Performance Measures

Memphis MPO

February 16, 2023

Memphis MPO
METROPOLITAN PLANNING ORGANIZATION

Background

- In compliance with federal regulations, the Memphis MPO must adopt the next round of performance measures set by each respective State
- The following slides provides an overview of performance measures progress and expected changes for the upcoming adoption.
  - For review are PM1, which must be adopted by February 27th, 2023
  - PM2, which must be adopted by June 14th, 2023
  - And PM3 (travel time), which must be adopted by June 14th, 2023

PM1: Safety

PM1: Safety

- **Area** – Individual State Targets for all public roads in the state

- **Data** – Highway Performance Monitoring System (HPMS), Fatality Analysis Reporting System (FARS), Tennessee Integrated Traffic Analysis Network (TITAN), MDOT's Safety Analysis Management System (SAMS)

- **Performance Measures** –
  - Number of Serious Injuries
  - Rate of Serious Injuries per 100 Million VMTs
  - Number of Fatalities
  - Rate of Fatalities per 100 Million VMTs
  - Number of Non-motorized Fatalities and Serious Injuries
- **Calculation** – 5-Year rolling avg. of 5 individual, consecutive points of data

PM1 Targets

	Baseline (2017-2021)	Target (2019-2023)
Tennessee (TDOT)		
Number of Fatalities	1148.6	1308.2
Number of Serious Injuries	5995.6	6069.4
Fatality Rate	1.417%	1.601%
Serious Injury Rate	7.416%	7.424%
Number of Non-Motorized Fatalities and Serious Injuries	546.4	600.9
Mississippi (MDOT)		
Number of Fatalities	706.6	761
Number of Serious Injuries	2001.6	3098
Fatality Rate	1.74%	1.87%
Serious Injury Rate	4.95%	7.64%
Number of Non-Motorized Fatalities and Serious Injuries	216.8	258

PM2: Infrastructure Condition

PM2: Infrastructure Condition

- **Area** – Individual State 2- & 4-Year Targets for the Interstate and Non-Interstate NHS
- **Data** – Highway Performance Monitoring System (HPMS) and National Bridge Inventory (NBI)
- **Performance Measures** –
  - % of Interstate Pavement in Good Condition
  - % of Interstate Pavement in Poor Condition
  - % of non-Interstate NHS Pavement in Good Condition
  - % of non-Interstate NHS Pavement in Poor Condition
  - % of NHS Bridges by deck area in Good Condition
  - % of NHS Bridges by deck area in Poor Condition
- **Calculation** –
  - Good and Poor Condition Rating Areas: International Roughness Index (IRI), Cracking, Rutting (Asphalt pavements), and Faulting (Concrete pavements)
  - Rated by lowest of the following subcomponent ratings: Deck, Superstructure, Substructure, and Culverts.

PM2 Targets

	Tennessee			Mississippi		
	Baseline	2-yr	4-yr	Baseline	2-yr	4-yr
% of Pavement in Good Condition (Interstate)	70.8%	58.0%	58.0%	71.2%	>55%	>55%
% of Pavement in Poor Condition (Interstate)	0.2%	1.0%	1.0%	0.7%	<5%	<5%
% of Pavement in Good Condition (Non-Interstate NHS)	40.3%	36%	36%	37.7%	>25%	>25
% of Pavement in Poor Condition (Non-Interstate NHS)	4.1%	6%	6%	4.2%	<10%	<10%
% of NHS bridges classified as in Good condition (deck area)	32.5%	32%	32%	55.8%	>50%	>50%
% of NHS bridges classified as in Poor condition (deck area)	5%	6%	6%	2.8%	<5%	<5%

PM3: System Performance

PM3: Travel Time & Truck Travel Time Reliability

- **Area** – Individual State 2 Year & 4 Year Targets for Interstate and 4 Year Target for Non-Interstate
- **Data** – National Performance Management Research Data Set (NPMRDS)
- Performance Measures –
  - % of the Person Miles Traveled on the Interstate System that are reliable
  - % of the Person Miles Traveled on the Non-Interstate NHS that are reliable
  - % of the Interstate System mileage providing for Reliable Truck Travel Times (Truck Travel Time Reliability Index)
- **Calculation** –
- $Level\ of\ Travel\ Time\ Reliability = \frac{\text{(80th Percentile Travel Time)}}{\text{(50th Percentile Travel Time)}}$
- $Truck\ Travel\ Time\ Reliability = \frac{\text{(95th Percentile Truck Travel Time)}}{\text{(50th Percentile Truck Travel Time)}}$

PM3 Targets

	Tennessee			Mississippi		
	Baseline	2-yr	4-yr	Baseline	2-yr	4-yr
% of Person-Miles Traveled on the Interstate that are Reliable	92.1%	88.2%	88.2%	99.6%	>93%	>93%
& of Person Miles Traveled on Non-Interstate NHS that are Reliable	93.4%	89.4%	89.4%	95%	>85%	>85%
Truck Travel Time Reliability Index on Interstate System	1.32	1.35	1.35	1.14	<1.4	<1.4

Updated Targets Summary

Safety Performance Measure (PM1)	TDOT 2019-23 Target	MDOT 2019-23 Target
Fatalities	1308.2	761
Fatality Rate	1.601%	1.87%
Serious Injuries	6069.4	3098
Serious Injury Rate	7.424%	7.64%
Non-Motorized Fatalities and Serious Injuries	600.9	258

System Performance Measure (PM3)	TDOT 2022-25 Target	MDOT 2022-25 Target
% of Person-Miles Traveled on the Interstate that are Reliable	88.2%	>93%
& of Person Miles Traveled on Non-Interstate NHS that are Reliable	89.4%	>85%
Truck Travel Time Reliability Index on Interstate System	1.35	<1.4

Infrastructure Condition Performance Measure (PM2)	TDOT 2022-25 Target	MDOT 2022-25 Target
% of Pavement in Good Condition (Interstate)	58%	>55%
% of Pavement in Poor Condition (Interstate)	1%	<5%
% of Pavement in Good Condition (Non-Interstate NHS)	36%	>25%
% of Pavement in Poor Condition (Non-Interstate NHS)	6%	<10%
% of NHS bridges classified as in Good condition (deck area)	32%	>50%
% of NHS bridges classified as in Poor condition (deck area)	6%	<5%

Mid-South Region Freight Flows & Industry Analysis

ETC and TPB Meetings

Pragati Srivastava, Memphis MPO
Sebastian Guerrero, WSP

February 16th, 2023

Memphis MPO
METROPOLITAN PLANNING ORGANIZATION
Strengthening Regional Transportation

TN TDOT Department of Transportation

WSP

S&P Global Market Intelligence

Agenda

1. Overview of Commodity Flows and Forecasts
2. Highlights of Economic Cluster Analysis
3. Key Recommendations

Freight infrastructure in the Mid-South serves broad national and global markets

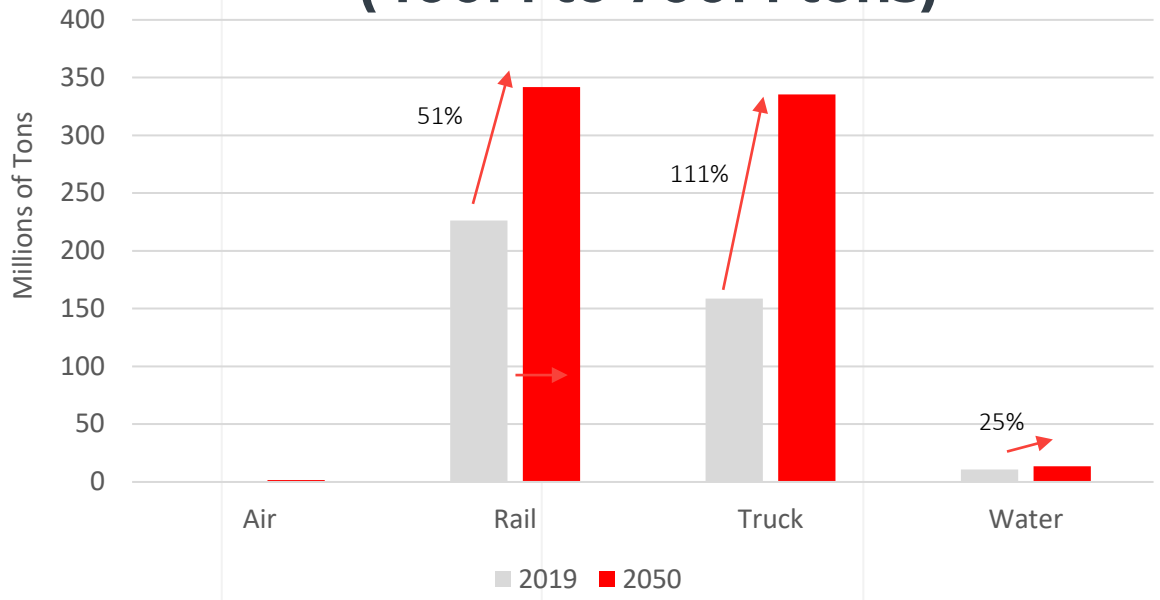
- Major **truck** corridors: I-55/I-69 from Chicago/Midwest/Canada to Gulf, I-40 coast-to-coast, I-22 to Southeast
  - *70% of US pop. within 2-day truck trip*
  - *Over 2/3 are passing through*
- **Air cargo** hubbing at Memphis Int. Airport
  - *Second largest air cargo airport in the world*
- One of the nation's main east-west **rail** gateways
  - *93% of rail tonnage is pass-through*
- Passthrough **water** down the Mississippi River

Inbound Logistics

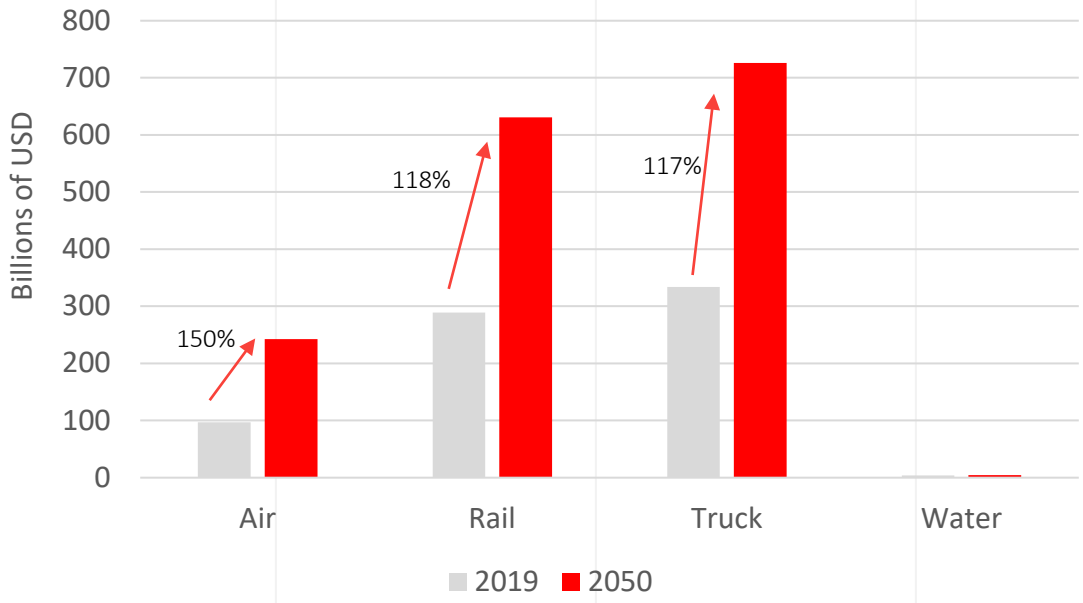
FedEx Corp.

Substantial pressure from tonnage and value growth out to 2050

75% increase in freight tonnage (400M to 700M tons)



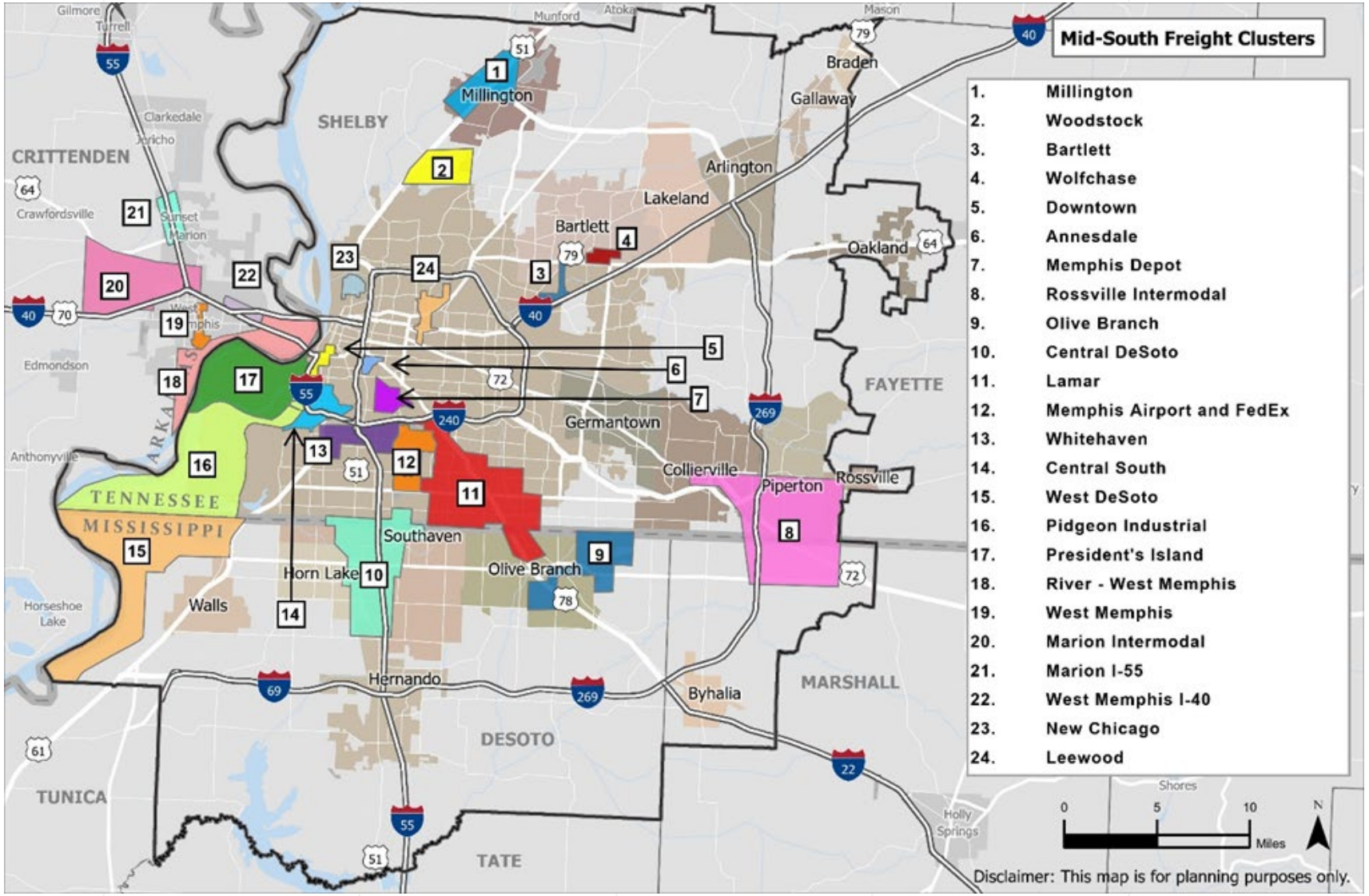
122% increase in freight value ($750B to $1,600B)



S&P Transearch

- Demand-driven forecast
  - *Unconstrained by infrastructure*
- Accounts for COVID-19 pandemic disruptions
- Includes local and pass-through freight

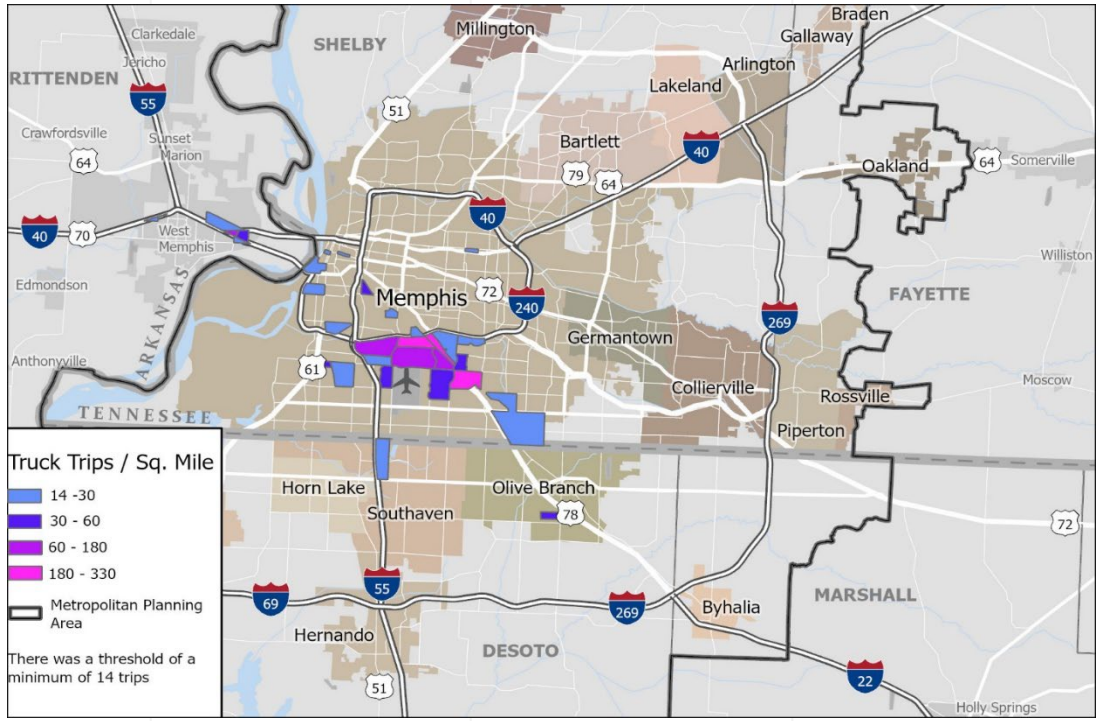
Revised freight clusters using latest data on establishments and truck GPS movements



- Establishment data on truck terminals, warehouses, wholesale, etc.
- Truck activity data from Replica
- 24 freight clusters

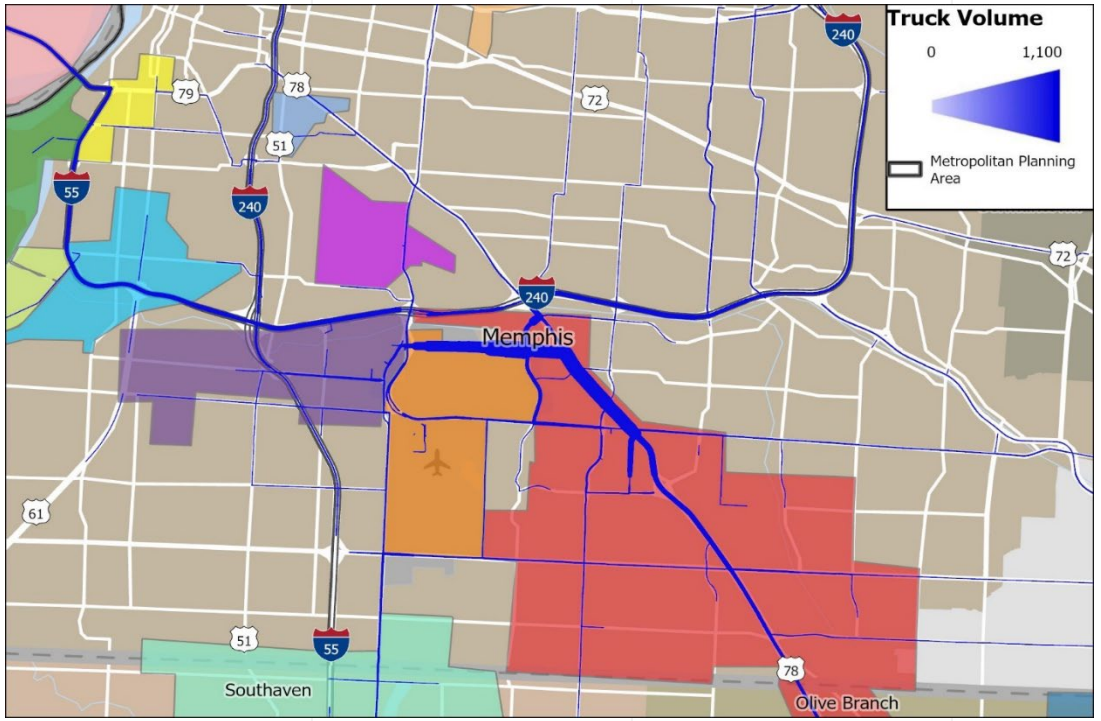
Roadway access to MEM airport is critical because cargo is valuable and time sensitive

Users of MEM Airport



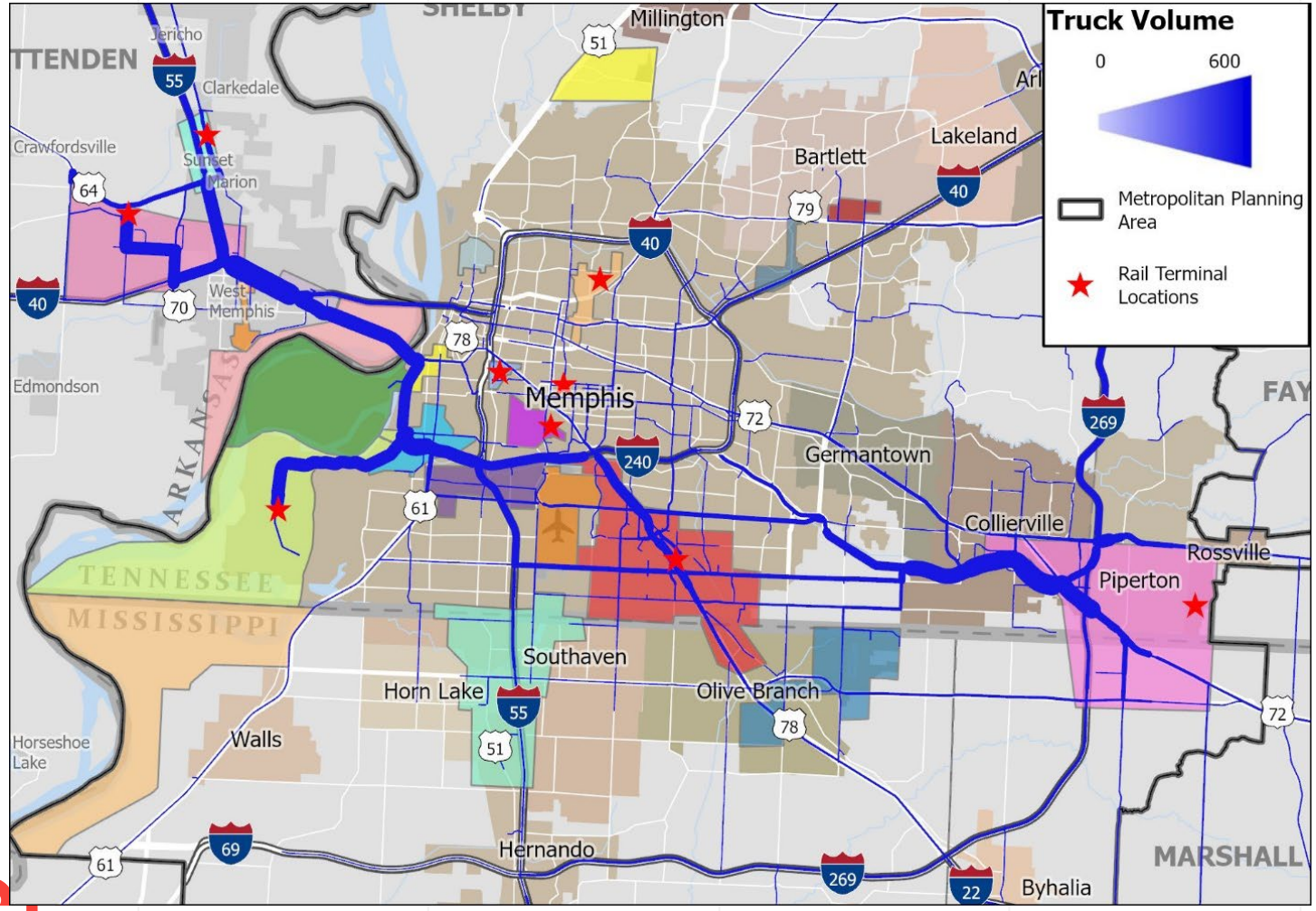
- North of the airport (large FedEx facilities)
- Clusters along I-240 and Lamar Avenue

Critical Access Roads



- Major roadways used:
  - Democrat Road
  - Lamar Avenue
  - Homewood Road

Roadway volumes of drayage trucks accessing rail intermodal terminals



- Red stars are rail intermodal terminals
- Significant truck drayage through:
  - I-55
  - I-240
  - Lamar Avenue

Analysis of Key Trends and Issues affecting Mid-South

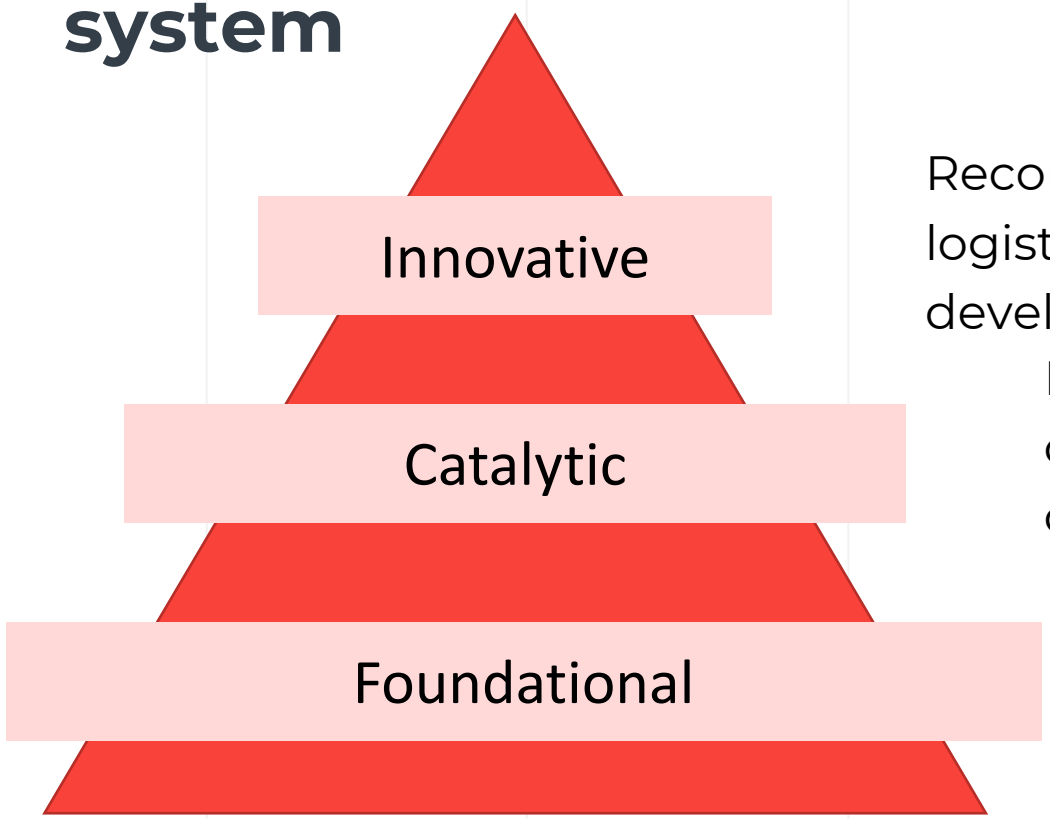
High Impact

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	

Developed multi-layered strategic recommendations to address challenges and improve Mid-South freight system

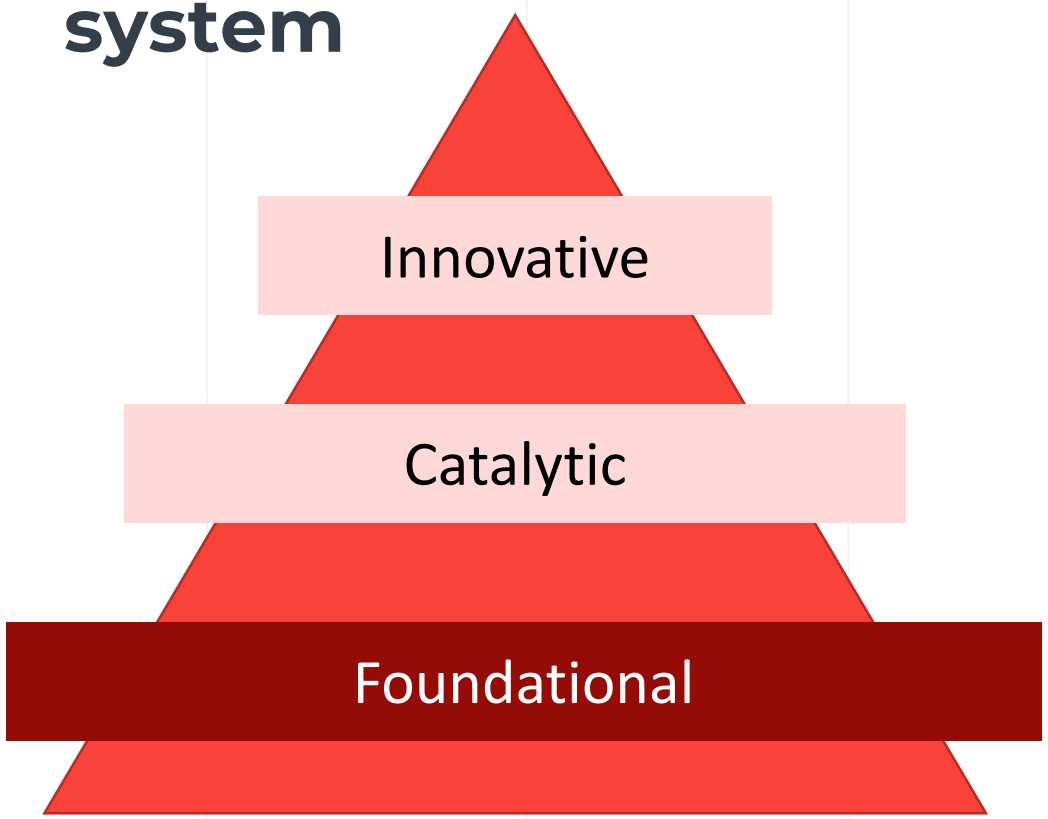


Recommendations that make the Mid-South a pioneer in logistics, and at the forefront of technology and developments

Recommendations that increase the attractiveness of the Mid-South to businesses by improving competitiveness of freight system

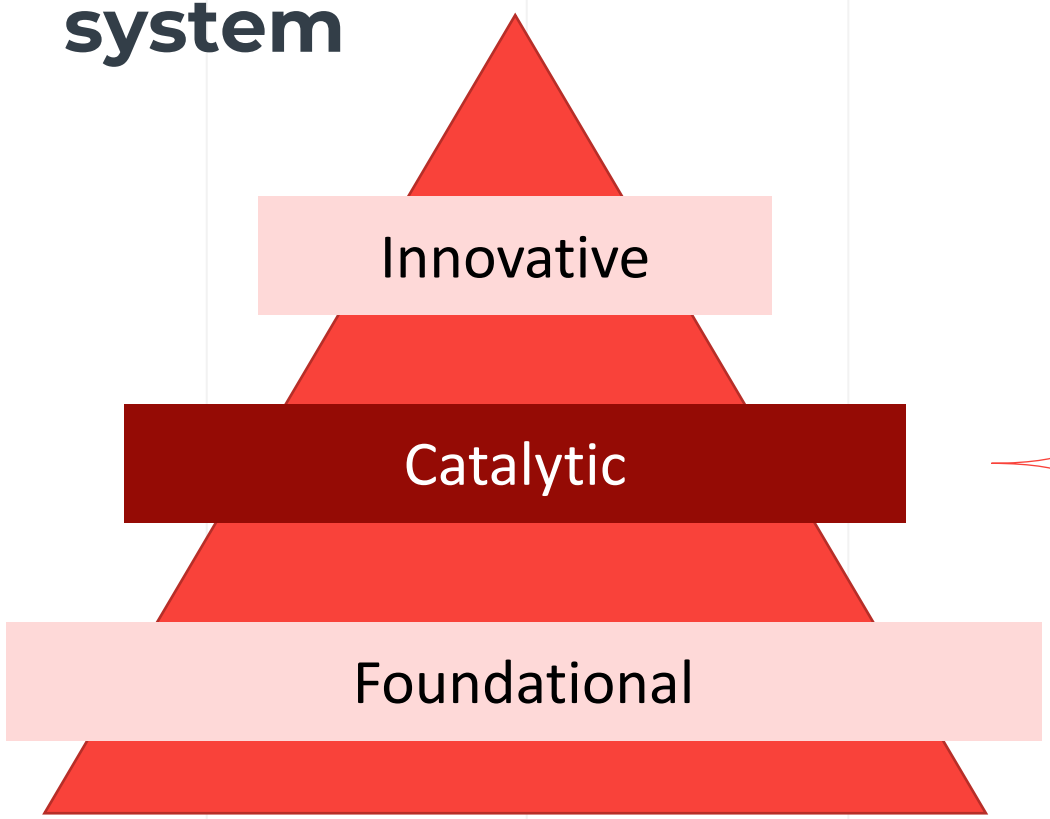
Recommendations that preserve freight system at current conditions and performance, addressing major shortcomings

Developed multi-layered strategic recommendations to address challenges and improve Mid-South freight system



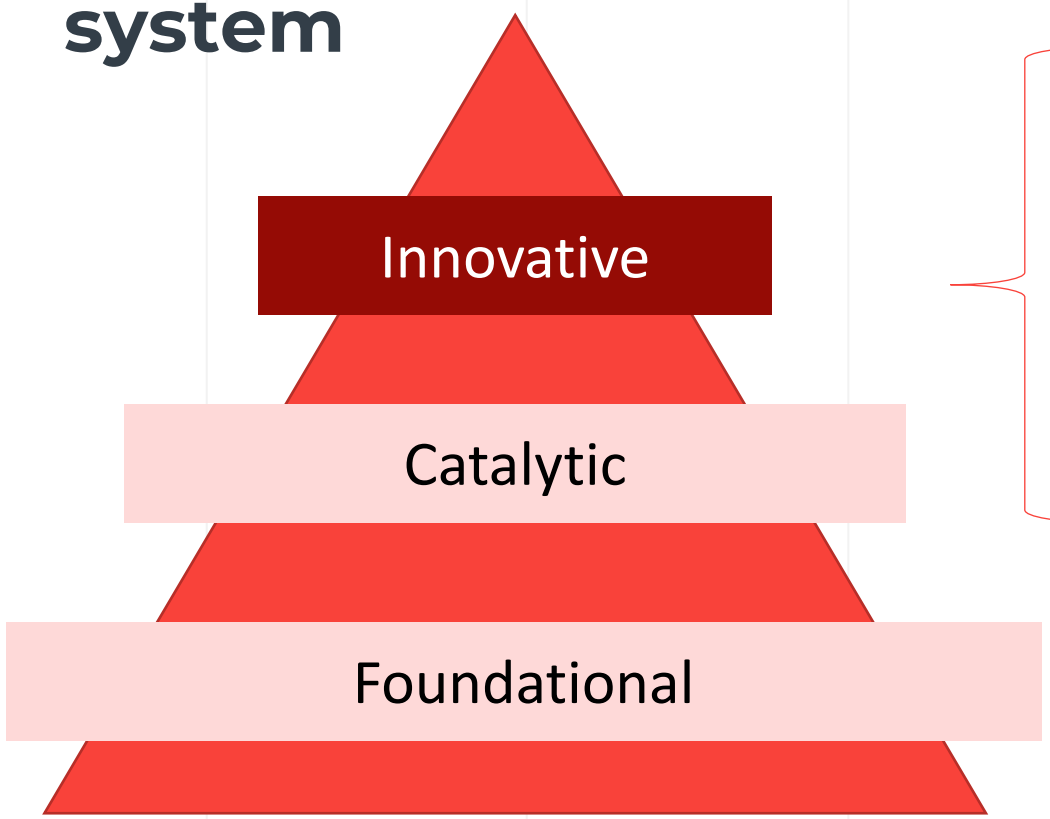
- Prioritize and invest in projects that improve freight safety
- Improve or separate high volume at-grade rail crossings.
- Review truck accommodation in work zone Traffic Control Plans (TCPs)
- Prioritize pavement preservation on freight routes

Developed multi-layered strategic recommendations to address challenges and improve Mid-South freight system



- Expand engagement with carriers and industry
- Protect freight-centric land uses
- Prioritize freight corridor projects that address congestion
- Promote rail-served development opportunities
- Support and invest in truck electrification
- Coordinate on the shortage of truck drivers and other logistics workers
- Support industrial land development on water

Developed multi-layered strategic recommendations to address challenges and improve Mid-South freight system



- Work with state DOTs to implement work zone ITS and information sharing programs on key freight corridors
- Promote involvement in national FLOW program to enhance supply chain visibility
- Pursue developments of local truck electrification industry
- Promote testing and deployment of connected and autonomous truck and delivery technologies

Thanks

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