

MULTIPLAN 2045

MISSISSIPPI'S UNIFIED
LONG-RANGE TRANSPORTATION
INFRASTRUCTURE PLAN

DECEMBER 2020







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SECTION 1

TRANSPORTATION IN MISSISSIPPI

A well-connected and high-quality multimodal transportation system is vital to a growing economy and quality of life in Mississippi. Sustained transportation infrastructure investment supports safe and efficient travel for residents, businesses, and tourists. Mississippi's vast transportation network requires significant investment to preserve, modernize, and expand infrastructure to meet the changing needs of the growing population and economy.

Inadequate infrastructure investments create inefficiencies that ripple across the state's economy. Residents, businesses and visitors feel the impact through traffic congestion, unreliable travel times, poor pavement and bridge conditions, and increasing travel costs throughout the state. As the economy continues to grow and Mississippi residents, workers, and visitors continue to travel, the State must understand how demand for the transportation network is changing to ensure efficient and affordable mobility today and in the future.

KEY BENEFITS OF TRANSPORTATION INVESTMENT

- ***Safer Travel***
- ***Shorter and more Reliable Travel Times***
- ***Lower Vehicle Maintenance Costs***
- ***Expanded Access to Jobs***
- ***Improved Quality of Life***
- ***Enhanced Economic Competitiveness***

A MULTIMODAL SYSTEM

Cargo moving from ports to rails, to the doorstep of residents is reliant on the multimodal transportation system in Mississippi. Transportation options are also critical for keeping residents and visitors to employment opportunities and Mississippi's greatest attractions. The inventory below provides a snapshot of scale and demand on the state's transportation system.

RAILROADS

Mississippi has

5 CLASS I RAILROADS & **22 SHORTLINE RAILROADS**
operating over **2,500 miles of railroad**
which carry **29 million tons of freight** annually.

Note: Does not include freight flows that travel through the State (i.e., do not have an origin or destination in the State). Includes rail, multiple modes and mail.



BIKE & PEDESTRIAN

Mississippi has over

693 MILES OF BICYCLE TOURING TRAILS
connecting **25 counties**
across the state.



AVIATION

Mississippi has

7 COMMERCIAL AIRPORTS
which record approximately
934,500 enplaned passengers per year.
There are **67 general aviation airports** which
support approximately 1.1 million operations annually.



TRANSIT

Mississippi has over

40 RURAL TRANSIT PROVIDERS
serving over **3 million passenger trips** annually.
3 urban public transportation providers in Mississippi serve
over **1.5 million passenger trips** annually.



PORTS

Mississippi has

16 PORTS along the
Gulf of Mexico,
Mississippi River, and
Tennessee-Tombigbee
Waterway that handle
approximately
41 million tons of goods annually.



HIGHWAYS

Mississippi has

162 THOUSAND LANE MILES
of public road
supporting over
200 million tons of freight carried
by trucks annually.

BRIDGES

Mississippi has over

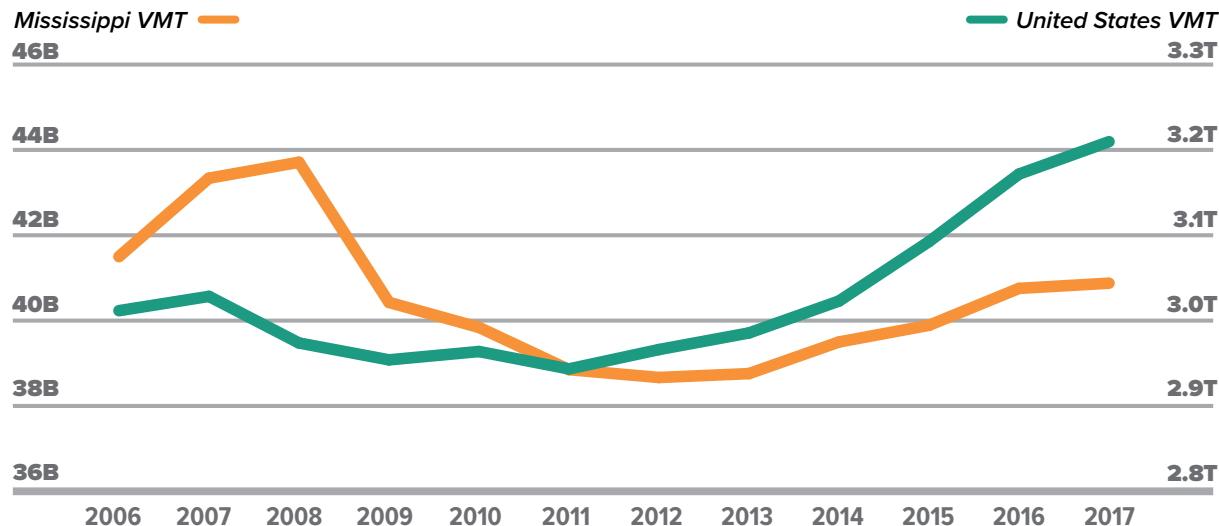
16,000 BRIDGES
of which **35% are owned and maintained by the state.**
1 out of 4 bridges
exceed their design life.



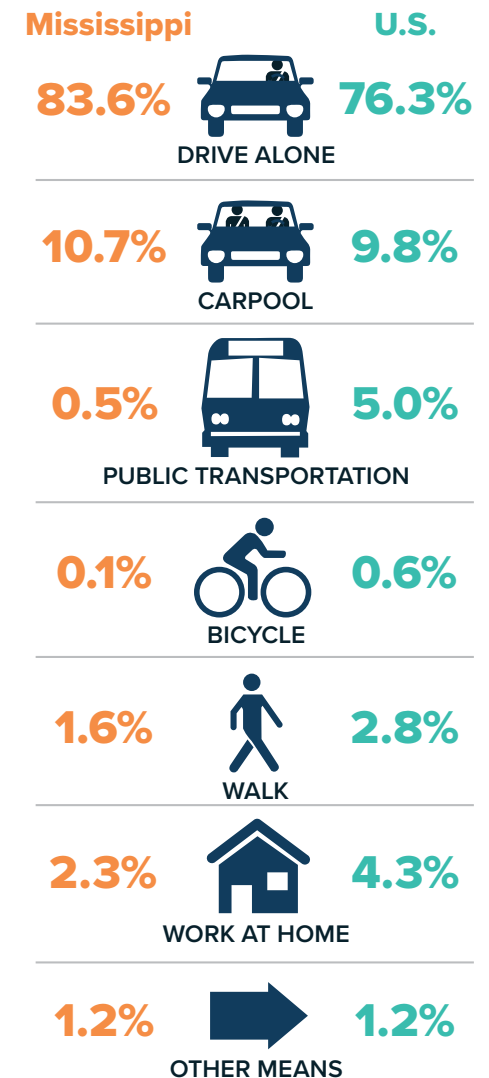
HOW MISSISSIPPI'S TRANSPORTATION SYSTEM MEASURES UP

By most measures, the transportation system in Mississippi today is functioning well and is meeting the diverse needs of residents and businesses. Similar to national trends, vehicle miles traveled (VMT) in Mississippi is increasing. From 2012 to 2017, Mississippi VMT grew by 1.1 percent on average annually, and most employees chose to commute by driving alone in a private vehicle. In Mississippi rates of commuters taking public transit, bicycling, walking, and working from home are lower than national averages, however, rates of carpooling in Mississippi are higher. These key commuting statistics indicate opportunities to enhance mobility across the range of transportation choices.

VEHICLE MILES TRAVELED, 2006 TO 2017



Source: U.S. DOT FHWA Office of Highway Policy Information, Highway Statistics Series.



Source: U.S. Department of Transportation, Bureau of Transportation Statistics.

ROADWAY NETWORK

The State of Mississippi owns **17%** of the state's **162,000 LANE-MILES** but carries **61%** of the **VEHICLE TRAFFIC** & **90%** of the **TRUCK MILES TRAVELED**

ROADWAY QUALITY

Out of the roadways maintained by MDOT, **27%** are in **POOR CONDITION** representing over **7,500 LANE-MILES**

BRIDGE QUALITY

There are **1,600** bridges in **POOR CONDITION** in Mississippi of which MDOT is responsible for maintaining **1 OUT OF EVERY 10** of those structures.

ROADWAY CAPACITY

There are **55 LANE-MILES** per **1,000 RESIDENTS** in Mississippi, roughly **2X** the **NATIONAL AVERAGE**

ROADWAY SAFETY

Mississippi's **FATALITY RATE** is **higher** than the national average

State	Fatality Rate per 100 Million Vehicle Miles Traveled
MS	1.69
U.S.	1.19

HOW DOES MISSISSIPPI'S TRANSPORTATION MEASURE UP

FREIGHT

2.0% of U.S. **TRUCK FREIGHT TON-MILES** and **1.3%** of U.S. **RAIL FREIGHT TON-MILES** flows through Mississippi



AVIATION

Mississippi has **313 ANNUAL BOARDINGS** per **THOUSAND RESIDENTS**. The **NATIONAL AVERAGE** is **2,750**



TRANSIT

Over **40 RURAL/DEMAND RESPONSE PROVIDERS** serve Mississippi. Of those, the **18 providers receiving federal funds serve 0.2 passenger trips per mile**, consistent with the national average. **3 URBAN TRANSIT PROVIDERS** serve **0.5 passenger trips per mile**, which is around **ONE-FIFTH OF THE NATIONAL AVERAGE**



PASSENGER RAIL

There are **8,700** average annual **AMTRAK PASSENGERS PER STATION** in Mississippi, which is about **15%** of the **NATIONAL AVERAGE** of **60,000**



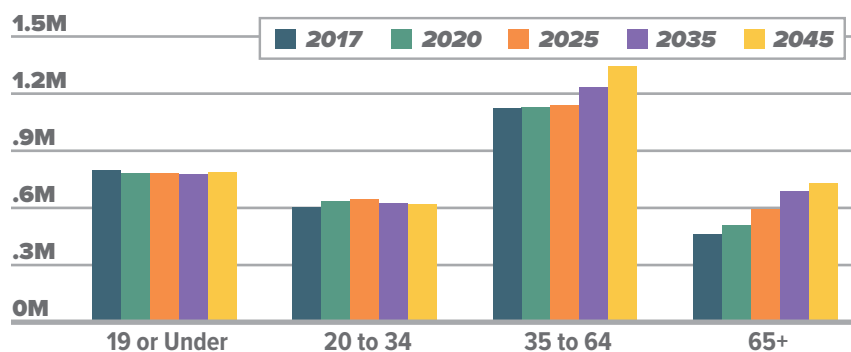
GROWTH FUELING TRANSPORTATION DEMAND

Trends in transportation, travel behavior, and revenue vary over time with changing economic and population characteristics, energy and environmental change, technological advances, and transitions in the political environment. The most direct influence on transportation demand is the presence of people and jobs, as well as the type of jobs and the demographics of the population. While the total population is the best indicator of system usage, other factors such as income levels and ages of individuals influence the amount of travel, the mode used, and the purpose of a given trip.

Population

In Mississippi, future population projections show the state continuing the steady historic growth patterns and is expected to grow between two to three percent every five years, with approximately 3.48 million residents by 2045. The general aging and growth of the population over the next 25 years is a key consideration in implementing a transportation system that continues to provide safe and adequate means of mobility for all people. An estimated 727,000 residents will be 65 years or older by 2045.

MISSISSIPPI POPULATION BY AGE GROUP, 2017 TO 2045



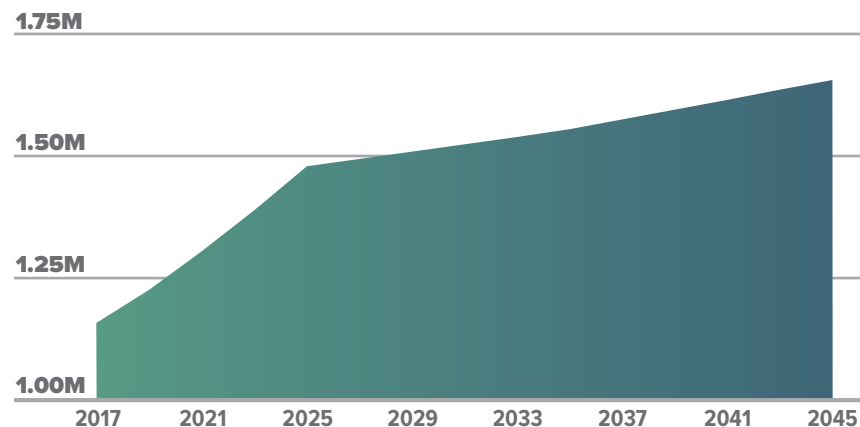
Note: Distribution of population by age based on Regional Economic Models, Inc. analysis completed for MULTIPLAN 2045, March 2019.

Source: Mississippi County Socioeconomic Forecasts, July 2019.

Economy

Between 2017 and 2045, the total number of employees is expected to increase by approximately 44 percent resulting in an estimated 1.66 million employees in 2045. Within this period five core industries including health care and social assistance, administrative support and waste management, and remediation services (e.g., mold removal, decontamination) are expected to gain the most employees.

MISSISSIPPI EMPLOYEES, 2017 TO 2045



Note: Total, nonfarm employment, not seasonally adjusted.

Source: Mississippi Socioeconomic Forecasts by County, July 2019.

Vehicle Miles Traveled (VMT)

Total VMT measures the total number of miles of all vehicles within a certain area. An increase in VMT suggests that more vehicles are on the roadway and/or drivers are traveling farther. The projected growth in population and employment will have a ripple effect on transportation demand. The resulting impact on projected travel demand in the State is reflected in the additional vehicle-miles traveled (VMT) and vehicle-hours traveled (VHT). Total daily VMT and VHT are estimated to increase by 33 percent and 37 percent, respectively, from 2013 to 2045.

TOTAL DAILY VEHICLE MILES TRAVELED AND VEHICLE HOURS TRAVELED, 2013 AND 2045

	2013 VMT (MILLIONS)	2045 VMT (MILLIONS)	CHANGE VMT 2013–2045 (MILLION)	CHANGE VMT 2013–2045 (PERCENT)	CAGR (PERCENT)
Total Daily VMT	78.6	95.1	16.5	21%	0.60%
	2013 VHT (MILLIONS)	2045 VHT (MILLIONS)	CHANGE VHT 2013–2045 (MILLIONS)	CHANGE VHT 2013–2045 (PERCENT)	CAGR (PERCENT)
Total Daily VHT	1.6	2.0	0.4	26%	0.71%

Freight Transportation Demand

Every business and resident in Mississippi depends on efficient and safe freight transportation. Freight demand is closely tied to the economy and a well-performing and connected freight transportation network is a critical factor for economic development. Total freight tonnage is projected to increase by 62 percent to more than 800 million tons in 2045.

MISSISSIPPI FREIGHT TONNAGE, THOUSANDS OF TONS, 2016 AND 2045

	 TRUCK	 RAIL	 WATER	 PIPELINE	 AIR <i>(including truck-air)</i>	 MULTIPLE MODES & MAIL
2016	201,341	18,364	7,102	262,278	60	5,733
2045	355,397	28,532	9,725	396,507	206	9,785
% Growth	+77%	+55%	+37%	+51%	+243%	+71%

Source: Freight Analysis Framework (FAF) Version 4.



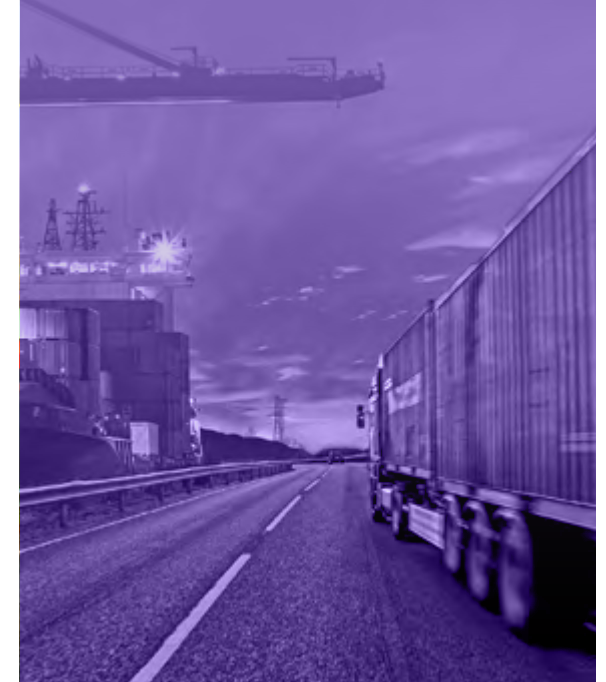
Environmental Factors

There is a significant relationship between environmental hazards and their impacts on statewide transportation infrastructure and operations. Mississippi threats and hazards are categorized by natural, technological, and human-caused hazards. Events like tornadoes, hurricanes, and wildfires reiterate the importance of creating sufficient evacuation routes whereas technological hazards such as bridge damage and dam failures can easily disrupt everyday transportation activities and deteriorate existing infrastructure. Creating a resilient system that can easily respond to system disruption ensures that Mississippi's critical infrastructure is protected during unforeseen hazards.



Urbanization of the Population

Changes in people's travel behavior have been mainly driven by changes in young people's socioeconomic conditions (less secure jobs and decline in disposable income, increased higher education participation) and living conditions (decline in home ownership and reurbanization), new ways of social interaction, and mode shift toward environmentally friendly transportation modes (transit, cycling, walking). Urban areas in Mississippi are projected to grow at a faster rate than surrounding rural counties, many of which are projected to experience population decline.



Global Policy and Transportation Investments

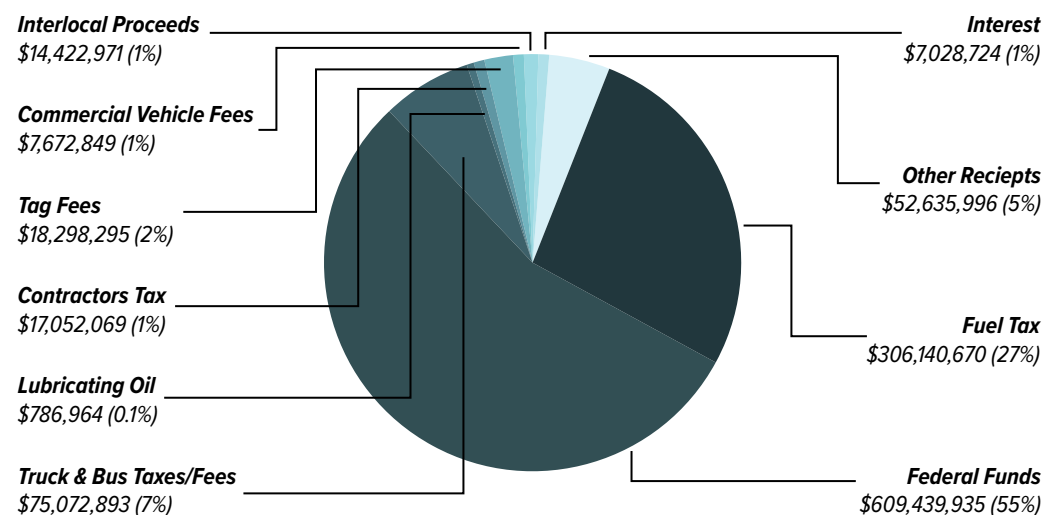
Increasing global trade continues to be fueled by international trade agreements. By 2045, the flow of cargo tonnage carried by truck is projected to grow by 64 percent. However, technological advancements and unforeseen events like COVID-19 could significantly increase the demand for freight movement across the state. Mississippi's geographic location positions the state to benefit from global opportunities by continuing to invest in deepwater ports, intermodal facilities, air cargo facilities, rail lines, and highways.

FUNDING TRANSPORTATION IN MISSISSIPPI

How Transportation is Funded in Mississippi

Funding for transportation comes from a variety of state and federal sources. Historically, roughly 50 percent has come from federal sources through the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), and the other half comes from a variety of state taxes and fees. The majority of federal funding is derived from the federal motor vehicle fuel tax and combined with the state fuel tax, the vast majority of funding for Mississippi's transportation system is dependent on revenues from the fuel pump. Around \$8.5 out of every \$10 spent on transportation in Mississippi supports the construction program that maintains the State of Mississippi's road and bridge system.

MDOT REVENUE SOURCES, FISCAL YEAR 2019



DECLINING REVENUE

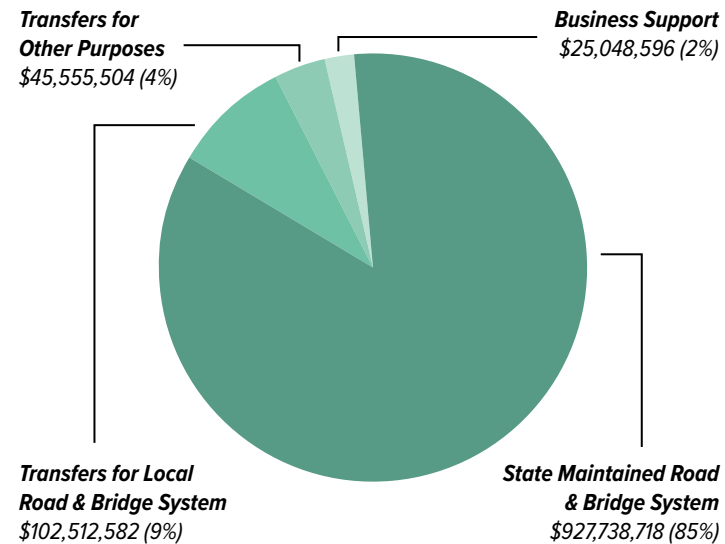
Transportation revenue in Mississippi has not kept pace with the State's transportation needs. Over time, transportation revenue is projected to decline due to:

- *Gas tax not indexed to inflation;*
- *Increase in vehicle fuel efficiency;*
- *Increase adoption of electric vehicles;*
- *Lack of growth in vehicle miles traveled; and*
- *Reduced federal funding share.*

How Transportation Funds are Spent in Mississippi

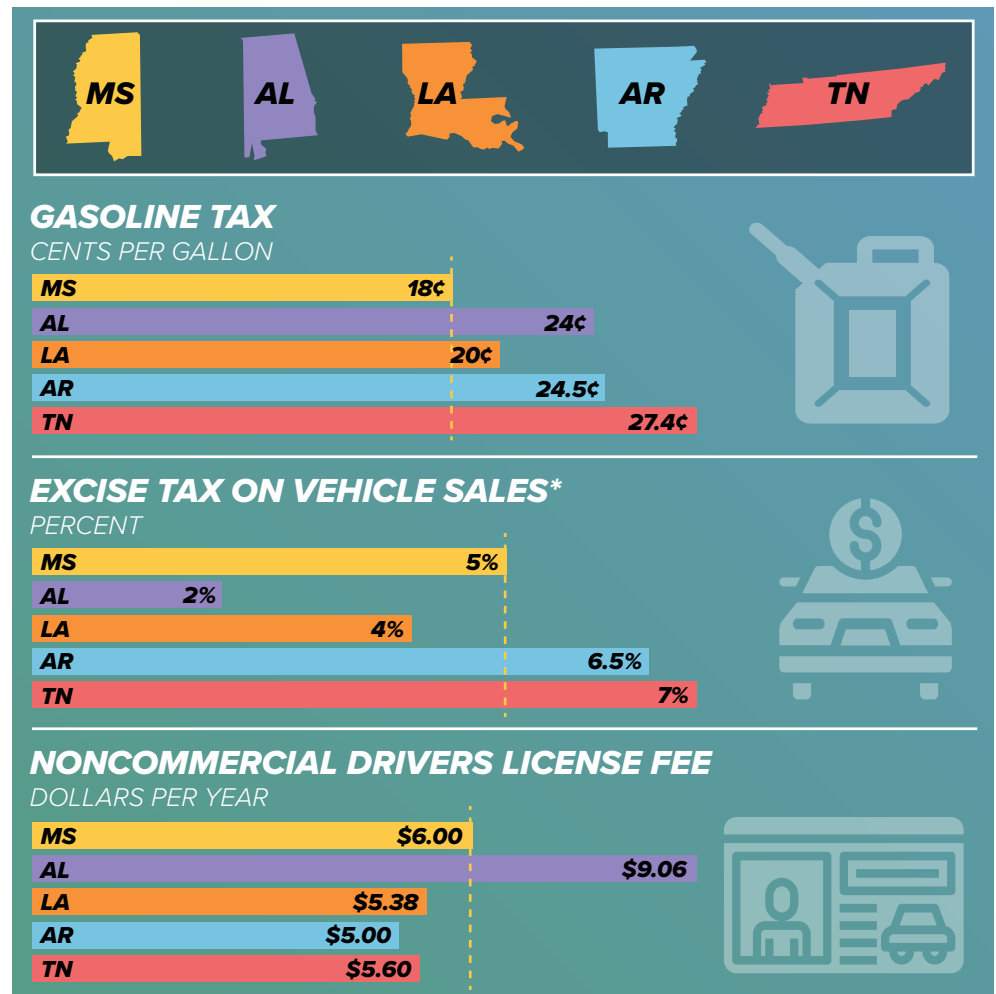
Mississippi ranks among the top 50 percent of all states in terms of overall transportation performance and cost-effectiveness. In FY 2019, 85 percent of the State's transportation funding was spent directly on state-maintained roadways and bridges.

MDOT EXPENDITURES, FISCAL YEAR 2019



Comparing common transportation revenue sources, Mississippi collects among the lower rates of key sources compared to the surrounding states.

MISSISSIPPI AND SURROUNDING STATES COMPARISON



* base excise tax rates.



SECTION 2

MULTIPLAN 2045 PLANNING PROCESS

A LONG RANGE PLAN FOR MISSISSIPPI'S MULTIMODAL TRANSPORTATION SYSTEM

MULTIPLAN 2045 is Mississippi's Unified Long-Range Transportation Infrastructure Plan for 2045. This plan is a continuation of statewide planning efforts and is an update to the most recent MULTIPLAN 2040 released in 2016. The Mississippi Department of Transportation (MDOT) and three of the state's metropolitan planning organizations (MPOs) work together to craft four comprehensive plans that are coordinated and consistent.

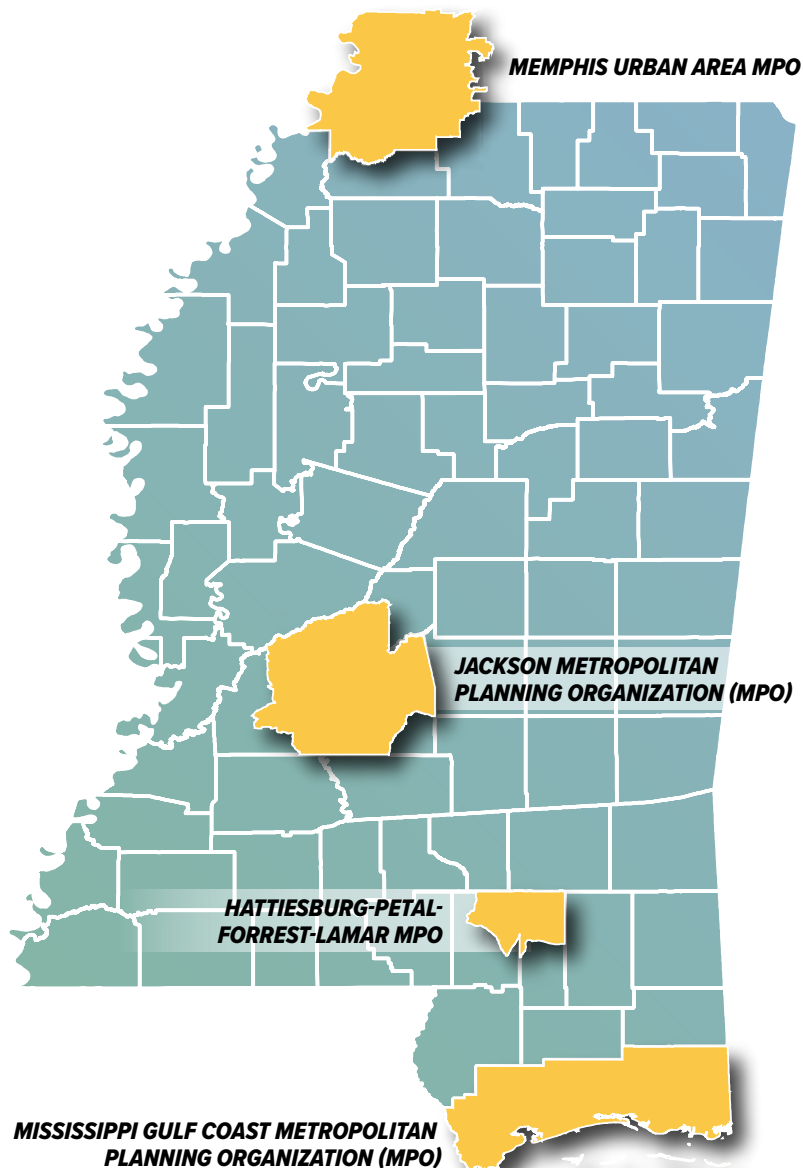
STATEWIDE PLANNING EFFORTS

- *Statewide Freight Plan*
- *Statewide Rail Plan*
- *Statewide Ports & Waterways Assessment*
- *Statewide Aviation Economic Impact Study*
- *Transit Plans & Studies*
- *Pedestrian and Bicycle Plans & Studies*
- *Strategic Highway Safety Plan*
- *ITS Strategic Plan*

The MULTIPLAN 2045 process identifies transportation needs and goals of residents, businesses, and visitors, compares various investment strategies based on impacts to the transportation system, and presents a plan of action for the state of Mississippi. A statewide transportation planning process is required by each state. This planning process includes consideration and implementation of projects, strategies, and services that address:

- Economic vitality;
- Safety and security;
- Accessibility and mobility of people and freight;
- Protection and Enhancement of the environment;
- Connectivity of the transportation system, across and between modes;
- Efficient system management and operations;
- Preservation of the existing transportation system;
- Resiliency and risk; and
- Travel and tourism.





Consistent with the previous four updates of the MULTIPLAN, this plan update leverages other statewide, regional, and local planning efforts and included close collaboration with the state's four MPOs, the Jackson Metropolitan Planning Organization (MPO), the Mississippi Gulf Coast Metropolitan Planning Organization (MPO), the Hattiesburg-Petal-Forrest-Lamar MPO, and the Memphis MPO, which crosses the border between Mississippi and Tennessee.

MULTIPLAN 2045 is an actionable plan, highlighting unmet funding needs compared to available resources. By comparing strategies based on transportation systems impacts and how they address systemwide goals, MULTIPLAN 2045 provides a plan of action for the state of Mississippi.

Transportation investment in Mississippi is guided by three overarching program category themes: Preservation, Modernization, and Expansion.

- **Preservation** – to maintain Mississippi's existing infrastructure and assets.
- **Modernization** – to upgrade existing assets to current design standards and technologies.
- **Expansion** – to provide new capacity to accommodate future growth.

Declining revenues and increases in population and employment mean Mississippi must strategically prioritize investment and do more with fewer resources. MULTIPLAN 2045 outlines the overall system needs, the financial constraints, and the plan of action to achieve the state's transportation goals. Two levels of investment were analyzed to demonstrate the range of investment choices, including:

- **Minimal Investment** – Investment needed to meet minimum Federal and State performance targets necessary to ensure a safe, well-maintained, and efficient transportation system.
- **Aggressive Investment** – Invest to get ahead by meeting all targets and addressing all essential multimodal needs.

PERFORMANCE BASED PLANNING

Measuring progress towards goals is a critical element of a long-range planning process. Performance based planning takes place within an overall Performance Framework, which is comprised of five basic elements. As part of the MULTIPLAN 2045 update, MDOT and its partners established goals, identified the performance measures to track progress, set reasonable targets, used a trade-off analysis to determine a preferred funding allocation, and make plans to measure and track results.

ESTABLISH GOALS & OBJECTIVES

Helps identify potential transportation solutions that meet regional needs.

SELECT PERFORMANCE MEASURES

Monitors progress toward achieving goals and objectives.

IDENTIFY TARGETS

Determines quantifiable metrics marking achievement of all or a portion of its goals.

DEVELOP INVESTMENT STRATEGIES

Make investments based on their demonstrated performance of the long range transportation goals and objectives.

ACHIEVED PERFORMANCE

After adoption of the MULTIPLAN, measures and records results of plan implementation.

OUTREACH

Providing integral guidance of long range planning for transportation, the general public, stakeholders, and MDOT partners gave important insight into local and regional concerns and priorities related to transportation. Engagement throughout the planning process with the general public, stakeholders, and MDOT partners informed the MULTIPLAN 2045 performance standards, investment strategies, and plan of action for transportation investments over the next 25 years.

Input from a varied group of stakeholders was solicited through targeted outreach and advisory committees, a key stakeholder mailing list, a public engagement website, meetings, and a statewide public survey. Outreach efforts employed a three-pronged approach engaging the general public, key business and public stakeholders, and MDOT management and leadership in key stages of the planning process. The goal of the outreach process was to understand what Mississippians need from the transportation system to develop long term strategies for improvements.

GENERAL PUBLIC – provided input and survey responses during several rounds of public meetings and a statewide survey. These engagements garnered input on the transportation system, priorities, and needs throughout the state.

KEY BUSINESS & PUBLIC STAKEHOLDERS – assisted with the development of the vision, goals, objectives, and performance measures.

MDOT MANAGEMENT & LEADERSHIP – established the MULTIPLAN 2045 goals and the performance goals, measures, and targets which were informed by key themes prioritized by stakeholders and the general public.



ESTABLISHING TRANSPORTATION PRIORITIES

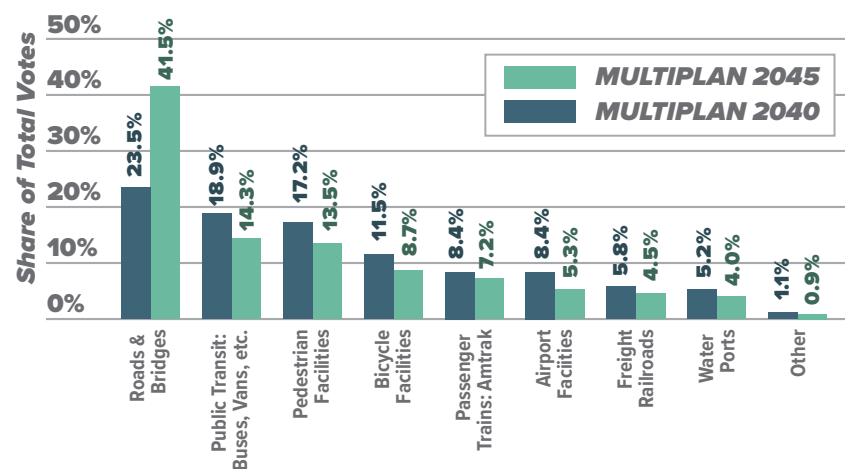
Key findings from the outreach phases of MULTIPLAN 2045, which occurred at the beginning and near the end of the planning process, help guide the planning process. Participation from the general public, key stakeholders, and MDOT transportation leaders established the transportation priorities for MULTIPLAN 2045.

To gain a better understanding of the public attitudes about transportation system improvements and transportation funding options, a survey of randomly selected members of the general public around the State was conducted. The survey asked respondents their thoughts on issues such as overall performance, accessibility, safety, modes used, features in need of improvement, future transportation challenges, and how improvements should be funded. Many of the questions were the same as the MULTIPLAN 2040 survey conducted in 2015, allowing a comparison of the two to determine changes in sentiment about the State's transportation system.

Overall, Mississippians feel they can travel reliably, safely, and quickly using the State's transportation system, and they feel the options available to them suit their needs. Despite this, one out of every four respondents feels the transportation system meets their needs poorly or very poorly, a significant decrease in satisfaction compared to the MULTIPLAN 2040 survey. Aging and deteriorating roads and bridges were noted as the top challenge facing Mississippi's transportation system in the next 25 years.

As part of MULTIPLAN 2045, a survey of key industry stakeholders and transportation leadership around the State was conducted to gain a better understanding of what things they expect to have the most impact on the State's transportation system and how they expect these impacts to be felt in terms of changes in transportation demand.

"WHICH PARTS OF MISSISSIPPI'S TRANSPORTATION SYSTEM DO YOU THINK NEED IMPROVEMENT?" ***SURVEY RESPONSES (SHARE OF TOTAL VOTES)***

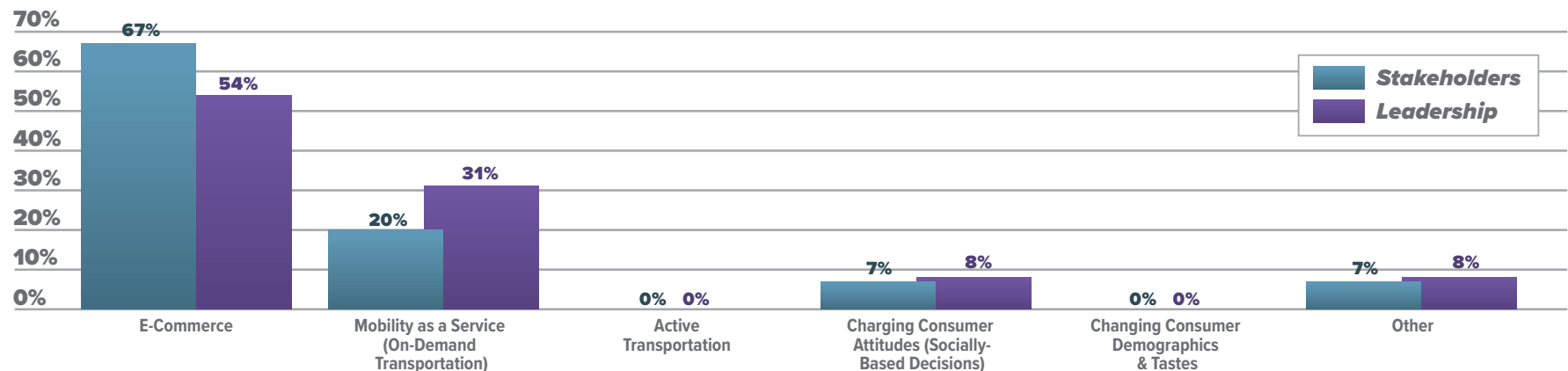


Source: MULTIPLAN Public Opinion Survey Results, March 2019

Key industry stakeholders and transportation leadership indicated that urbanization and trade dynamics will likely be the economic trends that have the largest impact on demand for the State's transportation system. The respondents expect continued growth in freight movements over the next 10 years. Technology was noted as having the potential to result in faster growth in transportation demand over the next 20 years compared to the last five years and among new and emerging technologies, the Internet of Things is expected to have the greatest impact on transportation. The state's key stakeholders expect e-commerce and mobility as a service (MaaS) to have a significant impact on transportation demand in the next 10 years.

Using the feedback provided from the general public and stakeholders, MDOT leadership set goals and system performance measures and targets to help ensure goals and objectives are meaningful to all Mississippians. The MULTIPLAN 2045 goals and performance measures and targets guide the direction of transportation over the next 25 years.

CHANGES IN BUSINESS AND CONSUMER PRACTICES PREDICTED TO HAVE THE GREATEST IMPACT ON TRANSPORTATION DEMAND IN THE NEXT 10 YEARS
SHARE OF RESPONDENTS

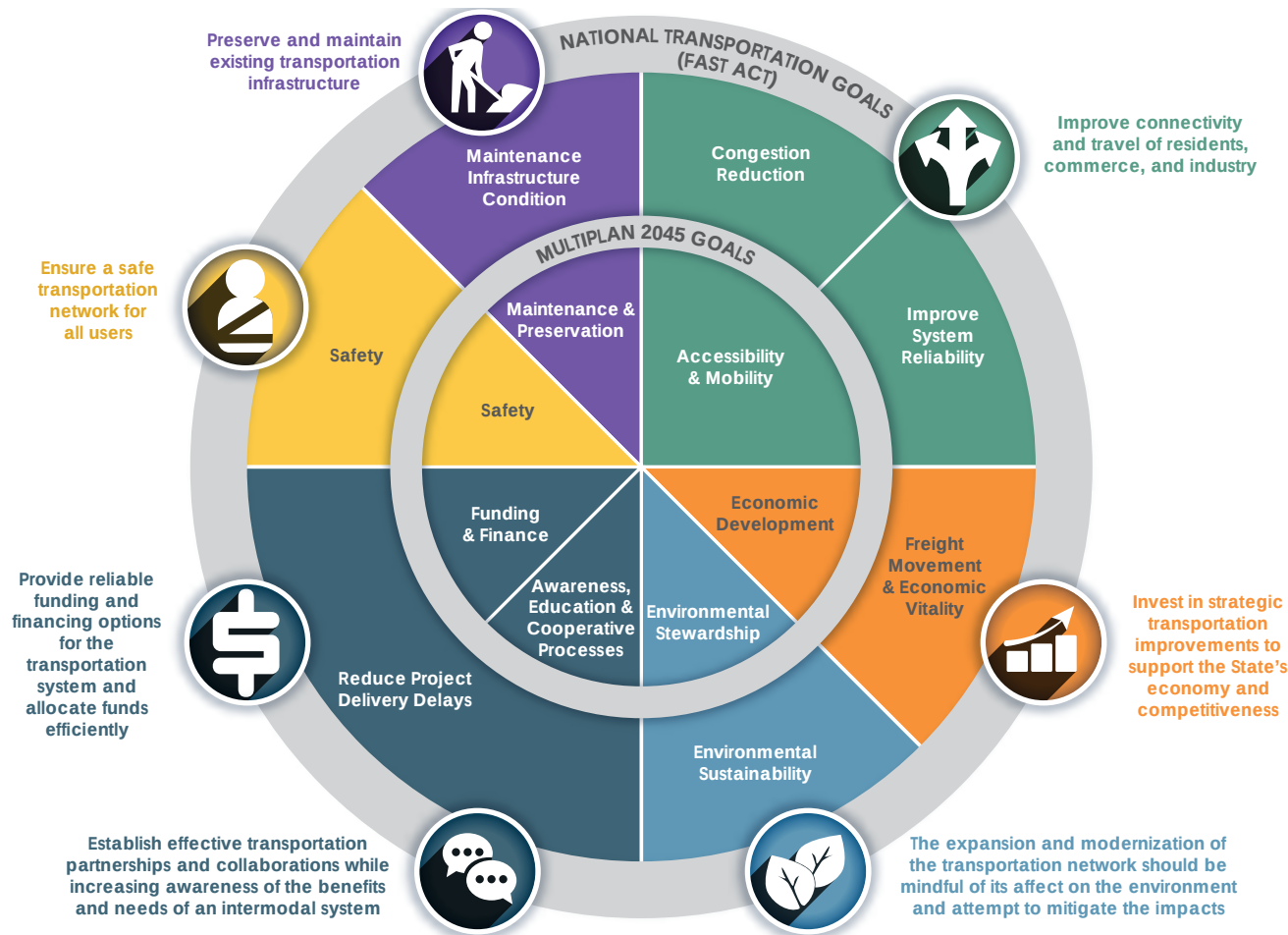


Sources: MULTIPLAN 2045, Stakeholder and Leadership Surveys, 2019.



SECTION 3

MULTIPLAN 2045 GOALS



Several key transportation goals guide MULTIPLAN 2045. Helping guide the vision of Mississippi's future transportation network, these goals are consistent with previous MULTIPLAN updates and directly relate to one or more national transportation goals under the FAST Act.

Two key goals (Awareness, Education & Cooperative Processes and Funding & Finance), are both critical in meeting each of the remaining goals. The seven statewide transportation goals established by MDOT are described on the next page.

AWARENESS, EDUCATION, AND COOPERATIVE PROCESSES

Establish effective transportation partnerships and collaborations while increasing awareness of the benefits and needs of an intermodal system.

Mississippi promotes a culture that fosters cooperation and essential partnerships to deliver a system that serves all members of the public. Collaborative processes across all transportation modes and various agencies increase public awareness, highlights unmet funding needs, and encourages innovation to improve project delivery and system performance. Collaboration between State agencies, local governments, and stakeholders helps identify partnership opportunities, investment priorities, technology and operational efficiencies, and important safety enhancements.



FUNDING AND FINANCE

Provide reliable funding and financing options for the transportation system and allocate funds efficiently.

Stable funding sources for transportation infrastructure are required to ensure adequate maintenance, modernization, and expansion of the Mississippi transportation network. Additional revenue and financing opportunities should be explored when possible. Cost efficiency and timely project delivery should be incentivized through funding allocation. Without sufficient funding to meet the most critical needs, funding allocation aims to benefit the greatest number of residents, to represent the needs of stakeholders, and to advance statewide transportation goals.



SAFETY

Ensure a safe transportation network for all users.

MDOT's mission is to provide a safe intermodal transportation network that is planned, designed, constructed and maintained in an effective, cost-efficient, and environmentally sensitive manner. As the mission states, safety is of the highest importance to MDOT's transportation engineering and planning efforts. Ensuring a safe transportation network for all users requires transportation solutions that protect the general public, with particular emphasis on vulnerable populations.



ENVIRONMENTAL STEWARDSHIP

The expansion and modernization of the transportation network should be mindful of its effect on the environment and attempt to mitigate the impacts.

As Mississippi maintains and modernizes its transportation network to accommodate future transportation needs, it is essential to consider how natural, technological, and human-caused hazards can cause risk and create vulnerabilities to the statewide transportation infrastructure, operations and services. Understanding the vulnerability of aging transportation infrastructure to extreme weather events and integrating resiliency planning considerations into decision-making is critical to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruption.



MAINTENANCE AND PRESERVATION

Preserve and maintain existing transportation infrastructure.

Over the next 25 years, the roadways, bridges, transit assets, and freight facilities within the state will require systematic up-keep to ensure safety and reliable transportation for residents and visitors. With travel expected to increase, pavement conditions and other asset preservation will play a critical role in providing a well-connected, quality transportation system that seamlessly moves people and goods within the state.



ACCESSIBILITY AND MOBILITY

Improve connectivity and travel of residents, commerce, and industry.

As the population is expected to grow, the demand for commerce, access to employment centers, access to transportation terminals, and connectivity to statewide resources will continue to increase. Maintaining the ease, ability, and quality of travel to and from key destinations within Mississippi is a priority. Mobility and accessibility investments can improve travel reliability and provide alternative routes or transportation options to meet the growing statewide need.



ECONOMIC DEVELOPMENT

Invest in strategic transportation improvements to support the State's economy and competitiveness.

Transportation is vital to ensure the efficient movement of goods and people to, from, and throughout Mississippi. A strong transportation network supports economic development by providing reliable transportation routes that connect businesses and to development opportunities while also providing residents and visitors access to major destinations. Investing in strategic transportation improvements along essential corridors and routes statewide will enhance freight efficiency, support travel and tourism needs, and boost the State's overall economic competitiveness.





SECTION 4

TRANSPORTATION ASSETS & NEEDS

Mississippi businesses, residents, and visitors rely on a multimodal transportation network to serve diverse transportation demands. Each mode within the state serves an important role in facilitating the movement of goods, people, or both. To determine the statewide transportation investment needs, MULTIPLAN 2045 analyzed the current and historical performance and capacity and predicted future performance for each mode. By aligning the MULTIPLAN 2045 transportation goals with the determined deficiencies, key investment strategies were developed for each capital program.

CAPITAL PROGRAMS

- » *Pavement*
- » *Bridges*
- » *Capacity*
- » *Safety*
- » *Intelligent Transportation Systems*
- » *Rail*
- » *Ports*
- » *Aviation*
- » *Public Transportation*
- » *Bike and Pedestrian*

Capital program snapshots summarize key information gathered and analyzed as part of the MULTIPLAN 2045 planning process. Below is a list of key information.



Key Statistics



Key Features



Investment Need



Performance Measures & Targets

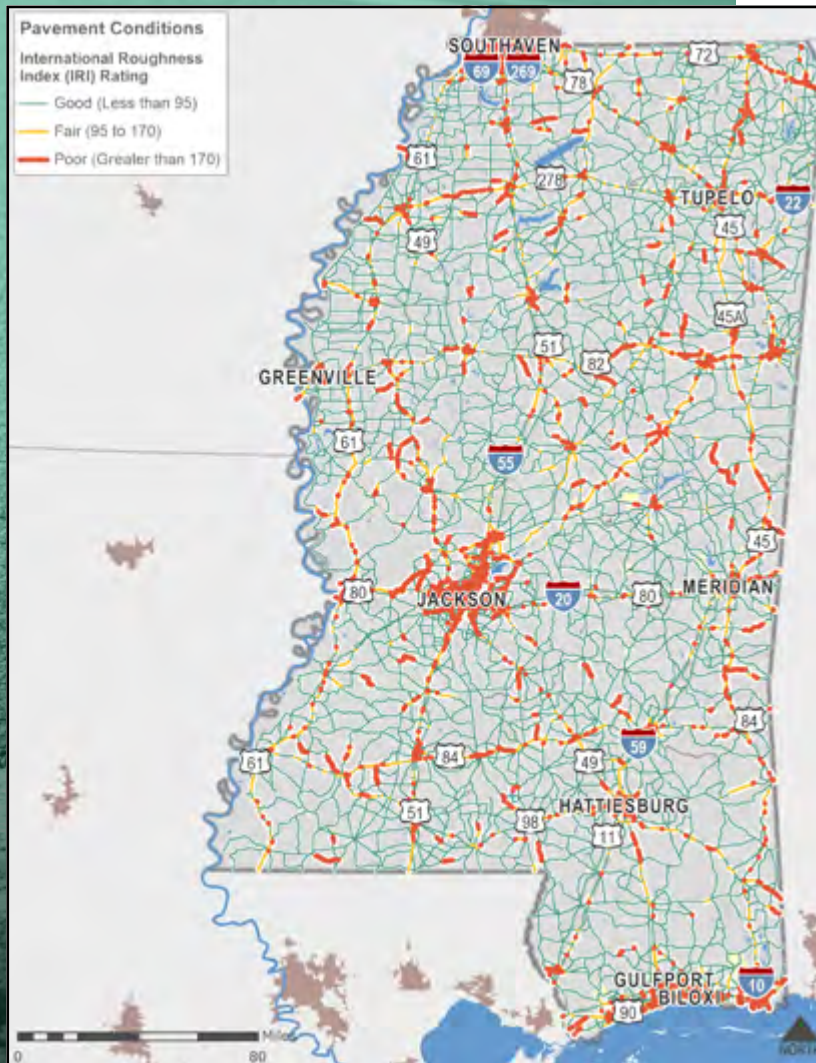


Investment Strategy



Impact of Investment





This map is for planning purposes only and is subject to change.

PAVEMENT

Key Statistics

- **Interstates** provide limited access, divided highways with high levels of mobility.
- **Other freeways and expressways** provide directional travel lanes separated by a physical barrier with limited access.
- **Other principal arterials** provide a high degree of mobility with access provided via driveways and intersections.
- **Minor arterials** provide mobility for moderate-length trips and offer connectivity with frequent access points and spacing of intersections.
- **Major and minor collectors** gather traffic from local roads and funnel it to the arterial network.
- **Local roadways** are not intended for long-distance travel but provide direct access to nearby land.

There are over 162,000 lane-miles (almost 77,500 centerline miles) of public roads in Mississippi. Of this total, 18 percent of the system is urban and 82 percent is rural.

MISSISSIPPI LANE-MILES BY FUNCTIONAL CLASS AND OWNER, 2018

FUNCTIONAL CLASSIFICATION	MDOT	COUNTY	MUNICIPAL	OTHERS	TOTAL
Interstate	3,482	—	—	—	3,482
Other Freeways and Expressways	244	—	8	—	252
Other Principal Arterial	9,051	78	655	—	9,794
Minor Arterial	7,625	374	1,632	628	10,260
Major Collector	7,392	17,088	2,813	19	27,311
Minor Collector	116	4,376	101	58	4,651
Local	323	85,460	19,402	1,165	106,350
Total	28,233	107,376	24,621	1,870	162,100

Source: MDOT, 2018.



Key Features

Pavement conditions are assessed using a variety of factors. The final measurement assigns either a Good, Fair, or Poor condition to each roadway segment. Overall 51 percent of pavement lane-miles are in good condition, an increase of 18 percent compared to 2013 and 5 percent of pavement lane-miles are in poor condition, a decrease of 21 percent compared to 2013.



Investment Need (2020 to 2045)

Maintains the existing conditions, exceeding or meeting Federal and MDOT performance targets

\$20,982M

Meets Federal and MDOT performance targets

\$18,798M

■ Aggressive ■ Minimal



Performance Measures and Targets

PROGRAMS	ACTUAL ASSETS (2018)	MEASURE	CURRENT CONDITION	PERF. TARGET		EXPECTED FUNDING SCENARIO		ADEQUATE FUNDING SCENARIO	
						AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.	AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.
NHS – Interstate Pavement Equivalent Federal PM2 Measure	3,482 lane-miles	% Good	67%	55%		\$153	40%	\$210	55%
		% Poor	0.5%	5%			3%		0%
NHS – Non-Interstate Pavement Equivalent Federal PM2 Measure	10,119 lane-miles	% Good	35%	25%		\$144	68%	\$144	68%
		% Poor	4%	10%			10%		10%
Non-NHS State Owned 4-Lane Pavement Equivalent PCR	711 lane-miles	% Good + Fair	73%	75%		\$9	75%	\$9	75%
		% Poor	27%	25%			25%		25%
Non-NHS State Owned, 2-Lane Pavement Equivalent PCR	14,722 lane-miles	% Good + Fair	68%	75%		\$37	<1%	\$360	75%
		% Poor	32%	25%			>99%		25%

Note: Federal Performance Measure Rule 2 (PM2) requires the reporting of the percentage of Interstate and non-Interstate NHS pavements in good and poor condition. The HERS IRI outputs were converted to an equivalent PM2 using ratio between the existing conditions in HERS IRI based on the 2017 HPMS and the 2018 federal report card.



Impacts of Investment



Gross State Product
\$23M
annually

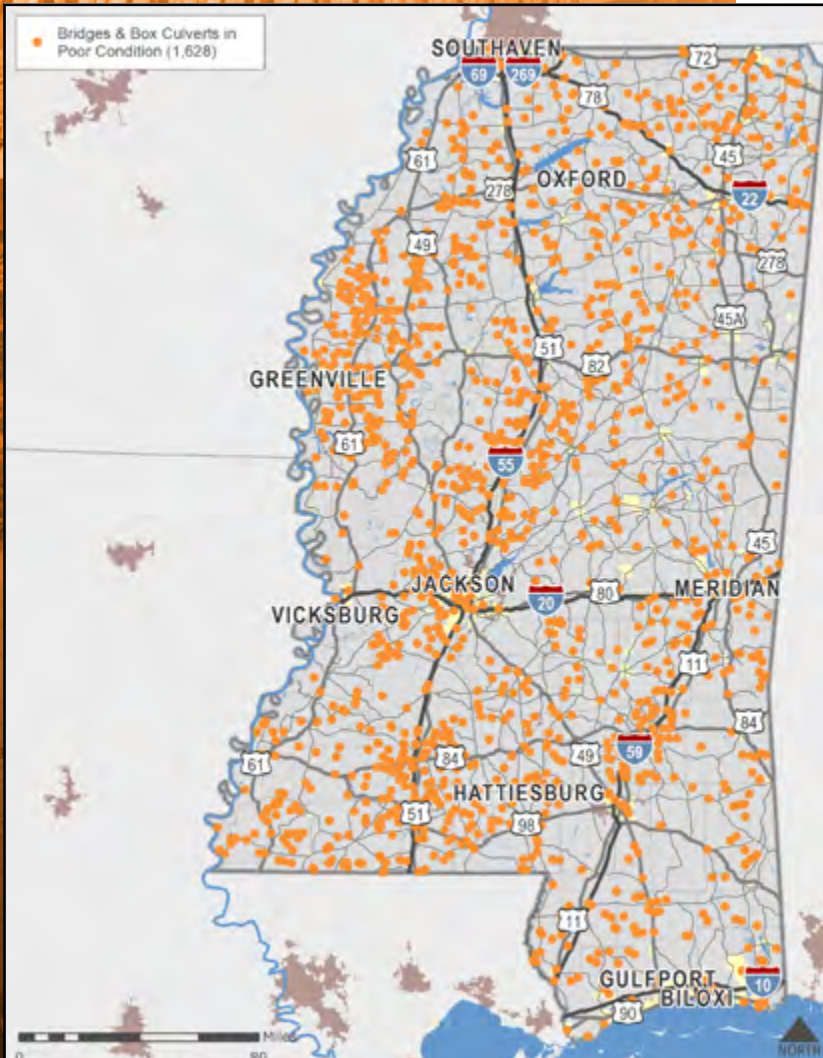


Income
\$16M
annually



250
jobs

Note: Impacts of investments reflect the difference between the expected funding and adequate funding of transportation in Mississippi.



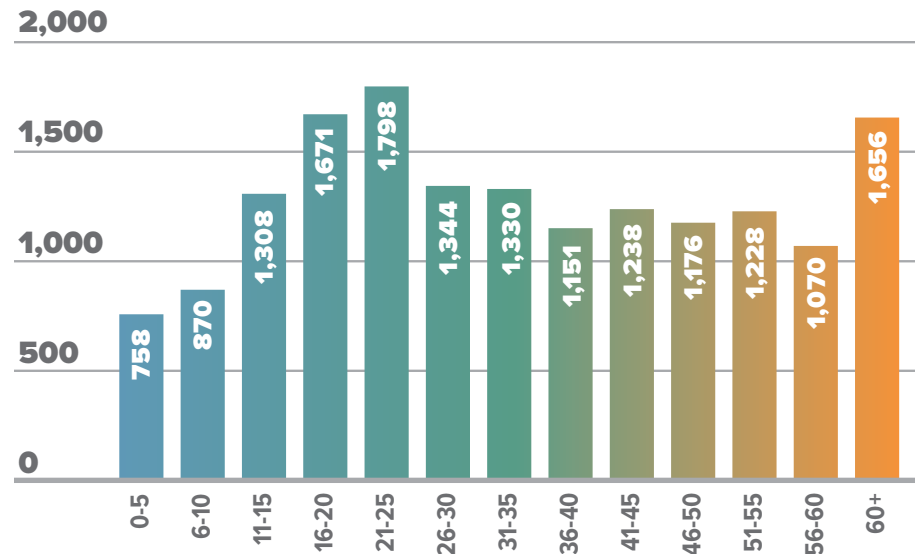
This map is for planning purposes only and is subject to change.

BRIDGES

Key Statistics

As of 2018, the average age of the structures in Mississippi is 35 years. Today, one out of every four bridges in Mississippi exceed their design life. By 2045, 66 percent of the existing bridges will be over 50 years old.

DISTRIBUTION OF MISSISSIPPI STRUCTURES BY AGE, 2018



Source: U.S. National Bridge Inventory Database 2018.

Key Features

Bridges are assigned a rating that represents the general condition of the structure.



Investment Need (2020 to 2045)

Maintains the existing conditions, exceeding or meeting Federal and MDOT performance targets

Meets Federal and MDOT performance targets

\$3,562M

\$2,306M

Aggressive Minimal



Performance Measures and Targets



Investment Strategy

PROGRAMS	ACTUAL ASSETS (2018)	MEASURE	CURRENT CONDITION	PERF. TARGET	Current Condition 2045 Expected Funding Performance Target 2045 Adequate Funding	EXPECTED FUNDING SCENARIO		ADEQUATE FUNDING SCENARIO	
						AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.	AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.
NHS State Owned Bridge by Deck Area (from NBIAS)	48 Million square feet	% Good + Fair	98%	95%		\$90	98%	\$90	98%
		% Poor	2%	5%			2%		2%
Non-NHS State Owned Bridge by Deck Area (from NBIAS)	23 Million square feet	% Good + Fair	97%	97%		\$45	98%	\$45	98%
		% Poor	3%	3%			2%		2%



Impacts of Investment



Deficient Bridges Impact Marketability of Land for Economic Development

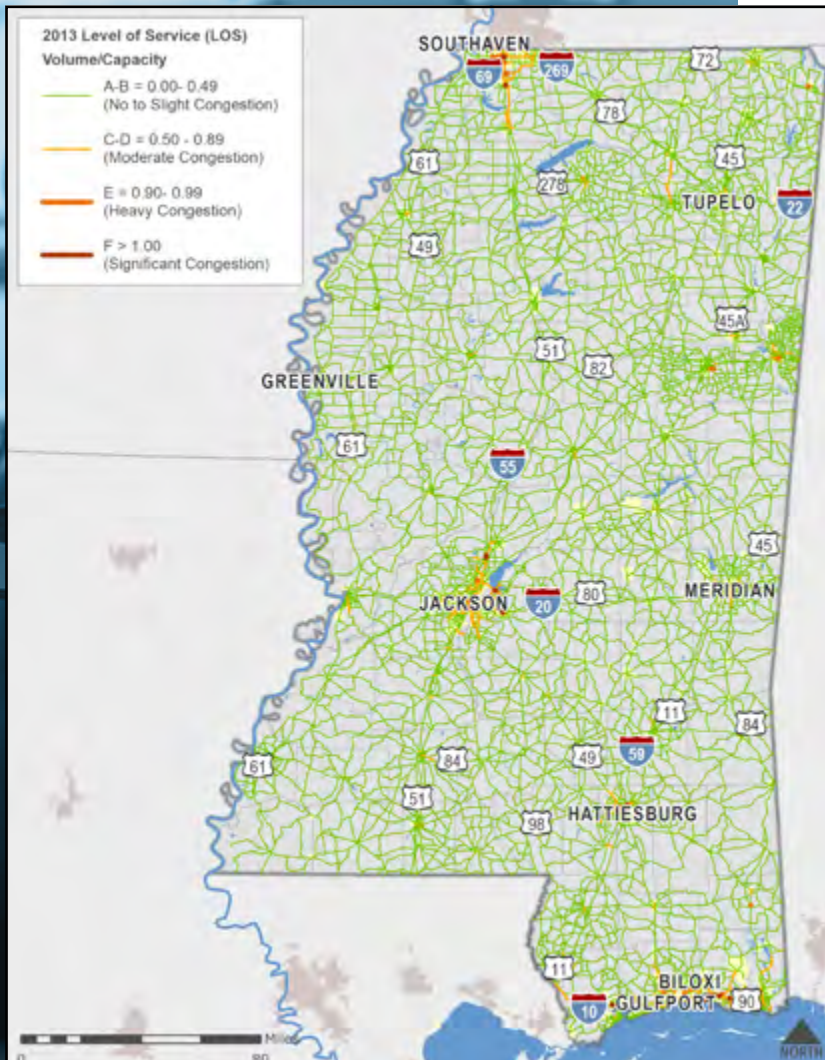
Diverted Traffic
Around Bridges Leads to
Higher Transportation Costs



Bridge Closures Eliminate Access for People and Goods



Note: Impacts of investments reflect the difference between the expected funding and adequate funding of transportation in Mississippi.



This map is for planning purposes only and is subject to change.

CAPACITY

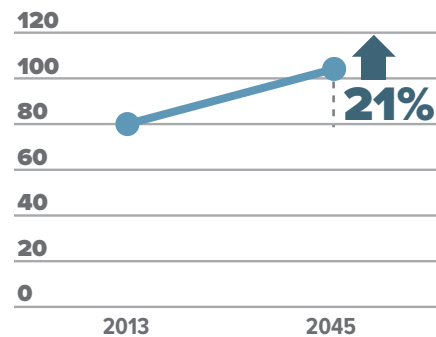


Key Statistics

Unreliable travel times and congestion arise as traffic volumes increase, costing time and money. Ensuring reliable travel times requires maintaining enough roadway capacity to meet the demands of a growing population and economy. The demand for roadways is measured by Vehicle Miles Traveled (VMT).

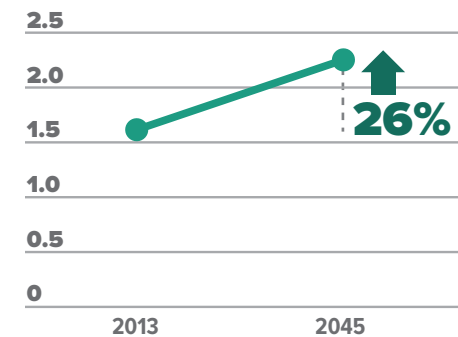
Both vehicles miles traveled and vehicle hours traveled (VHT) are projected to increase with vehicle hours increasing at a faster rate. This suggests that congestion will worsen in the absence of additional roadway expansions.

TOTAL DAILY VMT, MILLIONS, 2013 TO 2045



Source: Statewide Travel Demand Model, 2019.

TOTAL DAILY VHT, MILLIONS, 2013 TO 2045



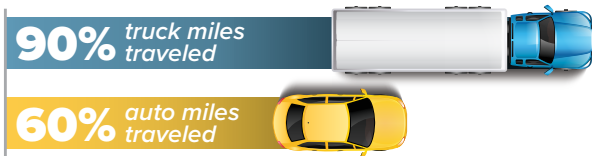
Source: Statewide Travel Demand Model, 2019.



Key Features

Highway capacity is often measured using Level of Service or LOS. LOS is based on the traffic volume to road capacity ratio. The higher the ratio, the worse the congestion and lower the LOS. LOS of traffic differs by type of roadway and is a complex consideration of traffic density, speeds, delay, and volume to capacity ratio, peak conditions, etc.

The State-owned facilities include the most heavily traveled corridors:



Source: U.S. DOT FHWA Office of Highway Policy Information, Highway Statistics Series.



Investment Need (2020 to 2045)

Invests in capacity needs on key corridors and other corridors for economic development purposes

\$4,822M

Invests in capacity needs on key corridors

\$2,566M

Aggressive Minimal

Note: Key corridors can be found in the MULTIPLAN 2045 Needs Assessment Annex.



Performance Measures and Targets

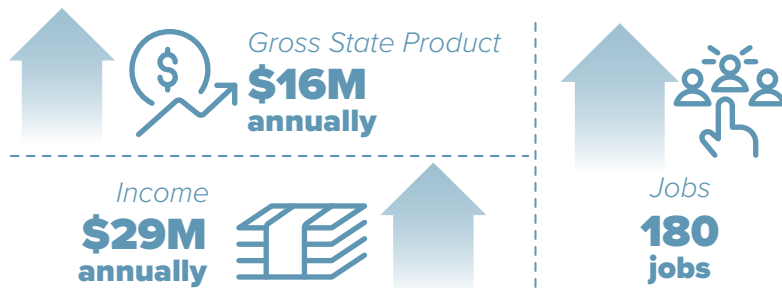


Investment Strategy

PROGRAMS	MEASURE	EXPECTED FUNDING SCENARIO		ADEQUATE FUNDING SCENARIO	
		AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.	AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.
CAPACITY by Number of Hours of Delay Reduced	Achieve LOS C in Rural Areas and LOS D in Urban Areas	\$17	Performance not applicable – Preliminary Engineering and Right-of-Way only	\$80	Key Corridors achieve LOS C in Rural Areas and LOS D in Urban Areas



Impacts of Investment



Note: Impacts of investments reflect the difference between the expected funding and adequate funding of transportation in Mississippi.



SAFETY

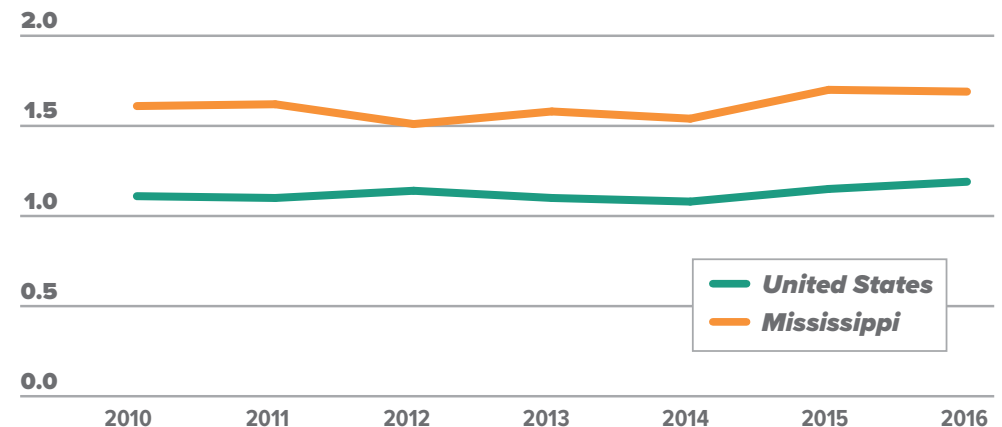


Key Statistics

Providing a safe transportation system for all roadway users is a top priority for MDOT. To provide this safe transportation system and lower fatality and injury rates, short-term and long-term solutions are needed. Continuing investment in engineering, enforcement, education, and emergency medical services is necessary to continue to lower fatality and injury rates in Mississippi and keep transportation system users safe.

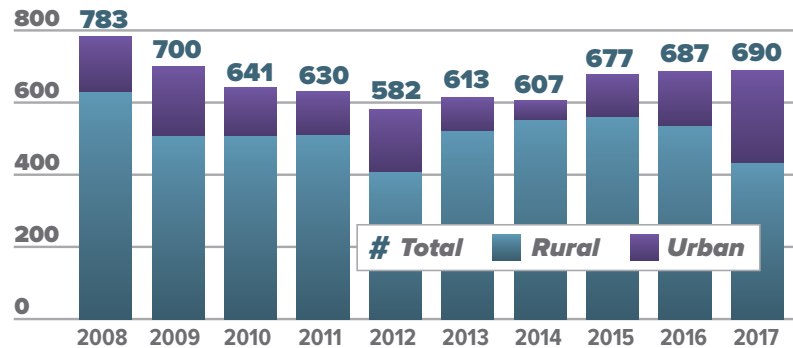
The Mississippi Department of Transportation is responsible to ensure that all state roadways are designed, constructed, and maintained to be safe for all modes of transportation. MDOT continually and extensively analyzes crash data to identify roadway locations where improvements can be made that could reduce crash frequency and severity.

FATALITIES PER 100 MILLION VEHICLE MILES TRAVELED, 2010 TO 2016



Source: National Highway Traffic Safety Administration, Traffic Safety Performance Measures for Mississippi, 2008-2017.

TRAFFIC FATALITIES IN MISSISSIPPI URBAN AND RURAL AREAS, 2008-2017



Source: National Highway Traffic Safety Administration, Traffic Safety Performance Measures for Mississippi, 2008-2017.

- **65% of the statewide fatalities occur on the state system**, and more frequently see impaired driving, unbelted occupants, and heavy vehicle crashes.
- **Total number of fatalities has decreased since 2008**, from 783 in 2008 to 690 in 2017.
- **Mississippi's fatality rate per 100 million vehicle miles traveled is still higher than the national average.**



Investment Need (2020 to 2045)

Maintaining current investment level in safety-specific projects (Minimum)

\$780 MILLION



Performance Measures and Targets



Investment Strategy

PROGRAMS	MEASURE	EXPECTED FUNDING SCENARIO	ADEQUATE FUNDING SCENARIO
		AVERAGE SPENDING 2020-2045 (\$2018M)	AVERAGE SPENDING 2020-2045 (\$2018M)
SAFETY	Maintain Existing Spending Levels	\$30	\$30



Impacts
of Crash
Reduction



Reduced
Fatalities



Increased
Productivity and
Earning Ability



Reduced
Insurance
Costs

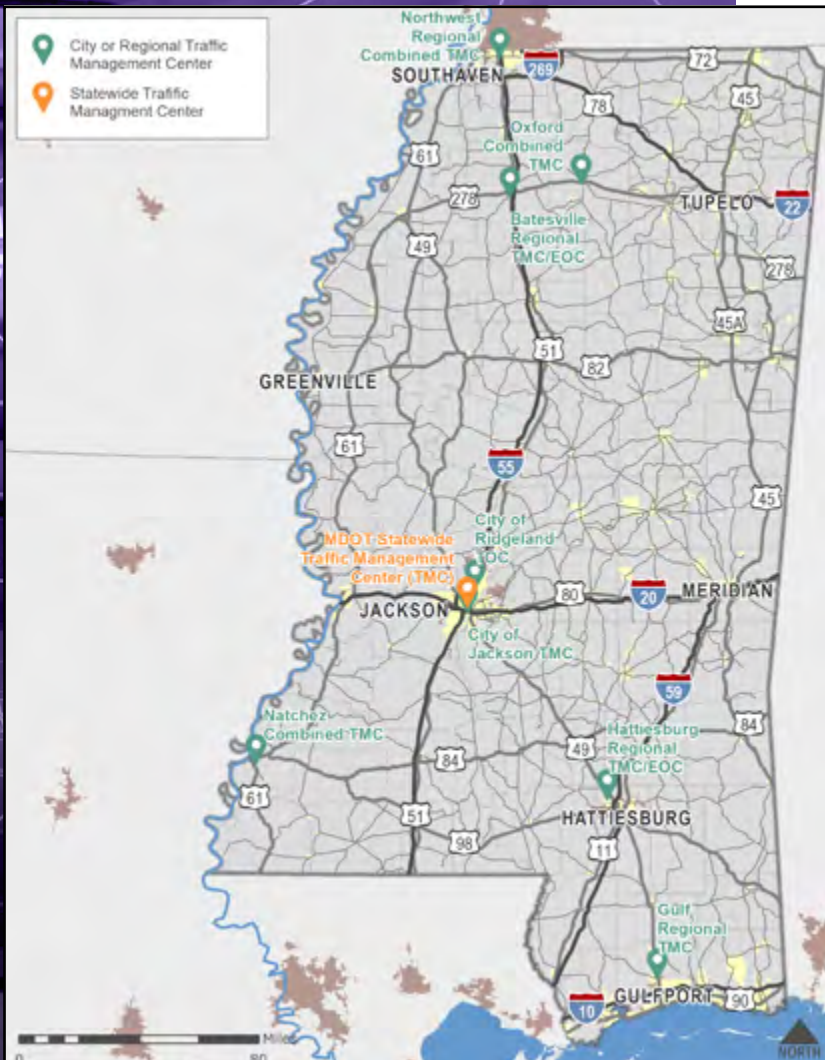


Reduced
Property
Damage
Costs



Reduced
Cargo
Loss
Costs

Note: Impacts of investments reflect the outcomes expected of funding Safety programs and projects.



This map is for planning purposes only and is subject to change.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)



Key Statistics

ITS technologies are continuously evolving, with new, more efficient, and less expensive infrastructure constantly being developed. Some of the emerging ITS technologies to address traveler's needs include automated driving systems, data exchanges, cybersecurity, and artificial intelligence. MDOT plans to use emerging ITS as part of future projects and will look for opportunities to evaluate, test, and analyze new devices, technologies and systems that may help operate the transportation system in a safer and more efficient manner. Below are the key benefits of ITS investments:

SAFETY: reduction in the overall number of crashes and severity;

MOBILITY: reduction in delay and variability in travel time;

CAPACITY/THROUGHPUT: the number of vehicles or people that can move through a transportation facility within a certain timeframe;

CUSTOMER SATISFACTION: the quality of service and number of complaints and/or compliments received;

PRODUCTIVITY: operational efficiencies and cost savings; and

ENERGY AND ENVIRONMENT: reduction in emissions and energy output.

Key Features

Transportation Management Centers (TMC)/Traffic Operation Centers (TOC) are the base for operating and monitoring the statewide, regional, or local transportation network. Typically manned 24 hours a day, seven days a week, TMCs provide a wide range of services, including relaying traveler information, monitoring traffic and weather conditions, and coordinating incident response.

Investment Need (2020 to 2045)



Performance Measures and Targets

PROGRAMS	MEASURE	CURRENT CONDITION	PERF. TARGET		EXPECTED FUNDING SCENARIO		ADEQUATE FUNDING SCENARIO	
					AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.	AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.
INTELLIGENT TRANSPORTATION SYSTEMS by % of Current Spending (\$1M)	% of Current Spending	100%	100%		\$1	100%	\$1	100%

Investment Strategy

Impacts of Investment



Improved Safety



Reduced Emissions



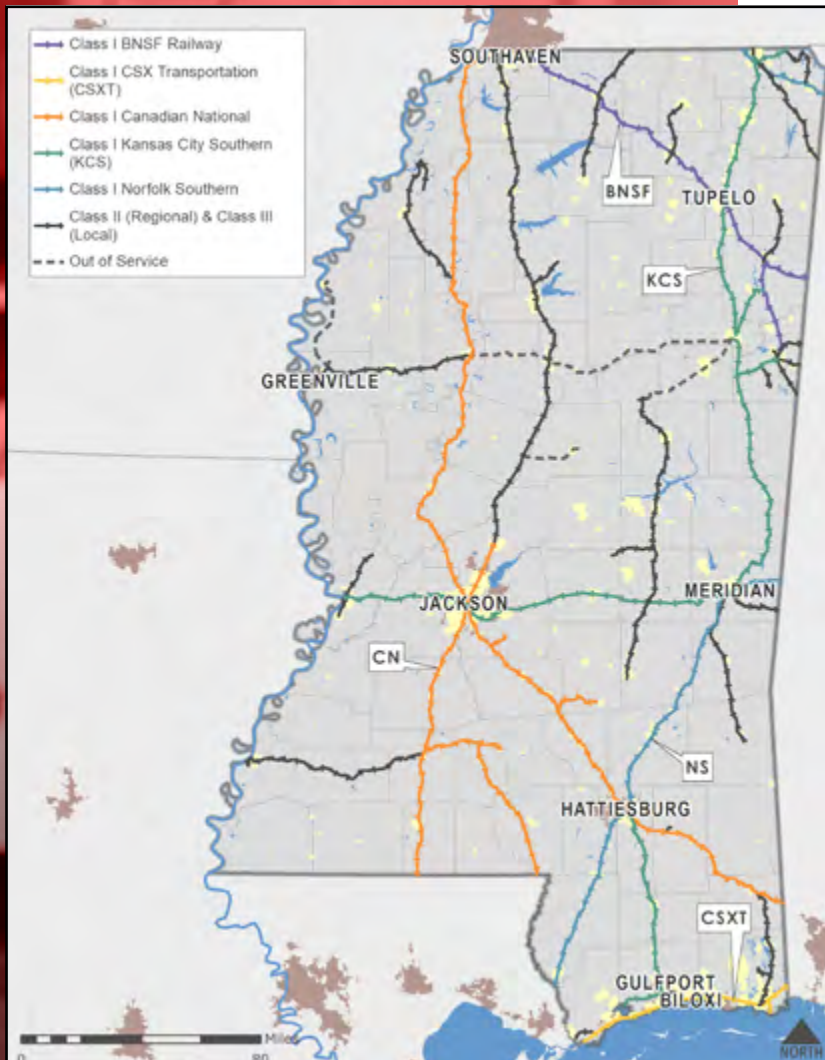
\$5.6M Travel Time Cost Savings Daily



Increased capacity and Improved Traffic Flow

Note: Impacts of investments reflect the outcomes expected of funding ITS programs and projects.





This map is for planning purposes only and is subject to change.

RAILROADS



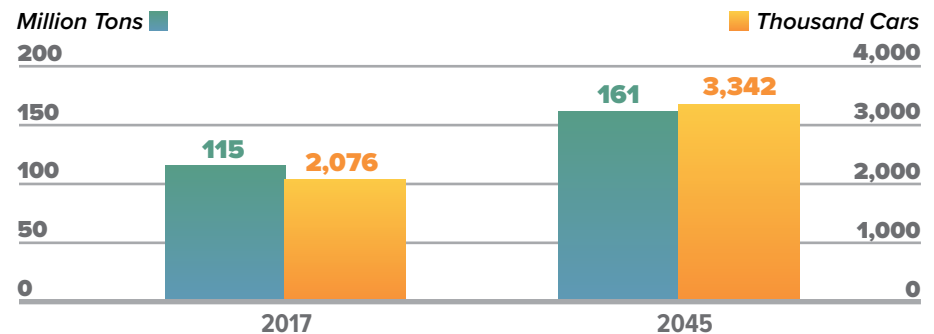
Key Statistics

Mississippi's 2,500-mile rail system is operated by five Class I railroads: Norfolk Southern (NS), BNSF Railway (BNSF), Canadian National (CN), Kansas City Southern (KCS), and CSX Transportation (CSXT); one Class II railroad; and 21 Class III railroads, as well as two Amtrak routes (the Crescent and the City of New Orleans).

The freight rail system is a critical component of Mississippi's economy, generating 1,831 jobs and carrying 115 million tons of goods in 2017. By 2045, freight rail demand is projected to increase:

61% MORE rail cars moved within the transportation system; and
40% ADDITIONAL tonnage carried.

RAIL FREIGHT FLOWS BY WEIGHT AND UNITS, 2017 TO 2045



Source:



Key Features

Mississippi is a vital state in the national freight rail transportation systems. Ranking 11th in the U.S. in number of operating freight railroads and 28th in the U.S. in active track mileage.



Investment Need (2020 to 2045)

Aimed at gaining market share for rail

Strategic investments focused on economic development to attract specific industries



Performance Measures and Targets

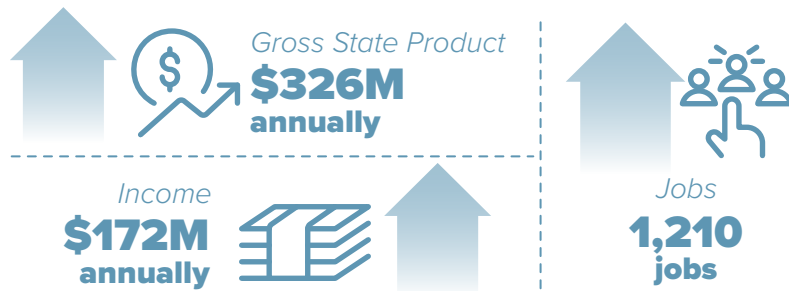
PROGRAMS	MEASURE	CURRENT CONDITION	PERF. TARGET		EXPECTED FUNDING SCENARIO		ADEQUATE FUNDING SCENARIO	
					AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.	AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.
Rail by % of Current Spending (\$1.2M)	% of Current Spending	100%	100%		\$1.2	100%	\$1.2	100%



Investment Strategy



Impacts of Rail Industry



Note: Impacts reflect the economic benefits of the industry on the state economy.

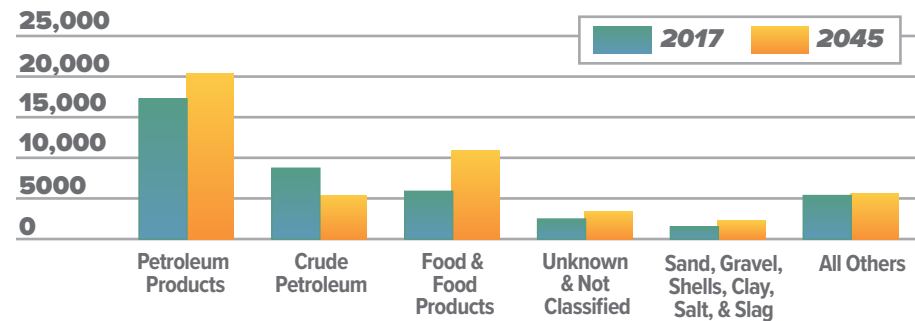


PORTS

Key Statistics

Mississippi's three major waterways: the Gulf of Mexico, Mississippi River, and Tennessee-Tombigbee Waterway, transported approximately 41 million tons of goods to, from, and within the State in 2017. Most goods were shipped outbound. Petroleum products and crude petroleum are the most common commodities shipped in Mississippi and represent approximately 63 percent of the total shipments in the state.

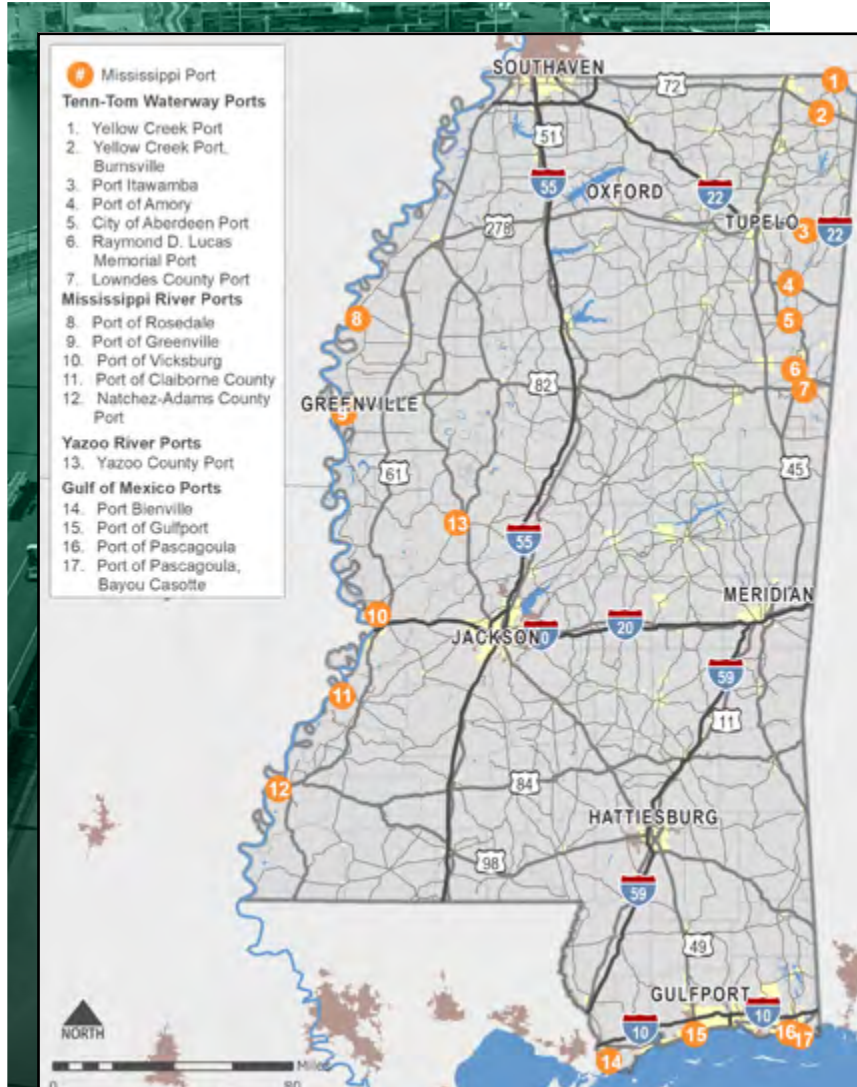
TOP COMMODITIES SHIPPED BY TONNAGE FLOW, IN THOUSANDS, 2017 AND 2045



Source: U.S. Army Corps of Engineers Navigation Data Center, Waterborne Commerce Statistics Center.

Key Features

Mississippi has a total of 16 ports along the **Gulf of Mexico, Mississippi River, and Tennessee-Tombigbee Waterway**. Facilitating efficient movement of freight to, from, through, and within Mississippi, these 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.



This map is for planning purposes only and is subject to change.



Investment Need (2020 to 2045)

Exceeds the performance target for vehicles and facilities and funds strategic enhancements

Upgrades current infrastructure along with new equipment and improvement to access roads and rail

\$328M

\$149M

■ Aggressive ■ Minimal



Performance Measures and Targets

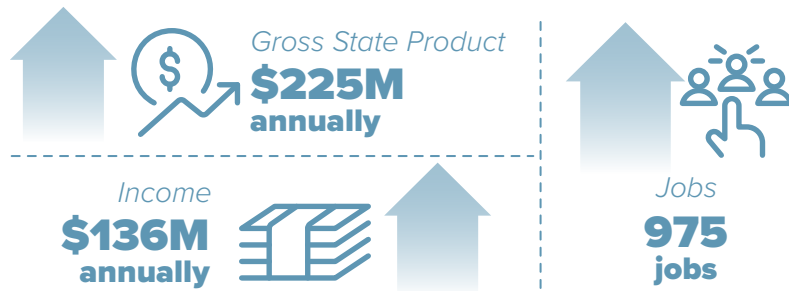


Investment Strategy

PROGRAMS	MEASURE	CURRENT CONDITION	PERF. TARGET	Current Condition Performance Target 2045 Expected Funding 2045 Adequate Funding	EXPECTED FUNDING SCENARIO		ADEQUATE FUNDING SCENARIO	
					AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.	AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.
Ports by % of Current Spending (\$3.8M)	% of Current Spending	100%	100%		\$3.8	100%	\$3.8	100%

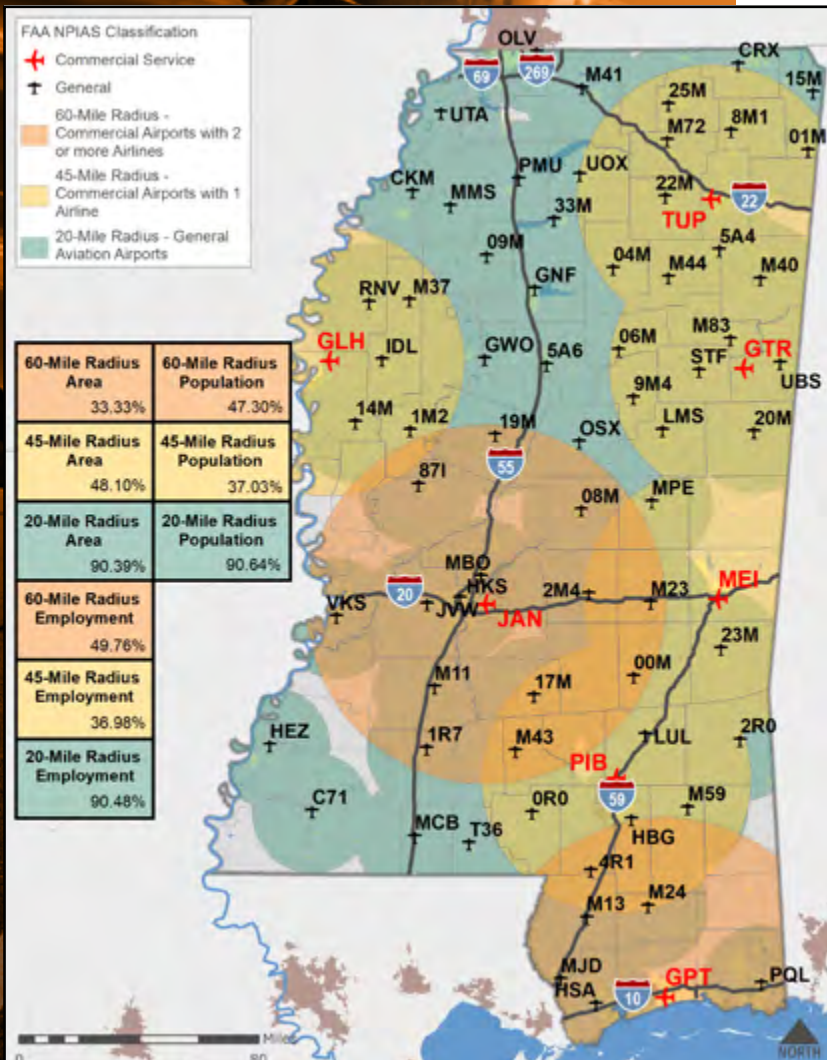


Impacts of Port Industry



Note: Impacts reflect the economic benefits of the industry on the state economy.





This map is for planning purposes only and is subject to change.

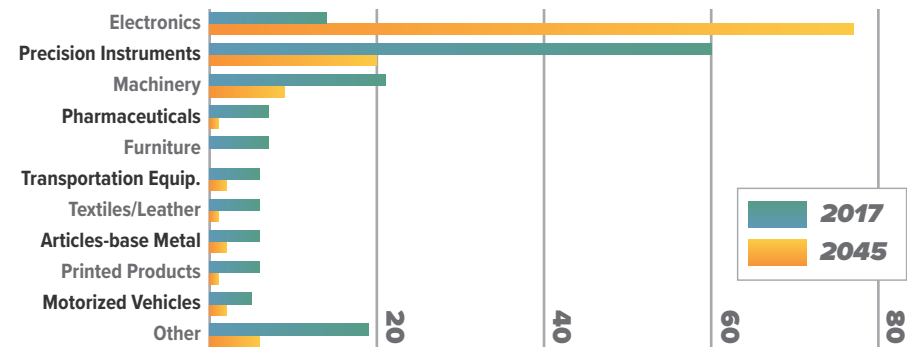
AVIATION



Key Statistics

Mississippi's airports connect people and goods at local and national levels. The quality of air transportation within the state impact ability to improve the quality of life for residents and to ensure efficient commerce. Although none of Mississippi's airports are expected to be limited by capacity today or by 2045, air cargo traffic is expected to increase facilitating the flow of high-value and time-sensitive goods.

TOP COMMODITIES SHIPPED BY AIR IN MISSISSIPPI, BY WEIGHT, 2017 AND 2045



Source:



Key Features

Mississippi's 74 public-use airports not only serve recreational pilots and pleasure fliers, but more importantly, they support local, regional, and state-wide economies and are responsible for generating more than \$2.5 billion in economic activity. About 47 percent of the state's population live within 60 miles of a commercial airport with two or more carriers.



Investment Need (2020 to 2045)

Exceeds the performance target for vehicles and facilities and funds strategic enhancements

Meets the performance target for vehicles and facilities and funds strategic enhancements

\$1,141M

\$751M

■ Aggressive ■ Minimal



Performance Measures and Targets

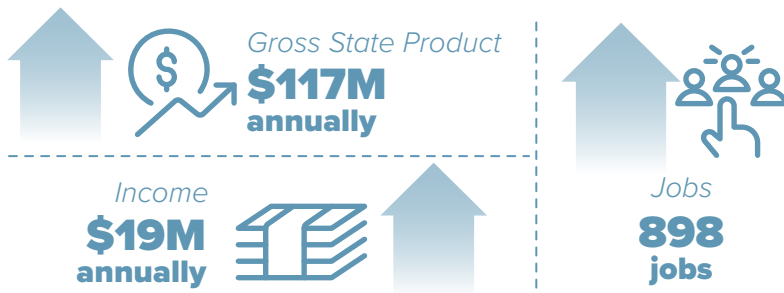


Investment Strategy

PROGRAMS	MEASURE	CURRENT CONDITION	PERF. TARGET	Current Condition Performance Target 2045 Expected Funding 2045 Adequate Funding	EXPECTED FUNDING SCENARIO		ADEQUATE FUNDING SCENARIO	
					AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.	AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.
Aviation by % of Current Spending (\$3M)	% of Current Spending	100%	100%		\$3	100%	\$3	100%

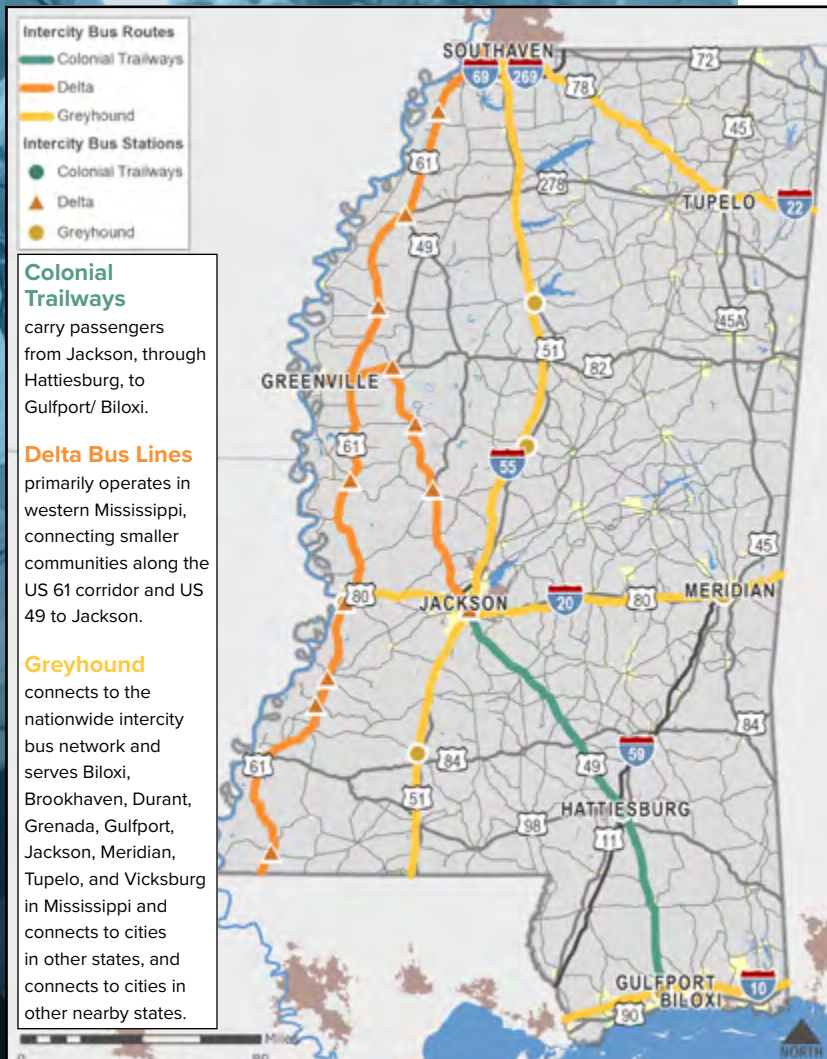


Impacts of Aviation Industry



Note: Impacts reflect the economic benefits of the industry on the state economy.







Investment Need (2020 to 2045)

Exceeds the performance target for vehicles and facilities and funds strategic enhancements

\$1,542M

Meets the performance target for vehicles and facilities and funds strategic enhancements

\$1,053M

■ Aggressive ■ Minimal



Performance Measures and Targets

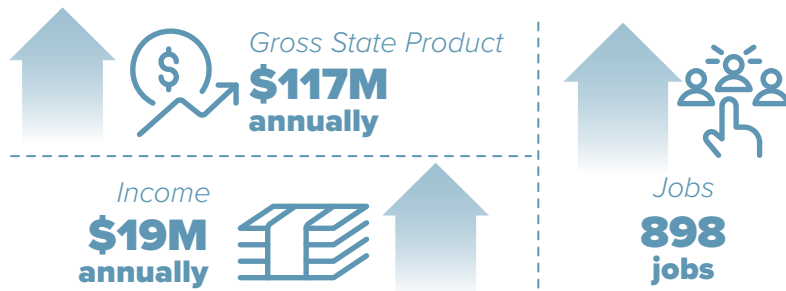


Investment Strategy

PROGRAMS	MEASURE	CURRENT CONDITION	PERF. TARGET	Current Condition 2045 Expected Funding Performance Target 2045 Adequate Funding	EXPECTED FUNDING SCENARIO		ADEQUATE FUNDING SCENARIO	
					AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.	AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.
TRANSIT - State of Good Repair by % of Current Spending	by % of Current Spending	100%	100%		\$25	100%	\$25	100%



Impacts of Transit Industry



Note: Impacts reflect the economic benefits of the industry on the state economy.



BIKE AND PEDESTRIAN

Key Statistics

Nationwide, bicycling and walking trips have steadily increased in the past 25 years. While bicycling and walking trips in Mississippi fall below the national average, localities across the State are supporting bicycling and walking through innovative design standards and policies. Mississippi is served by seven statewide bicycle routes that traverse the State. Providing safe and complete bicycle routes and pedestrian networks allows Mississippians of all ages and abilities to safely and conveniently travel.

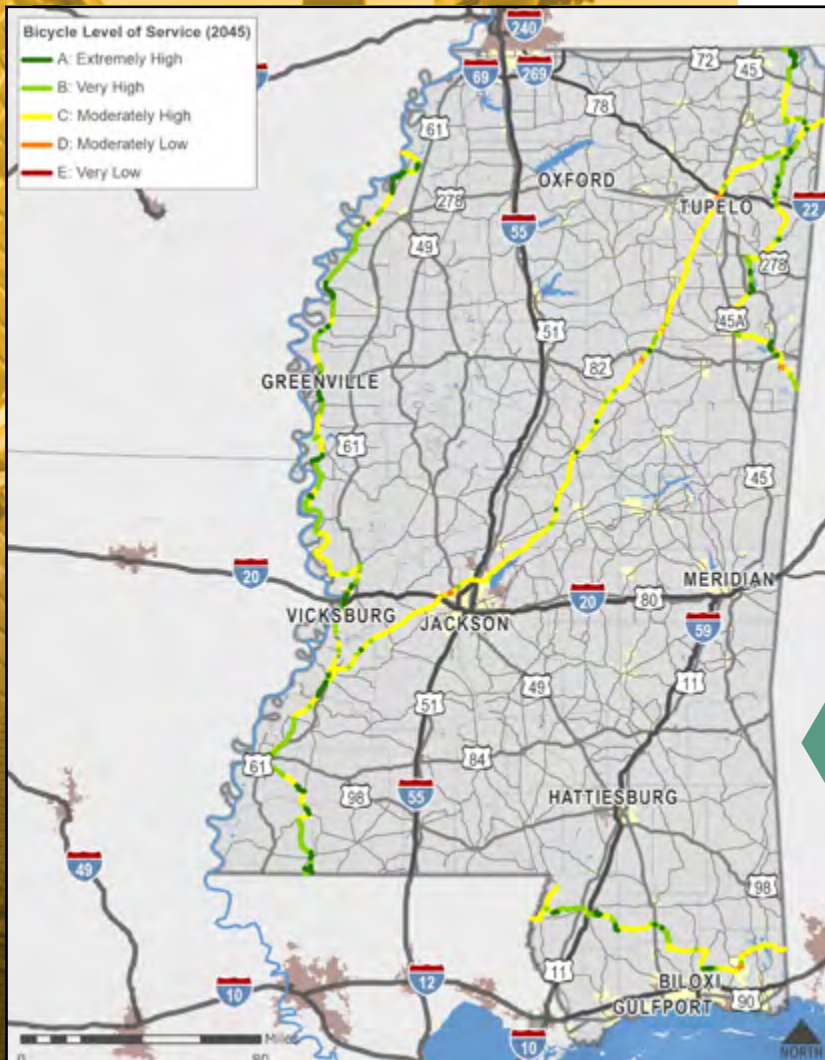
Key Features

The projected Mississippi Bicycle Level of Service (LOS) illustrates the comfort-level ratings for the average adult bicyclist on the five existing on-street statewide bicycle routes.

LOS A indicates that a roadway is extremely compatible for the average adult bicyclist, while **LOS E** identifies a roadway as extremely incompatible for the average adult bicyclist.

Overall Average Comfort-Level Rating by Route:

- **Underground Railroad (Iuka to Columbus) – LOS B**
- **Southern Tier (Hurley to White Sand) – LOS C**
- **Great Rivers (Tishomingo to Woodville) – LOS B**
- **Mississippi River Trail (Lula to Natchez) – LOS C**
- **Natchez Trace Parkway (Tishomingo to Natchez) – LOS C**



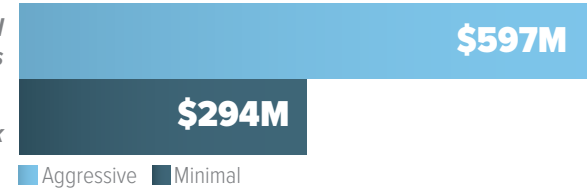
This map is for planning purposes only and is subject to change.



Investment Need (2020 to 2045)

Includes all MPO bicycle/pedestrian projects and invests in new trails filling key network gaps

Includes 2/3 of all MPO bicycle/pedestrian projects and improvements to statewide network



Performance Measures and Targets



Investment Strategy

PROGRAMS	ACTUAL ASSETS (2018)	MEASURE	CURRENT CONDITION	PERF. TARGET	Current Condition Performance Target 2045 Expected Funding 2045 Adequate Funding	EXPECTED FUNDING SCENARIO		ADEQUATE FUNDING SCENARIO	
						AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.	AVERAGE SPENDING 2020-2045 (\$2018M)	2045 PERF.
BIKE AND PEDESTRIAN by % of Current Spending (\$1M)	693 miles of trails	% of Current Spending	100%	100%		\$1	100%	\$1	100%



Impacts of Investment



Increased Tourism

Decreased Health Costs



Low Cost Transportation Services



Note: Impacts of investments reflect the outcomes expected of funding Bicycle/Pedestrian projects programs and projects.



SECTION 5

TRANSPORTATION INVESTMENT NEEDS

MULTIPLAN 2045 aims to provide a roadmap for meeting the State's future multimodal transportation needs in a challenging funding environment. Investments in transportation are necessary to maintain the existing infrastructure, to modernize and upgrade existing assets, and to provide needed capacity through system expansion. MDOT invests across three primary program areas including preservation, modernization, and expansion. The current deficiencies, both in terms of deteriorating quality and limited capacity, as well as the projected growth, determine the level of investment need.

INVESTMENT NEEDS

The varying levels of total transportation investment need to maintain and upgrade Mississippi's transportation system is based on the following investment levels and priorities:

1. MINIMAL – The level of investment needed to meet minimum Federal and State performance targets necessary to ensure a safe, well-maintained, and efficient transportation system. The annual investment needed to meet minimum performance targets is \$1.1 billion of which \$940 million is for pavement, bridges, and capacity on State-owned roadways.

2. AGGRESSIVE – The investment level needed to fully address all unmet needs. The annual investment needed to maintain and address all unmet needs in Mississippi is \$1.4 billion of which \$1.2 billion is for pavement, bridges, and capacity on State-owned roadways.

MDOT makes investments in all modes as well as priorities that make impacts across multiple modes, such as safety and security, key corridors, and Intelligent Transportation Systems (ITS). The investment need for each of the investment levels is summarized in the following table.

NEEDS BY MODE AND LEVEL OF INVESTMENT, MILLIONS OF 2018 DOLLARS

PROGRAM AREA	MINIMAL <i>(The level of investment needed to meet minimum performance targets necessary to ensure a safe, well-maintained, efficient transportation system.)</i>	AGGRESSIVE <i>(The investment level needed to fully address all unmet needs.)</i>
Pavement (State-Owned)	\$18,798	\$20,982
Bridge (State-Owned)	\$2,306	\$3,562
Operations	\$780	\$780
Capacity	\$2,566	\$4,822
Safety	\$780	\$780
ITS	\$275	\$438
Public Transit	\$1,053	\$1,542
Bicycle and Pedestrian	\$ 294	\$597
Rail*	\$55	\$490
Ports and Waterways	\$149	\$328
Aviation	\$751	\$1,141
Total Funding Need - All Program Areas (2020-2045)	\$27,807	\$35,463
Total Pavement, Bridge, and Capacity Need (2020-2045)	\$24,450	\$30,146
Total Funding Need - All Program Areas (Average Annual)	\$1,069	\$1,364

* Subject to change based on the state rail plan.

PROJECTED TRANSPORTATION FUNDING

Understanding how much funding is expected to be available for transportation in Mississippi is critical to understand the impacts of future investment scenarios. This section describes how the method to determine the transportation funding forecasts, the priorities for investment, and potential issues funding those priorities, including gaps in funding.

Methodology and Sources

The process used to determine how much funding the state will have for transportation programs can be broken down into three steps.

GROSS REVENUE	NON-CONSTRUCTION PROGRAM EXPENDITURES	ROADWAY & BRIDGE CONSTRUCTION PROGRAM BUDGET
Federal FHWA FTA State Motor fuel tax Truck & bus fees Interest Loricating oil Contractor's tax Commercial vehicle tax Other	Debt Obligation \$840 million over 2020-2045 timeframe Transfer to local bridge & road Transfer to non-highway modes Business support Transfers for other non-project expenditures	Pavement Bridges Safety Operations PE & ROW ITS
Average \$832 million per year (2018\$)	Average \$242 per year (2018\$)	Average \$590 per year (2018\$)

The first step is understanding the current state and federal investment programs and then projecting the funding from those programs into the future. For this funding projection, the timeframe used was 2016 to 2045.

The next step is to understand what are the current and future funding obligations that will need to be paid. These include paying off any debts or interest charged from those debts, as well as transfers to fund clearing roads, doing minor repairs, mowing, etc.

The last step is to develop a projection of the net transportation funding available to the state based on the funding from Federal and State sources, minus the funding obligations.

Source: Cambridge Systematics Analysis based on MDOT financial reports.



Funding Projections

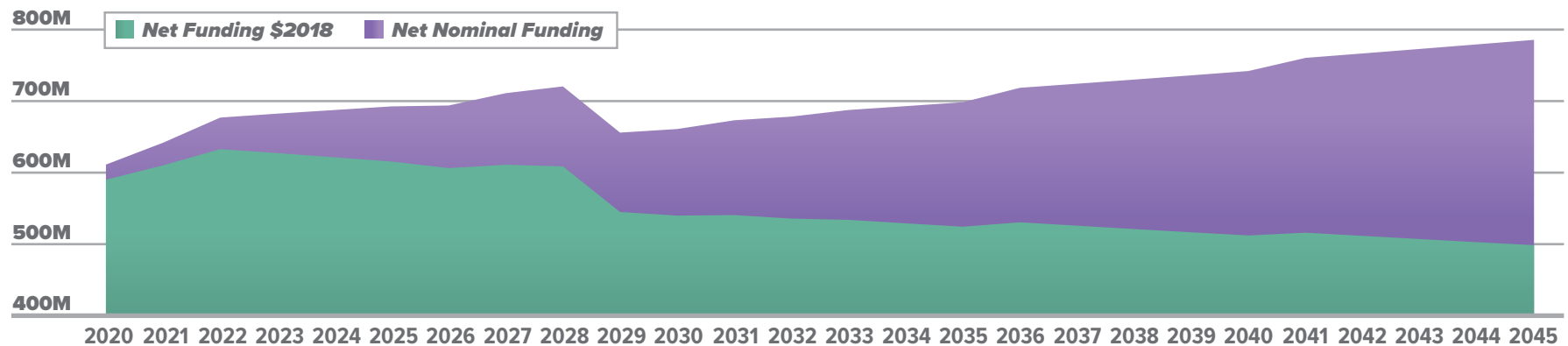
Using the methodology described above, the table below summarizes the expected funding projections (in constant 2018 dollars) for three time periods. The net funding, which is funding available after debt obligations and other non-construction program expenditures are subtracted, is estimated at \$14,453 million. This represents the amount available for the MDOT construction program for the next 25 years.

MISSISSIPPI EXPECTED TRANSPORTATION CONSTRUCTION FUNDING PROJECTS, MILLIONS OF 2018 DOLLARS

PROGRAMMING TIERS	MDOT FUNDING			
	FEDERAL	STATE	TOTAL GROSS FUNDING	NET FUNDING
2020-2025	\$2,919	\$2,878	\$5,797	\$3,699
2026-2035	\$4,600	\$3,872	\$8,472	\$5,592
2036-2045	\$4,289	\$3,099	\$7,388	\$5,163
Total	\$11,809	\$9,849	\$21,657	\$14,453

In 2028, Mississippi is expecting a significant reduction in funding as the revenues from the State Lottery and Sports Betting tax are redirected to the State's General Fund. In 2018 dollars, funding for transportation will decrease by 16 percent over the MULTIPLAN 2045 timeframe.

TRANSPORTATION FUNDING PROJECTED FOR CAPITAL PROGRAM, 2020 TO 2045



Potential Funding Disruptors

Predicting future funding through 2045 is a challenge and several disruptors could change the anticipated transportation funding in Mississippi.

- **Federal Program Funding:** Federal funding represents about half of the state's total funding. If there was any change in federal funding programs or allocation methodology then the state could be impacted. This happened in 2015 with the passage of the FAST Act, which replaced MAP-21, and the FHWA program funding to the state increased from \$466 million in 2014 to \$509 million in 2018.
- **Motor Fuel Tax Revenues:** Accounts for 62 percent of the state sources of funding, this source could be reduced over the long term due to a variety of factors, such as:
 - » The continued mileage efficiency in new vehicles and federal government legislation mandating certain mileage for new vehicles;
 - » An increase in electric/hybrid vehicles;
 - » A reduction in personal vehicle ownership rates;
 - » A reduction in the number of new drivers; and
 - » An increase in telecommuting and on-demand delivery services (Uber Eats, Amazon, etc.).

UNDERSTANDING THE TRADE-OFFS

Throughout the planning process of MULTIPLAN 2045, various public outreach tools were used to gather input to develop performance measures and targets by investment program. Using performance-based planning approaches, stakeholder group facilitation, public input, and federal guidelines, the team established performance measures and targets that provide the strategic framework for MULTIPLAN 2045. This strategic framework ensures the progress of goals and objectives determined by Mississippians are measured and tracked. The table on the following page shows each capital program area with its corresponding performance measure and target.

TRADEOFF ANALYSIS PROCESS



ESTABLISH VISION

PUBLIC & STAKEHOLDER INPUT

What does the public want?
What does the public want to improve?



STATEWIDE TRENDS

What are the current conditions?
Where is Mississippi heading?



PERFORMANCE MEASURES

What are our goals?
How should we measure success?



EVALUATE OPTIONS & OUTCOMES

AVAILABLE FUNDING

VS

INVESTMENT NEEDS



DIFFERENT SCENARIOS

Not everything can be funded.
What program(s) should be emphasized?



SELECT PREFERRED SCENARIOS

ALIGNS WITH VISION

WITHIN BUDGET

MEETS OR EXCEEDS PERFORMANCE TARGETS

PERFORMANCE MEASURES AND TARGETS BY INVESTMENT PROGRAM

INVESTMENT PROGRAM AREA	SHORT DESCRIPTION	PERFORMANCE MEASURE	PERFORMANCE TARGET
Pavement	Investments in the preservation of pavement	Pavement in Poor or Good Condition	NHS – Interstate Pavement: 55% Good / 5% Poor NHS – Non-Interstate Pavement: 25% Good / 10% Poor Non-NHS State Owned 4-Lane Pavement: 75% Good + Fair / 25% Poor Non-NHS State Owned 2-Lane Pavement: 75% Good + Fair / 25% Poor
Bridge	Investment in preservation and replacement of bridges	Total deck area for NHS bridges classified as Good + Fair and Poor Total deck area for Non-NHS bridges classified as Good + Fair and Poor	NHS Bridge: 95% Good + Fair / Less than 5% Poor State-Maintained Bridge, Non-NHS: 97% Good + Fair / Less than 3% Poor
Capacity	Adding capacity to existing roadways	Level of Service	LOS C or better – Rural areas LOS D or better – Urban areas
Safety	Investments in safety-related projects (e.g., Rehabilitate Deficient Highway Corridors)	Percent of current spending	100% or better
Intelligent Transportation Systems (ITS)	Investments in ITS related projects (e.g., Roadway Weather Information Systems Installation)	Percent of current spending	100% or better
Intermodal	Investments in Port, Rail, and Aviation infrastructure	Percent of current spending	100% or better
Transit	Investments in new transit vehicles and operations	Percent of current spending	100% or better
Bicycle and Pedestrian	Investments the statewide bicycle network	Percent of current spending	100% or better

A series of investment strategy scenarios, each with an alternative emphasis for investment, were developed and evaluated. The three scenarios include one that assumes an expected level of annual funding based on current funding sources and two that assume different levels of increased funding availability:

Scenario 1: Expected Budget – Invest to Preserve and Maintain

Meet Federal FAST Act requirements first, then proportionately disperse funds to preserve and maintain the State's transportation assets, and maintain existing funding levels for non-preservation categories.

Scenario 2: Enhanced Budget – Invest to Preserve and Maintain

Meet Federal FAST Act requirements first, then proportionately disperse funds to preserve and maintain the State's transportation assets, and maintain existing funding levels for non-preservation categories. Assumes transportation funding from the Lottery and Sports Betting Sales Tax continues beyond 2028.

Scenario 3: Adequate Budget – Invest to Maintain and Expand

Meet Federal FAST Act requirements, expand on key corridors as needed, maintain investment for non-preservation modes, and spend remaining funds proportionately on the preservation of the non-interstate state-owned system. Requires additional funding sources.

MULTIPLAN 2045 INVESTMENT & PERFORMANCE SCENARIOS

LEVEL OF FUNDING	SCENARIO 1: EXPECTED BUDGET			SCENARIO 2: ENHANCED BUDGET			SCENARIO 3: ADEQUATE BUDGET		
	ASSUMES FUNDING LEVELS REMAIN THE SAME			ASSUMES LOTTERY FUNDS DEDICATED TO TRANSPORTATION CONTINUES BEYOND 2028			ASSUMES THE FUNDING NEEDED TO FULLY FUND MISSISSIPPI'S BASIC TRANSPORTATION NEEDS		
INVESTMENT PROGRAM AREA	ANNUAL SPENDING (\$2018M)			ANNUAL SPENDING (\$2018M)			ANNUAL SPENDING (\$2018M)		
	2020-2025 AVERAGE	2020-2045 AVERAGE	PERFORMANCE	2020-2025 AVERAGE	2020-2045 AVERAGE	PERFORMANCE	2020-2025 AVERAGE	2020-2045 AVERAGE	PERFORMANCE
NHS – Interstate Pavement	\$110	\$153	40% Good / 3% Poor	\$110	\$153	40% Good / 3% Poor	\$210	\$210	55% Good / 0% Poor
NHS – Non-Interstate Pavement	\$135	\$144	68% Good / 10% Poor	\$135	\$144	68% Good / 10% Poor	\$144	\$144	68% Good / 10% Poor
Non-NHS State Owned 4-Lane Pavement	\$5	\$9	74% Good + Fair / 26% Poor	\$5	\$9	74% Good + Fair / 26% Poor	\$9	\$9	75% Good + Fair / 25% Poor
Non-NHS State Owned, 2-Lane Pavement	\$80	\$37	<1% Good + Fair / >99% Poor	\$80	\$60	7% Good + Fair / 93% Poor	\$360	\$360	75% Good + Fair / 25% Poor
NHS State Owned Bridge	\$105	\$90	98% Good + Fair / 2% Poor	\$105	\$90	98% Good + Fair / 2% Poor	\$90	\$90	98% Good + Fair / 2% Poor
Non-NHS State Owned Bridge	\$50	\$45	98% Good + Fair / 2% Poor	\$50	\$45	98% Good + Fair / 2% Poor	\$45	\$45	98% Good + Fair / 2% Poor
Capacity	\$17		Preliminary Engineering and Right-of-Way	\$17		Preliminary Engineering and Right-of-Way	\$80		Key Corridors achieve LOS C in Rural Areas and LOS D in Urban Areas
Safety	\$30		Maintain Existing Spending	\$30		Maintain Existing Spending	\$30		Maintain Existing Spending
Operations	\$30			\$30			\$30		

MULTIPLAN 2045 INVESTMENT & PERFORMANCE SCENARIOS (CONTINUED)

	SCENARIO 1: EXPECTED BUDGET			SCENARIO 2: ENHANCED BUDGET			SCENARIO 3: ADEQUATE BUDGET		
LEVEL OF FUNDING	ASSUMES FUNDING LEVELS REMAIN THE SAME			ASSUMES LOTTERY FUNDS DEDICATED TO TRANSPORTATION CONTINUES BEYOND 2028			ASSUMES THE FUNDING NEEDED TO FULLY FUND MISSISSIPPI'S BASIC TRANSPORTATION NEEDS		
INVESTMENT PROGRAM AREA	ANNUAL SPENDING (\$2018M)			ANNUAL SPENDING (\$2018M)			ANNUAL SPENDING (\$2018M)		
	2020-2025 AVERAGE	2020-2045 AVERAGE	PERFORMANCE	2020-2025 AVERAGE	2020-2045 AVERAGE	PERFORMANCE	2020-2025 AVERAGE	2020-2045 AVERAGE	PERFORMANCE
ITS	\$1		Maintain Existing Spending	\$1		Maintain Existing Spending	\$1		Maintain Existing Spending
Transit (FTA)	\$25		Maintain Existing Spending	\$25		Maintain Existing Spending	\$25		Maintain Existing Spending
Aviation (Multimodal Fund)	\$3		Maintain Existing Spending	\$3		Maintain Existing Spending	\$3		Maintain Existing Spending
Rail and Ports (Multimodal Fund)	\$5		Maintain Existing Spending	\$5		Maintain Existing Spending	\$5		Maintain Existing Spending
Bicycle and Pedestrian	\$1		Maintain Existing Spending	\$1		Maintain Existing Spending	\$1		Maintain Existing Spending
TOTAL Average Annual Investment 2020-2045	\$590			\$613			\$1,033		

The three different investment scenario strategies focus on one or more emphasis areas and varying levels of funding support for transportation. This represents different ways transportation investments can be distributed based on different long-term priorities of Mississippi residents, businesses and stakeholders, and MDOT transportation leaders.

EVALUATING THE OPTIONS WITH A TRADE-OFF ANALYSIS

The selection of the preferred scenarios and development of a plan of action given the future of constrained resources requires balancing funding availability and transportation needs. Each dollar spent on one part of the system is one less dollar on another part of the system. Finding the appropriate level of funding for each mode meant setting minimum and desired performance targets, calculating the performance resulting from the expenditures, and comparing the overall benefits across scenarios. The potential outcomes and performance of each of these strategies were calculated using a trade-off analysis tool.

The MULTIPLAN 2045 Planning for Performance tool describes the anticipated performance of each transportation mode given a specified funding level. The tool was developed to allow MDOT to quickly and easily compare funding distribution choices across major program areas and allow stakeholders and the public to see how alternative funding approaches can influence the future conditions of the entire transportation system.

MULTIPLAN 2045 PLANNING FOR PERFORMANCE TOOL

**VISUALIZE THE CONSEQUENCES
OF OUR DECISIONS**



**TRACK OUR BUDGET WHILE
RESPECTING THE COLOR OF MONEY**

**GENERATE FUNDING SCENARIOS
IN RESPONSE TO OUR OBJECTIVES**



The trade-off analysis revealed some significant performance differences across scenarios. However, one common theme emerged, regardless of how the money is spent, the expected funding level through 2045 will result in the deterioration of Mississippi's highway and multimodal transportation system.



SECTION 6

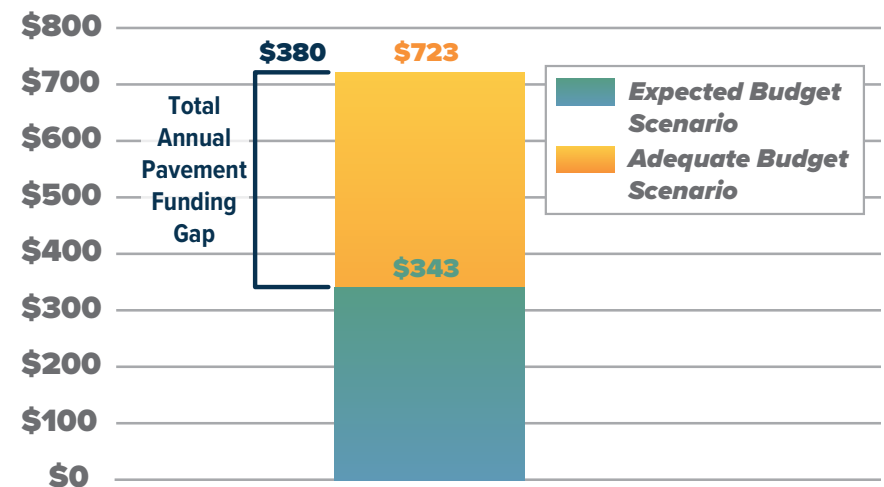
PLAN OF ACTION & INVESTMENT STRATEGIES

Two preferred strategies were identified through the trade-off analysis between spending and performance. Both strategies meet the Federal FAST Act performance measure requirements but differ based on the anticipated level of funding.

Expected Budget Scenario, is based on expected available funding, and prioritizes maintenance and preservation of the existing system while still allowing for some investment in safety, ITS, and intermodal transportation. The expected budget scenario results in pavement deterioration of the transportation network, most dramatically impacting the non-NHS State Owned two-lane roadways. Considering only pavement investments, in 2018 dollars, the total funding gap between the expected budget scenario and the adequate funding scenario for pavement is \$380 million annually. This scenario does not include funding for capacity expansion.

The limitations of the Expected Budget Scenario funding scenario limits MDOT's ability to maintain and preserve the transportation network, a key goal expressed by stakeholders and the general public throughout the planning process. Funding for safety, public transit, and pedestrian and bicycle facilities is maintained at current levels.

PAVEMENT FUNDING GAP BETWEEN ADEQUATE BUDGET SCENARIO AND EXPECTED BUDGET SCENARIO, ANNUAL, \$2018M



EXPECTED BUDGET SCENARIO

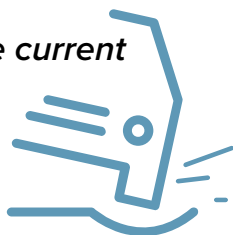


ECONOMIC COSTS OF UNDER FUNDING TRANSPORTATION

The Expected Budget Scenario underfunds transportation in Mississippi and results in deteriorating conditions and performance. The constrained funding strategy of the Expected Budget Scenario leads to:

A **DECLINE IN PAVEMENT CONDITIONS** of the State-owned system from the current

82% in FAIR OR BETTER condition
to only **45%** in FAIR OR BETTER condition



An **INCREASE** of almost **28 METRIC TONS** of **CO₂ EMISSIONS**



An **INCREASE IN THE HOURS OF DELAY** arising from congestion totalling

205 MILLION HOURS



472 MILLION GALLONS of **FUEL WASTED**



All of these declines in performance lead to higher transportation costs for residents and businesses. Higher transportation costs makes Mississippi more expensive in terms of the cost of doing business and the cost of living. This impacts the state's ability to retain and attract workers, businesses, and jobs.

ECONOMIC IMPACT OF THE EXPECTED CONSTRAINED FUNDING, 2020 TO 2045

COSTS TOTALING \$5.2 BILLION attributed to travel delay, vehicle operating and maintenance, emissions, and motor vehicle crashes due to deteriorating conditions and performance.

TOTAL EMPLOYMENT (JOBS BETWEEN 2025-2045) **-33,580**

GROSS STATE PRODUCT (IN BILLIONS \$2019) **-\$3.2**

PERSONAL INCOME (IN BILLIONS \$2019) **-\$3.6**

PROVIDING ADEQUATE FUNDING FOR MISSISSIPPI'S TRANSPORTATION INFRASTRUCTURE

The MULTIPLAN planning process demonstrated that the general public, stakeholders, and MDOT rely on a transportation network that preserves and maintains the existing assets and reaches above the proposed Federal target requirements. The long-term strategic plan is to raise and/or reallocate revenue to achieve Adequate Funding. This strategy reflects the funding required to adequately address the needs of the transportation network. The total funding requirements are about 74 percent higher than in the Expected Budget Scenario. This strategy highlights the deficit between expected funding levels and the minimum funding required to adequately maintain and preserve Mississippi's transportation network.

ECONOMIC RETURN OF MAKING ADEQUATE INVESTMENTS, 2020 TO 2045

SAVINGS OF NEARLY \$4.7 BILLION *attributed to avoided travel delay, vehicle operating and maintenance, emissions, and motor vehicle crashes over the 25-year period.*

TOTAL EMPLOYMENT
(JOBS BETWEEN 2025-2045)

↑ **30,380**

GROSS STATE PRODUCT
(IN BILLIONS \$2019)

↑ **\$2.9**

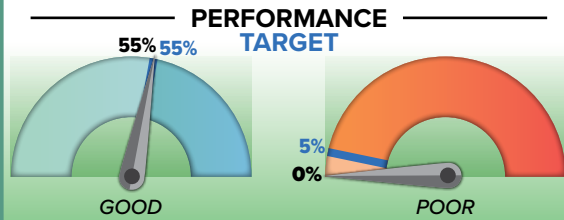
PERSONAL INCOME
(IN BILLIONS \$2019)

↑ **\$3.6**

ADEQUATE FUNDING

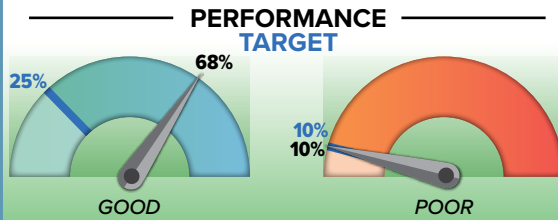
NHS – INTERSTATE PAVEMENT

2020-2045 AVERAGE SPENDING (\$2018M):
\$210



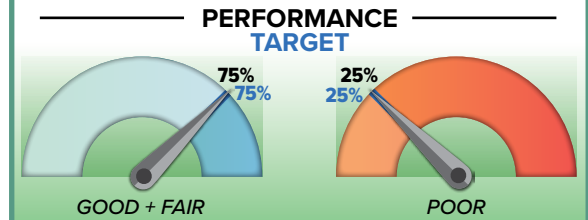
NHS – NON-INTERSTATE PAVEMENT

2020-2045 AVERAGE SPENDING (\$2018M):
\$144



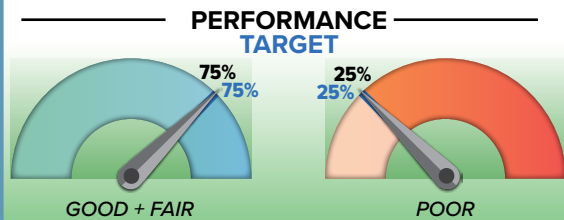
NON-NHS STATE OWNED 4-LANE PAVEMENT

2020-2045 AVERAGE SPENDING (\$2018M):
\$9



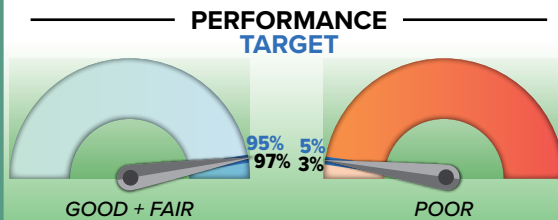
NON-NHS STATE OWNED, 2-LANE PAVEMENT

2020-2045 AVERAGE SPENDING (\$2018M):
\$360



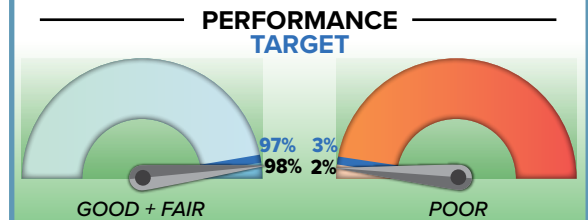
NHS STATE OWNED BRIDGE

2020-2045 AVERAGE SPENDING (\$2018M):
\$90



NON-NHS STATE OWNED BRIDGE

2020-2045 AVERAGE SPENDING (\$2018M):
\$45



CAPACITY

2020-2045 AVERAGE SPENDING (\$2018M):
\$80



SAFETY

2020-2045 AVERAGE SPENDING (\$2018M):
\$30



OPERATIONS

2020-2045 AVERAGE SPENDING (\$2018M):
\$30



INTELLIGENT TRANSPORTATION SYSTEMS

2020-2045 AVERAGE SPENDING (\$2018M):
\$1



TRANSIT (FTA)

2020-2045 AVERAGE SPENDING (\$2018M):
\$25



AVIATION (MULTIMODAL FUND)

2020-2045 AVERAGE SPENDING (\$2018M):
\$3



RAIL AND PORTS (MULTIMODAL FUND)

2020-2045 AVERAGE SPENDING (\$2018M):
\$5



BICYCLE & PEDESTRIAN

2020-2045 AVERAGE SPENDING (\$2018M):
\$1



The challenge of limited transportation infrastructure investment is understood not only by transportation leaders, but also the general public. When asked to predict the most significant transportation challenges for Mississippi over the next 25 years, the top three identified by MULTIPLAN public survey respondents were:

MISSISSIPPI'S MOST SIGNIFICANT TRANSPORTATION CHALLENGES

- 1. AGING AND DETERIORATING ROADS AND BRIDGES**
- 2. FINDING MONEY TO MAINTAIN AND IMPROVE THE TRANSPORTATION SYSTEM**
- 3. SAFE TRAVEL**

Over half of the MULTIPLAN public survey respondents do not believe State transportation funding is adequate and believe the top priorities for transportation investments should be maintaining the current system, improving safety, and improving roadway connectivity.

MULTIPLAN 2045 lays out the challenges Mississippi faces in terms of providing a transportation system that meets the needs of today's global economy.

The impacts of underfunding our transportation infrastructure are significant. Only by increasing the level of funding available to maintain and preserve the State's roadways and bridges, can Mississippi keep pace in an increasingly competitive global economy.



