

North Carolina Statewide Multimodal Freight Plan

# **Executive Summary**

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# NORTH CAROLINA'S STATE FREIGHT PLAN

North Carolina's freight system plays a critical role every day for every resident and business. Delivering goods to the State's businesses and residents, keeping the manufacturing plants operating, the store shelves stocked, the medicine flowing at area medical facilities, and food on the table.

North Carolina has a tremendous opportunity to leverage its well-connected network of highways, rail, ports, and airports to meet the demands of an increasingly competitive global marketplace.

This plan represents the State's first multimodal statewide freight plan. The North Carolina Statewide Multimodal Freight Plan was developed in compliance with Fixing America's Surface Transportation Act (FAST Act) requirements to ensure the State has access to Federal funding opportunities and competitive grant opportunities.

The Plan was supported by key freight stakeholders throughout the State and their input in every phase of development ensures a Plan grounded in real-world needs, expectations, and recommendations. North Carolina's multimodal freight transportation network is meeting the growing needs of the State to compete globally for quality jobs, provide safe and efficient people and goods mobility, and build quality communities for today and the future.

Enhance economic development opportunities	Improve freight system efficiency, reliability and resiliency	Pursue sustainable funding for freight investments	Improve, maintain and preserve freight assets
Foster partnerships with private sector freight stakeholders	Enhance freight safety and security	Support adoption and deployment of freight technologies	Protect and enhance the natural environment



## STAKEHOLDER ENGAGEMENT TO INFORM THE PLAN

North Carolina Freight Advisory Committee Meetings

• Formally met 7 times during the Freight Plan development

Metropolitan Planning Organizations (MPOs) and Rural Planning Organizations (RPOs) Outreach

• Interviews, workshops, webinars, and presentations in quarterly NCARPO and NCAMPO meetings

Board of Transportation Economic Development and Intergovernmental Relations Committee Presentations

• Presented at the ED&IR committee meetings 5 times

**Secretary of Transportation Briefings** 

• Briefed the Secretary on the Plan progress 4 times

# Freight and Industry Stakeholder Interviews

- Shippers and Receivers
- Carriers
- Ports and Airports
- Railroads
- North Carolina Railroad Company
- Industry Associations (e.g., North Carolina Trucking Association, and Farm Bureau)
- NCDOT (e.g., Rail Division, Safety and Mobility, Division Engineers)
- Department of Agriculture, Department of Commerce, North Carolina Chamber of Commerce, Regional Economic Development Organizations
- Military Bases

## NORTH CAROLINA FREIGHT ADVISORY COMMITTEE



# FUELING NORTH CAROLINA'S ECONOMY

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.

Freight transportation supports jobs throughout the State's economy, including in all of North Carolina's key exporting industries. There are approximately 236,600 North Carolinians directly employed in freight-related jobs in North Carolina, 50 percent of which are in the trucking industry. Warehousing and storage employs approximately 70,800 or 30 percent of the total freight-related jobs. These direct jobs support additional jobs in other sectors throughout the State.

	Jobs	Labor Income	Gross State Product
Direct	236,586	\$11.3	\$33.1
Indirect + Induced	202,663	\$10.2	\$30.9
Total	439,249	\$21.5	\$64.0

Note: Dollar values in 2015 billions.



# TAKING STOCK OF OUR FREIGHT RESOURCES

North Carolina has a well-connected multimodal freight transportation network...



# ...that carries a significant volume of freight for the State's businesses and residents and the amount is growing every year.





\$1.7 Trillion 794 \$955 Million 82% Growth 43% Growth Billion 557 Million 2015 2045 2045 201 Tons Value

Trucking is the dominant mode of transportation used to move freight in North Carolina. In total, the amount of freight being generated by North Carolina's businesses and consumers is projected to grow by 70 percent between now and 2045.





# THE NORTH CAROLINA PRIORITY FREIGHT NETWORK

The NCPFN is comprised of the highway, rail, port, and airport facilities responsible for moving the majority of freight in North Carolina and serving the State's key businesses.

The motivation for designating the North Carolina Priority Freight Network (NCPFN) is twofold:

- Designation of a subsystem that is responsible for carrying the majority of freight allows NCDOT to focus limited resources on the portion of the system that impacts the greatest number of users and the majority of the tonnage being moved.
- The FAST Act established the National Highway Freight Network and requires states to designate additional critical freight corridors.

The NCPHFN is comprised of the State's portion of the National Highway Freight Network (NHFN) and other corridors in the State that scored high in the freight system designation process, including:

#### 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 National Highway Freight Program (NHFP) funding. North Carolina may designate a maximum of **103.43 miles** as CUFCs.

#### 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 National Highway Freight Program (NHFP) funding. North Carolina may designate a maximum of **206.86 miles** as CRFCs. 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.



# SPOTLIGHT ON THE MILITARY

# **Supply Chain Focus** Military Freight

The military is a critical economic driver for the State of North Carolina. It is also 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.

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 ability to use Port of Wilmington due to insufficient staging area for convoys; insufficient dockside access; and transit time up and down the Cape Fear River.
- 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.

Annually, eastern North Carolina supports an overall military-related economic impact of \$48 billion, including 540,000 military-related jobs.

ource: NCDOT 25-Year Vision for North Carolina: Mapping Our Future.



# TRENDS SHAPING OUR FUTURE

There are a number of global, national, and statewide trends that will continue to drive the demand for and performance of North Carolina's freight transportation system.

# Trends shaping the future of freight transportation



# THE "AMAZON EFFECT"



# CHANGES are COMING...



# **RESHORING OF MANUFACTURING**

<b>U.S. Manufacturing Jobs/Year 2016</b> The Tide Has Turned					
	2000-2003 Annual Average	2016	~% Change		
New Offshoring	~240,000*	~50,000*	-80%		
New Reshoring and FDI	12,000*	77,000**	+500%		
Net Jobs Gained	~ -220,000	~ +25,000	N/A		

Source: Reshorenow.org.

FDI Foreign Direct Investment

\*Estimated. \*\*Calculated – Reshoring Library through December 31, 2016.

Between 2010-2016 **North Carolina was 5<sup>th</sup> in the Nation** attracting over 18,000 reshoring manufacturing jobs in 109 companies.

# DELIVERING THE GOODS, STRATEGIES, AND RECOM-MENDATIONS

NCDOT can improve the efficiency and reliability of the movement of freight in and through North Carolina through the identification, prioritization, and implementation of freight improvement projects, programs, and policies. These three types of solutions combine to create NCDOT's Freight Implementation Plan, a strategy based on the goals of the Freight Plan, stakeholder-identified needs and solutions, and analysis of the North Carolina Priority Freight Network.

The process for identifying projects for the freight plan leveraged a variety of stakeholder outreach activities to gain across-the-board perspectives. Stakeholder input was combined with an assessment of needs, project identification and gap analysis, and project prioritization process to arrive at a strategic and cost-effective approach to freight investment in North Carolina.

FHWA defines three categories of strategies for state freight plans: infrastructure improvements, operational innovations, and policies. Strategies were taken from several sources:

• NCDOT priorities and previous plans, including the Divisions and Modal Offices;

- Priorities for North Carolina State Ports Authority, MPOs and RPOs, and North Carolina Railroad;
- Industry priorities and suggestions, gathered through over 40 interviews, and the Freight Advisory Council (FAC); and
- Best practices from FHWA, other states, and the private sector.



## SUMMARY OF FREIGHT TRANSPORTATION NEEDS

Highway	Rail	Maritime	Air Cargo
<ul> <li>Enhance mobility and reliability</li> <li>Maintain and enhance bridges and pavements</li> <li>Mitigate crash hotspots</li> <li>Implement truck parking strategies</li> <li>Enhance two-lane rural freight routes</li> <li>Improve operations through technology</li> </ul>	<ul> <li>Maintain and improve track conditions</li> <li>Improve safety and grade crossing elimination</li> <li>Plan for increased passen- ger rail demand</li> <li>Invest in new and expanded transload and intermodal facilities</li> <li>Maintain shortline support programs</li> </ul>	<ul> <li>Support for "inside the gate" improvements such as new cranes, dredging and widening and new land development</li> <li>Grade crossing eliminations on port access routes</li> <li>Address rail bridges and clearance issues</li> <li>Ensure safe, reliable and efficient roadway access and connectivity to the ports</li> </ul>	<ul> <li>Ensure safe, reliable, and efficient roadway access and connectivity to the airports</li> <li>Support industrial development in and around the airport facilities</li> <li>Support "inside the gate" investments such as additional and longer runways and expanded air cargo handling facilities</li> </ul>

Resiliency of the network against natural and man-made interruptions

Sustainable and adequate funding

# Five Categories of Recommendations

- Funded Projects address a current or near-term need. They are worthwhile ideas today, no matter what the future holds. For example, addressing a safety hotspot. These strategies are already under development, many with funding secured. They will form the five-year Freight Investment Plan.
- **Robust Strategies** are expected to be appropriate no matter what the future holds, but are not necessarily funded. For example, enhancing the resiliency of the freight network.
- Hedging Strategies might not be needed, but if they are needed we will need to have started implementing them now.
   For example, providing connectivity and access to major development sites.
- Transformative Strategies allow North Carolina agencies to influence – and hopefully direct – trends for the future. For example, increasing the use of underutilized gateways and rail assets.
- **Deferred Strategies** might be necessary, but it is safe to wait and see what happens. For example, implementing truck only lanes along major trade corridors such as I-85.

The FAST Act established the NHFP funds which are available for obligation for up to four years. NHFP obligations are reimbursed from the Highway Account of the Highway Trust Fund – Projects must be identified in the STIP/TIP and be consistent with the Long-Range Plans. The State Freight Plan must provide a 5-year fiscally constrained Freight Investment Plan (FIP) that describe how the funds would be invested. Eligible

## NORTH CAROLINA FREIGHT INVESTMENT DECISION-MAKING PROCESS



projects, which must contribute to the efficient movement of freight on the NHFN, include planning, construction, ITS, bridges, alt fuel, etc. North Carolina's apportionment of the NHFP funds for the period spanning 2016-2020 is \$166.8 million. The FIP includes projects eligible for the NHFP funds.

#### FUNDED PROJECTS: SUMMARY OF THE FISCALLY CONSTRAINED 5-YEAR FREIGHT INVESTMENT PLAN

			Total	Total	Total	State Highway
		Number of	Projects	Federal*	NHFP	Trust Fund
Year	Need Area	Projects	Cost (\$M)	(\$M)	(\$M)	Match** (\$M)
2016	Asset Management and Utilization	2	\$14.48	\$10.76	\$1.00	\$3.72
	Mobility and Reliability	2	\$163.71	\$130.97	\$15.54	\$32.74
2017	Asset Management and Utilization	4	\$109.82	\$87.86	\$5.33	\$21.96
	Mobility and Reliability	2	\$121.97	\$97.58	\$34.80	\$24.39
2018	Asset Management and Utilization	12	\$80.60	\$64.48	\$10.92	\$16.12
	Mobility and Reliability	9	\$612.17	\$473.62	\$9.74	\$138.55
	Safety	1	\$7.27	\$5.82	\$0.00	\$1.45
2019	Asset Management and Utilization	12	\$134.40	\$107.52	\$33.30	\$26.88
	Mobility and Reliability	16	\$423.11	\$279.98	\$16.32	\$143.14
2020	Asset Management and Utilization	5	\$33.88	\$27.11	\$0.00	\$6.78
	Mobility and Reliability	11	\$359.18	\$287.35	\$36.50	\$71.83
Total	2016-2020	76	\$2,060.61	\$1,573.04	\$163.45	\$487.58

Note:

\* Total Federal Share includes NHFP as well as any other Federal funding source. See STIP for detailed breakout of other Federal sources.

\*\* The source of all match is the State Highway Trust Fund.

The longer-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 the 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

#### 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 trucks.

Invest in upgrading rail lines and other rail facilities.

Invest in alternate 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.

#### Operations

Invest in urban locations to service increasing number of fulfillment centers.

Develop alternative freight delivery vehicle operating guidelines.

# **Robust Strategies**

#### 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 ad 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 weight stations from the Statewide Truck Parking Study. The trucking industry suggested exploring industry user fees as a funding mechanism.

Address congestion hot spots on NCPHEN. This may include examining mass transit opportunities for removing passenger vehicles from these routes.

#### **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.

#### Institutional

Enhance public awareness program on "Sharing the Road" with trucks.

Add safety signage on NCPHFN about safe traveling distances and passing guidelines related to trucks.

Implement Freight Performance Measure Program and target setting.

Integrate freight into Strategic Transportation Investments (STI) process.

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.

Maintain on-going engagement with the industry through the Freight Advisory council and an annual Freight Leadership Summit that includes leaders from the industry, NCDOT, other state agencies and the NC Legislature.

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.

Develop a comprehensive "Freight Moves North Carolina" public awareness campaign that addresses the role of freight and how to better facilitate safe and efficient freight transportation and mitigate the potential negative impacts.

Implement freight planning requirements into the Comprehensive Transportation Planning (CTP) program at NCDOT.

# **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.





# North Carolina is strategically located about midpoint on the eastern seaboard of North America. This provides efficient reach from Canada to Florida. The State's two deep-water ports and its expansive highway system and two Class I railroads are assets that benefit businesses and residents statewide. While North Carolina may not become the East Coast's biggest gateway, it can become a very strategic gateway for shippers in North Carolina and beyond. Developing a vision of what the State wants to be as a gateway and developing a plan to achieve that vision could reshape the State's economic future.

The Central Coast Gateway Strategy would be guided by a shared vision to be achieved through a series of goals and objectives. It would be comprised of a set of key policies and programs, infrastructure investments and partnerships necessary to plan and implement the strategy.

The investment is already starting to happen with the CCX terminal in Rocky Mount, the Queen City Express service from Port of Wilmington to Charlotte and the upgrade of U.S. 70 and 74 to interstates. Additional investments are being studied including rail realignment at Port of Wilmington and Morehead City, master planning for major logistics activity around the CCX facility and expansion of opportunity at Global TransPark. The core pillars for the gateway strategy would be:

# Invest in a world-class transportation network

Increase major road and rail capacity necessary for accessing the ports

Increase container cargo capacity and handling capabilities

Increase bulk cargo capacity and handling capabilities

# Ensure attractive investment climate

Workfore development

Competitive costs

Community and political support

Foreign trade zone and import/export assistance

# **Develop key partnerships**

Federal, state and local public partners

Private sector including railroads, steamship liners, and developers

Financing community

Communities, residents, and businesses



## Next Gen Truck Technology

## Autonomous and Connected Trucking – a Game Changer for Fuel Efficiency, Safety, and Mobility

A recent report issued by the U.S. Energy Information Administration on autonomous projects 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. 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. 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. A first step for NCDOT is to ensure that the NCPHFN has the appropriate digital infrastructure necessary for facilitating new truck technologies.

### PROCESS FOR PLANNING AND IMPLEMENTING TECHNOLOGY PILOTS





# **Expand Rail Freight Market Opportunities**

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:

Upgrading all trackage to sustain 286,000
 Ib. loads, such as on the Oxford to Durham
 line and several short lines, improves cus tomer service by standardizing load limits
 throughout the State to minimize transfer
 and repacking issues and time.

- Continuing the strong FRRCSI 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.
- 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.

# 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 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.





