2045 Metropolitan Transportation Plan

Technical Report #7

Congestion Management Process

Jackson Metropolitan Planning Organization

November 2020

PROMOTING REGIONAL EXCELLENCE SINCE 1968

CMPDD

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1.0 Introduction

1.1 Foreword/Background

A Congestion Management Process (CMP) is an analytical process that measures the operational effectiveness of major transportation facilities located within a Transportation Management Area (TMA), an urbanized area with a population greater than 200,000 people. A CMP proposes strategies required to address congested areas identified within a TMA.

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) required each TMA to develop a Congestion Management System (CMS). The following subsequent legislation has continued this requirement:

- The Transportation Equity Act for the 21st Century (TEA-21) in 1998
- Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005
- Moving Ahead for Progress in the 21st Century Act (MAP-21) in 2012

When SAFETEA-LU was passed, the CMS became the CMP, reflecting that the goal of the laws passed is to utilize a process that is an integral component of metropolitan transportation planning. Prior to the CMP, the CMS was often treated as a stand-alone data analysis exercise or report on congestion. Since the creation of the CMP, it is intended to be an on-going process, fully integrated into the metropolitan transportation planning process[1]. The previous CMP effort for the Jackson Urbanized Area was conducted in 2015 to:

- Analyze the Jackson Metropolitan Planning Area's (MPA's) transportation system.
- Determine which areas experience the greatest mobility and maneuverability issues associated with traffic congestion.
- Identify a wide range of congestion reduction scenarios that, if implemented, can aid in improving free flow traffic conditions.

1.2 Definition of Congestion and Purpose of Congestion Management Process

Congestion is defined as the delay compared to normal free-flow traffic conditions on major transportation systems that impedes traffic mobility and maneuverability. Traffic congestion has several negative side effects, such as an increase in goods transportation costs, increased fuel consumption, and lost work productivity. It also contributes to air pollution, negatively impacting the health of the MPA's residents and workers, and the environment.

[1] https://www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/cmpguidebk.pdf

A CMP is an effective tool that assists in the management of new and existing transportation facilities. It does so through the use of travel demand reduction scenarios and supply management strategies that promote traffic mobility and accessibility in the MPA.

1.3 Federal Guidance/Federal Legislation

Section 450.322 (a) of Subpart C (Metropolitan Transportation Planning and Programming), 23 CFR (Final Rule), states that:

> "The transportation planning process in a Transportation Management Area (TMA) shall address congestion management through a process that provides for safe and effective integrated management and operation of the multimodal transportation system, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53 through the use of travel demand reduction (Including Intercity bus operators, employer-based commuting programs such as a carpool program, vanpool program, transit benefit program, parking cash-out program, shuttle program, or telework program), job access projects and operational management strategies."

Section 500.109 (a) of Subpart A (Management Systems), 23 CFR (Final Rule), states that:

> "For purposes of this part, congestion means the level at which transportation system performance is unacceptable due to excessive travel times and delays. Congestion management means the application of strategies to improve system performance and reliability by reducing the adverse impacts of congestion on the movement of people and goods in a region. A congestion management system or process is a systematic and regionally accepted approach for managing congestion that provides accurate, up-to-date information on transportation system operations and performance and assesses alternative strategies for congestion management that meet State and local needs."

Section 500.109 (b) states of Subpart A (Management Systems), 23 CFR (Final Rule), states that:

> "The development of a congestion management system or process should result in performance measures and strategies that can be integrated into transportation plans and programs. The level of system performance deemed acceptable by State and local officials may vary by type of transportation facility, geographic location (metropolitan area or subarea and/or non-metropolitan area), and/or time of day. In both metropolitan and non-metropolitan areas, consideration needs to be given to strategies that manage demand, reduce Single Occupant Vehicle (SOV) travel, and improve

transportation system management and operations. Where the addition of general-purpose lanes is determined to be an appropriate congestion management strategy, explicit consideration is to be given to the incorporation of appropriate features into the SOV project to facilitate future demand management strategies and operational improvements that will maintain the functional integrity of those lanes."

1.4 Causes and Types of Congestion

Within the United States urbanized areas, people are migrating from the core areas to the "outer rings" and suburbs. This out-migration trend has placed a strain on the existing infrastructure. This has affected other public facilities including transit, rental cars, bicycle lanes, and taxis.

The strategic location of the MPA causes additional congestion within the Jackson MPA. Described as "the crossroads of the South", Jackson is located within 250 miles of several large metropolitan areas, notably:

- New Orleans, Louisiana;
- Memphis, Tennessee;
- Mobile, Alabama; and
- Birmingham, Alabama.

This results in additional through traffic as travelers head from one major metropolitan area to another. It also generates additional stops within the MPA to rest or conduct other business while in the area. These additional trips have created a large increase in traffic on I-55, I-20, and US 49S.

Congestion can generally be classified as either recurring or non-recurring.

Recurring Congestion

- **Recurring congestion is regularly occurring traffic congestion that happens at the same time every day during peak hours. This congestion occurs due to traffic demand exceeding roadway capacity.**

Non-Recurring Congestion

- **Non-recurring congestion occurs due to accidents, adverse weather, special events, work zones, and other factors that do not follow a predictable pattern. As such, non-recurring congestion is caused by non-standard or random events.**

1.5 Previous and Existing Congestion Management Strategies

Strategies in the 1970s proposed to reduce traffic congestion in the MPA by decreasing the number of Single Occupancy Vehicles (SOVs) on the roadways. These efforts were guided by proposed alternative travel methods and travel demand strategies, such as carpooling/vanpooling and transit park-and-ride facilities. However, motorists preferred the convenience that SOVs provide and the strategies proved ineffective.

Alternative congestion reduction methods have since been proposed, such as the use of alternative routes and more effective use of Intelligent Transportation Systems (ITS). By promoting the use of alternative routes, and creating additional access to those routes, the MPA has achieved some congestion reduction on the existing roadway network.

Advancements in ITS have had a substantial impact on improving free-flow traffic conditions in the MPA, resulting in a noticeable decrease in traffic congestion along transportation corridors throughout the area. The use of ITS within the MPA is comprised of:

- Dynamic Message Signs (DMS),
- Coordinated traffic signal improvements,
- Text message alerts for motorists, and
- Modernized existing infrastructure that uses new technologies

The addition of DMS and text message alerts provides motorists with real-time traffic data on events such as construction, potential safety conflicts, and traffic incidents. Disseminating this information in a timely manner provides motorists an opportunity to make informed decisions and select alternate routes that avoid congestion. It also allows drivers to prepare for unavoidable slow-moving traffic.

Traffic signal coordination has improved traffic flow along major corridors by synchronizing multiple traffic signals along the corridor. These low-cost improvements make it easier for motorists to travel the length of a segment in a timely manner. While the improvements do not guarantee a motorist will not be stopped at multiple signals, they reduce the potential for being stopped. These signal improvements "open up" intersections along the corridor, providing additional time for motorists to travel the corridor at a quicker pace. Coordinated traffic signals are necessary, and sometimes the only alternative, for reducing traffic congestion where capacity improvements are not possible due to land use restrictions or inadequate space.

1.6 Goals and Objectives

A goal is a broad statement that describes a desired end state, while an objective is a specific, measurable statement that supports the achievement of a goal. The goals and objectives of the CMP are:

Goal 1: Provide an efficient transportation system

- Support projects and policies that can reduce travel time delay
- Support projects and policies that address future transportation needs

Goal 2: Provide a safe transportation system

- Support projects and policies that can improve the safety for the transportation system user within the MPA

Goal 3: Promote transportation alternatives

- Support projects, policies, and programs to increase transit ridership
- Support projects, policies, and programs that promote use of bicycle and pedestrian facilities
- Promote awareness of multimodal facilities

2.0 Data and Network

2.1 Congestion Data Sources

The following data sources were used to conduct the congestion analysis within the MPA.

National Performance Management Research Data Set (NPMRDS)

The NPMRDS is a vehicle probe-based data set used by the Federal Highways Administration (FHWA) to support Transportation Performance Measures (TPM) reporting requirements, Freight Performance Measures (FPM), and Urban Congestion Report (UCR) programs. The data uses GPS information obtained from mobile phones, vehicles, and portable navigation devices to provide monthly passenger and freight vehicle average travel time in 5-minute intervals along the reported National Highway System (NHS).

INRIX

The INRIX data, which is used in the NPMRDS, provides probe-based data obtained from GPS. The traffic data is presented in 5-minute intervals along the NHS, while the expanded network includes some arterials and collectors. The expanded INRIX network was used as part of the CMP effort.

Travel Demand Model (TDM)

The Metropolitan Planning Organization's (MPO) TDM predicts trip-making behavior such as the number of trips, their origins and destinations, and most probable trip routes. The TDM used for this CMP has an existing year of 2018 and has a horizon year of 2045. The TDM contains data on existing conditions, socioeconomic forecasts, and anticipated growth in external trips to replicate current travel demand and develop forecast travel demand on the MPA's roadway network. The TDM can be used to conduct an existing conditions congestion analysis where NPMRDS and INRIX data is unavailable. It can also be used to conduct a congestion analysis for future conditions.

Google Traffic

A feature in Google Maps, Google Traffic displays traffic data using colored overlays on top of roads to represent the speed of traffic. It uses crowdsourcing to obtain the GPS locations of cellphone users and generates live traffic maps along roadway segments. This data, shown on a scale from fast (representing little congestion) to slow (representing heavy congestion), is displayed on a map. The data displays traffic conditions along a particular section of road at specific times on specific days. Google Traffic was used to corroborate the congested segment results obtained from the INRIX and TDM data.

Crash Data

Crash data obtained from the Mississippi Department of Transportation's (MDOT) Safety Analysis Management System (SAMS) was used to identify non-recurring congestion, since incidents along a network may result in excessive delays. The crash records included latitude and longitude data, as well as the:

- Time
- Location
- Severity
- Crash type
- Location conditions

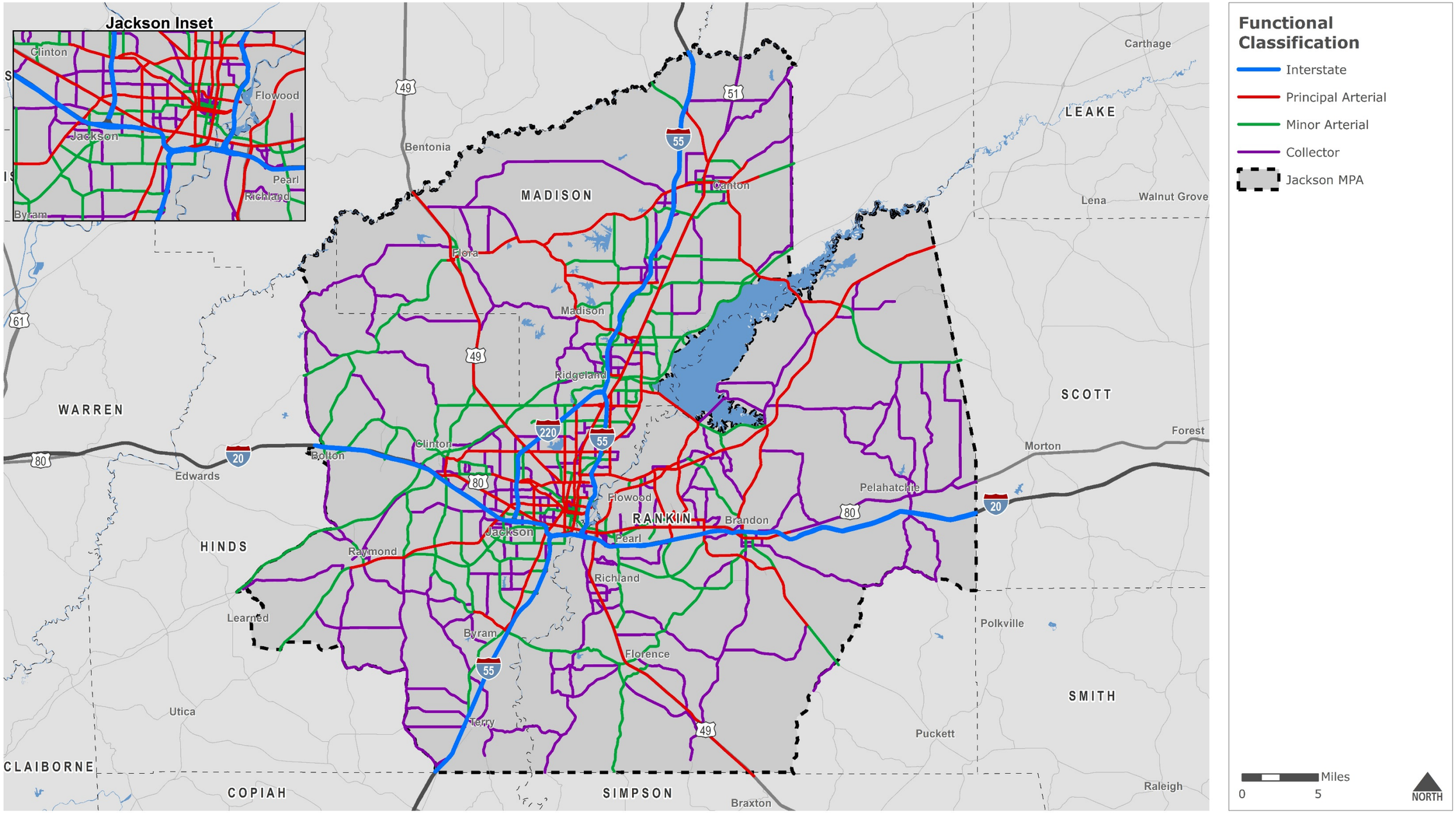
2.2 Network

The MPA's roadway network consists of five facility types. The facility types are:

- Interstates
- Principal Arterials
- Minor Arterials
- Collectors
- Local Roads

Each facility type provides separate and distinct traffic service functions, which are described in *Technical Report #2: Existing Conditions Analysis*. Their designs vary in accordance to the characteristics of traffic to be served by the facility. The CMP network includes all roadways within the TDM network that are functionally classified as a Collector or above. The boundaries of the MPA, and its CMP network, are shown in Figure 2.1.

Figure 2.1 Jackson MPA and CMP Network



Data Sources: MDOT

Disclaimer: This map is for planning purposes only.

2.3 Multimodal Mobility

The traditional understanding of congestion has been focused largely, if not solely, on automobiles. Typically, the standard solution for congestion reduction has been widening roads for automobiles. However, this solution usually induced more automobile travel, which may worsen the level of congestion that existed before the capacity expansion. By understanding congestion from a multimodal perspective, all modes can be considered as potential sources and remedies for congestion. Several studies have indicated that transit[2], walking, and cycling[3,4] can be tools to relieve automobile congestion.

Congestion also affects economic productivity. Growing freight demand increases congestion on the highway system as trucks and automobiles compete for space on the highway system while commuter trains and freight trains compete for space on the railroad network. This congestion affects both businesses and consumers as businesses require more operators and equipment to deliver goods while consumers wait longer for inventory deliveries[5].

Freight

The Jackson MPA is home to a large number of freight-generating establishments and is within proximity of several large metropolitan areas within the southern United States. These two factors mean that freight traffic has a major impact within the MPA. The major freight network within the Jackson MPA includes:

- Mississippi Freight Network Tier I Corridors
    - I-20/Kansas City Southern (KCS) Vicksburg-Jackson-Meridian Corridor
    - I-55/Canadian National (CN) Southaven-Jackson-McComb Corridor
    - US 49/Canadian National (CN) Jackson-Hattiesburg-Gulfport Corridor
- Mississippi Freight Network Tier II Corridor
    - MS 25 Jackson-Louisville-Starkville Corridor

[2] Nakamura, K., Hayashi, Y. (2013). Strategies and instruments for low-carbon urban transport: An international review on trends and effects. Transport Policy. 29, pp. 264–274

[3] Litman, T. (2014). Congestion Evaluation Best Practices. In: International Transportation Economic Development Conference. Sheraton Dallas Hotel, Dallas, USA. Apr. 09-11, 2014. pp. 1–20.

[4] Litman, T. (2018). Smart Congestion Relief - Comprehensive Evaluation of Traffic Congestion Costs and Congestion Reduction Strategies. Victoria Transport Policy Institute, Victoria, Canada

[5] https://ops.fhwa.dot.gov/freight/freight_analysis/freight_story/congestion.htm

- Additional major roadways
    - I-220
    - US 80
    - MS 18
    - MS 468
    - MS 475
- Additional major railroads such as the CN Railroad connection from Jackson to Canton
- Public airports
    - Jackson-Evers International Airport in Jackson
    - Hawkins Field in Jackson
    - Bruce Campbell Field in Madison
    - John Bell Williams Airport in Raymond

The economic consequences of delayed freight goods caused by congestion are very significant to the Jackson MPA. Data from the Jackson MPO TDM indicates that on the CMP Network the auto Vehicle Hours Delay (VHD) and auto congestion costs will increase by 92 percent from 2018 to 2045 and that truck VHD and truck congestion costs will increase by 86 percent during the same time period. *Technical Report #4: Needs Assessment* identified locations that experience freight congestion. Segments currently experiencing freight congestion, or are expected to experience freight congestion in 2045, are identified in Figure 5.3 and Figure 5.4 of *Technical Report #4* respectively.

Transit

Transit can provide people with mobility and access to employment, shopping, medical care, and other destinations and opportunities. For some, transit is a lifeline service for those who have no other choice due to economic or physical limitations. For others, transit serves as an alternative to driving as well as a cheaper method of travel. Using transit removes SOVs from the roadway network and reduces overall network congestion. This congestion reduction can also improve the reliability for transit. Projects that promote the use of transit help reduce congestion and eliminate the need for costly capacity improvements while reducing induced demand.

The Jackson Transit System (JTRAN) is the primary public transportation provided in the City of Jackson. JTRAN provides bus service and paratransit primarily within the City of Jackson. Intercity bus service is provided by private bus companies (e.g. Greyhound). In addition, Amtrak's "City of New Orleans" route runs through the Jackson MPA, offering train travel to and from the following cities:

- Memphis, Tennessee
- Chicago, Illinois
- New Orleans, Louisiana

The current transit conditions in the MPA can be found in Section 5.0: Public Transit of *Technical Report #2: Existing Conditions Analysis*, and the transit needs can be found in Section 7.0: Public Transit of *Technical Report #4: Needs Assessment*.

Bicycle and Pedestrian

Though bicycling and walking account for a relatively small portion of commuting patterns in both Mississippi and the United States as a whole, infrastructure that supports these modes expands commuter's transportation options. A seamless bicycle and pedestrian network would provide the MPA with a viable alternative to motor vehicle transportation and reduce the level of congestion by removing SOVs from the roadway network. Additionally, this network would produce benefits for the health of the MPA's residents and workers while improving regional air quality.

Bicycle facilities can include:

- Bicycle Lanes
- Paved Shoulders
- Marked Shared Lanes
- Shared Use Paths
- Cycle Tracks
- End of Trip Facilities

Pedestrian facilities can include:

- Sidewalks
- Crosswalks
- Enhanced Pedestrian Treatments
- Pedestrian Overpasses
- Pedestrian Amenities
- Shared Used Paths
- Curb Ramps
- Transit Stops
- Pedestrian Signals

More information on the current status of bicycle and pedestrian conditions in the MPA can be found in Section 4.0: Bicycle and Pedestrian of *Technical Report #2: Existing Conditions Analysis*, while bicycle and pedestrian needs can be found in Section 6.0: Bicycle and Pedestrian of *Technical Report #4: Needs Assessment*.

3.0 Congestion Measurement

3.1 Federal Guidelines for Measuring Congestion

Section 450.322 (d)(3) of Subpart C (Congestion Management Process in Transportation Management Areas), 23 CFR (Final Rule) states that a Congestion Management Process shall include:

"Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions. To the extent possible, this data collection program should be coordinated with existing data sources (including archived operational/ITS data) and coordinated with operations managers in the metropolitan area."

The following performance metrics are the calculated parameters used in this CMP effort. They serve as indicators to characterize the usage of a transportation facility or the characteristics of travelers using the system. The metrics were used to determine which roadways segments are congested, with the methodology described in later sections.

Volume-to-Capacity Ratios

The Volume-to-Capacity (V/C) ratio is defined as the demand flow rate over the capacity available for a traffic facility. The V/C ratio can be used independently as a measure of congestion in many studies; however, this CMP effort identifies other measures to supplement the V/C ratio.

Travel Time Index (TTI)

The TTI measures the amount of time delay that occurs when travelling a roadway segment. It is calculated by dividing the highest peak travel time (morning, midday, or afternoon) by the free-flow travel time. The TTI represents the increased travel time drivers experienced when travelling compared to the free-flow travel time.

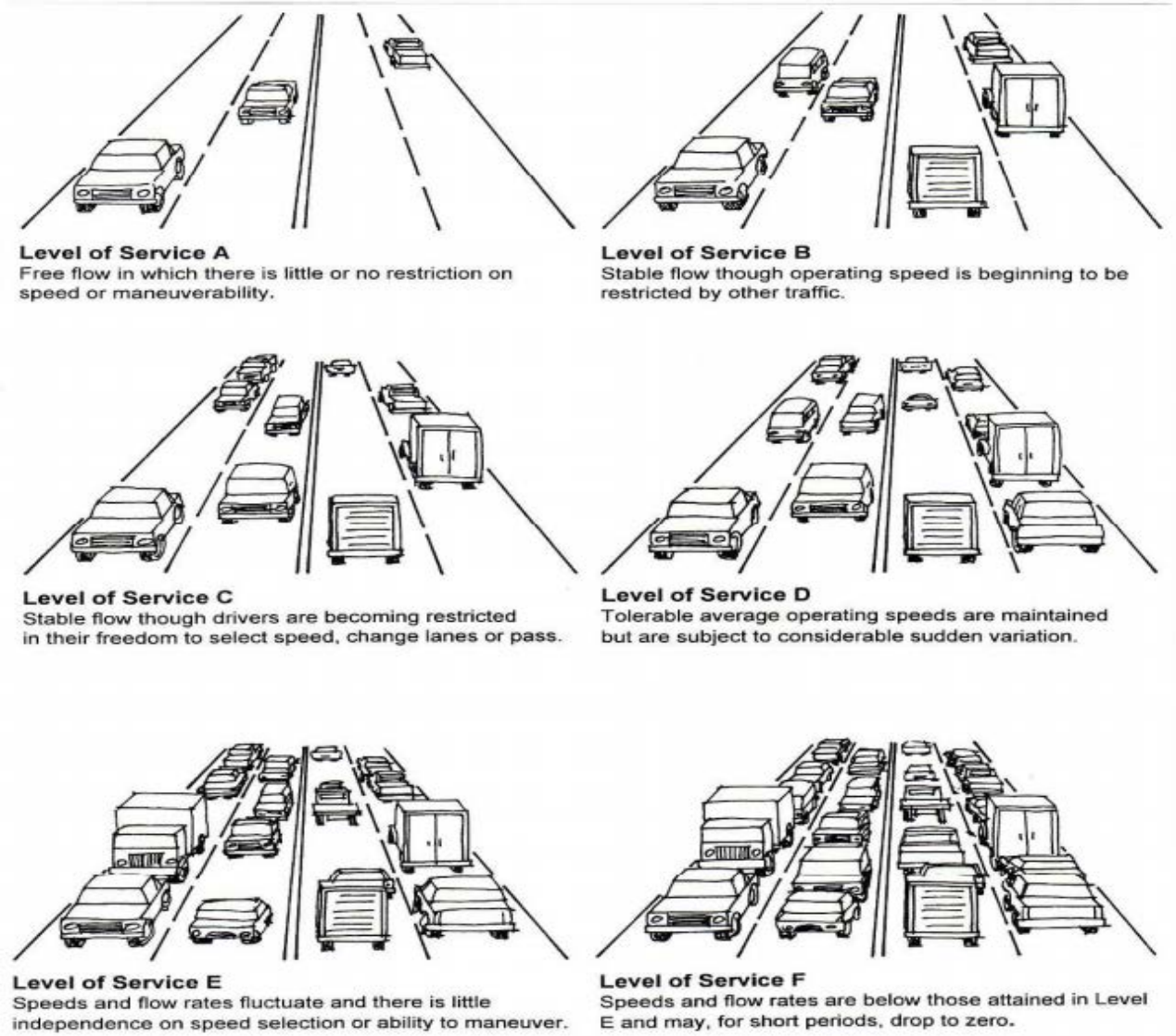
Facility Type Level of Service

The Level of Service (LOS) is a qualitative process used to analyze and assess a transportation facility's ability to efficiently service its daily traffic demand. There are six levels of service that can be assigned to a roadway segment; ranging from LOS A to LOS F. A LOS of A represents ideal free-flow traffic conditions, whereas a LOS of F represents total gridlock. The assigned value for each level is based on:

- Speed,
- Travel time,
- Freedom to maneuver,
- Traffic interruptions,
- Driver comfort, and
- Convenience.

The Level of Service definitions are shown in Figure 3.1.

Figure 3.1 Level of Service Definitions



Safety

Non-recurring congestion is a result of crashes, which impact travel time and cause delay. The SAMS crash data was used to locate the high crash frequency corridors and intersections.

3.2 V/C Ratios

For this CMP effort, the TDM volumes and capacities for each network link were used to develop the V/C ratio, which compares the existing traffic volumes to the capacity the roadways were designed to handle. The time of day (Morning, Midday, Afternoon, and Night) capacity factors developed in the TDM

are discussed in *Technical Report #1: Model Development Report*. The model volumes and capacities can be found in the TDM's network files.

Segments with a V/C ratio greater than 1.00 are considered over capacity. The results of the V/C ratio study are shown in Appendix A.

Many corridors in the MPA have received capacity improvements between 2013, the base year of the previous Metropolitan Transportation Plan (MTP), and 2018, the year of existing conditions in the 2045 MTP. Table 3.1 displays the corridors in the CMP network that have received capacity improvements between 2013 and 2018. The table displays each corridor's previous capacity, capacity after improvement, and change in capacity as a result of the improvement.

Table 3.1 Roadways with Improved Capacity between 2013 and 2018

Location	Limits	Previous Facility Type (2013)	Previous Capacity (2013)	New Facility Type (2018)	New Capacity (2018)	Capacity Increase/Decrease
I-20 Eastbound	Off-Ramp to US 80	1-lane Off-Ramp	11,000	3-lane Off-Ramp	34,000	23,000
I-20 Westbound	On-Ramp from US 80	1-lane On-Ramp	11,000	2-lane On-Ramp	22,000	11,000
I-55	I-20 to Siwell Rd	4-lane Divided	103,000	6-lane Divided	161,000	58,000
I-55 Northbound	Off-Ramp to Lakeland Dr	2-lane Off-Ramp	20,000	4-lane Off-Ramp	40,000	20,000
I-55	Old Agency Rd to MS 463	6-lane Divided	161,000	8-lane Divided	215,000	54,000
I-55 Northbound Frontage Rd	Steed Rd to Madison Ave	N/A	0	3-lane One-Way	26,000	26,000
I-55 Southbound Frontage Rd	Madison Ave to Steed Rd	N/A	0	2-lane One-Way	26,000	26,000
I-55 Southbound	On-Ramp from Gluckstadt Rd	N/A	0	1-lane On-Ramp	11,000	11,000
MS 25	MS 475 to Castlewoods Blvd	4-lane Divided	64,000	6-lane Divided	96,000	32,000
MS 468	4th St to MS 475	2-lane Undivided	20,000	4-lane with Two-Way Left Turn Lane	50,000	30,000
MS 471	US 80 to N College St	2-lane with Two-Way Left Turn Lane	22,000	4-lane with Two-Way Left Turn Lane	53,000	31,000
MS 471	N College St to Grants Ferry Rd	2-lane Undivided	25,000	4-lane with Two-Way Left Turn Lane	53,000	28,000
Hinds Pkwy	Parks Rd to Davis Rd at S Siwell Rd	N/A	0	4-lane Divided	45,000	45,000

Congestion Measurement

Location	Limits	Previous Facility Type (2013)	Previous Capacity (2013)	New Facility Type (2018)	New Capacity (2018)	Capacity Increase/Decrease
Pinehaven Dr	Northside Dr to Arrow Dr	2-lane Undivided	22,000	4-lane with Two-Way Left Turn Lane	46,000	24,000
Hampstead Blvd	Broadway St to US 80	N/A	0	2-lane with Two-Way Left Turn Lane	20,000	20,000
E Capitol St	Gallatin St to State St	3-lane One-Way	46,000	2-lane Divided	28,000	-18,000
E Fortification St	Jefferson St to Greymont Ave	4-lane Undivided	22,000	2-lane with Two-Way Left Turn Lane	22,000	0
E Metro Pkwy	MS 25 to Metroplex Blvd	N/A	0	4-lane Divided	59,000	59,000
Metroplex Blvd	Old Brandon Rd to E Metro Pkwy	N/A	0	2-lane Undivided	22,000	22,000
Old Fannin Rd	Flowood Dr to Spillway Rd	2-lane with Two-Way Left Turn Lane	25,000	4-lane with Two-Way Left Turn Lane	50,000	25,000
Lake Harbour Dr	US 51 to Pear Orchard Rd	2-lane with Two-Way Left Turn Lane	22,000	4-lane with Two-Way Left Turn Lane	43,000	21,000
Lake Harbour Dr	Pear Orchard Rd to Northpark Dr	2-lane Undivided	20,000	4-lane with Two-Way Left Turn Lane	43,000	23,000
Colony Park Blvd	Highland Colony Pkwy to US 51	N/A	0	4-lane Divided	50,000	50,000
Cotton Hill Rd	Madison Ave to 0.2 miles south of Madison Ave	2-lane Undivided	18,000	4-lane with Two-Way Left Turn Lane	42,000	24,000
Old Canton Rd	St Augustine Dr to Main St	2-lane Undivided	20,000	2-lane with Two-Way Left Turn Lane	21,000	1,000
Gluckstadt Rd	Calhoun Station Pkwy to I-55	2-lane Undivided	31,000	4-lane Divided	61,000	30,000

Location	Limits	Previous Facility Type (2013)	Previous Capacity (2013)	New Facility Type (2018)	New Capacity (2018)	Capacity Increase/Decrease
Gluckstadt Rd	I-55 to Weisenberger Rd	4-lane with Two-Way Left Turn Lane	50,000	6-lane with Two-Way Left Turn Lane	76,000	26,000
Woodland Dr	Canton Pkwy to Nancy Dr	N/A	0	2-lane Divided	25,200	25,200
Eagle Post Rd	US 49 to Williams Rd	N/A	0	2-lane Undivided	20,000	20,000
I-20 Eastbound	Off-Ramp to US 80	1-lane Off-Ramp	11,000	3-lane Off-Ramp	34,000	23,000

3.3 Travel Time Index (TTI)

The TTI is a measurement of the time delay that occurs when driving a particular roadway segment during peak compared to non-peak hours. The TTI was measured using the INRIX data where available and the TDM where INRIX data was unavailable. The TTI was measured by:

- Calculating the average travel time for three different time periods:
    - The morning "AM" peak traffic hours from 6:00 A.M. until 9:00 A.M.
        - The AM peak reflects traffic entering the urbanized core, often coming from the suburbs or from outside the MPA.
    - The Midday "MD" peak traffic hours from 9:00 A.M. to 3:00 P.M.
    - The afternoon "PM" peak traffic hours from 3:00 P.M. until 6:00 P.M.
        - The PM peak reflects traffic leaving the urbanized core to return home or travel to another location.
    - These time periods were chosen for consistency with the TDM's time periods.
    - Due to the low travel volumes, the nighttime travel hours, between 6:00 P.M. and 6:00 A.M., were not used in calculating the off-peak travel time.
- Calculating the travel time it would take to travel a segment at its free-flow speed.
- Dividing the highest of the three peak travel times (AM, MD, or PM) by the free-flow travel time.

The formula used to calculate TTI is shown below.

$$TTI = \frac{Highest\ Travel\ Time}{Free\text{-}flow Travel\ Time}$$

Where:

- *TTI* is Travel Time Index
- *Highest travel time* is the highest of the three peak travel times (AM, MD, or PM)
- *Free-flow travel time* is the travel time at free-flow speed

TTI Example

- The highest peak travel time on A Street between B Avenue and C Street is 3 minutes.
- The free-flow travel time on this segment is 1 minute.
- Divide 3 minutes, the highest peak travel time, by 1 minute, the free-flow travel time.
- This results in a TTI of 3.0.

The results from the TTI study are shown in Appendix B.

3.4 Level of Service Index

The LOS measure is used to analyze and assess each facility by its ability to efficiently service its daily traffic demand. Each roadway link was assigned a LOS letter value from A to F, with A representing free-flow conditions and F representing gridlock conditions.

Data for each roadway segment was collected for both travel directions using the same peak and off-peak periods described in Section 3.3. The data was then used to develop the LOS for each segment, for each of the three time periods, based on its facility type. The LOS values were then converted to numeric scores for the purpose of the CMP analysis, allowing them to be used in conjunction with the other criteria. Table 3.2 displays the numeric score assigned to each LOS.

Table 3.2 Level of Service Rating System

Alphabetic Ranking	Numeric Value
F	6
E	5
D	4
C	3
B	2
A	1

Defining LOS by Facility Type

The LOS was calculated for the following facility types:

- Freeways,
- Uninterrupted flow multi-lane highways (multi-lane highways),
- Uninterrupted flow two-lane highways (two-lane highways), and
- Interrupted flow streets (streets).

> Any facility that has a V/C ratio greater than 1.00 has a LOS of F, regardless of any other criteria (e.g. density, speed) for that facility.

Freeways

Freeways are separated highways with full access control and have two or more lanes in each direction dedicated to the exclusive use of motorized traffic. Traffic flow on freeways does not typically stop under normal traffic conditions, experiencing stoppage only during times of excessive traffic congestion or serious motor vehicle accidents. The MPA has three freeways: I-20, I-55, and I-220.

The LOS criteria for freeway facilities, displayed in Table 3.3, is based on the density of the freeway segment, expressed in passenger cars per mile per lane. The freeway density formula is:

$$Density = \frac{V/C\ Ratio\ \times\ Capacity_f}{Peak\ Period\ Speed}$$

Where:

Density is in Passenger Cars per Mile per Lane
Capacity is in Passenger Cars per Hour per Lane
Peak-Period Speed is in Miles per Hour (MPH)
f = Free-Flow Speed

Density Example

- The V/C ratio of a freeway segment is **0.7**.
- The free-flow speed of the freeway segment is 70 MPH; based on the Highway Capacity Manual, the capacity for this freeway segment at 70 MPH would be **2,400** passenger cars per hour per lane.
- The peak-period speed for the segment is **65** MPH.
- Therefore, the density is (0.7 X 2,400)/65, or ***25.8*** passenger cars per mile per lane.

Table 3.3 Freeways LOS Criteria

Level of Service		
Level of Service	Density (Passenger Cars per Mile per Lane)	V/C ratio
A	≤ 11	≤ 1.00
B	> 11 - 18	≤ 1.00
C	> 18 - 26	≤ 1.00
D	> 26 - 35	≤ 1.00
E	> 35 - 45	≤ 1.00
F	> 45	> 1.00

Freeway Capacities	
Free-Flow Speed (MPH)	Capacity (Passenger Cars per Hour per Lane)
55	2,250
60	2,300
65	2,350
70	2,400

SOURCE: Highway Capacity Manual

Multi-lane Highways

Multi-lane highways, like freeways, have two or more lanes in each direction and traffic flow on multi-lane highways does not stop under normal traffic conditions. However, multi-lane highways may or may not be separated, do not have full access control, and can serve modes other than motorized traffic. This may result in a slowdown of through traffic due to traffic entering, exiting, or crossing the highway. Examples of multi-lane highways within the MPA are US 49, MS 18 between Raymond and Jackson, and MS 25.

The LOS criteria for uninterrupted flow multi-lane highways is based on the density of the multi-lane highway segment, expressed in passenger cars per mile per lane. The multi-lane highway density is calculated using the same formula as the freeway density. Table 3.4 displays the LOS criteria for multi-lane highways.

Table 3.4 Multi-Lane Highways LOS Criteria

Level of Service		
Level of Service	Density (Passenger Cars per Mile per Lane)	V/C Ratio
A	≤ 11	≤ 1.00
B	> 11 - 18	≤ 1.00
C	> 18 - 26	≤ 1.00
D	> 26 - 35	≤ 1.00
E	> 35 - 45	≤ 1.00
F	> 45	> 1.00
Multi-Lane Highway Capacities		
Free-Flow Speed (MPH)	Capacity (Passenger Cars per Hour per Lane)	
45	1,900	
50	2,000	
55	2,100	
60	2,200	
65	2,300	

SOURCE: Highway Capacity Manual

Two-lane Highways

Two-lane highways have one lane in each direction for traffic use. Passing on two-lane highways occurs in the opposing lane of traffic. Passing maneuvers are limited by the availability of gaps in the opposing traffic stream and the availability of sufficient sight distance for a driver to discern the approach of an opposing vehicle. Examples of uninterrupted flow two-lane highways within the MPA are US 80 east of Brandon, MS 22, and Natchez Trace Pkwy. The LOS criteria for two-lane highways, which are displayed in Table 3.5, is based on percent free-flow speed.

Table 3.5 Two-Lane Highways LOS Criteria

Level of Service	Percent Free-Flow Speed	V/C ratio
A	> 91.7%	≤ 1.00
B	> 83.3% - 91.7%	≤ 1.00
C	> 75.0% - 83.3%	≤ 1.00
D	> 66.7% - 75.0%	≤ 1.00
E	≤ 66.7%	≤ 1.00
F	-	> 1.00

SOURCE: Highway Capacity Manual

Streets

Streets are facilities where traffic signals, stop or yield signs, or roundabouts interrupt through traffic flow. Additionally, these facilities can serve multiple modes of transportation, such as:

- Motorized vehicles
- Pedestrians
- Bicycles
- Transit

Examples of streets within the MPA are State St, Medgar Evers Blvd, and County Line Rd. The LOS criteria for streets is based on percent free-flow speed and the street's v/c ratio. Table 3.6 displays the LOS criteria for streets.

Table 3.6 Streets LOS Criteria

Level of Service	Percent Free-Flow Speed	V/C ratio
A	> 80%	≤ 0.60
B	> 67% - 80%	> 0.60 – 0.70
C	> 50% - 67%	> 0.70 – 0.80
D	> 40% - 50%	> 0.80 – 0.90
E	> 30% - 40%	> 0.90 – 1.00
F	< 30%	> 1.00

SOURCE: Highway Capacity Manual

The results from the LOS study are shown in Appendix C.

Calculating the LOS Index Rating

The segment's LOS Index was developed by:

- Establishing two records for each segment, one for each direction.
- Adding the numeric LOS values of all three time periods assigned to each record.
- Calculating the average of the LOS values to obtain the LOS Index rating.

An example is shown in Table 3.7.

Table 3.7 Level of Service Index Rating Example

Road Sections	AM Peak Traffic Level of Service	Midday Peak Level of Service	PM Peak Traffic Level of Service	Level of Service Index	Roadway Classification
Main St. West to East					
First St. - Second St.	C	D	B	3.00	Principal Arterial
	⬆	⬆	⬆	⬆	
(Assigned Numeric Value)	3	4	2	9/3 = 3.00	
Main St. West to East					
Second St. to First St.	A	C	C	2.33	Principal Arterial
	⬆	⬆	⬆	⬆	
(Assigned Numeric Value)	1	3	3	7/3=2.33	

3.5 Safety

Traffic incidents account for about 25 percent of all congestion on U.S. roadway networks. Crashes are one type of traffic incident[6]. Crashes, especially those that result in a fatality or life-threatening injury or involve hazardous materials, can result in significant congestion and dramatically reduce the available capacity and reliability of the entire transportation system. Additionally, congestion can result in additional crashes. Whenever a crash occurs, traffic incident management systems are in place to help reduce the impacts of a crash by reducing the delay, clearing the incident, and reducing the potential for secondary crashes.

[6] https://ops.fhwa.dot.gov/program_areas/reduce-non-cong.htm

The SAMS crash data was used to identify trends in total crash frequency and those that resulted in a fatality or life-threatening injury. Section 2.7: Roadway Safety of *Technical Report #2: Existing Conditions Analysis* identified high crash frequency and high crash rate locations within the Jackson MPA. These locations were identified in Tables 2.5 through 2.9 as well as in Figure 2.12 and Figure 2.13 of that report. The MPA's safety needs, as well as ways to reduce the number of crashes, are summarized in Section 4.3: Roadway Safety Needs of *Technical Report #4: Needs Assessment*.

4.0 Recurring Congestion Methodology and Analysis

4.1 Congestion Scoring

Once all performance metric data was gathered the information was used to develop congestion scores for each 2018 CMP network link. Tables 4.1 and 4.2 list the numeric values assigned to each study factor based on the results of the scoring described in Chapter 3.

> For the purposes of the recurring congestion analysis, the safety scores were not analyzed since they are random events that create nonrecurring congestion.

Table 4.1 Level of Service Index Ranking

Value	Score
5.00 or Greater	4
4.00 to 4.99	3
3.00 to 3.99	2
2.33 to 2.99	1

Table 4.2 Travel Time Index

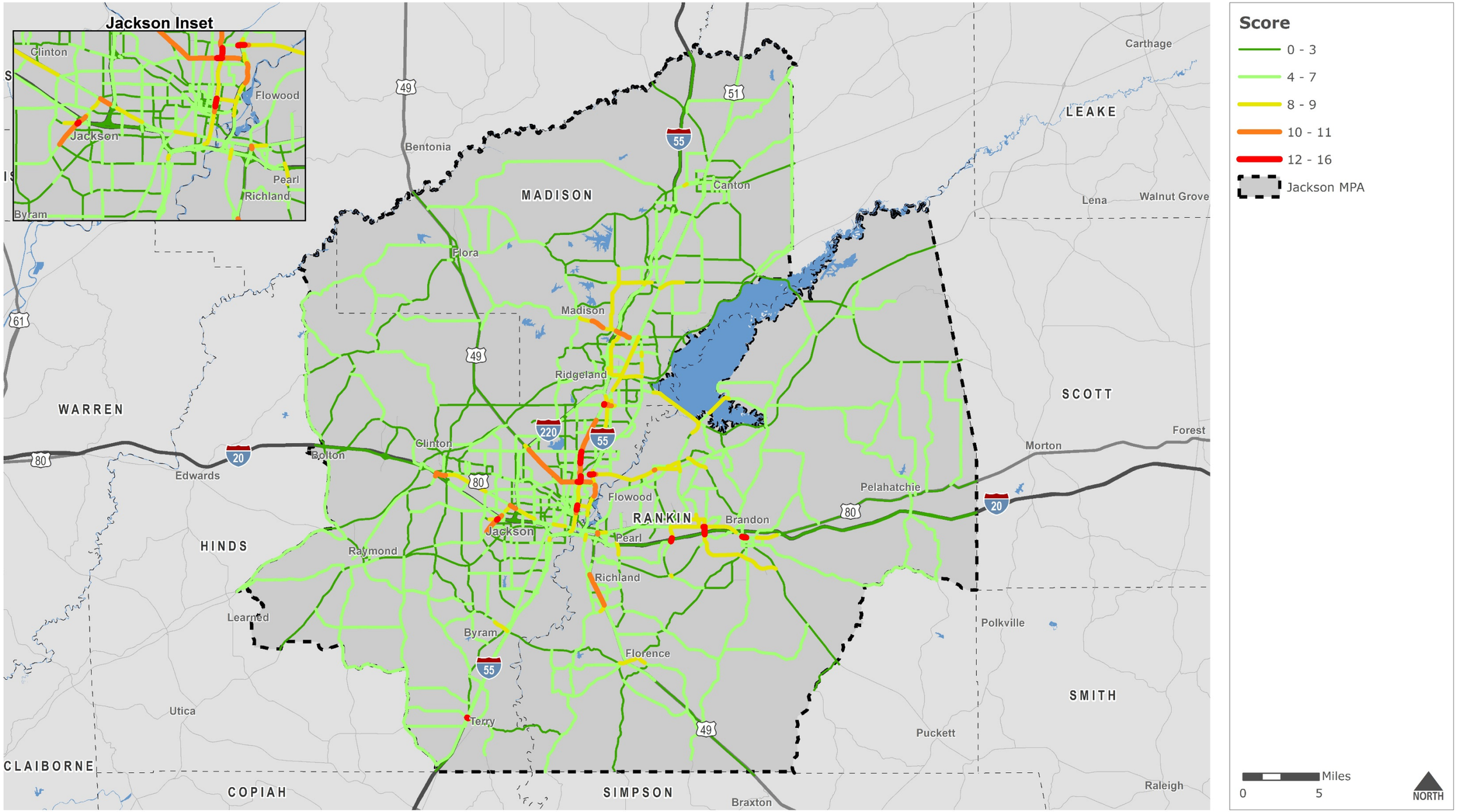
Value	Score
4.00 or Greater	4
3.00 to 3.99	3
2.00 to 2.99	2
1.50 to 1.99	1

The scores from the two metrics were added together for each roadway link direction to provide a final CMP Index Rating. The maximum possible CMP Index Rating score a two-way roadway link can receive is sixteen (16), and the maximum possible CMP Index Rating score a one-way roadway link can receive is eight (8). The CMP Index Rating score for one-way roadway links was doubled to adjust for the differences in maximum possible CMP Index Rating scores.

4.2 Congested Segments

Roadway segments with a CMP Index Rating of eight (8) or greater are considered to be congested. Figure 4.1 displays the existing recurring congested segments of the Jackson CMP network in 2018, based on their CMP Index Rating scores.

Figure 4.1 Recurring Congested Segments in 2018



Data Sources: NPMRDS, Travel Demand Model

Disclaimer: This map is for planning purposes only.

Public and Stakeholder Meeting and MPO Identification

Input from the public and stakeholders' meetings, as well the MPO, are also considered in the CMP. This input from the public, stakeholders, and MPO locates congested locations that were not identified in the analysis. The locations identified by the public are shown in Table 4.3 while the locations identified by the MPO are shown in Table 4.4.

Table 4.3 Congested Locations Identified by Public Meeting Input

Congested Location	Municipality
I-20 at I-55	Jackson
I-55 at Lakeland Drive	Jackson
I-55 at County Line Rd	Jackson
I-55 at E Woodrow Wilson Ave	Jackson
I-55 at I-220	Jackson
US 80 at Louis Wilson Dr	Brandon
Lakeland Dr at Ridgewood Rd	Jackson
Lakeland Dr at Airport Rd	Flowood
I-55 at Northside Dr	Jackson
Fortification St at State St	Jackson
I-20 at MS 18	Brandon
Old Brandon Rd at El Dorado Rd	Pearl
US 51 at Rice Rd	Ridgeland
I-20 at Airport Rd	Pearl
I-55 at E Fortification St	Jackson
US 51 at Yandell Rd	Madison
I-20 at S Gallatin St	Jackson
I-55 at Old Agency Rd	Ridgeland

Table 4.4 Congested Locations Identified by the MPO

Roadway	Segment	Length (miles)
Catlett Rd	Stribling Rd Ext to Gluckstadt Rd	0.91
Gluckstadt Rd	Bozeman Rd to Parkway East	2.17
Bozeman Rd	Gluckstadt Rd to MS 463	3.23
Yandell Rd	US 51 to Smith-Carr Rd	1.62
Grandview Blvd	MS 463 to Madison Ave	0.96
Sunnybrook Rd	Madison Ave to W Jackson St	1.98
W Jackson St	I-55 to US 51	0.85
Ridgewood Rd	E County Line Rd to Goodridge Dr	0.34
Spillway Rd	Harbor Dr to 0.22 miles west of N Shore Pkwy	3.42
Old Fannin Rd	Barnett Bend Dr to Spillway Rd	0.85
High St	US 51 to I-55	0.68
Old Fannin Rd	MS 25 to Flowood Dr	0.39
E Metro Pkwy	0.22 miles south of MS 25 to MS 25	0.22
Luckney Rd	Flowood Dr to Creekwood Dr	1.38
Greenway Dr	Woodland Way to MS 18 W	0.49
MS 468	Gloria Dr to Riverwind Dr	0.80
Old Brandon Rd	County Haven Rd to Crossgates Blvd	1.13
El Dorado Rd	Hollow Ln to Old Brandon Rd	0.32
Cross Park Dr	Old Brandon Rd to US 80	0.52
Crossgates Blvd	Old Brandon Rd to US 80	0.49
MS 18 E	S College St to Rosemont Dr	0.62
Siwell Rd	Lake Dockery Rd to I-55	1.01
Cleary Rd	Marie Dr to US 49	0.49
MS 469	Church St to Williams Rd	1.27
Williams Rd	MS 469 to Copper Ridge Way	0.60

4.3 Segment Prioritization

The segments displayed in Figure 4.1 were sorted based on their CMP Index Rating. Table 4.5 shows the CMP Index Rating, as well as the TTI and LOS Ratings for each segment.

Table 4.5 Congestion Management Process Index Rating for Recurring Congestion Segments (2018)

Rank	Road Name	Segment	Length (miles)	Directional TTI	Directional TTI	Directional LOS	Directional LOS	CMP Index Rating
1	E Woodrow Wilson Ave	0.19 miles west of State St to State St	0.19	4	3	4	4	15
2	State St	E Stadium St to Old Canton Rd	0.24	3	3	4	4	14
3	Lakeland Dr (Westbound)	I-55 North Frontage Rd to I-55 South Frontage Rd	0.25	3	-	4	-	14
4	MS 475	I-20 Eastbound Off-Ramp to I-20 Westbound Off-Ramp	0.20	4	2	4	4	14
5	MS 18 W (Eastbound)	Greenway Dr to I-20 Eastbound On-Ramp	0.07	3	-	4	-	14
6	MS 18 E	US 80 to I-20 Westbound Off-Ramp	0.32	4	2	4	4	14
7	Cunningham St/Green Gable Rd	I-55 Southbound Off-Ramp to I-55 Northbound Off-Ramp	0.09	2	4	3	4	13
8	State St	E Mayes St to E Northside St	0.76	4	2	4	3	13
9	State St	E Amite St to High St	0.30	3	2	3	4	12
10	US 51	W County Line Rd to 0.06 miles north of W County Line Rd	0.06	4	2	4	2	12
11	MS 18 E	I-20 Eastbound Off-Ramp to I-20 Westbound Off-Ramp	0.17	3	3	3	3	12
12	US 80	0.08 miles west of MS 18 E to MS 18 E	0.08	3	3	3	3	12
13	US 80	MS 471 to S College St	0.29	4	2	4	2	12
14	US 49	Old US 49 to Lowe Cir	0.74	2	3	3	3	11
15	MS 18 W	McDowell Rd to Greenway Dr	1.04	2	3	4	2	11
16	State St	E Pascagoula St to E Amite St	0.22	2	2	4	3	11
17	State St	E Woodrow Wilson Ave to E Stadium Dr	0.14	2	2	4	3	11
18	State St	Old Canton Rd to E Mayes St	0.88	2	2	3	4	11
19	US 80 (Clinton)	I-20 Eastbound Off-Ramp to I-20 Westbound Off-Ramp	0.17	2	3	3	3	11
20	Flowood Dr	0.04 miles south of US 80 to US 80	0.04	2	3	2	4	11
21	MS 25	MS 475 to 0.05 miles east of MS 475	0.05	4	2	3	2	11
22	US 80	MS 18 W to I-220 Southbound Off-Ramp	0.37	2	2	3	3	10
23	MS 18 W (Eastbound)	I-20 Eastbound Off-Ramp to I-20 Westbound On-Ramp	0.34	2	-	3	-	10
24	US 80	I-20 to Springridge Rd/Clinton Pkwy	0.69	2	2	3	3	10
25	Medgar Evers Blvd	I-220 to W Woodrow Wilson Ave	3.03	2	2	3	3	10
26	E Woodrow Wilson Ave	Medgar Evers Blvd to 0.19 miles west of State St	1.06	2	2	3	3	10
27	E Woodrow Wilson Ave	State St to I-55	0.62	2	2	3	3	10
28	Lakeland Dr (Eastbound)	I-55 Southbound Off-Ramp to I-55 Northbound Off-Ramp	0.24	2	-	3	-	10
29	MS 25 (Westbound)	0.16 miles east of I-55 East Frontage Road to I-55 East Frontage Road	0.16	2	-	3	-	10
30	US 49	Lowe Cir to Cleary Dr	1.49	2	3	2	3	10
31	State St	Northside Dr to Beasley Rd	2.29	2	2	3	3	10

Rank	Road Name	Segment	Length (miles)	Directional TTI	Directional TTI	Directional LOS	Directional LOS	CMP Index Rating
32	E County Line Rd	Dyess Rd to Ridgewood Rd	0.11	2	2	3	3	10
33	I-55 Northbound Frontage Rd	E County Line Rd to I-55 Northbound On-Ramp	0.07	2	-	3	-	10
35	MS 463	I-55 to Main St	0.88	2	2	3	3	10
35	MS 463	Fairfield Dr to Park Place Blvd	0.97	2	2	3	3	10
36	MS 18 W (Westbound)	I-20 Westbound On-Ramp to Greenway Dr	0.04	2	-	3	-	10
37	Flowood Dr (Northbound)	I-20 to 0.04 miles south of US 80	0.07	2	-	3	-	10
38	I-55 (Southbound)	E Woodrow Wilson Ave to E Fortification St	0.78	1	-	4	-	10
39	US 80	Springridge Rd/Clinton Pkwy to Wiggins Rd	2.92	2	2	2	3	9
40	MS 18 W	Lynch St to US 80	0.48	2	2	3	2	9
41	State St	US 80 to E Pascagoula St	1.10	2	2	2	3	9
42	State St	High St to E Woodrow Wilson Ave	1.57	2	2	2	3	9
43	MS 25	0.16 miles east of I-55 East Frontage Road to Ridgewood Rd	0.96	2	2	3	2	9
44	US 80	Flowood Dr to Childre Rd	0.56	2	1	4	2	9
45	US 80	Oak St to I-20 Eastbound Off-Ramp (West Brandon)	0.18	2	2	2	3	9
46	US 80	Trickham Bridge Rd to 0.18 miles west of I-20 (East Brandon)	1.35	2	2	2	3	9
47	MS 18 E	Greenfield Rd to Marquette Rd	0.52	2	2	2	3	9
48	Natchez Trace Pkwy	Rice Rd to Old Canton Rd	1.19	2	1	3	3	9
49	US 51	Rice Rd to Hoy Rd	3.04	2	2	3	2	9
50	Old Canton Rd	Calumet Rd to St Augustine Dr	0.24	2	2	3	2	9
51	MS 463	N Livingston Rd to Fairfield Dr	0.85	2	2	2	3	9
52	MS 463	Park Place Boulevard to I-55	0.91	2	2	2	3	9
53	E County Line Rd	I-55 North Frontage Rd to Dyess Rd	0.12	2	2	3	2	9
54	MS 468	Lake Cir to Greenfield Rd	0.09	2	2	3	2	9
55	MS 18 W (Westbound)	I-20 Westbound Off-Ramp to I-20 Eastbound Off-Ramp	0.37	2	-	2	-	8
56	MS 18 W (Eastbound)	At On-Ramp from I-20 Westbound	0.08	2	-	2	-	8
57	US 80 (Westbound)	I-220 to 0.09 miles west of I-220	0.09	2	-	2	-	8
58	US 80	I-220 to Ellis Ave	1.08	2	2	2	2	8
59	US 80	Terry Rd to S Gallatin St	0.77	2	1	2	3	8
60	State St	I-20/I-55 to US 80	0.36	0	0	4	4	8
61	Old US 49	0.70 miles south of US 80 to 0.35 miles south of US 80	0.35	2	1	3	2	8
62	I-55 (Southbound)	I-20 to E McDowell Rd	0.14	1	-	3	-	8
63	I-55 (Southbound)	E Fortification St Off-Ramp to E Fortification St On-Ramp	0.41	1	-	3	-	8
64	I-55 (Southbound)	E High St Off-Ramp to E Pearl St Off-Ramp	0.29	1	-	3	-	8

Rank	Road Name	Segment	Length (miles)	Directional TTI	Directional TTI	Directional LOS	Directional LOS	CMP Index Rating
65	I-55 (Southbound)	E High St On-Ramp to E Pascagoula St On-Ramp	0.32	1	-	3	-	8
66	I-55 (Northbound)	E Fortification St to E Woodrow Wilson Ave	0.83	0	-	4	-	8
67	I-55 (Southbound)	E Woodrow Wilson Ave Off-Ramp to E Woodrow Wilson Ave On-Ramp	0.40	1	-	3	-	8
68	I-55 (Southbound)	Lakeland Dr Off-Ramp to Lakeland Dr Westbound On-Ramp	0.18	1	-	3	-	8
69	MS 25 (Eastbound)	I-55 East Frontage Road to 0.16 miles east of I-55 East Frontage Road	0.16	2	-	2	-	8
70	MS 25	Ridgewood Rd to 0.14 miles west of MS 475	2.93	2	2	2	2	8
71	MS 25	0.05 miles east of MS 475 to E Metro Pkwy	1.64	3	1	2	2	8
72	Flowood Dr	Liberty Rd to Old Fannin Rd	0.80	2	2	2	2	8
73	MS 475	I-20 to US 80	0.82	2	2	2	2	8
74	US 80	MS 475 to 0.08 miles west of MS 18 E	2.10	2	2	2	2	8
75	US 80	MS 18 E to Oak St	2.01	1	2	2	3	8
76	MS 18 E	I-20 to Greenfield Rd	0.38	2	2	2	2	8
77	MS 18 E	Marquette Rd to S College St	2.92	2	2	2	2	8
78	MS 18 E	Rosemont Dr to Louis Wilson Dr	1.62	1	1	3	3	8
79	N Shore Pkwy	0.44 miles east of Parkway Rd to Fannin Landing Cir	1.68	2	2	2	2	8
80	Spillway Rd	0.22 miles west of N Shore Pkwy to N Shore Pkwy	0.22	2	2	2	2	8
81	I-55 (Northbound)	Northside Dr to I-220	3.43	0	-	4	-	8
82	E County Line Rd	Ridgewood Rd to Ridgewood Ct Dr	0.23	2	2	2	2	8
83	US 51	0.06 miles north of E County Line Rd to I-55 West Frontage Rd	0.23	2	2	2	2	8
84	US 51	Lake Harbour Dr to Rice Rd	0.88	2	1	2	3	8
85	I-55 (Northbound)	Off-Ramp to Westbound Old Agency Rd to On-Ramp from Old Agency Rd	0.30	0	-	4	-	8
86	Old Canton Rd	W Tidewater Ln to McClellan Dr	0.58	2	2	2	2	8
87	I-55 Northbound Frontage Rd	Off-Ramp to County Line Rd to County Line Rd	0.05	2	-	2	-	8
88	I-55 (Southbound)	Off-Ramp to Gluckstadt Rd to On-Ramp from Gluckstadt Rd	0.18	1	-	3	-	8
90	US 49 (Northbound)	On-Ramp to I-220 Southbound to Off-Ramp from I-220 Southbound	0.17	0	-	4	-	8
91	Old Canton Rd	Wayneland Dr to Ridgewood Rd	0.26	2	2	2	2	8
92	MS 22	W Fulton St to King Ranch Rd	0.20	1	1	3	3	8

5.0 Non-Recurring Congestion Methodology and Analysis

The methodology[7] used to determine the roadway segments experiencing nonrecurring congestion was to:

- Group speed data into one-hour periods for a year and calculate the annual average speed and the annual standard deviation by hour for each segment.
- Group speed data into one-hour periods by hour and day and calculate the average speeds by hour.
- Tabulate the average speeds calculated in the previous steps, side by side, for all the speeds collected over the two years (2017 and 2018), for a specific time period (hour and day).
- Calculate the Standard Normal Deviate (SND) for each time period (hour and day) using the below formula.

$$(SND)_{ij} = \frac{((Speed)_{i\,j} - (Annual\ Average\ Speed)_i)}{(Annual\ Standard\ Deviation)_i}$$

Where:

SND = Standard Normal Deviate
i = Hour
j = Day

Negative SND values that are greater than a selected threshold would indicate congestion beyond average levels. This indicates a high likelihood of non-recurring congestion. For this CMP effort, a threshold value of -1.5 was selected based on the research's sensitivity analysis[7]. SND values which deviated by more than -1.5 (i.e., less than -1.5) were indicative of non-recurring congestion speeds. Additionally, the delays for time period (hour and day) where the SND deviated by more than -1.5 were calculated using the below formula.

$$Time\ Delay = \left(\frac{Segment\ Length}{Segment\ Speed_i}\right) - \left(\frac{Segment\ Length}{Segment\ Annual\ Average\ Speed_i}\right)$$

Where:

Segment length is in miles
Segment speeds are in MPH
Time Delay is in hours
i = Hour

[7] Andrew J. Sullivan, Virginia P. Sisiopiku, Bharat R. Kallem, "Measuring Non-Recurring Congestion in Small to Medium Sized Urban Areas" Prepared by the University Transportation Center for Alabama.

5.1 Non-Recurring Congestion Segments

With the methodology established, the following process was used to locate segments that experienced excessive non-recurring congestion in 2017 and/or 2018:

- Calculate the SND and the time delay (in hours) for each segment.
    - Segments experiencing a maximum delay of at least one (1) hour and at least 150 occurrences of SND values deviating by more than -1.5 in 2017 and/or 2018 were considered to experience excessive non-recurring congestion.
- Calculate the five-year crash trends using the 2014-2018 MDOT SAMS crash data for both total and fatality/life-threatening crash frequencies.
    - The average yearly crash frequency was used to prioritize the segments experiencing excessive non-recurring congestion.

Figure 5.1 displays the segments that experienced excessive non-recurring congestion in the years 2017 and/or 2018. The non-recurring congestion trends for each segment are shown in Table 5.1.

Limitations

To develop a reliable methodology that identifies non-recurring congestion, a consistent and reliable travel time database is necessary. Speed data and travel times for each time interval (5-minute, 10-minute, 15-minute, or 1-hour) throughout an entire year is essential. However, the RITIS database contains several time intervals where speed and travel time data is unavailable or missing, making it difficult to perform an accurate and reliable non-recurring congestion analysis.

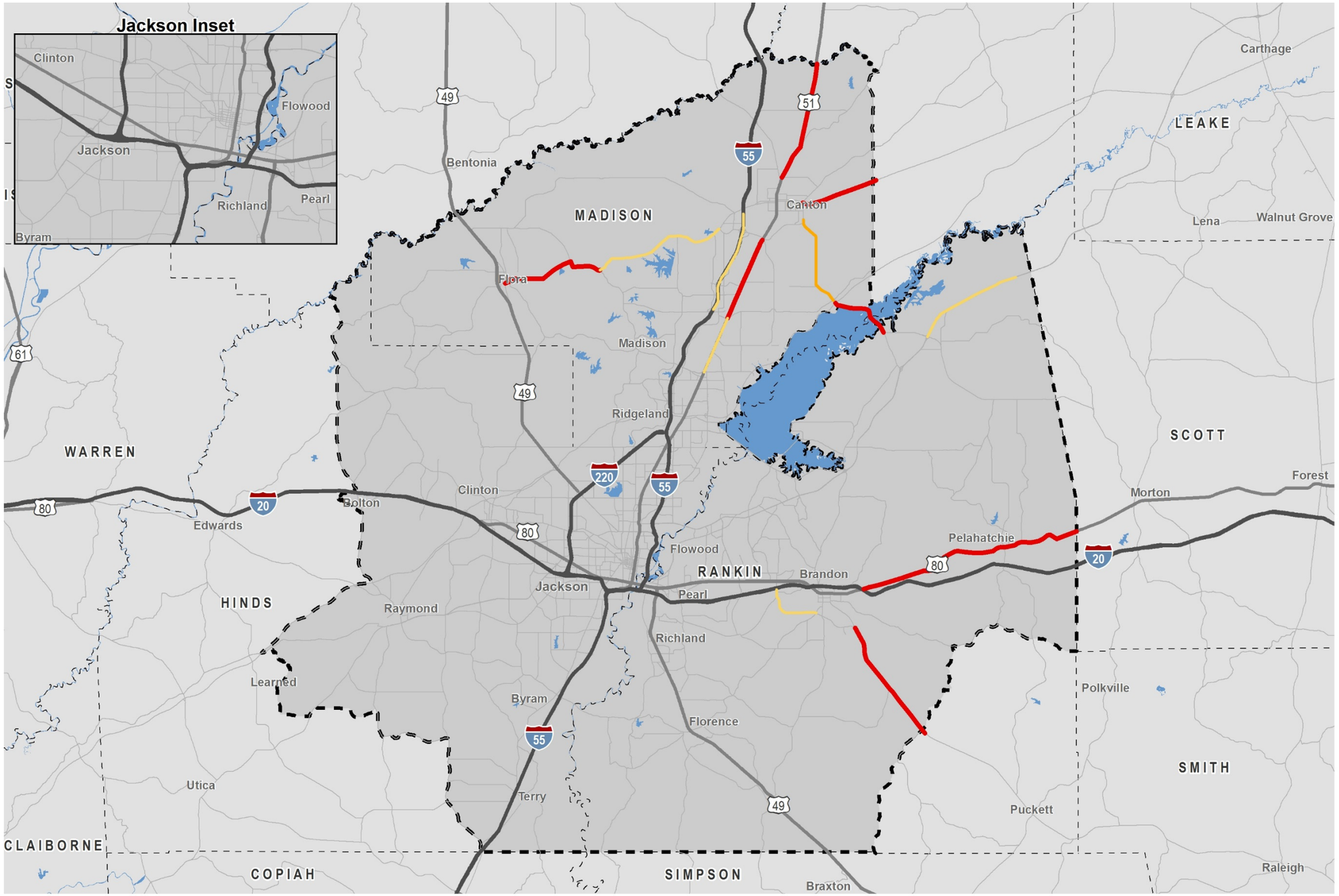
Additionally, the RITIS database travel time data is not available for each individual travel lane for multi-lane highways. However, with minor incidents, there is a chance that the impacts from the incident would negatively impact only the travel lane experiencing the incident and not the other travel lanes. This indicates that the incident would not be reflected in the RITIS database even though an incident had occurred.

5.2 Segment Prioritization

The segments displayed in Figure 5.1 were ranked based on the five-year average crash frequency. Table 5.1 shows the following:

- Frequency of non-recurring congestion incidents
- The maximum delay for a non-recurring congestion incident
- The change in frequency of non-recurring congestion incidents and maximum delay for a non-recurring congestion incident between 2017 and 2018
- The 5-year trends for total crash frequency and fatal and life-threatening injury crash frequency for each segment.

Figure 5.1 Segments Experiencing Excessive Non-Recurring Congestion



Non-Recurring Congestion

Year

- 2017
- 2018
- 2017 and 2018
- Jackson MPA

Miles
0 5
NORTH

Data Sources: NPMRDS

Disclaimer: This map is for planning purposes only.

Table 5.1 Non-Recurring Congestion Trends

Roadway	Segment	Length (miles)	Year(s) of Non-Recurring Congestion	2017 Non-Recurring Incidents	2017 Maximum Delay (Hours)	2018 Non-Recurring Incidents	2018 Maximum Delay (Hours)	5-Year Average Crash Frequency	5-Year Average Fatal/Life Threatening Crash Frequency	Change in Non-Recurring Incidents (2017 to 2018)	Change in Maximum Delay (Hours) (2017 to 2018)	5-Year Total Crash Trend	5-Year Fatal/Life Threatening Crash Trend
US 51	MS 463 to Weisenberger Rd	3.51	2017	161	1.19	162	0.87	59.8	0.4	1	-0.32	Decrease	Increase
MS 18 E	I-20 to MS 468	3.43	2017	186	1.01	171	0.76	51.8	0.2	-15	-0.26	Increase	Stable
US 80	I-20 (East Brandon) to MS 43	8.92	2017 and 2018	191	2.05	228	2.78	27.2	0.6	37	0.73	Increase	Increase
I-55 Northbound	Gluckstadt Rd to MS 22	6.14	2017	265	1.11	112	0.16	25.6	1.0	-153	-0.95	Decrease	Increase
US 51	Weisenberger Rd to Canton Pkwy	5.10	2017 and 2018	186	1.18	202	1.19	19.2	0.0	16	0.00	Decrease	Stable
MS 22	MS 463 to Nissan Pkwy	8.16	2017	164	2.56	147	1.47	17.6	0.0	-17	-1.08	Decrease	Stable
MS 22	1st St (Flora) to MS 463	6.31	2017 and 2018	224	1.95	188	1.95	17.4	0.4	-36	0.00	Increase	Increase
US 51	MS 16 W to Way Rd	7.19	2017 and 2018	164	1.95	155	1.94	15.8	0.0	-9	-0.01	Decrease	Stable
US 80	MS 43 to Scott County Line	4.68	2017 and 2018	202	2.58	225	2.58	12.6	0.4	23	0.00	Increase	Increase
MS 18	Louis Wilson Dr to Rock Hill Rd	7.67	2017 and 2018	176	2.62	183	3.34	11.8	0.4	7	0.72	Decrease	Decrease
MS 43	Natchez Trace Pkwy to Canton Pkwy	5.62	2018	244	0.79	200	1.25	11.8	1.0	-44	0.45	Decrease	Increase
MS 16	MS 43 to Sharon Rd	4.63	2017 and 2018	207	1.38	201	1.39	9.6	0.0	-6	0.00	Decrease	Stable
MS 25	MS 43 to Lone Pine Church Rd	6.59	2017	165	1.17	145	0.81	7.4	0.4	-20	-0.35	Increase	Increase
MS 43	MS 471 to Natchez Trace Pkwy	3.69	2017 and 2018	181	1.12	152	1.12	5.0	0.0	-29	0.00	Increase	Stable

6.0 Congestion Reduction Strategies

6.1 Federal Guidelines for Congestion Reduction Strategies

Section 500.109 (a) of Subpart A (Management Systems), 23 CFR (Final Rule) states:

> "...A congestion management system or process is a systematic and regionally accepted approach for managing congestion that provides accurate, up-to-date information on transportation system operations and performance and assesses alternative strategies for congestion management that meet State and local needs."

Section 450.322 (c)(4) of Subpart C (Metropolitan Transportation Planning and Programming), 23 CFR (Final Rule) further states that a Congestion Management Process shall include:

> "Identification and evaluation of the anticipated performance and expected benefits of appropriate congestion management strategies that will contribute to the more effective use and improved safety of existing and future transportation systems based on the established performance measures. The following categories of strategies, or combinations of strategies, are some examples of what should be appropriately considered for each area:
>
> - Demand management measures, including growth management and congestion pricing;
> - Traffic operational improvements;
> - Public transportation improvements;
> - ITS technologies as related to the regional ITS architecture; and,
> - Where necessary, additional system capacity."

Section 450.322 (c)(5) of Subpart C (Metropolitan Transportation Planning and Programming), 23 CFR (Final Rule) also states that a CMP shall include: "Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy (or combination of strategies) proposed for implementation."

6.2 Identifying Congestion Reduction Strategies Using CMP Toolbox

There are constant changes in the way our society and economy operate. With increased commercial, residential, and industrial development, there is also increased transportation demand on existing transportation facilities. To address this increase in demand and ensuing congestion, appropriate strategies must be formulated to prevent deterioration in free flow traffic conditions. These strategies can include upgrading existing transportation facilities, creating additional facilities, and also exploring the use of alternative travel methods. The CMP proposes three (3) management strategies that provide a variety of measures that can be implemented to reduce traffic congestion. These strategies are travel demand management, supply management, and land use management.

Travel Demand Management (TDM)

The use of TDM alleviates congestion by employing methods that reduce the number of vehicles traveling major thoroughfares during peak traffic hours. These methods are summarized in Table 6.1.

Table 6.1 TDM Strategies

Strategy	Description
Staggered work hours	The organization has varying starting and ending working hours for employees.
Alternative work locations	These facilities can be closer to the organization's customers and clients and/or employees' home. This is one system where employees do not commute or travel to a central place of work.
Telecommuting	Work is performed wherever the employee chooses. This is another system where employees do not commute or travel to a central place of work.
Carpooling/Vanpooling	Carpooling and/or vanpooling prevents the need for others to have to drive to a location themselves by sharing trips.
Toll Roads	This is a type of road where a fee is assessed for passage. High-occupancy toll lanes and express toll lanes have variable fees that are adjusted in response to demand.

Supply Management

Supply management analyzes methods for reducing traffic congestion on major transportation facilities once it has been determined the facilities have reached or exceeded their designed capacity. Supply management strategies that can be used as part of the CMP's efforts are shown in Table 6.2.

Table 6.2 Supply Management Strategies

Strategy	Description
ITS	ITS allows users to be better informed about transportation conditions and make more informed decisions. It encompasses a wide range of technologies such as cameras and variable message boards.
Transit park and ride facilities	Park and ride facilities are parking lots where people leave their vehicles and transfer to a bus system or carpool for the remainder of the trip.
Traffic signal synchronization	Traffic signal synchronization systems seek to minimize congestion and delays by timing traffic signals to allow vehicles to traverse the most intersections in the shortest possible amount of time.
Bicycle and pedestrian	Bicycling or walking can remove vehicle trips from roadways. This can be encouraged if bicycle and pedestrian facilities are adequate.
Increase highway capacity	Increasing highway capacity (e.g. adding lanes or new roads) is not always possible due to physical and fiscal constraints. However, it remains an important approach to addressing congestion.

Land Use Management

The use of land use management reduces excessive traffic congestion by altering the way land is developed through the use of smart growth concepts. Smart growth analyzes future growth potential of an area and includes in its plan measures to abate/prevent excessive traffic demand on a thoroughfare. A summary of methods is shown in Table 6.3.

Table 6.3 Land Use Management Strategies

Strategy	Description
Planning and zoning	Inadequate zoning, such as allowing larger developments, can overwhelm available transportation facilities.
Mixed use development	Mixed use developments have increased population density and encourage walking and bicycling and/or access public transit. These developments also build up freight movement for goods and services.
Density development	High-density development increases the feasibility for transit, walking, and/or bicycling.
Transit	An improved transit system can increase its attractiveness and reduce the number of vehicle trips.

Table 6.4 presents potential strategies that can be employed to alleviate or reduce congestion on the roadways identified in Figure 4.1 and Figure 5.1 that experience the highest levels of traffic congestion in the MPA. The table also lists agencies responsible for proposed improvements, possible funding sources for project implementation, and a proposed project implementation schedule.

Table 6.4 Proposed Strategies for Alleviating Congestion

Roadway	Segment	Congestion Recurring or Non-Recurring	Proposed Congestion Alleviation Strategy	Organization/Local Govt. Responsible for Implementation and Possible Funding Source	Implementation Schedule (Construct by or before)
MS 18 E	I-20 to MS 468	Recurring and Non-Recurring	Widen to six (6) lanes from I-20 to Greenfield Rd; widen to four (4) lanes from Greenfield Rd to MS 468; and traffic operational improvements (signal retiming and/or access management)	MDOT	2035
Cunningham St/Green Gable Rd	I-55 Southbound Off-Ramp to I-55 Northbound Off-Ramp	Recurring	Traffic operational improvements (interchange modification)	MDOT/Terry	2025
E County Line Rd	I-55 to Ridgewood Ct Dr	Recurring	Traffic operational improvements (signal retiming and/or access management)	Jackson or Ridgeland	2025
Flowood Dr	Liberty Rd to Old Fannin Rd	Recurring	Traffic operational improvements (signal retiming)	Flowood	2025
Flowood Dr	I-20 to US 80	Recurring	Traffic operational improvements (signal retiming)	MDOT/Pearl	2025
I-55	E Fortification St to E Woodrow Wilson Ave	Recurring	Improved ITS; promote use of alternate routes	MDOT	2025
I-55 (Northbound)	Off-Ramp to Old Agency Rd to On-Ramp from Old Agency Rd	Recurring	Improved ITS; promote use of alternate routes	MDOT	2025
I-55 (Northbound)	E Northside Dr to I-220	Recurring	Improved ITS; promote use of alternate routes	MDOT	2025
I-55 (Southbound)	On-Ramp from Westbound Gluckstadt Rd to On-Ramp from Eastbound Gluckstadt Rd	Recurring	Improved ITS; promote use of alternate routes	MDOT	2025
I-55 (Southbound)	Off-Ramp to Lakeland Dr to On-Ramp from Westbound MS 25	Recurring	Improved ITS; promote use of alternate routes	MDOT	2025
I-55 (Southbound)	Off-Ramp to High St to Off-Ramp to E Pearl St	Recurring	Improved ITS; promote use of alternate routes	MDOT	2025
I-55 (Southbound)	On-Ramp from High St to On-Ramp from E Pascagoula St	Recurring	Improved ITS; promote use of alternate routes	MDOT	2025
I-55 (Southbound)	State St to McDowell Rd	Recurring	Improved ITS; promote use of alternate routes	MDOT	2025
I-55 Northbound Frontage Rd	Off-Ramp to E County Line Rd to On-Ramp from E County Line Rd	Recurring	Traffic operational improvements (signal retiming)	MDOT/Jackson or Ridgeland	2025
Medgar Evers Blvd	I-220 to W Woodrow Wilson Ave	Recurring	Traffic operational improvements (signal retiming and/or access management)	Jackson	2025
MS 18 E	US 80 to I-20	Recurring	Widen to six (6) lanes; and traffic operational improvements (signal retiming and/or access management)	MDOT	2035
MS 18 E	Rosemont Dr to Louis Wilson Dr	Recurring	Widen to four (4) lanes; and traffic operational improvements (signal retiming and/or access management)	MDOT	2045
MS 18 W	Lynch St to US 80	Recurring	Traffic operational improvements (signal retiming and/or access management)	MDOT	2025
MS 18 W	McDowell Rd to I-20	Recurring	Traffic operational improvements (signal retiming and/or access management)	MDOT	2025
MS 22	W Fulton St to King Ranch Rd	Recurring	Traffic operational improvements (access management and/or intersection modifications)	MDOT/Canton	2025

Roadway	Segment	Congestion Recurring or Non-Recurring	Proposed Congestion Alleviation Strategy	Organization/Local Govt. Responsible for Implementation and Possible Funding Source	Implementation Schedule (Construct by or before)
MS 25	I-55 to 0.14 miles west of MS 475	Recurring	Traffic operational improvements (signal retiming and/or access management)	MDOT	2025
MS 25	MS 475 to E Metro Pkwy	Recurring	Traffic operational improvements (signal retiming and/or access management)	MDOT	2025
MS 463	N Livingston Rd to Main St	Recurring	Widen to four (4) lanes; and traffic operational improvements (signal retiming and/or access management)	MDOT	2035
MS 468	Lake Cir to Greenfield Rd	Recurring	Widen to four (4) lanes; and traffic operational improvements (intersection modifications)	MDOT	2045
MS 475	US 80 to I-20	Recurring	Widen to six (6) lanes; and traffic operational improvements (signal retiming)	MDOT	2045
Natchez Trace Pkwy	Rice Rd to Old Canton Rd	Recurring	Traffic operational improvements (intersection modifications)	National Park Service	2025
Northshore Pkwy	0.44 miles east of Parkway Rd to Fannin Landing Cir	Recurring	Promote use of alternate routes	Rankin County	2025
Old Canton Rd	W Tidewater Rd to McClellan Dr	Recurring	Traffic operational improvements (signal retiming)	Madison	2025
Old Canton Rd	Calumet Dr to St Augustine Dr	Recurring	Traffic operational improvements (signal retiming; school access improvements)	Madison	2025
Old Canton Rd	Canton Mart Rd to Ridgewood Rd	Recurring	Traffic operational improvements (signal retiming)	Jackson	2025
Old US 49	0.70 miles south of US 80 to 0.35 miles south of US 80	Recurring	Traffic operational improvements (access management)	Richland	2025
Spillway Rd	0.22 miles west of Northshore Pkwy to Northshore Pkwy	Recurring	Traffic operational improvements (signal retiming and/or access management)	Rankin County	2025
State St	W County Line Rd to I-55 South Frontage Rd	Recurring	Traffic operational improvements (signal retiming)	Ridgeland	2025
State St	I-20 to Beasley Rd	Recurring	Traffic operational improvements (signal retiming; access management; and/or road diet)	Jackson	2025
US 49	Old US 49 to Cleary Rd	Recurring	Widen to six (6) lanes; and traffic operational improvements (signal retiming and/or access management)	MDOT	Widening to six (6) lanes under construction
US 49 (Northbound)	On-Ramp to I-220 Southbound to Off-Ramp from I-220 Southbound	Recurring	Traffic operational improvements (signal retiming)	MDOT	2025
US 51	Lake Harbour Dr to MS 463	Recurring	Traffic operational improvements (signal retiming and/or access management)	MDOT	2025
US 80	I-20 (Clinton) to Wiggins Rd	Recurring	Traffic operational improvements (signal retiming and/or access management)	MDOT	2025
US 80	MS 18 W to Ellis Ave	Recurring	Traffic operational improvements (signal retiming and/or access management)	MDOT	2025
US 80	Flowood Dr to Childre Rd	Recurring	Widen to six (6) lanes; and traffic operational improvements (signal retiming)	MDOT	2045
US 80	MS 475 to I-20 (West Brandon)	Recurring	Traffic operational improvements (signal retiming and/or access management)	MDOT	2025
US 80	MS 471 to College St	Recurring	Traffic operational improvements (signal retiming and/or access management)	MDOT	2025
US 80	Trickham Bridge Rd to 0.18 miles west of I-20	Recurring	Construct Center Turn Lane (CTL)	MDOT	2035
US 80	Terry Rd to S Gallatin St	Recurring	Traffic operational improvements (signal retiming)	MDOT	2025

Roadway	Segment	Congestion Recurring or Non-Recurring	Proposed Congestion Alleviation Strategy	Organization/Local Govt. Responsible for Implementation and Possible Funding Source	Implementation Schedule (Construct by or before)
W Woodrow Wilson Ave	Medgar Evers Blvd to I-55	Recurring	Traffic operational improvements (signal retiming and/or access management)	Jackson	2025
I-55 (Northbound)	Gluckstadt Rd to MS 22	Non-Recurring	Safety improvements	MDOT	2025
MS 16	MS 43 to Sharon Rd	Non-Recurring	Safety improvements	MDOT	2025
MS 18	Louis Wilson Dr to Rock Hill Rd	Non-Recurring	Widen to four (4) lanes between Louis Wilson Dr and Mohr Rd; safety improvements	MDOT	2045
MS 22	MS 463 to Nissan Pkwy	Non-Recurring	Safety improvements	MDOT	2025
MS 22	1st St (Flora) to MS 463	Non-Recurring	Safety improvements	MDOT	2025
MS 25	MS 43 to Lone Pine Church Rd	Non-Recurring	Safety improvements	MDOT	2025
MS 43	Natchez Trace Pkwy to Canton Pkwy	Non-Recurring	Safety improvements	MDOT	2025
MS 43	MS 471 to Natchez Trace Pkwy	Non-Recurring	Safety improvements	MDOT	2025
US 51	MS 16 W to Way Rd	Non-Recurring	Safety improvements	MDOT	2025
US 51	MS 463 to Weisenberger Rd	Non-Recurring	Widen to five (5) lanes between Tisdale Rd and Weisenberger Rd; safety improvements	MDOT	2045
US 51	Weisenberger Rd to Canton Pkwy	Non-Recurring	Safety improvements	MDOT	2025
US 80	MS 43 to Scott County Line	Non-Recurring	Safety improvements	MDOT	2025
US 80	I-20 (East Brandon) to MS 43	Non-Recurring	Safety improvements	MDOT	2025

7.0 Maintenance of the Congestion Management Process

7.1 Federal Guidelines for Maintaining the Congestion Management Process

Section 450.322 (d)(3) of Subpart C (Metropolitan Transportation Planning and Programming), 23 CFR (Final Rule) states that a Congestion Management Process shall include:

> "Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions. To the extent possible, this data collection program should be coordinated with existing data sources (including archived operational/ITS data) and coordinated with operations managers in the metropolitan area."

Section 450.322 (d)(6) of Subpart C (Metropolitan Transportation Planning and Programming), 23 CFR further states that the CMP shall include:

> "Implementation of a process for periodic assessment of the effectiveness of implemented strategies, in terms of the area's established performance measures. The results of this evaluation shall be provided to decision makers and the public to provide guidance on selection of effective strategies for future implementation."

7.2 System Performance and Maintenance

The overall goal of the CMP is to reduce traffic congestion within the MPA and improve free-flow traffic conditions through the implementation of proposed congestion reduction strategies. To measure the effectiveness the proposed strategies the 2015 CMP had on reducing traffic congestion in the MPA a comparative analysis was performed. This comparative analysis shows the proposed improvement for the 2015 CMP congested roadways, if that roadway is congested in the 2020 CMP, if there is an ongoing project, and the MTP's project implementation schedule. The results of the comparative analysis between the 2015 CMP and the 2020 CMP are shown in Table 7.1.

Table 7.1 2015 CMP and 2020 CMP Comparative Analysis

Road	Segment	2015 CMP Proposed Improvement	Segment in 2020 CMP	Status	Previous Implementation Schedule (2040 MTP)	Current Implementation Schedule (2045 MTP)
US 49	Old Hwy 49 to Harper St	Widen to six (6) lanes and traffic operational improvements	Yes	Under construction	2018	Under construction
US 49	Harper St to Scarbrough St	Widen to six (6) lanes and traffic operational improvements	Yes	Under construction	2018	Under construction
MS 25	Luckney Rd to Old Fannin Rd	Widen to six (6) lanes and traffic operational improvements	No	Project completed	2018	Project completed
MS 18	I-20 to Greenfield Rd	Widen to four (4) lanes divided, traffic operational improvements, and add bridge over railroad	Yes	N/A	2030	2035
MS 18	Greenfield Rd to MS 468	Widen to four (4) lanes divided, traffic operational improvements, and add bridge over railroad	Yes	N/A	2030	2035
MS 25	Grants Ferry Rd to Luckney Rd	Widen to six (6) lanes and traffic operational improvements	No	Project completed	2018	Project completed
US 49	Scarbrough St - Monterey Rd	Widen to six (6) lanes and traffic operational improvements	Yes	Under construction	2018	Under construction
US 49	Monterey Rd to Main St in Florence	Widen to six (6) lanes and traffic operational improvements	No	Under construction	2018	Under construction
Flowood Dr	Liberty Rd to Old Fannin Rd	Traffic operational improvements and promote use of alternate routes	Yes	N/A	2018	2025
US 80	Crossgates Blvd to I-20	Traffic operational improvements and promote use of alternate routes	Yes	N/A	2020	2025
US 80	MS 471 to Louis Wilson Dr	Traffic operational improvements and promote use of alternate routes	Yes	N/A	2018	2025
MS 471	Value Rd to US 80	Widen to five (5) lanes and traffic operational improvements	No	Project completed	2017	Project completed
MS 468	End of 4-lane to River Oaks Blvd	Widen to four (4) lanes divided, traffic operational improvements, and promote use of alternate routes	No	Project completed	2015	Project completed
MS 468	River Oaks Blvd to MS 475	Widen to four (4) lanes divided, traffic operational improvements, and promote use of alternate routes	No	Project completed	2015	Project completed
MS 25	River Oaks Blvd to MS 475	Traffic operational improvements and promote use of alternate routes	Yes	MS 468 to the south widened; MS 25 east of MS 475 widened	2020	MS 468 to the south widened; MS 25 east of MS 475 widened
MS 475	MS 25 to MS 468 and Flowood Dr	Traffic operational improvements	No	MS 25 east of MS 475 widened; E Metro Pkwy between Old Brandon Rd (via Airlane) and MS 25 completed	2018	MS 25 east of MS 475 widened; E Metro Pkwy between Old Brandon Rd (via Airlane) and MS 25 completed

Road	Segment	2015 CMP Proposed Improvement	Segment in 2020 CMP	Status	Previous Implementation Schedule (2040 MTP)	Current Implementation Schedule (2045 MTP)
MS 475	US 80 to I-20	Traffic operational improvements	Yes	N/A	2018	2045 (Corridor added to Staged Improvement Program)
Crossgates Blvd	US 80 to I-20	Traffic operational improvements	Yes	N/A	2020	2035 (Corridor added to Staged Improvement Program)
MS 25	MS 475 to Old Fannin Rd	Widen to six (6) lanes and traffic operational improvements	No	Project completed	2018	Project completed
Main St in Florence	Church St to US 49	Widen to four (4) lanes with center turning lane	No	N/A	2025	2035
I-20	Ellis Ave to Gallatin St	Add capacity and improve access	Yes	N/A	2040	2045
I-55	Lakeland Dr to Fortification St	Improved ITS/Promote use of alternate routes	Yes	N/A	2020	2025
MS 18	MS 468 to Louis Wilson Dr	Widen to four (4) lanes divided and traffic operational improvements	Yes	N/A	2030	2035
US 51	Jackson St to Lake Harbour Dr	Traffic operational improvements and promote use of Lake Harbour Dr Extension once constructed	Yes	Lake Harbour Dr under construction	2018	Lake Harbour Dr under construction
US 80	US 49 to Pearson Rd	Traffic operational improvements and promote use of alternate routes	Yes	N/A	2018	2045 (Corridor added to Staged Improvement Program)
US 80	I-20 to MS 471	Traffic operational improvements and promote use of alternate routes	Yes	N/A	2020	2025
MS 463	Livingston Rd to Highland Colony Pkwy	Traffic operational improvements	Yes	N/A	2018	2035 (Corridor added to Staged Improvement Program)
MS 471	Luckney Rd to Value Rd	Widen to five (5) lanes and traffic operational improvements	No	Project completed	2017	Project completed
Clinton Pkwy	US 80 to I-20	Traffic operational improvements and promote use of alternate routes	No	N/A	2020	2025
County Line Rd	US 51 to I-55	Traffic operational improvements	No	N/A	2020	2025
Ellis Ave	US 80 to Raymond Rd	Traffic operational improvements	No	N/A	2020	2025
Fortification St	State St to I-55	Traffic operational improvements and promote use of alternate routes	No	N/A	2018	2025
Jackson Ave	I-55 to US 51	Traffic operational improvements and promote use of Lake Harbour Dr Extension once constructed	No	Lake Harbour Dr under construction	2018	Lake Harbour Dr under construction
Lakeland Dr	Old Canton Rd to I-55	Traffic operational improvements	No	N/A	2018	2025
I-55	Fortification St to I-55/I-20 Stack	Improved ITS and promote use of alternate routes	Yes	N/A	2020	2025
US 80	Springridge Rd to Shaw Rd	Traffic operational improvements and promote use of alternate routes	Yes	N/A	2020	2025

Road	Segment	2015 CMP Proposed Improvement	Segment in 2020 CMP	Status	Previous Implementation Schedule (2040 MTP)	Current Implementation Schedule (2045 MTP)
US 80	Fox Hall Rd to MS 475	Traffic operational improvements and promote use of alternate routes	No	N/A	2020	2025
MS 471	MS 25 to Luckney Rd	Widen to five (5) lanes and traffic operational improvements	No	N/A	2017	2045 (Corridor added to Staged Improvement Program)
Bozeman Rd	Gluckstadt Rd to MS 463	Widen to four (4) lanes divided and traffic operational improvements	No	E+C Project - Widen to 5 lanes	2018	2025
County Line Rd	I-55 to Ridgewood Rd	Traffic operational improvements	Yes	N/A	2020	2025
County Line Rd	Ridgewood Rd to Wheatley St	Traffic operational improvements	Yes	N/A	2020	2025
MS 468	MS 475 to Liberty Rd	Traffic operational improvements	No	N/A	2020	2025
I-55 Frontage Rd	Beasley Rd to Briarwood Dr	Traffic operational improvements	No	N/A	2020	2025
Main St in Madison	I-55 to Crawford St	Traffic operational improvements and promote use of alternate routes	Yes	N/A	2020	2025
Old Canton Rd	County Line Rd - Pear Orchard Rd	Traffic operational improvements	No	N/A	2020	2025

8.0 Future Conditions

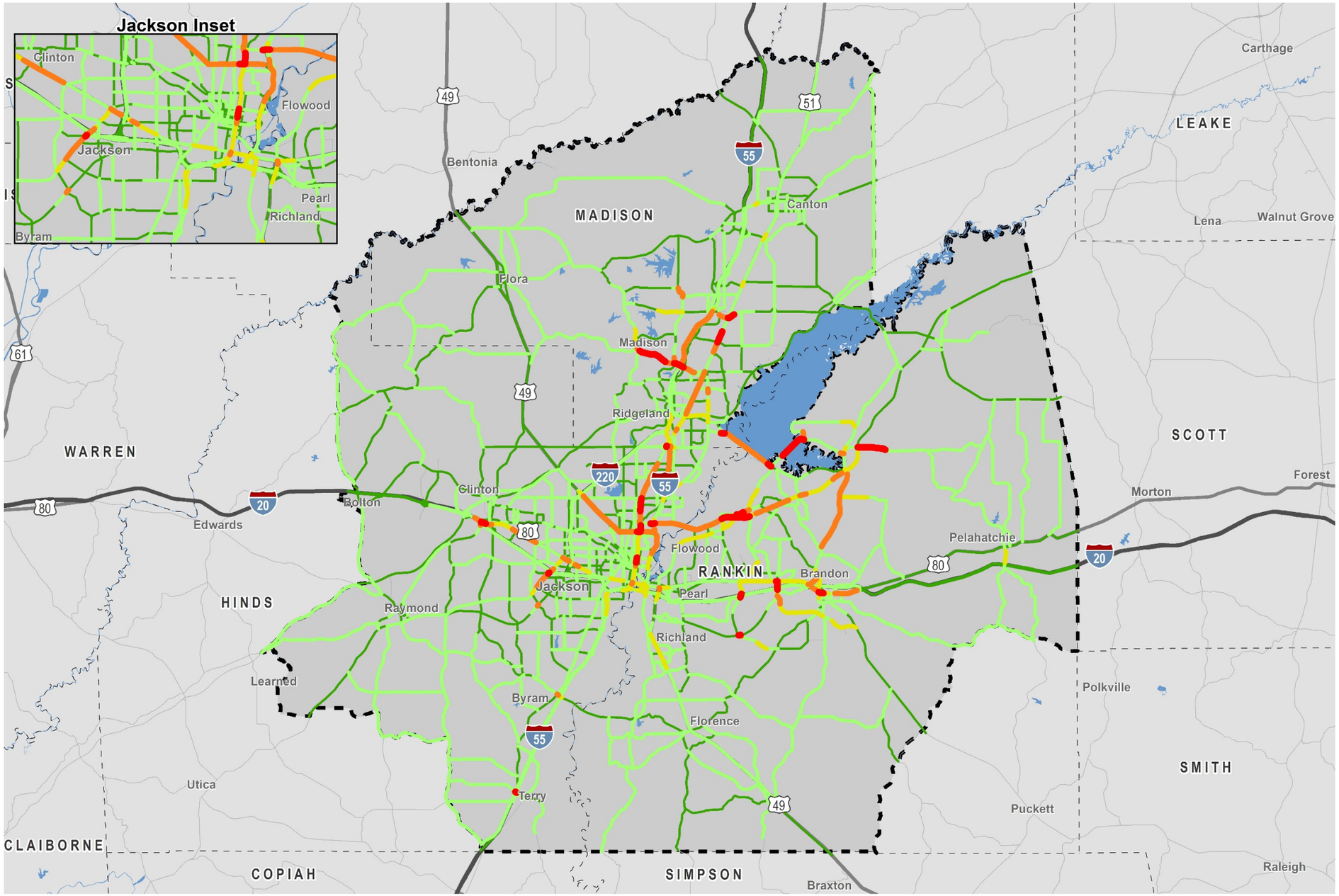
8.1 Future Congestion

Using the results from the 2045 Travel Demand Model, in the Jackson MPA, the Vehicle Miles Traveled (VMT) will increase by nearly 28 percent between 2018 and 2045, and the Vehicle Hours Traveled (VHT) will increase by just over 35 percent between 2018 and 2045. However, during this same time period, the Vehicle Hours Delay (VHD) will nearly double. This large increase in VHD is expected to result in increased congestion on the roadway network. During the public survey, congestion reduction on the roadway network was identified as the top priority for residents and workers. Section 4.0: Roadways and Bridges of *Technical Report #4: Needs Assessment* further summarized the congestion relief needs.

Using the same methodology for recurring congestion that was discussed in Chapter 4, scores were developed for each link in the 2045 CMP network. Figure 8.1 displays the expected recurring congested segments of the Jackson CMP network in 2045, ranked based on the results of the recurring congestion analysis process. Table 8.1 lists the segments that are expected to experience recurring congestion in 2045.

Non-recurring congestion analysis for the future was not conducted since the occurrence of random events such as crashes, road construction, or special events in the future cannot be determined. However, segments that currently experience non-recurring congestion due to crashes may experience longer delays in the future if no improvements are made. Chapter 5 identified the segments that experienced significant non-recurring congestion in 2017 and/or 2018.

Figure 8.1 Recurring Congested Segments in 2045



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Table 8.1 Future Recurring Congested Segments (2045)

Rank	Road Name	Segment	Length (miles)	Directional TTI	Directional TTI	Directional LOS	Directional LOS	CMP Index Rating in 2045	CMP Index Rating in 2018	Change in CMP Index Rating (2018 to 2045)
1	E Woodrow Wilson Ave	0.19 miles west of State St to State St	0.19	4	3	4	4	15	15	0
2	State St	E Woodrow Wilson Ave to Old Canton Rd	0.38	3	3	4	4	14	11	3
3	Lakeland Dr (Westbound)	I-55 North Frontage Rd to I-55 South Frontage Rd	0.25	3	-	4	-	14	14	0
4	MS 475	I-20 Eastbound Off-Ramp to I-20 Westbound Off-Ramp	0.20	4	2	4	4	14	14	0
5	MS 18 W (Eastbound)	Greenway Dr to I-20 Eastbound On-Ramp	0.07	3	-	4	-	14	14	0
6	MS 18 E	US 80 to I-20 Westbound Off-Ramp	0.32	4	2	4	4	14	14	0
7	Northshore Pkwy	0.44 miles east of Parkway Dr to Fannin Landing Cir	1.68	3	3	4	4	14	8	6
8	Holly Bush Rd	MS 25 to Adams Rd	1.65	3	3	4	4	14	6	8
9	State St	E Mayes St to E Northside St	0.76	4	2	4	3	13	13	0
10	US 51	W County Line Rd to 0.06 miles north of W County Line Rd	0.06	4	2	4	3	13	12	1
11	MS 25	MS 475 to 0.05 miles east of MS 475	0.05	4	2	4	3	13	11	2
12	MS 18 E	I-20 Eastbound Off-Ramp to I-20 Westbound Off-Ramp	0.17	3	3	4	3	13	12	1
13	Cunningham St/Green Gable Rd	I-55 Southbound Off-Ramp to I-55 Northbound Off-Ramp	0.09	2	4	3	4	13	13	0
14	Spillway Rd	0.22 miles west of Northshore Pkwy to Northshore Pkwy	0.22	2	3	4	4	13	8	5
15	MS 463	N Livingston Rd to Park Place Blvd	1.72	2	2	4	4	12	9	3
16	MS 463	Highland Colony Pkwy to I-55	0.36	2	3	3	4	12	9	3
17	MS 463	I-55 to Grandview Blvd/Galleria Pkwy	0.17	2	2	4	4	12	10	2
18	US 51	Green Oak Ln to 0.43 miles north of Green Oak Ln	0.70	2	2	4	4	12	7	5
19	MS 25	0.05 miles east of MS 475 to E Metro Pkwy	1.64	2	4	3	3	12	8	4
20	Flowood Dr	Liberty Rd to Lakeland Commons Dr	0.42	3	3	3	3	12	8	4
21	US 80	0.08 miles west of MS 18 E to MS 18 E	0.08	3	3	3	3	12	12	0
22	US 80	MS 471 to S College St	0.29	4	2	4	2	12	12	0
23	US 80	I-20 (Clinton) to 0.36 miles west of Clinton Pkwy/Springridge Rd	0.33	2	3	4	3	12	10	2
24	MS 18 W (Westbound)	I-20 Eastbound Off-Ramp to Greenway Dr	0.04	2	-	4	-	12	10	2
25	State St	E Amite St to High St	0.30	3	2	3	4	12	12	0
26	MS 468	MS 475 to Lake Cir	0.12	2	2	4	4	12	7	5
27	MS 18 W	McDowell Rd to Greenway Dr	1.04	2	3	4	2	11	11	0
28	US 80	MS 18 W to 0.09 miles west of I-220 Southbound Off-Ramp	0.33	2	3	3	3	11	10	1
29	US 80	0.36 miles west of Clinton Pkwy/Springridge Rd to Clinton Pkwy/Springridge Rd	0.37	2	3	3	3	11	10	1

Rank	Road Name	Segment	Length (miles)	Directional TTI	Directional TTI	Directional LOS	Directional LOS	CMP Index Rating in 2045	CMP Index Rating in 2018	Change in CMP Index Rating (2018 to 2045)
30	State St	0.09 miles south of US 80 to US 80	0.09	3	2	4	2	11	9	2
31	State St	E Pascagoula St to E Amite St	0.22	2	2	3	4	11	11	0
32	State St	Old Canton Rd to E Mayes St	0.88	2	2	3	4	11	11	0
33	MS 463	I-55 Southbound Off-Ramp to I-55 Northbound Off-Ramp	0.07	2	3	3	3	11	10	1
34	US 51	Tisdale Rd to Green Oak Ln	0.64	2	2	4	3	11	7	4
35	Weisenberger Rd	Parkway East to US 51	0.59	2	2	3	4	11	3	8
36	MS 25	0.35 miles east of Ridgewood Rd to 0.14 miles west of MS 475	2.58	2	3	3	3	11	8	3
37	MS 25	Castlewoods Blvd/Grants Ferry Rd to Vine Dr	0.39	2	3	3	3	11	5	6
38	MS 25	Marshall Rd to MS 471	0.65	2	2	3	4	11	4	7
39	Fannin Landing Cir	Northshore Pkwy to 0.47 miles north of Northshore Pkwy	0.47	2	2	3	4	11	6	5
40	MS 18 E	Greenfield Rd to Maquette Rd	0.52	2	2	3	4	11	9	2
41	Value Rd	US 80 to 0.37 miles north of US 80	0.37	2	2	3	4	11	7	4
42	US 80 (Clinton)	I-20 Eastbound Off-Ramp to I-20 Westbound Off-Ramp	0.17	3	2	3	3	11	11	0
43	Flowood Dr	0.04 miles south of US 80 to US 80	0.25	1	2	4	4	11	11	0
44	Catlett Rd	Stribling Rd Ext to Stribling Rd	0.63	2	2	3	3	10	0	10
45	Yandell Rd	US 51 to 0.48 miles west of Clarkdell Rd	0.41	2	2	3	3	10	4	6
46	I-55 (Southbound)	Gluckstadt Rd to MS 463	3.73	1	-	4	-	10	6	4
47	MS 463	Park Place Blvd to Highland Colony Pkwy	0.55	2	2	3	3	10	9	1
48	MS 463	Grandview Blvd/Galleria Pkwy to Main St	0.74	2	2	3	3	10	10	0
49	US 51	Jackson St to MS 463/Hoy Rd	2.75	2	2	3	3	10	9	1
50	Old Canton Rd	Calumet Dr to St Augustine Dr	0.24	2	2	3	3	10	9	1
51	US 51	Lake Harbour Rd to Christine Dr	0.11	2	3	2	3	10	8	2
52	Spillway Rd	Harbor Dr to Breakers Ln	0.22	2	2	3	3	10	6	4
53	I-55 Northbound Frontage Rd	E County Line Rd to I-55 Northbound On-Ramp	0.07	2	-	3	-	10	10	0
54	I-55 (Northbound)	E Northside Dr to E County Line Rd	2.58	2	-	3	-	10	8	2
55	State St	E Northside Dr to Beasley Rd	2.29	2	2	3	3	10	10	0
56	Lakeland Dr (Eastbound)	I-55 South Frontage Rd to I-55 North Frontage Rd	0.24	2	-	3	-	10	10	0
57	MS 25	Highland Dr to 0.35 miles east of Ridgewood Rd	1.17	2	2	3	3	10	8	2
58	Medgar Evers Blvd	I-220 to W Woodrow Wilson Ave	3.03	2	2	3	3	10	10	0
59	Woodrow Wilson Ave	Medgar Evers Blvd to 0.19 miles west of State St	1.06	2	2	3	3	10	10	0
60	E Woodrow Wilson Ave	State St to I-55	0.62	2	2	3	3	10	10	0

Rank	Road Name	Segment	Length (miles)	Directional TTI	Directional TTI	Directional LOS	Directional LOS	CMP Index Rating in 2045	CMP Index Rating in 2018	Change in CMP Index Rating (2018 to 2045)
61	I-55 (Southbound)	E Woodrow Wilson Ave to E Fortification St	1.59	2	-	3	-	10	10	0
62	I-20 Frontage Rd	Woodmoor Dr to US 80	0.46	2	2	3	3	10	6	4
63	US 80	Morrison Dr to Wiggins Rd	1.59	2	2	3	3	10	9	1
64	MS 18 W (Eastbound)	I-20 Eastbound Off-Ramp to I-20 Westbound Off-Ramp	0.34	2	-	3	-	10	10	0
65	MS 18 W (Westbound)	I-20 Westbound Off-Ramp to I-20 Eastbound Off-Ramp	0.21	2	-	3	-	10	8	2
66	US 80	0.09 miles west of I-220 Southbound Off-Ramp to I-220 Southbound Off-Ramp	0.18	2	2	3	3	10	9	1
67	US 80	0.11 miles east of I-220 Northbound Off-Ramp to Lynch St	0.22	2	2	3	3	10	8	2
68	Flowood Dr	Lakeland Commons Dr to Old Fannin Rd	0.38	2	2	3	3	10	8	2
69	MS 25	Oakridge Trail to Liberty Park Ct	0.38	2	2	3	3	10	7	3
70	MS 25	Luckney Rd to Hugh Ward Blvd	1.48	2	2	3	3	10	6	4
71	MS 471	Hillcrest Dr to MS 25	4.73	2	2	3	3	10	4	6
72	Northshore Pkwy	0.19 miles west of Old MS 471 to Old MS 471	0.19	2	2	3	3	10	6	4
73	Value Rd	0.35 miles west of Old MS 471 to Old MS 471	0.35	2	2	3	3	10	7	3
74	US 80 (Brandon)	I-20 to MS 471	0.47	3	1	4	2	10	7	3
75	US 80 (Brandon)	Trickham Bridge Rd to Meadowcreek Dr	0.88	3	2	3	2	10	9	1
76	US 80 (Brandon)	Meadowcreek Dr to 0.18 miles west of I-20	0.46	2	2	4	2	10	9	1
77	Raymond Rd	Forest Hill Rd to Maddox Rd	0.12	2	2	3	3	10	6	4
78	MS 468	Lake Cir to Greenfield Rd	0.09	2	2	3	3	10	9	1
79	Flowood Dr (Northbound)	I-20 to 0.04 miles south of US 80	0.07	2	-	3	-	10	10	0
80	MS 25	I-55 North Frontage Rd to Highland Dr	0.30	2	2	2	3	9	9	0
81	US 51	W Sowell Rd to E Sowell Rd	0.28	2	2	3	2	9	4	5
82	Gluckstadt Rd	0.68 miles west of Catlett Rd to Catlett Rd	0.68	2	2	3	2	9	4	5
83	MS 463	Reunion Pkwy to Robinson Springs Rd	0.66	1	2	3	3	9	6	3
84	US 51	W Jackson St to Rice Rd	0.29	3	1	3	2	9	9	0
85	Natchez Trace Pkwy	Rice Rd to Old Canton Rd	1.19	1	2	3	3	9	9	0
86	Old Canton Rd	W Tidewater Ln to McClellan Dr	0.58	2	2	2	3	9	8	1
87	US 51	Christine Dr to E Ford St	0.19	2	2	2	3	9	8	1
88	US 51	Ridgewood Rd to Lake Harbour Dr	0.20	2	1	3	3	9	7	2
89	MS 468	0.57 miles north of Underwood Dr to 0.49 miles west of Treetops Blvd	0.64	2	2	2	3	9	6	3
90	State St	High St to E Woodrow Wilson Ave	1.57	2	2	3	2	9	9	0

Rank	Road Name	Segment	Length (miles)	Directional TTI	Directional TTI	Directional LOS	Directional LOS	CMP Index Rating in 2045	CMP Index Rating in 2018	Change in CMP Index Rating (2018 to 2045)
91	State St	US 80 to E Pascagoula St	1.01	2	2	3	2	9	9	0
92	US 80	Terry Rd to S Gallatin St	0.77	2	2	3	2	9	8	1
93	US 80	Lynch St to Ellis Ave	0.75	2	2	2	3	9	8	1
94	MS 18 W	Lynch St to US 80	0.48	2	2	2	3	9	9	0
95	US 80	Clinton Pkwy to Morrison Dr	1.33	2	2	2	3	9	9	0
96	US 80	Flowood Dr to Chlidre Rd	0.56	1	2	2	4	9	9	0
97	Old US 49	0.70 miles south of US 80 to 0.35 miles south of US 80	0.35	2	2	3	2	9	8	1
98	US 80	MS 475 to 0.08 miles west of MS 18 E	2.15	2	2	3	2	9	8	1
99	US 80	0.17 miles east of MS 18 E to Value Rd	1.72	2	2	2	3	9	8	1
100	US 80	Oak St to I-20 Eastbound Off-Ramp (West Brandon)	0.18	2	2	3	2	9	9	0
101	MS 471	0.93 miles south of Old MS 471 to Old MS 471	0.93	2	2	3	2	9	7	2
102	Old MS 471	Value Park Dr to Orchardview Blvd	0.23	2	2	2	3	9	7	2
103	MS 18 E	I-20 to Greenfield Rd	0.38	2	2	2	3	9	8	1
104	MS 18 E	Marquette Rd to Dell Blvd	1.79	2	2	3	2	9	8	1
105	Old Fannin Rd	Flowood Dr to Laurel Dr	0.30	2	2	2	3	9	4	5
106	MS 25	Liberty Park Ct to Luckney Rd	0.24	2	2	2	3	9	7	2
107	MS 25	Hugh Ward Blvd to Castlewoods Blvd/Grants Ferry Rd	0.73	2	2	2	3	9	6	3
108	MS 22	W Fulton St to King Ranch Rd	0.20	1	1	3	3	8	8	0
109	US 51	N Old Canton Rd to Canton One Rd	0.39	2	1	3	2	8	6	2
110	Gluckstadt Rd	Dewees Rd to 0.68 miles west of Catlett Rd	0.81	2	2	2	2	8	2	6
111	I-55 (Southbound)	Off-Ramp to Gluckstadt Rd to On-Ramp from Westbound Gluckstadt Rd	0.17	1	-	3	-	8	8	0
112	I-55 (Northbound)	MS 463 to Gluckstadt Rd	3.56	0	-	4	-	8	6	2
113	MS 463	0.53 miles north of Reunion Pkwy to Reunion Pkwy	0.53	1	2	3	2	8	6	2
114	Bozeman Rd	0.34 miles north of MS 463 to MS 463	0.34	2	1	3	2	8	6	2
115	US 51	E Ford St to Rice Rd	0.59	1	2	2	3	8	8	0
116	Natchez Trace Pkwy	I-55 Southbound On-Ramp to I-55 Southbound Off-Ramp	0.10	1	1	3	3	8	5	3
117	I-55 (Northbound)	Natchez Trace Pkwy Off-Ramp to Natchez Trace Pkwy On-Ramp	0.19	1	-	3	-	8	4	4
118	I-55 (Southbound)	Natchez Trace Pkwy to I-220	1.12	1	-	3	-	8	4	4
119	US 51	0.07 miles north of E County Line Rd to I-55 South Frontage Rd	0.23	2	2	2	2	8	8	0
120	I-55 (Northbound)	E County Line Rd to I-220	0.85	2	-	2	-	8	8	0
121	E County Line Rd	I-55 North Frontage Rd to Ridgewood Rd	0.24	2	2	2	2	8	9	(1)

Rank	Road Name	Segment	Length (miles)	Directional TTI	Directional TTI	Directional LOS	Directional LOS	CMP Index Rating in 2045	CMP Index Rating in 2018	Change in CMP Index Rating (2018 to 2045)
122	I-55 North Frontage Rd	I-55 Northbound Off-Ramp to E County Line Rd	0.05	2	-	2	-	8	8	0
123	I-55 (Southbound)	On-Ramp from Westbound E County Line Rd to On-Ramp from Eastbound E County Line Rd	0.29	1	-	3	-	8	4	4
124	Old Canton Rd	Rice Rd to Natchez Trace Pkwy	0.40	2	2	2	2	8	6	2
125	Old Canton Rd	Canton Mart Rd to Kaywood Dr	0.71	2	2	2	2	8	6	2
126	I-55 (Northbound)	Off-Ramp to E Northside Dr to On-Ramp from E Northside Dr	0.41	1	-	3	-	8	4	4
127	Old Canton Rd	State St to Lakeland Dr	0.12	2	2	2	2	8	6	2
128	I-55 (Southbound)	Off-Ramp to Lakeland Dr to On-Ramp from Westbound MS 25	0.18	1	-	3	-	8	8	0
129	I-55 (Northbound)	E Fortification St to E Woodrow Wilson Ave	1.07	0	-	4	-	8	8	0
130	I-55 (Southbound)	E Fortification St to E Pascagoula St	0.93	1	-	3	-	8	6	2
131	I-55 (Northbound)	Off-Ramp to High St to On-Ramp from High St	0.19	0	-	4	-	8	6	2
132	I-55 (Northbound)	Off-Ramp to E Pearl St to On-Ramp from E Pascagoula St	0.11	1	-	3	-	8	6	2
133	US 80	State St to Old US 49	0.78	2	1	3	2	8	6	2
134	State St	I-20 to 0.09 miles south of US 80	0.36	0	0	4	4	8	8	0
135	I-55 (Southbound)	Off-Ramp to I-20 Eastbound	0.68	1	-	3	-	8	6	2
136	Old US 49	0.35 miles south of US 80 to US 80	0.35	1	2	2	3	8	7	1
137	MS 468	0.49 miles west of Treetops Blvd to N Flowood Dr	1.55	2	2	2	2	8	6	2
138	MS 25	0.14 miles west of MS 475 to MS 475	0.14	2	1	3	2	8	7	1
139	MS 475	MS 468 to MS 25	0.63	2	2	2	2	8	7	1
140	Flowood Dr	MS 25 to Liberty Rd	1.23	2	2	2	2	8	6	2
141	MS 25	E Metro Pkwy/Old Fannin Rd to Oakridge Trail	0.42	1	2	2	3	8	7	1
142	Old Fannin Rd	Laurel Rd to Bridlewood Dr	1.03	2	2	2	2	8	4	4
143	Spillway Rd	Breakers Ln to 0.22 miles west of Northshore Pkwy	3.20	2	2	2	2	8	6	2
144	Northshore Pkwy	Fannin Landing Cir to 0.07 miles east of Fannin Landing Cir	0.07	2	2	2	2	8	6	2
145	MS 25	Vine Dr to Marshall Rd	1.86	2	2	2	2	8	5	3
146	Baker Ln	MS 471 to Oakdale Rd	1.63	2	2	2	2	8	6	2
147	MS 25	MS 471 to Holly Bush Rd	1.72	1	1	3	3	8	1	7
148	Old MS 471	MS 25 to Spillway Rd	0.12	2	1	3	2	8	6	2
149	Old MS 471	Northshore Pkwy to Holly Bush Rd	0.40	2	2	2	2	8	6	2
150	Fannin Landing Cir	Sherrills Ln to Old MS 471	0.91	2	2	2	2	8	6	2
151	US 49 (Northbound)	I-20 On-Ramp to I-20 Westbound Off-Ramp	0.67	2	-	2	-	8	6	2

Rank	Road Name	Segment	Length (miles)	Directional TTI	Directional TTI	Directional LOS	Directional LOS	CMP Index Rating in 2045	CMP Index Rating in 2018	Change in CMP Index Rating (2018 to 2045)
152	MS 475	I-20 to US 80	0.78	2	2	2	2	8	8	0
153	US 80	MS 18 E to 0.17 miles east of MS 18 E	0.17	1	2	2	3	8	8	0
154	Airlane (E Metro Pkwy Connector)	E Metro Pkwy to Old Brandon Rd	0.79	2	2	2	2	8	6	2
155	US 80	Value Rd to Oak St	0.12	2	1	3	2	8	8	0
156	Old MS 471	Value Rd to Value Park Dr	0.21	2	2	2	2	8	7	1
157	MS 471	N College St to 0.93 miles south of Old MS 471	0.25	2	1	2	3	8	7	1
158	US 80	N College St to Courtside Dr	0.30	2	1	3	2	8	6	2
159	Overby St	W Jasper St to US 80	0.36	2	2	2	2	8	7	1
160	MS 18 E	Dell Blvd to S College St	1.13	2	2	2	2	8	8	0
161	MS 18 E	Rosemont Dr to Louis Wilson Dr	1.62	1	1	3	3	8	8	0
162	MS 43	I-20 to Grimes St	0.75	2	2	2	2	8	6	2
163	MS 468	1.04 miles east of Greenfield Rd to Woodridge Dr	0.66	2	2	2	2	8	4	4
164	US 49	Old US 49 to Cleary Rd	2.23	2	2	2	2	8	11	(3)
165	MS 18 W	Maddox Rd to McDowell Rd	0.50	2	1	3	2	8	7	1
166	MS 18 W (Eastbound)	At I-20 Westbound Off-Ramp	0.08	2	-	2	-	8	8	0
167	MS 18 W (Westbound)	I-20 Westbound On-Ramp to I-20 Westbound Off-Ramp	0.17	2	-	2	-	8	8	0
168	US 80	I-220 to 0.10 miles east of I-220	0.20	2	2	2	2	8	8	0
169	Siwell Rd	Terry Rd to Cemetery Rd	0.08	2	2	2	2	8	6	2
170	Siwell Rd	I-55 South Frontage Rd to I-55 Southbound Off-Ramp	0.03	2	2	2	2	8	7	1
171	Siwell Rd	I-55 Northbound Off-Ramp to I-55 North Frontage Rd	0.02	1	1	3	3	8	6	2
172	I-55 (Northbound)	Daniel Lake Blvd to I-20	1.24	1	-	3	-	8	6	2
173	I-55 (Southbound)	I-20 to McDowell Rd	0.49	1	-	3	-	8	8	0
174	I-20 (Eastbound)	On-Ramp from S Gallatin St to On-Ramp from State St	0.39	0	-	4	-	8	6	2
175	I-20 (Westbound)	State St Off-Ramp to S Gallatin St Off-Ramp	0.29	0	-	4	-	8	6	2
176	I-20 (Westbound)	US 49 to I-55 Southbound	0.48	0	-	4	-	8	6	2
177	Medgar Evers Blvd	I-220 Southbound On-Ramp to I-220 Southbound Off-Ramp	0.17	0	-	4	-	8	8	0

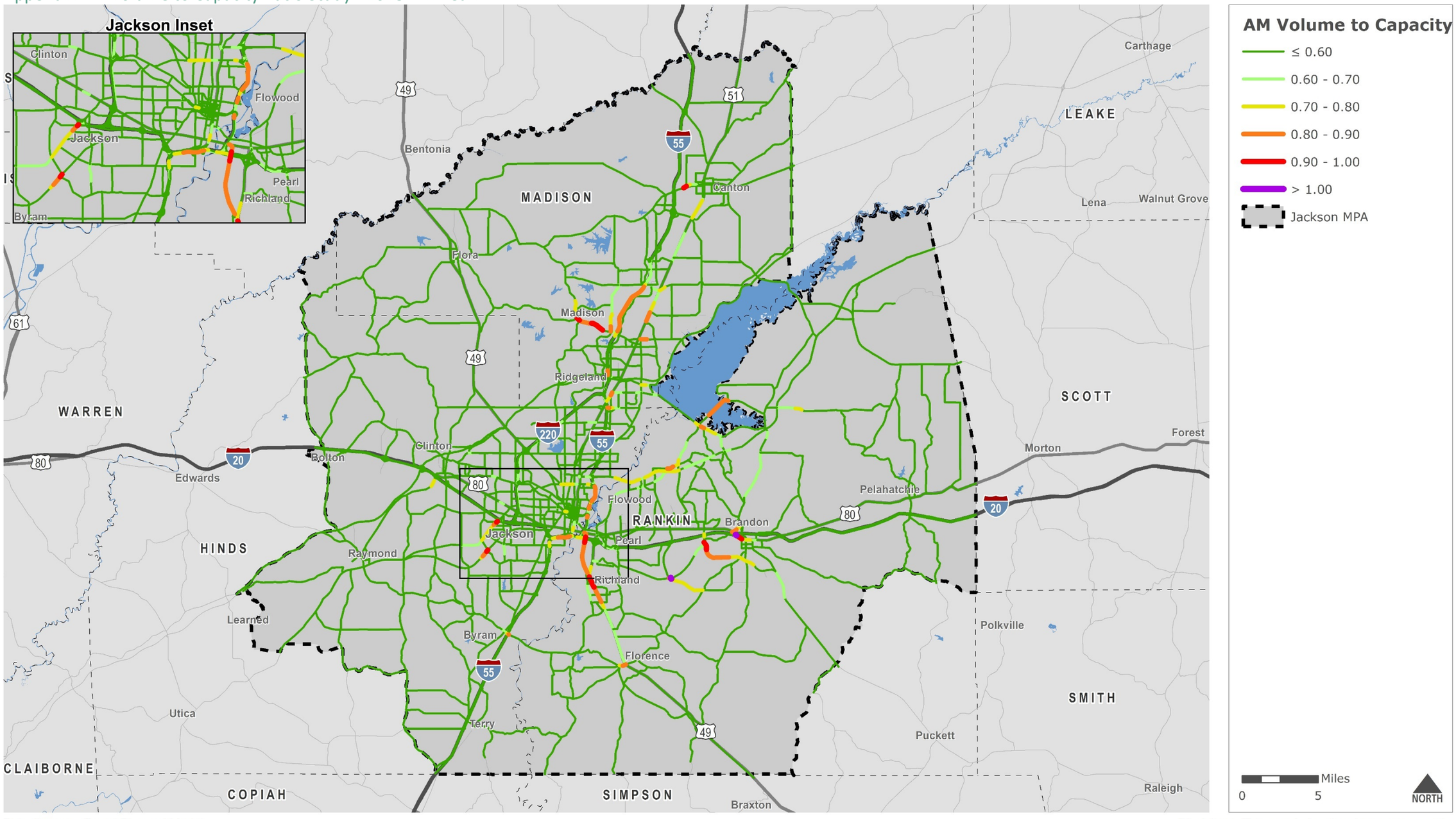
Appendices

Appendix A: Volume to Capacity Study

Appendix B: Travel Time Index Study

Appendix C: Level of Service Study

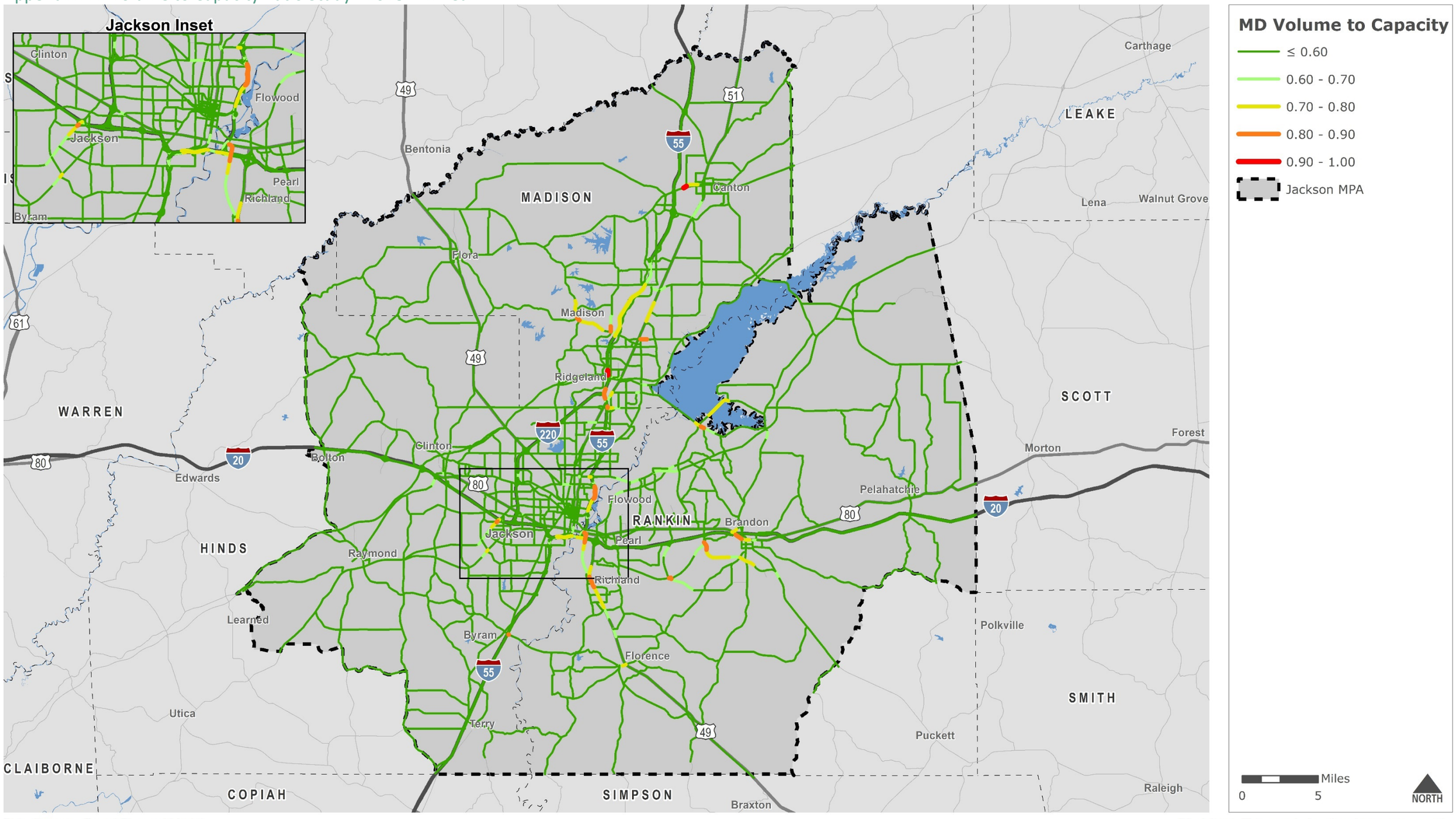
Appendix A.1 Volume to Capacity Ratio Study - 2018 AM Peak



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

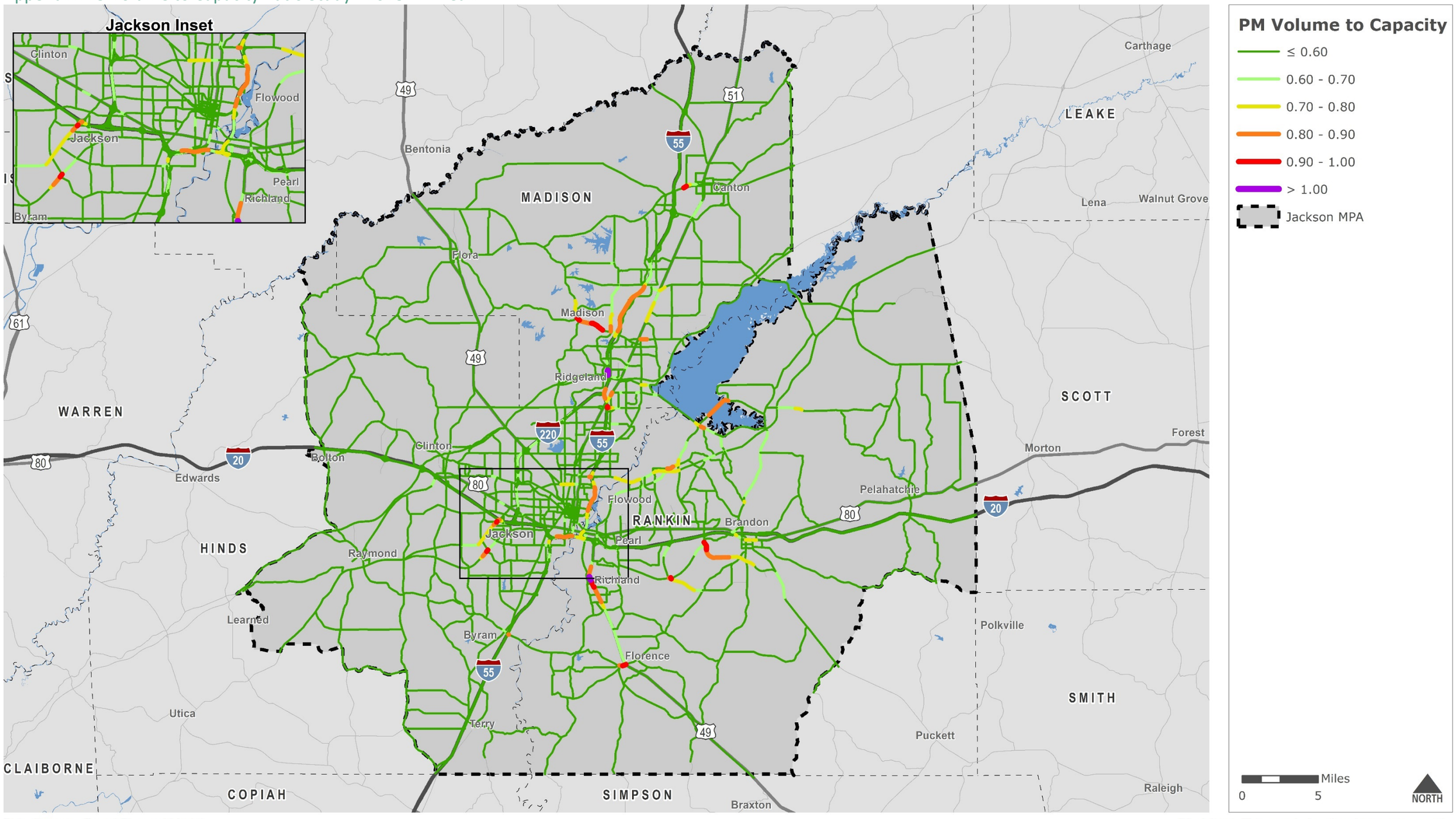
Appendix A.2 Volume to Capacity Ratio Study - 2018 MD Peak



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

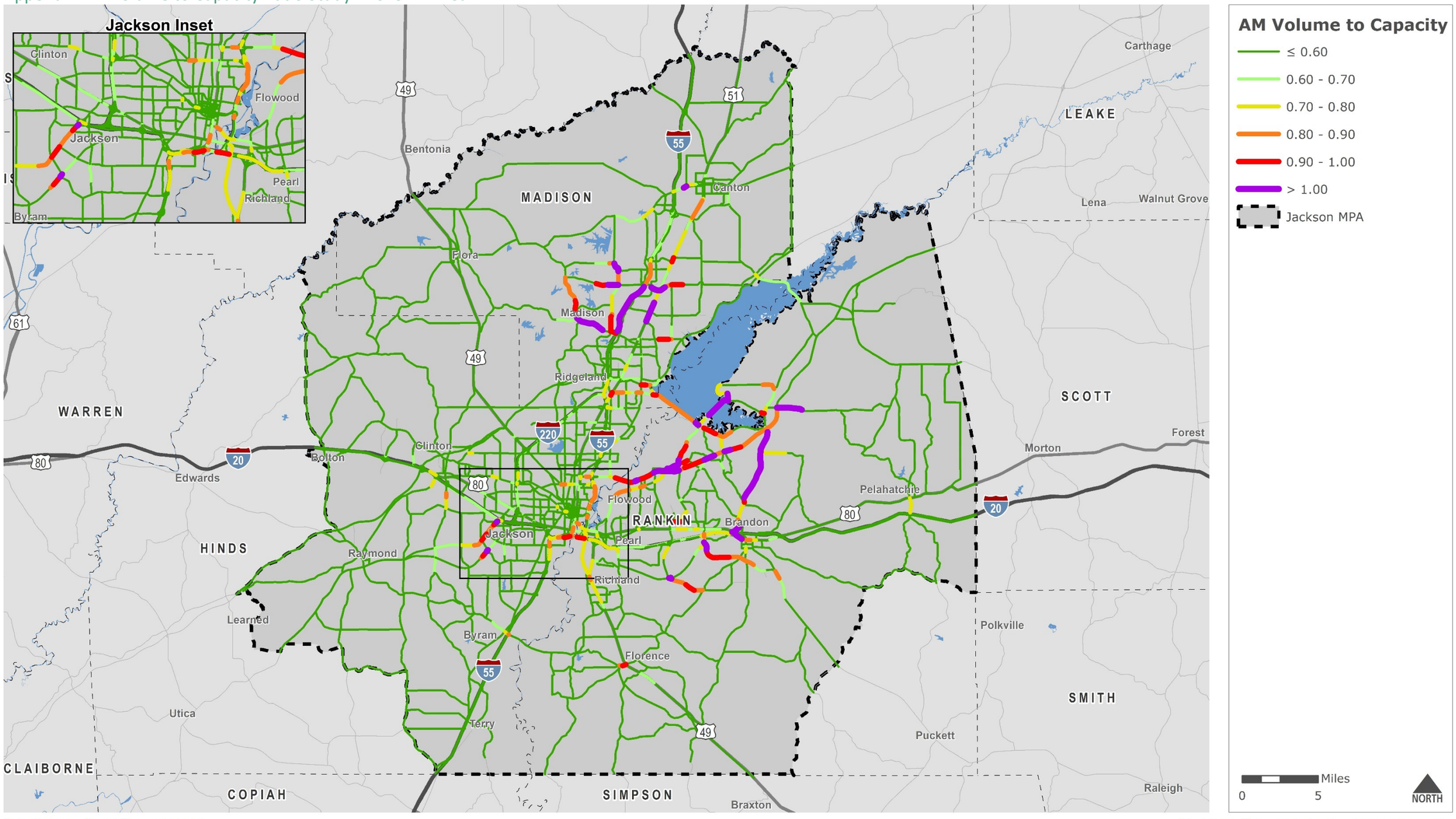
Appendix A.3 Volume to Capacity Ratio Study - 2018 PM Peak



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

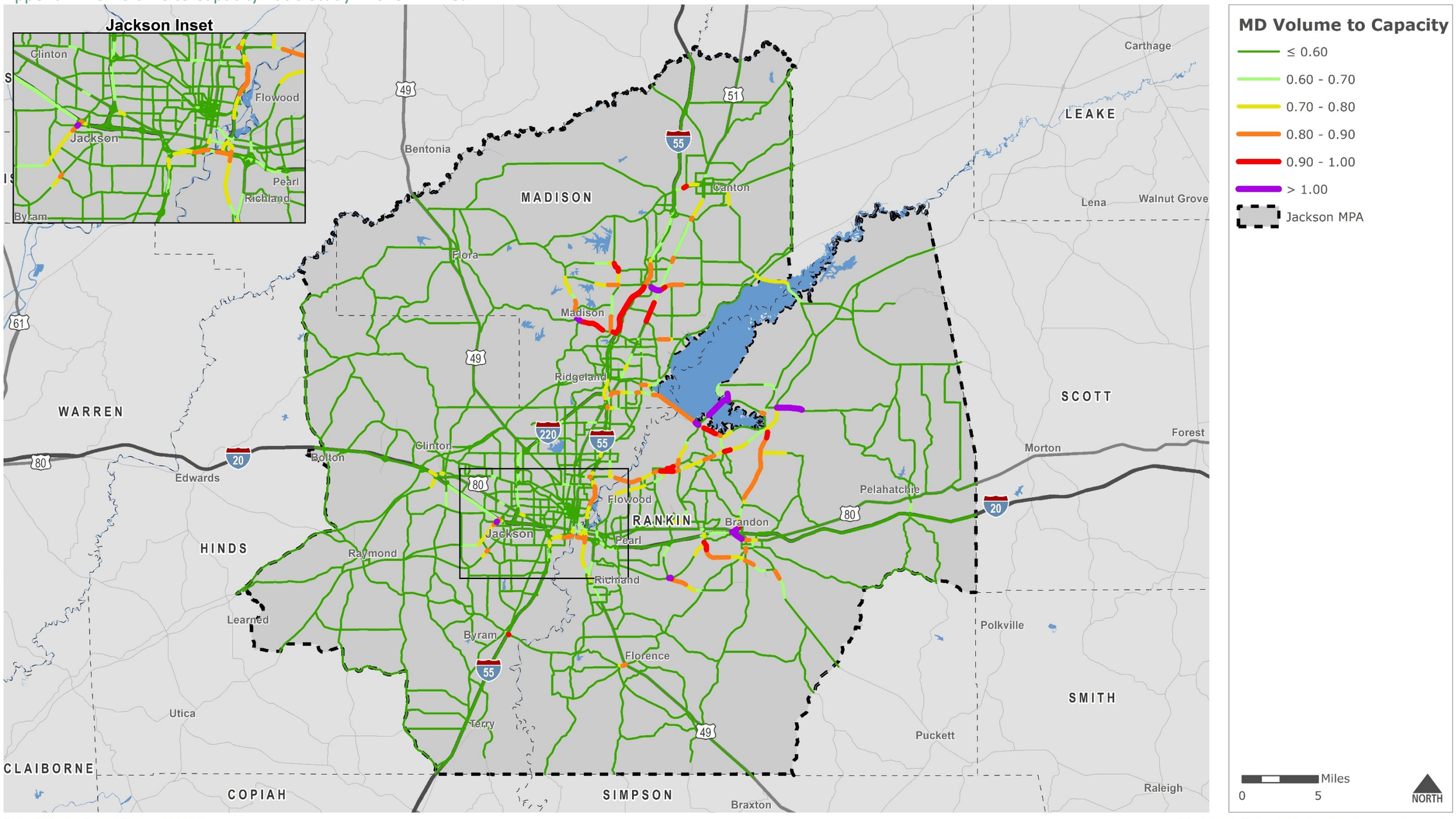
Appendix A.4 Volume to Capacity Ratio Study - 2045 AM Peak



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

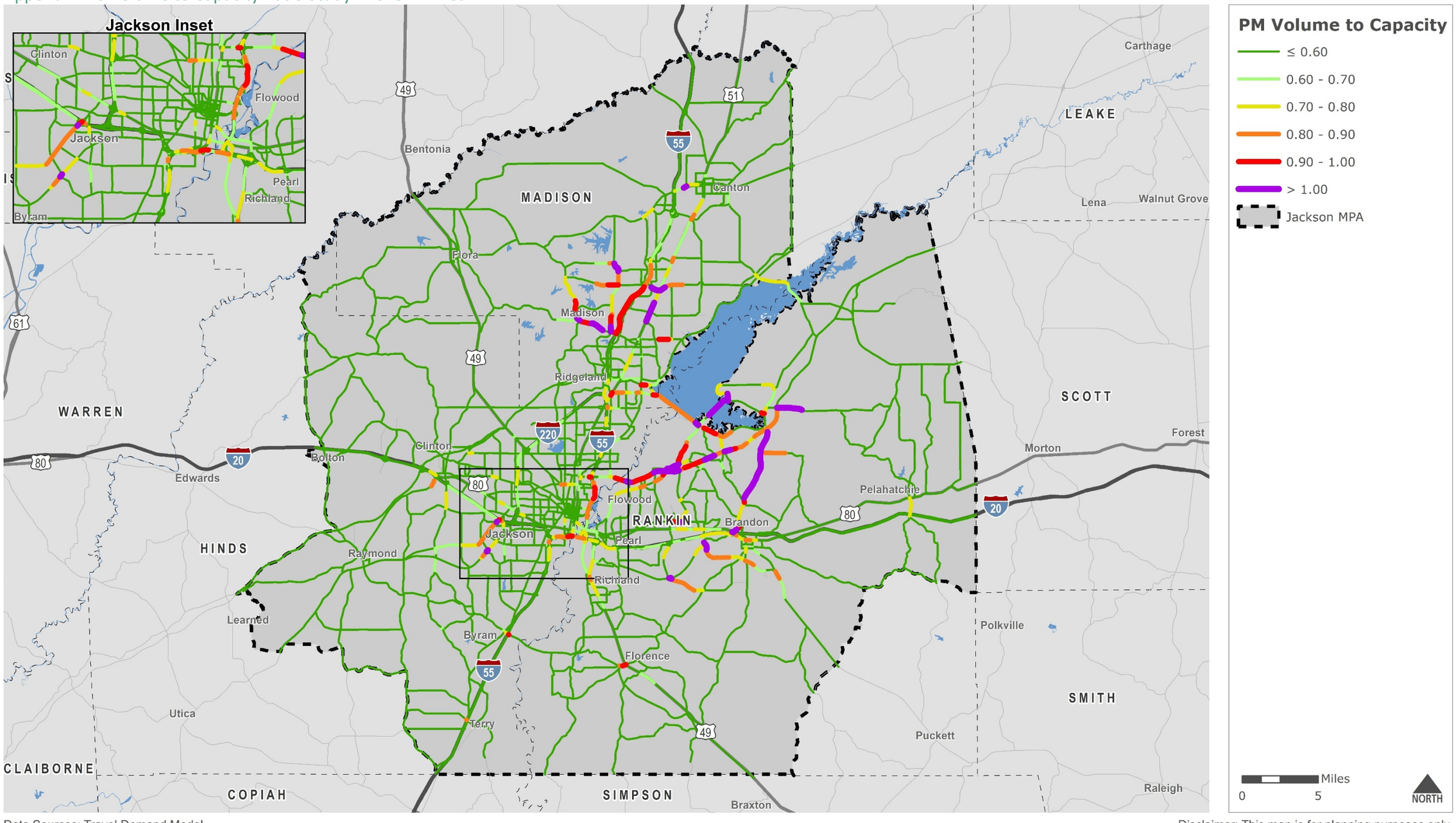
Appendix A.5 Volume to Capacity Ratio Study - 2045 MD Peak



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

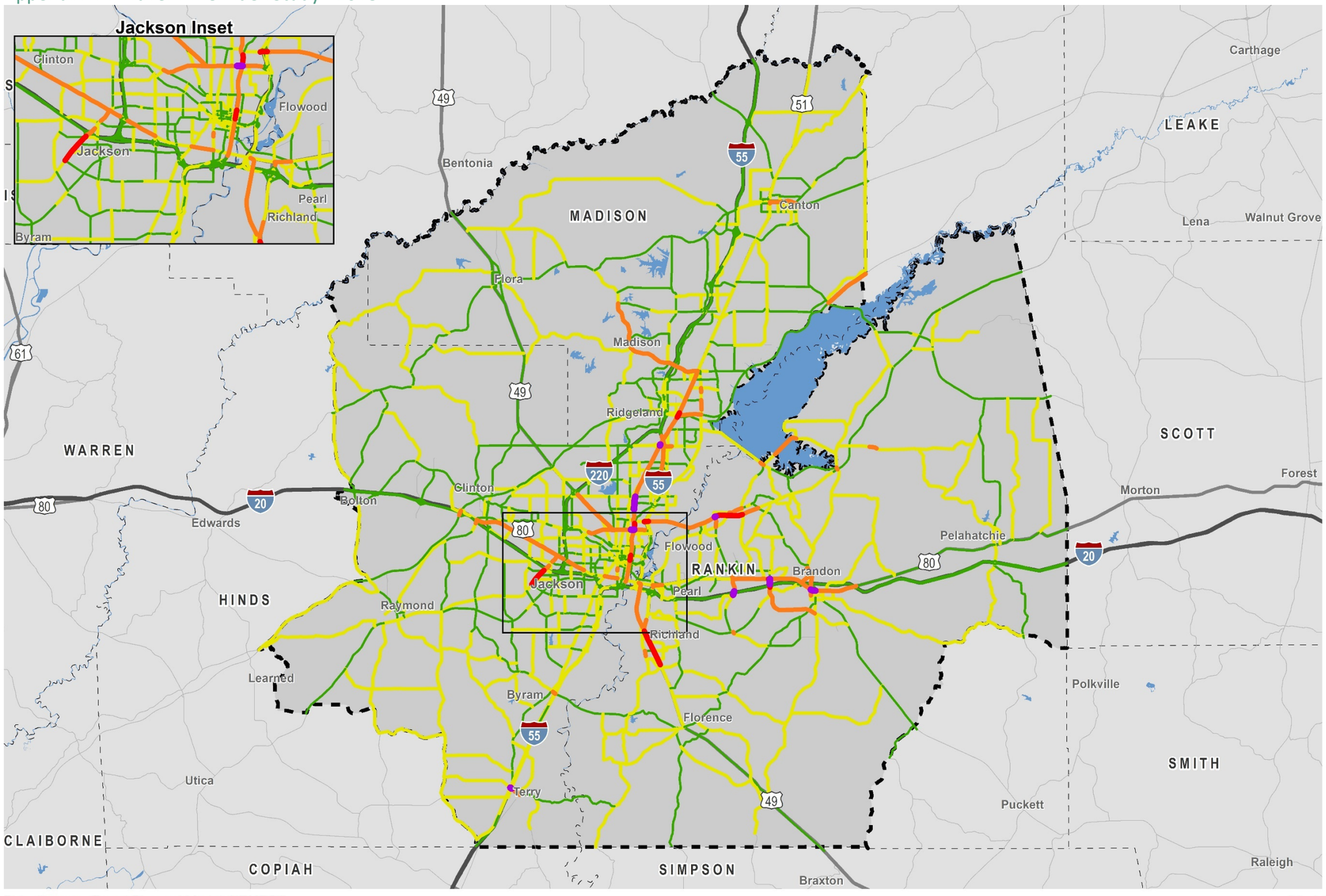
Appendix A.6 Volume to Capacity Ratio Study - 2045 PM Peak



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Appendix B.1 Travel Time Index Study - 2018



Travel Time Index

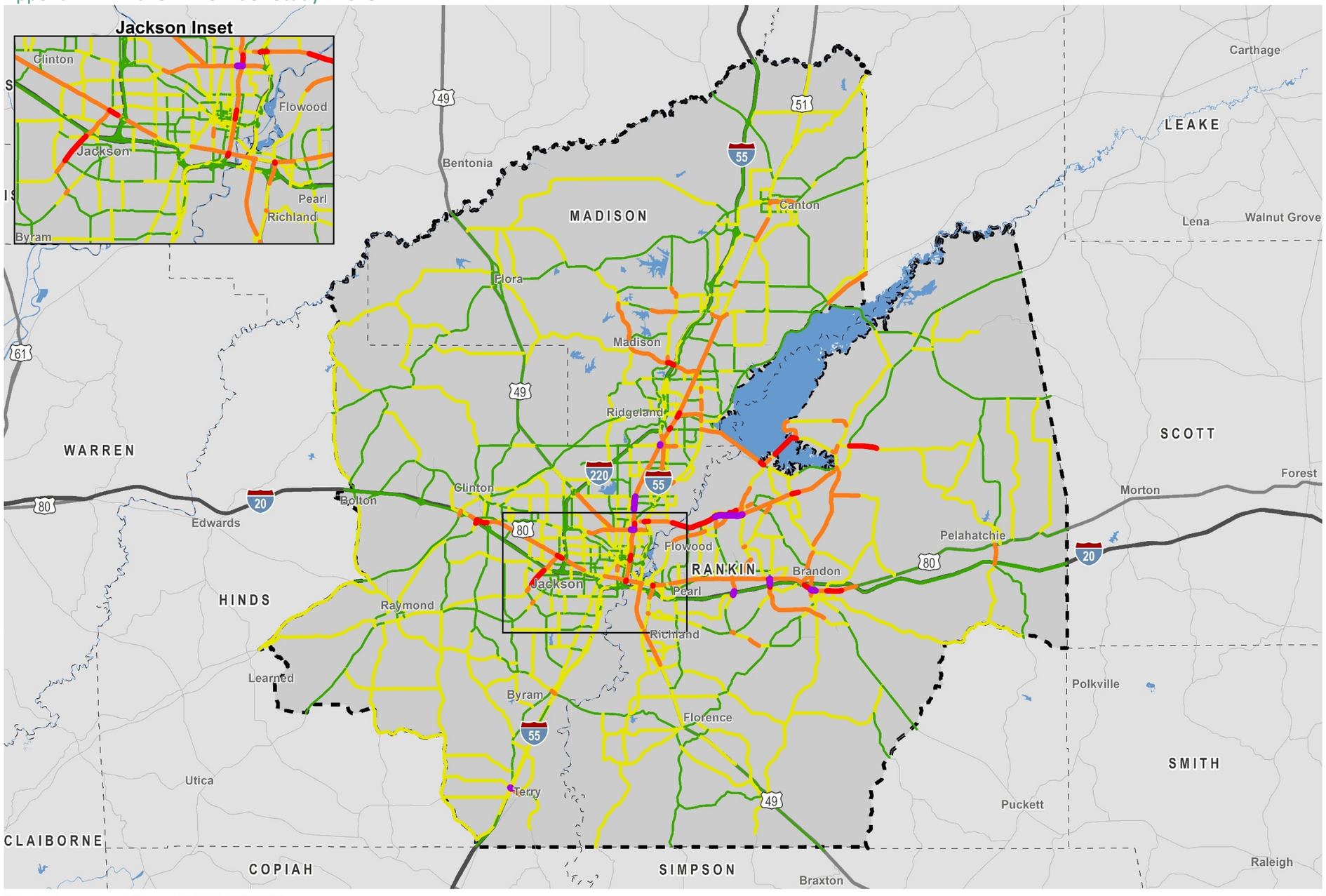
- < 1.50
- 1.50 - 2.00
- 2.00 - 3.00
- 3.00 - 4.00
- ≥ 4.00
- Jackson MPA

Miles
0 5
NORTH

Data Sources: Travel Demand Model, NPMRDS

Disclaimer: This map is for planning purposes only.

Appendix B.2 Travel Time Index Study - 2045



Travel Time Index

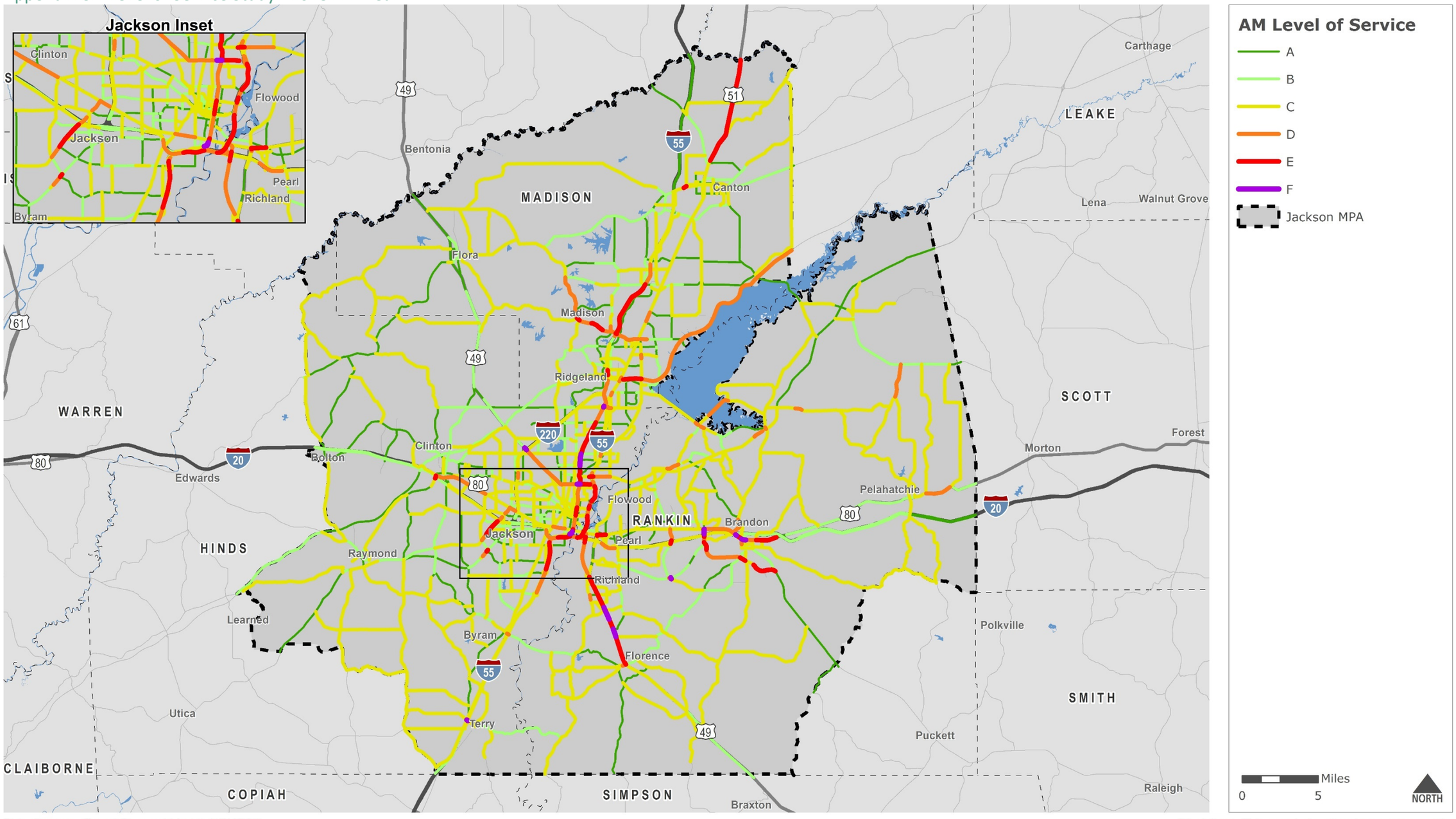
- < 1.50
- 1.50 - 2.00
- 2.00 - 3.00
- 3.00 - 4.00
- ≥ 4.00
- Jackson MPA

Miles
0 5
NORTH

Data Sources: Travel Demand Model, NPMRDS

Disclaimer: This map is for planning purposes only.

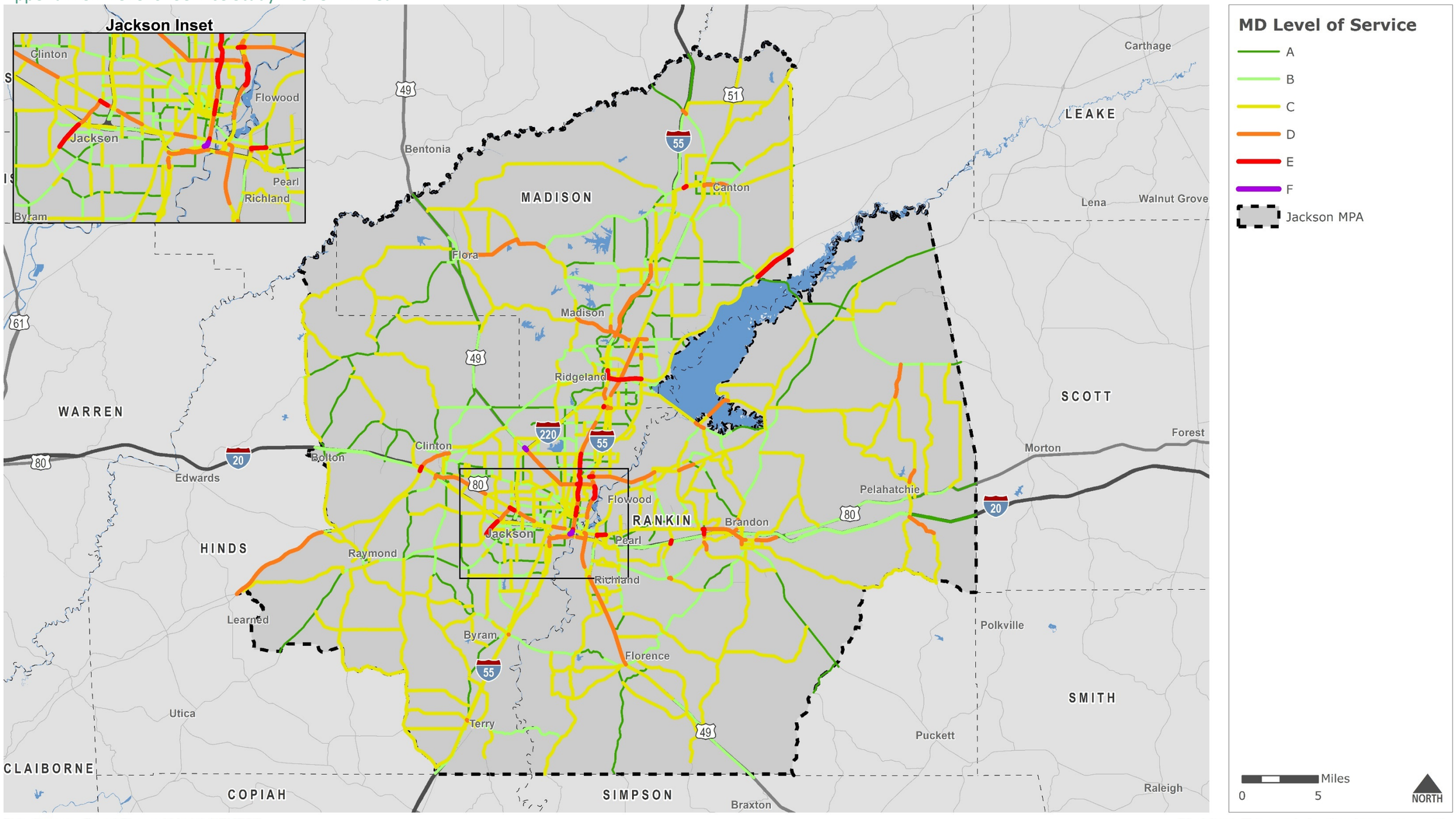
Appendix C.1 Level of Service Study - 2018 AM Peak



Data Sources: Travel Demand Model, NPMRDS

Disclaimer: This map is for planning purposes only.

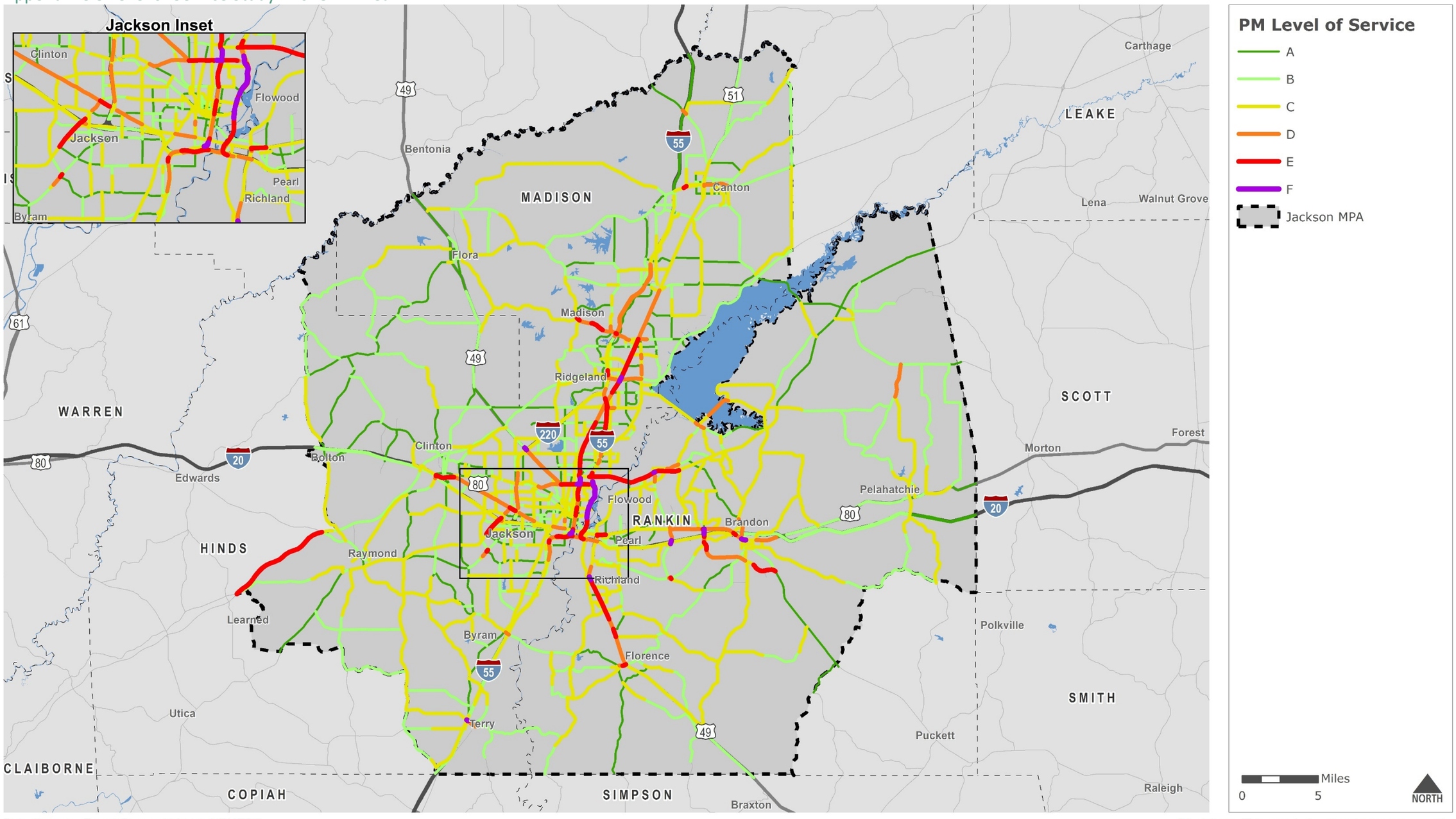
Appendix C.2 Level of Service Study - 2018 MD Peak



Data Sources: Travel Demand Model, NPMRDS

Disclaimer: This map is for planning purposes only.

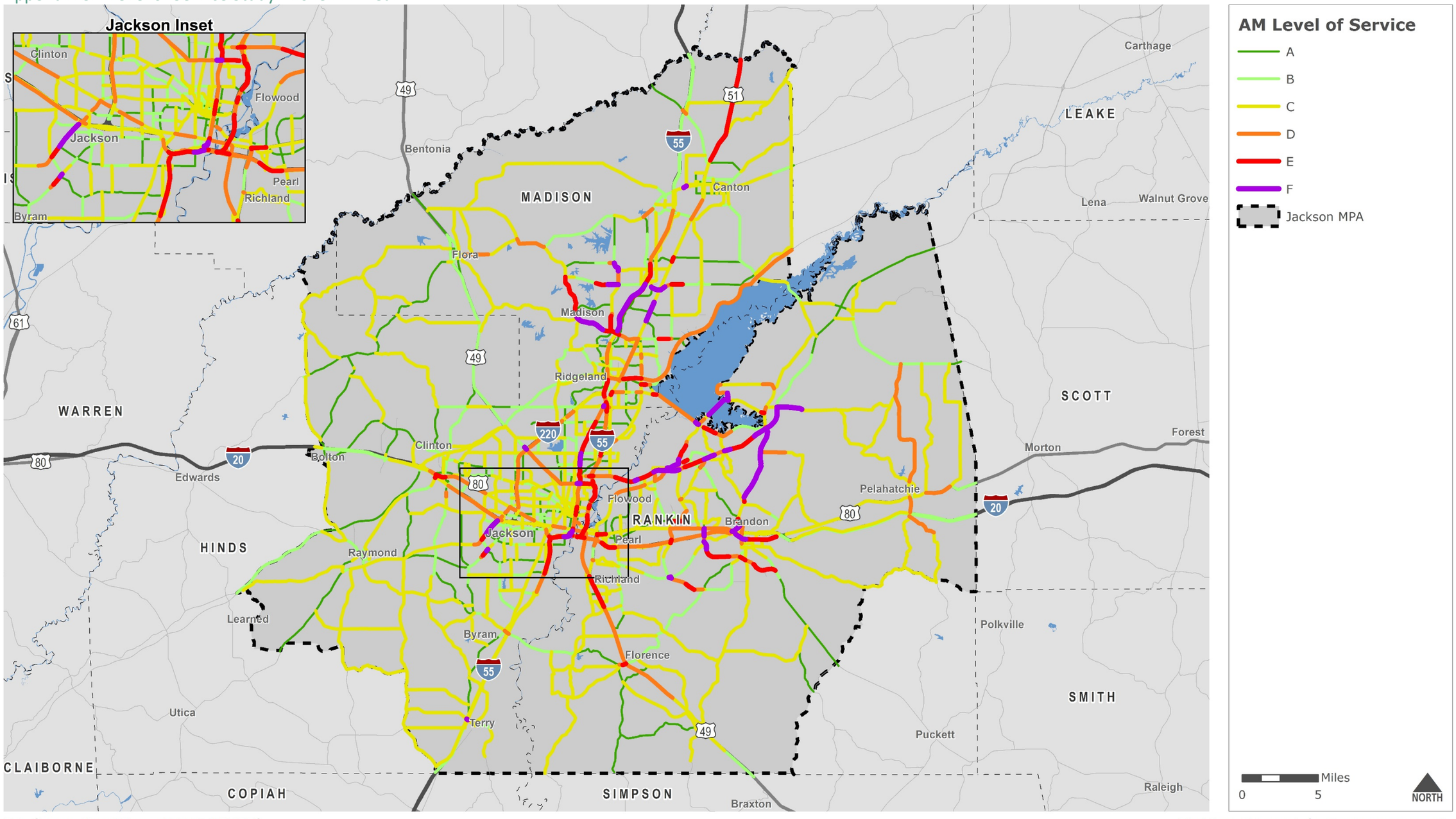
Appendix C.3 Level of Service Study - 2018 PM Peak



Data Sources: Travel Demand Model, NPMRDS

Disclaimer: This map is for planning purposes only.

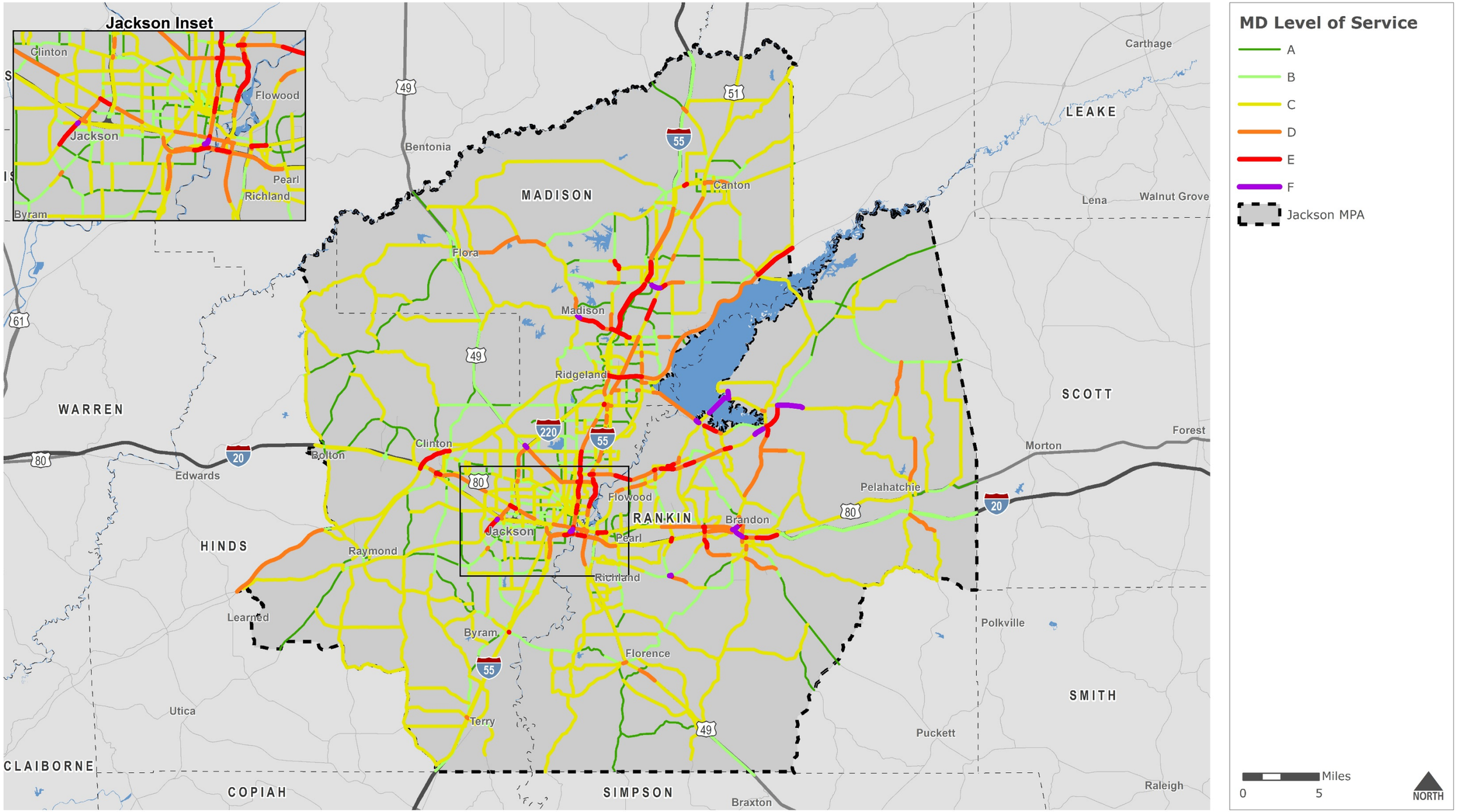
Appendix C.4 Level of Service Study - 2045 AM Peak



Data Sources: Travel Demand Model, NPMRDS

Disclaimer: This map is for planning purposes only.

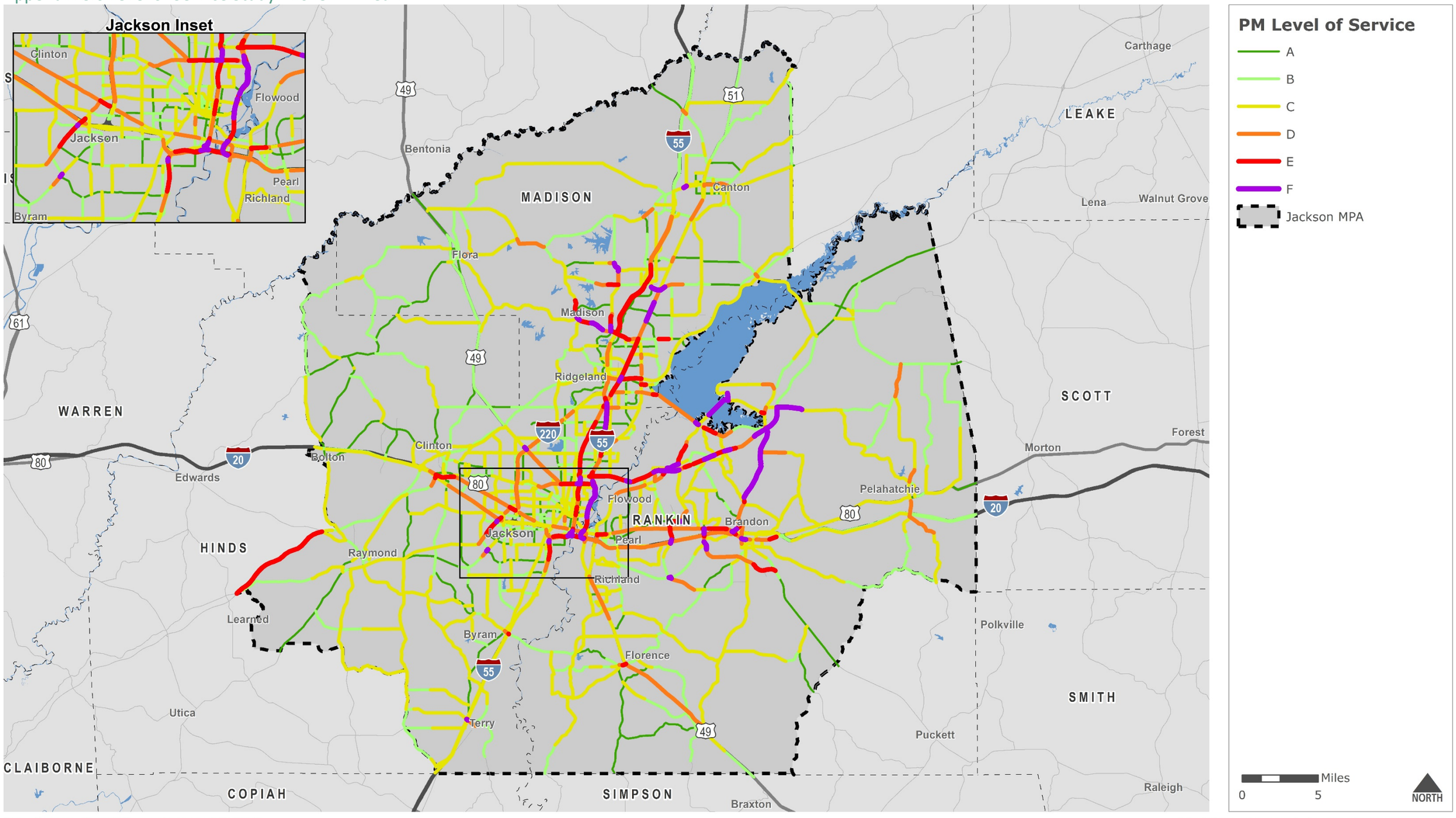
Appendix C.5 Level of Service Study - 2045 MD Peak



Data Sources: Travel Demand Model, NPMRDS

Disclaimer: This map is for planning purposes only.

Appendix C.6 Level of Service Study - 2045 PM Peak



Data Sources: Travel Demand Model, NPMRDS

Disclaimer: This map is for planning purposes only.