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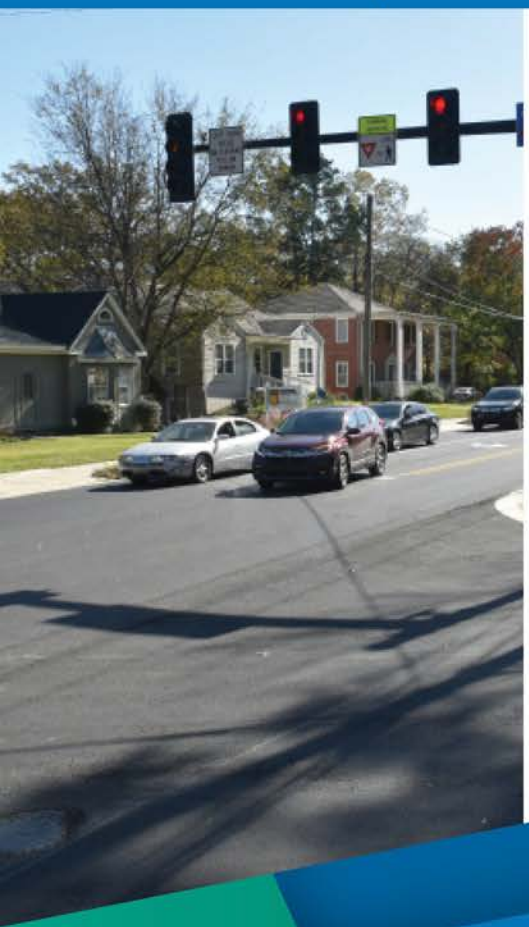
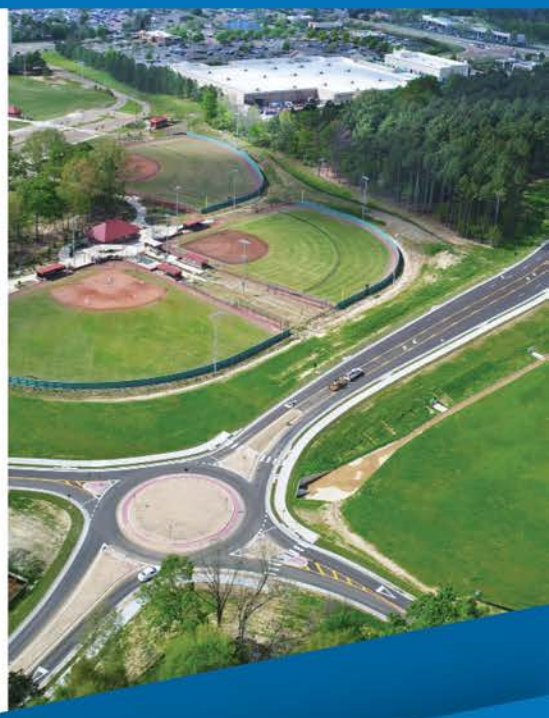
CENTRAL MISSISSIPPI
PLANNING AND DEVELOPMENT DISTRICT

2050 Metropolitan Transportation Plan





Technical Report #2

State of Current Systems

November 2025

Prepared by:

NEEL-SCHAFFER

CMPDD
PROMOTING REGIONAL EXCELLENCE SINCE 1968
CENTRAL MISSISSIPPI
PLANNING AND DEVELOPMENT DISTRICT

Central Mississippi Planning and Development District

2050 Metropolitan Transportation Plan

This Plan was prepared as a cooperative effort of the U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Mississippi Department of Transportation (MDOT), and local governments in partial fulfillment of requirements in Title 23 USC 134 and 135, amended by the IIJA, Sections 11201 and 11525, October 1, 2021. The contents of this document do not necessarily reflect the official views or policies of the USDOT.

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1.0 Introduction

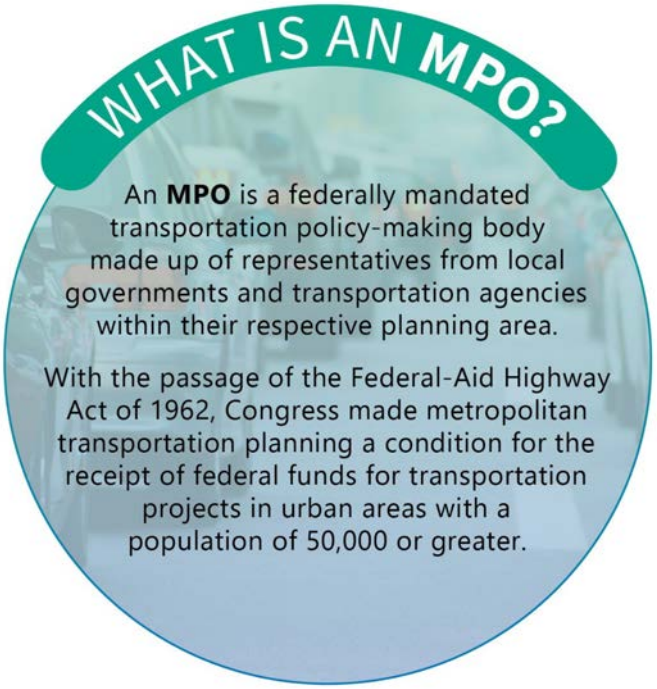
As part of the statewide MULTIPLAN effort, the ***2050 Metropolitan Transportation Plan*** (**MTP**) is the long-range transportation plan for the Central Mississippi Planning & Development District (CMPDD) planning area and replaces the 2045 MTP. This State of the Current Systems Report provides updated data and analysis, includes an overview of the existing conditions, trends, and plans, and serves as the foundation for improvement recommendations to address identified transportation needs within the region.

The MTP sets a regional vision and course of action for addressing the transportation needs of the region over the next twenty-five years.

1.1 Metropolitan Planning Organization Purpose and Primary Function

The CMPDD serves as the Metropolitan Planning Organization (MPO) for the urbanized areas, and areas anticipated to be urbanized by the Year 2050, of Hinds, Madison, and Rankin Counties, as shown in **Figure 1.1**.

As the MPO, CMPDD is responsible for coordinating, developing, and administering the transportation planning process and programs for the planning area. The primary mission of the MPO is to develop and maintain a transportation planning process that is compliant with federal and state requirements, and supports the development and enhancement of sustainable multimodal facilities, programs and systems in the area.[1]



[1] https://cmpdd.org/what-is-an-mpo/

Within the MPO are four (4) committees that make up its structure. These are:

- The Metropolitan Planning Policy Committee serves as the official governing authority for the MPO.
- Three advisory committees that review and makes recommendations on all transportation planning process procedures and products.
    - Intermodal Technical Committee,
    - the Bicycle and Pedestrian Subcommittee, and
    - the Stakeholders Committee.

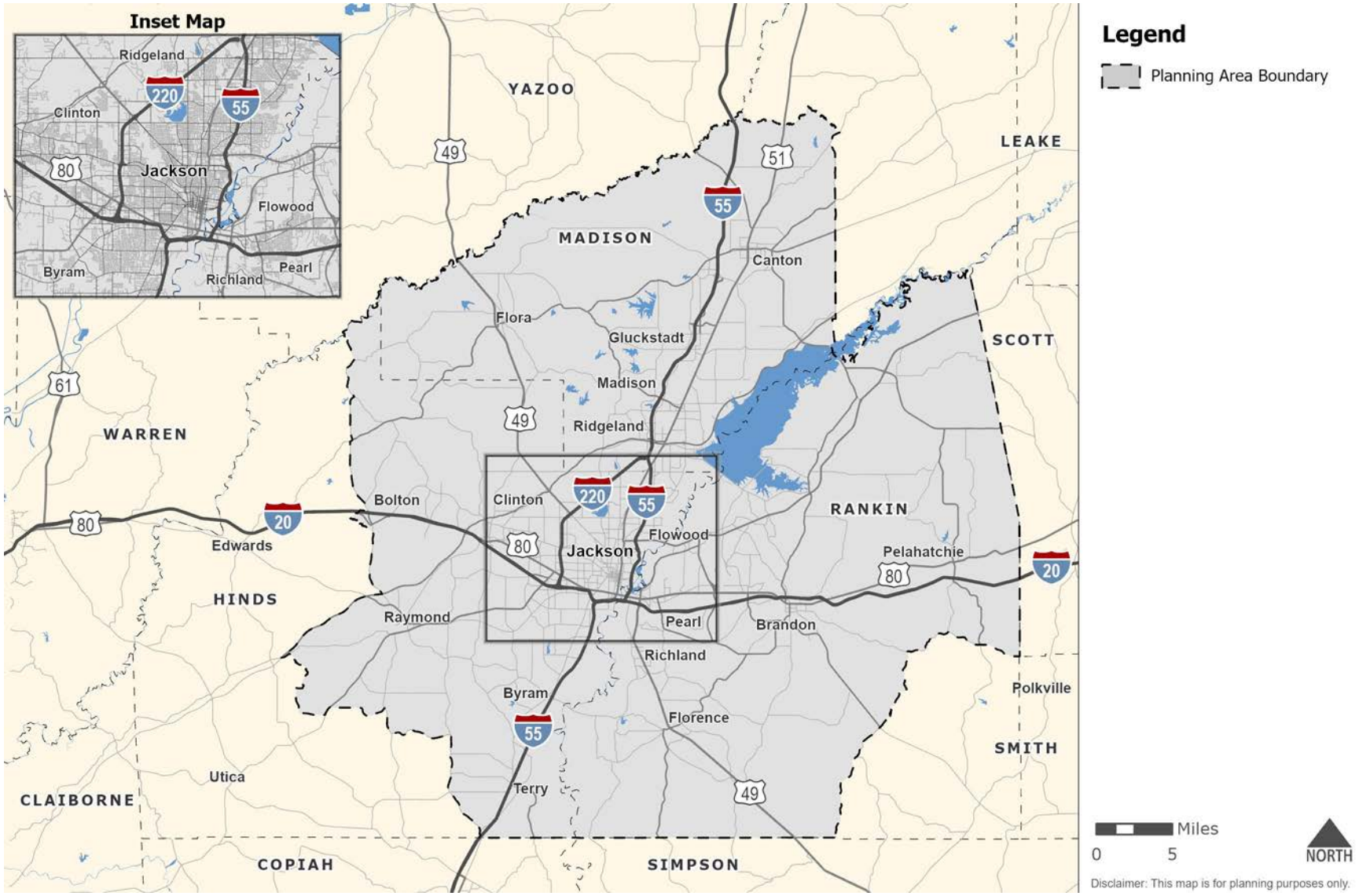
More information about the MPO committees is available at cmpdd.org.

Performance-Based and 3-C Planning Approach

To align with the Federal-Aid Highway Act in 1962 and to meet regional goals, the MPO incorporates both a performance-based and a continuing, cooperative, and comprehensive (3-C) planning approach within their transportation planning process. This ensures that MPO programs are meeting intended targets while meaningful coordination is conducted between MPOs, states, and public transit providers in urban areas.

The MPO also utilizes a performance-based planning and programming approach to apply performance management to the long-range planning and programming process. This approach uses data-derived indicators about the current and desired transportation system to determine how best to analyze and allocate limited funds. The indicators are also used to evaluate program outcomes.

Figure 1.1: MTP 2050 MPO Planning Area



Source: CMPDD, 2024

1.2 The Metropolitan Transportation Plan

As mentioned, federal legislation has required long-range transportation plans for urban areas as a condition for receiving surface transportation funds since the Federal-Aid Highway Act in 1962. The primary purpose of metropolitan transportation planning is to ensure transportation planning in urbanized areas is executed to meet this and other federal requirements and incorporate a 3-C planning process with key participants and stakeholders.

Key participants within the planning process include:

• Hinds, Madison, and Rankin Counties

• The Cities of Bolton, Brandon, Byram, Canton, Clinton, Florence, Flora, Flowood, Gluckstadt, Jackson, Madison, Pearl, Pelahatchie, Raymond, Richland, Ridgeland, and Terry

• Mississippi Department of Transportation (MDOT)

• The Federal Highway Administration (FHWA)

• The Federal Transit Administration (FTA)

• Other Stakeholders

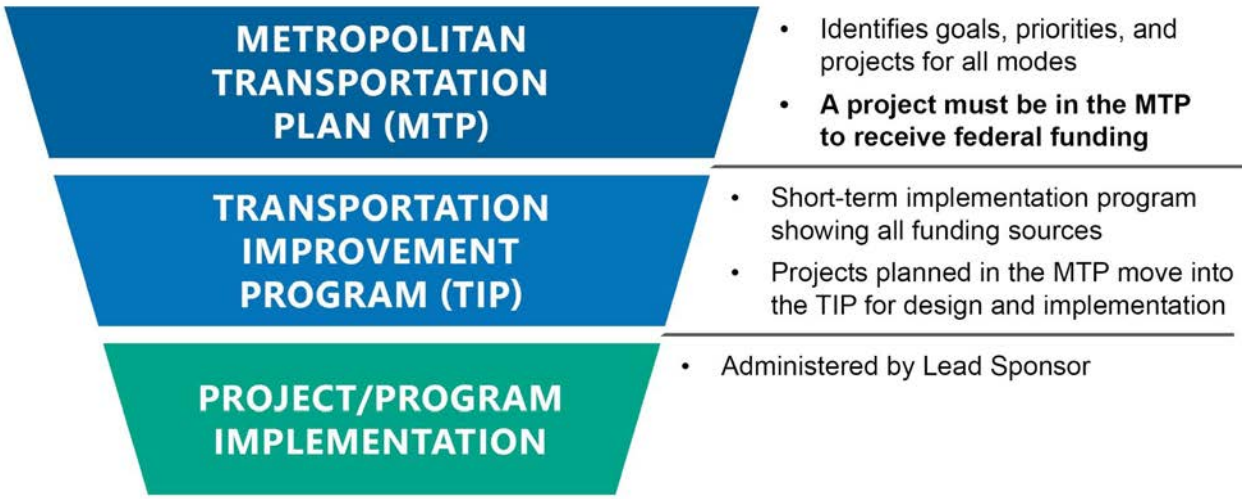
[2]

As a result, long-range transportation plans:

1. are based on the most current information,
2. reflect regional needs and priorities that are consistent with those of the state,
3. considers all modes of transportation, and
4. are consistent with other planning efforts.

MTP adoption is the first step towards the implementation of any transportation project using federal funds. It is also required for any regionally significant transportation project, regardless of funding source. Following the formal adoption of the plan, a project can be programmed in the Transportation Improvement Program (TIP), which is used to identify phases, funding sources, fiscal year(s) of implementation, and the estimated amount of funding to be used.

[2] Metropolitan Planning Policy Committee | CMPDD



Federal Requirements

Federal requirements for transportation planning include regulations and policies from multiple federal agencies, including the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Environmental Protection Agency (EPA), and other agencies as applicable. The requirements that directly relate to the transportation planning process and apply to the MPO are included in this section.

FHWA Requirements

The FHWA defines metropolitan transportation planning as:

> *"...the process of examining travel and transportation issues and needs in metropolitan areas. It includes a demographic analysis of the community in question, as well as an examination of travel patterns and trends. The planning process includes an analysis of alternatives to meet projected future demands, and for providing a safe and efficient transportation system that meets mobility while not creating adverse impacts to the environment."*[3]

Federal law requires each MPO to prepare and update a fiscally constrained long-range Metropolitan Transportation Plan.

Federal laws require MTPs to be updated at least every five years and consider, at a minimum, a twenty-year planning horizon.

[3] https://www.fhwa.dot.gov/planning/processes/metropolitan/

Additionally, the Metropolitan Transportation Plan must consider **10 planning factors** as defined in 23 CFR 450.206[4]. These are:

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
2. Increase the safety of the transportation system for motorized and non-motorized users.
3. Increase the security of the transportation system for motorized and non-motorized users.
4. Increase accessibility and mobility of people and freight.
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and encourage consistency between transportation improvements and state and local planned growth and economic development patterns.
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
7. Promote efficient system management and operation.
8. Emphasize the preservation of the existing transportation system.
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
10. Enhance travel and tourism.

EPA Requirements

The EPA monitors air quality and provides standards to determine the prevalence of airborne pollutants. Areas exceeding air quality standards for transportation-related pollutants are designated as either an air quality nonattainment area or maintenance area. If an MPO includes nonattainment or maintenance areas, it must ensure that its MTP, TIP, and federally funded projects conform to the state's air quality plan, known as the State Implementation Plan. Areas designated as air quality nonattainment areas must also update their plans every four years, as opposed to every five years.

Although MPO counties are in attainment, the U.S. Environmental Protection Agency periodically updates their air quality standards. In the future, the MPO region could become a non-attainment area if standards are made more stringent or pollution worsens.

[4] https://www.ecfr.gov/current/title-23/section-450.206

1.3 Consistency with Other Plans

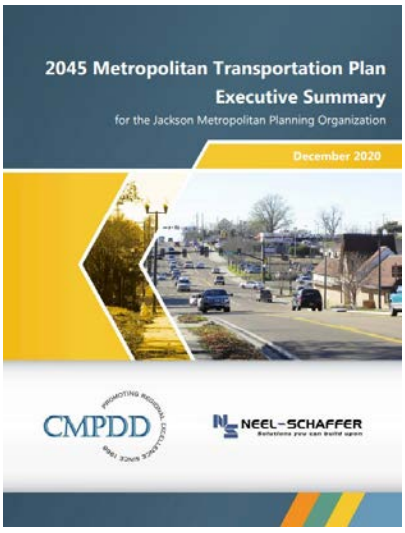
A requirement of the MTP is consistency with other plans, including, but not limited to:

- the statewide transportation planning process,
- the state's Strategic Highway Safety Plan,
- other safety and security plans,
- the Statewide Transportation Improvement Program (STIP), and
- the Transportation Improvement Program (TIP).

Before any changes can be made to the MPO's TIP or the state's STIP, the MPO must confirm the change is consistent with the current MTP. The MTP should also be developed to be consistent with:

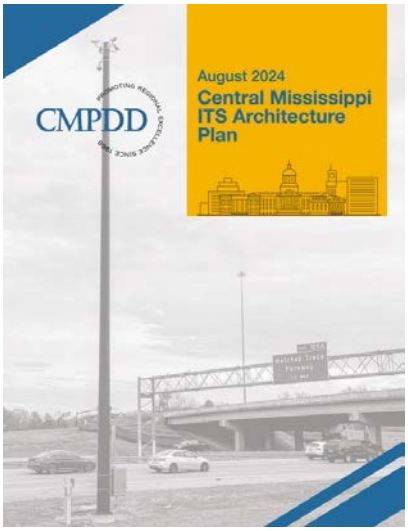
- the coordinated public transit human services transportation plan (section 5310 Program of the FTA)
- the regional Intelligent Transportation Systems Architecture Plan, and
- locally adopted planning documents.

There are also several existing local and regional plans and processes that can influence the MTP and its strategies. While not a comprehensive list of all plans and studies that affect the plan, the following are likely to have the greatest impact on the MTP update.



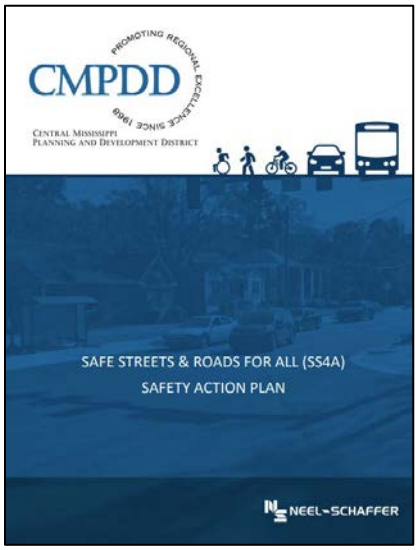
2045 Metropolitan Transportation Plan

The 2045 Metropolitan Transportation Plan was adopted by the Jackson Metropolitan Planning Policy Committee on November 12, 2020. The plan is comprised of two main components, the Executive Summary and seven Technical Reports. The plan identifies the conditions and characteristics of the existing transportation system in the MPO planning area and forecasts future needs based upon trends and anticipated travel demand through 2045.



Intelligent Transportation Systems (ITS) Architecture Plan

The Central Mississippi ITS Architecture Plan, adopted in August 2024, outlines a long-term plan for Intelligent Transportation Systems deployment and operation across Hinds, Madison, and Rankin Counties, aligning with the MPO's boundaries. Required for using federal funds on related infrastructure items, this plan ensures interoperability, resource sharing, and cohesive planning. It was developed with input from regional stakeholders through workshops.

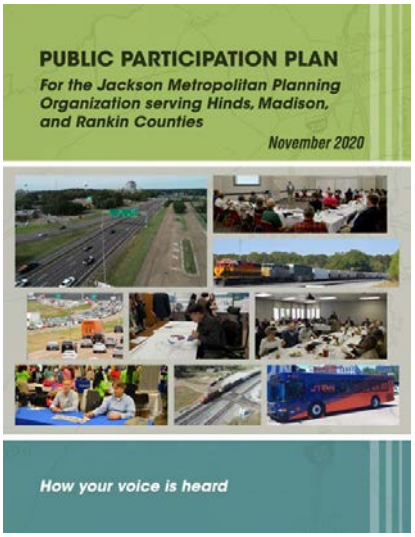


Safe Streets and Roads for All (SS4A) Safety Action Plan

Adopted in May 2024, the CMPDD Safety Action Plan aims to reduce roadway fatalities and injuries across the region. It analyzes crash data to identify high-risk areas and prioritizes safety strategies, with a focus on crash locations associated with serious injuries and fatalities.

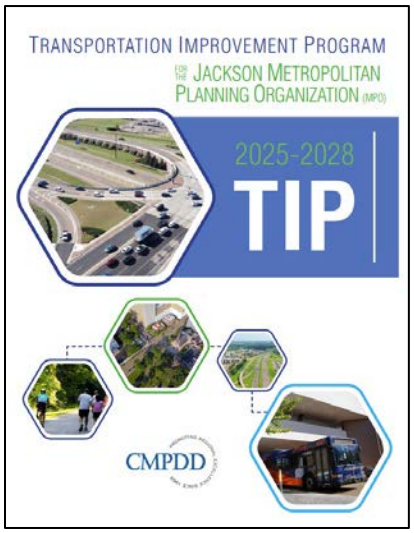
Prospectus

The Prospectus documents the organizational structure and procedures of the Jackson MPO, as required by the Mississippi Department of Transportation's Transportation Planning Operations Manual, although not federally mandated.



Public Participation Plan

The Public Participation Plan outlines strategies for public involvement in developing and maintaining transportation planning documents. It emphasizes transparency and ensures ample opportunities for public review and comment, with regular updates to maintain an open participation process.



Transportation Improvement Program (TIP)

The Transportation Improvement Program (TIP) is a multi-year list of transportation projects within the Jackson Metropolitan Area, detailing planned improvements and funding allocations.

The TIP serves as a short-term planning document that lists the next four years of federally funded or regionally significant transportation projects designed to carry out the recommendations of the region's MTP. The projects include various capital and operating needs of the region including reconstruction; maintenance and operation of major highways, arterials, collectors, and intersections; maintenance of public transit services; and construction of bicycle and pedestrian improvements.

All projects that have received a commitment of federal transportation funds, along with non-federally funded projects that are regionally significant, are included in the TIP. This includes a list of all project phases and the anticipated implementation schedule for those phases for each included project. The TIP is regional in scope and does not represent projects statewide. Therefore, each MPO's TIP is incorporated into the Statewide Transportation Improvement Program.

The current FFY 2025-2028 TIP can be modified to add new projects, delete projects, or to accommodate cost, phase of work, and scope changes to a project. Major changes require public review opportunities while minor changes can be made administratively. The TIP document is updated as needed to include any changes that have been made since it was originally approved.

The FFY 2025-2028 TIP Administrative Modification and Amendment table, available on the CMPDD website, details any changes that have been made since the TIP was originally adopted[5].

1.4 Plan Adoption and Amendment Process

The development of the MTP is a lengthy process that requires a large amount of data and information to be analyzed. The process provides several opportunities for the public and the stakeholders within the area to participate in and shape the plan and determine its needs and priorities. *Technical Report #5: Plan Development* describes the activities undertaken to involve the public and stakeholders.

The planning process also includes a formal review of the draft document. The draft is provided to the public during a 45-day public review and commenting period. Following this stage, the comments are considered and addressed. The MPO then considers the MTP for formal adoption, following adoption it is sent to the appropriate state and federal agencies for determination of compliance with applicable planning requirements. Once it has been determined that the MTP is compliant, the plan becomes an approved document.

Information on the MPO's procedures used to notify the public and other stakeholders when changes are needed to an approved MTP, such as with a plan amendment, are outlined within the MPO's Public Participation Plan.

[5] https://cmpdd.org/images/transportation/tip/2025-2028-TIP-Admin-Modifications-and-Amendments.pdf

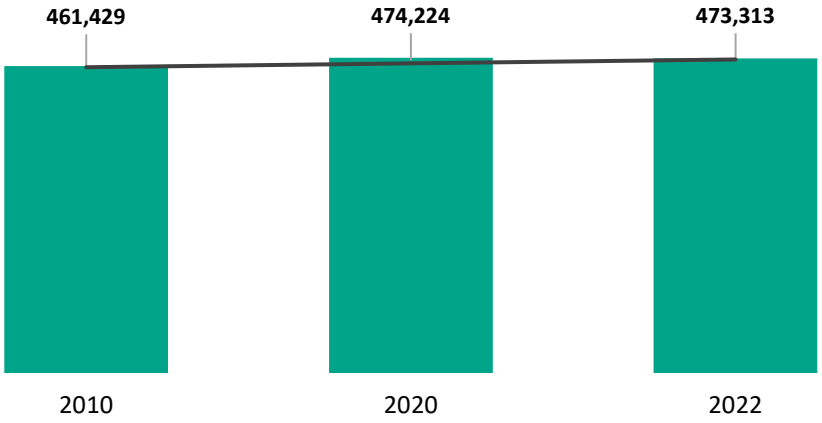
2.0 Demographic Profile

Trends in demographic data can provide insight into how the MPO region has historically grown and how it is expected to grow and change over time. This information supports long-range planning by helping to both identify current needs and anticipate future ones. Data within this section largely comes from the 2020 US Census, 2022 American Community Survey 5-Year Estimates, and the Bureau of Labor Statistics.

2.1 Population

Based on the 2010 Census, 2020 Census, and the 2022 American Community Survey 5-Year Estimates, the planning area population has grown by nearly 12,000 residents, or 2.6%, from 2010 to 2020, as shown in **Figure 2.1.**

Figure 2.1: MPO Planning Area Population (2010 – 2022)

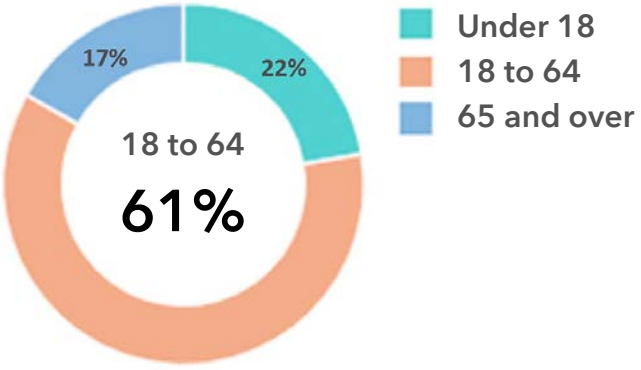


Source: US Census Bureau Total Population: 2010 Deccenial Census, 2020 Deccennial Census, and 2022 American Community Survey 5-Year Estimates

Age/Race

Within the planning area, more than half (61 percent) of the residents fall within the age group of 18-64 years old. **Figure 2.2** illustrates this, along with the percent of residents who are under 18 or 65 and older within the MPO planning area.

Figure 2.2: Population by Age Category

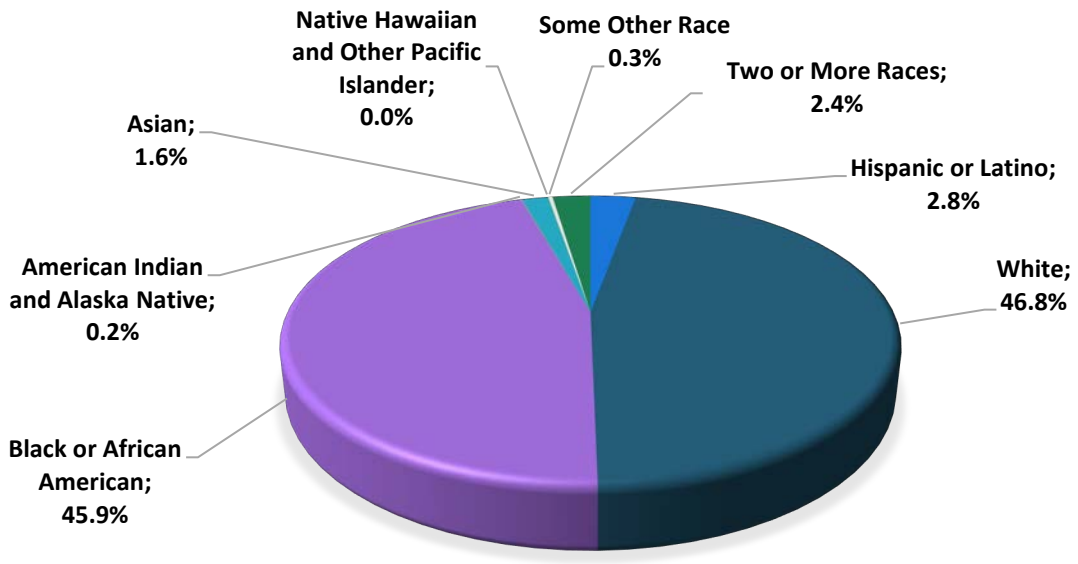


Source: Census Reporter, Census profile: Jackson, MS Metro Area 2022

Within the MPO area, approximately 46 percent of residents identify as Black or African American and nearly 47 percent identify as White. **Figure 2.3**. displays the population breakdown by race.

Household and population data used within the travel demand model, and information about the model and its development, can be found in *Technical Report #1: Model Development*.

Figure 2.3: Race Within the MPO Planning Area



Source: : US Census Bureau Total Population: 2020 Deccennial Census

2.2 Home Ownership, Income, and Economics

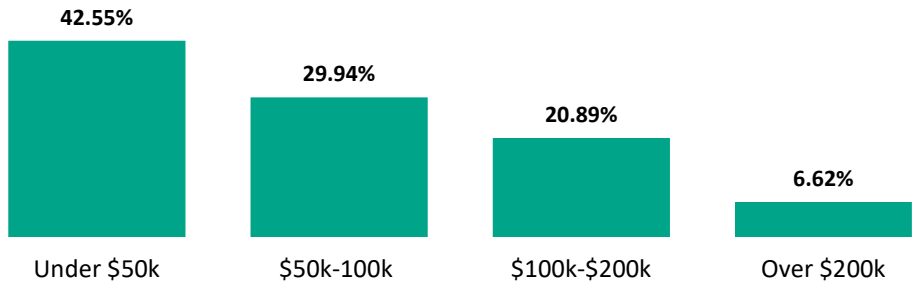
Home Ownership

While the majority of persons living in the MPO region are homeowners, according to 2020 US Census data, the highest percentage of renters reside within Hinds County, where renters comprise 42 percent of the County's population.

Household Income

Of the households within the MPO planning area, 40 percent make less than $50,000 a year, as shown in **Figure 2.4**. Although the median household income is $60,085, nearly one in six people within the region experience poverty. Within Hinds County, this value increases to over one in five people experiencing poverty.

Figure 2.4: Household Income in the MPO Planning Area

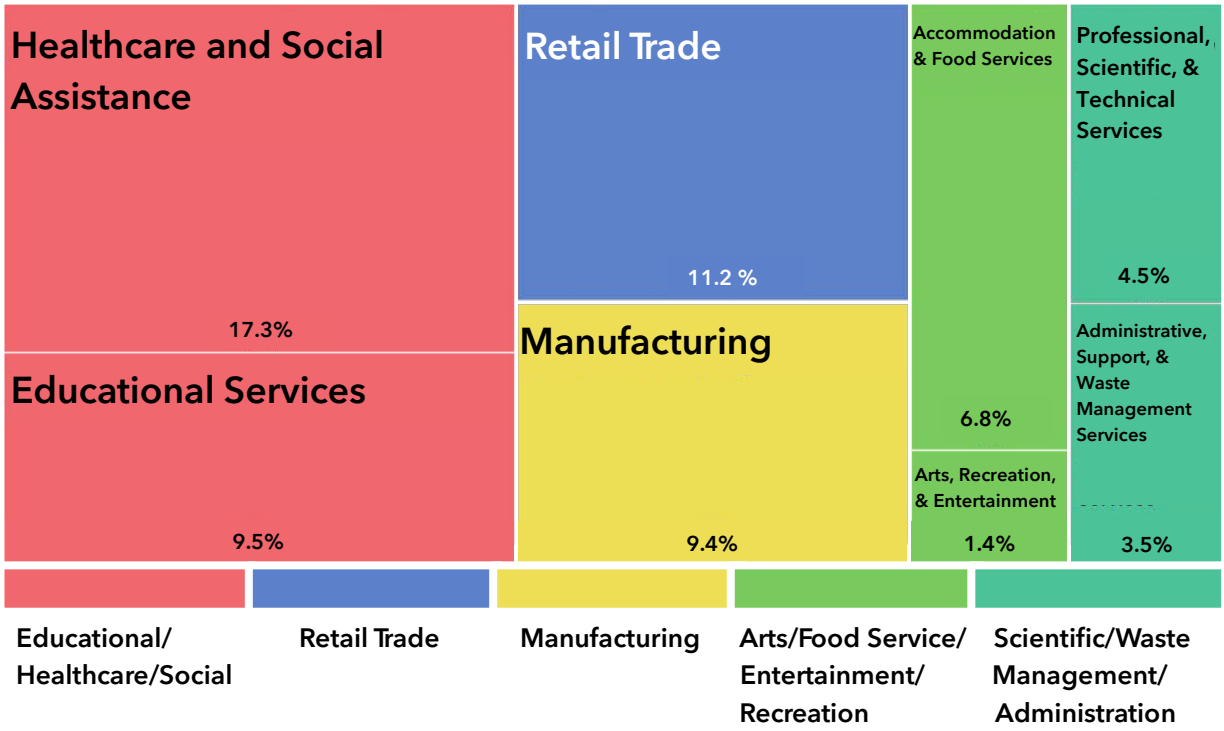


Source: 2022 ACS 5-Year Estimates

2.3 Employment

In recent years, the MPO region has seen a decrease in regional employment. Common jobs throughout the study area include Educational Services, Health Care and Social Assistance (62,199 employees) and Retail Trade (25,691 employees). The top industries by employment are displayed in **Figure 2.5.**

Figure 2.5: MPO Area Top Industries by Employment Sector



Source: Data USA, Jackson MSA; 2022 ACS 5-Year Estimates

Employment data used within the Travel Demand Model, and information about the Travel Demand Model and its development, can be found in *Technical Report #1: Model Development*.

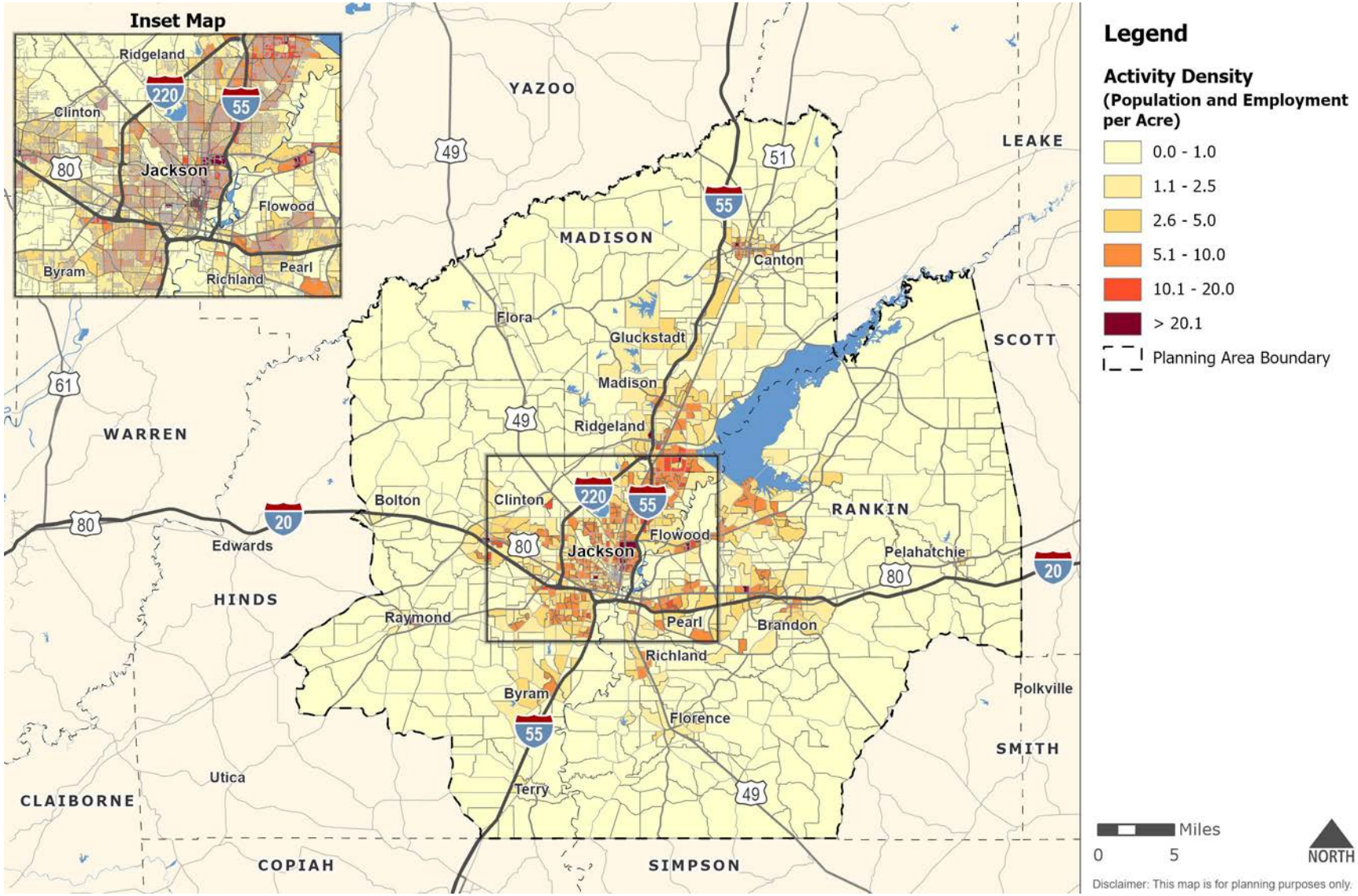
2.4 Activity Density

An area's activity density by acre is calculated using the sum of its population and employment, divided by its physical area. Block group boundaries from the US Census Bureau were used to delineate these areas and provide acreage totals.

This analysis produces a metric to compare where the most dense activity is located, and displays areas which may not have a significantly high population or employment density alone, but still generate significant activity overall. It also displays where mixed-use areas within the MPO planning area exist. Shown in **Figure 2.6** as activity per acre, the block groups with the greatest activity densities are located in or near:

- Downtown Jackson
- Ridgeland
- Flowood
- Brandon
- Mississippi College
- Canton

Figure 2.6: MPO Planning Area Activity Density



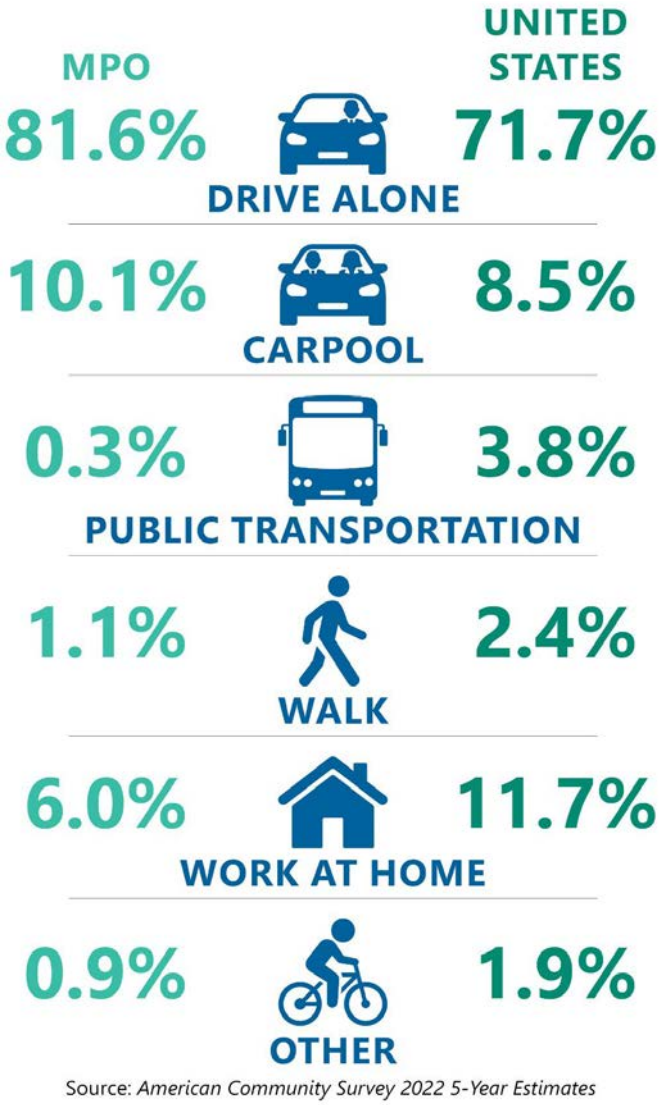
Source: U.S. Census Bureau, 2024; QCEW, 2024

2.5 Existing Travel Patterns

Commuting patterns can provide insight into overall travel patterns. Data obtained from the ACS 5-Year Estimates shows that the travel time to work can be quite varied within the MPO planning area, with a mean commute time just under 30 minutes.

Over 80 percent of commuters in the MPO counties drove alone to work, and 10.1 percent carpooled. Walking, biking, or using public transit to commute to work was uncommon, as shown in **Figure 2.7**.

Figure 2.7: Means of Transportation to Work



Source: *American Community Survey 2022 5-Year Estimates*

2.6 Housing and Transportation Affordability Index

The Housing and Transportation Affordability Index is a tool that uses the cost of housing and transportation to provide a comprehensive understanding of the affordability of a location. It does this by dividing housing and transportation costs by income, which illustrates the burden these expenses place on a typical household.

While housing alone is traditionally deemed affordable when consuming no more than 30 percent of income, the Housing and Transportation Affordability Index also incorporates transportation costs (15 percent), as this is usually a household's second-largest expense. The combined cost index offers an expanded view of affordability, which sets the benchmark at 45 percent of household income. Housing and transportation expenses that exceed this benchmark signify a lack of affordability and a larger financial burden on households.

County Affordability Overview

Hinds County

The average household in Hinds County spends 46 percent of their income on housing and transportation. Of this, 22 percent is spent on housing and 24 percent is spent on transportation. This means Hinds County exceeds the affordability value by 1 percent.

Madison County

The Housing and Transportation Affordability Index indicates that the average household in Madison County spends 57 percent, more than half, of their income on housing and transportation. Of this, 31 percent of the income is spent on housing and 26 percent is spent on transportation. This means Madison County exceeds the affordability value by 12 percent.

Rankin County

The Index indicates that the average household in Rankin County also spends more than half (54 percent) of its income on housing and transportation. The average household in Rankin County spends 27 percent on housing and 27 percent on transportation. This means Rankin County exceeds the affordability value by 9 percent.

Regional Affordability Overview

When referencing the "regional typical household," the Housing and Transportation Affordability Index utilizes the Core-Based Statistical Area (CBSA). All three counties within the study area fall within the Jackson Core-Based Statistical Area.

A Core-Based Statistical Area (CBSA) is a U.S. geographic area defined by the Office of Management and Budget. These areas have a metropolitan center as their core and are used in regional analysis to describe certain trends which may go beyond traditional jurisdictional boundaries, such as economic, population, and social trends.

[6]

[6] https://www.congress.gov/crs-product/IF12704#:~:text=Core%20Based%20Statistical%20Areas%20(CBSAs,with%20a%20population%20of%2050%2C000.

The Jackson CBSA has a typical household income of $60,085. This was used as the regional threshold, meaning that the costs of housing and transportation would need to be equal or less than 45% of household income in order to be considered affordable. The following regional thresholds were rounded to the nearest dollar.

- Housing Affordability Threshold (30%) - $18,026
- Transportation Affordability Threshold (15%) - $9,013
- Combined Affordability Threshold (45%) - $27,038

Nationally, the typical household income is $75,149. This was used as the national threshold, meaning that in order to be seen as affordable according to national levels, the costs of housing and transportation would need to be equal or less than 45% of the typical national household income. The following national thresholds were rounded to the nearest dollar.

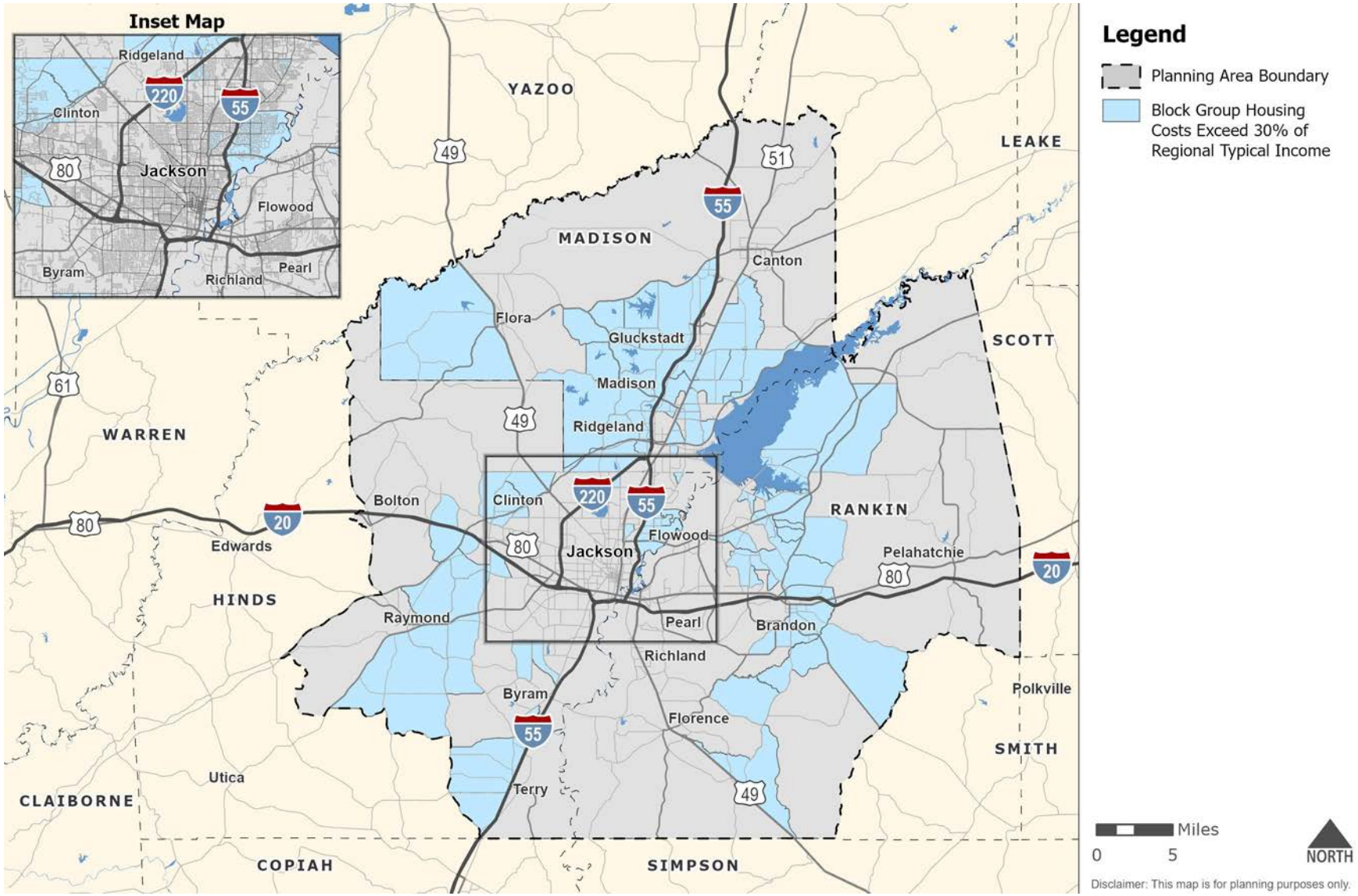
- Housing Affordability Threshold (30%) - $22,545
- Transportation Affordability Threshold (15%) - $11,272
- Combined Affordability Threshold (45%) - $33,817

The following figures compare the regional and national affordability metrics against the housing and transportation costs on the block group level within the MPO planning area. This allows for variation in these costs to be addressed, as different communities within the same jurisdiction may have higher or lower costs associated with housing and transportation.

As the typical household income used for analysis comes from the regional and national data sets, it does not account for household income variability by jurisdiction. While income may vary across jurisdictional boundaries, this allows for costs to be compared to a single typical income metric, supporting affordability analysis.

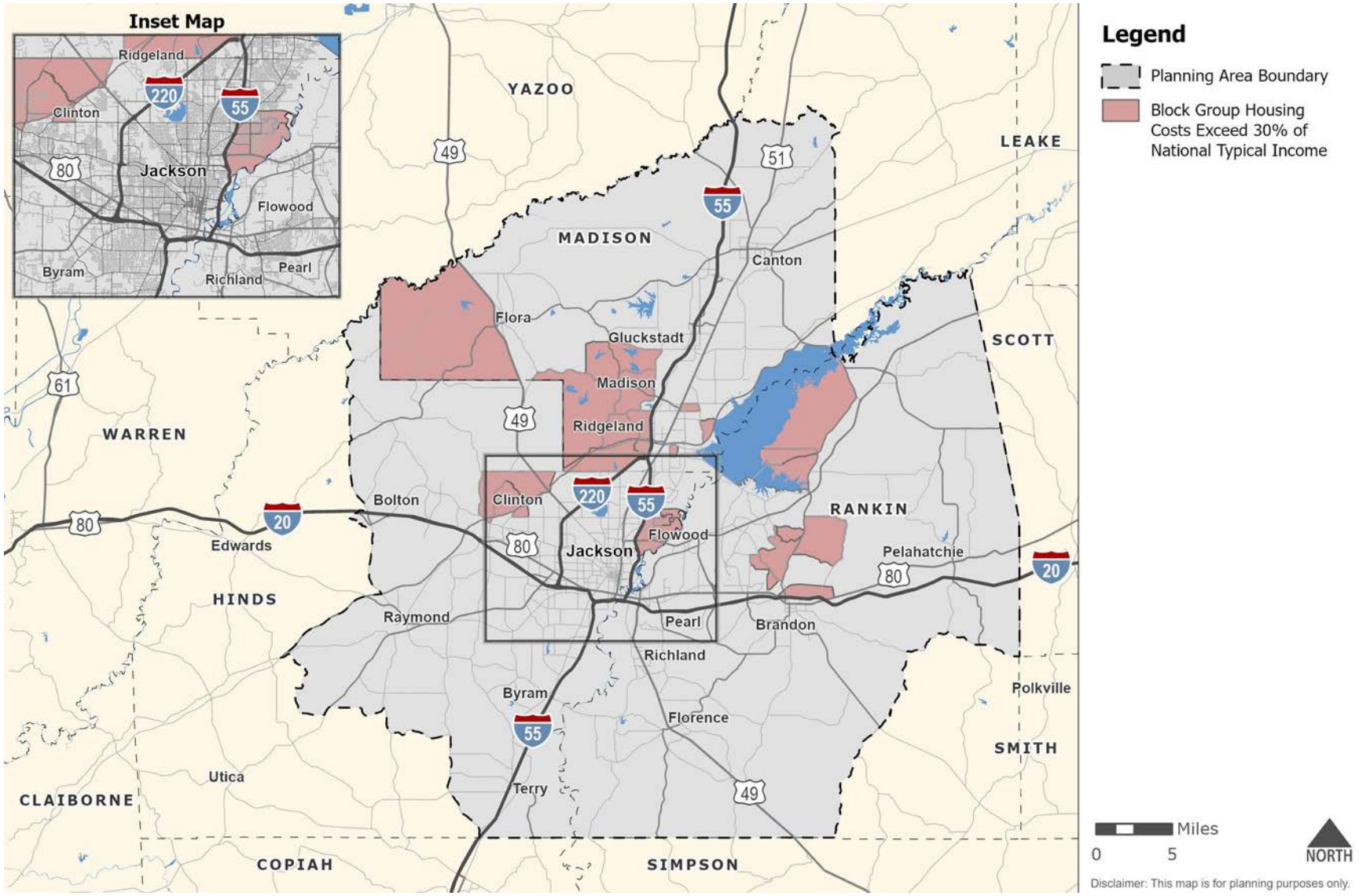
Figure 2.8 compares housing affordability based on the Regional Typical Household income, while **Figure 2.9** compares the same metric on the National level, using the National Typical Household income. **Figure 2.10** and **Figure 2.11** illustrate the affordability of both housing and transportation using the Housing and Transportation Affordability Index results and comparing their costs against the Regional Typical Household income and the National Typical Household income.

Figure 2.8: Housing Affordability Compared to Regional Typical Household Income



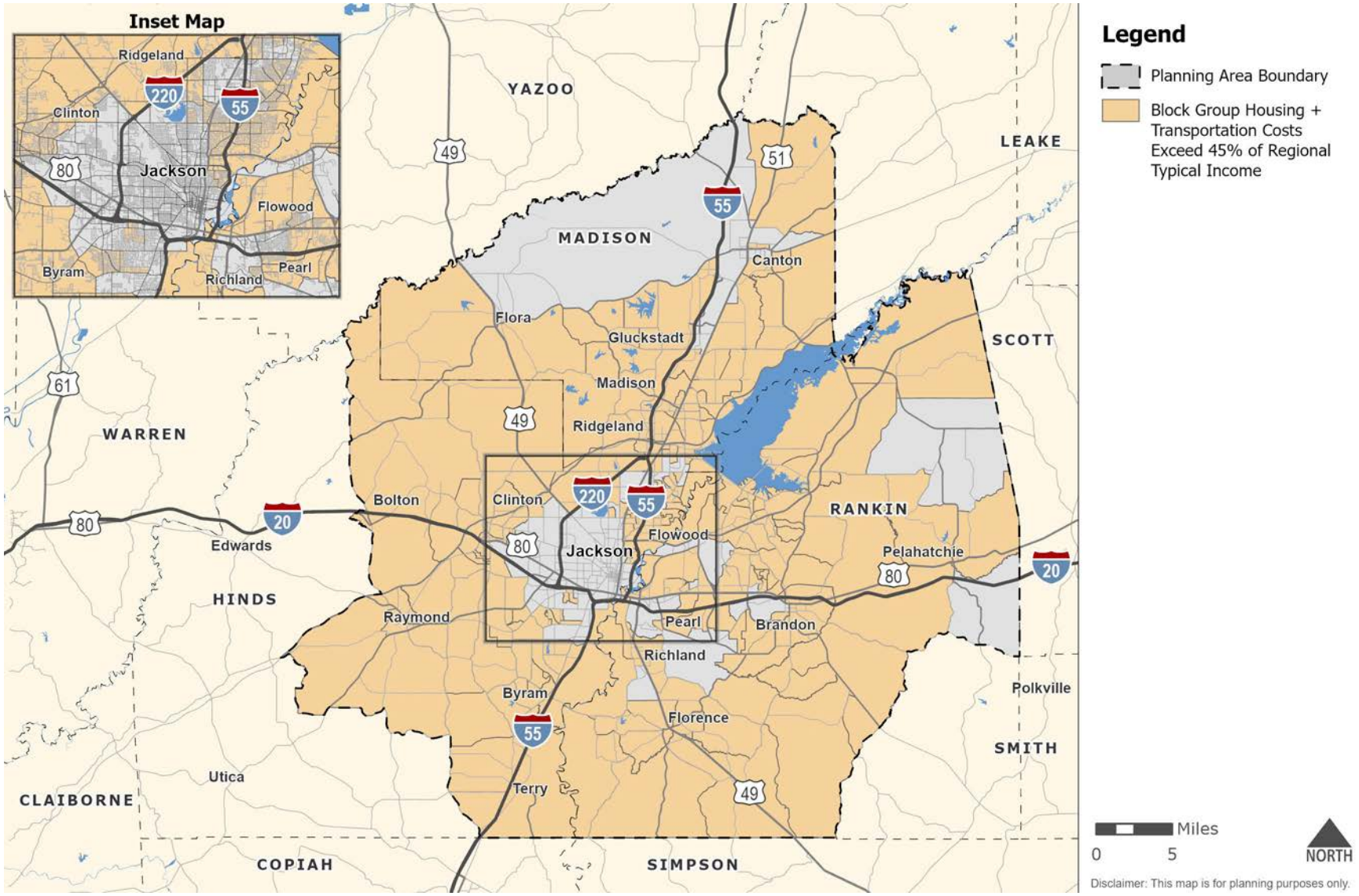
Source: H&T Affordability Index 2022

Figure 2.9: Housing Affordability Compared to National Typical Household Income



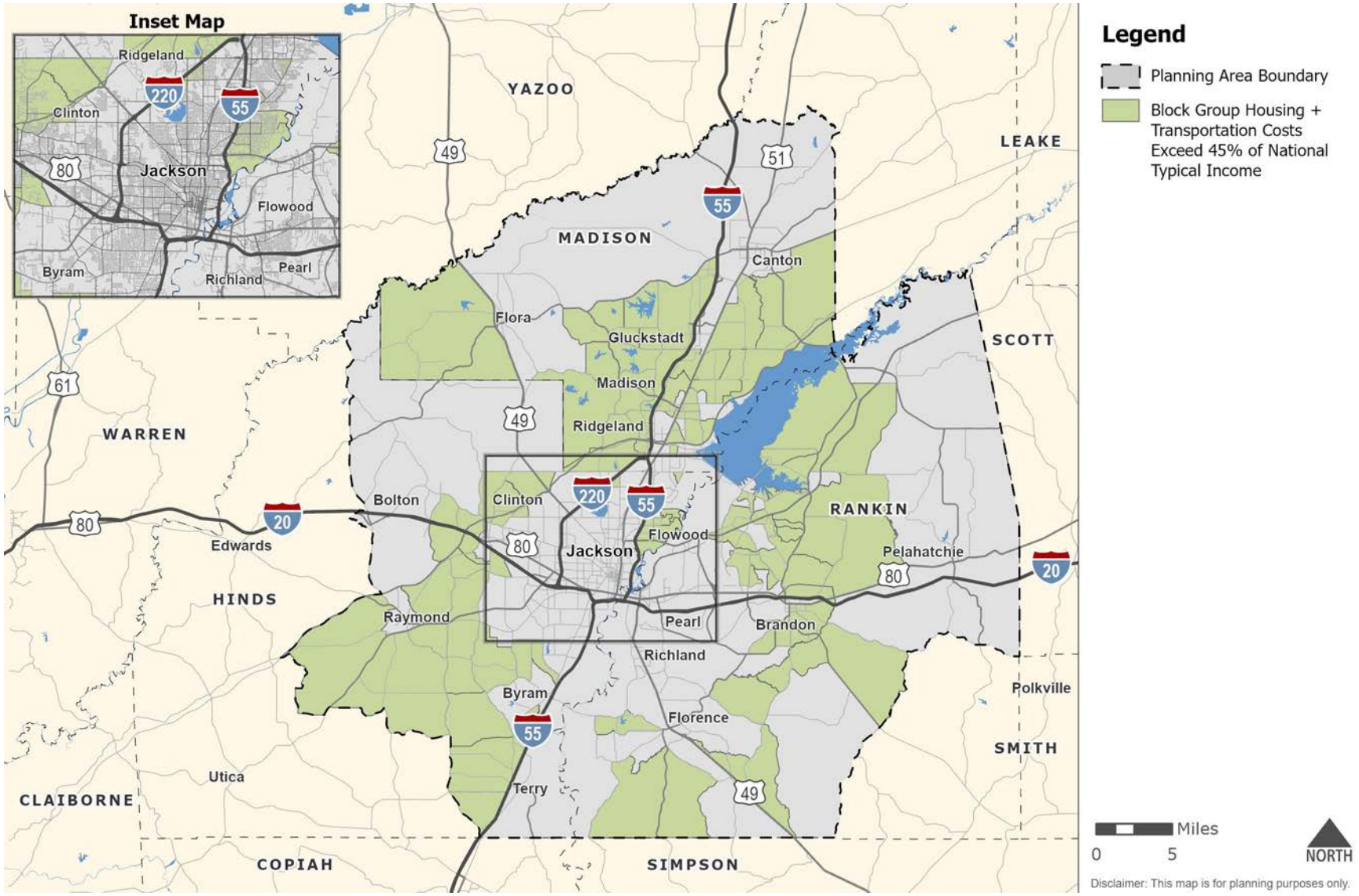
Source: H&T Affordability Index 2022

Figure 2.10: Housing and Transportation Affordability Compared to Regional Typical Household Income



Source: H&T Affordability Index 2022

Figure 2.11: Housing and Transportation Affordability Compared to National Typical Household Income



Source: H&T Affordability Index 2022

Affordability Analysis Results

As shown in the previous figures, the average household in most MPO planning area block groups spends more than 45 percent of their annual income on housing and transportation expenses. While housing costs are below the affordability index of 30 percent in Hinds and Rankin Counties, transportation costs range from 24 percent (Hinds County) to 27 percent (Rankin County) of household income. This suggests that transportation costs are driving down affordability in the region.

Table 2.1 displays the typical regional transportation costs per household for each MPO county, with the United States, Jackson MPO, and Jackson CBSA included for reference and comparison.

Table 2.1: Transportation Costs per Household

Area	Typical Income	Average Annual Cost			Total Average Annual Costs	
		Transit Only	Auto Payment	Fuel & Upkeep	Personal Vehicle Only	All Transportation
Hinds County	$60,085	$29	$11,138	$3,199	**$14,337**	**$14,367**
Madison County	$60,085	$12	$11,989	$3,781	**$15,770**	**$15,783**
Rankin County	$60,085	$11	$12,084	$3,855	**$15,939**	**$15,950**
Jackson MPO	$60,085	$21	$11,543	$3,480	**$15,023**	**$15,044**
Jackson CBSA	$60,085	$19	$11,716	$3,640	**$15,356**	**$15,374**
United States	$75,149	-----	-----	-----	-----	**$12,295**

Source: Housing and Transportation Affordability Index 2022

*State of Mississippi average annual transportation costs per household were not included in this analysis as the Housing and Transportation Affordability Index no longer provides State-level comparative data within its most recent update.

Automobile ownership, fuel, and upkeep exceed the 15 percent benchmark for transportation spending in each MPO county. High transportation costs can be attributed to the car-dependent means of travel in the region, as low spatial density and the distance between jurisdictions require residents to own more vehicles and travel farther. This increases transportation costs and contributes to the cost of living. This trend can also be seen in the mapping figures, as few block groups that have

little or no access to public transit have affordable housing and transportation costs when compared to regional affordability levels. Additionally, the national average annual transportation cost per household is $12,295; a value largely influenced by U.S. cities heavily reliant on public transit.

Of the MPO Counties, Hinds County households average the lowest annual transportation costs. While this may be partially explained by the County's access to transit, transportation costs still consume 24 percent of household income, well above the 15 percent threshold associated with affordable transportation costs.

Based on this, the MPO can work with its partner agencies to employ strategies that reduce automobile dependence as the primary means of transportation and increase the accessibility and safety of multi-modal and public transport systems.

3.0 Roadways and Bridges

3.1 Introduction

The region's roadways and bridges are used by personal motor vehicles, public and private transportation providers, bicyclists, and freight trucks. These roadways can also be used to provide access to other transportation modes. This chapter discusses the general use of the roadways and bridges within the MPO planning area. The existing conditions for other modes of transportation are discussed in later chapters.

For households in urbanized areas, like within the MPO area, traveling by motor vehicle is the primary means of transportation. The most recent American Community Survey 5-year estimates show that commuting by motor vehicle without carpooling is the most common form of commute within the region. This means most household travel is affected by the condition of the roadways and bridges within the MPO's planning area.

3.2 The Roadway Network

Several federal and state highways serve the study area and comprise its main roadway network. The most significant of these include:

- I-55
- I-20
- I-220
- US 51
- US 49
- US 80
- MS 16
- MS 18
- MS 22
- MS 25
- MS 43
- MS 463
- MS 467
- MS 468
- MS 469
- MS 471
- MS 475

Roadways by Functional Classification

Each type of roadway serves a function in the overall roadway network. Roadways are divided into functional classes, shown in **Figure 3.1**, based on their intended balance of mobility (speed) and access to adjacent land. Their designs vary in accordance with this functional classification.

Figure 3.1: Roadway Functional Classifications

Interstate

- Divided highways with full access control and grade separations at all intersections.
- The controlled access character results in high lane capacities, three times greater than the individual lane capacities of urban arterials.

Principal Arterials

- Serve major activity centers, high traffic volume corridors and long trip demands.
- Carry high proportion of total urban travel on minimum of mileage.
- Interconnect and provide continuity for major rural corridors to accommodate trips entering and leaving urban area.
- Serve demand for intra-area travel between the central business district and outlying residential areas.
- Serve corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel.
- Connect all or nearly all urbanized areas and a large majority of urban areas with over 25,000 people.

Minor Arterials

- Interconnect and augment the higher-level arterials.
- Serve trips of moderate length at a somewhat lower level of travel mobility than principal arterials.
- Distribute traffic to smaller geographic areas than those served by higher-level arterials.
- Provide more land access than principal arterials without going into identifiable neighborhoods.
- Provide connections for collectors.
- Link cities and larger towns.
- Provide service that acts as a link between arterials and local roads.

Collectors

- Provide both land service and traffic movement functions.
- Serve as intermediate feeders between arterials and local streets and primarily accommodate short distance trips.
- Generally not continuous for any great length since they serve few through trips.

Local Streets

- Provide access to immediately adjacent land.
- Within the local street classification, three subclasses are established to indicate the type of area served: residential, industrial, and commercial.

Like arterials, collectors can be further subdivided into major and minor subclassifications. Major collectors are roadways that carry low-medium traffic volumes and provide connectivity between arterials and local streets. Minor collectors perform the same function as major collectors but carry less volume.

Table 3.1 lists the functional class of corridors and their length within the MPO area. **Figure 3.2** illustrates the location of these roadways within the region, also by functional class.

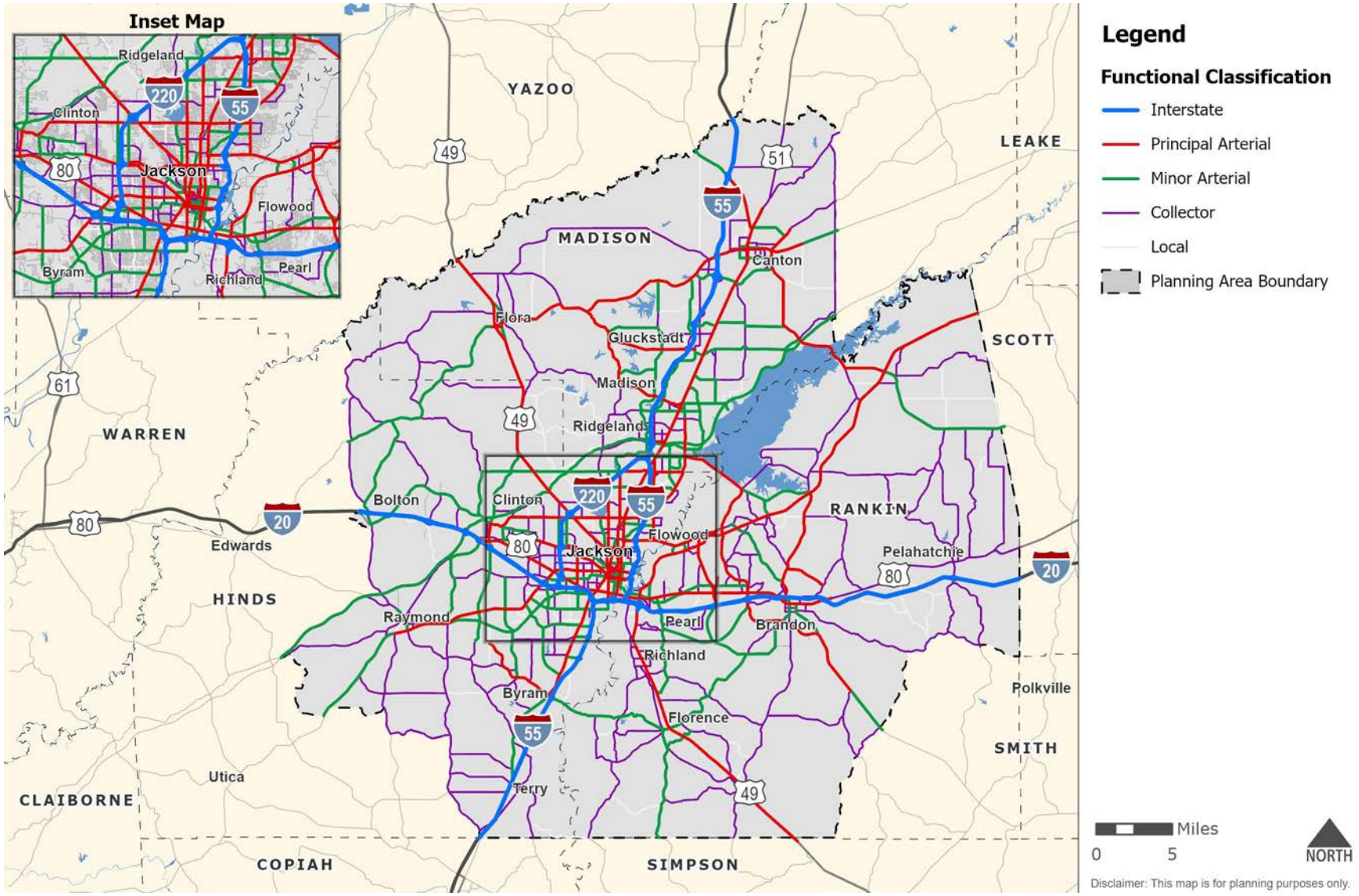
Table 3.1: Roadway Model Network Lane Mileage by Functional Class, 2022

Functional Classification	Centerline Miles		Lane Miles	
	Miles	Percent	Miles	Percent
Interstate	112.7	6.53%	267.8	6.47%
Principal Arterial	324.7	18.81%	1,116.0	26.95%
Minor Arterial	384.3	22.26%	898.7	21.70%
Major Collector	705.0	40.83%	1,456.3	35.16%
Minor Collector	17.5	1.01%	35.0	0.85%
Local	182.3	10.56%	367.5	8.87%
Total	**1,726.5**	**100.00%**	**4,141.3**	**100.00%**

Note: Centerline miles do not include ramps; some local roads are not included in the travel demand model and total lane mileage for all roads within CMPDD will be greater than what is listed.

Source: CMPDD Travel Demand Model

Figure 3.2: Functional Classification of Roadways, 2022



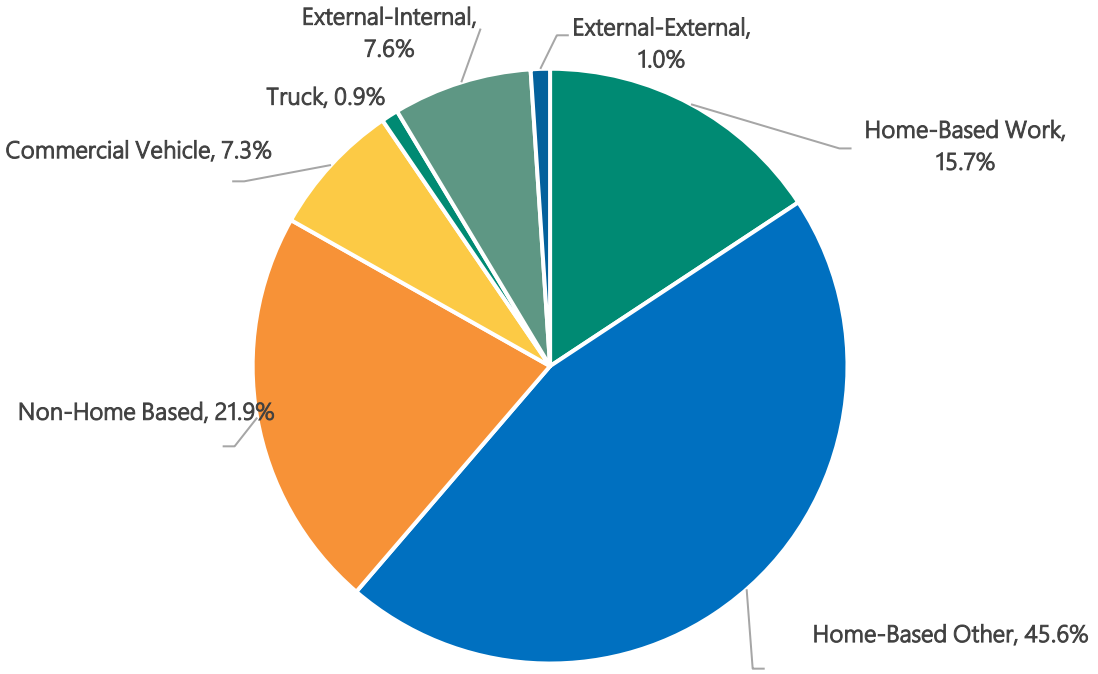
Source: MDOT, 2024; CMPDD, 2024

3.3 Traffic and Congestion

3,851,843 daily trips are made within the MPO region.

Travel time data was fed into the MPO's Travel Demand Model to analyze the impact of traffic and congestion on roadways throughout the region. The number of daily trips estimated by the Travel Demand Model, by trip purpose, in 2022 is summarized in **Figure 3.3**.

Figure 3.3: Percent of Trips by Trip Origin and Purpose



External-external trips, also known as pass-through trips, made up approximately 1 percent of vehicle trips within the MPO planning area. External-internal trips, where one leg of the trip started or ended within the region, made up nearly 8 percent of vehicle trips. The remaining trips are those that both began and ended within the MPO region. Internal commercial and freight vehicle trips (e.g., truck, taxi, etc.) account for just over 8 percent of vehicle trips.

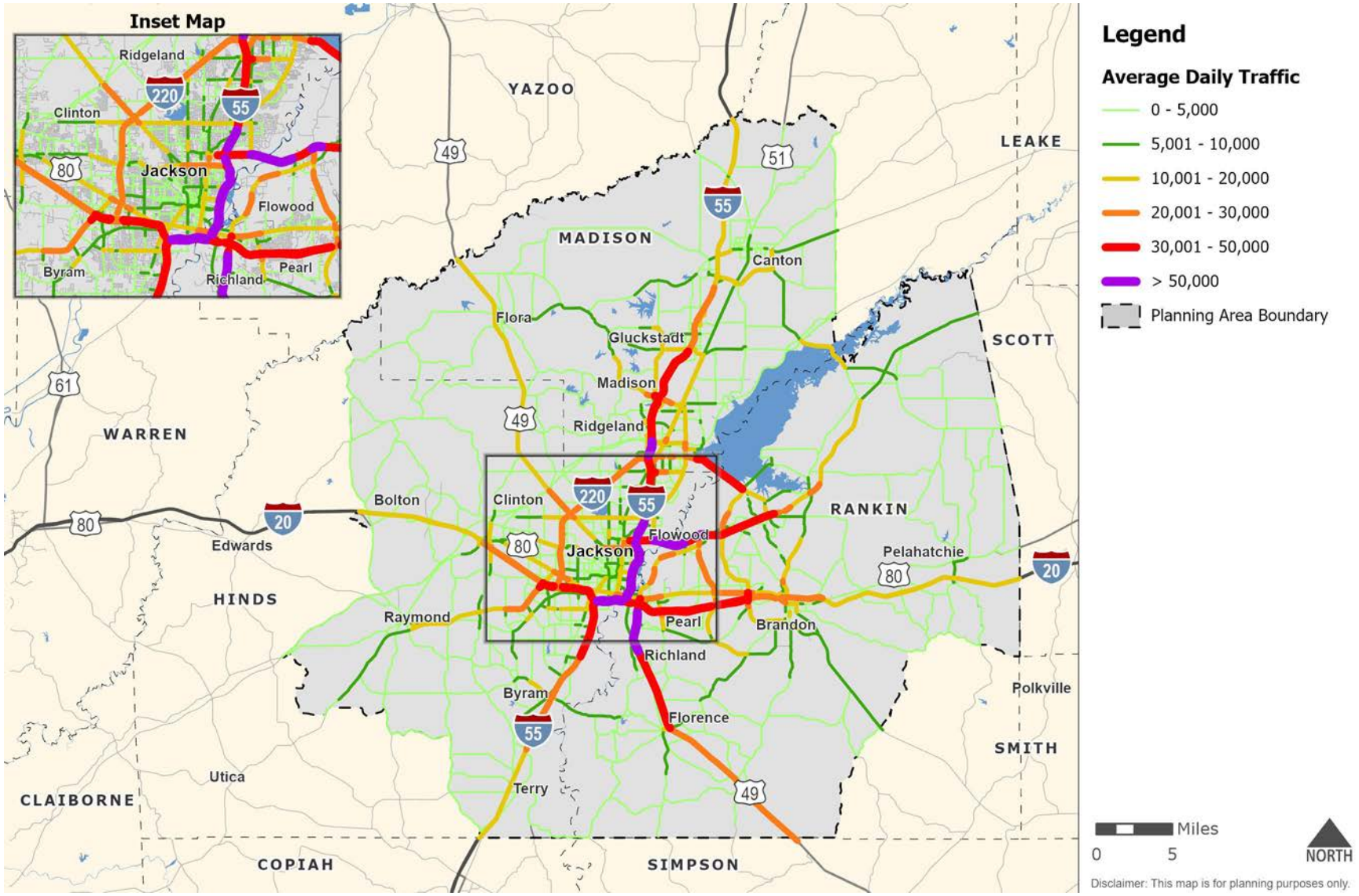
Table 3.2 displays how these trips are distributed onto the modeled transportation network and **Figure 3.4** displays vehicular traffic in the MPO planning area.

Table 3.2: Roadway System Travel Characteristics, 2022

Functional Class	Daily Vehicle Miles Travelled (VMT)		Daily Vehicle Hours Travelled (VHT)		Daily Vehicle Hours of Delay (VHD)	
	Number	Percent	Number	Percent	Number	Percent
Interstate	5,992,933	41.04%	98,532	28.65%	3,971	22.15%
Principal Arterial	4,537,102	31.08%	102,551	29.82%	9,526	53.13%
Minor Arterial	1,736,744	11.90%	43,258	12.58%	2,883	16.08%
Major Collector	1,264,309	8.66%	33,091	9.62%	1,453	8.10%
Minor Collector	14,694	0.10%	353	0.10%	2	0.01%
Local	1,054,362	7.22%	66,111	19.23%	96	0.53%
Total	**14,600,143**	**100.00%**	**343,897**	**100.00%**	**17,931**	**100.00%**

Source: CMPDD Travel Demand Model

Figure 3.4: Average Daily Traffic on Roadways, 2022



Source: CMPDD Travel Demand Model

According to the travel characteristics analysis, approximately 22 to 41 percent of total vehicle miles travelled, vehicle hours travelled, and traffic delay within the planning area occur on interstate routes. However, more than 69 percent of the delay is estimated to occur on the principal and minor arterials. This coincides with where the most vehicle miles travelled, and vehicle hours travelled occur. There is comparatively little delay estimated to occur on collectors and local roads.

Corridors in the region that experienced the greatest vehicular traffic, with each having an estimated average daily volume of over 30,000 vehicles, are:

- US 49 between MS 469 and I-20
- I-20 between US 49 and MS 18
- I-20 between MS 18 and I-55
- I-55 between Elton Rd and I-20
- I-55 between I-20 and Gluckstadt Rd
- MS 25 between I-55 and Vine Dr
- MS 25 between E University Dr and I-55 S Frontage Rd
- MS 18 between I-20 and US 80 in Brandon
- Spillway Rd between Harbor Dr and North Shore Pkwy

Congestion occurs when the volume of traffic on a roadway is greater than the capacity for that roadway.

To measure congestion, volume-to-capacity ratios were used. These ratios compare the volume of traffic to the amount of capacity built into a roadway segment. A ratio of greater than 1.0 signifies that the segment is overburdened with traffic, with traffic volumes greater than the roadway capacity allows.

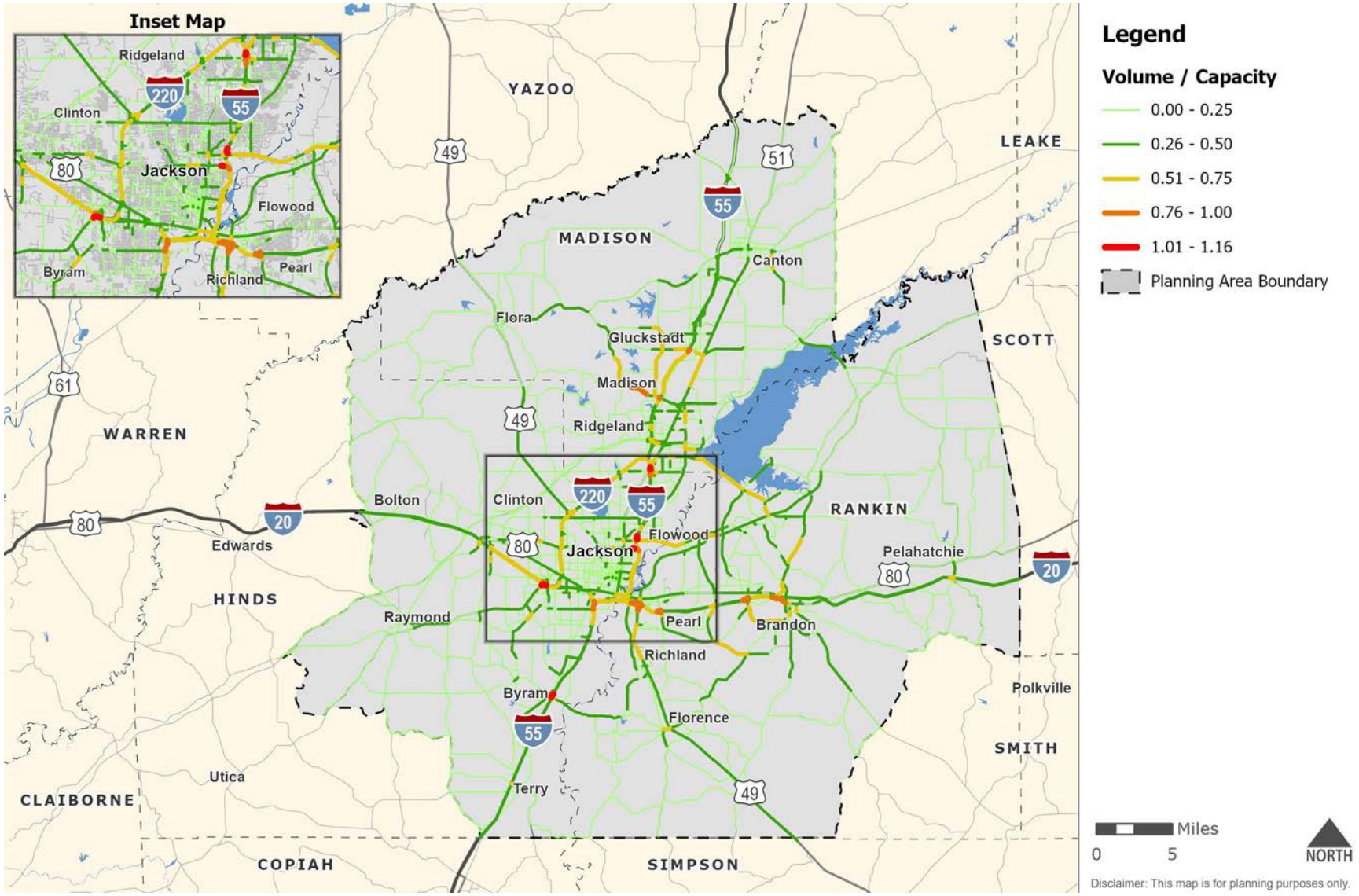
Table 3.3 lists the five roadway segments within the MPO region that experience congestion with a volume-to-capacity ratio of 1.0 or greater. **Figure 3.5** displays where these congested roadways are located. This analysis suggests that peak period congestion is currently an issue in the region, especially at these locations.

Table 3.3: Roadway Corridors with Volumes Exceeding Capacity, 2022

Roadway	Segment	Length (miles)
I-55 S Off-Ramp	I-55 to S Siwell Rd	0.25
I-20 W On-Ramp	MS 18 to I-20 in Jackson	0.32
I-55 N On-Ramp	MS 25 to I-55	0.24
E Woodrow Wilson Ave	VA Center Entrance to I-55 Off-Ramp	0.09
I-55 S Off-Ramp	I-55 to W Frontage Rd near Wingate Hotel	0.15

Source: CMPDD MPO Travel Demand Model

Figure 3.5: Existing Roadway Congestion, 2022



Source: CMPDD Travel Demand Model

3.4 Roadway Reliability

Most of the region's roadways do not have daily volumes that exceed their daily capacities. However, there are congestion issues at specific times, notably during peak periods. Travel time reliability is a measure of how congested travel times compare to free-flow conditions.

The Level of Travel Time Reliability (LOTTR) is defined as:

$$\text{Segment LOTTR} = \frac{\text{"Longer" 80th Percentile Travel Time}}{\text{"Normal" 50th Percentile Travel Time}}$$

Level of Travel Time Reliability data was collected in 15-minute segments during all time periods between 6 a.m. and 8 p.m. local time, with the worst levels being used to determine segment reliability. The most recent travel time data available, year 2023, was obtained from FHWA's National Performance Management Research Data Set (NPMRDS). Roadway segments with a Level of Travel Time Reliability score of less than 1.5 are defined by the FHWA as reliable. **Figure 3.6** displays the reliability scores of the monitored segments within the MPO planning area. Please note that the figure only displays the Level of Travel Time Reliability value and does not reflect a value expressed in person-miles.

Within the region, most interstate and non-interstate National Highway System roadways are considered reliable. Managing congestion on roadways, particularly through the application of the Congestion Management Process, will be necessary for the MPO to support the State target.

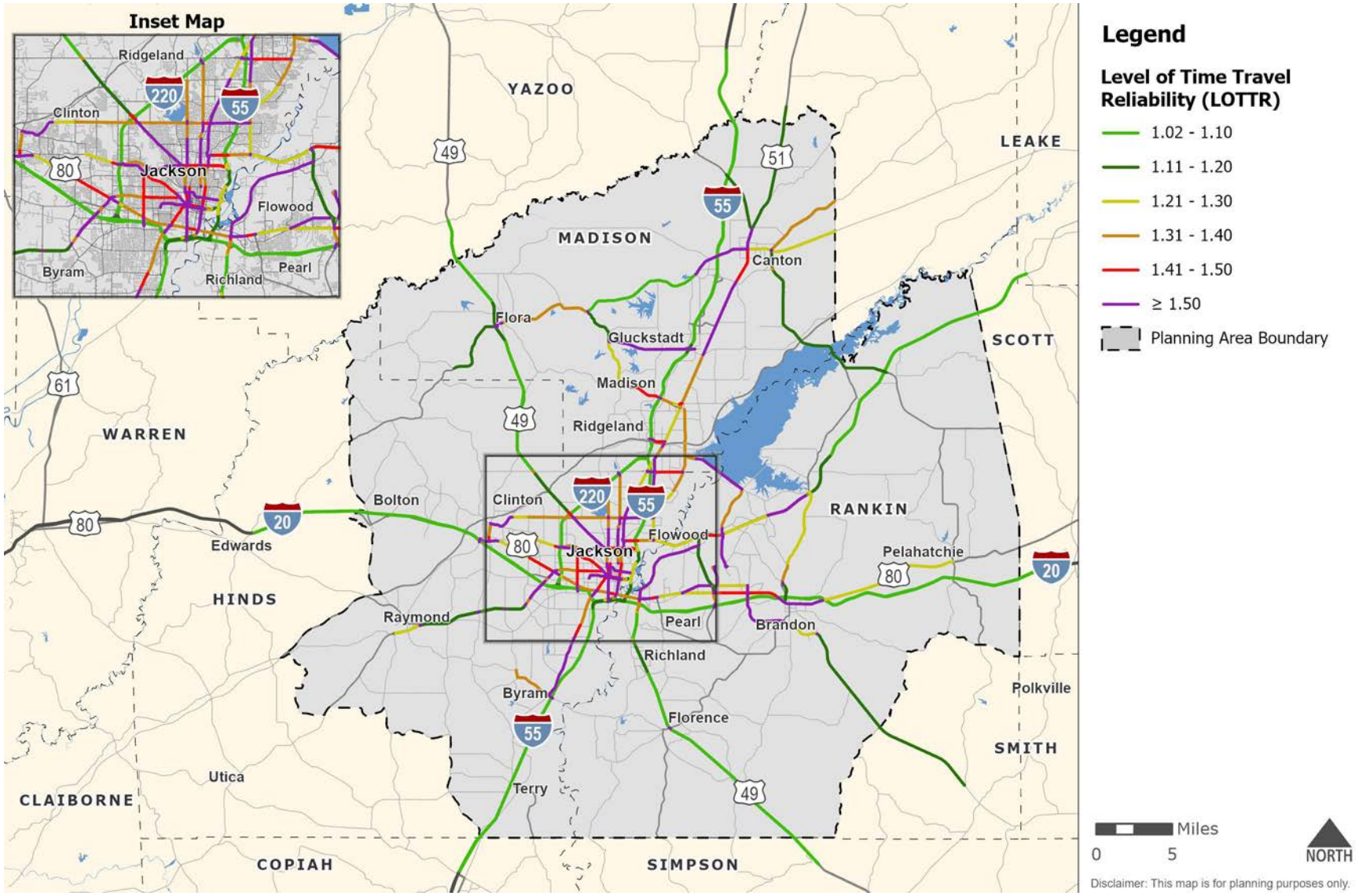
100.0%

Interstate NPMRDS reported NHS person-miles travelled that are reliable.

84.9%

Non-Interstate NPMRDS reported NHS person-miles travelled that are reliable.

Figure 3.6: Level of Travel Time Reliability on National Highway System Routes, 2024



Source: NPMRDS, 2024 Conflation

3.5 Pavement Conditions

Maintaining sufficient pavement conditions ensures that roadways operate at their full capacity. Good pavement conditions provide roadway users with safe, comfortable travel experiences, while minimizing vehicle wear and tear.

Pavement condition ratings for the MPO's planning area roadways were obtained from data submitted by the MDOT and found in the Highway Performance Monitoring System. This system is a national level highway information system that includes data on the extent, condition, performance, and use and operating characteristics of the nation's highways.

Highway Performance Monitoring System data is a sample dataset collected across the entire federal-aid eligible system for interstate, arterial, and collector networks.

Pavement condition data is based on the International Roughness Index, and includes cracking, rutting, and faulting.

The MPO planning area has better Interstate pavement conditions when compared to the State of Mississippi. While less than 1 percent of **interstate** pavements within the region are in Poor Condition, **non-interstate** pavements on the National Highway System (NHS) have nearly 19 percent in Poor Condition and more than two-thirds in Fair Condition.

Figure 3.7 illustrates the most recent pavement condition data for NHS roadways within the MPO planning area.

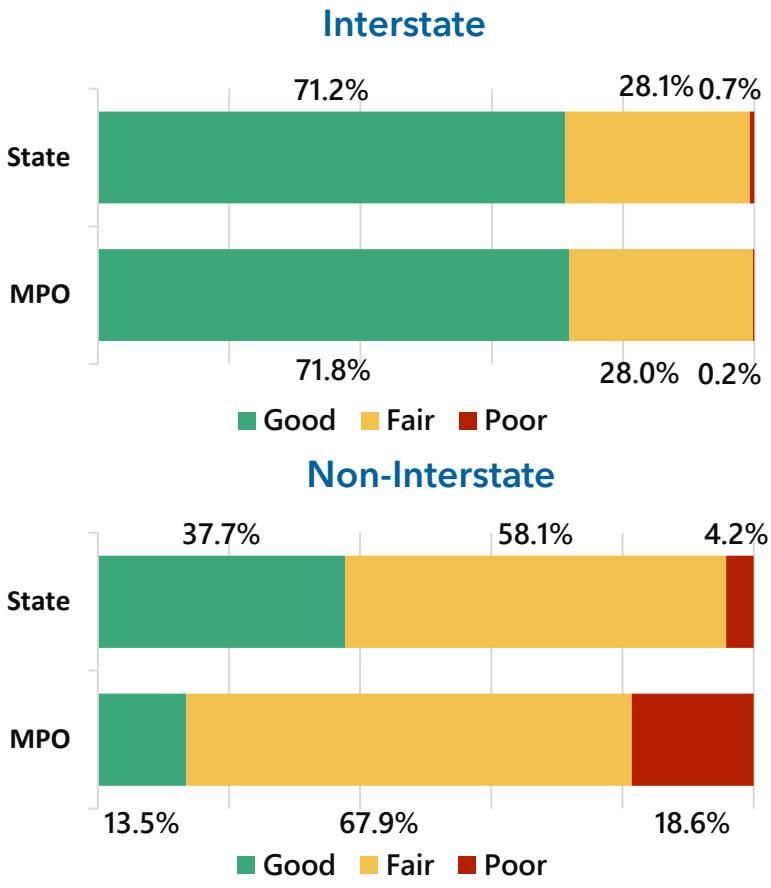
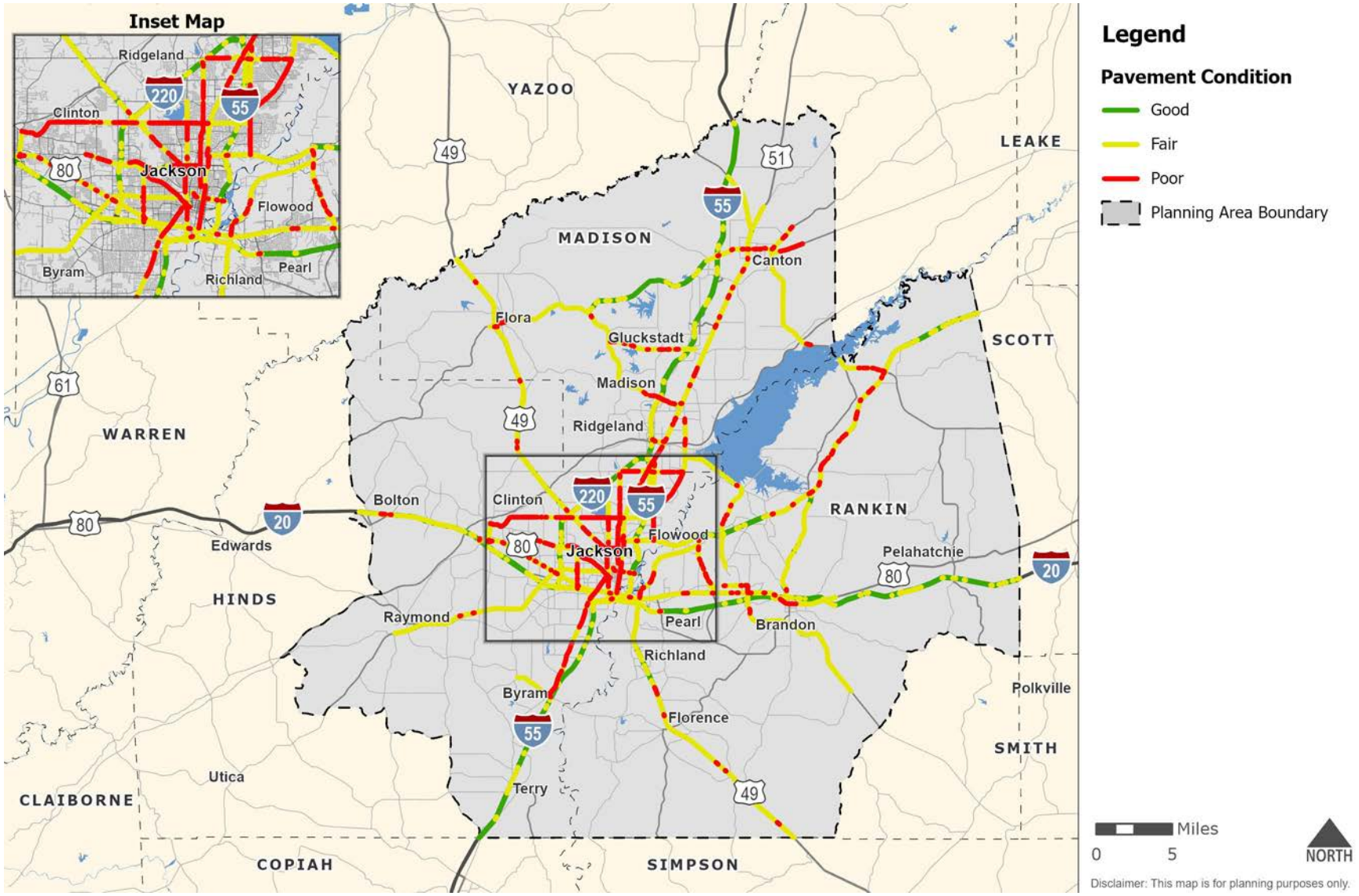


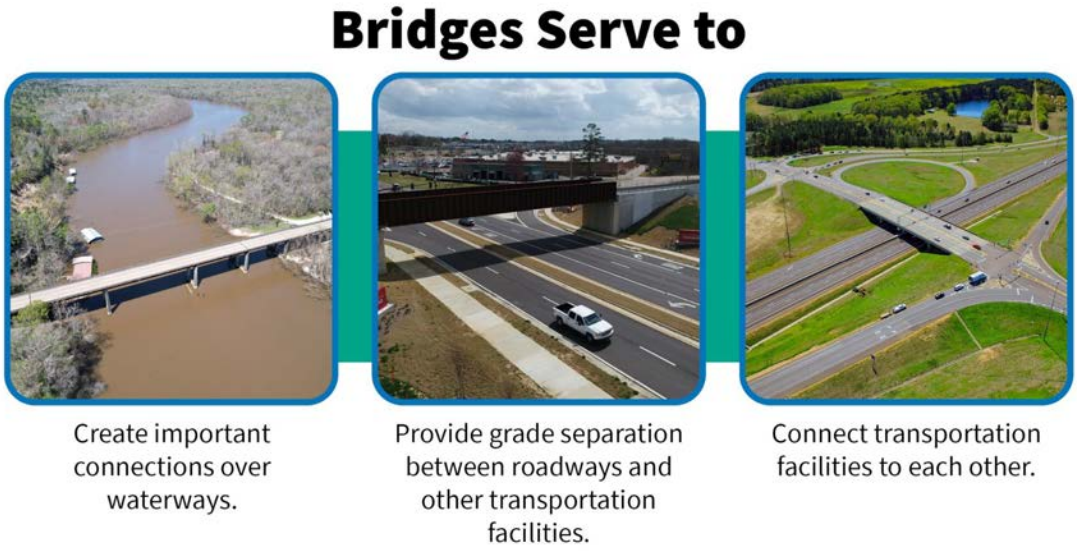
Figure 3.7: Roadway Pavement Conditions, 2024



Source: MDOT, 2024

3.6 Bridge Conditions

Bridges are a critical part of the overall transportation network. They must be maintained and upgraded as needed to ensure that they do not present safety or environmental hazards, bottlenecks, or limitations to freight movement.



There are over 1,050 bridges within, or bordering, the MPO planning area. Although most of these cross waterways, some bridges cross over other roadways or railroads.

Bridge Conditions and Scoring

The National Bridge Inventory provides bridge condition data for all bridges and bridge-length culverts located on public roads, including Interstate Highways, U.S. Highways, State and county roads, and publicly accessible bridges on Federal lands.

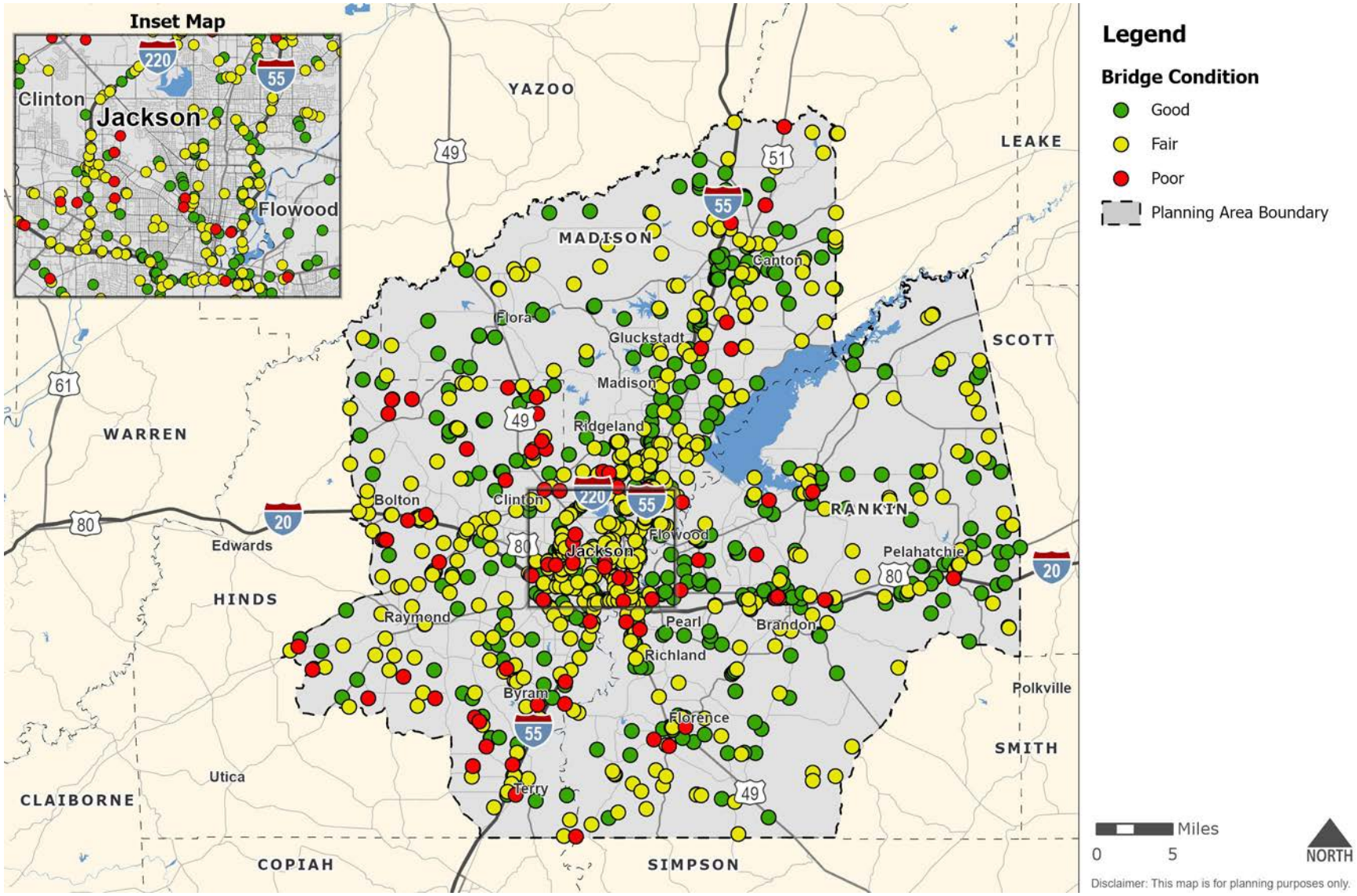
49.7% of NBI defined NHS Bridges are in Good Condition.

The condition of the bridge is determined by the lowest rating of deck, superstructure, substructure, or culvert. If the lowest rating of these categories is greater than or equal to seven, the bridge is classified as in good condition. If the score of the bridge is less than or equal to four, the classification is poor. The 2024 National Bridge Inventory data, the most recent available, was used for bridge condition analysis.

3.3% of NBI defined NHS Bridges are in Poor Condition.

Figure 3.8 displays the condition of each bridge within the MPO planning area. It should be noted that these include all bridges, not just those that are a part of the NHS.

Figure 3.8: Bridge Conditions in the MPO Region, 2024



Source: National Bridge Inventory

3.7 Safety

The MTP safety analysis focused on gathering and analyzing available safety data and identifying hazardous locations. Due to the limited scope of this study, location-specific recommendations for the identified hazardous locations have not been developed.

Disclaimer:

"This correspondence and the information contained herein is prepared solely for the purpose of identifying, evaluating, and planning safety improvements on public roads which may be implemented utilizing federal aid highway funds; and is therefore exempt from discovery or admission into evidence pursuant to 23 U.S.C. 407"

Supporting Documents

Highway Safety Improvement Program

The Infrastructure Investment and Jobs Act requires each state to maintain an annually updated Highway Safety Improvement Program. This program must include the FHWA performance measures for roadway safety and the development of a Strategic Highway Safety Plan. The required safety performance measures, state targets, and the MPO region's existing performance are discussed in *Technical Report #3: Transportation Performance Management*.

Strategic Highway Safety Plan

A Strategic Highway Safety Plan is a statewide coordinated safety plan developed and maintained by each state to identify strategies to reduce fatalities along all state highways and public roads.

Mississippi's Strategic Highway Safety Plan, updated in 2024[7], outlines the framework for change and helps strengthen collaboration among Mississippi's traffic safety community. Its components offer perspective on where the state stands in its pursuit of its Toward Zero Deaths vision and identifies objectives and strategies that support future success.

[7] https://mdot.ms.gov/portal/strategic_highway_safety_plan

The 2024 Strategic Highway Safety Plan focuses on five of the most prevalent areas that contribute to deaths and suspected serious injuries from 2020 to 2022[8]. These, known as emphasis areas, accounted for 91.8 percent of all fatal and serious injury crashes in Mississippi over the three-year period. Those emphasis areas are:

- Unbelted Occupants
- Lane Departures
- Impaired Driving
- Intersections
- Young Drivers

Mississippi's approach to continuous safety improvements has opened opportunities for involvement and partnerships among the "Four Es" of traffic safety.

Education	• Those who support, develop, and execute safety education programs.
Emergency Medical Services	• Those who respond to roadside crashes, provide emergency medical services, and work to improve emergency medical response and transport.
Enforcement	• Those who enforce traffic safety laws and collect crash data.
Engineering	• Those who analyze crash data and identify, recommend, and implement solutions that improve the safety performance of the transportation infrastructure.

Crash Impacts

According to the Fatality Analysis Reporting System data, from 2018 through 2022, an average of 39,588 people across the United States were killed annually as a result of a roadway collision. Every crash, regardless of the severity, costs money and time in

[8] https://mdot.ms.gov/portal/strategic_highway_safety_plan, pgs. 22 and 23

damages, emergency services, and delays. These costs affect both governments and taxpayers.

One goal of the MTP process is to improve travel safety by reducing the risk of crashes on the roadways. The first step toward meeting this goal was accomplished by analyzing the data and determining the most hazardous locations in the MPO planning area.

The crash records used in the analysis were obtained from the MDOT database and include all reported crashes from 2019 through 2023.

Study area crash records include data on crash:

- **severity**
- **location**
- **alcohol involvement**
- **vehicle type**
- **time of day**
- **roadway surface condition**
- **collision type**

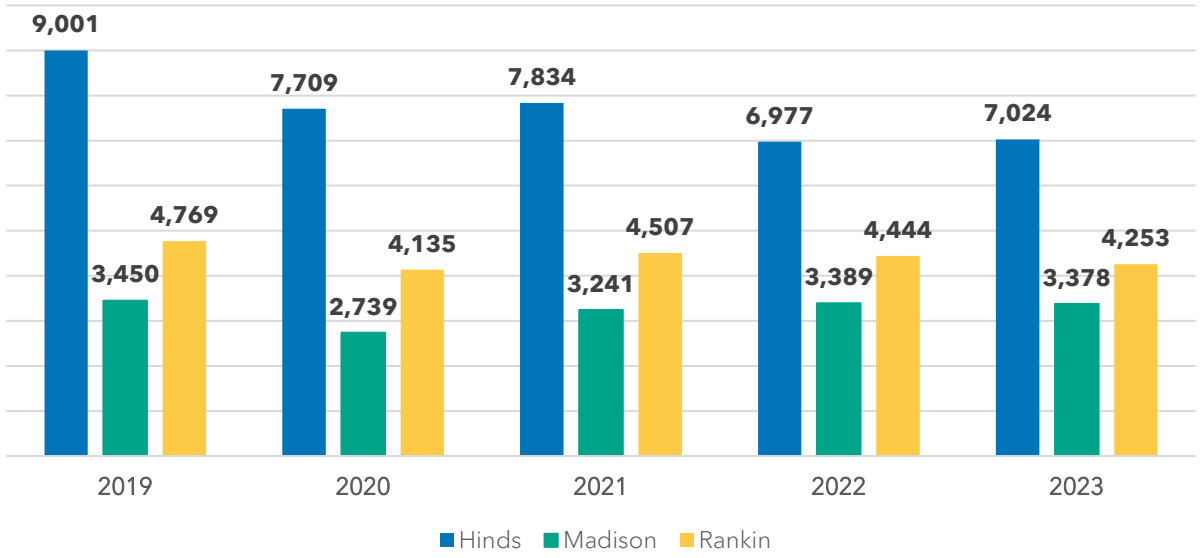
MPO Planning Area Crash Trends

This section discusses the observed trends regarding all crashes that occurred within the region during the analysis period.

Crashes by Year

From 2019 through 2023, a total of 76,850 crashes occurred within the MPO planning area. **Figure 3.9** displays the total number of crashes within the region by year and by county.

Figure 3.9: MPO Planning Area Crashes by Year and County, 2019 – 2023



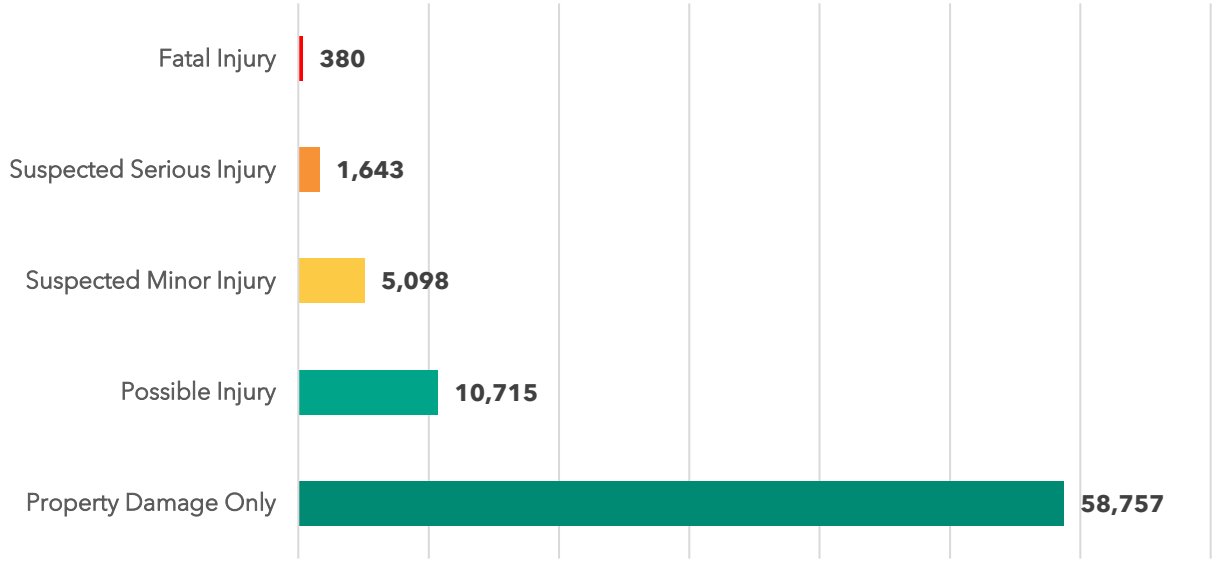
Source: MDOT, 2024

Crash Severity

Crash severity reveals the extent to which crashes pose a safety risk to roadway users. Within the MPO planning area, 380 fatal crashes and 1,643 serious injury or suspected serious injury crashes occurred during the analysis period. Approximately 2.6 percent of the total crashes resulted in a fatality or serious injury. **Figure 3.10** displays the number of crashes by severity within the region.

76.5% of crashes resulted in Property Damage Only.

Figure 3.10: Number of Crashes by Severity, 2019 – 2023



Source: MDOT, 2024

It is important to note that the number of suspected serious injury crashes significantly increased from September 2019 onwards due to a revised definition of what constitutes a serious injury. This definition was broadened to conform with updates to the National Highway Traffic Safety Administration's guidance in the Model Minimum Crash Criteria, 4th edition.

As of September 2019, the definition of what constitutes a suspected serious injury within a crash includes:

- **Severe lacerations**
- **Significant blood loss**
- **Broken or distorted extremities**
- **Crush injuries**
- **Significant burns**
- **Unconsciousness**
- **Paralysis**
- **Suspected skull, chest, or abdominal injuries (excluding bruises or minor lacerations)**

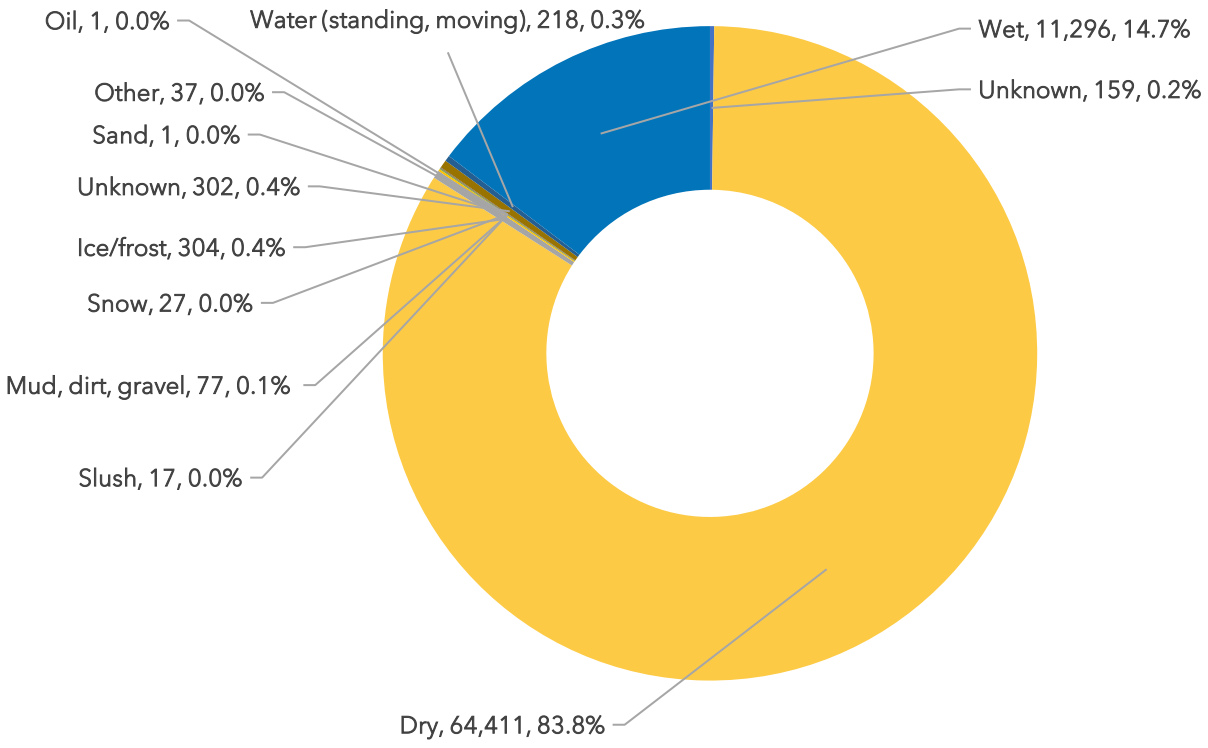
Driving Under the Influence (DUI) Crashes

From 2019 through 2023, 1,771 crashes involved drivers under the influence of a substance (i.e., alcohol, drugs, etc.). While this resulted in just more than 2 percent of the crashes within the MPO planning area, they accounted for 11 percent of fatal crashes within the region.

Roadway Surface Condition

The roadway surface can contribute to a crash when it experiences adverse conditions such as rain, oil, debris, or other elements. These conditions temporarily reduce the safety of the roadway. However, nearly 84 percent of the study area crashes occurred during dry conditions. This means the roadway surface condition was not a contributing factor in most crashes. The distribution of crashes by surface condition is displayed in **Figure 3.11**.

Figure 3.11: Crashes by Roadway Surface Condition, 2019 – 2023



Source: MDOT, 2024

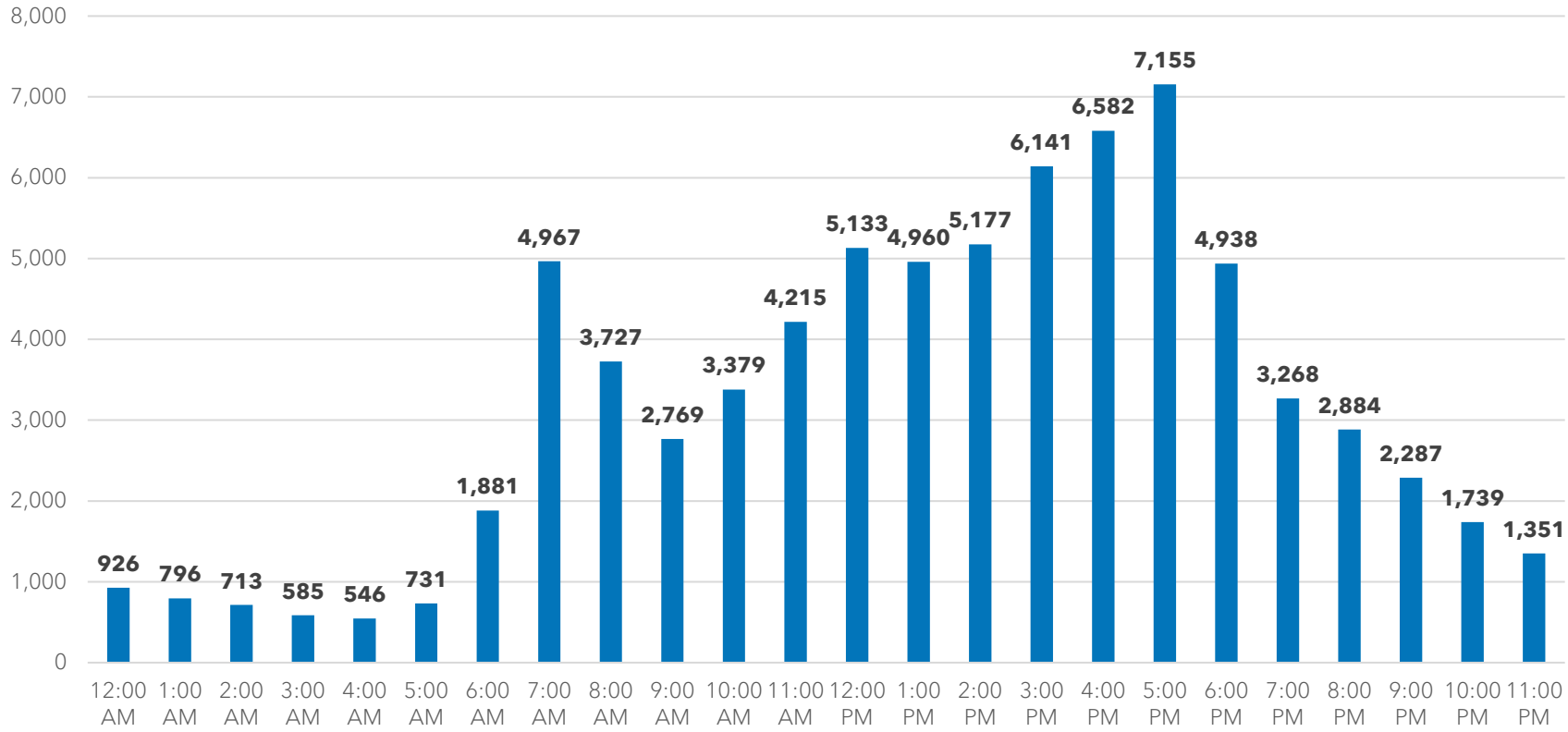
Crash Times

Identifying when crashes occur can assist with developing countermeasures for crashes affected by lighting, congestion, or other factors. Nearly 7 percent occurred during the morning commute from 7:00 AM to 8:00 AM. The lunch peak from 12:00 PM to 1:00 PM experienced nearly 7 percent of the daily crashes. However, the largest percentage of crashes during the day occurred during the evening commute from 5:00 PM to 6:00 PM, accounting for more than 9 percent of the crashes within the MPO planning area. The hour in which the crashes occurred is displayed in **Figure 3.12**.

Collision Type

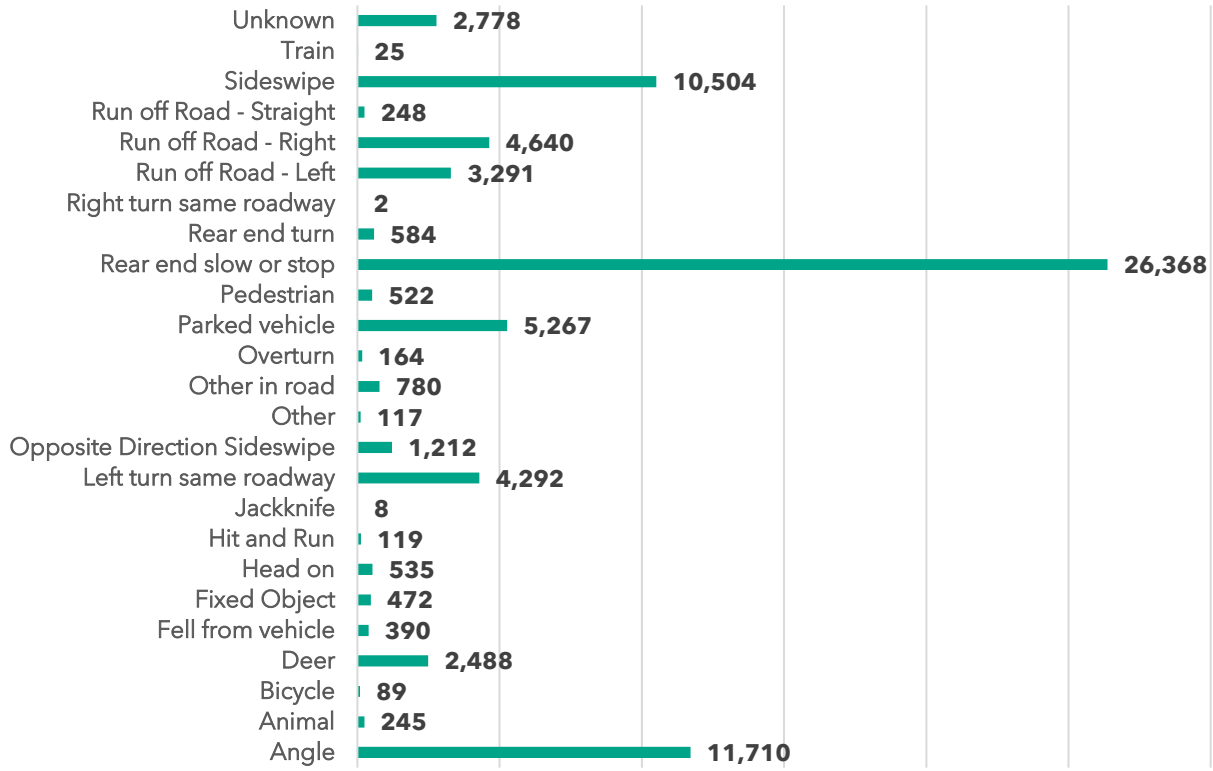
This study also considered collision types that occurred. **Figure 3.13** displays the crashes by collision type. The most common collision types were rear end [rear end slow or stop, rear end turn] (35 percent), angle (15 percent), and sideswipe (14 percent).

Figure 3.12: Crashes by Hour, 2019 – 2023



Source: MDOT, 2024

Figure 3.13: Crashes by Collision Type, 2019 – 2023



Note: "Train" as a collision type includes all crashes that were attributed to rail infrastructure. Crashes that were identified as being specifically between a vehicle and a train are discussed in Section 4.5.

Source: MDOT, 2024

Crash Locations

As the nature of this study is only to identify trends, it did not attempt to conduct analysis for specific solutions. However, locations that experience the highest crash frequencies or rates were identified. For this, the following definitions were used:

- **Crash frequencies** reflect how often crashes occur at a given location and are expressed in crashes per year.
- **Crash rates** reflect the number of crashes compared to the traffic volumes that a roadway experiences and are expressed as crashes per million vehicle miles traveled for roadway segments.
- **Intersection crash rates** are expressed as crashes per million vehicles entering the intersection.

Crash frequency locations shown in this report are not ranked, but rather a list developed for informational purposes.

Segment Crashes

For this study, roadway segments are defined in two ways:

- A roadway link between two significant roadways.
- A roadway link between a significant roadway and a specific distance from that point.

Crashes on segments can occur due to roadway design, pavement condition, lighting, or other factors. A segment identified in this analysis should be further analyzed in additional studies to determine what contributes to the high crash frequency and/or crash rate it experiences. These studies should also be used to develop site-specific countermeasures.

Crash Frequencies

Table 3.4 displays the roadway segments in the MPO planning area that have the highest crash frequencies. These locations are shown in **Figure 3.14**.

6.0% of all MPO area crashes occur on the **Top 20** crash frequency segments.

Crash Rates

Crash rates for the study area were based on the roadway network layer and existing year (2022) volumes obtained from the CMPDD Base Travel Demand Model. The length of each segment and the corresponding daily traffic volumes from the travel demand model are used in the crash rate equation.

The segment crash rate equation is:

$$Segment\ Crash\ Rate = \frac{N \times 10^6}{365 \times AADT \times L}$$

Where

Segment Crash Rate – crashes per million vehicle miles traveled

N – segment average annual crash frequency

AADT – segment annual average daily traffic based on the Base Travel Demand Model*

L – segment length (in miles)

Table 3.5 displays the roadway segments in the MPO planning area that have the highest crash rates. These locations are shown in **Figure 3.15**.

Table 3.4: Top Crash Frequency Segments, 2019 – 2023

Segment	Length (miles)	Total Crashes	Annual Average Crash Frequency
Old Fannin Road between Flowood Drive and Spillway Road	3.01	360	72.0
MS 25 (Lakeland Drive) between MS 475 (Airport Road)/Liberty Road and East Metro Parkway/Old Fannin Road	1.70	355	71.0
I-55 Southbound between Woodrow Wilson Avenue Off-Ramp and Fortification Street Off-Ramp	0.88	351	70.2
MS 25 (Lakeland Drive) between Ridgewood Road and Treetops Boulevard	1.37	319	63.8
MS 463 between North Livingston Road and Highland Colony Parkway	2.28	306	61.2
Spillway Road between Harbor Drive and Old Fannin Road/North Shore Parkway	3.64	236	47.2
East County Line Road between I-55 East Frontage Road and Ridgewood Road	0.21	227	45.4
Grandview Boulevard between Madison Avenue and MS 463 (Main Street)	0.96	226	45.2
Old Canton Road between East County Line Road and Lake Harbour Drive	1.04	219	43.8
US 49 between MS 469 and Gunter Road	1.97	213	42.6
US 80 (West Government Street) between Woodgate Drive and Marquette Road/Value Road	1.27	208	41.6
US 80 between MS 475 (Airport Road) and Cross Park Drive	1.85	201	40.2
MS 18 between I-20 Westbound and US 80 (West Government Street)	0.30	195	39.0
MS 25 (Lakeland Drive) between East Metro Parkway/Old Fannin Road and Luckney Road	1.02	181	36.2
MS 463 (Main Street) between Grandview Boulevard/Galleria Parkway and Crawford Street	0.50	179	35.8
I-55 Northbound between Fortification Street On-Ramp and Woodrow Wilson Avenue Off-Ramp	0.81	168	33.6
MS 25 (Lakeland Drive) between Hugh Ward Boulevard and Castlewoods Boulevard/Grants Ferry Road	0.74	167	33.4
Old Fannin Road between MS 25 (Lakeland Drive) and Flowood Drive	0.40	165	33.0
MS 18 between Greenfield Road and MS 468 (Whitfield Road)	3.00	163	32.6
US 80 between Springridge Road and Mount Salus Drive	0.58	160	32.0

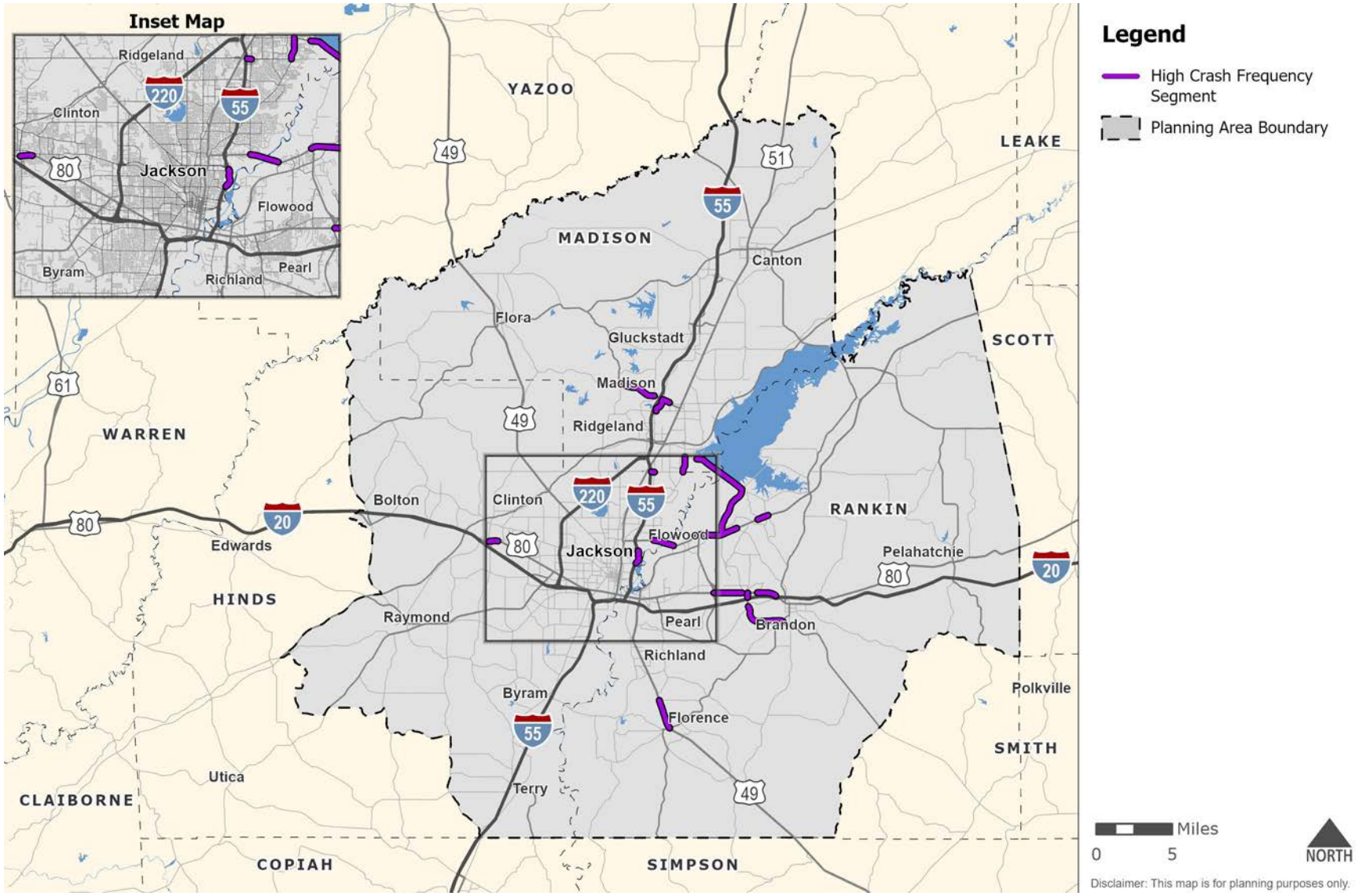
Source: MDOT, 2024

Table 3.5: Top Crash Rate Segments, 2019 – 2023

Segment	Length (miles)	Total Crashes	Annual Average Crash Frequency	ADT	Crash Rate
I-55 Southbound U-Turn Lane at East Northside Drive	0.12	50	10.0	1,389	164.0
East Harper Street between US 49 and Lowe Circle/Richland Circle	0.60	97	19.4	681	130.4
Valley Street between Raymond Road and US 80	0.28	19	3.8	703	53.3
I-20 Westbound Off-Ramp to Northbound Terry Road	0.13	16	3.2	1,661	39.4
Maple Street between Martin Luther King Jr. Drive and Bailey Avenue	0.42	17	3.4	773	28.6
Lindsey Drive between Robinson Road and McCain Avenue/St. Charles Street	0.46	12	2.4	591	24.0
East School Street between US 51 and Pear Orchard Road	0.59	16	3.2	628	23.6
Dalton Street between John R. Lynch Street and Dr. Robert Smith Sr. Parkway	0.24	7	1.4	729	22.2
Fortification Street between State Street and Jefferson Street	0.16	46	9.2	7,763	20.2
Rose Street between Dr. Robert Smith Sr. Parkway and Central Street	0.20	7	1.4	975	20.00
South Monroe Street between East Dinkins Street and East Peace Street	0.58	13	2.6	620	20.00
East County Line Road between I-55 East Frontage Road and Ridgewood Road	0.21	227	45.4	32,578	18.6
US 80 between Springridge Road and Mount Salus Drive	0.58	160	32.0	8,097	18.6
I-20 Eastbound Off-Ramp to Bolton-Brownsville Road	0.23	4	0.8	527	18.5
South Gallatin Street between West Rankin Street and Winter Street	0.21	43	8.6	6,330	17.6
East McDowell Road/South Gallatin Street between I-55 South Frontage Road and I-20 Eastbound/I-55 Northbound On-Ramp	1.32	44	8.8	1,094	16.7
I-55 Southbound Off-Ramp to Natchez Trace Parkway	0.41	18	3.6	1,444	16.5
US 49 East Frontage Road between Old Highway 49 and Kroger Drive	0.56	12	2.4	709	16.5
West South Street between South Gallatin Street and South Roach Street	0.18	4	0.8	749	16.4
West Jasper Street between Overby Street and College Street	0.27	4	0.8	509	16.0

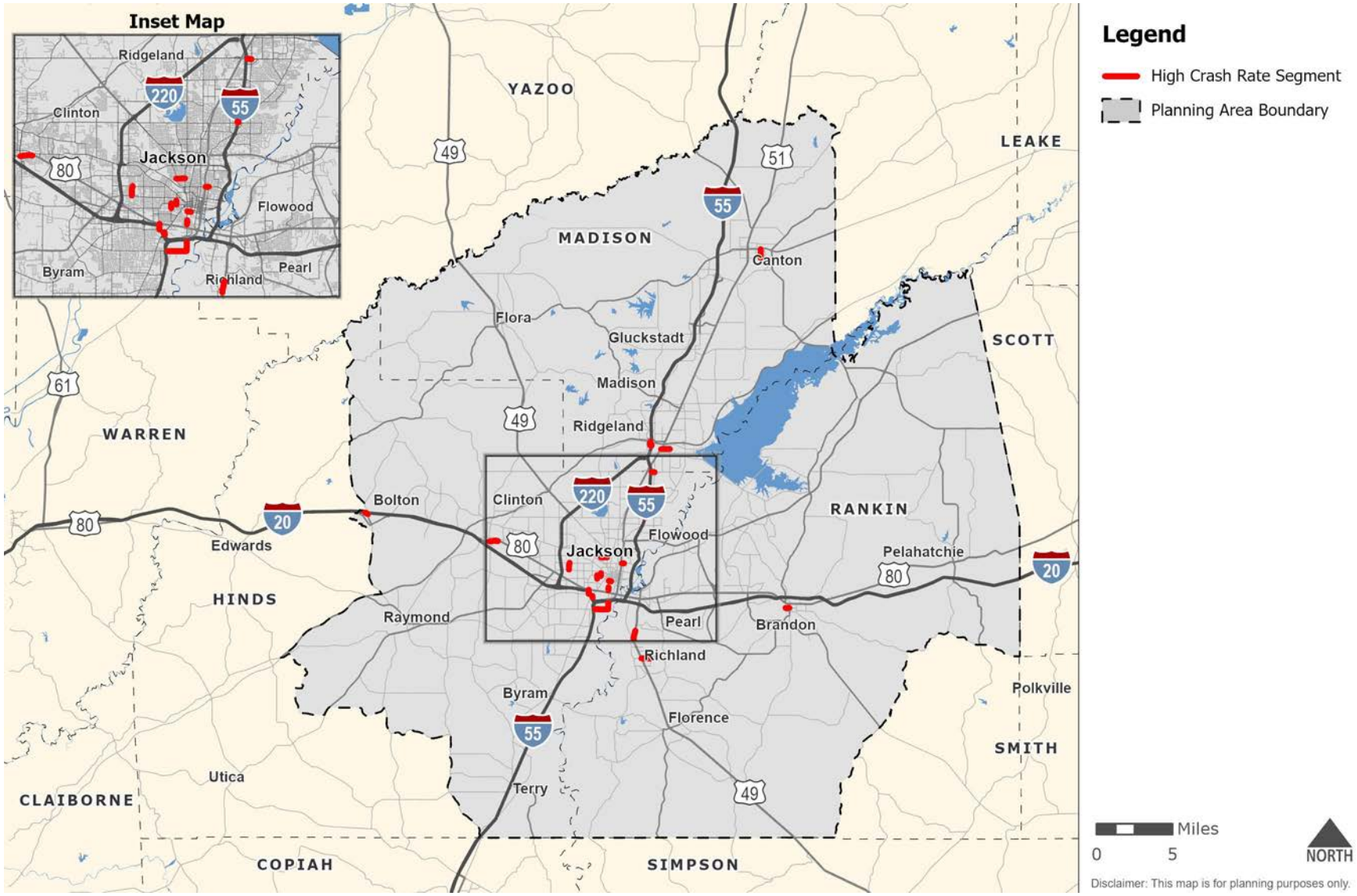
Source: MDOT, 2024; CMPDD Base Travel Demand Model, 2022

Figure 3.14: High Crash Frequency Segments, 2019 – 2023



Source: MDOT, 2024

Figure 3.15: High Crash Rate Segments, 2019 – 2023



Source: MDOT, 2024; CMPDD Base Travel Demand Model, 2022

Intersection Crashes

There were approximately 22,495 intersection crashes in the study area from 2019 to 2023.

Crash Frequencies

Table 3.6 shows the 21 intersections in the MPO planning area with the highest crash frequency. **Table 3.7** shows the collision types that occurred at these intersections. These locations are also displayed in **Figure 3.16**.

Additional studies should be conducted on these intersections to identify the cause of the crashes and how to reduce the severity and types of crashes they experience.

29.3%

of crashes in the MPO area occur at intersections.

17.0% of intersection crashes occur at the **Top 21** crash frequency locations

Table 3.6: Top Intersections by Crash Frequency, 2019 – 2023

Intersection	Total Crashes	Annual Average Crash Frequency
I-55 East Frontage Road at East County Line Road	437	87.4
US 80 (West Government Street) at MS 18 (Crossgates Boulevard)	265	53.0
MS 25 (Lakeland Drive) at East Metro Parkway/Old Fannin Road	220	44.0
US 80 at Springridge Road	209	41.8
US 80 at MS 475 (Airport Road)	193	38.6
MS 18 at Greenway Drive	182	36.4
I-55 West Frontage Road at Briarwood Drive	181	36.2
MS 463 (Main Street) at I-55	174	34.8
US 80 at MS 468 (Flowood Drive)	168	33.6
East County Line Road at Ridgewood Road	164	32.8
MS 463 (Main Street) at Grandview Boulevard/Galleria Parkway	164	32.8
I-55 West Frontage Road at Northside Drive	160	32.0
Siwell Road at Terry Road	160	32.0
Highland Colony Parkway at Old Agency Road	158	31.6
I-55 East Frontage Road at Northside Drive	156	31.2
I-55 West Frontage Road at East County Line Road	145	29.0
US 80 at Ellis Avenue	140	28.0
US 51 at Lake Harbour Drive	140	28.0
US 49 at Harper Street	137	27.4
I-55 East Frontage Road at Adkins Boulevard	134	26.8
MS 18 at I-20 Westbound	134	26.8

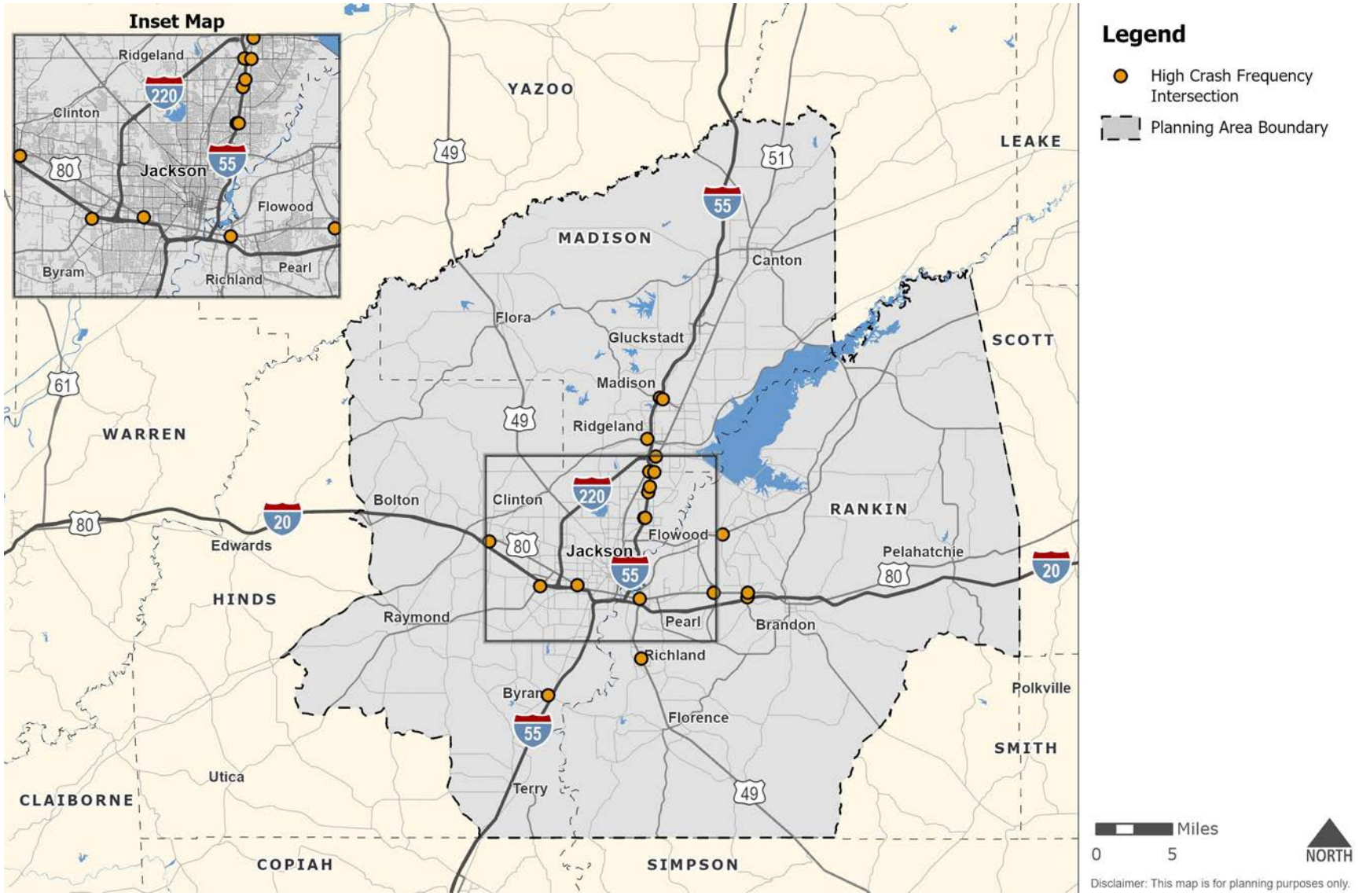
Source: MDOT, 2024

Table 3.7: Top Crash Frequency Intersections by Collision Type, 2019 – 2023

Intersection	Total Crashes	Annual Average Crash Frequency	Angle	Animal or Deer	Bicycle or Pedestrian	Fell from Vehicle	Fixed Object	Head on	Hit and Run	Jack-knife	Left Turn or Right Turn	Other in Road	Other or Unknown	Over-turn	Parked Vehicle	Rear End	Run Off Road	Side-swipe	Train
I-55 East Frontage Road at East County Line Road	437	87.4	47	0	0	0	0	0	0	0	9	1	4	0	0	349	1	26	0
US 80 (West Government Street) at MS 18 (Crossgates Boulevard)	265	53.0	11	0	0	1	0	1	0	0	12	0	1	0	0	209	2	28	0
MS 25 (Lakeland Drive) at East Metro Parkway/Old Fannin Road	220	44.0	15	0	0	0	0	0	0	0	23	0	2	0	0	153	1	26	0
US 80 at Springridge Road	209	41.8	15	1	0	0	0	0	0	0	52	0	1	0	0	126	0	14	0
US 80 at MS 475 (Airport Road)	193	38.6	9	0	0	0	0	1	0	0	3	0	2	0	0	172	0	6	0
MS 18 at Greenway Drive	182	36.4	24	0	0	0	0	0	0	0	24	0	1	0	1	113	0	19	0
I-55 West Frontage Road at Briarwood Drive	181	36.2	39	0	3	0	0	1	0	0	8	0	0	0	2	107	1	20	0
MS 463 (Main Street) at I-55	174	34.8	3	0	0	0	0	1	0	0	9	1	1	0	1	138	5	15	0
US 80 at MS 468 (Flowood Drive)	168	33.6	15	0	0	0	0	0	0	0	40	0	0	0	0	85	0	28	0
East County Line Road at Ridgewood Road	164	32.8	31	0	0	0	0	0	0	0	25	0	1	0	0	87	0	20	0
MS 463 (Main Street) at Grandview Boulevard/Galleria Parkway	164	32.8	14	0	1	0	0	0	0	0	13	1	8	0	0	86	1	40	0
I-55 West Frontage Road at Northside Drive	160	32.0	36	0	1	0	0	0	0	0	1	0	3	0	0	63	1	55	0
Siwell Road at Terry Road	160	32.0	22	0	0	0	0	2	0	0	32	0	2	0	0	82	2	18	0
Highland Colony Parkway at Old Agency Road	158	31.6	61	0	0	0	0	0	0	0	1	0	0	0	0	9	2	85	0
I-55 East Frontage Road at Northside Drive	156	31.2	25	0	1	0	0	0	0	0	5	0	2	0	0	57	2	64	0
I-55 West Frontage Road at East County Line Road	145	29.0	28	0	0	0	0	0	0	0	4	0	1	2	0	88	1	21	0
US 80 at Ellis Avenue	140	28.0	29	0	1	0	0	2	0	0	20	0	0	0	1	56	0	31	0
US 51 at Lake Harbour Drive	140	28.0	11	0	2	0	0	0	0	0	9	1	1	0	0	89	1	26	0
US 49 at Harper Street	137	27.4	21	0	0	0	0	0	0	0	13	0	1	0	0	88	2	12	0
I-55 East Frontage Road at Adkins Boulevard	134	26.8	38	0	0	0	0	0	0	0	5	0	0	0	0	52	2	37	0
MS 18 at I-20 Westbound	134	26.8	15	1	0	0	0	0	0	0	32	0	2	0	0	83	0	1	0

Source: MDOT, 2024

Figure 3.16: High Crash Frequency Intersections, 2019 – 2023



Source: MDOT, 2024

3.8 Security

While safety and security are closely related, they are differentiated by the cause of the harm from which the transportation system and its users are being protected. Safety encompasses the prevention of unintentional harm to system users or their property, including:

- vehicular crashes
- train derailments
- slope failures
- sudden destruction of roadways
- non-motorized user injuries.

Security involves the prevention, management, and response to intentional or environmental harm to the transportation system or its users. This includes:

- **theft or dismemberment of elements of the transportation infrastructure,**
- **assault on users of the system,**
- **acts of violence,**
- **large-scale attacks/terrorism intended to completely disrupt the movement of people and goods, and/or**
- **natural disasters, such as hurricanes, earthquakes, or extreme weather.**

MPO Role in Security

The MPO's main role in planning for security is to coordinate with relevant agencies, such as:

- fire departments
- first responders
- police and sheriff's departments
- emergency management officials

As part of this role, the MPO works with its partner agencies to coordinate efforts related to prevention, management, response, and recovery efforts.

Prevention

When discussing security, prevention refers to efforts to limit access to resources that may be compromised or efforts to increase surveillance. Examples of prevention measures include:

- access control systems
- locks
- security alarms
- fencing
- architectural barriers
- Closed Circuit Television Systems

The design of facilities and public spaces can also incorporate features that deter security breaches.

Protection

High vulnerability risk facilities should have additional design measures considered. These measures would mitigate potential security risks, should they occur. Protection efforts could also include law enforcement where necessary.

Response

Redundancy of transportation facilities should be encouraged in capital project planning. This assists in emergency evacuations or detours should a particular segment of the transportation network become unavailable. This is particularly important for the MPO planning area due to the risk of natural disasters, especially hurricanes. Additionally, the MPO's travel demand model can be used to model hurricane evacuation events by creating a scenario that uses contraflow and travel that reflects people evacuating the area, displaying areas that may need unique solutions during those events.

The use of Intelligent Transportation Systems to control traffic signals and other devices also assists in responding to security, allowing for more rapid response of emergency personnel and the re-routing of persons and vehicles away from incident locations. Transportation decision-makers at the emergency centers, within MDOT, or with local police, can monitor the Intelligent Transportation System devices to make decisions quickly to optimize response time and effort.

Recovery

Transportation decision-makers should be familiar with both short-term and long-term recovery plans for the MPO planning area. This includes everything from evacuations to restoring local businesses and neighborhoods.

Key Security Participants

As stated previously, the MPO coordinates with relevant agencies and is in a support role when responding to security events and concerns. While the MPO itself does not have a specific security policy, it can serve as a medium of communication between the various agencies involved. Some of the key agencies and organizations include:

State of Mississippi - Mississippi Emergency Management Agency (MEMA)

Hinds County - Emergency Management

Madison County - Emergency Management

Rankin County - Emergency Management Operations

Strategic Highway Network (STRAHNET)

The STRAHNET is a portion of the NHS considered vital to the nation's strategic defense. The current STRAHNET has approximately 64,000 miles of roadway, including all interstate routes, and links military installations with roadways that provide for the mobility of strategic military assets.

Within the MPO planning area, STRAHNET roadways are I-20, I-55, and I-220.

STRAHNET roadways require additional considerations, such as:

- **maintaining roadway pavements and bridges in a State of Good Repair,**
- **prioritizing maintenance, and**
- **providing congestion management.**

4.0 Freight

4.1 Introduction

The movement of freight throughout the MPO planning area affects both the regional and national economy. The region is a major generator of freight, as well as a distribution and processing center for many goods. It is home to many freight facilities including class I railroads and major highways.

This chapter provides an overview of freight facilities using big data sets such as the Freight Analysis Framework. It also uses data from existing plans and data.

4.2 Supporting Plans and Goals

Federal

Increasingly, federal legislation has provided incentives for states to focus on freight transportation investments. The provisions embodied in the 2021 Infrastructure Investment and Jobs Act established new dedicated freight programs and funding sources, intended to address freight needs that produce public benefits.

National Freight Goals

Per current transportation legislation, there are ten (10) National Multimodal Freight Policy Goals. These are:

1. *Identify infrastructure improvements, policies, and operational innovations that–*
    a. *Strengthen the contribution of the National Multimodal Freight Network to the economic competitiveness of the United States.*
    b. *Reduce congestion and eliminate bottlenecks on the National Multimodal Freight Network.*
    c. *Increase productivity, particularly for domestic industries and businesses that create high-value jobs.*
2. *Improve the safety, security, efficiency, and resiliency of multimodal freight transportation.*
3. *Achieve and maintain a state of good repair on the National Multimodal Freight Network.*
4. *Use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Multimodal Freight Network.*

5. *Improve the economic efficiency and productivity of the National Multimodal Freight Network.*
6. *Improve the reliability of freight transportation.*
7. *Improve the short- and long-distance movement of goods that –*
    a. *Travel across rural areas between population centers.*
    b. *Travel between rural areas and population centers.*
    c. *Travel from the Nation's ports, airports, and gateways to the National Multimodal Freight Network.*
8. *Improve the flexibility of States to support multi-State corridor planning and the creation of multi-State organizations to increase the ability of States to address multimodal freight connectivity.*
9. *Reduce the adverse environmental impacts of freight movement on the National Multimodal Freight Network.*
10. *Pursue the goals described in this subsection in a manner that is not burdensome to State and local governments.*

State

The *Mississippi Statewide Freight Plan*[9] is Mississippi's statewide comprehensive freight plan and was most recently updated in 2022. Freight transportation, including air, water, road, and rail systems, is a critical part of economic development, job creation, and global growth for the state of Mississippi. Efficient movement of goods to, from, and through Mississippi is also closely linked with manufacturing, which supports jobs throughout the state.

The purpose of Mississippi's Freight Plan is threefold:

1. Define strategic goals for the Mississippi freight system.
2. Establish a strategy to achieve freight-related goals that align with MDOT's guiding principles.
3. Fulfill the requirements of the FAST Act and the Infrastructure Investment and Jobs Act.

9 https://mdot.ms.gov/documents/Planning/Plan/MS%20Freight%20Plan/MS%20Statewide%20Freight%20Plan%202022.pdf

Due to the heavy reliance of the state's economy on freight transportation, MDOT recognizes the importance of planning, designing, constructing, and maintaining freight related projects to sustain mobility and accessibility for the future growth of the state's population and industries.

4.3 Trucking

The MPO planning area contains several active intermodal terminal facilities, listed in **Table 4.1**, and roadways that serve freight, shown in **Figure 4.1.** Within the region, I-20 and the portion of I-55 that connects to the intermodal connector in downtown Jackson are part of the National Highway Freight Network[10]. Those roadway sections, as well as the remainder of I-55 and I-220 within the planning area, are part of the National Multimodal Freight Network[11].

Additionally, MDOT has identified US 49 and MS 25 as part of the Mississippi Freight Network within the MPO planning area. Mississippi uses a 3-tier structure for the Mississippi Highway Freight Network, which includes the following criteria:

- Tier 1 – National Regional Significance
    - Interstate highways
    - Critical for moving goods across the state and nationally
- Tier 2 – Statewide Regional Significance
    - Providing access to the Tier I network
    - Serve as regional corridors within the state
- Tier 3 – Local Access Significance
    - Access to major freight generators
    - Primarily comprises Mississippi's National Highway System freight intermodal connectors, critical rural freight corridors, and critical urban freight corridors.

The detailed freight network can be found in Mississippi's freight plan.

[10] https://ops.fhwa.dot.gov/freight/infrastructure/ismt/state_maps/states/mississippi.htm

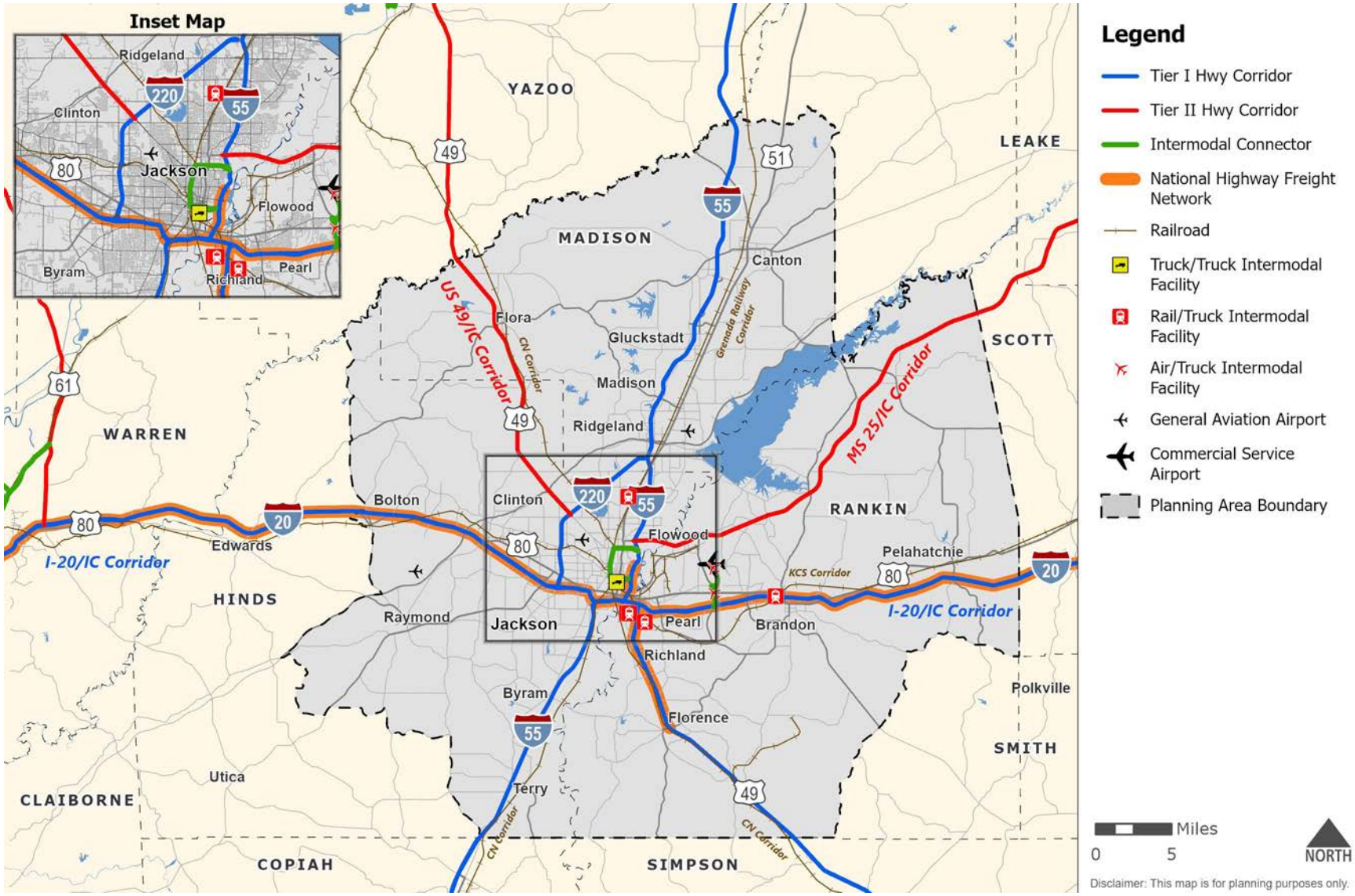
[11] https://www.transportation.gov/sites/dot.gov/files/docs/State_interimMFN_portrait_Mississippi_alt_text.pdf

Table 4.1: Intermodal Terminal Facilities for Trucks

Name	Modes Served	City
Jackson International Airport	Air & Truck	Jackson
Kansas City Southern	Rail & Truck	Richland
Lefleur Paper Company, LLC	Rail & Truck	Richland
Miller Transporters, Inc.	Rail & Truck	Brandon
Warehouse Services, Inc.	Rail & Truck	Jackson
USPS-PDC-PDF	Truck & Truck	Jackson

Source: FHWA

Figure 4.1: Freight Truck Network and Facilities



Source: NTAD, USDOT, MDOT

Volumes and Commodity Flows

To better understand the region's freight needs, the Travel Demand Model was used to estimate truck volumes, illustrated in **Figure 4.2.** The greatest volumes are on:

- I-55 from County Line Rd (South of Terry) to I-20
- I-55 from I-20 to Sowell Rd
- I-55 from MS 22 to MS 16
- I-20 through entire MPO
- US 49 from Henry Cannon Rd to I-20

Using data obtained from the FHWA's Freight Analysis Framework, general trends in freight movement within the MPO planning area can be observed. However, the freight analysis framework does not contain data that is readily available at the study area level. This means that freight analysis framework data needed to be used at the "State of Mississippi" level and that general trends would need to be used for the commodity flow data. While the number of actual commodities being moved throughout an area is likely to vary considerably throughout the state, the means of transporting freight is more uniform.

Pipeline moves the largest tonnage of goods within Mississippi; however, highways account for the second largest amount of tonnage moved. As shown in **Table 4.2,** trucks account for 41 percent of all freight tonnage originating in Mississippi.

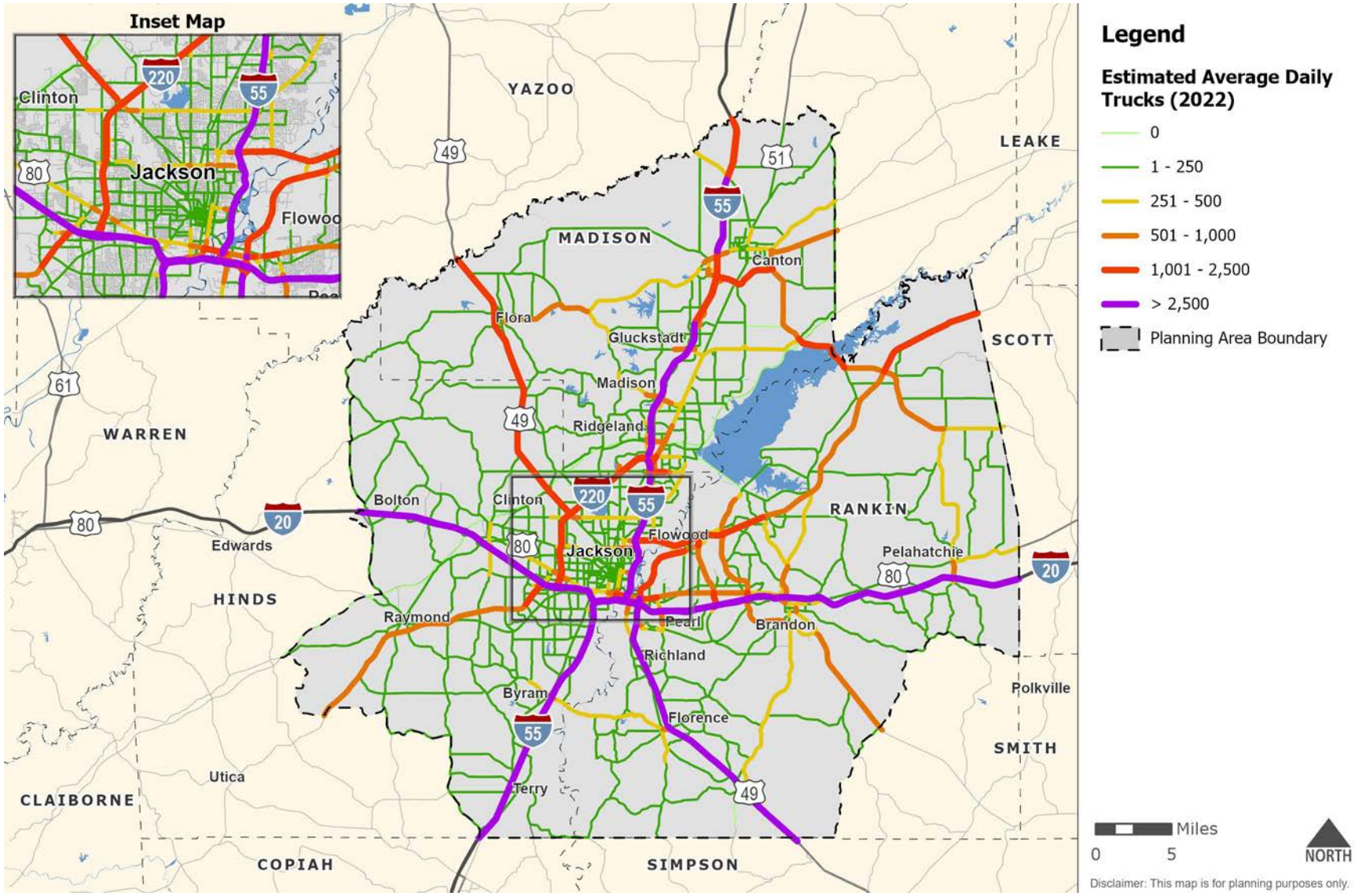
Table 4.2: Means of Transporting Freight Originating in Mississippi, 2023

Mode	Thousand Tons	Percent
Truck	124,627	41.0%
Rail	7,843	2.6%
Water	14,931	4.9%
Air (including truck-air)	18	0.0%
Multiple modes & mail	7,119	2.3%
Pipeline	149,352	49.1%
Other and unknown	31	0.1%
Total (All Modes)	**303,920**	**100.0%**

Source: Freight Analysis Framework 5

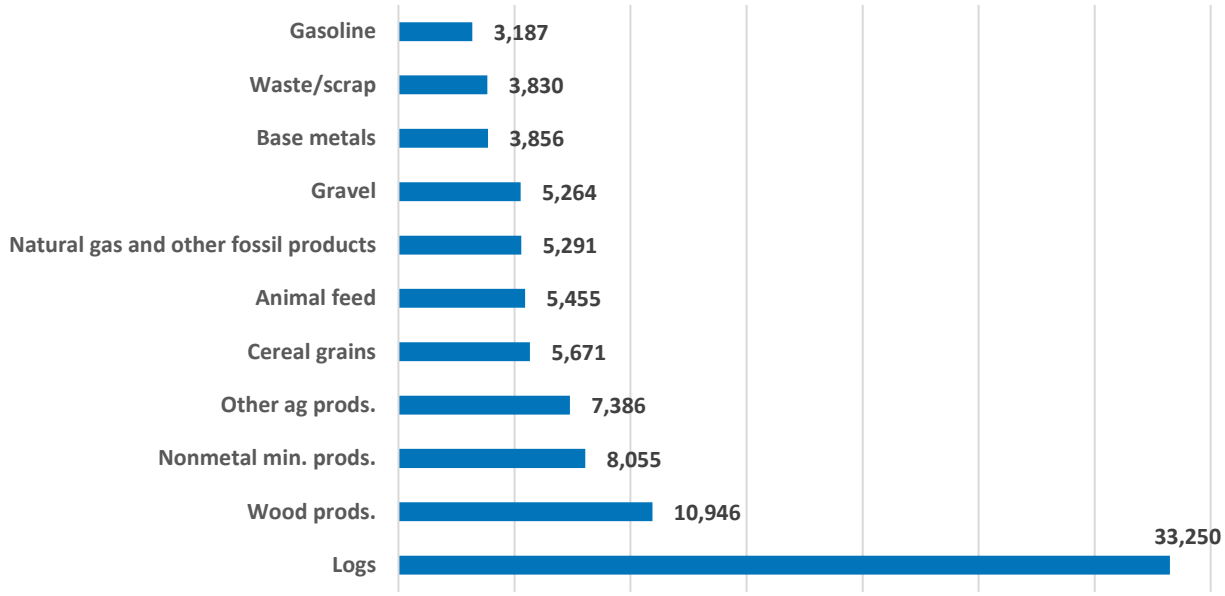
Figure 4.3 and **Figure 4.4** show the top commodities shipped via truck by total tonnage and value, respectively. Logs are the top truck commodity by tonnage, and mixed freight and pharmaceuticals are the top truck commodity by value.

Figure 4.2: Freight Truck Traffic, 2022



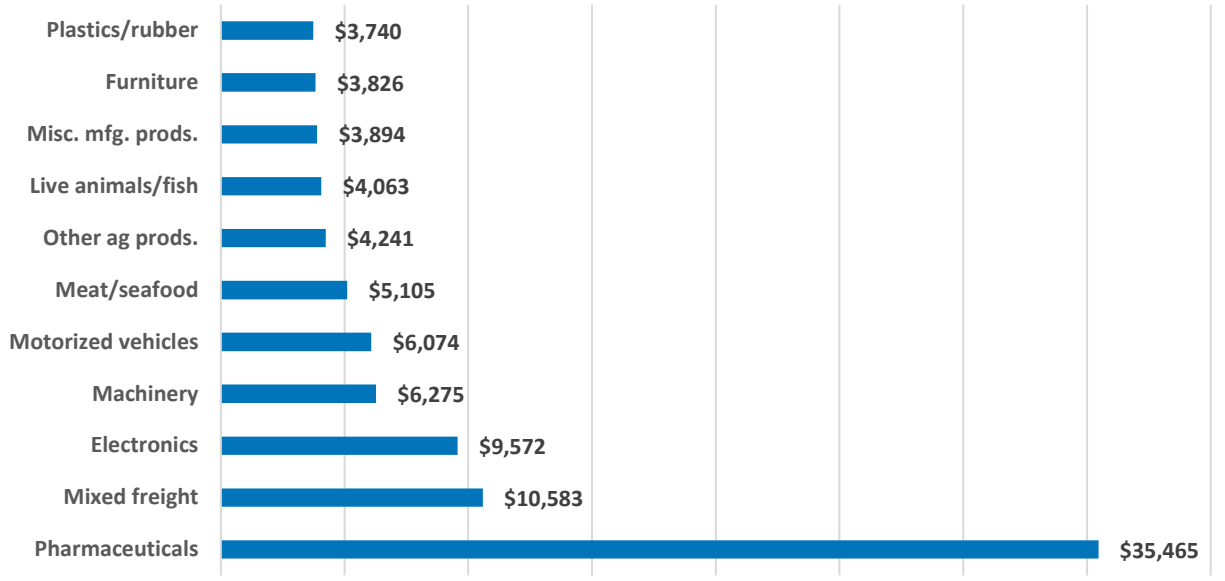
Source: CMPDD TDM

Figure 4.3: Top Commodities by Truck Tonnage (Thousand Tons), 2023



Source: Freight Analysis Framework 5

Figure 4.4: Top Truck Commodities by Value (Million Dollars), 2023



Source: Freight Analysis Framework 5

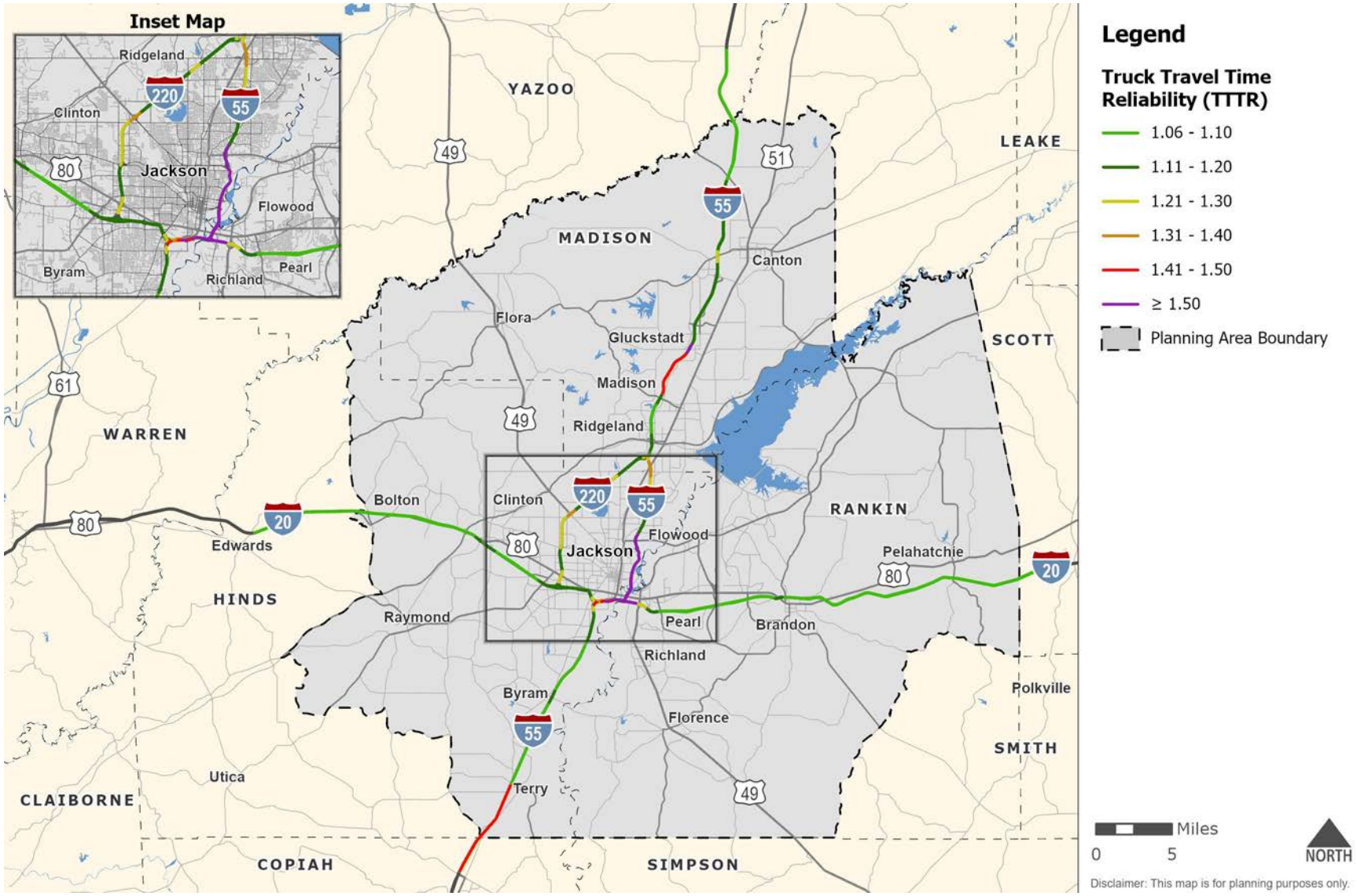
Truck Travel Time Reliability

The FHWA has established a freight performance measure to capture truck travel time reliability on the Interstate highway system: the Truck Travel Time Reliability index[12] . **Figure 4.5** displays this index rating for all Interstate routes in the MPO planning area. For this index, a rating of 1 is the lowest possible rating and would signify that there is no delay. Higher scores, especially those over 1.5, signify less reliability and greater delay.

The 2024 Truck Travel Time Reliability within the region is 1.18. The state's freight performance targets, and the MPO's progress towards them, are discussed in *Technical Report #3: Transportation Performance Management*.

[12] https://www.fhwa.dot.gov/tpm/rule/pm3/freight.pdf

Figure 4.5: Truck Travel Time Reliability, 2024

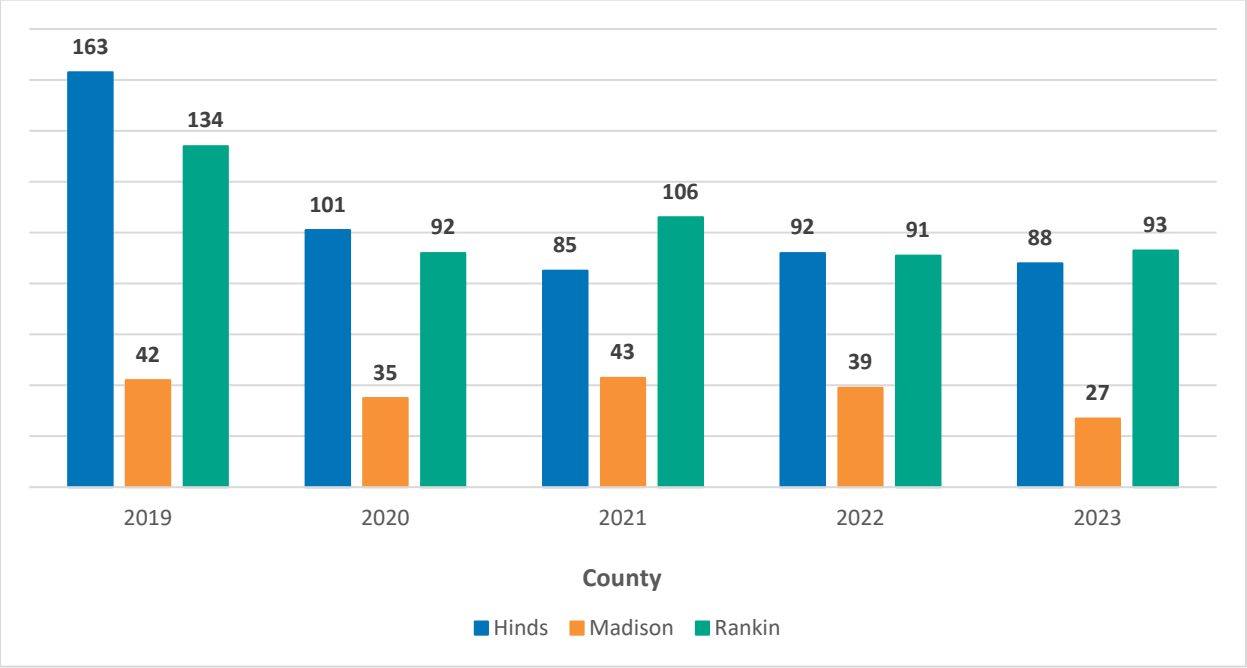


Source: NPMRDS

Safety

Crashes involving heavy vehicles were analyzed using crash records from 2019 to 2023 obtained from MDOT. A total of 1,231 crashes involving heavy vehicles occurred within MPO counties during the five-year study period. **Figure 4.6** shows the number of heavy vehicle crashes by county during the study period.

Figure 4.6: Heavy Vehicle Crashes by Year by County, 2019 - 2023



Source: MDOT

4.4 Bottleneck Segments and Truck Freight Network

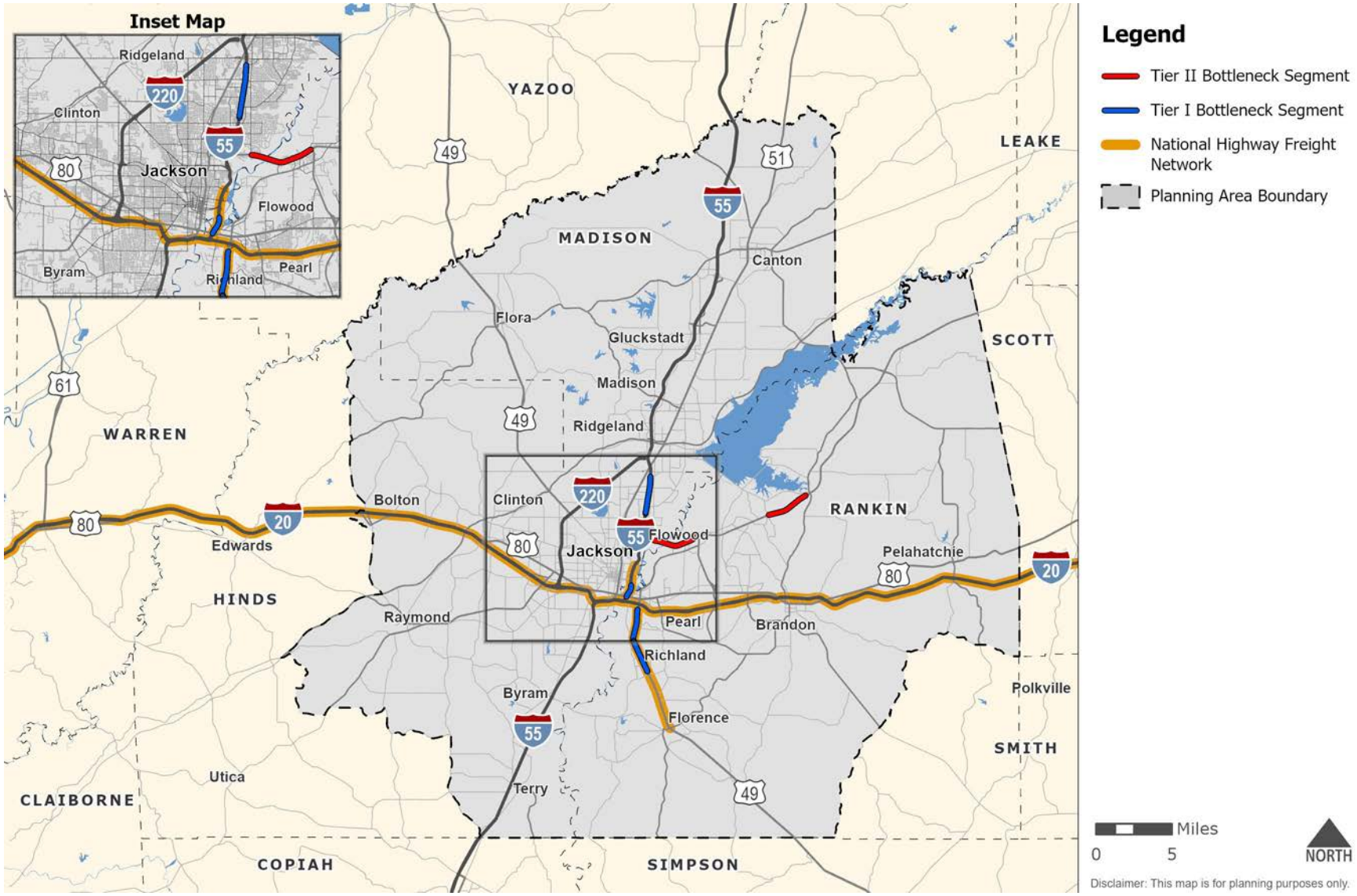
Bottlenecks are disruptions of vehicular traffic, which can be the result of several conditions on the roadways.

Common locations for bottlenecks include:

- Reduction of Lanes
- Weaving Areas
- Freeway On-Ramps and Exit Ramps
- Freeway-to-Freeway Interchanges
- Changes in Highway Alignment (Sharp curves and hills)
- Tunnels and Underpasses
- Narrow Lanes or Lack of Shoulders
- Traffic Control Devices (Traffic Signals)

Figure 4.7 displays the top bottleneck segments that overlap the state freight network within the MPO planning area.

Figure 4.7: Bottleneck Segments and Truck Freight Network



Source: RITIS Bottleneck Ranking Tool, 2024

4.5 Railways

The MPO planning area has approximately 160 miles of railroads, most of which are Class I railroads that are Tier I corridors within the Major Freight Network. Although the National Primary Freight Network does not include railroads, the railroads within the region are part of the National Multimodal Freight Network.

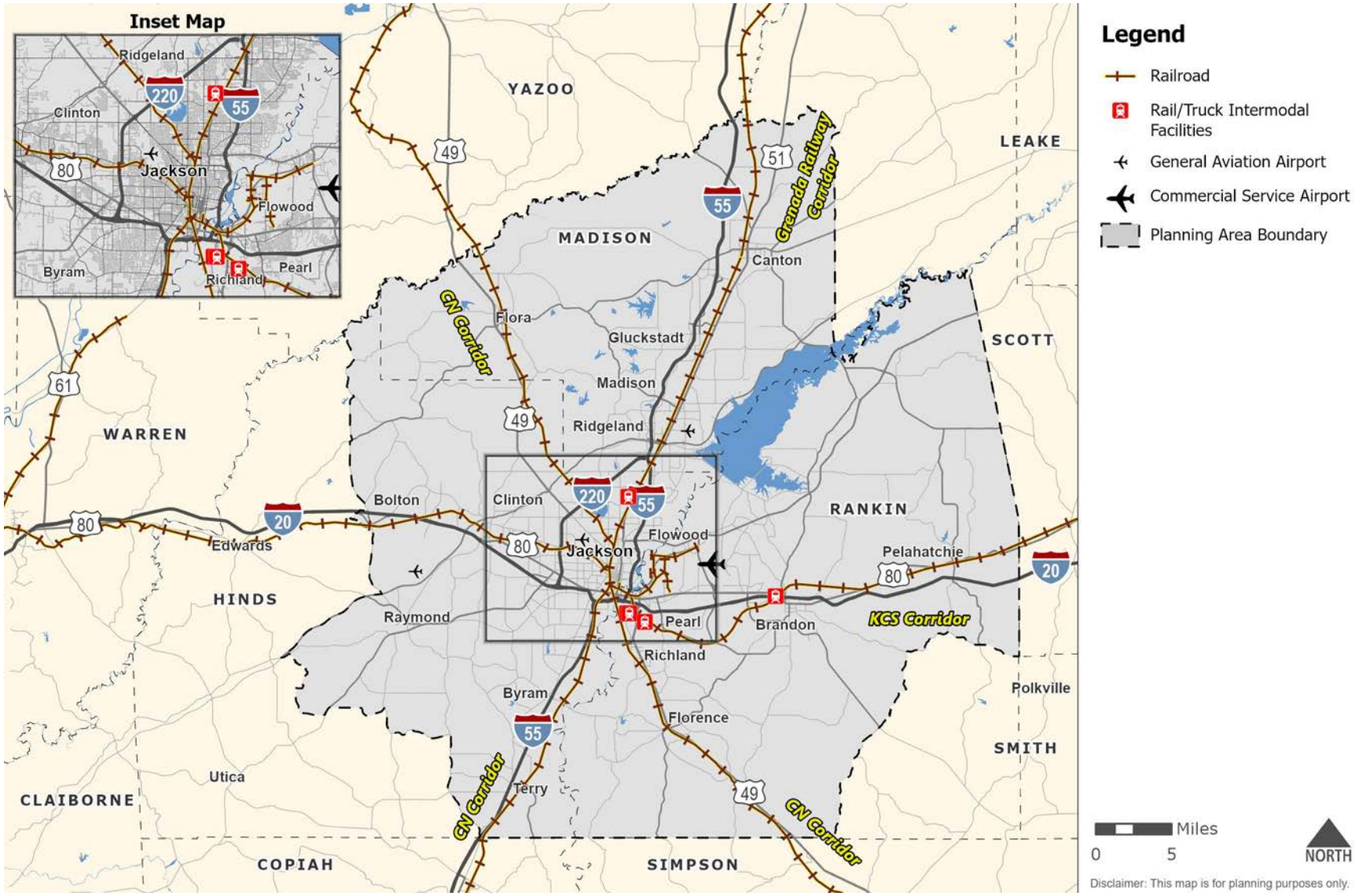
Table 4.3 lists the significant freight railroads within the planning area. **Figure 4.8** displays the region's railroads along with the Major Freight Network corridors.

Table 4.3: Significant Freight Rail Corridors in the MPO Region

Railroad	Abbreviation	Description
Kansas City Southern	KCS	The Kansas City Southern Railroad, running alongside the I-20 corridor, is part of the Tier I Vicksburg-Jackson-Meridian Corridor
Canadian National	CN	The Canadian National Railroad, running alongside the I-55 corridor, is part of the Tier I Southaven-Jackson-McComb Corridor.
Grenada Railway	GRYR	The Grenada Railway, running alongside the I-55 corridor from Memphis, TN, to Canton, MS, is a shortline Class III railroad with access to six Class I carriers on the rail corridor network.

Source: Mississippi Statewide Freight Plan, 2022

Figure 4.8: Freight Rail Network and Facilities



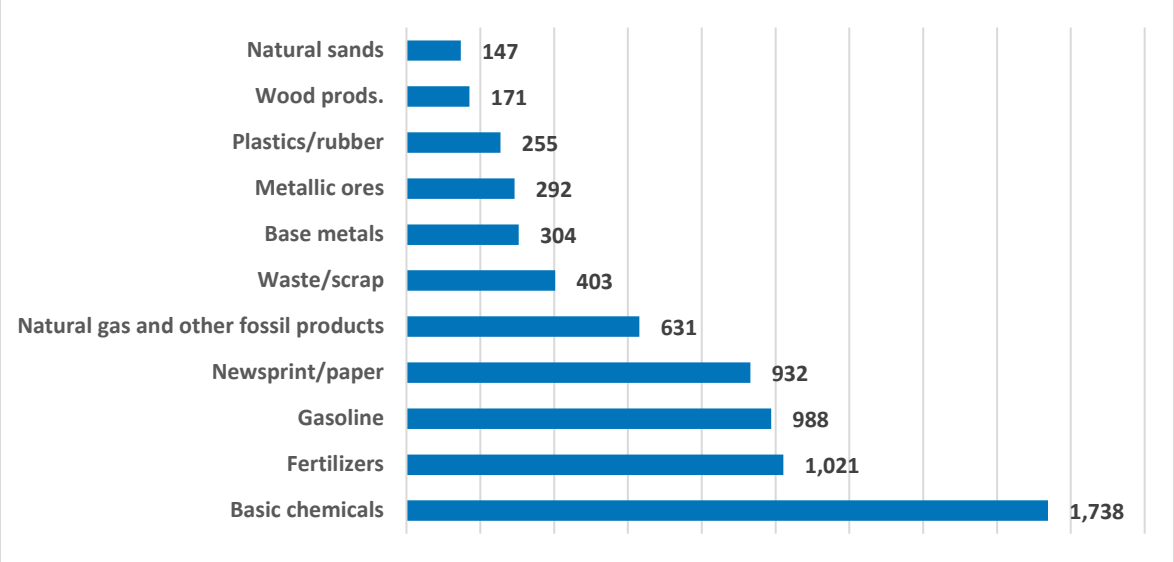
Source: NTAD, USDOT, MDOT

Commodity Flows

As shown in **Table 4.2**, less than 3 percent of the freight tonnage that originated in Mississippi in 2023 was transported by rail. Of this, **Figure 4.9** and **Figure 4.10** show the top commodities transported by rail by total weight and value, respectively.

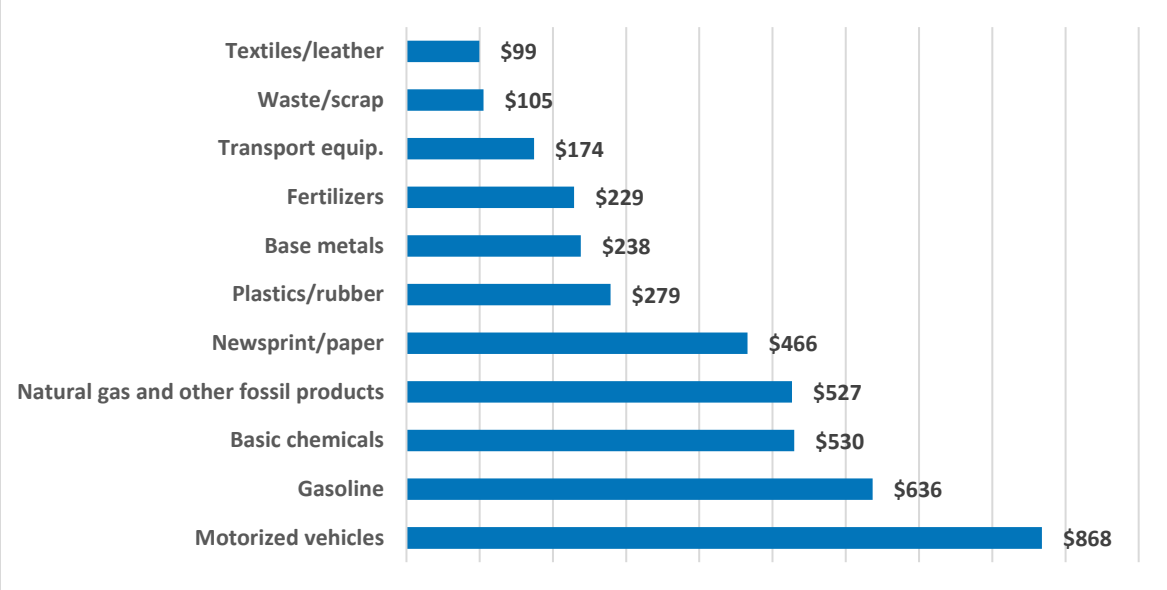
The top commodity by tonnage is Basic Chemicals, and the top commodity by value is Motorized Vehicles.

Figure 4.9: Top Commodities by Freight Rail Tonnage (Thousand Tons), 2023



Source: Freight Analysis Framework 5

Figure 4.10: Top Rail Commodities by Value (Million Dollars), 2023



Source: Freight Analysis Framework 5

Rail Safety

From 2019 through 2023, there were nine crashes involving an automobile and a train. According to the Federal Rail Administration, beyond the rail-automobile crashes, there were no additional reported train incidents in the MPO planning area from 2019 to 2023.

Crash data that involves "train" in Section 3, as shown in **Figure 3.13,** includes all crashes that involved a railway, regardless of the presence of a train.

Railroad Crossings Control Devices

To avoid collisions, warning/control devices are required at highway-railroad grade crossings. Warning devices are either passive or active.

- Passive devices include crossbucks, yield or stop signs, and pavement markings.
- Active devices include flashing lights, bells, and gates, in addition to most passive warning devices.

Table 4.4 shows the breakdown of the public at-grade highway-railroad crossings within the MPO planning area.

Table 4.4: MPO Planning Area Public At-Grade Highway-Railroad Crossings

Crossing Type	Number	Percentage
Active (Flashing lights and gates)	125	50%
Active (Flashing lights, no gates)	34	14%
Passive (Crossbucks and Stop/Yield Signs Only)	10	4%
Passive (Crossbucks Only)	81	32%
Total	250	100%

Source: FRA, 2024

4.6 Additional Freight Transportation Methods

Air Cargo

Historically, only a small amount of freight is typically shipped by air. However, the commodities transported this way tend to be high-value and time sensitive. Also, airports tend to serve as distribution and manufacturing hubs.

Inventory

The MPO planning area has four public airports:

- Jackson-Evers International Airport in Jackson;
- Hawkins Field Airport in Jackson;
- Bruce Campbell Field Airport in Madison; and
- John Bell Williams Airport in Raymond.

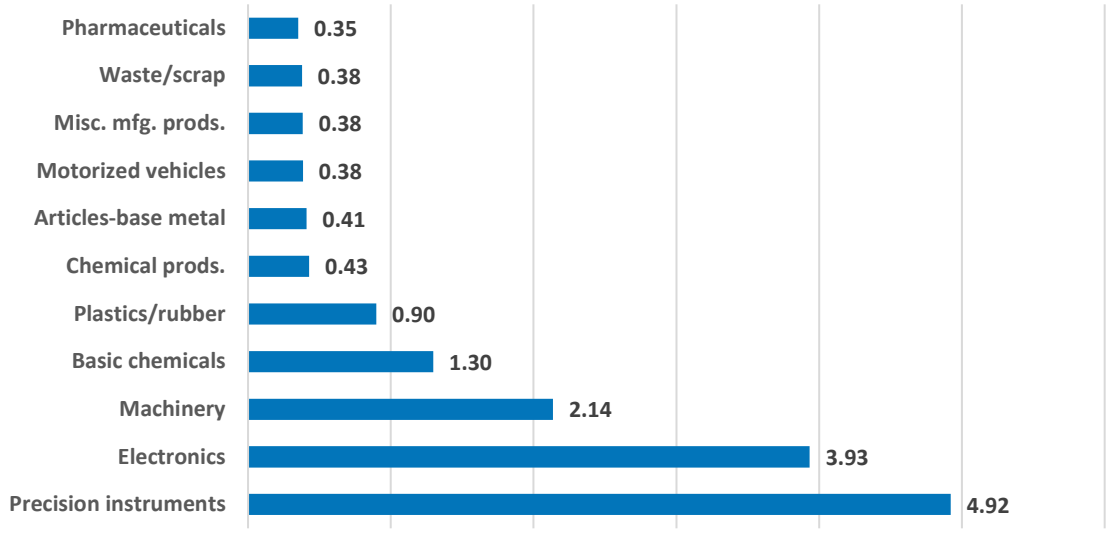
The Jackson-Evers International Airport is an intermodal facility, serving both air and truck freight. It has over 75,000 square feet of existing air cargo building space and 450,000 square feet of cargo aircraft parking space.

Commodity Flows

As previously mentioned, goods that are shipped by air tend to be high-value and time-sensitive. The goods shipped via air are transported either by all-cargo carriers, such as Federal Express or United Parcel Service, or by passenger airlines.

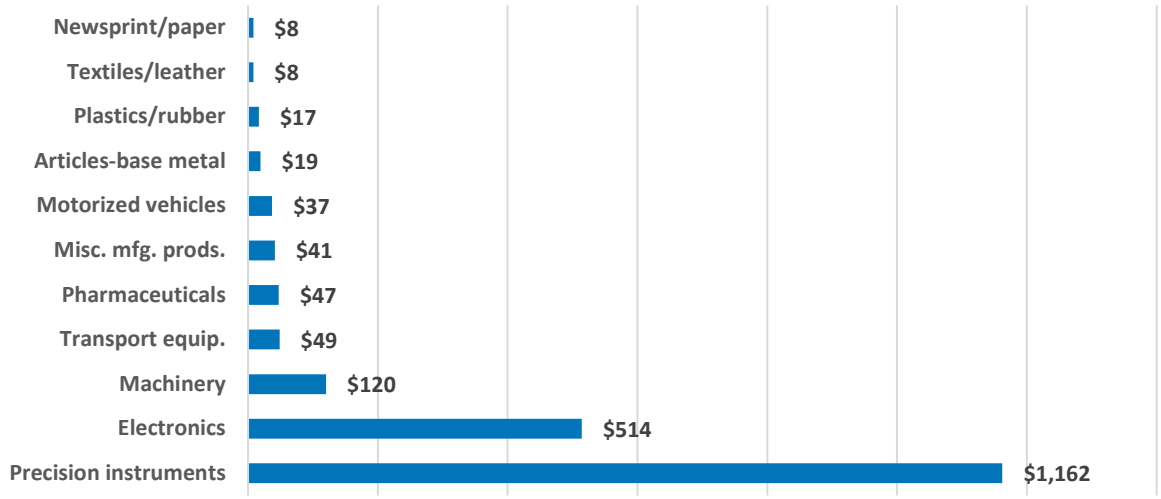
Figure 4.11 and **Figure 4.12** show the top commodities shipped via air by tonnage and by value, respectively. For each, the top commodity is precision instruments.

Figure 4.11: Top Air Commodities by Tonnage (Thousand Tons), 2023



Source: Freight Analysis Framework 5

Figure 4.12: Top Air Commodities by Value (Million Dollars), 2023



Source: Freight Analysis Framework 5

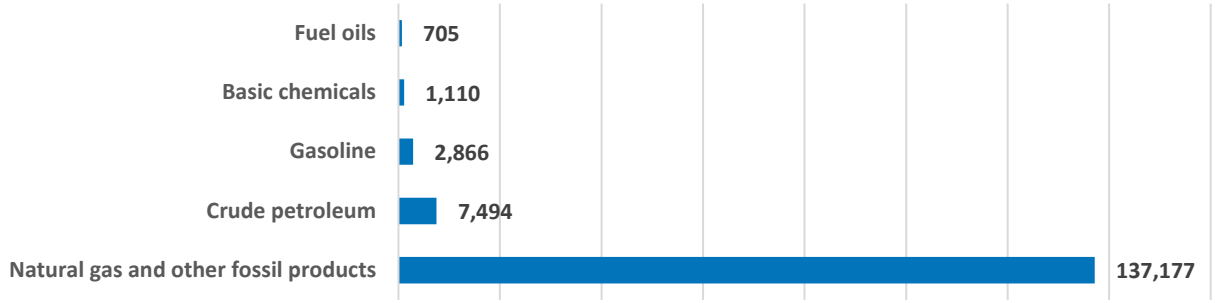
Waterway Network

There are no major port facilities within the MPO planning area. The closest major port is the Port of Vicksburg, located along the Mississippi River approximately 40 miles west of downtown Jackson. The Yazoo County Port is the nearest to the planning area; however, it is a small river port located in Yazoo City and does not serve as part of the region's waterway network.

Pipeline Network

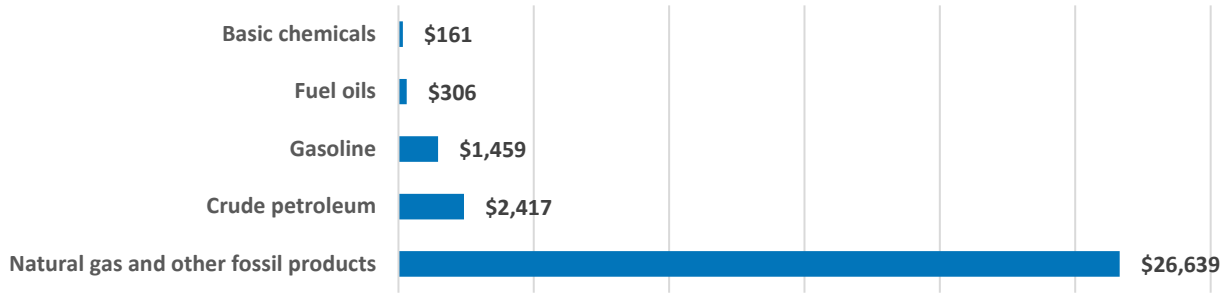
Mississippi's pipeline network consists of natural gas and other fossil products, basic chemicals, crude petroleum, and gasoline pipelines. By length, most pipelines are natural gas. **Figure 4.13** details the commodities carried by tonnage, while **Figure 4.14** displays the commodities by value, and **Figure 4.15** by length. **Figure 4.16** illustrates the MPO's planning area pipeline network.

Figure 4.13: Pipeline Commodities by Tonnage (Thousand Tons), 2023



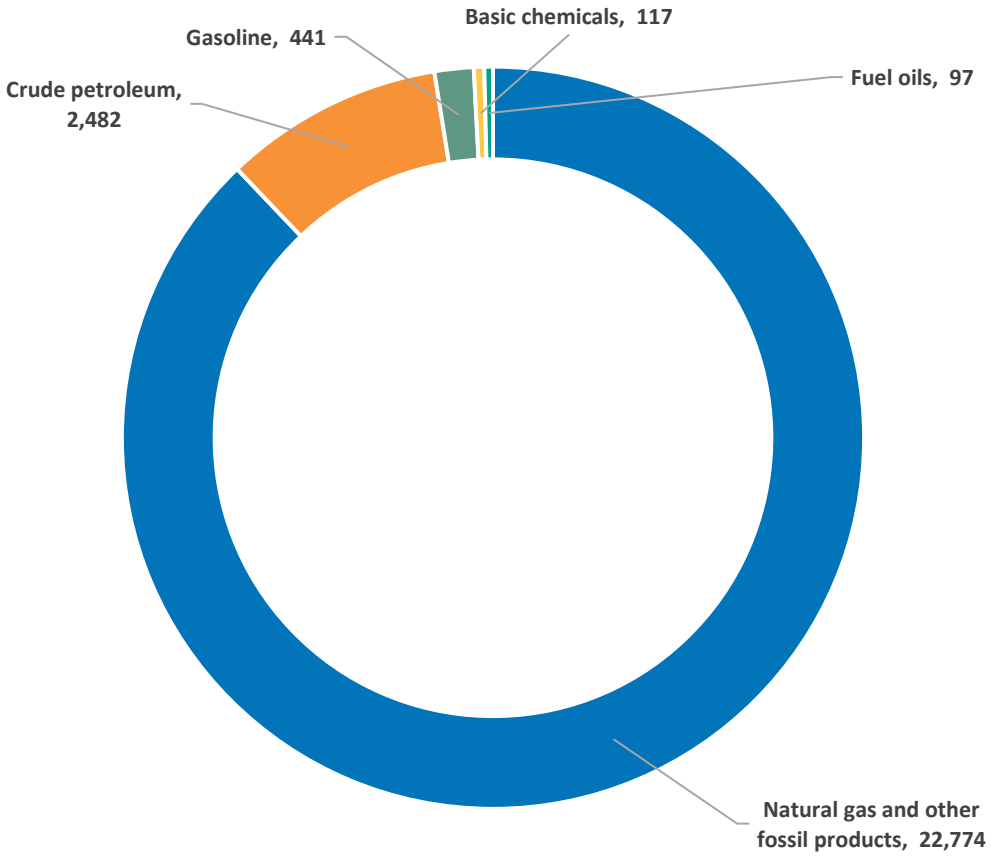
Source: Freight Analysis Framework 5

Figure 4.14: Pipeline Commodities by Value (Million Dollars), 2023



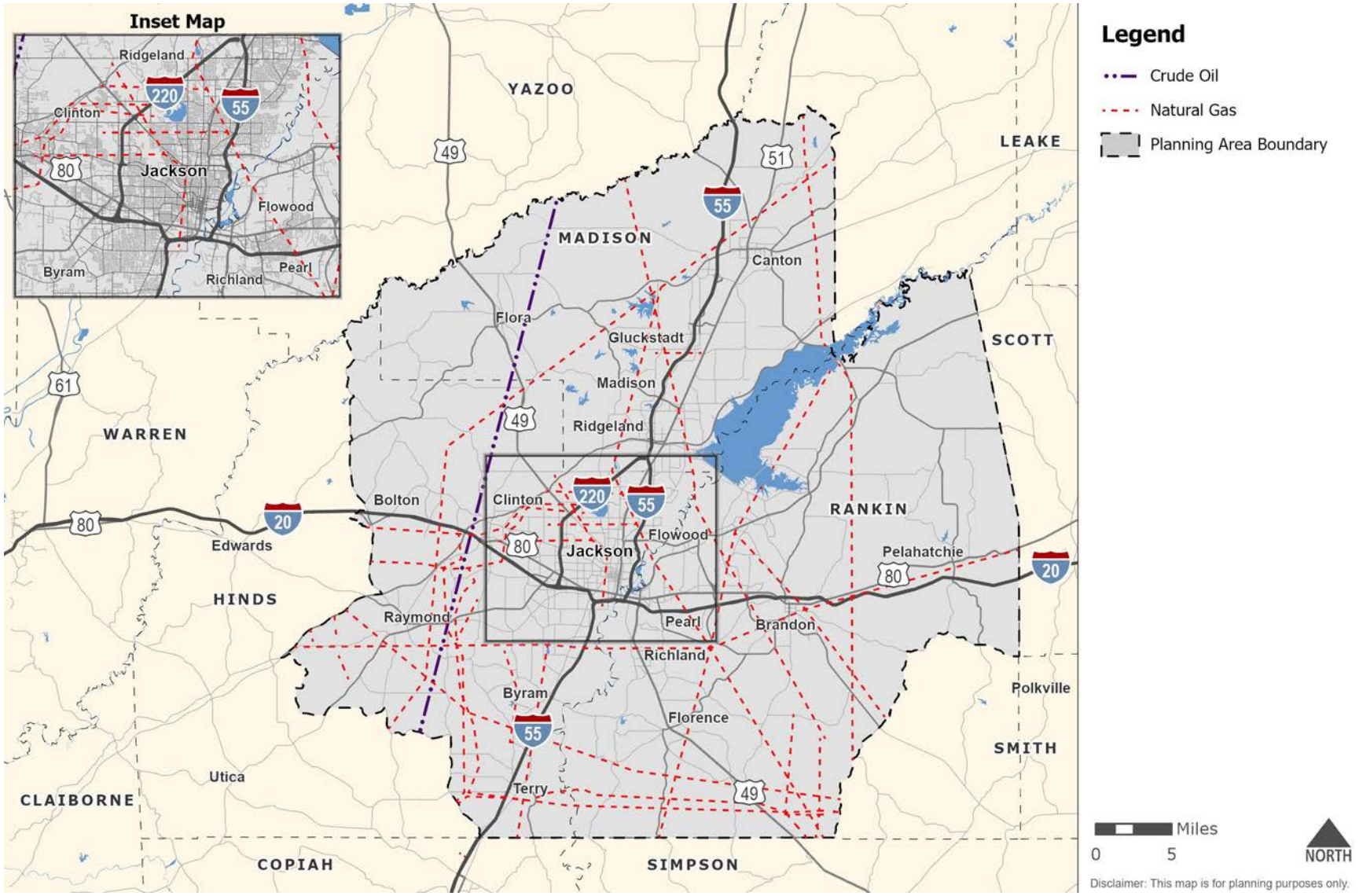
Source: Freight Analysis Framework 5

Figure 4.15: Pipeline Commodities by Length (Miles), 2023



Source: Freight Analysis Framework 5

Figure 4.16: Pipeline Network



Source: ESRI

5.0 Bicycle and Pedestrian

5.1 Classification of Bicycle and Pedestrian Facilities

The bicycle and pedestrian facilities in the MPO planning area are grouped into five classifications, including shared use paths, bike lanes, bikeable shoulders, bike routes, and sidewalks. **Figure 5.1** provides a brief explanation of these classifications.

Figure 5.1: Bicycle and Pedestrian Facility Type

Shared Use Path

- Physically separated from motorized vehicular traffic by open space, buffer or barrier.
- Typically, between 8 to 10 feet wide.
- Used by bicyclists, pedestrians, skaters, users of wheeled mobility devices and other non-motorized device users.

Bike Lane

- Portion of a roadway designated by striping, pavement markings and signage for the exclusive use of bicyclists.
- Located on both sides of a roadway and typically between 4 to 6 feet in width.
- Each lane is one way. Bicyclists travel in the same direction as motor vehicles.
- Lanes may be delineated between a travel lane and on street parking, curbs or the edge of pavement.
- Though they may be used by pedestrians, bike lanes are designed for the preferential use of bicyclists.

Bikeable Shoulder

- Functions similarly to bike lanes. Bikeable shoulders are delineated by using existing striping from the outermost vehicle lane to the edge of the shoulder.
- Located on both sides of a roadway. Should provide a minimum of four (4) feet of space for bicyclists from the outermost travel lane to the edge of the pavement.
- Each shoulder is one way with bicyclists traveling in the same direction as motor vehicles.
- Though they may be used by pedestrians, bikeable shoulders are designed for the preferential use of bicyclists

Bike Route

- Both bicyclists and motorists use roadways travel lanes.
- No striping delineating a portion of the roadway is set aside for bicyclists.
- Identified with appropriate directional and informational markers which read "Bike Route" or "Share the Road."
- It is recommended that any roadway classified as a bike route should have a minimum width of 14 feet, but be less than 16 feet, from striped center line.
- Routes are used by bicyclists. Pedestrians may use bike routes if there are no other alternatives; however, it is not recommended due to safety concerns.

Sidewalk

- Physically separated from motorized vehicular traffic by open space, buffer or barrier.
- Typically located within public right of way.
- Minimum width recommended by AASHTO and FHWA is 5 feet. Preferred width, to improve pedestrian mobility, is 6 feet.
- Should be continuous, unobstructed and located on both sides of a roadway.
- Mainly used by pedestrians. Bicycle usage should be kept to a minimum.

While each facility type is used to improve accessibility for the traveling public, there is no single bicycle and/or pedestrian facility that suits every user's needs. For example, sidewalks and shared use paths can be found along several roadways throughout the planning area; however, they do not provide the same functionality and thus should not be confused with one another.

5.2 Existing Inventory

The existing bicycle and pedestrian facilities network within the region consists of over 300 miles of shared use/bike paths, bicycle lanes, bikeable shoulders, bicycle routes, and sidewalks. These facilities are primarily located along or connected to roadways which are functionally classified as either Principal Arterials, Minor Arterials or Collectors.

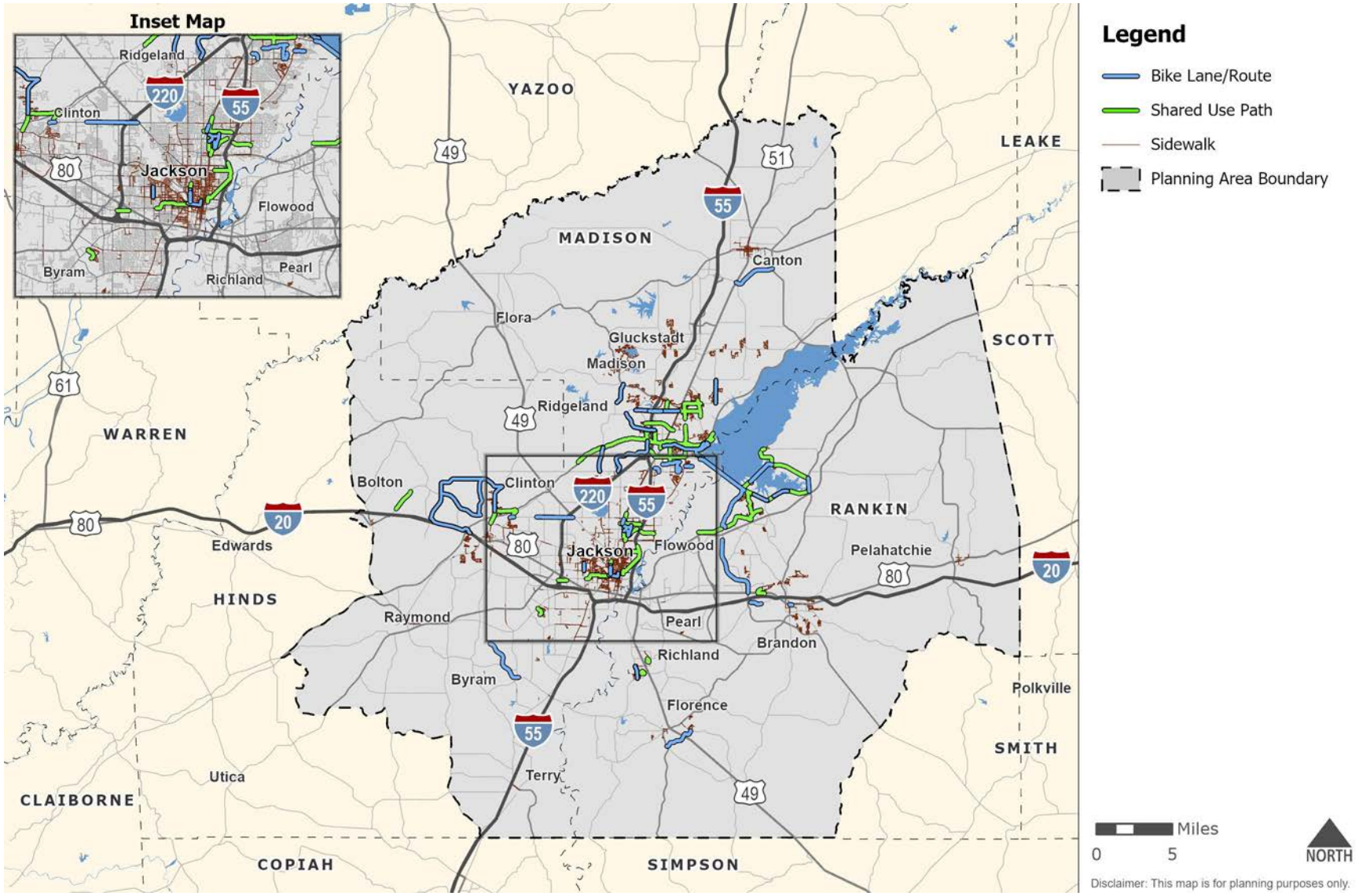
An inventory of existing bicycle and pedestrian facilities can be seen on the MPO's website[13] and in **Figure 5.2**.

Recent and Upcoming Projects

Within the existing inventory, there are several projects which have been completed since the 2045 Metropolitan Transportation Plan was adopted in 2020. **Table 5.1** details these bike and pedestrian projects; additionally, **Table 5.2** includes projects which are currently funded.

[13] https://cmpdd.org/viewers/

Figure 5.2: Existing Bicycle and Pedestrian Facilities Within the MPO Area



Source: CMPDD

Table 5.1: Bicycle and Pedestrian Facilities Completed Since 2045 MTP

Location	Beginning	Ending	Jurisdiction	Type
Museum to Market Trail	Mississippi St.	Laurel St.	Jackson	Path
Museum to Market Trail	Riverside Dr.	Children's Museum Entrance	Jackson	Path
Myrtle St.	Riverside Dr.	Laurel St.	Jackson	Route
Laurel St.	Myrtle St.	Museum to Market Trail	Jackson	Route
Little J Trail	W. Highland Dr.	Yarbro St.	Jackson	Path
Madison Ave.	End of Existing Path	Rice Rd.	Madison	Path
Boyce Thompson Dr.	Rouse Elementary	Marquette Rd.	Brandon	Lane
Eastover Dr.	District Blvd.	Eastwood Dr.	Jackson	Path
Old Canton Rd.	Old Canton Ln.	Lakeland Dr.	Jackson	Path
Eastover Dr.	Eastwood Dr.	Ridgewood Rd.	Jackson	Path
Cynthia Rd.	Arrow Dr.	Existing Path	Clinton	Path
Rice Rd. Ext.	Hwy. 51	Ridgeland City Hall	Ridgeland	Path
Arrow Dr.	Clinton High School	Pinehaven Rd.	Clinton	Path
Arrow Dr.	Clinton High School	Traceway Park	Clinton	Path
Rice Rd./Tisdale Rd.	Madison Ave.	Wellington Way	Madison	Path
Hoy Rd.	Old Canton Rd.	W. Bradford Place	Madison	Path
Mary Ann Dr.	Timber St.	North St.	Brandon	Lane
Dining St.	North St.	College St.	Brandon	Lane
Meadowbrook Rd.	Buckley Dr.	Northbrook Dr.	Jackson	Path
Woodgate Dr.	Hwy. 80	Gateway Dr.	Brandon	Path
Service Dr. Connector	Woodgate Dr.	Brandon Park	Brandon	Path
Museum to Market Trail	Myrtle St.	Museum Blvd.	Jackson	Path

Location	Beginning	Ending	Jurisdiction	Type
Museum to Market Trail	Riverside Dr.	Laurel St.	Jackson	Path
East Metro Pkwy	Airlane	Old Brandon Rd.	Brandon/ Flowood	Lane/ Sidewalk
Crossgates Blvd.	Old Brandon Rd.	Hwy. 80	Brandon	Lane/ Sidewalk
Marquette Rd.	Boyce Thompson Rd.	Existing Path	Brandon	Path
Luckney Rd.	Wirtz Rd.	Hartfield Academy	Flowood	Path
Mary Ann Dr.	Pearl Junior High School Entrance	Old Brandon Rd.	Pearl	Sidewalk
Reunion Pkwy Phase 3	Parkway East	Hwy. 51	Madison County	Path

Source: CMPDD

Table 5.2: Funded Bicycle and Pedestrian Facilities

Location	Beginning	Ending	Jurisdiction	Type
Highland Colony Pkwy.	Southtowne Ave.	Existing Path	Ridgeland	Path
Highland Colony Pkwy.	W. Parkway Place	Steed Rd.	Ridgeland	Path
Old Canton Rd.	Nichols Dr.	St. Augustine Dr.	Madison	Path
Bozeman Rd.	Gluckstadt Rd.	Hwy. 463	Madison County	Path
St. Augustine Dr.	Old Canton Rd.	Sherbourne Dr.	Madison	Path
Steed Rd.	Sunnybrook Rd.	Hallmark Hyundai Entrance	Ridgeland	Path
Steed Rd.	Existing Path	Highland Colony Pkwy.	Ridgeland	Path
Steed Rd.	Highland Colony Pkwy.	W. Parkway Place	Ridgeland	Path
Steed Rd.	The Blake at Township Entrance	Existing Path	Ridgeland	Path
Grants Ferry Pkwy.	Hwy. 471	Cornerstone Dr.	Brandon	Path
Fannin Landing Cir.	Arbor Landing	Fannin Landing Boat Ramp	Rankin County	Path
Flowood Dr.	Liberty Rd.	Lakeland Dr.	Flowood	Path
Lakeland Dr.	Liberty Rd.	East Metro Pkwy.	Flowood	Path

Source: CMPDD

Ridgeland Bikeshare Program

In 2024, a bike sharing service was launched in Ridgeland, MS in Madison County[14]. This is one of the first bike sharing programs in Mississippi. This service operates near access to the Chisha Foka Multi-Use Trail.

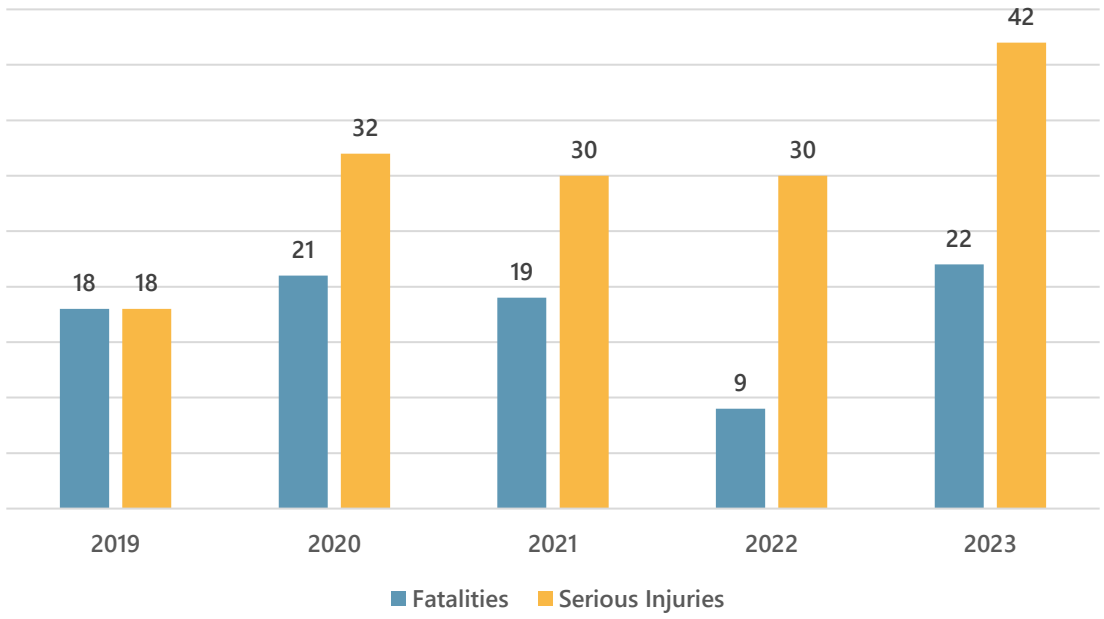
5.3 Safety

The Infrastructure Investment and Jobs Act requires MPOs and State DOTs to work collectively to examine performance data and establish targets for seven national performance goals focused on improving the overall transportation system, the first of which is safety. This goal requires State DOTs and MPOs to set targets for five safety-related performance measures and report progress toward their achievement annually. Each of the measures focus on achieving a significant reduction in traffic fatalities and serious injuries on all public roads. One of the safety performance measures focuses on reducing fatalities and serious injuries for non-motorized users of the transportation system.

As shown in **Figure 5.3** and **Figure 5.4**, between 2019 and 2023, there were 89 pedestrians and 9 bicyclists killed as a result of crashes involving non-motorized users within the MPO planning area. During that same span, there were 152 pedestrians and 10 bicyclists involved in crashes that resulted in serious injuries.

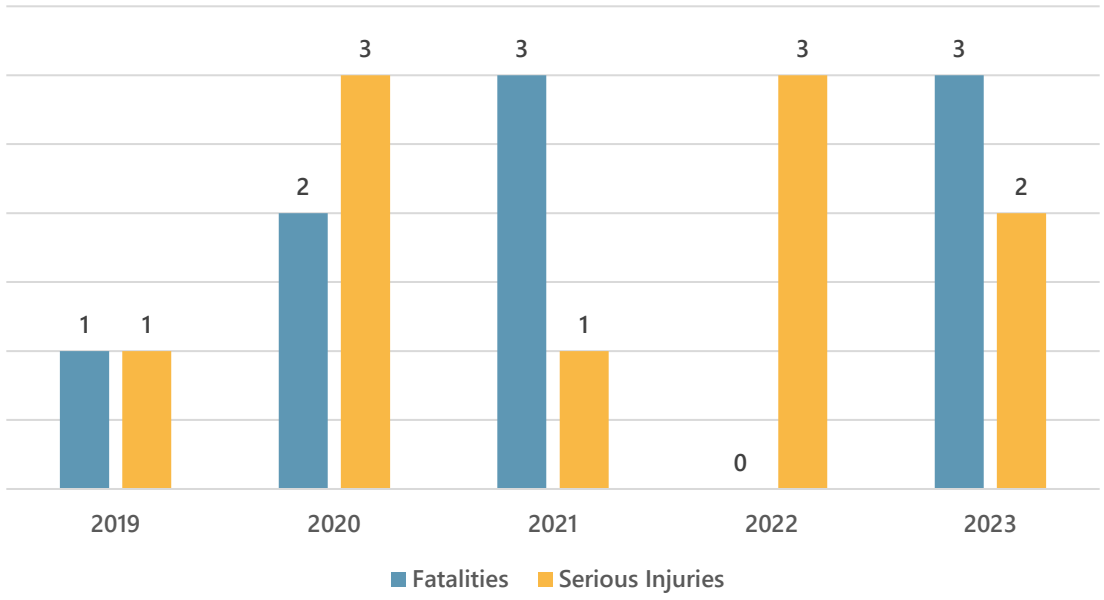
[14] https://www.exploreridgeland.com/things-to-do/outdoors/trails-parks-cycling/bikeshare/

Figure 5.3: Pedestrian Fatalities and Serious Injuries



Source: MDOT, 2024

Figure 5.4: Bicyclist Fatalities and Serious Injuries



Source: MDOT, 2024

5.4 Carbon Reduction Program and Complete Streets

As part of the Infrastructure Investment and Jobs Act, the Carbon Reduction Program[15] was created for the purpose of reducing transportation emissions.

To meet this need, emphasis areas were identified. These areas contain guidance on both different project types and elements within individual projects that should be considered to support nationwide carbon reduction goals. Within the scope of the MTP, the Mississippi Carbon Reduction Strategy, which aligns with the Federal Carbon Reduction Program, and guidance on Complete Streets, an identified emphasis area, are most impactful for planning considerations.

According to the FWHA,

"Transportation accounts for half of urban air pollution and 70 percent of U.S. oil consumption, resulting in the United States sending over $90 billion abroad to pay for petroleum imports in 2015. Better, more efficient transportation reduces pollution and puts money back into the American economy".

Mississippi Carbon Reduction Strategy

MDOT developed a Carbon Reduction Strategy that aligns with federal requirements and guidance, while addressing the unique context and transportation needs of Mississippi, to support carbon reduction efforts throughout the State. The development of this document included input from CMPDD, as well as other Mississippi MPOs, and resulted in the identification of five strategies that can be funded through the federal Carbon Reduction Program. These are[16]:

1. Transportation Technology
2. Congestion Management and Mitigation
3. Active Transportation and VMT Reduction
4. Energy Efficient and Green Construction Processes
5. Freight Efficiency

[15] https://www.fhwa.dot.gov/infrastructure-investment-and-jobs-act/crp.cfm

[16] https://mdot.ms.gov/documents/Planning/Plan/2023%20MS%20Carbon%20Reduction%20Plan.pdf

In addition to these strategies, focus areas that may be funded by the State or MPO were also identified and include:

- Streetlight Upgrades
- Zero Emission Vehicle Infrastructure
- Zero Emission Vehicle Fleet Conversion
- Signal Upgrades and Enhanced Intersections
- Bicycle and Pedestrian Facilities
- Intelligent Transportation Systems

Additional information about MDOT's Carbon Reduction Strategy can be found within the plan on the MDOT webpage.

Complete Streets

Complete Streets is a design philosophy that provides transportation users with multiple, safe travel options along a roadway, including both motorized and non-motorized users. Complete streets may include facilities designed that both physically share routes or those that use parallel, separated infrastructure. This design process allows those who prefer to walk and bicycle to have a safer and more comfortable experience, while still having access to mobility and the ability to conduct their business.

Examples of incorporating complete streets into design include:

- The addition of greenways and trails parallel to roadways
- The addition of pedestrian sidewalks
- The creation of a combined bike and pedestrian path
- Installation of median crossing islands
- Traffic calming measures
- The addition of bike lanes
- Road diets with the addition of bicycle/pedestrian lanes with streetscape beautification

The use of complete streets would enhance travel throughout the region by providing users with multiple options of travel, reducing roadway congestion, and increasing safety. A Complete Streets implementation strategy combines innovations from multiple disciplines to achieve the creation of safe, connected, and equitable street networks.

While complete streets will look different depending on the type of street, its function, traffic volumes, and level of community need, an example of complete street integration within an urban main street setting is depicted in **Figure 5.5.**

Figure 5.5: Example of Complete Streets Design

Source: Smart Growth America

5.5 Latent Demand Scoring

As part of the MTP, a Latent Demand Scoring was conducted to determine the locations within the MPO planning area where people are most likely to use or want bicycle and pedestrian facilities. The results can be seen in **Figure 5.6** and **Figure 5.7**. This analysis was based on various socioeconomic factors and the number and types of popular destinations within the planning area. The Latent Demand Scoring used the following categories, with the maximum possible score for each category shown in parentheses.

- **Age (10)**: Vulnerable populations who may be unable to use a vehicle. This is measured as people per acre under the age of 18 and over the age of 65.
- **Popular Destinations (15)**: Areas with a high density of popular destinations where people might want to travel to. These could include, but are not limited to, religious facilities, schools, grocery stores, etc.
- **Intersections (20)**: Areas with high density of roadway intersections. A higher density of intersections could indicate a suitable environment for biking and walking, while providing connectivity to the larger transportation system.
- **Zero-Vehicle Households (25)**: Households per acre with no vehicles. These households typically indicate low-income citizens who are more likely to bike, walk, or access the transit system.

- **Population and Employment (30)**: Areas of high general activity density. This shows not only where people live but where they work and undertake activities that may not necessarily be included in the popular destinations even though they are places people need or want to access.

The analysis was conducted at the block level to provide the most granular level of analysis available using 2020 Census data. These scores were then represented in the heat maps to determine where the greatest latent demand, or needs, for bike/ped facilities exist.

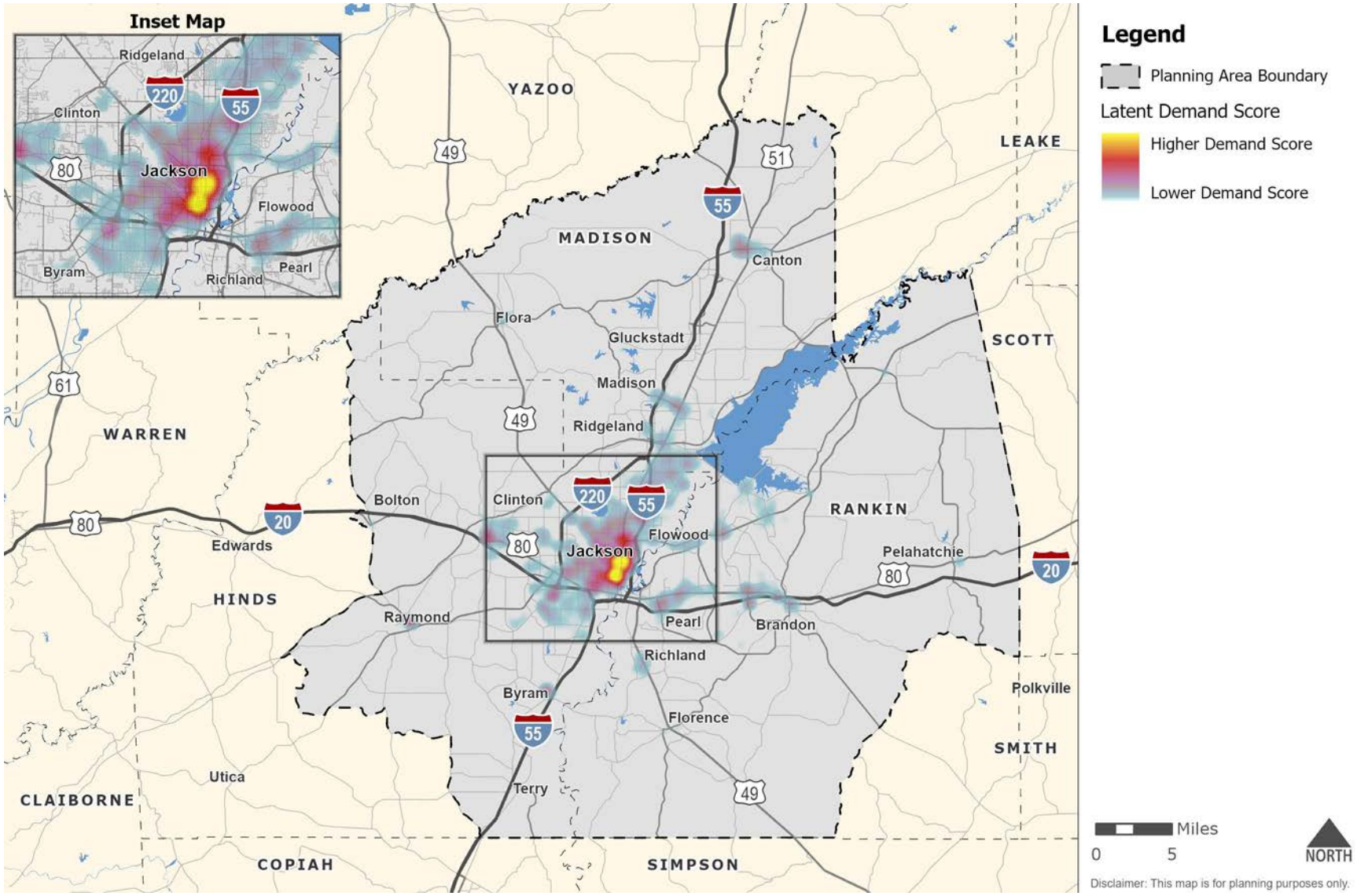
During the demand analysis, the greatest latent demand was recognized within the City of Jackson, especially towards the center of the city. To identify where the greatest need occurs outside of Jackson, the analysis was run an additional time with Jackson data excluded. This second analysis concluded that, outside of Jackson, the greatest needs can be found in or near:

- Brandon
- Madison
- Flowood
- Ridgeland
- Pearl
- Canton
- Richland
- Clinton

Figure 5.6 depicts a heat map showing where the greatest latent demand is located throughout the MPO planning area, with data from the City of Jackson included. **Figure 5.7** illustrates the same demand, but excludes data from the City of Jackson to better show other areas of need within the region. Each figure provides relative demand information, while the bicycle and pedestrian infrastructure inventory, discussed previously, provides figures and a list of existing facilities.

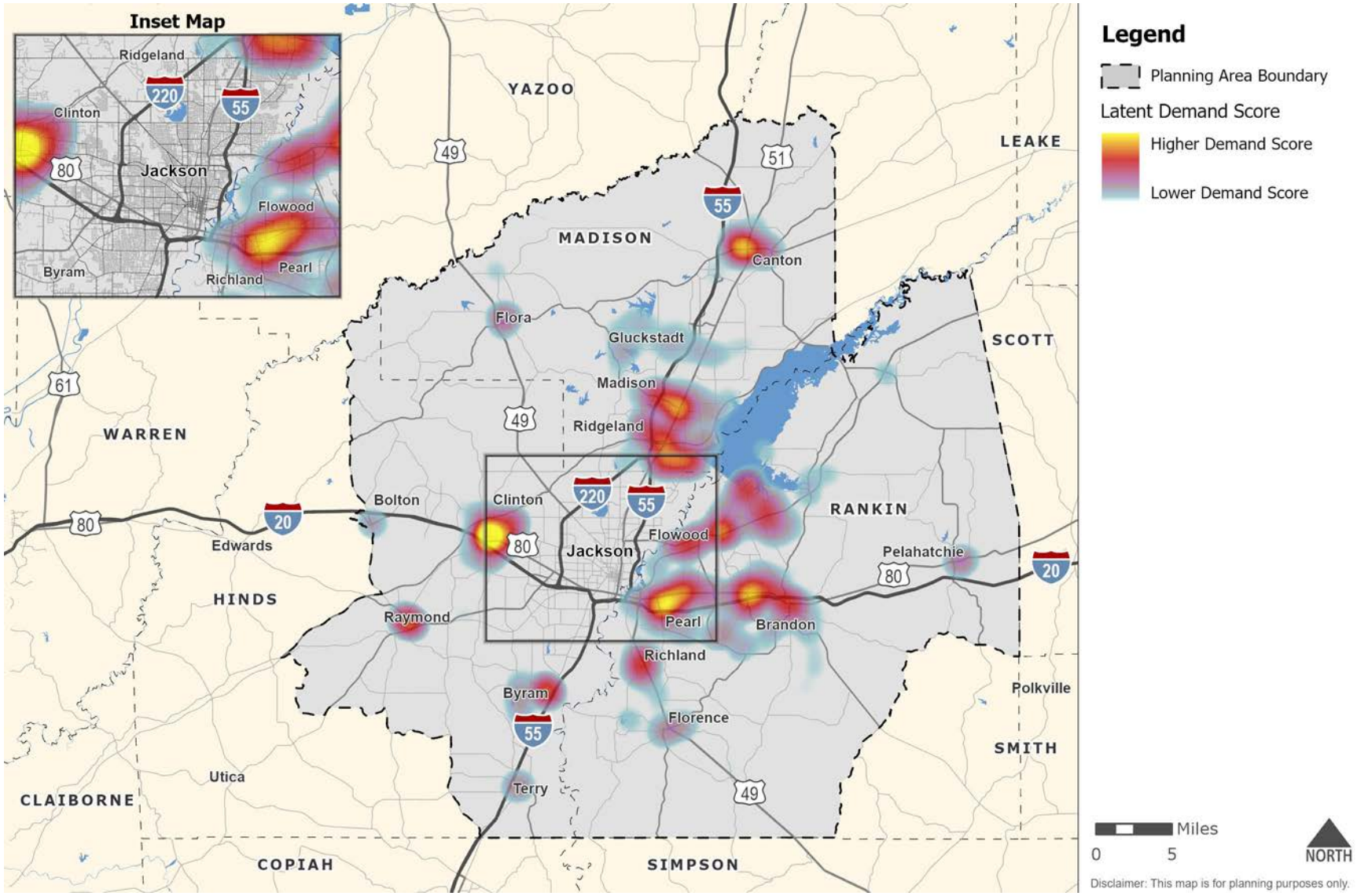
Outside of the City of Jackson, bicycle and pedestrian facilities are less frequent, resulting in service gaps in the MPO planning area. The discrepancy between the demand and inventory is known as a Needs Gap. The Gap analysis is discussed further in *Technical Report #4: Needs Assessment*.

Figure 5.6: Latent Demand Scoring Results – Entire MPO Planning Area



Source: NSI, 2024

Figure 5.7: Latent Demand Scoring Results – MPO Planning Area Without Jackson



Source: NSI, 2024

6.0 Public Transportation

6.1 Public Transit

Public transportation services in the MPO planning area play a key role in providing the community with access to the places they need to go, particularly for transit-dependent populations. Transit is a link to jobs and opportunities, connecting people to schools, health care, and their communities. Additionally, public transit has significant benefits for the entire community as it can increase local business access to skilled workers, reduce congestion and emissions, and foster walkable communities.

There are three primary transit usage patterns, which are:

- **Occasional riders** who take transit once in a while.
- **Commuters** who take transit regulary but only for work.
- **All-purpose riders** who take transit regulary for multiple reasons.

The goal is to engineer a transit system that encourages the creation of "all-purpose riders" by improving transit services, rather than being useful only to the traditional "captive riders". To do this, emphasis is placed on increasing the core system's strength and reliability to make the system more attractive to everyone. This can be achieved by:

- Fostering reliable, frequent service
- Increasing walkability
- Increasing frequency
- Travel time improvements

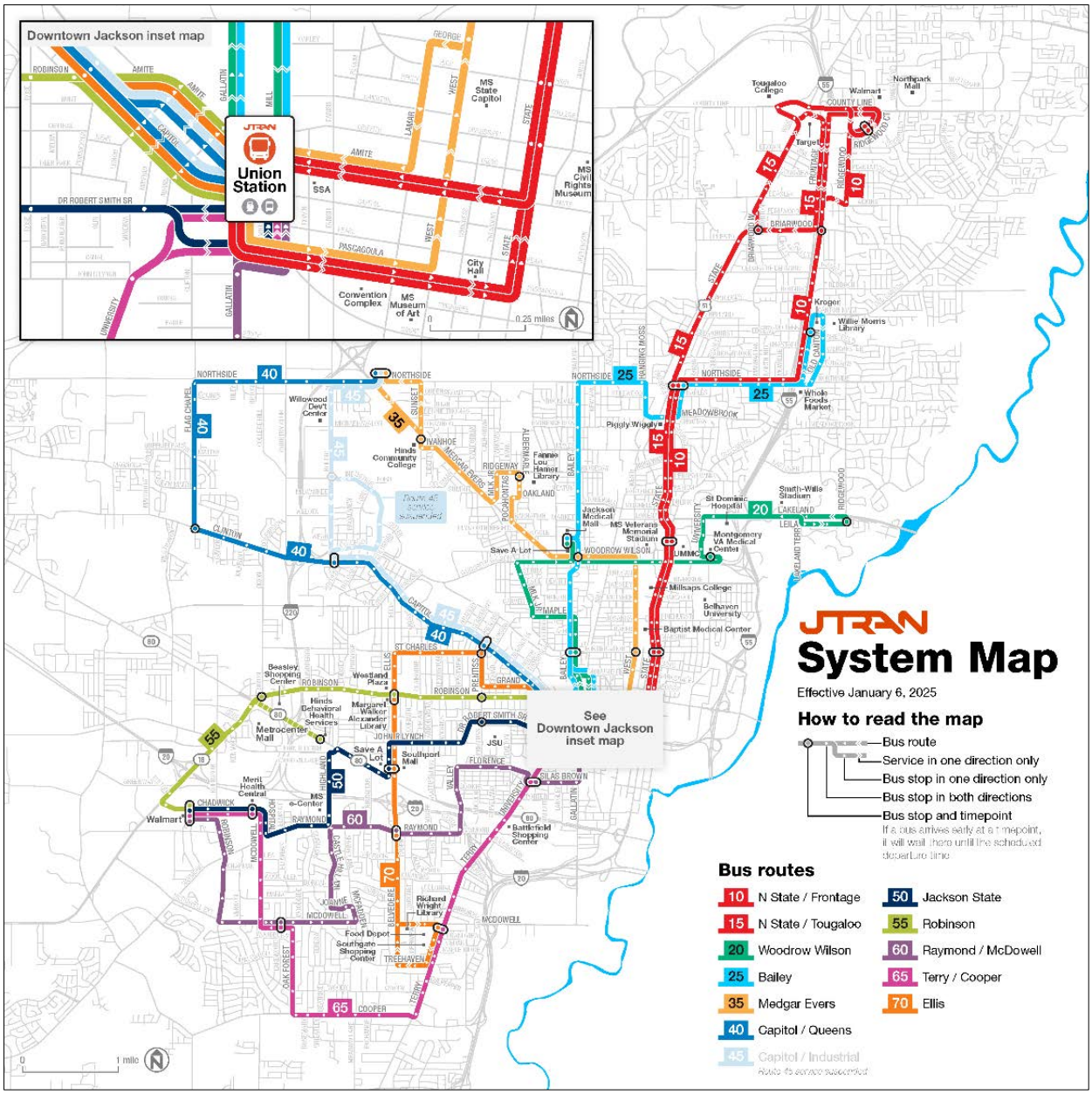
Without a good, reliable transit system, even those riders who often use transit out of necessity will find alternative transportation when possible. It is important to note that riders in all three of the usage patterns previously mentioned will supplement their use of the transit system with other modes of transportation, including using ride-sharing services, walking, cycling, or using an automobile.

Jackson Transit System (JTRAN)

Within the City of Jackson, JTRAN is the primary public transit provider, providing both scheduled, fixed-route bus service and paratransit service, for those who have a disability which prevents them from using the regularly scheduled buses. Currently, the JTRAN system has 11 fixed-route bus routes, which are displayed in **Figure 6.1.**

Additional information on the services provided, such as fares, specific routes, service areas, and updates to the service map or routes can be found on the JTRAN website (https://www.ridejtran.com).

Figure 6.1: 2025 Jackson Transit System Map

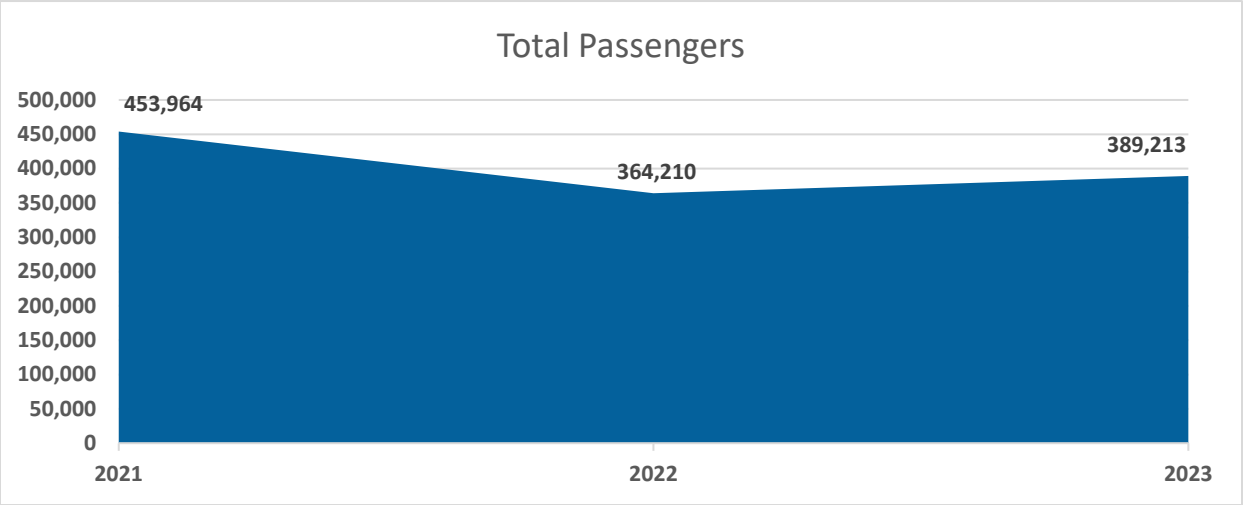


Source: JTRAN, April 2025

Ridership Trends

To understand existing ridership trends, three years of data were used to analyze post-COVID JTRAN ridership levels. This, depicted in **Figure 6.2**, illustrates an average ridership of around 402,462 passengers per year from 2021 through 2023.

Figure 6.2: Jackson Transit System Annual Ridership, 2021-2023



Source: NTA, 2024

Connect JXN Transit Plan

In 2022, JTRAN completed the *Connect JXN: Transit Plan* to improve the public transit system in the City of Jackson. This plan includes an overview of JTRAN's existing conditions, public outreach efforts, fixed-route, paratransit, and capital improvements, and existing expenses and revenue sources.

Of the strategies identified within the plan, the highest priorities were same day or on-demand trip booking, customer service mobile app for live vehicle tracking, and extension of service hours on weekdays. The full plan can be accessed on the JTRAN website at https://ridejtran.com/plans.

Other Transit Providers

In addition to JTRAN, multiple other transit services work to provide transportation options in the region. These focus on providing transportation options, especially for elderly, disabled, and persons living in rural areas, and include:

- Title XX Transportation,
- Rural Transportation Program,
- South Central Community Action Agency's Transportation Program,
- Senior Transportation Services, and
- CMPDD Area Agency on Aging Transportation Services.

Hinds County Human Resource Agency Transportation Services

Both Title XX Transportation and the Rural Transportation Program are services available through the Hinds County Human Resource Agency. While each service provides low-cost transportation options, Title XX Transportation provides transportation specifically for senior and disabled persons within Hinds County.

The Rural Transportation Program has affordable services available to all residents of rural Hinds County for trips to Jackson, Mississippi.

Madison County Citizen Services Agency (MCCSA) Transit Division

The Madison County Citizen Services Agency (MCCSA) provides transportation services to the residents of Madison County. This includes fixed commuter and popular destination routes, specialized transit trips, and demand response services. Low-cost and free options are available for Veterans, Seniors, and young children. Additional information can be found on their website: https://www.mccsaweb.org/.

South Central Community Action Agency's (SCCAA) Transportation Program

SCCAA is a nonprofit organization that serves residents within Simpson, Rankin, Copiah, and Hinds Counties. This includes transportation services, which are available by request to and from educational, medical, and occupational facilities[17]. Senior transportation is also available and provides older adults who qualify with an affordable transportation option to senior centers, drugs stores, medical appointments, or other personal errands.

Senior Transportation Services

The City of Jackson provides Transportation Services through their Senior Services Division. These services are available to seniors, aged 60 or older, who live within the City of Jackson. The City of Jackson website, located at https://www.jacksonms.gov, has additional information about the services available.

CMPDD Area Agency on Aging Transportation Services

CMPDD provides numerous services to residents within their region. This includes senior transportation services for aging adults, defined as those over 60 years of age, or those with a disability. Trip destinations may include medical or pharmaceutical facilities, senior centers, or other locations for obtaining needed goods or services. Information about the services provided through the Area Agency on Aging can be found on the CMPDD website at https://cmpdd.org/area-agency-on-aging/.

[17] https://www.yoursccaa.com/services/transportation/community-transportation/

6.2 Fixed-Route Regional Peer Comparison

Fixed-route regional peer comparison is a benchmarking tool that allows for an analysis of regional transit systems by comparing local services provided with those in regions with similar characteristics. The areas identified as being most similar and suitable for comparison, and selected for this analysis, are known as peer regions. Ideally, these regions have elements in common with the transit system studied, such as population of area served, geographical location (state or region), and type of services offered.

Since this is a regional long-range transportation plan, the criteria to select peer systems is somewhat different from the typical criteria used by transit agencies in short-range transit development plans. The focus is on the MPO planning area versus the service area of a particular agency.

Peer Selection Methodology

The Urban Integrated National Transit Database, provided by the Florida Department of Transportation, uses data from the National Transit Database and the 2023 American Community Survey, to identify urban transit systems across the United States which are most like one another. Criteria used to identify peer systems are:

- The presence of rail or heavy rail
- Service area population
- Total revenue miles
- Total operating budget
- Population density
- State capital
- Percent college students
- Population growth rate
- Percent low income
- Annual delay (hours) per traveler, freeway lane miles per capita
- Percent of service that is demand response

Based upon the above criteria, **Table 6.1** shows the four U.S. urban transit systems most similar to JTRAN. The peer selection module uses National Transit Database data, with exception to population, which uses Urban Integrated National Transit Database due to data conflation issues. The module data is shown in **Table 6.2**.

Table 6.1: Selected Peer Regions

Region	Urban Fixed Route System
Asheville, NC	ART (Asheville Rides Transit)
Augusta, GA	Augusta Transit
Beaumont, TX	BMT ZIP
Gretna, LA	Jefferson Parish Transit

Source: iNTD 2023

Table 6.2: Peer Fixed Route Systems Trends, 2023

Indicator	Asheville	Augusta	Beaumont	Gretna	Peer Average	Jackson
Service Area Population	93,350	204,484	82,731	440,781	205,337	160,628
Service Area Square Miles	45	25	41	94	51	101
Service Area Population Density	2,074	8,179	2,018	4,689	4,240	1,590
Boardings	1,377,810	405,478	264,742	1,360,309	852,085	389,213
Vehicle Revenue Miles	1,317,518	525,624	640,134	1,624,129	1,026,851	675,196
Vehicle Revenue Hours	103,055	45,181	47,030	123,793	79,765	47,011
Annual Operating Expense	$11,814,034	$5,314,497	$4,971,039	$17,257,651	$9,839,305	$5,690,018
Fare Revenue	$591,426	$316,755	$285,158	$1,990,097	$795,859	$275,947
Vehicles Operated in Maximum	33	18	17	42	28	14
Operating Expense per Boarding	$8.57	$13.11	$18.78	$12.69	$13.29	$14.62
Operating Expense per Vehicle Revenue Mile	$8.97	$10.11	$7.77	$10.63	$9.37	$8.43
Operating Expense per Vehicle Revenue Hour	$117.10	$124.85	$107.73	$147.86	$124.38	$132.51
Farebox Recovery Rate (%)	5.01	5.96	5.74	11.53	7.06	4.85
Average Fare	$0.43	$0.78	$1.08	$1.46	$0.94	$0.71
Vehicle Revenue Miles per Capita	14.22	2.71	8.01	3.99	7.23	4.33
Vehicle Revenue Hours per Capita	0.91	4.53	1.76	3.56	2.69	3.42
Boarding per Capita	14.76	1.98	3.20	3.09	5.76	2.42
Boardings per Revenue Mile	1.05	0.77	0.41	0.84	0.77	0.58
Boardings per Revenue Hour	13.66	9.53	5.74	11.66	10.15	9.06

Source: Urban iNTD, NTD

Fixed Route Regional Peer Comparison

The findings in **Table 6.2** provide relevant transit operations information for all fixed-route, urban transit services operating in the selected peer regions. The following is an overview of how JTRAN performed when compared to peer services.

Service Area Population:

- Jackson serves 22 percent fewer people (160,628 vs. 205,337) across an area twice as large.
- The Jackson area's population density is considerably lower than peer areas.
- This results in a less efficient and more costly system.

Service Supply and Usage

- Jackson has 55 percent fewer riders (389K vs. 852K) and operates 41 percent fewer hours than its peers.
- Jackson also operates 34 percent fewer miles (675K vs. 1M) than its peers, using a fleet that is half the size of other regions.
- Fewer vehicles, hours, and miles mean less frequent service, which can reduce ridership.

Financials

- Jackson spends 42 percent less ($5.69M vs. $9.84M) compared to its peers but collects 65 percent less ($276K vs. $796K).
- The average cost per rider in Jackson, $14.62 is greater than its peers at $13.29.
- Cost per revenue mile in Jackson is slightly cheaper than its peers.
- While Jackson spends less overall, it is less efficient per rider due to low ridership.

Fare Revenue and Recovery

- Jackson covers less of its costs with fares when compared to its peers (4.85% vs. 7.06%).
- Riders in Jackson on average pay a lower fare ($0.71 vs. $0.94).
- The lower fares make rides affordable but reduces revenue, increasing reliance on subsidies.

Key Takeaways

- The Jackson system serves a larger, lower-density area, making it harder to provide cost-effective service.
- Its lower usage and higher cost means that it has fewer boardings and a lower fare revenue, increasing reliance on subsidies.
- Overall, it is less efficient than its peers, and while Jackson is more cost-efficient by mile, it is less efficient by boarding and hour.
- This analysis shows that Jackson faces challenges from its larger, less-dense area and lower ridership, leading to higher costs and lower fare recovery.

Additional analysis for transit gaps, and potential solutions to those gaps and the existing services, are discussed in *Technical Report #4: Needs Assessment*.

6.3 Transportation Network Companies

A Transportation Network Company is a private company that matches passengers with vehicles, via websites and mobile apps. These are also referred to as ride-hailing services, with Uber and Lyft being the largest of these service providers. Currently, both Uber and Lyft serve the MPO planning area.

While these transportation services are not public transit, Transportation Network Companies are increasingly partnering with the public sector to test new ways to provide public, or subsidized, transportation. These pilot programs are still evolving, but many focus on providing trips in low-demand areas or times of day or for people with disabilities.

Additional services within the region include Greyhound and FLIXBUS, with a bus stop located in Jackson.

There is also Amtrak train service on the City of New Orleans route from Chicago to New Orleans. This stop includes a waiting room and is also located in Jackson.

7.0 Travel Demand Management

Travel demand management involves a set of strategies designed to change travel behavior and reduce Single Occupancy Vehicle trips. These strategies aim to reduce delays on local roadways during peak periods and are most effective when they are implemented on an area-wide basis with multiple levels of public and private support. **Figure 7.1** displays many of the most used travel demand management strategies.

Figure 7.1: Travel Demand Management Strategies

Carpooling

This strategy involves a group of people who live and work near each other commuting together in a single vehicle.

Vanpooling

This strategy involves allowing a group of people to share the ride, similar to a carpool but on a larger scale.

Transit

This strategy involves using transit to reach workplaces and other tasks. Generally, under this program, employers provide employees transit passes at discounted prices to encourage the use of transit to work.

Bike

This strategy involves using a bike to reach nearby destinations instead of a motor vehicle.

Telecommuting

This strategy involves allowing employees to work from home or another off-site location part-time or full-time.

Walking

This strategy involves encouraging students and employees to walk to their school or workplace.

8.0 Intelligent Transportation Systems and Emerging Technologies

Intelligent Transportation Systems are systems which use technology to help transportation networks perform more efficiently. This includes Transportation Systems Management and Operations, which represents a strategy for managing transportation networks by focusing on the utilization of technologies and other methods to mitigate congestion. Transportation Systems Management initiatives are essential for managing the complexities of modern transportation networks, allowing agencies to respond swiftly to incidents, disseminate real-time information to travelers, and optimize infrastructure use.

Within the State of Mississippi, MDOT leads Transportation Systems Management and Operations initiatives along with local partners such as the MPO to ensure a safe and efficient transportation network.

Through Intelligent Transportation System deployment, MDOT and the MPO leverage technologies such as Traffic Management Centers, Closed-Circuit Television cameras, and Dynamic Message Signs to monitor and manage traffic conditions effectively. These efforts are complemented by collaborations with local agencies, emergency services, and other stakeholders to create a unified approach to traffic management.

By utilizing advanced data analytics and proactive management techniques, Transportation Systems Management and Operations help to minimize travel delays, reduce emissions, and improve the overall quality of life for residents.

8.1 Existing Conditions

The MPO has established a robust inventory of transportation management systems that play critical roles in enhancing traffic operations and safety on area roadways. This inventory encompasses various technologies and strategies essential for real-time monitoring, traveler information dissemination, and traffic safety management. These systems, outlined in **Table 8.1**, can be organized into:

- Traffic Operations and Safety Management
- Traveler Information Systems
- Commercial Vehicle Operations
- Emerging Technologies

Table 8.1: Transportation Management Systems Inventory

Category	Systems
Traffic Operations and Safety Management	1. Transportation Management Centers 2. Communication Infrastructure 3. Traffic Signals 4. Closed-Circuit Television Cameras 5. Vehicle Detection Systems 6. Road Weather Information Systems 7. Smart Work Zones
Traveler Information Systems	1. Dynamic Message Signs 2. Highway Advisory Radio 3. MDOT Traffic Web Application
Commercial Vehicle Operations	1. Weigh-in-Motion Systems 2. Electronic Clearance Systems
Emerging Technologies	1. Electric Vehicles 2. Connected Vehicles 3. Autonomous Vehicles

Traffic Operations and Safety Management

Traffic operations and safety management are essential for ensuring the smooth functioning of the transportation network. This set of technologies and strategies focuses on monitoring traffic conditions, managing congestion, detecting hazardous situations, and responding effectively to incidents.

Traffic Management Centers

Traffic management centers are specialized facilities serving as central hubs for surface transportation systems. Their primary responsibility is to monitor and manage traffic through intelligent transportation system devices, enhancing roadway safety, and alleviating congestion. There are three traffic management centers in the MPO planning area. Two are located in Jackson and one is located in Ridgeland.

Communication Infrastructure

Communication infrastructure is a critical component of traffic operations and safety management, as it facilitates real-time data exchange between the regional traffic management center and Intelligent Transportation System devices operating in the area. This connectivity enables efficient traffic monitoring, incident detection, information dissemination, and adaptive control of traffic signals and other roadside

devices. The state relies on two primary communication methods: **fiber optics** and **cellular modems**[18].

Fiber optics infrastructure provides high-speed data transmission with significantly higher bandwidth and faster data transmission rates than other communication options. While fiber optics allow for fast transmission of information, they are not always an applicable option. To bridge this gap and extend coverage, **cellular networks** are used in areas where fiber optics are not currently deployed, or may not be feasible.

Traffic Signals

Traffic signals are a fundamental component of traffic operations and safety management. They play a critical role in ensuring the efficient movement of vehicles and pedestrians, enhancing road safety, and managing congestion on the state's roadways. These signals are managed by various agencies based on both the jurisdiction they are located in and the ownership of the roadway they are located on.

- MDOT manages traffic signals located on state roads.
- County Agencies manage traffic signals located on county roads within their jurisdiction.
- Municipalities manage traffic signals within their limits that are not situated on state or county roads.

Effective traffic signal management in the MPO planning area depends significantly on close collaboration with MDOT. The MPO has future plans[19] to coordinate traffic signal timing, allowing for the sharing of timing plans and joint operation of signals. This collaborative approach helps optimize traffic flow across jurisdictional boundaries, reducing delays and enhancing safety for all road users.

Closed-Circuit Television Cameras

Closed-circuit television cameras are a major component of the Intelligent Transportation System, providing real-time surveillance of the roadway network within the MPO area. As of 2024, the MPO's traffic management system consists of 106 closed-circuit television cameras[20] mostly deployed at key locations on Interstates and

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18 https://mdot.ms.gov/documents/Traffic%20Engineering/Manuals/MDOT%20ITS%20Design%20Manual.pdf

19 Central Mississippi Intelligent Transportation System (ITS) Architecture Plan Update

20 https://www.mdottraffic.com/default.aspx?showMain=true

state highways in and around the areas of Jackson, Ridgeland, I-55, and MS-25. These cameras are used to[21]:

- Detect incidents and verify location and type of incident.
- Determine appropriate responses to an unplanned event or incident.
- Monitor incident response and clearance.
- Monitor traffic conditions and congestion on mainlines and ramps.
- Monitor and operate traffic signals.
- Detect vehicle breakdowns, debris on the road, and unauthorized vehicles in restricted areas.
- Verify dynamic message sign messages and readability.
- Observe localized weather and other hazardous conditions along the roadway.
- Monitor assets.

Vehicle Detection Systems

The use of vehicle detection systems is predominantly located on arterial roadways and interstates. The four most common vehicle detection system deployments include:

- **Radar Detection Systems** detect vehicles and measure key traffic parameters such as speed, volume, and vehicle classification across multiple lanes. They provide continuous, real-time data on traffic conditions, making it well-suited for incident detection, traffic flow monitoring, and planning initiatives.
- **Bluetooth Detection Systems** gather travel time and origin-destination information by detecting Bluetooth-enabled devices within passing vehicles. Although not all vehicles are detected, this provides reliable travel time estimates, supporting applications such as corridor management and future connected vehicle technologies.
- **Video Vehicle Detection Systems** utilize cameras mounted above or beside the roadway to monitor specific zones within travel lanes. The system processes video images to identify vehicle presence, speed, volume, and classification. Video detection is particularly effective for real-time traffic management, including detecting wrong-way drivers and monitoring intersections for turning and lane-changing activities.

21 https://mdot.ms.gov/documents/Traffic%20Engineering/Manuals/MDOT%20ITS%20Design%20Manual.pdf

- **Loop Detection Systems** are installed beneath the roadway surface and use electromagnetic fields to detect vehicles passing over them. These detectors capture information on vehicle presence, count, speed, and occupancy, making them ideal for lane-by-lane traffic monitoring.

Roadway Weather Information Systems

A roadway weather information system is a network of sensors that collect and transmit essential weather data, including pavement and sub-surface temperatures, wind speed and direction, air temperature, visibility, precipitation, and humidity.

Smart Work Zones

MDOT employs Smart Work Zone systems[22] on large scale interstate improvement projects to enhance traffic safety and efficiency in work zone areas. These systems feature a variety of applications, including:

- queue detection
- speed monitoring
- travel time information
- alerts for construction equipment

By strategically deploying other Intelligent Transportation System technologies around work zones, MDOT collects and analyzes real-time traffic data. This data is used for disseminating important travel information to drivers, such as updates on lane closures, delays, speed advisories, and alternate routes. This, in turn, empowers drivers to plan their routes effectively, avoid delays, and navigate safely through and around work zones.

The MPO has identified Smart Work Zone technologies as a need in its Intelligent Transportation System Architecture Plan.

Traveler Information Systems

Traveler Information Systems play a vital role in providing real-time information to motorists, enhancing their ability to make informed travel decisions, helping improve safety and reduce delays on the highways.

Dynamic Message Signs

Dynamic message signs are roadway signs equipped with electronic displays that allow dynamic adjustment of messages or graphics to be presented to roadway users. These devices are primarily implemented at key decision points along major

[22] https://cmpdd.org/images/transportation/Intelligent-Transportation-Systems-Architecture/Central-Mississippi-ITS-Architecture-Plan-Update.pdf

corridors such as interstates and arterial roadways. As of 2024, there are 14 dynamic message signs deployed across the MPO area[23].

Highway Advisory Radio

As of 2024, MDOT maintains a network of Highway Advisory Radio antennas throughout the state. Highway Advisory Radio stations serve as an essential communication tool for providing information to the traveling public via AM, FM, and/or CB radio technologies. The primary objective of Highway Advisory Radio stations is to disseminate traffic and safety-related information, enabling travelers to make informed decisions about their intended routes and destinations.

MDOT Traffic Web Application

The MDOT traffic web application is an integral part of the region's traveler information systems, serving as a crucial resource for drivers by delivering comprehensive, real-time insights into traffic conditions and road safety. This application consolidates critical information into a single, user-friendly platform, empowering users to make informed choices about their travel routes. With its detailed map interface, the app allows users to access:

- alerts
- cancelled alerts
- road closures
- road work locations
- cameras
- message signs
- rest areas
- welcome centers
- posted bridges
- a traffic congestion map

Commercial Vehicle Operations

Commercial Vehicle Operations are crucial for maintaining efficient freight movement across the transportation network within the MPO planning area. This can include optimizing the flow of commercial traffic through various initiatives, including Weigh-in-Motion Systems and Electronic Clearance Systems. These efforts help ensure compliance with regulations, reduce congestion, and enhance the safety of both commercial and passenger vehicles on the road.

Weigh-in-Motion Systems and Electronic Clearance Systems

MDOT employs Weigh-in-Motion and Electronic Clearance systems to enhance commercial vehicle weight enforcement capabilities throughout the state. These systems consist of concealed scales embedded beneath the highway surface. As

[23] https://www.mdottraffic.com/default.aspx?showMain=true

trucks pass over these scales, a computer system instantly calculates crucial information, including the vehicle's weight, height, and axle count.

When a truck complies with legal and permitted limits, an LED indicator or a message is displayed, informing the driver that they can proceed without stopping at the scales. Conversely, if a truck exceeds the predetermined restrictions, the driver is directed to a nearby stationary weigh station for further inspection. By identifying overweight vehicles without impeding traffic or requiring trucks in compliance to pull off to be weighed, these systems help reduce congestion, enhance road safety, extend the lifespan of infrastructure, and facilitate accurate data collection for enforcement and transportation planning purposes. Examples of this technology currently in use include PrePass®[24] and Drivewyze®[25].

8.2 Emerging Technologies

Emerging technologies represent the forefront of innovation in transportation management, providing new solutions to enhance the efficiency and safety of the transportation network. These technologies have the potential to address impacts from trends that increase or alter how goods move, such as an increase in freight volume or in the severity of existing challenges, or the creation of new challenges. Understanding both trends and upcoming technologies is important for identifying potential operational solutions to the region's mobility needs.

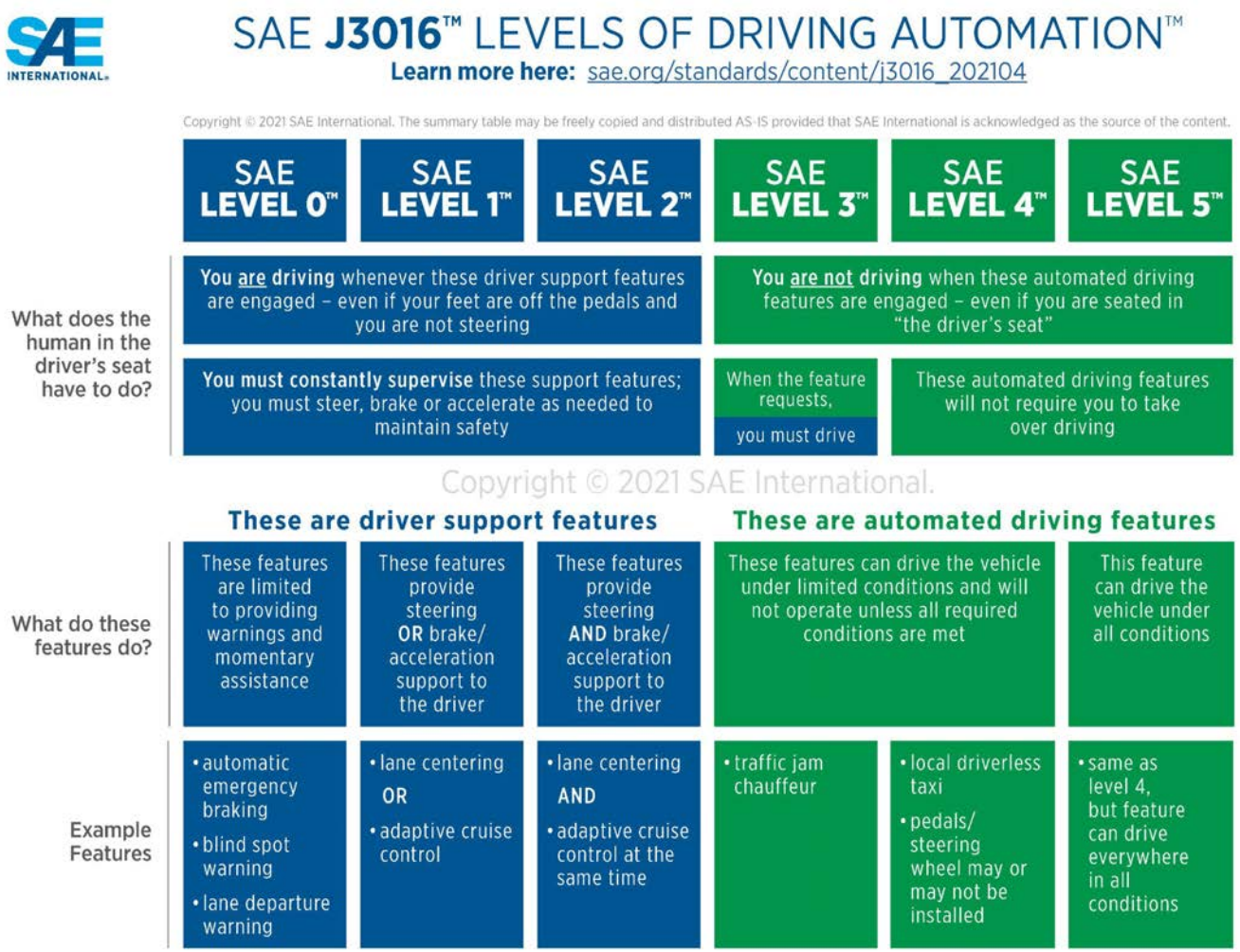
Connected and Autonomous Vehicles

The Society of Automation Engineers' automation levels classification scheme is the industry standard in terms of measuring the degree of automation in a vehicle, as shown in **Figure 8.1**. Levels one through three include Advanced Driver Assistance Systems, which consist of features such as blind spot monitoring, lane centering, and adaptive cruise control. Levels four and five have Automated Driving Systems and are more commonly referred to as autonomous vehicles, with the ability to be driverless in certain conditions.

[24] https://prepass.com/services/weigh-station-bypass-service/

[25] https://drivewyze.com/preclear/

Figure 8.1: SAE Levels of Automation



Source: Society of Automotive Engineers

Investments in connected and autonomous vehicle technology have been made at the federal, state, and regional level. Federal examples include the Ann Arbor Connected Vehicle Environment, Connected Vehicle Pilots Program, and the Advanced Transportation and Congestion Management Technologies Deployment Program.[26] USDOT also released its *Federal Automated Vehicle Policy in 2016, the Automated Driving Systems 2.0: Vision for Safety* in 2017, and *Preparing for the Future of Transportation: Automated Vehicle 3.0* in 2018, which provides more detailed guidance and best practices in terms of testing and deployment of automated technologies.

The Test Tracking Tool, put together by the National Highway Traffic Safety Administration, has become a helpful resource for tracking deployments.

Connected and Autonomous Vehicles for Passenger Transport

Autonomous vehicle technology has been increasingly applied in personal motor vehicles. This technology allows vehicles to navigate the environment around them using LiDAR or RADAR, as well as various external cameras and sensors. Connected and autonomous vehicles, with varying levels of automation and connectivity, are being designed, tested, and/or utilized for passenger transport in multiple ways, including with personal vehicles, rideshare, autonomous shuttle, and shared autonomous vehicle applications. Additionally, autonomous vehicle testing is ongoing and aims to bring fully autonomous vehicles onto public roadways.

- Personal-Vehicles are available to consumers from multiple manufacturers with Level 2 partial automation systems. These systems control steering and acceleration; however, drivers must be prepared to take control of driving.
- Rideshare is included in many autonomous vehicle testing efforts, allowing vehicles to be used as an additional mode of transportation to move larger volumes of people.
- Autonomous Shuttles are autonomous vehicles designed for lower-speed, specific routes. These types of vehicles, also referred to as specialized transit, are different in that they are built without a traditional driver's seat and operate at lower speeds, usually under 25 mph. As such, they can be ideal for servicing urban corridors or providing first or last mile connections to larger transportation systems.

[26] https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/320711/preparing-future-transportation-automated-vehicle-30.pdf

- Shared Autonomous Vehicle Applications tend to focus on providing mobility solutions through ridesharing vehicles or autonomous shuttles. However, it is important to note that autonomous vehicle technology has the potential to improve traditional public transportation vehicles as well. For instance, some companies have explored autonomous transit buses.
- Autonomous Vehicle Testing is being tested in controlled testbed facilities and on public roadways across the country. One prominent example within the U.S. is the University of Michigan's Mcity, which features more than 25 partners across both the private and public sector leading in autonomous vehicle testing.

Connected and Autonomous Vehicles for Freight Transport

While much attention on connected and autonomous vehicle technology has focused on passenger cars and the movement of people, an increasing number of trucks are utilizing these technologies for freight transport. Due to ongoing industry challenges to attract new drivers and the continued need to improve safety, the benefits of greater vehicle automation to the trucking industry are substantial and include reduced labor and fuel costs, reduced driver stress, fewer accidents, reduced congestion, and lower carbon emissions.

On a per-mile basis, labor and fuel are the two highest operational costs for the trucking industry. Autonomous trucks would significantly reduce both costs.

Another motivating factor behind the emerging trend of autonomous trucks is that it provides the ability for fleet operators to deploy trucks in platoons. Truck platoons use vehicle-to-vehicle communications and autonomous vehicle control technology to electronically "tether" tractor-trailers together in a convoy formation. This allows for greater fuel efficiency, which stems from reduced aerodynamic drag on the following vehicle(s). Vehicle-to-infrastructure technology allows the vehicle to also communicate with roadside infrastructure. This concept seeks to improve vehicle operation, safety and mobility, and impacts to the environment.

Personal Delivery Devices and Unmanned Aerial Systems

Personal delivery devices are smaller, lower-speed vehicles focused on the last-mile delivery of vehicles. Due to their size, they can navigate complex environments and operate on the road, bike lanes, or sidewalks.

Unmanned Aerial Systems, colloquially known as drones, utilize airspace for faster last-mile delivery. Although large companies have invested in unmanned aerial system programs, testing continues to largely occur in the public sector. Examples

include the Ohio Unmanned Aircraft Systems Center and the Lone Star UAS Center of Excellence and Innovation in Texas.

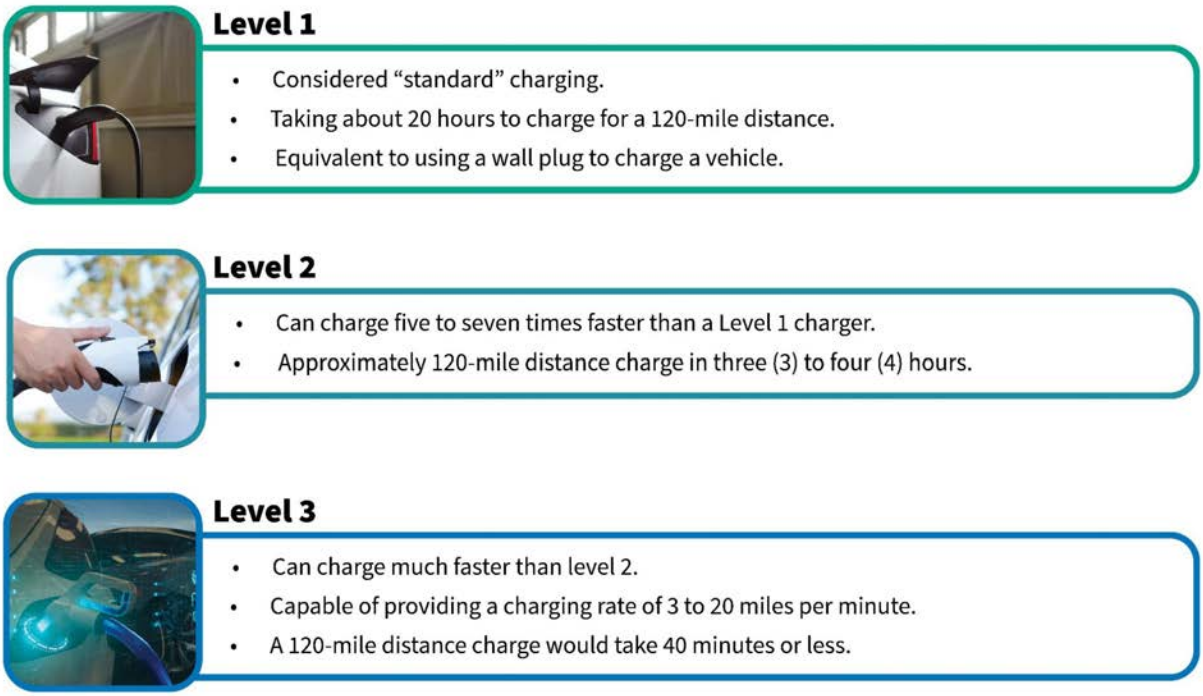
Vehicle Electrification

Advances in battery and fuel cell technology have allowed for the development of electric vehicles for both passenger and freight use. While numerous vehicle manufacturers have launched electronic vehicles into the U.S. market, these vehicles require charging and need a widely available charging infrastructure, such as charging stations, to be effective. This has prompted both federal and state governments to prioritize electric vehicle infrastructure investments.

As of 2024, the MPO planning area has 29 public charging stations, including[27] 19 stations with Level 2 Charging and 10 stations with DC Fast Charging (Level 3).

Currently, three levels of electric charging exist[28], shown in **Figure 8.2**.

Figure 8.2: Levels of Electric Charging

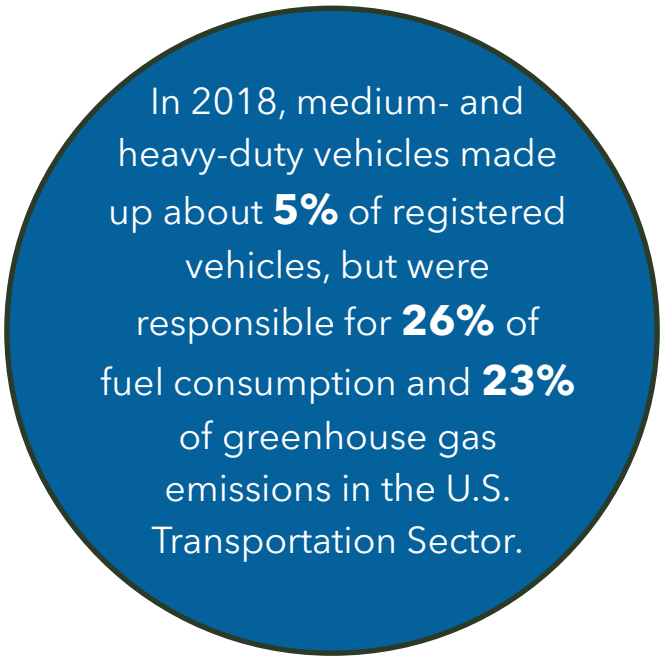


[27] https://afdc.energy.gov/stations#/analyze?region=US-MS&tab=fuel&fuel=ELEC&ev_levels=dc_fast

[28] Level 1, Level 2, or Level 3? EV Chargers Explained

Benefits of Vehicle Electrification

While passenger cars have generated the majority share of electric vehicles, electric trucks are seen as vital to reducing emissions and the environmental impact of the transportation sector. Electrification would also help to address important public health challenges through the reduction of airborne pollutants, such as tailpipe emissions, known to cause adverse health impacts. In addition to the ability of freight vehicle electrification to mitigate negative impacts, potential fuel cost savings is also a motivating factor.



Source: FHWA; EPA

Behind driver wages, fuel typically represents the second highest cost to motor carriers (about 24 percent of total cost) on a per mile basis.[29] Historically, electricity prices have been lower and more stable than gasoline and diesel prices, offering the opportunity for an industry characterized by tight profit margins to achieve considerable cost savings. As a result of these potential benefits to electrification, several operators of private and for-profit fleets have made investments in achieving electric and zero-emission fleets.[30]

Challenges to Vehicle Electrification

Despite the potential for electrification to generate personal and industry cost savings and positive environmental and transportation equity impacts, it is not without its challenges. Key barriers, ranging from upfront costs to concerns in the resiliency of electric grid infrastructure, each impact vehicle electrification trends. These barriers include[31]:

- **Higher Upfront Vehicle Costs** is perceived as one of the largest barriers to freight electrification. Besides batteries, which are the most expensive component of an

[29] American Transportation Research Institute, Operational Costs of Trucking, 2019.

[30] https://www.ttnews.com/articles/trucking-industry-making-strides-toward-electrification.

[31] https://www.electrificationcoalition.org/wp-content/uploads/2020/11/Electrifying-Freight-Pathways-to-Accelerating-the-Transition.pdf.

electric vehicle, other parts and components are also costly compared to diesel and gasoline equivalents. These costs particularly impact smaller carriers and owner-operators as they are not likely to have the capital or confirmed client demand to invest in electric vehicles.

- **Costly and Complex Charging Infrastructure Processes** is another of the largest barriers to deploying an electric fleet. To address this barrier, some automotive, utility, and infrastructure companies are testing technology that would allow for electric vehicles to charge while in-motion via under-road pads or overhead wires.[32] The process, known as dynamic charging, could reduce the cost of charging infrastructure.
- **Commercial and Industrial Electricity Rate Structures** could greatly reduce the financial savings of electricity over diesel or gasoline. While electricity charging costs in the U.S. are, on average, comparatively lower than diesel fueling costs[33], without greater flexibility in rate structures, it may be financially challenging for fleet operators to consider electrifying their fleets.
- **Limited Availability of Certified Service Centers and Technicians** may make fleet operators and users resistant to electrify their fleets/vehicles until they can be assured that timely repairs can be made to their vehicles to protect against extended periods of downtime.
- **Concerns with Grid Resiliency** surmise that without significant investments in utility upgrades to current grid infrastructure, local grid networks may be pushed beyond their current distribution capacity. This can create disruptions to services or a slowdown of electrification efforts. Evaluating the need for increasing grid distribution capacity is therefore essential to providing sufficient reliability to support a fully electrified transportation system.

32 Hodari, D., "These Companies Want to Charge Your Electric Vehicle as You Drive," Wall Street Journal, January 18, 2021.

33 "Fuel Prices." Alternative Fuels Data Center: Fuel Prices, U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy's Vehicle Technologies Office, https://www.afdc.energy.gov/fuels/prices.html.