Mid-South Region Freight Flows & Industry Analysis

Project Update and Preliminary Recommendation

Freight Advisory Committee
October 17th, 2022

Memphis MPO
METROPOLITAN PLANNING ORGANIZATION
Strengthening Regional Transportation

TN TDOT Department of Transportation

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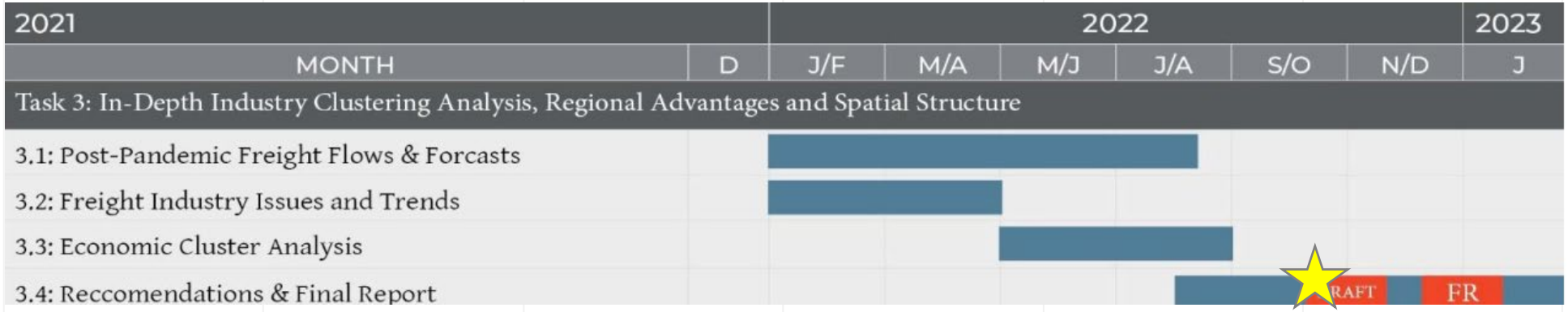
Agenda

1. Project Overview
2. Freight Flows and Forecasts
3. Issues and Trends
4. Recommendations: Freight System Investments and Strategies
5. Recommendations: Planning and Policy

Project Overview

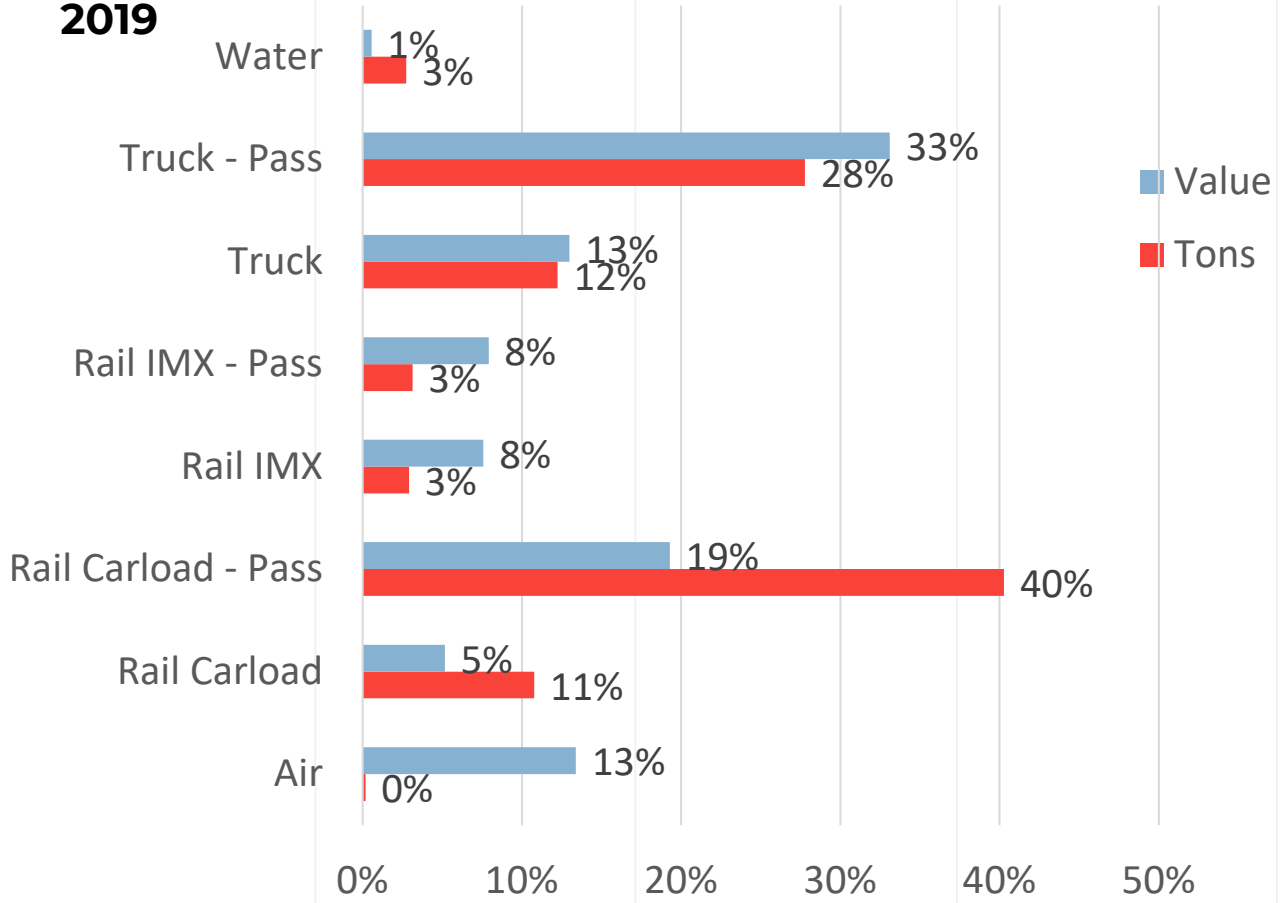
- Support and expand the logistics sector in the Mid-South region
  - *Trucking, railroad, air cargo, waterways, warehousing, and pipelines.*
  - *Forecast freight activity*
  - *Understand trends and issues*
  - *Improve competitive advantage*



Preliminary recommendations: Oct 2022
Draft Final Report: Nov 2022
Final Report: Jan 2023

Freight Flows
Overview

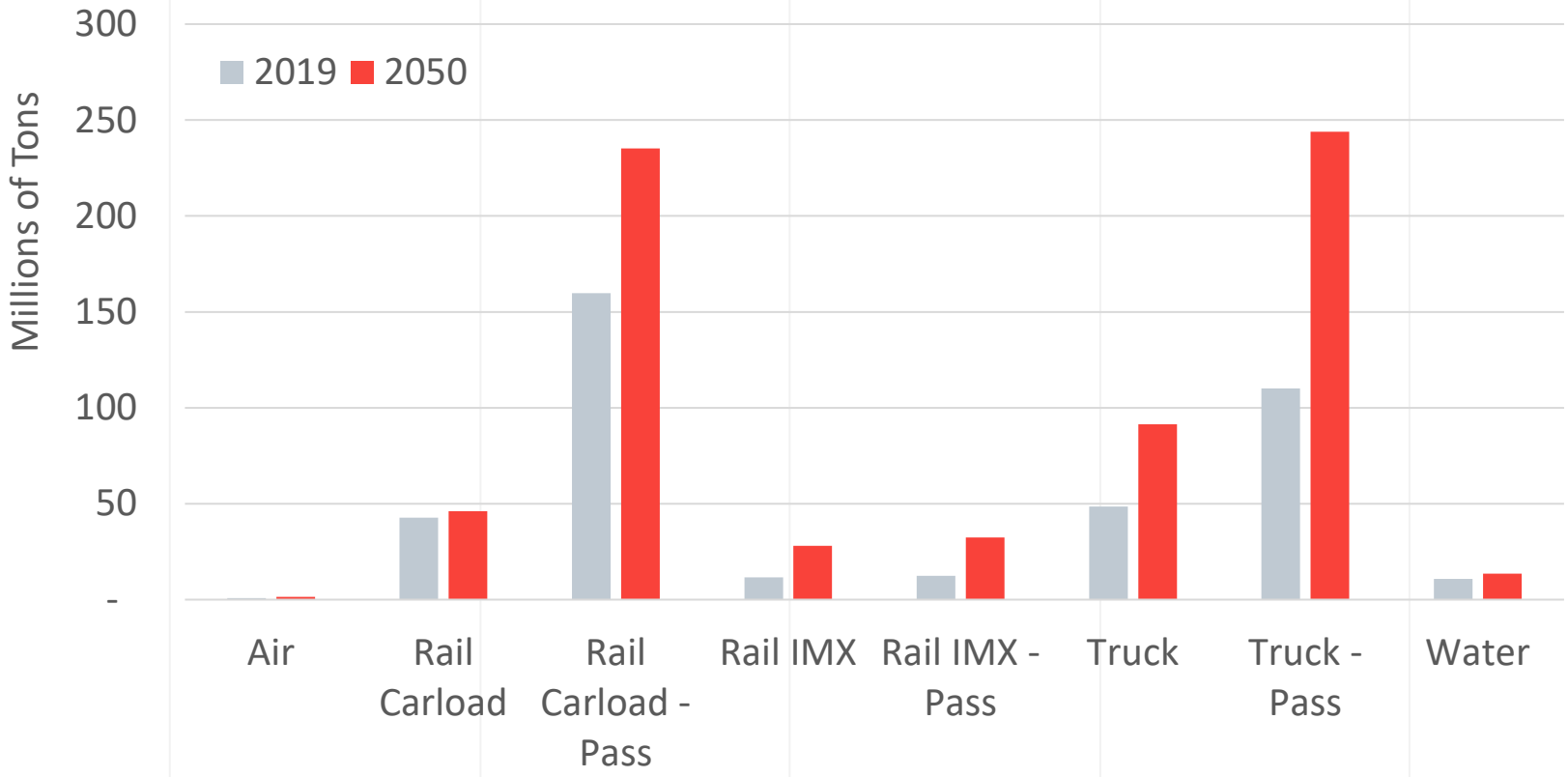
396 million tons and 724 billion dollars of freight in 2019



2019 IHS Transearch Commodity Flow Database

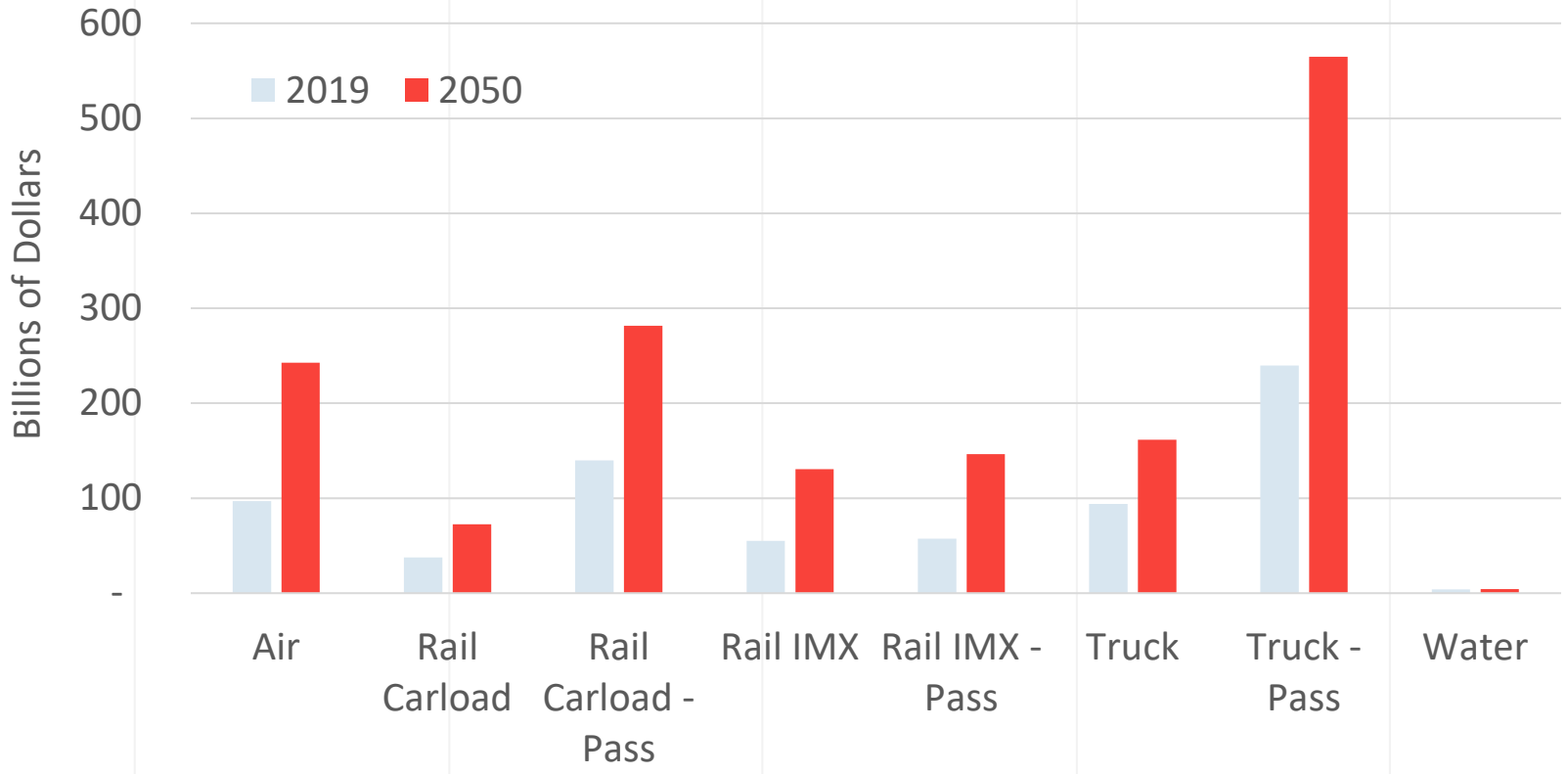
Freight Forecasts
Overview

Freight tonnage expected to increase from 396 M Tons to 692 M Tons by 2050



Freight Forecasts
Overview

Freight value is expected to more than double from $724 billion to $1.6 trillion by 2050



Analysis of Key Trends and Issues affecting Mid-South

High Impact

TREND OR ISSUE	MODE	OPPORTUNITY	STRENGTH	WEAKNESS	THREAT
E-commerce	Multimodal	X			X
Truck Roadway Safety	Truck/Highway			X	
Pavements and Structures	Truck/Highway				X
Truck Electrification	Truck/Highway	X			
Driver Shortage	Truck/Highway			X	
Rail Bridges and Structures	Rail			X	
Rail At-grade Crossings	Rail			X	
Rail and Economic Development	Rail	X			
Water Multimodal Access	Water			X	
Industrial Land Development on Water	Water	X			
Parcel Industry Developments	Air	X			
Growth in Warehousing and Distribution	Warehousing and Distribution		X		

Medium Impact

TREND OR ISSUE	MODE	OPPORTUNITY	STRENGTH	WEAKNESS	THREAT
COVID-19 Pandemic	Multimodal	X			X
Truck Congestion and Bottlenecks	Truck/Highway			X	
Truck Parking	Truck/Highway			X	
Rail Network Bottlenecks	Rail			X	
Precision Scheduled Railroading	Rail	X			X
Intermodal Network Restructuring	Rail				X
Improvements in Rail Technology	Rail	X			
Condition of Port Facilities and Assets	Water			X	
Barge Expansion (empty containers or trailers)	Water	X			
Barge Expansion (loaded containers)	Water	X			
Water Industrial Growth Opportunities	Water	X			
Accessibility of Memphis International Airport	Air			X	
Diversification of Warehousing and Distribution	Warehousing and Distribution	X			
Extensive Pipeline Infrastructure	Pipelines			X	

Strategies and Preliminary Recommendations

I. Freight System Investments and Strategies

- *Foundational*: Recommendations that preserve the freight transportation system at current conditions and performance. Represent baseline investments or strategies needed to ensure that the system provides adequate service, addressing major shortcomings and deficiencies.
- *Catalytic*: Recommendations that increase the attractiveness of the Mid-South to logistic businesses, by improving the competitiveness of the freight transportation system, land use, and other factors relative to other similar metropolitan areas. The focus of these recommendations is the attraction and growth of logistic sectors in the Mid-South.
- *Innovative*: Recommendations that seek to make the Mid-South a pioneer in logistics, so it can remain at the forefront of technology and developments in the sector.

II. Planning and Policy

- Freight Performance Measures
- Agency Coordination and Partnerships
- Data Program
- Future Studies
- Training and Education

Freight System Investments and Strategies
Foundational – High Priority

Prioritize and invest in projects that improve freight safety

Issue or Trend Impacted: The Mid-South region has some of the highest frequency of truck-involved crashes, partially because truck volumes are high. The Tennessee Freight Plan found that Shelby County had the most crashes of any county in the state.

Actions:

- Prioritize investments that improve safety at crash hot spots. (Recently kicked off Mid-South Safety Action Plan)
  - Safety & Security Prioritization Focus Area in RTP, Safe Streets and Roads for All (SS4A)
- Work with TDOT, ARDOT, and MSDOT to identify segments or nodes in the roadway system with designs that cause challenges for truck operations. This could involve acceleration/deceleration lanes being too short, deficiencies in passing lanes, and curb channelization.
- Work with partner jurisdictions to identify priority locations for lighting enhancements.
- Review truck signage, including wayfinding, and improve where necessary.
- Pursue implementation of freight-related safety projects from recent regional and state planning efforts.
- Coordinate with TDOT/MSDOT/ARDOT Traffic Ops to evaluate potential signal coordination on interstate-adjacent arterial streets to manage on- and off-ramp congestion. I-55 Corridor Study mentioned this.

Freight System Investments and Strategies
Foundational – High Priority

Improve or separate high volume at-grade rail crossings

Issue or Trend Impacted: There are numerous at-grade crossings on corridors with high train volumes and vehicles, causing significant safety risks, delay, and nuisance to residents.

Actions:

- Prioritize grade crossing separation, closure, or consolidation projects.
  - Frequency of crashes and hours of accumulated delay
  - FRA crossing inventory
  - FHWA Highway-Rail Crossing Handbook
  - Coordinate with TDOT's Office of Rail Engineering
- Review at-grade crossings adjacent to rail terminals for potential constraints on rail operations.
- Work with railroads to find and develop areas to park trains without blocking crossings. Public information indicates that trains are getting longer, which increases at-grade crossing delays.
- Investigate how trend towards longer trains increases future needs for at-grade crossing improvements.
- Pursue federal grants for projects with high benefits-to-costs.
  - Section 130 (Highway-Railroad Grade Crossing Program) funds
  - Established Railroad Crossing Elimination program and federal grants (RAISE, CIRIS, etc.)

Freight System Investments and Strategies
Foundational – Medium Priority

Initiatives to address truck parking needs

Issue or Trend Impacted: Truck parking needs in the Mid-South region are significant, however the region is not worse off than competing metropolitan areas in terms of parking capacity. Lack of parking availability decreases trucking sector productivity and fluidity. Frequent undesignated parking in commercial and industrial areas, primarily because of staging needs, cause safety and security risks. Mid-South region is also a hot spot for cargo theft in North America.

Actions:

- Encourage truck parking facilities to report availability in applications, such as Park My Truck.
- Develop pilot to allow trucks to park on underutilized infrastructure, such as parking lots at night.
- Promote parking reservation applications, such as SecurSpace, that allow commercial or industrial facility owners to rent out truck parking space for a fee. Often called the “Airbnb” of truck parking.
- Incentivize shippers and receivers to increase truck parking availability at their facilities.
- Mandate or incentivize restroom access for truck drivers at shipper and receiver facilities.
- Work with TDOT to implement recommendation from the I-55 Corridor Study to add truck parking capacity between Arkansas and Mississippi State Lines (~100 spots)
- Explore existing funding opportunities for truck parking, including federal grant programs.
- Track progress of Truck Parking Safety Improvement Act in Congress.
- Increase enforcement of trucks parking in unsafe undesignated locations.
- Communicate value of truck parking to local communities, leveraging recommendations of up-coming FHWA Guidebook on Truck Parking Developments.

Freight System Investments and Strategies
Other Foundational Recommendations

- Review and strengthen incident response
- Prioritize pavement preservation on freight routes
- Review truck accommodation in work zone Traffic Control Plans
- Identify and improve last-mile connectors to intermodal infrastructure.
- Make and support investments to improve condition of port facilities and assets.
- Support construction of third highway bridge crossing the Mississippi River

Freight System Investments and Strategies
Catalytic – High Priority

Expand engagement with carriers and industry

Issue or Trend Impacted: Understanding developments and needs in the logistics sector, particularly for large players such as FedEx, is critical for freight planning in the Mid-South.

Actions:

- Engage with FedEx, UPS, and other parcel companies in the Mid-South region to better understand impediments to their operations and make investments and/or implement policies that are beneficial for them.
- Establish Freight Fluidity Roundtable to facilitate coordination across freight modes, to discuss and find resolutions to system bottlenecks, like asset and chassis imbalance. There currently are disagreements and conflicts between railroads and carriers in this area.
- Work with statewide Freight Advisory Committees to attract participation of large logistics players, such as FedEx. Coordinate with MPO's Freight Advisory Committee.
- Consider working with chambers of commerce to start a yearly freight business roundtable. Develop relationships with leadership.
- Consider supporting the hosting of logistics conferences, such as Home Delivery World or Package Fulfillment Logistics & Delivery Expo.

Freight System Investments and Strategies
Catalytic – High Priority

Protect freight-centric land uses

Issue or Trend Impacted: Affordability of industrial leases combined with exceptional highway, rail, air, and water connections have resulted in fast growth of warehousing, distribution and other freight facilities, particularly since COVID-19. This is expected to continue. Proactively protecting and designating land uses for freight reduces negative impacts to communities and encourages economic development opportunities.

Actions:

- Adopt Freight-Efficient Land Uses (FELU) concepts that shape land use decisions. FELU also makes recommendations for reducing impacts of existing facilities.
  - Explore Logistic Focused Land Banking, Explore hybrid zoning approaches, including form-based zoning
- Preserve some land uses for warehousing or industrial developments along important corridors, such as I-269.
- Discourage new housing developments in close proximity to warehousing and industrial.
- Protect rail freight corridors from encroachment by incompatible land uses.
- Support land use planning that facilitates industrial development in appropriate areas.
- Work with Airport Authority to identify opportunities to acquire and develop nearby land to support expansions of business.
- Promote rail-served development opportunities.

Freight System Investments and Strategies

Catalytic – High Priority

Support and invest in truck electrification

Issue or Trend Impacted: Ensure that the region is prepared for needs of an electric truck fleet, and also to become a leader in this space and enhance the logistic competitiveness. Electrification also has the potential to significantly improve drayage operations, which are substantial in the region.

Actions:

- Leverage local, state, and federal funding to accelerate the build-out of charging infrastructure. Highlight equity implications of emission reductions.
- Work with private sectors to disseminate information on electric trucks and establish peer knowledge exchanges.
- Pursue membership in TennSmart – consortium of public and private entities focused on research, development, and deployment of smart mobility solutions.
- Provide incentives or regulatory exceptions for electric trucks. Streamline permitting and building requirements for EV Charging Infrastructure
- Explore funding opportunities for EV charging through new discretionary grant programs (e.g., National Electric Vehicle Infrastructure Formula Program, Discretionary Grant Program for Charging and Fueling Infrastructure).
- The TDOT Tennessee Electric Vehicle Infrastructure (TEVI) Formula Program Deployment Plan considers freight needs more thoroughly than many other state plans, however specific recommendations for freight are not provided, FHWA guidance on freight electrification in fall of 2022.

Freight System Investments and Strategies
Catalytic – High Priority

Address the shortage of truck drivers and other logistics workers

Issue or Trend Impacted: The shortage of truck drivers is often the number-one issue raised by trucking firms, especially through the COVID-19 pandemic and recovery. Driver shortage decreases trucking productivity, performance, and safety.

Actions:

- Make investments that improve the quality of life of drivers, such as improving truck stops or rest areas, and provide full amenities.
- Support job training programs for commercial drivers.
- Support programs to increase education in logistic jobs.
- Work with the Tennessee Board of Regents to identify and/or develop targeted educational and internship programs at member institutions for in-demand or emerging logistics workforce needs.
- Promote involvement in national and state programs that seek to alleviate the driver shortage.
  - White House Trucking Action Plan, Women of Trucking Advisory Board, Safe Driver Apprenticeship Pilot
- Coordinate with TN Dept. Of Safety and Homeland Security in engaging strategic partners (e.g., Depts. of Military, Corrections, and Labor; TN Board of Regents; TCAT; and private businesses) to increase CDL training and certification opportunities. (See TN EO 93.)

Freight System Investments and Strategies
Catalytic – Medium Priority

Prioritize freight corridor projects

Issue or Trend Impacted: The Mid-South region has congestion levels comparable to other metropolitan areas of similar size; however it faces acute bottlenecks in specific locations that should be addressed, particularly involving bridge crossings, rail at-grade crossings, and last-mile intermodal connectors.

Actions:

- Continue to pursue forward-looking investments in roadway infrastructure that benefit freight, including construction of the I-269 corridor, widening of Lamar Avenue, and extension of South Loop Drive, I-55 Interchange with Crump Boulevard, to name a few.
- Address identified regional bottlenecks.
- Continue to prioritize projects along Memphis' central freight corridor (Memphis International Airport, Lamar Ave, BNSF Intermodal Terminal, etc.).
- Ensure traffic and transportation plans account for current growth in warehousing and distribution facilities.
- Review existing traffic studies for Blue Oval facility to ensure they take into account expected truck generation.
- Continue to support new Mississippi River bridge crossing and/or major upgrades to existing bridges, particularly I-55 bridge.

Freight System Investments and Strategies
Other Catalytic Recommendations

- Review land use regulations and support amendments that facilitate warehousing developments
- Support industrial land development on water
- Support and invest in alternative fuels and propulsion technologies
- Promote rail-served development opportunities

Freight System Investments and Strategies
Innovative – High Priority

Work with state DOTs to implement Work Zone ITS and information sharing program on key freight corridors

Issue or Trend Impacted: Roadway work zones are a significant source of delay and unreliability. The Mid-South is particularly impacted by these disruptions because of the significant roadway projects planned in freight corridors and the degree of freight optimization in the region.

Actions:

- Providing advance information on closures or disruptions is valuable to terminal operations, particularly involving high value parcel moves. Provide this information to build industry stakeholder engagement, particularly for time-sensitive logistics operations.
- Work with TDOT, MSDOT, and ARDOT to explore the use of work zone ITS. Give users real-time and advance warning of significant work zone activities that are likely to have a significant impact on traffic. Examples could include the I-35 Connected Work Zone project in Texas and the High-Risk Commercial Vehicle Notification Project in Georgia.
  - Implementation could be achieved through the Smartway application maintained by TDOT.

Freight System Investments and Strategies
Innovative – High Priority

Promote involvement in national FLOW program to enhance supply chain visibility

Issue or Trend Impacted: Supply chains have been stressed in the recovery of the COVID-19 pandemic, particularly through national hubs such as the Mid-South. The Freight Logistics Optimization Works (FLOW) program seeks to improve the sharing of supply chain demand and capacity data to improve fluidity and avoid costly delays. FedEx and several other large logistics companies operating in the Mid-South are already part of the FLOW program.

Actions:

- An opportunity exists for the MPO to support the participation of other firms and encourage the sharing of information by firms already participating. Currently the FLOW program is focused on ports and terminals on the coasts, however participation of national hubs in the center of the country should also be critical.
- In conjunction with increasing participation in FLOW, the MPO could foster an environment where there is greater information sharing between logistics businesses to reduce inefficiencies and delays. Existing chassis imbalances at rail terminals could be one of the issues addressed. Information sharing, through community systems for example, could improve supply chain visibility and make logistics sectors in the Mid-South more resilient to future disruptions.

Freight System Investments and Strategies
Innovative – High Priority

Pursue developments of local truck electrification industry

Issue or Trend Impacted: Truck electrification represents a unique opportunity for the Mid-South region. Economic development opportunities exist related to electric truck technology development, piloting, and ultimately manufacturing.

Actions:

- National distribution hubs like the Mid-South are likely to play a central role in electric truck auto part supply-chains until capabilities are built more widely. The Mid-South counts with ideal transportation system to transport high-value components widely, and has a significant local demand from high levels of truck activity.
- Work with chambers of commerce and economic development agencies to attract truck electrification businesses to the region, building on the Ford Blue Oval City project.
- Work with and support the efforts of the Tennessee Department of Economic & Community Development and its initiatives to expand EV manufacturing in Tennessee, particularly the Mid-South.
- Engage area schools and universities to better provide educational opportunities for advanced manufacturing.

Freight System Investments and Strategies
Innovative – High Priority

Promote testing and deployment of connected and autonomous truck and delivery technologies

Issue or Trend Impacted: The Mid-South can become a pioneer in the area of emerging truck technologies. Opportunities exist to accelerate the testing and development of fully autonomous technologies, while also promoting the use existing connected vehicle technologies to improve safety and freight operations.

Actions:

- Develop program that accelerates use of Advanced Driver Assistance Systems (ADAS) through new truck purchases or retrofits. Given that the Mid-South is both a hotspot of crashes and truck activity, it is the ideal location to increase use of these technologies to achieve benefits. Program could include financial incentives or support for retrofitting old trucks.
- Partner with a logistics provider, potentially FedEx or large local fleets, to support the testing of autonomous technologies in the region. Review local laws and regulations for potential barriers. Partner with leading universities in this space.
- Support testing and deployment of delivery robots. Several pilots exist in Tennessee and neighboring states to explore the use of delivery robots in urban areas, including at the University of Tennessee. FedEx is testing delivery robots in Texas and New York, however Memphis could become a more convenient testing ground. Barriers against this type of activities in Memphis should be explored with industry.

Planning and Policy

Freight Performance Measures

Category/Goal Area	Measures
Safety	• Number of truck-related crashes • Number of fatal truck-related crashes • Number of truck-related crashes at work zones • Number of crashes involving a parked truck • Rate of truck-related crashes per 100 million VMT • Number of crashes at at-grade crossings
Asset Management	• Number of load restricted bridges on regional freight routes (NMFN) • % of bridges with vertical clearance less than 16.5 feet on NMFN • Pavement condition on intermodal connectors
Economic Competitiveness	• % growth in freight export value • employment in logistic businesses • GDP in logistic businesses
Multimodal Connectivity	• # of airport cargo-access issues addressed • % of intermodal connectors in fair or better pavement condition
Mobility and Reliability	• Incident clearance time on NHFN • Truck Travel Time Reliability on Interstate • Congestion costs to supply chains, considering recurring and non-recurring congestion
Sustainable Funding	• Number of public private partnerships for freight investments

Planning and Policy

Agency Coordination and Partnerships

- **Freight Advisory Committees:** Review existing function and identify enhancements to regional FAC. Establish roundtable to facilitate coordination across freight modes, to discuss and find resolutions to system bottlenecks
- **Regional economic development corporation (EDC) and chambers of commerce:** Implement projects and operations strategies that address the freight infrastructure and operations needs and deficiencies for growing and strong industries in the Mid-South region to facilitate industrial retention and expansion.
- **Freight Summit:** Conduct multi-state Freight Summit to bring together DOTs, Metropolitan Planning Organizations (MPOs), freight and logistics businesses, public officials, economic developers, and other stakeholders to discuss freight challenges and opportunities and potential multi-jurisdictional/megaregional freight projects.
- **Parcel industry:** Work to identify opportunities to engage with FedEx and other large logistics providers. While these companies are often difficult to reach, to obtain actionable insights on their operations, repeated efforts are warranted given the role they play in the local economy.
- **Railroad Industry:** Look for opportunities to support railroads as they adjust their terminal operations to handle larger containers. Support enhanced communication between truck dray operators and railroads to coordinate on asset and chassis imbalance issues and continue to study and promote innovative arrangements such as more chassis pooling.

Questions?

Thank you!

Sebastian Guerrero, PhD
sebastian.guerrero@wsp.com

Mary Connelly, AICP
mary.connelly@wsp.com