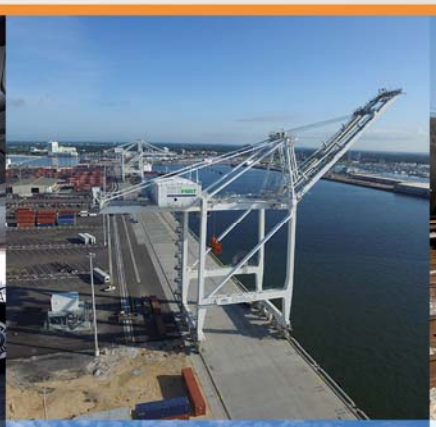
MISSISSIPPI
STATEWIDE FREIGHT PLAN



2022

MDOT
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

Mississippi Statewide Freight Plan

prepared for

Mississippi Department of Transportation

prepared by

Cambridge Systematics, Inc.

with

Neel Schaffer

September 2022

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

FEDERAL REQUIREMENTS & MISSISSIPPI STATEWIDE FREIGHT PLAN REFERENCES

Source	Requirement	Section Coverage
FAST	Identification of significant statewide **needs and issues.**	Section 3.5/ Section 3.6
FAST	Description of freight **policies, strategies, and performance measures** that will guide freight related transportation investment decisions.	Section 4
FAST/IIJA	Critical multimodal rural freight facilities.	Section 2.1
FAST/IIJA	Critical rural and urban freight corridors.	Section 2.1
FAST	Link to national multimodal freight policy and highway freight program **goals.**	Section 1.2
FAST	Description of **innovative technologies and operational strategies** (including ITS) that improve the safety and efficiency of freight movements.	Section 4.1
FAST	A description of **improvements** to reduce roadway deterioration by heavy vehicles (including mining, agricultural, energy cargo or equipment, and timber vehicles).	Section 4.1
FAST	**Inventory** of facilities with freight mobility issues and a description of the **strategies** the State is employing to address the freight mobility issues.	Section 3.5 /Section 4.1
FAST	**Description** of significant congestion or delay caused by freight movements and any strategies to mitigate that congestion or delay.	Section 3.5/Section 4.1
FAST	**Freight investment plan** that includes a list of priority projects and describes investment and matching funds.	Section 4.3
FAST	**Consultation** with the State freight advisory committee, if applicable.	Section 1.3
IIJA	Commercial motor vehicles parking facilities assessment.	Section 2.2/Section 3.6
IIJA	Understanding of **supply chain** cargo flows expressed by **mode of transportation** in the state.	Section 2.3/Section 3.1
IIJA	Inventory of **commercial ports** in the State.	Section 2.2
IIJA	Findings or recommendations made by any **multi-state freight compact**, if applicable.	Section 1.4
IIJA	Impacts of **e-commerce** on freight infrastructure in the State.	Section 2.3
IIJA	Consideration of **military freight**.	Section 3.3
IIJA	Strategies and goals to decrease impact of extreme weather, air pollution, flooding, stormwater runoff, or wildlife habitat loss due to freight movement.	Section 3.2/Section 3.4/ Section 4.1
IIJA	Considerations and enhancement strategies to **freight reliability.**	Section 4.1

Note: Detailed information on the condition and performance of the state's freight assets is included in the Plan's supplemental technical memorandums.

1

PLAN PURPOSE & OVERVIEW

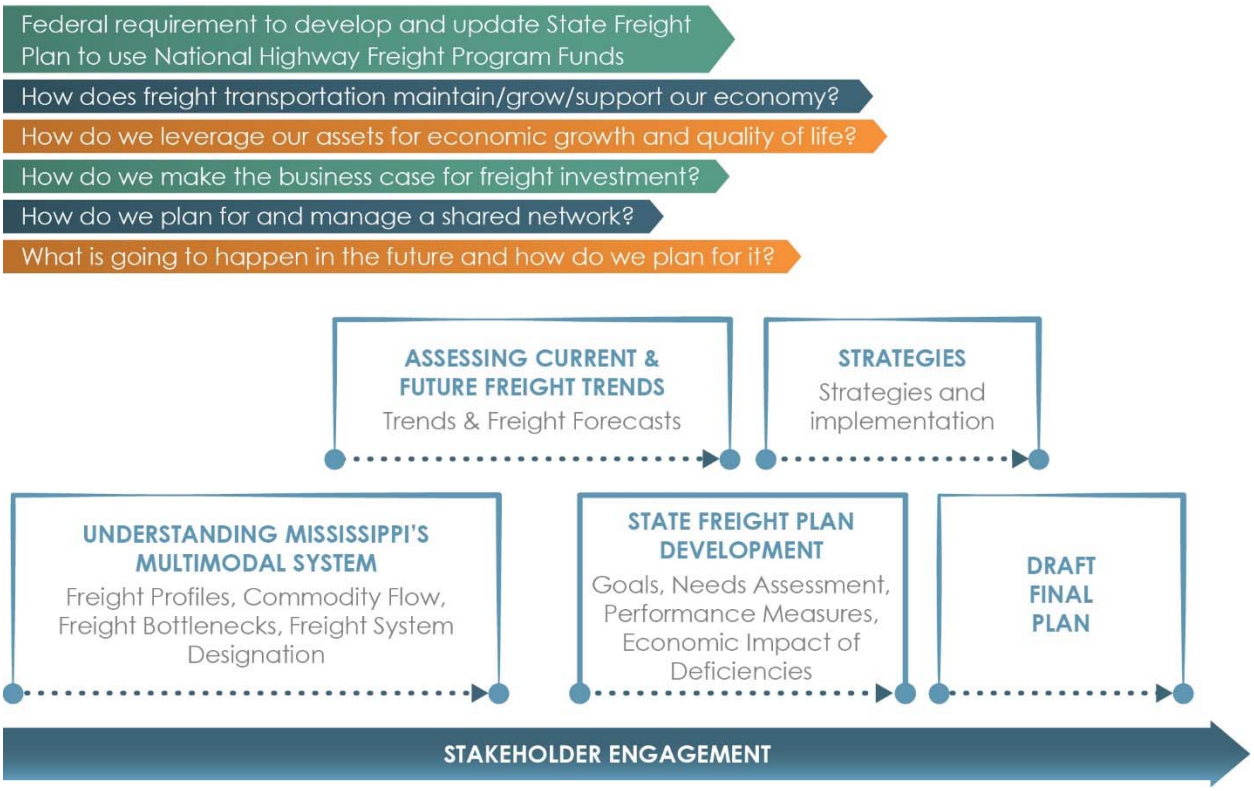
To support the state of freight in Mississippi, the 2022 Mississippi Statewide Freight Plan serves as a strategy reflecting evolving economic trends that are driving changes to the movement of goods, consumer behaviors, and industry needs. Aligned to meet federal regulations, the Mississippi Statewide Freight Plan provides an opportunity for MDOT to further recommendations and policies identified in other MDOT transportation plans such as the statewide long range transportation plan, MULTIPLAN 2045. The Mississippi Statewide Freight Plan identifies needs, trends, and projected freight movements to set the stage for the plan goals, strategies, a list of projects, and a freight investment plan.

1.1 Purpose of the Mississippi Statewide Freight Plan

The purpose of the Mississippi Statewide Freight Plan is to assess the condition and performance of the freight network, understand the role of freight within broader transportation and economic development initiatives, and develop strategies to address freight needs within Mississippi. This plan looks at the multimodal freight network including challenges related to its condition and performance, evolving economic trends surrounding

freight, drivers of change in the movement of goods, and strategies to address freight needs. The plan meets all federal requirements in the Fixing America's Surface Transportation (FAST) Act of 2017 and the Infrastructure Investment and Jobs Act (IIJA) of 2021, also known as the "Bipartisan Infrastructure Law".

Figure 1. | The Process

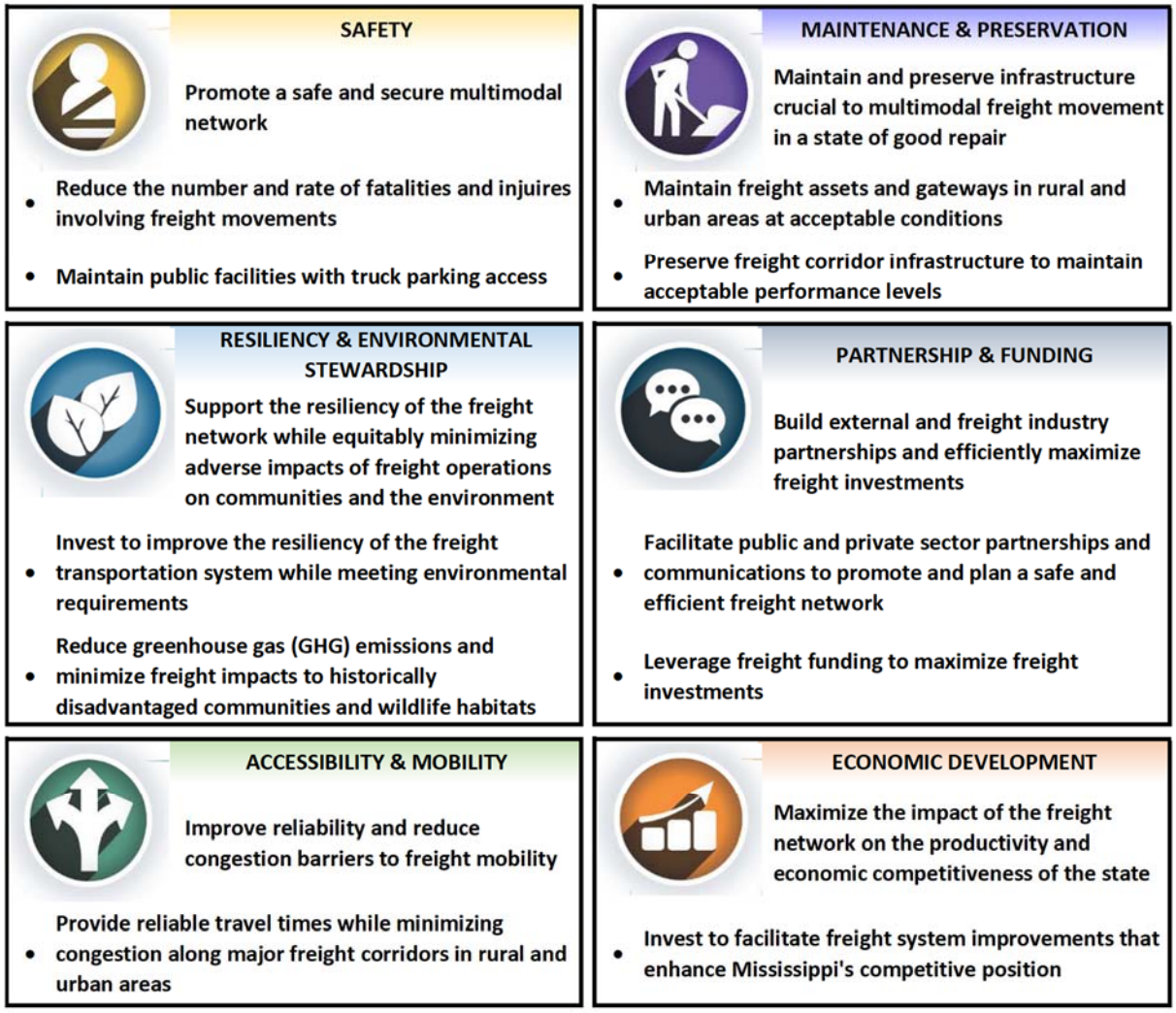


1.2 Goals & Objectives

The Mississippi Statewide Freight Plan goals align with those of the statewide long-range transportation plan, the state's rail plan, and national multimodal freight policy goals, as shown in Table 1. These goals guide the recommendations, freight investment plan and performance measures to support the progress of the Mississippi Statewide Freight Plan. The goals fall into six different areas: safety, maintenance and preservation, accessibility and mobility, economic development, resiliency and environmental stewardship, and partnership and funding.

Table 1. | Mississippi Statewide Freight Plan Goal Alignment

Mississippi Statewide Freight Plan Goals	National Freight Policy Goals									
	Enhancing economic efficiency, productivity, and competitiveness	Reducing congestion	Improving safety, security, and resilience	Improving state of good repair	Using innovation and advanced technology to improve the safety, efficiency, and reliability of the freight network	Improving the economic efficiency and productivity of the freight network	Improving the reliability of the freight network	Improving freight movements that serve rural areas and gateways	Improving multi-State freight corridor planning and connectivity	Reducing adverse environmental and community impacts
Safety - Promote a safe and secure multimodal freight network.			✓							
Maintenance & Preservation - Maintain infrastructure crucial to multimodal freight movement in a state of good repair.				✓				✓		
Accessibility & Mobility - Improve reliability and reduce congestion barriers to freight mobility.		✓					✓	✓		
Economic Development - Maximize the impact of the freight network on the productivity and economic competitiveness of the state.	✓				✓	✓				
Resiliency & Environmental Stewardship - Support the resiliency of the freight network while equitably minimizing adverse impacts of freight operations on communities and the environment.			✓							✓
Partnership & Funding - Build external and freight industry partnerships and efficiently maximize freight investments.	✓					✓			✓	



Note: Some multimodal freight objectives are outside of MDOT control.

1.3 Freight Advisory Committee & Stakeholder Engagement

This Mississippi Statewide Freight Plan was developed with engagement from transportation asset owners, freight providers, economic development experts, and industry representatives. These groups helped to ensure the analyses included local and specialized experience and information to inform economic trends and changes that may not be recognized through existing data sources. The support and guidance from stakeholders on the Mississippi Statewide Freight Plan ensures that its recommendations can be implemented, an essential element based on the fact that some of the most critical freight infrastructure is privately owned and operated.

Stakeholder engagement included outreach to several groups that understand freight movement and trends within the state. Of those groups, the MS-Freight Advisory Committee (MS-FAC) was one of the most important in guiding Mississippi Statewide Freight Plan outcomes. MS-

FAC is comprised of members who represent both public and private entities and have ties to several industries including ports, rail, airports, agricultural, manufacturing, metropolitan planning organizations (MPOs), state and federal agencies, and military and university representatives.

Other groups that participated in stakeholder engagement include private and economic development stakeholders, who were able to provide industry-specific feedback that is essential in understanding the challenges and needs of the diverse business communities within the state. Public sector stakeholders provided feedback from the user perspective.

Stakeholder Outreach Activities

Mississippi Freight Advisory Committee (MS-FAC) Meetings

Fall 2021
Winter 2021
Spring 2022
Summer 2022
Fall 2022

Industry & Stakeholder Forum

Fall 2021

Online Survey Tool

Fall 2021

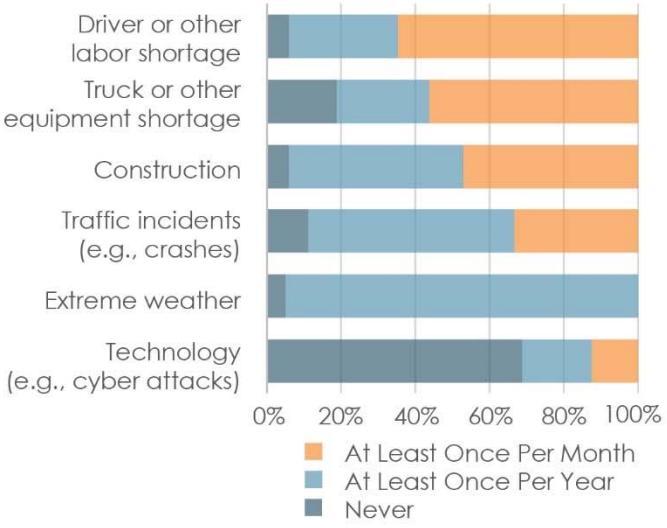
2 out of **3** survey respondents say the freight network serves their needs well

Trends likely to have the ***greatest impact*** on **freight movement** were:

- Economic Growth
- Business & Consumer Practices
- Technology

Sources: November 2021 Freight Stakeholder Survey & November 2021 Industry Stakeholder Forum.

How frequently do the following issues disrupt your business or freight movement in Mississippi? (N=19)



1.4 Multi-State Freight Coordination

Mississippi is a part of the Institute for Trade and Transportation Studies (ITTS). ITTS is a multi-state coalition funded by the U.S. Department of Transportation Federal Highway Administration (FHWA) and its member states. The ITTS fosters regional collaboration among its members and leads freight planning in the Southeast by providing research and information concerning freight trends and planning, developing effective freight planning tools and procedures, and partnering with relevant organizations and stakeholders.

- The ITTS Freight bottleneck study determined the top bottlenecks across the Southeast, including:
  - Raleigh, North Carolina-to- Dallas, TX corridor - aligns with State identified bottlenecks on US 49 and I-55 in Hinds and Rankin County; and
  - Memphis, Tennessee-to-Atlanta, Georgia corridor - aligns with State identified bottlenecks on I-55 in Desoto County.
- The ITTS Southeast Trade and Transportation Study analyzed freight and trade trends for the U.S. Southeast:
  - Percent growth in exports from ITTS states including Mississippi outpaced nationwide exports; and
  - Economic output from the wholesale, manufacturing, transportation and warehousing, retail, and construction industries grew between 1997 and 2020 for ITTS states as a whole and Mississippi specifically. However, construction sector growth has been more volatile compared to other freight-intensive industry sectors.

1.5 Organization of the Report

The Mississippi Statewide Freight Plan is organized into four sections, including:

Section 1—Plan Purpose and Overview: An introduction and overview of the purpose and goals of the Mississippi Statewide Freight Plan, including the requirements that it meets.

Section 2—Freight in Mississippi: An overview of the multimodal freight network and its existing conditions, freight trends, commodity flow, and economic role of freight within the state.

Section 3—Freight System Assessment: An assessment of major factors that affect the freight network and an overview of network deficiencies.

Section 4—Strategies and Recommendations: An overview of best practices and recommendations to address the needs of the freight system, along with a review of programmed projects.

2 FREIGHT IN MISSISSIPPI

2.1 The Mississippi Multimodal Freight Network

Overview of Network Elements

The Mississippi Multimodal Freight Network consists of the elements of the transportation system that moves goods using various freight modes throughout the state: highway, railroad, marine, aviation, and pipeline.

The **highway** network provides a critical connection between users and producers of goods throughout the state, the nation, and the world. The state's roadway network consists of 77,000 centerline miles and connects all of the intermodal facilities while providing truck access.

The **railroad** system in Mississippi spans 2,772 miles and has various operators. There are 5 Class I (major), 1 Class II (regional), and 21 Class III (local) railroads within the state. Around 65 percent, 1,800 miles of the railroad system is Class I. Mississippi ranks 11th in the US in the number of operating freight railroads and 28th in the U.S. in active track mileage.

Mississippi's **marine** system includes 16 public ports that consist of seaports and river ports. These ports are located along the Gulf of Mexico which is part of Marine Highway M-10, Mississippi River which is part of the Marine Highway M-55, and Tennessee-Tombigbee Waterway which is part of Marine Highway M-65 and allow for efficient movement of freight to, from, through, and within the state.

Aviation in Mississippi is typically used for lightweight, time-sensitive, and high-value cargo. Some of the common goods shipped via air freight include perishables (flowers, fish, produce), computers and peripherals, telecommunications equipment, oil and gas drilling, and medical supplies.

Pipelines are an important component of the Mississippi Multimodal Freight Network given the reliance of the energy sector on this mode. The petroleum supply chain relies on pipelines for transportation and there are multiple types of pipelines in this system for collecting, transmitting, and distributing petroleum products.

Tier I and Tier II Freight Corridors

Mississippi highways were redesignated into tiers of priority corridors to signify components of the network most crucial for facilitating freight movements. The process used factors related to economic competitiveness and goods movement levels to designate corridors as Tier I, Tier II, or Tier III. Economic competitiveness factors consider that segments of the highway network directly serve areas of relatively high freight-intensive employment and supporting facilities[1], which supports economic growth. Goods movement factors consider the level of freight activity on highways using average truck traffic, truck vehicle miles traveled, and commodity tonnage as criteria. In addition, corridors already designated on a national freight corridor including the National Highway Freight Network (NHFN) and the Strategic Highway Freight Network (STRAHNET) were brought into the state's network. The network is shown in Figure 2.

Tier I corridors primarily consist of Interstate highways and are critical for moving goods across the state and nationally. Tier II highway facilities serve as regional corridors within the state. These corridors are important for providing access to the Tier I network. Also, several Tier II corridors serve as primary east-west or north-south corridors for regions of the state that do not contain Interstate highways.

[1] Freight-intensive industries are defined as those with the following NAICS codes: 11 (Agriculture, Forestry, Fishing, and Hunting), 21, (Mining, Quarrying, and Oil and Gas Extraction), 31-33 (Manufacturing), 42 (Wholesale Trade), and 48-49 (Transportation and Warehousing).

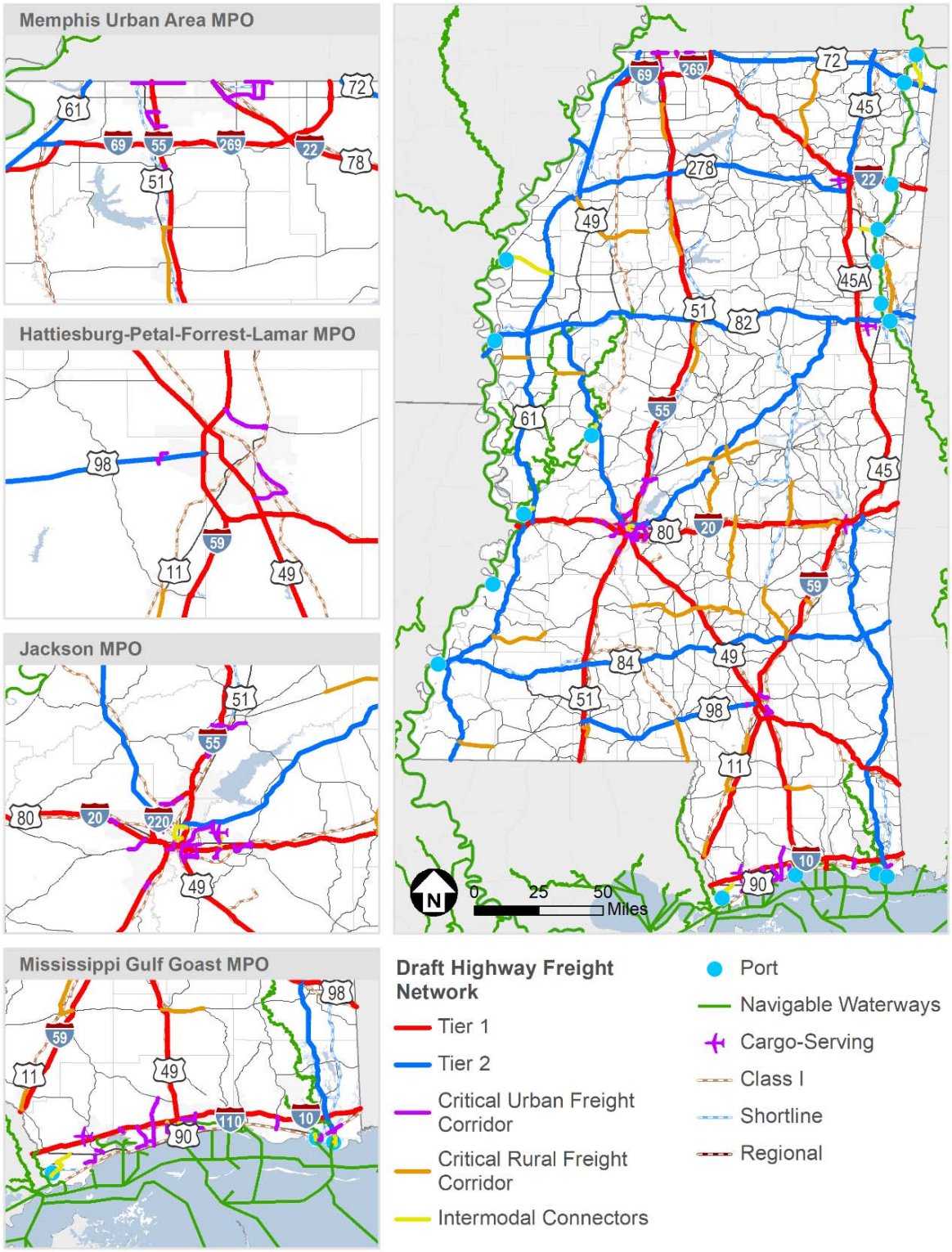
Tier I Freight Corridors include:

- I-10 Bienville-Gulfport-Pascagoula or "Gulf Coast" Corridor
- I-20 Vicksburg-Meridian Corridor
- I-22/US 78 Olive Branch-Tupelo-Fulton Corridor
- I-55 Southhaven – McComb Corridor
- I-59 Picayune-Meridian Corridor
- I-69/I-269 Corridor
- I-110 in Biloxi/D'Iblerville
- I-220 in Jackson
- US 45/US 45 Alt. Tupelo-Meridian Corridor
- US 49 Jackson-Hattiesburg-Gulfport Corridor
- US 98 Hattiesburg-Lucedale Corridor

Tier II Freight Corridors include:

- SR 25 from Jackson to Starkville
- SR 57/SR 63/US 45 from Meridian to Pascagoula
- SR 304 from US 61 to I-69
- US 45 from Tupelo to Tennessee State Line
- US 49/49W between I-220 and US 82
- US 49 from US 61 to the Arkansas State Line
- US 61from Tennessee to Louisiana State Lines
- US 72 from Alabama to Tennessee State Lines
- US 82 from Alabama to Arkansas State Lines
- US 84/US 425 from Alabama to Louisiana State Lines
- US 98 from McComb to Hattiesburg
- US 278 from Tupelo to Clarksdale

Figure 2. | Mississippi Freight Network



Source: Mississippi Department of Transportation.

Tier III Freight Corridors

Tier III corridors consist of corridors that provide first-/last- mile connectivity to major freight assets and freight-generating land uses as shown in Figure 2. These corridors primarily comprise Mississippi's NHS freight intermodal connectors (IC), critical rural freight corridors (CRFC), and critical urban freight corridors (CUFC). These corridors were identified by their ability to meet market access and connectivity criteria and have been reassessed based on federal regulation and statewide stakeholder engagement. Intermodal connectors were reassessed following coordination with MDOT staff and local entities. CRFCs were reassessed following coordination with MDOT staff and the Mississippi Freight Advisory Committee (MS-FAC). CUFCs were redesignated following coordination with the state's metropolitan planning organizations (MPOs) and mileage was expanded as allowed by the Bipartisan Infrastructure Law (BIL). Market access and connectivity criteria evaluate intermodal connectivity and connectivity to the NHS, the Primary Highway Freight System (PHFS, and State Freight Tier I and II Corridors). A list of Tier III freight corridors can be found in Appendix B.

2.2 Inventory and Existing Conditions

This element of the Mississippi Statewide Freight Plan is important as it provides an understanding of the existing performance and conditions of the network. By identifying existing deficiencies, its results provide the foundation for the needs assessment included in Chapter 3.

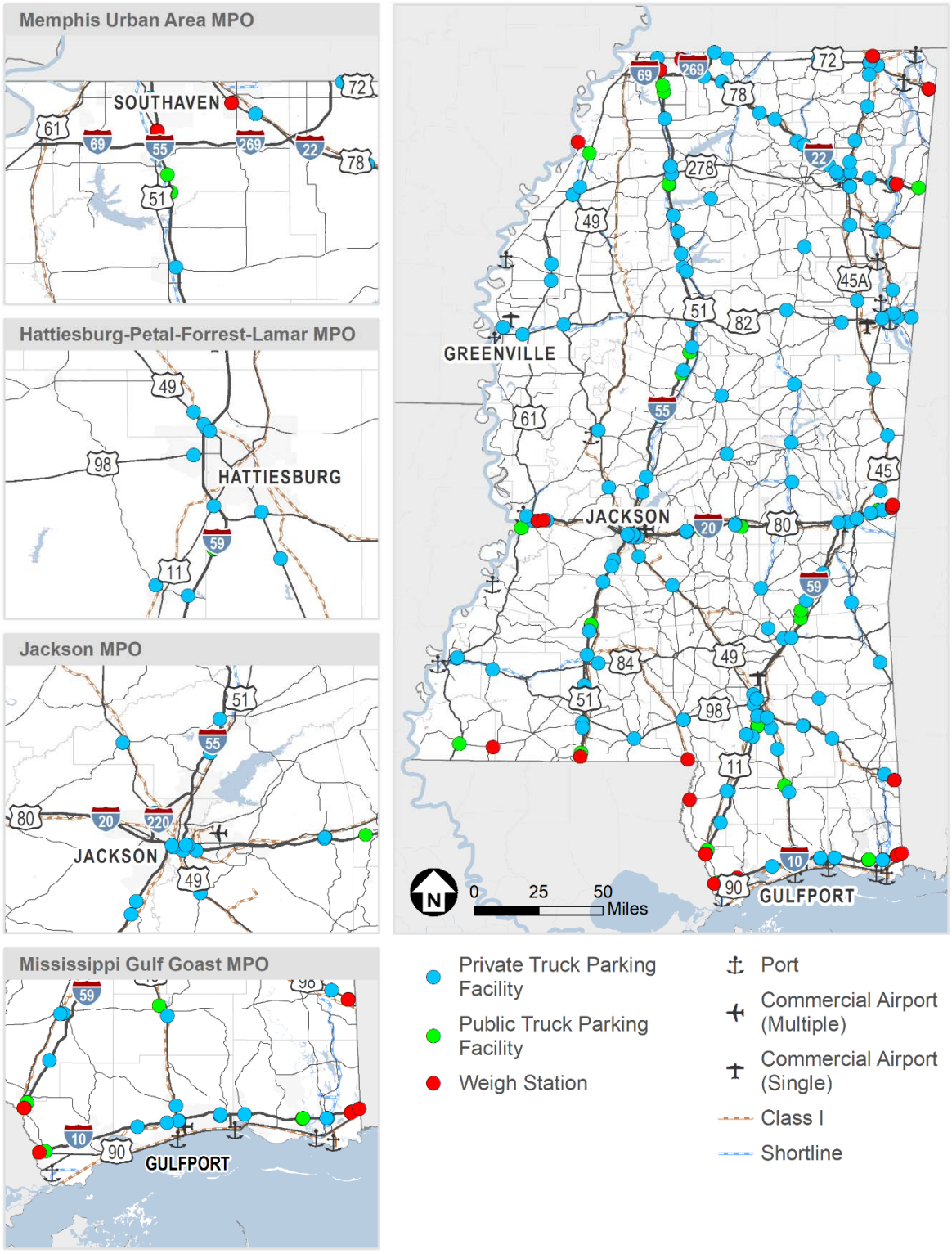
Highways

Inventory of Assets

Highways are a vital part of the multimodal network as they carry the majority of freight traffic and serve as a connection between intermodal facilities. Mississippi has approximately 77,000 centerline miles of highways with about 2,400 miles being designated as Tier I-II corridors. Over 12,500 bridges are located throughout Mississippi. Over 4,300 are maintained by the state, while the remainder are maintained by cities, counties, or other agencies.

In addition to roadways and bridges, truck parking facilities and intelligent transportation system (ITS) devices are critical elements of the highway network. Truck parking facilities are important to the highway network as they provide drivers with safe, authorized locations to park and meet federal regulations for hours-of-service, rest breaks, or staging ahead of delivery or pick up. Truck parking is also critical to the overall safety of the network as tired drivers present safety hazards to themselves and the traveling public. Public rest areas, private truck stops, and weigh stations all comprise the state's truck parking inventory as shown in Figure 3. Though weigh stations are not intended for long-term parking, these facilities can be used and in emergencies.

Figure 3. | Truck Parking Facilities & Weigh Stations

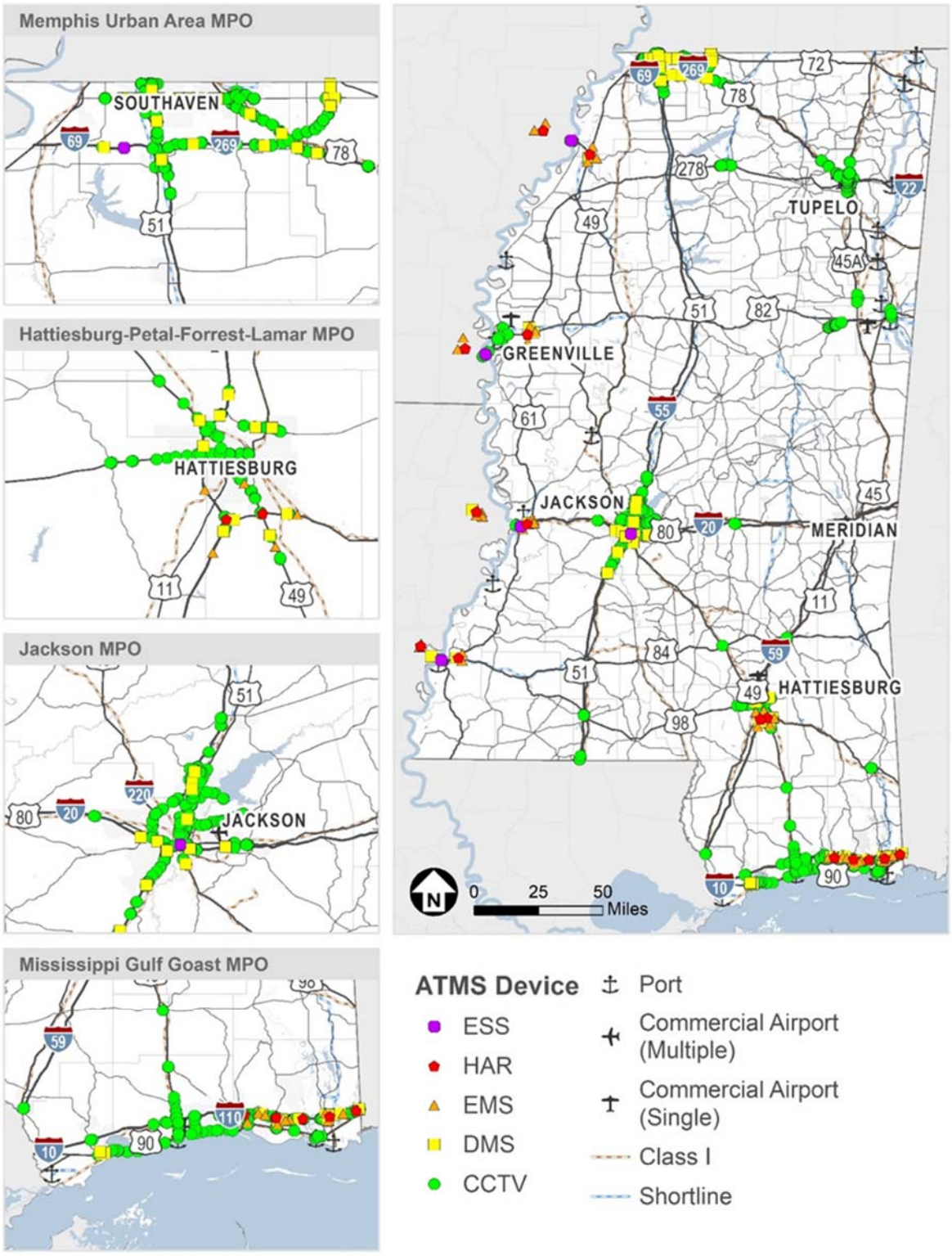


Source: Mississippi Department of Transportation, 2019 Jason's Law Survey Results.

About 18 percent of public truck parking facilities in Mississippi are over capacity (i.e., more than 100 percent full) daily based on results from the 2019 Jason's Law truck parking survey. About 26 percent of public facilities are at capacity (i.e., 76 percent to 100 percent full). Over-capacity facilities are largely clustered along I-10 on the Gulf Coast. Drivers tend to prefer private truck parking facilities since they can offer amenities such as laundry, showers, and restaurants. That Mississippi has multiple public facilities that are near, at, or over capacity suggests that there is not enough capacity to meet demand.

ITS is the integration of advanced communications technologies into vehicles and infrastructure to improve the safety, efficiency, and reliability of transportation operations including freight. Mississippi's ITS is managed by three traffic management centers that manage ITS devices (some of which are jointly operated with neighboring states) and roadway operations through the state's advanced traffic management system (ATMS). These include closed-circuit television cameras (CCTV) for providing coverage on high traffic corridors; dynamic message signs (DMS) for displaying messages to drivers; weigh in motion (WIM) for recording truck weights; classification count stations (CCS) for collecting traffic volume data; highway advisory radio (HAR) for disseminating information via radio; emergency service flashers (EMS) to alert drivers to HAR messages; and environmental sensor station (ESS) for measuring water levels and pavement conditions. Figure 4 shows the location of ITS devices.

Figure 4. | ITS Devices



Source: Mississippi Department of Transportation.

Conditions and Performance

Measures that reflect the usage, congestion and mobility, and accessibility and connectivity of the highway freight network as they are indicate which portions of the network are vital to the movement of goods and where investments should be focused to address any shortcomings. Truck traffic count data provide insight into where trucking activity is most prevalent within the state. As shown in Figure 5, much of Mississippi's 2019 annual average daily truck traffic (AADTT) activity is centered in its largest urban cores, namely the Jackson and Gulfport-Biloxi Metropolitan regions. However, interstate corridors in the city of Vicksburg and Meridian also experience some of the highest amounts of truck traffic in the state.

Congestion and mobility on the highway freight network are measured in terms of truck travel time reliability (TTTR). The TTTR metric is an indicator of how variable travel times are on the highway network. Figure 6 shows the maximum TTTR index observed over all time periods for interstate highways during 2019. The Jackson metropolitan area showed poor reliability, with segments along I-20 and I-55 with TTTR indexes that exceeded 3.0. This indicates that some motor carriers experience traffic conditions that result in travel times that exceed the average by three times or more. Areas of I-55 heading towards the Mississippi-Tennessee state line on average ranged from 2.0 to 3.0. Aside from the performance on these roadways, much of the state's interstate highway system performs well.

Accessibility and connectivity refer to the ease with which the transportation network allows users to reach various destinations. The accessibility and connectivity of the highway freight network is essential for users of the system and can be negatively impacted by at-grade crossings and bridges in poor condition. At-grade crossings can impose significant delays to trucks and other vehicles as they wait for trains to pass. Furthermore, they represent safety hazards due to potential collisions with trains. Mississippi's busiest at-grade crossings in terms of traffic volumes are in DeSoto and Jackson counties. Bridges in poor condition are another hindrance to accessibility and connectivity. Bridges that cannot handle the typical sizes and weights of trucks or present vertical clearance issues can lead to significant re-routing for trucks. If there is not a close alternative route, the detour can prove costly in both time and money.

About **7 percent** of the structures within the state are in ***poor condition*** and the majority of them are **bridges** and the rest are **box culverts**.

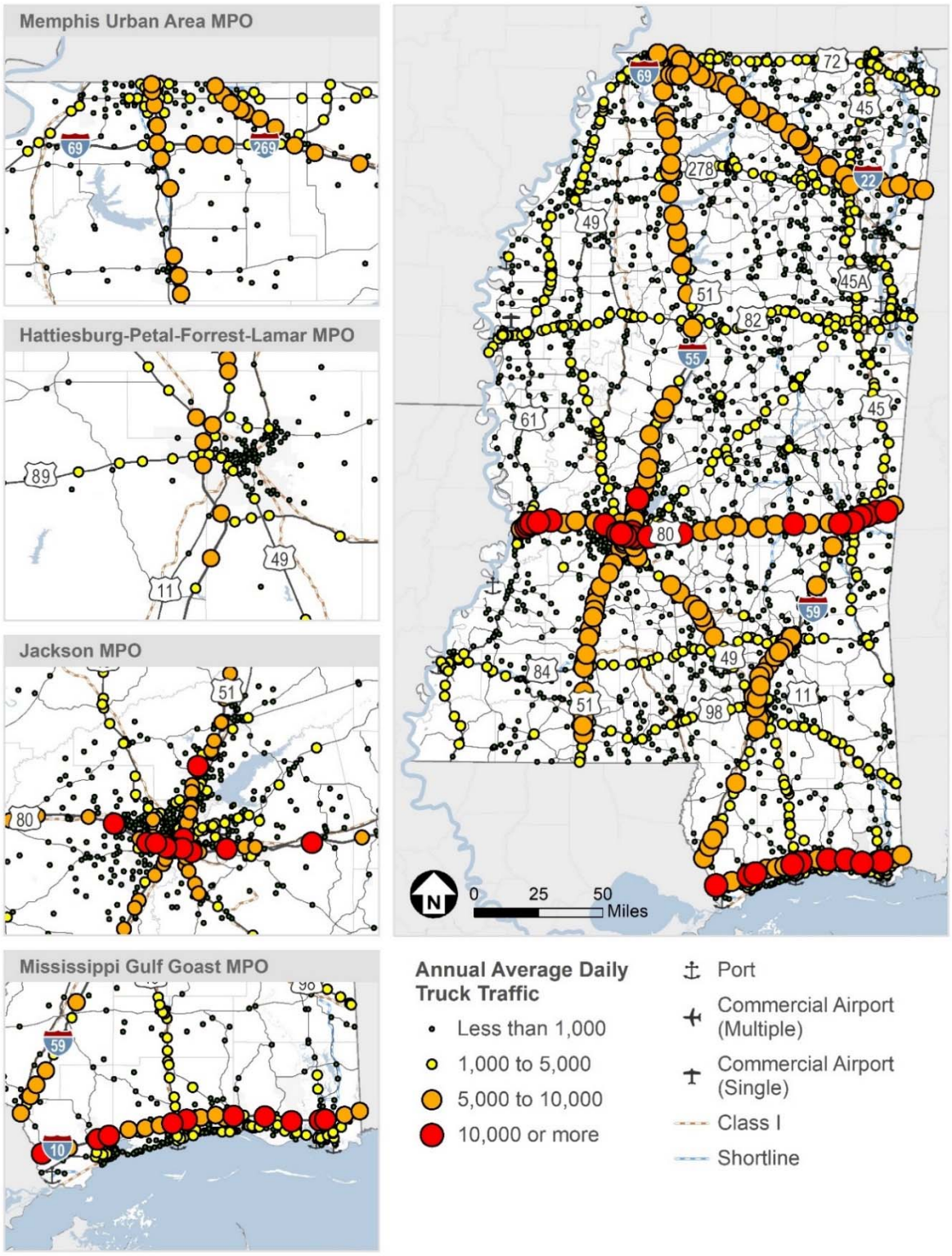
Source: U.S. National Bridge Inventory Database 2021.

Bridges with less than **16.5 feet vertical clearance** impose ***significant challenges*** to the **movement of goods**.

254 (23%) state maintained bridges and **6 (50%) non-state maintained bridges** are ***less than 16 feet high***.

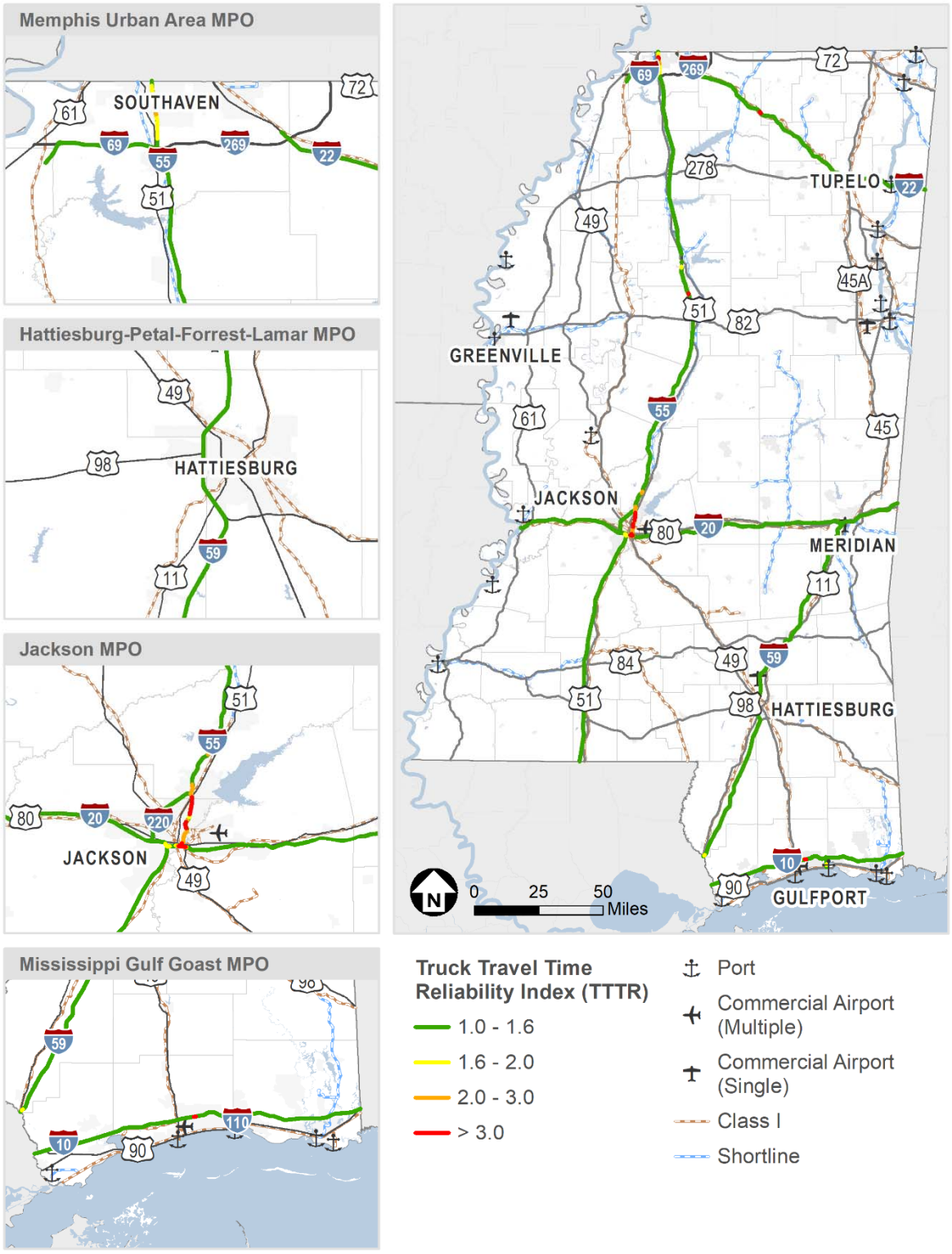
Source: National Transportation Atlas Database 2021; Cambridge Systematics, Inc. analysis.

Figure 5. | Annual Average Daily Truck Traffic, 2019



Source: Mississippi Department of Transportation; Cambridge Systematics, Inc. analysis.

Figure 6. | Interstate Truck Travel Time Reliability, 2019



Source: National Performance Management Research Data Set (NPMRDS)

Railroad

Inventory of Assets

Mississippi has 2,772 miles of rail and is a vital state for the national freight rail transportation system. It ranks 11th in the U.S. in the number of operating freight railroads and 28th in the U.S. in active track mileage. There are 5 Class I (major), one Class II (regional), and twenty-one Class III (local) railroads within the state, as shown in Figure 7.

Class I rail makes up around 65 percent, 1,817 miles, of the rail mileage in the state. Class II rail accounts for 52 miles of rail. Class III are local railroads and they account for 903 miles of rail within the state.

The **Class I rail operators** include:

- BNSF Railway Company (BNSF),
- CSXT Transportation (CSXT),
- Canadian National Railway (CN),
- Kansas City Southern Railway Co. (KCS), and
- Norfolk Southern Railway Co. (NS).

Shortline railroads include both **Class II** and **Class III regional** and **local railroads** and include the following operators:

Class II

- Alabama and Gulf Coast Railway

Class III

- Alabama Southern Railroad, Columbus and Greenville Roadway, Golden Triangle Railroad, Great River Railroad, Grenada Railroad, Luxapalila Valley Railroad, Meridian and Bigbee Railroad, Meridian Southern Railway, Mississippi Central Railroad Company, Mississippi Delta Railroad, Mississippi Export Railroads, Mississippi Southern Railroad, Mississippi Railway Cooperative Inc., Natchez Railway, Old Augusta Railroad, Port Bienville Railroad, R.J. Corman-Tennessee Terminal, Ripley and New Albany Railroad Company, Vicksburg Southern Railroad, West Tennessee Railroad, and Yellow Creek Port Railroad.

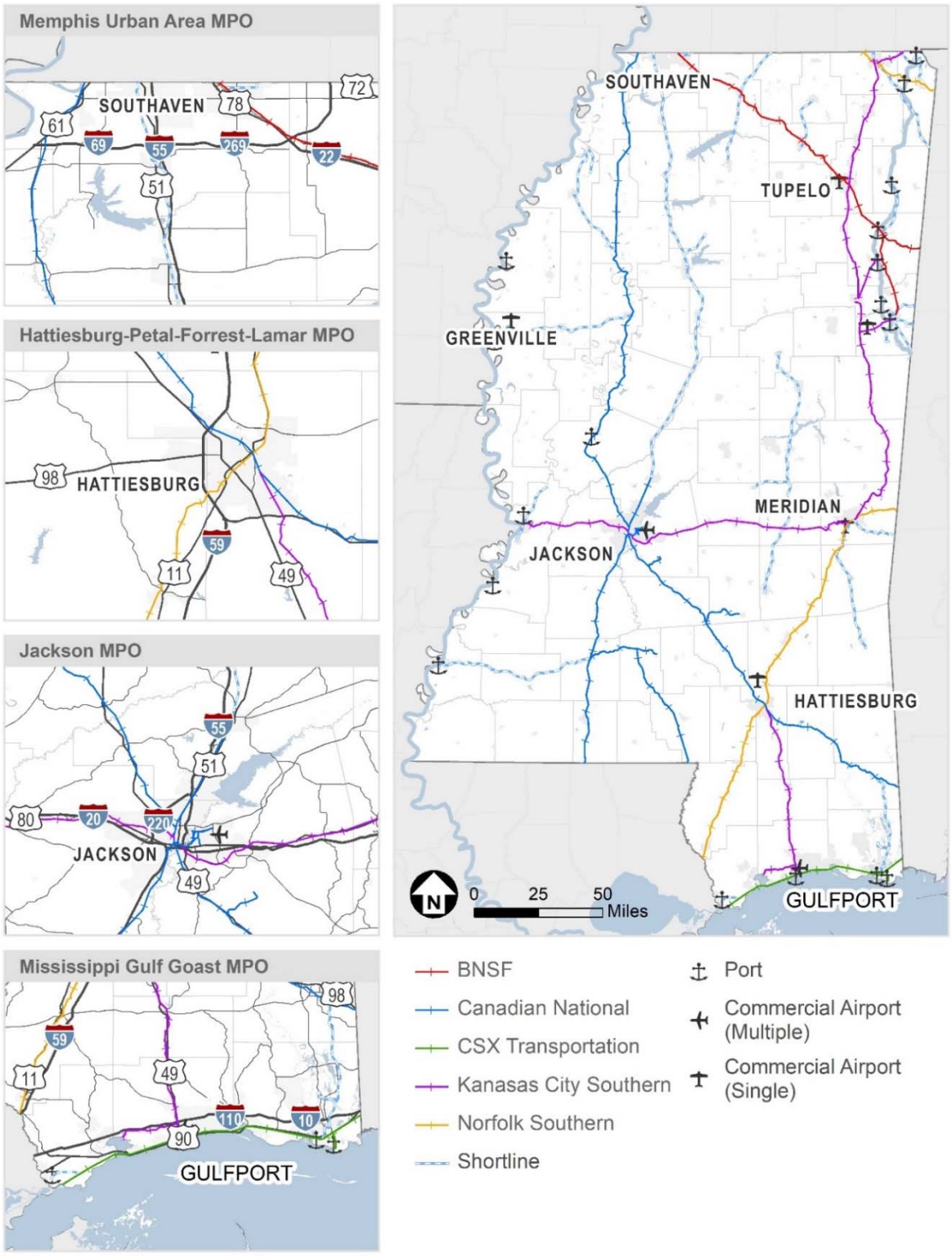
The five Class I railroads operating in Mississippi include BNSF Railway, CSX Transportation, Canadian National, Canadian Pacific/Kansas City Southern Railway, and Norfolk Southern Railway.

- **BNSF Railway.** BNSF operates over 179 route miles in Mississippi, cutting through the northeast corner of the state from Memphis to Birmingham via Tupelo with a branch from Amory to Columbus and trackage rights beyond Columbus.
- **CSX Transportation.** CSXT's network in Mississippi includes only 74 miles of owned tracks with another 20 miles operated via trackage rights. The railroad serves the Gulfport-Biloxi-Pascagoula region and Mississippi's Gulf Coast ports en route to New Orleans.
- **Canadian National Railway Company.** The Canadian National Railway Company (CN) is Canada's largest carrier. It operates 757 track miles in Mississippi via its subsidiary, the Illinois Central Railroad Company. CN's main route extends southward from Memphis to Jackson, with the main track route continuing almost due south to New Orleans.
- **Kansas City Southern Railway (KCS).** Kansas City Southern Railway (KCS) was acquired by Canadian Pacific Railway (CP), but will operate independently of CP until the U.S. Surface Transportation Board (STB) issues its decision on the companies' joint railroad control application to create Canadian Pacific Kansas City (CPKC).[2] KCS operates about 576 route miles in Mississippi and owns 27 percent of the Mississippi rail network, making it the largest railroad in the state based on ownership.
- **Norfolk Southern**. Norfolk Southern (NS) has two principal routes in Mississippi with one cutting diagonally across the northeast corner of the state via Corinth. The other route stretches from Meridian to Hattiesburg and Picayune en route to New Orleans from Birmingham and points in north and east. NS operates a total of 211 route miles in Mississippi.

Besides the state's Class I carriers, Mississippi has an extensive network of "short line" (i.e., Class II and III) railroads. They operate on a combined 990 miles of track in Mississippi and comprise 30 percent of the state system in terms of rail route miles ownership. The state's 22 short line railroads are critical for providing connecting service to the Class I railroads for industrial parks, ports, and other shippers that depend on rail. Often, short line railroads own and/or operate lines abandoned or spun off by Class I carriers.

[2] "2019 Capital Plan". Canadian National Railway Company. Available from: https://www.cn.ca/en/about-cn/capital-investments-plan/ .

Figure 7. | Class I & Short Line Railroads



Source: Mississippi Department of Transportation.

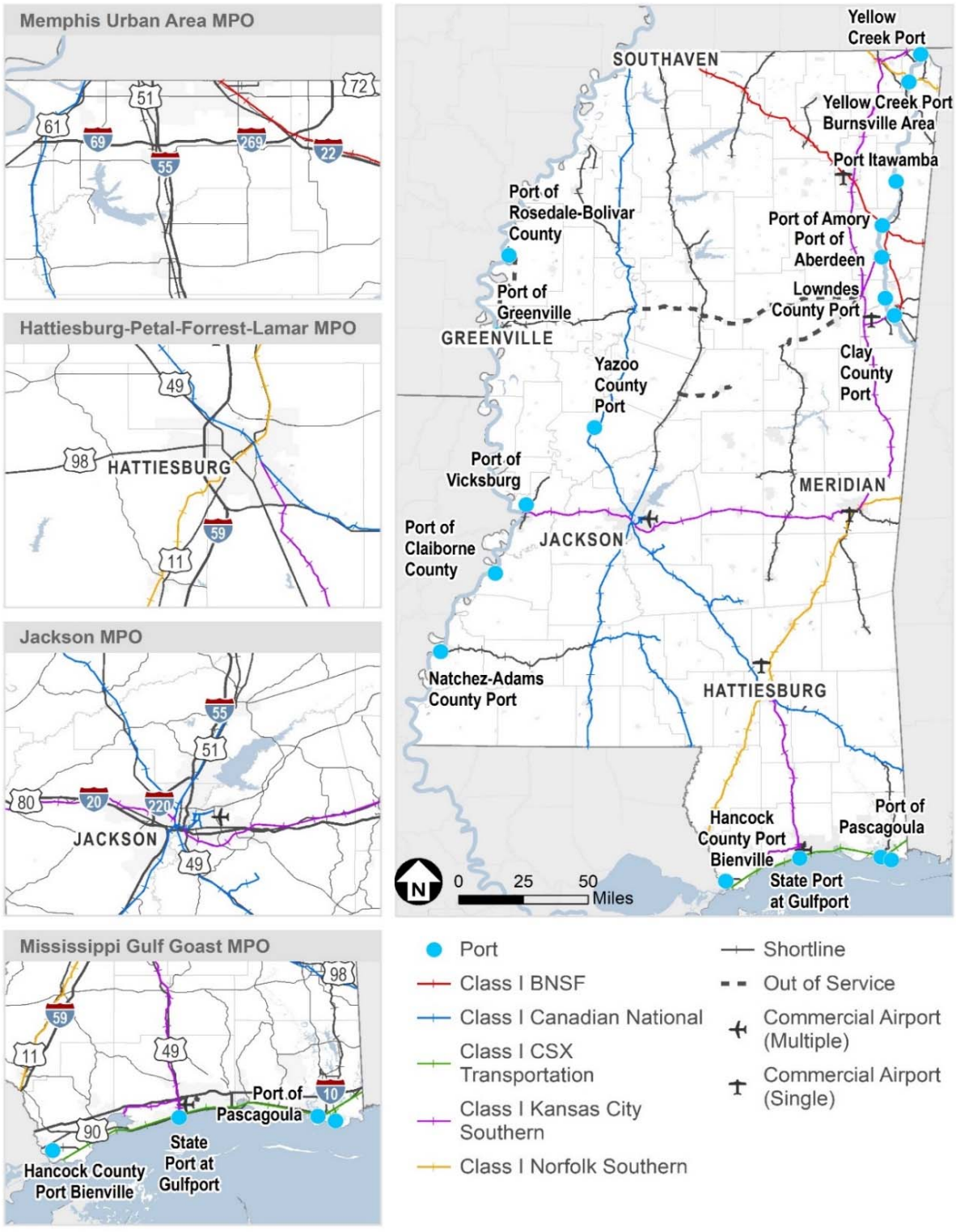
Multimodal freight rail terminals are facilities that transfer freight between rail and other transportation modes and are an integral part of the rail system. There are two major categories of multimodal freight rail terminals within the state: rail-truck and port-rail. For the transfer of goods between rail and truck, there is a single rail-highway trailer/container intermodal facility and bulk transfer facility in the state. Both are in Richland, MS with the intermodal terminal also referred to as the Richland Intermodal Facility being jointly operated by CN and KCS. For port-rail transfers, 13 of Mississippi's 16 ports have rail access or have plans to add rail access. These ports are listed in Table 2 and shown in Figure 8.

Table 2. | Mississippi Rail-Served Water Ports

Port	Waterway	Serving Rail Carrier
Bienville	Gulf of Mexico	PBVR
Gulfport	Gulf of Mexico	KCS, CSXT
Pascagoula	Gulf of Mexico	MSE, CSXT
Greenville	Mississippi	CAGY
Natchez	Mississippi	NTRZ
Rosedale[1]	Mississippi	Formerly GTR, renovation of branch line planned
Vicksburg	Mississippi	VSOR
Yazoo County	Mississippi	CN
Aberdeen[1]	Tennessee-Tombigbee	Plans to construct a spur to Class 1 KCS
Amory	Tennessee-Tombigbee	BNSF
Itawamba	Tennessee-Tombigbee	MSRW
Lowndes County	Tennessee-Tombigbee	KCS, CAGY
Yellow Creek	Tennessee-Tombigbee	YCRK

Source: MDOT

Figure 8. | Multimodal Freight Facilities and Ports



Source: Mississippi Department of Transportation.

Conditions and Performance

Freight rail network capacity is critical in keeping Mississippi's network economically competitive. The growth potential is dependent on sufficient excess capacity to handle increased movements. Some key elements that determine physical capacity limits include:

- Weight limits
- Vertical clearances
- Rail line operating speeds

Rail lines that are out of service or weight limited can present issues to shippers and the local economies. Sometimes lines are abandoned, or they cannot handle the standard 286,000-pound railcars, so they are not sufficient to move goods. Vertical clearances of 22 feet and 6 inches are needed to allow for all standard rail car configurations, including double-stacked intermodal and tri-level auto carries.

Railroad Conditions Limiting Performance

Mississippi has **197** rail-miles of *abandoned tracks* and **483** rail-miles of *weight-limited tracks* across **Class I and III railroads**.

In total, **295** bridges *cross over railroads* and about **27** percent (80 bridges) *do not meet* the desired **under clearance level**.[1] Some of these bridges are located on the state's primary freight rail corridors between Hattiesburg/Jackson and Hattiesburg/Meridian.

[1] *Note that this is based on unique bridge IDs. National Bridge Inventory 2021*

Rail line operating speeds determine how quickly shipments can move within a corridor. The operating speed is determined by several factors, including control systems, grade-crossing conditions, and track conditions. Top speeds can be mixed, but locations on the CN, KCS, and CSXT mainlines allow speeds up to 60 mph. The KCS mainline from Hattiesburg to Gulfport allows for speeds up to 49 mph along some segments. Train speeds outside of mainlines are generally slower, with trains operating on single-track lines with line speeds of less than 39 mph.

Railroad safety is another factor to consider when assessing conditions and performance. Between 2011-2020, train incidents and highway-rail incidents have decreased by 36 percent and 12 percent, respectively.[3] The largest number of highway-rail incidents occurred in Harrison County, which contains the Cities of Gulfport and Biloxi and is the second most populous county in the state.

[3] Source: FRA Office of Safety Analysis, 10-Year Accident/Incident Overview 2011-2020

Marine

Inventory of Assets

Mississippi has a total of 16 ports that are located along its three commercial waterways - the Gulf of Mexico which is part of Marine Highway M-10, Mississippi River which is part of Marine Highway M-55, and the Tennessee-Tombigbee Waterway which is part of Marine Highway M-65. This network of waterways allows for efficient movement of freight to, from, through, and within the state. Furthermore, Mississippi's ports serve as an intermediate stop in route to other Gulf Coast ports, such as the Port of Mobile in Alabama or the Port of New Orleans in Louisiana. Most of the ports in Mississippi are operated by local entities, except for the Port of Gulfport and Yellow Creek Port, which are operated by the state. All 16 ports are listed below and shown in Figure 9.

Gulf of Mexico

- Port Bienville
- Port of Gulfport
- Biloxi Port Division
- Port of Pascagoula

Mississippi River

- Port of Rosedale-Bolivar
- Port of Greenville
- Yazoo County Port
- Port of Vicksburg
- Port of Claiborne County
- Port of Natchez-Adams County

Tennessee-Tombigbee Waterway

- Yellow Creek Port
- Port Itawamba
- Port of Amory
- City of Aberdeen Port
- Raymond D. Lucas Memorial Port
- Lowndes County Port

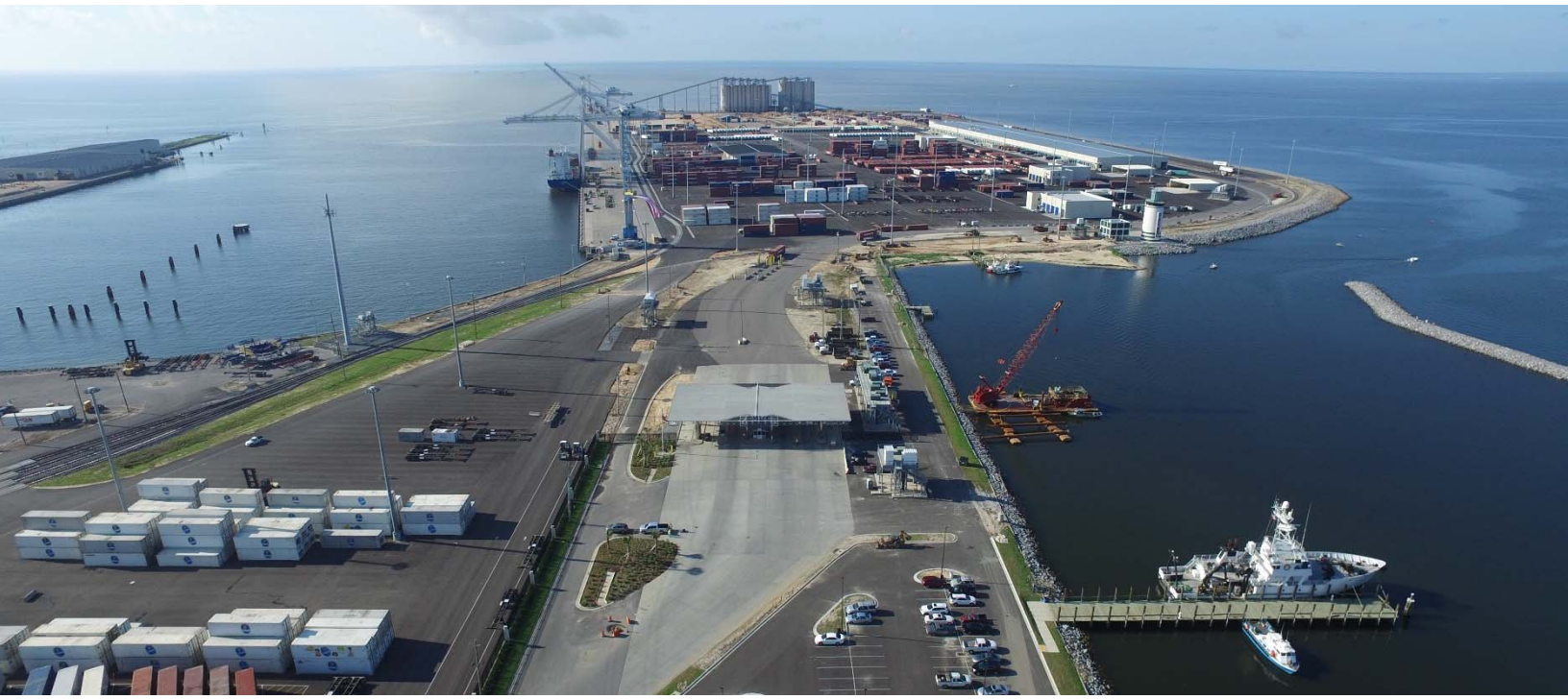
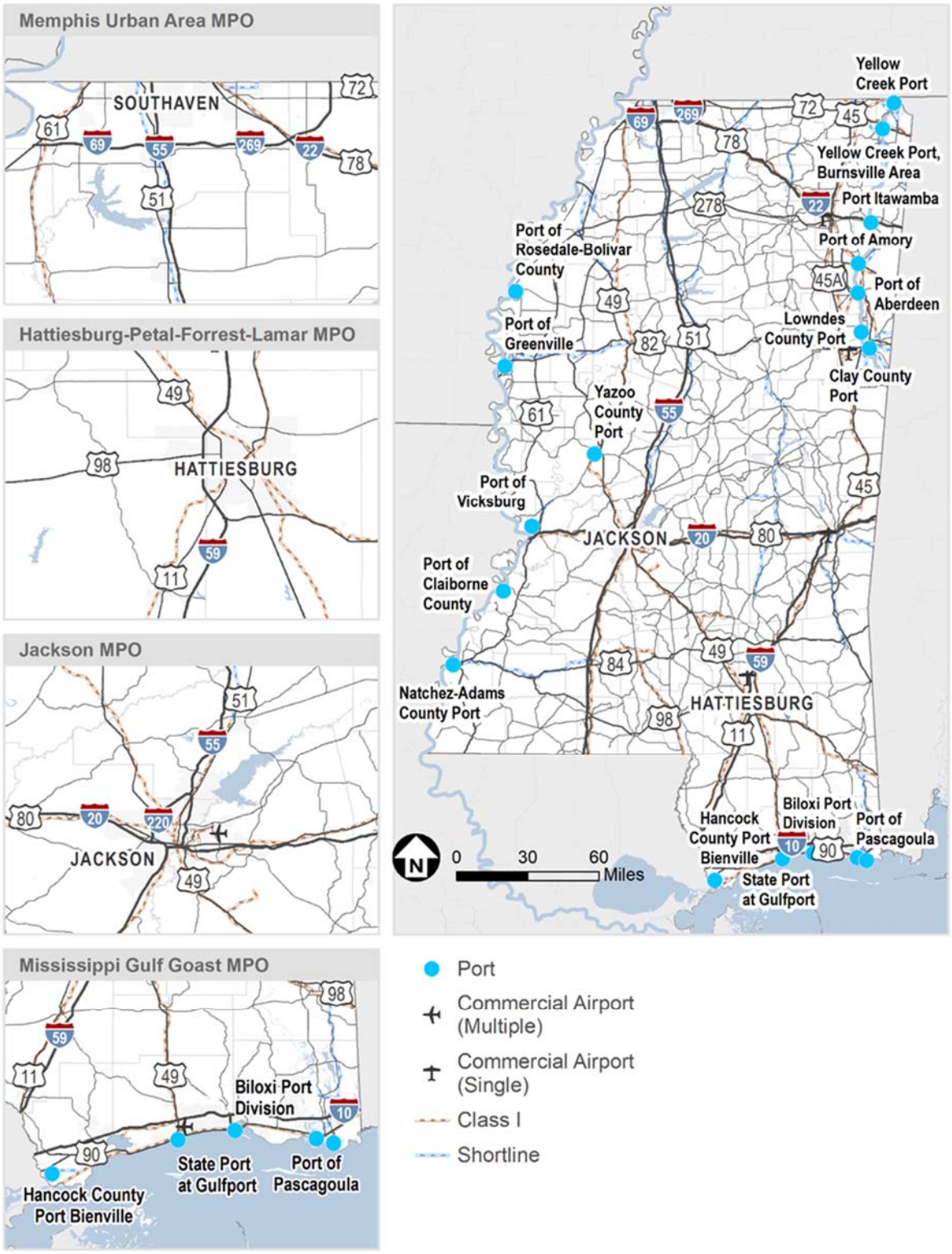


Figure 9. | Mississippi Ports



Source: Mississippi Department of Transportation.

The Port of Gulfport is one of the largest ports in Mississippi and encompasses approximately 300 acres with nearly 6,000 feet of berthing space across 10 vessel berths. The Port of Gulfport is primarily a container port and has two terminals, East Pier and West Pier. It has one 100-ton capacity mobile harbor crane, three ship-to-shore gantry cranes, and a specialized ramp built for roll on, roll vessels. In addition, the Port of Gulfport has an inland port facility about six miles north of the deep-water port along Seaway Road, which is just south of I-10. The Port of Gulfport is a major port of entry for fresh fruit from South America and was ranked #25 in the U.S. in terms of container trade in 2019.[4] Typical commodities handled by the Port of Gulfport include refrigerated bananas and other fresh produce, paper, containerized apparel, and crushed limestone.

The Port of Pascagoula is the largest seaport in Mississippi by tonnage as it moves on average about 26 million tons of cargo on an annual basis. It is one of the largest ports in the nation. In 2019, the Port of Pascagoula ranked 25th in total tonnage among U.S. ports.[5] The port has a combination of public and private terminals. The public terminals include West Harbor (Pascagoula River Harbor), which offers 436,000 square feet of covered storage, and East Harbor (Bayou Casotte Harbor), which offers a transit shed and over 250,000 square feet of paved open storage. Typical commodities served by the port include forest products, crude oil, chemicals, and aggregates, while typical outbound commodities include forest products, paper products, petroleum products, chemicals, and project cargo.

Other Gulf Coast Ports include the Port of Bienville and the Biloxi Port Division. Port Bienville, in Hancock County, is a shallow draft port and industrial park home to 18 industries and several public and private terminals. The port features a 3,600-acre industrial site and has 1,000 acres available for future development. Typical commodities moved at Port Bienville include chemicals, coal, construction materials, plastics, and metals. The Biloxi Port Division, located in Biloxi in Harrison County, accommodates pleasure craft users and commercial fishing operations on the Northern Gulf of Mexico.

Mississippi River ports facilitate cargo that is ultimately transshipped to the Port of New Orleans for international trade. There are six ports along the Mississippi River: the Ports of Rosedale, Greenville, Vicksburg, Claiborne County, Natchez-Adams County, and Yazoo County Port.

- **Port of Rosedale.** The Port of Rosedale is in Bolivar County and primarily serves the agriculture sector and other regional industries. Typical commodities served by the port include

[4] Bureau of Transportation Statistics, Port Performance Program. Port Profiles. https://www.bts.gov/ports.

[5] American Association of Port Authorities, Port Industry Statistics. 2019 U.S. Port Rankings by Cargo Tonnage. https://www.aapa-ports.org/unifying/content.aspx?ItemNumber=21048.

soybeans, rice, winter wheat, corn, fertilizers, aggregates, cottonseed, steel coils, and wire rod and shapes.

- **Port of Greenville.** The Port of Greenville is located in Washington County and was ranked #74 in the U.S. in terms of total domestic trade and #91 in total tonnage in 2019.[6] Typical commodities moved at the port include bulk, break-bulk, and project cargo, rice, winter wheat, corn, soybeans, petroleum products, frac sand, chemicals, and scrap steel. The port also has a Foreign Trade Zone (No. 158) and has Port of Entry status.
- **Yazoo County Port.** The Yazoo County Port is located along the Yazoo River, which connects to the Mississippi River via the Vicksburg Harbor Channel. The natural river conditions of the Yazoo River do not provide sufficient and a reliable channel for barge transportation. Because the Yazoo River level fluctuates, it is not maintained to support commercial navigation.
- **Port of Vicksburg.** The Port of Vicksburg is located in Warren County. It ships just over three million tons of freight annually and was ranked #92 in the U.S. in terms of total domestic trade and #75 in terms of domestic trade in 2019[7]. Additionally, it is a designated Foreign Trade Zone and Port of Entry. Typical commodities handled at the port include agricultural products, oil and gas distribution, pig iron, fertilizers, lime, petroleum coke, and sand.
- **Port of Claiborne County.** Currently, the Port of Claiborne County is inactive. But the port's facilities and harbor channel are still maintained as there are ongoing efforts to bring it into operation.
- **Port of Natchez-Adams County.** Unlike other river ports that require cargo to be transloaded at a deepwater port for international shipping, the Port of Natchez-Adams County provides direct service to ports in 50 countries. Typical commodities handled at the port include lumber and other construction products, structural steel, liquid petroleum products, cotton, grain, scrap, dry bulk cement, biodiesel, chemicals, and oversized fabricated machinery components.

The Tennessee-Tombigbee Waterway (known as the Tenn-Tom Waterway) is located in the northeastern portion of the state. It provides a connection between the Tennessee River, located in northern Alabama and Tennessee, and the Tombigbee River, which connects to Mobile, Alabama along the Gulf of Mexico. Mississippi ports located along the Tenn-Tom Waterway include Yellow Creek Port, Port of Itawamba, Port of Amory, City of Aberdeen Port, Raymond D. Lucas Memorial Port, and Lowndes County Port.

---

[6] American Association of Port Authorities, Port Industry Statistics. 2019 U.S. Port Rankings by Cargo Tonnage. https://www.aapa-ports.org/unifying/content.aspx?ItemNumber=21048

[7] Ibid.

- **Yellow Creek State Inland Port.** Yellow Creek State Inland Port is located in Tishomingo County. The Yellow Creek State Inland Port has an approximately 400-acre footprint but has about 2,500 acres of developable land. There is a cluster of steel fabrication and processing companies at Yellow Creek State Inland Port. As such, typical commodities handled by the port include steel coils, I-beams, pig iron, and steel rods.
- **Port of Itawamba.** The Port of Itawamba is located in Itawamba County. Typical commodities handled at the port include general cargo, bulk/palletized cargo, steel pipe, forestry products, coiled steel, steel scrap, and manufactured equipment.
- **Port of Amory.** The Port of Amory is located in Monroe County along a Tenn-Tom waterway canal, which has little variation in river stages and low water velocity. Typical commodities include wood chips, wood pellets, rock salt, soybeans, ore, pet coke, steel, gravel, and raw materials for the chemical industry. There are approximately 1,200 acres of developable land around the port.
- **City of Aberdeen Port.** The City of Aberdeen Port is located in Monroe County and is considered a general freight transfer facility. Specifically, the port receives petroleum products shipped from the Gulf Coast for distribution to area markets. Other typical commodities include general cargo, synthetic slag, potash, bentonite clay, and wood products.
- **Raymond D. Lucas Memorial Port.** The Raymond D. Lucas Memorial Port is located in Clay County. Typical commodities handled by the port include grains, basic chemicals, crushed stone, and fertilizers.
- **Lowndes County Port.** The Lowndes County Port is located in the City of Columbus and is primarily used for the transfer of general commodities between barge, truck, and rail. Typical commodities include chemicals, construction materials, limestone, caustic soda, pig iron, and scrap steel.

Conditions and Performance

The capacity of port facilities can be measured by a variety of methods, including channel depth, available square footage of warehouse and dock space, and the total acreage of the port. The channel depth is the deciding factor on the type and size of ships that can utilize a particular port. Channel depth must be at least 47 feet to consistently provide service to larger ships. Currently, the Port of Pascagoula has the greatest channel depth in Mississippi, ranging from 38 to 42 feet. The Port of Gulfport has the second greatest channel depth at 36 feet following the port expansion and restoration project. Among ports along the Mississippi River, the Port of Natchez has the greatest depth at 22 feet, even greater than the Ports of Bienville and Biloxi along the Gulf Coast.

Mississippi's Largest Ports

1. **Port of Pascagoula** - the busiest Mississippi port in terms of total tonnage, facilitating nearly 26 million tons of goods shipped through the port with a nearly even balance of imports, exports, and domestic traffic.
2. **Ports of Greenville** – over 3.1 million tons of domestic goods shipped
3. **Ports of Vicksburg** – over 3 million tons of domestic goods shipped
4. **Port of Gulfport** – over 2 million tons of goods shipped with over 71 percent of traffic consisting of imports.
5. **Port of Rosedale-Bolivar** – over 1.4 million tons of goods were shipped with all its traffic consisting of domestic shipments.

Source: U.S. Army Corps of Engineer's (USACE) Waterborne Commerce Center, 2019.

Aviation

Inventory of Assets

In general, goods shipped via air are lightweight, time-sensitive, and high-value. Common examples of air freight include perishables (flowers, fish, produce), computers and peripherals, telecommunications equipment, vehicle parts, oil and gas drilling equipment, pharmaceuticals, clothing, medical supplies and equipment, and beauty supplies. Typically, air cargo movements take place via one of three types of carriers: all-cargo, integrated express, or on passenger airlines as belly cargo. All-cargo carriers operate airport-to-airport freight services for their customers but do not offer passenger service. Examples of all-cargo carriers include Antonov Airlines and Kalitta Air Cargo. Integrated express operators rely on a hub-and-spoke system to move the customer's goods door-to-door, providing shipment, collection, transport via air/truck, and delivery.

Neighboring Aviation Assets

Although not located within the state, Memphis International Airport (MEM) is important to freight activity in Mississippi. MEM is located just north of the Mississippi-Tennessee state line and is the largest cargo airport in the United States and the second-largest in the world. It is the global hub for Federal Express (FedEx) and hosts other significant air cargo carriers such as the United Parcel Service (UPS), Air Transport International, and Mountain Air.[1] Cargo operations at MEM impact freight development and activity patterns in northern Mississippi, especially DeSoto County.

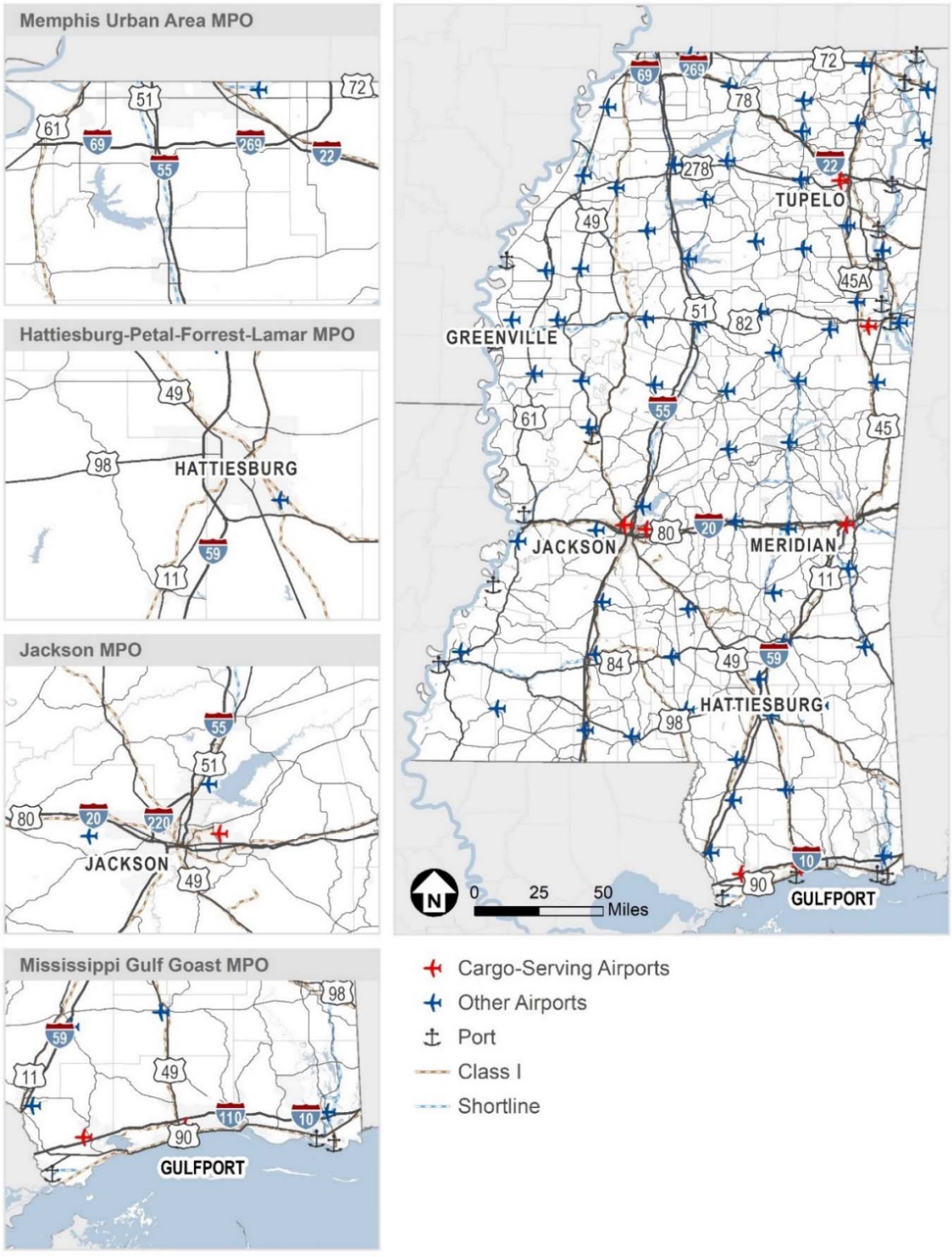
[1] *Greater Memphis Regional Freight Plan, 2017, https://memphismpo.org/sites/default/files/public/documents/Greater%20Memphis%20Regional%20Freight%20Plan.pdf*

Integrated express operators include FedEx Express and United Parcel Service (UPS). Passenger airlines typically offer air cargo services via "belly cargo" that is stored under the main deck of the aircraft. Several airlines, for example Lufthansa and Emirates, operate fleets of both dedicated passenger and freighter aircraft.

There are 74 public use airports within Mississippi and 7 are cargo-serving airports. The 7 cargo airports within the state include and are shown in Figure 10:

- Jackson-Medgar Wiley Evers International Airport.
- Stennis International Airport.
- Tupelo Regional Airport.
- Gulfport-Biloxi International Airport.
- Golden Triangle Regional Airport.
- Hawkins Field Airport.
- Key Field/Meridian Regional Airport.

Figure 10. | Cargo - Serving Airports, 2021



Source: Mississippi Department of Transportation; Cambridge Systematics, Inc. analysis.

Conditions and Performance

In 2019, over 10,000 tons of freight landed at Mississippi's airports based on data from the Bureau of Transportation Statistics' Air Carrier Statistics Database. United Parcel Service (UPS), Delta Air Lines, and Antonov Airlines are Mississippi's primary cargo carriers as they accounted for nearly all of Mississippi's air cargo activity. For example, UPS provided nearly 97 percent of all cargo services to Mississippi in 2019. Jackson-Medgar Wiley Evers International Airport (JAN) is Mississippi's primary cargo-serving airport. In 2019, JAN accounted for the vast majority of Mississippi's air cargo activity at over 99 percent.

Runway length is one of the most critical characteristics that impact an airport's ability to accommodate air cargo service. It determines the size of aircraft that can operate at an airport. Runway lengths of 8,000 feet are required for most domestic cargo operations, while 10,000 feet is preferable for international operations. In addition, heavy lift air cargo aircraft generally require longer runways because they require more room for takeoff and landing due to the heavy weight of a full fuel load and cargo.

Mississippi airports with at least one runway that is 8,000 feet or longer:

- **Meridian Regional Airport** (10,003 ft),
- **Gulfport-Biloxi International Airport** (9,002 ft),
- **Jackson-Medgar Wiley Evers International Airport** (8,500 ft),
- **Tunica Municipal Airport** (8,500 ft),
- **Stennis International Airport** (8,497 ft),
- **Golden Triangle Regional Airport** (8,003 ft), and
- **Greenville Mid- Delta Airport** (8,001 ft).

Pipeline

Inventory of Assets

Pipelines are an important asset to the multimodal freight system as they serve a vital role in the energy sector. Though pipeline infrastructure is privately owned, it is included in the freight plan given its public importance. There are multiple types of pipelines within the system for collecting, transmitting, and distributing products.

Collection pipelines move products to regional hubs which then connect to storage facilities or terminals along the Gulf Coast which connect to many international markets. Transmission pipelines carry the product from terminals to market hubs, other terminals and processing plants that sell fuel and other products refined from these resources to customers via distribution pipelines. Many transmission pipelines are interstate systems that supply products to other states and ports to ship to global markets. The petroleum supply chain relies heavily on these pipelines for transportation of goods.

The four main commodities transported by pipeline include crude oil, natural gas, hydrocarbon gas liquids (HGLs), and refined petroleum products. These four main commodities are shown by pipeline in Figure 11.

Crude oil pipelines

Transport crude oil from well operations to terminals (gathering systems) and from terminals to Interstate pipelines (transmission lines) that transport product to refineries and large storage facilities. Based on 2020 data from the U.S. Energy Information Agency (EIA), there are seven crude oil pipeline systems operated in Mississippi.

Natural gas pipelines

Consist of gathering systems, interstate pipeline systems, and distribution systems that transport natural gas to gas processing plants, to residential and commercial customers, and to liquefied natural gas (LNG) facilities for export.

Hydrocarbon gas liquid (HGL) pipelines

Transport HGLs such as natural gas liquids (NGL), which include ethane, propane, butane, and others. NGLs are important to the petrochemical industry and are used to produce compounds for making plastics and resins. There are two HGL pipeline systems in Mississippi.

Refined petroleum pipelines

Transport refined petroleum from refineries to terminals and eventually to retail fuel stations. Refined petroleum products include gasoline, diesel, fuel oil, jet fuel, and other distillates. These products are shipped in "batches" along the pipeline and stored in storage tanks at petroleum storage terminals. These pipelines connect to Gulf Coast ports and are loaded onto ships for export. There are six refined petroleum product pipeline systems in Mississippi.

There are multiple pipeline operators in Mississippi, each having networks dedicated to the specific type of commodity being transported. Based on 2020 data from the U.S. Energy Information Agency (EIA), seven companies operate crude oil pipelines, several natural gas pipeline operators, one HGL pipeline operator, and five refined petroleum pipeline operators as shown in Table 3.

Table 3. | Pipeline Operators

Pipelines	Operators
Crude Oil	Enbridge, Shell Pipeline Company, Sunoco, Plains All American Pipeline, Hunt Crude Oil Supply, Genesis Energy, and Energy Transfer
Natural Gas	Enbridge Pipelines, Columbia Gulf Pipeline, Crosstex Mississippi Pipeline, Gulf South Pipeline Co., etc.
Hydrocarbon Gas Liquids	Enterprise Products
Refined Petroleum	Colonial Pipeline, Kinder Morgan, Marathon Pipeline, Enbridge, and Collins Pipeline

Figure 11. | Crude Oil, Natural Gas, Petroleum Product, and HGL Pipelines, 2020

Source: U.S. Energy Information Agency, April 2020.

Conditions and Performance

The safety and age of pipelines are important performance measures for the pipeline system. According to data from the Pipeline and Hazardous Materials Safety Administration (PHMSA), there were 195 incidents over the 2001 to 2020 period. On average, Mississippi experiences about 10 pipeline incidents annually. Most incidents did not result in serious injury and there were 5 fatalities and 17 serious injuries reported from 2001 to 2020.

The new construction of natural gas distribution hazardous liquids pipelines has decreased the average age of the network. In 2005, only about 11 percent of natural gas distribution pipelines had been installed in the year 2000 or later. By 2020, this amount had increased to 27 percent. For natural gas transmission pipelines, in 2005 only about two percent of lines were installed in the year 2000 or later. By 2020, this amount had climbed to approximately 14 percent. The share of hazardous liquids pipelines constructed since 2000 or later has only slightly increased, from about 11 percent of total mileage in 2010 to about 14 percent by 2020. Though these reductions represent significant improvements in conditions, they also suggest that some of the most vulnerable components of the pipeline network (as indicated by age) are still prevalent throughout the state.

2.3 Freight Trends

Transportation trends and freight demand are impacted by the state's economy. Since 1998, the total number of jobs in Mississippi has increased from nearly 1.45 million to over 1.54 million in 2020.[8] This trend is expected to continue as the state's employment growth is on par with its population growth over this same period. As Mississippi continues to grow its employment base, there will be increased demand for freight transportation services to support those industries. Broader national emerging trends may disrupt long-term freight outlooks, including the potential for connected and autonomous vehicles, alternative fuel commercial vehicles, changing business and consumer practices like e-commerce, and changes in international trade policies.

Commodity Flow Data

The Commodity Flow data is based on the Federal Highway Administration's Freight Analysis Framework version 5 (FAF5) database and the Surface Transportation Board's Carload Waybill Sample.

The FAF5 integrates data from a variety of sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation. Data from the FAF5 was merged with data from the Carload Waybill Sample, which is a stratified sample of carload waybills for all U.S. rail traffic submitted by those rail carriers terminating 4,500 or more revenue carloads annually.

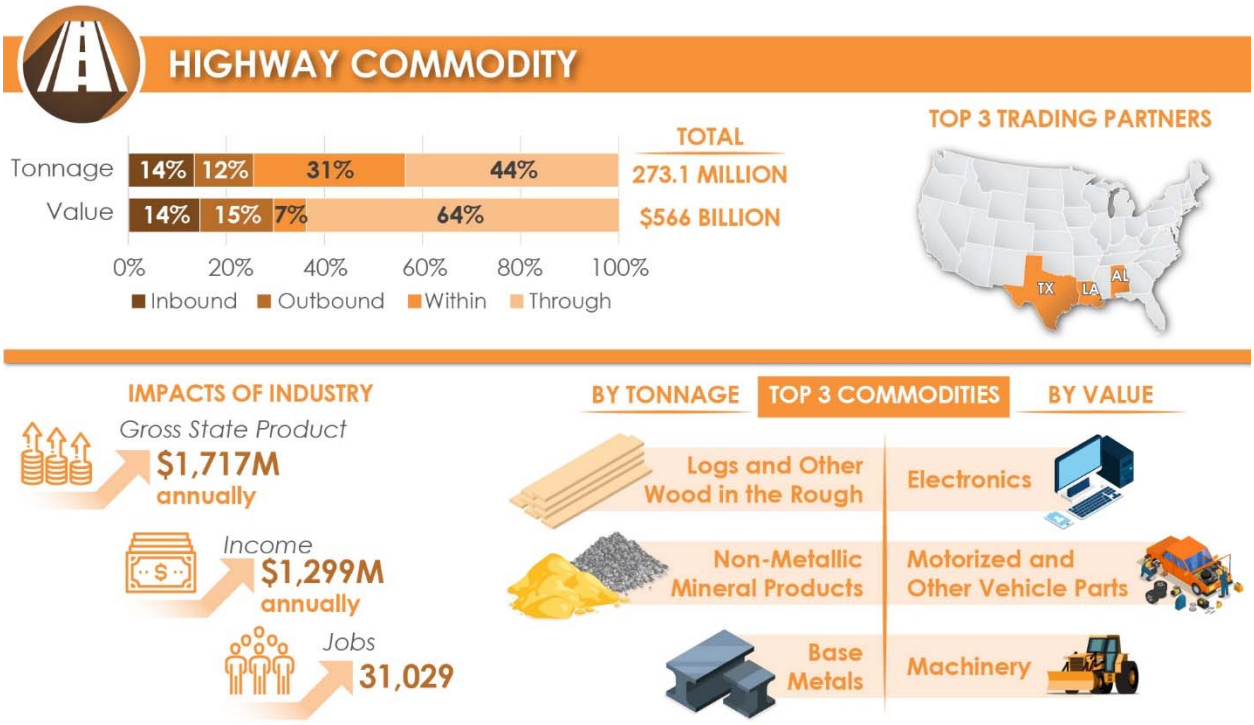
[8] U.S. Bureau of Economic Analysis, SAEMP25N Total Full-Time and Part-Time Employment by NAICS Industry, https://apps.bea.gov/iTable/iTable.cfm?reqid=70&step=1&acrdn=4.

Commodity Flows & Economic Impacts of Freight

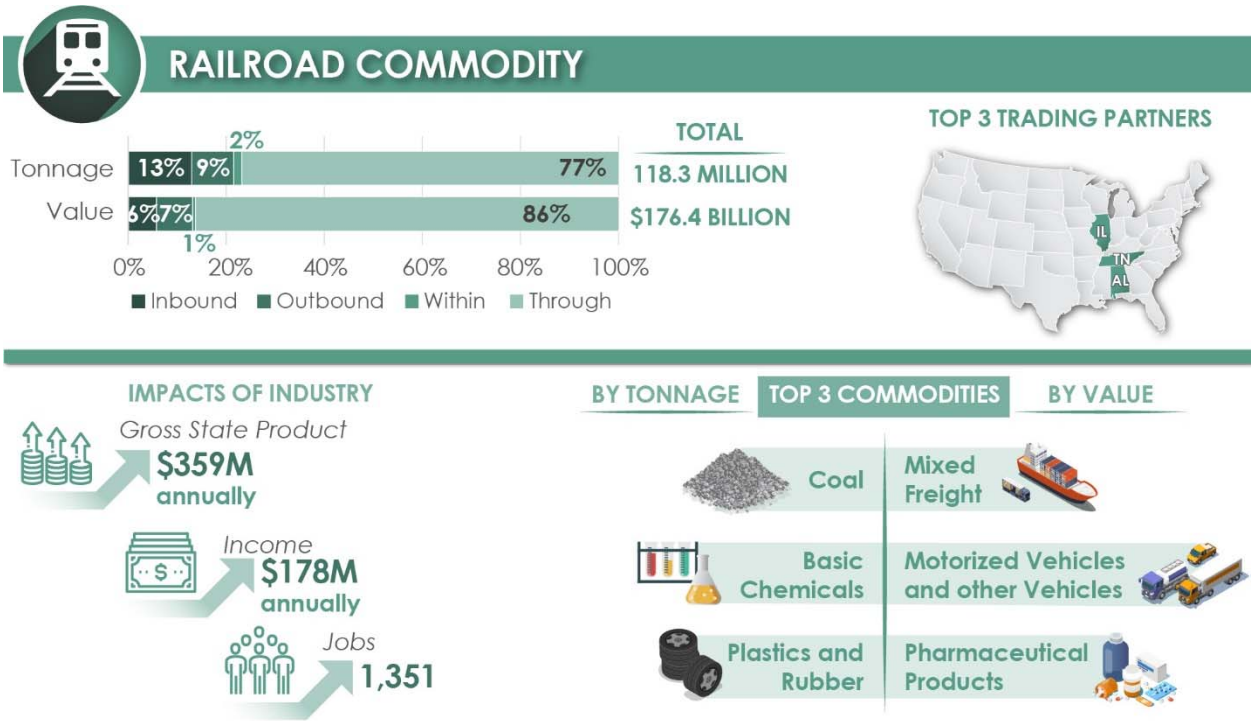
The commodity flow analysis examines the tonnage and value of goods transported across Mississippi for each of the state's major freight modes: highway, rail, marine, aviation, and pipelines. These profiles also identify the top commodities and trading partners by mode. The purpose of this analysis is to illustrate the economic activity underlying the freight activity on the state's network.

International trade is primarily experienced through the state's marine system. Foreign zones that are the top international trade partners for Mississippi as captured by import and export tonnage and value of waterborne commodity flows are Mexico, the rest of Americas including South America and the Carribeans, and Southwest and Central Asia.

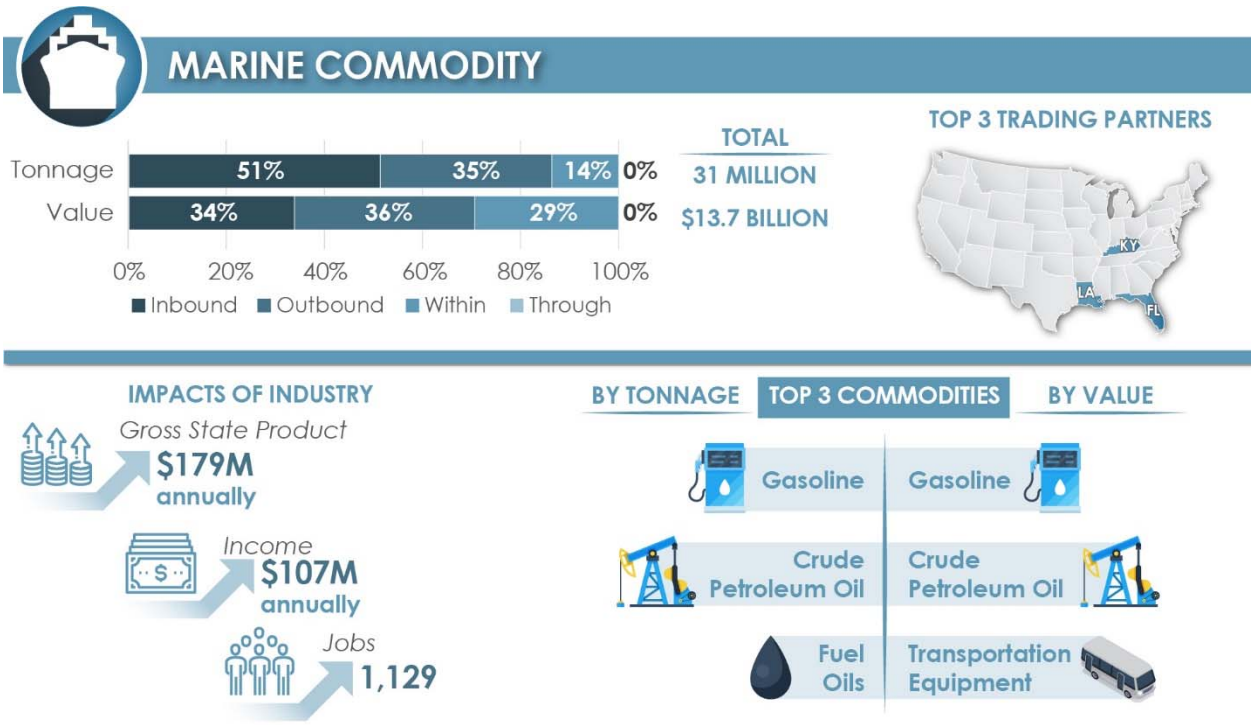
Highway



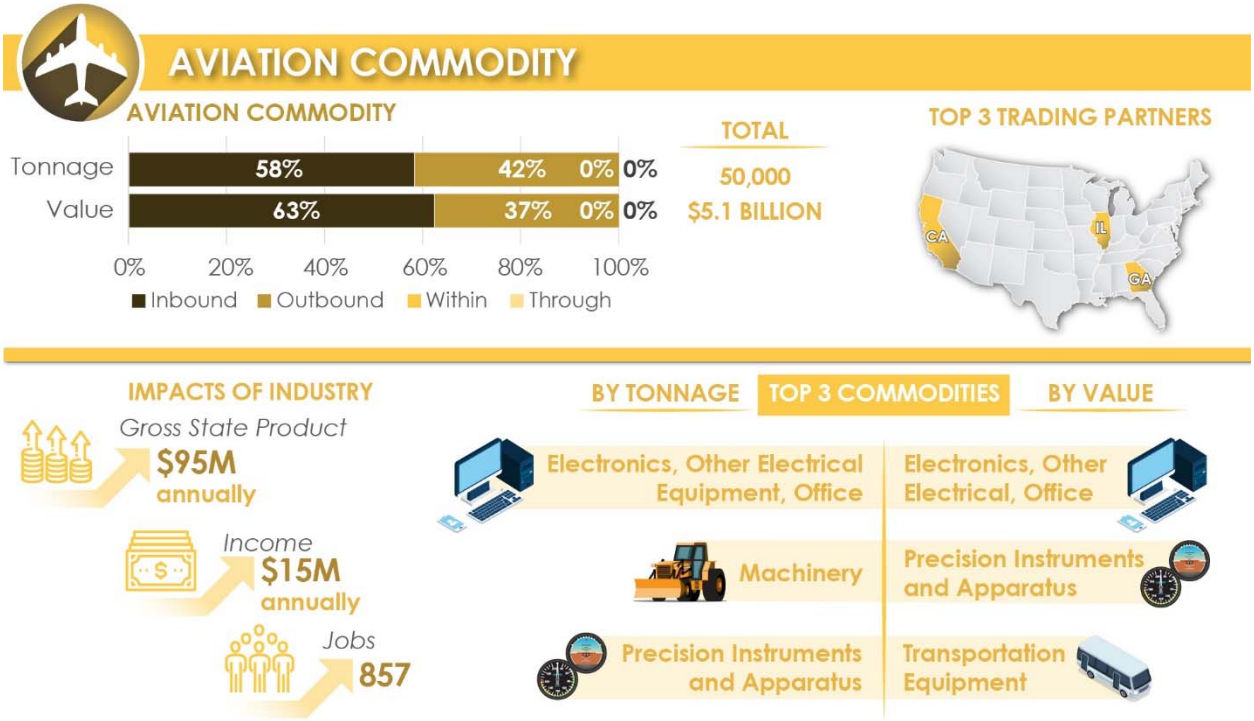
Railroad



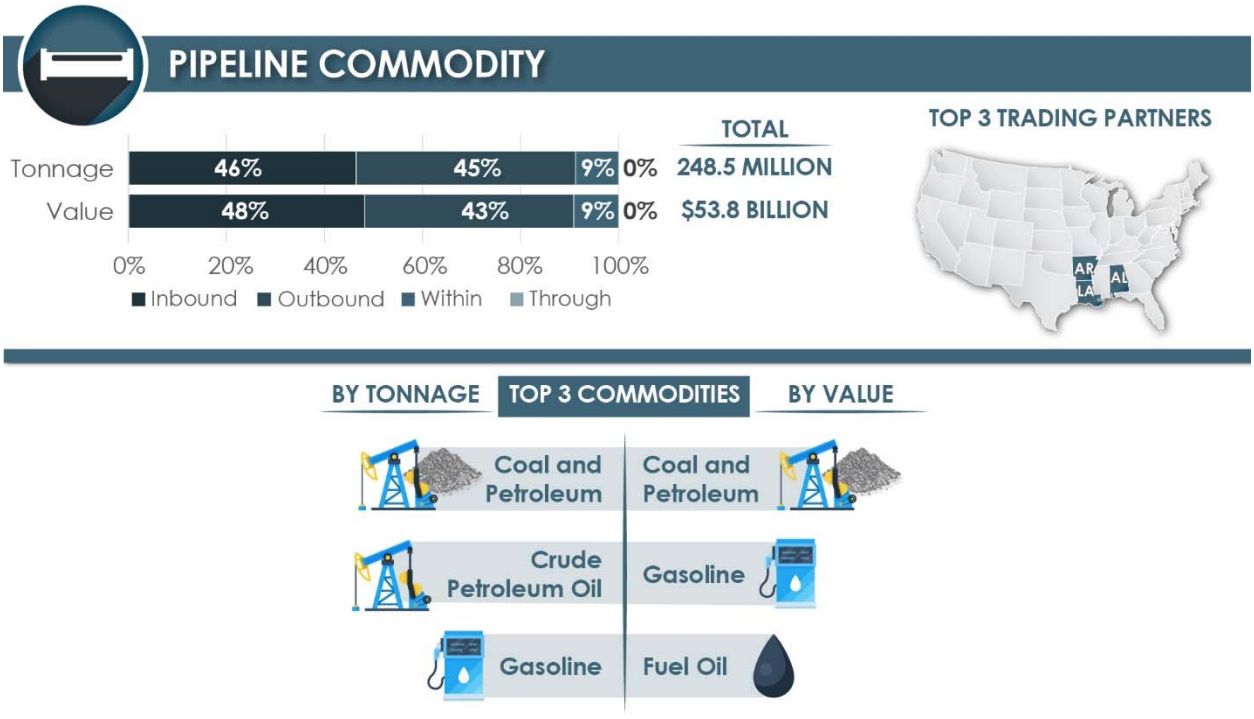
Marine



Aviation



Pipeline



The Role of Freight in Mississippi's Economy

Mississippi's multimodal freight network is critical to the State's economy and enables the productivity of a broad range of freight-intensive industries. Freight-intensive industries are those industry sectors that heavily depend on, and often make location decisions based on access to the multimodal freight network. These industries are major producers, consumers, or distributors of freight and include industries that are goods producing, service providing, or involved in moving large volumes of freight.

One in every four direct jobs in the state belongs to freight-intensive industries.[9] These industries contribute 36 percent of wage earnings and more than one-quarter of annual GDP as shown in Table 4.

[9] The state's economy detailed data on employment, wages, and GDP was used to measure the direct economic contribution of freight-intensive industry sectors.

Table 4. | Direct Economic Contribution (Shares) from Employment Generated by Freight-Intensive Industries in Mississippi, 2019

	Employment	Wages (Millions of 2019$)	GDP (Millions of 2019$)
All Sectors	1,135,598	46,204	113,257
Freight-Intensive Industries	310,871	16,804	30,827
Freight-Intensive Industries (Share)	27%	36%	27%

Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages and CPI US City Average; U.S. Census Bureau, Non-Employer Statistics; U.S. Bureau of Economic Analysis, GDP by State; Association of American Railroads, State Data

Emerging Trends Impacting Freight

Multiple emerging trends may impact the long-term outlook for freight transportation demand in Mississippi. However, a few trends are considered especially important for the Statewide Freight Plan update due to their potential to disrupt demand and influence how freight moves across the network. These include connected and autonomous vehicles, alternative fuel commercial vehicles, and changing business and consumer practices.

Connected and Autonomous Technology

Due to labor shortages and the continued need to improve safety and efficiency, the benefits of greater vehicle automation to the trucking industry are substantial. On a per-mile basis, labor and fuel are the two highest operational costs for the trucking industry. In addition, improving safety is a primary industry concern. Connected and autonomous technologies have the potential to improve all of these metrics.

Connected vehicle (CV) technology utilizes short-range communications to sense what other travelers are doing to identify potential hazards.

Vehicle-to-vehicle (V2V) and **vehicle-to-infrastructure (V2I)** allow for vehicles to have an awareness of each other's location.

The successful implementation of connected and autonomous vehicles has the potential to significantly enhance safety which has the secondary benefit of reducing congestion on the roadways. Connected and autonomous vehicles remove some opportunity for human error, which could result in a decrease in crashes which would allow for reductions in associated congestion, emission, and fuel costs. This could be a significant impact on the trucking industry due to truck drivers having to abide by the federal hours of service restrictions.

Potential Impacts to Freight

Fuel Savings: vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications can allow trucks to save fuel by more efficiently managing speeds based on traffic conditions through information sharing with traffic signals and other vehicles.

Safety Benefits: V2I tech to alert trucks of abrupt stops, curves, wrong-way drivers, lane departure warnings, and automatic braking.

Labor cost savings: truck operations without driver

Connected and autonomous vehicles are not expected to have a large impact on the overall volume of freight and types of movements. These technologies are aimed more at optimizing the flow of goods. As such, these technologies have great potential to influence how freight moves across the network.

Alternative Fuels Available for Commercial Vehicles:

Natural Gas – natural gas vehicles (NGVs) can provide smaller to moderated reduced GHG emissions over conventional diesel and gasoline fuels. There is limited fuel infrastructure so it is appropriate for commercial vehicles with activity that remains within a small region.

Biodiesel – biodiesel is a renewable, biodegradable fuel manufactured from vegetables oils, animal fats, or recycled restaurant grease. Almost all medium- and heavy-duty diesel vehicles are capable of running on biodiesel blends.

Propane – liquified petroleum gas (LPG) has long been used as a vehicle fuel. Propane fuel has a lower carbon content than conventional gasoline and diesel fuel and as a result, can provide life cycle GHG emissions reductions over conventional fuels.

Electric – electric powered medium and heavy-duty trucks can also work to reduce the overall environmental impact of the transportation sector. Electric trucks are seen as a way to reduce fuel costs for motor carriers.

Alternative Fuels

The advancement of commercial vehicles that use alternative fuels – namely natural gas, biodiesel, propane, and electric – is viewed as central to U.S. climate change goals. The widespread adoption of alternative fuel commercial vehicles could lead to substantial reductions in GHG emissions as transportation is one of the primary sources of GHG emissions, accounting for about 29 percent of all U.S. emissions.[10]

Despite the potential economic and environmental benefits of electrification, there are challenges. These barriers include higher upfront vehicle costs, costly and complex charging infrastructure processes, concerns with grid resiliency, and the impact of increased curb weight on infrastructure conditions. Furthermore, the push for alternative fueling comes with the need for fueling infrastructure to support alternative fuel. While at-home and fleet facilities charging stations are a good starting point, charging stations located at public facilities and along major highway corridors are needed for broader market acceptance.

[10] United States Environmental Protection Agency, "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2019,"

Business and Consumer Practices

E-commerce is a strategy for business-to-consumer (B2C) and business-to-business (B2B) sales that leverage digital platforms instead of brick-and-mortar marketplaces. E-commerce increased from 4 percent of total retail activity in 2010 to nearly 15 percent of total retail sales in 2020.[11] This increase in demand can be attributed to the COVID-19 pandemic, which pushed people to shelter-in-place. The steady growth of e-commerce as a preferred method for purchasing consumer goods has impacted freight traffic and land use in metropolitan regions, such as Jackson.

Example of the Impact of E-Commerce in Mississippi

A **700,000 square foot Amazon fulfillment center** being developed in *Madison County* near Canton

A new **UPS package distribution center** being developed near *Ridgeland*.

Sources:
https://www.clarionledger.com/story/news/2022/02/16/amazon-fulfillment-center-canton-mississippi-pushes-opening-date/6797916001/

https://www.clarionledger.com/story/business/2020/11/12/amazon-build-its-third-fulfillment-mississippi-center-canton/6265233002/

In response to the massive supply chain disruptions from 2020 through 2022, freight warehousing strategies will pivot from just-in-time delivery to stockpiling goods, before shippers find a balance between the two methods. These transformations in the supply chain will have impacts on local land use and traffic patterns. The COVID-19 pandemic exposed major weaknesses in supply chains for manufactured items, resulting in prolonged shortages of essential goods. The pandemic hastened efforts that were already underway for businesses to reexamine their supply chain to make them more resilient.

Mississippi's highway network will see increased truck trips due to e-commerce, reverse logistics, and increased manufacturing of goods. This will add additional wear and tear to the roads and bridges. There will also be greater volumes on the network on both highways and rail. The state should continue to partner with its MPOs to study freight corridors for planning purposes. It may take increased maintenance on impacted freight corridors as well as initiatives to better manage freight activity (such as ITS technology).

[11] U.S. Census Bureau, "Estimated Annual U.S. Retail Trade Sales – Total and E-Commerce: 1998-2020," Annual Retail Trade Survey: 2020.

3 FREIGHT SYSTEM ASSESSMENT

While the Mississippi freight system is contributing significantly to the economic health of the state, key freight needs and opportunities create limitations on the success of the Mississippi Multimodal Freight Network. As shown in Table 5, there are several needs and opportunities on Mississippi's multimodal freight network within the framework of the state's six freight goals to promote a safe and secure multimodal freight network, maintain infrastructure crucial to multimodal freight movement in a state of good repair, improve reliability and reduce congestion barriers to freight mobility, maximize the impact of the freight network on the productivity and economic competitiveness of the state, support the resiliency of the freight network while equitably minimizing the adverse impacts of freight operations on communities and the environment, and build external and freight industry partnerships and efficiently maximize freight investment.

These needs and opportunities were determined through data analysis and stakeholder engagement, which was a vital part of understanding needs as it allowed for feedback from users who interact with the freight system regularly. These needs and opportunities serve as the basis for developing recommendations and strategies as part of the Mississippi Statewide Freight Plan. It is important to note that though partnership and funding and economic development are not explicitly included in Table 5 below, it cuts across and impacts all of the quantitative goal areas and is accounted for in the recommended strategies.

Table 5. | Mississippi Freight System Needs and Opportunities

Category	Need or Opportunity
Maintenance & Preservation	**Highway infrastructure conditions** Pavements and bridges on some Tier I-II freight corridors need rehabilitation.
	Challenges on freight intermodal connectors Freight intermodal connectors need rehabilitation.
	Rail infrastructure conditions Some segments of track and bridges do not meet weight standards.
	Port infrastructure conditions Ports have preservation needs ranging from dock repairs to replacing railroad ties.
	Air cargo infrastructure conditions Cargo-serving airports have preservation needs including maintaining existing pavements, runways, taxiways, and aprons.
	Vertical clearances Some bridges crossing Tier I-II freight corridors do not have vertical clearances that meet the State's desired level.
Accessibility & Mobility	**Truck bottlenecks** Though Mississippi's highway network overall operates at a high level of service, there are bottlenecks especially in urban areas.
	Access to regional rail facilities and short lines Some short line railroads have limited capacity and ability to accommodate longer trains and service ports.
	Access to air cargo Runway lengths for cargo operations are typically at least 8,000 ft.
	Capacity and operations needs at ports Some ports have expansion needs ranging from new export terminals to storage areas and piers.
Safety	**Truck safety** Improve safety on highways with relatively high truck crash rates.
	Truck parking The amount of truck parking does not seem to meet demand, especially on the I-10 corridor.
	At-grade crossing safety Highway/rail incidents have decreased since 2016, but some crossings have multiple incidents.
Resiliency and Environmental Stewardship	**Negative impacts on disadvantaged communities** Disadvantaged communities often experience disproportionate freight-related congestion and environmental impacts.
	Freight network resiliency Some freight assets are vulnerable to flooding, sea level rise, and other risks.

The remainder of this chapter describes the current needs and opportunities of Mississippi's freight system. It first examines the supply chains of a selection of freight-intensive industries that are important to the Mississippi economy. The section then investigates the resiliency of the Mississippi freight network and how the freight network supports military logistics needs. It then assesses Mississippi's freight needs in light of the performance and conditions described in Chapter 2 and how they relate to supply chain, resiliency, military, environmental and equity, and freight bottleneck concerns.

3.1 Key Supply Chains

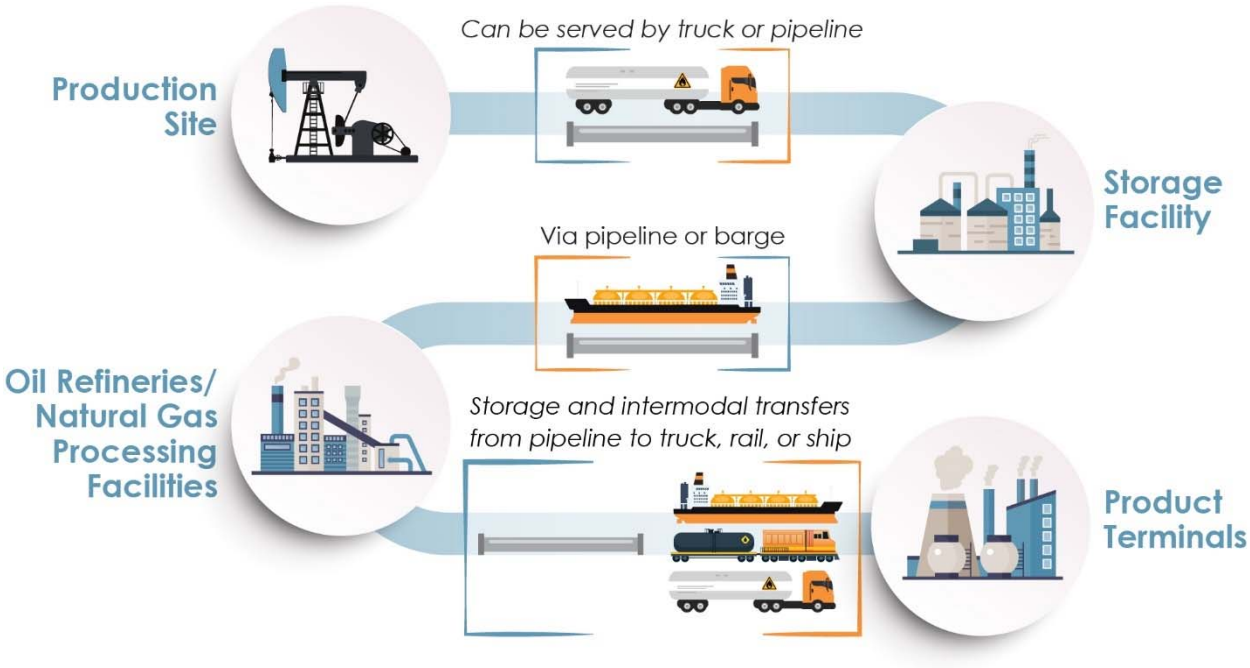
Mississippi's multimodal freight network is critical for facilitating the region's most critical supply chains. Disruptions to supply chains can have adverse effects on key industries and communities across the state. This section analyzes three key industry supply chains in Mississippi and their associated commodity flows oil and gas production, automotive manufacturing, and agriculture. For each key industry supply chain, the associated commodities were routed over the state's highway network using the MDOT Statewide Travel Demand Model and a qualitative analysis was performed to examine the role of non-highway freight assets. This section provides insights into the following: implications of statewide freight needs for particular industry sectors, which industries will benefit from investment in particular modes, and which industries rely heavily on the multimodal freight network.

Oil and Gas

In 2021, Mississippi produced approximately 37,000 barrels of crude oil, making it the 15th highest-producing state.[12] The Pascagoula oil refinery is the nation's 10th largest refinery, with the capacity to process about 356,000 barrels of oil per day into motor gasoline, diesel fuel, and other petroleum products. In addition, Mississippi is one of the few states with large underground salt caverns capable of storing natural gas, and the state has about one-fourth of the total U.S. underground salt cavern natural gas storage capacity.

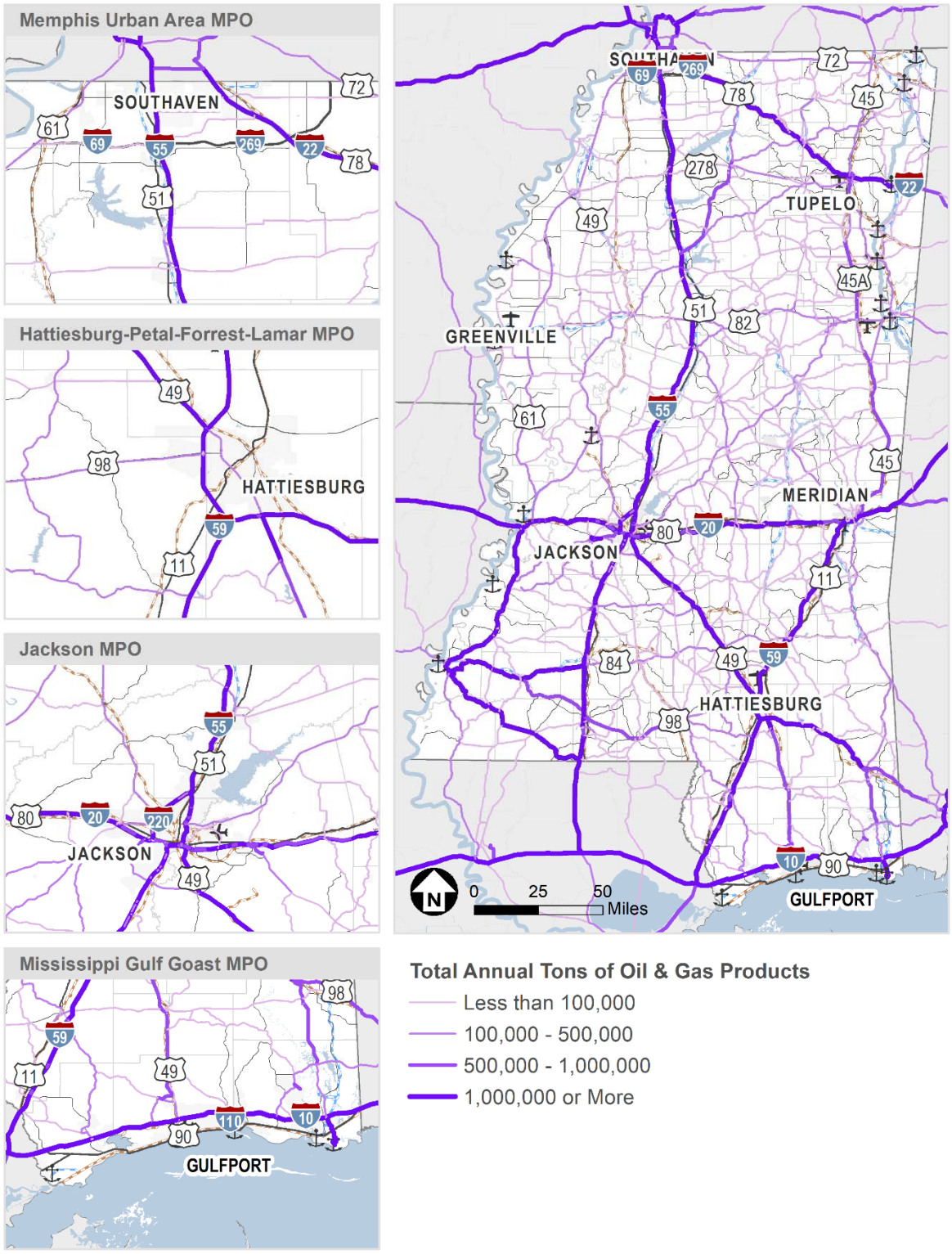
[12] Source: U.S. Energy Information Administration, Petroleum Supply Monthly, March 2022, preliminary data, https://www.eia.gov/energyexplained/oil-and-petroleum-products/where-our-oil-comes-from.php.

The oil and gas supply chain generally contains the following steps:



Although surface transportation modes of truck, rail, and ports serve an important role in the oil and gas supply chain, Mississippi's pipeline infrastructure is the backbone of the supply chain. The oil and gas-related commodities are shown by freight flows in Figure 12. These flows have implications for the freight investment needs on Interstate highways and corridors such as US 61, US 98, US 45, and US 49.

Figure 12. | Freight Flows of Oil and Gas Products, 2019



Source: FHWA Freight Analysis Framework, 5.0 and 5.2; Cambridge Systematics, Inc. analysis.

Automotive Manufacturing

Mississippi is home to Nissan, PACCAR, and Toyota assembly plants. In support of these plants, several vehicle parts suppliers have located in Mississippi including major tire manufacturers such as Continental Tire, Yokohama Tire, and Cooper Tire. The Mississippi Development Authority estimates that over 200 automotive industry companies are located in the state and employ over 15,000 people.[13]

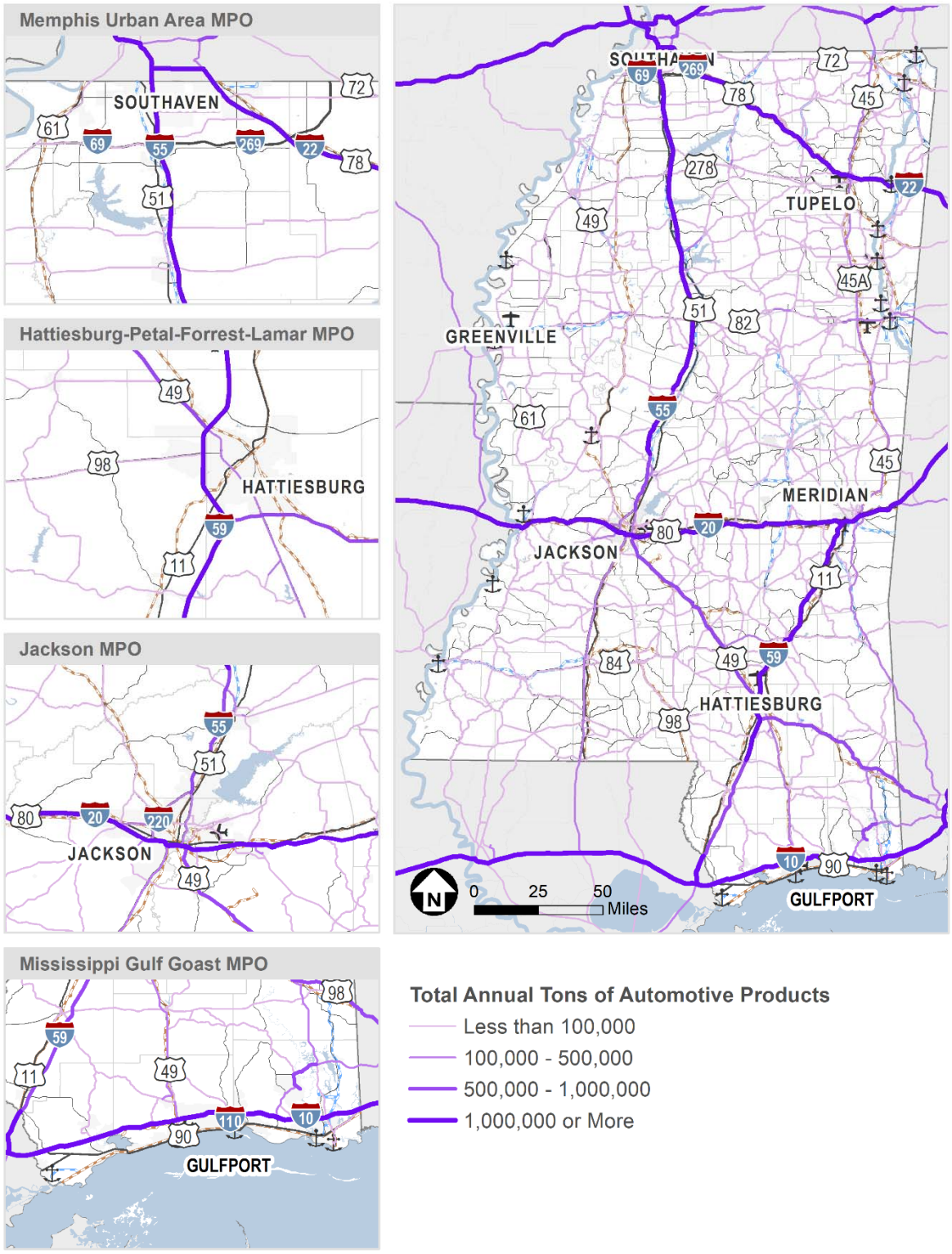
The automotive manufacturing supply chain steps include:

- Parts Suppliers to Manufacturing Plants
- Manufacturing Plants to Distribution Terminals
- Distribution Terminals to Vehicle Dealership

Freight flows for automotive manufacturing-related commodities are shown in Figure 13. Trucks are generally the main mode used for automotive manufacturing, so issues surrounding facilitating the automotive manufacturing supply chain include addressing bottlenecks and reliability along major highway corridors.

[13] https://mississippi.org/doing-business/industries/automotive/.

Figure 13. | Freight Flows of Automotive Products, 2019



Source: FHWA Freight Analysis Framework, 5.0 and 5.2; Cambridge Systematics, Inc. analysis

Agriculture

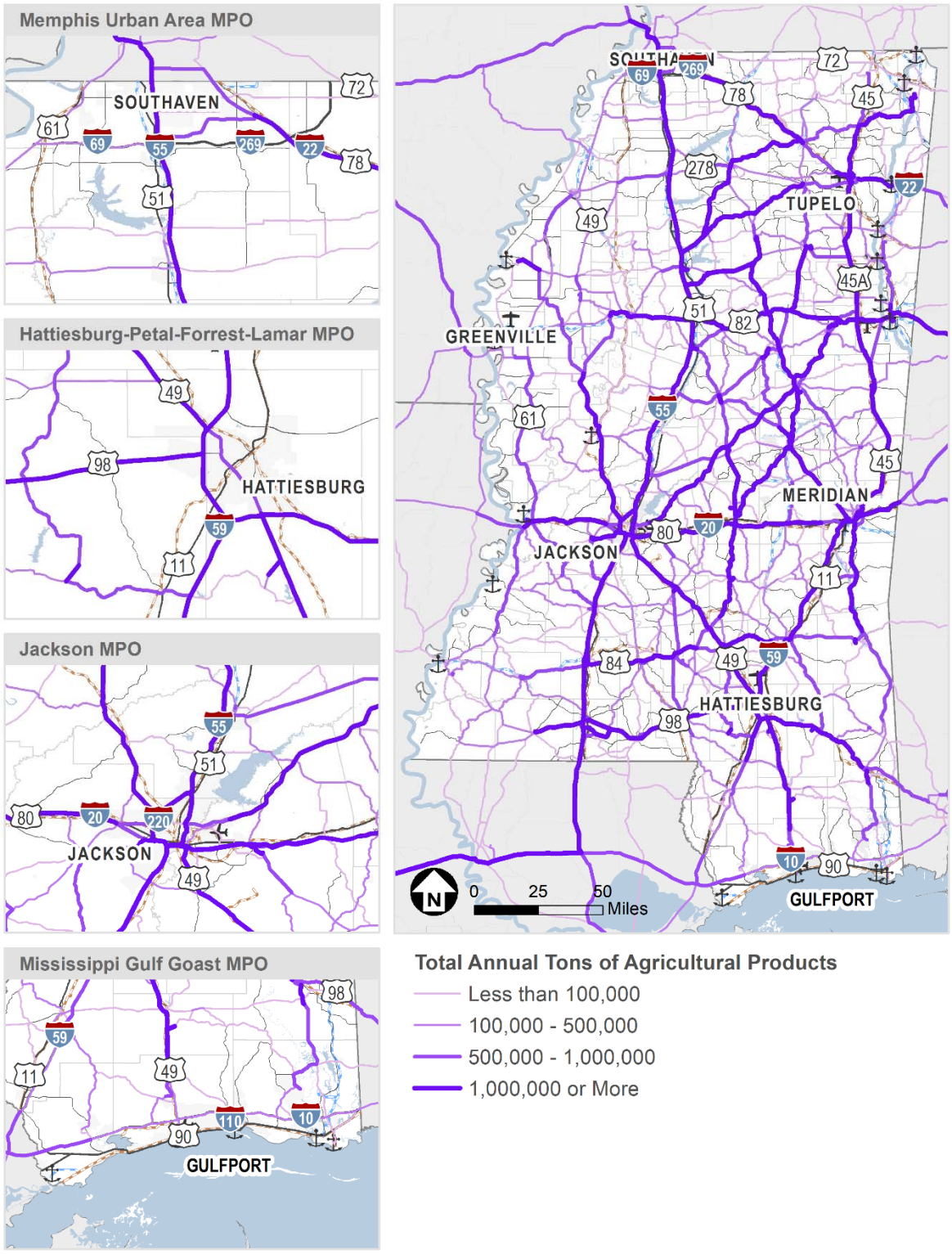
The U.S. is a world leader in agriculture and Mississippi is one of the leading agricultural states. According to the Mississippi Department of Agriculture and Commerce, agriculture is an $8.83 billion industry within the state with approximately 34,700 farms in the state. The top five agricultural crops in terms of value are poultry/eggs, soybeans, forest products, corn, and cotton.

The agricultural supply chain varies based on the specific good being transported, but the supply chain can generally be described as follows:

- Farm to Temporary Storage or Initial Processing Facility: via truck on rural roads
- Temporary Storage/Initial Processing Facility to Processing Facility/Longer-Term Storage Facility: via truck
- Processing Facility/Longer-Term Storage Facility to Market: via truck, rail, or barge

One of the primary implications of the agricultural supply chain within Mississippi is the importance of addressing the freight needs on rural freight corridors. The roadways that are important to link the different points of the supply chain are typically lower functional class rural roads and they may not have adequate designs or maintenance schedules to handle freight movement of bulk goods. Furthermore, the implications of addressing needs related to modal connectivity and highway bottlenecks are crucial for the agricultural supply chain. Throughout this process, goods move to higher functional class roadways and other modes such as rail or port. If connections to those highways or freight modes are poor, then it hinders the supply chain and makes it costlier to ship. Freight flows for agricultural-related commodities are shown in Figure 14 with corridors in the northeastern portion of Mississippi being important to the movement of agricultural goods. Major corridors such as I-22, SR 25, and US 45 are estimated to transport over 1 million tons of agricultural products annually.

Figure 14. | Freight Flows of Agricultural Products, 2019



Source: FHWA Freight Analysis Framework, 5.0 and 5.2; Cambridge Systematics, Inc. analysis

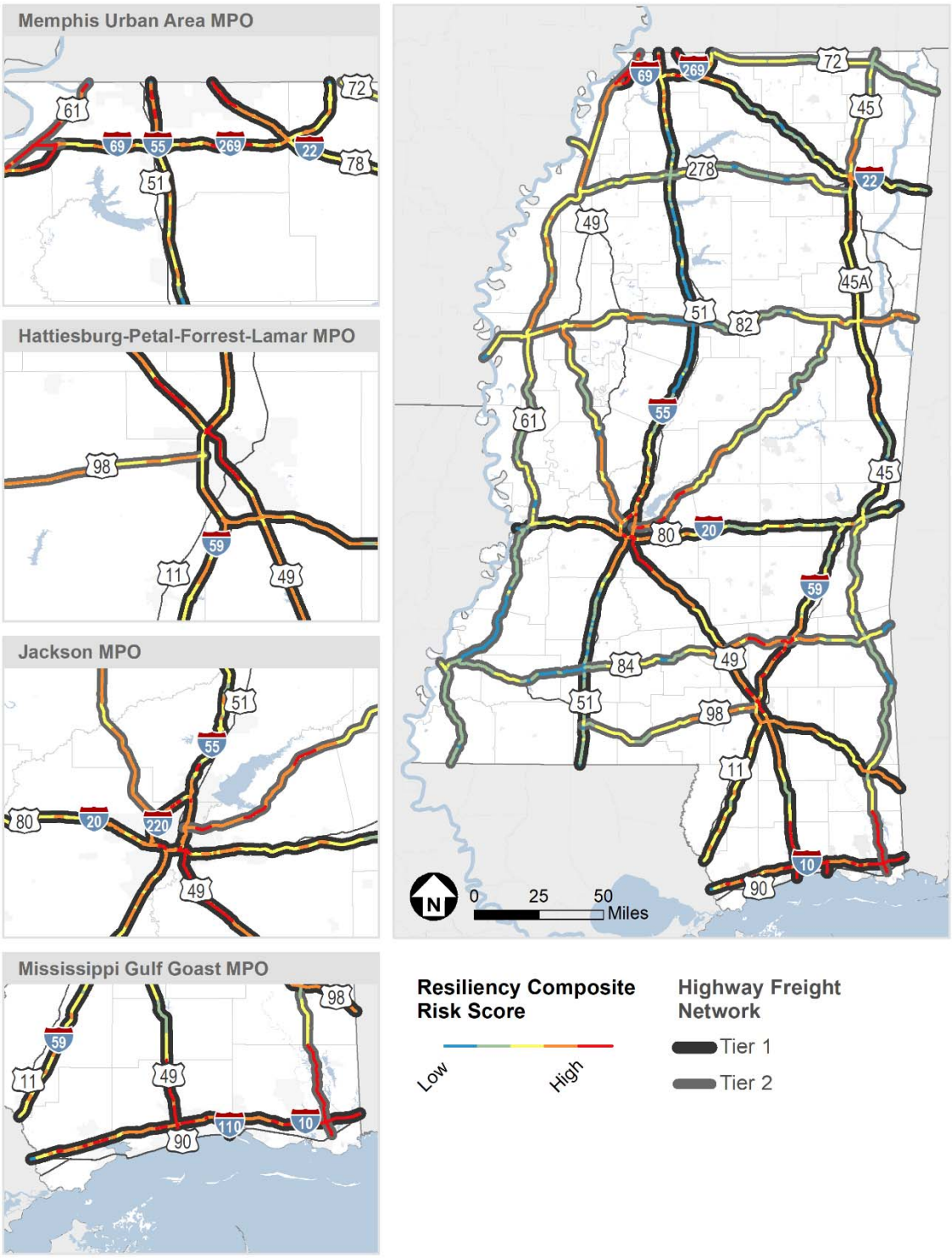
3.2 Freight Network Resiliency

Over the last decade, State Departments of Transportation (DOTs) have taken steps to assess the vulnerability of the nation's aging transportation infrastructure to extreme weather events and to integrate resilience planning considerations into transportation decision-making. The Federal Highway Administration (FHWA) defines resilience as "the ability to anticipate, prepare for, and adapt to, changing conditions and withstand, respond to, and recover rapidly from disruptions." Freight resiliency entails the ability of the multimodal freight network to withstand disruptions with minimal impacts on safety and the economy. As large-scale disruptions to the freight network and associated supply chains have become more common, resiliency has become a much more important component of freight transportation planning.

MULTIPLAN 2045, Mississippi's long-range transportation plan, performed a detailed and comprehensive analysis of resiliency for Mississippi. It examined risks posed to multimodal transportation system across several dimensions including flooding, sea level rise, and winter storms, among others. The analysis took an indicator-based approach to assess the risks of each hazard on Mississippi's transportation systems, which is determined by the likelihood of these hazards occurring from factors such as historical patterns, climate impacts and infrastructure conditions, the consequences of such hazards impacting the transportation system, and Mississippi transportation infrastructure's vulnerability to the hazards. From there a composite risk map was created by spatially calculating the sum of all hazards' risks in Mississippi. The risk score at each cell was calculated by multiplying the vulnerability score by the likelihood and consequence scores of that hazard. The composite risk score for each cell is the sum of all hazard risks at that location.

The resiliency analysis performed as part of the State Freight Plan was informed by MULTIPLAN 2045's findings. The Mississippi Statewide Freight Plan performed a spatial overlay of the Tier I-II highway freight network with the composite risk map to assign a risk score to each segment included in the network. The results are shown in Figure 15.

Figure 15. | Resiliency Composite Risk Score on the Tier I-II Highway Freight Network



Data Source: Mississippi Department of Transportation.

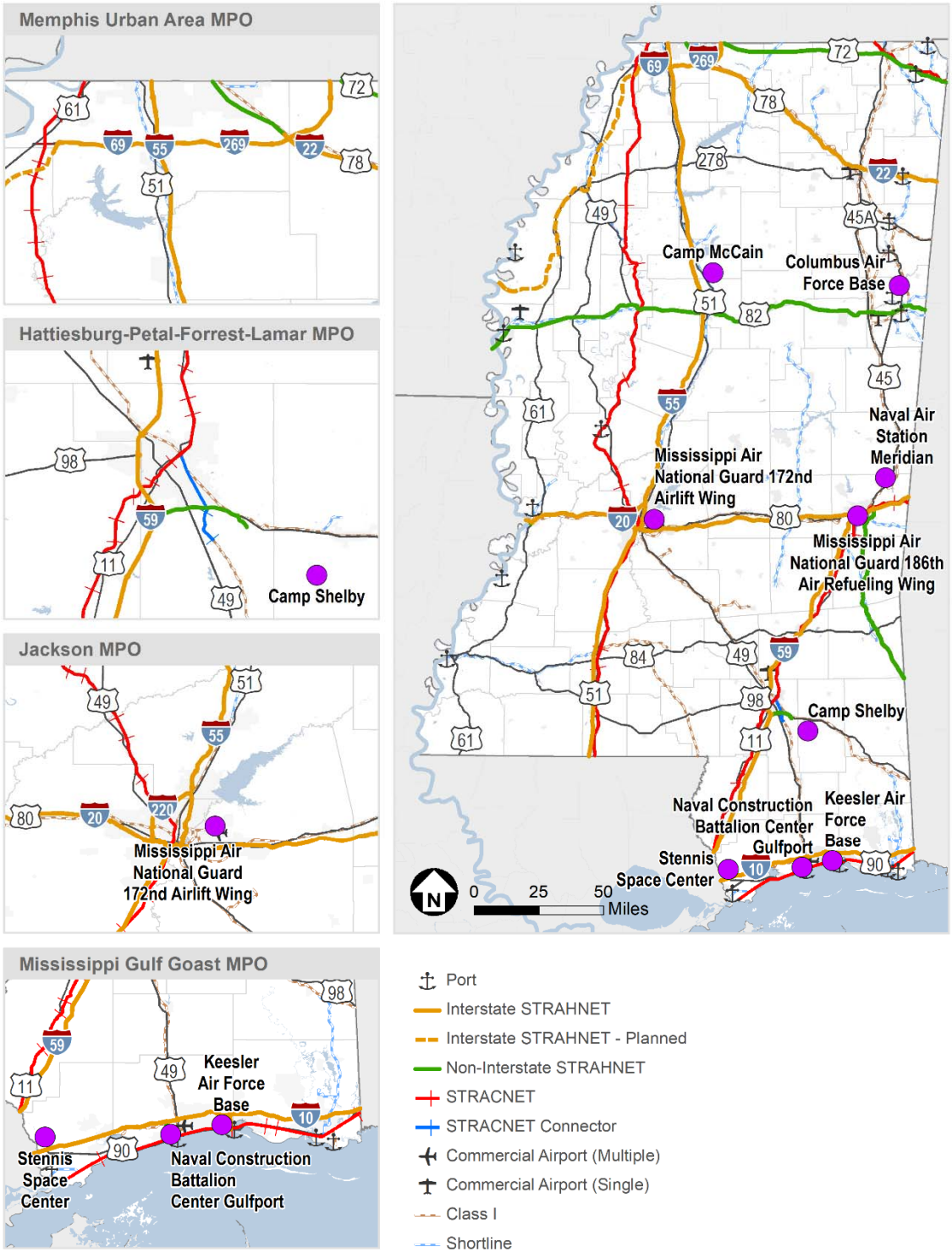
Mississippi's freight resiliency challenges are concentrated in the state's metropolitan regions, but impact Tier I-II freight corridors across the state. Tier I-II freight corridors along the coast in the Gulfport-Biloxi region have the highest risk of multiple hazards, including hurricanes, flooding, sea level rise, tornados, wildfires, hazardous material releases, radiological releases, and droughts. Tier I-II freight corridors in the Hattiesburg region are vulnerable to hurricanes, flooding, tornados, hazardous material releases, and wildfires. Tier I-II freight corridors in the Jackson region are vulnerable to dam failures, droughts, tornados, hazardous material releases, radiological releases, and flooding. In the area between Southaven and Greenville, Tier I-II freight corridors are at risk of dam failures, hazardous material releases, earthquakes, flooding, and winter storms. Tier I-II freight corridors near Tupelo are vulnerable to dam failures, droughts, flooding, and tornados.

Tier I-II facilities in these areas face operational disruptions, such as traffic control systems and monitoring devices, delays, or road closures, depending on the hazard. Additional disruptions could result in structural damage and washouts, erosion of the coastal facilities, damage to transportation devices, and increased safety concerns. Understanding these risks allows Mississippi to identify the portions of the network that are more susceptible to disruptions and therefore less resilient. These locations can be candidates for investments to improve resiliency, either by reducing their vulnerability to disruption or improving their ability to quickly recover, or both.

3.3 Freight Impacts on the Military

There are nine military installations throughout Mississippi as shown in Figure 16. The transportation needs of these, and other military installations outside the state, are served by the Strategic Highway Network (STRAHNET), the Strategic Rail Corridor Network (STRACNET), and the Port of Gulfport which is a Strategic Seaport. The STRAHNET is a system of roads deemed necessary for emergency mobilization and peacetime movement of heavy armor, fuel, ammunition, repair parts, food, and other commodities to support U.S. military operations. It provides defense, continuity, and emergency capabilities to support U.S. military installations. The STRAHNET includes all Tier I-II freight corridors. The STRACNET is an interconnected and continuous rail line network consisting of over 36,000 miles of track serving 120 defense installations. Strategic seaports are ports designated by the Secretary of Defense as significant transportation hubs important to the readiness and cargo handling capacity of the Department of Defense. Along with 17 other ports, the Port of Gulfport is designated as a Strategic Seaport.

Figure 16. | Military Installations, STRAHNET and STRACNET in Mississippi, 2019



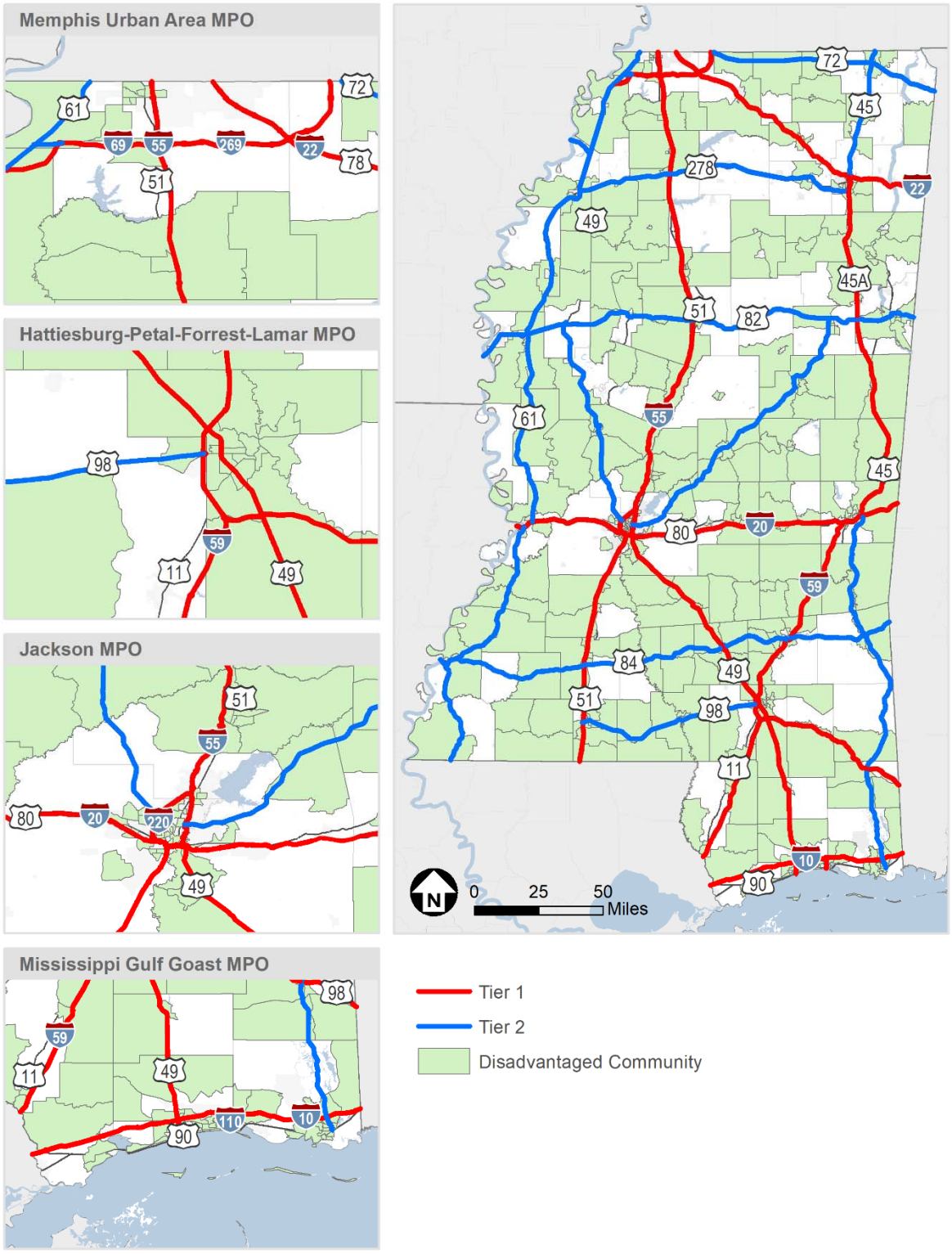
Source: Mississippi Department of Transportation; Federal Highway Administration; Federal Railroad Administration.

Key freight needs and challenges related to military installations include poor pavement conditions on roadways near military installations, vertical clearance issues, and risk of natural and man-made disasters. These challenges impact the operations of the military installations they serve. Furthermore, the Port of Gulfport is a strategic seaport, meaning that U.S. military can utilize the port for cargo and equipment shipments. The Office of Eastern Federal Lands Highways (EFLH) of the Federal Highway Administration (FHWA) is currently assisting the Department of Defense (DoD) in conducting the Power Project Platform (PPP) Route Assessment studies to assess critical infrastructure along the Strategic Highway Network (STRAHNET) to support DoD deployment needs. The PPPs are mission-critical facilities that include military installations, Aerial Ports and Sea Ports of Embarkation (APOE/SPOE). A future study will include the route from Fort Leonard Wood, MO to the Port of Gulfport. MDOT will assist were applicable once the study is initiated.

3.4 Environmental and Equity Freight Impacts

Transportation equity seeks to ensure that the benefits and burdens of the transportation system are equitably distributed and to provide fairness in mobility and accessibility to meet the needs of all community members. Under Executive Order 13985, equity is defined as the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment. The Mississippi Statewide Freight Plan follows the USDOT definition for disadvantaged communities which classifies Census tracts as disadvantaged or non-disadvantaged according to six indicators: transportation, health, economy, equity, resilience, and environmental. If a Census tract meets the criteria for four or more indicators, then it is classified as a disadvantaged community. Figure 17 shows disadvantaged communities in Mississippi in relation to the freight network. Chapter 4 includes specific strategies and recommendations to address freight impacts on disadvantaged communities.

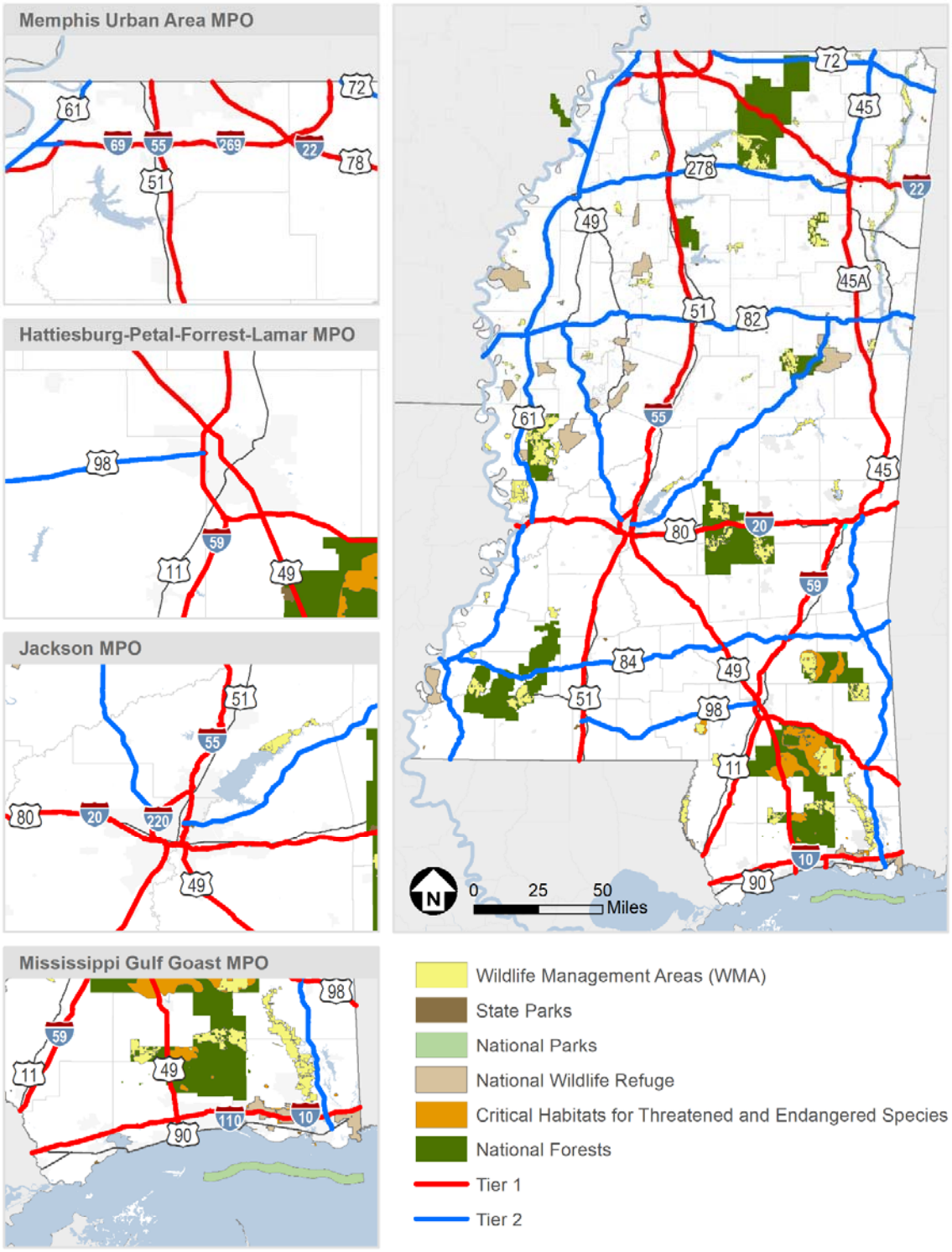
Figure 17. | Tier I-II Highway Freight Network and Disadvantaged Communities



Source: United States Department of Transportation.

Transportation networks intertwine with wildlife habitats and can have adverse effects such as loss of habitat, degradation of habitat quality, crashes that can reduce animal populations, and population fragmentation and isolation. Consideration of the effects of transportation on wildlife and mitigation projects that facilitate movement of animals across transportation infrastructure helps support the natural patterns of wildlife. As shown in Figure 18, Mississippi is home to several state parks, national parks, and national forests that serve as wildlife habitats. There are also national wildlife refuges within the state which are protected areas managed by the United State Fish and Wildlife Service (USFWS). In addition, Mississippi contains wildlife management areas which are protected lands for the sustainable management of wildlife. Also, areas of the state have been designated as critical habitat for threatened and endangered species by USFWS. Chapter 4 includes specific strategies and recommendations that address Mississippi's freight transportation needs and impacts on wildlife and wildlife habitat loss.

Figure 18. | Tier I-II Highway Freight Network & Protected Wildlife Areas



Source: U.S. Fish and Wildlife Service; Mississippi Department of Wildlife, Fisheries, and Parks; National Park Service.

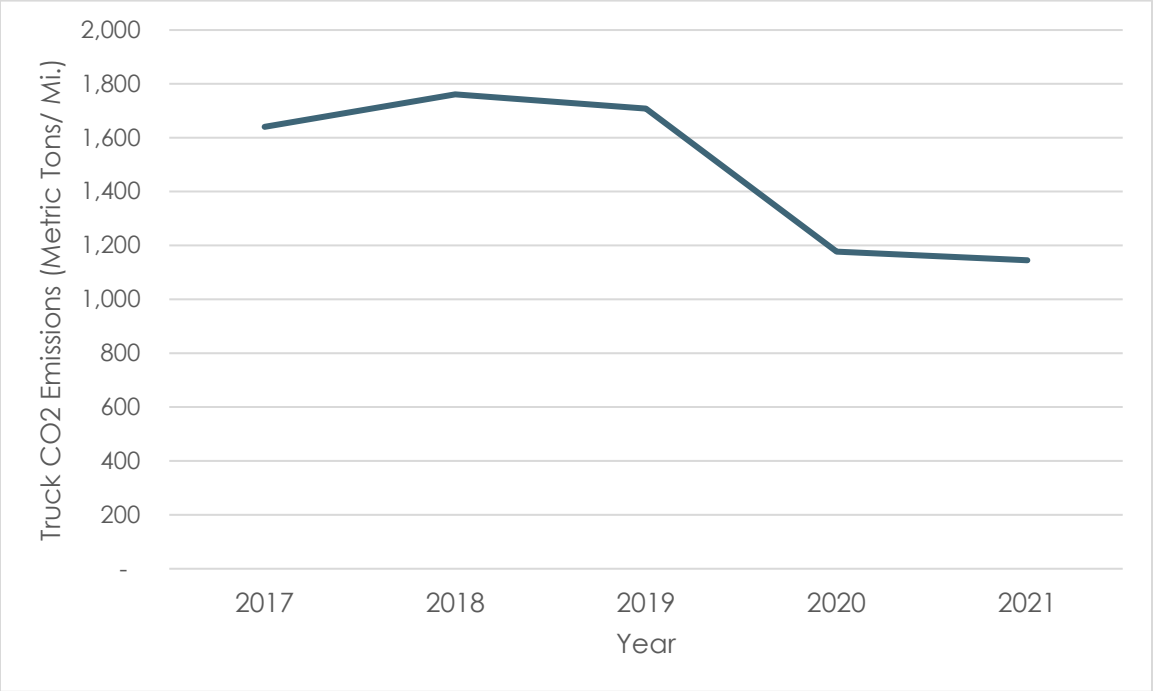
Stormwater runoffs can potentially pose significant impacts to the environment. These events are a result of rain or melted snow and other precipitation that creates water flows over roadways and land surfaces which often ends up emptying into streams, rivers, lakes, and other bodies of water. Runoffs can pick up and carry road surface pollutants that can contaminate these water systems and the ecosystem they support. Mitigation of stormwater runoffs along Tier I - II Freight Corridors and those traversing wildlife management areas is crucial to limiting impacts to the environment and wildlife habitats.

The burning of fossil fuels such as coal and oil, along with deforestation, land-use changes, and other activities have caused the concentrations of heat-trapping greenhouse gases (GHG) to increase significantly in the Earth's atmosphere (IPCC 2021). GHG include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrochlorofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). These gases in the atmosphere absorb some of the energy being radiated from the surface of the Earth that would otherwise be lost to space, which makes the Earth's surface warmer than it would be otherwise. This has implications for rainfall patterns, snow and ice cover, sea level, other aspects of climate.

Among GHG, CO_2 is the largest source of U.S. emissions and has accounted for over 75 percent of total U.S. gross emissions across the 1990 – 2020 time period.[14] The majority of CO_2 emissions are generated by fossil fuel combustion – about 92.1 percent in 2020. Transportation activities accounted for 36.2 percent of U.S. CO_2 emissions from fossil fuel combustion in 2020, with the largest contributors being passenger vehicles (38.5 percent), followed by freight trucks (26.3 percent) and light-duty trucks (18.9 percent). In Mississippi, truck traffic on Interstate highways were estimated to generate approximately 1,145 metric tons of CO_2 per mile as shown in Figure 19. More efficient freight operations are crucial to reducing GHG emissions generated from transportation activities. This is reflected in Mississippi's performance measures, strategies, and recommendations which are discussed in Chapter 4.

[14] United States Environmental Protection Agency, "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2020," https://www.epa.gov/system/files/documents/2022-04/us-ghg-inventory-2022-main-text.pdf. Washington DC, 2021. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019.

Figure 19. | Truck CO_2 Emissions per Mile for Mississippi Interstate Highways, 2017 - 2021



Source: FHWA, Freight Mobility Trends and Highway Bottlenecks, https://ops.fhwa.dot.gov/freight/freight_analysis/mobility_trends/index.htm.

3.5 Freight Bottlenecks

Fast and reliable truck transportation is critical to modern supply chains and the companies that rely on them. The ability of Mississippi to support these supply chains impacts economic development opportunities across the state. As a result, addressing needs related to congestion, unreliability, and bottlenecks is a crucial element of freight transportation planning.

Freight bottlenecks are points or sections on the highway network where freight flows are constricted. The bottlenecks within this analysis are based on Congestion-Based Delay, which is congestion caused by several factors (e.g., roadway geometry, high traffic volumes, disruptive events that cause a temporary loss in capacity such as incidents or weather). The methodology used to identify bottlenecks includes elements of the methodological approach described in the *FHWA Freight performance Measures Approaches Bottlenecks, Arterial, and Linking Volumes to Congestion Report*.[15] The top bottlenecks on the primary and secondary freight corridors are

[15] FHWA *Freight Performance Measures Approaches Bottlenecks, Arterials, and Linking Volumes to Congestion Report.*

identified as they potentially pose significant impacts from disruptions to truck freight movements and supply chains.

The first step of the bottlenecks analysis was to perform an initial screening of bottlenecks. The goal of this step was to obtain a set of candidate sites to be designated as freight bottlenecks. These sites were identified based on three factors: (1) their freight performance as captured by the Travel Time Index (TTI), (2) annual average daily truck traffic (AADTT), and (3) level of service (LOS) as calculated by the MDOT travel demand model.

The TTI is the mean travel time over the highway section divided by the travel time that would occur at the reference speed. Higher TTI values indicate poor conditions for freight travel while lower values indicate better conditions. The TTI was derived from the NPMRDS data for Mississippi. An example TTI calculation is described below:

- The highest peak period travel time on A Street between B Avenue and C Avenue is three (3) minutes.
- The free-flow travel time on this segment is one minute.
- Divide three minutes, the highest peak travel time, by one minute, the reference speed travel time.
- This results in a TTI of 3.0, which implies that it takes three times longer to travel during the peak period.

The initial screening also considered truck volumes in identifying bottlenecks. Corridors were required to carry significant volumes of trucks, in addition to exhibiting relatively high TTI values, to be considered freight bottlenecks. Specifically, the following AADTT and TTI criteria were used:

- Freeways: AADTT ≥ 2,500 and TTI ≥ 1.50
- Arterials: AADTT ≥ 500 and TTI ≥ 2.00

Lastly, the initial screening considered LOS results from the MDOT Statewide Needs Assessment as additional indication of potential bottleneck activity. Freeway and arterial highway segments with TTI and AADTT values exceeding the above thresholds were compared with the segments that have an unacceptable LOS from the Statewide Needs Assessment (i.e., LOS D or worse in rural areas and LOS E or worse in urban areas).

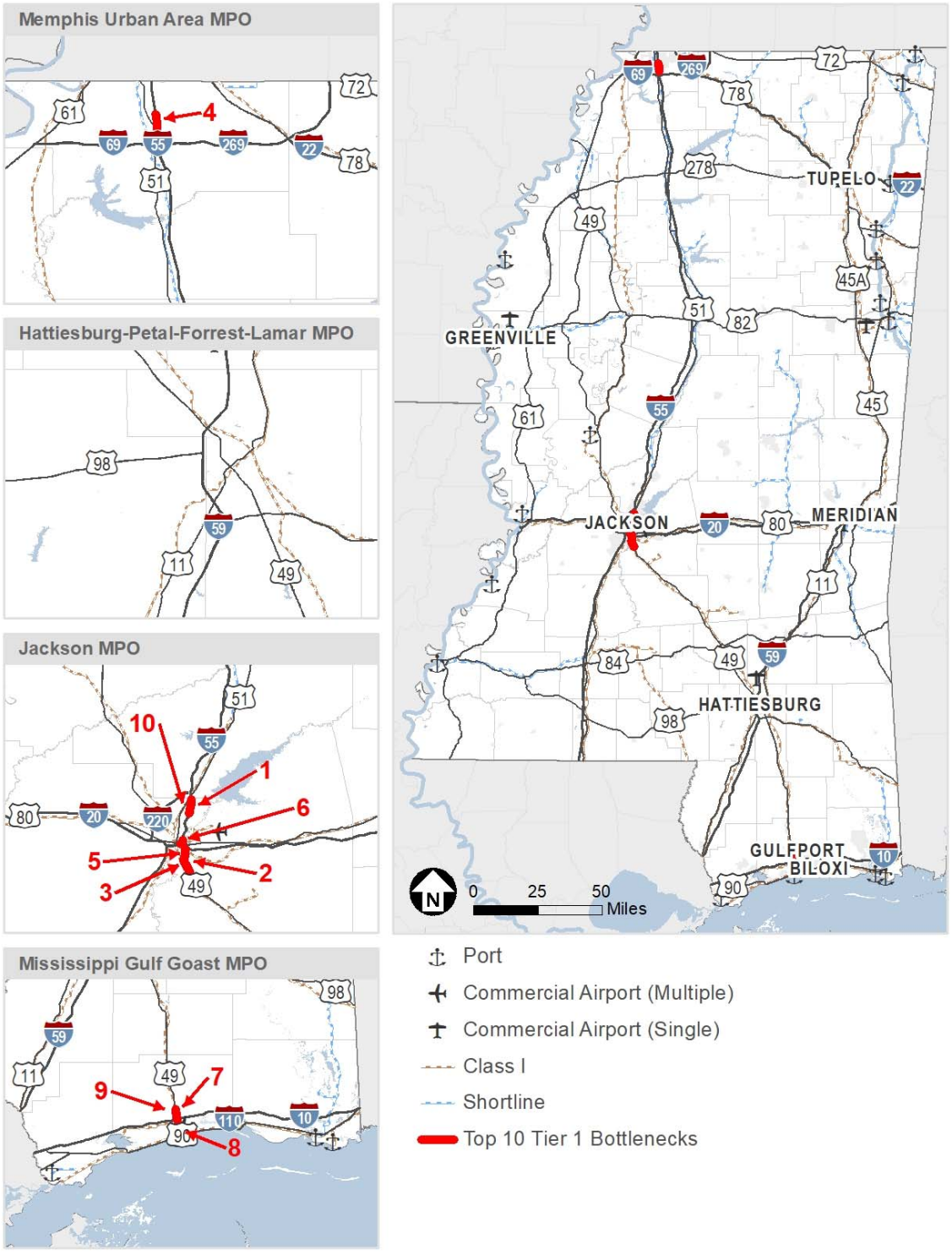
The top ten bottlenecks on the Tier 1 freight network are listed in Table 6 and shown in Figure 20. The bottlenecks were ranked in order of decreasing values of truck vehicle-hours of delay per mile as calculated using data from the National Performance Management Research Data Set (NPMRDS). The top ten bottlenecks are all located in the state's largest urban counties, namely Hinds, Rankin, Desoto, and Harrison.

Table 6. | Top Ten Tier I Freight Network Bottlenecks, 2019

Roadway	County	Limits	Bottleneck Rank
I-55 Northbound	Hinds	Northside Dr. to County Line Rd.	1
US 49 Northbound	Rankin	Cleary Rd. to Old Hwy. 49	2
US 49 Southbound	Rankin	Old Hwy. 49 to Cleary Rd.	3
I-55 Northbound	DeSoto	Pleasant Hill Rd. to Church Rd.	4
US 49 Southbound	Rankin	I-20 to Old Hwy. 49	5
I-55 Northbound	Rankin and Hinds	I-20 to Pearl St.	6
US 49 Northbound	Harrison	I-10 to O'Neal Rd.	7
US 49 Northbound	Harrison	28th St. to Airport Rd.	8
US 49 Southbound	Harrison	O'Neal Rd. to I-10	9
I-55 Southbound	Hinds	County Line Rd. to Northside Dr.	10

Source: National Performance Management Research Data Set; MDOT; Neel-Schaffer analysis.

Figure 20. | Top Ten Tier I Freight Network Bottlenecks



Source: National Performance Management Research Data Set; MDOT; Neel-Schaffer analysis.

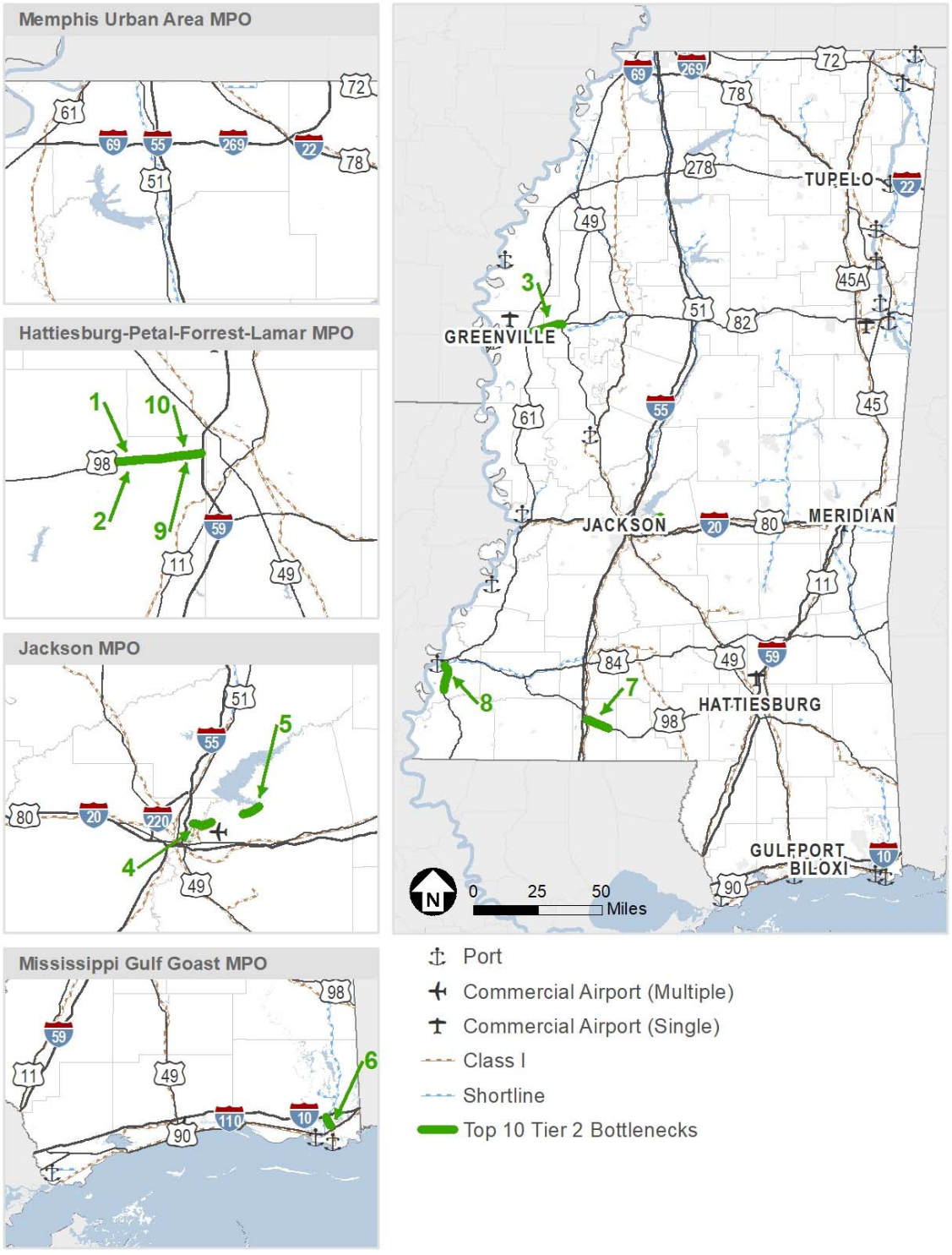
Tier II freight network bottlenecks are more widely distributed throughout the state's arterial roadways as shown in Figure 21. The prevalence of these bottlenecks is likely due to the complexity of the roadway environments as there is control delay introduced by signals and other traffic control devices, greater numbers of intersection roadways and driveways relative to freeways, and the presence of pedestrians and bicyclists.

Table 7. | Top Ten Tier II Freight Network Bottlenecks, 2019

Roadway	County	Limits	Bottleneck Rank
US 98 Westbound	Lamar	Weathersby Rd to SR 589	1
US 98 Eastbound	Lamar	SR 589 to Weathersby Rd	2
US 82 Westbound	Sunflower	US 49W to Dunleith Rd	3
SR 25 Northbound	Hinds and Rankin	Ridgewood Rd to SR 475	4
SR 25 Southbound	Rankin	SR 471 to Grants Ferry Rd	5
SR 63 Northbound	Jackson	Grierson St to I-10	6
US 98 Westbound	Pike	Pike 93 Central to US 51	7
US 61 Northbound	Adams	Hutchins Landing Rd to US 84	8
US 98 Eastbound	Lamar	Weathersby Rd to I-59	9
US 98 Westbound	Lamar	I-59 to Weathersby Rd	10

Source: National Performance Management Research Data Set; MDOT; Neel-Schaffer analysis.

Figure 21. | Top Ten Tier II Freight Network Bottlenecks



Source: National Performance Management Research Data Set; MDOT; Neel-Schaffer analysis.

3.6 Needs Assessment

In this section of the report, the needs and opportunities identified at the beginning of this chapter are broken down and discussed in detail by mode. It also provides additional technical information to support the identification of these needs and the development of strategies to address them.

Highway Needs

Freight needs and opportunities along the Tier I and Tier II freight corridors represent the priority needs to be addressed by future freight investments along the primary and secondary highway portions of the Mississippi Multimodal Freight Network. These needs are listed in Table 8.

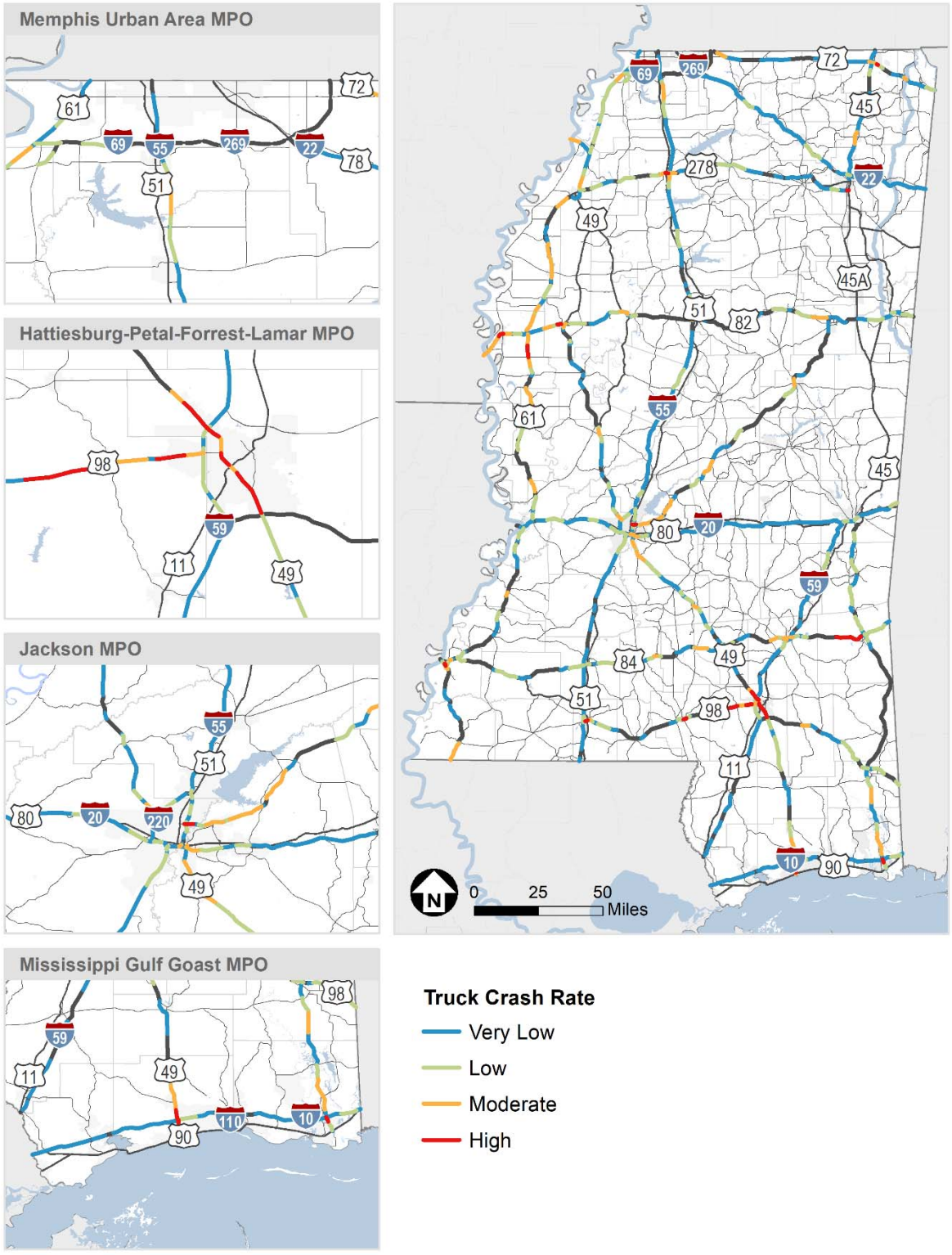
Table 8. | Mississippi Highway Freight System Needs and Opportunities

Category	Need or Opportunity
Highway	**Truck safety** Some highway segments have relatively high truck crash rates.
	Truck parking The amount of truck parking does not seem to meet demand, especially on the I-10 corridor.
	Truck bottlenecks Though Mississippi's highway network overall operates at a high level of service, there are bottlenecks especially in urban areas.
	Highway infrastructure conditions Improve pavement and bridge conditions on Tier I-II freight corridors in need of rehabilitation.
	Challenges on freight intermodal connectors Improve asset conditions and operations on last-mile freight intermodal connectors.
	Vertical clearances Some bridges crossing Tier I-II freight corridors do not have vertical clearances that meet the State's desired level.
	At-grade crossing safety Highway/rail incidents have decreased since 2016, but some crossings have multiple incidents.

Truck Safety

Ensuring a safe transportation network for people and goods is central to MDOT's mission. Both safety programs and infrastructure improvements can help to improve safety. Areas with high crash rates may coincide with aspects of the road such as curvature, visibility, speeds, pavement conditions, or other factions. The annual average truck crash rate per annual truck volume was calculated for Tier I and II freight highway segments and is shown in Figure 22.

Figure 22. | 2016–2019 Annual Average Truck Crashes per Annual Truck Volume on Tier I–II Highway Freight Network



Source: Mississippi Department of Transportation; Cambridge Systematics, Inc. analysis.

Crash data involving commercial vehicles with crash types involving other vehicles, bicycles, pedestrians, and animals such as deer were used to assess truck safety on the states's highway freight network. The analysis indicates that there are multiple corridors along the Tier I-II freight network that may be of potential interest when considering strategies to address truck safety.

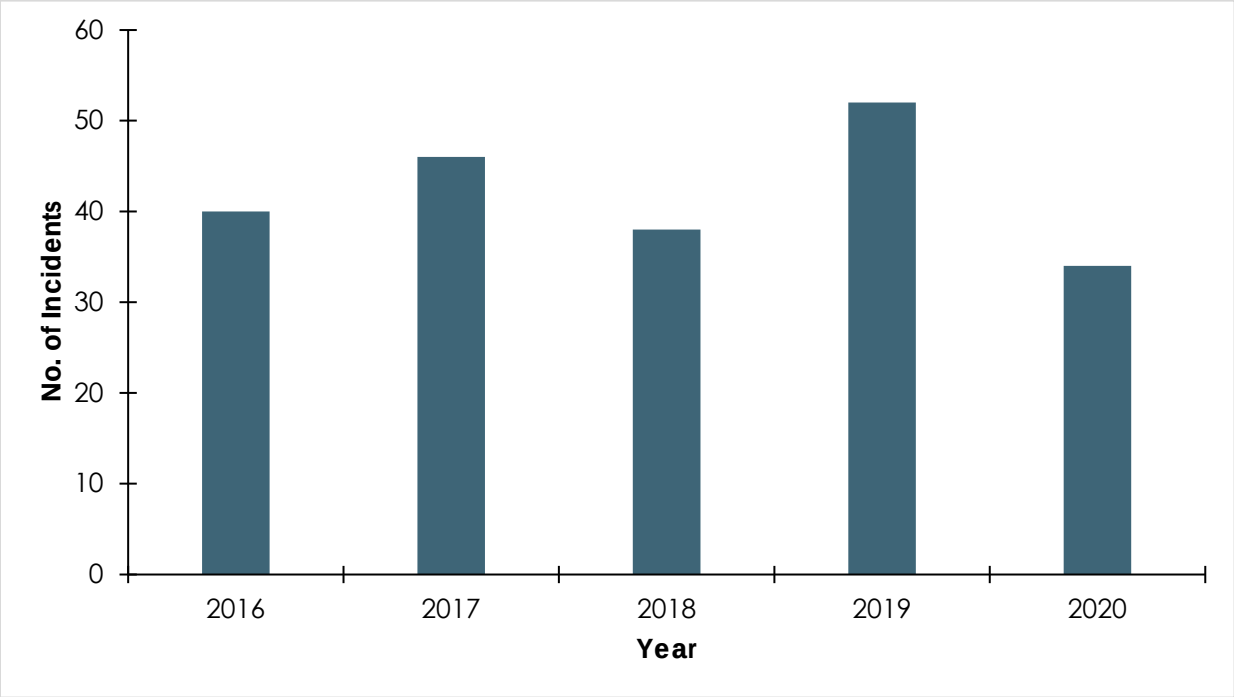
- US 98 West of Hattiesburg in Lamar County;
- SR 25 in Hinds and Rankin Counties;
- US 49 in Harrison County;
- US 49 through Hattiesburg in Forrest County;
- US 82 East of the Mississippi River in Washington County;
- US 84 West of US 45 in Wayne County; and
- US 61 in Washington and Bolivar Counties.

At-Grade Crossing Safety

Highway/rail at-grade crossings are a particular safety concern as there is potential for an incident involving a train and a truck, passenger vehicle, or other roadway users. In addition to safety, at-grade crossings can also be the source of significant delays on the roadway network. Grade separating highway/rail crossings removes these conflicts but is costly and not always feasible. Other solutions include upgrading warning devices, applying ITS technologies to manage traffic around crossings, and improvements to the design of roadway approaches to crossings.

There are over 2,100 public at-grade crossings in Mississippi and between 2016-2020 there were 210 highway-rail incidents at these crossings. The number of highway-rail incidents by year is shown in Figure 23. The state should continue to work to improve the safety of at-grade crossings by working with the railroads and local road authorities to close unnecessary crossings, upgrade warning devices, and improve the designs of roadway approaches. There are multiple crossings throughout the state that on average experience more than one crash based on historical data and they are candidates for improvements.

Figure 23. | Mississippi Highway-Rail Incidents by Year, 2016-2020



Source: Federal Railroad Administration, Highway-Rail Crossing Database.

Truck Parking

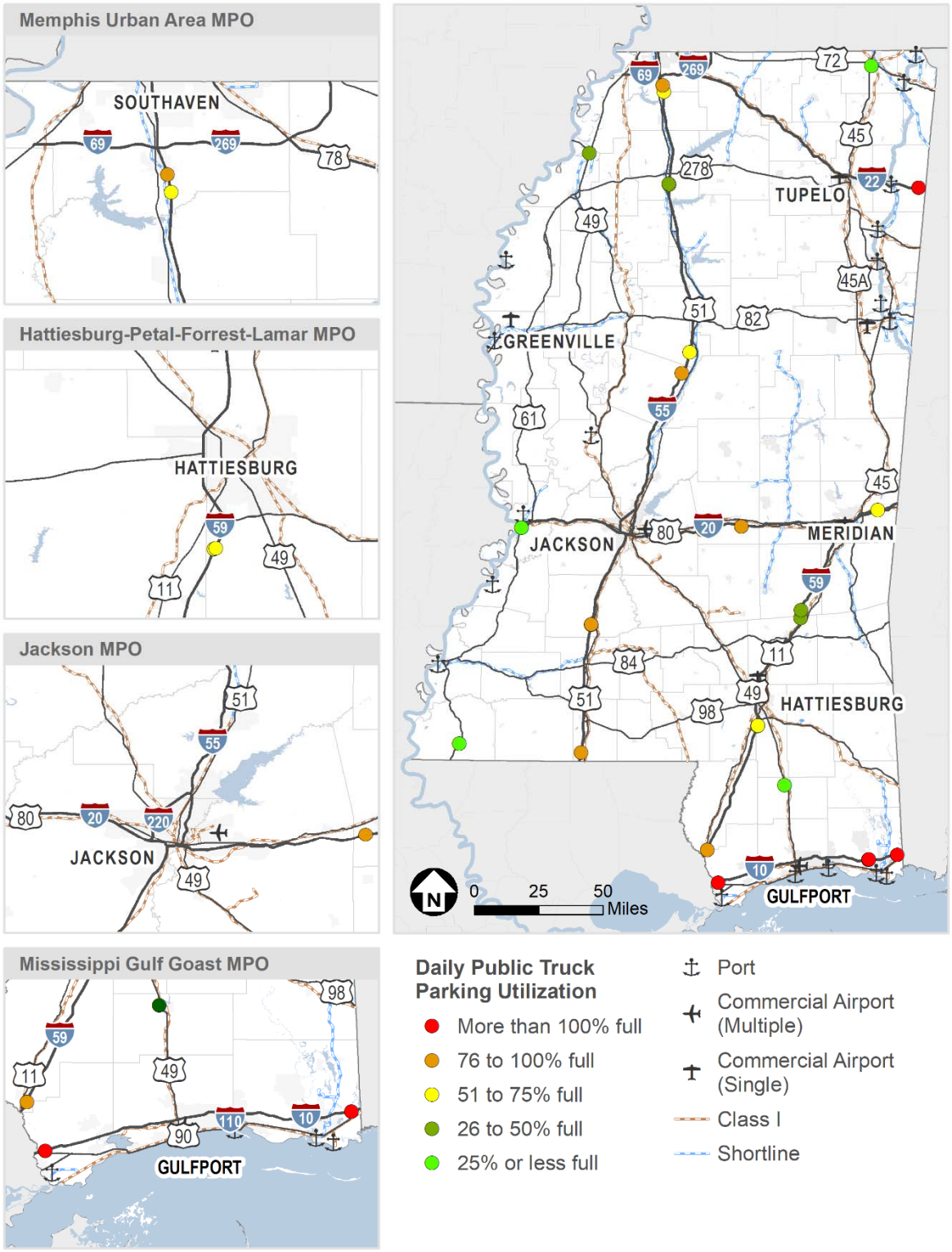
Population growth, increase demand for goods and services, and changes in the Federal Motor Carrier Safety Administration's Hours of Service (HOS) are among several contributing factors to growing truck volumes and the associated need for truck parking. Commercial drivers seeking to comply with HOS regulations may be forced to park in unauthorized locations when authorized parking is unavailable or the location of authorized parking is unknown. This potentially impacts safety for both truck drivers and the traveling public as fatigue is a contributing factor to truck-involved crashes. Truck drivers need to park for different reasons and there are unique challenges for various types of parking needs as shown in Figure 24. Truck parking is considered a critical asset of the multimodal freight system and improving access to truck parking can increase levels of safety.

Figure 24. | Reasons Truck Drivers Park

There are 27 public truck parking facilities in Mississippi and over-capacity facilities are largely clustered along I-10 on the Gulf Coast as shown in Figure 25. Approximately, 26 percent of the facilities are at capacity (76-100 percent full) while 18 percent of the facilities are estimated to be over-capacity (more than 100 percent full) and are listed below. These facilities represent locations for identifying and implementing solutions to enhance truck parking access:

- I-10 Eastbound Rest Area in Jackson County;
- I-10 Westbound Rest Area in Jackson County;
- I-10 Welcome Center in Jackson County;
- I-10 Welcome Center in Hancock County; and
- I-22 Welcome Center in Itawamba County.

Figure 25. | Daily Truck Parking Utilization at Public Facilities, 2019



Source: Jason's Law Truck Parking Survey for Mississippi, 2019.

Drivers tend to prefer private truck parking facilities since they can offer amenities such as laundry, showers, and restaurants. Given that Mississippi has multiple public facilities that are near (i.e., 51 percent to 75 percent full), at (i.e., 76 percent to 100 percent full), or over (i.e., more than 100 percent full) capacity, it suggests that there is not enough capacity to meet demand. Corridors, where the demand data suggests that private sectors are also over-burdened, include the following:

- I-10 between the Alabama and Louisiana state lines: All four public facilities along this corridor are over capacity, suggesting that the 9 private facilities are also at or over-capacity.
- I-55 between I-20 and the Louisiana state line: Two of the public facilities are at capacity and one is near capacity; this suggests that the 9 private facilities on this corridor are at or near capacity.
- I-20 between I-59 and I-55: Two of the public facilities are at capacity, suggesting that the 11 private facilities are at or near capacity.
- I-22 between the Alabama state line and US 45: The single public facility along this corridor is over capacity, suggesting that the 3 private facilities are also at or over capacity.

A statewide truck parking study is needed to provide a more detailed estimate of exactly where there is insufficient capacity to meet demand, and the magnitude of the capacity shortage.

Infrastructure Condition Needs

There are over 2,400 centerline miles and 1,700 bridges on the Tier I-II freight network. Poor pavement and bridge conditions can increase delays, increase wear and tear on vehicles, cause damage to goods in transit, and potentially impact safety. Building and maintaining the Tier I-II freight network to a condition that facilitates the efficient movement of goods is a critical statewide need.

The majority of bridges on the Tier I-II freight network are in good or fair condition, with only 1 percent being in poor condition. Of the bridges in poor condition, 14 are on interstate facilities. Table 9 shows the distribution of condition ratings of bridges by functional class.

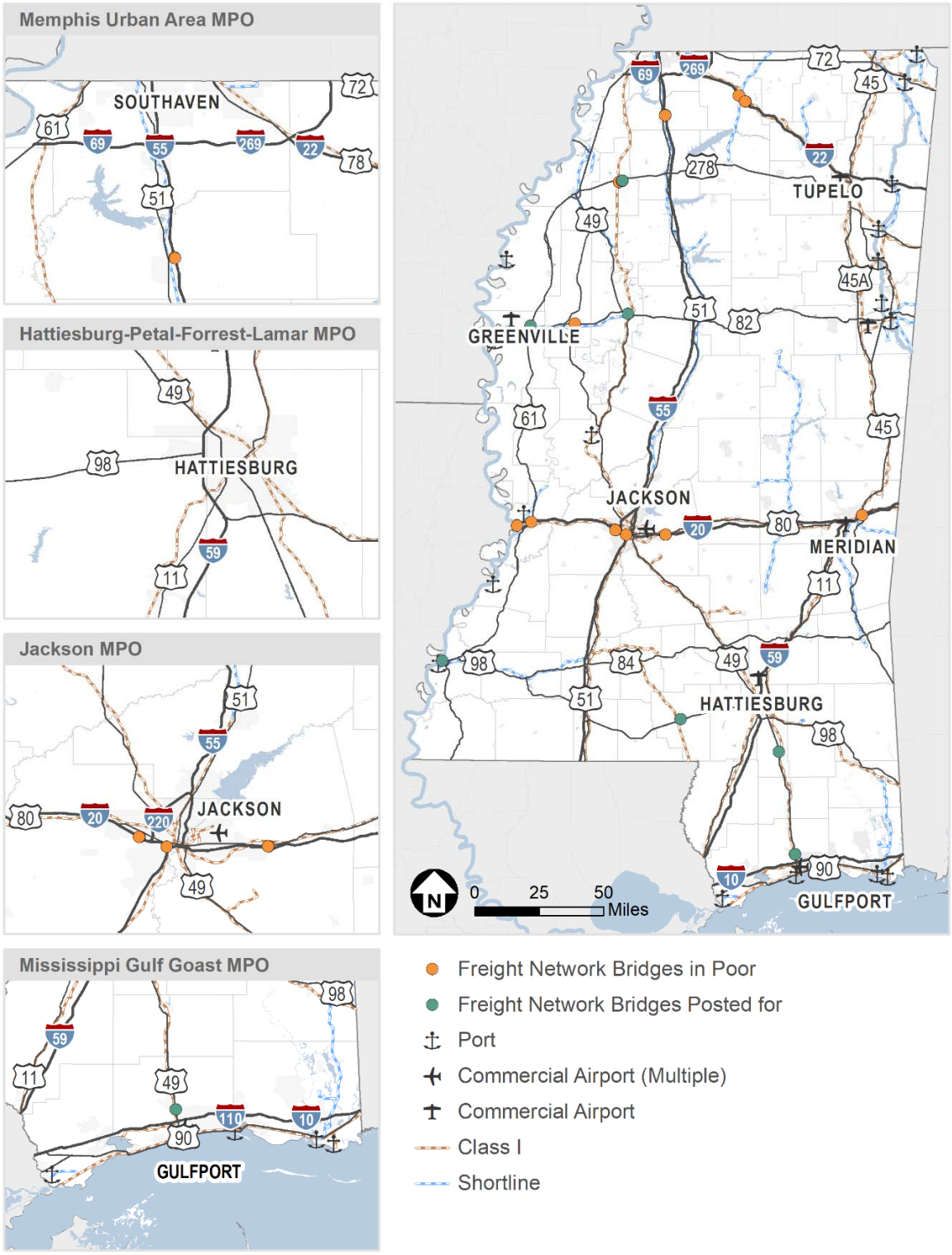
Table 9. | Condition Rating of Bridges on Mississippi Tier I-II Freight Highways by Functional Classification, 2020

Functional Classification	Bridges in Good Condition	Share of Bridges in Good Condition	Bridges in Fair Condition	Share of Bridges in Fair Condition	Bridges in Poor Condition	Share of Bridges in Poor Condition	Total Number
Interstate	355	20.8%	405	23.7%	14	0.8%	774
Principal Arterial	694	40.7%	230	13.5%	3	0.2%	927
Minor Arterial and Collector	5	0.3%	0	0.0%	0	0.0%	5
Total	**1,054**	**61.8%**	**635**	**37.2%**	**17**	**1.0%**	**1,706**

Source: US National Bridge Inventory Database 2021.

Tier I-II freight network bridges in poor condition are shown in Figure 26. Freight corridors with bridges in poor condition include I-20, I-55, I-20/I-59, I-22, US 49, US 82, and US 278. Eleven of the Tier I-II freight network bridges in poor condition are on I-20, which is one of the busiest trucking corridors in the state. In addition, eight bridges on the Tier I-II freight network are posted for load. A posted bridge is one that has a weight limit below the standard truck axle distribution weight, which means heavier trucks may not be able to use the bridge. The heavy truck must either detour around the bridge or reduce its payload, which would lead to more trucks on the road for the same haul. All of the posted bridges on the Tier I-II freight highways are maintained by MDOT and are located on the following corridors: US 49, US 61, US 82, US 98, and US 278. These posted bridges are shown in Figure 26.

Figure 26. | Tier I and II Highway Freight Network Bridges in Poor Condition and Posted for Load

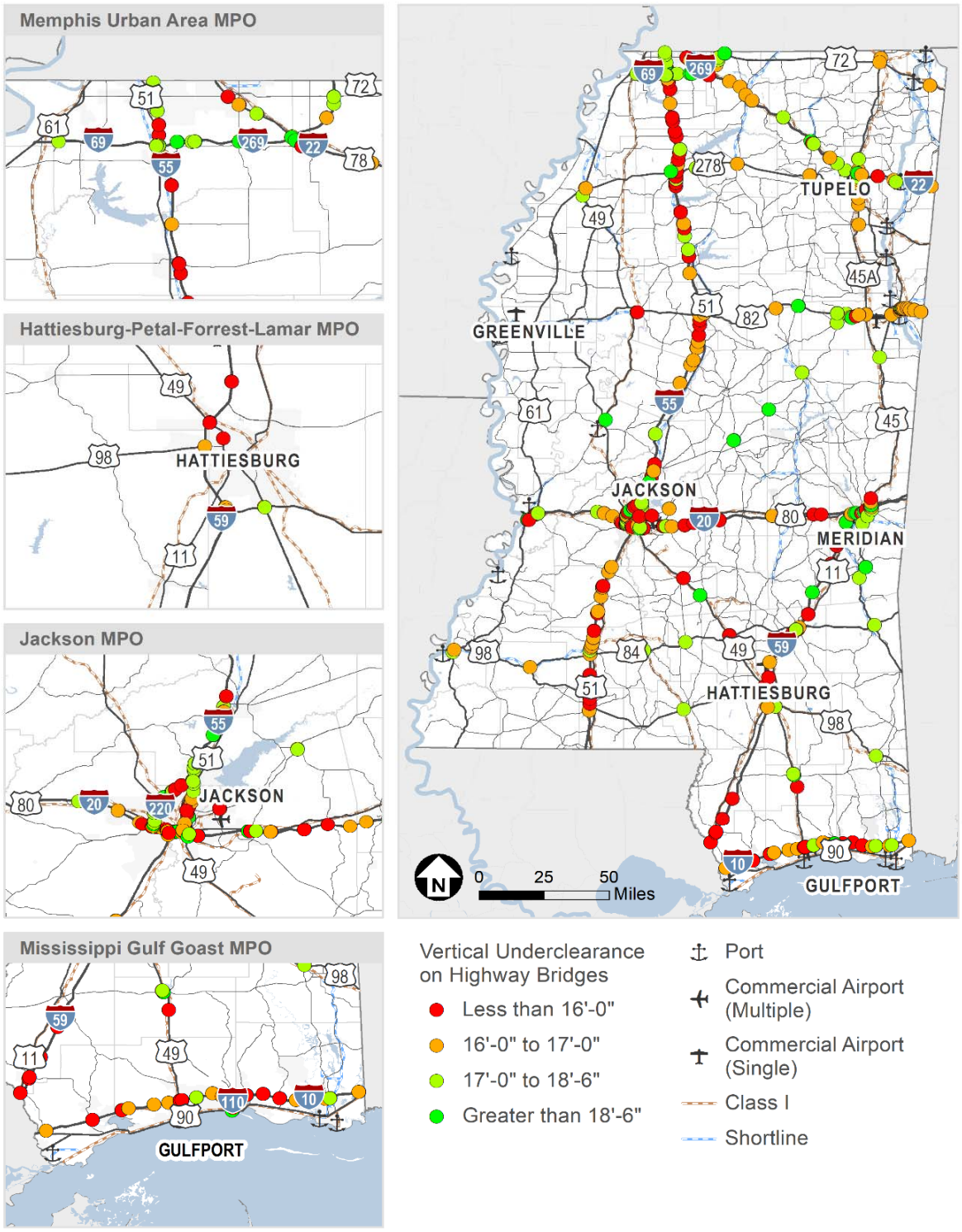


Source: U.S. National Bridge Inventory Database 2021.

Vertical clearance is another issue that can impact freight mobility as trucks are forced to divert to less efficient routes if a facility does not have sufficient vertical clearance. According to MDOT's 2020 Roadway Design Manual, the minimum vertical clearance for new or reconstructed bridges is 16 feet while a 17 feet clearance is preferred.[16] In general, bridges with less than 16.5 feet of vertical clearance can impose significant challenges to the movement of goods. Figure 27 shows the vertical clearance for bridges that cross Tier I-II freight network highways. To improve bridges to the state's preferred 17-foot vertical clearance standard, 395 bridges would have to be replaced.

[16] MDOT, 2020 Roadway Design Manual, https://mdot.ms.gov/documents/Roadway%20Design/Standards/Manuals/2020%20Roadway%20Design%20Manual.pdf.

Figure 27. | Vertical Clearance on Bridges Crossing Tier I-II Freight Network Highways, 2021



Source: National Bridge Inventory 2021; Cambridge Systematics, Inc. analysis.

Challenges to Freight Intermodal Connectors

Strong connections between freight-intensive industries and multimodal freight facilities (e.g., intermodal rail terminals, ports, bulk transfer terminals, etc.) are critical for supporting the economic activity associated with these industries. These connections allow businesses to move goods efficiently across multiple freight modes. FHWA NHS freight intermodal connectors are first-/last-mile linkages that provide critical connections between major freight nodes and designated NHS highways. As such, they support the ports, rail yards, airports, and other freight-intensive nodes to which they connect. For Mississippi, freight intermodal connectors are important given the state's substantial number of intermodal facilities, particularly river ports. Designation as a freight intermodal connector depends on a roadway meeting one of several primary and/or secondary criteria established by FHWA for facilities that serve freight movements. Although they only account for a small fraction of total NHS mileage, NHS freight intermodal connectors are key conduits for the timely and reliable delivery of goods. Table 10 shows the pavement conditions of the 2021 Mississippi freight intermodal connectors and proposed 2022 freight intermodal connectors using data on IRI from the Highway Performance Monitoring System (HPMS).

Table 10. | Pavement Condition based on IRI by Mileage on 2021 Mississippi NHS Freight Intermodal Connectors

NHS Freight Intermodal Connector	No. of Connector Routes	Good	Fair	Poor
Airport	3	20.1%	31.0%	49.0%
Port	19	24.1%	60.2%	15.7%
Rail/Truck Terminal	2	0.0%	0.0%	100.0%

Source: Highway Performance Monitoring System, 2019; Cambridge Systematics, Inc. analysis

Bridge condition is another consideration for freight intermodal connectors. Bridges that cannot handle the typical truck sizes or weight may contribute to congestion, lead to significant re-routing, and aid in the loss of time and money. Of the 22 bridges on Mississippi's freight intermodal connectors, 12 bridges are in good condition, 8 bridges are in fair condition, and 2 bridges are in poor condition based on the 2020 National Bridge Inventory and the FHWA NHS databases.

Rail Needs

Mississippi has an extensive freight rail network and is served by five Class I railroads and 22 Class II and III railroads. This network is critical for moving bulk commodities and provides Mississippi shippers access to markets across the country. Total tonnage on the state's rail network is expected to grow at an average annual rate of 1.1 percent. This will result in nearly an

additional 50 million tons moving on Mississippi's rail network by 2050. Table 11 provides an overview of freight rail needs in the state. These needs draw from the draft 2020 State Rail Plan, Rail Advisory Committee, Freight Advisory Committee, and technical analyses performed for this plan.

Table 11. | Mississippi Freight Rail Needs and Opportunities

Category	Need or Opportunity
Rail	**Access to regional rail facilities and short lines** Some short line railroads have limited capacity and ability to accommodate longer trains and service ports.
	Rail infrastructure conditions Some segments of track and bridges do not meet weight standards.

Source: Mississippi Department of Transportation

Rail access is critical for many businesses as it provides an efficient and cost-effective alternative for shipping high volumes of bulk goods. Improving access to rail facilities and short lines include investments that modernize the network, create new or improve existing connections, and expand service. The draft 2020 State Rail Plan outlines these needs:

- **Modernization:** These projects entail infrastructure improvements to meet market demands, now and in the future. This includes track-related capacity projects on main lines, improvements to civil works, terminal improvements, and enhancements to system capacity and resiliency.
- **New or Improved Connections:** This includes providing rail access to existing or new customers or improving existing connections to commercial and industrial developments, ports, intermodal, and transload facilities. The intent is to attract specific traffic that is currently not being shipped by the sponsor carrier.
- **Service Expansion:** These projects entail re-opening embargoed or abandoned rail lines and upgrading rail infrastructure to accommodate new rail traffic.

Rail lines that have not been abandoned but are either out of service (i.e., embargoed) or of such condition that they cannot handle standard 286,000 – pound railcars can have an adverse impact on shippers and the local economies that rely on the shippers for jobs and revenues. Table 12 lists the rail lines that are either out of service or have weight-limited tracks and Figure 28 shows their locations.

Table 12. | Embargoed and Weight-Limited Rail Mileage in 2020

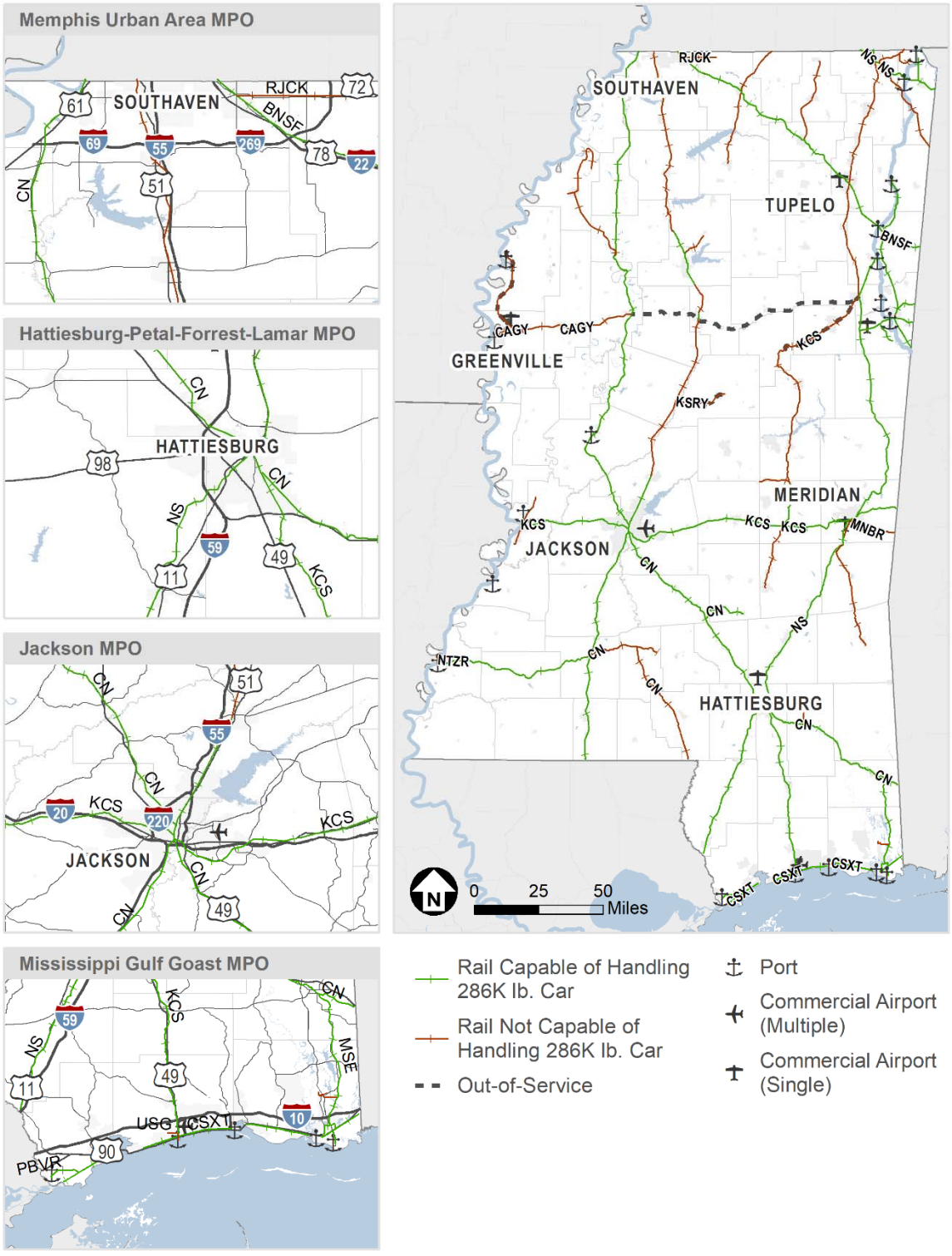
Railroad	Reporting Marks	Mississippi Route Miles		
		Operated[1]	Embargoed Track	Weight-Limited Track[2]
Class I Railroads		**1,817**	**<10**	**162**
Canadian National Railway	CN	757	<10	62
Kansas City Southern Railway Co.	KCS	576	0	100
Class III (Local) Railroads		**903**	**187**	**321**
Columbus and Greenville Railway	CAGY	85	92	25
Grenada Railroad LLC	GRYR	180	21	0
Great River Railroad	GTR	0	32	0
Luxapalila Valley Railroad	LXVR	12	0	11
Meridian and Bigbee Railroad	MNBR	23	0	19
Meridian Southern Railway	MDS	55	0	60
Mississippi Central Railroad Company	MSCI	108	0	56
Mississippi Delta Railroad	MSDR	60	0	21
Mississippi Export Railroad	MSE	42	6	5
Mississippi Southern Railroad	MSR	122	35	103
Vicksburg Southern Railroad	VSOR	21	1	21
Grand Total		**2,772**	**197**	**483**

Source: 2016 State Rail Plan; correspondence or surveys of Class I and Class II/III railroads conducted in April 2020.

[1] *To allow for comparison, the total operated mileage for each railroad class includes all railroads in Mississippi, even though the table only includes railroads that reported embargoed or weight-limited mileage.*

[2] *Track that is not able to accommodate 286,000-pound carloads.*

Figure 28. | Rail Car Weight Capacity, 2020



Source: 2016 Mississippi State Rail Plan updated by Cambridge Systematics with 2020 State Rail Plan Railroad Survey responses.

Port and Waterway Needs

The network of waterways in Mississippi, supported by a total of 16 ports, allows opportunities for efficient movement of freight to, from, through, and within Mississippi. The ports also allow for intermediate stops to larger ports in the region, such as the Port of Mobile in Alabama or the Port of New Orleans in Louisiana.

The total tonnage being imported and exported into Mississippi ports is predicted to grow, though not at a rapid pace. Future investments are expected to concentrate on preserving existing facilities by maintaining adequate channel depths. Port facilities also have the opportunity to modernize by increasing multimodal connectivity and improving individual ports' marketability and competitiveness. Key port and waterway needs identified as part of the MULTIPLAN 2045 planning process are listed in Table 13.

Table 13. | Port Railroad Needs at Mississippi Ports

Category	Need or Opportunity
Ports and Waterways	**Port infrastructure conditions** Ports have preservation needs ranging from dock repairs to replacing railroad ties.
	Capacity and operations needs at ports Some ports have expansion needs ranging from new export terminals to storage areas and piers.

Source: Mississippi Department of Transportation.

These needs outline poor infrastructure conditions at degrading port facilities due to inadequate maintenance and repairs. This lowers the value of Mississippi's water freight resources and limits the potential for increased freight across these maritime assets. MULTIPLAN 2045 identified nearly $5 million of preservation needs at Mississippi ports ranging from dock repairs to replacing railroad ties.

Aside from infrastructure needs, investment in capacity and operation at ports is important for statewide freight needs. Feedback from stakeholders indicated that some ports lack adequate connection to highways and rail. Other port capacity and operational needs include the following:

- **Modernization.** Port and waterway modernization investment needs include upgrades to current infrastructure, investments in new equipment, and improved access to roads and rail. In particular, access to highway and rail connections are a concern for ports along the Mississippi River and Tennessee-Tombigbee Waterway. Many ports along these waterways only have access to State highways via rural low-capacity roads. Table 14 summarizes railroad access needs for Mississippi ports.

- **Expansion.** Changes in freight flow and types of commodities traveling to and from ports could result in some expansion needs. This includes projects for new construction or acquisition of land. Table 15 summarizes expansion needs at Mississippi ports.

Table 14. | Port Railroad Needs at Mississippi Ports

Port	Serving Railroad	Need/Issue
Aberdeen	KCS	▶ Currently without rail service ▶ Need to secure funding for the completion of the rail spur and do some preventative maintenance of the dock
Amory	BNSF	▶ South end lacks rail access ▶ Port is not transloading at maximum capacity
Bienville	PBVR	▶ Transfer available to CSXT only ▶ Narrow passages and bridge location restricts barge traffics
Greenville	CAGY	▶ Need to replace all light rail with heavier rail and new timber for 3 miles of track ▶ Improve rail bed
Gulfport	KCS, CSXT	▶ None; all previous required improvements have been completed
Itawamba	MSRW	▶ Cannot interchange industry standard carloads
Lowndes County	KCS	▶ No rail service for west bank terminal
Natchez-Adams	NTRZ	▶ Extend rail on bulk cargo dock ▶ Build rail extension to the south of Port
Pascagoula	MSE, CSXT	▶ None
Rosedale	GTR	▶ Railroad out of service since 2002 ▶ In negotiations for operating contract with rail operator. Plan to rehab the line for car storage and eventual freight car movement to/from Port
Vicksburg	VSOR	▶ Capacity restrictions in Vicksburg ▶ Current rail in poor condition
Yazoo County	CN	▶ None
Yellow Creek	KCS	▶ Rail line needs repair and maintenance ▶ Connection to NS Railway to offer customers dual access

Source: MDOT MULTIPLAN 2045.

Table 15. | Port Expansion Needs at Mississippi Ports

Port	Project(s)	Time Frame
Aberdeen	Construct off-load facility	2026–2035
Claiborne County	Construct 100K S.F. warehouse building	TBD
Greenville	Build new flood-free terminal facility	2030
	Develop 30-acre flood-free site	2025
Gulfport*	DOD storage expansion	2020–2021
	East pier expansion	2021–2024
Lowndes County	Construct loading/ offloading facility	2021
	Purchase land from USACE	2022
Pascagoula	Pellet export terminal	Ongoing
	Construct south terminal at Pascagoula River	TBD
Yellow Creek	Ferrousouth coil storage facility	TBD

Source: MDOT MULTIPLAN 2045.

**Note: The Port of Gulfport has a planned facility expansion that may generate additional truck traffic and as a result may require additional operational management by the port.*

Air Cargo Needs

Air freight is a critical mode for high-value goods and Mississippi is projected to experience an increase in air cargo traffic over the long term. Many users of air freight truck goods to Memphis International Airport as it is a global hub for the air freight network. However, some air cargo demand is served by airports within the state, particularly Jackson-Medgar Wiley Evers International Airport (JAN). Table 16 outlines the needs and opportunities for air cargo.

Table 16. | Air Cargo Needs and Opportunities

Category	Need or Opportunity
Air	**Air cargo infrastructure conditions**
	Cargo-serving airports have preservation needs including maintaining existing pavements, runways, taxiways, and aprons.
	Access to air cargo
	Runway lengths for cargo operations are typically at least 8,000 ft.

Maintaining infrastructure is essential to ensuring air cargo can facilitate movement across the multimodal freight network. This includes maintaining existing pavements and infrastructure at airports such as runways, taxiways, and aprons.

One of the most critical characteristics that impact an airport's ability to accommodate air cargo is runway length. Runway length determines the size of aircraft that can operate at an airport. Most domestic cargo operations require runway lengths of 8,000 feet, while international operations prefer 10,000 feet. In addition, heavy life air cargo generally requires longer runways because they require more room for landing and takeoff. Of Mississippi's cargo-serving airports, only Tupelo Regional Airport does not have at least one runway that is 8,000 feet or longer. Maintaining cargo service at this airport over the long term may require an investment in a longer runway.

Economic Cost of Freight Transportation Needs

Given the substantial amount of economic activity that Mississippi's multimodal freight network facilitates, it is important to understand the cost of deficiencies on the network. This analysis investigates the economic cost of freight as it relates to congestion and reliability, safety, and state of good repair.

The continued positive success on the State's economy from person and freight travel will depend heavily on investment in its transportation infrastructure. The effects of future congestion on the statewide system could offset the economic benefits that freight provides. The estimated dollar value of the cost of congestion includes the annual cost of delay, unreliability, wasted fuel, and CO_2 emissions on the Mississippi highway freight network to 2050. The cost of unreliability was estimated as a percentage of the total cost of truck travel delay.[17] It represents the cost borne by freight trucks when dealing with travel times that are unpredictable due to roadway congestion. Examples of unreliability costs borne by freight trucks include replacement costs when substitute inventory is used to replace delay shipments, loss of cargo value when shipments fail to meet arrival deadlines and are not accepted by the consignee, or additional transportation costs associated with rerouting or diverting shipments. Table 17 presents the additional hours of delay, fuel consumption and CO2 emissions to be experienced by freight trucks if congestion on the Mississippi freight network is not addressed over the next 30 years.

[17] The cost of unreliability was assumed to equal 17 percent of truck travel delay cost based on the findings of the report: U.S. Department of Transportation. *Assessing the Full Costs of Congestion on Surface Transportation Systems and Reducing Them through Pricing*. February 2009.

Table 17. | Additional Delays, Wasted Fuel and CO2 emission to be experienced by Freight Trucks Traveling on the Mississippi Highway Freight Network, 2020–2050

Period	Additional Hours of Delay	Additional Gallons of Wasted Fuel	CO2 Emissions (in Metric Tons) from Wasted Fuel
From 2020 to 2050	21,840,100	13,158,700	194,100
Average Annual	704,500	424,500	6,300

Source: Cambridge Systematics, Inc. analysis.

Table 18 shows the breakdown of the total cost of congestion associated with truck travel on the Mississippi highway network from 2020 to 2050. The overall congestion cost associated with truck travel is anticipated to total **$982** million within the 30-year period.

Table 18. | Cost of Congestion to be Experienced by Freight Trucks Traveling on the Mississippi Highway Freight Network 2020-2050

Additional Costs due to Congestion	Freight Trucks	Freight Trucks (%)
Hours of Delay (Millions of 2020$)	$797	81%
Unreliability (Millions of $2020)	$133	14%
Wasted Fuel (Millions of 2020$)	$38	4%
CO_2 Emissions from Wasted Fuel (Millions of 2020$)	$14	1%
Total Cost of Congestion (Millions of $2020)	**$982**	**100%**

Source: Cambridge Systematics, Inc. analysis.

The ability of Mississippi's multimodal freight network is also impacted by its safety performance. Incidents impose a high cost on the freight network in the form of lost time, damage to property, and injuries. The future cost of truck-involved crashes on the Mississippi highway network is calculated by the change in traffic over the long term, estimating the potential number and severity of crashes based on historical data, and monetizes its cost. All crashes, whether an injury occurs or not, result in a cost. This cost can range from time lost due to the crash itself and resulting events to the price of repairing vehicles and other property; costs from an injury; and/or the statistical value due to a loss of life.

Table 19 presents the economic cost of crashes involving freight trucks in Mississippi from 2020 to 2050, assuming no changes in the scenario. The results indicate that crashes involving freight trucks in Mississippi in that time period will result in a cost of $2.6 billion.

Table 19. | Economic Cost of Mississippi Crashes Involving Freight Trucks 2020-2050

Crash Severity (Most Severe Crash Outcome)	Cost of Crashes Involving Trucks (Millions of 2020$)	Cost of Crashes Involving Trucks (%)
Fatal	$2,421.0	94.0%
Suspected Serious Injury	$45.9	1.8%
Suspected Minor Injury	$0.2	0.01%
Possible Injury	$62.4	2.4%
Property Damage Only	$44.2	1.7%
Unknown	$0.8	0.03%
Total	**$2,574.4**	**100.0%**

Source: Cambridge Systematics, Inc. analysis.

4 STRATEGIES & RECOMMENDATIONS

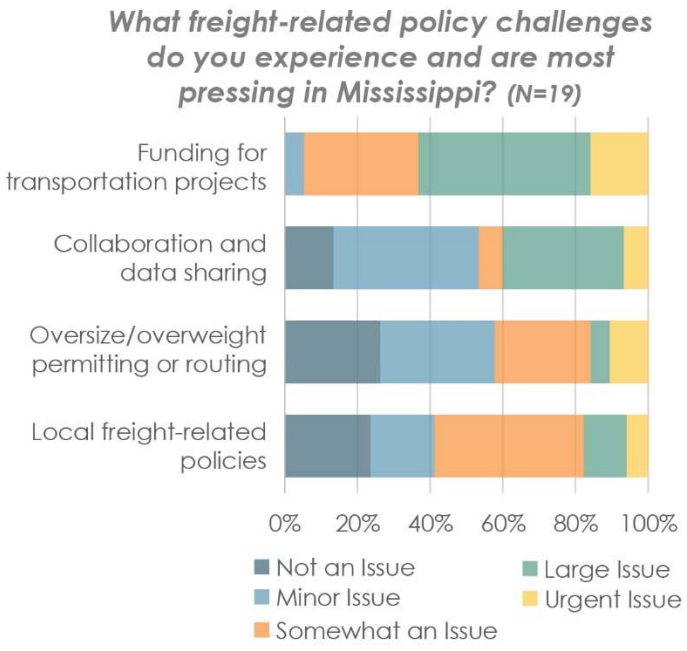
4.1 Strategies & Recommendations

The strategies for the 2022 Mississippi Statewide Freight Plan were developed to address system-level needs and to advance Mississippi's freight goals and objectives, which were developed with strategic input from freight stakeholders including MDOT staff and the Mississippi Freight Advisory Committee (MS-FAC). The following captures stakeholder input which served as a resource in the analysis and development of strategies and recommendations in this section.

Freight stakeholder priorities for the **freight plan** include:

- Multimodal connections
- Bottlenecks
- Rural Needs
- Economic Competitiveness
- Safety
- Resiliency
- Funding Needs

Sources: November 2021 Freight Stakeholder Survey & November 2021 Industry Stakeholder Forum.



MDOT developed a set of strategies, supported by specific action items, designed to be implementable and to address Mississippi's multimodal freight needs. Strategies were developed under the context of three multimodal and broad-based categories: (1) Infrastructure, (2) Technology and Operations, and (3) Policies and Programs. Descriptions of these strategies are shown in Table 20. The following subsections describe each strategy and the associated actions.

Table 20. | Strategy Types

Strategy Type	Description
Infrastructure	Infrastructure strategies advance Mississippi's freight goals and objectives through capital investments on its multimodal freight network.
Technology & Operations	Technology and operations strategies improve the efficiency, safety, and mobility of the freight network through operational investments as opposed to capacity expansions or larger capital improvements.
Policies & Programs	These strategies include policy, coordination, outreach, and programmatic initiatives that help to address Mississippi's freight transportation needs and opportunities.

Infrastructure

Infrastructure strategies advance Mississippi's freight goals and objectives through capital investments on its multimodal freight network.

- **Prioritize and perform pavement and bridge rehabilitation projects on Tier I-II freight corridors.** Maintaining pavement conditions along freight-intensive highway corridors is especially important for facilitating safe and efficient movement of freight, as trucks have a disproportionate impact on pavement deterioration due to their size and weight. To improve conditions for freight travel, MDOT should focus these efforts on its Tier I-II freight network.

  Likewise, maintaining bridge conditions on freight-intensive corridors is important for freight mobility and resiliency. Tier I-II bridges that are posted for load or in poor condition should be prioritized for replacement. For bridges crossing railroads that have less than 22'-6" of vertical clearance, prioritize for replacement of those bridges crossing railroads with current or anticipated double-stack operations. Also, prioritize replacement bridges crossing Tier I-II freight corridors that have less than 16'-6" of vertical clearance as they approach the end of their useful life. Bridges with less than 16'-6" of vertical clearance can impose significant challenges to the movement of goods.

- **Prioritize and perform infrastructure upgrades to Tier III freight corridors.** Tier III freight corridors, including NHS freight intermodal connectors, represent the first and last mile for trucks accessing major freight terminals and other freight activity centers. MDOT should work with its local partners to improve the state of repair of these facilities. This includes rehabilitating pavements, replacing damaged or missing signage, re-striping pavements, and other

maintenance projects. In addition, as part of this process, MDOT should consider alternative intersection designs on Tier III corridors, such as roundabouts, to further support improved safety and operations.

- **Continue to partner with airports, ports, and railroads to support operations and service expansions through direct investments and landside infrastructure maintenance, capacity, and operational improvements.** MDOT partners with the State's airports, ports, and railroads through the Office of Intermodal Planning. The Multimodal Transportation Improvement Program (MTIP) provides funding for airports, ports, and railroads to improve their service, operations, and competitive position. MDOT should continue to support these modes through the MTIP program, but also identify and implement landside investments in the corridors that provide access to multimodal freight assets to complement on-terminal improvements.
- **Incorporate green infrastructure for managing stormwater runoff and infrastructure resiliency enhancement into Tier I-II freight corridor roadway designs.** Limiting negative impacts of goods movement on the environment supports MDOT's resiliency and environmental stewardship goal and objectives. Incorporating green infrastructure such as bioswales, planter boxes, and street trees can help to filter roadway surface pollutants from stormwater runoff before they enter water bodies and generally serve as another layer of flooding control for freight corridors. It can also help to preserve existing, aging gray infrastructure (e.g., curbs, gutters, pipes) as green infrastructure would divert some stormwater before it enters those systems. Incorporating design standards with consideration for environmental impacts will provide opportunities for enhancing infrastructure resiliency of freight corridors.
- **Maintain state freight corridors including those traversing or near wildlife habitats and disadvantaged communities to minimize congestion, emissions, and other negative impacts.** The needs assessment identified where Mississippi's Tier I-II freight network crosses historically disadvantaged communities, wildlife management areas, critical habitats for threatened and endangered species, national forests, and other protected wildlife areas. This strategy recommends that MDOT takes steps to relieve congestion and reduce GHG emissions of freight corridors including those that traverse these areas.

Technology and Operations

Technology and operations strategies improve the efficiency, safety, and mobility of the freight network through operational investments as opposed to capacity expansions or larger capital improvements. Although these approaches will not physically increase transportation network capacity, they can enhance the safety and efficiency of the freight network by mitigating congestion, bottlenecks, and safety impacts.

- **Develop and adopt freight-focused transportation systems management and operations (TSMO) including enhanced ITS solutions for mitigating truck bottlenecks.** MDOT already

manages a variety of transportation technologies including transportation management centers (TMC), dynamic messaging signs, environmental sensor stations, and the MDOTtraffic.com website and mobile application. MDOT should expand its current ITS program to include freight-specific applications such as freight signal priority, and freight advanced traveler information systems.

- **Conduct a statewide truck parking study to provide a detailed analysis of needs and solutions.** Truck parking facilities provide drivers with safe, authorized locations to park to meet federal regulations for hours-of-service (HOS), rest breaks, or staging ahead of delivery or pickup. The sufficient availability of safe spaces for rest is critical to overall highway safety. Mississippi's 2019 Jason's Law Survey results suggest that the state may not have sufficient capacity (i.e., public and private) to meet demand. MDOT should conduct a statewide truck parking study to determine the demand for truck parking, determine if and where capacity is insufficient to meet demand and develop solutions for addressing Mississippi's truck parking needs. Based on the needs identified as part of the study, three potential strategies that MDOT should consider exploring in detail include opportunities to expand capacity at existing facilities, build new capacity, and deploy a truck parking availability system (TPAS) along Interstates. The detailed investigation of these strategies could take the form of high-level concept drawings of new or expanded facilities, an outline of a concept of operations for a TPAS, and planning level cost estimates for implementing the strategies.
- **Deploy signage alerting drivers to the locations and capacities of public truck parking facilities.** This is a low-cost investment that would add signage to Tier I-II freight corridors alerting drivers to the locations of public truck parking facilities and their capacities.
- **Upgrade rail crossing safety equipment at at-grade crossings and invest in grade separations where feasible.** Overall, the total number of incidents and the number of incidents resulting in serious or fatal injuries at highway-rail crossings have remained consistent over the past five years. However, some at-grade crossings have experienced multiple incidents over that time period. These and other crossings where high vehicle usage, pedestrian or cyclist activity, and other risk factors are present should be considered for grade separations.
- **Align with future freight guidance on the National Electric Vehicle Infrastructure (NEVI) Formula Program.** This includes coordinating planning efforts to incorporate the state's freight network with the pending Electric Vehicle (EV) Alternative Fuel Corridors (AFC) designations of the majority of the state's interstate system towards the development of future Mississippi EV Infrastructure Deployment Plans and EV charging network. This would support the environmental goal of reducing emissions from freight movement.

Policies and Programs

These strategies include policy, coordination, outreach, and programmatic initiatives that help to address Mississippi's freight transportation needs and opportunities.

- **As part of the planning process, identify opportunities to provide new or upgrade existing multimodal infrastructure along Tier I-II freight corridors in disadvantaged communities.** Freight assets can act as physical barriers to mobility for transportation disadvantaged communities as railroads, expressways, and major arterials often have limited locations to safely cross. This particularly impacts households that do not own vehicles and instead rely on walking, cycling, and public transit. This strategy recommends that MDOT include as part of its project development process a formal check to determine if new or upgraded multimodal assets (e.g., sidewalks with landscaped buffers, multiuse trails, protected bike lanes, pedestrian crossings) can be provided for projects that contain Tier I-II freight corridors within their limits.
- **Partner with local governments, MPOs, shippers, and carriers on initiatives to mitigate freight impacts to disadvantaged communities, including pursuing federal funding opportunities and freight planning efforts.** Mitigating emissions, air quality, and congestion impacts to transportation disadvantaged communities that are disproportionately impacted by goods movement is a critical component of MDOT's resiliency and environmental stewardship goal. As part of the Bipartisan Infrastructure Law, multiple discretionary grant programs either directly aimed at addressing equity challenges in transportation disadvantaged communities or include it as a key factor. Examples include the Reconnecting Communities Pilot Program and the Railroad Crossing Elimination Program. MDOT should partner with local governments, MPOs, shippers, and carriers on developing projects that work to limit or avoid negative impacts on these communities. For projects that are good candidates for discretionary grants, MDOT should pursue these funding opportunities with its partners. Another area of collaboration is to share data and information towards local governments' and MPOs' freight planning efforts to leverage resources.
- **Encourage and support local governments to provide truck parking and incorporate truck parking needs into land use decisions.** Generally, the majority of truck parking capacity nationwide (and in Mississippi) is developed by the private sector. In addition, the need for truck parking is generated by manufacturing, warehousing, energy production, and other economic activities that occur in local jurisdictions. As such, local land use policies and practices have a substantial impact on the availability of truck parking. This strategy calls for MDOT to encourage and support local governments in incorporating truck parking needs into land use decisions. This includes identifying the benefits of truck parking to communities, developing strategies to eliminate potential negative impacts, developing tools for estimating truck parking generation and needs, and factors for identifying sites. Once finalized, the FHWA Truck Parking Development Handbook which is currently under development would provide a good resource for implementing this strategy.
- **Seek opportunities to expand, the Multimodal Transportation Improvement Program to support multimodal freight projects.** The Multimodal Transportation Improvement Program

(MTIP) provides funding to public airports, ports, and railroads for infrastructure improvements and expansion needs. Though trucking is Mississippi's predominant freight mode in terms of total volume, the availability of multiple freight modes is important for enhancing the resiliency of the freight network and the State's economic competitiveness as shippers have multiple modal options. In addition, the ability to transport greater volumes of goods by rail and barge, in particular, can be part of a broader solution to alleviating truck bottlenecks. For these reasons, MDOT should seek opportunities to expand the MTIP.

- **Partner with short line and Class I railroads to secure funds to expand service, increase capacity, and enhance operations.** The freight rail network in Mississippi is privately owned and operated by a variety of Class I and short line (Class II and III) carriers. Those owners are responsible for the maintenance of and investment in the network, and MDOT does not have any control or oversight of those activities. However, MDOT should support and partner, when possible, with railroads to expand rail access and service to businesses throughout the state to facilitate and increase multimodal freight activity. One potential area of partnership is the pursuit of federal funding to develop new spur lines into industrial parks and ports, upgrade track, separate grade crossings, and perform other upgrades.
- **Work with other states as part of multi-state coalitions to identify opportunities and collaborate on projects and programs.** Freight does not stop at state lines and multiple freight challenges within Mississippi are part of broader, multi-state challenges – for example, truck parking. This strategy encourages MDOT to work with other states as part of multi-state compacts or coalitions that work collaboratively to develop solutions for freight challenges that impact multiple states.
- **Continue to facilitate engagement with the industry through the Mississippi Freight Advisory Committee (MS-FAC).** Continued engagement with industry stakeholders through the MS-FAC will allow MDOT to strengthen its partnership with the public and private sectors to better support strategic freight planning and initiatives. In addition, this better positions MDOT to pursue grant opportunities to leverage state and local funding for freight-related projects.

Summary of Strategies and Recommendations

The strategies and the goal areas they support are summarized in Table 21. Overall, the strategies support the entire range of goals and objectives selected by MDOT and its stakeholders. Many strategies simultaneously support multiple goal areas.

Table 21. | Mississippi Freight Strategies and Recommendations

Strategy Type	Description and Recommended Actions
Infrastructure	Prioritize and perform pavement and bridge rehabilitation projects on Tier I-II freight corridors.
	Prioritize and perform infrastructure upgrades to Tier III freight corridors.

Strategy Type	Description and Recommended Actions
	Continue to partner with airports, ports, and railroads to support operations and service expansions through direct investments and landside infrastructure maintenance, capacity, and operational improvements.
	Maintain state freight corridors including those traversing or near wildlife habitats and disadvantaged communities to minimize congestion, emissions, and other negative impacts.
	Incorporate green infrastructure for managing stormwater runoff and infrastructure resiliency enhancement into Tier I-II freight corridor roadway designs.
Technology & Operations	Develop and adopt freight-focused transportation systems management and operations (TSMO) including enhanced intelligent transportation systems (ITS) solutions for mitigating truck bottlenecks.
	Conduct a statewide truck parking study to provide a detailed analysis of needs and solutions.
	Deploy signage alerting drivers to the locations and capacities of public truck parking facilities.
	Upgrade rail crossing safety equipment at at-grade crossings and invest in grade separations where feasible.
	Align with future freight guidance on the National Electric Vehicle Infrastructure (NEVI) Formula Program.
Policies & Programs	As part of the planning process, identify opportunities to provide new or upgrade existing multimodal infrastructure along Tier I-II freight corridors in disadvantaged communities.
	Partner with local governments, MPOs, shippers, and carriers on initiatives to mitigate freight impacts to disadvantaged communities, including pursuing federal funding opportunities and freight planning efforts.
	Encourage and support local governments to provide truck parking and incorporate truck parking needs into land use decisions.
	Seek opportunities to expand, the Multimodal Transportation Improvement Program to support multimodal freight projects.
	Partner with short line and Class I railroads to secure funds to expand service, increase capacity, and enhance operations.
	Work with other states as part of multi-state coalitions to identify opportunities and collaborate on projects and programs.
	Continue to facilitate engagement with the industry through the Mississippi Freight Advisory Committee (MS-FAC).

4.2 Performance Measures

The application of TPM principles to freight planning requires the development and use of freight performance measures. Performance measures are part of the first steps to determining the strategic direction of the freight plan. They are based on metrics that are used to track progress

toward goals, objectives, and achievements of established performance targets.[18] They enable agencies to gauge system condition and use, evaluate transportation programs and projects, and help to identify beneficial projects and investments where funding is constrained. Some important outcomes that performance measures aid agencies in achieving include:[19]

- **Link actions to Goals.** Performance measures help to link plans and actions to agency goals and objectives.
- **Prioritize Projects.** Performance measures can provide information needed to invest in projects and programs that provide the greatest benefits.
- **Manage Performance**. Applying performance measures can improve the management and delivery of programs, projects, and services.
- **Communicate Results.** Performance measures can help communicate the value of transportation investments by providing quantifiable, understandable indicators that the public can observe.
- **Strengthen Accountability.** Performance measures promote accountability by revealing whether transportation investments are providing the expected performance or demonstrating the need for improvement.

Performance measures should be manageable, sustainable, and based on collaboration with partners and stakeholders. Also, measures must be selected so that they rely on data that is timely, available, and of good quality. Otherwise, the measures will provide little value for determining progress towards meeting targets and generally for managing performance. If measures are supported with reliable data of good quality, then they provide an effective basis for evaluating strategies for performance improvement.

The performance measures, along with the goals and objectives they support, are shown in Table 22. Performance measures are divided into two categories: (1) MDOT Performance measures and (2) other performance measures. MDOT performance measures are those measures for which MDOT has direct influence. For these measures, MDOT can make investments, develop policies and programs, and adjust engineering and planning decisions to directly impact their outcomes. For example, the condition rating of pavements is directly impacted by MDOT investments in resurfacing, rehabilitation, and other maintenance projects. Other performance measures are those measures for which MDOT has only indirect influence. MDOT can still take action to impact these measures, but those actions would only indirectly influence outcomes. For example, MDOT may rehabilitate pavements and adjust signal timing on a last-mile connector to provide for more reliable travel times to a port, but that investment alone does not determine

[18] https://www.tpmtools.org/guidebook/chapter-01/.

[19] https://dot.nebraska.gov/media/10761/nebraska-freight-plan.pdf.

cargo volumes at the port. Distinguishing between measures that MDOT directly influences versus indirectly influences is important for prioritizing strategies and communicating with stakeholders.

Table 22. | Mississippi Freight Performance Measures

Freight Plan Goals and Objectives	MDOT Performance Measures	Other Performance Measures	Data Sources
Promote a safe and secure multimodal freight network. ▶ Reduce the number and rate of fatalities and injuries involving freight movements. ▶ Maintain public facilities with truck parking access.	▶ Statewide annual rate of crashes, injuries, and fatalities involving heavy trucks. ▶ Statewide annual number of highway-rail incidents. ▶ Public truck parking facilities and spaces.	▶ None proposed.	▶ MDOT Crash Database ▶ Federal Railroad Administration (FRA) Highway/Rail Grade Crossing Incidents Database ▶ FHWA Jason's Law Survey
Maintain infrastructure crucial to multimodal freight movement in a state of good repair. ▶ Maintain freight assets and gateways in rural and urban areas at acceptable condition. ▶ Preserve freight corridor infrastructure to maintain acceptable performance levels.	▶ Percentage of Freight Network pavements in good condition. ▶ Percentage of Freight Network bridges/culverts in good condition.	▶ Authorized channel depth for Gulf Coast and river ports. ▶ Average age of pipelines by decade of installation. ▶ Percent of weight-limited track on freight railroads.	▶ MDOT Pavement Management System ▶ MDOT Bridge Data, National Bridge Inventory ▶ Freight Railroads ▶ Pipeline and Hazardous Materials Safety Administration, By-Decade Inventory ▶ State and Local Port Authorities
Improve reliability and reduce congestion barriers to freight mobility ▶ Provide reliable travel times while minimizing congestion along major freight corridors in rural and urban areas.	▶ Total annual hours of truck delay. ▶ Truck delay by Freight Network tier. ▶ Truck Travel Time Index on freight interstate corridors.	▶ Maximum speed rating on railroads.	▶ National Performance Management Research Data Set ▶ MDOT Traffic Data ▶ Freight Railroads

Freight Plan Goals and Objectives	MDOT Performance Measures	Other Performance Measures	Data Sources
Maximize the impact of the freight network on the productivity and economic competitiveness of the state ▶ Invest to facilitate freight system improvements that enhance Mississippi's competitive position.	▶ Statewide annual funds invested by MDOT for freight-related projects through its Multi-Modal Transportation Improvement Program and return on investment.	▶ Annual total tonnage of goods shipped into and out of Mississippi ports. ▶ Annual total tonnage of goods shipped into, out of, and within Mississippi by rail. ▶ Annual total tonnage of goods shipped into and out of Mississippi by air cargo. ▶ Total tonnage of goods shipped into, out of, and within Mississippi by roadway measured every 5 years.	▶ U.S. Army Corps of Engineers Waterborne Commerce Statistics Center ▶ Surface Transportation Board Carload Waybill Sample ▶ Municipal airport authorities of cargo-serving airports ▶ FHWA Freight Analysis Framework ▶ MDOT Multimodal Transportation Improvement Program (MTIP)
Support the resiliency of the freight network while minimizing adverse impacts of freight operations on communities and the environment. ▶ Invest to improve the resiliency of freight transportation system while meeting environmental requirements. ▶ Reduce greenhouse gas (GHG) emissions and minimize freight impacts to historically disadvantaged communities and wildlife habitats.	▶ Percentage of Freight Network bridge/culverts in moderate- to high-risk flood and sea level rise zones in good condition. ▶ Truck CO_2 emissions per mile on Interstate highways.	▶ None proposed.	▶ MDOT Bridge Data, National Bridge Inventory ▶ FHWA Freight Mobility Trends Tool

Freight Plan Goals and Objectives	MDOT Performance Measures	Other Performance Measures	Data Sources
Build external and freight industry partnerships and efficiently maximize freight investments. ▶ Facilitate public and private sector partnerships and communications to promote and plan a safe and efficient freight network. ▶ Leverage freight funding to maximize freight investments.	▶ Activity level with Mississippi Freight Advisory Committee (MS-FAC) and other state FACs meetings/communication. ▶ Activity level with Institute for Trade and Transportation Studies (ITTS) and other regional coalitions meeting/communication. ▶ Utilization of National Highway Freight Program funds. ▶ Number of state and federal discretionary grants for projects impacting freight	▶ Number of active freight advisory committees at Mississippi metropolitan planning organizations (MPOs).	▶ FACs coordination ▶ ITTS and other regional coordination ▶ MDOT Multimodal Transportation Improvement Program (MTIP) ▶ Mississippi MPOs ▶ Mississippi Development Authority (MDA) and Mississippi Department of Environmental Quality (MDEQ) freight-related programs/opportunities ▶ Federal discretionary grants (Infrastructure for Rebuilding America [INFRA], Rebuilding American Infrastructure with Sustainability and Equity [RAISE], etc.) ▶ MDOT Freight Investment Plan

4.3 Freight Investment Plan

Funding for significant freight projects was established by the FAST Act through the National Highway Freight Program (NHFP). Allocated funding is focused on improving freight performance on the National Highway Freight Network (NHFN), which includes the Primary Highway Freight System (PHFS), other Interstate portions not on the PHFS, critical rural freight corridors, and critical urban freight corridors. Current freight mobility needs exceed the available NHFP funds. The Freight Investment Plan represents the fiscally constrained list of projects assuming a consistent level of NHFP funding. The eight-year Freight Investment Plan is shown in Appendix A. This table contains the proposed fiscally constrained NHFP funded projects with anticipated NHFP funding and matches for the identified FFY and is subject to change. Amendments will be made to account for changes to the STIP and future federal apportionments. A list of eligible projects for NHFP funded is also provided in Appendix A.

A

APPENDIX A. FREIGHT INVESTMENT PLAN

Proposed Constrained National Highway Freight Program Funded Projects											
Project/Detail #	FMIS #	County	Project Location	Scope of Work	Federal Fiscal Year (FFY)	NHFP Funds Apportionment	NHFP Funds Obligated/ Anticipated	Other Federal Funds	State Funds	AC	Total Cost
			Carryover from 2017 NHFP funds from FMIS# 0552(229)			$2,448,666					
108091/301000	0552(257)*	Holmes	I-55 from 0.5 mile N of SR 17 to Carroll County Line	Mill & Overlay	2022	$16,437,541	$18,886,207	$21,000,000	$4,431,802	$2,481,743	$46,799,752
108591/301000/ 301100	0202(102)	Scott	I-20 from Rankin County Line to SR 35	Mill & Overlay	2023	$16,766,292	$16,766,292	$0	$1,862,922	$19,305,786	$37,935,000
109251/301000	0592(118)	Jones	I-59 from N of Rocky Creek River to Jasper County Line	OGFC Lift	2024	$17,101,617	$17,101,617	$0	$1,900,180	$1,398,203	$20,400,000
108587/301000	0022(101)	Newton	I-20 from 5.1 miles E of SR 15 to 2.3 miles E of Chunky River	Mill & Overlay	2025	$17,300,000	$15,750,000	$0	$1,750,000	$0	$17,500,000
109254/301000	0553(100)	Yalobusha	I-55 from 6.45 miles N of Grenada County Line to Panola County Line	OGFC Lift			$1,550,000	$0	$172,222	$5,468,038	$7,190,260
109258/301000	0061(106)	Marshall	I-22 from beginning of Holly Springs Bypass to end of Holly Springs Bypass	Mill & Overlay	2026	$17,450,000	$17,450,000	$0	$1,938,889	$2,208,611	$21,597,500
501561/602000		Harrison	SR 601 from I-10 to Port of Gulfport	Grade, Drain, Bridge, Pave	2027**	$17,860,130	$17,860,130				$17,860,130
501561/602000		Harrison	SR 601 from I-10 to Port of Gulfport	Grade, Drain, Bridge, Pave	2028**	$18,217,333	$18,217,333				$18,217,333
501561/602000		Harrison	SR 601 from I-10 to Port of Gulfport	Grade, Drain, Bridge, Pave	2029**	$18,581,679	$18,581,679				$18,581,679
Total Amount						$142,163,258	$142,163,258	$21,000,000	$12,056,015	$30,862,381	$206,081,654

Note:

*FMIS# 0552(257) NHFP obligated funds include remaining 2017 NHFP funds from FMIS# 0552(229).

**NHFP funds beyond the Bipartisan Infrastructure Law (BIL) period are currently estimated as follow at a 2% annual increase and will be amended with new federal apportionments once available.
- 2027 = $17,860,130
- 2028 = $18,217,333
- 2029 = $18,581,679

This table contains the proposed fiscally constrained projects with anticipated NHFP funding and matches for the identified FFY and is subject to change. Amendments will be made to account for changes to the STIP and future federal apportionments.
Amended May 2024

Eligible Capital Projects for National Highway Freight Program Funds				
Project/Detail #	**County**	**Project Location**	**Scope of Work**	**Cost**
100881/301000	Simpson	SR 28 between Copiah County Line and SR 11	Bridge Replacement	$13,400,000
102246/302000	Pearl River	US 11 over Hobolochitto Creek	Bridge Replacement	$19,100,000
102383/302000	Tallahatchie	SR 32 between Webb and Charleston	Bridge Replacement	$35,200,000
102401/301000	Lauderdale	US 80 between Chunky and Meehan	Bridge Replacement	$7,400,000
102401/302000	Newton	US 80 between Chunky and Meehan	Bridge Replacement	$6,400,000
103332/301000	Yalobusha	US 51 between Grenada County Line to Panola County Line	Bridge Replacement	$18,300,000
105338/302000	Yalobusha	US 51 over Yocona River	Bridge Replacement	$8,800,000
106078/301000	Smith	SR 28 at SR 37	Intersection Improvements	$4,500,000
106102/301000	Carroll	US 51 between Holmes County Line and SR 35	Bridge Replacement	$16,900,000
106109/301000	Humphreys	SR 12 over Sunflower River	Bridge Replacement	$12,600,000
106109/302000	Washington	SR 12 over Sunflower River	Bridge Replacement	$10,000,000
106971/301000	Simpson	SR 28 over Tanyard Creek	Bridge Replacement	$2,100,000
106972/301000	Pike	US 51 between SR 48 and Magnolia Dr	Bridge Replacement	$4,100,000
106972/302000	Pike	US 51 between Magnolia Dr and Airport Fernwood Rd	Bridge Replacement	$1,600,000
107036/301000	Jefferson	SR 28 between SR 33 and Fountain Rd	Bridge Replacement	$4,300,000
107438/301000	Tate	US 51 at Main St	Intersection Improvements	$3,500,000
107509/301000	Hancock	I-10 at Diamondhead	Interchange	$6,400,000
107569/303100	Rankin	I-20 over Pearl River	Bridge Preservation	$1,000,000
107899/301000	Hinds	I-55 over Pearl River	Bridge Preservation	$10,000,000
108091/301000	Holmes	I-55 from 0.5 mile N of SR 17 to Carroll County Line	Mill & Overlay	$46,799,752
108138/301000	Pearl River	I-59 from 0.5 mile N of LA State Line to McNeil	Mill & Overlay	$22,400,000
108139/301000	Clarke	I-59 from 6 miles N of Clarke County Line to Lauderdal County Line	Mill & Overlay	$10,900,000
108140/301000	Panola	I-55 from 1.8 mile N of SR 35 to Tate County Line	Mill & Overlay	$30,000,000
108141/301000	Lee	I-22 from Pontotoc County Line to Belden	Mill & Overlay	$3,150,000
108141/302000	Pontotoc	I-22 from Union County LIne to Lee County Line	Mill & Overlay	$3,150,000
108142/301000	Union	I-22 from SR 30 to Pontotoc County Line	Mill & Overlay	$17,000,000
108143/301000	Hinds	I-20 from Warren County Line to Natchez Trace	Mill & Overlay	$21,500,000
108145/301000	Rankin	I-20 from I-55 Stack to 1.3 mile E of US 49	Pavement Restoration	$7,500,000
108270/301000	Grenada	US 51 from Gesslin Corner to Yalobusha County Line	Mill & Overlay	$2,550,000
108273/301000	Lamar	US 11 from Mitchell St to 5.7 miles S	Overlay	$2,300,000

Eligible Capital Projects for National Highway Freight Program Funds				
Project/Detail #	County	Project Location	Scope of Work	Cost
108397/301000	Warren	I-20 over Clear Creek	Bank Stabilization	$5,000,000
108513/301000	Hinds	I-20 over Spring Ridge Rd	Drainage	$200,000
108587/301000	Newton	I-20 from 5.1 miles E of SR 15 to 2.3 miles E of Chunky River	Mill & Overlay	$17,500,000
108588/301000	Pearl River	I-59 from McNeil to Hillsdale	Mill & Overlay	$29,200,000
108590/301000	Carroll	I-55 from Montgomery County Line to Grenada County Line	Mill & Overlay	$8,500,000
108591/301000/301100	Scott	I-20 From Rankin County Line to SR 35	Mill & Overlay	$37,935,000
108658/301000	Leake	SR 16 from Carthage to Neshoba County Line	Mill & Overlay	$4,500,000
108685/301000	Pearl River	US 11 from Poplarville City Limit To Lamar County Line	Overlay	$3,796,635
108698/301000	Jefferson	SR 28 from Dennis Cross Rd to Copiah County Line	Overlay	$2,870,000
108708/301000	Pearl River	US 11 from I-59 to Cayten St	Overlay	$1,944,715
108777/302000	Panola	I-55 between SR 720 and SR 35	Bridge Preventive Maintenance	$900,000
108777/305100	Lauderdale	I-59 over Toomsuba Creek	Bridge Preventive Maintenance	$300,000
108812/301000	Pike	I-55 from SR 24 to US 98 in Summit	Pavement Restoration	$25,000,000
108812/302000	Pike	I-55 at US 98 in Summit	Roundabout	$6,000,000
108824/301000	Harrison	I-10 at Shriners Blvd	Roundabout	$2,200,000
108847/302000	Marshall	I-22 over Musgray Rd	Bridge Preservation	$1,100,000
108877/301000	Warren	I-20 between Washington St and US 61	Bridge Repair	$3,320,000
109172/301000	Hinds	I-20 over Big Black River	Bridge Repair	$7,700,000
109172/302000	Warren	I-20 over Big Black River	Bridge Repair	$1,300,000
109251/301000	Jones	I-59 from N of Rocky Creek River to Jasper County Line	OGFC Lift	$20,400,000
109253/301000	Clarke	I-59 from Jasper County Line to Lauderdale County Line	Mill & Overlay	$4,900,000
109254/301000	Yalobusha	I-55 from 6.45 miles N of Grenada County Line to Panola County Line	OGFC Lift	$7,190,260
109255/301000	Panola	I-55 from Yalobusha County Line to US 278	OGFC Lift	$3,000,000
109256/301000	Grenada	I-55 from Carroll County Line to SR 8	Mill & Overlay	$11,100,000
109257/301000	Jones	I-59 from Moselle to Rocky Creek River	Mill & Overlay	$10,900,000
109258/301000	Marshall	I-22 from beginning of Holly Springs Bypass to end of Holly Springs Bypass	Mill & Overlay	$21,597,500
109264/301000	Desoto	I-69 From Tunica CL to I-55	Grade, Drain, Bridge, Pave	$19,750,000
501561/602000	Harrison	SR 601 from I-10 to Port of Gulfport	Grade, Drain, Bridge, Pave	$54,659,142

This table contains highway capital projects eligible for the National Highway Freight Program funds and is subject to change. Amendments will be made to account for changes to the STIP and future federal apportionments.
Amended May 2024

B

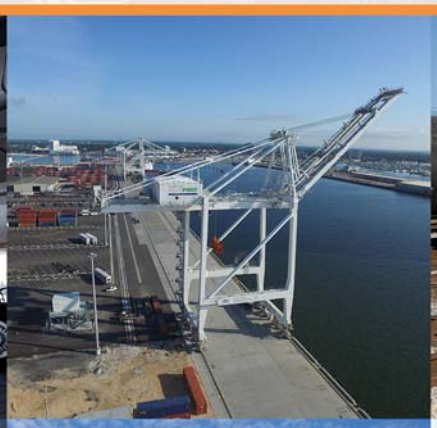
APPENDIX B. TIER III HIGHWAY FREIGHT CORRIDORS

MS Critical Rural Freight Corridors - 2022					
County	Route	Start Point	End Point	Length (miles)	CRFC Criteria ID
Coahoma Tallahatchie	US 49/US 49E/MS 32	US 61	MS 35	36.5	D - access to agricultural facilities
Grenada Yalobusha	MS 729/US 51	I-55	End Dam Rd	22.0	D - access to agricultural, gravel, freight facilities
Lowndes Monroe	US 45	US 82	MS 25	28.0	F - access to gravel and chemical facilities
Montgomery Carroll Holmes	US 51	US 82	MS 19	22.2	D - access to agricultural and forestry facilities
Tate Panola	MS 306/US 51	I-55	MS 310	14.2	F - access to manufacturing and gravel facilities
Union Tippah	MS 15	I-22	US 72	37.0	F - access to manufacturing and transportation facilities
Humphreys	MS 12	US 49W	Cole Lake Rd	10.7	D - access to forestry facilities
Jefferson Copiah	MS 28	US 61	MS 552	23.1	D - access to forestry facilities
Lauderdale Newton	US 80	I-20	MS 503	14.2	D - access to poultry and forestry facilities
Leake	MS 35	MS 25	MS 487	6.5	D - access to poultry facilities
Leake	MS 16	MS 25	MS 427	18.7	D - access to poultry and forestry facilities
Leake Madison	MS 16	MS 25	MS 17	10.6	D - access to poultry and forestry facilities
Newton	MS 15	I-20	MS 492	16.7	D - access to poultry, forestry, lumber facilities F - access to industrial park in Newton
Scott Leake	MS 13	I-20	MS 25	27.7	D - access to poultry and freight facilities
Scott	MS 35	I-20	MS 21	3.1	D - access to poultry & gravel facilities
Scott Smith	MS 35	I-20	MS 18	22.0	D - access to poultry, lumber, gravel facilities
Washington	MS 438	US 61	MS 1	9.6	D - access to agricultural facilities
Jasper	MS 528	I-59	Main St	2.4	B - access to energy areas
Jones Jasper	MS 15	US 84	MS 18	23.3	D - access to poultry & lumber facilities
Marion	MS 35	US 98	LA State Line	16.3	D - access to poultry & gravel facilities
Pearl River	US 11	I-59	MS 43	5.6	D - access to gravel and manufacturing facilities
Pearl River Lamar	MS 26/US 11	I-59	MS 589	27.4	F - access to refinery N of Lumberton & industrial park S of Lumberton
Pike	Airport Fernwood Rd/US 51	I-55	MS 48	5.2	F - access to industrial park in Magnolia
Simpson Copiah	MS 28	US 49	MS 27	28.1	D - access to poulty & lumber facilities
Simpson Smith	MS 28/Co-Op Rd/MS 28	US 49	MS 37	18.9	D - access to poultry & lumber facilities
Stone	MS 26	US 49	MS 15	9.7	D - access to forestry & agricultural facilities
Wilkinson	MS 24	US 61	MS 33	13.4	D - access to forestry & gravel facilities
			Total Centerline Mileage	473.1	

MS Critical Urban Freight Corridors - 2022						
MPO	County	Route	Start Point	End Point	Length (miles)	CUFC Criteria ID
CMPDD	Hinds	Beasley Rd Watkins Dr	Industrial Park Rd I-220	Watkins Dr Beasley Rd	2.4	J - Serves a major freight generator - Northwest Industrial Park
	Hinds	E McDowell Rd S Gallatin St	I-55 E McDowell Rd	S Gallatin St US 80	2.1	J - Serves a major freight generator - UPS & gravel facilities
	Hinds	I-20 Frontage Rd Norrel Rd	Continental Pkwy I-20 Frontage Rd	Norrel Rd I-20	1.4	J - Serves a major freight generator - Continental Tire Plant
	Hinds	I-20 Frontage Rd US 80	Industrial Park Dr I-20 Frontage Rd	US 80 I-20	2.0	J - Serves a major freight generator - Clinton Industrial Park
	Hinds	I-55 South Frontage Rd Siwell Rd	Mendell Davis Dr I-55 South Frontage Rd	Siwell Rd I-55	1.5	J - Serves a major freight generator - industrial facilities
	Hinds	Industrial Dr	I-220	Outer Cir	1.2	J - Serves a major freight generator - industrial park
	Hinds	MS 18	N Siwell Rd	I-20	3.4	K - MPO determined important - significant truck route
	Hinds	W County Line Rd	I-220	Floral Dr	0.9	J - Serves a major freight generator - distribution facility
	Madison	Gluckstadt Rd	Distribution Dr	I-55	0.4	J - Serves a major freight generator - Gluckstadt Distribution Center
	Madison	Gluckstadt Rd Industrial Dr Old Jackson Rd	I-55 Gluckstadt Rd Industrial Dr	Industrial Dr Old Jackson Rd Sowell Rd	2.2	J - Serves a major freight generator - manufacturing & industrial facilities
	Madison	MS 857 W Sowell Rd	Nissan Parkway I-55	W Sowell Rd MS 857	4.2	J - Serves a major freight generator - Nissan Canton Vehicle Assembly Plant
	Madison	Industrial Dr	Parkway E	Gluckstadt Rd	0.9	J - Serves a major freight generator - manufacturing & industrial facilities
	Madison	Nissan Pkwy	MS 22	MS 43	5.7	J - Serves a major freight generator - Amazon Fulfillment Center, Nissan Canton Vehicle Assembly Plant, industrial park & warehousing facilities
	Rankin	Interstate Dr Industrial Park Dr	US 49 Interstate Dr	Industrial Park Dr Weems St	1.6	J - Serves a major freight generator - KCS / Jackson Intermodal Rail Yard
	Rankin	MS 18 Marquette Rd	I-20 MS 18	Marquette Rd US 80	3.5	J - Serves a major freight generator - East Metropolitan Center
	Rankin	MS 475 Allen Stuart Dr Forensic Science Dr	I-20 Forensic Science Dr Old Whitfield Rd	Allen Stuart Dr MS 475 Allen Stuart Dr	2.6	J - Serves a major freight generator - FedEx facility
	Rankin	MS 475	Old Brandon Rd	MS 25	3.8	H - Connects Intermodal Facility to PHFS - Jackson International Airport / MS Air Cargo Logistics Center to I-20
	Rankin	MS 468 S Pearson Rd Chidre St	I-20 MS 468 Weems St	S Pearson Rd Chidre St S Pearson Rd	1.8	H - Connects Intermodal Facility to PHFS - KCS / Jackson Intermodal Rail Yard to I-20
	Rankin	Interstate Dr/Ware St	Industrial Park Dr	Weems St	1.3	J - Serves a major freight generator - industrial facilities & freight carriers
	Rankin	MS 468	US 80	MS 475	5.8	J - Serves a major freight generator - industrial & warehousing facilities & freight carriers
	Rankin	Old US 49 S	US 49	US 80	2.9	J - Serves a major freight generator - industrial facilities & freight carriers
	Rankin	US 80	US 49	Gulf Line Rd	2.0	J - Serves a major freight generator - industrial facilities
	Rankin	N College St Lakeland Dr MS 471 US 80	E Value Rd N College St Lakeland Dr MS 471	Lakeland Dr MS 471 US 80 I-20	1.5	J - Serves a major freight generator - industrial facilities

MS Critical Urban Freight Corridors - 2022						
MPO	County	Route	Start Point	End Point	Length (miles)	CUFC Criteria ID
GRPC	Hancock	Lower Bay Rd	Lakeshore Rd	US 90	4.0	K - MPO determined important
	Hancock	MS 43	Kiln Waveland Rd	US 90	1.9	K - MPO determined important - significant truck usage
	Harrison	28th St	Canal Rd	30th Ave	2.3	H - Connects Intermodal Facility to Interstate System - Port of Gulfport to I-10
	Harrison	Canal Rd	28th St	Proposed MS 601	2.0	H - Connects Intermodal Facility to Interstate System - Port of Gulfport to I-10
	Harrison	Beatline Rd (proposed)	Railroad St	US 90	0.6	K - MPO determined important - will complete a corridor that will provide primary freight carrier access to Western Harrison County
	Harrison	Red Creek Rd Beatline Rd	I-10 Red Creek Rd	Beatline Rd Railroad St	5.6	J - Serves a major freight generator - Long Beach Industrial Park
	Harrison	County Farm Rd	I-10	MS 53	7.2	J - Serves a major freight generator - freight carrier & gravel facilities
	Harrison	MS 605	Lorraine Rd	I-10	0.8	J - Serves a major freight generator - Bernard Bayou Industrial District
	Harrison	MS 605 Pass Rd	I-10 MS 605	Pass Rd Debuys Rd	4.8	J - Serves a major freight generator - Bernard Bayou Industrial District K - MPO determined important - significant truck usage
	Harrison	Johnson Rd	Epsy Rd	Beatline Rd	1.0	J - Serves a major freight generator - Long Beach Industrial Park
	Harrision	Kiln Delisle Rd	1.0 mi S of I-10	Cuevas Rd	1.3	J - Serves a major freight generator - warehousing/distribution & chemical facilities
	Harrison	North St Menge Ave	Market St North St	Menge Ave I-10	7.6	J - Serves a major freight generator - industrial & gravel facilities
	Harrison	Seaway Rd	Three Rivers Rd	MS 605	3.3	J - Serves a major freight generator - Bayou Bernard port & industrial facilities
	Jackson	MS 57	Old Spanish Trails	I-10	3.4	J - Serves a major freight generator - Sunplex Light Industrial Park
	Jackson	US 90	Chicot Rd	Moss Point East Urban Limits	3.8	J - Serves a major freight generator - Port of Pascagoula
	Jackson	Ingalls Ave Market St	Desoto St Ingalls Ave	Market St MS 613	1.9	J - Serves a major freight generator - Port of Pascagoula
	Jackson	Old Mobile Ave	MS 611	US 90	1.4	J - Serves a major freight generator - Port of Pascagoula
HPFL	Forrest	JM Tatum Industrial Dr	US 49	Old Hwy 49/James St	2.6	J - Serves a major freight generator - Hattiesburg-Forrest Industrial Park
	Forrest	Old Hwy 49/James St	Faulkner St	JM Tatum Industrial Dr	3.4	J - Serves a major freight generator - KCS Rail Yard & Industrial Area
	Forrest	MS 42	I-59	US 11	3.8	J - Serves a major freight generator - FedEx & gravel facilities
	Lamar	Gravel Pit Rd	US 98	Jackson Rd	0.9	J - Serves a major freight generator - Waste Management & gravel facilities
	Lamar	Old Hwy 11	Lincoln Rd Ext	US 98	0.5	K - MPO determined important
Memphis	Desoto	Church Rd W	US 51	Airways Blvd	1.4	J - Serves a major freight generator - Desoto Trade Center
	Desoto	Star Landing Rd	US 51	Airways Rd	0.4	J - Serves a major freight generator - Desoto Trade Center
	Desoto	Star Landing Rd	Airways Rd	Swinnea Rd	1.0	K - MPO determined important
	Desoto	McCracken Rd	W Commerce St	Vaiden Dr	0.6	J - Serves a major freight generator - Hernando Industrial Park
	Desoto	Stateline Rd	Alexander Rd	Forest Hill Irene Rd	3.1	J - Serves a major freight generator - Metro Industrial Park
	Desoto	Hacks Cross Rd	Stateline Rd	MS 302/Goodman Rd	2.3	J - Serves a major freight generator - Metro Industrial Park
	Desoto	Polk Ln	Stateline Rd	MS 302/Goodman Rd	2.2	J - Serves a major freight generator - Metro Industrial Park
	Desoto	MS 302	Polk Ln	US 78	4.6	J - Serves a major freight generator - warehousing/distribution facilities
	Desoto	Stateline Rd	Tulane Rd	I-55	2.3	J - Serves a major freight generator - warehousing/distribution facilities
	Desoto	Stateline Rd	I-55	Getwell Rd	3.7	J - Serves a major freight generator - warehousing facilities
	Desoto	US 51	Star Landing Rd	Church Rd	2.2	J - Serves a major freight generator - warehousing/distribution & gravel facilities
	Desoto	US 78	Cockrum Rd	TN State Line	4.5	J - Serves a major freight generator - FedEx & warehousing/distribution facilities
				Total Centerline Mileage	147	

MS Intermodal Connectors - 2022					
Facility	Type	Connector #	Description	Length (miles)	Facility ID
Gulfport-Biloxi Regional Airport	Airport	1	Airport Rd to US 49	1.4	MS12A
Gulfport-Biloxi Regional Airport	Airport	2	John Hill Blvd to US 49	1.5	MS12A
IC Railroad	Truck/Rail Facility	1	North Mill St to Woodrow Wilson Dr to I-55	2.9	MS14R
Jackson Amtrak Rail Facility	AMTRAK Station	1	North Mill St to Pascagoula/Pearl St to I-55	1.9	MS15S
Jackson International Airport	Airport	1	International Drive to MS 475 to I-20	2.9	MS13A
Port of Aberdeen	Port Terminal	1	Norm Connell Dr to US 45	0.9	MS21P
Port of Amory	Port Terminal	1	Waterway Dr from port entrance to US 278 to US 45	7.7	MS11P
Port of Bienville	Port Terminal	1	Port and Harbor Dr to Lower Bay Rd to US 90 to MS 607/US 90	9.7	MS10P
Port of Columbus	Port Terminal	1	Port Access Rd at port entrance to Main St to US 82	2.8	MS6P
Port of Columbus	Port Terminal	2	Old Macon Rd to MS 182 to US 45	3.2	MS6P
Port of Greenville	Port Terminal	1	Industrial Fill Rd to MS 809 to US 82	2.5	MS4P
Port of Gulfport	Port Terminal	2	30th Ave to Proposed MS 601 to Canal Rd to I-10	5.8	MS5P
Port of Itawamba	Port Terminal	1	Access Rd to MS 25 to I-22	1	MS7P
Port of Natchez	Port Terminal	1	L.E. Barry Rd to Government Fleet Rd to US 84	2.1	MS8P
Port of Pascagoula	Port Terminal	1	Port Access Rd and Hardee Rd/Heavy Haul Rd to MS 611 to US 90	4.5	MS1P
Port of Pascagoula	Port Terminal	1	MS 617 from Access Rd to US 90	1.6	MS17P
Port of Rosedale	Port Terminal	1	Russell Crutcher Rd to MS 8 to US 61	21.4	MS19P
Port of Vicksburg	Port Terminal	1	Industrial Dr to Haining Rd to N Washington St to US 61	7.3	MS2P
Port of Vicksburg	Port Terminal	2	N Washington St to Levee St to Proposed Levee St Extension to Washington St to I-20	5.7	MS2P
Port of Yazoo	Port Terminal	1	Levee Rd to Old River Rd to MS 3 to US 49W	4.8	MS9P
Yellow Creek Port Facility	Port Terminal	1	CR 351 to CR 370 to MS 25 to US 72	14.5	MS20P
Yellow Creek Port Facility	Port Terminal	2	MS 365 to US 72	2.5	MS20P
			Total Centerline Mileage	108.6	



MDOT

MISSISSIPPI DEPARTMENT OF TRANSPORTATION