Leading Edge Practices for Regional and Local Freight Plans

APA Transportation Planning Division Webinar

Jacki Murdock
Chris Nazar
Roger Schiller

May 3, 2019

CDM Smith

Agenda

- Speaker Introductions
- Purpose and Outcomes of Webinar
- Overview of Projects
  - Will County Community Friendly Freight Mobility Plan
  - JOHRTS Regional Freight Mobility Plan
  - Greater Charlotte Regional Freight Mobility Plan
- Synthesis of Best Practices
  - Innovative Use of Data
  - Community and Environmentally Friendly Freight Planning
  - Land Use and Freight
  - Project Selection and Funding
  - Freight Workforce Development

Speaker Introductions

CDM Smith

Jacki Murdock

- Planner at CDM Smith
- 8 years of experience in transportation and freight planning
- Regional and Local Freight Plan
  - Long Range Transportation Plans
  - Performance Based Planning
  - Project Evaluation and Prioritization
- Masters in Urban and Regional Planning UCLA

Chris Nazar, AICP

- 18 Years at CDM Smith
- Technical Delivery Manager
- Diverse Planning Background
  - Corridors
  - NEPA Environmental
  - Long Range Transportation Plans
  - Freight Plans
- Lead Roles on 6 Freight/Rail Plans
- Masters in Urban Planning University of Toronto

Roger Schiller

- Planner at CDM Smith
- 12 years of experience in transportation and freight planning
  - State and regional freight plans
  - Freight technology plans and deployments
  - Economic analysis
  - Corridor planning
- Masters in Urban and Regional Planning Florida State University

Purpose and Outcomes

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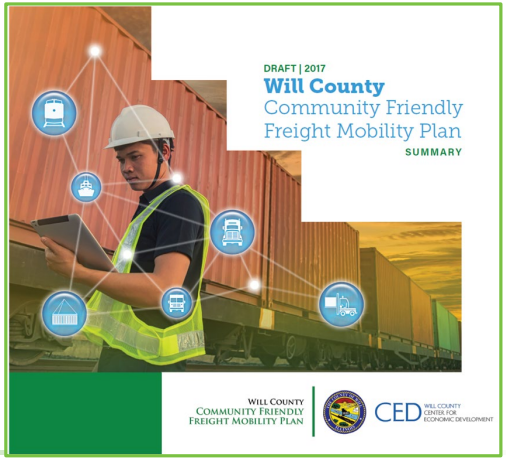
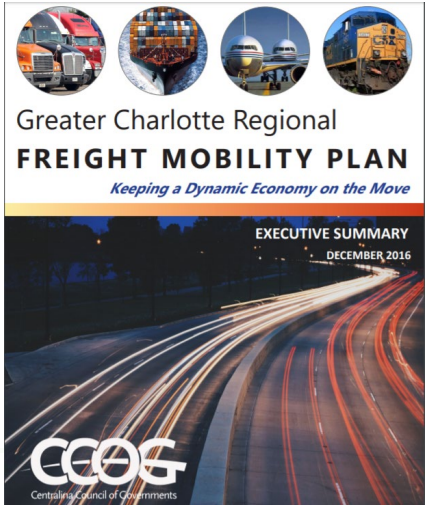
Purpose and Outcomes of Webinar

- Introduce regional and local freight planning projects which had unique challenges
- Focus on challenges and solutions
- Synthesize best practices for future application





Project Introductions

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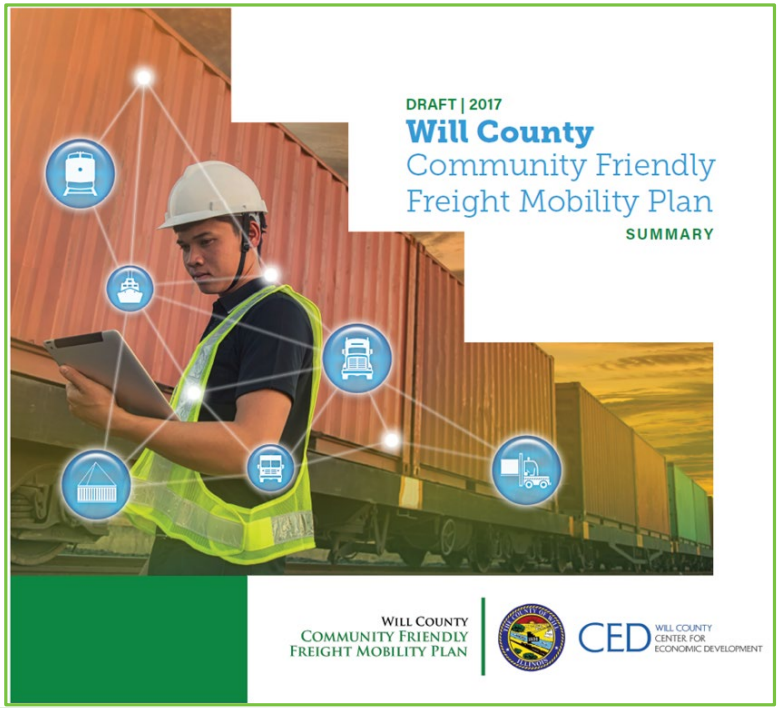
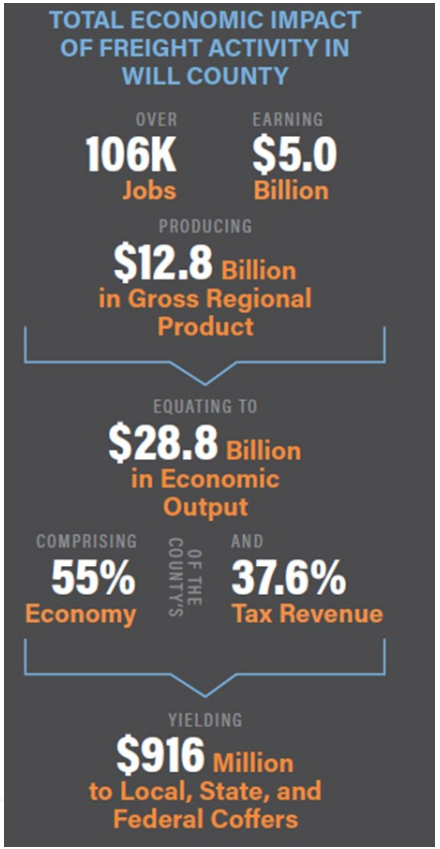
Will County Community Friendly Freight Mobility Plan – Project Basics

- Will County, IL (South of Chicago)
- Massive expansion of intermodal and warehouse facilities
- Freight, local, agriculture conflicts



Will County Community Friendly Freight Mobility Plan – Key Challenges

- Need to tell complete, current freight story – build funding support
- Two-year old data is out-of-date
- Balancing/managing freight growth with community/environmental impacts
- Prioritize projects
- Address workforce development – increase local job benefits

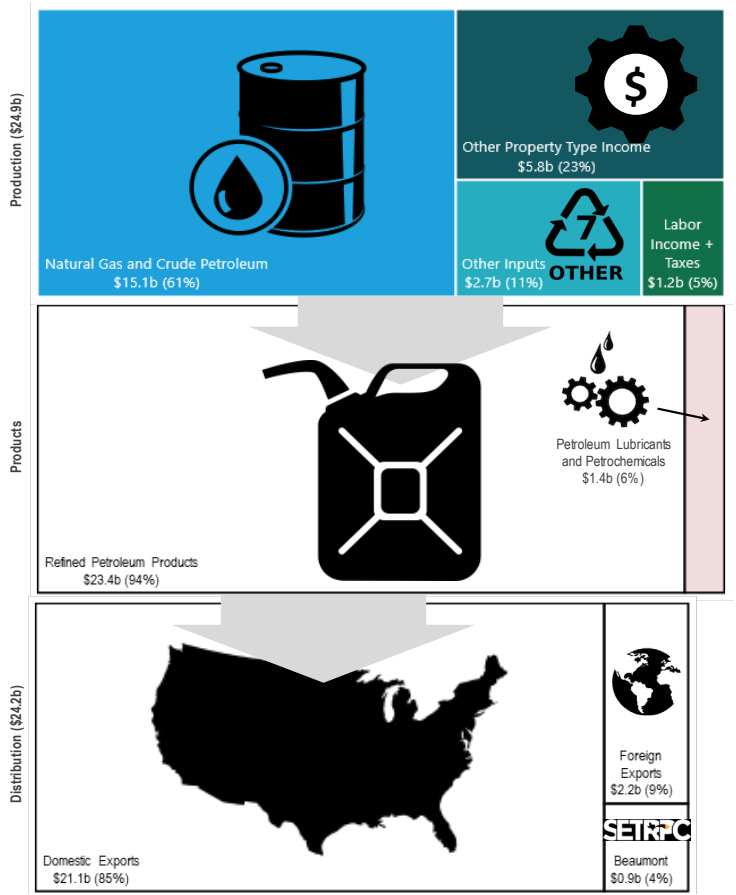


JOHRTS Regional Freight Mobility Plan – Project Basics

- Beaumont-Port Arthur, TX MSA
- Major oil and gas refining hub with related manufacturing
- Key export point for crude oil and natural gas
- Military cargo

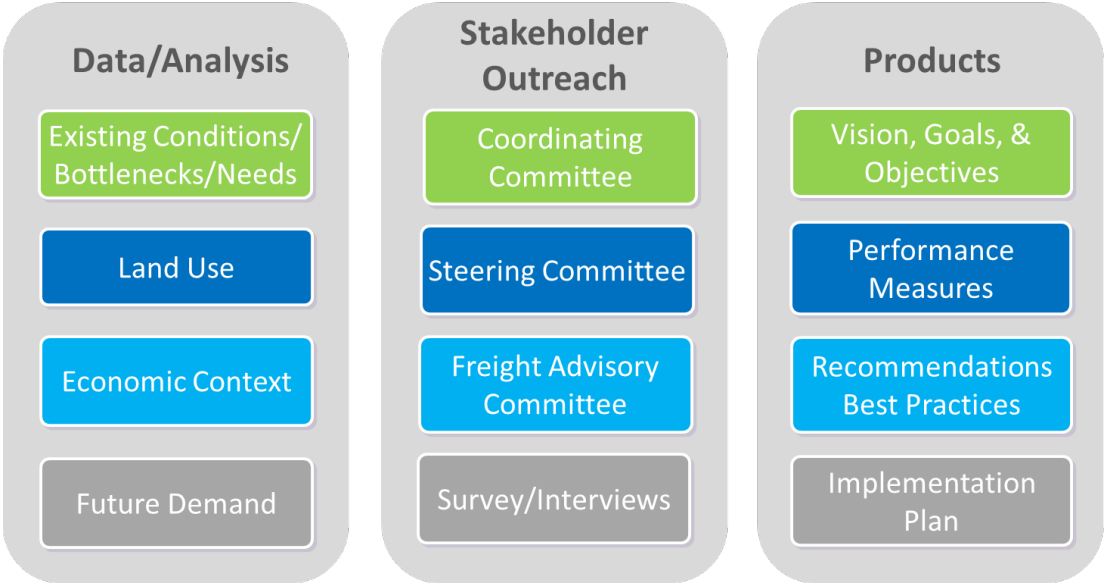
JOHRTS Regional Freight Mobility Plan – Key Challenges

- Evaluating freight data from multiple sources to tell the best story
- Linking multimodal freight flows to the regional and national economy
- Considering resiliency post-Hurricane Harvey



Greater Charlotte Regional Freight Mobility Plan – Project Basics

- Greater Charlotte Region
  - Multi-Jurisdictional; 14 Counties across 2 States
- Public-Private Collaboration
- Extensive collaborative effort across many planning agencies and organizations, and private sector



Greater Charlotte Regional Freight Mobility Plan – Key Challenges Addressed

- Identify and address key bottlenecks
- Identify economic development linkages
- Prioritize improvements to reduce barriers to efficiency
- Promote effective land use planning in freight corridors
- Mitigate environmental impacts

Innovative Use of Data

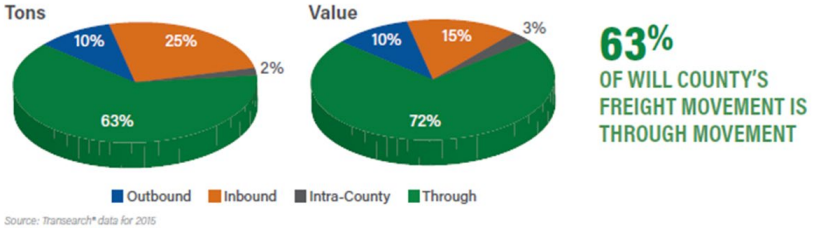
Innovative Use of Data – Combining Data Sets

- JOHRTS
  - Corps of Engineers
  - Transearch
  - Freight Analysis Framework
  - IMPLAN
- Will County
  - Transearch/IMPLAN
  - ATRI
  - MPO
  - EMSI
  - COSTAR
  - Statewide/National Datasets – Applied Regionally
  - Local surveys to validate/augment

Freight Movement in Will County by Mode, 2015

	Truck	Rail	Water	Pipeline
Tonnage (in millions)	152	160	6.6	59.1
Value (in billions)	$282	$321	$3.30	$15.9
Units (in millions)	11.3	4.6	NA	NA
Value/ton	$1,852	$2,008	$506	$270

Freight Movement by Direction, 2015



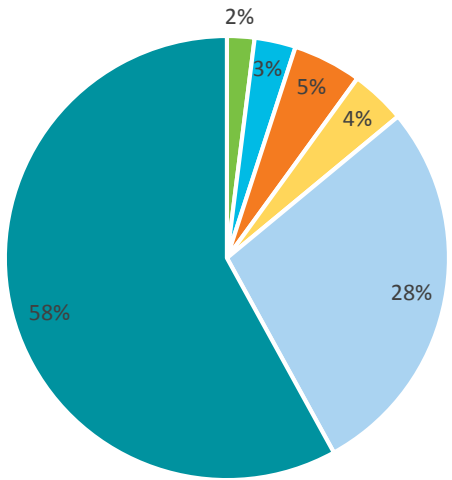
Source: Transearch* data for 2015

Innovative Use of Data – Telling a Story

- Telling a Compelling and Accurate Story
  - Will County – Magnitude of freight and rate of development and workforce growth
  - Will County – Global movement – local impact
  - Will County – Stakeholder input
  - JOHRTS – Oil supply chain and impact
  - Charlotte—Freight by the Numbers, Connecting to Land Use and Economics

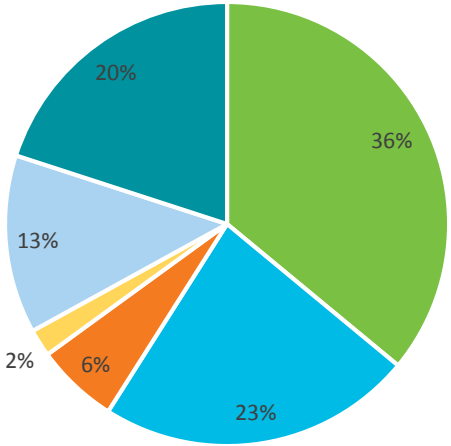
Innovative Use of Data – Telling a Story

JOHRTS Regional Employment by Industry, 2016



Petroleum & Coal Products Mfg
Chemical Mfg
Other Mfg
Transportation & Warehousing
Other Goods Industries
Services

JOHRTS Regional Output by Industry, 2016



Petroleum & Coal Products Mfg
Chemical Mfg
Other Mfg
Transportation & Warehousing
Other Goods Industries
Services

Innovative Use of Data – Telling a Story

ROADS

I-85 & I-77

Critical freight trucking corridors

77%

Of tonnage moved by Truck

Non-metal Minerals & Gravel

Top commodities by weight moved by truck

RAIL

9

Class I and Shortline Railroads serve the region

5%

Of freight tonnage moved by rail

Cereal Grains

Top commodity by weight moved by rail

AIR

42%

Of all NC air cargo is handled by CLT

$31B in annual economic gains from Aviation

Top commodity by value & weight moved by air

Electronics

Innovative Use of Data – Graphical Representation

- Will County – Communication with Elected Officials at all Levels – Funding
  - Executive Summary
  - Fact Sheets
  - Graphics
- Greater Charlotte—Freight by the Numbers.
  - Distilling key freight movement data and connecting to commodities and key supply chains

Innovative Use of Data – Summary

- Leverage multiple databases to understand total freight flow patterns
  - Which modes and data sources are the most relevant and accurate?
- Understand strengths and weaknesses of different data sets
  - Commodity detail and codes, geography, availability of forecasts, ability to identify through traffic
- Link freight flows to regional and national economic activity
- Tell a story

Community and Environmentally Friendly Freight Planning

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Community and Environmentally Friendly Freight Planning – Identifying Issues

- Will County
  - Land use – freight conflicts
  - Agricultural base
  - Visual and noise
  - Resources to protect – Lincoln Cemetery, Midewin Tall Grass Prairie

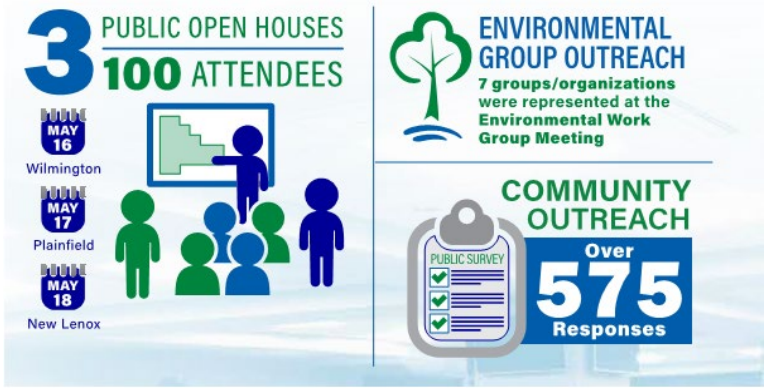
- JOHRTS
  - Hurricane Harvey flooding crippled the regional freight infrastructure
  - Identify critical infrastructure; develop options to restore capacity
    - Improving drainage, dredge capacity, ITS

Community and Environmentally Friendly Freight Planning – Identifying Issues

- Greater Charlotte
  - Land use – freight conflicts
  - Reduce the emissions resulting from freight congestion and excessive vehicle/train idling
  - Conflicts with non-industrial and residential land uses
  - Greater emissions generation in more rural and agricultural environments;

Community and Environmentally Friendly Freight Planning – Working with Stakeholders

- Will County
  - Freight Forums
  - Public Open Houses
  - Environmental Stakeholders Meeting
  - Local Officials Meeting
- JOHRTS
  - Roundtable meetings
  - Stakeholder interviews
    - Public and private sector



Community and Environmentally Friendly Freight Planning – Working with Stakeholders

- Greater Charlotte had extensive stakeholder engagement

Coordinating Committee	Steering Committee	Freight Advisory Committee	Surveys/Interviews
• 22 Members • Federal, State, and Local • Technical Oversight	• 63 Members • Transportation & economic development partners • Policy-level	• 20 Members • Private-sector freight • Guide implementation of Freight Plan	• Web-based survey • Phone interviews • Private & public stakeholders

"Highest priorities for private sector freight are congestion relief and travel time reliability."

Community and Environmentally Friendly Freight Planning – Economic Resiliency

	Employment	Labor Income*	Value Added*	Output*
Beaumont Economy	*205,349*	*$12,196*	*$26,999*	*$69,649*
Impact Type				
Direct	-6,371	-$1,355	-$9,022	-$34,785
Indirect	-10,966	-$923	-$1,491	-$3,006
Induced	-10,627	-$423	-$776	-$1,357
Total	-27,964	-$2,701	-$11,289	-$39,149
Percent of Economy				
Direct	-3%	-11%	-33%	-50%
Indirect	-5%	-8%	-6%	-4%
Induced	-5%	-3%	-3%	-2%
Total	-14%	-22%	-42%	-56%

* millions of dollars

Community and Environmentally Friendly Freight Planning – Developing Tools

- Tool Box Development

Community Issue	Measures to Address
Safety	– Prioritize projects that address higher truck crash locations – Address critical at-grade rail crossings with safety concerns – Designate truck routes to reduce conflicts in residential areas
Trucks on Local Roads	– Partner with local communities, including townships, to designate truck routes to reduce conflicts in residential areas – Better communicate designated routes to truckers
Congestion	– Prioritize projects that address high congestion locations – Ensure new freight related developments address traffic growth and circulation through traffic plans and private sector cost sharing for improvements needed
Noise (also an environmental issue)	– Implement land use and zoning/site plan standards that include requirements for buffer areas and noise standards – Further investigate potential quiet zones for rail
Emergency Access	– Prioritize grade separations on roads with emergency facilities
Encroachment on Agricultural Land	– Create a County land use plan that creates strategies to focus new freight development in freight clusters. The County land use plan could also identify zones to protect agricultural areas that may be locally defined
Light Pollution and Aesthetics (also an environmental issue)	– Implement land use and zoning/site plan standards that include requirements for buffer areas and lighting standards, and aesthetic considerations, particularly for new freight related development

Community and Environmentally Friendly Freight Planning – Environmental Mitigation

- Tool Box Development

Environmental Issue	Measures to Address
Air Quality	– Partner with industry to minimize air quality impacts from freight – Partner on strong anti-idling regulations and technology – Plan for buffer zones around new/expanding freight developments
Water Quality	– Employ best management practices for avoidance and minimization of impacts to wetlands and for stormwater management – Consider water quality impacts in truck route selection and implement stormwater best management practices in roadway design
Hazardous Materials Transportation	– Regularly review and update route designations with partners – Ensure emergency management plans are reviewed and updated
Encroachment on Sensitive Areas	– Develop a county land use plan and strategy – Focus new freight development in existing identified freight clusters – Review truck routing to minimize impacts to adjacent environmentally sensitive areas

Community and Environmentally Friendly Freight Planning – Performance Measures

Proposed Freight Plan Goals	Proposed Freight Performance Measures
Economic Competitiveness	• Number of completed intermodal port connector projects from Port Connectivity Report and Appendix • Number of high-value jobs
Freight Mobility and Reliability	• Truck Travel Time Reliability Index • Truck Planning Time Index • Truck Frequency of Congestion
Safety, Security, and Resiliency	• Number of truck-involved crashes in the JOHRTS region • Number of severe crashes (injuries and fatalities) involving trucks in the JOHRTS region • Number of injuries involving trucks in the JOHRTS region • Number of months/weeks to reopen freight corridors or freight facilities.

Community and Environmentally Friendly Freight Planning – Performance Measures

- Greater Charlotte
  - Performance measures are tied to the 7 freight goals
  - Focus on safety, preservation, maintenance, and congestion reduction
  - Require data for tracking
  - Data sources include NCDOT, SCDOT, and federal data resources such as INRIX and NBIS

Freight Mobility Plan Goals	Freight Mobility Plan Objectives	Performance Measures (source of data)
1. Economic Competitiveness and Efficiency	• Develop, integrate, and support a freight transportation system that supports the region's position as a major freight hub via a network of highways, railroads and airports • Encourage regional efforts to maximize the region's competitiveness in freight and logistics • Formulate a relationship between the private and public sectors to leverage available public and private revenue resources	• Reduce congestion on intermodal connectors and roads leading to major energy/manufacturing centers (INRIX travel time data or AADT-based level of service)
2. Safety and Security	• Assist regional emergency management agencies to be better prepared in the event of crashes on the freight system, and in response to hazardous material incidents • Expand the use of technology to increase regional freight safety and security • Reduce the number of high crash locations that involve trucks or at-grade rail crossings	• Hours of delay from incidents (NCDOT, SCDOT) • Number of crashes and fatal crashes involving trucks (and rate) (NCDOT, SCDOT, SCDPS) • Grade Crossing Crash/Incident Rate (NCDOT, SCDOT, SCDPS)
3. Infrastructure Preservation and Maintenance	• Maintain regionally significant streets, highways and bridges to a state of good repair to minimize truck travel times and cargo damage	• Percent of structurally deficient bridges on freight network (NCDOT, SCDOT, NBIS) • Percent of freight network meeting pavement condition targets (NCDOT, SCDOT) • Number of weight-restricted bridges on the freight network (NCDOT, SCDOT, NBIS) • Number of vertical restrictions on the freight network (NCDOT, SCDOT, NBIS)
4. Environmental Stewardship	• Encourage land use planning that supports and promotes the efficient movement of freight • Reduce the emissions resulting from freight congestion and excessive vehicle/train idling	• MPO and RPO Air Quality Design Values (MPO/RPO Data) • Annual Hours of Excessive Delay Per Capita* • 2- and 4-year Total Emission Reductions for each applicable criteria pollutant and precursor*

Community and Environmentally Friendly Freight Planning – Performance Measures

- Will County
  - Performance measures tied to 6 goals including community and economic development

Performance Measures

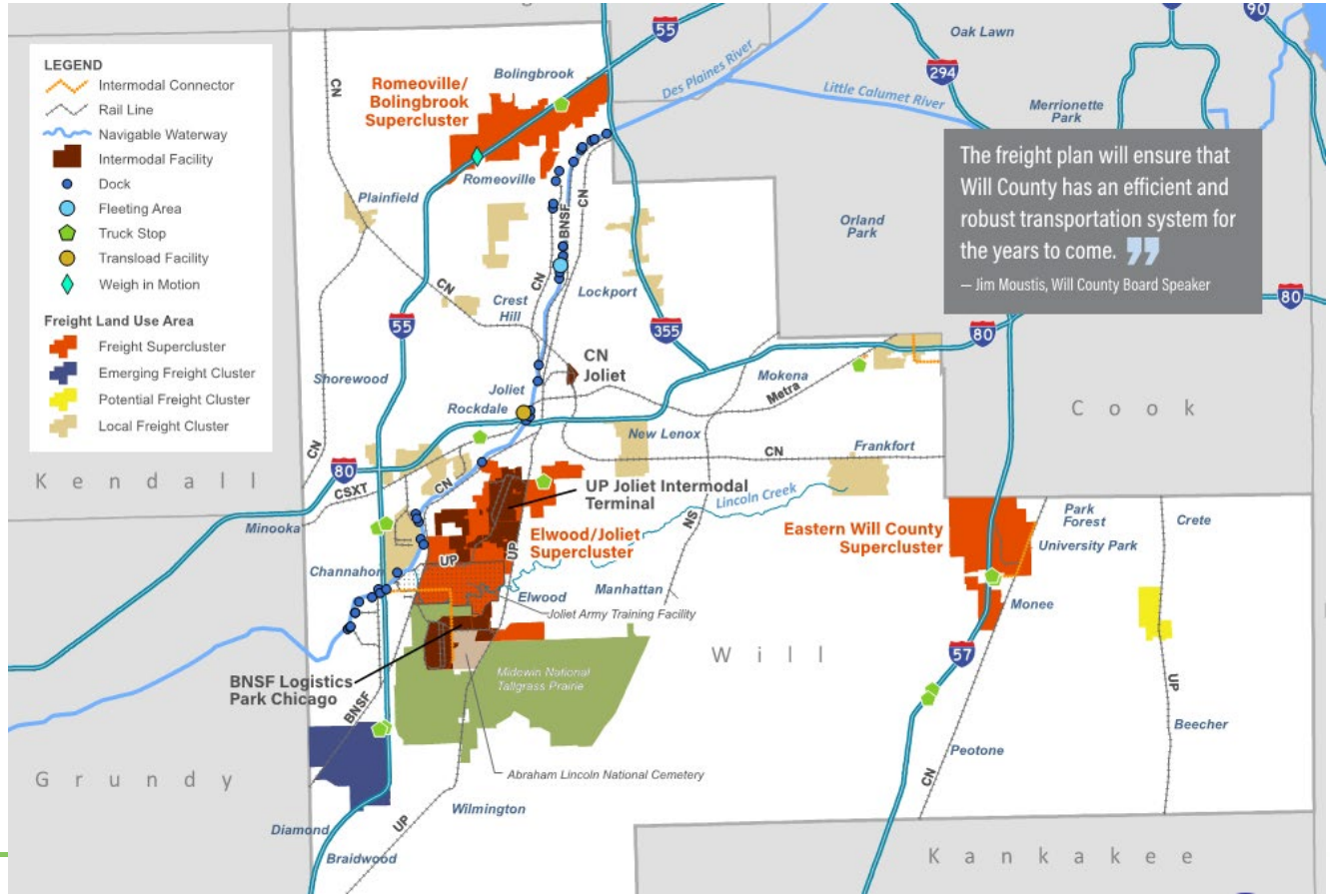
- Number of Designated Truck Route miles in residential and recreational areas
- Number of comprehensive plans that integrate freight planning and land-use decision-making activities
- Percent of truck traffic volume traveling on non-designated Truck Route System
- Multijurisdictional collaboration on planning large logistics facilities on a case-by-case basis

Community and Environmentally Friendly Freight Planning – Summary

- Work with stakeholders – engage with the contentious
- Leverage different tools – forums, surveys
- Understand regional freight issues and opportunities
  - Tailor mitigation strategies
- Tool boxes
- Measure performance beyond just moving good/vehicles

Land Use and Freight

Land Use and Freight – Mapping Freight Clusters



Land Use and Freight – Forecasting Growth and Impacts

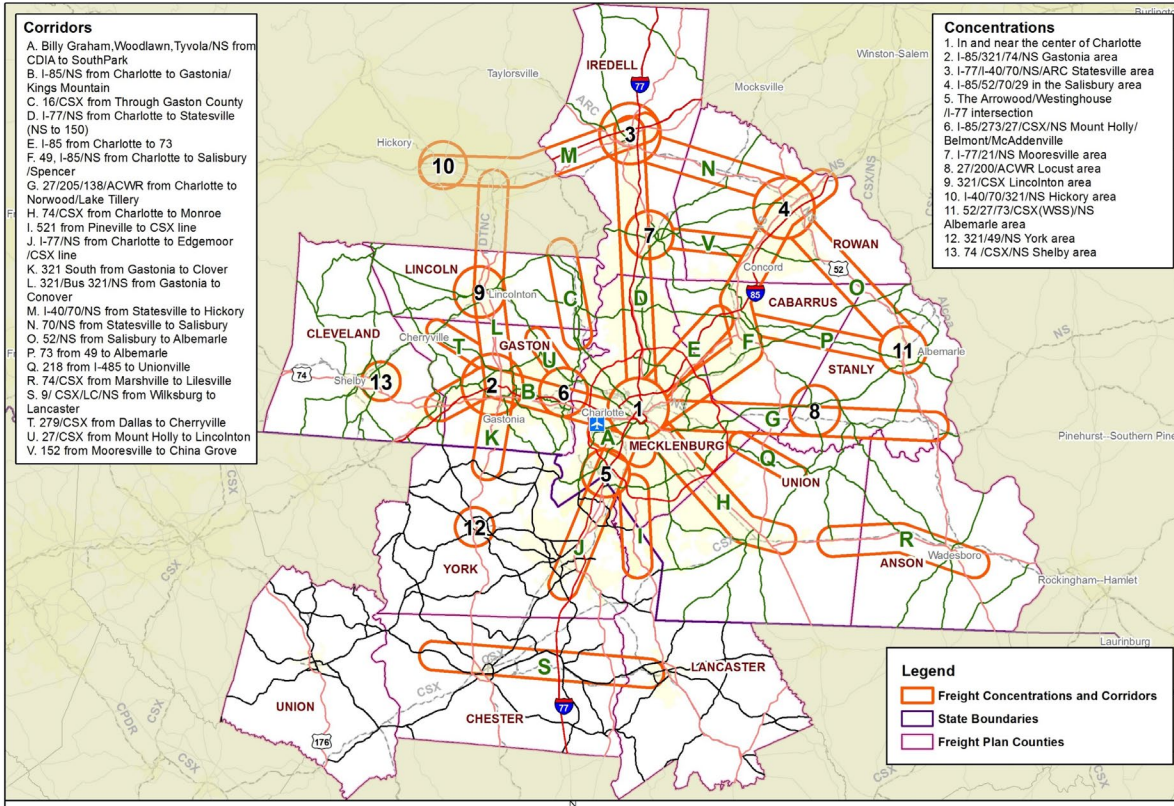
- Will County – Macro and Micro
  - TRANSEARCH National/Global to Regional – translated to trip generation
  - Land Use – Bottom-up Cluster Build Out Analysis
  - Ground truth in local land use plans and with COSTAR/EMSI

Cluster	Industrial			Current Employment (2014)			Future Employment (2026)
	Existing Building Area (s.f.)	Anticipated Growth in Building Area (s.f.)	Percent Build Out (2026)*	Cluster Total	Transportation/ Trade/Utilities	Percent	
Elwood/Joliet	22,879,553	24,490,000	48%	2,290	1,429	62.4%	10,984
I-80/Houbolt Rd	9,698,466	4,740,000	61%	4,486	1,757	39.2%	6,055
Channahon	2,109,612	2,590,000	34%	955	316	33.1%	1,891
New Lenox	5,088,882	5,400,000	56%	1,738	800	46.0%	2,723
Total	39,776,513	39,220,000		9,469	4,302	45.4%	21,653

** The percent build out refers to the rentable building area required to fill all of the industrial space in each cluster.*
Source. RT&A, Industry Cluster Analysis

Land Use and Freight – Mapping Freight Clusters

- 13 Concentrations
- 22 Corridors
- Economic activity, freight movements
- Advanced manufacturing



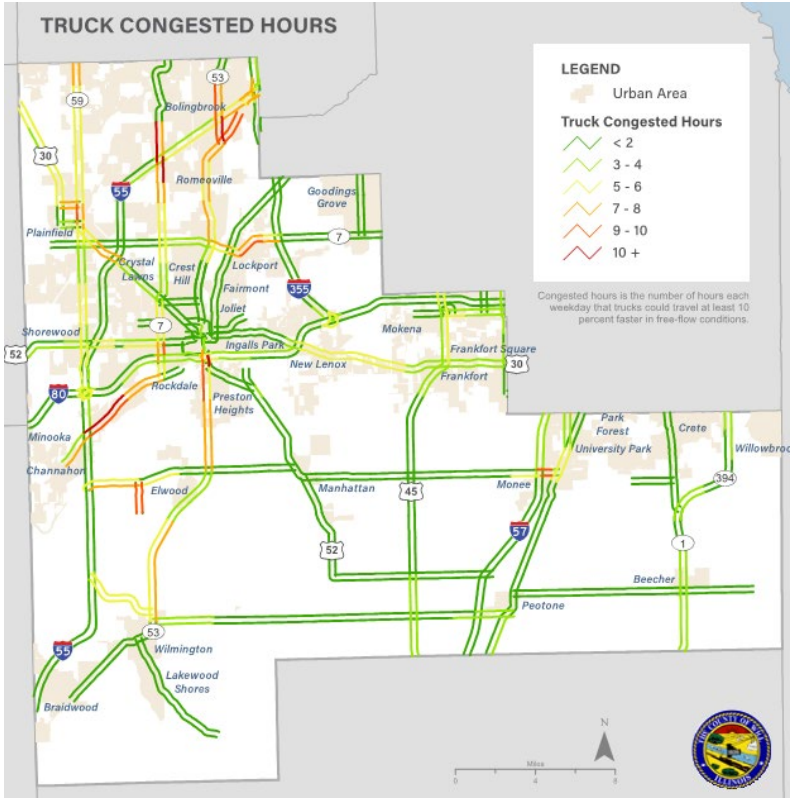
Land Use and Freight – Summary

- Know the planned freight-related acreage
- Overlay acreage with freight concentrations & corridors
- Incentivize freight-related businesses within freight concentrations & corridors
- Develop local strategies for freight concentrations
- Prioritize freight improvements within freight concentrations and corridors
- Incorporate freight into site design standards

Project Selection and Funding

Project Selection – Developing Projects

- Will County
  - Merged a lot of existing lists
  - Built on LRTP, not redo it – isolate freight related projects tied to freight clusters
  - Vet with stakeholder input



Project Selection – Selecting Criteria

Greater Charlotte Project Evaluation Process

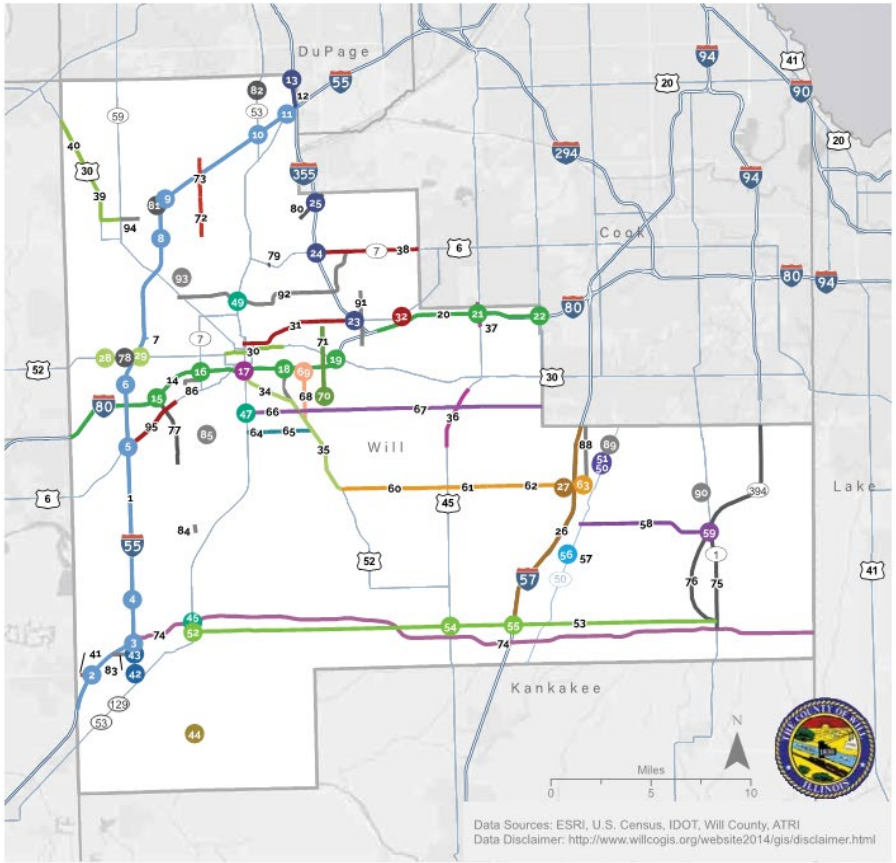
1. Step 1 – Evaluate the list of recommended projects
2. Step 2 – Perform a gap analysis to identify projects that were missing from the initial list of potential investments
3. Step 3 – Define prioritization factors for each mode
4. Step 4 – Analyze each project on the final list and produce a summary assessment

Will County Projects Evaluated Using:

- Preservation/ Enhancement
- Safety
- Mobility
- Economic Competitiveness
- Community Sensitivity
- Environmental Sensitivity.

Project Selection – Input and Prioritization Tools

- GIS Based Tools
- Filters by different categories
- Weighting by Stakeholders



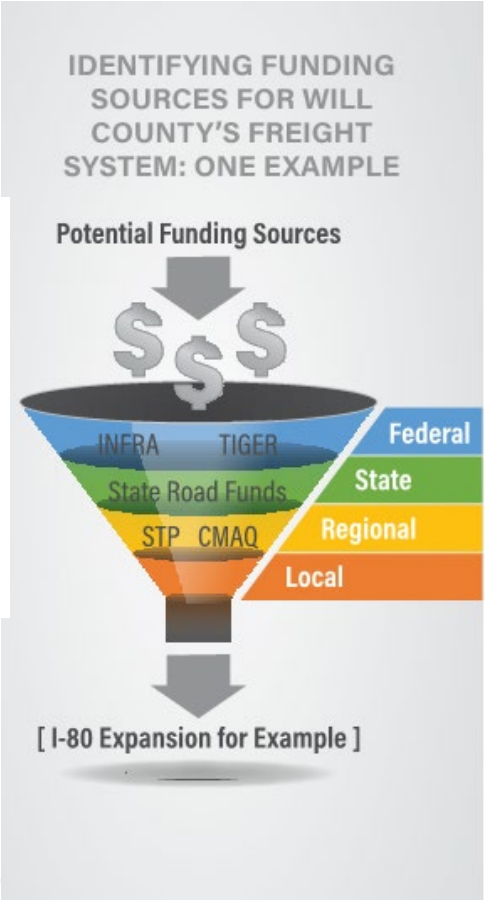
Project Selection – Developing Projects

- Greater Charlotte: Developing a process for selecting projects

Goal 1: Economic Competitiveness and Efficiency

Project Prioritization	Criteria		Factors	
• Is on the defined Strategic Freight Network • Improves access to/from existing or developing freight hubs • Preserves freight reliant jobs • Improves freight network access • Improves access to freight generators • Improves access among two or more modes • Supports retention or expansion of business • Supports or expands freight related land use		**Freight Impacted**		**Does not improve**
		**Freight Related**		**Somewhat improves**
		**Freight Focused**		**Improves**
				**Significantly improves**
				**Greatly improves**

Project Selection – Linking to Economic Competitiveness and Funding



Project Selection and Funding – Summary

- GIS tools and selecting criteria that work in this framework
- Stakeholder input
- Communicating the prioritization related to goal and performance measures – not just a score
- Evaluate with consideration on how projects are funded including criteria and identifying eligible projects only

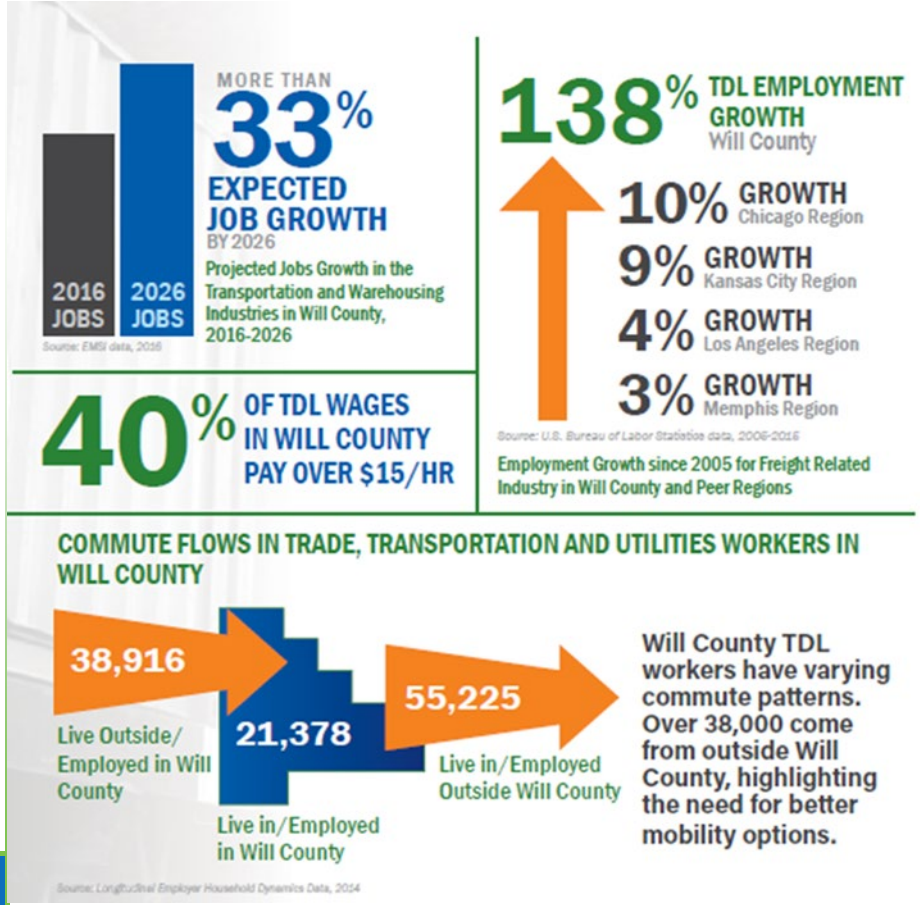
Freight Workforce Development

Freight Workforce Development – Understanding Issues

- Will County – Background Research and Workforce Forums
  - Employer needs
  - Workforce characteristics
  - Mis-match between local work force and needs
  - Skills development and retention
  - Commuting – distance, cost, transit
- Charlotte – target industry linkage

> Our TDL workforce is a vital asset to our current and future economic competitiveness in Will County. We want to do the best job possible to recruit, train, and retain workers in our TDL businesses. All the businesses in Will County win when that happens.
>
> — John E. Greuling, President and CEO, Will County Center for Economic Development

Freight Workforce Development – Telling a Story



57%
OF ALL PRIVATE SECTOR JOBS IN WILL COUNTY ARE FREIGHT DEPENDENT

Freight Workforce Development – Summary

- Action Plan
- Opportunities for workforce is a way communities' benefit from freight
- Research is key – different groups of stakeholders
- Partnership – industry, public sector, education
- A key part of telling the story

Summary

Top Takeaways

- Importance of using broad sets of data to tell an accurate and compelling freight story
- Stakeholder input – key to all aspects of analysis
- Linking commodity flows to the local/regional economy to make case for investment
- Environmental and community-oriented approaches – minimize and mitigate
- Performance/data driven planning at a local level

TRIANGLE REGIONAL FREIGHT PLAN

Freight Webinar

Kenneth Withrow, Capital Area MPO

May 3, 2019

CAMPO Metropolitan Planning Organization

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Planning Tomorrow Today

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TRIANGLE REGIONAL FREIGHT PLAN

PLAN PURPOSE

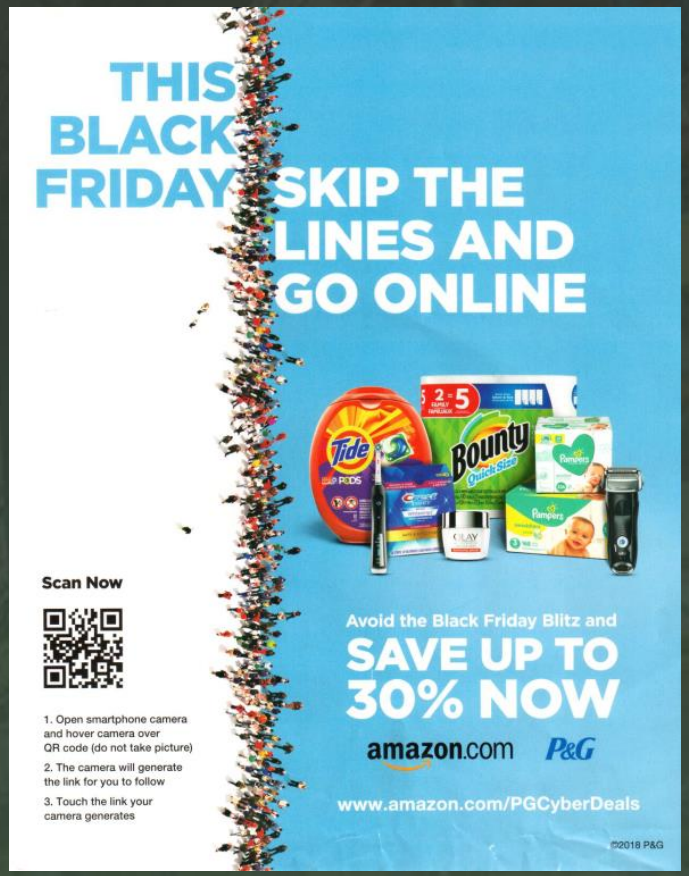
- Conduct a comprehensive regional study of freight, goods movements, and services mobility needs
- Develop a framework to proactively address these mobility needs, and their challenges in our region
- Examine all modes of freight with emphasis on trucks, rail and air cargo, and develop recommendations for the 2045 joint Metropolitan Transportation Plan

➡ Guide policy and investment to address the needs of industry and people, within overarching regional goals for safety, equity, livability, sustainability, and economic productivity.

TRIANGLE REGIONAL FREIGHT PLAN

PLANNING PROCESS

1. Stakeholder Outreach & Engagement
2. Data Collection & Assessment
3. Freight Goals/Objectives & Performance Measures
4. Trends & Existing Conditions
5. Freight Model & Forecasts – 2035/2045
6. Evaluation of Future Conditions
7. Strategic Freight Corridors & Zones
8. Recommendations & Implementation Strategies



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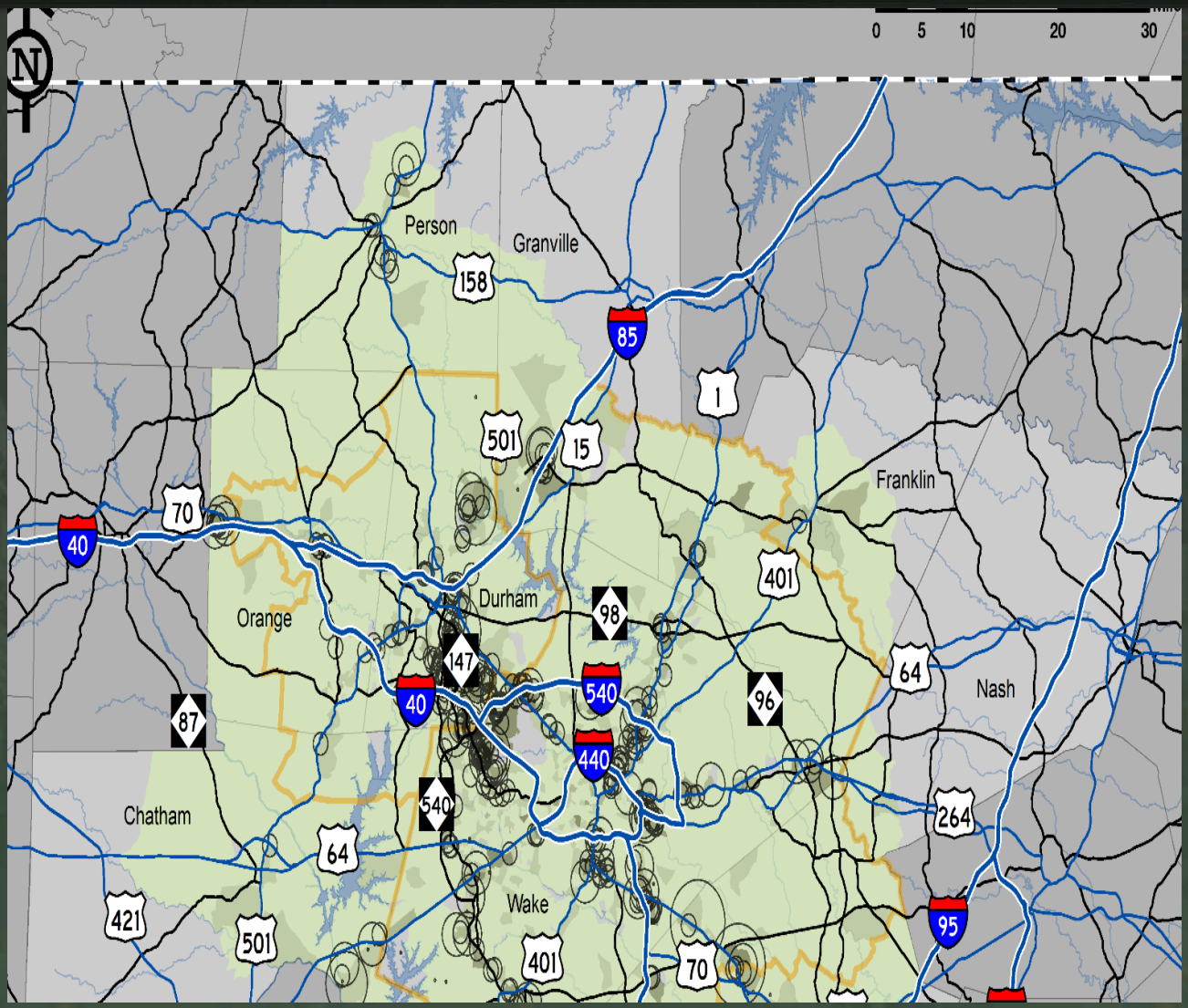
TRIANGLE REGIONAL FREIGHT PLAN

FREIGHT-DEPENDENT EMPLOYMENT & FREIGHT-INTENSIVE INDUSTRIES

- Freight-dependent industries account for *one-third* of Triangle Gross Regional Product - $21 Billion*

*Bureau of Economic Analysis, 2013 (2009 chained $)



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TRIANGLE REGIONAL FREIGHT PLAN

FREIGHT PLAN VISION

The Triangle Region's goods movement system will be safe and efficient, provide multimodal interconnectivity, enhance economic competitiveness, create jobs, and promote innovation, while reducing environmental impacts and improving local communities'

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TRIANGLE REGIONAL FREIGHT PLAN

FREIGHT PLAN GOALS

Freight Plan Goals

Manage Congestion and System Reliability

Allow goods to move with minimal congestion and time delay, and greater predictability.

Improve Infrastructure Condition

Increase proportion of highways and highway assets in "good" condition.

Promote Multimodal and Affordable Choices

Increase utilization of non-truck travel modes

Promote Safety and Health

Increase safety and security of transportation users.

Freight Plan Goals

Protect Environment and Minimize Climate Change

Reduce mobile source emissions, GHG, and energy consumption.

Stimulate Economic Vitality

Increase economic growth and prosperity that supports communities and businesses.

Ensure Equity

Link land use and transportation planning and ensure that transportation investments do not create a disproportionate burden for any community.

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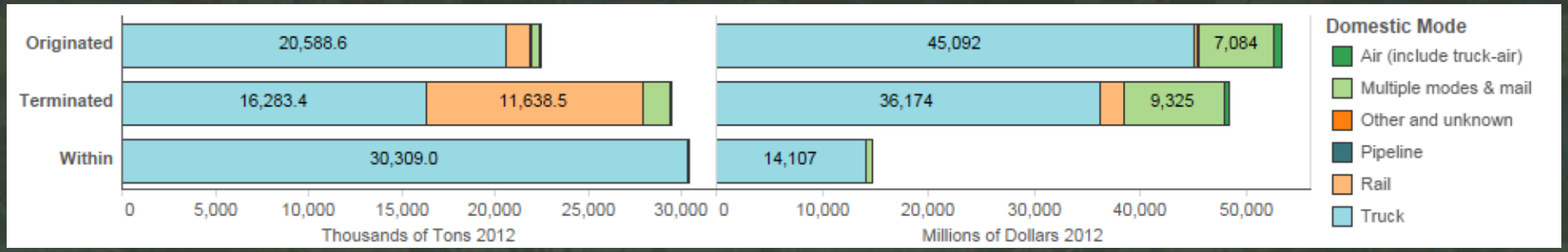
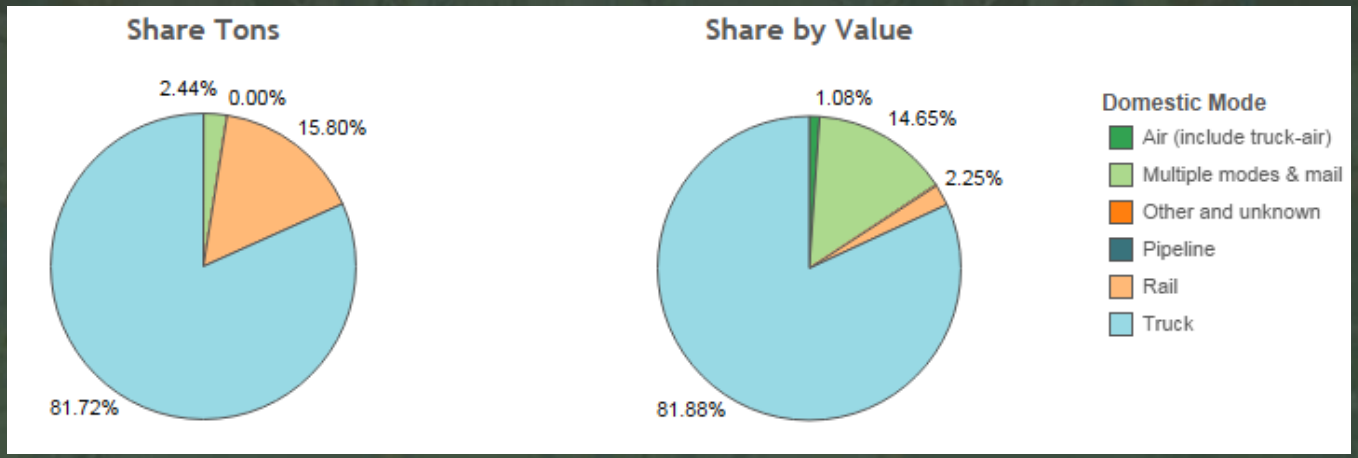
Overview of Recent Freight Flows

- The region handled 81.7 million tons of freight worth $109.3 billion dollars in 2012 – mainly by truck

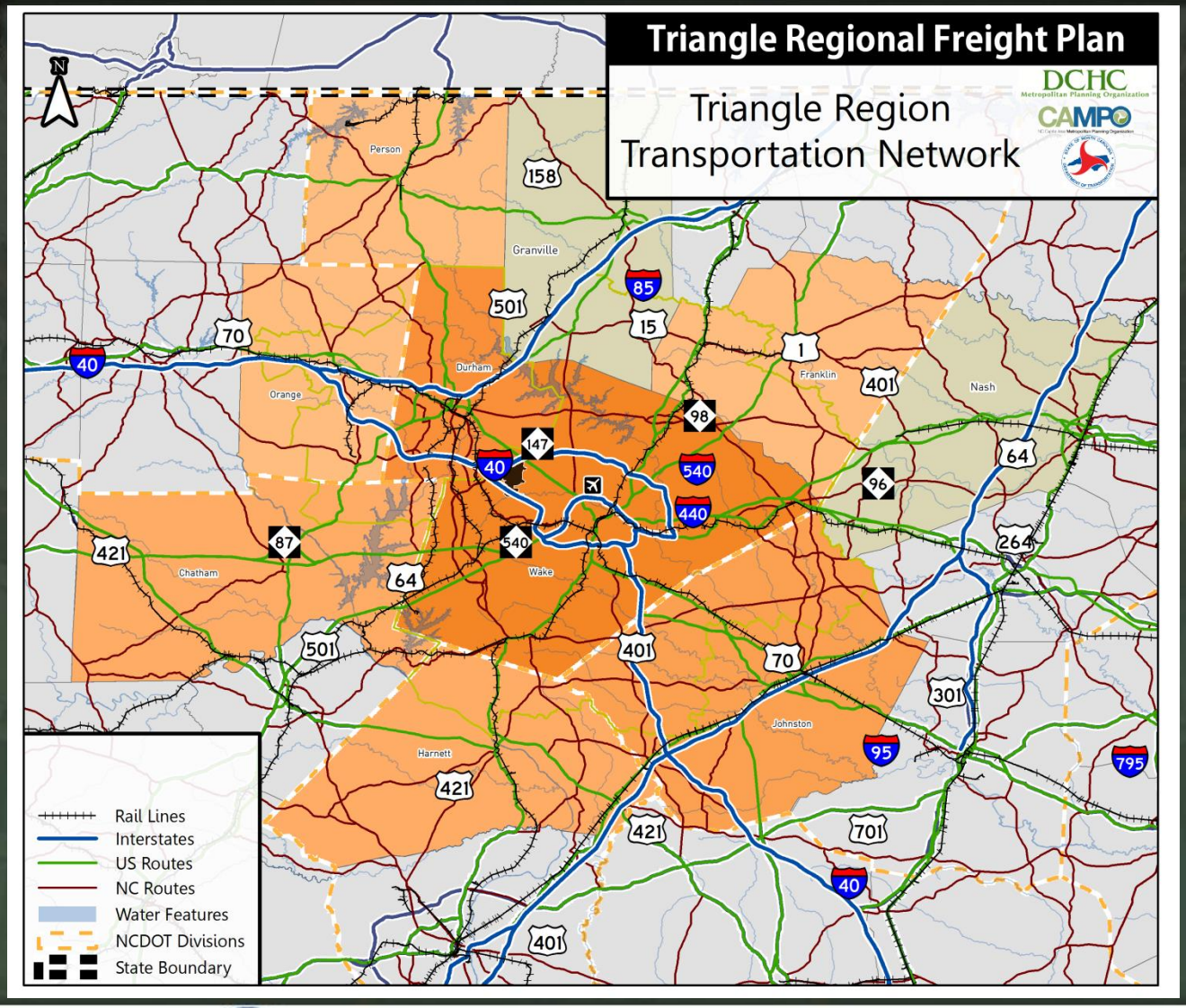




Freight Analysis Framework 4.0

TRIANGLE REGIONAL FREIGHT PLAN

DAILY TRUCK TRIPS
OUTBOUND BY COUNTY - 2012



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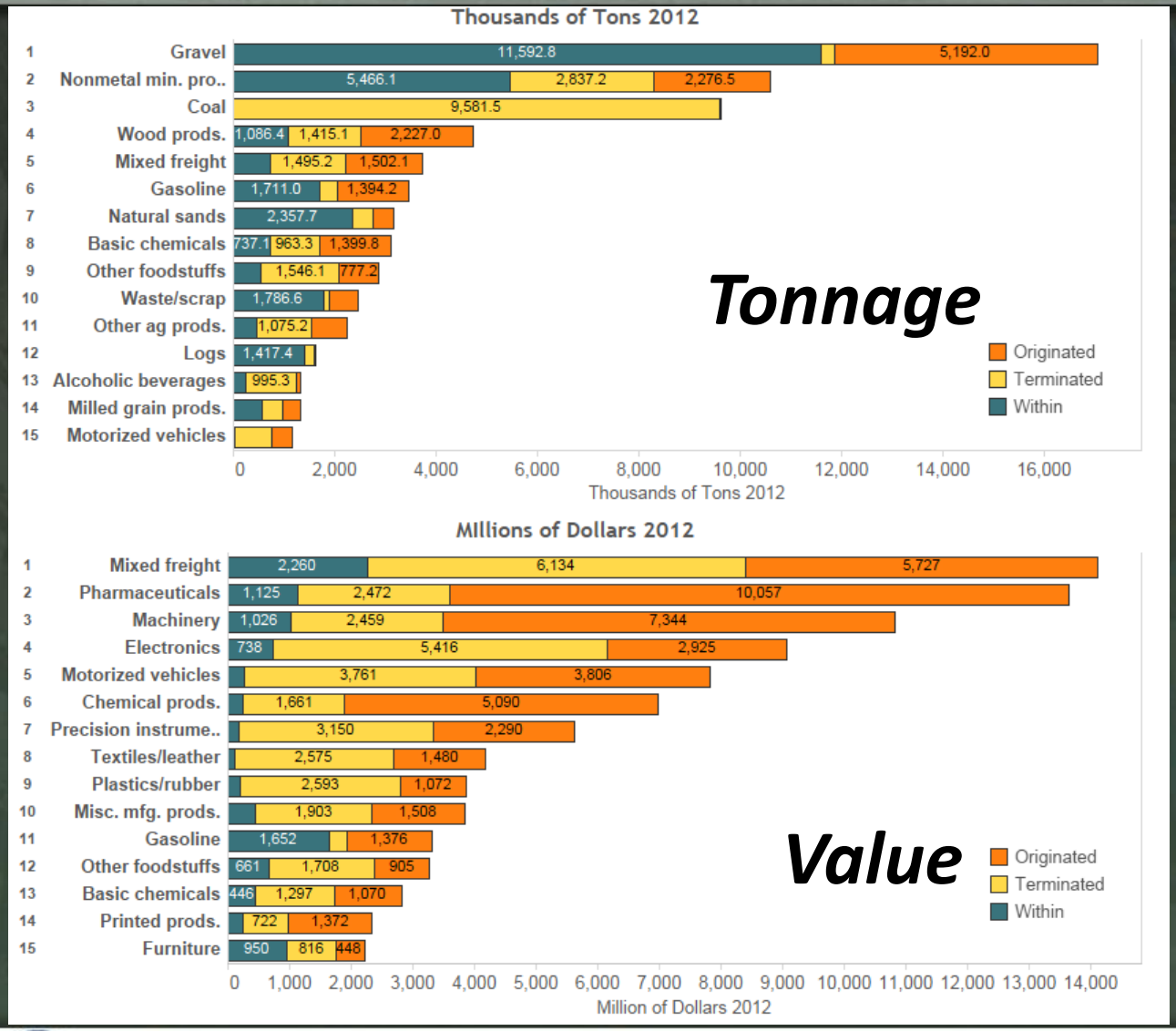
TRIANGLE REGIONAL FREIGHT PLAN

TOP 15 COMMODITIES: 2012

- Top 15 commodities represent: 83% of tons and 80% of dollars
- ..but very different commodities



Freight Analysis Framework 4.0

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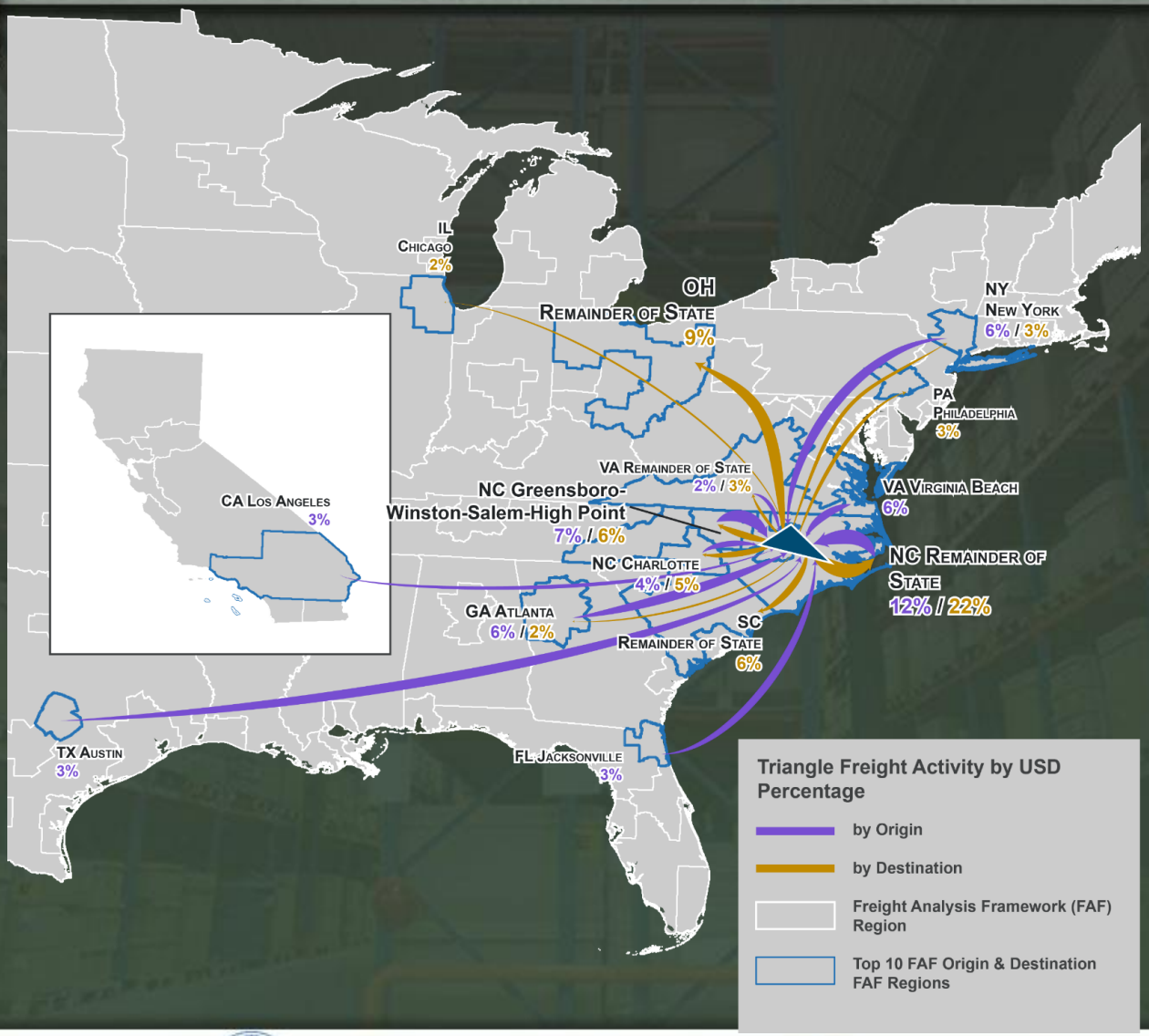
TRIANGLE REGIONAL FREIGHT PLAN

TOP 10 ORIGINS & DESTINATIONS BY VALUE: 2012



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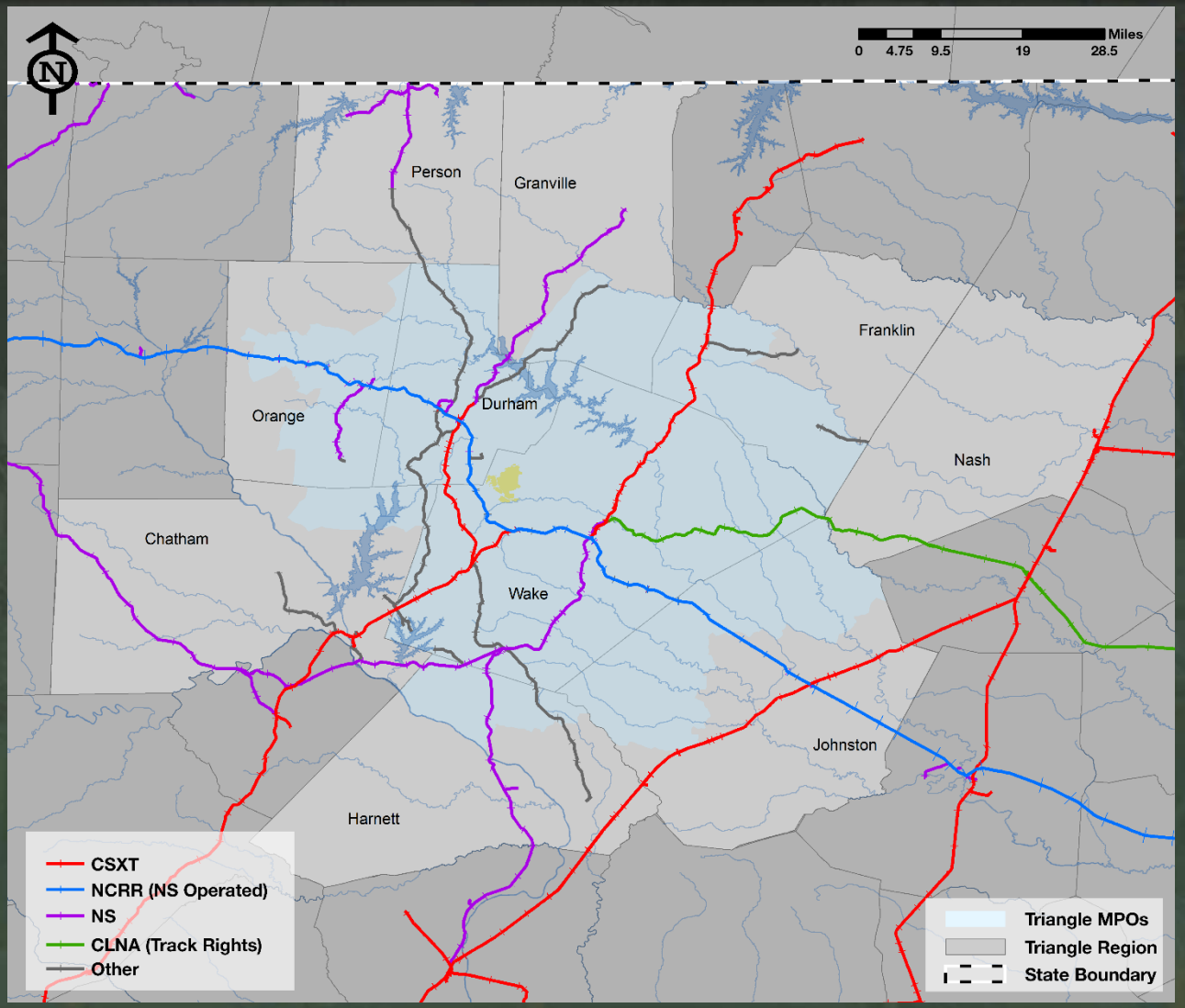
TRIANGLE REGIONAL FREIGHT PLAN

REGIONAL RAIL SYSTEM

- CSX, NS and NCRR/NS carry 13 million tons on 300+ miles of active track
- 90% of tonnage is inbound, 2/3 of inbound is utility coal
- Intermodal service: NS at Greensboro, CSX breaking ground in Rocky Mount this month



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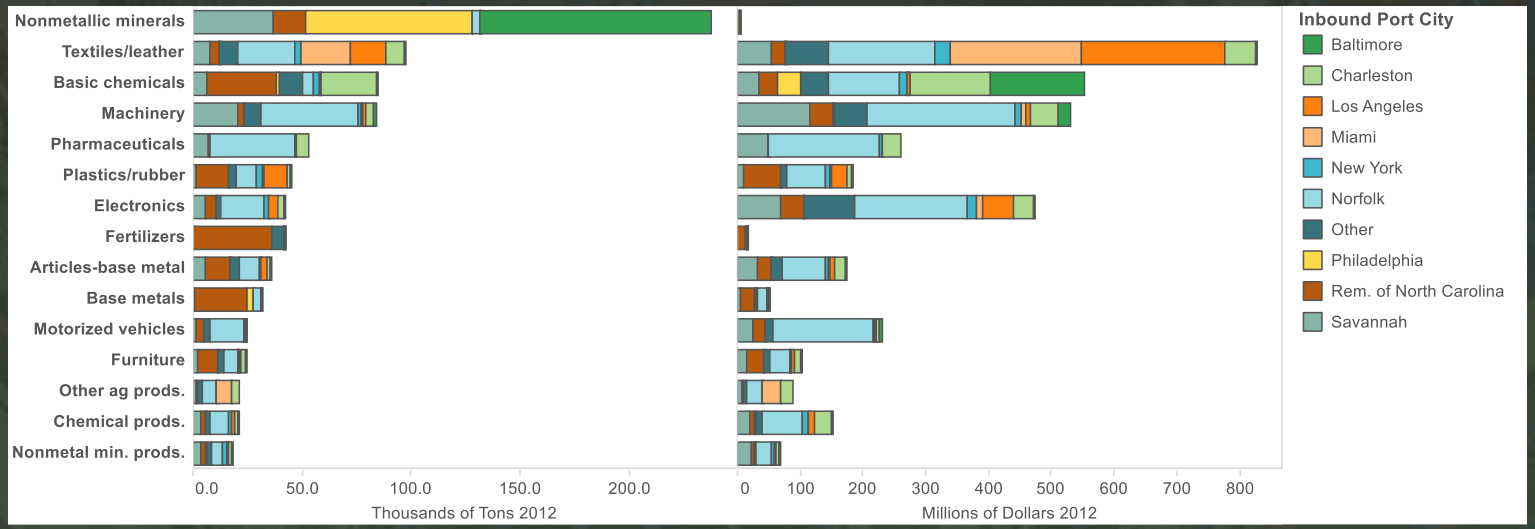
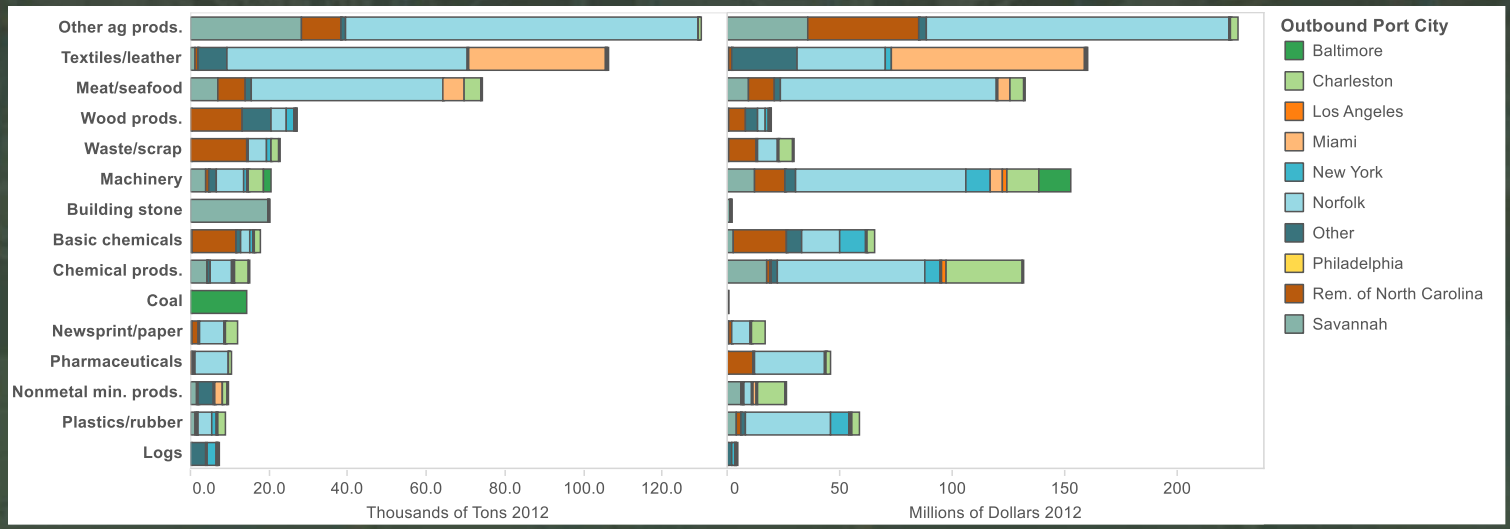
TRIANGLE REGIONAL FREIGHT PLAN

PORT CITIES FOR INTERNATIONAL MARINE SHIPMENTS

Triangle Imports



Triangle Exports



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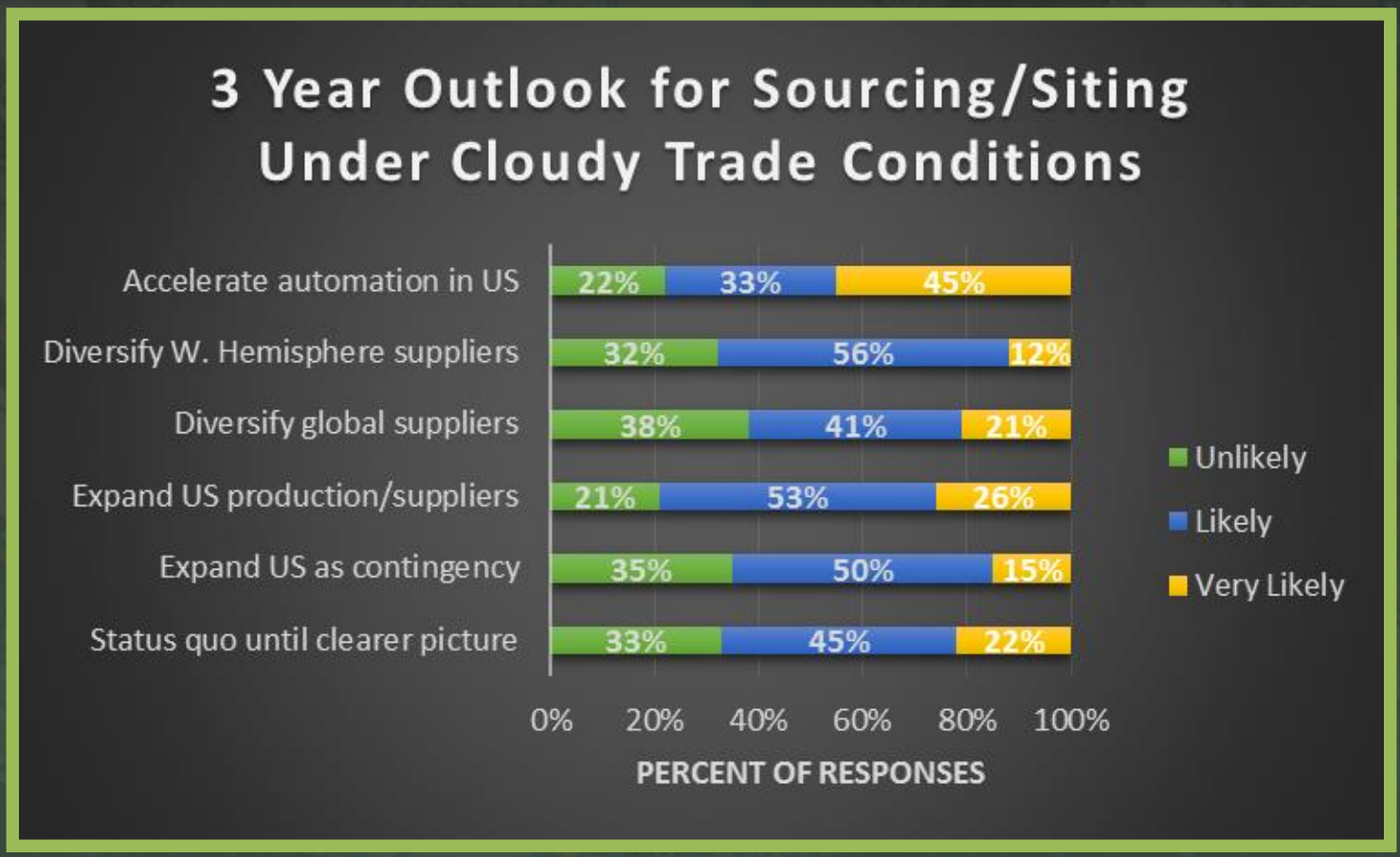
TRIANGLE REGIONAL FREIGHT PLAN

TRADE PICTURE: MULTIPLE RISKS, MULTIPLE SUPPLY CHAIN STRATEGIES



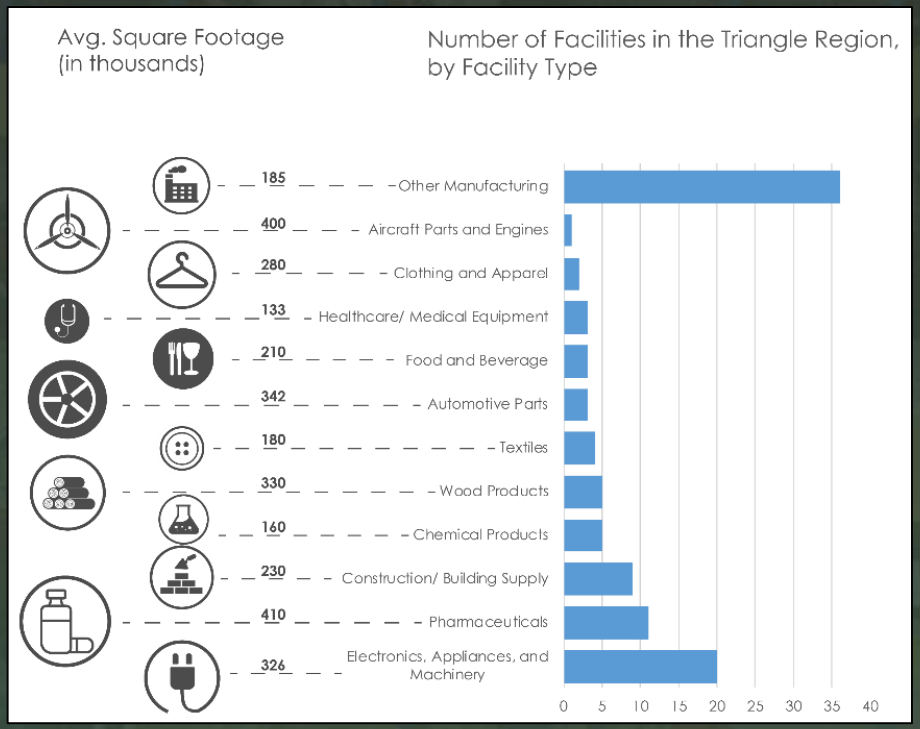
- Accelerating automation in US is top strategy: almost half view as very likely
- Diversifying off-shore less likely than expanding on-shore
- IMO Fuel Mandate effective 1/20 is another source of disruption

Source: Tompkins International Supply Chain Survey, 2017

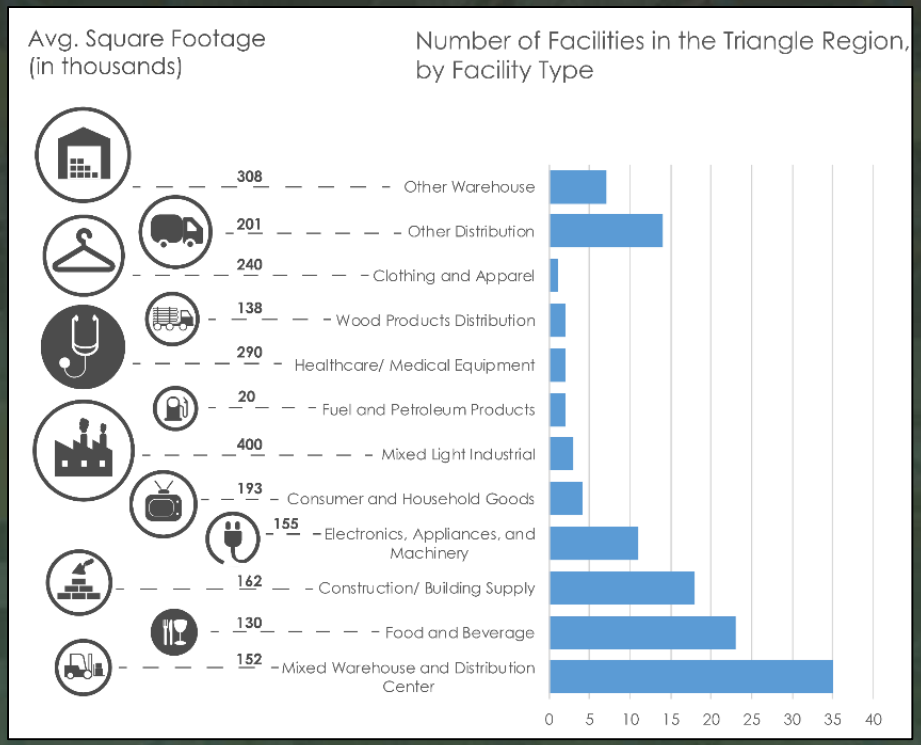
TRIANGLE REGIONAL FREIGHT PLAN

REGIONAL MANUFACTURING & DISTRIBUTION FACILITIES

Manufacturing Facility Types



Warehouse/ Distribution Center Facility Types



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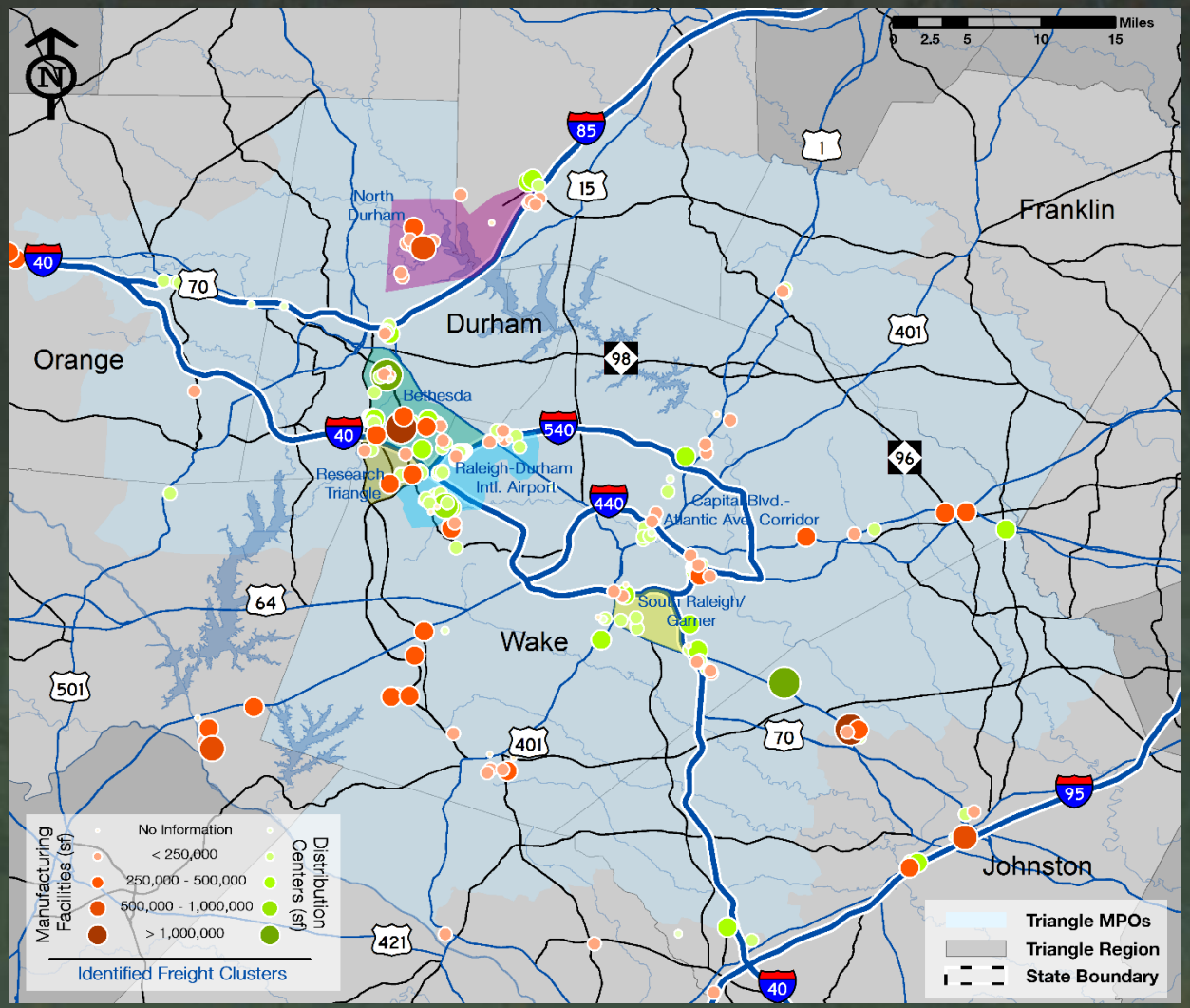
TRIANGLE REGIONAL FREIGHT PLAN

FREIGHT-INTENSIVE INDUSTRY AND FREIGHT CLUSTERS

- Freight concentrates in 6 primary clusters, located in an arc from North Durham to South Raleigh
- Clusters generally serve dual roles in manufacturing and distribution



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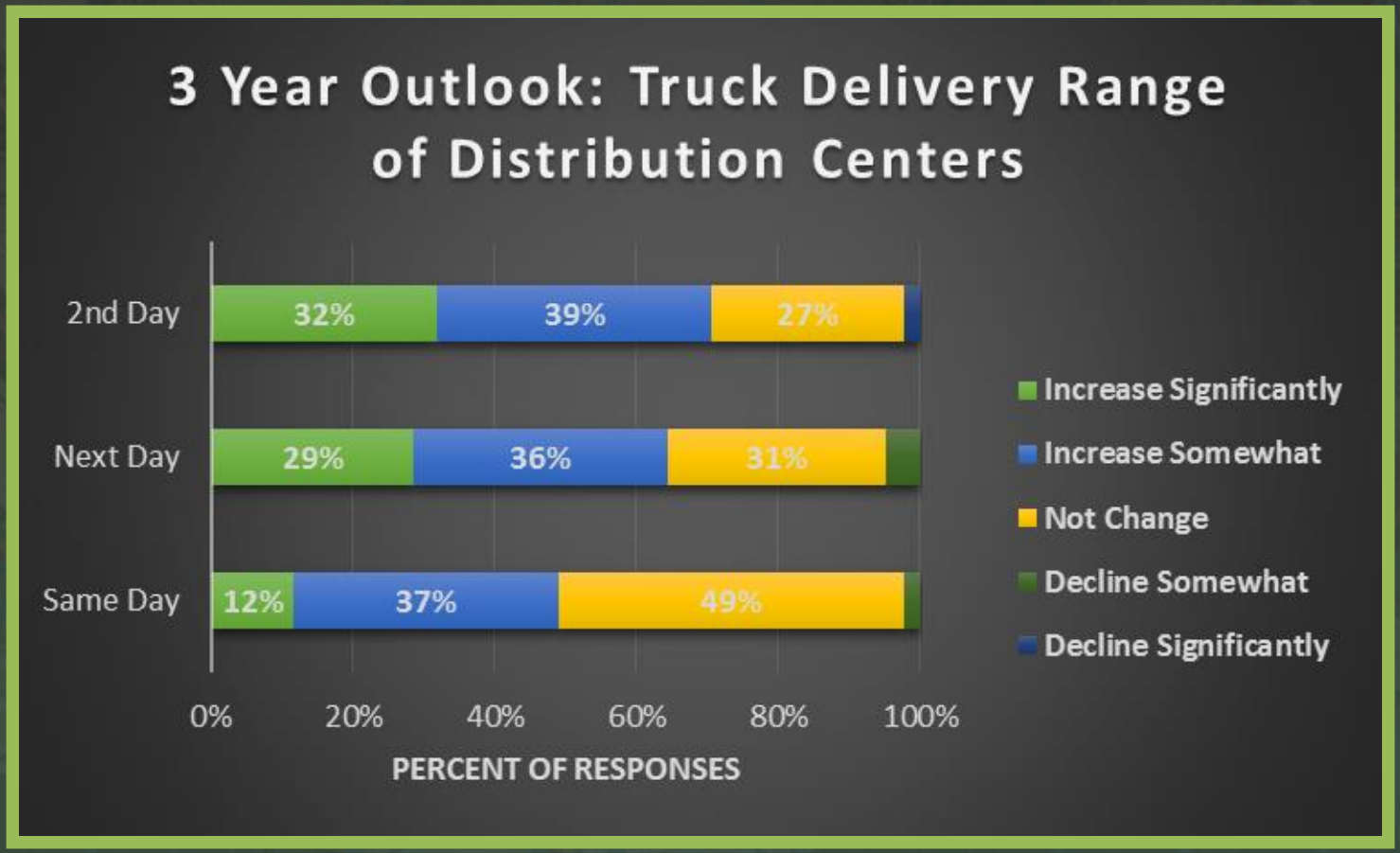
TRIANGLE REGIONAL FREIGHT PLAN

SHORTENING DISTRIBUTION RANGES AND SAME DAY DELIVERY



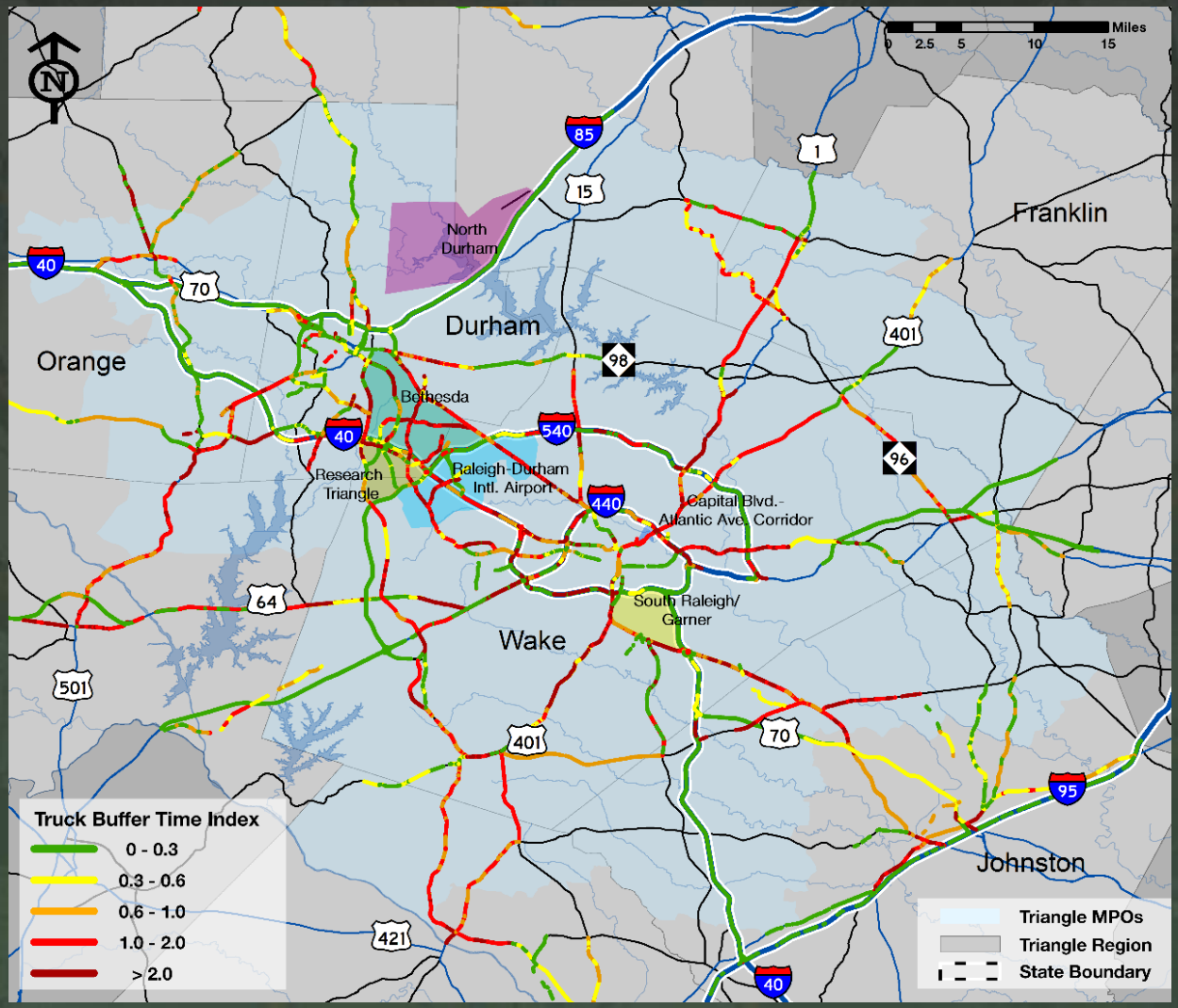
- Half of survey participants see same-day delivery needs increasing
- Nearly two-thirds see next day delivery needs increasing

Source: Tompkins International Supply Chain Survey, 2017

TRIANGLE REGIONAL FREIGHT PLAN

CLUSTER CONNECTION PERFORMANCE : TRUCK BUFFER TIME INDEX

8-9 AM,
April 2015



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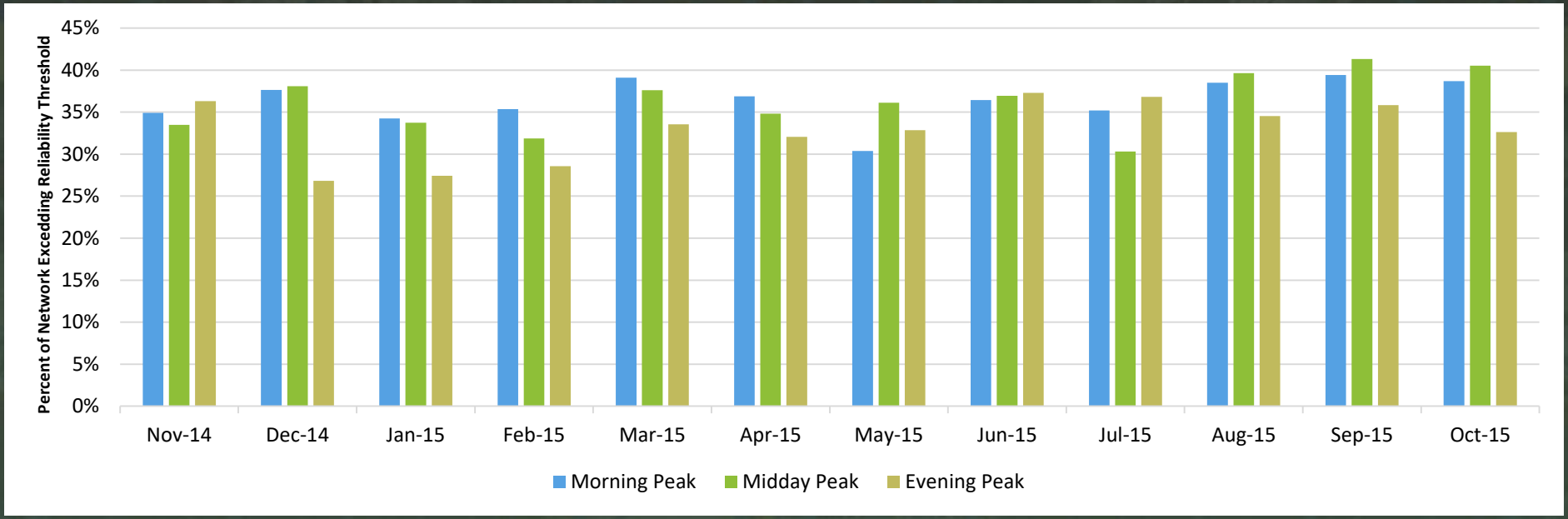
TRIANGLE REGIONAL FREIGHT PLAN

One-Third of Network at Double Time

Amount of Network Exceeding Buffer Time Index of 1.0, Nov. 2014 – Oct. 2015



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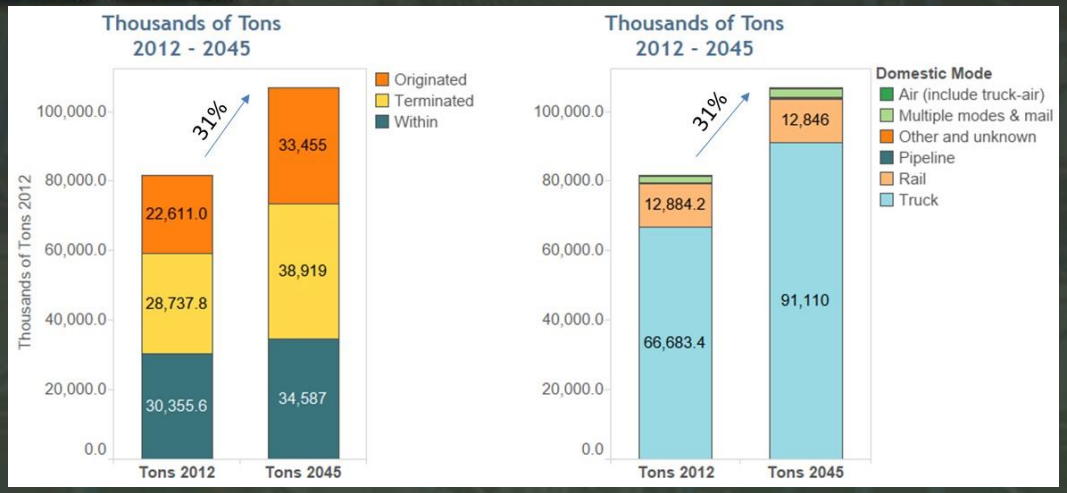
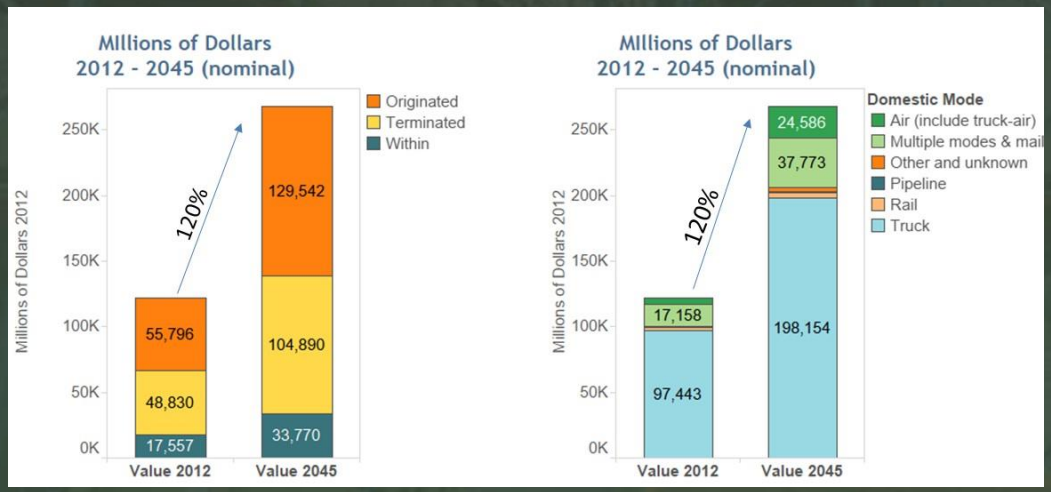
TRIANGLE REGIONAL FREIGHT PLAN

2045 Forecast Volume





- Tonnage: 31% growth
  - 25 million incremental tons
  - Increment is 97% truck, 43% outbound
- Value: 120% growth
  - 146 billion incremental dollars
  - Increment is 69% truck, 14% air, 51% outbound

Source: Freight Analysis Framework 4.1, in current dollars

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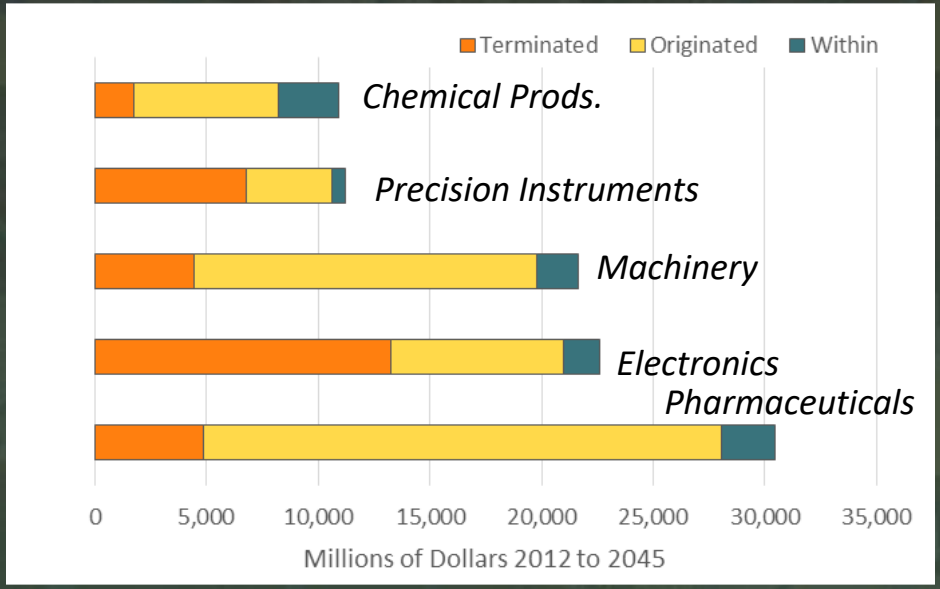
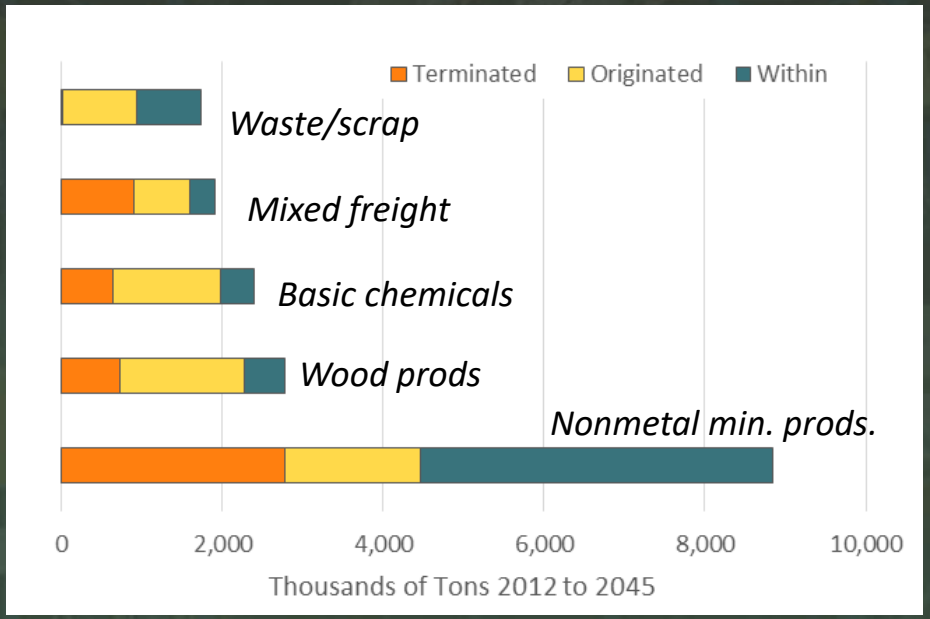
TRIANGLE REGIONAL FREIGHT PLAN

TOP GROWING COMMODITIES BY NEW VOLUME (Δ)

Value (nominal)



Tonnage



Freight Analysis Framework 4.1, in current dollars

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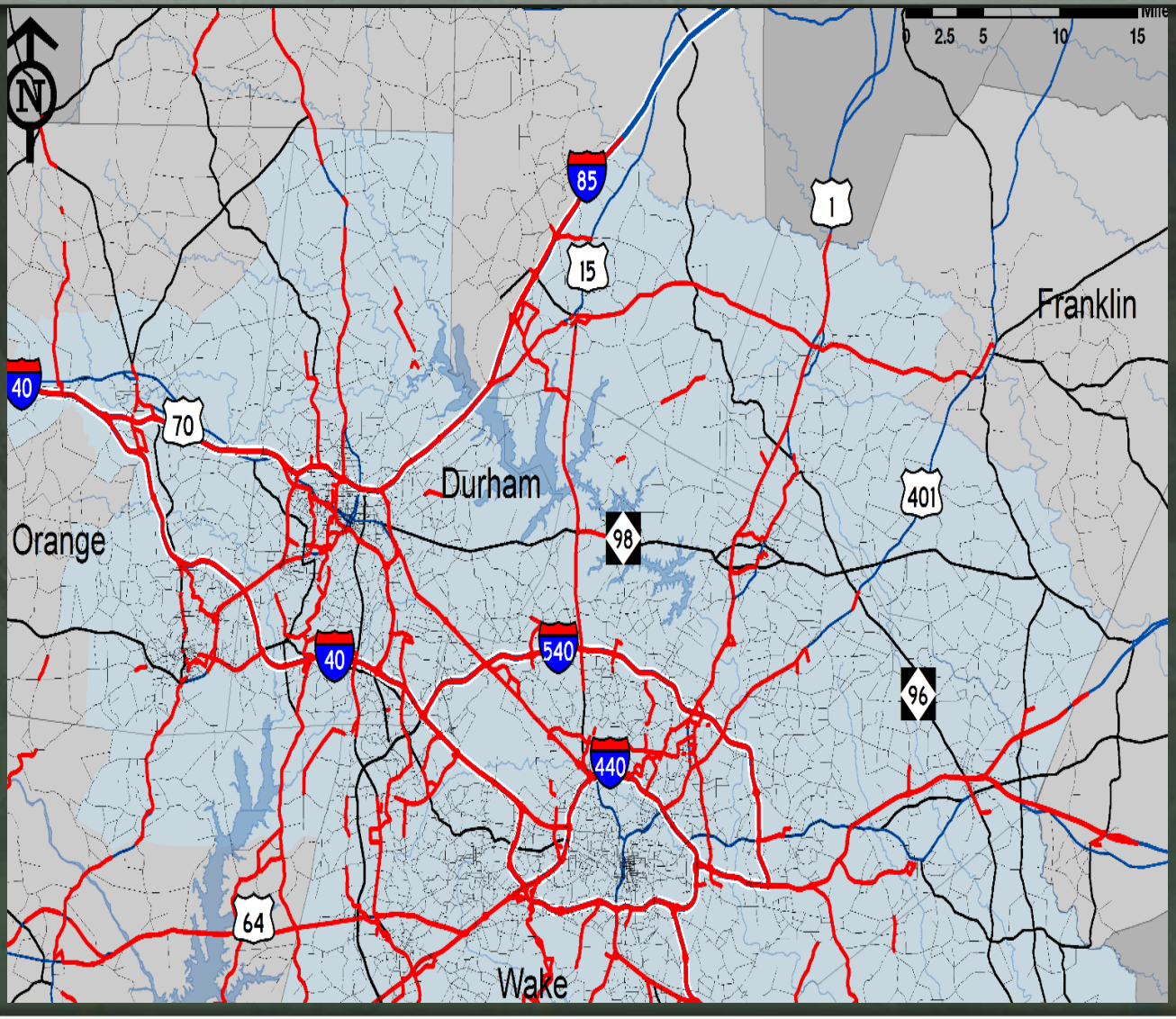
TRIANGLE REGIONAL FREIGHT PLAN

TRUCK VOLUME FORECAST ON NETWORK

Roadways with 2040 Daily Truck Traffic > 1,000

Source: Triangle Freight Forecasting Model



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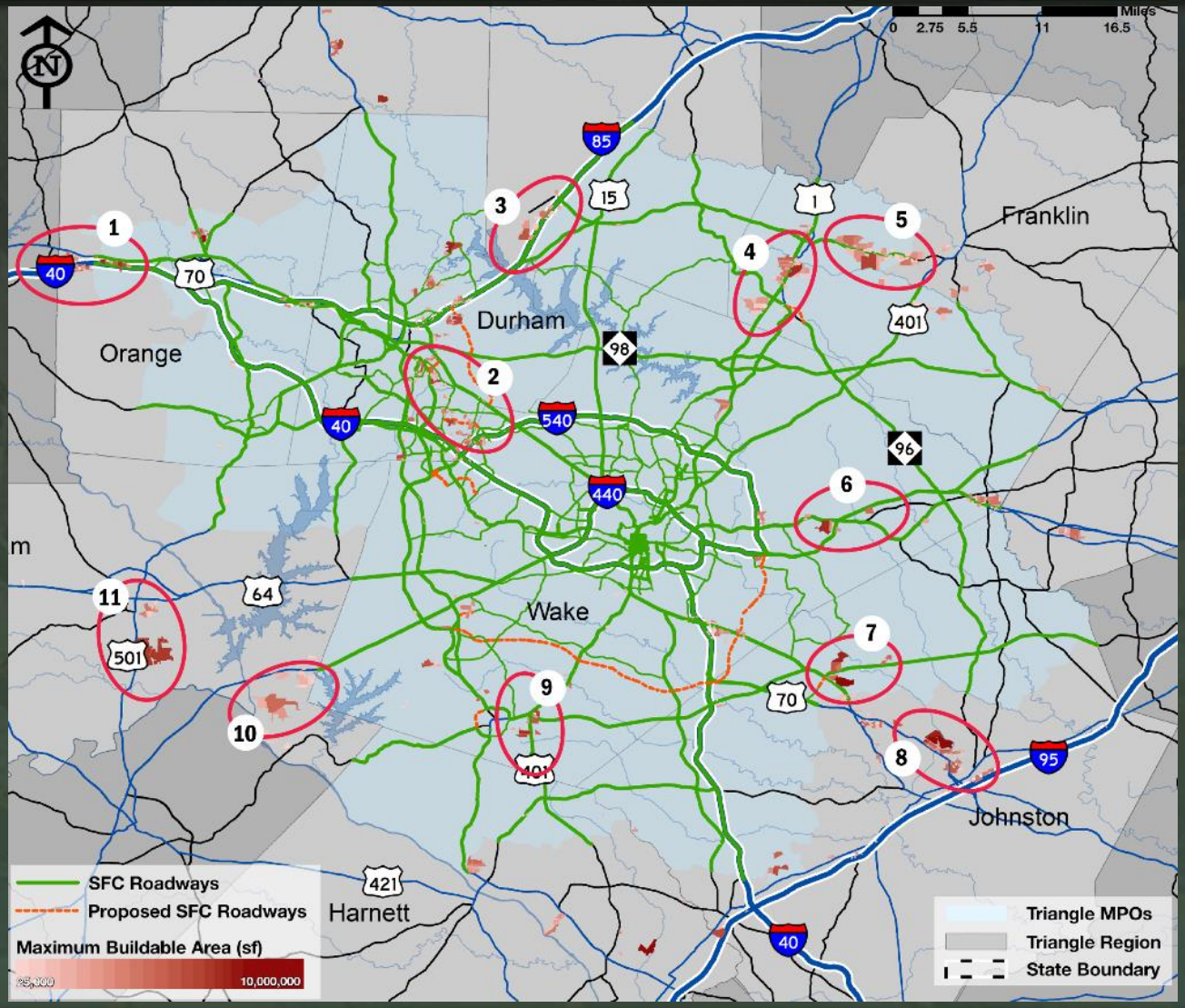
TRIANGLE REGIONAL FREIGHT PLAN

TEN SITES FOR POTENTIAL DEVELOPMENT AND REDEVELOPMENT

- Infill and adaptive redevelopment in existing clusters
- New development around region's periphery



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TRIANGLE REGIONAL FREIGHT PLAN

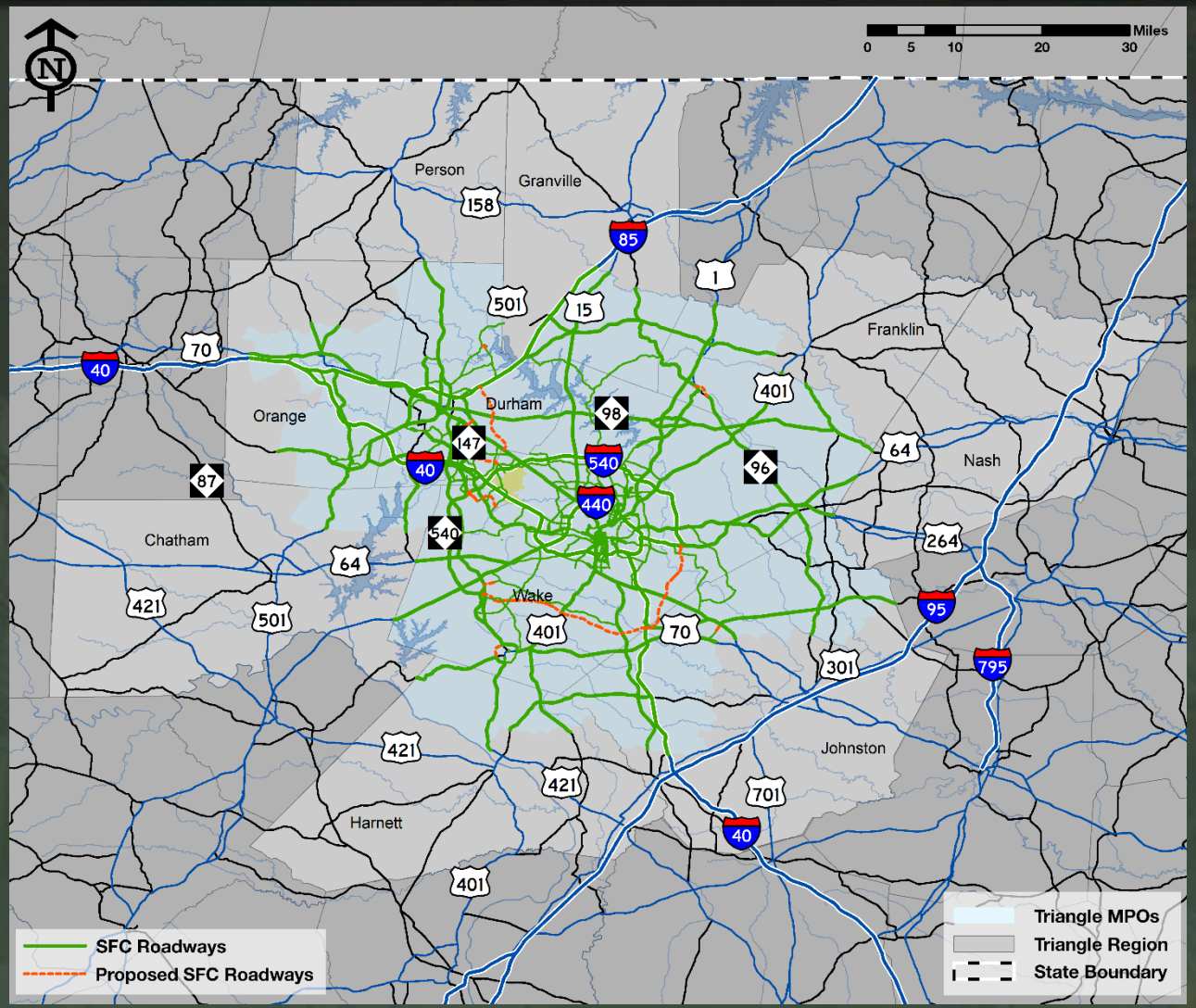
PRINCIPAL STRATEGIES: ROADWAY

- **Network:**
  - Adopt and invest in 1,250 mile Strategic Freight Corridor system
- **Truck Parking:**
  - Evaluate capacity and initiatives for drivers of long distance and local freight
- **Signage:**
  - Provide wayfinding across the SFC system, and in freight clusters, FOD opportunity areas, and activity centers
- **ITS:**
  - Form task force on automation in freight transportation, coordinated with passenger efforts

TRIANGLE REGIONAL FREIGHT PLAN

STRATEGIC FREIGHT CORRIDOR SYSTEM

- SFC serves 3 purposes:
  - Concentrates limited financial and management resources
  - Anticipates and prepares for future
  - Manages performance affecting Triangle supply chains
  - ➡ Key locations for projects



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TRIANGLE REGIONAL FREIGHT PLAN

3 TIERS OF SFC CORRIDORS

- **Trade Routes**
  - **C**onnect Triangle to other regions and external facilities (e.g. ports, intermodal terminals)
  - Economic links to principal trading partners
- **Distribution/Connectivity Routes**
  - **C**onnect freight-intensive industries and clusters, freight-oriented development (FOD) and urban activity centers
  - Backbone of efficient navigation of the supply chain and freight distribution network, now and in the future.
- Critical Access Routes
  - Connect **existing industrial sites and potential redevelopment areas**
  - **Local access to major freight-related facilities and industries**

TRIANGLE REGIONAL FREIGHT PLAN

STRATEGY PACKAGE PROGRAM INVESTMENTS: $7.2 BIL. TO 2040

	Project Costs by Implementation Year ($Millions)			
Strat. Package	By 2025	By 2030	By 2035	By 2040
Distribution Routes	$1,934.3	$1,817.6	$711.3	$174.6
Trade Routes	$968.2	$567.0	$337.0	-
Access Routes	$140.3	$351.9	$72.3	$88.9
Total	**$3,024.8**	**$2,736.5**	**$1,120.6**	**$263.5**

Project Costs by Implementation Year ($Mil)		
Strat. Package	Total	Major Corridors
Distribution Routes	$4,673.8	NC 540, US 1, US 70, I-440, US 401
Trade Routes	$1,872.2	I-40, I-85, US64/I-87, US 70
Access Routes	$653.4	Mixed local
Total	**$7,163.4**	

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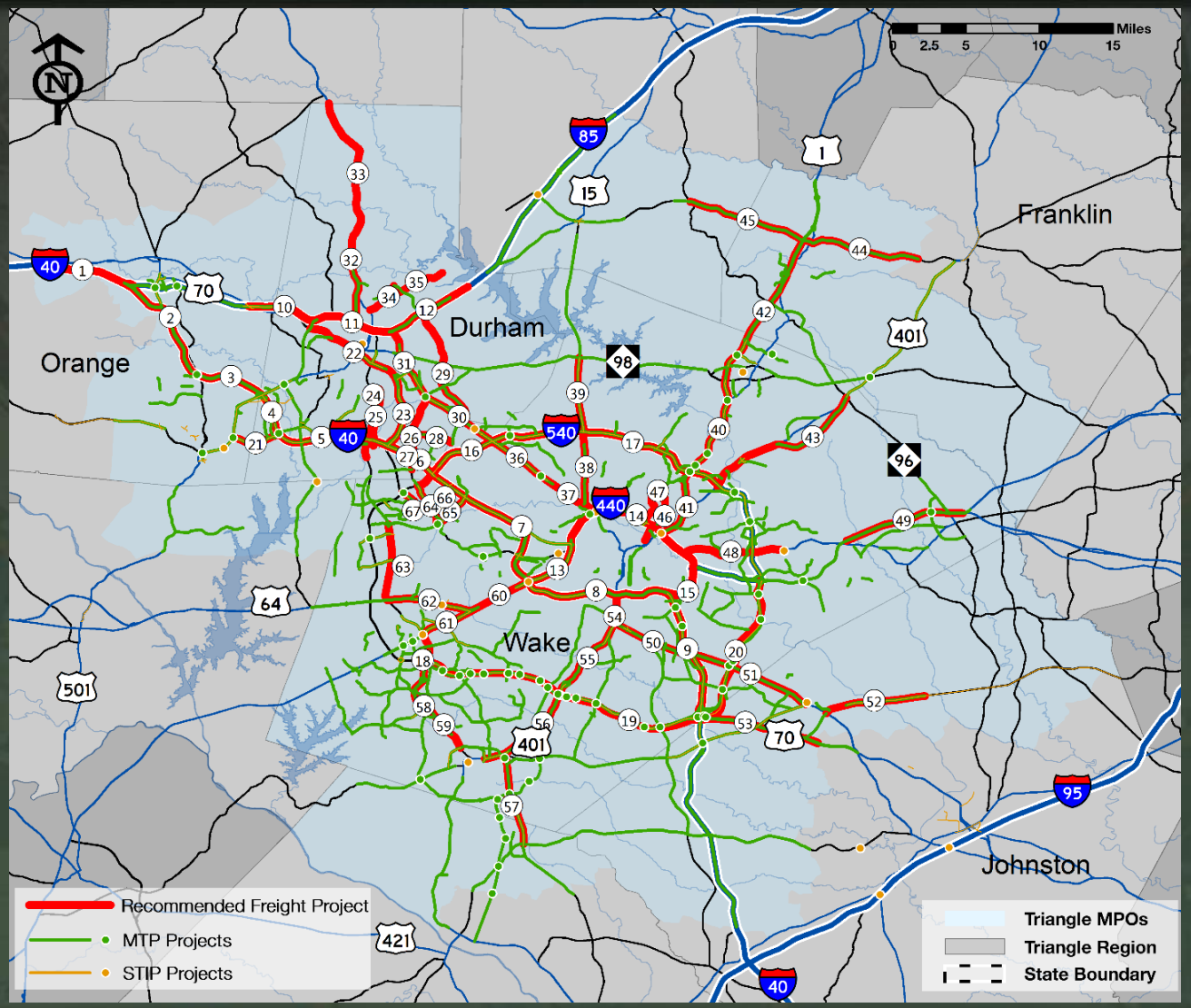
TRIANGLE REGIONAL FREIGHT PLAN

67 Recommended Freight Projects



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TRIANGLE REGIONAL FREIGHT PLAN

PRINCIPAL STRATEGIES: DEVELOPMENT

- **Distribution Centers:**
  - Foster DC development in multiple areas to support diverse points of access to the regional market
- **Redevelopment:**
  - Support redevelopment in older freight clusters, especially in close-in locations
- **CNG Access:**
  - Encourage expansion of Compressed Natural Gas fueling stations to protect air quality and hedge against rising diesel prices

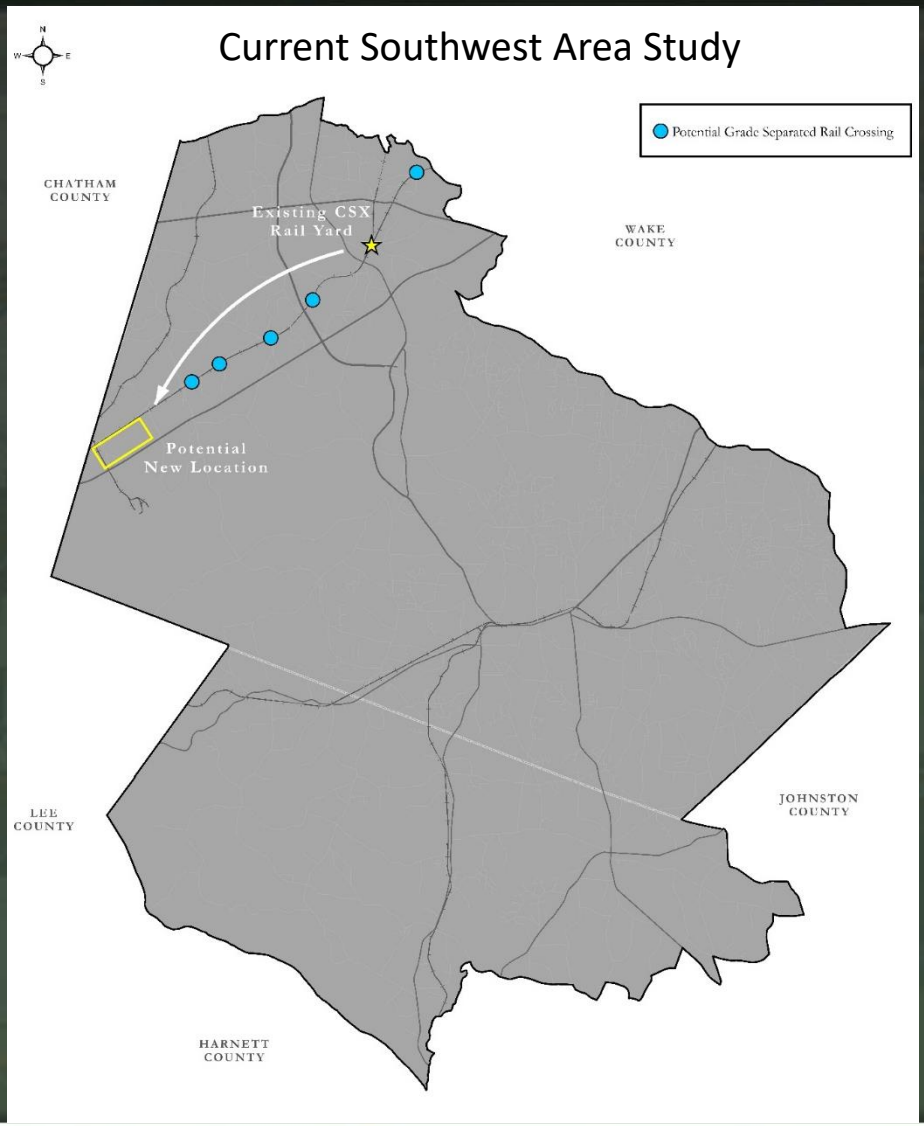
TRIANGLE REGIONAL FREIGHT PLAN

PRINCIPAL STRATEGIES: MULTIMODAL

- **Marine:**
  - Advance improvements on port access corridors: I-40 south toward Wilmington and U.S. 64/I-87 corridor to Morehead City and Norfolk
- **Rail:**
  - Advance improvements on intermodal access corridor: I-85 to Greensboro, U.S. 64/I-87 to Rocky Mount
  - Seek to retain rail carload service
  - Improve railway-roadway at-grade crossings or create grade separated crossings
  - Support Go Triangle passenger rail for indirect benefits to freight
- **Air:**
  - Advance improvements on airport access corridors: I-40, I-540 and U.S. 70 for RDU; I-85 north and south for external airports

CSX-Apex Yard

Potential Relocation



TRIANGLE REGIONAL FREIGHT PLAN

THANK YOU!

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