FREIGHT, ECONOMIC DEVELOPMENT AND LAND USE

Melissa Ziegler, CDM Smith

- Freight Planning - Why It Matters
- Freight and Economic Development and Competitiveness
- Unique Opportunity to Integrate Freight, Economic Development and Land Use
FREIGHT: COMPLEX, INTEGRATED SYSTEM

- **Multiple Modes**
- **Driven by Evolving Business and Customer Demands**
- **The future will change: How will freight respond**
FREIGHT: THE ECONOMY IN MOTION

- **US Economy will double by 2045**
- **US Population increasing to 390 M**
- **Freight will increase by 42%**
- **Charlotte region population 4.2M by 2050**
- **Freight volumes increase by 35% in next 2045**
WHY FREIGHT PLANNING MATTERS

• “Slice and Dice” complex system, develop data needed to gain understanding

• Assess obstacles and opportunities within region’s freight network

• Identify strategic improvements and investments to enhance competitiveness, safety, & environmental Quality

• Establish a foundation to integrate freight, economic development, and land use to achieve greater prosperity and community resilience and livability
• Excellent Freight Transportation Assets in Region

• Freight is a critical economic competitiveness factor

• Some business sector more dependent on freight than others

• Lower freight costs – Higher profitability and regional competitiveness
FREIGHT AND ECONOMIC DEVELOPMENT

- **60% of regions employees work in freight dependent businesses**
- **Business sectors in region use freight differently**
- **Freight dependent business sectors**
TRANSPORTATION COST AS A SHARE OF SECTOR OUTPUT

Source: Transportation Satellite Accounts Database, Bureau of Transportation Statistics, Research and Innovation Technology Administration
FREIGHT AND MANUFACTURING

• 30% REGIONAL ECONOMY SUPPORTED BY MANUFACTURING

• 144,000 DIRECT JOBS; 220,000 ADDITIONAL INDIRECT JOBS

• AVE. MANUFACTURING WAGE IN NC $69,400

• 94% NC TOTAL GOODS EXPORTS ARE MANUFACTURED GOODS

• 9% OF COST PER $ OF PRODUCT OUTPUT SPENT FOR FREIGHT TRANSPORTATION
FREIGHT AND LAND USE

• CONSIDER LAND USE AND DEVELOPMENT PATTERNS
• EVALUATE STRATEGIC GROWTH NODES AND THE IMPORTANCE OF FREIGHT TO GROWTH INDUSTRIES
• DEVELOP HOLISTIC APPROACH TO FREIGHT AND LAND USE
• TAKE ADVANTAGE OF FREIGHT ASSETS, LAND INVENTORY, AND OTHER RELATED ASSETS TO CREATE MORE RESILIENT AND LIVABLE FUTURE
• PLAN TO COLLABORATE
FREIGHT, ECONOMIC DEVELOPMENT, LAND USE

- **Amazing Inventory of Freight Land**
- **Invaluable Database**
- **Foundation for an Important Discussion and Action**
- **Innovative Plan – This is the Beginning**
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NC STATEWIDE FREIGHT PLAN

- Explosive Rate of Change in Supply Chains – How Do We Prepare?

Charles HW Edwards, Director – Logistics and Strategic Planning, NC DOT

15 September 2017
'TODAY IS THE SLOWEST DAY OF YOUR LIFE'
Source: Jim Tompkins, Tompkins International, 3 February 2017

Supply Chains are being re-configured as frequently as every 90 days! — How do planners respond and act?
TECHNOLOGY DRIVEN DISRUPTION

Source: Roadmap 2.0, MHI April 2017
TECHNOLOGY OPTIONS
CHANGING CONSUMER BEHAVIOR – INDIVIDUALS AND COMPANIES

• What I Want
• When I Want It
• Where I Want It
• Inexpensive or No Charge for Transport
• Easy and Free Return Process

Source:
Roadmap 2.0, MHI April 2017
THE LOGISTICS INFRASTRUCTURE PLANNING CONUNDRUM

Planners look 30 years into the future!
Meeting the growing needs of the state to compete globally for quality jobs, provide safe and efficient goods mobility, and build quality communities.

- Economic development
- Efficiency, reliability and resiliency
- Sustainable funding
- Improve, maintain and preserve freight assets
- Partnerships
- Safety and security
- Freight technologies
- Natural environment
FUTURE FREIGHT FLOWS IN NC

2045 Total Tons: 794 Million
2045 Total Value: $1.7 Trillion

2015 Total Tons: 557 Million
2015 Total Value: $955 Billion

THE NC FREIGHT NETWORK
WHAT IS NEXT?

Strategy
- Create a unique statewide strategy
- Multi-modal approach
- Business needs driven

Tactical
- Technologies / alternatives
- Project identification / development / design
- STI Scoring process

Delivery
- Project selection and funding
- Project phasing and delivery
STRATEGIC ALTERNATIVES

• **Immediate Funding** address a current or near-term need

• **Robust Strategies** are needed but not necessarily immediate priorities

• **Hedging Strategies** might or may not be needed

• **Transformative Strategies** NC agencies shape the future

• **Deferred Strategies** wait and see what happens
TRANSFORMATIVE STRATEGY

**Invest in a world-class transportation network**
- Increase capacity of all modes
- Coordinated effort that incorporate new technologies
- Prioritized freight projects

**Ensure attractive investment climate**
- Workforce development
- Competitive costs
- Community and political support
- Foreign trade zone and import/export assistance

**Develop key partnerships**
- Federal, state and local partners
- Private sector partners
- Financing community
- Communities, residents and businesses
- Researchers
For more information, please contact:

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The Future of Transportation & Autonomous Systems

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Human Supervisory Control

- Complex, time-pressured, high risk domains
- Systems require embedded automation/autonomy with human supervision

- How to balance humans & automation?
SRKE Taxonomy

Automation more capable (for now)
The tricky nature of collaboration vs. replacement

High Workload

Low Workload

Penalty Value

Optimal arousal
Optimal performance

Impaired performance
because of strong anxiety

Increasing attention
and interest
Modeling and designing command centers of the future
The future

- What about the loss of jobs to robots?
- Developing a qualified workforce
  - Skill profiles for operators & maintenance personnel
- Educating future technology/software developers and leaders
  - K-12 and beyond
Questions?

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