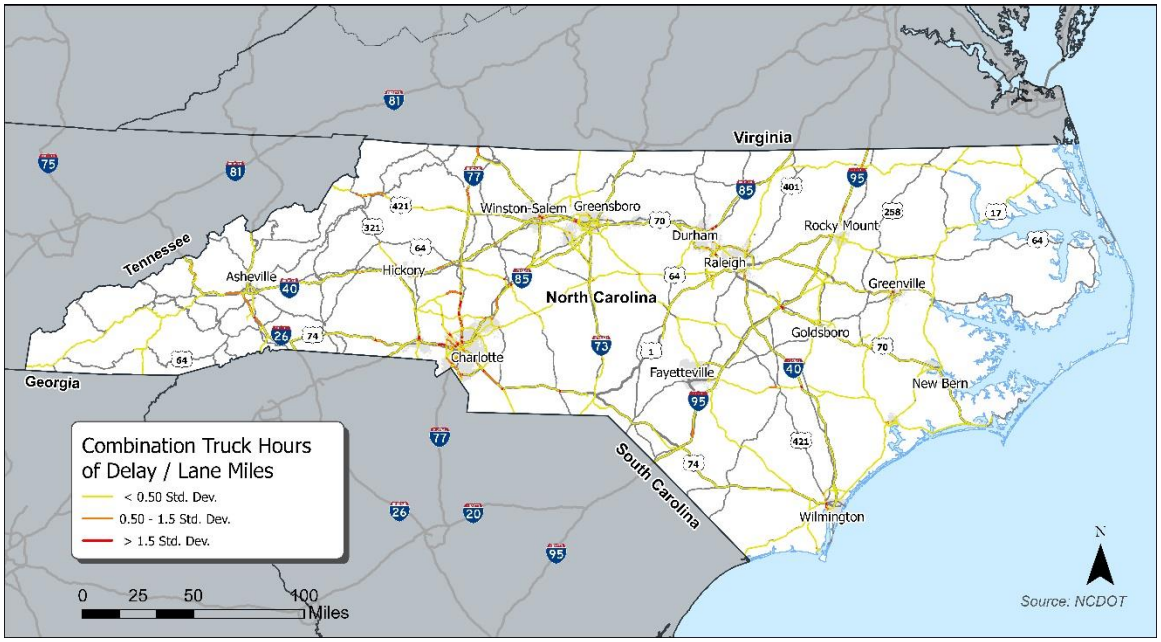
Truck Hours of Delay (Combination Truck Hours of Delay) measure the difference between daily real-world travel times and travel times under an uncongested condition (defined as LOS B). The hours of daily truck delay can be determined by the following formula:

$$Truck\ Volume\ \times (Hours\ of\ Daily\ Truck\ Travel\ Time - Truck\ Travel\ Time\ at\ LOS\ B)$$

The result of this analysis provides hours of truck delay along segments of the NCHFN and helps to identify congested corridors.

Within the State, a majority of truck hours of delay are located in and around major urban centers. The Charlotte urbanized area features excessive delays along the major roadways leading into the urban core. Additionally, the southern and western ring roads of the urbanized areas experience congestion. Moderate levels of truck delay are located in Winston-Salem, Raleigh and Fayetteville urbanized areas.

NORTH CAROLINA COMBINATION TRUCK HOURS OF DELAY / LANE MILES



The southwestern portions of the Asheville urbanized area contain multiple NCHFN segments featuring higher than average hours of truck delay. Boone and Elkin, in the northwestern section of the state, experience delay leading to and through the urbanized areas. Eastern sections of the state, including the coastal areas, have limited delay issues.

Truck Travel Time Reliability

Truck travel time reliability metrics, such as the Buffer Time Index (BTI), help to identify roadway corridors that experience high variability in travel times. Corridors with higher variability in travel times create unreliable and more expensive operations cost to motor carriers. Addressing segments with high variability in travel times will help to improve on-time arrivals, reduced emissions and provide cost savings.

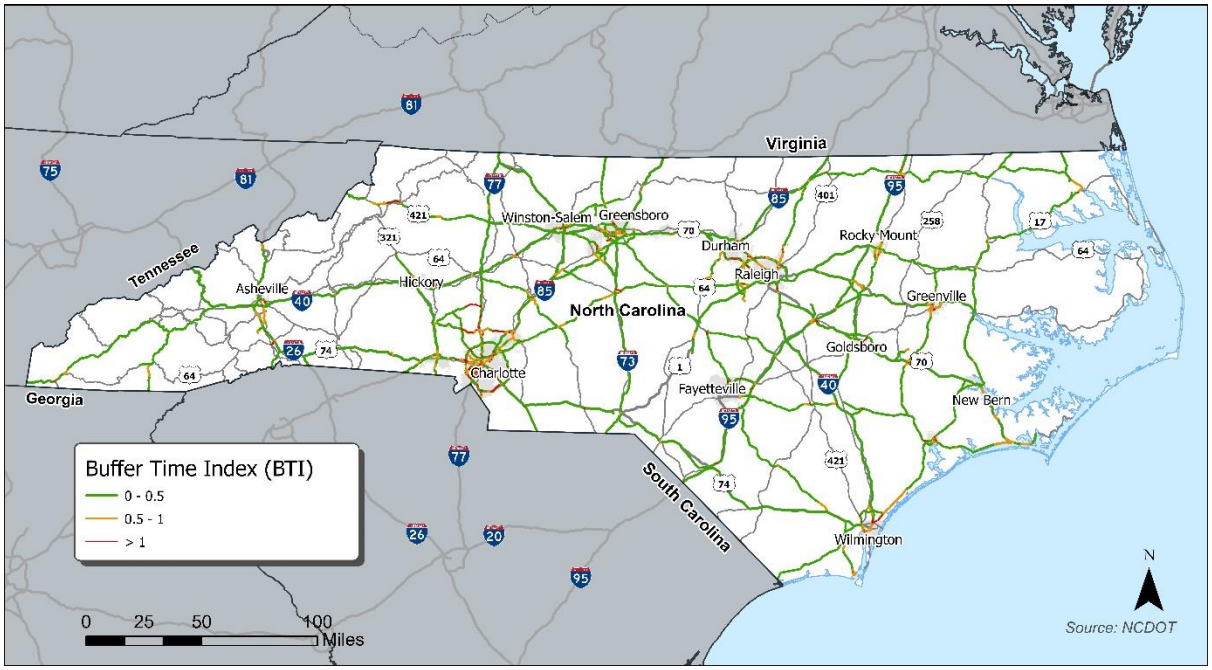
The BTI is a ratio of the 95th percentile truck travel time and average travel time. With the 95th percentile truck travel time representing the amount of time required to ensure 95% of all trips arrive on time. This provides an almost worst-case scenario for roadway conditions and the time to make a trip. The free flow travel time is defined as the travel time along the corridor in an uncongested condition.

$$BTI = \frac{95th\ \%\ Travel\ Time}{Free\ Flow\ Travel\ Time}$$

Thus, BTI represents the extra time (i.e., buffer) that must be factored into scheduling to ensure an on-time arrival for 95% of truck trips. For example, a BTI equal to 0.5 indicates that a trip that on average takes 30 minutes would need 50 percent more time or an extra 15 minutes (for a total scheduled travel time of 45 minutes) to reach its destination on time with confidence. A lower buffer time index indicates that expected travel delays are minimal and additional time may not be required to travel through that corridor. A higher BTI indicates the opposite, that extra travel time is needed to traverse a corridor.

Areas of North Carolina with the highest population densities coincide with areas of highest BTI and suffer unreliable travel times. These urbanized areas are Charlotte, Winston-Salem, Greensboro, Durham, Raleigh and Fayetteville. Rural areas and their roadways in east, central, and far west of North Carolina have relatively reliable travel times.

NORTH CAROLINA FREIGHT NETWORK BUFFER TIME INDEX



Volume to Capacity Ratio

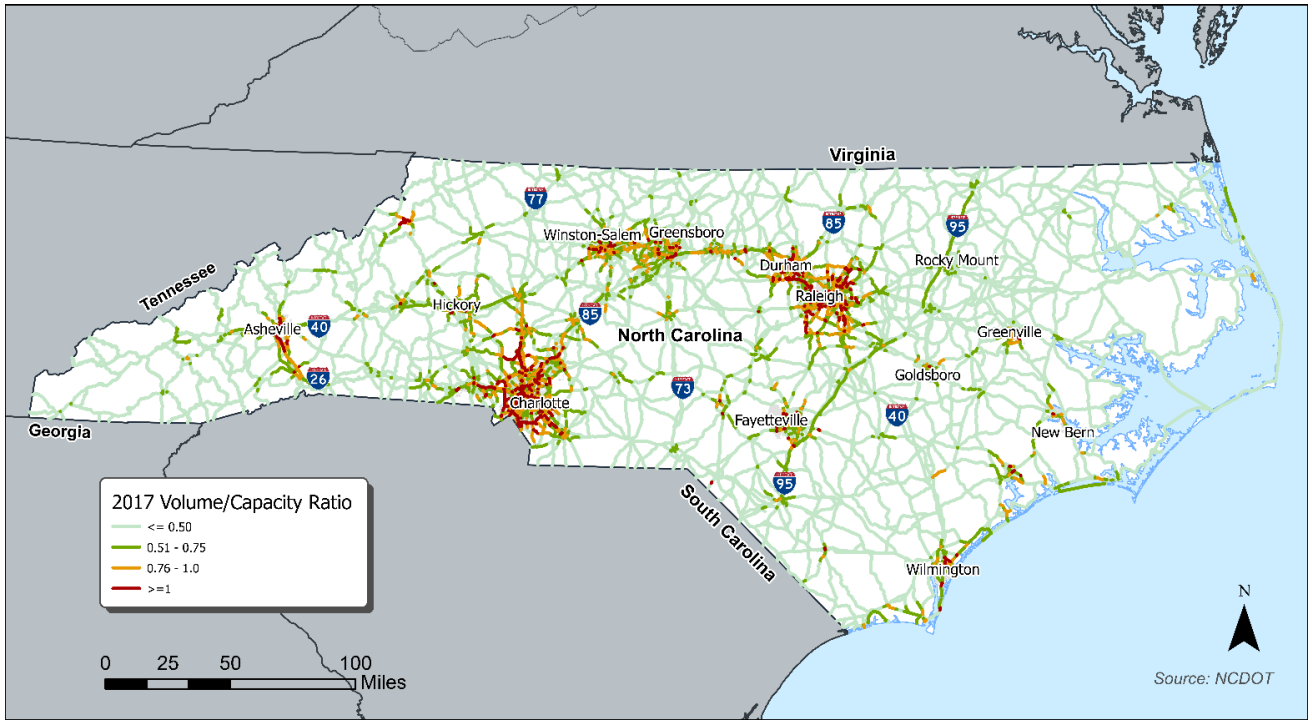
Volume to Capacity Ratio (V/C) is a measurement of the operating capacity of a roadway. In the simplest sense V/C is a ratio of the number of vehicles traveling a roadway segment compared to the theoretical total capacity of the roadway capacity.

$$V/C = \frac{Total\ Segment\ Volume}{Segment\ Capacity}$$

A V/C of 1.00 represents a roadway operating at capacity. V/C ratios less than 1.00 indicate a roadway with additional capacity available and a higher quality of level of service. When greater than 1.0 the roadway is operating above capacity reflects a congested scenario and increased travel times. This measure provides information on the quality of the travel along a corridor.

The North Carolina Statewide Model was used to determine V/C ratio on the state's roadway network for 2017. V/C issues are generally found within the urbanized areas of the state.

NORTH CAROLINA FREIGHT NETWORK VOLUME TO CAPACITY RATIO



Crash Analysis

The crash analysis focuses on individual metrics that highlight needs and deficiencies on the NCHFN. The metrics are related to the safety of commercial vehicles that could be addressed by projects and initiatives that reduce the number of severe and fatal commercial vehicle crashes.

$$Segment\ Crash\ Rate = \frac{5\ Year\ Total\ Truck\ Crashes}{5\ Year\ Million\ Truck\ Miles\ Traveled}$$

Freight Network Truck Crash Heat Map

The Truck Crashes Heat Map highlights the magnitude of crashes on the NCHFN using GIS analysis techniques. Crashes are generally focused within the state's urban areas.

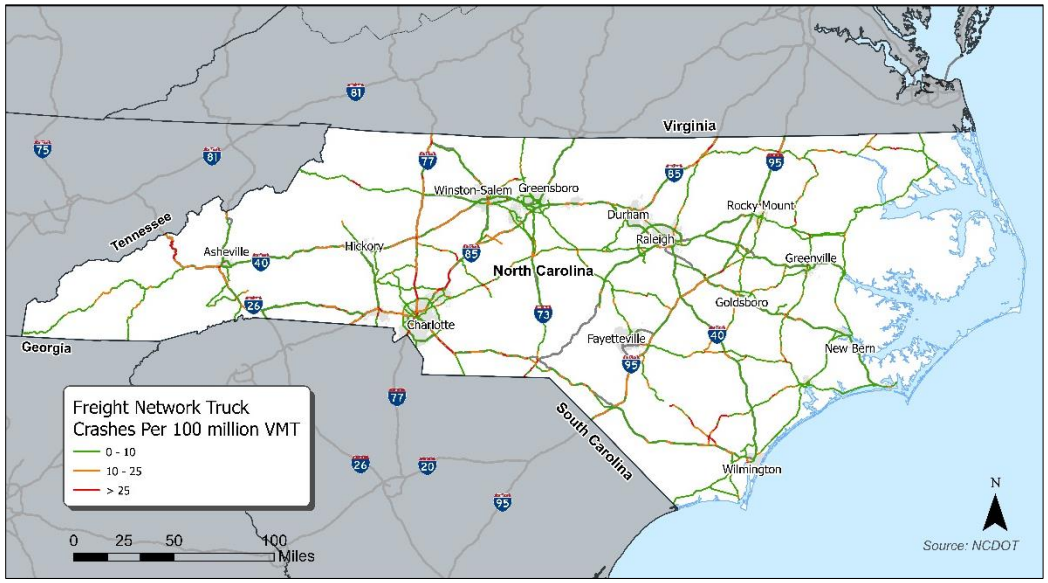
At-Grade Railroad Crashes

At grade railroad locations were examined to identify locations of crashes. Incidences at these locations affect both the highway and rail network reliability. These crashes are concentrated around the State's urban areas.

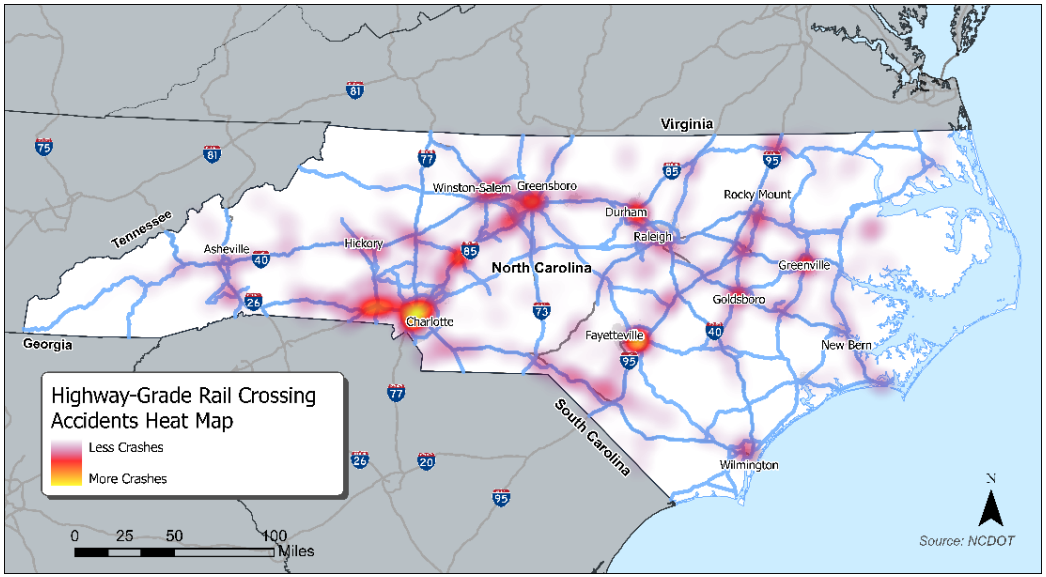
North Carolina Freight Network Truck Segment Crash Rate Map

Additionally, a truck crash rate map has been developed. The truck crash rate controls for the volumes of traffic on the corridor. This methodology allows for a uniform comparison between segments and highlight corridors with the highest rates of truck crashes. Crashes are generally focused on the State's urban areas.

NORTH CAROLINA FREIGHT NETWORK SEGMENT TRUCK CRASH RATE 2015-2019



NORTH CAROLINA FREIGHT NETWORK TRUCK CRASHES HEAT MAP 2015-2019



Repair & Rehabilitation Analysis

The repair and rehabilitation analysis focuses on individual metrics that highlight needs and deficiencies on the NCHFN. The metrics regard pavement and bridge condition that could be addressed by projects and initiatives that improve deficient pavement, bridges and tunnels.

Pavement Condition 2022

As part of ongoing maintenance activities and performance monitoring, the NCDOT continually monitors roadway pavement condition. Pavement rating conditions account for roughness and other roadway distress such as cracking. The lower the pavement condition the worse the quality of ride is for roadway users. Poor pavement conditions result in increased vehicle maintenance cost, increased fuel consumption, and safety concerns. Ensuring higher quality pavement conditions on the NCHFN will contribute to emissions reductions, safety and reduced operating cost for all road users.

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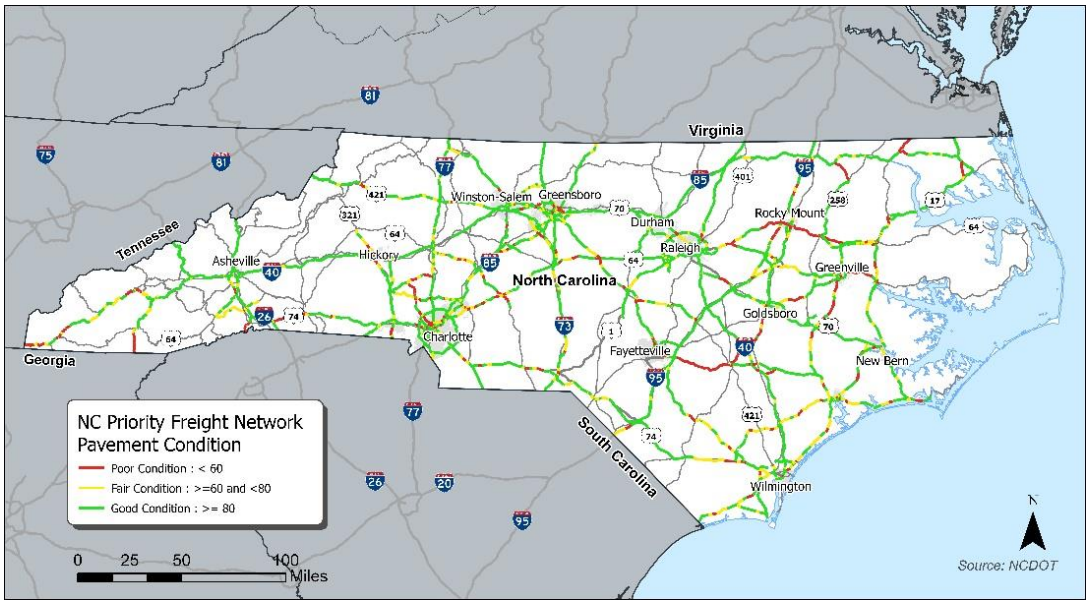
NORTH CAROLINA FREIGHT NETWORK PAVEMENT CONDITION MAP



Pavement condition ratings were gathered from NCDOT's Pavement Condition Shapefile and classified based on condition rating.

- Poor Condition <60
- Fair Condition >=60 and <80
- Good Condition >=80

Bridge Load Restrictions 2022

Bridge load restrictions are a regulatory mechanism to alert roadway users of the maximum allowable vehicle weight a bridge structure can bare. Vehicles over the allowable weight can cause significant structural damage and create a safety issue to all roadway users. Additionally, trucks may be forced to take an alternate travel route when truck weight is in excess of a bridge's weight limit. Bridges with insufficient load ratings ultimately limit regional connectivity on the NCHFN. Ensuring all bridges on the NCHFN have the capability to support trucks in excess of 99 tons will reduce potential safety and truck detour activities.

NCDOT's Posted Bridge Shapefile was used to identify bridges with posted weights less than 99 tons.

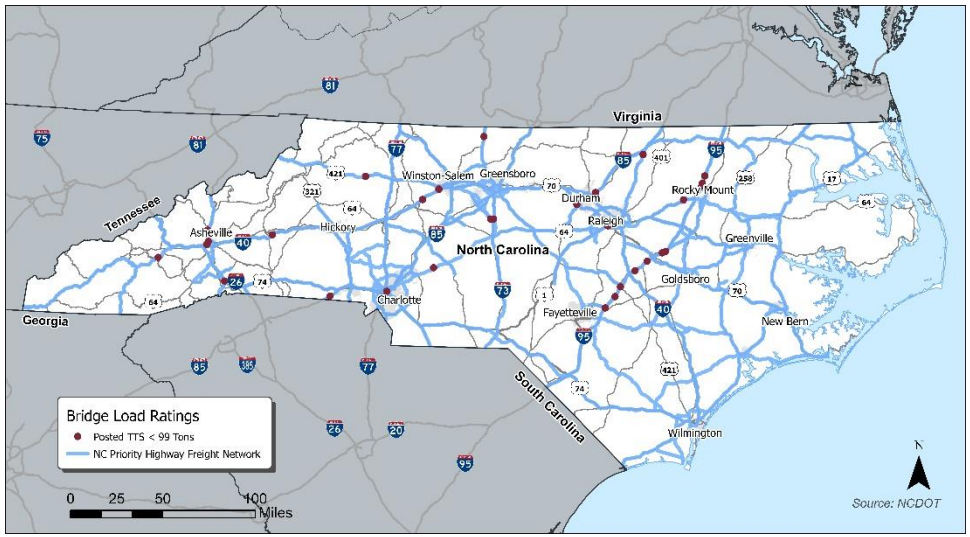
Structurally Deficient and Functionally Obsolete Bridges 2022

Structurally deficient bridges are those bridges that have some level of damage or deterioration to load bearing elements. Though they are not unsafe, they may require ongoing monitoring and higher maintenance intervals which may lead to more frequent bridge closures. These bridges are often slated for major repair or replacement in the near term. Functionally obsolete bridges are those bridges that do not meet current design standards. This may include insufficient lane widths, insufficient shoulder widths, or obsolete traffic barriers for example. These outdated designs may not contain the latest safety features that would be implemented in a replacement project. Reducing the number of bridges on the NCHFN classified as either structurally deficient of functionally obsolete will improve safety and travel time reliability.

Using the NCDOT Structures Shapefile, bridges classified as "functionally obsolete" or "structurally deficient" were identified on the NCHFN. Additionally, bridges meeting both classification standards have been identified, and may require the highest prioritization.

Due to the geography of North Carolina, mountainous areas in the western portion of the state feature more bridges in comparison to the lower lying eastern areas. This has resulted in a higher concentration of functionally obsolete or structurally deficient bridges in western North Carolina. Furthermore, a concentration of these structures is found in the State's urban areas and associated overpasses.

NORTH CAROLINA FREIGHT NETWORK BRIDGE LOAD MAP

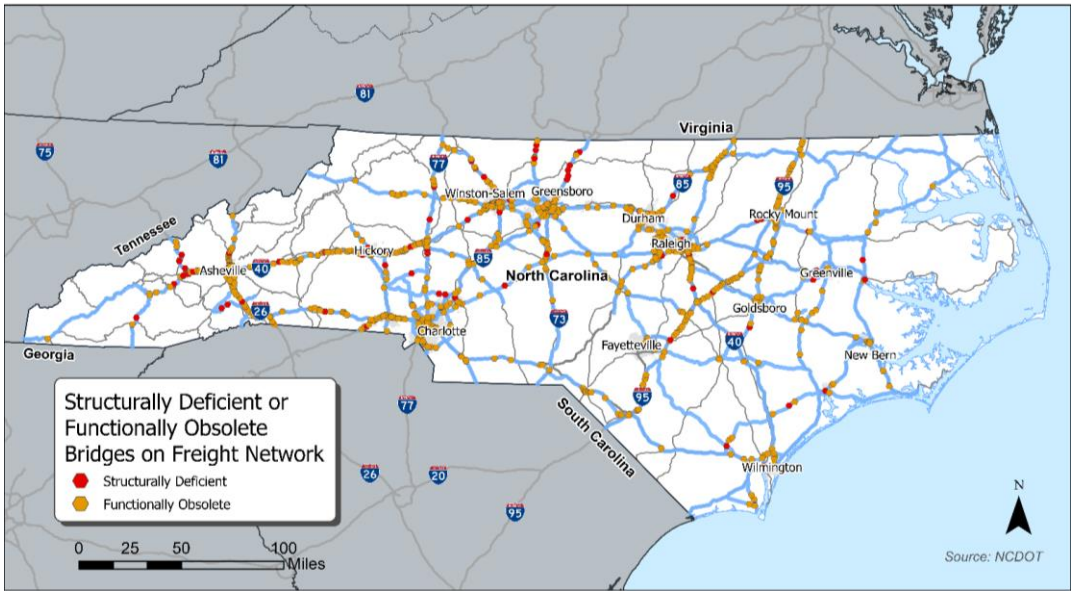


Bridge Condition Sufficiency Rating 2022

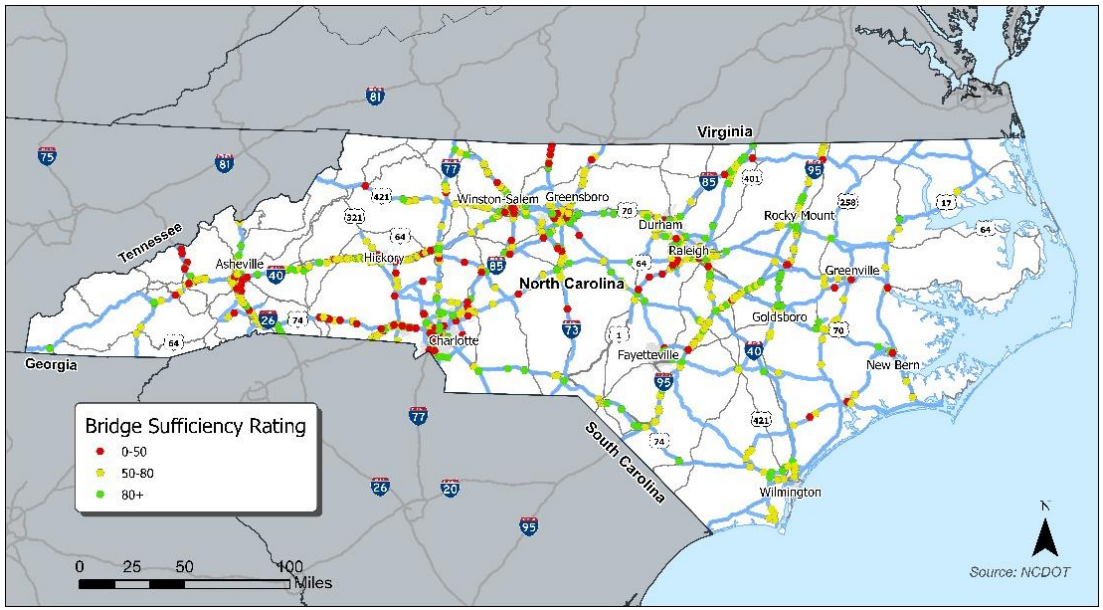
Bridge Condition Ratings provide a composite score for the conditions of bridge features including the deck, substructure and superstructure. The sufficiency rating is based on a 100-point scale with ratings less than 50 qualifying for replacement and ratings under 80 eligible for repair.

The NCDOT Structures Shapefile was used to determine the bridge sufficiency ratings on the NCHFN. The sufficiency ratings were then mapped for the NCHFN. In general, the western portion of the State has a higher concentration of lower-rated bridges.

NORTH CAROLINA FREIGHT NETWORK BRIDGE CONDITION MAP



NORTH CAROLINA FREIGHT NETWORK BRIDGE CONDITION-SUFFICIENCY MAP



TSM&O & Traffic Operations Analysis

The TSM&O and traffic operations analysis focuses on metrics that highlight needs and deficiencies on the NCFHN. The goal is to identify projects and initiatives that increase network and fiber connectivity and enhance or expand ITS and signal infrastructure.

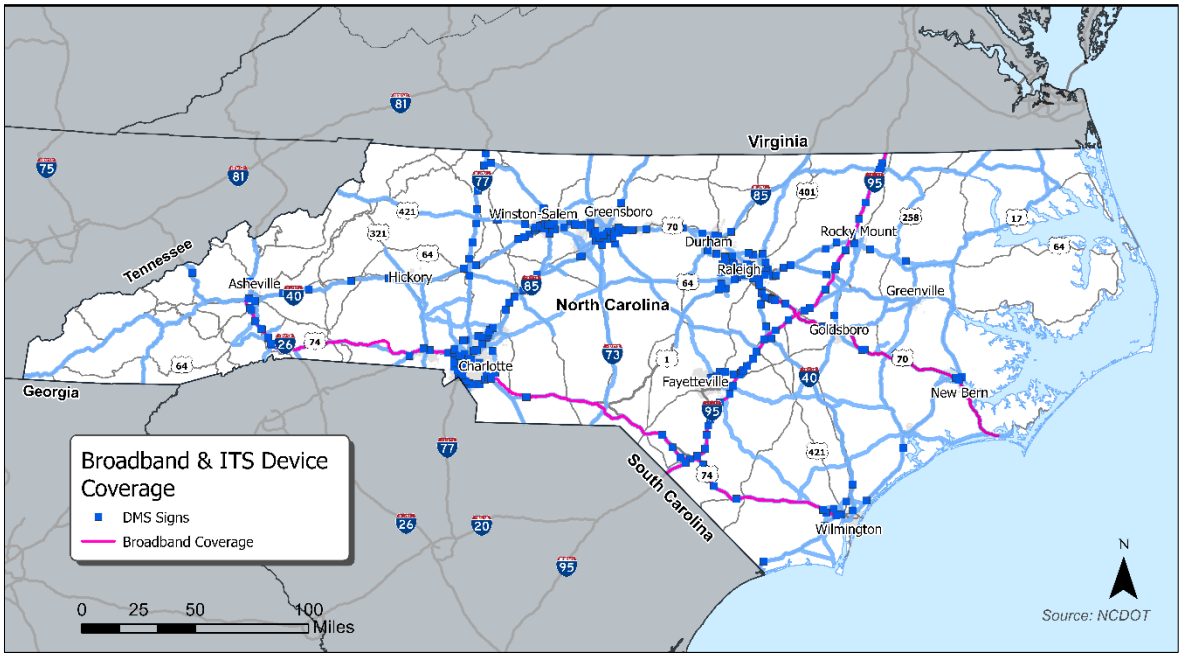
Broadband & ITS Coverage

Broadband infrastructure is a critical component in TSM&O and other operational strategies that move people and goods more efficiently on the NCDOT roadways. The DMS location map provides insight on the spatial patterns of sign locations. The fiber connectivity analysis identifies existing broadband infrastructure on the NCHFN to determine gaps and deficiencies in coverage that should be addressed in future projects to ensure statewide connectivity.

Dig Once Policy, which encourages internet service providers to cooperatively locate broadband infrastructure within NCDOT ROW.

This technology has mainly been implemented along Interstates, with a significant concentration in urban areas.

DMS SIGN LOCATIONS AND BROADBAND COVERAGE



WIM Coverage

Weigh stations and weigh-in-motion (WIM) locations serve a critical role in the preservation of state infrastructure by enforcing size and weight limits of commercial vehicles. WIM sites are located throughout the state, providing continuous weight and classification data for major freight and heavy truck routes on the North Carolina Highway Network. WIM data can be utilized for a variety of uses including oversize/overweight enforcement, pavement design, safety analysis and freight planning.

Below are locations of existing weigh stations and WIM sites along with planned WIM sites identified in the NCDOT Weigh Station Feasibility Study conducted by the Transportation Mobility and Safety Division ITS and Signals Maintenance Unit.

WEIGH STATION AND WIM COVERAGE MAP

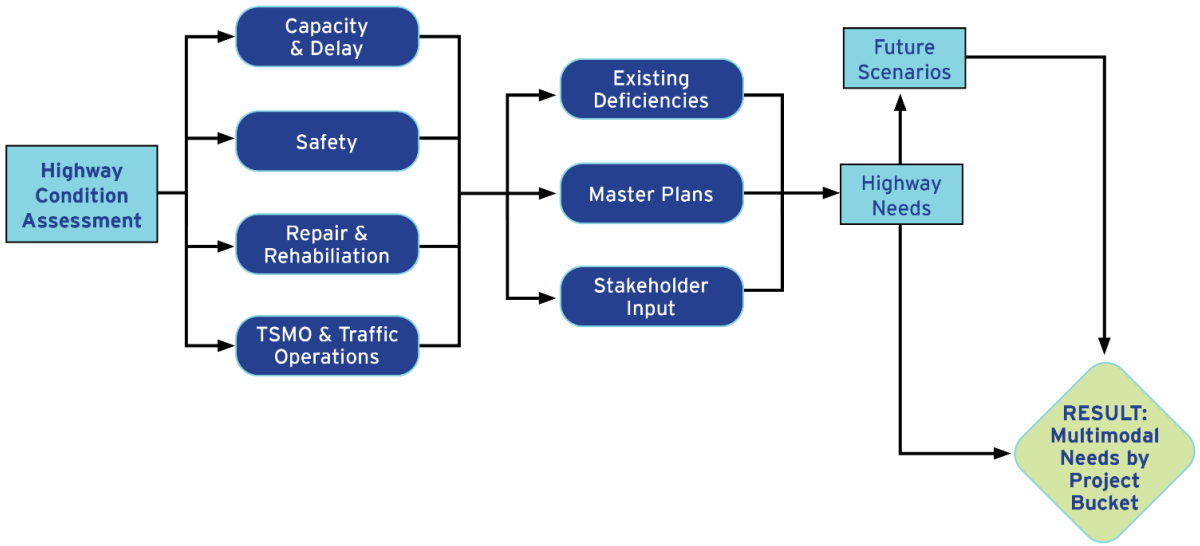
HIGHWAY FREIGHT NEEDS

Highway freight needs were identified using the analysis results from the highway freight network conditions assessment; existing policy and plans review; and the extensive stakeholder engagement and outreach efforts conducted during the development of this plan. Projects from the STIP 2020-2029 located on the highway freight network were reviewed and compared with the results of the condition assessment to identify areas that may have gaps between an identified need and a planned project that could address a specific deficiency. Detailed highway project lists and supporting information can be found in Chapter 7 Project Screening and Prioritization.

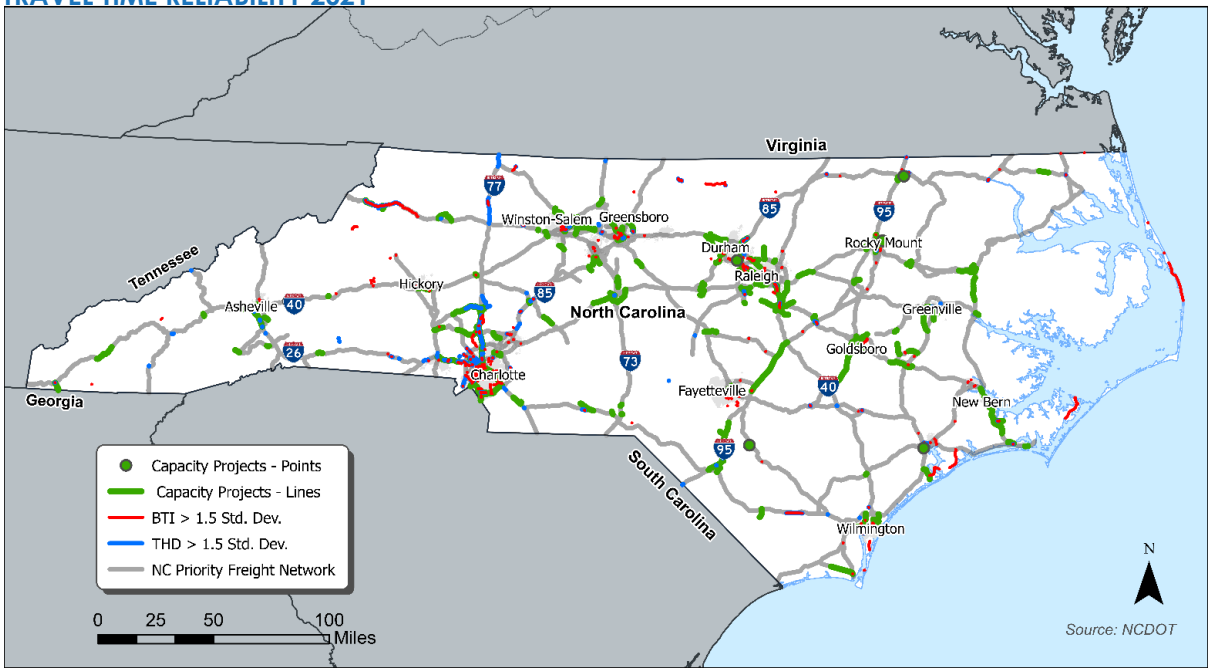
Capacity and Delay

An overview of STIP 2020-2029 Project locations and the associated Needs Assessment Gaps is shown in the figure. Roadway segments with greater than 1.5 Standard Deviations from the mean were determined for both the BTI and Truck Hours of Delay. Using standard deviations for these values highlights areas with the largest variations in congestion measures from the most common roadway conditions on the NCHFN. Future year capacity issues are consistent with existing congestion issues found through travel time analysis. BTI represents the Buffer Time Index score, and THD represents Truck Hours of Delay scores.

NORTH CAROLINA HIGHWAY CONDITION ASSESSMENT PROCESS



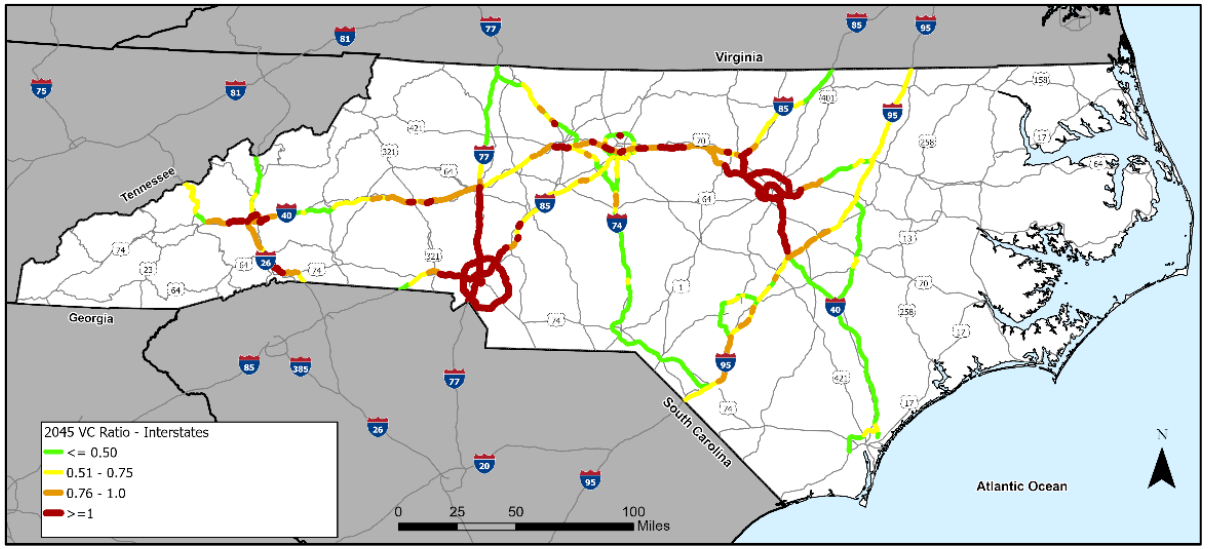
NORTH CAROLINA FREIGHT NETWORK PROJECT LOCATION AND NEEDS LOCATION TRAVEL TIME RELIABILITY 2021



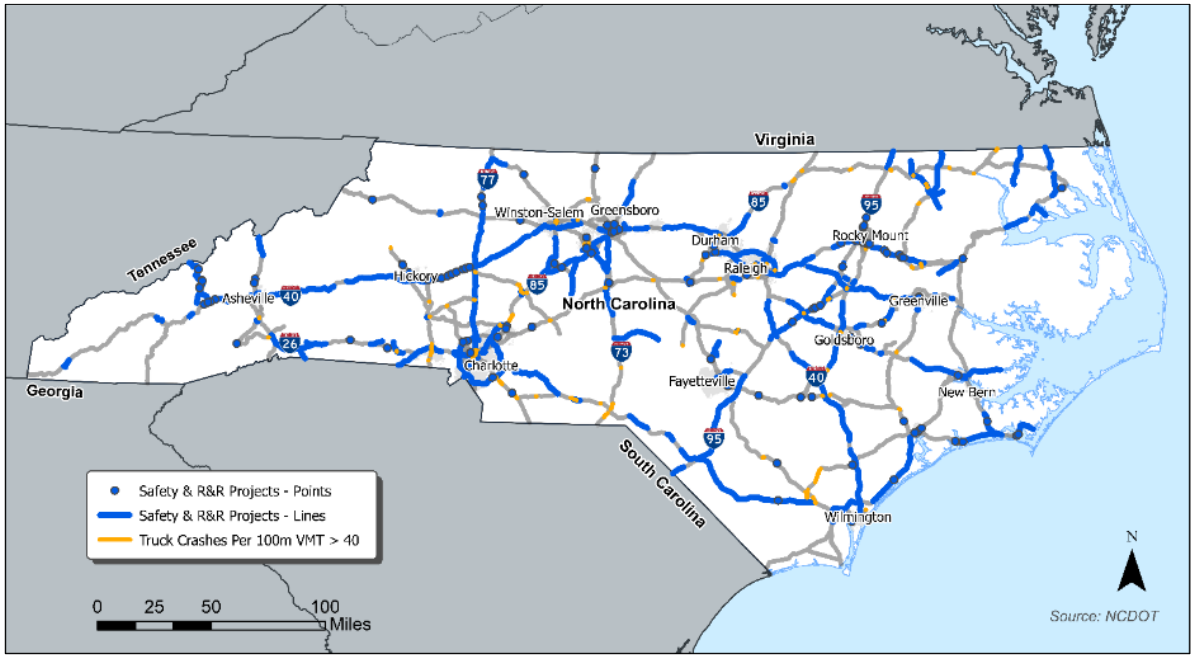
Safety

Safety on the NCHFN is addressed through a systemwide approach that includes repair & rehabilitation projects, inclusion of latest design standards into projects and projects that address identified safety needs. An overview of STIP 2020-2029 project locations and the associated needs assessment gaps is shown below. Truck crash rates per million VMT greater than 40 have been highlighted.

NORTH CAROLINA FREIGHT NETWORK PROJECT LOCATION AND NEEDS LOCATION V/C



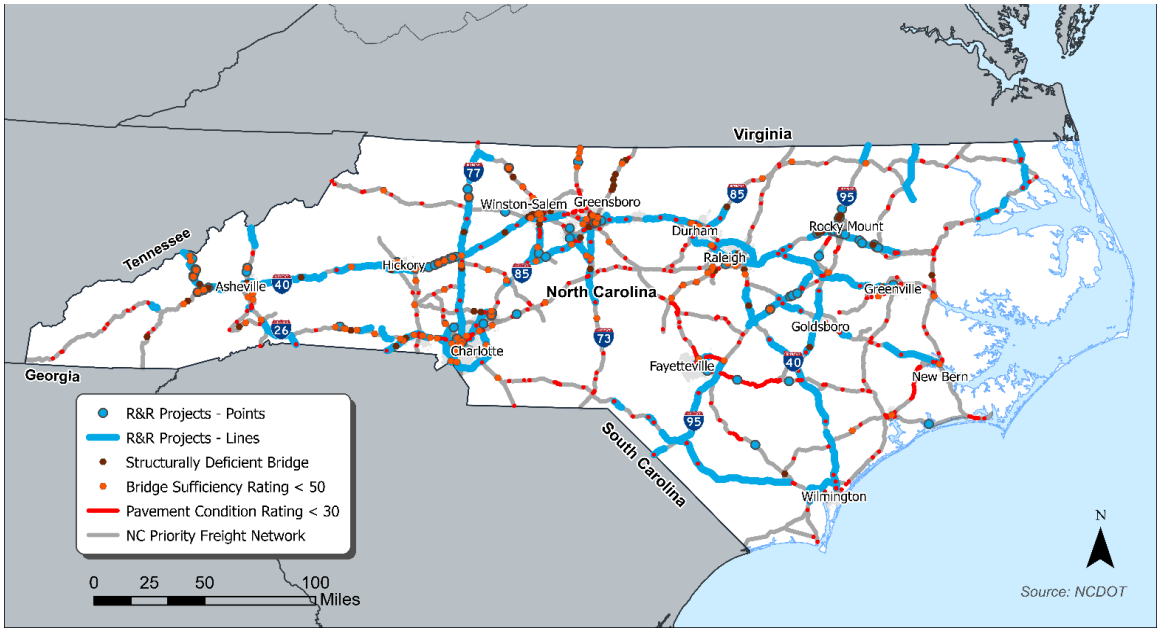
NORTH CAROLINA FREIGHT NETWORK PROJECT LOCATION AND NEEDS LOCATION SAFETY



Repair & Rehabilitation 2015-2019

Bridge sufficiency ratings less than 50, structurally deficient bridges, posted weight limit bridges, and pavement conditions less than 30 have been mapped.

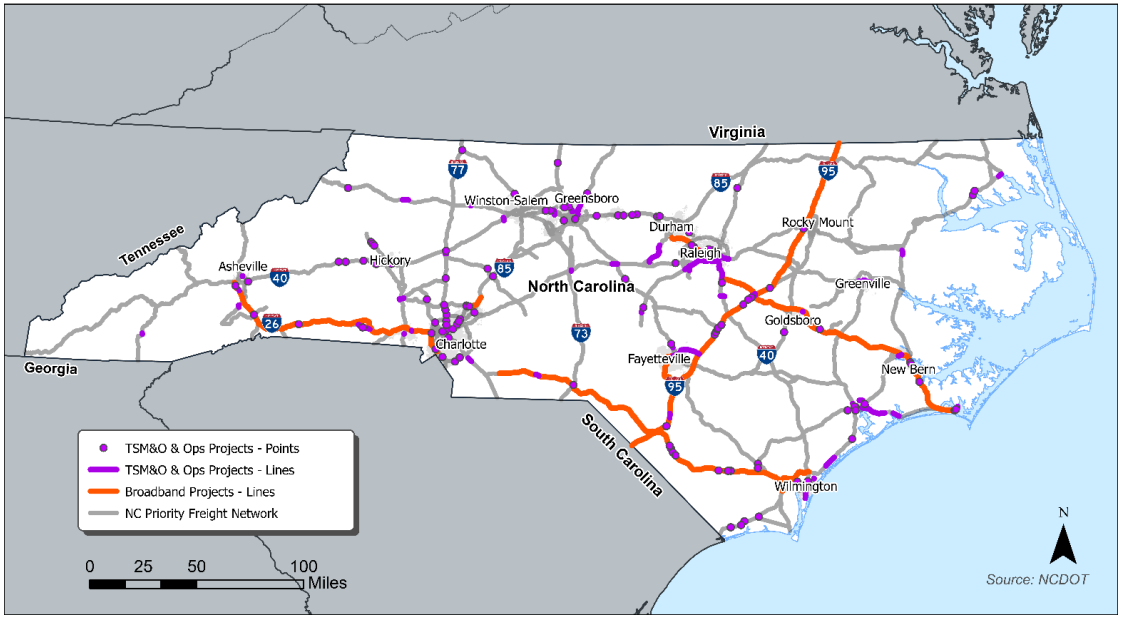
NORTH CAROLINA FREIGHT NETWORK PROJECT LOCATION AND NEEDS LOCATION REPAIR & REHABILITATION 2015-2019



TSM&O & Operations 2022

This plan recommends reviewing current broadband capabilities and DMS Signage on Interstates on the NCHFN. The interstate system provides the highest regional connectivity as well as serves the most truck miles traveled. Providing route options, travel times and other data on the Interstates will allow for improved operations during peak periods or incidents of non-recurring congestion.

NORTH CAROLINA FREIGHT NETWORK PROJECT LOCATION AND NEEDS LOCATION



Truck Parking

A truck parking study was conducted as part of this plan update. The purpose of this study is to conduct an analysis of the adequacy of truck parking facilities in the state of North Carolina and identify truck parking solutions that better serve freight transportation needs and provide a safer environment for the traveling public in and through North Carolina. This will be accomplished by utilizing the information provided in the 2017 and 2020 Truck Parking studies as a baseline. The study's key tasks include the following activities:

- Re-assess truck parking supply along the state's key freight routes;
- Assess demand for truck parking by reviewing truck growth along freight routes;
- Assess the best way to optimize public and private sector assets for truck parking;
- Identify public-private partnerships that may lead to increased truck parking; and
- Identify the costs and funding sources for increasing capacity of existing public truck parking facilities as well as converting existing rest areas, weigh stations and other assets to truck parking.

Truck parking strategies developed during the assessment include:

- Partner with truck travel centers seeking to expand facilities;
- Explore trial truck parking at selected weigh stations;
- Explore retrofitting selected abandoned rest areas;
- Explore using non-truck parking facilities for overnight truck parking;
- Conduct truck parking notification system pilot;
- Coordinate with Metropolitan Planning Organizations (MPO) and Rural Planning Organizations (RPO) on increasing awareness and acceptability; and.
- Convene a Standing Truck Parking Committee.

The following table is based on stakeholder feedback received during the development of this plan.

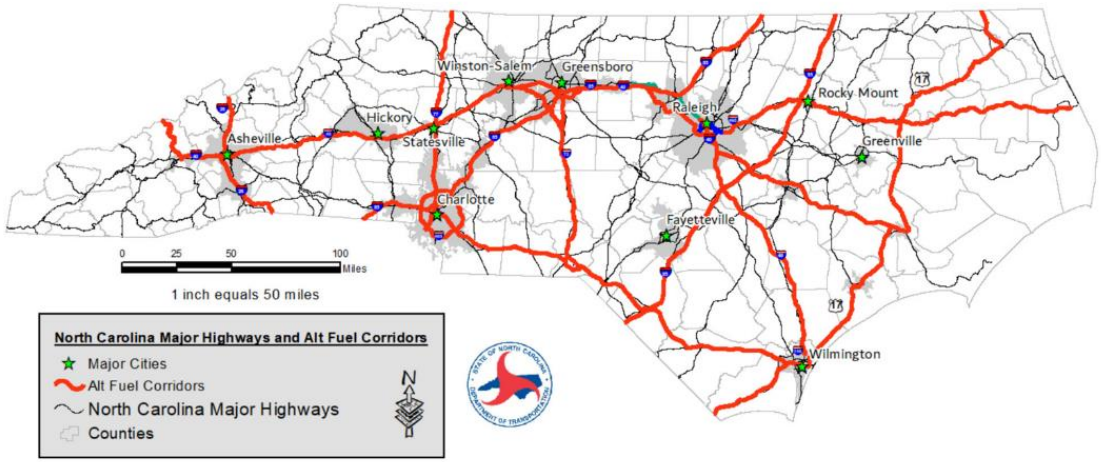
TRUCK PARKING NEEDS LOCATIONS

Project Name	County	Project Scope
I-95	Harnett, Cumberland, and Robeson	Additional Truck Parking
I-40; East of I-95	Johnston, Sampson, Duplin, Pender, New Hanover	
U.S. 401; North of Raleigh	Warren, Franklin, and Wake	
US 64 & US 17 Interchange; Williamston	Martin	
I-26; South of Asheville	Buncombe and Henderson	
I-85; West of Charlotte	Mecklenburg	
I-40; West of Asheville	Haywood and Buncombe	
Port of Wilmington; North and South Gate	New Hanover	
Alligator Tram Rd and Old Winberry Rd Intersection; near Port of Morehead City	Carteret	
NC 152; South of Salisbury (near Macy's fulfillment center, 1.2 million sq ft)	Rowan	
I-85 and U.S. 29; along Webb Rd (near 700k sq ft warehouse under construction)	Rowan	
I-85 and Long Ferry Rd Interchange (near Red Rocks development, 2.7 million sq ft)	Rowan	
U.S. 1; Southwest of Raleigh	Wake	
U.S. 421; near Greensboro Randolph Mega Site	Guilford	
I-85; near Walmart Distribution Center by Greensboro	Guilford	
I-40 and W Ten Rd; east of Greensboro	Guilford	
N.C. 87; along Ashley Loop	Rockingham	
I-95; near CCX facility north of Rocky Mount	Nash	

CAV and Alternative Fuels

Current use of alternative fuels in the freight industry are often limited to first-mile last-mile operations. Consistent with FHWA's criteria for Alternative Fuel Corridors as well as National Electrical Vehicle Infrastructure (NEVI) Program Guidance, co-location of freight alternative fuels infrastructure should be examined at locations where NEVI funding is being used. Initially, build out will occur along the State's alternative fuel corridors. NCDOT's NEVI plan is currently under development.

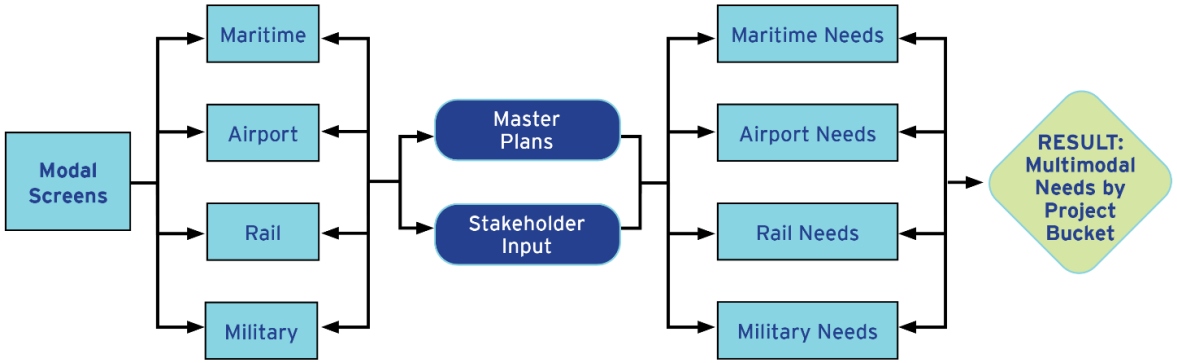
NORTH CAROLINA ALTERNATIVE FUELS CORRIDOR



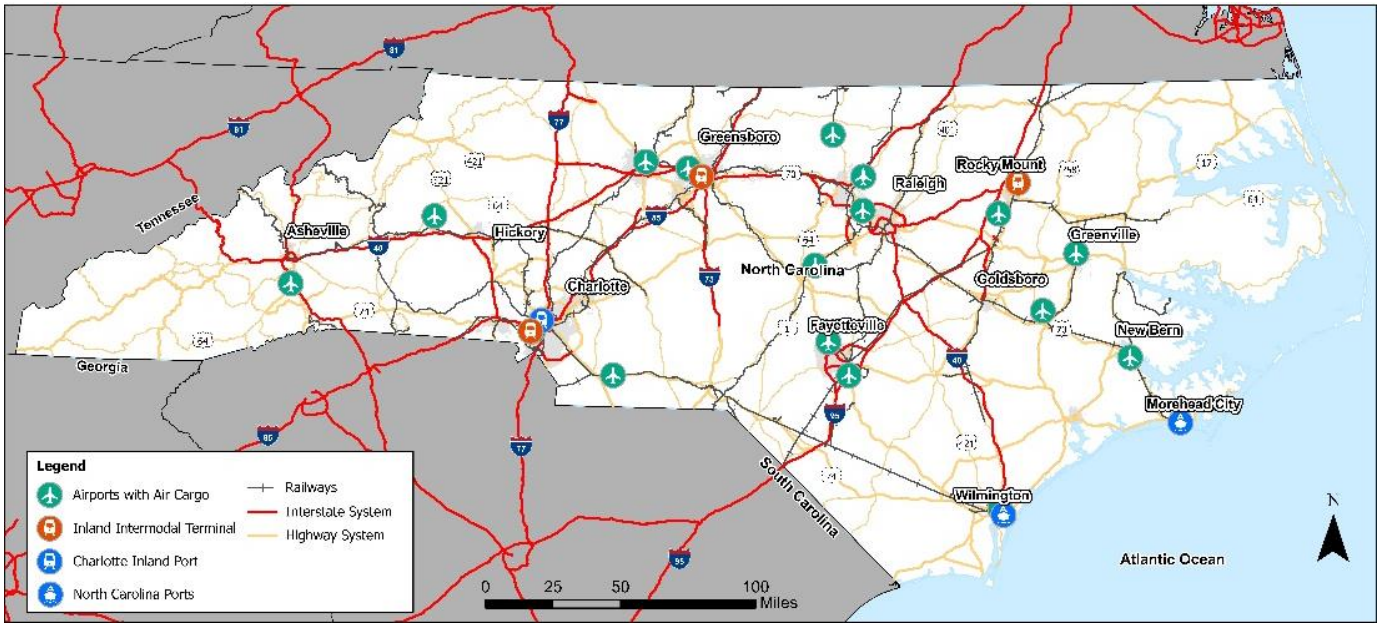
MULTIMODAL FREIGHT CONDITIONS ASSESSMENT

Additionally, a policy and plans review was conducted to provide a qualitative conditions assessment that focused on needs related to the North Carolina Multimodal Freight Network as well as future facing needs related to connected. The results and input provided during multimodal needs assessment efforts will be used to aid in the prioritization of freight projects during future STIP development activities.

MULTIMODAL CONDITIONS ASSESSMENT PROCESS



NORTH CAROLINA MULTIMODAL FREIGHT FACILITIES



RAIL CONDITIONS ANALYSIS

Plans Review

The 2021 Draft North Carolina State Rail Plan was reviewed during the development of the 2022 Rail Profile to get a better understanding of the current state of the State's rail system and identify existing deficiencies and project opportunities that can improve the efficiency of the system. Rail needs are included in Chapter 7.0 of this document.

Stakeholder Input

The Draft State Rail Plan was developed through the input and discussion of freight rail stakeholders. The main identified deficiency is congestion. Most of the rail lines are shared between freight and passenger services. There is a growing demand for passenger, intercity and commuter rail combined with capacity limits along the existing freight rail line that is causing congestion to grow. As noted in the Rail Profile, most of the Amtrak Passenger Rail delays are due to Freight Train Interference (FTI) lasting more than 360 minutes between the three main Class I Railroad lines. Additionally, there are infrastructure limitations such as narrow tunnels, utility lines and deficient bridges that restrict the ability to withstand oversized loads or to double stack containers. Overall, there is also a limited connectivity between modes, especially between rail and port, as well as last mile connections between the Class I railroads and short line railroads.

Through stakeholder input, project opportunities were identified in the Rail Needs table. Many of the projects include connector tracks that expand access to short line rail lines and ports, as well as redundant lines that can help relieve the congestion of the Class I rail lines. Other projects include upgrading track components and infrastructure that improves time efficiency and safety for rail. Project opportunities are summarized below:

RAIL NEEDS

Project Name	County	Project Scope
Forest City to Hamlet		Connector track between CSX SG-Line and SF-Line
Statewide		Passing siding and transloading track to expand capacity at short line facilities
South of Rockingham (South Carolina State Line) to North of Henderson (Virginia State Line)		S-Line and SA-Line Acquisition (Redundant rail corridor)

AIRPORT CONDITION ANALYSIS

Plans Review

The 2022 Air Cargo Profile and the 2015 North Carolina Airport System Plan Update were reviewed to get a better understanding of the current state of the State's airport system, identify existing deficiencies and project opportunities that can improve the efficiency of the system. Airport needs are included in Chapter 7.0 of this document.

Stakeholder Input

Airport authorities were interviewed for the development of the Air Cargo Profile including the Burlington-Alamance Airport Authority, Charlotte-Douglas International Airport, Piedmont Triad International Airport Authority, Raleigh-Durham International Airport and the NCDOT Aviation Division.

Through the interviews, it was discussed trucks have become a viable option for express delivery with the rise in demand from e-commerce. Expanding air cargo access can improve mobility and help maintain cargo as a competitive mode. Facility infrastructure and industrial development is other areas that can benefit from financial investment. The airport authorities have considered or have already developed expansion plans where the construction of storage facilities is being built on-site for tenants and customers to lease. Developing an industrial area around the airports can also help increase the value of air cargo services.

Project opportunities were also identified in these interviews. Most of the projects include creating better access to the airport facilities and upgrading and expanding the infrastructure to provide a more efficient service. Project opportunities are summarized below:

AIRPORT NEEDS

Project Name	County	Project Scope
Tucker St; East of Burlington-Alamance Airport	Alamance	Create access from Tucker St into facility
Hwy 49; East of Burlington-Alamance Airport	Alamance	Improvements
Hwy 62; West of Burlington-Alamance Airport	Alamance	Expansion
Burlington-Alamance Airport; On-campus	Alamance	Build storage sites for businesses
I-69; Piedmont Triad International Airport	Guilford	Proposed Interstate
Piedmont Triad International Airport; On-campus	Guilford	Proposed multimodal yard
Piedmont Triad International Airport; On-campus	Guilford	Proposed rail spur on the west side of the facility

PORTS CONDITION ANALYSIS

Plans Review

The 2022 Maritime Ports Profile was reviewed to get a better understanding of the current state of the State's Port system and identify existing deficiencies and project opportunities that can improve the efficiency of the system. Port needs are included in Chapter 7.0 of this document.

Stakeholder Input

The North Carolina State Ports Authority's Planning Director was interviewed for the development of the Ports Profile to learn more about the existing deficiencies and what projected projects in their 5-Year Capital Projects List were of most importance. Some of the identified deficiencies mostly involve congestion from the railroads and infrastructure and facility amenity limitations.

The Port of Morehead City experiences a bottleneck into the port's entrance for passenger vehicles. Due to the slow train speeds and the blocking of at-grade crossings, the highway corridor leading into the ports becomes congested. The Port of Wilmington experiences truck congestion on the access roads as they wait for trains to move from the at-grade crossings due to switching activities near the north entrance of the port.

The top priority projects for the North Caroline Ports Authority are summarized below:

PORT NEEDS

Project Name	County	Project Scope
Port of Wilmington; North Gate & Inland Road Improvements	New Hanover	New North gate; improvements to U-5734, U-5729, U.S. 74 & U.S. 70 to highway standards
Port of Wilmington; Channel Deepening	New Hanover	Deepening from 42 to 47 ft
Port of Morehead City; Expansion Capital	Carteret	New warehouse north of A-Frame building
Port of Morehead City; Expansion Capital	Carteret	Radio Island development and rail improvements
Port of Wilmington; Intermodal Rail Facility	New Hanover	Add dedicated intermodal rail facility at Port of Wilmington

PROJECT SCREENING AND PRIORITIZATION

Project Screening

The first step in the project screening and prioritization process involved a review of existing NCDOT STIP 2020-2029 highway and modal projects and scopes to further classify potential freight projects on the North Carolina Multimodal Freight Network for inclusion the Freight Plan. Projects were classified into six categories that include capacity to aid NCDOT in more easily identifying funding opportunities, implementation offices and partners, and schedules during the implementation of this Plan. The results of the quantitative analysis will serve as prioritization criteria in the reports following section.

NORTH CAROLINA STIP SCREENING AND CATEGORIZATION PROCESS

Project Categories

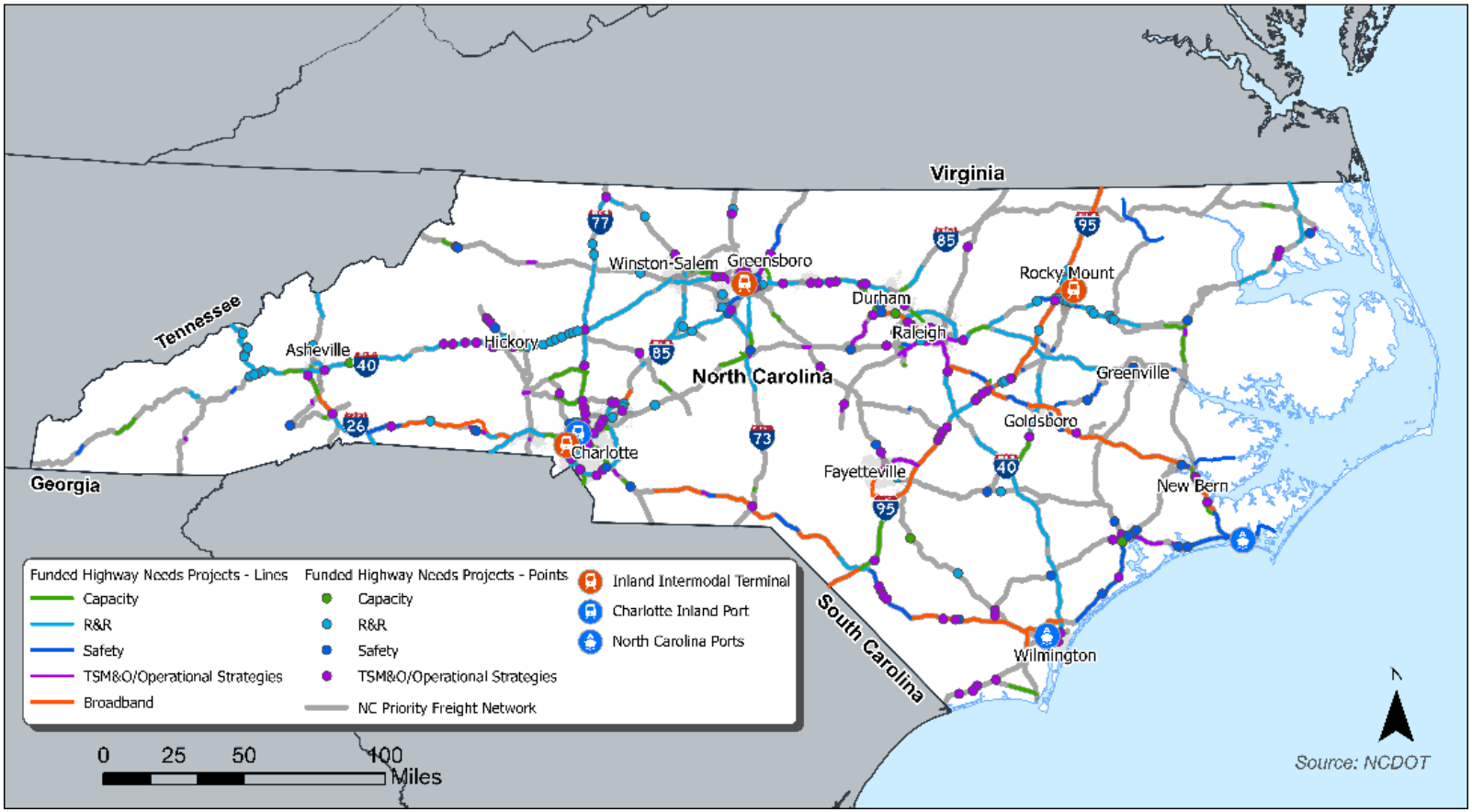
The STIP 2020-2029 Projects have been classified into five categories to aid NCDOT in more easily identifying funding opportunities, implementation offices and partners, and schedules during the implementation of this Plan.

- **Capacity:** Projects that require additional capacity (add lanes, new berth, cargo facility expansion, etc.)
- **Repair and Rehabilitation:** Projects requiring repair and rehabilitation of existing facilities (resurfacing, berth rehab, runway rehab, rail crossing improvements, etc.)
- **Transportation Systems Management and Operations (TSM&O)/Operational Strategies:** Projects to improve freight operations on the multimodal freight network that do not require major construction activities (traffic signal timing, dynamic messaging signs, turn lanes, intersection improvements, gate management systems, rail crossing signs, advanced notification systems, etc.)
- **Safety:** Projects to improve safety on the multimodal freight network for both freight carriers and the traveling public that address specific crash types (road departure, intersections, curvature/geometry, etc.)
- **Connected and Autonomous Vehicles / Alternative Fuels:** Projects focused on the development and adoption of connected/autonomous vehicle technology and alternative fuel regarding the freight industry (V2X infrastructure, enhanced striping and signage, alternative fuel accessibility, etc.)

NCDOT Freight Network Projects

The Freight Network Projects are categorized by project category. Additional information on NC Freight network projects' cost and scope can be located in the appendices of this document.

NORTH CAROLINA HIGHWAY FREIGHT NETWORK FUNDED PROJECTS



Existing Freight Prioritization Factors

Prioritization Freight Factors

The NCDOT Prioritization Factors are quantitative in nature. The current factors focus on identifying corridors with high freight related uses. An additional criterion is the future interstate completion factor which support the completion of interstate corridors between National Highway System Routes.

Truck Volume

Truck volume data is derived by multiplying the corridors truck percentage by the AADT. The raw measures data is then scaled.

$$Truck\ Volume\ Measure \times 0.50$$

Truck Percentage

Truck percentage data is derived from traffic surveys. The raw measures data is then scaled.

$$Truck\ Percentage \times 0.50$$

Future Interstate Completion Factor

$$\frac{Project\ Length}{Miles\ of\ Route\ between\ NHS\ Routes} \times 100$$

Complete Criteria

$$(Truck\ Volume\ Measure \times 0.50) + (Truck\ Percentage \times 0.50) + Future\ Interstate\ Completion\ Factor$$

Federal Freight Factors

The overarching goals for federal freight programs are outlined in the National Highway Freight Program and include:

- Investing in infrastructure and operational improvements that strengthen economic competitiveness, reduce congestion, reduce the cost of freight transportation, improve reliability and increase productivity;
- Improving the safety, security, efficiency and resiliency of freight transportation in rural and urban areas;
- Improving the state of good repair of the NHFN;
- Using innovation and advanced technology to improve NHFN safety, efficiency and reliability;
- Improving the efficiency and productivity of the NHFN;
- Improving state flexibility to support multi-state corridor planning and address highway freight connectivity; and
- Reducing the environmental impacts of freight movement on the NHFN.

Prioritization factors have been developed under individual competitive grant programs. A large majority of the competitive grant programs' applications require a benefit-cost analysis (BCA) or other quantitative measures that address project impacts. Therefore, as NCDOT undertakes freight prioritization, the focus should be on developing quantitative prioritization measures that can support future competitive grant applications.

Proposed Freight Prioritization Factors

Factors are intended to address multiple planning needs. These include:

- Quantifiable-Factors are generally quantitative and allow for uniform project comparison across project types. Factors are consistent with quantitative needs screening criteria developed in previous plan sections.
- Measurable-Factors are based upon publicly/NCDOT developed data and are based upon accepted methodologies. Additionally, project impacts can be measured over time and support system performance measurement.
- Aligned with national and state goals-factors are consistent with overarching goals for both FHWA and NCDOT freight programs and other plans such as the National Electric Vehicle Infrastructure (NEVI) Alternative Fuel Corridors (AFC) which identify electric vehicle charging station corridors.
- Support BCA-Factors can be used in the development of future BCAs to support competitive grant applications.

Congestion

Truck Travel Time Delay

Prioritization of corridors, interchanges, and intersections with excessive freight delay provides a uniform methodology to identify locations with the greatest opportunity to reduce delay. Additionally, reduction in delay supports multiple plan goals including increasing travel time reliability, reduction in emissions and economic competitiveness.

Future Volume/Capacity

Based on the expected conditions in 2045, V/C ratios provide insight into future capacity failures. Prioritizing based on roadway segments with the highest congestion provides the greatest opportunity to reduce delay. Reduction in delay supports multiple plan goals including increasing travel time reliability, reduction in emissions and economic competitiveness.

Stakeholder Identified Issues

Input from stakeholders on issues along the North Carolina Highway Freight Network (NCHFN) help to verify problem locations identified through quantitative analysis. Additionally, stakeholder input is important for future narrative development on project needs and impacts.

Safety

Segment Truck Crash Rate

Segment crash rates help to identify corridors with a greater than expected number of accidents in comparison to other segments of the NCFN. These locations provide the opportunity to identify correctable crashes that may be addressed during a projects design. A freight network with reduced incidents of non-reoccurring congestion support goals of safety, travel time reliability and emissions reductions.

Replacement & Rehabilitation

Bridge Condition-Structurally Obsolete

Addressing bridges along the NCFN that are structurally obsolete will reduce the potential for bridge closures and freight related detours. A freight network with structurally sound bridge sub- and superstructure ensures route options for drives, supports network resiliency in case of closures along other segments of the NCFN and enhances economic competitiveness.

Posted Bridges

Addressing bridges along the NCFN that have posted weight limits will reduce the potential for freight related detours. A freight network that can accommodate all truck classes ensures route options for drives, supports network resiliency in case of closures along other segments of the NCFN and enhances economic competitiveness.

Pavement Condition Rating

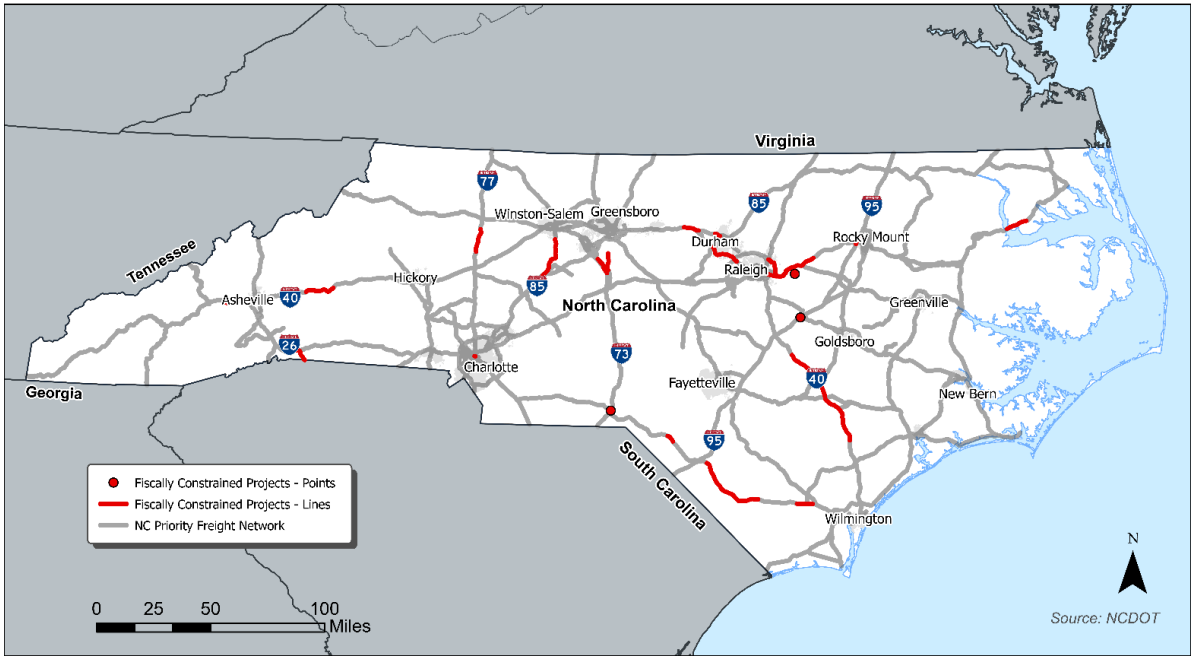
Substandard pavement condition creates safety issues, increases vehicle maintenance cost, and increase emissions. Keeping the pavement within an acceptable condition on the NCFN addresses the three issues previously identified and helps contribute to the State's overall economic competitiveness.

Funded and Unfunded Freight Projects

National Highway Freight Program Funded Projects

NCDOT has previously identified projects receiving NHFP funding. These projects will continue under this plan. A project table has been provided as well.

NATIONAL HIGHWAY FREIGHT PROGRAM FUNDED PROJECTS 2023-2028



NATIONAL HIGHWAY FREIGHT PROGRAM FUNDED PROJECTS IN MILLIONS OF DOLLARS

Project Name	TIP / Project Number	County	Programmed Project Cost ($M)	Total Federal Share ** ($M)	NHFP ($M)	Match ($M)	Source of Match
2023			**$60.11**	**$48.08**	**$36.16**	**$5.47**	
Asset Management and Utilization			**$60.11**	**$48.08**	**$36.16**	**$5.47**	
US 64: SR 1306 (South Old Franklin Road) to SR 1603 (Old Carriage Road). Pavement Rehabilitation.	I-6045	Nash	$19.30	$15.44	$12.66	$3.86	State Highway Trust Fund
US 74 (Future I-74): East of NC 41 to the Columbus County Line. Pavement Rehabilitation.	HI-0016	Robeson	$9.20	$7.36	$6.25	$1.84	State Highway Trust Fund
US 74 (Future I-74): Scotland County Line to I-74/US 74 Business. Pavement Rehabilitation.	HI-0017	Robeson	$3.00	$2.40	$2.00	$0.60	State Highway Trust Fund
I-26: Mile Marker 65 to South Carolina State Line. Pavement Rehabilitation.	I-5927	Polk	$20.60	$16.48	$13.85	$4.12	State Highway Trust Fund
I-277: West of I-77 to East of I-77. Bridge Rehabilitation.	I-6052	Mecklenburg	$8.01	$6.40	$1.40	$1.61	State Highway Trust Fund
2024			**$29.96**	**$23.96**	**$36.88**	**$6.00**	
Asset Management and Utilization			**$29.96**	**$23.96**	**$36.88**	**$6.00**	
I-40: East of SR 1224 (Monte Vista Road) to pavement joint West of SR 3412 (Sand Hill Road). Reconstruct pavement.	I-2513AA	Buncombe	$31.70	$25.36	$19.88	$6.34	State Highway Trust Fund
US 74 (Future I-74): East of NC 214 to the West of SR 1824 (Water Tank Road). Pavement Rehabilitation.	HI-0015	Columbus	$7.70	$6.16	$4.00	$1.54	State Highway Trust Fund

I-95: SR 1770 (Sunset Avenue) to SR 1544 (North Halifax Road). Pavement and Bridge Rehabilitation.	I-5934	Nash	$5.46	$4.36	$3.50	$1.10	State Highway Trust Fund
I-85: Orange County Line to US 15/ US 501 In Durham. Pavement Rehabilitation.	I-5941	Durham	$16.80	$13.44	$9.50	$3.36	State Highway Trust Fund

Project Name	TIP / Project Number	County	Programmed Project Cost ($M)	Total Federal Share ** ($M)	NHFP ($M)	Match ($M)	Source of Match
2025			**$128.87**	**$103.07**	**$37.62**	**$25.80**	
Asset Management and Utilization			**$128.87**	**$103.07**	**$37.62**	**$25.80**	
I-285 / US 52 / NC 8: I-85 to Forsyth County Line. Pavement Rehabilitation.	HI-0005	Davidson	$30.15	$24.11	$9.52	$6.04	State Highway Trust Fund
I-40: Mile Marker 73 to Mile Marker 86. Pavement Rehabilitation.	I-5900	McDowell	$25.11	$20.08	$8.60	$5.03	State Highway Trust Fund
I-40: East of NC 147 to SR 3015 (Airport Boulevard). Pavement Rehabilitation.	I-5995	Wake, Durham	$32.41	$25.92	$9.50	$6.49	State Highway Trust Fund
I-87 / Future I-87 / US 64 / US 264: SR 1003 (Rolesville Road) to Nash County Line. Pavement Rehabilitation.	I-6001	Franklin, Wake	$41.20	$32.96	$10.00	$8.24	State Highway Trust Fund
2026			**$75.79**	**$60.62**	**$38.37**	**$15.17**	
Asset Management and Utilization			**$75.79**	**$60.62**	**$38.37**	**$15.17**	
I-77: Mile Marker 58.4 to Yadkin County Line. Pavement Rehabilitation.	I-5920	Iredell	$19.29	$15.42	$12.37	$3.87	State Highway Trust Fund
I-87 / US 64 / US 264: I-440 in Raleigh to SR 1003 (Rolesville Road). Pavement Rehabilitation.	I-5944	Wake	$28.60	$22.88	$13.00	$5.72	State Highway Trust Fund
I-540: Triangle Town Center Boulevard in Raleigh to I-87/US 64/US 264 in Knightdale. Pavement Rehabilitation.	I-5945	Wake	$27.90	$22.32	$13.00	$5.58	State Highway Trust Fund

NATIONAL HIGHWAY FREIGHT PROGRAM FUNDED PROJECTS IN MILLIONS OF DOLLARS

Project Name	TIP / Project Number	County	Programmed Project Cost ($M)	Total Federal Share ** ($M)	NHFP ($M)	Match ($M)	Source of Match
2027			**$54.70**	**$43.76**	**$39.14**	**$10.94**	
Asset Management and Utilization			**$54.70**	**$43.76**	**$39.14**	**$10.94**	
I-40: SR 1001 (Sugar Hill Road) to NC 226. Pavement Rehabilitation.	HI-0009	McDowell	$14.90	$11.92	$9.89	$2.98	State Highway Trust Fund
US 74 (Future I-74): West of SR 1585 (Union Valley Road) to West of US 701 Business. Pavement Rehabilitation.	HI-0019	Columbus	$5.40	$4.32	$4.00	$1.08	State Highway Trust Fund
US 74 (Future I-74): Robeson County Line to West of SR 1585 (Union Valley Road). Pavement Rehabilitation.	HI-0020	Columbus	$15.00	$12.00	$11.50	$3.00	State Highway Trust Fund
I-40: Mile Marker 34 to Buncombe County Line. Pavement Rehabilitation.	I-5928	Haywood	$9.75	$7.80	$6.75	$1.95	State Highway Trust Fund
I-40/ I-85: West of SR 1114 (Buckhorn Road) to West of SR 1006 (Orange Grove Road). Pavement Rehabilitation.	I-5958	Orange	$9.65	$7.72	$7.00	$1.93	State Highway Trust Fund
2028			**$78.01**	**$62.40**	**$39.92**	**$15.61**	
Asset Management and Utilization			**$78.01**	**$62.40**	**$39.92**	**$15.61**	
I-73 / US 220: SR 1009 (Old US Highway 311) to Guilford County Line. Pavement Rehabilitation.	HI-0003	Randolph	$8.12	$6.49	$4.00	$1.63	State Highway Trust Fund
I-74: SR 1928 (Cedar Square Road) to I-73/ US 220. Pavement Rehabilitation.	HI-0004	Randolph	$8.14	$6.51	$4.00	$1.63	State Highway Trust Fund
I-40: Johnston County Line to the Duplin County Line. Pavement Rehabilitation.	HI-0011	Sampson	$22.40	$17.92	$10.00	$4.48	State Highway Trust Fund
I-40: Sampson County Line to the Pender County Line. Pavement Rehabilitation.	HI-0012	Duplin	$31.10	$24.88	$17.92	$6.22	State Highway Trust Fund
US 17 (Future I-87): Bertie County Line to Perquimans County Line. Pavement Rehabilitation.	I-6027	Chowan	$8.25	$6.60	$4.00	$1.65	State Highway Trust Fund

Highway

Project Name	County	Project Scope
I-87/ U.S. 17	Perquimans	Convert at-grade intersection to an interchange
U.S. 74, U.S. 76	Columbus	Upgrade at-grade intersection to interchange
U.S. 74	Columbus	Convert at grade intersection to grade separation
Kivett Drive	Guilford	Convert a grade separation of Kivett Drive and I-85 to an interchange
I-85 Business, U.S. 29, U.S. 70	Davidson	Re-construct interchange at intersection of I-85 Business/U.S. 29/70 & U.S. 64 East of Lexington
N.C. 55 Bypass	Wake	Upgrade existing at grade intersection to interchange
N.C. 55 Bypass (Main Street)	Wake	Upgrade existing at grade intersection to interchange
U.S. 220	Rockingham	Reconfigure interchange
U.S. 17 (Shallotte Bypass)	Brunswick	Upgrade existing at grade intersection to interchange
U.S. 117	Duplin	Upgrade at-grade intersection to interchange
N.C. 54 (Raleigh Road)	Orange	Improve interchange
U.S. 15, U.S. 501	Orange	Intersection improvement for a standalone superstreet intersection concept, improve interchange
N.C. 24 (Kenansville Bypass)	Duplin	Improve intersection
U.S. 421 (Former I-40 Business)	Forsyth	Upgrade interchange to improve safety and capacity
I-77	Mecklenburg	Convert existing diamond interchange with two loops to a diverging diamond
U.S. 1	Wake	Improve interchange to 6 lane DDI
U.S. 220	Rockingham	N.C. 770 Bridge over U.S. 220 needs to be widened and ramps upgraded to Interstate standards
I-42, U.S. 70	Craven	Improve interchange
SR 1437 (Old Fayetteville Road	Brunswick	Convert grade-separation to an interchange
U.S. 158 Bypass	Warren	Add northeast bound left turn lane
U.S. 421	Chatham	Construct interchange at U.S. 421 and N.C. 902
I-95	Johnston	Improve interchange to current standards allowing for future widening of I-95
I-40	Forsyth	Add Lanes to I-40 WB exit loop, modify traffic signal at intersection of U.S. 158. Extend deceleration lane on I-40 WB
U.S. 1	Lee	Construct single roundabout at intersection of U.S. 421 on/off ramps for southbound direction and N.C. 42 (western intersection)
I-40	Buncombe	Upgrade interchange
U.S. 321 Business (North Carolina Ave/Main Street)	Catawba	Realign offset intersections connecting U.S. 321 (BUS) North Carolina Avenue) to S.R. 2003 (S. Main Ave)
I-85	Mecklenburg	Conversion of existing interchange to diverging diamond interchange, includes improvements at the Hoskins Road intersection
U.S. 258 (Richlands Hwy), N.C. 24	Onslow	Add right turn lane on northbound U.S. 258 and right turn lane on S.R. 1329
I-85	Mecklenburg	Construct two additional constrained loops within the interchange

Project Name	County	Project Scope
I-440	Wake	Upgrade existing interchange to folded interchange concept on the existing structure
U.S. 258 (Mutual Boulevard)	Edgecombe	Construct U.S. 64 Westbound off-ramp and upgrade interchange to interstate standards for future I-87
U.S. 74	Mecklenburg	Construct Express Lanes Ramp Connectors through the U.S. 74/I-485 interchange in Matthews.
I-485	Mecklenburg	Convert the existing diamond interchange at I-485/Rocky River Road to a DDI interchange design
I-485, N.C. 51 (Pineville-Matthews Road)	Mecklenburg	This project is intended to make improvements to the I-485/N.C. 51 interchange and make operational improvements along N.C. 51 between Park Road and Polk Street in Pineville
I-485	Mecklenburg	This project is intended to improve the interchange at I-485/N.C. 49 in southwest Charlotte. Additional improvements will be needed along N.C. 49 between Arrowood Road and Westinghouse Boulevard to reduce congestion and improve traffic operations.
I-277	Mecklenburg	Upgrade numerous interchanges and ramps along the I-277 Loop in Uptown Charlotte to improve safety mobility and capacity
I-40	Buncombe	Upgrade interchange improve EB off-ramp connection to S.R. 2838 (Porters Cove Road)
Apex Citywide Signal System	Wake	Upgrade existing infrastructure and install new fiber controllers signals and other equipment as necessary
N.C. 24 (Southwest Boulevard), N.C. 24 (MLK Jr Boulevard0	Sampson	Construct roundabout or other improvement at the intersection of N.C. 24 and Butler Rd/Tram Rd
I-540	Wake	Improve interchange through ramp improvements and improvements along Buffaloe Rd to reduce delay at interchange
N.C. 55	Durham	Add third SB lane on N.C. 55 from Meridian to I-40 EB on-ramp and improve ramp terminals. Also Add bike/ped facilities
I-40/ I-85	Alamance	Upgrade interchange and capture some developments that are going on north and south of the interstate
I-74/U.S. 74	Columbus	Upgrade the interchange on Future I-74/U.S. 74 at U.S. 76 from a trumpet to a collector/distributor and add ramps to S.R. 1005 (Peacock Rd)
U.S. 17 Business (MLK Jr Boulevard)	Craven	Upgrade intersection into the Chick-fil-a restaurant/Twin Rivers Mall entrance
I-240	Buncombe	Improve Interchange
U.S. 64	Randolph	Conversion of the intersection of E. Salisbury St. and U.S. 64 into a traditional 3-way signalized intersection
N.C. 87	Lee	Improve intersection to superstreet
U.S. 258, N.C. 24	Onslow	Install a traffic signal. Add a right turn lane from northbound U.S. 258/N.C. 24 to W. Franck Street).
U.S. 17	Onslow	Preferred improvement is a Reduced Conflict Intersection (RCI). Add additional left and right turning lanes to westbound N.C. 50. Extend right turn lane on northbound U.S. 17.
U.S. 64 (Mocksville Road)	Davidson	Upgrade intersection of ramps from U.S. 52 (I-285) at U.S. 64 with installation of RAB's at each ramp.
U.S. 17	Bertie	Construct interchange to allow mobility for future I-87
U.S. 70	Craven	Improve Hwy 70/Future I-42 interchange over U.S. 17 Business/Martin Luther King Jr. Blvd.
N.C. 16	Lincoln	Convert the at grade intersection of N.C. 16 and Saint James Church Rd to an interchange.

Project Name	County	Project Scope
N.C. 49	Stanly	Improve the intersection stem alignment to a more perpendicular setting and add a right turn lane with wider radius to accommodate larger vehicles. In addition, add a left turn lane from NC49 onto Wesley Chapel Road.
SR 1412 (New Road)	Pender	Convert Grade Separation of I-40 and SR 1412 (New Road) to an Interchange to relieve existing congestion of I-40 and N.C. 210 interchange.
I-40	Durham	Widen the I-40 eastbound exit ramp to provide an exclusive left turn lane onto Davis Drive and provide additional stacking capacity. Widen the I-40 eastbound entrance ramp to provide receiving lanes and construct additional northbound right turn lane on Davis Drive. Extend southbound left turn lane on Davis Drive for the eastbound I-40 entrance ramp.
I-85	Mecklenburg	Convert existing interchange to diverging diamond interchange
I-40	Catawba	Construct roundabouts at both ramp terminals.
SR 2114 (McCanless Road)	Rowan	Construct a grade separated interchange
I-40, I-85	Guilford	This project is to improve the interchange by constructing roundabout at the westbound I-40/85 off-ramp/on-ramp, implementing access management on Mt. Hope Church Road and also the realignment of Knox Road northwest of the interchange.
Greensboro Citywide Signal System	Guilford	Upgrade signal system to implement ATSPM (Automated Traffic Signal Performance Measures) using video-based detection and high-resolution data collection capabilities to improve efficiency and reduce congestion. Includes purchase installation and integration of new central signal system software as well as local field software installation video detection equipment and associated equipment upgrades. Approximately 525 intersections. GUAMPO has a detailed cost estimate of $12 million.
N.C. 24, N.C. 87	Harnett	Upgrade at-grade intersection to an interchange.
I-85	Davidson	Operational Improvements in and around the I-85 and N.C. 109 interchange.
US 70 (Wendover Avenue)	Guilford	Improve interchange to remove some free-flowing ramps to eliminate portions or all of the cloverleaf interchange that will provide a smaller footprint and provide improved bicycle and pedestrian accommodations.
US 52, N.C. 49	Stanly	Modernize Intersection
US 74	Anson	Define Movement at problem intersections. Movement in two ""inner city"" intersections should be evaluated as part of this study.
US 74	Anson	Enhance movement between vehicles and pedestrians.
US 52 (Future I-285)	Forsyth	Upgrade Akron Drive bridge over existing U.S. 52 (Future I-285) to accommodate a future 6 lane interstate facility. Tie into existing ramps with associated roadway and bridge improvements on Akron Drive between Sheraton Street & Ogburn Avenue. Remove driveway access off of SB U.S. 52 Ramp. Ramp construction on Akron Drive associated with new bridge upgrade will tie into existing acceleration/deceleration ramps currently in use.
South Main Street	Davidson	Improve the existing intersection with one that will better accommodate traffic.
I-42, 70 Bypass	Johnston	Construct full cloverleaf interchange at U.S. 70 BYP and I-95. Project will include relocating a section of I-95 along with other various improvements. See FS-1604A for details.
US 264 Alternate (Raleigh Rd Pkwy West)	Wilson	Upgrade intersection with roundabout.

Project Name	County	Project Scope
SR 2147 (Westmoreland Road) in Cornelius	Mecklenburg	Convert existing grade separation to SPUI interchange
US 521 (Johnston Road)	Mecklenburg	Construct grade separation on U.S. 521 at Ballantyne Commons Parkway and southbound auxiliary lane from I-485 Outer exit ramp to Ballantyne Commons Parkway
N.C. 16 (Brookshire Boulevard)	Mecklenburg	Intersection Improvements
I-485	Mecklenburg	Interchange improvements
I-40, I-540	Wake	Construct access road along I-40 westbound from east of I-540 ramp to Page Road as per NCDOT study recommendations.
US 1	Wake	Convert signalized intersection to interchange based on City of Raleigh corridor study conducted by WSP.
US 19, U.S. 129, U.S. 74	Graham, Cherokee	Modernize Roadway
I-26, U.S. 19, U.S. 23	Buncombe	Upgrade existing 4-lane section to Interstate Standards
I-26, U.S. 19, U.S. 23	Buncombe	Upgrade existing 4-lane section to Interstate Standards
US 74	Scotland, Robeson	Upgrade Freeway to Interstate Standards
I-26	Henderson	Add Additional Lanes.
I-74, U.S. 52	Surry, Stokes, Forsyth	N.C. 65 in Winston-Salem to I-74 in Surry County. Upgrade to interstate standards.
I-73, I-74, U.S. 220	Montgomery	Upgrade freeway to interstate standards
U.S. 64	Davidson	Widen to Multi-Lanes.
U.S. 1	Richmond	Widen to Multi-Lanes.
U.S. 13	Gates	Widen to Multi-Lanes.
U.S. 17	Craven	Widen to Multi-Lanes.
U.S. 17	Beaufort	Widen to Multi-Lanes. Project ends 0.4 miles South of S.R. 1127 to join up with existing 4-lane section.
N.C. 49	Stanly	Widen to Multi-Lanes to make facility continuous.
N.C. 49	Randolph	Widen to Multi-lanes.
I-42, U.S. 70	Lenoir, Jones	Upgrade Roadway to Freeway.
N.C. 87	Bladen	Widen to Multi-Lanes.
N.C. 87	Bladen, Columbus	Widen to 4 lanes from S.R. 1730 (Elwell Ferry Road) in Bladen County to R-2561CA at SR 1808 (Woodyard Road) in Columbus County.
N.C. 87	Columbus	Widen to 4 lanes from R-2561CA at S.R. 1811 (Narrow Gap Road) to U.S. 74 / 76.
U.S. 158	Guilford, Gates, Pasquotank	Widen to Multi-Lanes.
U.S. 158	Rockingham, Guilford	Modernize
U.S. 158, N.C. 903	Halifax	Widen to Multi-Lanes.
U.S. 158	Northampton	Widen to Multi-Lanes Part on New Location.
U.S. 158	Warren, Halifax	Widen to Multi-Lanes with Bypasses of Norlina Macon and Littleton on New Location
U.S. 74, U.S. 76	Brunswick, Columbus	Upgrade Roadway to interstate Standards
U.S. 70, N.C. 12	Carteret	Upgrade Existing Roadway.

Project Name	County	Project Scope
U.S. 321	Caldwell	Add Additional Lanes.
N.C. 58 (Kingold Boulevard)	Greene	Widen Existing Two-Lane Road to Four Lanes with depressed median and access management improvements.
U.S. 23, U.S. 441	Macon	Implement Access Management Strategies.
N.C. 53	Pender	Modernize N.C. 53 in Burgaw from U.S. 117 Bypass to SR 1400 (Smith St) and construct streetscape improvements per the N.C. 53 Corridor Study
N.C. 211	Brunswick	Widen N.C. 211 to 4 lanes from U.S. 17 in Supply to SR 1112 (Sunset Harbor Rd) per Feasibility Study WS-40814
I-74, U.S. 74	Columbus, Robeson	Upgrade U.S. 74 to Interstate Standards
N.C. 68	Guilford	Widen from 4 Lane Divided to 6 Lane Divided.
U.S. 117	Duplin, Sampson	Upgrade U.S. 117 to Interstate with interchanges at U.S. 117 and N.C. 50
U.S. 117	Wayne, Duplin	Upgrade U.S. 117 to Interstate with an interchange at S.R. 1147.
U.S. 421 (Former I-40 Business)	Forsyth, Guilford	Widen to 6 Lane Freeway.
N.C. 46, U.S. 158	Northampton	Widen to Multi-Lanes with Bypass of Jackson Part on New Location.
I-95	Robeson	Widen Roadway to 6 Lanes.
I-95	Cumberland	Widen Roadway to 8 Lanes.
I-95	Northampton, Halifax	Widen Roadway to 6 Lanes.
I-77	Mecklenburg	Widen existing freeway by constructing four managed lanes (two in each direction) does not include the cost of the I-277 (Belk Frwy) interchange but does include the cost of the I-277 (Brookshire Frwy) interchange.
U.S. 13, U.S. 258	Greene	From the U.S. 13 Bypass to the intersection of the proposed U.S. 258 Bypass upgrade to a 4-lane divided boulevard. From the proposed U.S. 258 Bypass to the U.S. 13/U.S. 258 split improve to a 4-lane median-divided expressway.
I-87, U.S. 64	Edgecombe, Nash, Franklin	Upgrade U.S. 64 to Interstate Standards. Project consists of two segments on either side of Rocky Mount MPO.
I-587, U.S. 264	Pitt, Greene	Upgrade roadway to interstate standards
I-87, U.S. 17	Bertie, Martin	Upgrade roadway to Interstate. By improving the current major thoroughfare to an interstate, the project is intended to improve mobility, connectivity, as well as encouraging economic development. In conjunction with these improvements, the safety along the corridor should increase as access is more appropriately managed.
I-87, U.S. 17	Bertie	Upgrade roadway to Interstate
I-87, U.S. 17 (Windsor Bypass)	Bertie	Upgrade freeway to interstate standards
I-87, U.S. 17 (Elizabeth City Bypass)	Pasquotank	Upgrade freeway to interstate standards
U.S. 74	Rutherford, Polk, Cleveland	Upgrade freeway to interstate standards
I-87, U.S. 17	Perquimans, Chowan, Pasquotank, Camden	Upgrade roadway to Interstate
I-40	Buncombe	Widen Existing Roadway

Project Name	County	Project Scope
U.S. 220	Rockingham	Upgrade U.S. 220 expressway to interstate standards.
U.S. 264	Pitt, Beaufort	Upgrade roadway to freeway standards.
U.S. 15, U.S. 501	Orange, Durham	Construct capacity and operational improvements and add sidewalks, side paths, and transit accommodations.
U.S. 1, U.S. 158	Vance, Warren	Widen Roadway
I-77	Iredell	Widen from N.C. 150 in Mooresville to I-40 in Statesville
N.C. 24, N.C. 87	Harnett	Widen roadway to 6 lanes and add sidewalks and bike lanes or a multi-use path on both sides of the road.
N.C. 24, N.C. 87	Cumberland, Harnett	Widen to 6 lanes with median
U.S. 17 (Wilmington Hwy)	Onslow	Improve multiple intersections along corridor from S.R.1119 (High Hill Rd) to SR 116 (Onslow Pines Rd).
U.S. 17 (Martin Luther King Jr. Boulevard)	Craven	Limit turning movements of cross-streets- Request the Congestion Management Team recommend an appropriate concept based on their expertise
U.S. 13, N.C. 11	Pitt, Edgecombe	Upgrade roadway to Interstate Standards. Note: Existing median type is depressed grass but there is no guardrail. There was not an option for depressed grass median with no guardrail.
U.S. 220	Rockingham	Upgrade U.S. 220 expressway to freeway standards.
SR 1200 (Stantonburg Road)	Pitt	Construct medians with specified turn lanes sidewalks on each side and protected bike lane.
U.S. 17 Business (Marine Boulevard)	Onslow	Improve multiple intersections along corridor between N.C. 24 EB off-ramp and U.S. 258 signalized intersection.
N.C. 73	Lincoln	Widen from 2 to 4 lanes from Anderson Creek west of S.R. 1383 (Ingleside Farm Rd) to N.C. 16 including widening of railroad bridge and interchange improvements at N.C. 16.
I-40	Iredell	Widen from four lanes to six lanes as recommended by FS-1512A in 2016
U.S. 64	Nash, Edgecombe	Upgrade U.S. 64 to Interstate 87.
U.S. 17	Craven, Beaufort	Widen to Multi-Lanes. Project ends.4 miles South of SR1127 to join up with existing 4-lane section.
U.S. 158 (Murfreesboro Bypass)	Hertford, Northampton	Convert multi lane divided section to superstreet concept to match segment from U.S. 158 Business east to U.S. 13 near Winton. Included with the superstreet concept will be an interchange at the intersection of U.S. 158, U.S. 258 and N.C. 11. Also included will be the realignment of SR 1179 Chowan College Rd. eastward tying into U.S. 258 north of the proposed interchange approach fill section.
I-40	Catawba	Widen roadway to six lanes.
U.S. 74	Cherokee, Macon	Widen roadway to multi-lanes and add paved shoulders.
U.S. 220 (North Fayetteville Street)	Randolph	Widen to multi-lanes.
I-85	Durham	Widen roadway and improve ramps (lengthen on ramps and remove two-way ramps).
N.C. 16 (Brookshire Boulevard)	Mecklenburg	Widen from 4 lanes to 6 lanes with median and multi-use path.
U.S. 29	Guilford	Implement access management and safety improvements. Includes ramp closures and consolidations.
I-540	Wake, Durham	Implement managed motorways along corridor and construct managed shoulders in both directions along I-540. Managed shoulders are expected to be in operation for approx. 3 hours during morning and evening peak periods (6 hours total).

Project Name	County	Project Scope
I-87, U.S. 64	Wake	Widen interstate to 8 lanes and include managed motorways components along corridor from I-540 to U.S. 64 BUS.
N.C. 24 (West Corbett Avenue)	Onslow	Construct superstreet/superstreet intersection along N.C. 24 corridor from Belgrade-Swansboro to Front Street before crossing bridge. Improve safety and eliminate left turns.
I-485	Mecklenburg	Construct one Express Lane in each direction (in the median) on I-485 between I-77 and I-85 in southwest Charlotte
I-485	Mecklenburg	Construct one Express Lane in each direction along I-485 in the median between the U.S. 74 interchange (Exit 51) and the N.C. 24/27 interchange (Exit 41) at Albemarle Road
U.S. 220 (North Fayetteville Street)	Randolph	Widen to a multilane facility
I-277	Mecklenburg	This project will upgrade numerous interchanges and ramps between North Davidson Street and Graham Street along the I-277 loop in Uptown Charlotte to improve safety mobility and capacity. Improvements shall also be consistent with those specified in NCDOT Feasibility Study FS-1610A. Division 10 is open to alternative solutions.
I-40	Haywood, Buncombe	Widen Roadway.
McConnell Road	Guilford	Install roundabout at Gorrell Street and Willow Hope St.
U.S. 17 (Ocean Highway), U.S. 74, U.S. 421 (Carolina Beach Road), U.S. 117 (Shipyard Boulevard), U.S. 17 BUS, Cape Fear Crossings Alternative	Brunswick, New Hanover	Upgrade existing facilities to provide additional mobility and access between New Hanover and Brunswick Counties and to the NC Port of Wilmington. Includes new river crossing south of existing Cape Fear Memorial Bridge. Cape Fear Crossings Alternative
I-40, I-440, I-87, U.S. 1	Wake, Johnston	Convert interstates and freeways to managed motorways including I-40 from Wade Ave to N.C. 42 I-440 I-87 to I-540 and US-1 south to NC-540.
I-40	Burke, Catawba	Widen Existing Roadway
N.C. 211	Brunswick	Widen N.C. 211 to 4-lanes from U.S. 17 to N.C. 906
SR 4464 (Bryan Boulevard)	Guilford	Add auxiliary lane between the on and off ramps in both directions of Bryan Boulevard in between Holden Road and Westridge Road. This project would tie on to U-5852 and essentially extend it to Westridge Road.
N.C. 87	Brunswick	N.C. 87 - Widen N.C. 87 (George II Hwy) to 3 lanes from the signal at SR 1539 (E Boiling Spring Rd) to the signal at SR 1541 (Cougar Rd) in Boiling Spring Lakes
N.C. 87	Brunswick	N.C. 87 - Add a southbound auxiliary lane to N.C. 87 from N.C. 133 (River Rd) to N.C. 133 (Long Beach Rd)
U.S. 258 Business	Pitt	Improve intersection.
N.C. 73	Lincoln	Widen to 4-lane boulevard.
U.S. 52 (Future I-74)	Stokes	Upgrade freeway to interstate standards - Shoulder widening, construct outside 12' FD paved shoulders (2' dirt shoulder), 4' FD paved median shoulders, interchange improvements, and intermittent bridge replacements.
U.S. 321 Business (Maiden Highway)	Lincoln	Widen to 4-lane roadway.
U.S. 421	Chatham, Lee	Upgrade existing corridor to Interstate-grade freeway

Project Name	County	Project Scope
U.S. 17 (Future I-87)	Perquimans, Pasquotank, Bertie	Upgrade to Interstate
U.S. 70	Craven	Multiple intersection improvements
I-77	Yadkin, Surry	Improve & lengthen acceleration and deceleration lanes on I-77 to the N.C. 67 interchange.
U.S. 64	Chatham	Construct Reduced Conflict Intersections along the US64 Corridor in the vicinity of Lake Jordan
U.S. 17	Pender, New Hanover	Convert roadway to superstreet configuration and provide access management.
U.S. 52	Stanly	Construct a Roundabout.
U.S. 52 (Future I-74)	Forsyth	Widen roadway & upgrade freeway to interstate standards - Add additional travel lane in each direction to achieve a 6-lane roadway, construct outside 12' FD paved shoulders (2' dirt shoulder), 4' FD paved median shoulders, interchange improvements, and intermittent bridge replacements.
U.S. 52 (Future I-285)	Forsyth	Upgrade U.S. 52 to interstate standards (I-285) by widening existing 4-lane facility to 6-lanes, widen paved shoulders, upgrade bridges / interchanges. Begin 6-lane section at W. Clemmonsville Rd. interchange overpass.
N.C. 280 (Asheville Highway)	Transylvania, Henderson	Upgrade roadway, Eliminate 5-lane section to 4 lane divided add multi use path on one side and bike lanes. Widen 4-lane undivided section to 4-lane divided with a 17.5' median. Continue Multi use path and bike lanes.
N.C. 24 (Cedar Point Boulevard)	Carteret	Convert N.C. 24 into a superstreet within the town of Cedar Point; upgrade intersection of N.C. 24 and N.C. 58 to a diamond interchange with one loop.
N.C. 49	Cabarrus	Widen existing two-lane cross section to NCDOT Highway Cross Section 4F
N.C. 280 (Airport Road)	Buncombe, Henderson	Construct a raised median that precludes across-roadway movements along N.C. 280 (Airport Rd). Incorporate complete streets elements and other access management strategies such as driveway limited-movement designs and reduced conflict intersection designs.
N.C. 49	Cabarrus, Stanly	Widen facility to math existing multi-lane from Mt. Pleasant, NC to Ritchfield, NC
U.S. 64	Davidson	Upgrade the two I-85/U.S. 64 ramp intersections at exit ramps for right turns only & by eliminating full movement access in the median crossovers of the existing 4 lane section of U.S. 64. Construct leftovers on 64 at I-85 ramp intersections and at the intersections of Bowers Road & New Bowers Road. Install left turns with bulb-outs as-needed for U-turns.
U.S. 258 (U.S. 258 South)	Lenoir	Add an alternating passing lane, improve intersection visibility, add rumble stripes along the center yellow lines and the white lines along the shoulders, and add more reflective thermoplastic paint to road markings.
U.S. 258	Lenoir	Widen to a four-lane boulevard from Tyree Road (SR 1341) to the proposed Kinston Bypass"
N.C. 24	Duplin	The proposed project (DUPL0001-H) is to install a 2-lane roadway with a raised median with curb and gutter with 12-foot travel lanes, and 5-foot on road bike lanes with sidewalks from the Sampson County line to I-40 with appropriate median breaks and traffic signals.
U.S. 70 (Arendell Street)	Carteret	Make intersection improvements at the following intersections: Arendell St/N 35th St; Arendell St/N 20th St; Arendell St/N 24th and 23rd Sts (Atlantic Beach Causeway); Arendell St/N 4th St.
U.S. 258 (Richlands Hwy)	Onslow	Construct superstreet
N.C. 24 (Freedom Way)	Carteret	Upgrade a portion of N.C. 24 to a superstreet in Carteret County from SR 1119 (Red Barn Road) to SR 1147 (McCabe Road).
U.S. 17 (Wilmington Highway)	Onslow	Upgrade roadway to a superstreet.

Project Name	County	Project Scope
U.S. 17 Business (South Marine Boulevard)	Onslow	Widen existing roadway to replace TWLTL with center median. Improve right turning lanes from US17 Business to U.S. 258.
I-95	Johnston	Widen I-95 from 4 to 8 lanes from Exit 90 U.S. 701 to Exit 95 U.S. 70 Bus.
N.C. 87	Cumberland	Convert existing at-grade intersections to reduced conflict intersections.
U.S. 421	Randolph	Upgrade U.S. 421 from Expressway to Freeway
I-587, U.S. 264	Nash, Wilson, Wake, Johnston	Upgrade U.S. 264 to interstate standards.
U.S. 117 (Shipyard Boulevard)	New Hanover	Improve access management along U.S. 117 corridor between U.S. 421 and Rutledge Drive.
U.S. 117 (Shipyard Blvd)	New Hanover	Install speeds sensors and coordinated warning activation prior to the entrance to the South Gate at the Port of Wilmington. The project would also include flashing speed limit signs and sensors coordinated with the traffic signal at U.S. 421 to allow for freight truck priority during peak times.
SR 4240 (Gate City Boulevard)	Guilford	Smart corridor project which includes installation of dedicated wireless communication, advanced vehicle detection technology, connected vehicle roadside equipment, enhanced surveillance, traveler information, transit priority and data management to improve multimodal safety and mobility. (Also submitted under Bike/Ped mode).
I-95	Nash	Widen I-95 from 4 to 8 lanes with median barrier from U.S. 64 to N.C. 4.
N.C. 87	Lee, Harnett	Upgrade Arterial to Superstreet
U.S. 64	Chatham	Upgrade 5-lane U.S. 64 to a superstreet from the Walmart Entrance Road to SR 1003 (Silk Hope Road). The western terminus connects with the superstreet design of funded R-5737.
I-42, U.S. 70	Johnston	Upgrade to interstate standard.
U.S. 158	Halifax	Widen to 4-lane divided section; Partial Segment of Previous R-2581 project
U.S. 158	Halifax	Widen existing road to 4-lane divided with limited access control. Partial Segment of Previous R-2581 project
U.S. 25 (Hendersonville Road)	Buncombe	Implement access management along the corridor with complete streets improvements.
I-85	Durham, Granville	Widen existing I-85 - Continuation of I-85 widening Project currently in SPOT. Approximately 3.6 miles.
I-40	Haywood	Install 5 CCTV Cameras at the following locations: MM 18, MM 11.3 MM 7, MM 6 and MM 1 along I 40. Install 6 gates at the following locations: MM 13.5, MM 11.3, MM 8.5, an Interstate Gate at MM 20 and Ramp Gates at MM 20 and MM 15 along the I-40 corridor. 3 Dynamic message signs to inform motorists of Closure ahead.
U.S. 15	Durham	Add travel lanes to 15/501. Include 3 NB through lanes (perhaps 2 lanes plus 1 choice lane) for NB vehicles traveling through the Business/Bypass interchange. If needed, include improvements at/between Erwin Road to the west of 15-501 and Erwin Road to the east of 15-501.
I-77	Mecklenburg, Iredell	Add third general purpose (GP) lane in each direction on I-77 from I-485 (Exit 19) to N.C. 150 (Exit 36)
I-77	Mecklenburg, Iredell	Purchase the I-77 Express Lanes contract and keep the Express Lanes as planned
U.S. 264 Alternate (Raleigh Road Parkway)	Wilson	Convert existing 4 lane divided section to a reduced conflict intersection facility.
U.S. 421	Chatham	Improve at-grade intersection along U.S. 421 between Siler City and the Lee County line with Reduced Conflict Intersections.
SR 1140 (Burnett Boulevard)	New Hanover	Widen existing roadway to 3-lane cross section to allow for truck stacking at entrance of the North Gate of the Port of Wilmington.

Project Name	County	Project Scope
U.S. 1	Wake	Convert facility to a managed freeway ("managed motorway") with ramp metering and other ATM/ITS.
I-40, U.S. 70	Johnston	Convert facility to a managed freeway ("managed motorway") with ramp metering and other ATM/ITS.
I-540	Wake	Implement managed motorways along corridor and construct managed shoulders in both directions along I-540. Managed shoulders are expected to be in operation for approx. 3 hours during morning and evening peak periods (6 hours total).
I-40	Johnston	Widen interstate to 8 lanes and incorporate managed motorways treatments along corridor including ramp metering, variable speed limits and lane control, messaging, and other ITS components.
U.S. 1	Wake	SB auxiliary lane to connect from Walnut Street ramp, continue under Cary Parkway bridge and tie into existing aux lane which runs from Cary Parkway to U.S. 64. On ramp from Cary Parkway will merge into this extended aux lane. Loop ramp from Cary Parkway will need to shift slightly, just by decreasing radius if possible. otherwise shift ramp terminal also.
I-40	Durham	Add service roads to reduce weaving, per recommendations in the HNTB study.
I-277 (John Belk Freeway)	Mecklenburg	Add one lane in each direction on I-277 and improve interchanges along the corridor to improve operations
U.S. 264 Alternate (Greenville Boulevard)	Pitt	Convert 5-lane corridor to 4-lane divided with construction of raised concrete center median within the existing TWLTL. Construct bicycle and pedestrian accommodations along corridor in support of complete streets initiative. Intersection Improvements at select locations to improve capacity and mobility. Bus stop improvements including shelters and benches along corridor shall be considered where appropriate.
U.S. 70 (Future I-42)	Johnston	Upgrade roadway to Interstate Standards. (**See Feasibility Study FS-1604A)
U.S. 64 (Future I-87)	Martin, Edgecombe	Upgrade existing freeway to Interstate Standards. To include ITS and Signing Improvements, existing ramps (Exits 502,505, 507, 512, & 514) widen to 16' lane width.
U.S. 17 (Future I-87)	Martin	Upgrade Arterial to Interstate Standards
U.S. 17	Pender	Upgrade to a controlled access facility with service roads.
I-540	Wake	Add EB auxiliary lanes from Leesville Road to U.S. 401. Note that I-5968 adds an EB auxiliary lane from U.S. 70 to Leesville Road. Add WB auxiliary lanes from U.S. 401 to U.S. 70. Adding auxiliary lanes will also enable more effective ramp metering by allowing more ramp storage, which will contribute to additional travel time savings.
I-540	Wake, Durham	Coordinated adaptive ramp metering (CARM), aka "Managed Freeways", without lane use control gantries. In addition to 14 new ramp meters, 4 existing ramp meters will be upgraded with improved detection, software, and ramp storage.
N.C. 55	Wake	Widen to 6-lane superstreet with grade separation at Jesse Dr.
N.C. 55	Wake	Widen to 6-lane superstreet from E. Williams St. to U.S. 1 with grade separation at Jesse Drive, and upgrade to 6-lane expressway from S. Main St. to E. Williams St. with interchanges at S. Main St. and Holly Springs Rd. and grade separation at Avent Ferry Road; $8M local contribution.
Lamont Road, Macridge Road	Cumberland, Harnett	Widen to Multilanes with New Location
N.C. 55	Wake	Upgrade N.C. 55 corridor to 6 lane expressway/superstreet
West Arlington Boulevard	Pitt	Convert 5-lane corridor to 4-lane divided with construction of raised concrete center median within the existing TWLTL. Construct bicycle and pedestrian accommodations along corridor in support of complete streets initiative. Intersection Improvements at select locations to improve capacity and

Project Name	County	Project Scope
		mobility. Bus stop improvements including shelters and benches along corridor shall be considered where appropriate.
East Arlington Boulevard	Pitt	Convert 5-lane corridor to 4-lane divided with construction of raised concrete center median within the existing TWLTL. Construct bicycle and pedestrian accommodations along corridor in support of complete streets initiative. Intersection Improvements at select locations to improve capacity and mobility. Bus stop improvements including shelters and benches along corridor shall be considered where appropriate.
U.S. 17 (Carolina Avenue), U.S. 264 (Bridge Street)	Beaufort	Construct Additional pedestrian signal/ button at SE & SW corners; increased signal crossing time; median refuge, improve corridor for safety
N.C. 11 (Memorial Drive)	Pitt	Convert 5-lane corridor to 4-lane divided with construction of raised concrete center median within the existing TWLTL. Construct bicycle and pedestrian accommodations along corridor in support of complete streets initiative. Intersection Improvements at select locations to improve capacity and mobility. Bus stop improvements including shelters and benches along corridor shall be considered where appropriate.
U.S. 264	Pitt	Upgrade roadway to interstate standards.
N.C. 11, SR 1119 (Jolly Road), SR 1149 (Mill Street), SR 1108 (Littlefield Road), SR 1120 (Dennis McLawhorn Road)	Pitt	Improve intersection by constructing Reduced-Conflict Intersections (RCI) at Jolly Rd (SR 1119), Dennis McLawhorn Rd (SR 1120) and Littlefield Rd. Improve Mill St (SR 1149)/Vernon White Rd (SR 1130) intersection per NCDOT Congestion Management's conceptual design through Pre-submittal process.
U.S. 1	Wake	Upgrade corridor to include freeway lanes, dedicated bus lanes, access roads, interchanges and grade separations as identified in City of Raleigh's recent Capital Blvd corridor study; Managed Motorway aspects

Stakeholder Needs

Unfunded highway and multimodal projects are defined below. These projects have been identified based on plans reviewed and stakeholder outreach.

Rail

Project	County	Project Scope
NS M Line	Randolph	Construct new siding at Sophia near MP 15 on the NS M Line to accommodate freight traffic.
CSX AC Line (abandoned)	Duplin, Pender, New Hanover	Restoration of the Wallace to Castle Hayne Rail Corridor from just north of Wilmington to Wallace.
KSH Line	Lenoir	Construction of extension of KSH rail line from existing terminus MP 5.65 in Global TransPark to the CSX AA line near MP 173.45 parallel with N.C. 11.
CSX S Line/NCDOT Capital Yard	Wake	Construction of NCDOT north Lead track extension towards grade separation with Capital Boulevard in Raleigh.
CSX AF Line	Pender, New Hanover	Construct approximately 1.5 mile rail line extension from MP AF 286.60 (near Invista) to support new rail volumes inbound & outbound from Pender Commerce Park. Project includes at-grade crossing improvements to U.S. 421 (Crossing # 629 171T).

Project	County	Project Scope
NCRR/NS H Line	Durham, Orange	Construction of second main track from Control Point Funston (MP 49.8) to East Durham Yard (MP 56) in Durham.

Rail Grant Projects

Consolidated Rail Infrastructure and Safety Improvements Program Projects

Railroad Corridor	Railroad Corridor (City to City)	Project Scope
ACB-Line	Wilmington Beltline	Access management improvements at S. 6th St., and close Martin St. crossing (629441P). Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Closure of Martin/Hooper St. crossing (629443D). Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Closure of S. 9th St. (629438G) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Closure of Clay St. (642724T) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Cantilevers and new crossing surface at Covil Ave. (629426M) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Cantilevers, new crossing surface, and pedestrian crossing at Princess Place Dr. (629288B) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Channelization improvements at S. 5th St. (629442W) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Addition of crossing gates at S. 13th St. (629435L) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Addition of crossing gates at Colonial Dr. (629429H) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Addition of crossing gates at Forest Hills Dr. (629428B) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Addition of crossing gates at Mercer Ave. (629427U) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Addition of crossing gates, and new crossing surface at N. 30th St. (629287U) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Addition of crossing gates, signals, crossing surface improvements, utility pole relocation, and road realignment at King St. (629284Y) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Addition of crossing gates and signals at S. 7th St. (629440H) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Addition of crossing gates and signals at S. 10th St. (629437A) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Addition of crossing gates and signals at S. 12th St. (629436T) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Addition of crossing gates, signals, and new crossing surface at S. 8th St. (629439N) Included on STIP as part of project P-5740.

Railroad Corridor	Railroad Corridor (City to City)	Project Scope
ACB-Line	Wilmington Beltline	Addition of crossing gates, signals, and driveway access improvements at S. 4th St. (629445S) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Crossing signal upgrades and channelization at US 76/ Oleander Dr. (629431J) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	New crossing surface, and gate arms at Marstellar St. (629434E) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	New crossing surface, and addition of raised median at US17/ Market St. (629290C) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	New crossing surface, and addition of raised median at N. 23rd St. (629286M) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Addition of crossing gates and signals at Wrightsville Ave. (629430C) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	New crossing surface improvements, and upgrade sidewalks at S.16th St. (629433X) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	New crossing surface improvements, and upgrade sidewalks at S.17th St. (629432R) Included on STIP as part of project P-5740.
ACB-Line	Wilmington Beltline	Signal upgrades at Henry St. (629289H) Included on STIP as part of project P-5740.
SF-Line	Monroe to Hamlet	Closure of Boylin Rd. (SR 1420) crossing. (631757A)
SF-Line	Monroe to Hamlet	Crossing surface improvements at N. Sutherland Ave. (631579R)
SF-Line	Monroe to Hamlet	Bridge improvements to support siding addition at Private Rd./Dozer Rd. (908637E)
SF-Line	Monroe to Hamlet	Bridge improvements to support siding addition at Roosevelt Blvd./US 74. (631580K)
SF-Line	Monroe to Hamlet	New siding track starting at Main St. (631785D)
SF-Line	Monroe to Hamlet	Crossing improvements at Stewart St. (631572T)
SF-Line	Monroe to Hamlet	Crossing improvements at Bivens St. (631573A)
SF-Line	Monroe to Hamlet	Crossing improvements at Edgewood Dr. (631574G)
SF-Line	Monroe to Hamlet	Crossing improvements at Private Rd. (631575N)
SF-Line	Monroe to Hamlet	Crossing improvements at Bivens Rd. (631576V)
SF-Line SF-Line	Monroe to Hamlet Monroe to Hamlet	Crossing improvements at Secrest Ave. (631578J) New siding track ending at Normand St. (631581S)

Unfunded Railroad Needs Projects

Railroad Corridor	Railroad Corridor (City to City)	Project Description
KNR-Line	Kinston to Snow Hill	Construction of extension of KSH rail line from existing terminus MP 5.65 in Global TransPark to the CSX AA line near MP 173.45 parallel with NC 11.

Railroad Corridor	Railroad Corridor (City to City)	Project Description
S-Line	Hamlet to Henderson	Construct grade separation and close West Maynard Rd. crossing (643400U) in Cary. (STIP Project No. P-5739)
SF-Line	Monroe to Hamlet	Construct Grade Separation at Wesley Chapel Stouts Rd. crossing. (STIP Project No. P-5744)
NC-Line	Greensboro to Goldsboro	Construct grade separation at Harrison Ave. crossing (734755X) in Cary. (STIP Project No. P-5708).
Main Line	Charlotte to Raleigh	Construct grade separation at Yanceyville St. crossing (722542D) in Greensboro. (STIP Project No. P-5735)
Main Line	Charlotte to Raleigh	Salisbury Station Building Improvements: Upgrade City of Salisbury station building, expand waiting space and surface parking. (STIP Project No. P-5733)
Main Line	Charlotte to Raleigh	Construct grade separation in vicinity of 5th Street and closure of 7th Ave. at-grade crossing (722306Y) in Lexington. (STIP Project No. P-5731). Subsequent Federal grant will be used for construction of station.
Main Line	Gastonia to Charlotte	Extend Clanton Rd. to US 29/74 (Wilkinson Blvd.) with a grade separation of NS RR and close the Donald Ross Rd. crossing. (STIP Project No. P-5730)
NC-Line	Raleigh to Goldsboro	Construct grade separation at Shotwell Rd. Close existing at-grade crossing in Clayton. (STIP Project No. P-5743)
NCRR Main Line, NC-Line	Charlotte to Raleigh	Construct grade separation at S. English St. crossing (722955X) in Greensboro. (STIP Project No. P-5747)
NCRR Main Line, NC-Line	Charlotte to Raleigh	Construct grade separation at Vandora Springs Rd. crossing (735324J) in Garner. (STIP Project No. P-5738)
NCRR Main Line, NC-Line	Charlotte to Raleigh	Construct grade separation at Hoskins St. crossing (722351T) in High Point. (STIP Project No. P-5752)
NCRR Main Line, NC-Line, and S-Line	Charlotte to Raleigh	Extend Beryl Rd. to Royal Avenue, and close Beryl Rd. crossing (630647L). (STIP Project No. P-5736)
NCRR Main Line, NC-Line, and S-Line	Charlotte to Raleigh	Construct grade separation at Trinity Rd. crossing (630657S) in Cary. (STIP Project No. P-5734)
Main Line	Charlotte to Raleigh	Construct grade separation at Turner St. crossing (722327S) in Thomasville. (STIP Project No. P-5751)
NCDOT	Wallace to Castle Hayne	Restoration of the Wallace to Castle Hayne corridor. Phase 1: Wallace to Burgaw Phase 2: Burgaw to Castle Hayne
Various	Selma to Goldsboro	Raleigh to Goldsboro Passenger Service: Infrastructure for *Piedmont* Service Raleigh to Goldsboro (includes Raleigh to Selma).
NC-Line	Greensboro to Goldsboro	NC-Line Improvements - Morrisville to Cary: Construction of second main track between MP H 66.9 (Clegg) and MP H 73.1 (Fetner) in Morrisville and Cary.
NC-Line	Greensboro to Goldsboro	NC-Line Improvements - Durham: Construction of a second main track from Control Point Funston (MP 49.8) to East Durham Yard (MP 56) in Durham.
NC-Line	Greensboro to Goldsboro	NC-Line Improvements - East Durham: Construction of second main track from East Durham Yard (MP 58.5) to Nelson (MP 63.5) in Durham.
NC-Line	Greensboro to Goldsboro	NC-Line Improvements - Triple Track Bridge Over I-40: Construct triple track bridge over I-40 in Durham County (Crossing #734 743D).
NC-Line	Greensboro to Goldsboro	NC-Line Improvements - Raleigh: Construction of second main track between MP H 81.0 (Boylan) and MP H 84.2 (S. Raleigh) in Raleigh
NC-Line	Greensboro to Goldsboro	NC-Line Improvements - Garner: Construction of second main track between MP H 85.4 (Bagwell) and MP H 90.4 (Auburn) in Garner.

Railroad Corridor	Railroad Corridor (City to City)	Project Description
NC-Line	Greensboro to Goldsboro	NC-Line Improvements - Clayton: Construction of second main track between MP H 94.0 (Wake) and MP H 100.0 (Powhatan) near Clayton.
NC-Line	Greensboro to Goldsboro	NC-Line Improvements - Raleigh Crossover: Construction of crossover near MP H 74 in Raleigh.
NC-Line	Greensboro to Goldsboro	NC-Line Curve Improvements - Hillsborough: Curve improvement projects on the NC-Line to increase operating speeds for the Piedmont service. Construction of curve radius improvements from MP H 44.5 to MP H 48 near Hillsborough.
NC-Line	Greensboro to Goldsboro	NC-Line Curve Improvements - Efland: Curve improvement projects on the NC-Line to increase operating speeds for the Piedmont service. Construction of curve radius improvements from MP H 38 to MP H 40.4 near Elfland.
NC-Line	Greensboro to Raleigh	NC-Line Curve Improvements - McLeansville and Greensboro: Curve improvement projects on the NC-Line to increase operating speeds for the Piedmont service, beyond those identified separately. Curve in East Durham is funded as STIP Project P-5706, Additional curves near Hillsborough and Efland are listed. Representative curves include McLeansville, and east Wagoner Bend in Greensboro.
NC-Line, A-Line	Greensboro to Goldsboro	Rocky Mount to Raleigh Passenger Service: Passenger Rail from Imperial Tobacco Site to Raleigh Union Station. Construct and upgrade rail facilities necessary to support passenger service to/from Raleigh. Connection should be made via Rocky Mount Station. Proposed 3 runs a day - AM, midday, PM.
Various	Charlotte to Kings Mountain / SC State Line	Passenger Service - Charlotte to Gastonia and Kings Mountain: Infrastructure to support extension of Piedmont intercity passenger service from Charlotte to Gastonia and Kings Mountain.
New Location	Charlotte to Atlanta	Atlanta to Charlotte High Speed Rail: High speed rail service from Charlotte to Atlanta.
SE-Line	Wilmington	Wilmington Multimodal Station: Construct a passenger station to accommodate future rail service to downtown Wilmington. The passenger station will be a part of a larger multimodal center ultimately accommodating public transportation, private mass transportation, passenger rail, bicyclists and pedestrians.
AF-Line	Wilmington to Pender County	Construction of rail line extension from MP 286.60 (near Invista to Pender Commerce Park). Project includes at-grade crossing improvements to US 421 (Crossing #629 171T).
SF- and SG-Lines	Monroe to Charlotte	Proposed rail connector track between the CSX SG-Line (Monroe to Waxhaw) and CSX SF Line (Monroe to Charlotte) on new alignment. (Approximately MP SG 306.09 to MP SG 311.32 and MP SF 306.10 to MP SF 310.45). This proposed track would be located on the west side of the City of Monroe in Union County, however the exact alignment has yet to be determined.
A-Line	Dillon, SC to Weldon	Weldon Station: Renovate existing building and construct siding improvements including platform, to serve as Weldon train station.
M-Line	High Point to Asheboro	Construct new siding at Sophia, near MP 15, on the Main Line
Main Line	Charlotte to Raleigh	NS mainline North End track improvements in Charlotte.
N/A	Charlotte	Stonewall Street extension near the Charlotte Gateway Station.
CLNA	Greenville	Expand capacity of loading station on short line near Pitt County Recycling Center.
S-Line	Hamlet to Henderson	Construction of grade separation at SW Cary Parkway and closure of existing at-grade crossing (Crossing #643 702W) in Cary. (Previously listed as STIP Project No. P-5746)

Railroad Corridor	Railroad Corridor (City to City)	Project Description
S-Line	Hamlet to Henderson	Capital Yard - North Lead Track: Construction of NCDOT north Lead track extension towards grade separation with Capital Boulevard in Raleigh.
S-Line	Hamlet to Henderson	Construction of grade separation at SR 2044 (Ligon Mill Road) and closure of existing at-grade crossing (Crossing #630 598S) in Wake Forest.
S-Line	Hamlet to Henderson	Construction of grade separation at Wolfpack Lane (Crossing #630 609C) and closure of existing at-grade crossing. Project includes separation of Atlantic Avenue.
SF-Line	Monroe to Hamlet	Construction of grade separation in the vicinity of SR 1469 (Freedom Drive) (Crossing #631 759N) and closure of existing SR 1469 at-grade crossing to bypass NC 218 west of Polkton. Project will include roadway connection from SR 1416 (Peachland-Polkton Road) to existing NC 218.
S-Line	Hamlet to Henderson	Construction of Alexander Avenue extension to SR 1267 (Dabney Drive) and grade separation. Project also includes the closure of SR 1228 (Chavasse Avenue) existing at-grade crossing (Crossing #630 489N) in Henderson.
SF-Line	Monroe to Hamlet	Construction of Railroad Street extension to either SR 1703 (Ninth Street) or SR 1703 (Wall Street) and close Cowan Street existing at-grade crossing (Crossing #631 747U) in Lilesville.
SDS-Line	Raleigh	Construction of grade separation of SR 3124 (Morrisville Parkway) and closure of existing at-grade crossing (Crossing #926 247P) in Cary.
S-Line	Hamlet to Henderson	Construction of new switching facility from MP 180 to MP 182 near New Hill area to relocate existing switching facility from downtown Apex.
S-Line	Hamlet to Henderson	Construction of additional tracks south of downtown Apex from MP 171.21 to MP 172.14.
S-Line	Hamlet to Henderson	Construction of grade separation of E. Holding Avenue and closure of existing at-grade crossing (Crossing #630 591U) in Wake Forest.
S-Line	Hamlet to Henderson	Construction of grade separation of Elm Street and closure of existing at-grade crossing (Crossing #630 589T) in Wake Forest.
S-Line	Hamlet to Henderson	Construction of grade separation of SR 1133 (Bert Winston Road) and closure of existing at-grade crossing (Crossing #630 527V) north of Youngsville.
S-Line	Hamlet to Henderson	Construction of grade separation of SR 1267 (Eric Medlin Road) and closure of existing at-grade crossing (Crossing #630 517P) near Franklinton.
S-Line	Hamlet to Henderson	Construction of grade separation of N. Dixon Avenue and closure of existing at-grade crossing (Crossing #630 668E) in Cary.
S-Line	Hamlet to Henderson	Construction of grade separation of Old Apex Road and closure of existing at-grade crossing (Crossing #630 669L) in Cary.
S-Line	Hamlet to Henderson	Construction of grade separation of High House Road and closure of existing at-grade crossing (Crossing #643 399C) in Cary.
S-Line	Hamlet to Henderson	Construction of grade separation of Laura Duncan Road and closure of existing at-grade crossing (Crossing #630 689X) in Apex.
S-Line	Hamlet to Henderson	Construction of grade separation of SR 2013 (Gresham Lake Road) and closure of existing at-grade crossing (Crossing #630 602E) in Raleigh.
S-Line	Hamlet to Henderson	Construction of grade separation on extension of SR 1931 (Harris Road) to Flathery Avenue in Wake Forest. Project also includes closure of existing at-grade crossing of Brick Street (Crossing #630 582V).
CSX S-Line, NS NC-Line	Greensboro to Goldsboro	Construction of grade separation on South West Street Raleigh, NC. Project also includes closure of the existing at-grade crossing at West Cabarrus Street (Crossing #735 488A). (Previously listed as STIP Project No P-5745)

Railroad Corridor	Railroad Corridor (City to City)	Project Description
S-Line	Hamlet to Henderson	Construction of grade separation at Apex Peakway near S. Salem Street in Apex, NC. Project also includes closure of existing at-grade crossing of SR 1153 (Tingen Road) (Crossing #630 696H).
SF-Line	Monroe to Hamlet	Construction of grade separation of Hovis Road and closure of existing at-grade crossing (Crossing #631 792N) in Charlotte.
SF-Line	Monroe to Hamlet	Construction of grade separation in the vicinity of Hoskins Road and closures of existing Hoskins Road at-grade crossing (Crossing #631 426M) and Goff Street at-grade crossing (Crossing #631 425F) in Charlotte.
S-Line	Hamlet to Henderson	Bear Pond Road grade separation (Henderson).
EC-Line	Goldsboro to Morehead City	Construct grade separation at US 70EB and WB. Close existing at-grade crossing near Newport. (STIP Project No. P-5742)
CSX S-Line, NS NC-Line	Greensboro to Goldsboro	Construction of grade separation on Jones Franklin Road extension in Raleigh
CSX S-Line, NS NC-Line	Greensboro to Goldsboro	Construction of grade separation on Edwards Mill Road extension and closure of sR 1657 (Nowell Road) existing at-grade crossing (Crossing #630 654W) in Raleigh. Closure dependent on funding of either Edward Mills Road or Corporate Center Drive.
CSX S-Line, NS NC-Line	Greensboro to Goldsboro	Construction of grade separation on Corporate Center Drive extension and closure of SR 1657 (Nowell Road) existing at-grade crossing (Crossing #630 654W) in Raleigh. Closure dependent on funding of either Edward Mills Road or Corporate Center Drive.
NC-Line	Greensboro to Goldsboro	Construction ot at-grade crossing improvements at Blackwell Street (Crossing #735 229N), US 15 (Mangum Street) (Crossing #735 231P), and SR 1118 (Fayetteville Street) (Crossing #910 605Y) per Durham TSS in Durham.
NC-Line	Greensboro to Goldsboro	Construction of grade separation at Dimmocks Mill Road (Crossing #735 154S) and closure of Bellvue Street existing at-grade crossing (Crossing #735 152D) and West Hill Avenue existing at-grade crossing (Crossing #735 151W). Project includes a pedestrian tunnel at Hill Avenue
CSX S-Line, NS NC-Line	Greensboro to Goldsboro	Construction of grade separation on realigned Powell Drive to Youth Center Drive and closure of existing Powell Drive existing at-grade crossing (Crossing #630 650U) in Raleigh.
EC-Line	Goldsboro to Morehead City	Construction of grade separation of US 17 and closure of existing at-grade crossing (Crossing #466 041T) in Bridgeton.
NB-Line	Vanceboro	Construction of 4-lane, divided grade separation at US 17 Bypass (Crossing #466 092D) near Vanceboro.
NC-Line	Greensboro to Goldsboro	Construction of grade separation of SR 2683 (Rush Street) and closure of existing at-grade crossing (Crossing #735 480V) in Raleigh.
NC-Line	Greensboro to Goldsboro	Construction of grade separation of SR 2539 (Yeargan Road) and closure of existing at-grade crossing (Crossing #735 476F) in Garner.
NC-Line	Greensboro to Goldsboro	Construction of grade separation at New Rand Road and closure of existing at-grade crossing (Crossing #735 328L) in Garner.
NC-Line	Greensboro to Goldsboro	Construction of grade separation at Jones Sausage Road and closure of existing at-grade crossing (Crossing #735 331U) in Garner.
NC-Line	Greensboro to Goldsboro	Construction of grade separation of SR 2555 (Auburn-Knightdale Road) and closure of existing at-grade crossing (Crossing #735 336DF) near Garner.
NC-Line	Greensboro to Goldsboro	Construction of grade separation of Guy Road and closure of existing at-grade crossing (Crossing #735 390W) in Garner.

Railroad Corridor	Railroad Corridor (City to City)	Project Description
NC-Line	Greensboro to Goldsboro	Construction of grade separation at Powhatan Road and closure of existing at-grade crossing (Crossing #735 410F) in Clayton.
EC-Line	Goldsboro to Morehead City	Construction of new at-grade crossing at SR 1124 (Howard Boulevard) and extension to Orange Street. Project will close existing E. Chatham Street at-grade crossing (Crossing #722 664H) in Newport. Reconfigure adjacent street network as needed.
KNR-Line	Kinston to Snow Hill	Construction of grade separation of NC 148 (CF Harvey Parkway) and closure of existing at-grade crossing (Crossing #930 684S) near Kinston.
CPLJ Line	Jacksonville to Morehead City	Construction of grade separation at SR 1756 (Lake Road) and closure of existing at-grade crossing (Crossing #722 882P) near Havelock.
NC-Line	Greensboro to Goldsboro	Construction of grade separation at Rudd Station Road and closure of existing at-grade crossing (Crossing #722 550V) north of Greensboro.
Main Line	Charlotte to Raleigh	Construction of grade separation of NC 150 and closure of existing at-grade crossing (Crossing #722 553R) north of Greensboro.
Main Line	Charlotte to Raleigh	Construction of grade separation of SR 1352 (Oakdale Road) and closure of existing at-grade crossing (Crossing #722 355V) in Jamestown.
Main Line	Charlotte to Raleigh	Construction of grade separation of SR 1332 (Scientific Street) and closure of existing at-grade crossing (Crossing #722 352A) in Jamestown.
Main Line	Charlotte to Raleigh	Construction of grade separation of Pendleton Street and closure of existing at-grade crossing (Crossing #736 238R) in High Point.
Main Line	Charlotte to Raleigh	Construction of grade separation at SR 2120 (Long Ferry Road) and closure of existing at-grade crossing (Crossing #715 307N) in Spencer.
NC-Line	Greensboro to Goldsboro	Construction of grade separation at SR 1317 (Neal Road) and closure of existing at-grade crossing (Crossing #735 202E) in Durham.
K-Line	Charlotte to Raleigh	Extension of NS K Line onto PTIA site. Construction of 4,928TF rail spur from MP K 6.7 to PTI airport Phase 1 site. Project includes improvements for siding and Phase 1 improvements.
NC-Line	Greensboro to Goldsboro	Construction of grade separation at SR 1954 (W. Ellis Road) and closure of existing at-grade crossing (Crossing #735 236Y) in Durham. (Previously listed as STIP Project No. P-5716)
NC-Line	Greensboro to Goldsboro	Construction of grade separation at SR 3024 (Ward Road) and closure of existing at-grade crossing (Crossing #722 962H) in Greensboro. Project also includes closure of at-grade crossing of SR 3025 (Maxfield Road) (Crossing #722 964W)
NC-Line	Greensboro to Goldsboro	Construction of grade separation at SR 3040 (Wagoner Bend Road) and closure of existing at-grade crossing (Crossing #722 966K) in Greensboro. Project also includes closure of at-grade crossing of SR 3026 (Buchanan Church Road) (Crossing #722 965D) (Previously listed as STIP Project No. P-5727)
Main Line	Charlotte to Raleigh	Construction of grade separation at SR 1191 (Old Dowd Road) and closure of existing at-grade crossing (Crossing #716 184H) in Charlotte.
NC-Line	Greensboro to Goldsboro	Construction of new railroad bridge, or other railroad approved methoed, over Exchange Park Lane (Crossing #735 158U) to accommodate pedestrian traffic within the structure.
NC-Line	Greensboro to Goldsboro	Grade separate Buckhorn Road by building a roadway bridge over the tracks (this includes three (3) grade separated options included in Mebane's Train Separated Study and NCDOT Express Design). These options depict an ability to construct a grade separation while limiting surrounding impacts. The project involves realigning the widened - 4 lane divided - Buckhorn Road north of the I-40 interchange to US 70.

Railroad Corridor	Railroad Corridor (City to City)	Project Description
Main Line	Charlotte to Raleigh	Construction of grade separation near Orr Road (SR 2848) in Mecklenburg County. Includes closure of existing at-grade crossing (Crossing #715 350U) in Charlotte.
Main Line	Raleigh to Morehead City	Trent River Bridge modernization/replacement.
CLNA	Raleigh to Bellhaven	Greenville Boulevard/14th Street grade separation (Greenville).
CSX AA-Line, CLNA	Raleigh to Bellhaven	14th Street grade separation and close Crossing # 641614E near Beatty Street (Greenville).
CLNA	Raleigh to Bellhaven	NC 11 (Memorial Drive) near Moye Boulevard grade separation (Greenville).
AA-Line	Parmele to Kinston	Construct grade separation at Firetower Road (SR 1708) near Baywood Drive. Close existing at-grade crossing (#641 620H) in Greenville.
NS L-Line (abandoned)	Piedmont Triad	Restoration of the NS L Line in Eden and Rockingham County. Connecting to the active NS L Line in Southern Virginia.
WTRY	Wilmington	Front Street railroad signals (RW-65).
WTRY	Wilmington	Remove Davis Yard at-grade crossing.
AC-Line	Charlotte to Wilmington	Restore former Atlantic coast Rail line from Malmo to the RJ Corman Carolina line in Whiteville.
AC-Line	Charlotte to Wilmington	Restore former Atlantic coast Rail line from Malmo to the International Logistics Park near the Columbus/Brunswick County Line.
AC-Line	Charlotte to Wilmington	Wilmington Rail Realignment Project. Build a new rail bridge across the Cape Fear River providing access from the Port of Wilmington to the CSX SE-Line in Davis Yard.
ACH	RJCS	Construct grade separation of the RJCS ACH Line and SR 1005 (Peacock Road) in Chadbourn
WTRY	Wilmington	Interchange redesign near Northwest District Park
NS NC-Line /CSX A-Line / CSX SE-Line	Raleigh to Wilmington	Southeastern NC Service - Infrastructure and equipment to support passenger service from Raleigh to Wilmington either via the NC-Line and W&W via Selma, Goldsboro, Wallace, and Castle Hayne or via the A-Line and Fayetteville. Final alignment to be determined.
SE-Line	Hamlet to Wilmington	Construct a grade separation of SR 1426 (Mt. Misery Rd) over the CSX SE line (Crossing # 630 589T)
SE-Line	Hamlet to Wilmington	Construct a grade separation of SR 1740 (Old Lake Rd) over the CSX SE line (Crossing # 631 483B)
N/A	Tabor City to Myrtle Beach	Tabor City Station Building: Construct a passenger rail depot in Tabor City to serve a potential tourist train to Myrtle Beach.
NC-Line	Greensboro to Goldsboro	Close the existing the at-grade SR 1402 (Crossing # 735 474S)which connects East Washington Street and US 70. This closure will then be replaced with an at-grade crossing by extending Mattress Factory Road (SR-1146) northward across East Washington Street and the NCRR/Norfolk Southern railroad right-of-way to intersect US 70.
NC-Line	Greensboro to Goldsboro	This project would realign Mt. Willing Road to line up with Efland Cedar Grove Road at US 70 and would remove the at-grade crossing (735145T) of the Norfolk Southern Rail Line at mile post H-37.31 and would construct a bridge over this line. This line serves as a connect from Greensboro to Durham.
SE-Line	Hamlet to Wilmington	Construct a grade separation of NC 11 over the CSX SE-Line near Sandyfield
SE-Line	Hamlet to Wilmington	Construct a grade separation of the CSX (SE) Line and SR 1846 (Sand Hole Road) and closure of an existing at-grade crossing (#631 484H) near Riegelwood.

Railroad Corridor	Railroad Corridor (City to City)	Project Description
SE-Line	Hamlet to Wilmington	Upgrade existing rail crossing of SR 1846 (Sand Hole Road) and the CSX SE-Line (#631 484H) in Riegelwood.
SE-Line	Hamlet to Wilmington	Upgrade the double rail crossing at SR 1818 (Neils Eddy Road) and the CSX SE-Line to make the crossing level (#631 488K) in Acme, NC.
K-Line	Charlotte to Raleigh	Construction of at grade crossing as part of the SR 2264 (Akron Drive) extension project.
SE-Line	Hamlet to Wilmington	Restore rail line from active rail line at SR 1437 (Luter Road) into the Laurinburg/Maxton Airport. Includes restoration of grade crossings at Luter Rd., Airport Rd., and Pioneer Rd.
S-Line, A-Line	Raleigh to Petersburg	The project will construct a rail corridor between Raleigh and Petersburg along the SEC alignment. It includes right of way acquisition beyond the S-Line (acquired separately), track construction, grade separations, associated highway improvements, and new signal installations. The project provides freight network resiliency and would also support future passenger services.
SA-Line	Henderson to Weldon	This project will purchase the out of service SA-Line and construct rail infrastructure to allow for restoration of local freight service.
AF-Line	Wilmington	Safety improvements to US 17 / 421 Railroad Crossing south of I-140/Dan Cameron Bridge, Crossing ID# 629163B. Install gates, signalization and supplementary safety measures per FRA guidelines to achieve optimal benefit per spending.
WTRY	Port of Wilmington	Construct new rail line connecting the Cape Fear Memorial Bridge to the WTRY (Port) north end trackage in Wilmington.
O-Line	Charlotte to Winston-Salem	Construction of Mazeppa Road Grade Separation and closure of existing at-grade crossing (Crossing #721 665L) in Mooresville. Mazeppa and Connectors Road will be constructed over NC 115 and NS O Line.
N/A	Charlotte	Charlotte Locomotive and Railcar Maintenance Facility: Construction of Phase 1B of the Locomotive Railcar Maintenance Facility (LRMF) in Charlotte.
Main Line	Charlotte to Raleigh	Widen underpass at crossing #716196C in Cramerton.
A-Line	Dillon, SC to Weldon	Construct industrial spur track and mainline wye connection between Halifax Corporate Park and CSX A Line. Proposed mainline wye connection is located at CSX A-Line MP 91.02.
NC-Line	Greensboro to Goldsboro	Install three wheelchair ramps, four crosswalks, and relocate stop bars for pedestrian access at SR 1118 (Fayetteville Street) (Crossing # 910 605Y) in Durham
NC-Line	Greensboro to Goldsboro	Install 200' of decorative fence, four streetscape lights, six wheelchair ramps, and sidewalk for pedestrian safety at US 15 Bus (Mangum Street) (Crossing # 735 231P) in Durham.
NC-Line	Greensboro to Goldsboro	Install 200' of decorative fence and 25' of restricted access fence, four streetscape lights, four wheelchair ramps, and sidewalk. Improve safety by clustering traffic signal cabinets on north and south side off crossing at Blackwell/Corcoran Street (Crossing # 735 229N) in Durham
NC-Line	Greensboro to Goldsboro	Construction of grade separation at SR 3040 (Wagoner Bend Road) and closure of existing at-grade crossing (Crossing # 722 966K) in Greensboro. Project also includes closure of at-grade crossing of SR 3026 (Buchanan Church Road) (Crossing # 722 965D) and Naco Road Extension.
NC-Line	Greensboro to Goldsboro	Repair sidewalks, concrete structures, walls, landscaping and bridge structure at SR 1127 (Chapel Hill Street), Crossing Number 735 228G in Durham.

Railroad Corridor	Railroad Corridor (City to City)	Project Description
NC-Line	Greensboro to Goldsboro	Install wheelchair ramps and crosswalks for pedestrian access and safety at SR 1445 (Duke Street) (Crossing # 735 227A) in Durham.
NC-Line	Greensboro to Goldsboro	Install wheelchair ramps and crosswalk for pedestrian access and safety at Buchanan Boulevard (Crossing Number 735 225L) in Durham.
NC-Line	Greensboro to Goldsboro	Widen shoulder on Swift Avenue in Durham, within railroad ROW with edgeline for pedestrian access and safety. Install four wheelchair ramps and two crosswalks.
Main Line	Greensboro to Goldsboro	Mackay Road Grade Separation; includes relocating Atwater Drive.
NC-Line	Greensboro to Goldsboro	Construct grade separation of SR 1003 (Buffalo Road) and closure of existing at-grade crossing (Crossing #735 422A) as element of highway interchange project in Selma.
A-Line	Dillon, SC to Weldon	Replace rail bridge over US 70 Bus (E Market St) and raise grade so that roadway grade under bridge can also be raised to minimize flooding. Crossing #629960S.
SE-Line	Hamlet to Wilmington	Rail line between NC 72 and SR 1549 (Pine Log Road) in Robeson County. Construct rail spur south from the main line into the "I-95 Eagle Site" industrial park, an NC Commerce-certified industrial site.
VF-Line	Fayetteville to Raleigh	Construction of grade separation on SR 6108 (SW Judd Parkway) and closure of existing at-grade crossing (Crossing # 959 203G) in Fuquay Varina.
VF-Line	Fayetteville to Raleigh	Construction of grade separation at SR 1100 (Wagstaff Road) and closure of existing at-grade crossing (Crossing # 465 831V) in Fuquay Varina.
VF-Line	Fayetteville to Raleigh	Construction of grade separation at Piney-Grove Rawls Rd and closure of existing at-grade crossing. Crossing # 465836E
VF-Line	Fayetteville to Raleigh	Construction of grade separation at Rawls Church Road and closure of existing at-grade crossing. Crossing # 465837L
VF-Line	Fayetteville to Raleigh	Construction of grade separation at Spence Mill Rd and closure of existing at-grade crossing. Crossing # 465838T
VF-Line	Fayetteville to Raleigh	Construction of grade separation at Chalybeate Road and closure of existing at-grade crossing.
VF-Line	Fayetteville to Raleigh	Construction of grade separation of US 401 and closure of existing at-grade crossing (Crossing #465 843P).
VF-Line	Fayetteville to Raleigh	Construction of grade separation at Lafayette School Rd and closure of existing at-grade crossing (#465 845D).
VF-Line	Fayetteville to Raleigh	Construction of grade separation at SR 1443 (Lafayette Rd) and closure of existing at-grade crossing (Crossing # 465 846K) in Fuquay-Varina, Harnett County
VF-Line	Fayetteville to Raleigh	Construction of grade separation at SR 2215 (Harnett Central Rd) with NS and closure of existing at-grade crossing (Crossing # 960 078T) in Kipling, Harnett County
VF-Line	Fayetteville to Raleigh	Construction of grade separation at SR 1437 (Ballard Rd) and closure of existing at-grade crossing (Crossing # 465 853V) in Harnett County
VF-Line	Fayetteville to Raleigh	Construction of grade separation at US 401 and closure of existing at-grade crossing (Crossing # 465856R) north of Lillington in Harnett County
A-Line	Dillon, SC to Weldon	Construction of grade separation at SR 1330 (Raleigh Road) with CSX and closure of existing at-grade crossing (Crossing # 629730R) in Johnston County
A-Line	Dillon, SC to Weldon	Construction of grade separation at SR 1354 (Camelia Rd) with CSX and closure of existing at-grade crossing (Crossing # 629729W) in Johnston County
A-Line	Dillon, SC to Weldon	Construction of grade separation at SR 1353 (Olivers Grove Rd) with CSX and closure of existing at-grade crossing (Crossing# 629728P) in Johnston County

Railroad Corridor	Railroad Corridor (City to City)	Project Description
A-Line	Dillon, SC to Weldon	Construction of grade separation at SR 1166 (Parkertown Rd) with CSX and closure of existing at-grade crossing (Crossing # 629727H) in Johnston County
S-Line	Hamlet to Henderson	Construction of grade separation at SR 1149 (Friendship Rd) with CSX and closure of existing at-grade crossing (Crossing # 630706L) in Friendship, Wake County
S-Line	Hamlet to Henderson	Construction of grade separation East Whitaker Mill Rd and closure of existing at-grade crossing (Crossing # 630613S) in Raleigh
SE-Line	Hamlet to Wilmington	Extend rail spur into the I-95 Kings Industrial Park; project located southwest of Lumberton near Kenny Biggs Road at United State Cold Storage spur.
S-Line	Hamlet to Henderson	Construct rail spur approximately 7,800 feet from main line going into the proposed Energy Way Industrial Park. Located near Hamlet between the At-grade rail crossing with Airport Rd and the At-grade rail crossing with Osborne Rd.
SE-Line	Hamlet to Wilmington	Extend rail spur across Tyner Rd (SR1574) about 1/4 mile into the "Hwy 72 Rail Industrial Site". This site is bounded by Tyner Rd (SR 1574), Lowe Rd (SR 1550), NC 72, and Pine Log Rd (SR1549)
AA-Line	Raleigh to Bellhaven	Improve existing train track foundation by installing concrete tops at the intersection of 14th St and Beatty St (Crossing # 641 614E).
AA-Line	Raleigh to Bellhaven	Improve existing at-grade rail crossing on Arlington Boulevard (Crossing # 642 719W) with adequate Concrete Panels/Tubs for high vehicle and truck traffic in the region. Improve safety for all road users (near Greenville).
AA-Line	Raleigh to Bellhaven	Improve existing at-grade rail crossing on 5th St (Crossing # 641 609H) with adequate Concrete Panels/Tubs for high vehicle and pedestrian traffic in Greenville, NC.
WTRY	Port of Wilmington	Multimodal bridge replacement of the Cape Fear Memorial Bridge in Wilmington. The proposed project would span the Cape Fear River connecting to rail lines to the Port of Wilmington on the eastern side, and Davis Yard on the western side.
WTRY	Port of Wilmington	New trackage connecting Davis Yard in Navassa with a southern rail crossing (on or parallel to) the Cape Fear Memorial Bridge. This section will include a crossing of US 17/74/76/NC 133 as well as the Cape Fear River parallel to Thomas Rhodes bridge (US 74/421).
ML-Line	Aberdeen to Fayetteville	Construct grade separation at NC 20 (St. Pauls Dr) and closure of existing at-grade crssing (Crossing # 847338C) in Raeford (Hoke County)
AE-Line	Fayetteville	Construct grade separation at US 401 Bypass (Country Club Drive) and closure of existing at-grade crossing (Crossing # 629 913J) in Fayetteville (Cumberland County)
AE-Line	Fayetteville	Construct grade separation at Langdon Street and closure of existing at-grade crossing (Crossing # 629 910N) in Fayetteville (Cumberland County)
AF-Line	Fayetteville	Construct grade separation at W. Russell Street and closure of existing at-grade crossing (Crossing # 629 572T) in Fayetteville
AE-Line	Fayetteville	Construction of grade separation at CSX rail crossing of Shaw Mill Road and closure of existing at-grade crossing (Crossing # 629 914R) in Fayetteville
A-Line	Dillon, SC to Weldon	Construction of grade separation at CSX A LIne Rail Crossing of Hay Street and closure of existing at-grade crossing (Crossing #629 881F) in Fayetteville
AF-Line	Fayetteville	Construction of grade separation at CSX AF line rail crossing of SR 1404 (Hay Street) and closure of at-grade crossing (Crossing # 629 570E) in Fayetteville.
A-Line	Dillon, SC to Weldon	Construction of grade separation at CSX rail crossing of Beard Road (Crossing # 629 872G) in Eastover.
AE-Line	Fayetteville	Construction of grade separation at CSX AE Line rail crossing of Cumberland Street (Crossing # 629 907F) in Fayetteville.

Railroad Corridor	Railroad Corridor (City to City)	Project Description
A-Line	Dillon, SC to Weldon	Construction of grade separation at CSX A line rail crossing of Cumberland Street (Crossing # 629 877R) in Fayetteville.
VF-Line	Fayetteville to Raleigh	Construction off grade separation at Norfolk Southern rail crossing of Ramsey Street (Crossing# 465 906S) in Fayetteville.
VF-Line	Fayetteville to Raleigh	Construction of grade separation at Norfolk Southern rail Crossing of Cumberland Street (Crossing # 465 912V) in Fayetteville.
A-Line, AE-Line	Fayetteville	Ft. Bragg Lead Connector Project. Add additional connector track along the western quadrant of the CSX A line and AE line junction

Air Cargo

Federally Funded Project Table

Project Name	County	Project Scope
Wilkes County Airport: Eastside Development and Access Road	Wilkes	Project includes land acquisition, site preparation and paving of a partial parallel taxiway, taxilanes, ramp areas, and access road extension for hangar development. PC# 2307
Wilkes County Airport: New Fuel Farm	Wilkes	The current above ground fuel tanks are dated and not compliant with current industry standards. Maintenance and replacement of failed components is problematic. New tanks will be compliant with current industry standards and will require less maintenance. PR# 4471
Wilkes County Airport: Taxilane and Hangar Construction (Phase 1&2)	Wilkes	Phase I - paving two taxilanes for a 10 bay T-hangar building and construction of a 10 bay T-hangar. Phase II - paving one taxilane for the north hangar development area and construction of a 10 bay T-hangar. Phase includes paving a connector taxiway one taxilane and construction of a 20 bay T-hangar building on the north hangar development area. (includes Project Request Numbers: 2301 & 4240)
Wilkes County Airport: New Airport Terminal	Wilkes	Construct new airport terminal. Anticipated size of the new terminal building is 8500 square feet to replace the existing building. The age of the existing facility is approximately 35 years old. (PR#4140)
Wilkes County Airport: Eastside Parallel Taxiway	Wilkes	This project would complete a second parallel taxiway east of Runway 1/19 to connect to the eastside development area and promote future growth. PC#3803
Avery County - Morrison Field: Avery Airport Terminal and Hangar	Avery	Construct new terminal building and hangar building (PR#4347)
Ashe County Airport: Construct new terminal building and hanger building	Ashe	Construct a new terminal building and hanger building to address facility deficiencies and capacity issues.
Elizabeth City CG Station - Regional Airport: Corporate Hangars	Pasquotank	Construct corporate storage and box hangars with access road, utilities, and aprons to support existing demand for based aircraft and aircraft currently on waiting list. (4172).
Odell Williamson Municipal Airport: T-Hangars & Taxiways	Brunswick	Construct one 10-unit T-Hangar and the taxiways/taxilanes. Includes Project Request Number: 0004479
Concord Regional Airport: South Apron Expansion	Cabarrus	Construction of an apron to the north of the commercial terminal building. The dimension of the apron will be 450' by 280'. This project is to accommodate future growth for additional airline service to the airport. (3574, 3576)
Concord Regional Airport: Fire Station/Security Center	Cabarrus	Construct a fire station and security center. (3451, 2239)
Concord Regional Airport: Commercial Terminal Expansion	Cabarrus	The proposed dimensions of the expansion would be 130 x 175' and will be expanded along with the south apron increasing the capacity to four airline gates with two remote parking pads as this would fill up the remaining land area at the current site and is a much more cost effective solution than constructing at another location on the airport. (3578)
Michael J. Smith Field: Improve Runway 8-26 Strength	Carteret	Improve pavement strength of Runway 8-26 to 100,000 lbs dual wheel. (PC #3024)
Michael J. Smith Field: Apron Expansion	Carteret	Expand Apron to accommodate future Aircraft growth and types (8350 square yard expansion) (includes Project Request Number: 3022)
Michael J. Smith Field: Hangars (Phase 2)	Carteret	Design and construction of a new 12-Unit T-Hangar to replace the hangars being taken as part of the US70 relocation project. (Project Request Number 2378)

Project Name	County	Project Scope
Michael J. Smith Field: Runway 8-26 Extension to 6000'	Carteret	Extend the runway and parallel taxiway to 6000' - includes environmental assessment land acquisition and relocation of N.C. 101 (Project Request Numbers: 3018, 2373, 3015, 3020, 2376, 4455)
Michael J. Smith Field: New Terminal Building	Carteret	As the existing terminal building is less than 2000 sf, it does not have sufficient capacity as defined by the NCDOT General Aviation Development Plan. Project would construct new terminal building north of existing structure. (PC Project Request Number: 3017)
Lumberton Regional Airport: Runway 13-31 Taxiway B&C Construction	Robeson	Construct taxiways to the cross wind runway 13-31. The pavement condition was rated ""failing"" in the 2008 Pavement Management Inspection Report that was conducted by the NCDOA. Corresponds to Partner Connect project # 3582.
Coastal Carolina Regional Airport: Hangar Construction	Craven	Hangar construction for mid-size corporate aircraft and apron (4196)
Coastal Carolina Regional Airport: Runway 4-22 Strengthening	Craven	Project includes strengthening the Runway 4 approach portion of the existing runway 4-22 to match the strength of the remaining runway and to accommodate the critical aircraft identified in the Master Plan update. (Project Request Number 4197)
Coastal Carolina Regional Airport: Corporate Development	Craven	Includes development of current airport property on the south side of Runway 4-22 to support aviation related industrial development including support of the F-35 program. (3829)
Coastal Carolina Regional Airport: Runway 04 Approach Light System	Craven	Project includes installation of a Medium Intensity Lighting System with Runway Alignment Indicator Lights (MALSR). Allowing the airport to meet published state system plan standards for commercial service airports and reducing instrument approach minimums to better serve the community. (3727)
Coastal Carolina Regional Airport: Entrance Road Rehabilitation / Construction	Craven	This project is for the construction of the rehabilitation of the main entrance road to the Airport terminal area and parking. The circular road can be accessed via Airport Road and Williams Road off Highway 70. The road circles the parking lot and passes in front of the passenger terminal. (3171)
Coastal Carolina Regional Airport: Hangar Construction	Craven	This project involves construction of two new 60' x 60' hangars and apron. (4200)
Rockingham County / NC Shiloh Airport: Construct Corporate Hangers	Rockingham	Construct corporate hangars (six - 60 'x 60') and access aprons. (includes Project Request Numbers: 2544).
Rocky Mount-Wilson Regional Airport: GA Terminal Building Renovations	Nash	The project includes PC Project Request Number: 3701 Renovate the existing terminal building and improve the main building entrance and improve the parking lot. Furnish the terminal with furniture and add landscaping.
Harnett Regional Jetport: Hangars & Taxiways	Harnett	This project will construct hangar taxiways and hangars. The hangar development includes a 5 unit hangar and a 13 unit t-hangar building. (includes Project Request Numbers: 2195, 2196, 2198)
Columbus County Municipal Airport: Perimeter Fencing	Columbus	Construct perimeter fencing to increase safety and reduce wildlife inundation (PC# 2389/3049).
Columbus County Municipal Airport: Hangars & Taxiways - Phase 2	Columbus	CPC (Columbus County Airport) - Construct one 8-unit T-hangar three 60'x60' corporate hangars (PC# 4056) and accompanying taxiways on the west side of the Phase 1 hangars (PC# 2388)
Columbus County Municipal Airport: Runway Extension to 6000'	Columbus	Purchase land to extend the RPZ and extend the existing runway to a final length of 6000 feet (PC # 3051/3052).
Columbus County Municipal Airport: Water and Sewer extension	Columbus	Extend the existing water and sewer infrastructure to the new terminal building site and other necessary infrastructure. (PC# 4433).

Project Name	County	Project Scope
Asheboro Regional Airport: Terminal Building	Randolph	Construct new terminal building (includes Project Request Numbers: 3047). New PC #3799
Henderson Field: Runway Lighting System Rehabilitation	Pender	This project includes the removal of the existing lighting system and installation of a new lighting system. The project includes installing new REILs at both runway ends, connected to the new lighting system. This includes the installation of a new airfield lighting vault. The vault would be a precast building constructed in the terminal area. New equipment would be installed in the airfield lighting vault, including a new regulator for the runway lighting system. (PC# 4295)
Henderson Field: Runway Pavement Rehabilitation	Pender	'The last Runway 9-27 pavement rehabilitation project at Wallace-Henderson Field (ACZ) occurred in 2005. In 2019 an update to the Pavement Management System for ACZ was completed, reporting a current runway pavement PCI of 70. The report projects that the PCI will decrease to 61 in the next five years, well below the State System Plan objective. (PC# 4279)
Henderson Field: Hangars and Taxilane	Pender	There are currently no airport owned hangars available for lease on the airport. The existing hangars are privately owned and are old and dilapidated and need to be replaced as soon as possible. This project will include site preparation for and construction of an 8-unit hangar. (PC# 2483)
Henderson Field: Parallel Taxiway-Complete	Pender	This project is the design and construction of a parallel taxiway. This parallel taxiway will extend from the apron to the east end and the west end of the runway. The Environmental Assessment for this project will be completed as part of the EA for the Runway Extension Project. [(PC# 3214 (east) & 4297 (west)]
Henderson Field: Partial Parallel Taxiway - East	Pender	This project includes the design and construction of the eastern partial parallel taxiway. This portion of the taxiway will connect to the end of Runway 27 and to the east edge of the existing terminal area apron. The Environmental Assessment for this project was completed as part of the EA for the Runway Extension Project. (PC#3214)
Henderson Field: Partial Parallel Taxiway - West	Pender	This project includes the design and construction of the western partial parallel taxiway. This portion of taxiway will connect to the end of Runway 9, to the taxiway being constructed with PC Project #2485 and to the west edge of the existing terminal area apron. The Environmental Assessment for this project was completed as part of the EA for the Runway Extension Project. (PC#4297)
Smith Reynolds Airport: Terminal improvement with hangar development	Forsyth	Make improvements to existing terminal building entrance road and construction of a new hangar. Project would also include the demolition of old hangar old cargo building and office building. After improvements are made the fixed based operator (FBO) would relocate to terminal which would become the front door to the community. Project included on pen and ink change to Airport Layout Plan (ALP). (PR#3900 & 4469)
Smith Reynolds Airport: Terminal Renovations	Forsyth	Make improvements to terminal building and entrance road. Project would also include the demolition of old air cargo building. After improvements are made, the terminal would become the front door to the community. Project included on pen and ink change to Airport Layout Plan (ALP). (PR# 3900)
Smith Reynolds Airport: Hangar Renovation	Forsyth	Project would include renovations to an existing hangar, demolition of a old hangar and construction of a new hangar. The existing hangars are at capacity at INT. Project included on pen and ink change to Airport Layout Plan (ALP). (PR#4469)

Project Name	County	Project Scope
Columbus County Municipal Airport: Construct New Terminal Building	Columbus	Construct a new terminal building. The existing terminal building does not meet the recommended square footage (3200 SF) for terminal buildings. CPC is far enough away from the coast that this airport with a 5500' runway length could allow emergency aircraft to land and use the facility as a command station during a hurricane. The Terminal building could also serve as a disaster recovery center for southeastern NC during natural disasters. (PC# 2387)
Coastal Carolina Regional Airport: RVR Installation	Craven	This project involves runway visual range installation for precision takeoff and landing operations. (4212)
Shelby-Clevland County Regional Airport: T-Hangar Taxilanes South - Paving & Hangar Building	Cleveland	This project includes construction of one proposed 10-unit T-hangar building and associated taxilanes connecting to the existing apron area.
Shelby-Clevland County Regional Airport: Airport Entrance Road	Cleveland	This project includes the demolition and reconstruction of the airport entrance and portions of highway 150. The improvements will eliminate the existing unsafe skewed intersection replacing it with a 90 degree intersection while maintaining the appropriate sight distances.
Lincolnton-Lincoln County Airport: Terminal Area Expansion - Paving	Lincoln	Two new corporate taxilanes are needed to provide access to new corporate hangar sites and T-hangars made available by the terminal area expansion completed in FY 2019. This phase of the project includes paving the taxilanes made available by the terminal area expansion site preparation project completed in FY 2019.
Columbus County Municipal Airport: Improve Runway Safety Area and Widen Runway	Columbus	CPC (Columbus Co Municipal) - In order to improve operational safety, this project would accommodate visibility minimums to the Runway 24 approach as low as 1/2 mile. This requires the Runway Safety Area must be widened to 300' wide and lengthened to at least 600' beyond the runway end. The runway must also be widened from 75' to 100' and an approach lighting system MALSR must be installed for the Runway 24 approach. (PC#s 3720/3721/3722)
Lincolnton-Lincoln County Airport: Runway, Taxiway, Taxilane, and Terminal Area Improvements	Lincoln	Rehabilitate existing runway and taxiway edge lighting systems. Construct a new paved asphalt/stone base corporate hangar taxilane, a new concrete/stone base apron and a new paved/stone base vehicular drive. Construct two new corporate taxilanes. Replace existing South Apron with a thicker flexible pavement section.
Lincolnton-Lincoln County Airport: South Apron Strengthening	Lincoln	The preliminary estimate includes removal of the existing flexible pavement section and replacement with a thicker flexible pavement section.
Lincolnton-Lincoln County Airport: Obstruction Survey - Runway 5 Approach - 30:1 Surface	Lincoln	Perform a survey for the approach to Runway 5 to locate obstructions in the 30:1 approach surface
Lincolnton-Lincoln County Airport: New Helicopter Parking Areas	Lincoln	Two helicopter parking areas are proposed north of the existing aircraft parking apron. The parking areas will each consist of a 50-foot by 50-foot concrete pad, with elevated edge lighting and a paved access drive to the aircraft parking apron.
Richmond County Airport: Apron and Taxiway Rehabilitation	Richmond	Rehabilitate the apron and taxiway pavements that were rated as fair in the 2019 PCI Report. (includes PS Project Request Numbers 4231 and 4232)
Cape Fear Regional Jetport / Howie Franklin Field: Runway Rehabilitation	Brunswick	This project will strengthen the existing runway to support 500 annual departures of a Gulfstream 650 as the critical aircraft. The project will also remove the displaced threshold so aircraft can utilize the entire runway length for landing. (PC #3744 & 2974)
Cape Fear Regional Jetport / Howie Franklin Field: SUT Terminal Area Hangar Development (Phase 1)	Brunswick	SUT (Cape Fear Regional Jetport) - This project will provide 20 T-hangars with supporting infrastructure located adjacent to the new terminal area/west apron. (PC #2177)
Lumberton Regional Airport: Hangar Taxilane	Robeson	This project will provide a hangar taxiway for corporate hangar development northeast of terminal building. (includes PC Project Request Number: 2409)

Project Name	County	Project Scope
Richmond County Airport: Land Acquisition (38 AC)	Richmond	Acquire land for the Runway 14 safety area and to clear trees that penetrate approach to Runway 14. (includes PC Request Number 2935)
Lumberton Regional Airport: MALSR Appoach Lighting	Robeson	Install medium-intensity approach lighting system (MALSR) off the Runway 5 end. (Includes PC project request # 2423. The sponsor would like this project completed with Project Request # 2411).
Wilmington International Airport: Emergency Boat Ramp Access Launch Rwy 6	New Hanover	This project will provide ARFF Rescue boat a concrete water access ramp along with a dock to provide life safety during an aircraft crash emergencies in Smith Creek. Includes (Project Request Number: 3806)
Wilmington International Airport: 1st Paved Aircraft Taxi Lane	New Hanover	Construct a new hangar taxi lane to provide access into development hangar leasehold area per ILM's Airport Layout Plan. Includes (3821)
Laurinburg-Maxton Airport: New Terminal Building	Scotland	This project will remove the existing aged terminal building and replace it with a new 7500 sf terminal building in the same location. (includes PC Project Request Number: 2932)
Wilmington International Airport: Perimeter Road Improvements	New Hanover	Project will improve safety by relocating the Airport's vehicle perimeter road outside NAVAID critical areas and Object Free Areas. The road will be all-weather road allowing traffic to be separated from Aircraft movement areas. Includes (3415)
Lumberton Regional Airport: Two 10 Unit T-Hangars and Taxiway	Robeson	Project will build two 10-Unit T- hangars and associated taxiways and aprons for the Lumberton Regional Airport increasing current capacity. Corresponds to Partner Connect Project Request #2424 (HANGAR TAXIWAYS AND T-HANGARS)
Wilmington International Airport: 1st General Aviation Hangar Taxilane	New Hanover	Construct a new hangar taxilane to provide access into development hangar leasehold areas per ILM ALP. Includes (3759)
Gastonia Municipal Airport: Hangars	Gaston	Construction Site preparation for expansion of Hangar Area (5 hangars, 2 corporate)
Henderson-Oxford Airport: New Corporate Hangar	Granville	Construct a new 100' X 120' corporate hangar and associated apron. Includes PC Project Request Number: 2896.
Henderson-Oxford Airport: North Terminal Area Development	Granville	Construct a new parallel taxiway with terminal area apron and new terminal building Project will also include access road and parking for new terminal. Includes PC Project Request Numbers: 3462, 3463, 3464, & 3465.
Person County Airport: New Corporate Hangar	Person	This project will construct a new 130' x 120' corporate hangar at the Person County Airport. The hangar will include office space, restroom faciliites, vehicle parking lot, and apron area connected to the existing taxiway. A fire suppression system will also be installed in accordance with the NC Building Code requirements. Includes PC Project Request Number: 4174.
Henderson-Oxford Airport: Corporate Hangar - 50' x 60'	Granville	Construct a new 50' x 60' corporate hangar as well as apron taxilane and access road. Includes PC Project Request Numbers: 3067.
Person County Airport: Terminal Expansion and Parking Expansion	Person	Expand existing 2000 terminal building to +/-5000 sq ft. Expand terminal auto parking and 6in waterline from SR 1131 to terminal area. Includes PC Project Request Number: 2439.
Person County Airport: Airfield Pavement Strengthening	Person	Strengthen Runway Taxiway and Apron Pavements to 90000# for Critical Air Freight Aircraft. The design strength for current taxiway and apron pavements are 30000# SWG 68.000# DWG. The pavement PCI's range from 67 (Fair) on the runway 74 (Satisfactory) on the taxiways & 67 (Fair) on the apron. Airport currently has operations by aircraft in excess of the pavement design strength. Includes PC Project Request Number: 3406.

Project Name	County	Project Scope
CLT - Charlotte Douglas International Airport: Concourse B Expansion	Mecklenburg	Construct an additional 8-10 gates needed to support the future aircraft gate requirements. This expansion would widen the concourse and expand to the west off of the south end of the concourse. This includes passenger boarding gates hold rooms public restrooms circulation areas with moving sidewalks concession areas and other support areas. (3663)
CLT - Charlotte Douglas International Airport: Center Airfield Lighting Vault Relocation	Mecklenburg	Relocation of the Center Airfield Lighting Vault to facilitate the construction of the South Ramp Expansion to accommodate the Concourse B and Concourse C Expansions.(3666)
CLT - Charlotte Douglas International Airport: South End Around Taxiway	Mecklenburg	The Airport has proposed to construct an End Around Taxiway (EAT) that would extend south from the Taxiway V and S intersection, around the approach end of Runway 36C, and connect to Taxiway F. (4483)
CLT - Charlotte Douglas International Airport: Two Aircraft Hold Pads	Mecklenburg	This project would construct two hold pads between the west runway and the proposed fourth parallel runway. (4487)
CLT - Charlotte Douglas International Airport: Terminal Lobby Expansion Construction	Mecklenburg	Construct an expansion of the current terminal lobby including all four levels of the ticketing area for additional public circulation space main lobby area baggage claim lobby area security check point areas and airline ticket counter queuing spaces as well as associated mechanical and support areas. (3673)
CLT - Charlotte Douglas International Airport: Third Aircraft Rescue and Firefighting Station	Mecklenburg	Construct a third aircraft rescue and firefighting station as a requirement of the construction of a fourth parallel runway. (3671)
CLT - Charlotte Douglas International Airport: Deice Pad	Mecklenburg	Construct a dedicated deice facility. The centralized location will require the construction of a crossfield taxiway for planes to use during time-sensitive operations. To access the deice pad, the Airport will extend Taxiway F by 3,000 feet to the south toward the approach end of Runway 36C. (4481)
CLT - Charlotte Douglas International Airport: Satellite Terminal	Mecklenburg	Construct a satellite concourse to support future aircraft gate requirements. This includes passenger boarding gates, hold rooms, public restrooms, circulation areas with moving sidewalks, concession areas, and other support areas. (4482)
SVH - Statesville Regional Airport: Terminal Renovation	Iredell	Replace existing terminal with new facility in the same location as the existing aged facility PC 3371
CLT - Charlotte Douglas International Airport: General Aviation Group Hanger	Mecklenburg	This group hangar would be 52,000 sf of hangar space and 10,000 sf of Admin/Crew space with options to add more hangars adjacent or near the original in the future. (4484)
CLT - Charlotte Douglas International Airport: North End Around Taxiway Phases I & II (Half NEAT)	Mecklenburg	The Airport has proposed to construct an End Around Taxiway (EAT) that would extend north from the Taxiway V and N intersection, around the approach end of Runway 18C, and connect to the north end of the Concourse A and West Ramp Expansion Phase I. (4485)
CLT - Charlotte Douglas International Airport: North End Around Taxiway Phase (Full NEAT)	Mecklenburg	The Airport has proposed to construct an End Around Taxiway (EAT) that would extend north from a future taxiway on the west side of the proposed fourth parallel runway, turn east and take aircraft around the approach end of Runway 18C and the future runway. It will then connect to the north end of the Concourse A and West Ramp Expansion Phase I. (4486)
RCZ - Richmond County Airport: Taxiway Rehab	Richmond	Rehabilitate taxiway pavement (includes PC Project Request Numbers 3247 and 3248)
EQY - Charlotte-Monroe Executive Airport: Strengthen Runway to 95,000 Dual Wheel, Fillet Widening	Union	Currently, the pavement at EQY has a strength of 67,500 DW. With the increase in air traffic from larger aircraft, EQY intends to strengthen airfield pavement to 95,000 DW. This project will include the strengthening of the entire 7,000 foot Runway 5-23. (Proj. Req. #2822)e 7,000 foot Runway 5-23. (Proj. Req. #2822)

Project Name	County	Project Scope
EQY - Charlotte-Monroe Executive Airport: North Hangar Area Phase IA	Union	Construct an apron, a taxiway and access road for future corporate hangar development off the north corner of the parallel taxiway. This project is required to be completed prior to phase 1b and subsequent phases of the north hangar area to provide access to the runway and taxiway system. (includes Project Request Numbers: 2830)
EQY - Charlotte-Monroe Executive Airport: Strengthen Taxiways to 95000 Dual Wheel Fillet Widening (Phase 1)	Union	Rehabilitation and strengthening of taxiways to 95000 dual wheel and widen fillets at selected taxiways where group 3 aircraft operations are anticipated. This project is the next phase of improvements that include unfunded project elements and a continuation of project AV-5814.(2814)
EQY - Charlotte-Monroe Executive Airport: Terminal Building Expansion	Union	A proposed 6200 square foot expansion to the existing terminal building includes a new conference center reconfiguration of existing offices and new office space. (includes Project Request Numbers: 2831)
MRN - Foothills Regional Airport: New Terminal Building & Aircraft Parking Apron	Burke, Caldwell	Construct a larger replacement terminal building and expand aircarft parkign apron. PC Project Request Number 3202
MRN - Foothills Regional Airport: T-Hangar Expansion	Burke, Caldwell	Construct new T-Hangars. PC Project Request Number: 4179
ISO - Kinston Regional Jetport at Stallings Field: Construct North Parallel Taxiway	Lenoir	PC Project Request Number(s): 2727, 3128, 3141, 3142, 2725. Construct parallel taxiway to accommodate future hangars and traffic.
ISO - Kinston Regional Jetport at Stallings Field: Northside Development Area	Lenoir	171,500 sq ft hangar w/fire suppression system and concrete apron and taxiway for MRO facility north of Runway 23 threshold. Project includes taxiway and landside improvements Project Requests 3476 & 3477
ISO - Kinston Regional Jetport at Stallings Field: Construct Hangar Development	Lenoir	Construct Taxilane to T-hangar area (Phase 2) at the southeast end of the airfield. Approximately 510'x45') and apron (approximately 510'x190'). Also construct a new 10 unit T-Hangar. PC Project Request Number(s): 2722, 3135
ISO - Kinston Regional Jetport at Stallings Field: PCC Apron Construction	Lenoir	Construct PCC apron north side of Runway 5 (North Cargo Area) for corporate hangar area (approx. 8,200 sy) . PC Project Request Number: 3220
DPL - Duplin County Airport: MALSR Construction	Duplin	Installation of new medium intensity approach lighting with rails for Runway 23. PC Project Request number: 4254
DPL - Duplin County Airport: Connector Taxiway	Duplin	Install new taxiway connector between the runway and taxiway just north of the t-hangar area. PC Project Request Number: 4105
W40 - Mount Olive Municipal Airport: Airport Entrance Road Improvements	Wayne	Realign Mount Olive Airport Road between Everett Road and the terminal area to allow for the development proposed in the terminal area. This work would include rehabilitation of approximately 400 ft of existing roadway and construction of approximately 600 ft of new roadway. PC Project Request Number: 3397
DPL - Duplin County Airport: Corporate Hangars & Terminal/Corporate Apron Expansion	Duplin	Expansion of the new corporate area between the terminal building and the Airpark. Project will include construction of an approximately 5,600 sy concrete apron expansion; site preparation and construction of two 120'x100' hangars; and construction of an asphalt access road and parking lots to serve the hangars. PC Project Request Number: 3261
DPL - Duplin County Airport: Industrial AirPark Development Phase II	Duplin	Establishment of four industrial lots, 4-100'x100' hangars each with 2000 SF of office space, and the development of associated airside infrastructure (aprons/taxilane) as well as landside roadway access. This project includes wetland mitigation which is included in the cost of the development.PC Project Request Number: 3262

Project Name	County	Project Scope
W40 - Mount Olive Municipal Airport: Apron Expansion & Airport Entrance Road Improvements	Wayne	Construction of approximately 8,000 SY of new apron space to provide additional aircraft parking, maneuvering space and to allow the Jet A and AV Gas fuel systems to be installed in their ultimate locations depicted on the ALP. Also, Realign Mount Olive Airport Road between Everett Road and the terminal area to allow for the development proposed in the terminal area. This work would include rehabilitation of approximately 400 ft of existing roadway and construction of approximately 600 ft of new roadway. (PC #'s 2327 & 3397)
W40 - Mount Olive Municipal Airport: T-Hangar Taxiway Construction	Wayne	Construction of a new T-Hangar taxilane to serve a future T-hangar at Mt Olive Airport. PC Project Request Number: 2338
W40 - Mount Olive Municipal Airport: T-Hangars & Taxiway Construction	Wayne	Construction of a new T-Hangar taxilane and a 10 unit T-Hangar building. PC Project Request Number: 4322 & 2338
W40 - Mount Olive Municipal Airport: Perimeter Fencing	Wayne	Installation of perimeter fencing around the airport to increase airport security and help reduce any potentialwildlife issues. PC Project Request Number: 2328
EWN - Coastal Carolina Regional Airport: Future Development Land Acquisition	Craven	Land acquisition of approximately seven acres on Clermont road to accommodate future expansion of the airport. Joined with the property on which the old passenger terminal was located provides easy access to Runway 4/22 and Runway 14/32. (3172)
EQY - Charlotte-Monroe Executive Airport: Air Traffic Control Tower & Access Road	Union	Construct new air traffic control tower and construct a new access road to the proposed air traffic control tower. (includes Project Request Numbers: 2832)
OAJ - Albert J. Ellis Airport: Entrance Roadway Extension and Realignment	Onslow	Construct new entrance road between the terminal area and N.C. 111. (3110)
OAJ - Albert J. Ellis Airport: GA Terminal Access Roadway Phase 3	Onslow	Construct new roadway to divert traffic away from the main terminal (3104)
OAJ - Albert J. Ellis Airport: Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights	Onslow	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights project. (4310)
OAJ - Albert J. Ellis Airport: OAJ - Air Carrier Apron Improvements	Onslow	This project will rehabilitate existing heavy aircraft pavement in the Terminal area. Milling and overlaying of asphalt and replacing joint sealant on PCC pavement. (4311)
OAJ - Albert J. Ellis Airport: GA Apron Expansion and Hangar Site Preparation	Onslow	Construction a southern expansion of the GA Apron and site preparation. (4309)
EXX - Davidson County Airport: Corporate Hangar Construction	Davidson	Construct a 10,000 square foot corporate hangar on the east side of the Davidson County Airport to accommodate requests for this type of facility. The airport has received several request for corporate hangar space and are currently unable to accommodate the aircraft. This project includes PC Project Request Number 4319.
OAJ - Albert J. Ellis Airport: OAJ - Taxiway Mill/Overlay/Strengthening	Onslow	This project will mill and overlay the main parallel taxiway A. (4312)
EXX - Davidson County Airport: Avionics Shop Hangar, 16 T-Hangars, 10,000 sf Corporate Hangar	Davidson	The Avionics Shop includes the environmental document, design, bidding and construction of a new 10,000 SF hangar with 3,000 SF of office space. The project includes PC Project Request Number: 4315. The T-Hanger will fill an immediate need boosting the County's tax base and increasing operations at the airport. The Project includes PC Project Request Number: 2536. The airport has a shortage of corporate hangar space. This Project includes Project Request Number: 4319.
EXX - Davidson County Airport: T-Hangar Construction	Davidson	Construction of these T-Hangars is needed to meet current demand. They will be located adjacent to the existing t-hangars on the east side of the airport. This project includes the PC Project Request Number 2536.

Project Name	County	Project Scope
EXX - Davidson County Airport: Construct Avionics Hangar	Davidson	The Avionics Hangar will be centrally located and adjacent to the maintenance hangar. There is a avionics shop owner that would like to relocate to the airport. The project includes the PC Project Request Number 4315.
IXA - Halifax Northampton Regional Airport: T-Hangars	Halifax	Construction of one 12-unit T-hanger building that is a little bigger than the standard T-hangers (includes Project Request Numbers: 2789)
BUY - Burlington - Alamance Regional Airport: Aviation Terminal Building and Terminal Area Development	Alamance	This project will perform land acquisition and construction of new Terminal (8000 sf) and Flight Operations (55000 sf). Included with this project is the public access road public vehicle parking and aircraft parking apron and approximately 9 acres of land acquisition. It will take over 5 years to complete all phases of this project. Includes PC Project Request Numbers: #4477 & 4478
ILM - Wilmington International Airport: Widen North-South Taxiway System	New Hanover	The airport has had plans to widen the North-South TWY system to make the width consistent throughout. Currently the TWY system width ranges from 51 to 75 feet. The project will also add shoulders and keep the TWY lights on pavement to reduce mowing and maintenance. Includes (2988)
MQI - Dare County Regional Airport: Southeast Box Hangars	Dare	Construct a 3-unit box hangar adjacent to the taxilanes and 14-unit T-Hangar that was most recently constructed (Southeast side) in accordance with Airport Master Plan and ALP. (includes Project Request Numbers: 2358)
7W6 - Hyde County Airport: Corportate Hangars Apron and Taxiway	Hyde	Design and Installation of 3 60'x60' Corporate Hangars and associated apron/taxiways (3078)
EDE - Northeastern Regional Airport: Box Hangars	Chowan	The airport has a waiting list for hangars. This project provides additional box hangars. (2482)
PMZ - Plymouth Municipal Airport: Corportate Hangars Apron and Taxiway	Washington	Construct 80'X100' corporate hangar including site preparation apron and taxilane access. (includes Project Request Numbers: 2734)
ONX - Currituck County Regional Airport: Corportate Hangar with Office	Currituck	Construction of 10000 SF Corporate Hangar and 3000 SF office space. (includes Project Request Numbers: 2624)
ONX - Currituck County Regional Airport: T-Hangar Apron and Taxiway	Currituck	Construction of one new 10-unit T-Hangar and Hangar Taxiway and Apron Site work and Paving. (includes Project Request Numbers: 2633)
EWN - Coastal Carolina Regional Airport: Runway 4/22 Extension 500'	Craven	Extend main runway 500 feet (3827, 3724)
JQF - Concord Regional Airport: North Apron Expansion	Cabarrus	The proposed project is for the construction of an apron expansion to the north. The dimensions of the apron expansion will be approximately 300' X 300'. (2247)
ILM - Wilmington International Airport: Widen Taxiways	New Hanover	Increase width of all taxiways to 75' that will accomendate all aircraft that utilize ILM. Includes Project Request Number: (3450)
ILM - Wilmington International Airport: Taxiway J Improvements	New Hanover	This project will be designed and constructed to meet the new FAA requirements which does not allow direct access to or from an aircraft ramp to a runway. Includes (Project Request Number: 3810)
IXA - Halifax Northampton Regional Airport: Apron and Taxilane for Corportate Hangars	Halifax	Construction of taxilane and apron for corporate hangar development and site preparation for 6 corporate hangars and associated parking lots. (includes Project Request Numbers: 2170)
ILM - Wilmington International Airport: Runway 6-24 Pavement Rehabilitation	New Hanover	Rehabilitate runway 6-24 due to it exceeding its useful life of 20 years. Signs of alligator cracking in the pavement and exposed aggregate on the runway. This project will include all runway markings and possible taxiway markings. Includes (3787)
ETC - Tarboro-Edgecombe Airport: Runway Extention to 5000	Edgecombe	Upgrade runway by 1000 ft to a length of 5000 ft. (3771)

Project Name	County	Project Scope
SVH - Statesville Regional Airport: RUNWAY 28 EXTENSION TO 8000' (Phase 2)	Iredell	Project consists of extending the runway from its current length of 7000' to 8000 to the east. Phase II completes mitigation, site preparation, paving & lighting for the runway extension after the land acquisition and road relocation is completed in Phase I. PC# 4167, 4168 & 4169"
GSO - Piedmont - Triad International Airport: Taxiway J between Taxiway A and D	Guilford	New taxiway to increase capacity and improve aircraft movement between Taxiways A and D. (4480)
GSO - Piedmont - Triad International Airport: Perimeter Road	Guilford	Construct Perimeter Road on southeast side of the airport to improve safety, access, and response time for emergency vehicles. (4457)
GSO - Piedmont - Triad International Airport: Perimeter Fence	Guilford	"Construct perimeter fencing to improve safety around the airport. (4459)
GSO - Piedmont - Triad International Airport: Extension of Runway 32	Guilford	"Runway 14-32 will be extended 875 feet on the 32 end to increase the overall length to 7,255 feet. Will provide future operation projections and improve capacity. (4456)
MRN - Foothills Regional Airport: Full Parallel Taxiway	Burke, Caldwell	Construct partial parallel taxiway to Runway 3 end for full parallel per FAA standards. PR#2577
FQD - Rutherford County - Marchman Field: East Airfield Development & Terminal Building	Rutherfordton	Design and site work to provide a partial parallel taxiway and new apron for larger corporate aircraft parking fueling and hangar development. This project also consists of a terminal building to serve the east side of the airport. (2269, 2920)
FQD - Rutherford County - Marchman Field: Full Parallel Taxiway	Rutherfordton	Construct a new taxiway with the standard 300' of separation from the Runway (3798)
ILM - Wilmington International Airport: Runway 35 Wind Cone/PAPI Replacement	New Hanover	Replace PAPI and wind cone equipment consistent with end-of-life cycle replacement schedule. (3805)
ILM - Wilmington International Airport: Runway 17/35 Blast Pads	New Hanover	Increase safety by constructing new blast pads, project simultaneous with runway pavement replacement project. Reduces Foreign Object Debris and erosion. Includes PC (3814)
ILM - Wilmington International Airport: Runway Protection Zone (RPZ)	New Hanover	At the approach of runway 17 is developed property and per FAA Standards, the airport would like to purchase and own the Runway Protection Zone (RPZ) in Fee for Land Use Compliance. (Project Request Number: 3804)
ILM - Wilmington International Airport: Midfield Taxiway Improvements	New Hanover	Improve Safety by removing an FAA identified ?Hot Spot? safety area that may cause confusion during airfield navigation. (Project Request Number: 3760)
ILM - Wilmington International Airport: Runway 6-24 Blast Pads	New Hanover	Increase safety by replacing deteriorating blast pads, project simultaneous with runway pavement replacement project, reducing foreign object debris and extending pavement life of runway. (3807)
ILM - Wilmington International Airport: Runway 24/Taxiway Extension	New Hanover	Increase capacity for larger aircraft by extending runway length and providing aircraft access to the future runway end. Includes PC (3822)
ILM - Wilmington International Airport: Runway 6 MALSR Catwalk	New Hanover	Improve safety and capacity by installing MALSR and Catwalk (with FAA Funding assistance) to reduce approach minimums on primary runway. Includes PC (3813)
FQD - Rutherford County - Marchman Field: Runway 5 Extension to 6,000'	Rutherfordton	Extend the runway to 6000' as shown on the current ALP. (includes Project Request Numbers: 3209)
ASJ - Tri-County Airport: Hangar Taxiway and 6-Unit T-Hangars	Hertford	This project will construct a new 6-Unit T-Hangar at Tri-County Airport. The project will also construct a new taxilane to provide access to the T-Hangars from the existing North Apron. (2648)
LHZ - Triangle North Executive Airport: New Terminal, Landside and Airside Improvements	Franklin	Construct new airport terminal, landside parking/access and utilities, and airside access (apron, taxilane) (includes PR #2685)

Project Name	County	Project Scope
LHZ - Triangle North Executive Airport: Airport Rd Relocation & Industrial Area Access	Franklin	Relocate Airport Rd., and associated utilities, purchase ROW, construct access road and apron to accommodate the intended use of the industrial/commercial area. (Includes PR #3536 & 4239)
LHZ - Triangle North Executive Airport: NAVAID Improvements	Franklin	Relocate the AWOS, replace existing MALSR, upgrade the glideslope (includes PR #3677)
ZEF - Elkin Municipal Airport: Hangar Site Preparation and T-Hangar Taxilane - East	Surry	This project will prepare multiple individual hangar location for build out by the airport or individuals. This project will construct an 10 Unit T-hangar and prepare site ready locations for box hangars on the eastside of the terminal area. PC#2222
ZEF - Elkin Municipal Airport: Box Hangar	Surry	This project will include site preparation and construction of one box hangar. Site preparation will also be completed for additional box hangars (leaving site ready platforms). Large Box Hangars are needed to enable additional aircraft to be based in multi aircraft and corporate aircraft hangars at the airport. PC#4141
MWK - Mount Airy-Surry County Airport: New General Aviation Apron and Terminal Building	Surry	Construct new GA apron and terminal building, parking lot, and entrance road. Includes PC Project Request Number: #2601
AFP - Anson County - Jeff Cloud Field: Acquire privately owned existing hangars and land.	Anson	Airport is Currently leasing privately owned hangars on privately owned land which abuts airport property.
ZEF - Elkin Municipal Airport: Runway 7 Extension 1000 FT with Partial Parallel Taxiway	Surry	This project will extend the Runway 7 end 1000 ft and complete a partial parallel taxiway on the same end. Land acquisition is needed for the runway protection zone. PC#2981
OCW - Washington-Warren Field: T-Hangar and Taxiway	Beaufort	Includes construction of a new 6 unit T-Hangar Site Preparation and necessary taxiway located south of the existing T- Hangar development. The airport requests the ability to reserve FY 17 18 and 19 Vision 100 Funds to complete this project. (includes Project Request Numbers: 2672)
IPJ - Lincolnton-Lincoln County Airport: Runway-Taxiway Lighting Rehabilitation	Lincoln	Rehabilitate existing runway and taxiway edge lighting systems. Included in this project would be the replacement of the existing runway edge lights with new height intensity base mounted edge lights, installation of conduit, replacement of all associated vault electrical equipment. Also included in this project would be the replacement of MITL fixtures with base mounted LED fixtures, installation of conduit, replacement of all cables and replacement of all associated vault equipment.
IPJ - Lincolnton-Lincoln County Airport: South Corporate Hangar Taxilane and Vehicular Drive	Lincoln	A new paved asphalt/stone base corporate hangar taxilane, a new concrete/stone base apron and a new paved/stone base vehicular drive. This phase of the total project involves construction only.
AKH - Gastonia Municipal Airport: New Terminal Building	Gaston	GA Terminal Bldg: Upgrade Existing, reconfiguration of existing offices and new office space for FBO, customers, pilots and citizens, also to upgrade security of current facility
PGV - Pitt-Greenville Airport: Corporate Hangars	Pitt	"Corporate Hangar Construction (4333)
PGV - Pitt-Greenville Airport: Runway 8-26 Rehabilitation	Pitt	"Runway 8-26 Rehabilitation & Removal of 3rd Runway & Associated Taxiways (4329)
PGV - Pitt-Greenville Airport: Design & Construct Rehabilitate Taxiways	Pitt	"Design & Construct Rehabilitate Taxiways A (North), A5, A6, A7 and Improve Runway 2-20 Subgrade between A6 & A7
PGV - Pitt-Greenville Airport: Drainage Improvements-City of Greenville Swale	Pitt	"Drainage Improvements-City of Greenville Swale (4327)
AKH - Gastonia Municipal Airport: Runway Realignment Extension	Gaston	Extension of the existing runway 03/21 from its current length of 3,770 feet to a total length of 5,000 feet across Union Road to the south, with associated parallel taxiway. Includes construction of roadway tunnels along the ultimate alignment of Union Road to pass vehicular traffic under the extended runway and taxiway system.

Project Name	County	Project Scope
PGV - Pitt-Greenville Airport: Replace AWOS	Pitt	Replace AWOS
PGV - Pitt-Greenville Airport: Design, Construct-Rehabilitate South Taxiways	Pitt	"Design, Construct-Rehabilitate Taxiways A (South) A1, A3, A4 (4328)
PGV - Pitt-Greenville Airport: Security Fence Replacement & Perimeter Road Improvements	Pitt	"Security Fence Replacement & Perimeter Road Improvements (2557)
EHO - Shelby-Clevland County Regional Airport: Runway 5 Extension and NAVAIDs	Cleveland	Environmental Assessment, Land Easements for Runway Extension, Extend Runway to 5,500 Feet, Localizer Antenna & MALSR. An environmental assessment must be performed requesting a FONSI for a runway extension prior to the construction of the runway, extended runway safety area and parallel taxiway extension. Approximately 55.3 acres of avigation easement needs to be acquired for the future runway extension that are not currently under control by the City of Shelby. Obstruction clearing will also be included in this project. This project includes extending the runway 5 end a distance of 500 feet, along with a corresponding extension of the parallel taxiway to the new runway end. Also included is a 150 foot wide by 300 foot long extended runway safety area beyond the new runway end.
SIF - Rockingham County / NC Shiloh Airport: Terminal Apron Expansion (New Apron and Access Taxiway)	Rockingham	Expand terminal apron (includes Project Request Numbers: 2542).
PGV - Pitt-Greenville Airport: Taxiway A North Jet Blast Deflector	Pitt	Install Jet Blast Deflector at Taxiway A North (4331)
ETC - Tarboro-Edgecombe Airport: T-Hangars & Taxilane	Edgecombe	Construction of a 6-unit T-Hangar building and taxilanes for access (3431)
PGV - Pitt-Greenville Airport: Taxiways B & C Rehabilitation	Pitt	"Rehabilitate Taxiways B & C (4332)
ETC - Tarboro-Edgecombe Airport: Corporate Apron and Hangar	Edgecombe	Expand the Corporate Apron by 8,400 SF and construct a 80' X 80' Hangar. (2898)
JNX - Johnston Regional Airport: T-Hangars Apron and Corporate Area Site Prep	Johnston	This project provides for construction of the new corporate area development. It will include the construction of a new t-hangar area and construction of a new apron. Elements of construction will include clearing and grubbing grading and drainage paving and erosion control measures. (includes Project Request Numbers: 2127)
JNX - Johnston Regional Airport: Taxiway Widening	Johnston	The existing taxiway pavements will be approaching the end of their useful life and require pavement rehabilitation. Assumed design would include a 3"" asphalt maintenance overlay. The taxiways will be widened to 50' at this time to conform to C- III standards. (includes Project Request Numbers: 2129)
AFP - Anson County - Jeff Cloud Field: Frontage Road Land Acquisition	Anson	To purchase land along SR 1645 to make airport grounds contiguous to the surrounding road with no breaks.
VUJ - Stanly County Airport: Visual Clearing	Stanly	The airport has several extended areas of perimeter overgrowth which is starting to impede the line of sight for certain aircraft during takeoff. These areas are in need of extensive tree removal for safety during departure and take-off.
RCZ - Richmond County Airport: Fuel Farm Modification	Richmond	Modify the existing fuel farm so that Jet 'A' can be pumped as self-service and sold through the existing point of sale system.
TTA - Raleigh Executive Jetport at Sanford-Lee County: South Side Site Prep	Lee	Site preparation for hangar development on south side of airport
TTA - Raleigh Executive Jetport at Sanford-Lee County: Wildlife Protection Fence	Lee	Construct wildlife protection fence (Partner Connect ID 3881)

Project Name	County	Project Scope
AFP - Anson County - Jeff Cloud Field: Airport Perimeter Fencing	Anson	"This project would fund the completion of perimeter fencing to AFP. The airport currently has only partial fencing and still needs approx. 2000 lin.ft. to be fully contained. The prior section was funded through MPE, and project bids exceeded the available funding.
TTA - Raleigh Executive Jetport at Sanford-Lee County: Develop areas east of airport	Lee	Develop new aviation-related business areas east of airport (Partner Connect ID 3877).
TTA - Raleigh Executive Jetport at Sanford-Lee County: Wash, Fuel, Run-up Area, Fuel Truck Parking	Lee	Improve wash/fuel facilities, fuel truck parking (Partner Connect ID 4133 and 4134)
VUJ - Stanly County Airport: Land Purchase for Sight-line extension	Stanly	This project scope is to purchase several parcels of privately owned land surrounding the perimeter of the Stanly County Airport. The purchase of this land will allow for the sightline improvements and future airport expansion.
RCZ - Richmond County Airport: Runway lighting rehab and PAPI replacement	Richmond	Rehabilitate the aging Runway 14-32 lighting and replace outdated PAPIs which both systems are over 20 years old. Additionally, the Airport has been having problems with pilots trying to utilize the radio controller in the electrical vault. (Includes PC Project Request numbers 3245 and 3246)
RCZ - Richmond County Airport: Extend Runway 14 RSA	Richmond	Extend Runway 14 Runway Safety Area and relocate displaced threshold. (Includes PC Project Request Numbers 2938 and 3237)
OCW - Washington-Warren Field: Gravity Sewer Line to serve hangars	Beaufort	Project involves installation of approximately 2400 LF of new gravity sewer line from the intersection of Airport Road and Market Street to the terminal area to serve existing and future corporate hangar tenants and the maintenance hangar. (includes Project Request Numbers: 3002)
MCZ - Martin County Airport: T-hangar	Martin	Construct a 10 unit T-Hangar Construct an access road to existing T-hangars (includes Project Request Numbers: 2156/2154)
RCZ - Richmond County Airport: 10 Unit T-Hangar	Richmond	Preparation of site for and construction on a 10 Unit T-Hangar. (Includes PC Project Request Number 4238)
TTA - Raleigh Executive Jetport at Sanford-Lee County: T-Hangar Construction	Lee	Construct 15-unit T-hangar building (Partner Connect ID 4132)
TTA - Raleigh Executive Jetport at Sanford-Lee County: Corporate Hangar Apron Expansion Phase 2	Lee	Construct phase 2 of corporate hangar apron expansion project (Partner Connect ID 2401). Please note this project was previously funded in P4.0 as AV-5856 but lost its funding in P5.0.
TTA - Raleigh Executive Jetport at Sanford-Lee County: West Side Taxi Lane Connection and Taxi Lane Rehab	Lee	Build new taxi lane connecting south ramp road and all taxi lanes on Ammons Farm Roadside of T-hangars (Partner Connect ID 3883); rehabilitation of T-hangar taxi lanes (Partner Connect ID 3882)
RCZ - Richmond County Airport: Corporate Hangars	Richmond	12,000 sf Corporate Hangar and apron extension.
MCZ - Martin County Airport: Corporate Hanger	Martin	Construct 60'x60' corporate hangar. (Includes Project Request Numbers: 2837)
OCW - Washington-Warren Field: Maintenance Hangar	Beaufort	Project includes design and construction of new 100' x 100' maintenance hangar. The existing hangar was damaged during the tornado that hit the airport in 2012. The airport request the ability to reserve FY 17 18 and 19 vision 100 Funds to complete this project. (includes Project Request Numbers: 3003)
RCZ - Richmond County Airport: Fuel Farm Construction	Richmond	Design and construction of a new fuel farm and fuel truck access road (includes PC Project Request Numbers 2941 and 3240.
SOP - Moore County Airport: Hangar Development (2502)	Moore	Continue hangar development per GA development plan as demand warrants. Includes construction of a new 10 Unit T-Hangar and 5 Unit Box Hangar. (Partner Connect ID 2502)

Project Name	County	Project Scope
SCR - Siler City Municipal Airport: Parallel Taxiway	Chatham	Construct parallel taxiway (Partner Connect ID 3124 and 3127)
SOP - Moore County Airport: Apron Pavement Strengthening	Moore	Strengthen pavement in four apron areas where the pavement is more than 25 years old. Includes construction of a new concrete apron where larger aircraft park today (100,000# DWG), as well as construction of new pavement and rehabilitation of existing bituminous pavements. (Partner Connect ID 2490)
SOP - Moore County Airport: Hangar Development (2925)	Moore	Continue hangar development per GA development plan as demand warrants. Includes construction of a new 10 Unit T-Hangar and 5 Unit Box Hangar. (Partner Connect ID 2925)
SOP - Moore County Airport: Taxiway Pavement Strengthening	Moore	Rehabilitate and strengthen taxiways to support 100,000 lb DWG aircraft loads (Partner Connect ID 3396)
SOP - Moore County Airport: Corporate Hangar Development	Moore	Construct a 120x100 executive hangar (Partner Connect ID 2506)
SOP - Moore County Airport: Hangar Taxiways Phase 3	Moore	Construct Hangar Taxiways to new hangar area. (Partner Connect ID 2509)
SOP - Moore County Airport: Runway Pavement Strengthening	Moore	Strengthen runway pavement (Partner Connect Project # 3229)
IXA - Halifax Northampton Regional Airport: Maintenance Hangar	Halifax	The proposed maintenance hangar will be located approx. 850 feet southwest of terminal. Construction of a 100' X 120' aircraft maintenance hanger. (includes Project Request Numbers: 2791)
GWW - Wayne Executive Jetport: Terminal Building	Wayne	Construction of new 6000 sq ft terminal building to accommodate additional users (includes PC Project Request Number: 2146).
GWW - Wayne Executive Jetport: Apron Expansion, Corporate Hangars and Hangar Access Road	Wayne	Expansion of the existing aircraft apron and construction of 2 new corporate hangers (100' x 100'). Also includes construction of an access road (approximately 750 linear feet) and parking for existing and future corporate hangers (includes PC Project Request Numbers: 3546, 2148, 4476).
GWW - Wayne Executive Jetport: T-Hangar Building - Phase 1	Wayne	Construction of new 12 unit t-hangar building on hangar-ready site (includes PC Project Request number 4122).
GWW - Wayne Executive Jetport: Land Acquisition (~14 Ac.) for Future Airport Development	Wayne	Acquisition of approximately 14 acres of land adjacent to Airport Road for future development (includes PC Project request number 3544).
GWW - Wayne Executive Jetport: Parking Lot Reconfiguration	Wayne	Expand existing terminal area parking and re-design existing layout (includes PC Project Request number 3547).
GWW - Wayne Executive Jetport: New Taxilane & T-Hangar (Phase 2)	Wayne	Construction of new t-hangar taxilane and a 12-unit t-hangar building (includes PC Project request number 3548 and 4257).
GWW - Wayne Executive Jetport: Runway Safety Area (RSA) Improvements	Wayne	Eliminate Ditches in Runway Safety Area (RSA) and correct grade deficiencies to improve safety (includes PC Project Request number 3042).
GWW - Wayne Executive Jetport: Airfield Pavement Strengthening	Wayne	Strengthening of existing airfield pavement to accommodate use by larger aircraft. The proposed pavement strength should, at a minimum, be increased to 65,000 lbs. DW and an ACN of 12 (includes PC Project request numbers: 3549 & 4258)
Wayne Executive Jetport: Land Acquisition (~37 Ac.) for Future Hangar Development	Wayne	Acquisition of approximately 37 acres of land for expansion of the Corporate Area (includes PC Project request number 3754).
Wayne Executive Jetport: Land Acquisition - Easement (~91 Ac.)	Wayne	Easement acquisition of ~91 Acres for future Runway 23 approach (includes PC Project Request number 3552).
Wayne Executive Jetport: Perimeter Fence (Construction)	Wayne	Removal of existing fence and installation of approximately 1,100 LF of ornamental fence in the terminal area and approximately 19,000 LF of wildlife fence around the airport perimeter. (includes PC Project Request numbers 2149,4253 and 4255).

Project Name	County	Project Scope
Wayne Executive Jetport: Runway 23 Extension & Glide Slope Relocation	Wayne	1,000' Extension of Runway 23 and NAVAID relocation/installation. Includes fee simple acquisition of ~33 AC needed for the extended runway and RPZ. This project includes the following Wayne County Parcel ID Numbers: 0032210, 0066664, 0100875, 0100877, 0100878, 0100879, 0032207, 0100880, 0100876, 0032256, 0102207, 0032160 (partial), 0032209, & 0032161. (includes PC Project Request number 3302 & 4416).
Wayne Executive Jetport: LAND ACQUISITION - CORPORATE AREA	Wayne	Fee simple acquisition of a 19.6 AC parcel (ID #0031235) of land needed for the future expansion of the Corporate Area. (includes PC Project Request number 3551).
Wayne Executive Jetport: Land Acquisition - Easement (~25 Ac.)	Wayne	Easement acquisition of ~25 acres for AWOS critical area and transitional surface (includes PC Project Request number 3554).
Harnett Regional Jetport: Runway Extension to 5500'	Harnett	The project will extend the runway from 5000 feet to 5500 feet and provide a 150-foot-wide runway safety area (RSA). (Project Request Numbers: 2191 & 3048)
Harnett Regional Jetport: Terminal Area Hangar Dev.	Harnett	This project will provide land acquisition of approximately 35 acres and construction of new T-hangars and Corporate hangars with the required supporting infrastructure (i.e. taxiways/taxilanes, access roads, utilities, etc.) for the Airport. (PC #2194)
Pitt-Greenville Airport: Airfield Drainage Improvements	Pitt	Airfield Drainage Improvements (2558)
Clinton-Sampson County Airport: Hangars	Sampson	There are currently no airport owned hangars available for lease on the airport and no leasable area for new private/corporate hangar construction. This project will develop a hangar complex adjacent to the new southwest parallel taxiway. This project will include site preparation for and construction of two 8-unit 40x40 Hangars. (includes Project Request Numbers: 2464)
Curtis L Brown Jr. Field: Corporate Taxilane & Hangars	Bladen	Site preparation and construction of two new corporate hangars. Project to include site preparation, taxilane and ramp paving, utility installation and construction of two hangars (one 80'x80' and one 100'x100') (includes Project Request Numbers: 2142, 4474)
Pitt-Greenville Airport: Access Road Improvements	Pitt	Access Road Improvements (2549)
Clinton-Sampson County Airport: Hangars 2	Sampson	There are currently no airport owned hangars available for lease on the airport and no leasable area for new private/corporate hangar construction. Project will develop a hangar complex adjacent to the new southwest parallel taxiway over the course of four phases. This project will include site preparation for and construction of two 8 unit 40x40 Hangars.(includes Project Request Numbers: 3265)
Curtis L Brown Jr. Field: Airport industrial park phase II	Bladen	Phase 2 - Airport industrial park. Site prep for and construction of three 150'x120' hangars and construction of approximately 5560 sq yd aircraft apron and parking lot. Includes Project Request Number 3404 & 4475.
Pitt-Greenville Airport: Rental Car Facility	Pitt	Construct a Consolidated Rental Car Facility. (3275)
Western Carolina Regional Airport: New Terminal	Cherokee	Construct Terminal Building (includes Partner Connect Request Number: 2955)
Shelby-Clevland County Regional Airport: Taxiway Overlay, Widening and Direct Access Taxiways	Cleveland	Correct nonstandard taxiway geometry with fillet taper widenings. Also includes two new taxiway connectors that will replace two nonstandard direct access taxiways. A nominal 3 inch overlay will also be done in this project. All taxiway markings and lights/signs will also be replaced.

Project Name	County	Project Scope
Tucker St; East of Burlington-Alamance Airport	Alamance	Create access from Tucker St into facility
N.C. 49; East of Burlington-Alamance Airport	Alamance	Improvements
N.C. 62; West of Burlington-Alamance Airport	Alamance	Expansion
Burlington-Alamance Airport; On-campus	Alamance	Build storage sites for businesses
I-69; Piedmont Triad International Airport	Guilford	Proposed Interstate
Piedmont Triad International Airport; On-campus	Guilford	Proposed multimodal yard
Piedmont Triad International Airport; On-campus	Guilford	Proposed rail spur on the west side of the facility

Seaports

Project Name	County	Project Scope
Port of Wilmington; Container Yard Expansion Plan	New Hanover	Refrigerated capability, complete paving, container berth improvements, dedicated intermodal facility, and new container cranes
Port of Wilmington; North Gate & Inland Road Improvements	New Hanover	New north gate, and improving U-5734, U-5729, U.S. 74 & U.S. 70 to highway standards
Port of Wilmington; Channel Deepening	New Hanover	Deepening from 42 to 47 ft
Port of Morehead City; Infrastructure Improvements	Carteret	Berths 4/5, 6/7, and 8/9 improvements
Port of Morehead City; Expansion Capital	Carteret	New warehouse north of A-Frame building, new bulk warehouse W6 (was W8)
Port of Morehead City; Expansion Capital	Carteret	Radio Island development and rail improvements

SHAPING NORTH CAROLINA'S FREIGHT FUTURE

The world is quickly changing, and North Carolina must be proactive, resilient and flexible in responding to those changes. However, the traditional planning process relies on trying to predict the future based on a single long-term forecast. The peril of planning based on a single forecast is that, if the "most likely" future fails to occur, investments may be less effective, ineffective or even counterproductive. There also is an opportunity cost – investing in the wrong solutions implies that not enough was invested in the right ones.

This Plan update has carried forward, unchanged, the scenarios that were developed during the last freight plan. These overarching strategies developed from the scenarios remain pertinent to understanding the future of North Carolina's Freight Network. Sub-strategies have been updated to reflect changes in the freight industry as well as North Carolina's overall economy.

The Freight strategies are:

- Funded Projects (Immediate Strategies) address a current need and are generally projects existing within the STIP. Robust Strategies are priority strategies that may not be funded or only partially funded.
- Hedging Strategies are projects that might not be necessary but would need to be under implementation now.
- Transformative Strategies place North Carolina on the cutting edge of innovative trends within the United States and Internationally.
- Deferred Strategies are items where a wait-and-see approach is appropriate.

Fiscally Constrained Freight Investment Plan

A fiscally constrained Freight Program has been developed for FY 2023-2028. The fiscally constrained plan relies upon funding from FHWA through the NHFP and NCDOT funding from the State Highway Trust fund. Rail, port, and air cargo projects can be found in Chapter 7 of the plan.

Immediate Strategies

The immediate-term strategy for the use and allocation of NHFP dollars is the maintenance and improvement of the existing condition of the NCFN. The repair and rehabilitation needs that have been identified under the previous plan remain a priority. Maintaining a high-quality freight network contributes to overall safety, mobility, and economic competitiveness.

Project Name	TIP / Project Number	County	Programmed Project Cost ($M)	Total Federal Share ** ($M)	NHFP ($M)	Match ($M)	Source of Match
2023			**$60.11**	**$48.08**	**$36.16**	**$5.47**	
Asset Management and Utilization			**$60.11**	**$48.08**	**$36.16**	**$5.47**	
US 64: SR 1306 (South Old Franklin Road) to SR 1603 (Old Carriage Road). Pavement Rehabilitation.	I-6045	Nash	$19.30	$15.44	$12.66	$3.86	State Highway Trust Fund
US 74 (Future I-74): East of NC 41 to the Columbus County Line. Pavement Rehabilitation.	HI-0016	Robeson	$9.20	$7.36	$6.25	$1.84	State Highway Trust Fund
US 74 (Future I-74): Scotland County Line to I-74/US 74 Business. Pavement Rehabilitation.	HI-0017	Robeson	$3.00	$2.40	$2.00	$0.60	State Highway Trust Fund
I-26: Mile Marker 65 to South Carolina State Line. Pavement Rehabilitation.	I-5927	Polk	$20.60	$16.48	$13.85	$4.12	State Highway Trust Fund
I-277: West of I-77 to East of I-77. Bridge Rehabilitation.	I-6052	Mecklenburg	$8.01	$6.40	$1.40	$1.61	State Highway Trust Fund
2024			**$29.96**	**$23.96**	**$36.88**	**$6.00**	
Asset Management and Utilization			**$29.96**	**$23.96**	**$36.88**	**$6.00**	
I-40: East of SR 1224 (Monte Vista Road) to pavement joint West of SR 3412 (Sand Hill Road). Reconstruct pavement.	I-2513AA	Buncombe	$31.70	$25.36	$19.88	$6.34	State Highway Trust Fund

US 74 (Future I-74): East of NC 214 to the West of SR 1824 (Water Tank Road). Pavement Rehabilitation.	HI-0015	Columbus	$7.70	$6.16	$4.00	$1.54	State Highway Trust Fund
I-95: SR 1770 (Sunset Avenue) to SR 1544 (North Halifax Road). Pavement and Bridge Rehabilitation.	I-5934	Nash	$5.46	$4.36	$3.50	$1.10	State Highway Trust Fund
I-85: Orange County Line to US 15/ US 501 In Durham. Pavement Rehabilitation.	I-5941	Durham	$16.80	$13.44	$9.50	$3.36	State Highway Trust Fund
2025			**$128.87**	**$103.07**	**$37.62**	**$25.80**	
Asset Management and Utilization			**$128.87**	**$103.07**	**$37.62**	**$25.80**	
I-285 / US 52 / NC 8: I-85 to Forsyth County Line. Pavement Rehabilitation.	HI-0005	Davidson	$30.15	$24.11	$9.52	$6.04	State Highway Trust Fund
I-40: Mile Marker 73 to Mile Marker 86. Pavement Rehabilitation.	I-5900	McDowell	$25.11	$20.08	$8.60	$5.03	State Highway Trust Fund
I-40: East of NC 147 to SR 3015 (Airport Boulevard). Pavement Rehabilitation.	I-5995	Wake, Durham	$32.41	$25.92	$9.50	$6.49	State Highway Trust Fund
I-87 / Future I-87 / US 64 / US 264: SR 1003 (Rolesville Road) to Nash County Line. Pavement Rehabilitation.	I-6001	Franklin, Wake	$41.20	$32.96	$10.00	$8.24	State Highway Trust Fund
2026			**$75.79**	**$60.62**	**$38.37**	**$15.17**	
Asset Management and Utilization			**$75.79**	**$60.62**	**$38.37**	**$15.17**	
I-77: Mile Marker 58.4 to Yadkin County Line. Pavement Rehabilitation.	I-5920	Iredell	$19.29	$15.42	$12.37	$3.87	State Highway Trust Fund

I-87 / US 64 / US 264: I-440 in Raleigh to SR 1003 (Rolesville Road). Pavement Rehabilitation.	I-5944	Wake	$28.60	$22.88	$13.00	$5.72	State Highway Trust Fund
I-540: Triangle Town Center Boulevard in Raleigh to I-87/US 64/US 264 in Knightdale. Pavement Rehabilitation.	I-5945	Wake	$27.90	$22.32	$13.00	$5.58	State Highway Trust Fund
2027			**$54.70**	**$43.76**	**$39.14**	**$10.94**	
Asset Management and Utilization		**$54.703.55**	**$54.70**	**$43.76**	**$39.14**	**$10.94**	
I-40: SR 1001 (Sugar Hill Road) to NC 226. Pavement Rehabilitation.	HI-0009	McDowell	$14.90	$11.92	$9.89	$2.98	State Highway Trust Fund
US 74 (Future I-74): West of SR 1585 (Union Valley Road) to West of US 701 Business. Pavement Rehabilitation.	HI-0019	Columbus	$5.40	$4.32	$4.00	$1.08	State Highway Trust Fund
US 74 (Future I-74): Robeson County Line to West of SR 1585 (Union Valley Road). Pavement Rehabilitation.	HI-0020	Columbus	$15.00	$12.00	$11.50	$3.00	State Highway Trust Fund
I-40: Mile Marker 34 to Buncombe County Line. Pavement Rehabilitation.	I-592	Haywood	$9.75	$7.80	$6.75	$1.95	State Highway Trust Fund
I-40/ I-85: West of SR 1114 (Buckhorn Road) to West of SR 1006 (Orange Grove Road). Pavement Rehabilitation.	I-5958	Orange	$9.65	$7.72	$7.00	$1.93	State Highway Trust Fund
2028			**$78.01**	**$62.40**	**$39.92**	**$15.61**	
Asset Management and Utilization			**$78.01**	**$62.40**	**$39.92**	**$15.61**	
I-73 / US 220: SR 1009 (Old US Highway 311) to Guilford County Line. Pavement Rehabilitation.	HI-0003	Randolph	$8.12	$6.49	$4.00	$1.632	State Highway Trust Fund

I-74: SR 1928 (Cedar Square Road) to I-73/ US 220. Pavement Rehabilitation.	HI-0004	Randolph	$8.14	$6.51	$4.00	$1.63	State Highway Trust Fund
I-40: Johnston County Line to the Duplin County Line. Pavement Rehabilitation.	HI-0011	Sampson	$22.40	$17.92	$10.00	$4.48	State Highway Trust Fund
I-40: Sampson County Line to the Pender County Line. Pavement Rehabilitation.	HI-0012	Duplin	$31.10	$24.88	$17.92	$6.22	State Highway Trust Fund
US 17 (Future I-87): Bertie County Line to Perquimans County Line. Pavement Rehabilitation.	I-6027	Chowan	$8.25	$6.60	$4.00	$1.65	State Highway Trust Fund

Medium- and Long-Term Strategies

The medium and long-term strategies fall into the categories of Robust, Hedging and Deferred. The robust strategies are highest priority since they are needed and effective under multiple plausible freight futures. The hedging strategies are medium priorities but may become high priorities depending on the direction and pace of freight trends. Thus, sufficient planning and preparation should be in place to allow NCDOT to move relatively quickly if needed. The deferred strategies are lower priority and do not require much pre-work. Key robust and hedging strategies are summarized.

Hedging Strategies (Medium Priority)
Infrastructure
Expand key two lane rural routes on the NCPHFN. The priority facilities that need expanding will depend on regional and industry growth trends but plans should be advancing for all two-lane facilities on the NCPHFN.
Develop and modify infrastructure to be capable of handling platooning and autonomous vehicles.
Invest in upgrading rail lines and other rail facilities.
Invest in alternative routes for highly congested corridors.
Invest in roadways, interchanges and rail spurs to serve large development sites.
Preserve rail corridors, especially those going out of service
Utilize existing air cargo and maritime relationships to create more complementary cargo networks
Operations
Invest in urban locations to service increasing number of fulfillment centers.
Develop alternative freight delivery vehicle operating guidelines.

Impact Strategies
Climate Change
Implement the strategies within the 2020 Resilience Strategy Report
Support strategies to increase infrastructure resilience along NCDOT coastal highways.
Emissions
Continue to foster partnerships like the Port Initiative's and implement environmentally sustainable port strategies through partnerships between USEPA and ports.
Support development of actionable strategies to aid in the NC Clean Transportation Plan, one of the five workgroups focusing on developing actionable strategies to address emissions from medium- and heavy-duty vehicles.
Equity
Develop a deployment strategy for ZEV charging stations.
Create effective infrastructure deployment strategies.
Habitat Fragmentation
Identify opportunities to improve habitat fragmentation such as trenches used to provide safe passage underneath railroad tracks for wildlife.
Stormwater
Implement Executive Order 80 through the Department of Environmental Quality (DEQ), with support of other agencies and stakeholders, to prepare the North Carolina Climate Risk Assessment and Resilience Plan (2020 Resilience Plan).

Robust Strategies (Highest Priority)
Infrastructure
Maintain safe, reliable connections to ports, rail terminals, air cargo facilities, military bases and major logistics and manufacturing sites.
Invest in modernizing the interstates, ensuring that they meet design standards to accommodate freight vehicles of today and in the future. This includes replacing bridges with weight restriction and weight limits on the NCPHFN.
Pursue mitigation strategies to protect the NCPFN against climate change and increasing weather events.
Invest in mobility solutions in the major urban areas to more efficiently and safely move both people and freight.
Ensure adequate connectivity between rural regions and the state's gateways and urban centers. Invest in heavy haul corridors in regions with ports, energy exploration and agricultural production.
Implement truck parking strategies at abandoned rest areas and weigh stations from the Statewide Truck Parking Study. The trucking industry suggested exploring industry user fees as a funding mechanism.
Address congestion hot spots on NCPHFN. This may include examining mass transit opportunities for removing passenger vehicles from these routes.
Increase truck parking capacity along key corridors
Develop strategies surrounding e-commerce and distribution
Ensure cyber security remains a top priority as freight networks continue to grow
Operations
Develop resiliency strategies to mitigate impact of man-made or natural disruptions of the NCPFN.
Invest in incident clearance on the NCPHFN. Reexamine the MOVES program for incident clearance for potential implementation.
Develop digital backbone to deploy technology to leverage real-time travel and truck parking data aimed at the freight industry.
Invest in ITS technology along key corridors to increase efficiency and reliability
Institutional
Enhance public awareness programs such as "Sharing the Road" with trucks and "BeRailSafe" with rail.
Add safety signage on NCPHFN about safe traveling distances and passing guidelines related to trucks. Implement Freight Performance Measure Program and target setting.
Conduct a vehicle inventory and use survey (VIUS) for commercial vehicles to enhance NCDOT's tools and processes for identifying and evaluating freight needs and projects.
Conduct a Statewide Rail Access and Utilization Study that assesses the opportunity for truck to rail diversion and an assessment of regional rail bottlenecks and solutions.
Implement freight planning requirements into the Comprehensive Transportation Planning (CTP) efforts at NCDOT, Metropolitan Transportation Plans performed by the Metropolitan Planning Organizations and the Comprehensive Transportation Plans performed by the Regional Planning Organizations.

The previous version of the Freight Plan included substantive discussions of many medium and long-term strategies to implement North Carolina's vision. With the passage of the BIL, a greater focus has been placed on climate change/resiliency, equity, emissions and habitat conservation. These issues are discussed in depth throughout this document and in topic-specific white papers in the appendix. Specific issues addressed include:

- Understanding how climate change will impact all areas of North Carolina and ensuring that critical components of the Priority Freight Network have sufficient resiliency and redundancy to ensure efficient operation, even during severe climatic events.
- Evaluating current and planned freight infrastructure improvements with regards to Areas of Persistent Poverty (APPs) and Historically Disadvantaged Communities (HDCs). Project should seek to address not only current effects but also those that negatively impacted communities in the past.
- Replacing diesel and gasoline infrastructure with more efficient electrical units and transitioning Medium and Heavy Duty (MHD) trucks from carbon-based engines to zero emission vehicles (ZEVs).
- Evaluating current and planned freight infrastructure improvements with regards to impacts to wildlife habitat, especially wildlife corridors. This includes pursuing strategies to reduce current and future animal strike incidents.

Transformative Strategies

Transformative or shaping strategies are those that can alter the State's freight future. In other words, the State's public and private sectors proactively pursue strategies with the intention of altering current trends. Following are three potential transformative strategies.

Next Gen Truck Technology Strategy

Expand Rail Freight Market Opportunities Strategy

Next Gen Truck Technology Strategy

Autonomous, Connected and Electric Trucking and Drones are a Game Changer for Fuel Efficiency, Safety, and Mobility

A technique that has been used for years in the trucking industry, drafting or truck platooning, is about to enter the world of autonomous driving known as Level 2 truck platooning. Level 2 truck platooning is an extension of cooperative adaptive cruise control that uses automated lateral and longitudinal vehicle control, while maintaining a tight formation of vehicles with short following distances. A platoon is led by a manually driven truck and allows the drivers of the following truck(s) to disengage from the driving tasks and monitor the system performance. Driving in a platoon formation has demonstrated the potential for significant fuel saving benefits and associated reductions in emissions from the vehicles within the platoon. Additionally, electrification of truck fleets allows for transport companies to reduce their impact on the environment. Electric trucking also has the capability to be used with autonomous and connected technology.

The Triangle Expressway was designated as a USDOT Autonomous Vehicle Proving Ground in 2017. Volvo Truck/Fedex Platooning Demonstration was performed in 2018[1]. The demonstration project detailed included:

- Veridea Parkway served as the proving ground and southern terminus of route
- Davis/Hopson interchange was used as northern terminus of route
- Salt barn location at Green Level was used to store tractors/trailers overnight
- Demonstration occurred outside a.m. and p.m. peak periods
- Trucks were spaced 75 to 100 feet apart as they traveled at 62 miles per hour
- All tractors had licensed drivers, each with 15+ years driving experience
- Safety Was Paramount in all demonstrations

A report issued by the U.S. Energy Information Administration on autonomous projects stated that heavy-duty, long-haul commercial vehicles will be the first large group of early autonomous technology adopters simply due to the potential for efficiency gains and lower operating costs. Other likely developments related to Next Gen Truck Technology predicted in the report include:

> "Research suggests that platooning technology can provide a 5 to 20% fuel savings, depending on the gap, speed, number of vehicles and location of a vehicle within a platoon…Platooning also offers other benefits, such as emission reductions, additional vehicle safety features and increased highway throughput, just to name a few."
>
> TTI Senior Research Engineer Beverly Kuhn

- Truck platooning provides most of the fuel economy benefits associated with autonomous trucks. Platooning can be carried out by Level 1 autonomous vehicle technology and the industry can expect to see it deployed far earlier than more advanced autonomous technology.
- The real driver of the rate of adoption for high levels of autonomous driving technology in trucking is dependent on the driver shortage and associated cost issues. If these trends do not improve, it is likely the industry will move toward those greater degrees of autonomous technology.

[1] North Carolina Turnpike Authority, Board of Directors Operations Committee Meeting, July 2018, Volvo Trucks/FedEx Platooning Demonstration.

- Truck platooning has the potential to ease congestion on highway corridors, since it does away with the "accordion" effect of having lines of vehicles speed up and slow-down in unpredictable ways. Even a market penetration rate of around 10% for truck platooning can provide a noticeable increase in roadway throughputs and associated increased vehicle efficiencies.
- Drivers in trucks operating in autonomous mode will also be able to engage in route optimization and seek out freight in real time, which the report says truck platooning will increase trucking revenue, reduce miles driven and possibly reduce the number of trucks required to haul cargo, while increasing the cargo density of the trucks that are moving freight.
- By 2050, fuel consumption could be reduced by as much as 18% for commercial light trucks, buses and heavy-duty "freight trucks." This reduction would be accelerated by the usage of electric commercial vehicles
- 94% of insurance executives expect liability coverage to change as a result of autonomous vehicles, while 52% expect property damage coverage to change (reduced rates).

Another important need to help make the Next Gen Truck Technology Strategy successful is the implementation of the National Electric Vehicle Infrastructure (NEVI) to add 500,000 new charging stations to alternative fuel corridors (AFC) across the country by 2030. North Carolina has identified how they will build out electric vehicle charging stations every 50 miles along AFC's in the North Carolina NEVI Plan[2]

State policy to accelerate the adoption of zero-emission trucks and buses in North Carolina was advanced in 2022 by Executive Order 271[3]. The Executive Order directs the NC Department of Environmental Quality to begin rulemaking for Advanced Clean Trucks (ACT), a policy that will grow the state's zero-emission medium- and heavy-duty vehicle (MHDV) market by setting sales targets to increase the number of zero-emission trucks and buses sold in North Carolina. Executive Order 271 also sets important complementary actions into motion, ensuring that a transportation pollution health assessment is conducted, and that necessary zero-emission vehicle infrastructure needs are met as the market grows.

Drones

Drones are being deployed to deliver packages for Amazon, UPS and health care providers in the United States. In fact, NCDOT partners flew more than 3,400 medical delivery flights, and NCDOT completed more than 300 flights in response to natural disasters.[4] A delivery by drone provides a 98% decrease in carbon emissions to the atmosphere compared to a car or truck-based delivery[5]. On-demand drone deliveries will allow for goods to be moved faster from warehouse to the consumer while providing a carbon reduced alternative to the last-mile effort of the movement of goods. Drone pilots are required to hold a FAA Part 135 Single Pilot license to be authorized to fly a drone carrying a package under 55 lbs[6]. Amazon is the first company to hold a license to operate a drove carrying a package of over 55 lbs. Several factors will determine the speed at which drones are widely used in the United States: regulation, public acceptance and cost[7]. These critical factors will help determine the progress of the use of drones for delivery purposes into the future.

[2] North Carolina Electric Vehicle Infrastructure Deployment Plan, August 1, 2022.

[3] State of North Carolina, Executive Order No. 271, Growing North Carolina's Zero-Emission Vehicle Market, October 2022

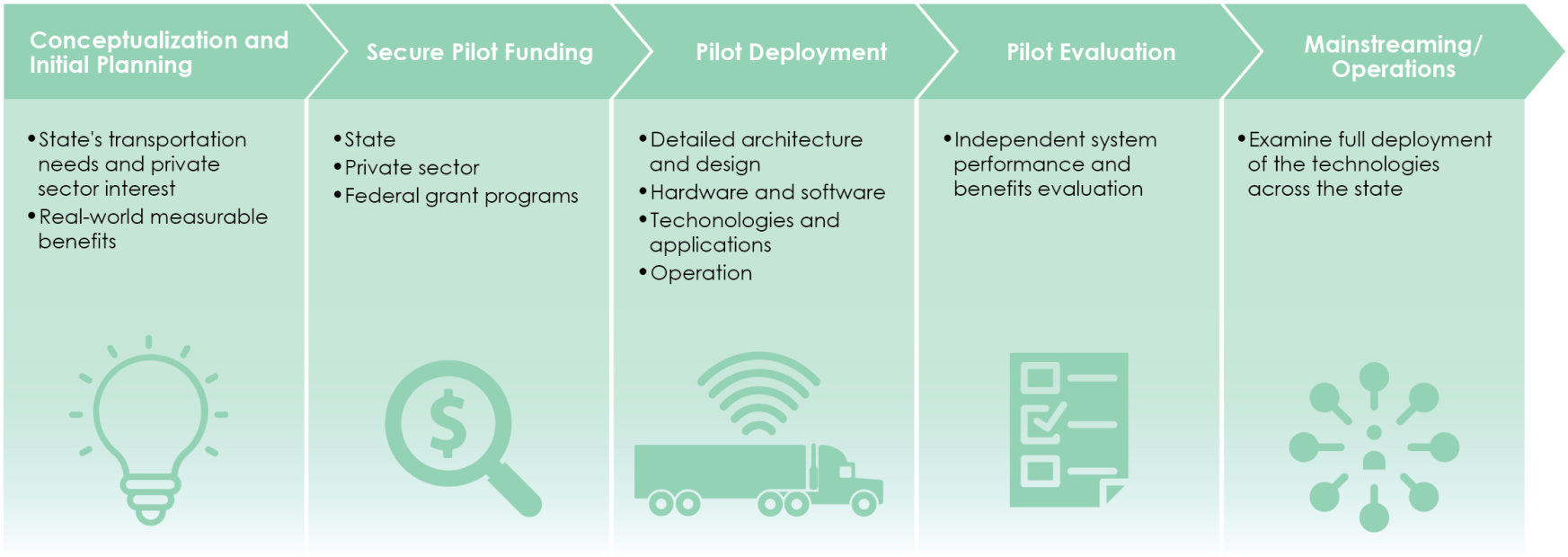
[4] Groundbreaking Drone Work to Continue at NCDOT, NCDOT, 11/2020

[5] Health Via Drone, 2022. Forbes.

[6] Package Delivery by Drone (Part 135), 2022. FAA.

[7] Drone Delivery: More lift than you think, 2022. McKinsey & Company.

Process for Planning and Implementing Technology Pilots



North Carolina is a leader in the knowledge economy and a hub for research and development for all things technology, especially truck manufacturing. Combining this with the state's expansive highway system positions North Carolina to take advantage of this opportunity. Not only could deploying the technology be a boom for shippers and carriers, but leading the research and development, and equipment production could have unprecedented impacts on the state's role in freight transportation and all its related upstream and downstream opportunities.

Expand Rail Freight Market Opportunities Strategy

North Carolina is in a position to significantly grow rail freight in the state by capitalizing on recent developments within the state as well as global shifts in trade patterns. Through strategic actions, North Carolina can expand its rail freight market, making the state more competitive for shippers and easing the pressures on the highway system.

Expanding/Modernizing Rail Infrastructure

North Carolina recognizes the need and importance of continually improving its rail infrastructure to benefit all residents and businesses. The rail network serves both passenger and freight needs with direct improvements to one often indirectly impacting the other. Rail is also a vital economic development asset as many shippers require reliable, efficient rail service to remain competitive. Modernizing the rail system increases its functionality, for example:

- Continue upgrading all trackage to sustain 286,000 lb. loads improves customer service by standardizing load limits throughout the State to minimize transfer and repacking issues and time.
- Continuing the strong Federal Railroad Authority's Competitive Discretionary Grant Programs FRA CRISI program increases safety by replacing aged and obsolete rail structures, and reducing at-grade highway/rail crossings.
- Reconstructing rail corridors to accommodate double-stacked containers and oversized (wide) project cargo creates flexible, high capacity facilities that dovetail well with private industry's push to intermodal yard automation.
- Implementation of Positive Train Control
- Increase of track speeds through improving track curves to improve network efficiencies.
- Partnering with private rail carriers to provide expedited, regular service.
- Preserving and increasing the number of direct rail served sites.

Shifting Distribution Center Activity Along Eastern Seaboard

North Carolina can capitalize on trade shifts from the Panama Canal's expansion, which has led to larger ships reaching the U.S. East Coast, by encouraging distribution center clusters around North Carolina's freight hubs, including the ports, airports, intermodal facilities, and short rail corridors. The State can build on the momentum of the CCX Intermodal Terminal being developed in Rocky Mount, North Carolina on CSX's crucial A-Line which parallels I-95, the National Gateway Corridor, through coordinated rail corridor improvements such as installing passing sidings and/or double-tracking busy sections of track, and grade-separating highway/railroad crossings that increase corridor safety, efficiency, and reliability. Additionally, the State can incentivize rail-centric mega sites plus encourage rail connections to other mega sites (Siler City, Randolph County, Brunswick County and New Hanover County) to aid in the clustering to further support the East Coast's growing container ship market.

Truck to Rail Diversion

As the roads become further congested and widening them becomes less of an option to meet growing demand, diverting truckloads to rail cars can extend the life of the current road network as well as better utilize the state's extensive rail network. Adding last-mile highway connectors to rail-served facilities will aid in simplifying diversions. Removing at-grade crossings will benefit both road and rail travel time reliability and safety.

New Industrial or Other Freight-Oriented Development

Starting with the North Carolina Statewide Logistics Plan in the early 2000's, North Carolina's agencies, rail- road companies, and private businesses have taken an active role in addressing freight and logistics needs to shape the state of North Carolina through policies, programs and projects that support and encourage freight movement and freight-oriented developments. For instance, from talks with agricultural and pharmaceutical industry experts, it was found that North Carolina had a lack of refrigerated facilities near their ports so cold shipments were often sent to neighboring states' ports. Highlighting this gap in services was one step that led to the new in-port cold storage facility in Wilmington. Similarly, North Carolina's Port of Morehead City was found to be one of the stronger project cargo ports on the East Coast that could further expand by offering white glove service for new industries such as windmills.

Attracting North Carolina Traffic from Neighboring States' Intermodal Facilities

South Carolina has Greer and Dillon; Virginia has Front Royal. These intermodal facilities directly stream goods to their ports and the two Class I railroads in the North Carolina region thereby creating booming economic development in their vicinities. Each of these out-of-state intermodal facilities is currently serving several of North Carolina's home grown industries and agriculture. North Carolina has an opportunity to recapture this business by building on its current facilities, including the Charlotte Intermodal Terminal. By carefully master planning the CCX

Intermodal Terminal in Rocky Mount along with its surrounding areas, North Carolina can draw in additional traffic. Additionally, North Carolina can capitalize on the large number of short lines in the state to further increase eco- nomic development by connecting these large national terminals with local industry.

The North Carolina Freight Network is one of the state's most important economic assets. To continue to compete in a global economy, the state must ensure sufficient investment to protect, enhance, and grow freight transportation assets and opportunities. Protect the assets and the businesses that depend on them by ensuring a state of good repair; Enhance the assets by addressing congestion, safety and modernization needs; and Grow the assets by investing in critical new facilities and programs necessary to meet the rapidly expanding and changing needs of manufacturers, logistics providers, and consumers.

CONCLUSION

The North Carolina Statewide Multimodal Freight Plan documents the freight transportation strengths, weaknesses, opportunities and challenges, both currently and into the future. The Plan sets forth recommendations and strategies to assist the state in meeting existing needs and future challenges. More importantly, it lays out strategies that can shape not only the future of the state's freight transportation system, but the future of the North Carolina's economic well-being. In meeting the FAST Act and BIL requirements, the plan also positions the state to take advantage of federal funding opportunities for freight infrastructure. However, that will not be enough. The needs far exceed available resources. This plan can serve as a call for action to position North Carolina to compete in a global economy dependent on the safe and efficient movement of freight.

The North Carolina Freight Network is one of the state's most important economic assets. To continue to compete in a global economy, the state must ensure sufficient investment to Protect, Enhance, and Grow freight transportation assets and opportunities. Protect the assets and the businesses that depend on them by ensuring a state of good repair; Enhance the assets by addressing congestion, safety, and modernization needs; and Grow the assets by investing in critical new facilities and programs necessary to meet the rapidly expanding and changing needs of manufacturers, logistics providers, and consumers.