NC State Freight Plan

FAC Meeting #4

February 14, 2017

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Agenda

- Welcome and Introductions
- State Freight Plan Update
  - » Vision, goals and objectives
  - » Freight trends, challenges and opportunities
  - » Modal profiles overview and needs
  - » Freight system designation process and tool
- Next steps and meeting

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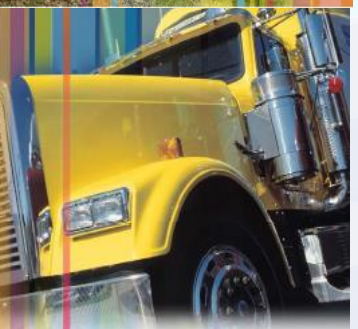

VISION, GOALS AND OBJECTIVES

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Developing Vision, Goals and Objectives

- Input received from the Freight Advisory Committee (FAC):
- The *25-year Vision for North Carolina;*
- Goals and objectives of the NCDOT's 2040 Plan and the Strategic Transportation Corridors;
- North Carolina Statewide Transportation Plan; and
- National freight policy goals defined in the 2012 MAP-21 Act and the 2015 FAST Act.

Draft NC State Freight Plan Vision

North Carolina's multimodal freight transportation network helps us compete globally for quality jobs, provide safe and efficient people and goods mobility and build quality communities for today and the future.

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Draft NC State Freight Plan Goals

- Enhance economic development opportunities and competitiveness
- Improve system efficiency and reliability
- Improve infrastructure conditions and preservation
- Enhance safety, security and resilience
- Protect and enhance the natural environment
- Support adoption and deployment of new technologies
- Foster public-private partnerships and collaboration
- Improve access to data and information
- Ensure good fiscal management

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Homework

- Review vision, goals and objectives
- Forward comments no later than COB on Monday, Feb 27, 2017 to Heather Hildebrandt at

hjhildebrandt@ncdot.gov

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Stakeholder Input

- Trends and Policies Affecting Freight Flows
  - » Economic and trade
  - » Technology
  - » Business and consumer practices
  - » Regulations and institutional setting

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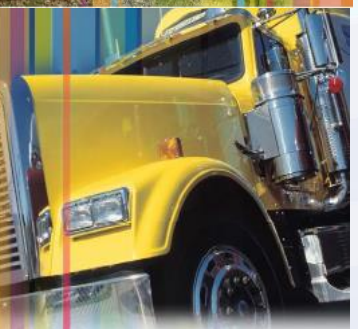


To Participate in Poll

http://Camsys.participoll.com/

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Economic Trends

Over the next 5 years, do you think the economy in the region will:

A. Decline

B. Stay about the same

C. Grow slower than the rest of the state

D. Grow faster than the rest of the state

E. Grow about the same as the rest of the state

F. Not sure

Economic Trends

What do you think will have the largest impact on region's economy?

A. Population growth

B. Trade dynamics and policy

C. Energy dynamics and policy

D. Business climate

E. Other

A	B	C	D	E	0

Economic Trends

How are proposed changes in trade dynamics and policy likely to impact freight in your region over the next 10 years:

A. Decline

B. Stay about the same

C. Grow slower than in the past 5 years

D. Grow faster than in the past 5 years

E. Grow about the same as the past five years

F. Not sure

Economic Trends

How are proposed changes in energy dynamic and policy likely to impact freight in your region over the next 10 years:

A. Decline

B. Stay about the same

C. Grow slower than in the past 5 years

D. Grow faster than in the past 5 years

E. Grow about the same as the past five years

F. Not sure

A B C D E F 0

Economic Trends

How are proposed changes in business climate likely to impact freight in your region over the next 10 years:

A. Decline

B. Stay about the same

C. Grow slower than in the past 5 years

D. Grow faster than in the past 5 years

E. Grow about the same as the past five years

F. Not sure

Technology

What technologies do you think will have the greatest impact on freight movements in your region in the next 10 years:

A. Autonomous and connected trucks

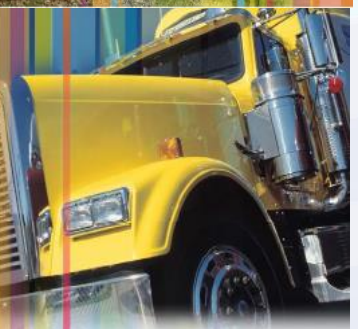
B. Alternative delivery systems (drones, freight shuttles, etc.)

C. Advances in manufacturing

D. “Uber-like” cargo shipping

E. Warehouse and factory automation

F. Other


Business and Consumer Practices

What changes in business practices will have the greatest impact on freight movements in your region in the next 10 years:

A. Near-shoring

B. Off-shoring

C. Supply chain traceability and identity preservation

D. Omni-channel marketing and distribution

E. Transloading

F. Other

Business and Consumer Practices

How will changes in business practices impact growth in freight movements in your region in the next 10 years:

A. Decline

B. Stay about the same

C. Grow slower than in the past 5 years

D. Grow faster than in the past 5 years

E. Grow about the same as the past five years

F. Not sure

Business and Consumer Practices

What change in shipping patterns do you think will most impact freight movements in your region:

A. Truck to rail diversions

B. Rail to truck diversions

C. Containerization of bulk commodities

D. Substitution of all-water routes over land bridges

E. Other

A B C D E 0

Business and Consumer Practices

What changes in consumer practices will have the greatest impact on freight movements in your region in the next 10 years:

A. E-Commerce

B. Sharing economy

C. Same day/next day delivery expectations

D. Changing consumer attitudes (socially-based consumption)

E. Changing consumer demographics and tastes

F. Other

Business and Consumer Practices

How will changes in consumer practices impact growth in freight movements in your region in the next 10 years:

A. Decline

B. Stay about the same

C. Grow slower than in the past 5 years

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E. Grow about the same as the past five years

F. Not sure

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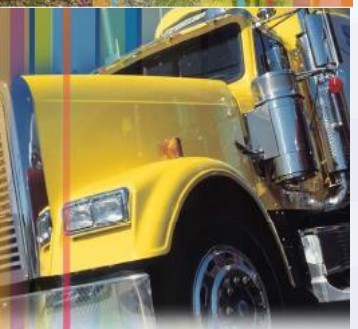

MODAL OVERVIEWS

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Maritime Modal Profile

- Inventory
- Activity
- Port Needs:
  - » Infrastructure
  - » Operations
  - » Policy

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Inventory

- Facilities

Cargo Capacity	Wilmington	Morehead City
Intermodal containers (TEUs)	600,000	0
Breakbulk (Tons)	1,470,000	1,080,000
Bulk (Tons)	2,220,000	2,730,000
Ro/Ro (Units)	Unknown	Unknown

Sources: North Carolina Maritime Strategy (2012), 2015 Strategic Plan of the NCSPA, NCSPA Facilities Guide, G&W interview, CNLA

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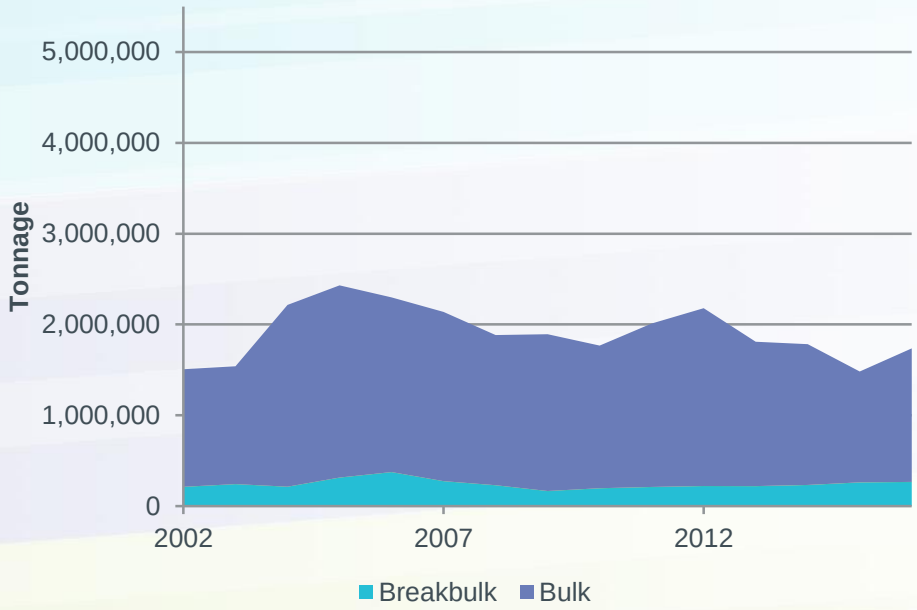
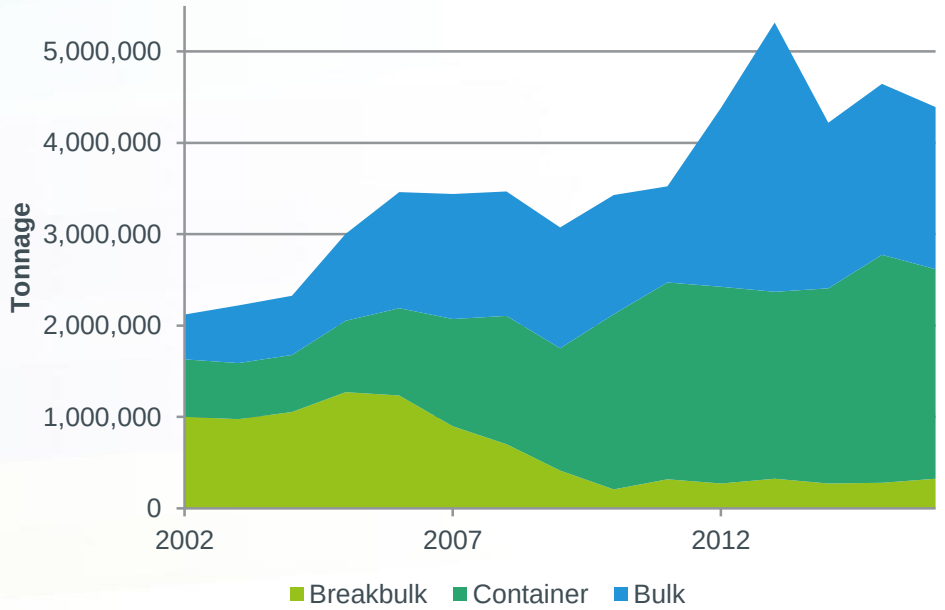
Port Traffic, 2002-2016

Port of Morehead City



Port of Wilmington



Source: NCSPA

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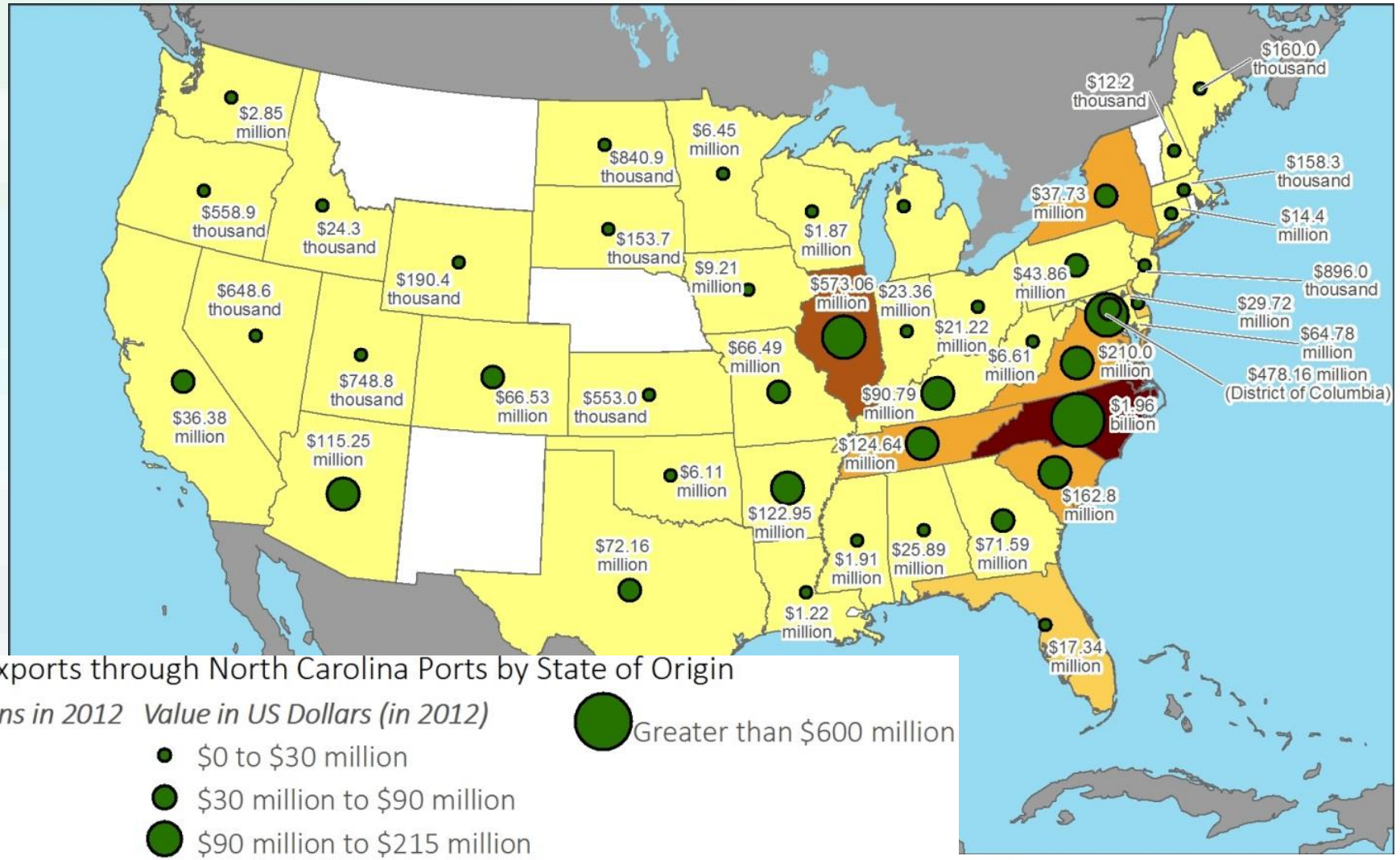

Waterborne Exports through North Carolina Ports by State of Origin

Percentage K Tons in 2012

- 0 to 0.5%
- 0.5% to 1%
- 1% to 10%
- 10% to 30%
- Greater than 30%

Value in US Dollars (in 2012)

- $0 to $30 million
- $30 million to $90 million
- $90 million to $215 million
- $215 million to $600 million
- Greater than $600 million

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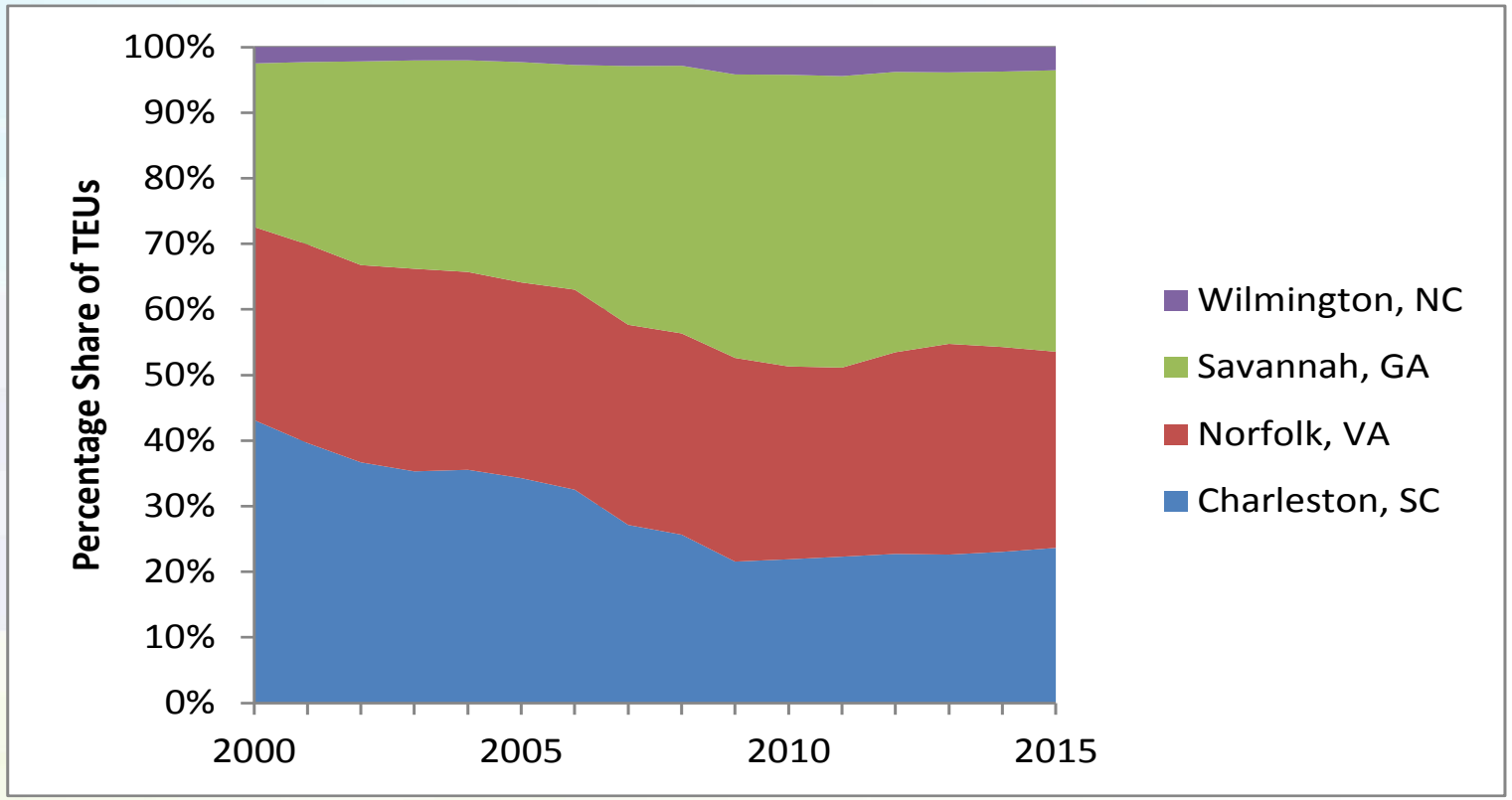
Container Volumes at Regional Ports



Source: AECOM, from MARAD container ports data, 2000 to 2015

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On-site Port Infrastructure Needs

Port of Wilmington	Port of Morehead City
• Complete turning basin expansion • Complete cold storage facility • Finish wood pellet export facility • Expand container yard • Purchase additional cranes	• Further develop Radio Island • Expand wood pellet export facility • Create and partially fund an ongoing dredging agreement with USACE • Replace aging cranes • Purchase a rail loader • Relocate scales • Extend track into warehouse north of Arendell Street • Replace aging warehouses and transit sheds • Increase building setbacks for better rail access and crane movement • Cover a portion of the rail yard for cargo operations

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Port Operational Needs

Port of Wilmington	Port of Morehead City
On-site: • Consider having separate main gate lanes to minimize processing times of freight • Optimize on-site routing	On-site: • Move military operations to Radio Island • Optimize on-site routing
Road (same concepts for both ports): • Regularly optimize traffic signals • Use variable message signs to notify travelers when the at-grade crossings will be closed • Create a cellphone app that updates drivers directly when the crossings will be closed	
Rail: • Work with Wilmington Terminal Railroad to eliminate non-port freight from being handled on port property	Rail: • Prioritize train movements through town to minimize closings of at-grade crossings • Have NS drop/pick up cars west of the town and short line conduct operations through town at more convenient times

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Port Policy Needs

- Port governance and funding
- Comprehensive maritime vision and marketing plan
- Continued stakeholder input
- Integration of maritime freight needs into statewide transportation planning
- Shared rail service
- Regulation of shipping alliances

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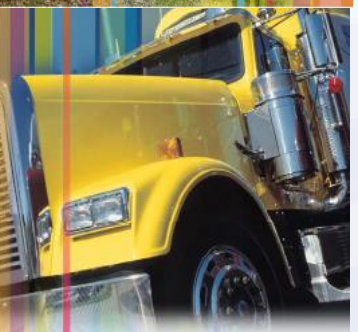

Rail Modal Profile

- Inventory
- Activity
- Rail Needs:
  - » Rail Service Needs - Freight
  - » Freight Rail Needs and Opportunities

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Inventory

Major Rail Facilities Across North Carolina

- Interstate Highway
- US Highway

Rail Facilities

- Intermodal
- Transload
- Rail Yard

Railroad Owner

- Shortline
- Norfolk Southern
- CSX Transportation
- North Carolina RR Company
- CSX Transportation & Norfolk Southern

- Seaport
- Major Rail Yard

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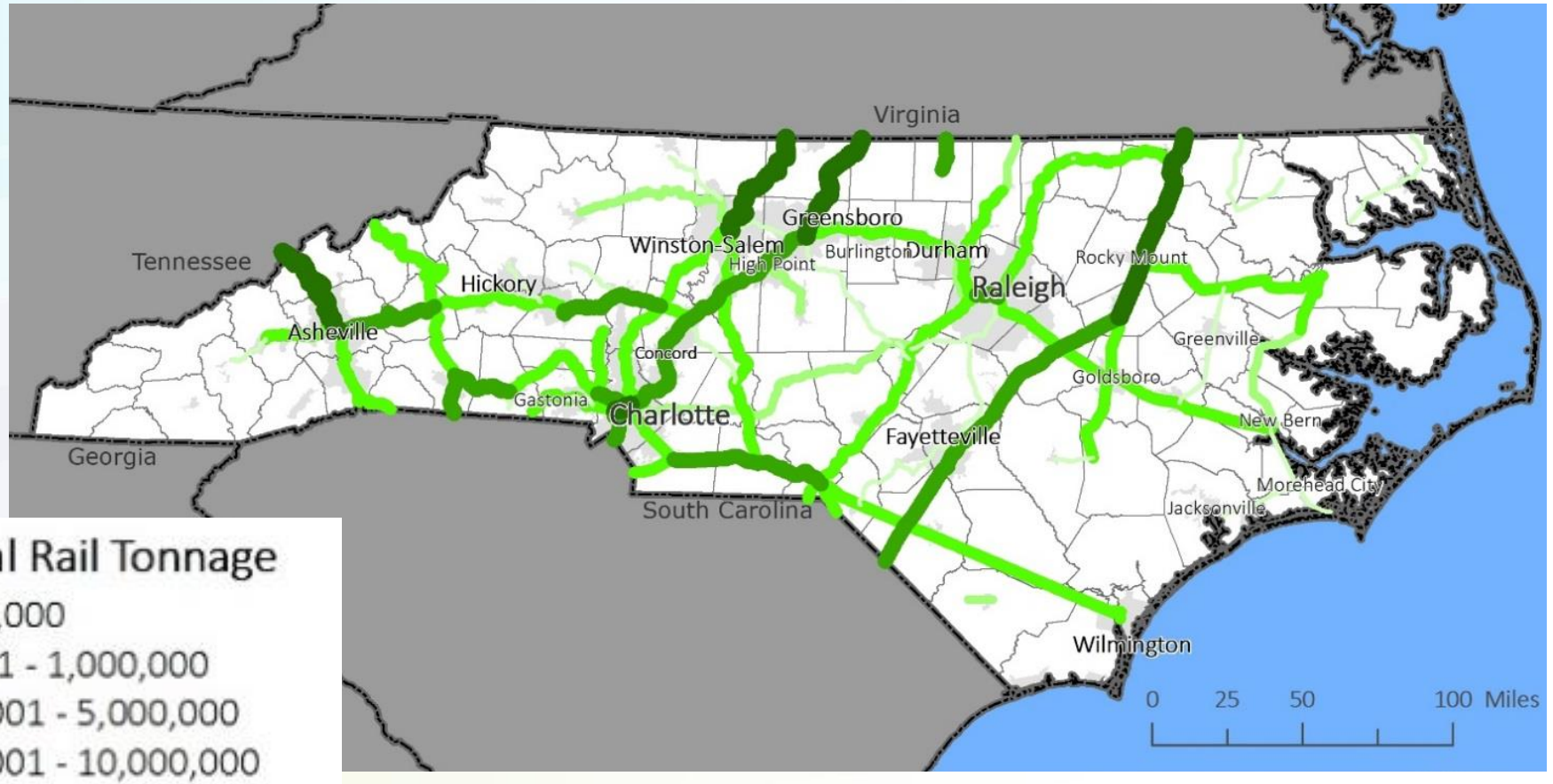
Activity



2014 Annual Rail Tonnage

- <= 500,000
- 500,001 - 1,000,000
- 1,000,001 - 5,000,000
- 5,000,001 - 10,000,000
- > 10,000,000

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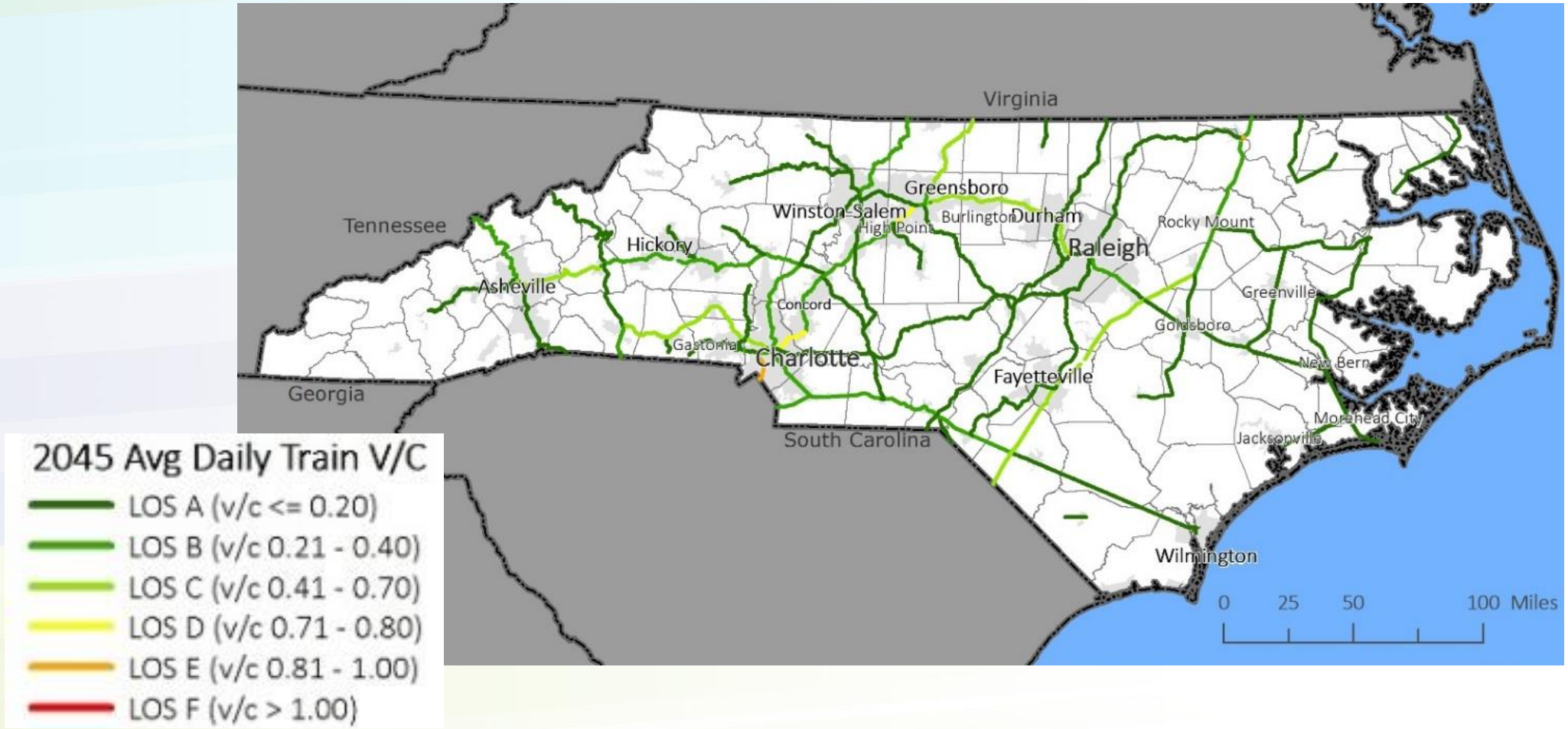
Activity



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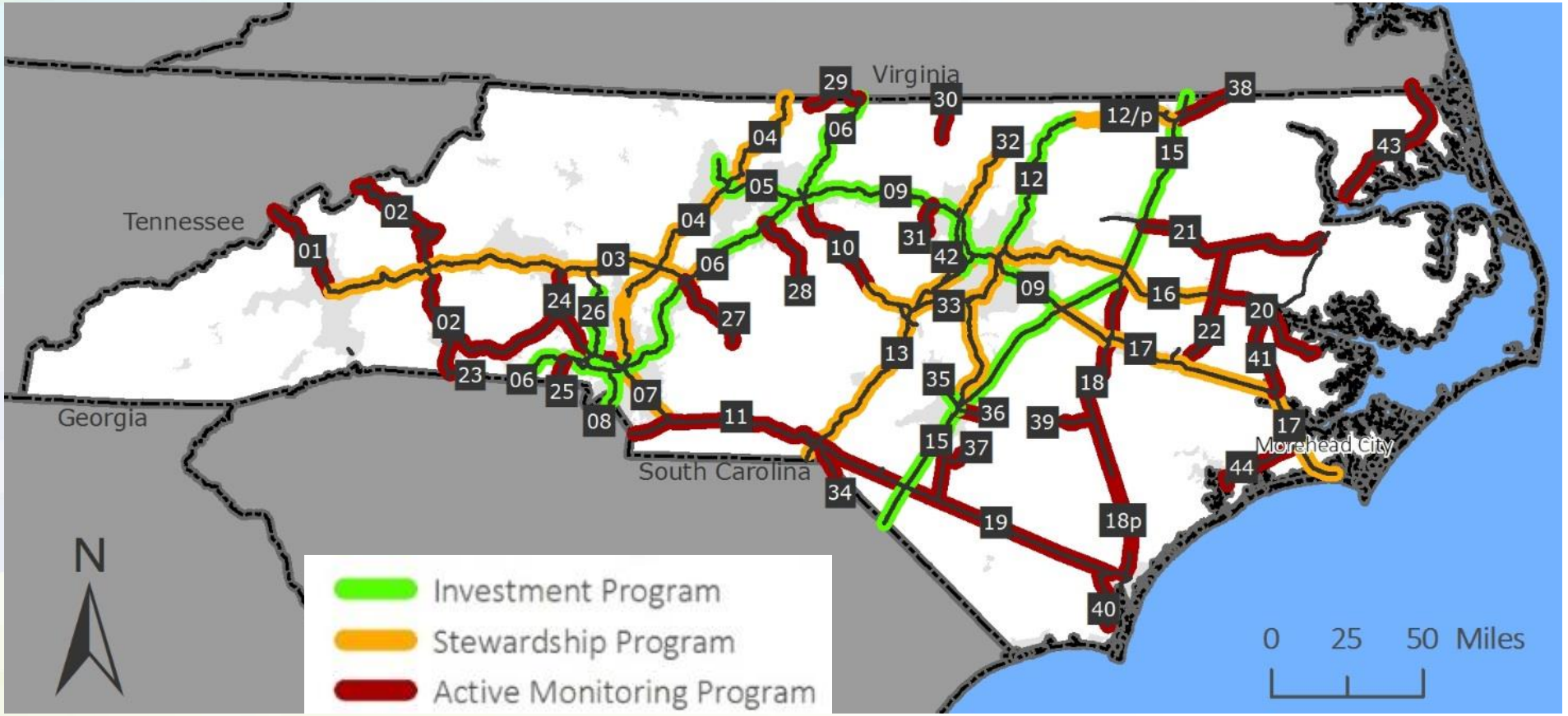
Prioritized Freight Corridor Needs



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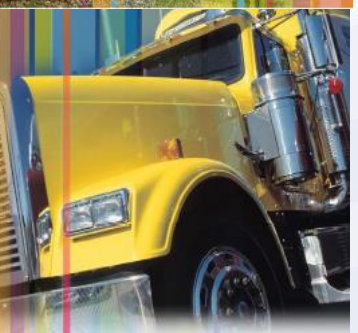


Freight Rail Needs

Rail Service Needs - Freight

- Maintain and improve track capacities, especially on Class II and III systems, for existing and future high flow corridors.
- Improve safety and strive to minimize delays.
- Expand freight rail infrastructure and/or add redundancy in select locations across the state to support economic development aligned with rail-based markets as well as supply chain reliability.

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Freight Rail Needs

Freight Rail Needs and Opportunities

- Congestion on lines that carry both passenger and freight traffic that lead to interoperability and performance issues for both passenger and freight service providers
- Increased need for investment in transload facilities
- Need for investment in the intermodal network to continue to efficiently serve industries and also provide consumable goods to the growing population
- Improved access and service to North Carolina's ports is needed to better serve North Carolina industries and consumers

Freight Rail Needs

Freight Intermodal Advisory Council

- Prepare for the emergence of the energy industry in North Carolina.
- Continue leading and investing in our nationally-recognized best practice safety program.
- Develop implementation plan for the short-term solutions and plan for the long-term recommendations presented in the Eastern Infrastructure Study for GTP, the Port of Morehead City, and the Port of Wilmington.
- Maintain short line support programs such as the Rail Industrial Access Program and Short Line Industrial Access Program via FRRCSI funds.
- Continue efforts to partner with railroads to evaluate placing an intermodal facility to help mitigate future highway congestion's impacts on the Triangle region's access to intermodal service(s) that are currently located in Charlotte and Greensboro. Also, support the expansion of existing CSXT and NS intermodal facilities in Charlotte and Greensboro.
- Leverage private sector rail capacity investments and augment them to foster truck–to-rail mode shifts.

Pipeline and Hazardous Material Profile - Overview

- No single or complete source of data is available to evaluate HazMat as freight, many data sources were used in profile – profile focused on two sectors, **general industry and fuel**

- HazMat is any chemical that has one or more hazardous properties that meet the definition for USDOT HazMat Classes –
  - Explosives
  - Gasses
  - Flammable Liquids
  - Flammable Solids
  - Oxidizing Substances And Organic Peroxides
  - Toxic And Infectious Substances
  - Radioactive Materials
  - Corrosive Substances
  - Miscellaneous

- NC is the 7th highest value producer and shipper of chemicals in the United States with a value of well over $2.3 billion dollars shipped in 2012 by the chemical manufacturing industry

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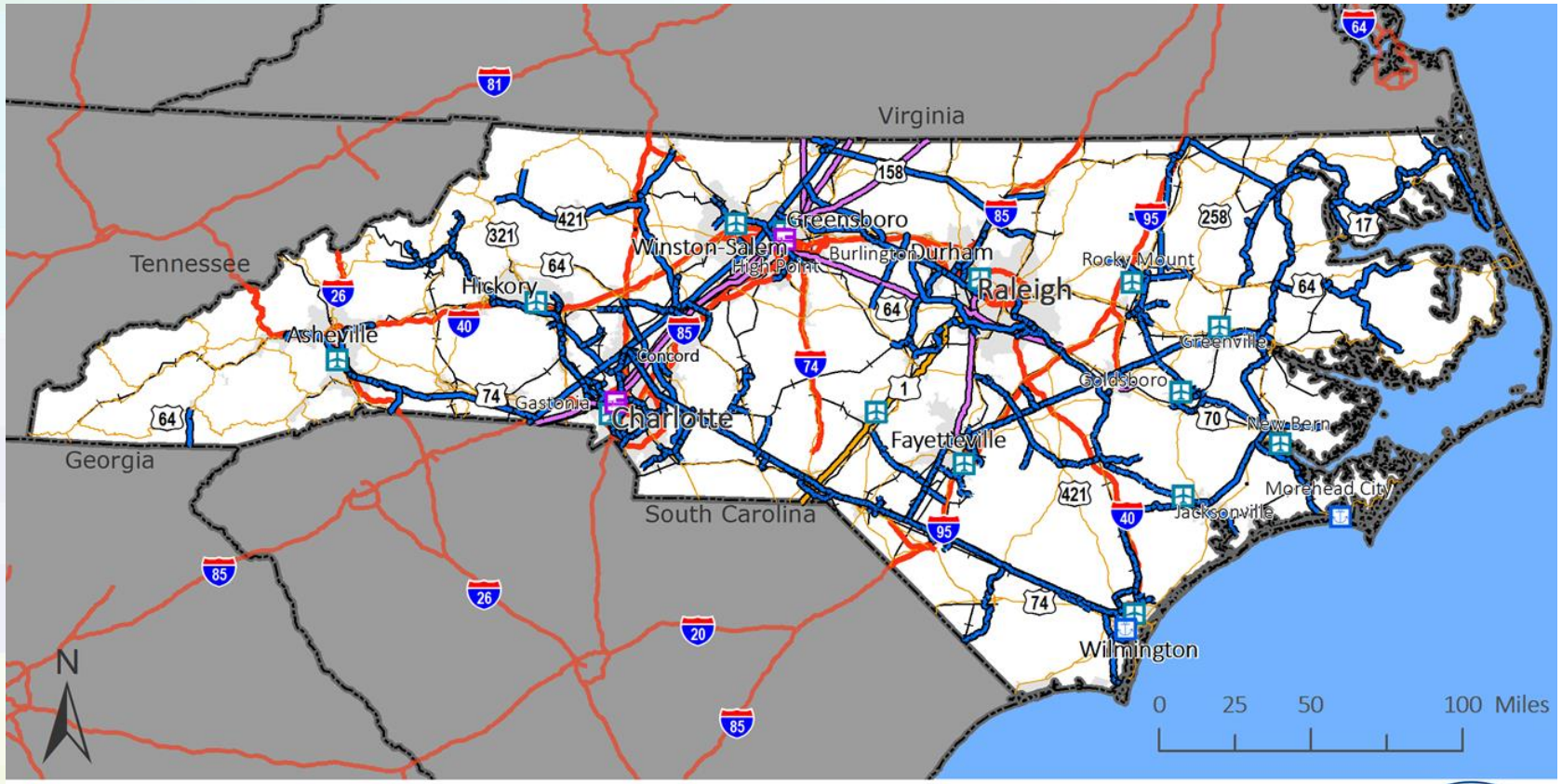
Inventory of Facilities for Fuels

- 5,490 miles of pipeline for the movement of petroleum fuel, non-fuel products, propane, and natural gas
- 38 inland motor fuel terminals served by rail, truck and marine transportation modes
- 12 aviation fuel terminals –7 military bases, 5 supported by pipeline, 3 by rail, and 4 by truck
- 2 propane terminals – one supported by pipeline and one supported by rail, both support truck loading operations
- 2 Transload Facilities that transfer unit train quantities of butane from rail tank cars to truck tank trailers

Inventory of Facilities for Fuels

- 6 marine petroleum terminals - receive ships and barges through the Port of Wilmington
- Rail transport of petroleum fuels and bio-fuels for large volume delivery to terminals and large volume consumers not served by a pipeline or port
- Truck tank trailer fleets and support services to enable the transport and local delivery of all fuels but natural gas
- 6 bio-fuel production facilities with close to 97 million gallons per year production capacity or about 5 percent of demand

NC Active Pipeline Network Map



North Carolina Pipeline Network by Commodity

Inland Terminal	Interstate Highway	Natural Gas	Liquefied Petroleum Gas
Port	US Highway	Product	Other Gas
Airport	Railroad		

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Fuel Model - Freight Findings

- Pipelines import 1,877,000 barrels per day into NC
- Nearly **two million fuel shipments** were made into and within the state over all modes of the state's transportation system in 2015
- 459 million barrels of fuel were delivered to consumers in 2015
- Forecasts project a 23% reduction in NC's demand for motor fuel out to 2045, reducing demand for motor fuel to 352 million barrels annually

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2015 Estimated Refined Fuel Shipments in NC by Mode

		Into Terminals		Out of Terminals	
Mode	**Percent**	**Barrels**	**Shipments**	**Barrels**	**Shipments**
Pipeline	62	283,435,932	-	-	-
Ship	31	143,622,565	118	-	-
Rail	7	30,522,539	30,508	-	-
Truck	< 1	1,386,690	6,299	414,701,130	1,924,950
Air *				44,266,596	N/A
Totals		**458,967,726**	**36,925**	**458,967,726**	**1,924,950**

Includes Gasoline, Diesel, Bio-Fuels, Propane, Aviation Fuel and Additives. Does not include Natural Gas.
* 44,266,596 barrels of jet fuel is used to fuel aircraft with no outbound shipments

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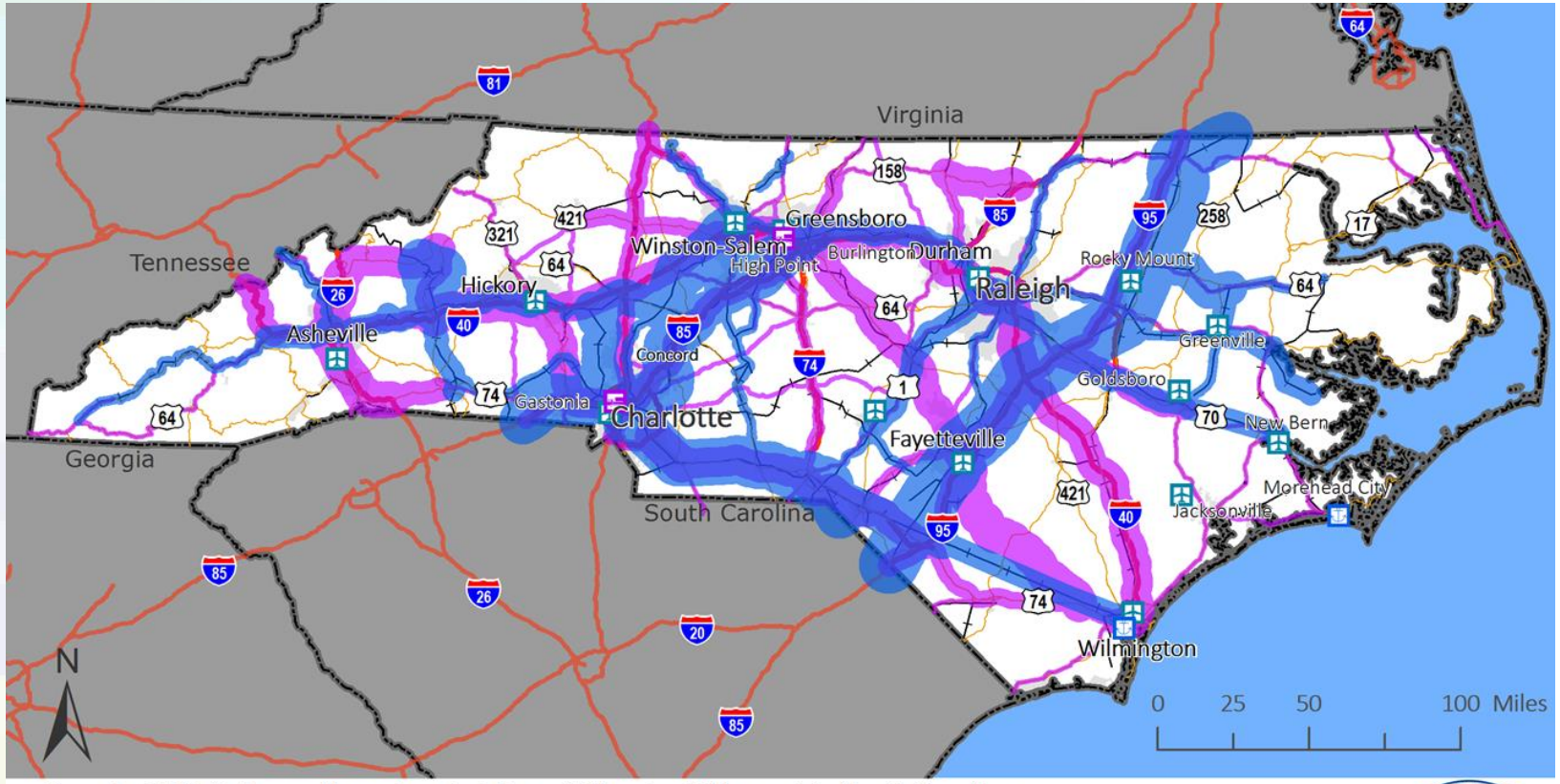
Combined Extremely Hazardous Substance Flows and Volumes



Sampled EHS (Extreme Hazardous Substance) Chemical Shipment in North Carolina

Inland Terminal
Port
Airport
Interstate Highway
US Highway
Railroad

by Highway in 1,000,000 lb/year
1 2 5 10 20 50

by Rail in 1,000,000 lb/year
50 100 200 500 1,000

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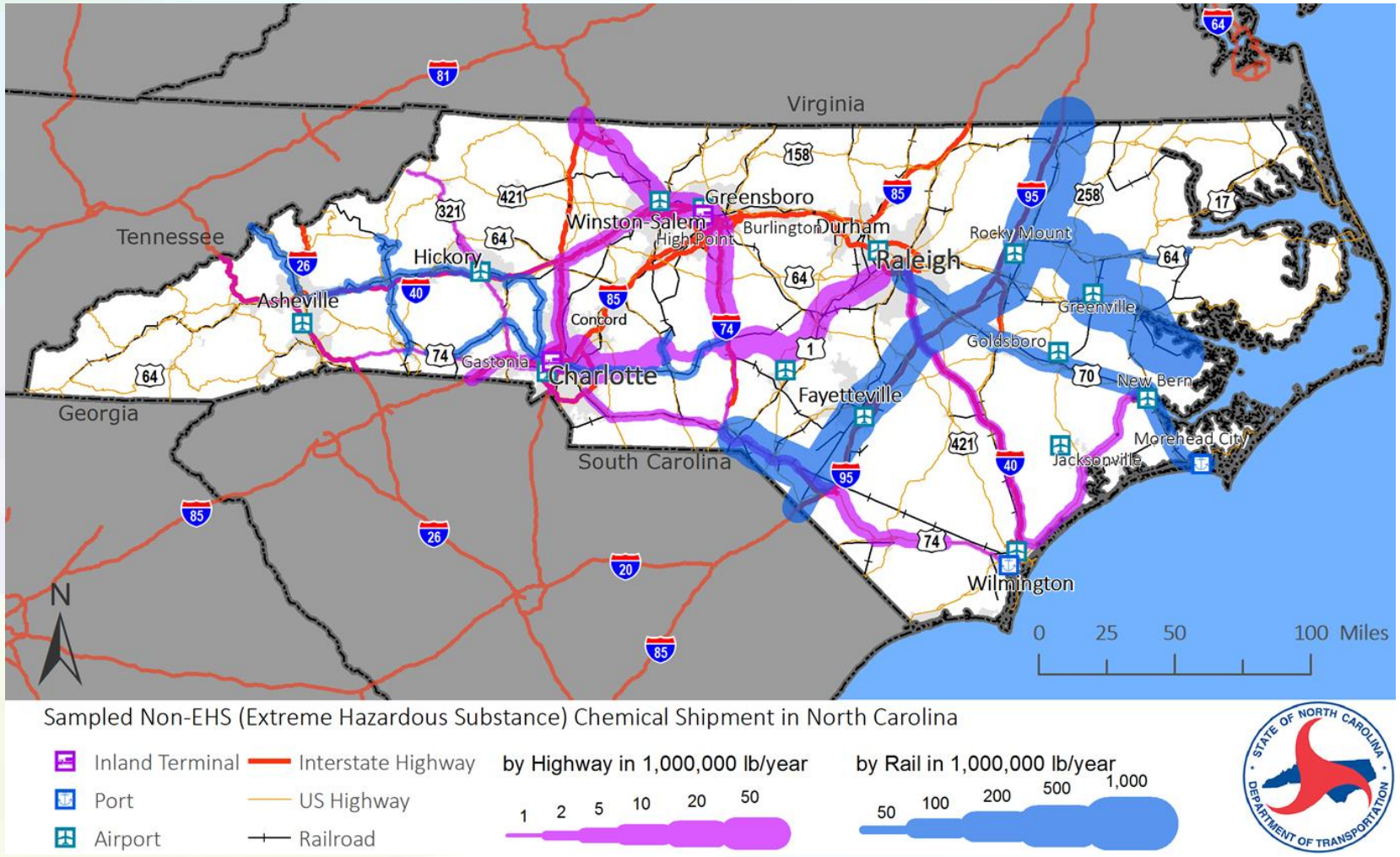
Combined Non-EHS Flows and Volumes



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Bottlenecks and Deficiencies

- The pipelines are operating at or near peak capacity creating a vulnerability for disruption
- The navigation channel into Morehead City adjacent to Radio Island is filling with sediment and presents a navigation hazard
- The concurrent use of the two Class I railroad mainlines for passenger, freight, and HazMat service presents a significant source of risk
- High risk HazMat transportation areas include: are with heavy land-use development, storage of chemicals at unsecured rail yards, side rails within major communities, at-grade railroad crossings and freeway ramps
- Heavy volume of freight from fuel terminals onto community road networks is a high priority concern

Existing and Future Needs

- All parties should work through the Local Emergency Planning Committee (LEPC) in their county to develop land-use planning policies that prevent incompatible land-uses relative to HazMat storage, use or transportation
- Communities should eliminate as many at-grade railroad crossing as possible
- Railroads should consider not using side rails within city limits to store HazMat rail cars
- Connections to local road networks from fuel terminals need to be improved to allow for safe integration of trucks into traffic

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Air Cargo Overview

- 74 publicly owned airport
- 9 provide scheduled commercial service
- 4 provide international service
- 18 reported air cargo activity in 2015

NC Airports with Cargo Activity

COMMERCIAL SERVICE AIRPORTS

Asheville Regional Airport (AVL)

Charlotte/Douglas International Airport (CLT)

Fayetteville Regional/Grannis Field Airport (FAY)

Piedmont Triad International Airport (GSO)

Pitt-Greenville Airport (PGV)

Albert J. Ellis (OAJ)

Coastal Carolina Regional Airport (EWN)

Raleigh-Durham International Airport (RDU)

Wilmington International Airport (ILM)

GENERAL AVIATION AIRPORTS

Clinton Sampson County Airport (CTZ)

Hickory Regional Airport (HKY)

Smith Reynolds Airport (INT)

Dare County Regional Airport (MEO)

Cherry Point MCAS (N1C)

Gastonia Municipal Airport (NC1)

Rocky Mount-Wilson Regional Airport (RWI)

Statesville Regional Airport (SVH)

Person County Airport (TDF)

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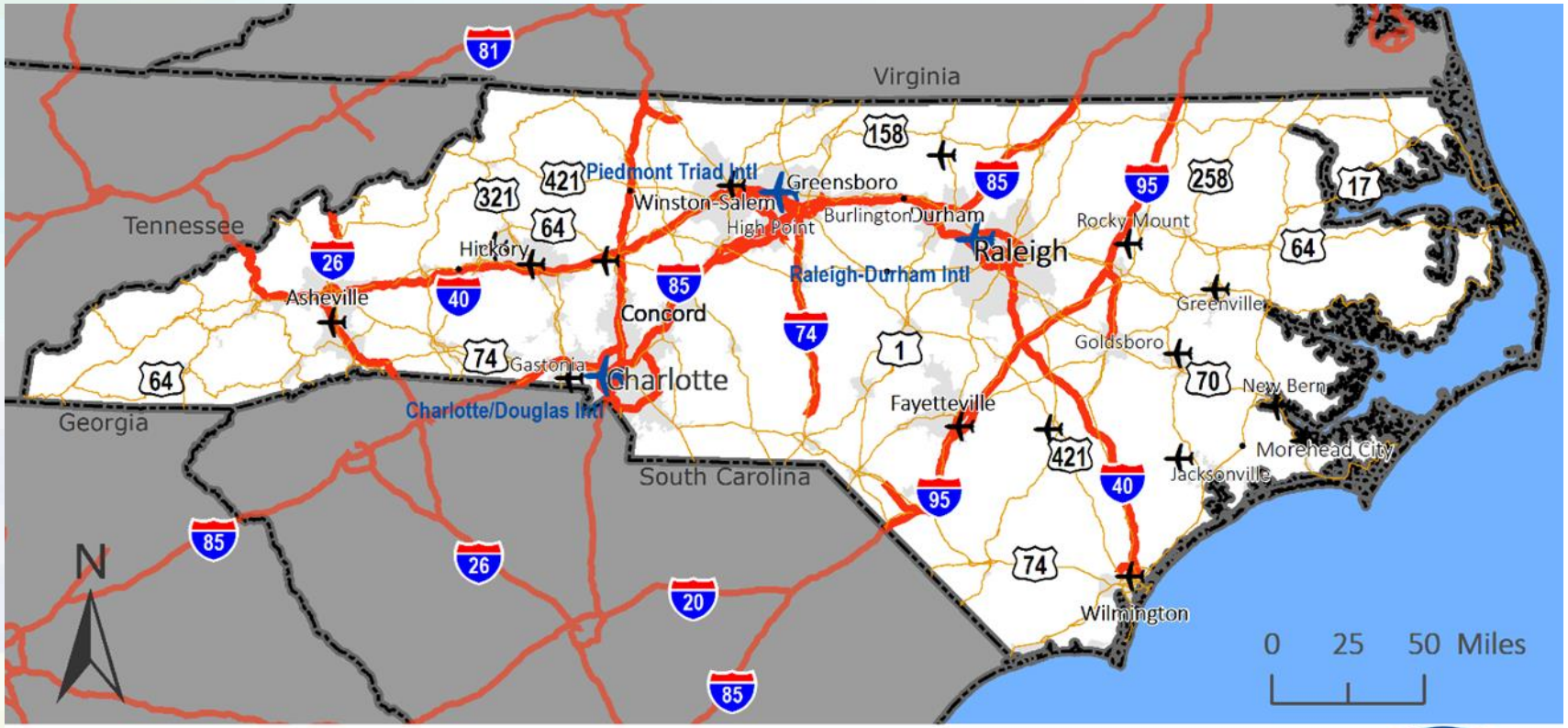
Airports with Air Cargo Activity



Airports with Air Cargo Activity in North Carolina

- Primary Airports
- Other Airports
- Interstate Highway
- US Highway

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Air Cargo in NC

- Three airports comprise 99 percent of air cargo activity in North Carolina:
  - Charlotte Douglas International Airport (CLT),
  - Piedmont Triad International Airport (GSO) and
  - Raleigh-Durham International Airport (RDU).

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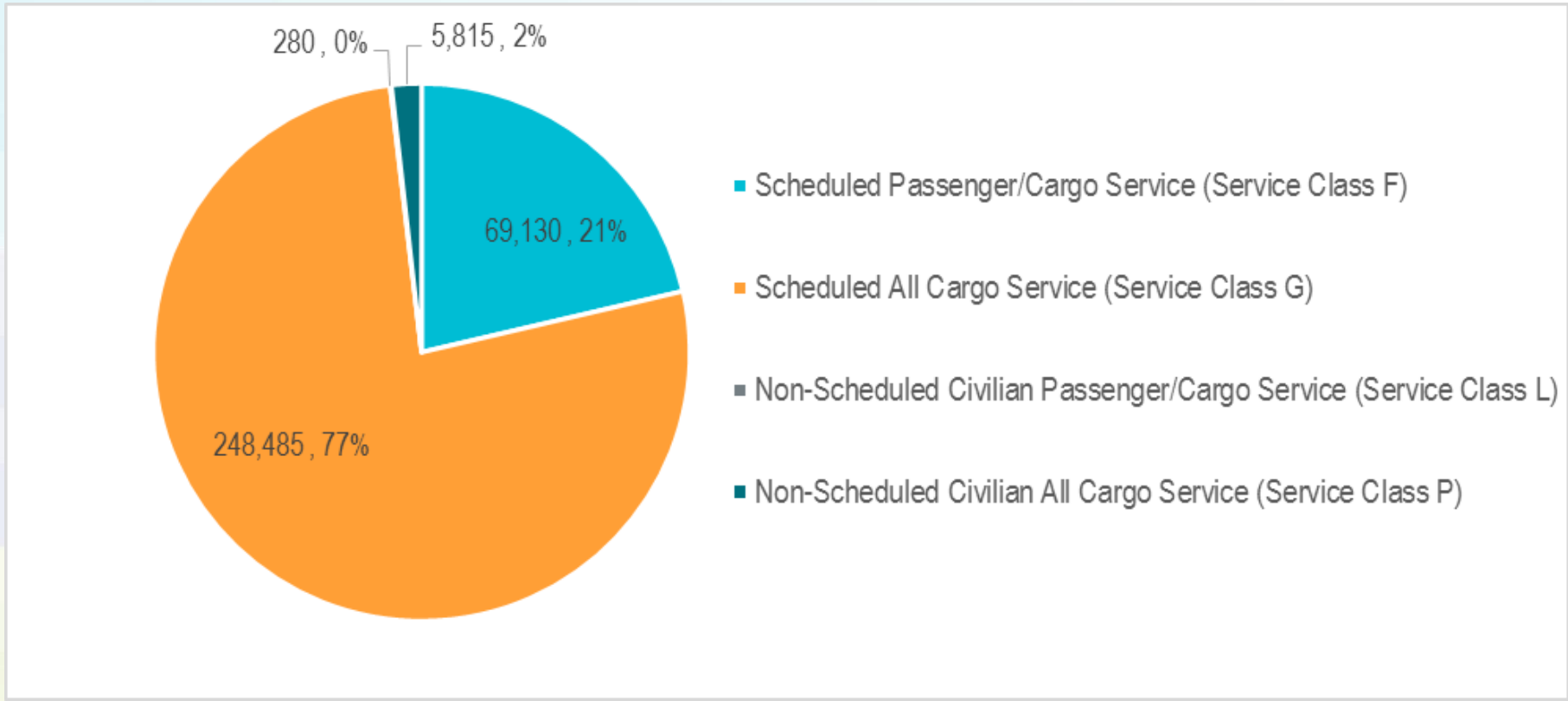
Air Cargo Service Types



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Air Cargo Carriers in NC

Carrier Name	Freight Tons	Mail Tons	Total Tons	% of Total Tons
FedEx	156,567	-	156,567	53%
United Parcel Service (UPS)	56,242	552	56,794	19%
American Airlines Inc.	15,782	8,051	23,833	8%
US Airways Inc.	13,656	9,383	23,038	8%
ABX Air Inc	13,351	-	13,351	5%
Lufthansa German Airlines	6,736	-	6,736	2%
Delta Air Lines Inc.	1,346	3,814	5,159	2%
Southwest Airlines Co.	2,863	-	2,863	1%
Atlas Air Inc.	2,117	-	2,117	1%
All Other Carriers	2,425	839	3,264	1%
TOTAL	271,086	22,638	293,724	100%

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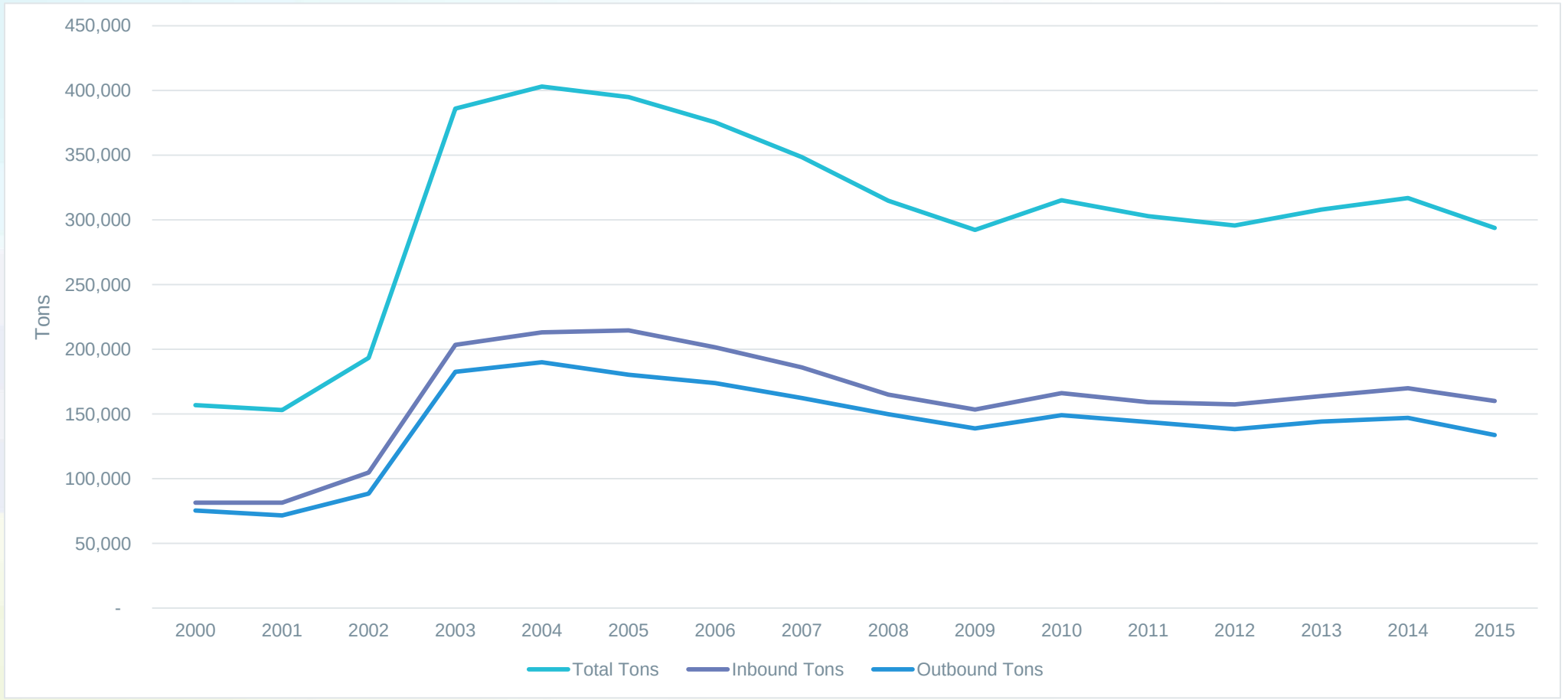
Trends in Air Cargo in NC



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Top NC Air Cargo Commodities, Tonnage

Commodity	Total Tons	% of Total
Electronics	62,961	21%
Machinery	41,210	14%
Textiles/leather	25,451	9%
Precision instruments	19,187	7%
Pharmaceuticals	17,467	6%
Plastics/rubber	15,577	5%
Motorized vehicles	12,055	4%
Basic chemicals	11,305	4%
Chemical prods.	11,280	4%
Articles-base metal	11,081	4%

Source: BTS TranStats Database, 2015; FAF4.1 data.

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Top NC Air Cargo Commodities, Value

Commodity	Total Value ($M)	% of Total
Electronics	5,156	22%
Pharmaceuticals	4,247	18%
Machinery	3,459	15%
Precision instruments	2,198	10%
Basic chemicals	1,565	7%
Transport equip.	1,018	4%
Plastics/rubber	928	4%
Chemical prods.	692	3%
Misc. mfg. prods.	667	3%
Textiles/leather	603	3%

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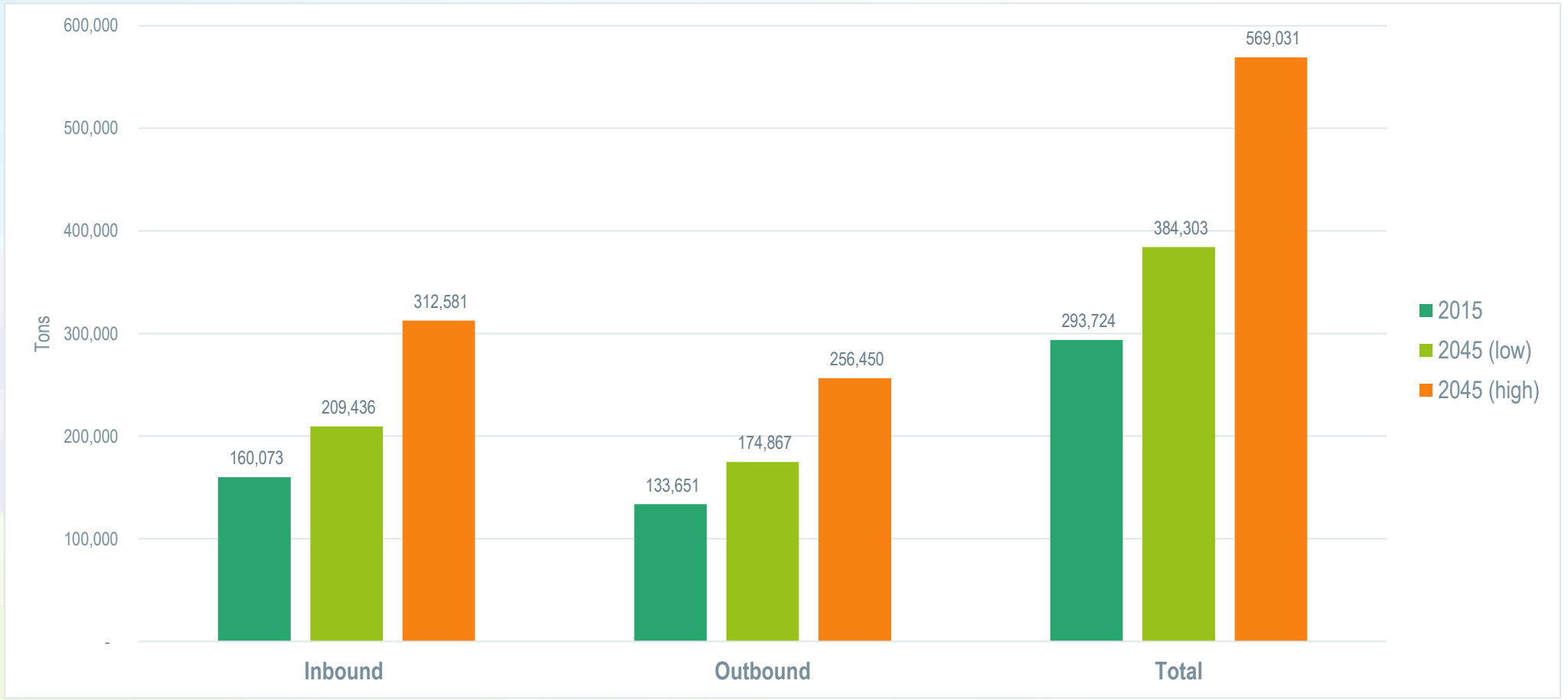
Projected Growth in Air Cargo, 2015-2045



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Air Cargo Needs

- Airport access
  - US 70 and access to GTP
  - US 64 and US 17 access to RDU and eastern NC
  - Rail spur at GSO
  - The I-85/I-485 interchange, which is directly northwest of the CLT campus
- Runway and facility needs
  - Extend CLT runway too 12,000 feet
  - RDU expanding a runway to 11,5000
  - Numerous supporting facilities at GSO aimed at enhancing air cargo handling efficiency
- Industrial development needs

NC PRIMARY FREIGHT HIGHWAY SYSTEM DESIGNATION

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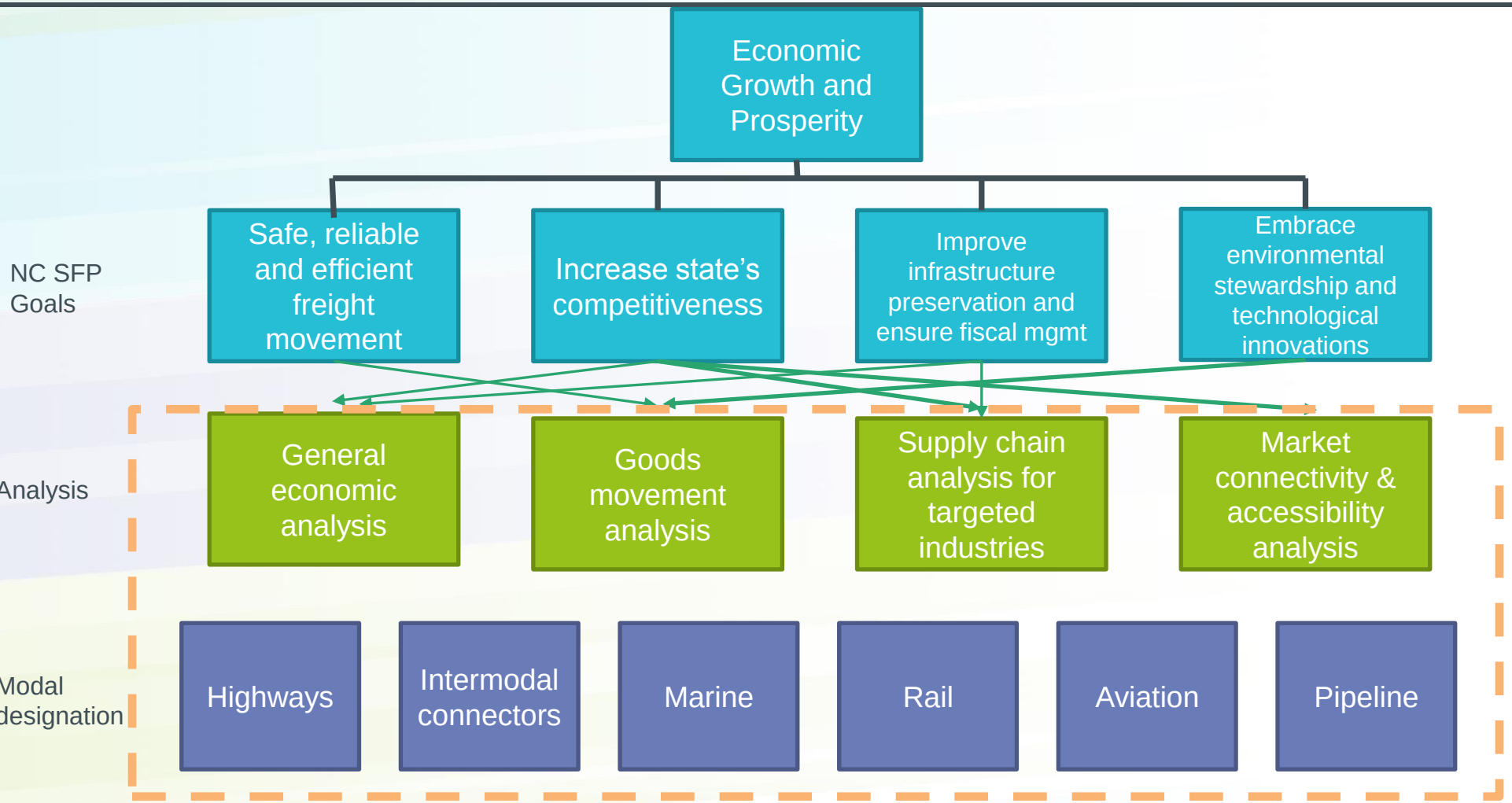
Analysis and Designation Process



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General Economic Analysis

- Demographic preparedness index – workforce quality and quantity
- Freight intensity index – employment in transportation dependent industries
- Supporting facilities/infrastructure – serves regional economic generators that also require significant freight such as military, education, technology and medical facilities
- Equity – supports/serves economically distressed areas based on income and property values

Goods Movement Analysis

- Truck volumes and percentages
  - » Current
  - » Growth (% change)
- Truck VMTs
  - » Absolute
  - » Normalized by lane mile
- Commodity tonnage and value

Supply Chain Analysis

- Examine freight supply chains to understand how businesses move goods between suppliers, producers, distributors and final consumers

- Number of targeted supply chain industries and businesses supported

Aerospace, Aviation and Military/Defense	Automotive, truck, heavy equipment	Biotechnology, Pharmaceuticals and Life Sciences
Information and Communications Technology	Chemicals, Plastics and Rubber	Distribution/Logistics
Food Processing and Distribution	Energy / Green Energy	Textiles, Apparel and Textile Machinery

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Market Access and Connectivity

- Intermodal connectivity
- Connectivity to North American trading partners via inland gateways
- Access to international gateways via marine port terminals
  - Gateway Access scored based on truck travel times along network

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TOOL DEMO AND INITIAL FINDINGS

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Weighting of Criteria

- Currently the analyses are equally weighted – 25% each
- Need your input – should some analyses/metrics be weighted more heavily?
- Individual worksheets and group polling
  - » Complete individual worksheets on how metrics should be weighted
  - » Do some group polling

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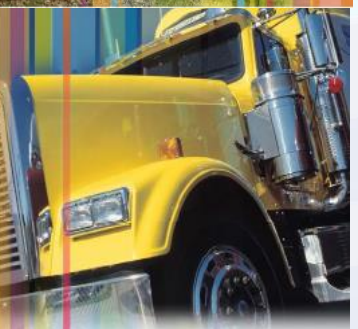


Analysis	Proposed Weighting
General Economic	
Goods Movement	
Supply Chain	
Accessibility and Connectivity	
	100%

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To Participate in Poll

http://Camsys.participoll.com/

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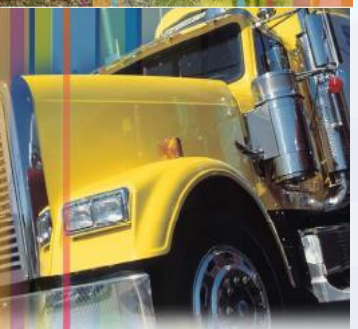


General Weighting

- Should all the metrics be equally weighted?

A. Yes

B. No

C. Not sure

A B C 0

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Economic Analysis

- Should the metrics in the economic analysis be weighted…

A. Equally with other metrics

B. More heavily

C. Less heavily

D. Not sure

A B C D 0

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Goods Movement Analysis

- Should the metrics in the good movement analysis be weighted…

A. Equally with other metrics

B. More heavily

C. Less heavily

D. Not sure

CAMBRIDGE SYSTEMATICS

Supply Chain Analysis

- Should the metrics in the supply chain analysis be weighted…

A. Equally with other metrics

B. More heavily

C. Less heavily

D. Not sure

A B C D 0

CAMBRIDGE SYSTEMATICS

Market Accessibility and Connectivity Analysis

- Should the metrics in the market accessibility and connectivity analysis be weighted…

A. Equally with other metrics

B. More heavily

C. Less heavily

D. Not sure

A B C D 0

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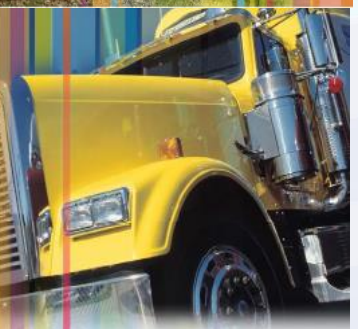

NEXT STEPS

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On-going Activities and Next Steps

- Roll out NC Freight Data Tool – Jan 2017
- Finalize needs assessment and system designation – Feb 2017
- Complete supply chain and economic analysis – Feb 2017
- Performance measure development – March 2017
- Start developing and screening recommendations – April 2017

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Stakeholder Outreach

- MPO/RPO
  - » Update – Jan and Feb
  - » Workshops – April – May 2017
- Next FAC meeting – in conjunction with NC MPO conference on April 26-28 in New Bern

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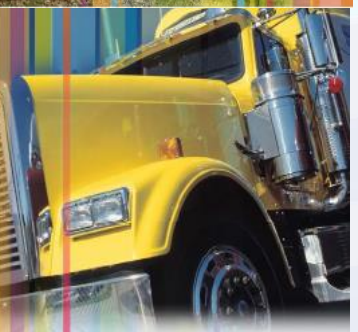

DISCUSSION

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Think Forward

Table 1 Economic Analysis Metrics and Scoring Methodology

Factor	Metric	Data Source(s)	Measure	Scoring Method	Data Usage Methodology
Demographic Preparedness	Population Growth	US Census 2010 / 2014	Growth rate of tract compared to statewide growth rate	0 = 0 1 – 49 = 0.2 50 – 99 = 0.4 100 – 149 = 0.6 150 – 199 = 0.8 200 and above = 1.0	Population growth indicates opportunities for economic growth. All negative growth rates scored as 0.
	Workforce Size	US Census 2014	Census tract workforce size compared to tract population relative to state average	0 = 0 1 – 49 = 0.2 50 – 99 = 0.4 100 – 149 = 0.6 150 – 199 = 0.8 200 and above = 1.0	Higher density of workers indicates a competitive and efficient labor market.
	Educational Attainment	US Census 2014	Census tract relative to state average	0 = 0 1 – 49 = 0.2 50 – 99 = 0.4 100 – 149 = 0.6 150 – 199 = 0.8 200 and above = 1.0	Well trained workforce desirable for investment. Population 18 years of age or older with high school or higher education.
	Per Capita Income	US Census 2014	Tract PCI vs the statewide average	0 = 0 1 – 49 = 0.2 50 – 99 = 0.4 100 – 149 = 0.6 150 – 199 = 0.8 200 and above = 1.0	Higher PCI equates to more economic activity generated from a diverse market of goods and services.
Freight Intensity and Supported Industries	Freight Employment Intensity	US Census 2014	Employment in freight intensive sectors vs state average	0 = 0 1 – 49 = 0.2 50 – 99 = 0.4 100 – 149 = 0.6 150 – 199 = 0.8 200 and above = 1.0	Dependence on supporting freight infrastructure key to growth in these areas.
	Technology Centers	US Census 2014	Employment in technology sectors vs state average	0 = 0 1 – 99 = 0.4 100 – 199 = 0.8 200 – 299 = 1.2 300 – 399 = 1.6 400 and above = 2.0	High tech industries typically require highly mobile staff and rely on products being shipped rapidly. Improved infrastructure will promote growth.
	Medical Centers	US Census 2014	Employment in medical care sectors vs state average.	0 = 0 1 – 49 = 0.2 50 – 99 = 0.4 100 – 149 = 0.6 150 – 199 = 0.8 200 and above = 1.0	Connectivity to medical centers is important to the regional economy.
	Institutions of Higher Learning	US Census 2014	Students enrolled in public / private universities and colleges vs state average	0 = 0 1 – 99 = 0.4 100 – 199 = 0.8 200 – 299 = 1.2 300 – 399 = 1.6 400 and above = 2.0	Attract adjacent growth of industry and promote skilled workforce.

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Factor	Metric	Data Source(s)	Measure	Scoring Method	Data Usage Methodology
	Key Military Facilities		Census tracts that are comprised of key military faciliites.	0 = None 1 = Facility	Fort Bragg; Seymour Johnson AFB; Sunny Point MOCT; New River MCAS; Camp Lejeune; Cherry Point MCAS
	Property Tax	US Census 2014	Property tax values at tract level vs state average.	0 = 0 1 – 49 = 0.2 50 – 99 = 0.4 100 – 149 = 0.6 150 – 199 = 0.8 200 and above = 1.0	Measure serves as a proxy for economic activity and transportation dependence.

Table 2 Goods Movement Analysis Metrics and Scoring Methodology

Mode	Metric	Data Source(s)	Value Range	Proposed Scoring Method	Data Usage Methodology
Highway	Daily Truck Volumes	NCDOT	0 – 16,000 AADTT	0 = Less than 2,500 1 = 2,501 to 5,000 2 = 5,001 to 7,500 3 = 7,501 to 10,000 4 = 10,001 to 16,000	Measures daily truck volumes on NC roads. Identifies corridors with heavy truck traffic.
	Absolute Vehicle Miles Traveled (VMT)	NCDOT	0 – 50,000	0 = Less than 1,000 1 = 1,000 to 2,499 2 = 2,500 to 4,999 3 = 5,000 to 9,999 4 = More than 10,000	Use truck counts by link to derive truck VMT
	VMT by Lane Mile	NCDOT, Highway Performance Monitoring System (HPMS)	0 – 12,500	0 = Less than 500 1 = 500 to 999 2 = 1,000 to 2,499 3 = 2,500 to 4,999 4 = More than 5,000	Use truck counts by link to derive truck VMT. HPMS data provides number of lanes by link. These sources together will show truck VMT by lane mile.
	Total Tonnage	FAF4.1	0 – 200M+ tons	0 = Less than 5M tons 1 = 5M to 10M tons 2 =10M to 20M tons 3 = 20M to 50M tons 4 = 50M to 100M tons 5 = 100M to 200M 6 = More than 200M	Assessment of annual tonnage by road segment for top commodities transported by truck in North Carolina.
	Total Value	FAF4.1	0 - $500B+	0 = Less than $10B 1 = $10B to $20B 2 = $20B to $50B 3 = $50B to $100B 4 = $100B to $200B 5 = $200B to $500B 6 = More than $500B	Assessment of annual value by road segment for top commodities transported by truck in North Carolina.
	Tonnage Growth	FAF 4.1	Change in Tonnage (%)	0 = Less than 25% 1 = 25% - 50% 2 = 50% - 75% 3 = 75% - 100% 4 = 100%+	Assessment of percentage change in total tonnage between base (2015) and forecast (2045) years.
	Value Growth	FAF 4.1	Change in Value (%)	0 = Less than 25% 1 = 25% - 50% 2 = 50% - 75% 3 = 75% - 100% 4 = 100%+	Assessment of percentage change in total tonnage between base (2015) and forecast (2045) years.

Table 3 Supply Chain Analysis Metrics and Scoring Methodology

Mode	Metric	Data Source(s)	Value Range	Proposed Scoring Method	Data Usage Methodology
Highway	Support for Targeted Industries	InfoUSA	0 – 9	0 = No support 1 = Support for 1-4 targeted industries 2 = Support for ≥ 5 targeted industries	Assess level of support for targeted industries via highway. "Support" determined when industry is located within 2 miles of highway segment.
	Support for Targeted Industries Businesses	InfoUSA	0 – 71	0 = No support 1 = 1 to 2 TI businesses 2 = 3 to 5 TI businesses 3 = 6 to 10 TI businesses 4 = More than 11 TI businesses	Assess level of support for targeted industries via highway based on number of TI businesses within 2 miles of highway.
	Support for Commodities Associated with Targeted Industries (Tonnage)	InfoUSA / Loaded FAF Network	0 – 74M	0 = Less than 2M tons 1 = 2M to 5M tons 2 = 5M to 10M tons 3 = 10M to 20M tons 4 = More than 20M tons	Assessment of how much annual tonnage is supported via highway for each targeted industry. Evaluated for each roadway segment.
	Support for Commodities Associated with Targeted Industries (Value)	InfoUSA / Loaded FAF Network	0 – $180M	0 = Less than $2M 1 = $2M to $5M 2 = $5M to $10M 3 = $10M to $20M 4 = More than $20M	Assessment of how much annual value is supported via highway for each targeted industry. Evaluated for each roadway segment.

Table 4 Targeted Supply Chain Industries

Industry Category	NAICS Codes	SCTG Commodity Code(s)
Aerospace, Aviation, and Military/Defense	3364 – Aerospace Product and Parts Manufacturing 481 – Air Transportation 4881 – Support Activities for Air Transportation	34 – Machinery 35 – Electronics 36 – Motorized vehicles 37 – Transportation equip. 38 – Precision Instruments
Information and Communications Technology	334 – Computer and Electronic Product Manufacturing	35 – Electronics
Food Processing and Distribution	311 – Food Manufacturing 312 – Beverage and Tobacco Product Manufacturing 49312 – Refrigerated Warehousing Storage 49313 – Refrigerated Farm Products	01 – Animals and fish 02 – Cereal grains 03 – Other ag prods. 04 – Animal feed 05 – Meat/seafood 06 – Milled grain prods. 07 – Other food stuffs 08 – Alcoholic beverages
Automotive, truck, and heavy equipment	331 – Primary Metal Manufacturing 332 – Fabricated Metal Product Manufacturing 336 – Transportation Equipment and Manufacturing	33 – Articles of base metal 34 – Machinery 35 – Electronics 36 – Motorized vehicles 37 – Transportation equip. 38 – Precision instruments
Chemicals, Plastics and Rubber	324 – Petroleum and Coal Products Mfg 3251 – Basic Chemical Manufacturing 3252 – Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing 3253 – Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing 3255 – Paint, Coating, and Adhesive Manufacturing 3256 – Soap, Cleaning Compound, and Toilet Preparation Manufacturing 3259 – Other Chemical Product and Preparation Manufacturing 3261 – Plastics Product Manufacturing 3262 – Rubber Product Manufacturing	20 – Basic chemicals 22 – Fertilizers 23 – Chemical prods. 24 – Plastics/rubber
Energy / Green Energy	2111 – Oil and Gas Extraction 2121 – Coal Mining 2131 – Support Activities for Mining 2211 – Electric Power Generation, Transmission and Distribution 2212 – Natural Gas Distribution 4861 – Pipeline Transportation of Crude Oil 4862 – Pipeline Transportation of Natural Gas 4869 – Other Pipeline Transportation	15 – Coal 16 – Crude petroleum oil 17 – Gasoline and aviation turbine fuel 18 – Fuel oils 19 – Coal-n.e.c.
	221111 – Hydroelectric Power Generation 221114 – Solar Power Generation 221115 – Wind Power Generation 221116 – Geothermal Power Generation 221117 – Biomass Electric Power Generation 221118 – Other Electric Power Generation (except hydroelectric, fossil fuel, nuclear, solar, wind, geothermal, biomass)	34 – Machinery 35 – Electronics
Biotechnology, Pharmaceuticals,	3254 – Pharmaceutical and Medicine Manufacturing 3391 – Medical Equipment and Supplies Manufacturing	20 – Basic chemicals 21 – Pharmaceuticals

Industry Category	NAICS Codes	SCTG Commodity Code(s)
and Life Sciences		38 – Precision instruments
Distribution/ Logistics	481112 Scheduled Freight Air Transportation 481212 Nonscheduled Chartered Freight Air Transportation 482 – Rail Transportation 483111 - Deep Sea Freight Transportation 483113 - Coastal and Great Lakes Freight Transportation 483211 - Inland Water Freight Transportation 484 – Truck Transportation 4921 - Couriers and Express Delivery Services 493 – Warehousing and Storage	33 – Articles of base metal 39 – Furniture 40 – Misc. mfg. prods 43 – Mixed freight
Textiles, Apparel, and Textile Machinery	313 – Textile Mills 314 – Textile Product Mills 315 – Apparel Manufacturing 316 – Leather and Allied Product Manufacturing	24 – Plastics/rubber 30 – Textiles/leather 34 – Machinery

Table 5 Market Access and Geography Metrics and Scoring Methodology

Mode	Metric	Data Source(s)	Value Range	Proposed Scoring Method	Data Usage Methodology
Highway	Intermodal Connectivity	Bureau of Transportation Statistics (BTS)	N/A	0 = No connection 2 = Connects Intermodal Terminal	Network segments that connect intermodal terminals (truck / rail / air / port) to Major highway defined as having functional class of Principal Arterial higher
	High-Diversity Market Gateway (HDMG) Access	Esri, HERE	N/A	0 = Outside 4 hour TTT 1 = Within 4 hour TTT 2 = Within 2 hour TTT 3 = Within 1 hour TTT	Measured using Truck Travel Times (TTT) from Marine Port Terminals. Includes Norfolk, VA and Charleston, SC.
	Market Gateway (MG) Access	Esri, HERE	N/A	0 = Outside 2 hour TTT 1 = Within 2 hour TTT 2 = Within 1 hour TTT 3 = Within Half hour TTT	Identifies road segments that facilitate access to inland port terminals (rail, airport) as measured using TTT. Includes Greer, SC

The draft vision statement for the North Carolina Statewide Multimodal Freight Plan is:

- **North Carolina's multimodal freight transportation network helps us compete globally for quality jobs, provide safe and efficient people and goods mobility and build quality communities for today and the future.**

The vision statement strives to describe a desired outcome, achievement or big-picture orientation from the perspective of transportation customers. It is meant to inspire the imagination of people and industries, and develop a momentum toward implementation of the Statewide Multimodal Freight Plan.

To achieve this vision, the North Carolina Statewide Multimodal Freight Plan will also need to define goals and objectives. The proposed goals and objectives for the statewide freight plan are summarized below. This table also provides an assessment of how the defined goals and objectives are aligned with the national freight policy goals, the 25-year vision for North Carolina, and the NCDOT's 2040 Plan and the STC policy.

NC Statewide Multimodal Freight Plan Goals and Objectives

Freight Plan Goal	Freight Plan Objectives	Support National Freight Goals?	Support 25-Year Vision?	Support 2040 Plan and STC Policy?
Enhance economic development opportunities and competitiveness	• Support the state's freight economy sectors to attract quality growth and high paying jobs • Improve the ports and the airports to increase exports to key trading partners and to fully participate in the global markets • 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	☑	☑	☑

Freight Plan Goal	Freight Plan Objectives	Support National Freight Goals?	Support 25-Year Vision?	Support 2040 Plan and STC Policy?
Improve system efficiency and reliability	• 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 lights on US and NC routes • Monitor and evaluate system performance to assess operational conditions and effectiveness of congestion management strategies	☑	☑	☑
Improve infrastructure conditions and preservation	• Maintain, preserve, and extend the service life of existing and future freight transportation infrastructure • Monitor infrastructure conditions and prepare an annual freight state-of-the-system report	☑	☑	☑
Enhance safety, security and resilience	• Reduce fatality, 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 • 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	☑	☑	☑
Protect and enhance the natural environment	• Reduce freight-induced negative impacts on natural, cultural and environmental resources • Reduce mobile source emissions, GHG, and energy consumption • Reduce noise, vibration and other freight-induced negative impacts on residential communities • Improve quality of life for those communities most impacted by freight operations.	☑	☑	☑

Freight Plan Goal	Freight Plan Objectives	Support National Freight Goals?	Support 25-Year Vision?	Support 2040 Plan and STC Policy?
Support adoption and deployment of new technologies	• Promote the adoption of safety, fuel efficiency, telematics, alternative fuel, electronic logging device, fleet management and other technologies for the trucking industry • Implement adaptive signal control and other ITS safety solutions on key freight transportation corridors and freight facilities • Foster safe future use of autonomous vehicles & drones in freight transportation • Foster the adoption of Mobility-as-a-Service, UberRUSH or similar last mile freight delivery operations in urban population centers	☑	☑	
Foster public-private partnerships and collaboration	• Develop and nurture partnerships with private industries with significant role in the state's economy • Provide a forum for public agencies, industry groups, US military, and local business chambers to coordinate and integrate freight movements • Provide a forum for participation by freight shippers and carriers in metropolitan areas	☑	☑	☑
Improve access to data and information	• Expand access to traffic speed, incidents, and construction management information • Expand external communication through social media and mobile apps		☑	
Ensure good fiscal management	• 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		☑	

NC State Freight Plan

Military Cargo Profile

February 2017

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Agenda

- North Carolina Military Bases
- North Carolina National Guard
- NCDOT Strategic Transportation Corridors
- Key Findings
- Future Trends and Needs

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North Carolina Military Bases

Military Base	Location	Military Branch	Description
Fort Bragg	Fayetteville	US Army	Special Ops and Forces Command, 2 Airfields
Military Ocean Terminal Sunny Point (MOTSU)	Southport	US Army	Import and export of weapons, ammunition, explosives and military equipment
Camp Lejeune	Jacksonville	US Navy Marines	Marine Expeditionary Force, Special Operations Command and Regiment, Training
MCAS Cherry Point	Havelock	US Navy Marines	Marine Aircraft Groups, Combat Logistics and Fleet Readiness Center
MCAS New River	Jacksonville	US Navy Marines	Naval Aviation Technical Training, Marine Wing Support, Air Control and Training Squadrons
Seymour Johnson AFB	Goldsboro	US Air Force	Air Force base, Air Refueling Wing and Fighter Group
Coast Guard Air Station	Elizabeth City	US Coast Guard	Aviation Technical Training Center, the Aviation Logistics Center and Station Elizabeth City

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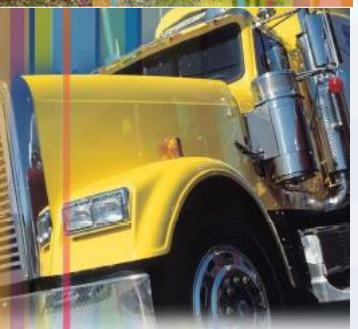


NC National Guard Units

National Guard Unit	Location
60th Troop Command	Raleigh
449th Theater Aviation Brigade	Morrisville, NC
30th Armored Brigade Combat Team	Clinton
113th Sustainment Brigade	Greensboro
139th Regiment	Fayetteville
130th Maneuver Enhancement Brigade	Charlotte
145th Airlift Wing	Charlotte

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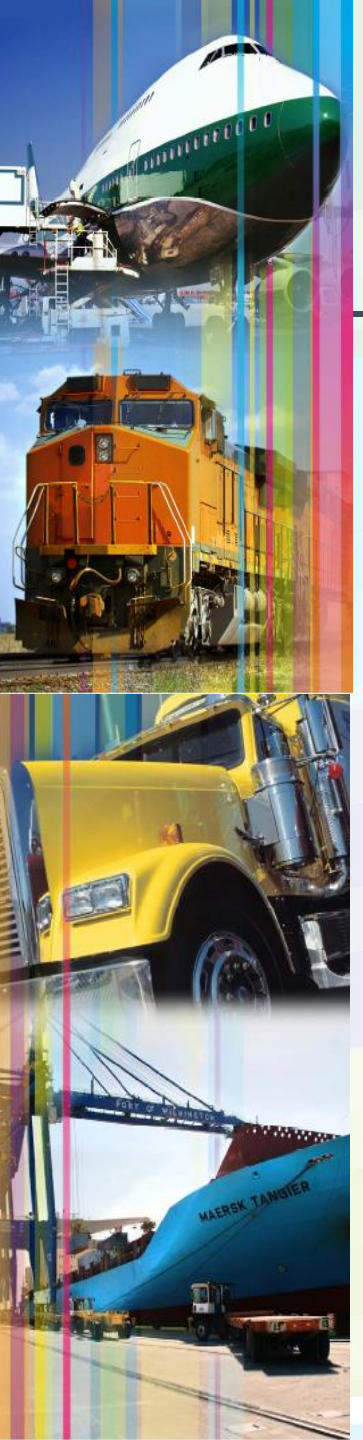
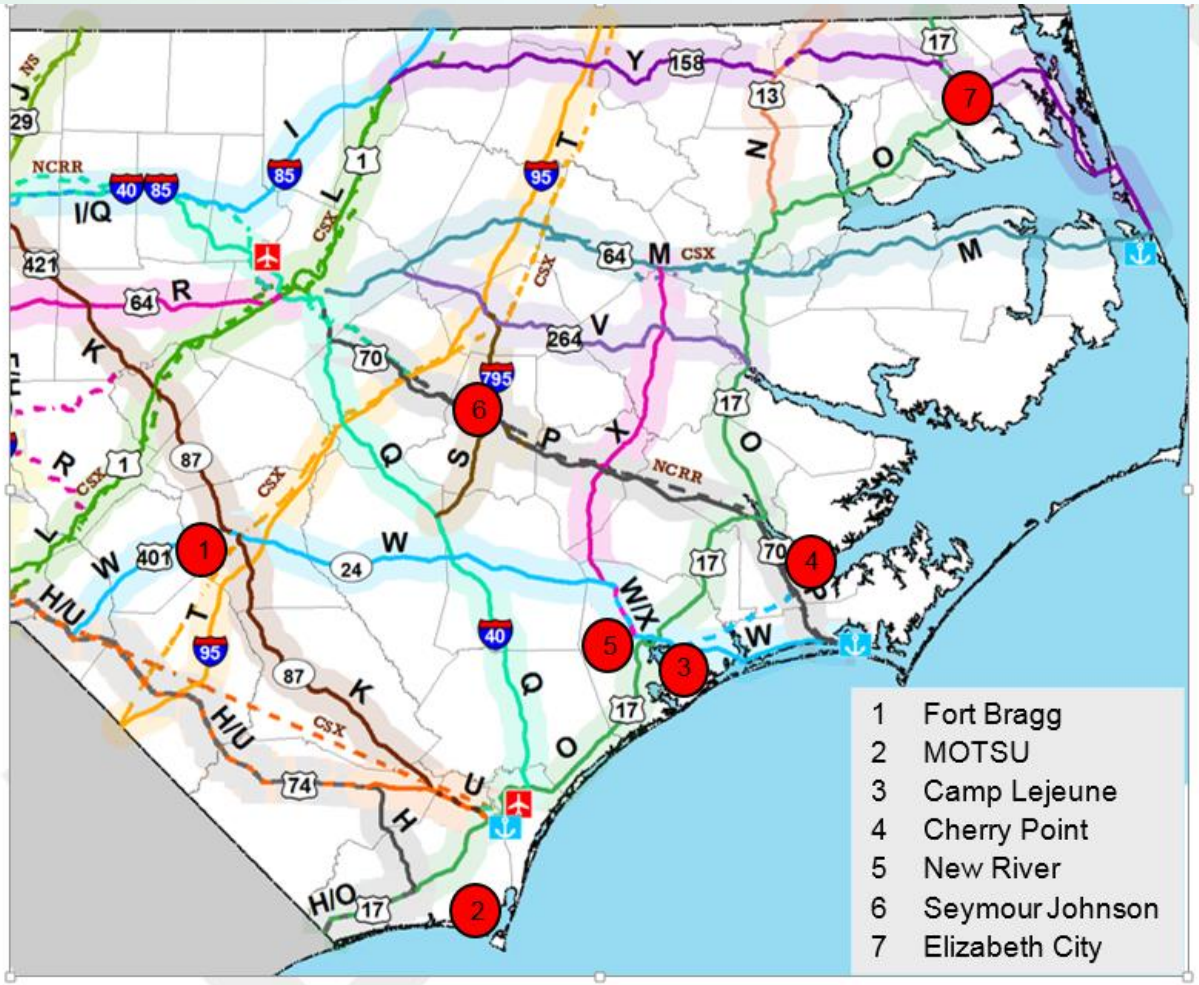


Key NC Military Bases and Freight Assets



Fort Bragg and Seymour Johnston are well positioned close to I-95, CSX and NCRR. Cherry Point and MOTSU have good rail access, coastal bases rely on US 17, US 64, US 70 and US 74 for truck access.

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Fort Bragg Annual Shipment Data

Fort Bragg Shipments FY15

Surface Movement Center

11,731	Shipments
1,798	LTL Loads
30,595	Pieces

Airfield Control Group

1,036	Outbound Trips
172	Inbound Trips
71,781	Soldiers
5,932	Pieces

Rail Operations Group

763	Outbound rail cars
1,299	Inbound rail cars
1,292	Outbound pieces
2,437	Inbound pieces

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MOTSU Annual Shipment Data

MOTSU Shipments FY 15

Year	Direction	Tons	Containers
FY 2015	Outbound	135,000	3,833
	Inbound	121,700	3,177
FY 2016 YTD	Outbound	195,000	5,648
	Inbound	126,000	3,682

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Cam Lejuene Annual Shipment Data

Camp Lejeune Shipments, FY15

Small Shipments in US	5,275
Small Shipments outside US	1,574
Less-than-Loaded (LTL) Outbound	2,364
Arms & Ammunition Outbound (Trucks)	170
Railcars Outbound	12
Railcars Inbound	111
Truckloads Outbound	1,758
Truckloads Inbound	2,916

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Chery Point Annual Shipments

MCAS Cherry Point Shipments

Truck Shipments	Trips/Mo	Capacity	Gal/Year
Jet Fuel to Base	175	8,000 gals	16.8 Million
Fuel Service Stations	8	8,000 gals	64,000
Parts to Air Depot	12	Semi-trailers	144 trucks/Yr.
Rail Shipments	**Cars/Mo**	**Rail Capacity**	**Gals/Yr.**
Jet Fuel to Base	4	20,000	80,000

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Seymour Johnson Annual Fuel Shipments

Seymour Johnson Annual Fuel Totals

Fuel Shipments	Annual Gallons
Jet Fuel Rail	29,120,000
Jet Fuel Truck	37,440,000
Unleaded Gas Truck	416,000
Diesel Fuel Truck	416,000
Total Fuel	**67,392,000**

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USCG Elizabeth City Annual Truck Shipments

USCG Elizabeth City Truck Trips

Deliveries	Trips/Day	Trips/Year	Route
LTL Trucks	8	2,920	To and from Norfolk, VA
FedEx trucks	2	730	Fed Ex Hub Norfolk, VA
UPS trucks	2	730	UPS Hub, Norfolk, VA

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NC Military Key Findings

- Military operations generate over 40,000 truck trips and 14,000 rail moves annually.
- Military facilities in North Carolina move more than 100 million gallons of fuel annually, 75 percent by truck and 25 percent by rail.
- The NC National Guard has a team of 800 truck drivers, 380 with Commercial Drivers Licenses.
- Fort Bragg and Seymour Johnson have the best highway and rail access.

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NC Military Key Findings

- Safe and efficient movement of military cargo required for military operations in a cost effective manner is vital to the retention and expansion of military operations.
- NC 17, NC 24, US 70 and US 74 are critical corridors for coastal military installations.
- Cherry Point contracts with NS Railroad for heavy cargo but some truck transportation is needed if loads do not meet NS requirements.

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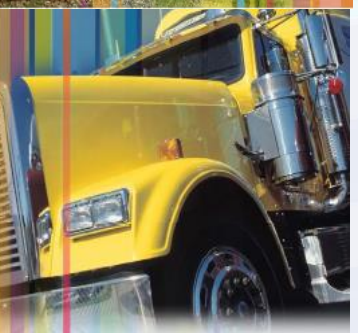

Future Needs and Trends

- Projections are for Fort Bragg to continue to significantly grow and expand its mission, leading to more cargo shipments.
- Natural gas will replace coal at several bases, resulting in a shift from rail to pipeline transport.
- The NC National Guard has decreased its number of facilities from 105 to 95 to consolidate into regional armories along I-40 and I-95.
- Significant military growth over the last decade and more growth expected will impact highways and other transportation facilities.

Challenges and Bottlenecks

- Camp Lejeune, Cherry Point, the Marine Air Station at New River are all isolated from major highway corridors, resulting in higher freight costs.
- Fort Bragg does not use Port of Wilmington due to limited staging; insufficient dockside access; and Cape Fear River transit times.
- While rail cargo opportunities exist for some of the military bases, there are cargo restrictions for minimum loads
- Bridge conditions restrict movements of some large equipment, resulting detours or the need to make the moves by rail.
- Restrictions on over size cargo movements at night creates challenges for convoy movements and increase needs for parking