2045 Metropolitan Transportation Plan

Technical Report #2

Existing Conditions

Gulf Regional Planning Commission
Metropolitan Planning Organization

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Gulf Regional Planning Commission

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1.0 Introduction

This report identifies the conditions and characteristics of the existing transportation system in the Gulf Coast Metropolitan Planning Area (MPA) for 2018 where possible. Where required by the Fixing America's Surface Transportation (FAST) Act, it provides the data for the most recent year available.

For each mode of transportation, the report focuses on the following information:

- Network facilities and assets
- Maintenance
- Safety and security
- Traffic and demand

Detailed information for federally required performance measures and targets are discussed in *Technical Report #3: Transportation Performance Management Report*.

Planning for the future transportation system and its improvements begins with evaluating the existing transportation system.

2.0 Roadways and Bridges

2.1 Introduction

The region's roadways and bridges are used by personal motor vehicles, public and private transportation providers, bicyclists, and freight trucks. These roadways can also be used to provide access to other transportation modes. This section discusses the general use of the MPA's roadways and bridges. The existing conditions for biking, walking, public transit, and freight will be further discussed in greater detail later in this report.

84.8%

Households in the Gulf Coast MPA that commute by motor vehicle and drive alone

For households in urbanized areas, like the Gulf Coast, traveling by motor vehicle is the primary means of transportation. The most recent American Community Survey (ACS) 5-year estimates show that commuting by motor vehicle without carpooling is the most common method of commuting within the MPA counties. This means the overwhelming majority of household travel is affected by the condition of the MPA's roadways and bridges.

2.2 The Roadway Network

Several federal and state highways serve the study area and constitute its main roadway network. The most significant of these facilities are shown below.

- I-I0 begins at SR 1 in Santa Monica, CA and travels east to I-95 in Jacksonville, FL. It goes through the study area from west to east.

- I-110 begins at US 90 in Biloxis, MS and ends at I-10 in D'Iberville, MS. I-110 is wholly contained within the MPA and travels from south to north.

- US 90 begins at Business Interstate 10 in Van Horn, TX and travels east to SR-A1A in Jacksonville Beach, FL. US 90 goes through the study area from west to east.

- US 49 begins in Gulfport, MS and travels north to Piggot, AR. US 49 goes through the study area from the south to north

Roadways by Functional Classification

Each type of roadway serves a function in the overall roadway network. Roadways are divided into functional classes based on their intended balance of mobility (speed) and access to adjacent land. Their designs vary in accordance with this functional classification. Table 2.1 summarizes this information by centerline miles and lane miles. Figure 2.1 illustrates the functional classification of the Gulf Coast MPA's roadways.

Interstates

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

Expressways

- Provides for movement of large volumes of traffic at relatively high speed, and are primarily intended to serve long trips.
- Have some grade separated intersections, while the majority of the intersections are widely spaced and signalized.

Arterials

- Serve both as feeders to interstates and expressways, and as principal travel ways between major land use concentrations within the study area.
- Typically divided facilities (undivided where right-of-way limitations exist) with relatively high traffic volumes and traffic signals at major intersections.
- The primary function of arterials is to move traffic; they are the main means of local travel, with a secondary function of land access.

Collectors

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

Local Streets

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

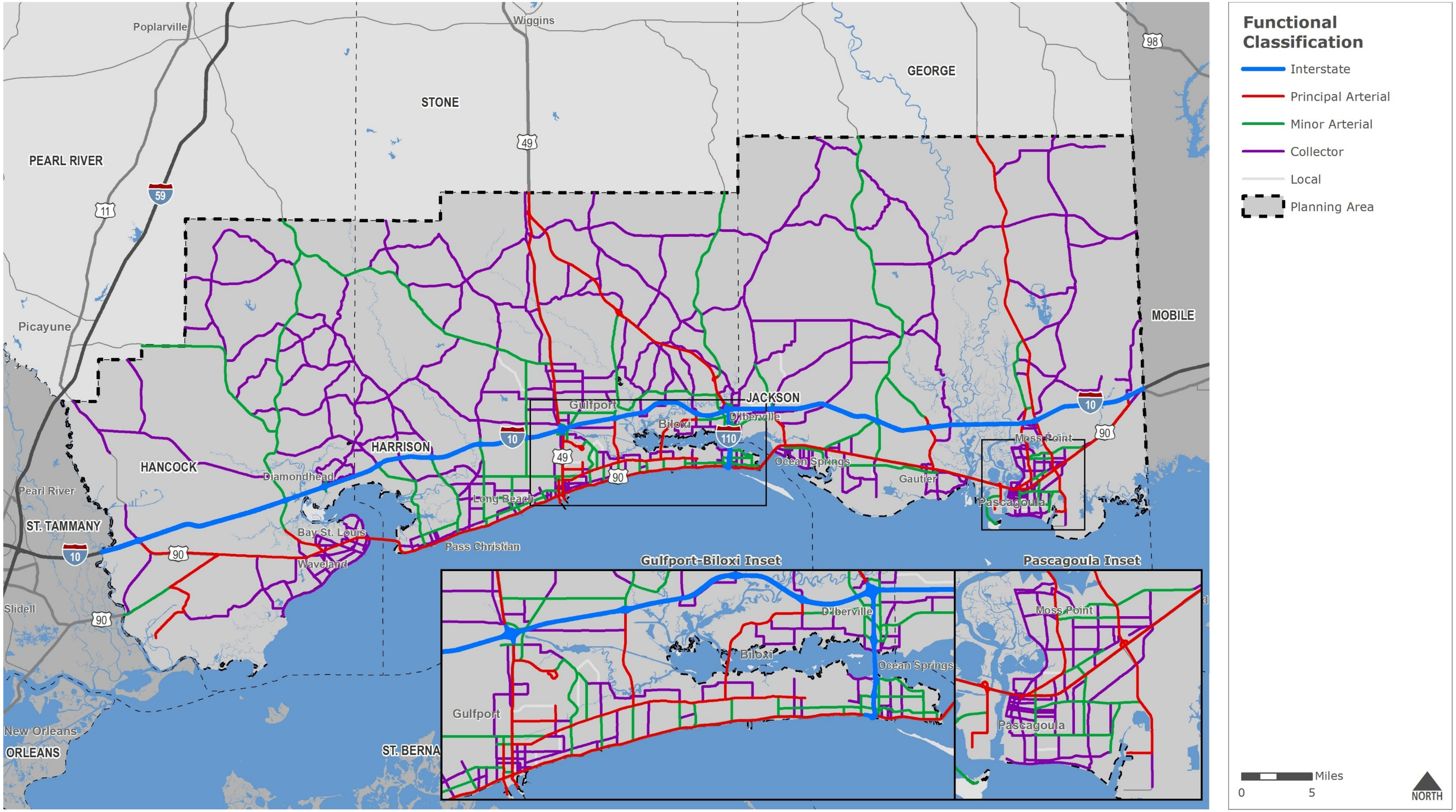
Within the arterial classification are principal and minor subclassifications. Within the collector classification are major and minor subclassifications within the rural areas. Principal arterials in both rural and urban areas serve as high volume traffic corridors. They provide access to the major centers of activity of a metropolitan area from its furthest points. Minor arterials connect the principal arterials and provide a lower level of travel mobility for shorter travel lengths. Rural major collectors are those collectors in rural areas that carry low-medium traffic volumes and connect arterials and local streets. These roadways typically carry more volume than rural minor collectors. Rural minor collectors perform the same function as rural major collectors, but they carry less volume.

Table 2.1: Roadway Model Network Lane Mileage by Functional Class, 2018

Functional Class	Centerline Miles		Lane Miles	
	Miles	Percent	Miles	Percent
Interstate	81.5	5.9%	428.0	11.8%
Principal Arterial	201.8	14.6%	825.0	22.8%
Minor Arterial	265.1	19.2%	624.4	17.2%
Collector	809.4	58.7%	1,704.5	47.0%
Local	20.8	1.5%	42.9	1.2%
Total	1,378.5	100.0%	3,624.8	100.0%
Hancock County				
Interstate	16.9	6.0%	75.7	11.0%
Principal Arterial	31.2	11.1%	104.9	15.2%
Minor Arterial	47.7	16.9%	104.0	15.1%
Collector	185.5	65.8%	402.7	58.5%
Local	0.5	0.2%	1.1	0.2%
Total	281.7	100.0%	688.3	100.0%
Harrison County				
Interstate	34.6	5.6%	199.5	12.0%
Principal Arterial	97.1	15.7%	407.5	24.5%
Minor Arterial	139.1	22.5%	334.4	20.1%
Collector	336.2	54.3%	697.2	41.9%
Local	11.7	1.9%	24.8	1.5%
Total	618.7	100.0%	1,663.4	100.0%
Jackson County				
Interstate	30.0	6.3%	152.8	12.0%
Principal Arterial	73.5	15.4%	312.6	24.6%
Minor Arterial	78.3	16.4%	186.1	14.6%
Collector	287.7	60.2%	604.6	47.5%
Local	8.5	1.8%	17.0	1.3%
Total	478.1	100.0%	1,273.1	100.0%

Note: Centerline miles exclude ramps
Source: GRPC/MPO Travel Demand Model

Figure 2.1: Functional Classification of Roadways, 2018



Data Sources: MDOT

Disclaimer: This map is for planning purposes only.

2.3 Traffic and Congestion

The number of daily trips estimated by the Travel Demand Model, by trip purpose, in 2018 is summarized in the graph below. Less than one (1) percent of vehicle trips pass through the MPA. Internal commercial and freight vehicle trips (e.g., truck, taxi, etc.) account for about one in ten vehicle trips. The majority of vehicle trips in the MPA (58 percent) begin or end at home.

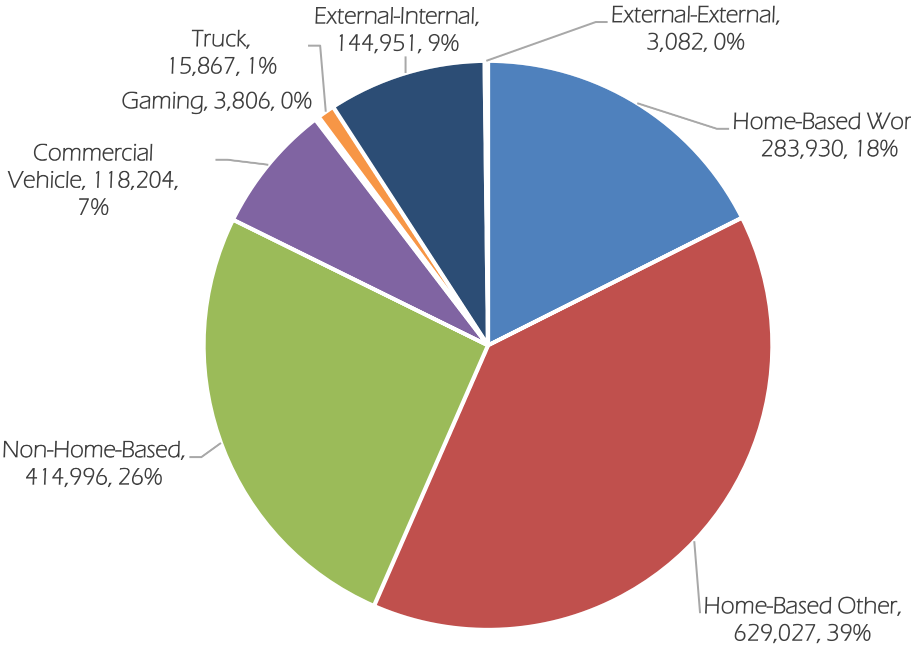


Table 2.2 displays how these trips are distributed onto the modeled transportation network. The Interstates within the MPA experience the most delay, just over 42 percent. There is comparatively little delay estimated to occur on minor arterials. This is in large part due to travel on these roadways accounting for less than 14 percent of vehicle miles traveled and 15 percent of vehicle hours traveled.

Table 2.2: Roadway System Travel Characteristics, 2018

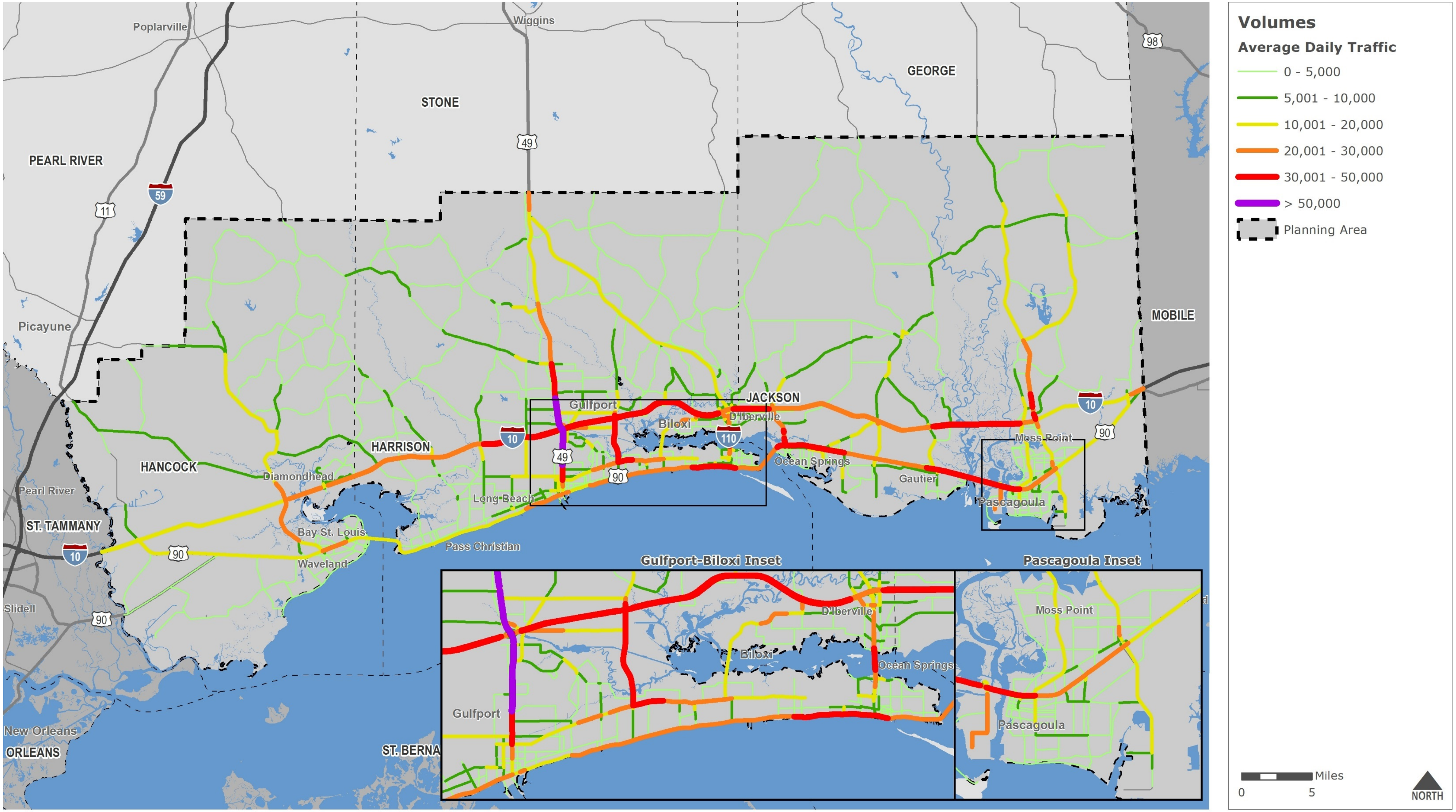
Functional Class	Daily Vehicle Miles Travelled (VMT)		Daily Vehicle Hours Travelled (VHT)		Daily Vehicle Hours of Delay (VHD)	
	Number	Percent	Number	Percent	Number	Percent
Interstate	4,476,909	35.9%	89,903	30.5%	14,199	42.1%
Principal Arterial	4,082,219	32.7%	98,325	33.4%	11,455	34.0%
Minor Arterial	1,670,940	13.4%	43,754	14.8%	3,634	10.8%
Collector	2,240,958	17.9%	62,251	21.1%	4,411	13.1%
Local	14,841	0.1%	499	0.2%	13	0.0%
Total	12,485,867	100.0%	294,732	100.0%	33,712	100.0%
Hancock County						
Interstate	648,179	35.0%	10,874	27.8%	1,112	39.0%
Principal Arterial	365,523	19.7%	7,670	19.6%	338	11.9%
Minor Arterial	365,254	19.7%	7,990	20.4%	729	25.6%
Collector	471,595	25.5%	12,533	32.1%	668	23.5%
Local	289	0.0%	8	0.0%	0	0.0%
Total	1,850,841	100.0%	39,075	100.0%	2,847	100.0%
Harrison County						
Interstate	2,174,417	36.2%	44,941	30.6%	6,897	39.0%
Principal Arterial	2,132,354	35.5%	53,927	36.7%	7,146	40.4%
Minor Arterial	851,582	14.2%	23,442	15.9%	2,014	11.4%
Collector	847,394	14.1%	24,442	16.6%	1,607	9.1%
Local	6,229	0.1%	230	0.2%	3	0.0%
Total	6,011,977	100.0%	146,981	100.0%	17,668	100.0%
Jackson County						
Interstate	1,654,313	35.8%	34,089	31.4%	6,190	46.9%
Principal Arterial	1,584,342	34.3%	36,728	33.8%	3,972	30.1%
Minor Arterial	454,103	9.8%	12,322	11.3%	891	6.8%
Collector	921,969	19.9%	25,276	23.3%	2,135	16.2%
Local	8,323	0.2%	260	0.2%	9	0.1%
Total	4,623,049	100.0%	108,675	100.0%	13,197	100.0%

Source: GRPC/MPO Travel Demand Model

Figure 2.2 displays the vehicular traffic in the MPA, which is greatest on I-10, I-110, US 49, US 90, and Loraine Road. These areas have estimated average daily volumes exceeding 30,000 vehicles.

Figure 2.3 displays the volume to capacity (V/C) ratios for the major roadways in the MPA. Currently, there are six (6) roadway segments in the MPA (summarized in Table 2.3) that experience a V/C ratio of 1.0 or greater, representing congested segments. Almost all these segments are near the intersections of roadways and/or at interstate interchanges with high traffic volumes. This suggests that peak period congestion is currently an issue in the Gulf Coast MPA.

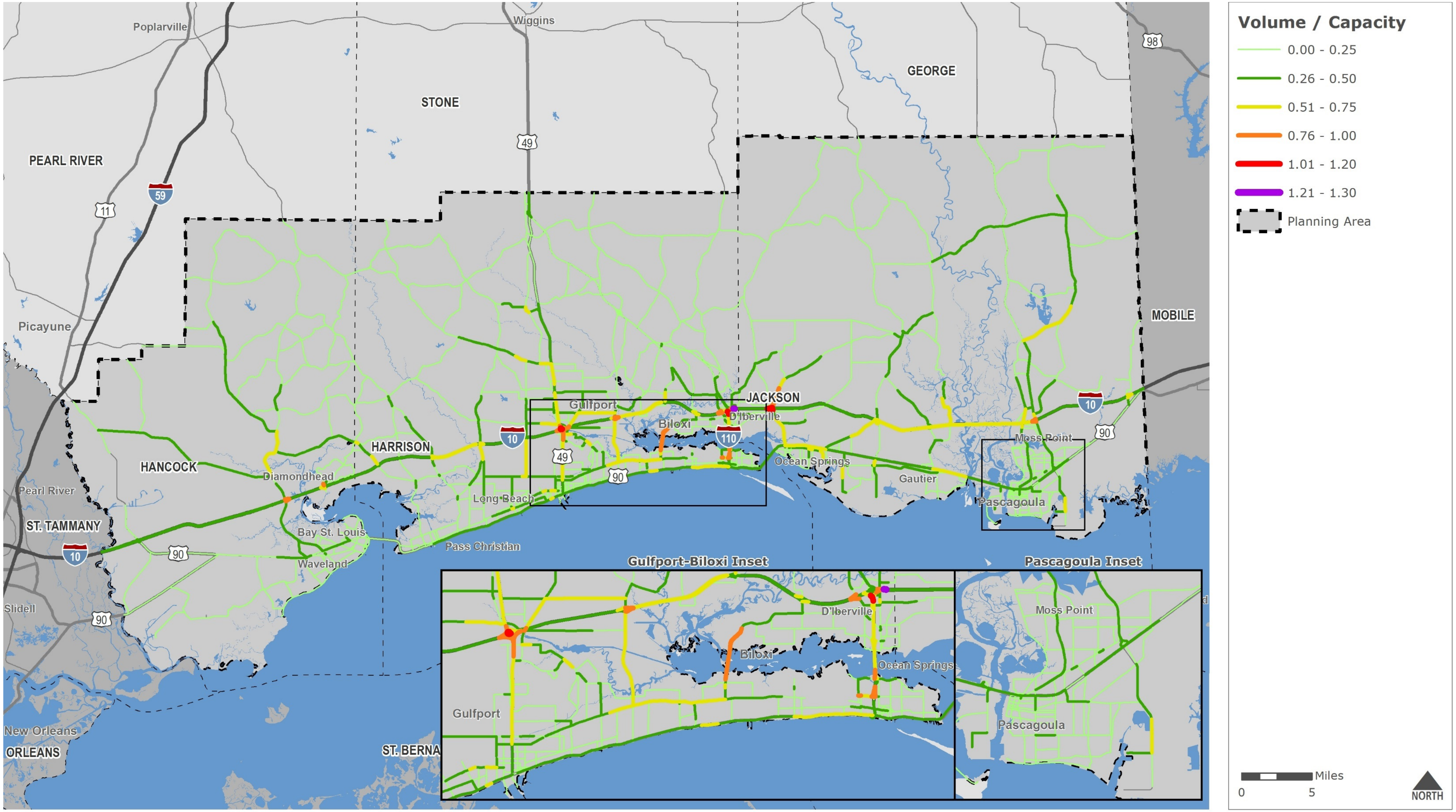
Figure 2.2: Average Daily Traffic on Roadways, 2018



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Figure 2.3: Existing Roadway Congestion, 2018



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Table 2.3: Roadway Corridors with Volumes Exceeding Capacity, 2018

Roadway	Location	Length (miles)
I-10 WB Off Ramp	I-10 WB to US 49	0.26
I-10 EB Off Ramp	I-10 WB Off Ramp to I-110 SB	0.20
I-10 EB On Ramp	I-10 EB On Ramp Merge at MS 67 to I-10 EB	0.10
I-10 WB Off Ramp	I-10 WB to I-10 WB Off Ramp Split at MS 67	0.07
I-10 EB Off Ramp	I-10 EB to Tucker Rd	0.31
I-10 WB On Ramp	Tucker Rd to I-10 WB	0.36

Source: GRPC/MPO Travel Demand Model

2.4 Roadway Reliability

Most of the region’s roadways do not have daily volumes that exceed their daily capacities. However, there may still be congestion issues at specific times, notably peak periods. Travel time reliability is a measure of how congested travel times compare to free-flow conditions. The Level of Travel Time Reliability (LOTTR) is defined as:

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

The LOTTR of each roadway segment is calculated for four time periods (including AM and PM peaks), with the worst LOTTR being used to determine segment reliability. The most recent LOTTR data available, year 2018, was obtained from the Federal Highway Administration's (FHWA) National Performance Management Research Dataset (NPMRDS). Roadway segments with an LOTTR less than 1.5 are defined by the FHWA as reliable. Figure 2.4 displays the LOTTR of the monitored segments within the MPA.

It should be noted that the current NPMRDS for the Gulf Coast MPA does not meet the full Enhanced National Highway System (NHS), which is reflected in this report. This is due to the reporting cycle of the NPMRDS data and recent updates to the Enhanced NHS by the FHWA. The Federal Register states that the Metropolitan Planning Organization (MPO) is only responsible for reporting what the NPMRDS displays.

The NPMRDS data shows that the Interstate system within the MPA is very reliable. While less reliable, the non-Interstate system within the MPA still meets the Mississippi Department of Transportation (MDOT) targets.

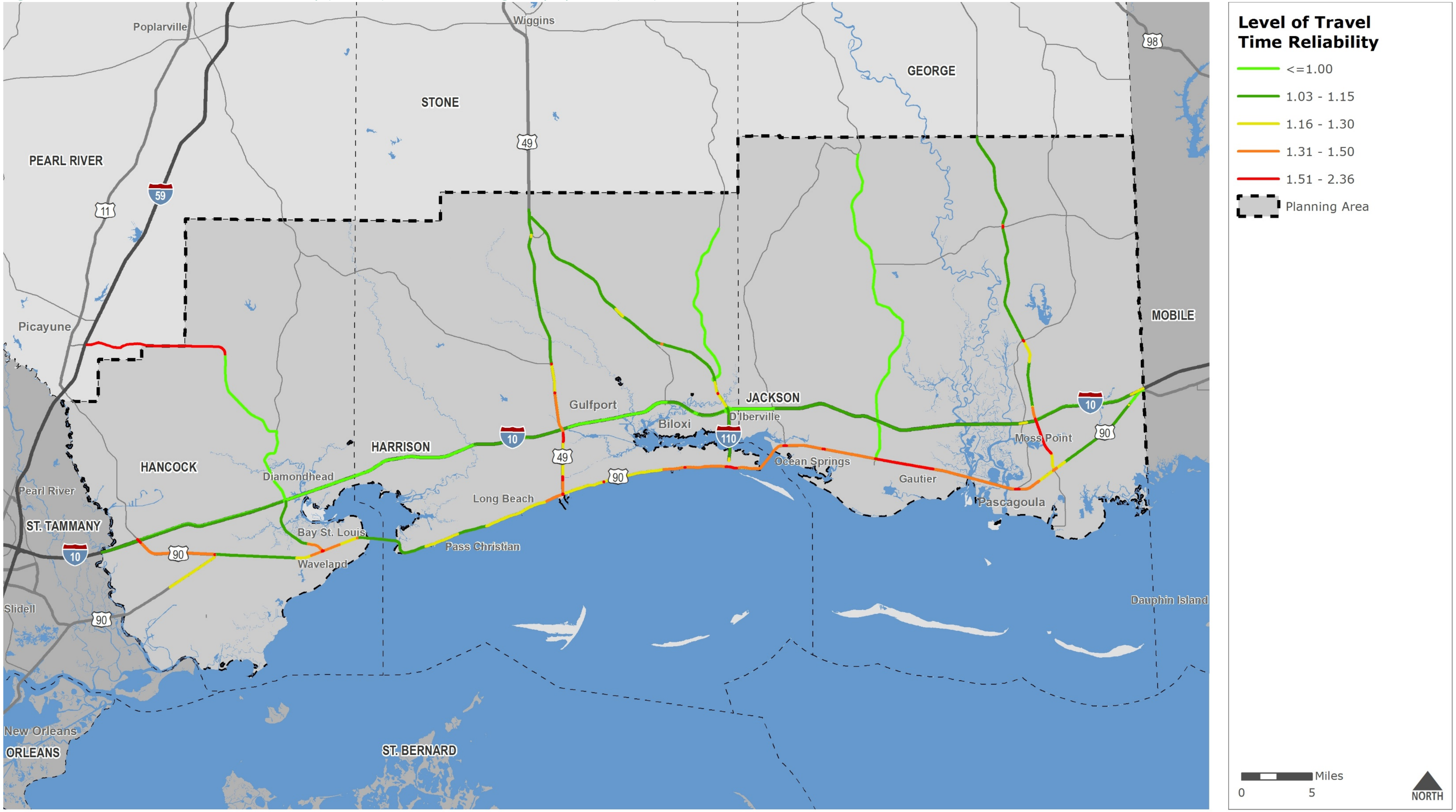
100.0%

Interstate NPMRDS reported NHS person-miles travelled are reliable

90.4%

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

Figure 2.4: Level of Travel Time Reliability (LOTTR) on National Highway System (NHS) Routes, 2018



Data Sources: NPMRDS

Disclaimer: This map is for planning purposes only.

2.5 Pavement Conditions

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

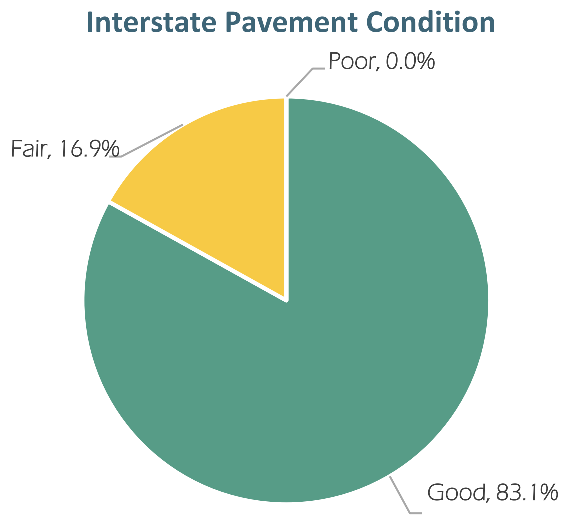
Results from the public participation survey showed that maintaining roadways and bridges were the public's top priority. In a funding allocation exercise where the public was asked to allocate future transportation dollars by improvement type, the public allocated just over 25 percent of all funding to maintaining roads and bridges through regular maintenance or due to safety concerns with the current roadway surfaces.

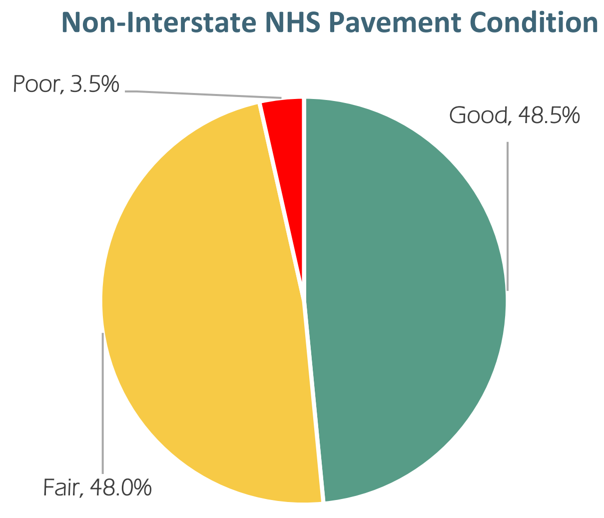
Pavement condition ratings for the MPA's roadways were obtained from data submitted by MDOT and found in the Highway Performance Monitoring System (HPMS). The HPMS is a national level highway information system that includes data on the:

- extent,
- condition,
- performance, and
- use and operating characteristics of the nation's highways.

The HPMS data is a sample dataset collected across the entire federal-aid eligible system for Interstate, arterial, and collector networks.

> The HPMS pavement condition is based on the International Roughness Index (IRI), cracking, rutting, and faulting.



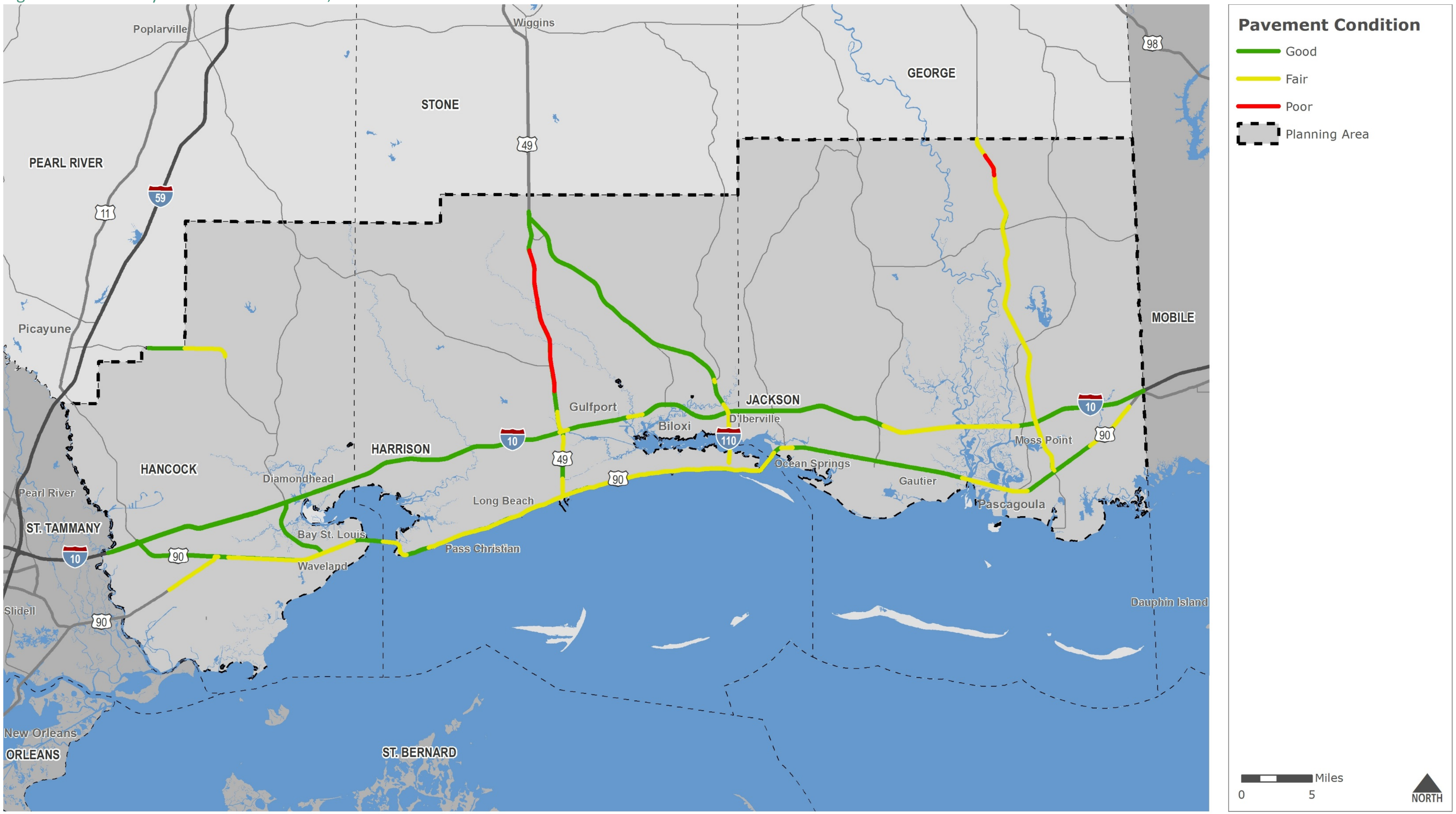


The data displayed in the above charts shows that there are no Interstate pavements within the MPA ranked as Poor, while nearly four (4) percent of Non-Interstate NHS pavements in the MPA rank as Poor.

Figure 2.5 illustrates the most recent pavement condition data for the NPMRDS monitored roadways within the MPA. The locations of the Poor pavement within the MPA occur at various points along:

- US 49 between O'Neal Rd and Old Hwy 49 in Saucier
- MS 63 between Polktown Rd and 1.5 miles north of Polktown Rd

Figure 2.5: Roadway Pavement Conditions, 2018



Data Sources: MDOT

Disclaimer: This map is for planning purposes only.

2.6 Bridge Conditions

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

Bridges serve as important connections over waterways, provide grade separation between roadways and other transportation facilities, and connect transportation facilities to each other.

As previously mentioned, results from the public outreach survey showed that the public places a high priority on maintaining the current transportation system and increasing its safety. The public funding allocations shows that they wish to allocate just over 25 percent of all funding to maintaining roads, which includes bridges.

There are 658 bridges or bridge-like structures within, or in close proximity to, the Gulf Coast MPA. Most of these cross waterways. However, bridges can also be structures that cross over other roadways and railroads.

Bridge Conditions and Scoring

The National Bridge Inventory (NBI) provides bridge conditions for all bridges in the United States with public roads passing above or below them. The NBI also defines bridges to include bridge-length culverts. The condition of the bridge is determined by the lowest rating of deck, superstructure, substructure, or culvert. If the lowest rating of these categories is greater than or equal to seven (7), the bridge is classified as good. If the score of the bridge is less than or equal to four (4), the classification is poor.

53.4%*

NPMRDS defined NHS Bridges in Good Condition

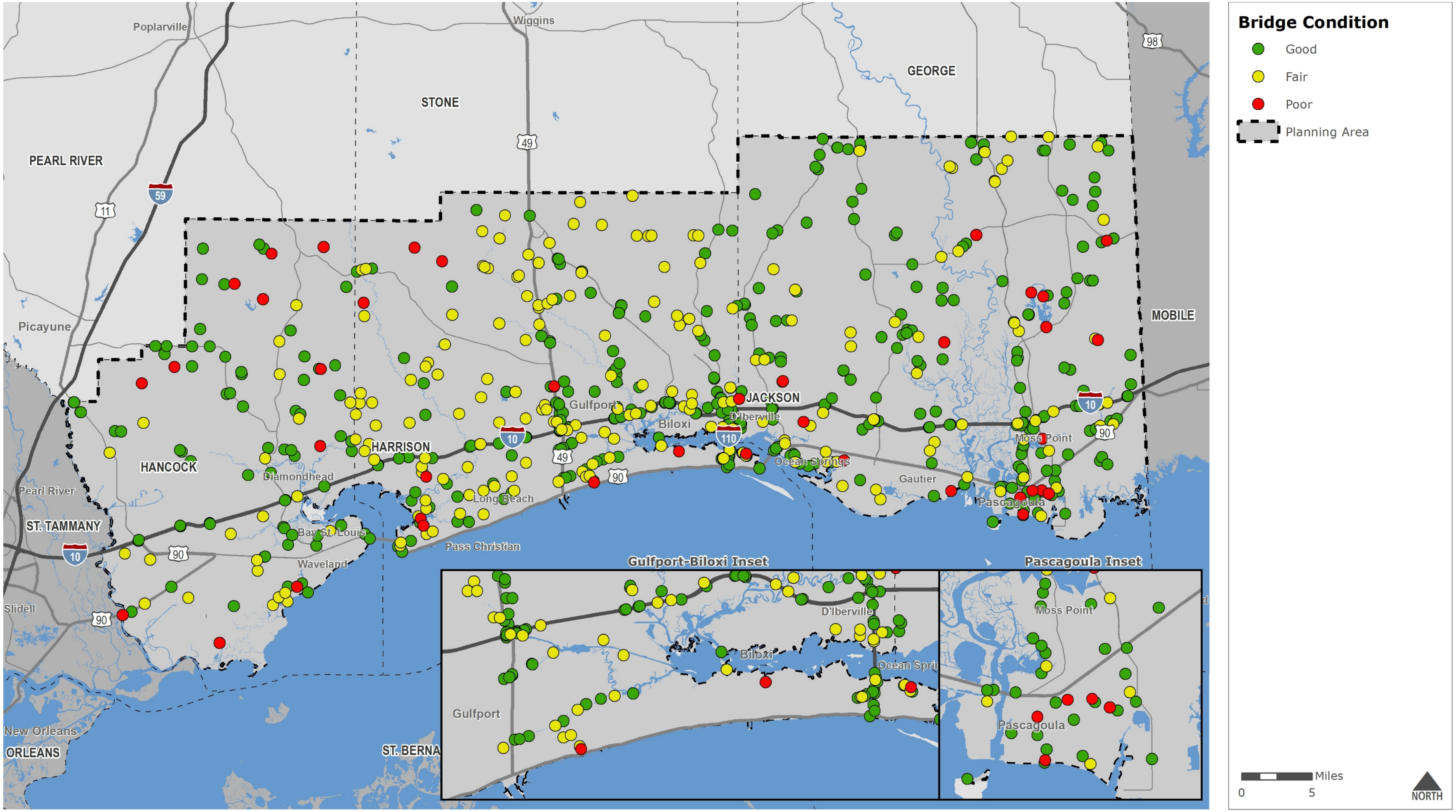
0.1%

NPMRDS defined NHS Bridges in Poor Condition

***Falls outside of MDOT state target**

Figure 2.6 displays the condition of each bridge within the MPA. It should be noted that these include all bridges within the MPA.

Figure 2.6: Bridge Conditions in the MPA, 2018



Data Sources: National Bridge Inventory

Disclaimer: This map is for planning purposes only.

Structurally Deficient and Functionally Obsolete Bridges

All bridges in the nation are evaluated to determine if they are “structurally deficient”. Structural deficiency is characterized by deteriorated conditions of significant bridge elements and potentially reduced load-carrying capacity. A structurally deficient bridge typically requires significant maintenance and repair to remain in service. These bridges would eventually require major rehabilitation or replacement to address the underlying deficiency. These bridges are those that are defined as having a score of four (4) or less on any of the scoring components described above. There are 40 structurally deficient bridges in the MPA. Two (2) of those bridges are on the reported sections of the NHS.

2.7 Roadway Safety

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

> “Disclaimer: This document and the information contained herein is prepared solely for the purpose of identifying, evaluating and planning safety improvements on public roads which may be implemented utilizing federal aid highway funds; and is therefore exempt from discovery or admission into evidence pursuant to 23 U.S.C. 409.”

Supporting Documents

<u>Highway Safety Improvement Program (HSIP)</u>

2019

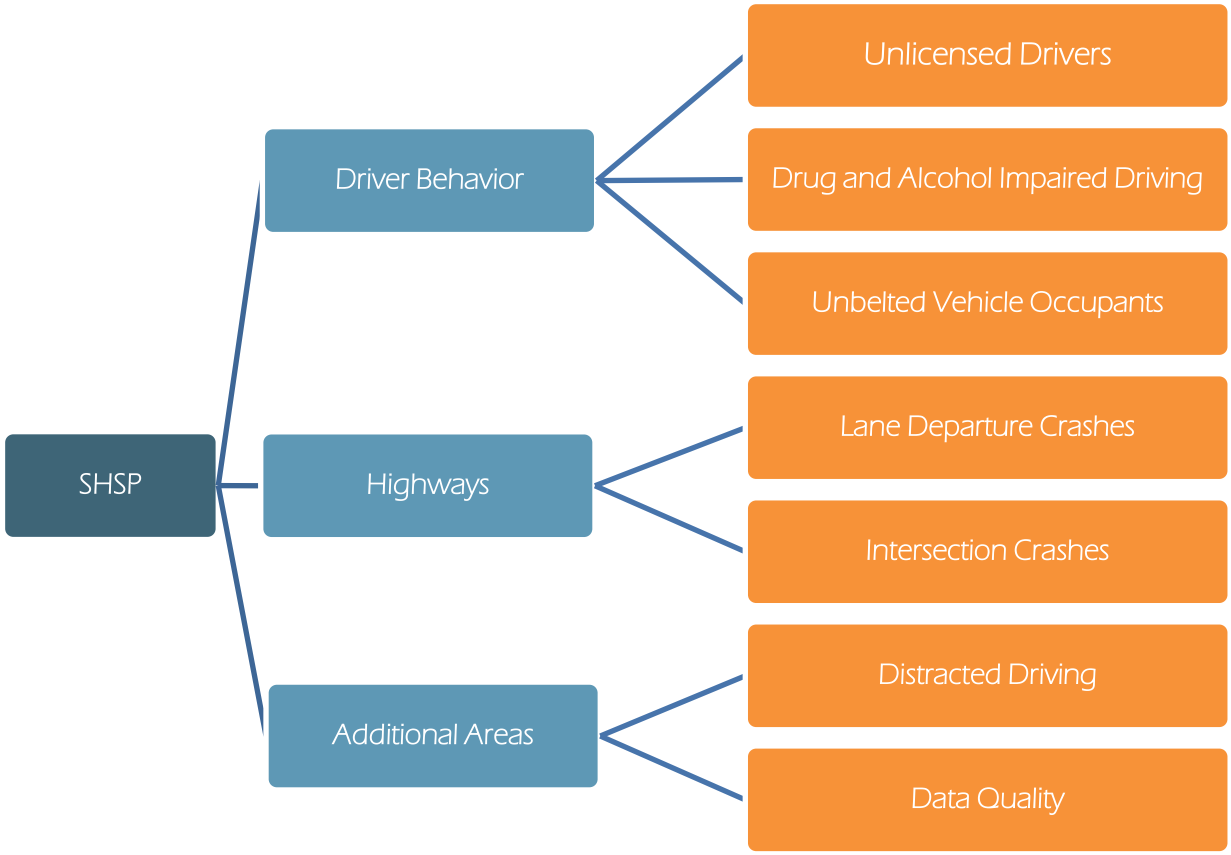
Most Recent SHSP

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

Strategic Highway Safety Plan (SHSP)

A SHSP is a statewide coordinated safety plan developed and maintained by each state to reduce fatalities along all state highways and public roads. The SHSP[1], developed by the Mississippi Department of Transportation (MDOT), uses the 4Es of traffic safety: Engineering, Enforcement, Emergency Response, and Education. The SHSP also identifies strategies and emphasis areas for analysis and investment. The MDOT SHSP emphasis areas are shown in Figure 2.7.

Figure 2.7: 2019 SHSP Emphasis Areas



[1] http://mdot.ms.gov/documents/traffic%20engineering/plan/shsp.pdf

Crash Impacts

According to the most recent Fatal Accident Reporting System (FARS) data, an average of 35,212 people in the United States were killed annually from 2013 through 2017. Every crash, regardless of the severity, costs money and time in damages, emergency services, and delays. These costs affect both governments and taxpayers. One of the goals of the MTP process is to improve travel safety by reducing the risk of crashes on the roadways. This was accomplished by analyzing the data and determining the most hazardous locations in the MPA.

The crash records used in the analysis were obtained from MDOT's Safety Analysis Management System (SAMS) and cover all reported crashes from 2014 through 2018.

The crash records include the:

- severity
- location
- DUI involvement
- vehicle type
- time of day
- number of fatalities or severe injuries
- roadway surface condition
- collision type

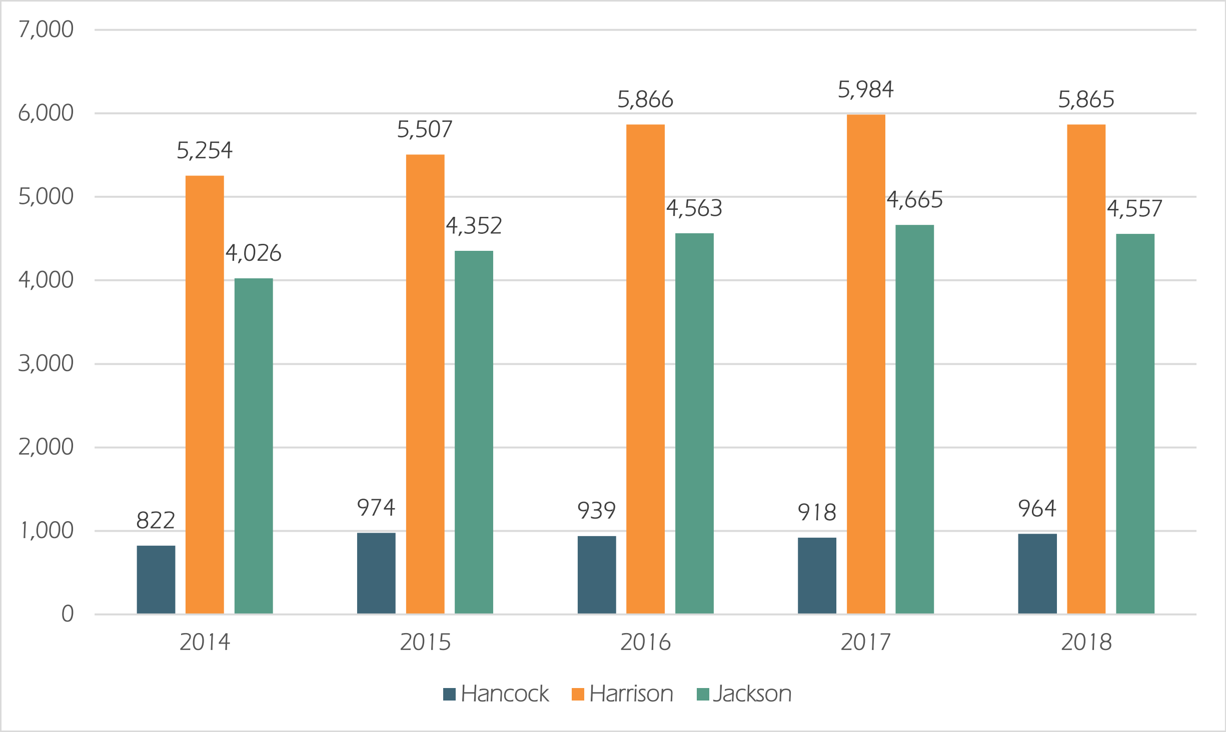
MPA Crash Trends

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

Crashes by Year

From 2014 through 2018, there were a total of 55,256 crashes within the MPA. Figure 2.8 displays the total number of crashes within the MPA by year and county.

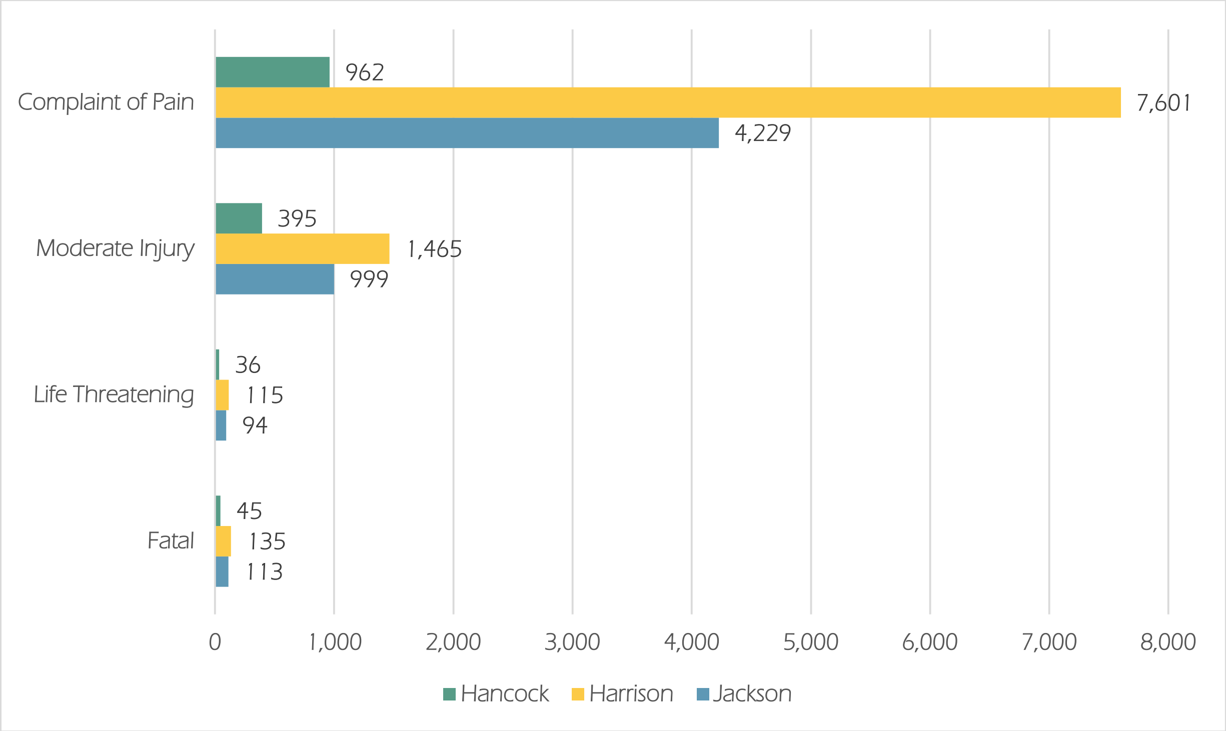
Figure 2.8: MPA Crashes by Year and County, 2014-2018



<u>Crash Severity</u>

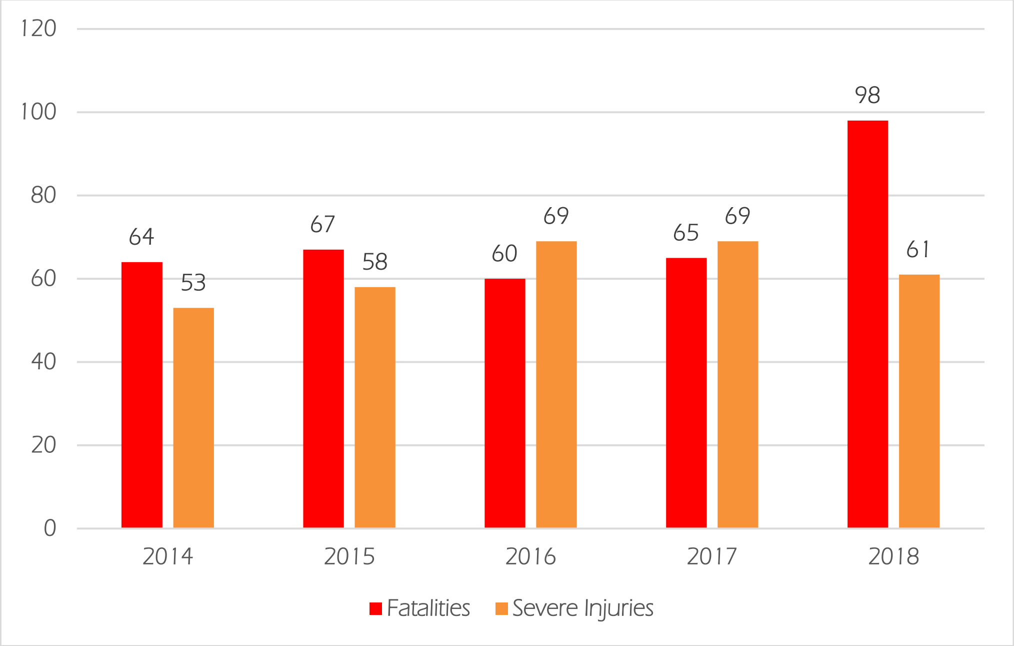
Crash severity reveals the extent to which crashes in the MPA pose a safety risk to roadway users. Within the MPA there were 293 fatal crashes and 245 life-threatening (severe injury) crashes during the analysis period. Less than one (1) percent of the total crashes resulted in a fatality or severe injury. Figure 2.9 displays the severity of the fatal/injury crashes within the MPA by year and county.

Figure 2.9: Severity of Fatal/Injury Crashes, 2014-2018



From 2014 through 2018, the fatal and life-threatening crashes resulted in 354 deaths and 310 severe injuries. The total fatalities and severe injuries, by year, during this time period are shown in Figure 2.10.

Figure 2.10: Fatalities and Severe Injuries, 2014-2018



Driving Under the Influence (DUI) Crashes

55

Fatalities from DUI crashes

From 2014 through 2018, there were 2,565 crashes that involved drivers under the influence of a substance (alcohol, drugs, etc.) This means less than five (5) percent of the crashes in the MPA were related to DUI. However, these crashes also resulted in nearly 16 percent of the fatalities within the area.

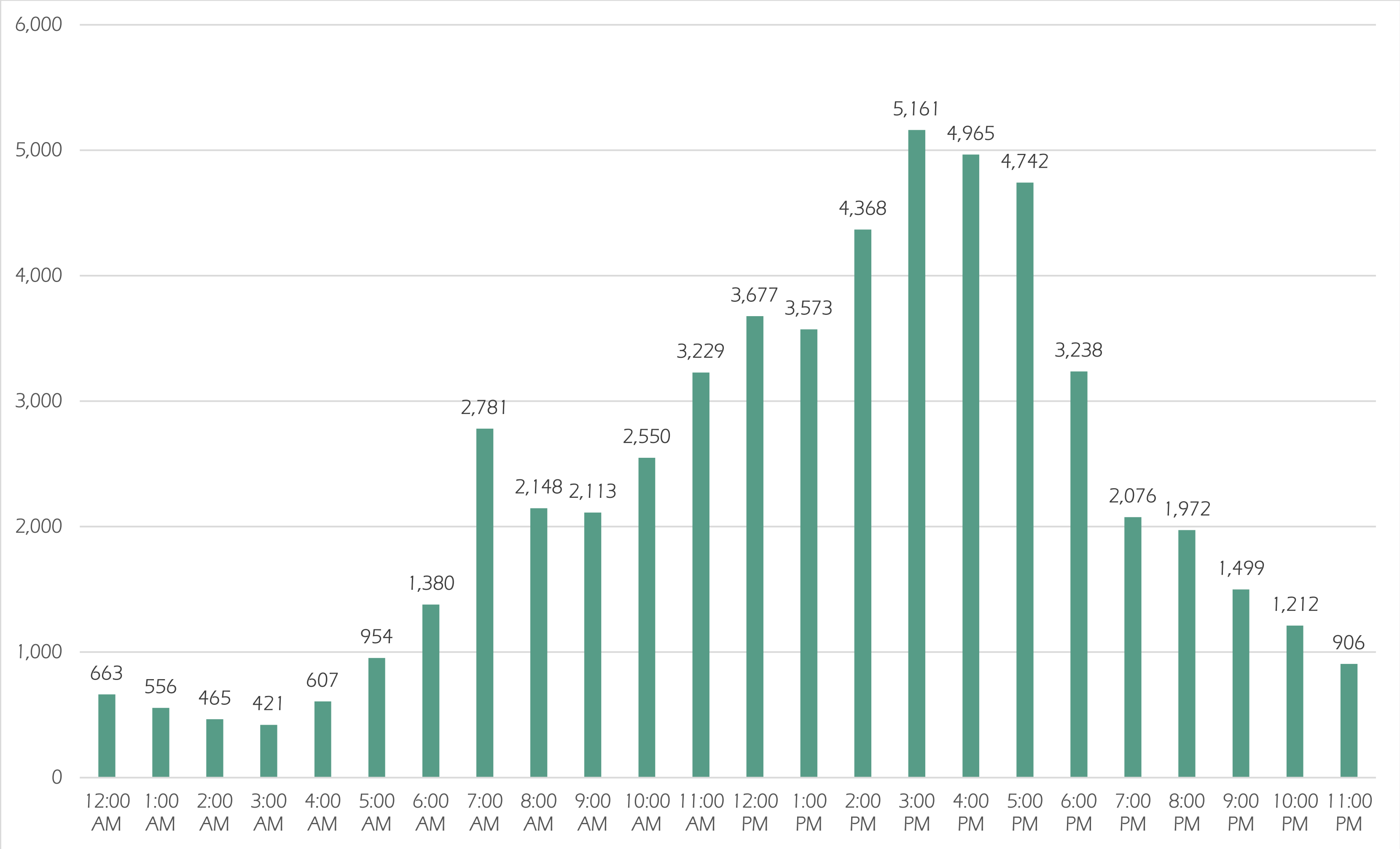
Crash Times

Identifying when crashes occur can assist with developing countermeasures for crashes affected by lighting, congestion, or other factors. Within the MPA, 23 percent of the crashes occur during hours where there is little to zero daylight. However, nearly 27 percent of the MPA's crashes occur from 3 PM to 6 PM. This is likely the result of high traffic volumes when children are released from school or people return home from work. The hour in which the crashes occurred is displayed in Figure 2.11.

Roadway Surface Condition

The roadway surface can also contribute to a crash through adverse conditions such as rain, oil, debris, or other sources. These conditions temporarily reduce the safety of the roadway and can lead to a crash. However, more than 80 percent of the crashes occurred during dry conditions. This means the roadway surface condition is not a contributing factor in the vast majority of crashes.

Figure 2.11: Crashes by Hour, 2014-2018



Collision Type

This study also considers collision types that occurred. Table 2.4 displays the crashes by collision type and county.

Table 2.4: Crashes by Collision Type, 2014-2018

Collision Type	Hancock County	Harrison County	Jackson County	Total
Angle	762	5,510	4,243	10,515
Animal	36	41	103	180
Bicycle	23	127	84	234
Deer	110	181	247	538
Fell from Vehicle	24	76	119	219
Fixed Object	22	241	199	462
Head On	33	186	139	358
Hit and Run	4	117	314	435
Jackknife	2	6	15	23
Left Turn Across Traffic	12	37	48	97
Left Turn Same Roadway	238	1,815	1,066	3,119
Other	15	53	67	135
Other in Road	25	89	127	241
Other Object	10	103	73	186
Overturn	25	116	50	191
Parked Vehicle	83	638	1,080	1,801
Pedestrian	35	381	189	605
Rear End Slow or Stop	1,365	10,367	7,715	19,447
Rear End Turn	42	205	214	461
Right Turn Cross Traffic	0	4	3	7
Run Off Road - Left	505	2,219	1,514	4,238
Run Off Road - Right	742	2,511	2,122	5,375
Run Off Road - Straight	29	112	96	237
Sideswipe	467	3,288	2,288	6,043
Train	4	26	11	41
Unknown	4	27	37	68
Total	4,617	28,476	22,163	55,256

Source: SAMS, 2019; NSI, 2019

Rear End

Most common collision type

66.0%

Crashes that are Angle, Sideswipe, or Rear End

Crash Locations

The nature of this study is only to identify trends; thus, it did not attempt to analyze each hazardous location and corresponding crash records for specific solutions. However, it features an identification of locations that experience the highest crash frequencies or rates. Crash frequencies reflect how often crashes occur at a given location and are expressed in crashes per year. Crash rates reflect the amount of crashes compared to the traffic volumes a roadway experiences and are expressed as crashes per million vehicle miles traveled for roadway segments. Intersection crash rates are expressed as crashes per million vehicles entering the intersection.

The hazardous locations shown in this report are not a ranking of these locations, but merely a list developed for informational purposes.

Segment Crashes

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

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

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

Crash Frequencies

The total crash frequency for a roadway segment is the number of reported crashes between 2014 and 2018 that were not within 150 feet of an intersection. Table 2.5 displays the roadway segments in the MPA that have the highest crash frequencies and a breakdown of the severity of the crashes. These locations are shown in Figure 2.12.

6.3% of MPA crashes occur on the top 20 crash frequency segments.

Crash Rates

Crash rates for the study area were based on the model network layer and existing year (2018) volumes obtained from the GRPC/MPO travel demand model. The length of each segment and the corresponding daily traffic volumes from the model are used in the crash rate equation.

The segment crash rate equation is:

$$Segment\ Crash\ Rate = \frac{N * 10^6}{365 * ADT * L}$$

Where: Segment Crash Rate = crashes per million vehicle miles traveled

N = average annual crash frequency of the segment

ADT = average daily traffic of the segment based on the 2018 Travel Demand Model

L = length of the model segment in miles

Table 2.6 displays the roadway segments in the MPA that have the highest crash rates. These locations are shown in Figure 2.13.

Table 2.5: Top 20 Crash Frequency Segments and Severity, 2014-2018

Route	Location	Total Crashes	Average Annual Crash Frequency[1]	Fatal	Life Threatening	Moderate Injury	Complaint of Pain
US 49	Parkwood Blvd to 0.18 miles north of Orange Grove Blvd	314	62.8	0	2	3	81
US 49	Creosote Rd to 0.14 miles north of Airport Rd	263	52.6	5	0	5	52
I-10 WB	MS 613 (N Main St) On Ramp to Martin Bluff Rd	246	49.2	0	0	17	57
I-10 EB	Martin Bluff Rd to Exit 68	217	43.4	2	2	12	40
Jerry St. Pe Hwy	Homeport Rd (USS Vicksburg Way) to Litton Rd (Access Rd)	216	43.2	0	0	3	26
MS 605 (Lorraine Rd)	Brentwood Blvd to Magnolia St	213	42.6	0	1	8	49
Litton Rd (Access Rd)	Jerry St. Pe Hwy to Ingalls Shipyard	185	37.0	0	1	0	9
I-10 EB	US 49 On Ramps to Exit 38	179	35.8	1	1	8	42
US 90 (Bienville Blvd)	MS 609/Washington Ave to Martin Luther King Jr Ave	165	33.0	0	0	3	32
US 90 (Bienville Blvd)	0.21 miles west to Hanshaw Rd	153	30.6	0	0	8	43
Dedeaux Rd	Wingate Dr to Lynn Ave	150	30.0	0	0	5	41
I-10 WB	Franklin Creek Rd On Ramp to Exit 69	142	28.4	3	2	5	28
I-10 WB	MS 605 (Lorraine Rd) On Ramp to Exit 34B	141	28.2	1	0	2	44
I-10 EB	East of Old Fort Bayou Rd to Exit 57	140	28.0	3	0	7	29
US 90 (Bienville Blvd)	0.42 miles west to Ocean Springs Rd	139	27.8	0	0	8	33
I-10 WB	Canal Rd On Ramp to Exit 28	136	27.2	0	0	4	18
US 49	Community Rd to Landon Rd	127	25.4	2	0	3	29
I-110 SB (MS 15)	Rodriquez St On Ramp to Exit 1D	124	24.8	0	1	7	42
US 90 (Bienville Blvd)	Hanley Rd to 0.35 miles west	123	24.6	0	1	3	32
US 49	0.2 miles south of Wortham Rd to School Rd	115	23.0	2	1	6	24
	Total	3,488	697.6	19	12	117	751

Source: SAMS, 2019; NSI, 2019

1 The Average annual crash frequency is the average number of reported crashes per year between 2014 and 2018.

Table 2.6: Top 20 Crash Rate Segments, 2014-2018

Route	Location	Total Crashes	Average Annual Crash Frequency[1]	ADT	Length (mi)	Crash Rate
Cresote Rd	US 49 to 0.14 miles west of US 49	55	11.0	2,118	0.14	102.68
Eden St	Middle Ave to 0.12 miles south of Old Mobile Hwy	26	5.2	1,772	0.12	69.68
Tucker Ave	Market St to 9th St	20	4.0	786	0.25	56.54
Hospital Rd	Lt Majure Dr to 0.15 miles south of Lt Majure Dr	10	2.0	671	0.15	55.03
Jackson Ave	Pascagoula St to 0.23 miles east of Pascagoula St	27	5.4	1,182	0.23	54.90
Eden St	Boston Ave to Chicago Ave	12	2.4	917	0.15	48.72
Government St	Kotzum Ave to Handy Ave	45	9.0	3,555	0.15	45.54
Eden St	24th St to Middle Ave	41	8.2	1,772	0.29	43.57
8th Ave	0.11 miles south of 34th St to 0.08 miles north of Pass Rd	8	1.6	715	0.17	36.65
Davis Ave	E 2nd St to E Scenic Dr	4	0.8	551	0.11	34.67
Chicot St	US 90 to 0.18 miles north of US 90	38	7.6	3,479	0.18	33.80
Frederick St	Shortcut Rd to US 90	5	1.0	511	0.16	32.98
13th St	29th Ave to 26th Ave	14	2.8	1,625	0.14	32.87
Telephone Rd	Joe Ave to MS 613	18	3.6	2,564	0.12	31.68
I-110 Southbound	Off Ramp to US 90 Westbound	105	21.0	7,036	0.26	31.03
Community Dr	0.14 miles east of US 49 to 0.25 miles west of Klein Rd	53	10.6	2,990	0.31	30.87
Jackson Ave	0.26 miles west of Market St to Market St	23	4.6	1,608	0.26	30.13
Courthouse Rd	Victory St to Security Square	63	12.6	3,064	0.40	28.11
Old Mobile Hwy	Market St to Francis St	20	4.0	1,589	0.27	25.47
Macphelah Rd	Frederick St to 0.28 miles south of Frederick St	11	2.2	848	0.28	25.35

Source: SAMS, 2019; NSI, 2019

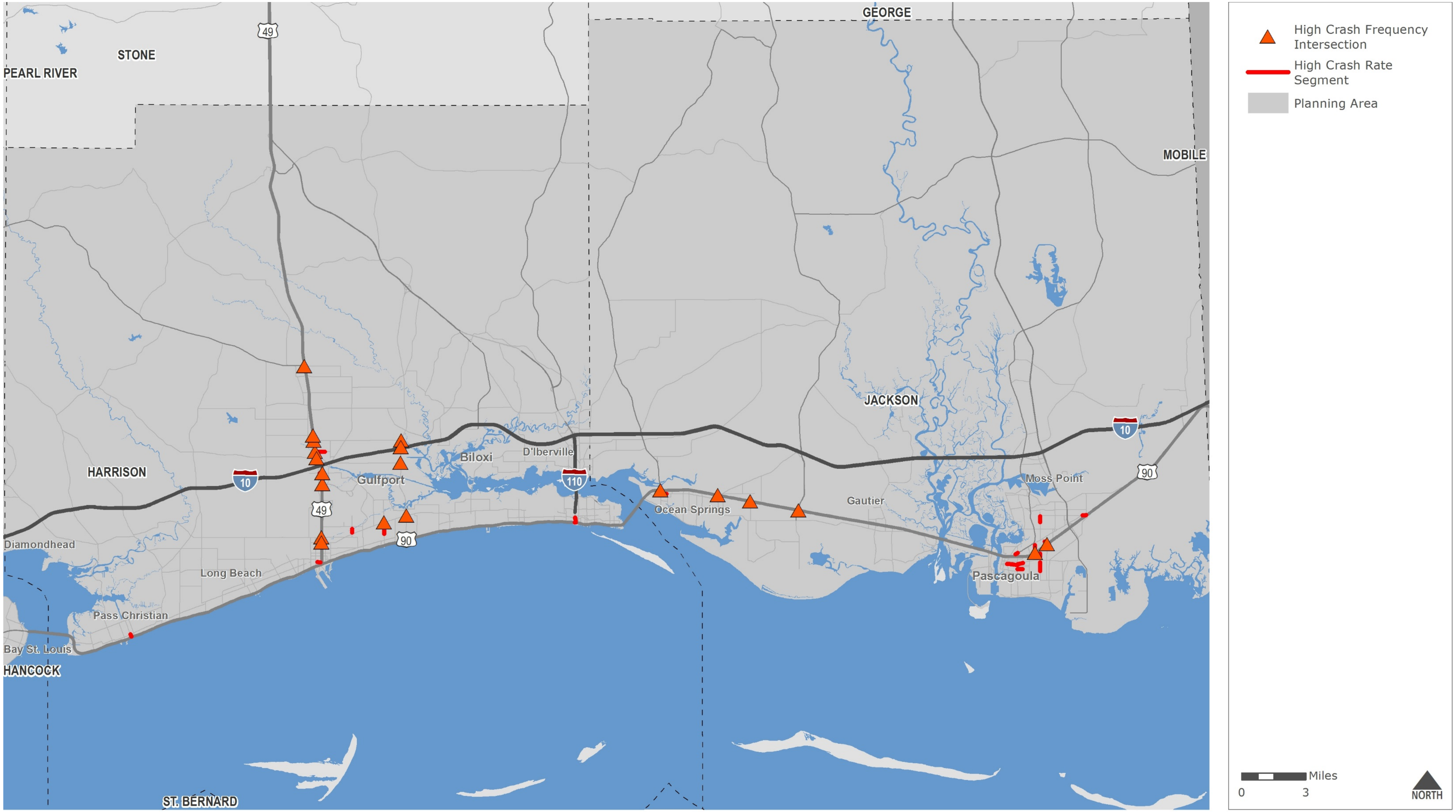
1 The average annual crash frequency is the average number of reported crashes per year between 2014 and 2018.

Figure 2.12: High Crash Frequency Areas, 2014-2018

Data Sources: MDOT SAMS 2014 - 2018

Disclaimer: This map is for planning purposes only.

Figure 2.13: High Crash Rate Areas, 2014-2018



Data Sources: MDOT SAMS 2014 - 2018

Disclaimer: This map is for planning purposes only.

Intersection Crashes

There were nearly 26,000 intersection crashes in the MPA from 2014 to 2018.

47.8%

of crashes in the MPA occur at intersections

Crash Frequencies

Table 2.7 shows the 20 intersections in the MPA with the highest crash frequency and their severity. Table 2.8 shows the collision types that occurred at these intersections. These locations are also displayed in Figures 2.12 and 2.13.

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

17.6%

of intersection crashes occur at the Top 20 crash frequency locations

Crash Rates

The intersection crash rate equation is:

$$Intersection\ Crash\ Rate = \frac{N * 10^6}{365 * ADT}$$

Where:

Intersection Crash Rate = crashes per million vehicles entering

N = average annual crash frequency of the intersection

ADT = average daily traffic entering the intersection based on the 2018 Travel Demand Model

Tables 2.9 through 2.11 show the ten (10) intersections in each county with the highest crash frequencies and their corresponding crash rates.

Table 2.7: Top 20 Intersections with High Crash Frequency by Severity, 2014-2018

Intersection	Total Crashes	Average Annual Crash Frequency[1]	Fatal	Life-Threatening	Moderate Injury	Complaint of Pain	Property Damage Only
US 49 @ Creosote Rd / Factory Shop Blvd	439	87.8	0	0	3	97	339
Pass Rd @ Cowan Rd	388	77.6	0	1	3	95	289
US 49 @ Crossroads Pkwy / Landon Rd	381	76.2	0	0	2	78	301
US 90 (Bienville Blvd) @ MS 609 / Washington Ave	335	67.0	0	0	4	54	277
US 49 @ Dedeaux Rd	328	65.6	0	1	1	75	251
US 90 (Terry Micheal Byrd Memorial Hwy) @ Chicot St	257	51.4	0	0	9	57	191
US 49 @ Community Rd	220	44.0	0	0	5	67	148
MS 605 (Lorraine Rd) @ Seaway Rd	204	40.8	1	1	3	44	155
US 90 (Terry Micheal Byrd Memorial Hwy) @ Hospital St	198	39.6	0	0	5	59	134
US 49 @ MS 53 / N Swan Rd	198	39.6	3	0	5	47	143
MS 605 (Lorraine Rd) @ I-10 WB Ramps	195	39.0	0	0	7	55	133
US 49 (25th Ave) @ Pass Rd (25th St)	194	38.8	0	0	3	39	152
US 90 (Bienville Blvd) @ Hanshaw Rd	184	36.8	0	1	13	43	127
US 49 @ Airport Rd	184	36.8	1	0	0	39	144
MS 605 @ Dedeaux Rd	182	36.4	0	0	0	41	141
US 49 (25th Ave) @ 28th St	157	31.4	0	1	2	43	111
US 49 @ Orange Grove Blvd	152	30.4	1	0	1	32	118
US 90 (Bienville Blvd) @ Ocean Springs Rd / Guilford Rd	151	30.2	0	1	3	27	120
US 90 (Scott Pruitt Memorial Hwy) @ MS 57	147	29.4	0	0	2	29	116
Courthouse Rd @ Pass Rd	141	28.2	0	0	3	28	110
Total	4,635	927.0	6	6	74	1,049	3,500

Source: SAMS, 2019; NSI, 2019

1 The average annual crash frequency is the average number of reported crashes per year between 2014 and 2018.

Table 2.8: Top 20 Intersections with High Crash Frequency by Collision Type, 2014-2018

Location	Total Crashes	Average Annual Crash Frequency[1]	Angle	Bicycle	Deer	Fell from vehicle	Fixed Object	Head on	Hit and Run	Jackknife	Left turn cross traffic	Left turn same roadway	Other	Other in road	Other Object	Overturn	Parked vehicle	Pedestrian	Rear end slow or stop	Rear end turn	Right turn cross traffic	Run off Road - Left	Run off Road - Right	Run off Road - Straight	Sideswipe	Train
US 49 @ Creosote Rd / Factory Shop Blvd	439	87.8	35	1	1	0	0	1	1	0	0	6	0	0	0	0	0	1	330	1	0	1	0	0	61	0
Pass Rd @ Cowan Rd	388	77.6	21	0	0	0	0	1	0	0	0	42	0	0	0	0	0	0	293	1	0	1	1	0	27	0
US 49 @ Crossroads Pkwy / Landon Rd	381	76.2	31	0	0	0	0	0	1	0	0	12	0	0	0	0	0	0	276	0	0	2	0	0	59	0
US 90 (Bienville Blvd) @ MS 609 / Washington Ave	335	67.0	22	1	0	0	0	0	0	0	1	18	0	0	0	1	0	0	235	3	0	3	0	0	51	0
US 49 @ Dedeaux Rd	328	65.6	14	1	0	0	0	0	0	0	0	9	0	0	0	0	0	0	276	1	0	1	0	0	26	0
US 90 (Terry Micheal Byrd Memorial Hwy) @ Chicot St	257	51.4	60	1	0	0	1	0	3	0	0	20	0	0	0	0	1	0	125	2	0	3	7	0	33	1
US 49 @ Community Rd	220	44.0	16	1	0	0	0	0	0	0	1	53	0	0	0	0	0	0	127	0	0	1	0	0	21	0
MS 605 (Lorraine Rd) @ Seaway Rd	204	40.8	4	0	0	0	0	0	1	0	0	7	0	0	0	0	0	1	185	0	0	0	1	0	5	0
US 90 (Terry Micheal Byrd Memorial Hwy) @ Hospital St	198	39.6	39	1	0	0	0	0	2	0	2	26	0	0	0	0	1	0	115	1	0	2	0	0	9	0
US 49 @ MS 53 / N Swan Rd	198	39.6	15	0	0	0	1	0	0	0	0	11	0	0	0	0	0	0	156	0	0	2	0	0	13	0
MS 605 (Lorraine Rd) @ I-10 WB Ramps	195	39.0	22	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	133	2	0	2	1	0	10	0
US 49 (25th Ave) @ Pass Rd (25th St)	194	38.8	34	1	0	0	0	0	0	0	0	36	0	0	0	0	0	0	85	4	0	1	0	0	33	0
US 90 (Bienvelle Blvd) @ Hanshaw Rd	184	36.8	13	1	0	1	0	0	1	0	1	29	0	0	0	1	0	0	119	1	0	0	4	0	13	0
US 49 @ Airport Rd	184	36.8	7	0	0	0	0	0	0	0	0	6	0	0	0	0	0	2	139	0	0	2	3	0	25	0
MS 605 @ Dedeaux Rd	182	36.4	11	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	145	0	0	1	0	0	14	0
US 49 (25th Ave) @ 28th St	157	31.4	20	4	0	1	2	0	0	0	0	16	0	0	1	0	0	0	84	0	0	2	1	0	26	0
US 49 @ Orange Grove Blvd	152	30.4	21	0	0	0	0	0	0	0	0	13	0	0	0	1	2	0	83	2	0	10	2	1	17	0
US 90 (Bienvelle Blvd) @ Ocean Springs Rd / Guilford Rd	151	30.2	10	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	123	0	0	2	0	0	13	0
US 90 (Scott Pruitt Memorial Hwy) @ MS 57	147	29.4	5	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	122	1	0	1	1	0	7	0
Courthouse Rd @ Pass Rd	141	28.2	35	1	0	0	2	0	0	0	0	23	0	0	0	0	0	2	59	1	0	1	2	0	15	0
Total	4,635	927.0	435	13	1	2	6	2	9	0	5	375	0	0	1	3	4	6	3,210	20	0	38	23	1	478	1

Source: SAMS, 2019; NSI, 2019

1 The average annual crash frequency is the average number of reported crashes per year between 2014 and 2018.

Table 2.9: Hancock County Top 10 High Crash Frequency Intersections and Crash Rates, 2014-2018

Intersection	Total Crashes	Average Annual Crash Frequency[1]	ADT	Crash Rate
US 90 @ MS 43/Nicholson Ave	128	25.6	29,781	2.36
US 90 @ Kiln Waveland Cutoff Rd/Waveland Ave	88	17.6	23,508	2.05
US 90 @ Blue Meadow Rd/Main St	62	12.4	21,666	1.57
MS 43 (Kiln Rd/Nicholson Ave) @ Longfellow Rd	59	11.8	16,326	1.98
US 90 @ McLaurin Rd	59	11.8	24,880	1.30
US 90 @ Washington St	54	10.8	24,335	1.22
MS 43/MS 603 @ I-10 WB Ramps	51	10.2	26,002	1.07
MS 43/MS 603 @ I-10 EB Ramps	51	10.2	26,744	1.04
MS 43 (Kiln Rd) @ Kiln Waveland Cutoff Rd	49	9.8	23,389	1.15
US 90 @ Drinkwater Blvd	47	9.4	24,998	1.03

Source: SAMS, 2019; NSI, 2019

1 The average annual crash frequency is the average number of reported crashes per year between 2014 and 2018.

Table 2.10: Harrison County Top 10 High Crash Frequency Intersections and Crash Rates, 2014-2018

Intersection	Total Crashes	Average Annual Crash Frequency[1]	ADT	Crash Rate
US 49 @ Creosote Rd / Factory Shop Blvd	439	87.8	73,228	3.28
Pass Rd @ Cowan Rd	388	77.6	50,311	4.23
US 49 @ Crossroads Pkwy / Landon Rd	381	76.2	81,394	2.56
US 49 @ Dedeaux Rd	328	65.6	63,817	2.82
US 49 @ Community Rd	220	44.0	61,644	1.96
MS 605 (Lorraine Rd) @ Seaway Rd	204	40.8	41,663	2.68
US 49 @ MS 53 / N Swan Rd	198	39.6	41,067	2.64
MS 605 (Lorraine Rd) @ I-10 WB Ramps	195	39.0	39,448	2.71
US 49 (25th Ave) @ Pass Rd (25th St)	194	38.8	43,908	2.42
US 49 @ Airport Rd	184	36.8	66,068	1.53

Source: SAMS, 2019; NSI, 2019

[1] The average annual crash frequency is the average number of reported crashes per year between 2014 and 2018.

Table 2.11: Jackson County Top 10 High Crash Frequency Intersections and Crash Rates, 2014-2018

Intersection	Total Crashes	Average Annual Crash Frequency[1]	ADT	Crash Rate
US 90 (Bienville Blvd) @ MS 609 / Washington Ave	335	67.0	57,838	3.17
US 90 (Terry Michael Byrd Memorial Hwy) @ Chicot St	257	51.4	30,230	4.66
US 90 (Terry Michael Byrd Memorial Hwy) @ Hospital St	198	39.6	29,472	3.68
US 90 (Bienville Blvd) @ Hanshaw Rd	184	36.8	31,812	3.17
US 90 (Bienville Blvd) @ Ocean Springs Rd / Guilford Rd	151	30.2	44,307	1.87
US 90 (Scott Pruitt Memorial Hwy) @ MS 57	147	29.4	40,603	1.98
US 90 (Bienville Blvd) @ Hanley Rd	141	28.2	40,635	1.90
MS 609 (Washington Ave) @ Big Ridge Rd/Money Farm Rd	139	27.8	30,016	2.54
US 90 @ Gautier-Vancleave Rd	138	27.6	37,463	2.02
US 90 (Bienville Blvd) @ Martin Luther King Jr Ave/Vermont Ave	135	27.0	45,718	1.62

Source: SAMS, 2019; NSI, 2019

1 The average annual crash frequency is the average number of reported crashes per year between 2014 and 2018.

2.8 Roadway Security

While safety and security are closely related, they are differentiated by the cause of the harm from which the transportation system and its users are being protected.

Safety encompasses the prevention of unintentional harm to system users or their property. This includes vehicular crashes, train derailments, slope failures, sudden destruction of roadways, or non-motorized user injuries. Security involves the prevention, management, and response to intentional harm to the transportation system or its users. This includes:

- theft or dismemberment of elements of the transportation infrastructure,
- assault on users of the system, or
- large-scale attacks intended to completely disrupt the movement of people and goods.

Security concerns can include natural disasters, acts of violence, and terrorism.

MPO Role in Security

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

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

MPOs can take certain measures to improve security prevention, protection, response, and recovery.

Prevention

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

- access control systems
- Closed Circuit Television (CCTV) systems
- security alarms
- fencing
- locks
- architectural barriers

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

Protection

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

Response

Redundancy of transportation facilities should be encouraged in capital project planning. This assists in emergency evacuations or detours should a particular segment of the transportation network become unavailable. The use of Intelligent Transportation Systems (ITS) to control traffic signals and other controls also assists in responding to security risks.

Recovery

Transportation decision-makers should be familiar with both short-term and long-term recovery plans for the MPA. This includes everything from evacuations to restoring local businesses and neighborhoods. MDOT has dedicated evacuation routes and each county in the MPA have its own emergency management bodies and hazard mitigation plans. More information can be found on each county's websites at:

Harrison County Office of Emergency Management -

http://co.harrison.ms.us/departments/ema/

Hancock County Emergency Management-

https://hancockcounty.ms.gov/departments/emergency-management-e-911-fire-department/

Jackson County Office of Emergency Services-

https://co.jackson.ms.us/224/Office-of-Emergency-Services

Key Security Participants

As stated previously, the MPO coordinates with relevant agencies and is in a support role when security issues arise. The MPO can serve as a medium of communication between the various agencies involved. Several key participants to the security management process have been identified below.

State and Local Governments

MDOT's Emergency Services Section is under the Office of Enforcement. The section oversees and administers MDOT's emergency services which include:

- emergency plan development and maintenance,
- coordination of emergency response operations,
- coordination of state and federal emergency preparedness and response programs, and
- coordination of Homeland Security initiatives.

Information on the MDOT's emergency services can be found at:

http://mdot.ms.gov/portal/emergency_services.aspx

Mississippi Emergency Management Agency (MEMA)

An additional provider for emergency management in the state is MEMA. MEMA defines its mission as:

> "…coordinate activities that will save lives, protect property and reduce suffering of Mississippi's citizens and their communities impacted by disasters through a comprehensive and integrated program of disaster preparedness, response, recovery and mitigation initiatives."

The MEMA website (http://www.msema.org/) provides information and planning to the public and the emergency management communities. This site focuses on continuous development and timely and accurate data.

Local Colleges and Universities

Security threats have necessitated documents and emergency plans for several types of emergencies, including hurricanes, tornadoes, earthquakes, and more.

The MPA is home to multiple college campuses and universities and information about their emergency plans can be obtained from their websites or administrative staff.

Additional MPO Measures

Each MPO is ultimately responsible for crafting a security policy consistent with its goals, state guidance, and the FAST Act. Security must also be considered during the establishment of future MPO goals and the support for MPO funding priorities. The following presents potential areas of focus, recognizing that hurricane evacuation is a primary concern within the Gulf Coast Urbanized Area.

Use of MPO Transportation Model to Assess Evacuation Plans

The TransCAD regional model can be modified to simulate evacuation events. This can be used to test the effectiveness of existing plans or to improve plans for routing traffic through the MPO region.

Use of Area Transit Systems to Support Evacuation Events

The MPO will work with local transit providers to investigate opportunities for the use of transit vehicles to provide for the evacuation of transit dependent populations.

Integration of Intelligent Transportation Systems (ITS) in Evacuation Planning

The MPO supports investment in ITS technologies. The MPO understands the need to study and assess how this technology can be used to assist evacuees in their decision-making and expedite their progress during evacuation events.

Integration of Hurricane Evacuation Purpose and Need in Planning for Future Roadway Improvements

As the MTP projects are refined within the context of the MDOT Construction Program, project features will be reviewed for consistency with a hurricane evacuation purpose and need. Every hurricane produces a unique evacuation event. Evacuees are influenced by the amount of notice provided in advance of the storm's landfall, as well as the projected storm path and intensity. Information on hurricane evacuation routes and procedures can be found at:

http://mdot.ms.gov/hurricanes/

Strategic Highway Network (STRAHNET)

The STRAHNET is a portion of the NHS considered vital to the nation's strategic defense. The current STRAHNET is about 61,000 miles long and links military installations with roadways that provide for the mobility of strategic military assets. All Interstate highways, including I-10 and I-110 within the MPA, are included as part of the STRAHNET. The MPA contains a major STRAHNET connector from I-10 to the Naval Construction Battalion Center.

The STRAHNET routes need additional considerations, which include maintenance of bridge capability, pavement conditions, and congestion management. The use of ITS along these corridors, particularly dynamic message signs, will allow for better management of the traffic related to military convoys.

3.0 Freight

3.1 Introduction

The movement of freight throughout the MPA affects both the regional and national economy. The region is a significant generator of freight, as well as a major distribution and processing center. It is home to major freight facilities, notably including several major ports, class I railroads, and Interstate 10.

3.2 Trucking

Inventory

The MPA contains several roadways that serve freight. It also contains active intermodal terminal facilities designated as intermodal connectors. Within the MPA, I-10 and the portion of Canal Road that connects to the Port of Gulfport are part of the National Highway Freight Network (NHFN)[2]. Those highways, as well as I-110 within the MPA, are part of the National Multimodal Freight Network (NMFN)[3]. In addition to the NPFN and NMFN, MDOT has identified US 49 as part of the Mississippi Freight Network (MFN) within the MPA.

6

Intermodal connectors in the MPA

The intermodal connectors within the MPA are shown in Table 3.1. The detailed freight network can be found in Mississippi's freight plan[4]. MDOT's identified freight network within the MPA is shown in Figure 3.1.

Table 3.1: Intermodal Connectors, 2018

Facility ID	Intermodal Description	Corridor(s)
MS12A	US 49 and Airport Rd / 34th Street in Gulfport connecting I-10 to Gulfport-Biloxi International Airport	I-10 and US 49
MS1P	To Port of Pascagoula (east) via US 90: south on MS 611	I-10
MS5P	To Port of Gulfport from I-10 via US 90: south on Port Access Road	I-10 and US 49
MS5P	To Port of Gulfport from I-10 via US 90: West Pier Gate to 27th Avenue	I-10 and US 49
MS10P	To Port of Bienville from I-10 via US 90/MS 607, southwest on US 90, south on Ansley Rd	I-10
MS17P	To Port of Pascagoula (west) via US 90: south on MS 617 to MS 619, east on River Edge Rd	I-10

Source: Mississippi Department of Transportation

[2] https://ops.fhwa.dot.gov/freight/infrastructure/ismt/state_maps/states/mississippi.htm
[3] https://www.transportation.gov/sites/dot.gov/files/docs/State_interimMFN_portrait_Mississippi_alt_text.pdf
[4] http://mdot.ms.gov/documents/planning/freight/documents/MS%20Freight%20Plan.pdf

The following roadways in the MPA are part of the MFN:

- I-10 is part of the Tier I Gulf Coast Corridor.

- US 49 is part of the Tier I Jackson-Hattiesburg-Gulfport Corridor.

Table 3.2 displays the intermodal terminal facilities in the MPA. The MPA also contains several trucking establishments which provide local and long-distance trucking services. The intermodal facilities and major trucking establishments in the MPA are shown in Figure 3.1.

Table 3.2: Intermodal Terminal Facilities for Trucks, 2018

Name	Modes Served	City
Yellow	Rail & Truck	Gulfport
Port of Gulfport	Truck - Port - Rail	Gulfport
Port of Pascagoula	Truck - Port - Rail	Pascagoula
Gulfport-Biloxi International Airport	Air & Truck	Gulfport
USPS-PDC-PDF	Truck & Truck	Gulfport

Source: Bureau of Transportation Statistics, 2015 National Transportation Atlas

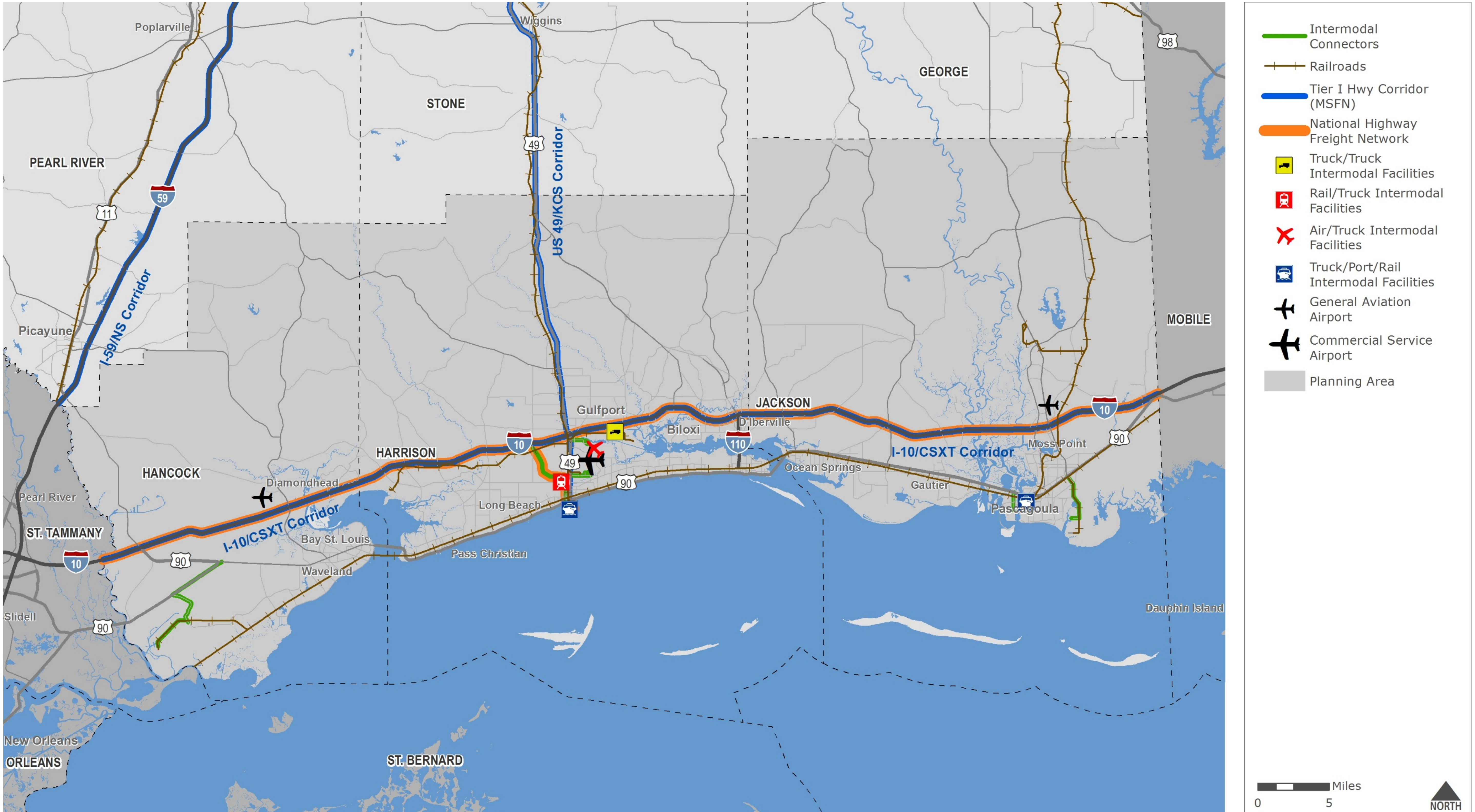
Volumes

To better understand the MPA's freight needs, the travel demand model's daily truck volumes were used, and these estimated volumes are illustrated in Figure 3.2.

Estimated freight truck volumes suggest the following trends:

- *Freight truck traffic is greatest on I-10 and US 49. These correspond to the roadways included in the MFN.*
- *Freight truck traffic is also relatively high on I-110, US 90, MS 57, MS 63, MS 605, MS 607, MS 609, MS 613, and MS 619.*

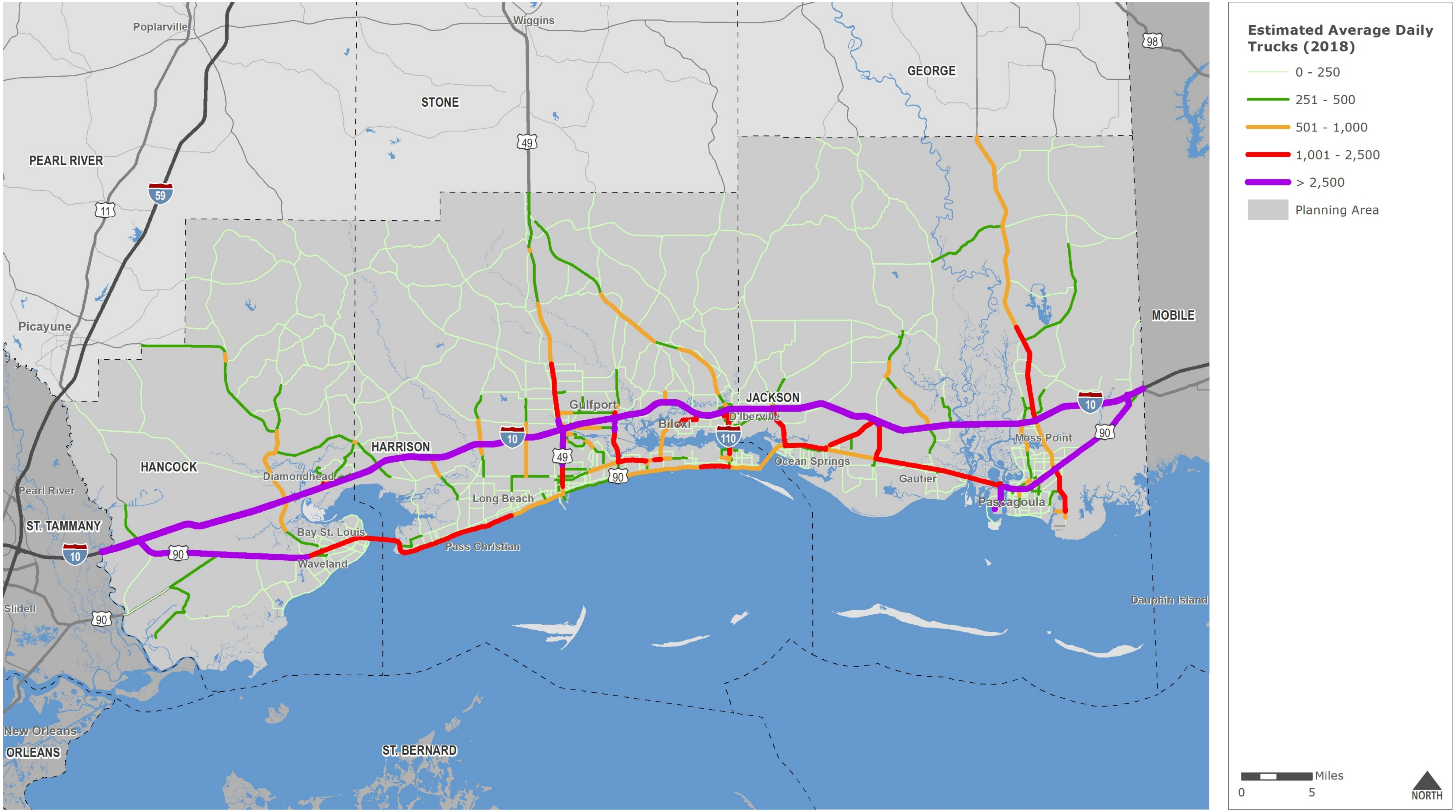
Figure 3.1: Regional Freight Network and Facilities - Trucking, 2018



Data Sources: 2015 National Transportation Atlas; USDOT; MDOT

Disclaimer: This map is for planning purposes only.

Figure 3.2: Modeled Regional Freight Truck Traffic, 2018



Data Sources: Travel Demand Model

Disclaimer: This map is for planning purposes only.

Commodity Flows

Commodity Flows

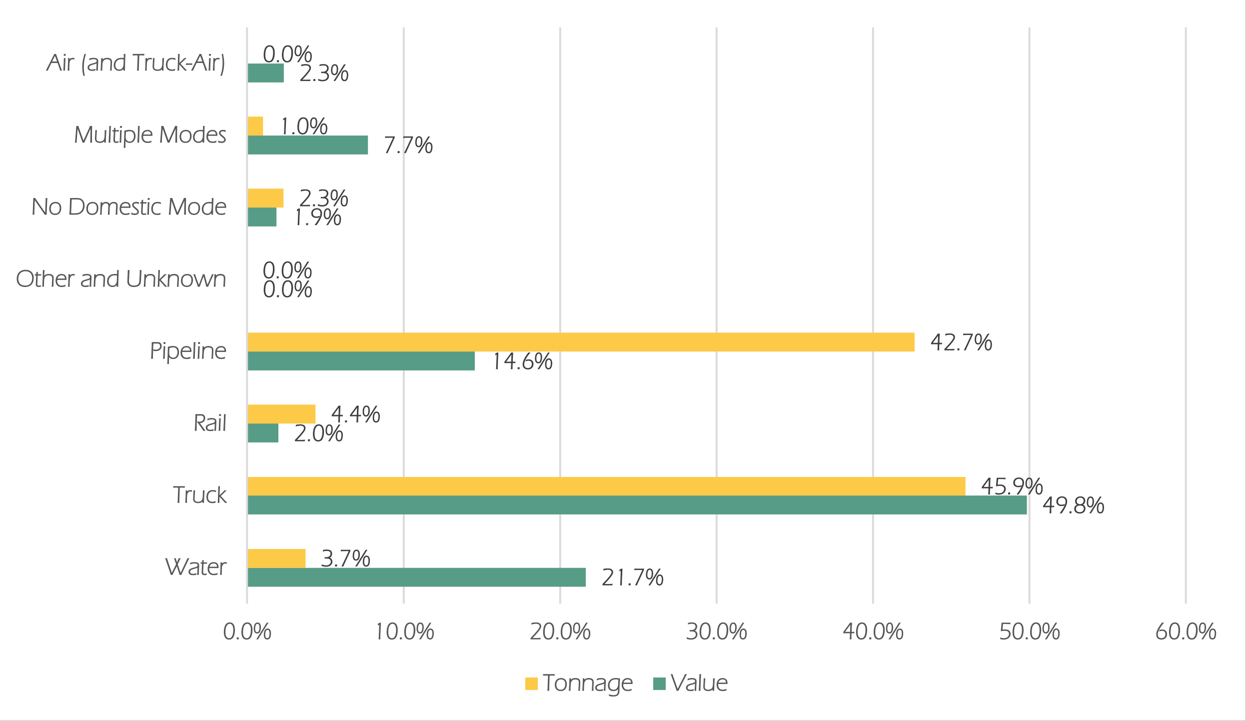
Using data obtained from the FHWA's Freight Analysis Framework (FAF), general trends in freight movement within the MPA can be observed. The freight truck movements for the MPA counties, and their statewide rankings, are summarized below.

In 2016:

- Hancock County ranked 49th in Mississippi by truck freight weight and 57th by truck freight value.
- Harrison County ranked 22nd in Mississippi by truck freight weight tonnage and 16th by truck freight value.
- Jackson County ranked fourth in Mississippi by truck freight weight and third by truck freight value.

Highways move the majority of goods in the MPA among all transportation modes. As shown in Figure 3.3, trucks account for 50 percent of total tonnage and 46 percent of total value moved into, out of, and within the MPA. By tonnage, pipelines are second at 43 percent. By value, the water mode is second at 22 percent. The remaining modes account for approximately 12 percent of total tonnage and 29 percent of total value.

Figure 3.3: Percent of Total Weight and Value by Mode, 2016



Source: Freight Analysis Framework Version 4

As shown in Table 3.3, most of the truck freight in the MPA originates outside the MPA. By tonnage, approximately 65 percent originates outside the MPA ("inbound" movements) and 33 percent originates in the MPA ("outbound" movements). Only two (2) percent of freight, by tonnage, stays within the MPA. Additionally, more than 62 percent of the total truck freight tonnage is intrastate.

By value, inbound movements represent approximately 63 percent and outbound movements represents more than 36 percent. Only one (1) percent of freight, by value, stays within the MPA. Although intrastate freight movements represent 62 percent of truck freight tonnage within the MPA, this movement is only approximately 33 percent of truck freight value within the MPA.

Table 3.3: Commodity Flows by Truck, 2016

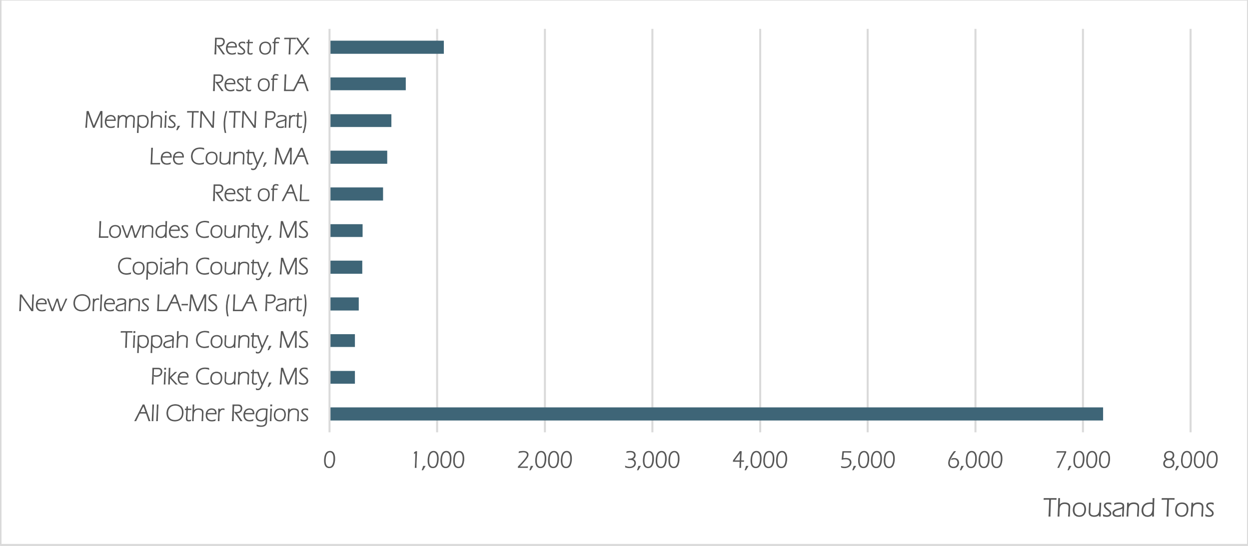
Direction	Tons (Thousands)	Percent of Total	Value ($ Million)	Percent of Total
Inbound (Interstate)	4,817	26.0%	$6,680	41.2%
Inbound (Intrastate)	7,243	39.1%	$3,476	21.5%
Outbound (Interstate)	1,783	9.6%	$3,987	24.6%
Outbound (Intrastate)	4,331	23.4%	$1,826	11.3%
Within MPA	371	2.0%	$225	1.4%
Total	18,544	100.0%	$16,195	100.0%

Source: Freight Analysis Framework 4

Figure 3.4 and Figure 3.5 show the top ten (10) inbound and outbound domestic trading partners for the MPA, respectively. The top ten (10) trading partners are located either within Mississippi or the southern United States. Mississippi counties outside of the MPA account for four (4) of the inbound trading partners and seven (7) of the outbound trading partners. "Rest of Texas" and Lee County, Mississippi represent the largest trading partners for inbound and outbound freight movements in the MPA, respectively. Regions that are top ten (10) trading partners for both inbound and outbound freight movements in the MPA are:

- Copiah County, Mississippi
- Lowndes County, Mississippi
- "Rest of Louisiana"
- The Louisiana Portion of the New Orleans-Metairie-Hammond, Louisiana-Mississippi region

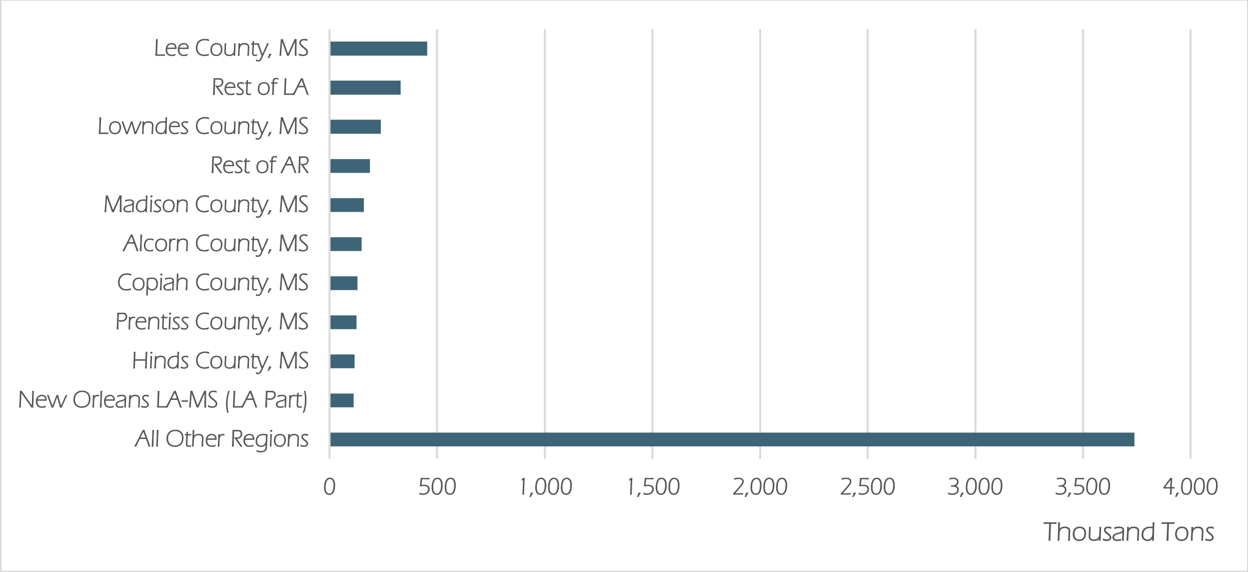
Figure 3.4: Top Inbound Trading Partners by Total Truck Tonnage



Source: Freight Analysis Framework version 4

NOTE: "Rest of TX", "Rest of LA", and "Rest of AL" refer to the areas of those states that are outside the FAF 4 designated metropolitan areas.

Figure 3.5: Top Outbound Trading Partners by Total Truck Tonnage

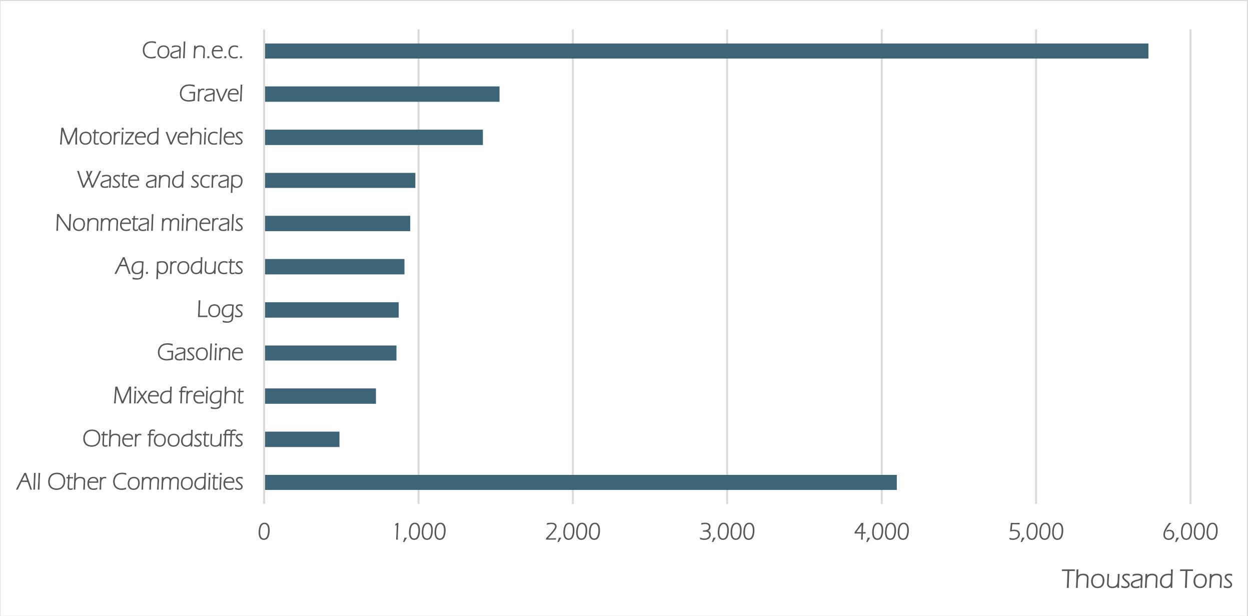


Source: Freight Analysis Framework version 4

NOTE: "Rest of LA" and "Rest of AR " refer to the areas of those states that are outside the FAF 4 designated metropolitan areas.

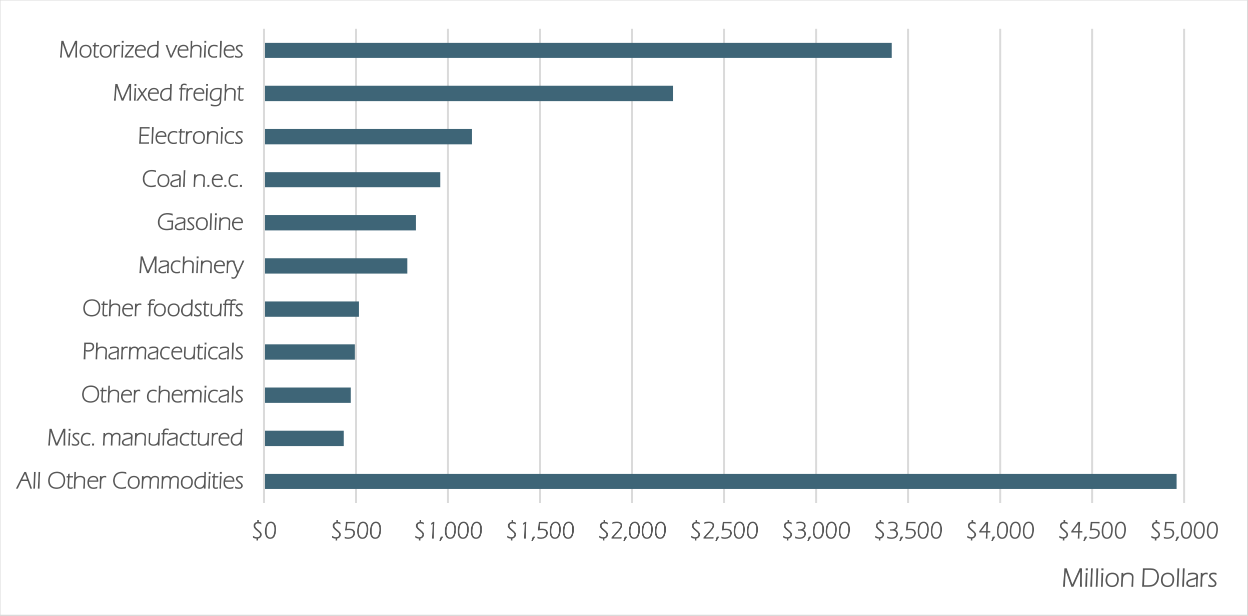
Figure 3.6 and Figure 3.7 show the top commodities shipped via truck by total weight and value, respectively. Coal and Petroleum Products, not elsewhere classified ("Coal n.e.c.") is the top commodity by tonnage, and motorized vehicles is the top commodity by value. Together, the top ten (10) commodities account for 78 percent of total freight truck tonnage and approximately 69 percent of total freight truck value within the MPA.

Figure 3.6: Top Commodities by Truck Tonnage, 2016



Source: Freight Analysis Framework version 4

Figure 3.7: Top Truck Commodities by Value, 2016



Source: Freight Analysis Framework version 4

Truck Travel Time Reliability

The FHWA has established a freight performance measure to capture truck travel time reliability on the MPA's Interstate highway system: the Truck Travel Time Reliability (TTTR) index[5].

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

The 2018 NPMRDS data indicates the following about the Interstates in the Gulf Coast MPA:

- I-10 has an overall TTTR of 1.11, and
- I-110 has an overall TTTR of 1.44.

The 2018 TTTR of each Interstate segment is shown in Figure 3.8. The state's freight performance measures, and the MPO's progress towards them, are discussed in *Technical Report #3: Transportation Performance Management Report*.

Figure 3.8: Congested Freight Corridors (Truck Travel Time Reliability), 2018

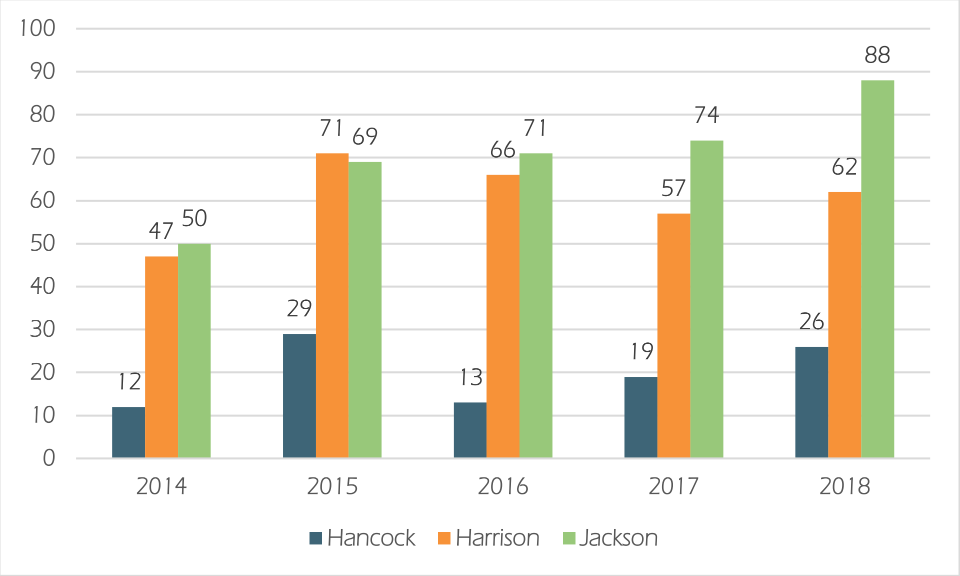
Data Sources: NPMRDS

Disclaimer: This map is for planning purposes only.

Safety

Crashes involving heavy vehicles were analyzed using crash records from 2014 to 2018 obtained from SAMS program. A total of 754 crashes involving heavy vehicles occurred within the Gulf Coast MPA counties during the five-year study period. Figure 3.9 shows the number of heavy vehicle crashes by county during the study period.

Figure 3.9: Heavy Vehicle Crashes by Year by County, 2014 - 2018



Source: SAMS, 2019; NSI, 2019

Between 2014 and 2018, fatal crashes involving heavy vehicles comprised less than one (1) percent of heavy vehicle crashes. However, nearly two (2) percent of all fatal crashes in the study area involved a heavy vehicle.

5

Fatal crashes involving heavy vehicles

Since heavy vehicle crashes represented less than two (2) percent of the total crashes during the study period, many locations experienced little to no heavy vehicle crashes. However, two intersections in the study area experienced at least five heavy vehicle crashes between 2014 and 2018.

- US 49 at Cresote Rd
- US 49 at Airport Rd

There were also several roadway segments in the MPA that experienced at least five heavy vehicle crashes between 2014 and 2018:

- I-10 Eastbound between Diamondhead and Kiln DeLisle Rd
- I-10 Eastbound between MS 609 and MS 57
- I-10 Eastbound between MS 57 and Gautier Vancleave Rd
- I-10 Eastbound and Westbound Pascagoula River Bridges
- I-10 Eastbound between MS 63 and Franklin Creek Rd
- I-10 Westbound between MS 43 and 5.2 miles west of MS 43
- US 49 between Orange Grove Rd and Parkwood Blvd
- MS 43 between N Benville Rd and Old Kiln Rd

3.3 Railways

Inventory

The MPA has approximately 170 miles of railroads, most of which are Class I railroads that are Tier I corridors in the MFN. The NPFN does not include railroads. However, most of the railroads in the MPA are part of the NMFN. Figure 3.10 displays the MPA's railroads and MFN corridors. The following railroads in the MPA are part of the MFN:

- The CSX Transportation Railroad, running alongside the I-10 corridor, is part of the Tier I Gulf Coast Corridor
- The Kansas City Southern Railroad, running alongside the US 49 corridor, is part of the Tier I Jackson-Hattiesburg-Gulfport Corridor.

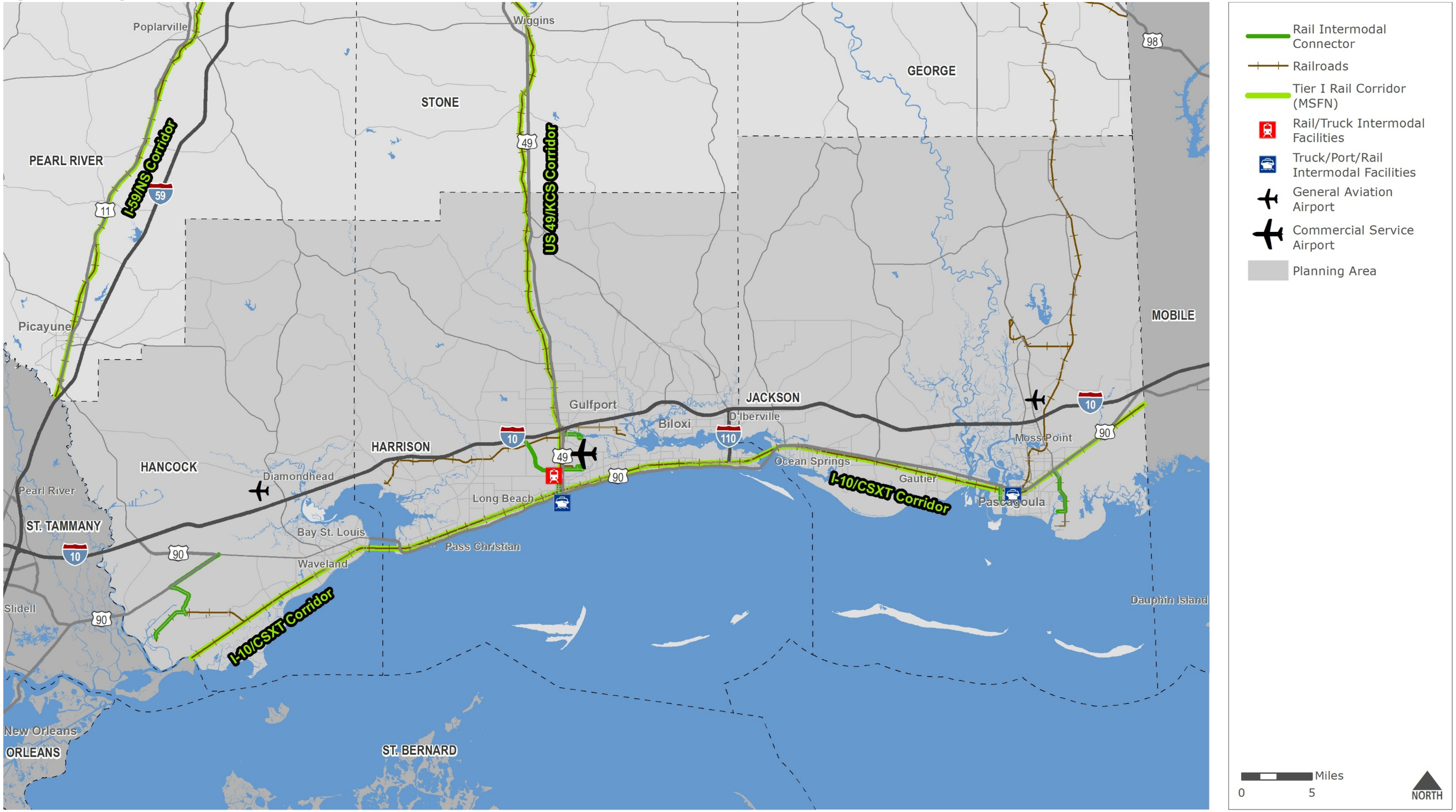
The intermodal facilities within the MPA that serve railroads are shown in Table 3.4. There are also several line-haul railroad establishments within the MPA. These establishments provide intercity movement of trains between the terminals and stations on main and branch lines of a long-distance rail network. Figure 3.10 shows the location of the intermodal facilities and line-haul establishments within the MPA.

Table 3.4: Intermodal Terminal Facilities for Rail, 2018

Name	Modes	City
Yellow	Rail & Truck	Gulfport
Port of Gulfport	Truck - Port - Rail	Gulfport
Port of Pascagoula	Truck - Port - Rail	Pascagoula

Source: Bureau of Transportation Statistics, 2015 National Transportation Atlas

Figure 3.10: Regional Freight Network and Facilities - Rail, 2018



Data Sources: 2015 National Transportation Atlas; USDOT; MDOT; Travel Demand Model

Disclaimer: This map is for planning purposes only.

Commodity Flows

The freight rail movements for the MPA counties, and their statewide rankings, are summarized below.

In 2016:

- Hancock County ranked 37th in Mississippi by rail freight tonnage and 45th by rail freight value.
- Harrison County ranked second in Mississippi by rail freight tonnage and fifth by rail freight value.
- Jackson County ranked third in Mississippi by rail freight tonnage and fourth by rail freight value.

As shown in Table 3.5, most of the rail freight in the MPA originates outside the MPA. By tonnage, approximately 75 percent originates outside the MPA ("Inbound" movements), and 24 percent originates in the MPA ("Outbound" movements). Less than one (1) percent of total rail freight tonnage remains in the MPA. Nearly 95 percent of the total rail freight tonnage is interstate. By value, inbound movements represent approximately 56 percent, and outbound movements represent nearly 44 percent. Less than one (1) percent of total rail freight value remains in the MPA. More than 93 percent of the total rail freight value is interstate.

Table 3.5: Commodity Flows by Rail, 2016

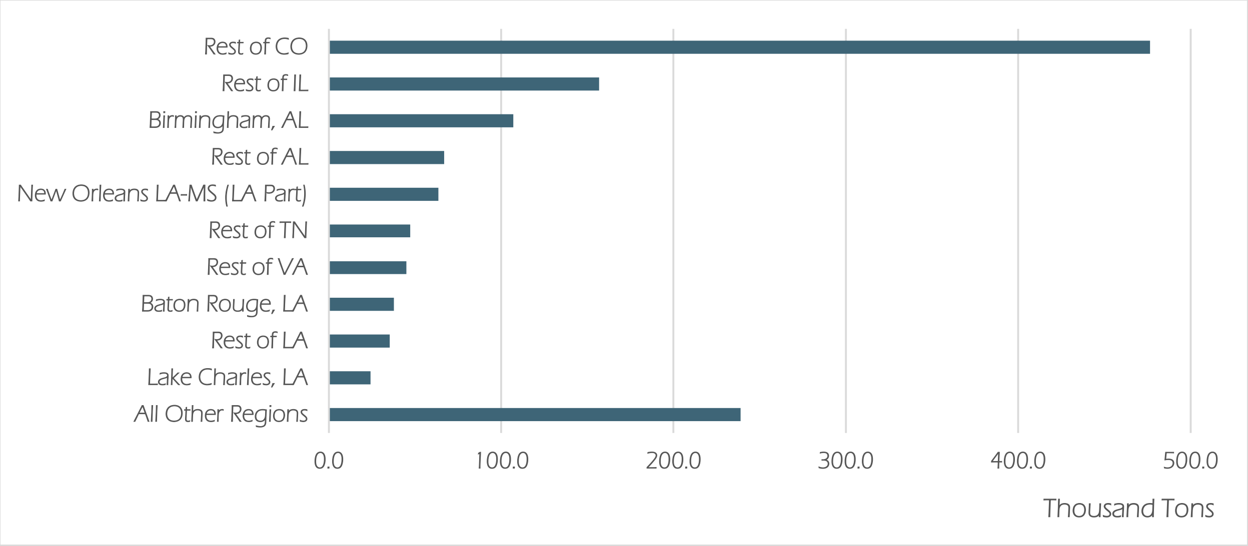
Direction	Tons (Thousands)	Percent of Total	Value ($ Million)	Percent of Total
Inbound (Interstate)	1,265	71.7%	$330	50.8%
Inbound (Intrastate)	65	3.7%	$34	5.2%
Outbound (Interstate)	409	23.2%	$275	42.4%
Outbound (Intrastate)	21	1.2%	$9	1.4%
Within MPA	3	0.2%	$1	0.2%
Total	1,763	100.0%	$649	100.0%

Source: Freight Analysis Framework 4

Figure 3.11 and Figure 3.12 show the top ten inbound and outbound domestic trading partners for the MPA, respectively. Most of the MPA's top ten inbound or outbound domestic trading partners for rail freight are in the Southern or Midwestern United States. Regions that are top ten trading partners for both inbound and outbound freight movements in the MPA are:

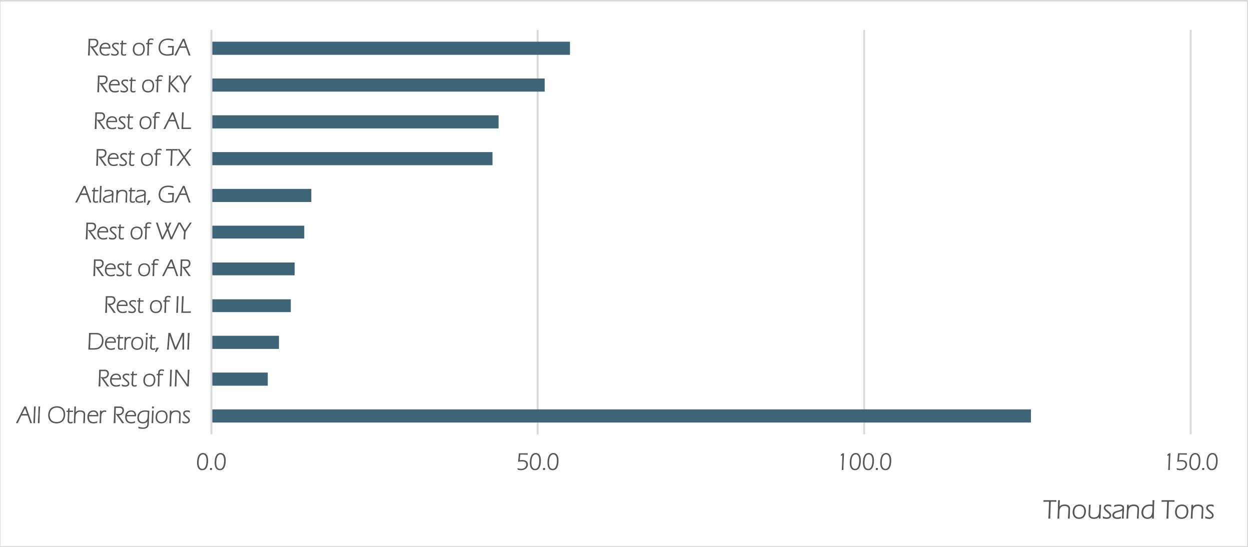
- "Rest of Alabama"
- "Rest of Illinois"

Figure 3.11: Top Inbound Trading Partners by Rail Tonnage



Source: Freight Analysis Framework version 4
NOTE: "Rest of CO", "Rest of IL", "Rest of AL", "Rest of TN", "Rest of VA", and "Rest of LA" refer to the areas of those states that are outside the FAF 4 designated metropolitan areas.

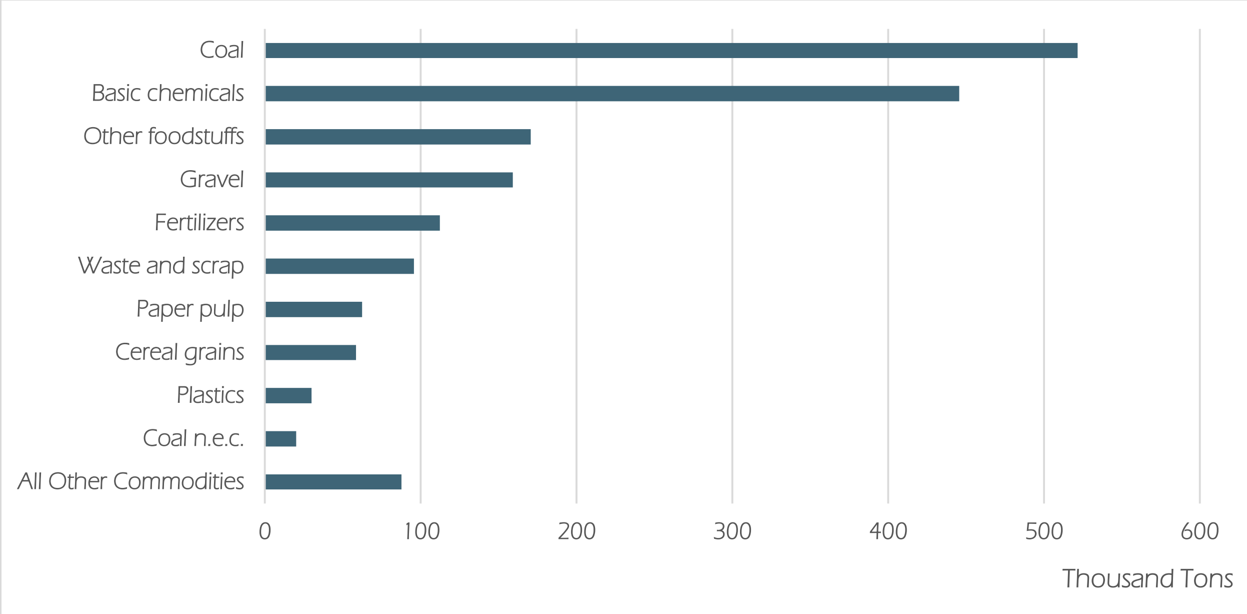
Figure 3.12: Top Outbound Trading Partners by Rail Tonnage



Source: Freight Analysis Framework version 4
NOTE: "Rest of GA", "Rest of KY", "Rest of AL", "Rest of TX", "Rest of WY", "Rest of AR", "Rest of IL", and "Rest of IN" refer to the areas of those states that are outside the FAF 4 designated metropolitan areas.

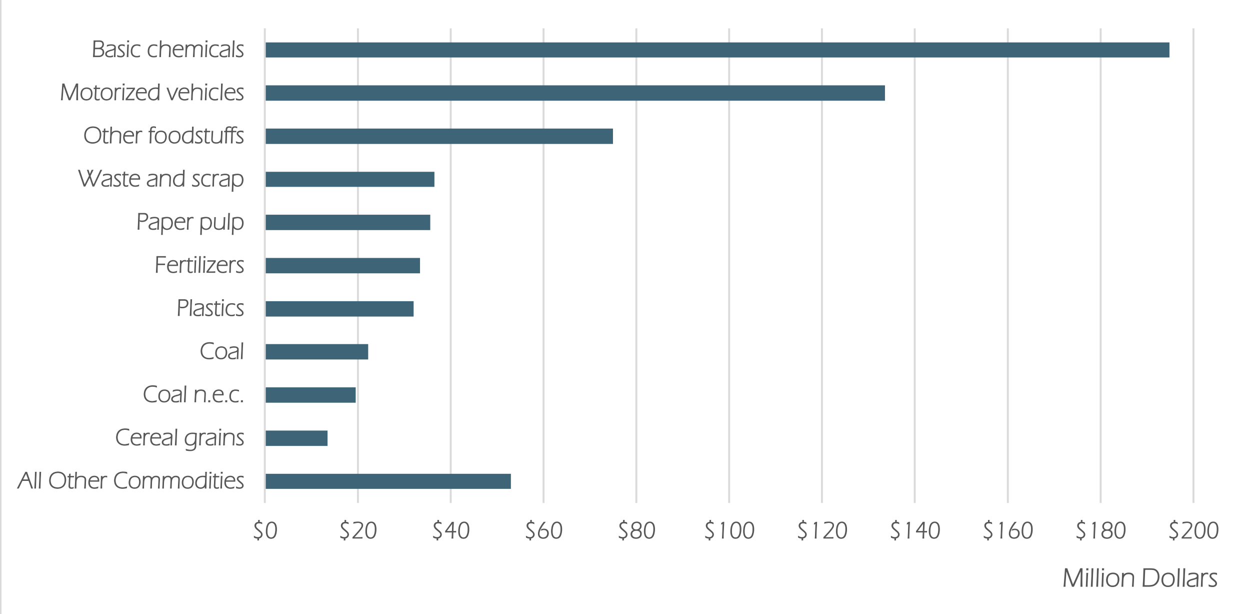
Figure 3.13 and Figure 3.14 show the top commodities by total tonnage and value, respectively, that are for rail. Coal is the top commodity by tonnage, and basic chemicals is the top commodity by value. Together, the top ten (10) commodities account for 95 percent of total freight rail tonnage and approximately 92 percent of total freight rail value within the MPA.

Figure 3.13: Top Commodities by Freight Rail Tonnage, 2016



Source: Freight Analysis Framework version 4

Figure 3.14: Top Rail Commodities by Value, 2016



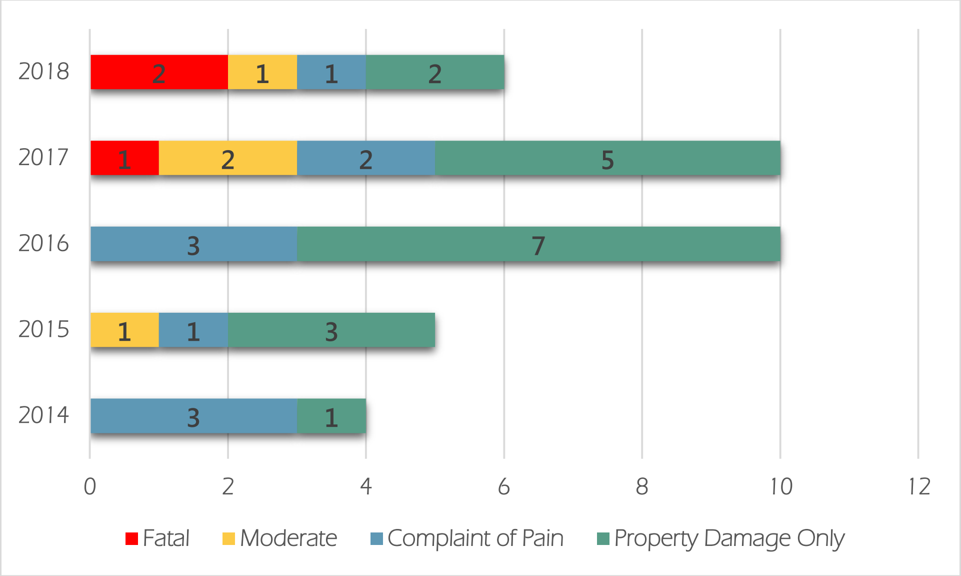
Source: Freight Analysis Framework version 4

Rail-Automobile Collisions

From 2014 through 2018, there were 35 crashes involving an automobile and a train. Figure 3.15 shows the breakdown of these crashes by severity. Fatal freight rail crashes represented nearly one (1) percent of all fatal crashes, even though rail crashes were only a very small percentage of all crashes in the MPA. Twenty-seven automobile-train collisions occurred at crossings with CSX Transportation (CSXT) tracks, four occurred at crossings with Kansas City Southern (KCS) tracks, and four occurred at crossings with Mississippi Export (MSE) tracks. Of the 35 train crashes that occurred in the MPA there were:

- 3 in Hancock County
- 23 in Harrison County
- 9 in Jackson County

Figure 3.15: Freight Rail Crashes by Year by Severity, 2018



Source: SAMS, 2019; NSI, 2019

One crash involved a collision between a transit bus and a train. This crash resulted in several fatalities.

!

9%

Train crashes that resulted in a fatality

The four roadway-railroad crossings in the MPA experienced more than one automobile-train collision between 2014 and 2018.

- Gill Ave at CSX Railroad in Biloxi;
- Main St at CSX Railroad in Biloxi;
- Nixon St at CSX Railroad in Biloxi; and
- Tanner Williams Rd at MSE Railroad north of Moss Point.

Derailments

According to the Federal Rail Administration, from 2014 to 2018, one (1) train derailment occurred within the Gulf Coast MPA. Table 3.64 displays the derailment details.

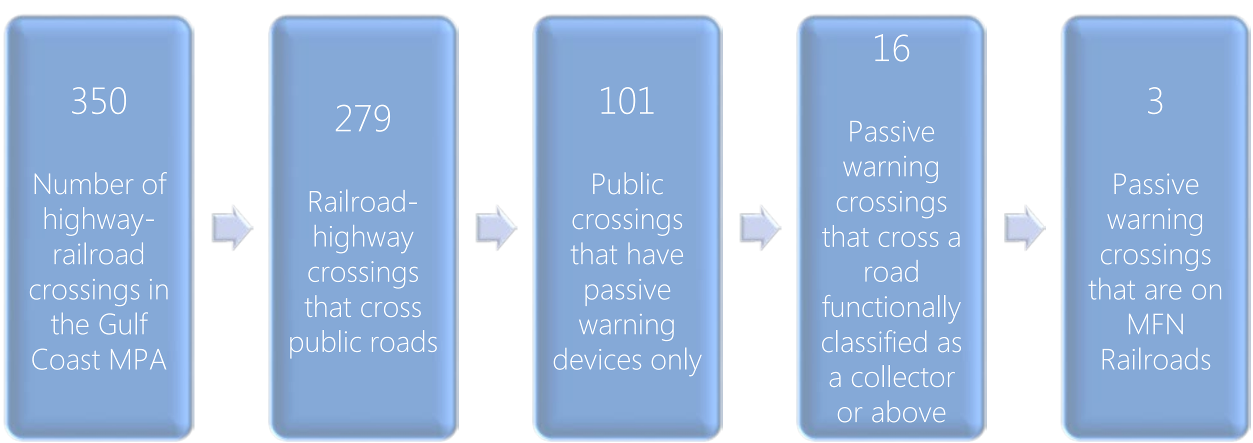
Table 3.6: Derailments, 2014 - 2018

Date	City	Railroad	County	Primary Cause	Severity
March 8, 2016	Moss Point	MSE	Jackson	Instruction to train/yard crew improper	No Injury

Source: Federal Railroad Administration

Railroad Crossings with Active Warning Control Devices

To avoid collisions, warning/control devices are required at highway-railroad grade crossings. Aside from passive warning devices, such as yield and stop signs, many highway-railroad grade crossings have active warning devices. Active warning devices include devices and controls such as bells, flashing lights, and gates, in addition to passive warning devices.



The Mississippi Statewide Freight Plan sets a performance standard where all highway-railroad crossings between a public road that is functionally classified as a Collector or greater and a railroad on the MFN are to have active crossing warning (gates and flashers). Highway-railroad crossings between a road that is functionally classified as a Collector or above and an MFN railroad that lack active warning devices are shown in Table 3.7.

Table 3.7: Highway-Railroad Crossings Lacking Active Warning Devices on MFN Railroads

Railroad	Street	Place	County	Maximum Speed	Average Daily Traffic
CSXT	S Lang Ave	Long Beach	Harrison	Unknown	900
CSXT	Old Mobile Ave	Pascagoula	Jackson	25 MPH	4,100
KCS	Old Hwy 49	Saucier	Harrison	35 MPH	500

Source: Federal Railroad Administration

3.4 Air Cargo

Inventory

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

The Gulf Coast MPA has three public airports:

- Stennis International Airport in Kiln,
- Gulfport-Biloxi International Airport in Gulfport, and
- Trent Lott International Airport in Moss Point.

The Gulfport-Biloxi International Airport contains one (1) intermodal facility: Gulfport-Biloxi International Airport. This facility services air and truck modes. The Gulfport-Biloxi International Airport features a 40,000 square foot cargo facility. Airside access from the runway system at the airport can accommodate two MD11s, DC10s, or B747s.

The total number of aircraft based at each airport and the daily aircraft operations are shown in Table 3.8. The daily aircraft operations at Gulfport-Biloxi International Airport also includes commercial flights.

Table 3.8: Based Aircraft and Daily Aircraft Operations

Airport	Based Aircraft	Daily Aircraft Operations
Stennis International Airport	25	174
Gulfport-Biloxi International Airport	31	134
Trent Lott International Airport	24	143

Source: Federal Aviation Administration

Volumes

Cargo data is not readily available for any of the airports in the MPA.

Commodity Flows

_As mentioned earlier, goods that are shipped by air tend to be high-value and time-sensitive. These goods are shipped via air are transported either by all-cargo carriers, such as Federal Express (FedEx) or United Parcel Service (UPS), or by passenger airlines in empty space either in the belly-holds of their aircraft or through a separate fleet of dedicated freight aircraft. According to the FAF, air travel accounted for approximately 0.02 percent of the total freight tonnage in the MPA. However, by value, the mode share for air was approximately five (5) percent.

The top five (5) origins for air freight in the MPA by tonnage and by value are:

Tonnage

1. Massachusetts
2. California
3. Georgia
4. Pennsylvania
5. Illinois

Value

1. California
2. Washington
3. Pennsylvania
4. Massachusetts
5. Georgia

The top five destinations for air freight in the MPA by tonnage and by value are:

Tonnage

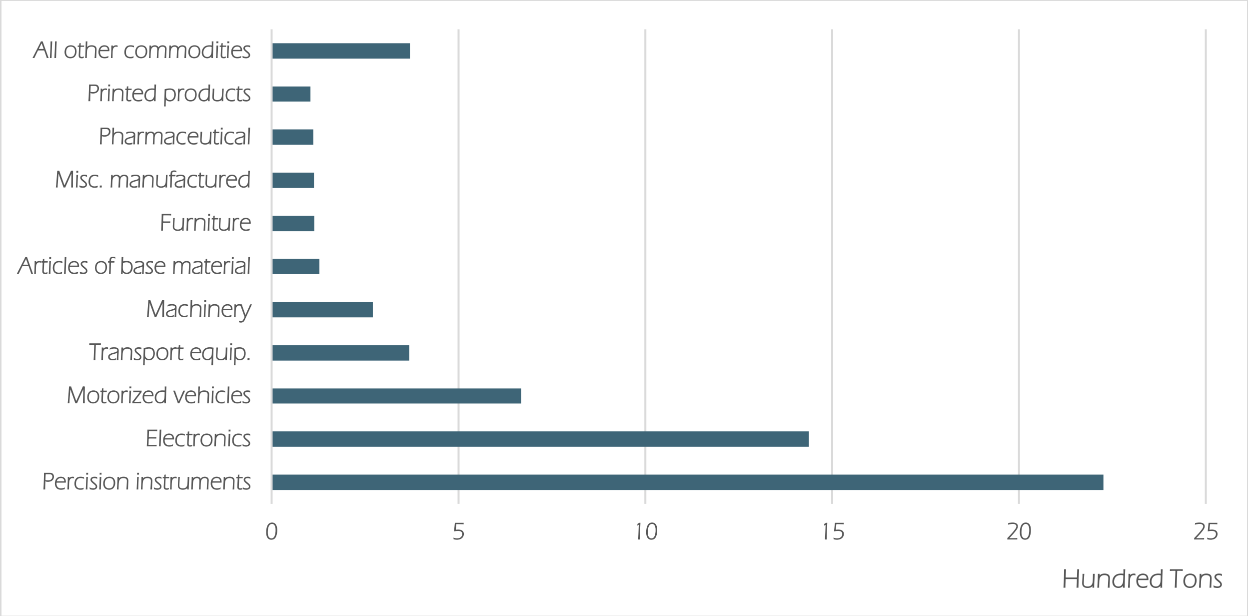
1. California
2. Florida
3. Pennsylvania
4. Massachusetts
5. Connecticut

Value

1. California
2. Colorado
3. Florida
4. Texas
5. Virginia

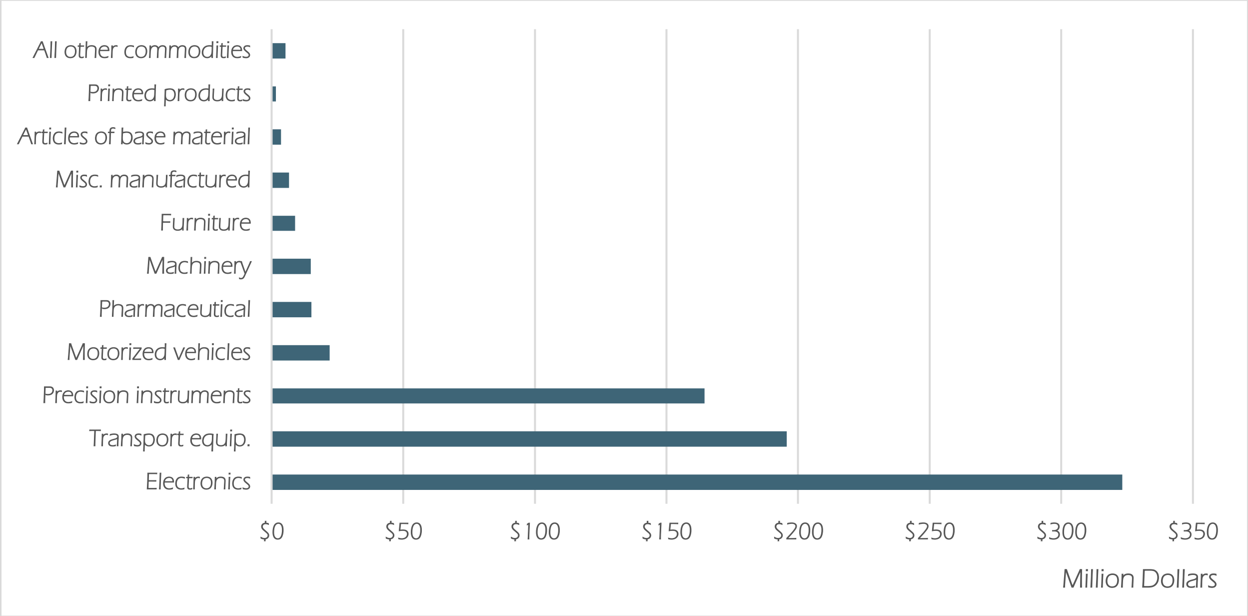
Figure 3.16 and Figure 3.17 shows the top ten commodities shipped via air for tonnage and value, respectively. The top ten commodities accounted for 94 percent by tonnage and 99 percent by value.

Figure 3.16: Top Air Commodities by Tonnage, 2016



Source: Freight Analysis Framework version 4

Figure 3.17: Top Air Commodities by Value, 2016



Source: Freight Analysis Framework version 4

3.5 Waterways and Ports

Inventory

There are four port facilities within the MPA, which provide valuable connections to national and international markets. A description of the four ports is shown below:

Port Bienville

- Shallow draft port and industrial park located in Bay St Louis, MS
- Channel depth of 12 feet and over 600,000 square feet of warehouse and dock space
- Connects to I-10 via US 90 and MS 607 and to the CSX Railroad via the Short line Port Bienville Railroad
- Facilities include a 100-ton Manitowac crawler crane and heavy lift servies and a 3600-acre industrial park

Port of Gulfport

- State-owned port located in Gulfport, MS
- Channel depth of 36 feet and over 5,000,000 square feet of warehouse and dock space
- Connects to I-10 vis US 49 and US 90 and to the KCS Railroad
- Two terminals: East Pier and West Pier
- Facilities include 6,000 feet of berthing space, 110 acres of open storage space, 400,000 sq. ft. of covered warehouse space, RO-RO ramp, and two 100-ton capacity mobile harbor cranes

Biloxi Port Division

- Local port located in Biloxi, MS
- Channel depth of 12 feet and 20,000 square feet of warehouse and dock space
- Served by I-10, I-110, US 90, and MS 609
- Facilities include two commercial docks and two recreational marinas
- Primarily caters to the recreational boating industry
- The seafood industry is the only commercial activity at the port

Port of Pascagoula

- Located in Pascagoula, MS
- Channel depth of 42 feet and nearly 2,000,000 square feet of warehouse and dock
- Connects to I-10 and US 90 via MS 63 and MS 613 and to the CSX and MSE Railroads
- Mississippi's largest port by freight weight
- Facilities include two harbors with public and private terminals and three industrial parks

All four ports are located along the Mississippi Sound, which is a component of the Gulf Intracoastal Waterway (GIWW). The GIWW is part of the USDOT Marine Administration's (MARAD) Marine Highway Program and has been designated Marine Highway 10 (M-10).

The Port of Gulfport and the Port of Pascagoula are part of the NMFN. Additionally, the Gulf Intracoastal Waterway and the waterways that connect the Port of Gulfport and the Port of Pascagoula to Marine Highway 10 (M-10) are part of the NMFN.

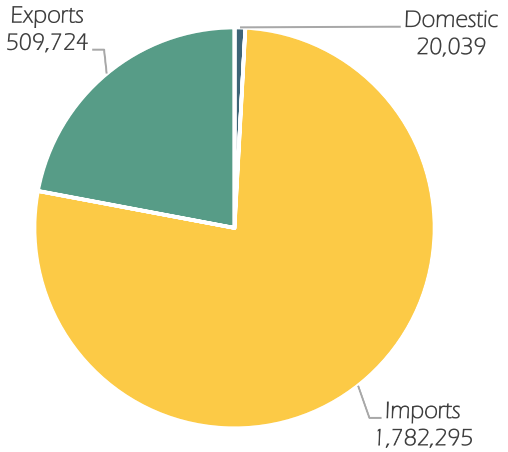
Commodity Flows

The U.S. Army Corps of Engineers (USACE) collects data pertaining to the usage of the top 150 ports within the U.S in terms of total tonnage. In 2017, the Port of Pascagoula was ranked 28th in the nation, and the Port of Gulfport was ranked 104th. Port Bienville and the Port of Biloxi were ranked outside the top 150, and therefore were omitted from the USACE assessment.

Port of Gulfport

Figure 3.18 shows the tonnage at the Port of Gulfport by domestic and international trade. In 2017, the Port of Gulfport handled approximately 2.3 million tons of freight. Most of the freight handled was international (exports and imports), accounting for 99 percent of all freight handled. Approximately 77 percent of all freight at the port was imported, and 22 percent was exported.

Figure 3.18: Trade Tonnage at the Port of Gulfport, 2017



Source: USACE Navigation Data Center, Waterborne Commerce Statistics Center

At the Port of Gulfport, the top five origins for imported freight accounted for 83 percent of all imported tonnage, and the top five destinations for exported freight accounted for all exported tonnage. The top five origins and destinations, in 2017, were:

Origins (Imports)

1. Honduras
2. Guatemala
3. Mozambique
4. Mexico
5. Australia

Destinations (Exports)

1. Honduras
2. Guatemala
3. Peru
4. Colombia
5. Japan

Table 3.9 shows the top ten (10) commodities at the Port of Gulfport in 2017. The top commodity is non-ferrous ores n.e.c. The top ten (10) commodities account for 95 percent of all tonnage at the Port of Gulfport. By movement, approximately 78 percent of tonnage flowed inbound, while 22 percent flowed outbound. There were no Intraport tons reported at the Port of Gulfport in 2017.

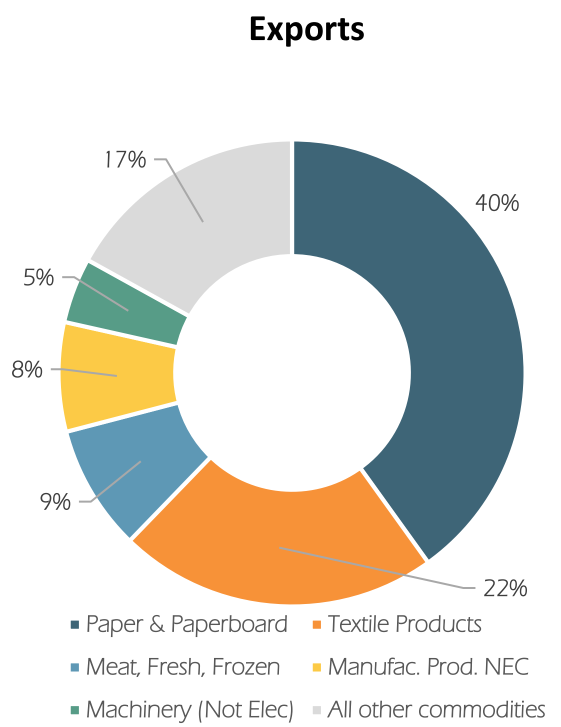
Table 3.9: Top Ten Commodities at Port of Gulfport, 2017

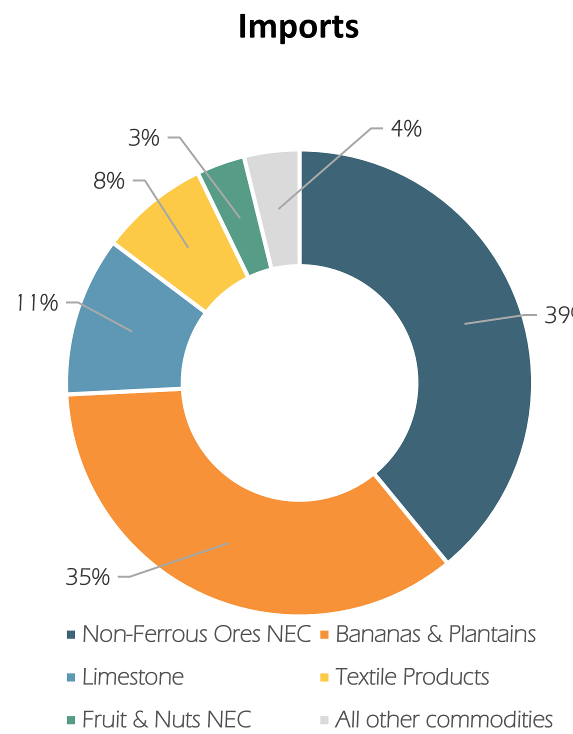
Commodity Group	Inbound Tons	Outbound Tons	Total Tons	Percent of Total
Non-Ferrous Ores NEC	696,145	6,836	702,981	30%
Bananas & Plantains	626,579	803	627,382	27%
Textile Products	134,687	112,907	247,594	11%
Paper & Paperboard	33	204,326	204,359	9%
Limestone	196,840	0	196,840	9%
Fruit & Nuts NEC	59,660	35	59,695	3%
Manufac. Prod. NEC	16,380	38,584	54,964	2%
Meat, Fresh, Frozen	208	44,373	44,581	2%
Unknown or NEC	4,841	22,159	27,000	1%
Machinery (Not Elec)	132	23,069	23,201	1%
All Others	56,411	67,050	123,461	5%
Total	1,791,916	520,142	2,312,058	100%

Source: USACE Navigation Data Center, Waterborne Commerce Statistics Center

Figure 3.19 notes the top five (5) import and export commodities at the Port of Gulfport. The top export commodity is paper & paperboard, while the top import is non-ferrous ores n.e.c. The top five (5) exported commodities account for 83 percent of all tonnage. The top five (5) imported commodities account for 96 percent of all tonnage.

Figure 3.19: Top Commodities for Exports and Imports, Port of Gulfport, 2017



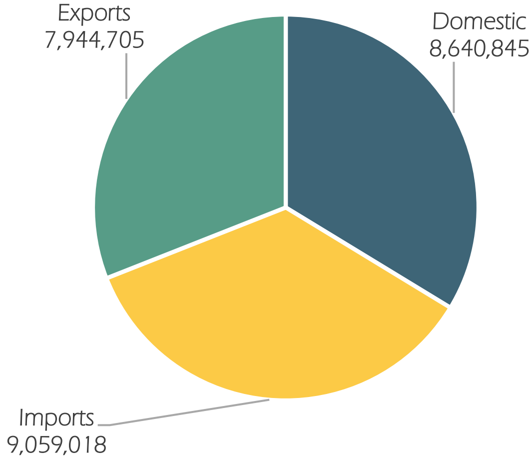


Source: USACE Navigation Data Center, Waterborne Commerce Statistics Center

Port of Pascagoula

Figure 3.20 shows the tonnage at the Port of Pascagoula by domestic and international trade. In 2017, the Port of Pascagoula handled approximately 25.6 million tons of freight. Most of the freight handled was international (exports and imports), accounting for 66 percent of all freight handled. Approximately 35 percent of all freight at the port was imported, and 31 percent was exported.

Figure 3.20: Trade Tonnage at the Port of Pascagoula, 2017



Source: USACE Navigation Data Center, Waterborne Commerce Statistics Center

At the Port of Pascagoula, the top five (5) origins for imported freight accounted for 70 percent of all imported tonnage, and the top five (5) destinations for exported freight accounted for 63 percent of all exported tonnage. The top five (5) origins and destinations, in 2017, were:

Origins (Imports)

1. Venezuela
2. Brazil
3. Colombia
4. Netherlands
5. Russia

Destinations (Exports)

1. Panama
2. Mexico
3. Honduras
4. Guatemala
5. Spain

Table 3.10 shows the top ten (10) commodities at the Port of Pascagoula in 2017. The top commodity is non-ferrous ores n.e.c. The top ten (10) commodities account for 95 percent of all tonnage at the Port of Pascagoula. By movement, approximately 41 percent of tonnage flowed inbound, while 59 percent flowed outbound. A small volume, less than one (1) percent was Intraport tonnage.

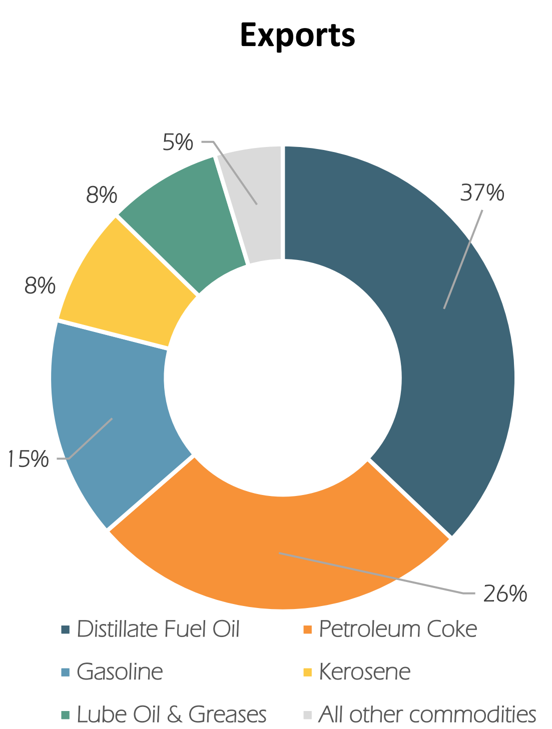
Table 3.10: Top Ten Commodities at Port of Pascagoula, 2017

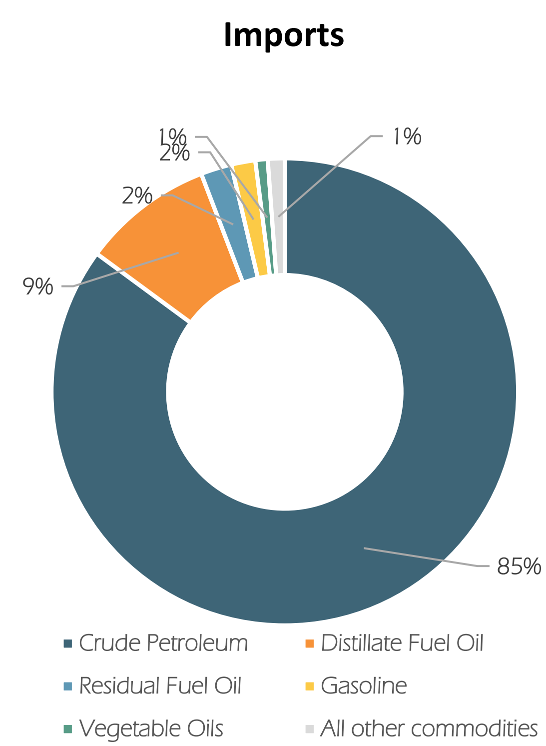
Commodity Group	Inbound Tons	Outbound Tons	Intraport Tons	Total Tons	Percent of Total
Crude Petroleum	8,105,453	35,694	0	8,141,147	32%
Distillate Fuel Oil	1,296,341	3,919,928	3,697	5,219,966	20%
Gasoline	202,142	4,025,635	0	4,227,777	16%
Kerosene	1,880	2,356,696	0	2,358,576	9%
Petroleum Coke	0	2,110,374	0	2,110,374	8%
Lube Oil & Greases	5	1,082,214	0	1,082,219	4%
Residual Fuel Oil	226,731	192,206	51,218	470,155	2%
Benzene & Toluene	14,137	316,108	0	330,245	1%
Sulphur (Liquid)	0	271,490	0	271,490	1%
Acyclic Hydrocarbons	12,501	214,463	0	226,964	1%
All Others	572,733	632,922	0	1,205,655	5%
Total	10,431,923	15,157,730	54,915	25,644,568	100%

Source: USACE Navigation Data Center, Waterborne Commerce Statistics Center

Figure 3.21 notes the top five (5) import and export commodities at the Port of Pascagoula. The top export commodity is distillate fuel oil, while the top import is crude petroleum. The top five (5) exported commodities account for 95 percent of all tonnage. The top five (5) imported commodities account for 99 percent of all tonnage.

Figure 3.21: Top Commodities for Exports and Imports, Port of Pascagoula, 2017





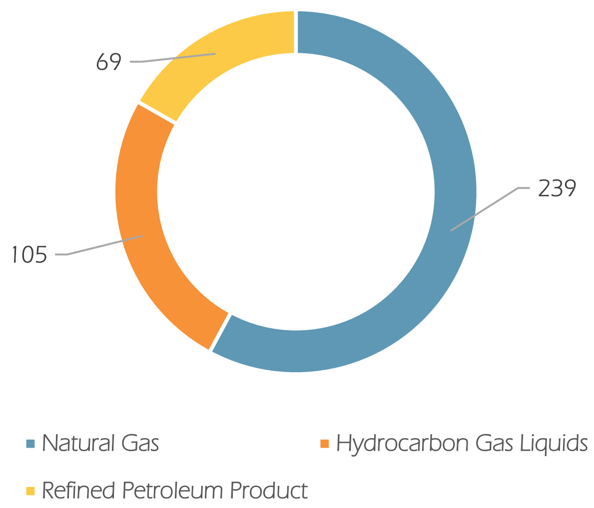
Source: USACE Navigation Data Center, Waterborne Commerce Statistics Center

3.6 Pipelines

Inventory

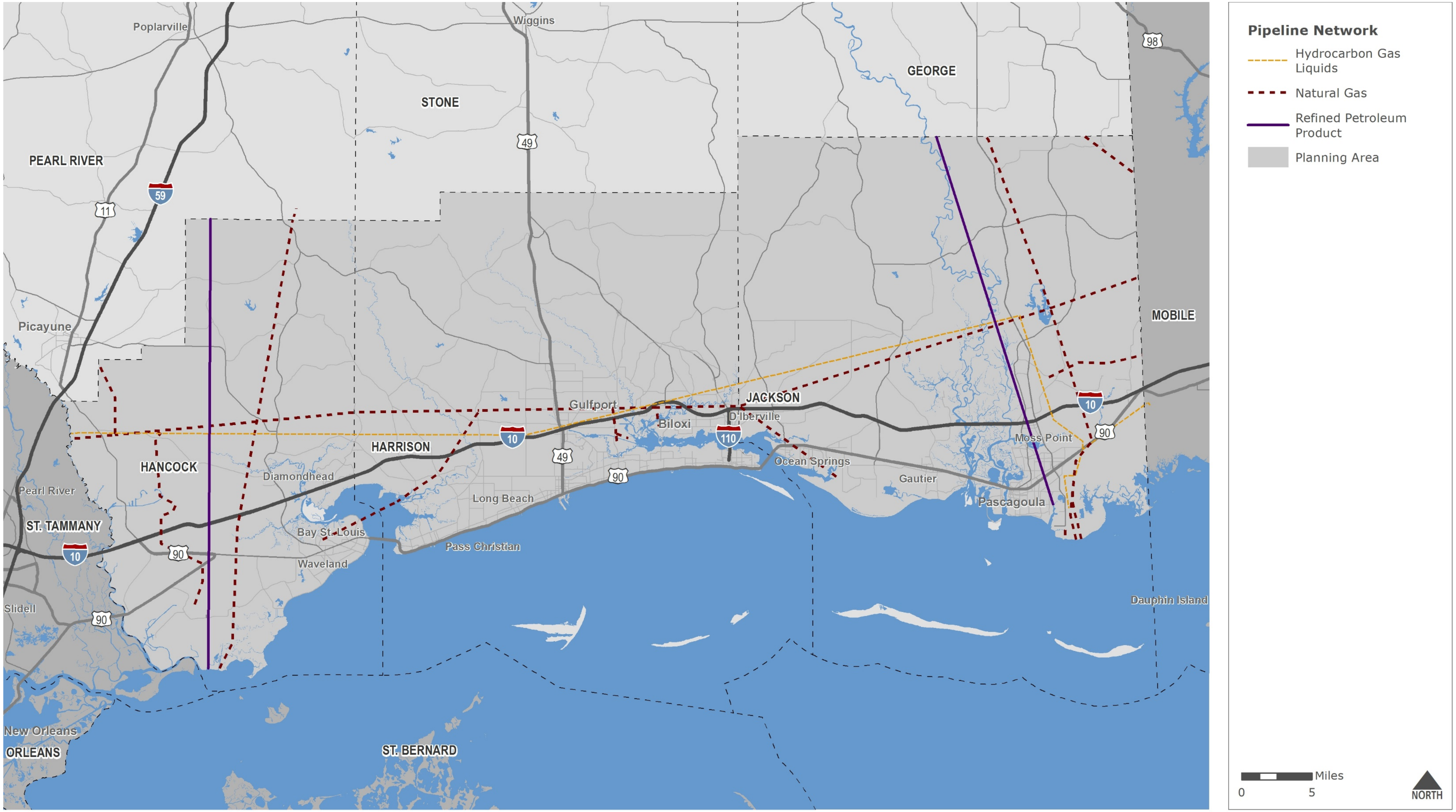
The MPA's pipeline network consists of approximately 413 miles of natural gas, hydrocarbon gas liquids, and refined petroleum products pipelines as of 2018. By length, most pipelines in the MPA are natural gas. Figure 3.22 details the pipeline length (in miles) by commodity carried. Figure 3.22 shows the MPA's pipeline network.

Figure 3.22: Pipeline Commodity by Length, 2018



Source: Energy Information Administration

Figure 3.23: MPO Pipeline Network, 2018



Data Sources: Energy Information Administration

Disclaimer: This map is for planning purposes only.

Commodity Flows

According to the FAF, the pipeline mode ranked second for freight tonnage and value in the MPA. By tonnage, pipelines carry nearly 43 percent of all freight in the MPA. However, the pipeline's value share was only 15 percent.

The top five (5) origins for pipeline freight account for 97 percent by tonnage and by value in the MPA. Three (3) of the top five (5) origins are located on the Gulf Coast. The top five (5) origins by tonnage and value are:

Tonnage

1. "Rest of Louisiana"
2. "Rest of Arkansas"
3. Lake Charles, Louisiana
4. New Orleans, LA-MS (LA Part)
5. Houston, Texas

Value

1. "Rest of Louisiana"
2. Lake Charles, Louisiana
3. New Orleans, LA-MS (LA Part)
4. "Rest of Arkansas"
5. Houston, Texas

NOTE: "Rest of Louisiana" and "Rest of Arkansas" refer to the areas of those states that are outside the FAF 4 designated metropolitan areas.

The top five (5) destinations for pipeline freight account for 87 percent by tonnage and 86 percent by value in the MPA. The top five (5) destinations by tonnage and by value are:

Tonnage

1. "Rest of Alabama"
2. "Rest of Tennessee"
3. Mobile, Alabama
4. Memphis, Tennessee (TN Part)
5. Nashville, Tennessee

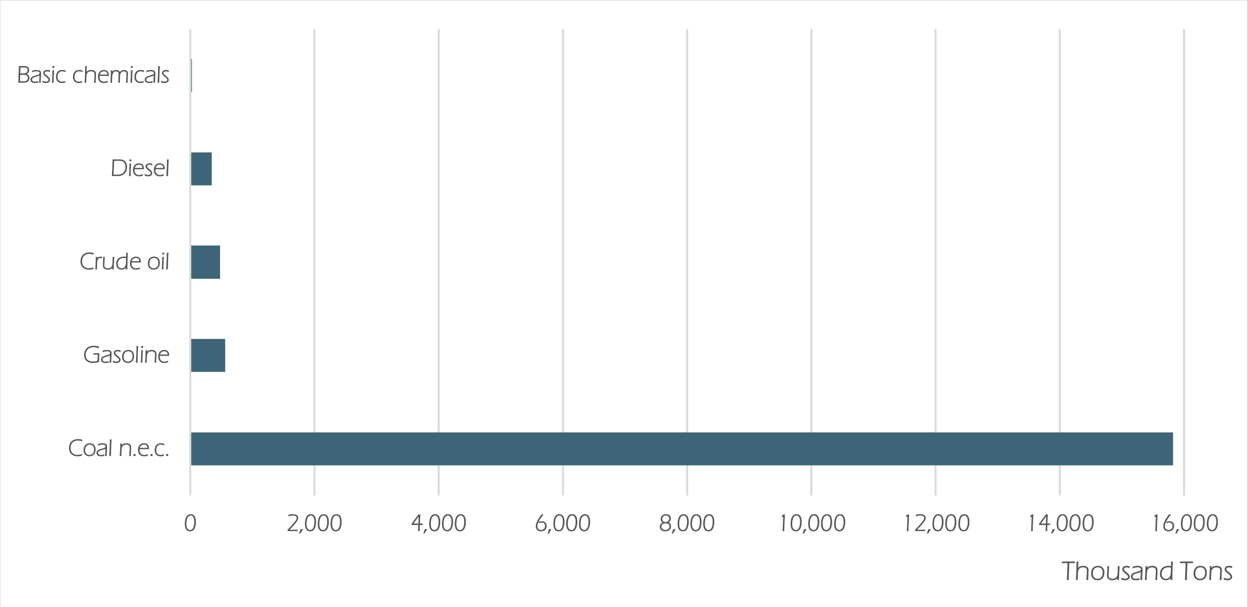
Value

1. "Rest of Alabama"
2. "Rest of Tennessee"
3. Mobile, Alabama
4. Memphis, Tennessee (TN Part)
5. Nashville, Tennessee

NOTE: "Rest of Alabama" and "Rest of Tennessee " refer to the areas of those states that are outside the FAF 4 designated metropolitan areas.

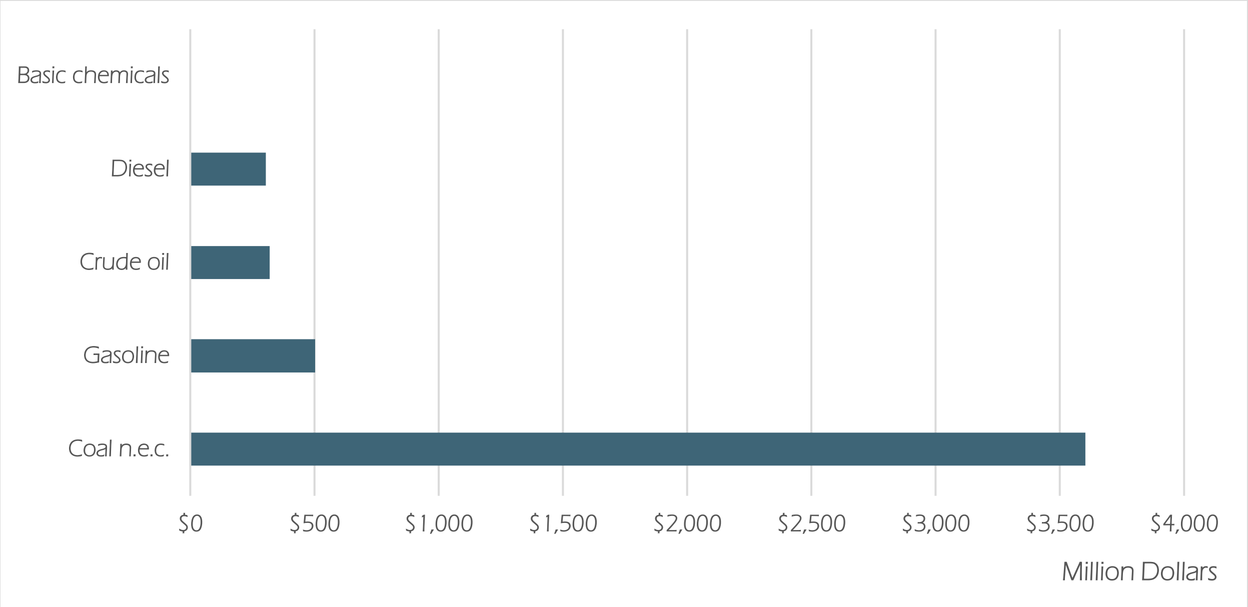
Figure 3.24 and Figure 3.25 show the five (5) commodities carried by pipeline within the MPA by weight and by value, respectively. By tonnage and by value, coal n.e.c. is the top commodity, accounting for 92 percent of the total tonnage and 76 percent of freight value carried by pipeline.

Figure 3.24: Pipeline Commodities by Tonnage, 2016



Source: Freight Analysis Framework version 4

Figure 3.25: Pipeline Commodities by Value, 2016



Source: Freight Analysis Framework version 4

4.0 Bicycle and Pedestrian

4.1 Introduction

Walking and bicycling are a key transportation option, providing an affordable transportation alternative to many Americans. While Americans have always walked and ridden bikes, creating the infrastructure for, and ensuring there are safe, accessible places for walking and cycling has not always been a priority. The last two to three decades have seen communities make purposeful efforts to plan and install high-quality pedestrian and bicycle facilities. There are four reasons that cities, counties, and states are now focusing on this type of infrastructure: safety, equity, health, and economics.

Safety Benefits

According to the Pedestrian and Bicycle Information Center, a joint effort of the Federal Highway Administration (FHWA) and the National Highway Traffic Safety Administration (NHTSA), pedestrian and bicyclist fatalities from crashes with motor vehicles increased by 32 percent in the ten-year period between 2008 and 2017.[6] During the same time period traffic fatalities were decreasing.

While safe travel for pedestrians and bicyclists is problem, it is also important to note that data on crashes involving pedestrians and bicyclists is incomplete, inconsistent, and that there is no official record of injuries such as how fatalities are tracked by FARS. When the lack of good data is combined with the fact that many of these types of crashes are under-reported, the problem of pedestrian and bicycle safety is substantial.

Many communities are moving to incorporate Vision Zero policies, a multi-pronged approach to changing the built environment, enforcement policies, and influencing behavior to reduce and eventually eliminate traffic deaths and major injuries. The policies focus on education, enforcement, engineering, and emergency response.

Equity Benefits

Designing communities and transportation systems for cars excludes citizens that do not have regular access to personal vehicles. Vulnerable populations, such as low-income households, minorities, children, persons with disabilities, and older adults typically own fewer vehicles and have longer commutes. Transportation options such as walking and biking, are sometimes the only available and affordable transportation choice. Without access, essential services and employment are often out of reach for a significant portion of our nation.

Health Benefits

It is well known that the number of overweight and obese Americans has reached epidemic proportions. The National Center for Health Statistics documents that two-thirds of adults and one-third of children

[6] Pedestrian and Bicycle Information Center: http://www.pedbikeinfo.org/factsfigures/facts_safety.cfm

are overweight or obese.[7] The downstream effects of this epidemic are reflected in the record numbers of chronic illnesses of diabetes and heart disease. These chronic illnesses dramatically affect both the cost of health care and quality of life.

Along with prevention and medical treatment, regular physical activity is a critical part of the nation's recovery from the obesity epidemic. Making physical activity easy and safe plays a key role in successful strategies to fight obesity.

Economic Benefits

Surveys and research around the country are documenting the role that walkable and bicycle friendly communities play in the economic prosperity of a place. Research conducted by the National Association of Realtors and American Strategies show that in 2017, six (6) in ten (10) respondents said that they would pay more to live in a walkable community.[8]

4.2 Existing Bicycle and Pedestrian Facilities

Bicycle and Pedestrian Facility Inventory

An inventory of existing bicycle and pedestrian facilities in the MPA is shown in Figure 4.1.

Sidewalk coverage is best in more established areas such as the downtowns of Gulfport, Biloxi, Pascagoula, and Bay St. Louis. Other areas with good sidewalk coverage are around newer developments that installed sidewalks, mostly around Gulfport, Biloxi, and Ocean Springs.

Bicycle facilities are much less commonplace. Existing multi-use paths are mostly along beaches and major bridges. Downtown Biloxi has several bike lanes and the Cowan/Lorraine bike lane in Gulfport stretches for several miles. While the beachfront boardwalk in Harrison County is not officially a bicycle facility, many bicyclists do use it.

It is important to note that this inventory does not Include information on the current condition or quality of these facilities. Aside from maintenance issues, many existing facilities may not meet best practices in design standards.

Bike-Sharing and Scooter-Sharing

In recent years shared mobility options like bike-sharing and scooter-sharing have become commonplace in urban areas throughout the country. These transportation services are provided publicly, privately, or through public-private partnerships and can be either dock-based or dockless. They can also be powered manually or electric.

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[7] National Center for Health Statistics:
https://www.cdc.gov/nchs/data/hestat/obesity_adult_13_14/obesity_adult_13_14.pdf
https://www.cdc.gov/nchs/data/hestat/obesity_child_13_14/obesity_child_13_14.pdf

[8] National Association of Realtors: https://www.nar.realtor/sites/default/files/documents/2017%20Topline%20Results.pdf

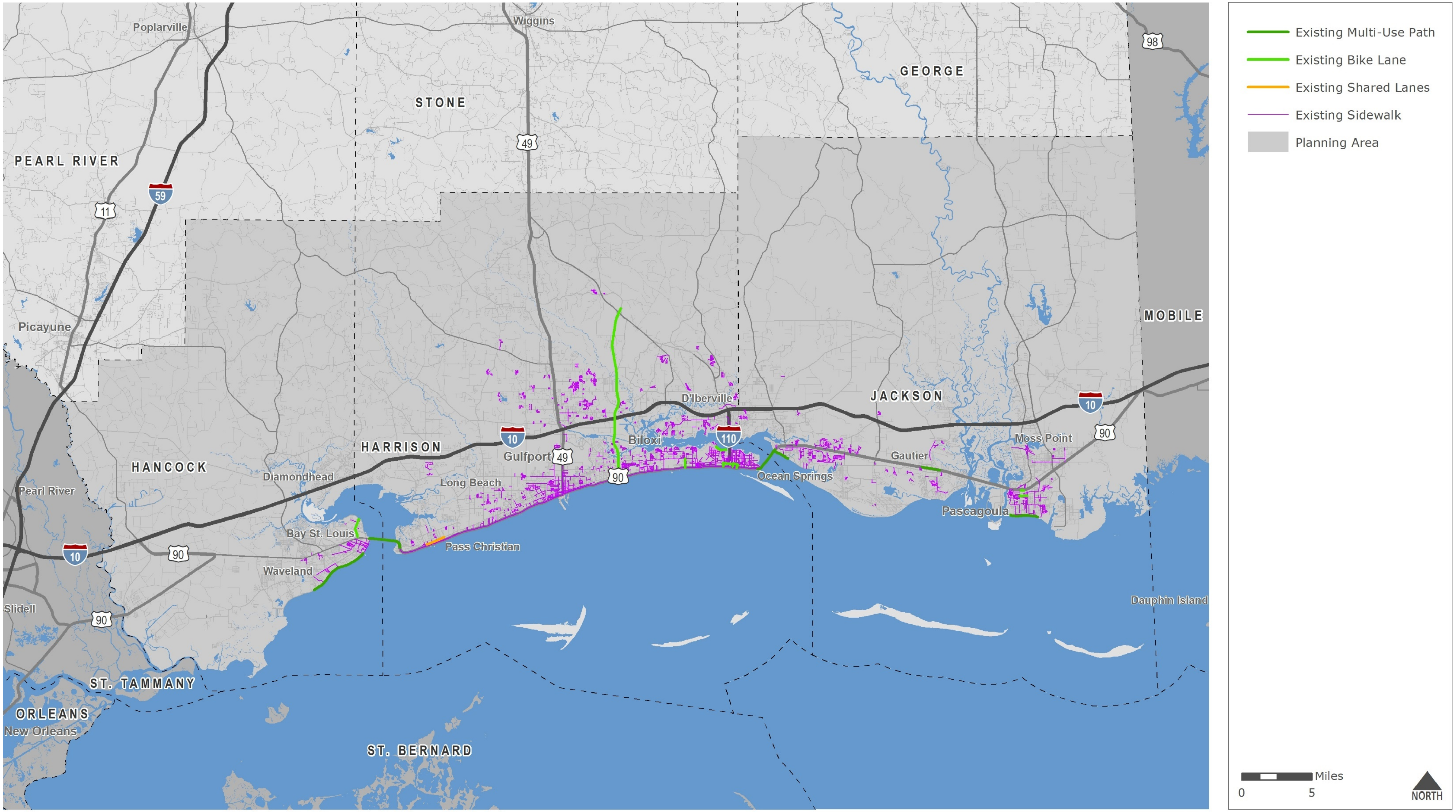
Today, the markets for these shared mobility options are mostly in urban centers or in major activity centers like universities. Because these services are usually available to users by the minute or hour, they are typically used for relatively short, one-way trips.

The City of Biloxi offers the only bike-sharing services in the MPA. This system is provided through the City of Biloxi in partnership with the national bike-sharing company, Zagster. Currently, the city has two bike sharing stations its Downtown area - one at the Biloxi Visitors Center and the other at the MGM Park.

There are currently no scooter-sharing services in the MPA.

Due to the rapid expansion dockless bike-share and scooter-share services, primarily electric scooters, and a lack of associated Infrastructure Improvements (e.g. bike facilities or scooter lanes), there have been many reported conflicts with drivers and pedestrians. Many cities have banned these services and others have begun introducing regulations and improving Infrastructure to mitigate conflicts.

Figure 4.1: Existing Bicycle and Pedestrian Facilities, 2018



Data Sources: MPO Staff; Neel-Schaffer

Disclaimer: This map is for planning purposes only.

4.3 Existing Traffic and Usage Patterns

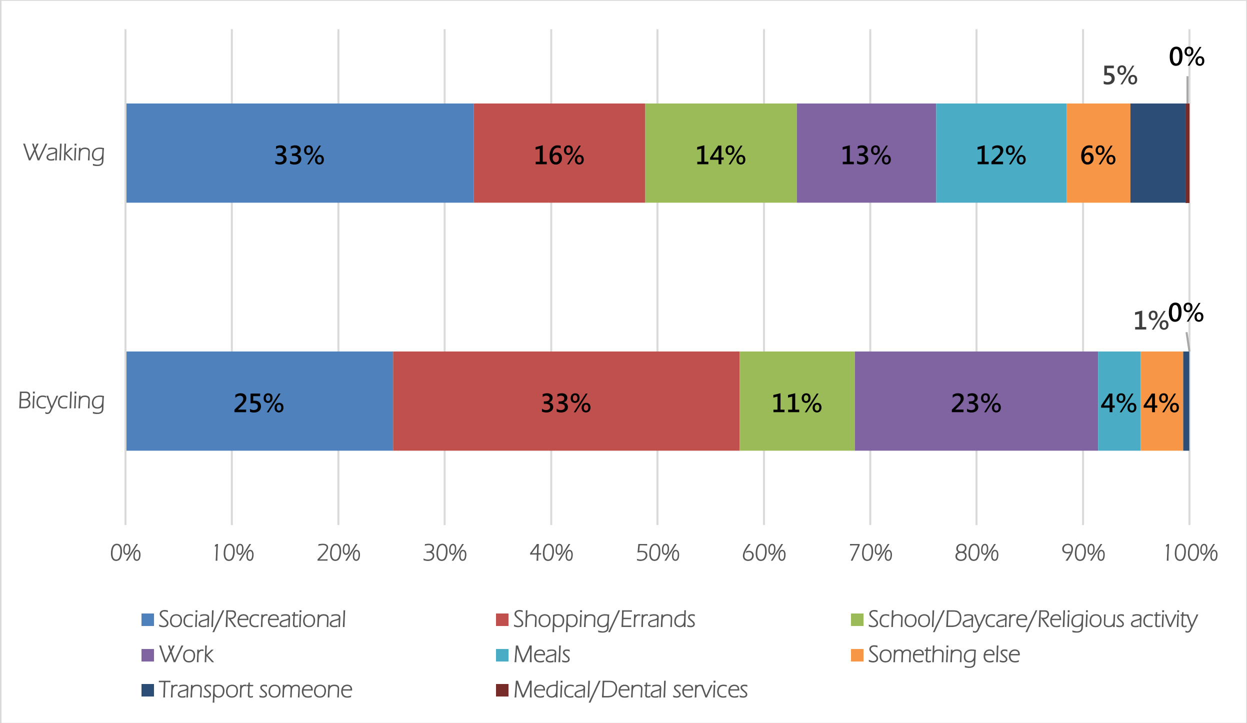
The 2017 National Household Travel Survey (NHTS) estimates that, each day, about sixteen (16) percent of the U.S. population make a trip by walking and three (3) percent do so by biking. Still, there is great variation from area to area and person to person. Most notably, people in rural households were much more dependent on driving and people in urban households were more likely to walk or bike.

Walking and Biking Trip Purposes

The primary reasons for walking and biking in mid-size metro areas are for social and recreational purposes and for shopping and errands. Work and school-related purposes are also important. While more people walk to work overall, commuting to work is a more popular reason for biking than it is for biking.

It is important to note that these travel patterns are a national average and that there is great variation within metropolitan areas and between metropolitan areas. Work-related and utilitarian trips by walking and biking will be more common in areas where walking and biking is more comfortable and in areas where access to cars is more limited.

Figure 4.2: Walking and Bicycling Trip Purposes in Mid-Size Metro Areas



Note: Mid-Size Metro Area = 250,000-500,000 residents
Source: National Household Travel Survey, 2017

Commuting to Work by Walking and Biking

While there is no local household travel survey about non-work trips, there are estimates of which modes workers in the region use to commute to work from the Census Bureau's American Community Survey.

This information, summarized in Table 4.1, shows that about four (4) percent of workers residing In the Gulfport Urbanized Area commute to work by walking or biking and only about one (1) percent of workers in the Pascagoula Urbanized Area do so. This puts the Gulfport area on par with the national average and the Pascagoula area below the national average and about the same as the state average.

However, Figure 4.4 shows that there is great variation within the region. Most notably, about 80 percent of workers residing at the Keesler Air Force Base (2,500 people) commute to work by walking or biking and about 40 percent of workers residing at the Naval Construction Battalion Center (300 people) do the same. Outside of these areas though, commuting by walking and biking is much less common.

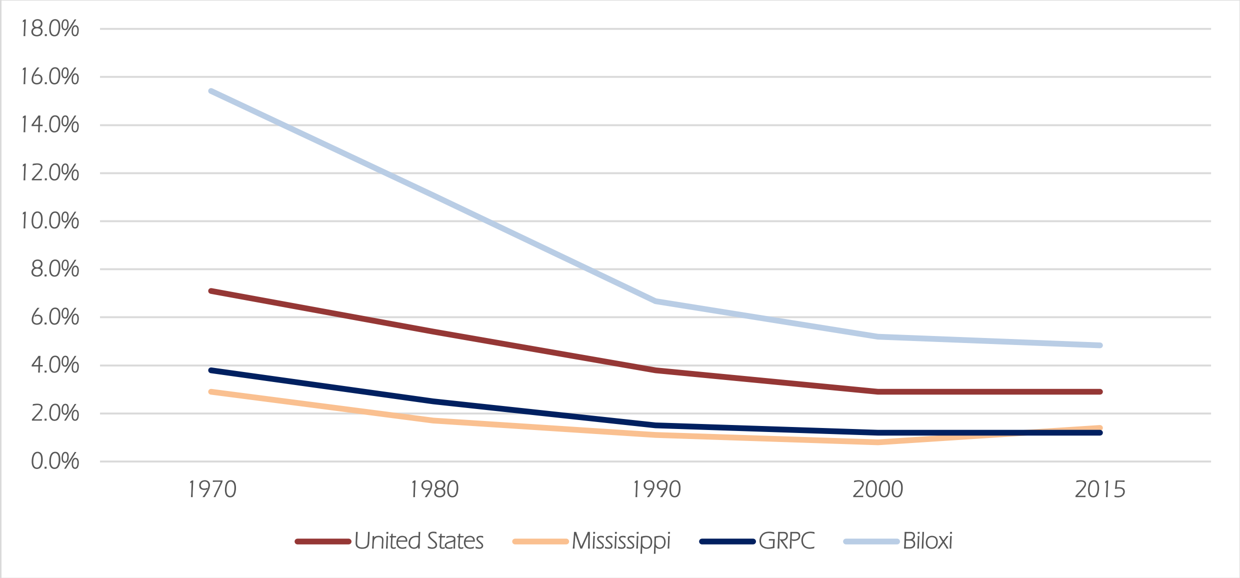
Figure 4.3 shows the decrease from 1970 to 2015 in the percent of people who walk to work. Mississippi and the GRPC are both below the 2015 national average of 2.9%. Since 2000 the percent of people walking to work nationally has stayed constant, increased across Mississippi, and slightly decreased in the GRPC. The GRPC percentage is an average of the percent of people walking to work in Bay St. Louis, Biloxi, D'Iberville, Gulfport, Moss Point, Ocean Springs, Pascagoula, and Pass Christian. These municipalities shared a similar percentage of walking commuters except for Biloxi, which has a significantly higher percentage of walkers.

Table 4.1: Means of Transportation to Work in Urbanized Areas

Mode	National Average	State Average	Gulfport	Pascagoula
Drove Alone	78.4%	86.6%	84.8%	89.4%
Carpooled	9.5%	9.3%	9.1%	7.4%
Rode Transit	7.1%	0.9%	0.9%	0.3%
Biked	0.7%	0.2%	0.3%	0.1%
Walked	3.0%	1.6%	4.0%	1.1%
Other	1.3%	1.4%	1.0%	1.8%

Source: Census Bureau, 2017 American Community Survey, 5-year estimates

Figure 4.3: Percentage of People Walking to Work, 1970-2015



Source: National Historic Geographic Information Systems; ACS 2013-2017 5-Yr Estimates; GRPC is an average of Bay St. Louis, Biloxi, D'Iberville, Gulfport, Moss Point, Ocean Springs, Pascagoula, and Pass Christian. Biloxi is an outlier compared to all the other cities and so is also shown separately.

Bicycle and Pedestrian Traffic Counts

Pedestrian traffic counts were collected at targeted locations throughout the region to better understand existing pedestrian volumes and to put pedestrian crash data in context. Locations were selected to be geographically diverse and to cover pedestrian crash hotspots and areas with high pedestrian demand.

Pedestrian traffic counts were collected at targeted locations throughout the region to better understand existing pedestrian and bicyclist volumes and to put crash data in context. Locations were selected to be geographically diverse and to cover locations with high pedestrian crash rates. Counts were collected between 6 A.M. and 6 P.M. on clear, dry Tuesdays and Thursdays between October 24 and November 20, 2019. Counters were located at all four corners of each intersection.

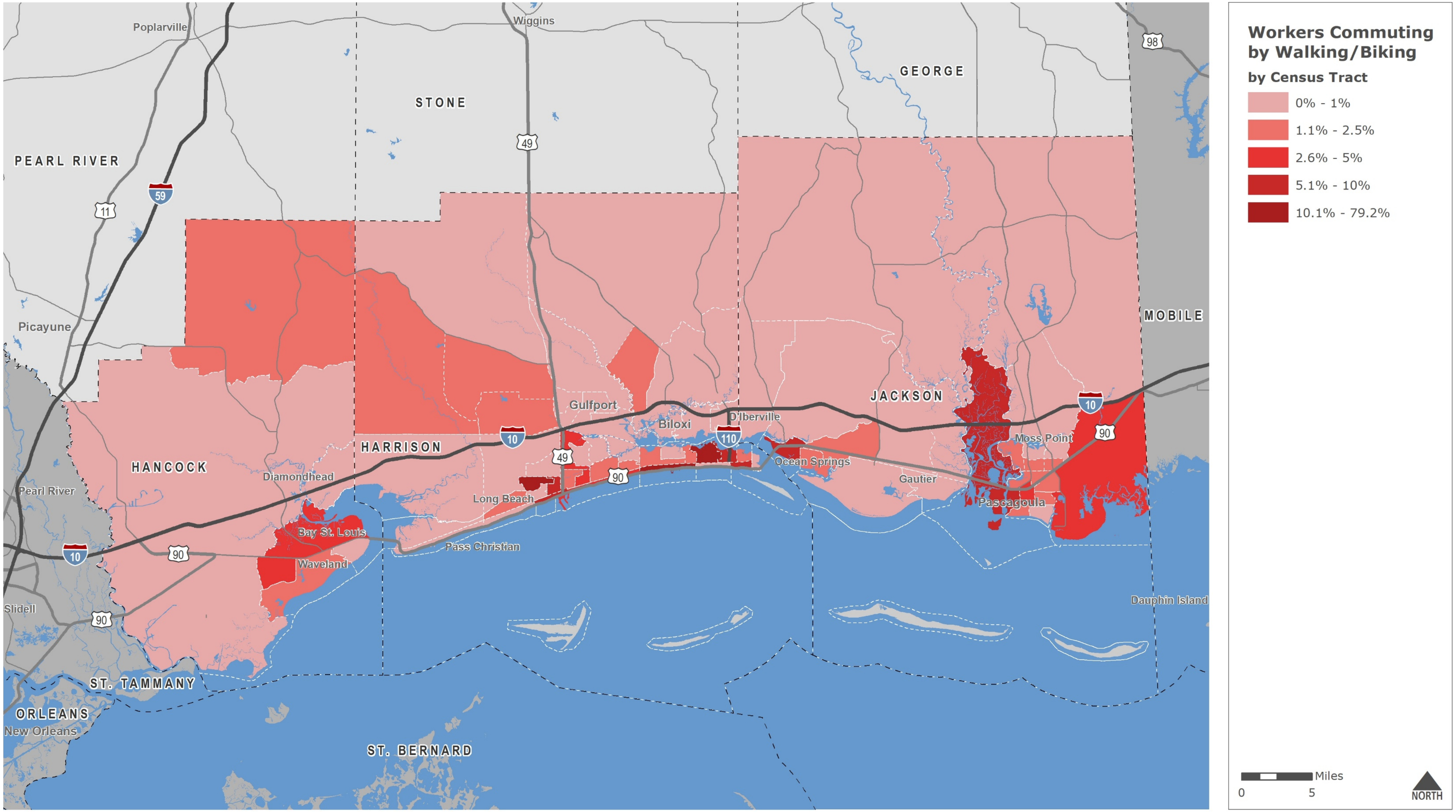
Table 4.2 shows the twenty-three locations and their pedestrian and bicyclist counts for one twelve-hour period. Figure 4.5 maps these locations; the numbers on the map correspond to the label numbers in Table 4.2. The popularity of time of day varies for each intersection, but most intersections had their highest volumes in the morning after 9am and in the early afternoon. Two locations In Biloxi- US-90 at G E Ohr Street and US-90 at Reynoir Street- experienced significantly more pedestrian counts than any other locations. Other frequently trafficked locations occurred In Gulfport and Pascagoula. The intersection with the heaviest bicycle traffic is at MLK Blvd & Main Street.

Table 4.2: Bicycle and Pedestrian Counts

Map ID	Intersection	Pedestrian Count	Bicycle Count	Total Count
1	US 90 (Denny Ave) & Chicot Street	144	45	189
2	Veterans Blvd & Shortcut Road	40	27	67
3	US 90 & Veterans Blvd	24	22	46
4	MLK Blvd & Main Street	218	59	277
5	US 90 & Ladnier Road	21	12	33
6	Ocean Springs Road & US 90	35	10	45
7	US 90 & Main Street	350	41	391
8	US 90 & G E Ohr Street	1082	15	1097
9	US 90 & Reynoir Street	1115	17	1132
10	US 90 & Callavet Street	216	13	229
11	Hopkins Blvd/US 90 (US 90 & I-110)	130	6	136
12	Popps Ferry Road & Pass Road	97	24	121
13	Pass Road/Eisenhower Drive	35	20	55
14	Apartments/Rue Pala Fox/ Eisenhower Drive	171	30	201
15	Ct. Switzer Drive/Eisenhower Drive	245	42	287
16	Trailer Park/Pass Road	70	9	79
17	Lindh Road/Pass Road	34	13	47
18	US 49 & Crossroads Parkway	57	4	61
19	Pass Road & Courthouse Rd	78	10	88
20	US 49 & MLK Blvd	128	42	170
21	US 90 & Jeff Davis Avenue	54	13	67
22	US 90 & Dunbar Street	38	41	79
23	US 90 & Waveland Avenue	72	41	113

Note: Counts were only during from 6 AM to 6 PM.

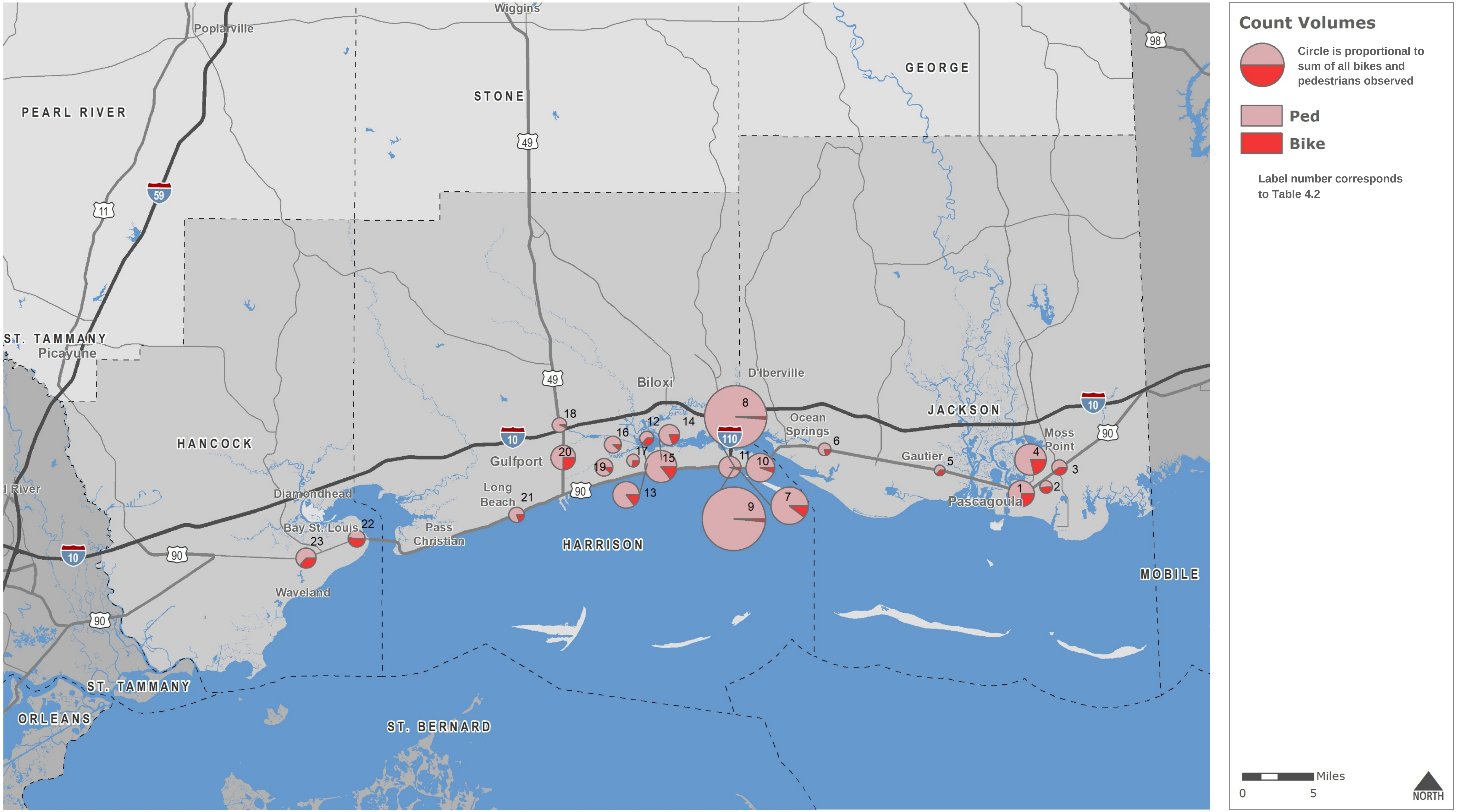
Figure 4.4: Commuting by Walking and Biking in the Region



Data Sources: Census Bureau, 2017 American Community Survey

Disclaimer: This map is for planning purposes only.

Figure 4.5: Bicycle and Pedestrian Count Traffic, 2019



Data Sources: Neel-Schaffer

Disclaimer: This map is for planning purposes only.

4.4 Regional Bicycle and Pedestrian Demand

Latent Demand Score Analysis

In order to better understand the existing potential demand for pedestrian and bicycle trips, a latent demand score analysis was conducted that attempts to illustrate potential demand based on characteristics of the built environment, location of major attractors, and demographics.

The demand analysis is the same for pedestrians and bicyclists. The mapping exercise used fine-grained information to assess an area's potential demand for pedestrian or bicycle trips based on a 0-100 scale. Points were awarded based on the factors summarized in Table 4.3.

Table 4.3: Latent Bike/Ped Demand Score Criteria

Factor	Measure	Maximum Points
Land Use	Population, jobs, and students per acre	30
	Within half mile of popular destination(s)[1]	15
Demographic	Senior (65+) and youth (<15) population per acre	10
	Households with no vehicle available or on-campus housing unit[2]	25
Travel Environment	Intersections per square mile[3]	20
	Total Possible Points	**100**

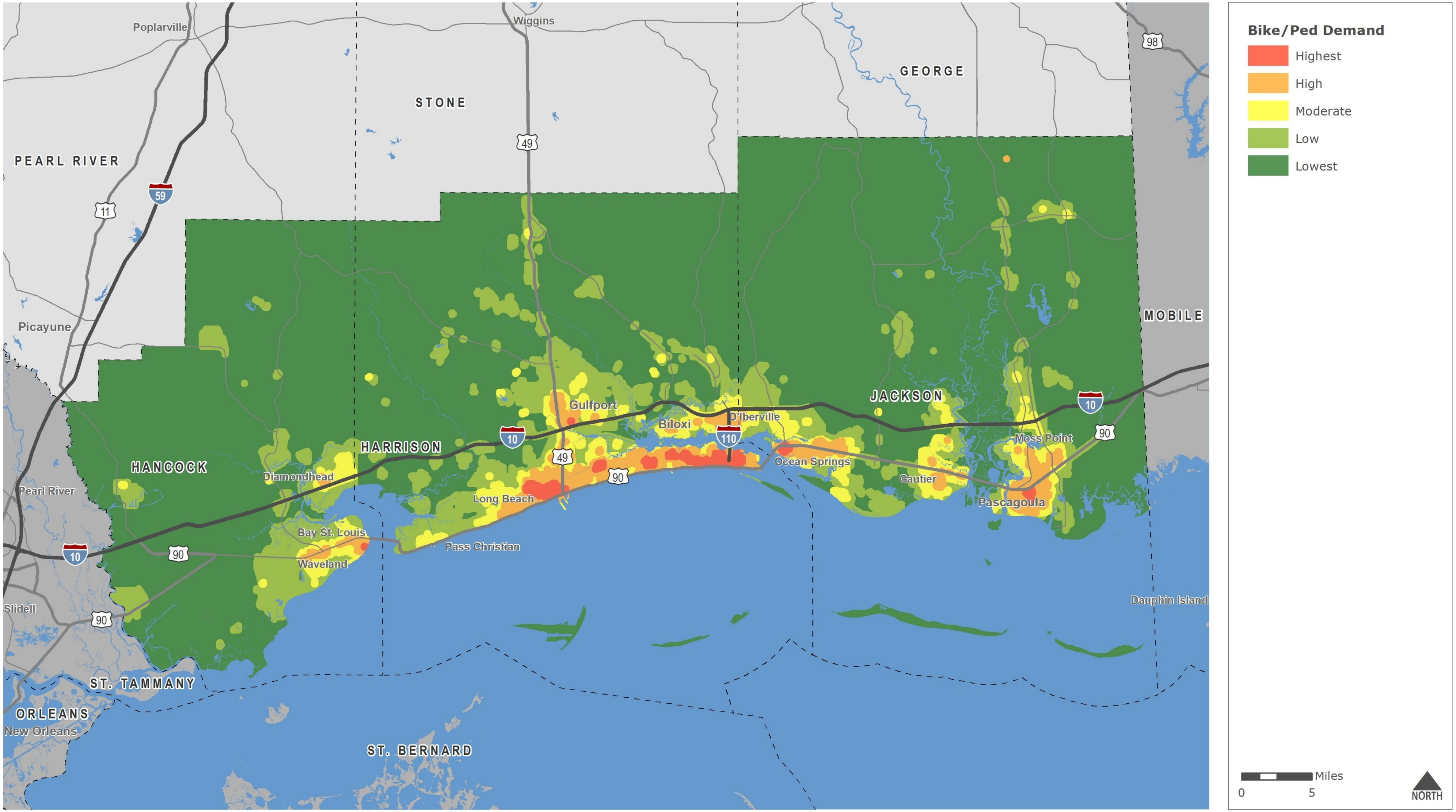
Notes: 1Popular destinations are parks, major recreation centers, beaches, schools, libraries, hospitals, grocery stores, pharmacies, convenience stores, eating/drinking places, casinos, hotels/motels, and military bases. Universities and military bases were weighted 10x, other schools, hospitals, casinos, and beaches were weighted 5x and grocery stores, pharmacies, convenience stores, hotels/motels, and parks/rec centers were weighted 2x.
2On-campus housing units calculated by dividing group quarters dorm population by 2.2.
3Intersections with at least 4 segments are weighted 2x.

Findings

Figure 4.6 shows the results of the latent demand score analysis. Again, this exercise reflects relative potential demand, not absolute demand. Simply put, it shows which areas are more likely to have high or low demand relative to all other areas within MPA. It does not attempt to quantify the actual number of bicycle or pedestrian trips occurring in these areas.

The analysis indicates that greatest potential bicycle and pedestrian demand is between Downtown Gulfport and Downtown Biloxi. There are also smaller areas of high demand in the downtowns of Bay St. Louis and Ocean Springs and in areas with multi-family housing in Pascagoula, Gulfport, and D'Iberville. Demand decreases as distance from the urban cores increases.

Figure 4.6: Bicycle and Pedestrian Demand in the Region, 2018



Data Sources: Census Bureau; InfoUSA; MPO Staff; Neel-Schaffer

Disclaimer: This map is for planning purposes only.

4.5 Bicycle and Pedestrian Safety

Collision data can help identify safety issues in the planning area. However, vehicular collisions with pedestrians and bicycles are typically under-reported. Research indicates pedestrian collisions may be underreported to police by as much as 55% and bicycle collisions underreporting is thought to be even higher.[9]

There are three general categories of issues that contribute to traffic crashes involving bicyclists and pedestrians:

- motorist behavior,
- non-motorist behavior, and
- infrastructure.

Motorist behaviors include speeding, distraction, lack of traffic law awareness, non-compliance with traffic laws, and alcohol or drug impairment.

Non-motorist (i.e., pedestrian and bicyclist) behaviors include lack of traffic law awareness, non-compliance with traffic laws, poor conspicuity, and alcohol or other impairment.

Infrastructure issues include inadequate separation between motorists and non-motorists, lighting, and signage or crosswalks.

Understanding the scope of the impact of many these issues can be difficult to quantify. There is some data available. For each reported collision, data is collected for a range of factors. The lighting conditions, location of crash relative to intersections, and severity of injury are documented.

From these data collection efforts, national data indicates pedestrian safety can be improved through discouragement of mid-block crossings and implementation of lighting improvements. In 2017, pedestrians and bicyclists accounted for 18.2% of all traffic fatalities nationally. Of these fatalities 75% of pedestrian fatalities and 45% of bicycle fatalities occur in dark conditions. Crossing at non-intersections is also predictor in pedestrian and bicycle fatalities. A majority of pedestrian fatalities, 73%, occur at non-intersections and 58% of bicycle fatalities occur at non-intersections. This increases in urban settings where crossing density is higher.

[9] University of North Carolina Highway Research Center. http://www.pedbikeinfo.org/factsfigures/facts_safety.cfm

Bicycle Collision Data

Between 2014 and 2018, 244 bicycle collisions occurred in the MPA. Of the crashes involving bicycles, only 23 percent documented property damage only.

6

Bicycle fatalities from 2014 through 2018

The percentage of bicycle collisions at non-intersections matches national trends with 48 percent of bicycle collisions occurring at non-intersections. A larger than anticipated proportion of collisions, 73 percent, occurred in daylight conditions. Of the six (6) cyclist fatalities, four (4) occurred at non-intersections and two (2) occurred during dark-lit or dark-unlit conditions.

Pedestrian Collision Data

12

Pedestrian fatalities from 2014 through 2018

Between 2014 and 2018, 176 pedestrian collisions occurred. Of the crashes involving pedestrians, only 22 percent documented property damage only.

Pedestrian collision data in the MPA followed national trends. Seventy-six percent of the collisions involving pedestrians occurred at non-intersection locations. Of the pedestrian-involved collisions, 51 percent occurred in dark-lit or dark-unlit conditions.

4.6 Existing Plans and Initiatives

Proposed Regional Bike Route Network

During the development of the 2035 Long Range Transportation for the Gulf Coast, MPO staff sketched a conceptual network of bike routes across the entire MPA based on existing plans, community input, and connectivity benefits. The proposed network was largely the result of synthesizing recommendations from local government comprehensive plans, the Hancock County Greenways Plan, the Federal Emergency Management Agency (FEMA) long-term recovery plans, the 2030 Long Range Transportation Plan, and input from public meetings, local advocates and planners. Additional emphasis was placed on connectivity to existing routes, schools, parks, transit routes and commercial centers.

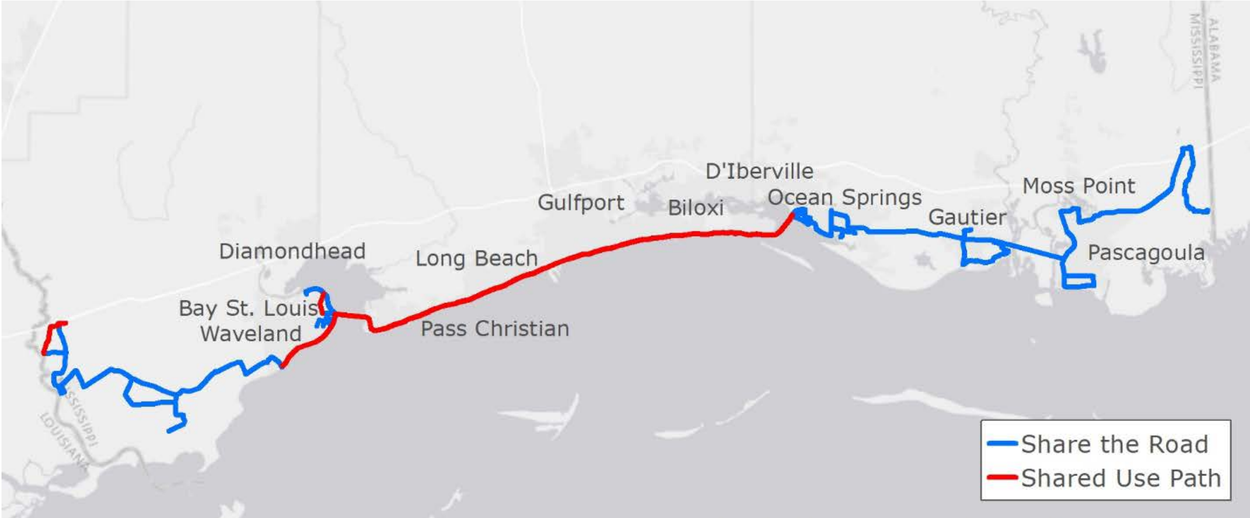
The proposed conceptual routes were not assigned specific types of bicycle treatments (e.g. multi-use path, bike lane, shared lane, etc.) and right-of-way costs and potential conflicts with utilities, drainage facilities, or wetlands were not identified. Additional planning would need to occur to advance these conceptual routes.

Mississippi Coastal Heritage Trail (Border to Border Trail)

The Mississippi Coastal Heritage Trail (MCHT), the Gulf Coast Heritage Trails Partnership's signature project, would connect Infinity Science Center's Possum Walk Trail in western Hancock County to the Grand Bay National Estuarine Research Reserve in eastern Jackson County, crossing through many Gulf Coast communities along the way.

The proposed route, also referred to as the "border to border" trail is Intended to improve regional mobility, accessibility, and public health for users of all ages and abilities.

Figure 4.7: Proposed Mississippi Coastal Heritage Trail



Source: Heritage Trails Partnership of the Mississippi Gulf Coast

Jackson County Bicycle, Pedestrian and Trails Master Plan

This recently adopted plan Identifies projects and strategies that will transform Jackson County Into a safe and comfortable place for people of all ages and abilities to walk, bike and paddle. It recommends bicycle, pedestrian and blueway network plans that cover the entire county, Including all municipalities and unincorporated areas.

The plan includes a set of policy and program strategies needed to effectively implement the plan, including design guidelines and a Complete Streets policy template.

5.0 Public Transit

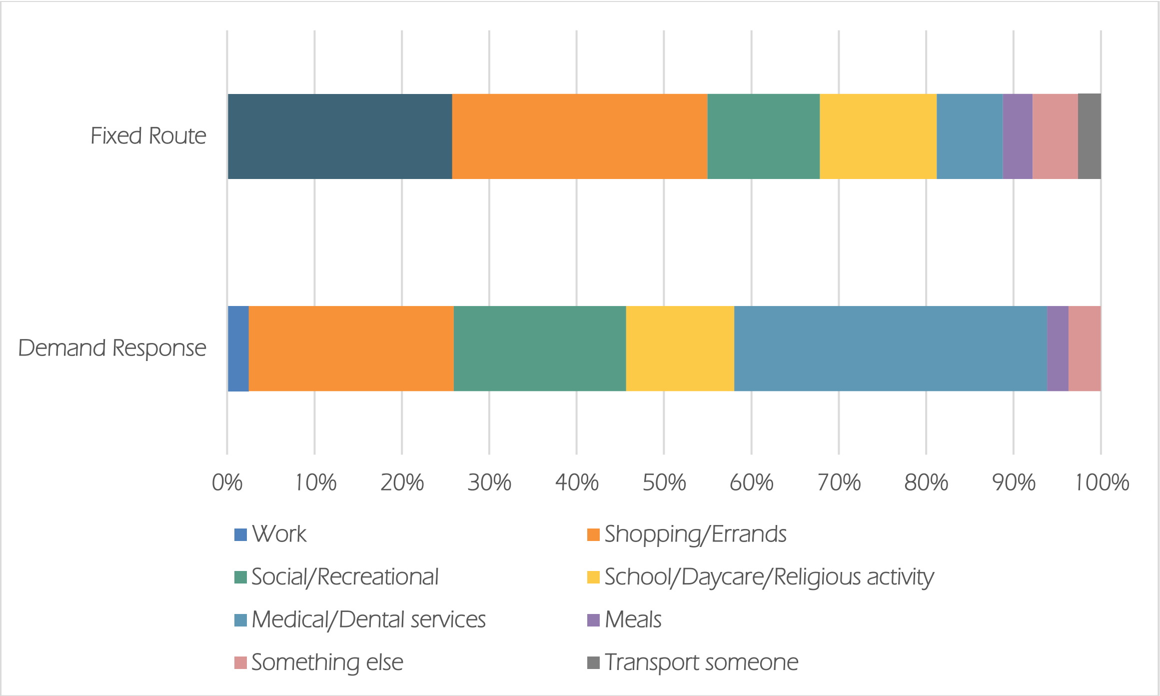
Public transit provides people with access to the places they need to go – work, school, grocery stores, medical facilities, and other destinations. For those that have no other choice, either because of economic or physical limitations, it is a lifeline service. For others, it reduces the burden of transportation costs and serves as a convenient alternative to driving.

Public transit also has significant benefits for the entire community as it can increase local business access to skilled workers, reduce congestion and emissions, reduce urban sprawl, and foster walkable communities.

Still, in small to mid-size metropolitan areas like the Gulf Coast, public transit accounts for a small percentage of all trips– less than 2 percent according to the 2017 National Household Travel Survey.

For those that do use public transit in these areas, trip purposes vary substantially. People riding fixed routes are primarily traveling for work or shopping/errands. People using demand response services are overwhelmingly traveling for medical, shopping/errands, or social/recreational purposes. However, trip purpose patterns will ultimately depend on the quality of public transit in the region.

Figure 5.1: Trip Purposes for Transit Riders in Small to Mid-Size Metro Areas



Note: Small to Mid-Size Metro Area = under 1,000,000 residents
Source: 2017 National Household Travel Survey

5.1 Coast Transit Authority

Services Provided

The Coast Transit Authority (CTA) provides fixed route bus service, paratransit service, and vanpooling services along the Gulf Coast. CTA is the primary public transit provider in the Gulf Coast MPA.

Fixed Route (Bus) Service

CTA operates eight bus routes along the Gulf Coast. All bus routes operate Monday through Saturday and some bus routes also operate on Sunday as well. Most buses run from 5:30 a.m. to 7:00 p.m. on weekdays and have slightly shorter spans of service on the weekends. However, each route's schedule varies.

Frequencies also vary by route, ranging from every 25 minutes to every 90 minutes. Routes are timed to make transferring easy and all routes connect with other routes at either the Gulfport Transit Center or Biloxi Transit Center. Figure 5.2 shows the current bus routes and major transit hubs provided by CTA and Table 5.1 shows the frequencies of these routes.

Bus fares are $1.50 for regular riders, $0.75 or free for seniors, $0.75 for people with disabilities, $0.75 for people with a Medicare Card, $1.25 for students, and free for children age 5 or under. There are also daily, 3-day, and 31-day pass options for riders.

CTA operates with a system of fare zones. CTA DOES NOT offer free or reduced transfers. Customers pay a fare when they board the vehicle and must pay an additional fare each time they cross a fare zone.

Table 5.1: CTA Bus Routes and Frequencies

Route	Monday-Friday	Saturday	Sunday
Beachcomber - Route 1	45 minutes	45 minutes	No service
Casino Hopper - Route 2	25 minutes	25 minutes	25 minutes
D'Iberville - Route 4	90 minutes	90 minutes	90 minutes
Ocean Springs - Route 7	90 minutes	90 minutes	No service
Gulfport Biloxi Pass Road - Route 34	45 minutes	45 minutes	45 minutes
Gulfport - Route 37	90 minutes	90 minutes	No service
Gulfport - Route 38 Red	90 minutes	90 minutes	No service
Gulfport - Route 38 Blue	90 minutes	90 minutes	No service

Source: Coast Transit Authority

Paratransit Service

CTA provides paratransit service throughout Hancock, Harrison, and Jackson counties. However, there are multiple paratransit programs and different eligibilities for each.

- **ADA Paratransit** - for certified people with limited mobility due to physical or mental disability who are traveling within 3/4 mile of CTA's fixed route service. This service is available during the same times as CTA's fixed route service.
- **ADA Paratransit Plus** - this is an expansion of the ADA Paratransit service to include all of Harrison and Jackson counties as capacity allows. This service is only available Monday through Friday from 7:00 a.m. to 6:00 p.m.
- **Handy Ride** - for certified seniors and people with disabilities residing in Hancock County. This service is only available on Tuesdays and Thursdays from 9:00 a.m. to 4:00 p.m.

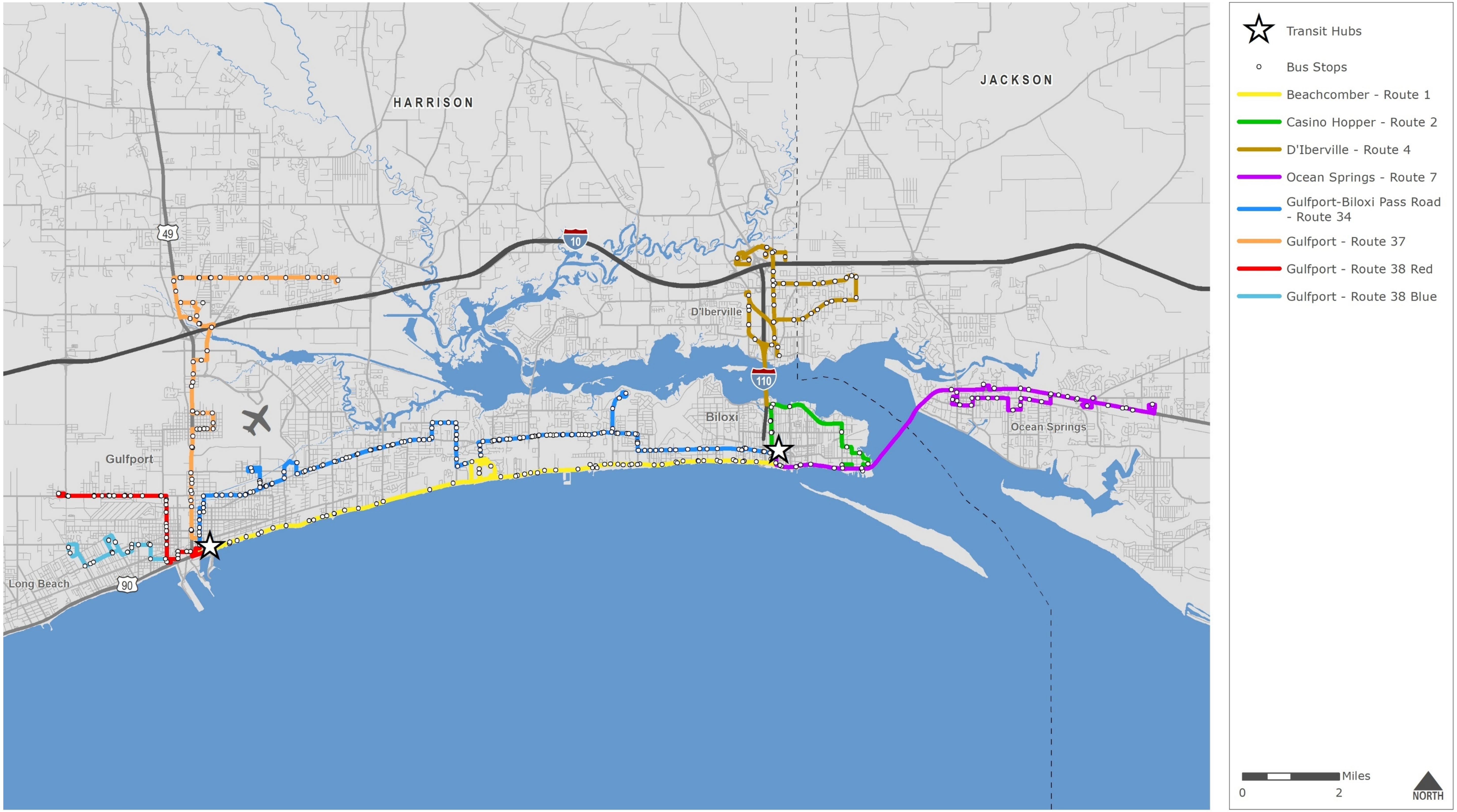
All of these paratransit services are curb-to-curb services that require advance reservation.

Fares for paratransit are $2.00 per zone traveled, so the total cost of a trip depends on a rider's distance traveled.

Vanpooling (Coast Commuter) Service

CTA works with employers and employees across the coast to provide vanpooling and carpooling services. The goal of the service is to assist employers on the Mississippi Gulf Coast in recruitment and retention of employees and to provide cost and stress reducing commute options for employees

Figure 5.2: CTA Fixed Route System



Data Sources: Coast Transit Authority

Disclaimer: This map is for planning purposes only.

Ridership Trends

In recent years, ridership for all three CTA services (fixed route, paratransit, and vanpooling) has declined. Fixed route and vanpool service decreased more significantly than paratransit service. This mirrors the national trend of transit ridership decline, largely attributed to a strong economy and historically low automobile loan rates.

Route 34 (Gulfport Biloxi Pass Road) has the highest ridership of the fixed routes, accounting for approximately one-quarter of all CTA ridership. Route 2 (Casino Hopper) and Route 1 (Beachcomber) are also popular. Even with its drastic decline, the vanpooling service is still relatively popular among CTA services. The paratransit service only accounts for about 5% of all trips.

Despite a strong tourism market with season attractions in the area, ridership does not vary substantially by month, typically ranging from 60,000 to 70,000 trips per month.

Table 5.2: CTA Annual Ridership by Mode, 2014-2018

Mode	2014	2015	2016	2017	2018
Fixed Route	819,734	662,756	790,666	740,636	655,076
Paratransit	51,262	48,339	45,399	47,440	46,385
Vanpool	156,496	151,927	135,846	110,980	99,176
Total	1,027,492	863,022	971,911	899,056	800,637

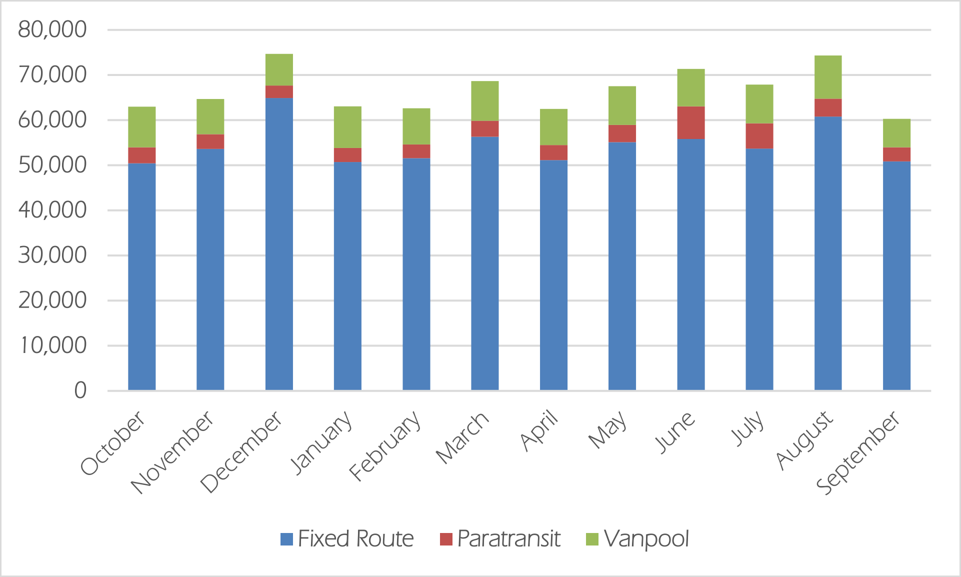
Source: National Transit Database

Table 5.3: CTA Average Daily Ridership by Route/Service, 2018

Route/Service	Average Daily Ridership
Beachcomber - Route 1	326
Casino Hopper - Route 2	400
D'Iberville - Route 4	89
Ocean Springs - Route 7	92
Gulfport Biloxi Pass Road - Route 34	631
Gulfport - Route 37	158
Gulfport - Route 38	120
Paratransit	127
Vanpool	392
TOTAL	**2,335**

Note: Average Daily Ridership based on holidays listed in passenger guide. Excludes eliminated Popp's Ferry route and Festival Hopper for special events.
Source: Coast Transit Authority

Figure 5.3: Recent CTA Ridership by Month



Source: National Transit Database, FY 2018

Operating Trends

The level of service for CTA's fixed route service has dropped since 2014, with moderate decreases in both vehicle revenue hours or miles. Coupled with declining ridership, CTA's productivity, cost-efficiency, and farebox related performance measures have generally declined in the last five years.

For paratransit, the story is very similar, though less pronounced. Levels of service have slightly decreased over the last five years and so has ridership. However, productivity, as measured in boardings per hour, has improved slightly, likely because of quicker travel times.

For vanpooling, the number of vehicles used in maximum service has decreased and ridership has decreased at an even faster rate. However, the cost efficiency of the service has remained stable over the last five years and the service has become self-sufficient according to the farebox recovery ratio.

Table 5.4: CTA Fixed Route Trends, 2014-2018

Indicator	2014	2015	2016	2017	2018	Change (2014-2018)	Trend
General System Statistics							
Urbanized Area Population	274,100	274,100	274,100	274,100	274,100	0.0%	--
Urbanized Area Square Miles	218	218	218	218	218	0.0%	--
Urbanized Area Population Density	1,255	1,255	1,255	1,255	1,255	0.0%	--
Vehicles Operated in Maximum Service	17	17	17	20	17	0.0%	--
Vehicle Revenue Miles	983,463	860,224	879,722	891,905	840,661	-14.5%	▼
Vehicle Revenue Hours	70,309	61,150	68,146	67,930	61,127	-13.1%	▼
Boardings	819,734	662,756	790,666	740,636	655,076	-20.1%	▼
Fare Revenue	$734,680	$642,396	$574,792	$615,837	$627,623	-14.6%	▼
Annual Operating Expense	$4,026,371	$3,800,580	$4,285,321	$4,496,399	$4,649,391	15.5%	▲
Level of Service							
Vehicle Revenue Miles per Capita	3.6	3.1	3.2	3.3	3.1	-14.5%	▼
Vehicle Revenue Hours per Capita	0.3	0.2	0.2	0.2	0.2	-13.1%	▼
Productivity							
Boardings per Revenue Mile	0.8	0.8	0.9	0.8	0.8	-6.5%	▼
Boardings per Revenue Hour	11.7	10.8	11.6	10.9	10.7	-8.1%	▼
Boardings per Capita	3.0	2.4	2.9	2.7	2.4	-20.1%	▼
Cost Efficiency							
Operating Expense per Vehicle Revenue Mile	$4.09	$4.42	$4.87	$5.04	$5.53	35.1%	▲
Operating Expense per Vehicle Revenue Hour	$57.27	$62.15	$62.88	$66.19	$76.06	32.8%	▲
Operating Expense per Boarding	$4.91	$5.73	$5.42	$6.07	$7.10	44.5%	▲
Farebox							
Average Fare	$0.90	$0.97	$0.73	$0.83	$0.96	6.9%	▲
Farebox Recovery Rate	18.2%	16.9%	13.4%	13.7%	13.5%	-26.0%	▼

Source: National Transit Database

Table 5.5: CTA Paratransit Trends, 2014-2018

Indicator	2014	2015	2016	2017	2018	Change (2014-2018)	Trend
General System Statistics							
Urbanized Area Population	274,100	274,100	274,100	274,100	274,100	0.0%	--
Urbanized Area Square Miles	218	218	218	218	218	0.0%	--
Urbanized Area Population Density	1,255	1,255	1,255	1,255	1,255	0.0%	--
Vehicles Operated in Maximum Service	15	15	15	15	15	0.0%	--
Vehicle Revenue Miles	265,382	276,654	266,300	261,001	252,968	-4.7%	▼
Vehicle Revenue Hours	24,406	23,200	23,048	21,439	21,242	-13.0%	▼
Boardings	51,262	48,339	45,399	47,440	46,385	-9.5%	▼
Fare Revenue	$36,826	$34,436	$31,160	$30,919	$33,134	-10.0%	▼
Annual Operating Expense	$1,122,949	$1,158,557	$1,293,891	$1,304,239	$1,326,738	18.1%	▲
Level of Service							
Vehicle Revenue Miles per Capita	1.0	1.0	1.0	1.0	0.9	-4.7%	▼
Vehicle Revenue Hours per Capita	0.1	0.1	0.1	0.1	0.1	-13.0%	▼
Productivity							
Boardings per Revenue Mile	0.2	0.2	0.2	0.2	0.2	-5.1%	▼
Boardings per Revenue Hour	2.1	2.1	2.0	2.2	2.2	4.0%	▲
Boardings per Capita	0.2	0.2	0.2	0.2	0.2	-9.5%	▼
Cost Efficiency							
Operating Expense per Vehicle Revenue Mile	$4.23	$4.19	$4.86	$5.00	$5.24	23.9%	▲
Operating Expense per Vehicle Revenue Hour	$46.01	$49.94	$56.14	$60.83	$62.46	35.7%	▲
Operating Expense per Boarding	$21.91	$23.97	$28.50	$27.49	$28.60	30.6%	▲
Farebox							
Average Fare	$0.72	$0.71	$0.69	$0.65	$0.71	-0.6%	▼
Farebox Recovery Rate	3.3%	3.0%	2.4%	2.4%	2.5%	-23.8%	▼

Source: National Transit Database

Table 5.6: CTA Vanpool Trends, 2014-2018

Indicator	2014	2015	2016	2017	2018	Change (2014-2018)	Trend
General System Statistics							
Urbanized Area Population	274,100	274,100	274,100	274,100	274,100	0.0%	--
Urbanized Area Square Miles	218	218	218	218	218	0.0%	--
Urbanized Area Population Density	1,255	1,255	1,255	1,255	1,255	0.0%	--
Vehicles Operated in Maximum Service	47	44	40	36	35	-25.5%	
Vehicle Revenue Miles	989,901	981,933	911,741	748,765	637,416	-35.6%	
Vehicle Revenue Hours	18,681	18,271	17,034	14,380	13,037	-30.2%	
Boardings	156,496	151,927	135,846	110,980	99,176	-36.6%	
Fare Revenue	$425,913	$131,186	$481,631	$439,636	$477,573	12.1%	
Annual Operating Expense	$663,219	$370,571	$518,284	$496,929	$423,108	-36.2%	
Level of Service							
Vehicle Revenue Miles per Capita	3.6	3.6	3.3	2.7	2.3	-35.6%	
Vehicle Revenue Hours per Capita	0.1	0.1	0.1	0.1	0.0	-30.2%	
Productivity							
Boardings per Revenue Mile	0.2	0.2	0.1	0.1	0.2	-1.6%	
Boardings per Revenue Hour	8.4	8.3	8.0	7.7	7.6	-9.2%	
Boardings per Capita	0.6	0.6	0.5	0.4	0.4	-36.6%	
Cost Efficiency							
Operating Expense per Vehicle Revenue Mile	$0.67	$0.38	$0.57	$0.66	$0.66	-0.9%	
Operating Expense per Vehicle Revenue Hour	$35.50	$20.28	$30.43	$34.56	$32.45	-8.6%	
Operating Expense per Boarding	$4.24	$2.44	$3.82	$4.48	$4.27	0.7%	
Farebox							
Average Fare	$2.72	$0.86	$3.55	$3.96	$4.82	76.9%	
Farebox Recovery Rate	64.2%	35.4%	92.9%	88.5%	112.9%	75.8%	

Source: National Transit Database

Safety and Security Trends

As a recipient of federal transportation funds, CTA is required to report safety and security events occurring on a transit right-of-way, in a transit revenue facility, in a transit maintenance facility, or involving a transit revenue vehicle.

Table 5.7 shows CTA's reported safety and security events from the last 5 years of available data and compares its incidence rates to the national and state averages of other urbanized area providers. Overall, CTA's safety record over the last five years is slightly above average compared to other urbanized area systems in the state and country.

Table 5.7: CTA Safety and Security Events, 2014-2018

	2014	2015	2016	2017	2018	Total
All Events	3	4	4	3	5	19
Fatalities	0	0	0	0	0	0
Injuries	5	3	1	8	3	20

Source: National Transit Database

Table 5.8: Safety and Security Events per 100,000 Vehicle Revenue Miles, 2014-2018

	Coast Transit Authority	Mississippi Urbanized Area Providers	U.S. Urbanized Area Providers
All Events	0.19	0.22	0.21
Fatalities	0.00	0.01	0.01
Injuries	0.20	0.24	0.26

Source: National Transit Database

Transit Asset Management

All transit agencies receiving federal funding are required to submit asset inventory data, condition assessments, performance targets, and a narrative report to the National Transit Database annually in addition to developing a Transit Asset Management (TAM) plan. CTA submits this information and recently developed a TAM plan.

Federal TAM regulations require transit agencies to address the four asset categories shown in Table 5.9, as applicable to the agency. For CTA, only the rolling stock, equipment, and facilities asset categories are applicable.

As of 2018, CTA had 39 vehicles in its rolling stock fleet, 12 vehicles in its equipment fleet, and 9 reportable facilities. During the development of its TAM Plan, CTA set performance targets for each vehicle type. For rolling stock and equipment, this performance measure is simply the percentage of vehicles whose age exceeds the Useful Life Benchmark (ULB) established by the group. Each vehicle type has its own ULB target due to unique operating and maintenance characteristics. For facilities, the

TAM performance measure is the percentage of facilities rated under 3.0 using FTA's TERM software (3.0 indicates adequate condition).

As shown in Tables 5.10-5.12, in 2018, CTA did not meet performance targets for its cutaway buses and non-revenue/service automobiles. CTA will implement its TAM Plan to continually monitor and improve the condition of its vehicles and facilities.

Useful Life Benchmark: The expected lifecycle of a capital asset for a particular transit provider's operating environment, or the acceptable period of use in service for a particular transit provider's operating environment.

Note: ULB is distinct from the useful life definition used in FTA's grant programs

Table 5.9: Transit Asset Management Performance Measures

Asset Category	FTA established Performance Measure	Reported by CTA
Rolling Stock	% of revenue vehicles exceeding ULB	Yes
Equipment	% of non-revenue service vehicles exceeding ULB	Yes
Facilities	% of facilities rated under 3.0 on the TERM scale	Yes
Infrastructure	% of track segments under performance restriction	No

Note: ULB = Useful Life Benchmark; TERM is software used to rate facility conditions
Source: Federal Transit Administration

Table 5.10: CTA Rolling Stock Inventory and Performance

Vehicle Type	Total	ULB (years)	% Exceeding ULB	2018 Target	Status
Bus	7	14	0%	20%	Target Met
Cutaway Bus	21	10	52%	25%	Target Not Met
Rubber-tire Vintage Trolley	10	14	0%	20%	Target Met
Van	1	8	0%	25%	Target Met
Overall	39	n/a	28%	n/a	n/a

Source: Coast Transit Authority Transit Asset Management Plan, 2018

Table 5.11: CTA Equipment Inventory and Performance

Vehicle Type	Total	ULB (years)	% Exceeding ULB	2018 Target	Status
Custom 1	4	4-9	0%	10%	Target Met
Non Revenue/Service Automobile	5	5-10	60%	50%	Target Not Met
Trucks and other Rubber Tire Vehicles	3	5-10	33%	50%	Target Met
Overall	12	n/a	33%	n/a	n/a

Source: Coast Transit Authority Transit Asset Management Plan, 2018

Table 5.12: CTA Facility Inventory and Performance

Asset Category	Total	Average TERM Scale Rating	% Under 3.0 on TERM Scale	Target	Status
Administration	1	4.0	0%	5%	Target Met
Parking Structures	1	4.0	0%	5%	Target Met
Passenger Facilities	7	4.0	0%	5%	Target Met

Source: Coast Transit Authority Transit Asset Management Plan, 2018

5.2 Fixed Route Regional Peer Comparison

A peer comparison analysis is a benchmarking tool that allows an area to compare itself to areas with similar conditions. Ideally, the peer group has elements in common with the transit system studied such as population of area served, geographical location (state or region), and type of services offered.

Because this is a regional long-range transportation plan, the criteria to select peer systems is somewhat different from the typical criteria used by transit agencies in short-range transit development plans. The focus is on the urbanized areas of Gulfport-Biloxi and Pascagoula versus the service area of a particular agency.

Peer Selection Methodology

Selection criteria were utilized that were intended to highlight urban areas that are very similar to the Gulfport-Biloxi and Pascagoula urbanized areas in terms of urban structure, land use patterns, and demographics. These three factors, outside of the type and level of transit service provided, are the primary drivers of transit demand and barriers. By selecting peer areas similar in these regards, we can highlight areas operating under similar constraints but producing different results.

- Metro Area Size – Included only urbanized areas within metropolitan areas with populations between 250,000 to 500,000.
- In Southeast – Areas outside of the Southeast were excluded due to lower funding levels and poorer public perception of transit in the Southeast.
- Tourism's Share of Metro Area Economy – at least 4% tourism GDP share.
- Urbanized Area Density – removed areas more than 1.5x as dense as Gulf Coast.

- Urban, Fixed Route system – excluded areas without an urban, fixed route transit system.

Table 5.13 shows the resulting five peer areas identified. It should be noted that Mobile Bay includes Baldwin County and its urbanized area.

Table 5.13: Selected Peer Regions

Region	Urban Fixed Route Systems
Asheville, NC	City of Asheville (ART); Buncombe County (Mountain Mobility); Henderson County
Mobile Bay, AL	City of Mobile (WTS)
Myrtle Beach, SC	Waccamaw Regional Transportation Authority (The Coast RTA)
Ocala, FL	City of Ocala, Florida (SunTran)
Pensacola-Fort Walton, FL	Escambia County Board of County Commissioners, FL (ECAT); Okaloosa County Board of County Commissioners (EC Rider)
Gulf Coast, MS	Ms Coast Transportation Authority (CTA)

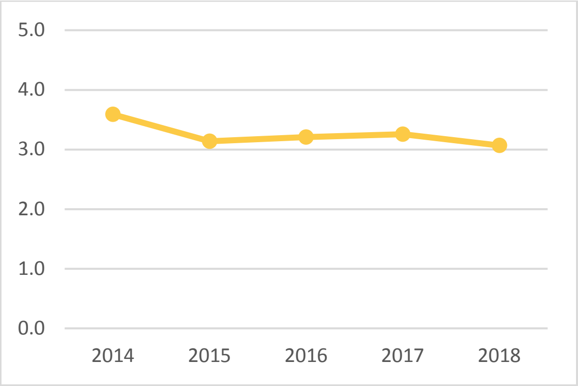
Table 5.14: Peer Fixed Route System Trends, 2018

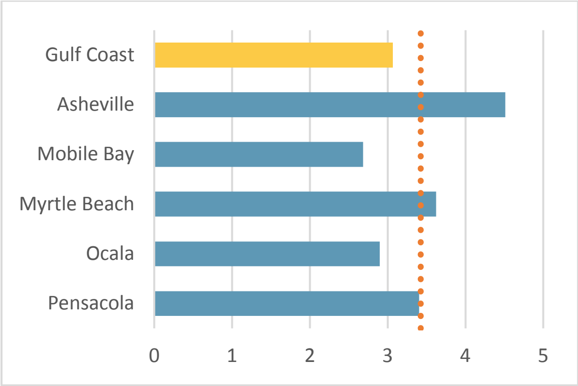
Indicator	Asheville	Mobile Bay	Myrtle Beach	Ocala	Pensacola-Fort Walton	Peer Average	Gulf Coast
General System Statistics							
Urbanized Area Population	294,536	396,018	250,568	167,213	569,480	250,568	274,100
Urbanized Area Square Miles	267	282	194	112	370	194	218
Urbanized Area Population Density	1,102	1,404	1,290	1,489	1,541	1,290	1,255
Vehicles Operated in Maximum Service	23	21	14	6	46	14	17
Vehicle Revenue Miles	1,329,655	1,063,780	907,703	484,964	1,938,145	907,703	840,661
Vehicle Revenue Hours	93,310	76,679	41,698	30,839	135,050	41,698	61,127
Boardings	2,062,077	850,598	509,586	416,242	1,564,760	509,586	655,076
Fare Revenue	$555,966	$585,706	$420,637	$308,776	$1,514,757	$420,637	$627,623
Annual Operating Expense	$6,722,520	$7,591,657	$4,803,578	$2,325,359	$11,286,453	$4,803,57	$4,649,39
Level of Service							
Vehicle Revenue Miles per Capita	4.5	2.7	3.6	2.9	3.4	3.4	3.1
Vehicle Revenue Hours per Capita	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Productivity							
Boardings per Revenue Mile	1.6	0.8	0.6	0.9	0.8	0.8	0.8
Boardings per Revenue Hour	22.1	11.1	12.2	13.5	11.6	11.6	10.7
Boardings per Capita	7.0	2.1	2.0	2.5	2.7	2.7	2.4
Cost Efficiency							
Operating Expense per Vehicle Revenue Mile	$5.06	$7.14	$5.29	$4.79	$5.82	$5.82	$5.53
Operating Expense per Vehicle Revenue	$72.05	$99.01	$115.20	$75.40	$83.57	$83.57	$76.06
Operating Expense per Boarding	$3.26	$8.93	$9.43	$5.59	$7.21	$7.21	$7.10
Farebox							
Average Fare	$0.27	$0.69	$0.83	$0.74	$0.97	$0.97	$0.96
Farebox Recovery Rate	8.3%	7.7%	8.8%	13.3%	13.4%	13.4%	13.5%

Source: National Transit Database

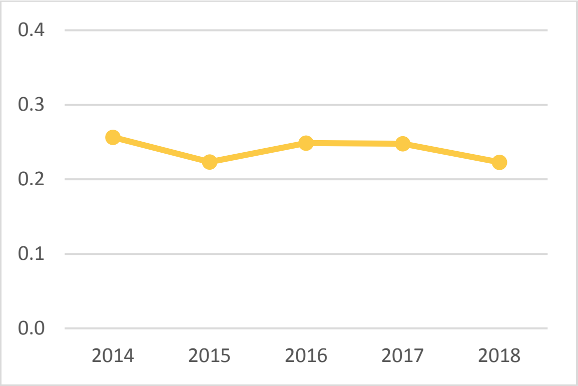
Level of Service Indicators

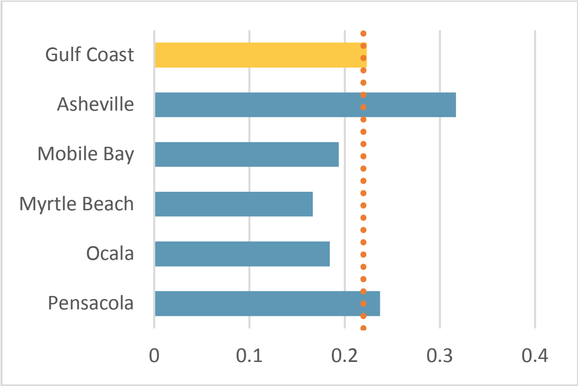
Vehicle Revenue Miles per Capita





Vehicle Revenue Hours per Capita

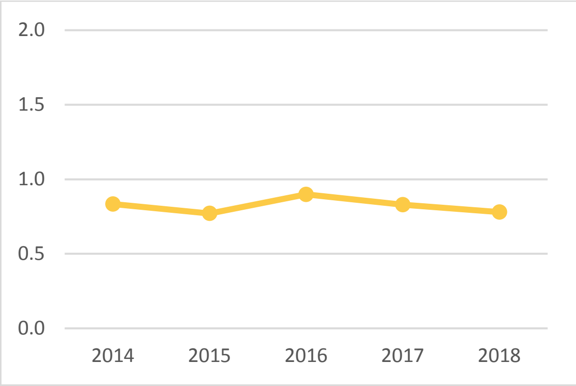


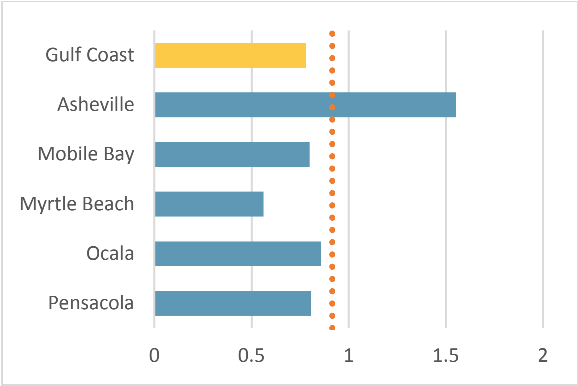


Peer Average

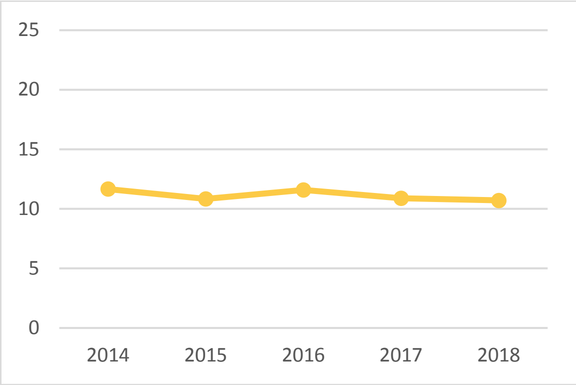
Productivity Indicators

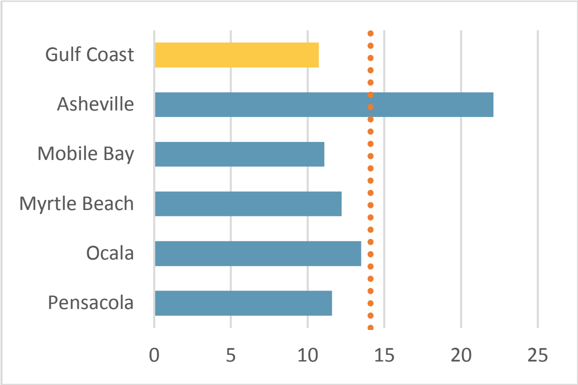
Boardings per Revenue Mile



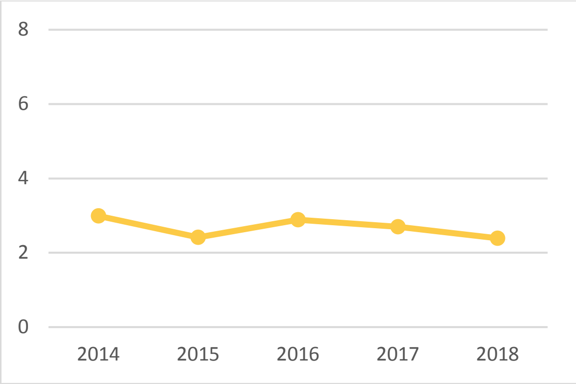


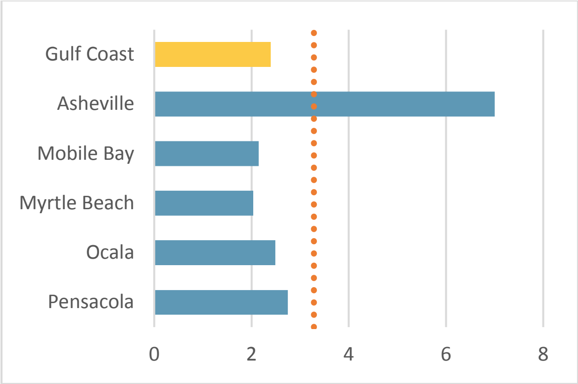
Boardings per Revenue Hour





Boardings per Capita

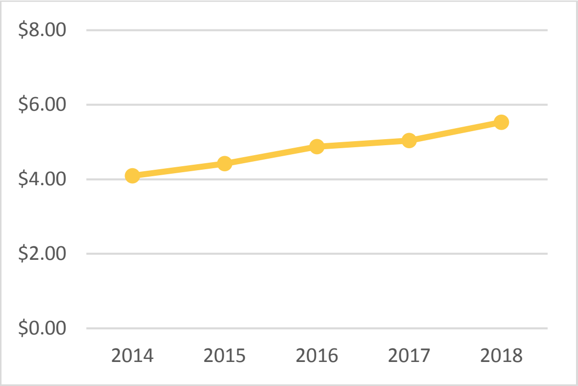


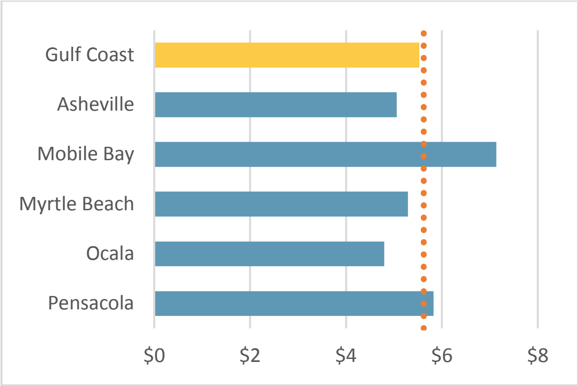


Peer Average

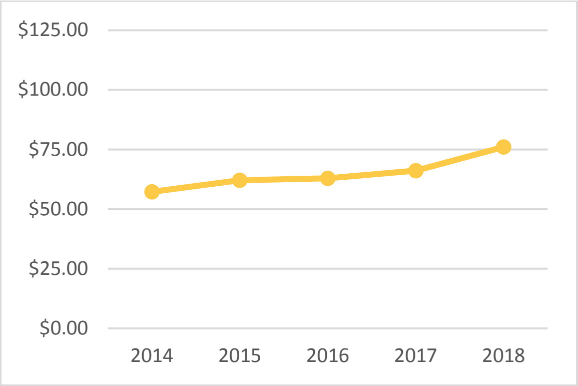
Cost Efficiency Indicators

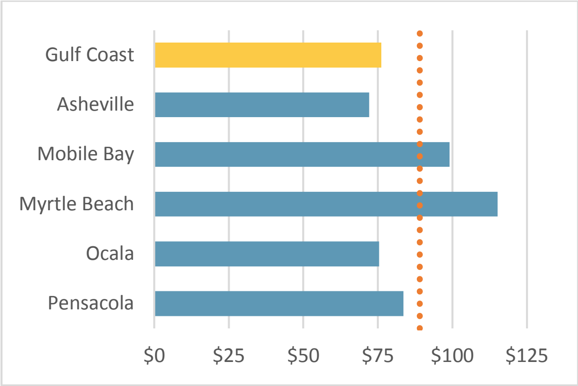
Operating Expense per Vehicle Revenue Mile



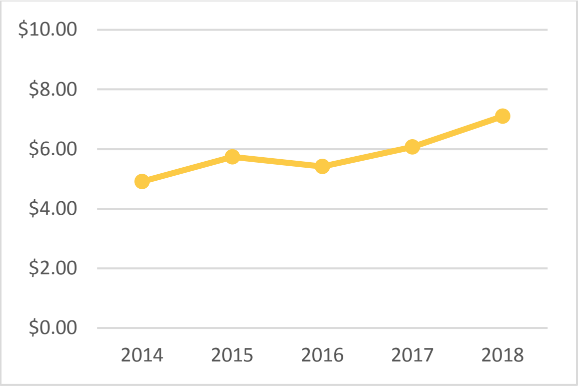


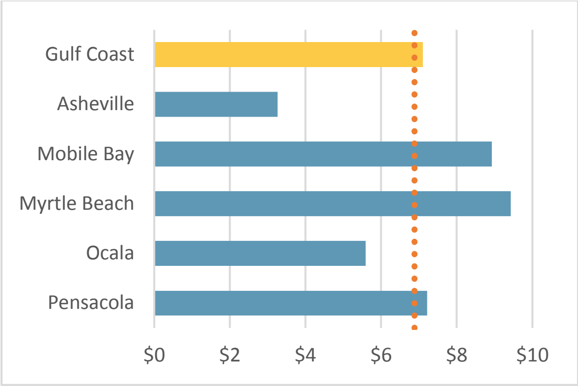
Operating Expense per Vehicle Revenue Hour





Operating Expense per Passenger Trip

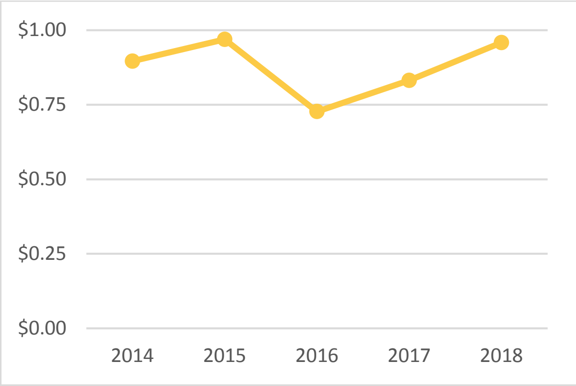


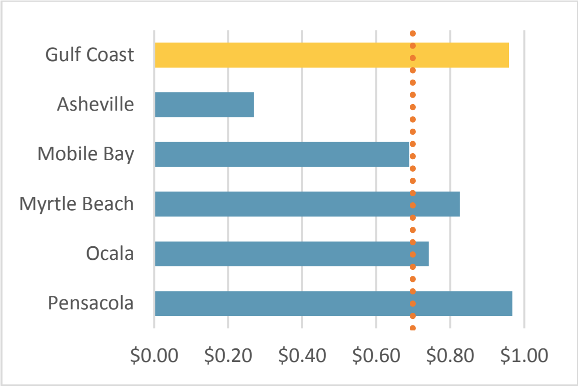


Peer Average

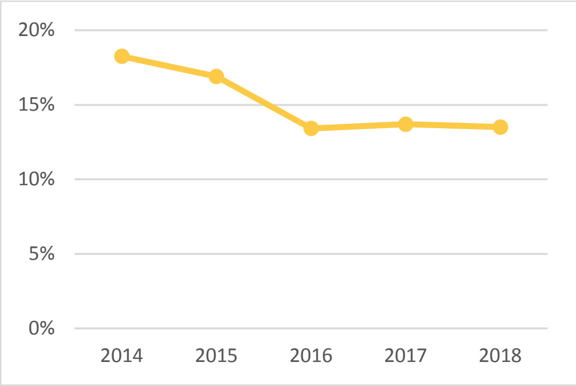
Farebox Indicators

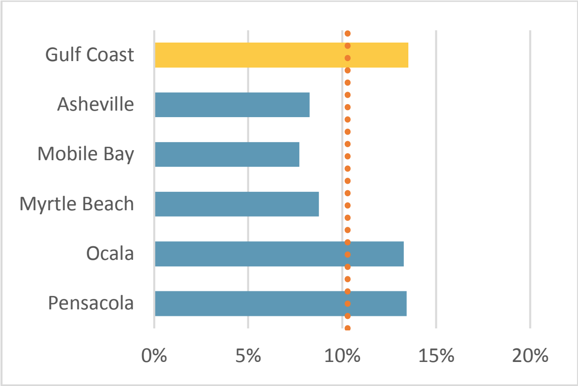
Average Fare





Farebox Recovery Rate





Peer Average

Peer Comparison Analysis

Table 5.14 provides relevant transit operations information for all fixed route, urban transit services operating in the selected peer regions. The following trends can be gleaned from this information:

- Transit System Size
    - CTA provides a similar level of transit service as most of its peers. This is true for both vehicle revenue hours and miles provided per capita.
- Productivity
    - CTA is in line with its peers in terms of productivity, but it is on the lower end of this spectrum.
    - CTA's boardings per mile are slightly higher relative to peers than its boardings per hour. This is because CTA's vehicles are traveling at slower average speeds than its peers, due to congestion or lower speed limits along its routes.
- Cost Efficiency
    - CTA is in line with its peers in terms of cost efficiency.
    - CTA's operating cost per mile is slightly higher relative to peers than its cost per hour. As with productivity, this is due to CTA's slower than average travel speeds.
- Farebox recovery
    - CTA's average fare is higher than most of its peers but is similar to the Pensacola-Fort Walton region.
    - CTA's farebox recovery rate, or the share of operating costs covered by fares, is on the higher end of its peers.

Overall, CTA operates very similarly to the selected peer regions. However, a potential area for improvement is CTA's slower than average travel speed. This issue would require more detailed analysis to better understand root causes and specific "slow zones."

5.3 Coordination with Other Transit Providers and Stakeholders

Coast Transit Authority coordinates directly with other transit providers and stakeholders through the Southern Connect group, one of six regional groups in Mississippi for local coordinated transit planning. The Southern Connect groups works together to assess regional transportation needs, identify transportation gaps, and develop alternatives and recommendations to address unmet needs and gaps.

The CTA also recently worked with a broad coalition of transit providers and stakeholders to develop a Coordinated Public Human Service Transportation Plan (2016) that identifies the transportation needs of individuals with disabilities, older adults, and those with lower incomes, and to identify and prioritize strategies for meeting those needs. This plan recommends five specific goals, each of which is accompanied by specific strategies and activities.

- Goal 1: To increase and expand on current service hours.
- Goal 2: To more effectively engage the local elected officials in supporting transit growth on the Gulf Coast
- Goal 3: To improve and expand the availability of transportation services to include more of the traditionally underserved populations such as the disabled and elderly.
- Goal 4: To develop and implement and education and awareness program. Specifically, to identify and secure the assistance of a mobility manager, and to increase community awareness and support of coordinated transportation efforts
- Goal 5: To better coordinate services to improve operation of transportation services.

5.4 Intercity Public Transit

The Gulf Coast MPA is served by two intercity transportation providers: Greyhound and Flixbus. While Amtrak service from New Orleans to Jacksonville has yet to be restored since Hurricane Katrina, funding has partially been committed to restore Amtrak service between New Orleans and Mobile.

Greyhound – provides intercity bus service at the CTA Biloxi Transit Center, offering connections throughout the Southeast and beyond. Fares vary depending upon accommodations and travel itinerary. For more information, go to www.greyhound.com

Flixbus – provides intercity bus service at two locations in Biloxi: the CTA Biloxi Transit Center and the Golden Nugget Casino at Point Cadet. This service provides direct connections to 18 other cities in the Southeast. Fares vary depending upon accommodations and travel itinerary. For more information, go to www.flixbus.com

5.5 Transportation Network Companies

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

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

5.6 Regional Transit Demand Analysis

Transit Demand Analysis

The regional demand analysis uses a GIS-based approach to identify the level of transit service supported throughout the Gulf Coast MPA. There are a number of factors that can be analyzed to evaluate and predict transit demand in an area. Given the availability of data and regional scope of the 2045 MTP, the transit demand analysis focused on the following factors.

Residential density – A higher concentration of housing for residents and visitors in an area creates more potential transit riders in an area. This is especially true of very dense areas, where other factors, such as parking availability or congestion, may further influence demand.

Employment density – A higher concentration of employment in an area creates more potential transit riders in an area. This is especially true of very dense areas, where other factors, such as parking availability or congestion, may further influence demand. Some studies argue that employment density is more important for predicting ridership than residential densities.

Activity density – In areas with both residential areas and employment, it is necessary to consider a combined density.

Low-income household density – Low-income persons are more likely to ride transit due to a greater likelihood that they do not have regular access to a vehicle or seek to minimize travel by automobile for economic reasons.

Transit-supportive employment density – Certain industries attract transit riders at higher level than average. This is partly because some industries, such as retail and food services, employ a disproportionately large number of low-wage jobs. But it is also important to note that industries like healthcare and higher education often cluster employees at relatively dense "campuses" that can be well served by transit.

Density of adults without a vehicle – Persons without access to a vehicle are more likely to ride transit due to a lack of other options. A person may lack a vehicle because of economic reasons, physical or mental ability, or because of a decision to live a car-free lifestyle.

Table 5.15 shows the Transit Demand Analysis criteria and measurements. For each density criterion, an area’s value is calculated. Before being assigned a level of service tier, all criteria values are multiplied by an area’s street connectivity factor. Based on these adjusted values, level of service tiers are then assigned, based on industry standard thresholds.

Figure 5.4 illustrates the results of this analysis and the distribution of transit demand throughout the region.

Based upon Figure 5.4, there are several areas within the Gulf Coast MPA that support fixed route service with frequencies of 60 minutes or better and many of these areas are already served by CTA routes. However, there are several areas of high transit demand not currently served by a fixed route, such as Pascagoula and Bay St. Louis. In general, the highest demand is in Biloxi and Gulfport at major activity centers and near areas with a high concentration of affordable housing.

Table 5.15: Transit Demand Analysis Criteria and Level of Service Thresholds

Criteria	Measurement	Transit Level of Service				
		On-Demand	Flexible	60 min.	30 min.	15 min.
Residential Density	Households, dorm units, and hotel rooms per acre[1]	0 to 1	1 to 2	2 to 4	4 to 7	7+
	Households using food stamps, dorm units, and budget hotel rooms per acre	0 to 0.33	0.33 to 0.66	0.66 to 1.33	1.33 to 2.33	2.33+
	Households without vehicle, dorm units, and budget hotel rooms per acre	0 to 0.25	0.25 to 0.5	0.5 to 1	1 to 1.75	1.75+
Employment Density	Jobs and college enrollment per acre	0 to 5	5 to 10	10 to 25	25 to 50	50+
	Jobs per acre for industries with high percentage of workers riding transit[2]	0 to 2.5	2.5 to 5	5 to 12.5	12.5 to 25	25+
Activity Density	Sum of residential and employment density values	0 to 3.75	3.75 to 7.5	7.5 to 18.75	18.75 to 37.5	37.5+
	Sum of low-income residential and transit-supportive employment density values	0 to 1.5	1.5 to 3	3 to 7.5	7.5 to 15	15+
	Sum of no vehicle residential and transit-supportive employment density values	0 to 1.25	1.25 to 2.5	2.5 to 6.25	6.25 to 12	12+

1 Dorms were converted to households assuming an average of 2.5 people per dorm and a hotel occupancy rate of 65% was assumed.
2 Industries with high percentage of workers riding transit included NAICS codes: 44-45, 61, 62, 71, and 72

Transit-Dependent Populations

In order to ensure that the needs of the transit-dependent population are being addressed by the transit demand analysis, the concentration of various transit-dependent populations were mapped.

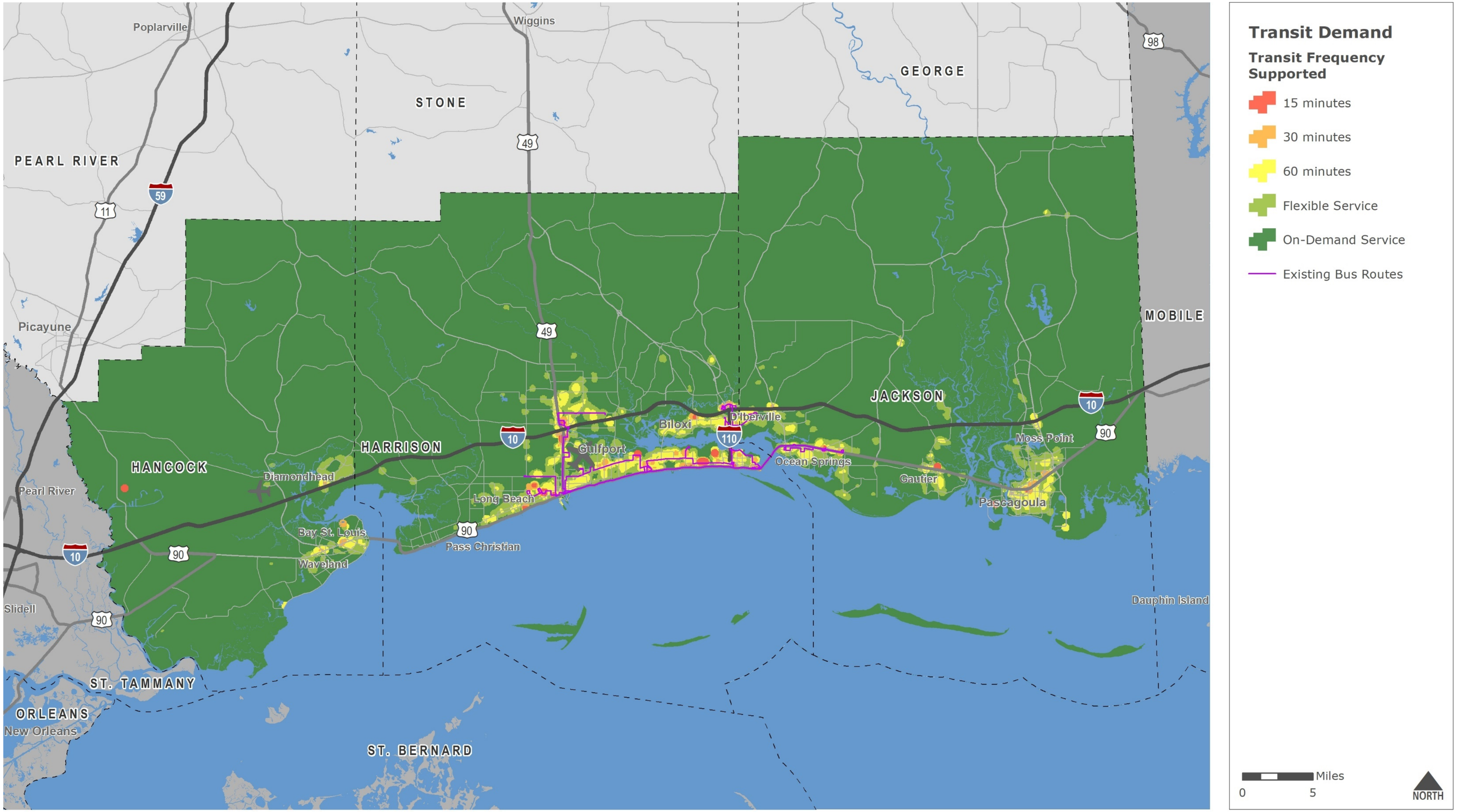
Figure 5.5 illustrates the concentration of households without regular access to a vehicle. While there are not many areas with higher concentrations of carless households, there are clusters near Keesler Airforce Base, along Pass Road, around Downtown Gulfport, and in central Pascagoula.

Figure 5.6 depicts the concentration of low-income households. These households may have access to a car, but due to economic reasons, are more likely to rely on transit. The distribution of high-density clusters of low-income households is similar to that of households without access to a vehicle but is more expansive - including areas along Dedeaux Rd, D'Iberville, and parts of Bay St. Louis, Ocean Springs, and Gautier.

Figure 5.7 shows the concentration of households that include people with disabilities. These households rely on transit because of physical or mental limitations. The highest concentrations for households including people with disabilities is very similar to the concentration of low-income households but is slightly more expansive - spreading into more suburban areas.

Figure 5.8 shows the concentration of persons aged 65 or older. Similar to people with disabilities, this population is more likely to rely on transit because of physical or mental limitations. The highest concentrations of senior residents are very similar to the concentrations of households including people with disabilities. However, these concentrations also include Diamondhead and some other additional areas.

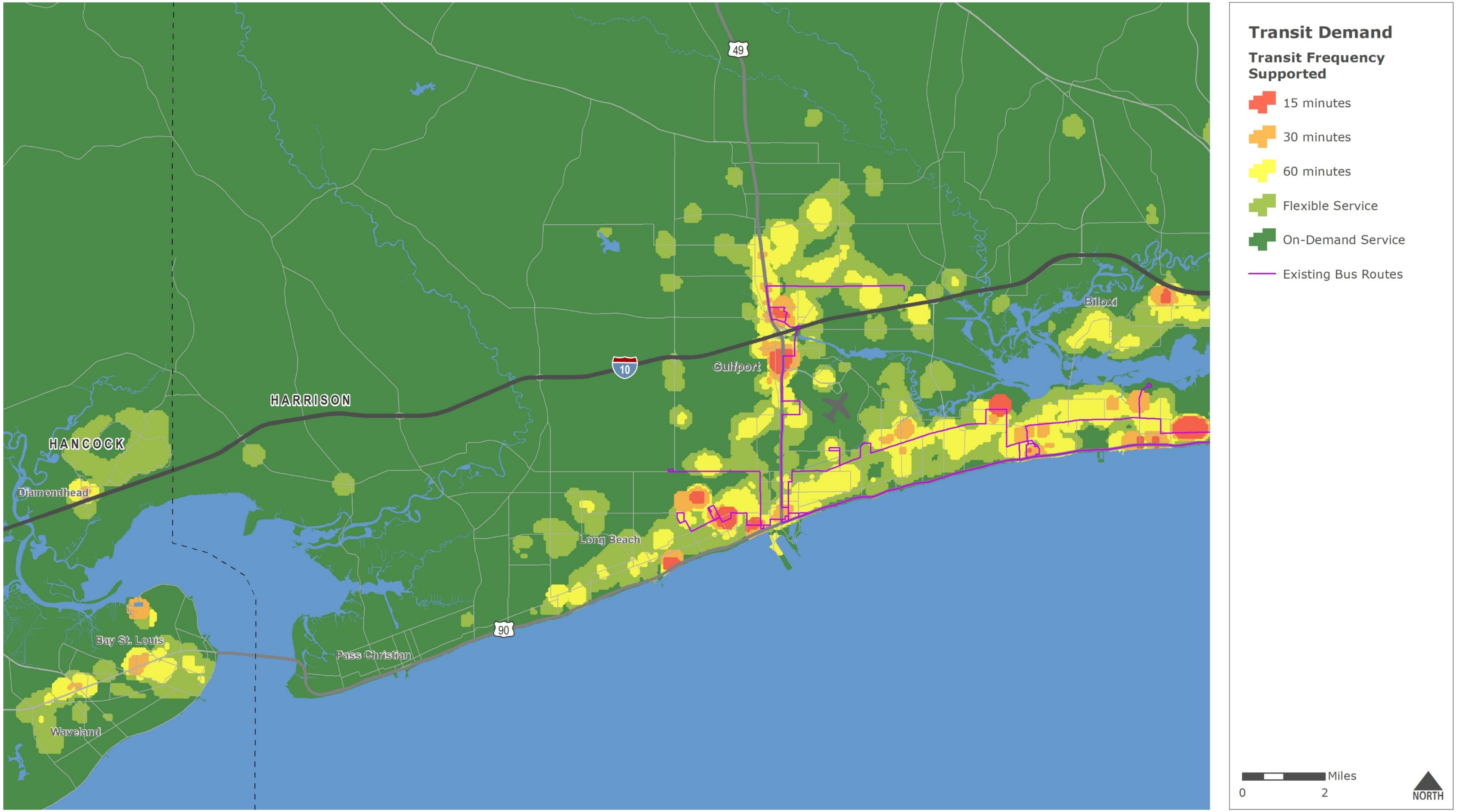
Figure 5.4: Regional Transit Demand Analysis



Data Sources: Neel-Schaffer

Disclaimer: This map is for planning purposes only.

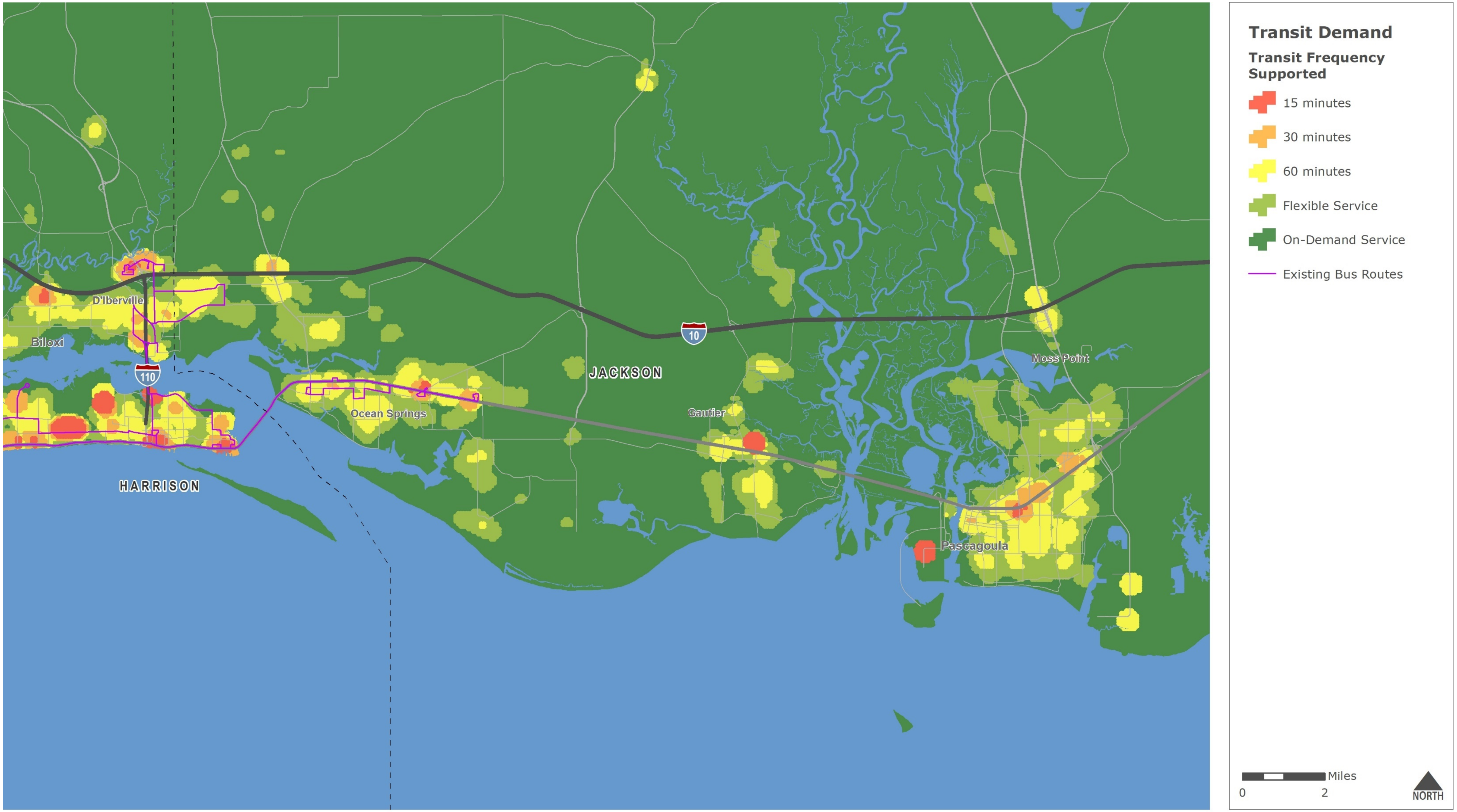
Figure 5.4 (zoom west): Regional Transit Demand Analysis



Data Sources: Neel-Schaffer

Disclaimer: This map is for planning purposes only.

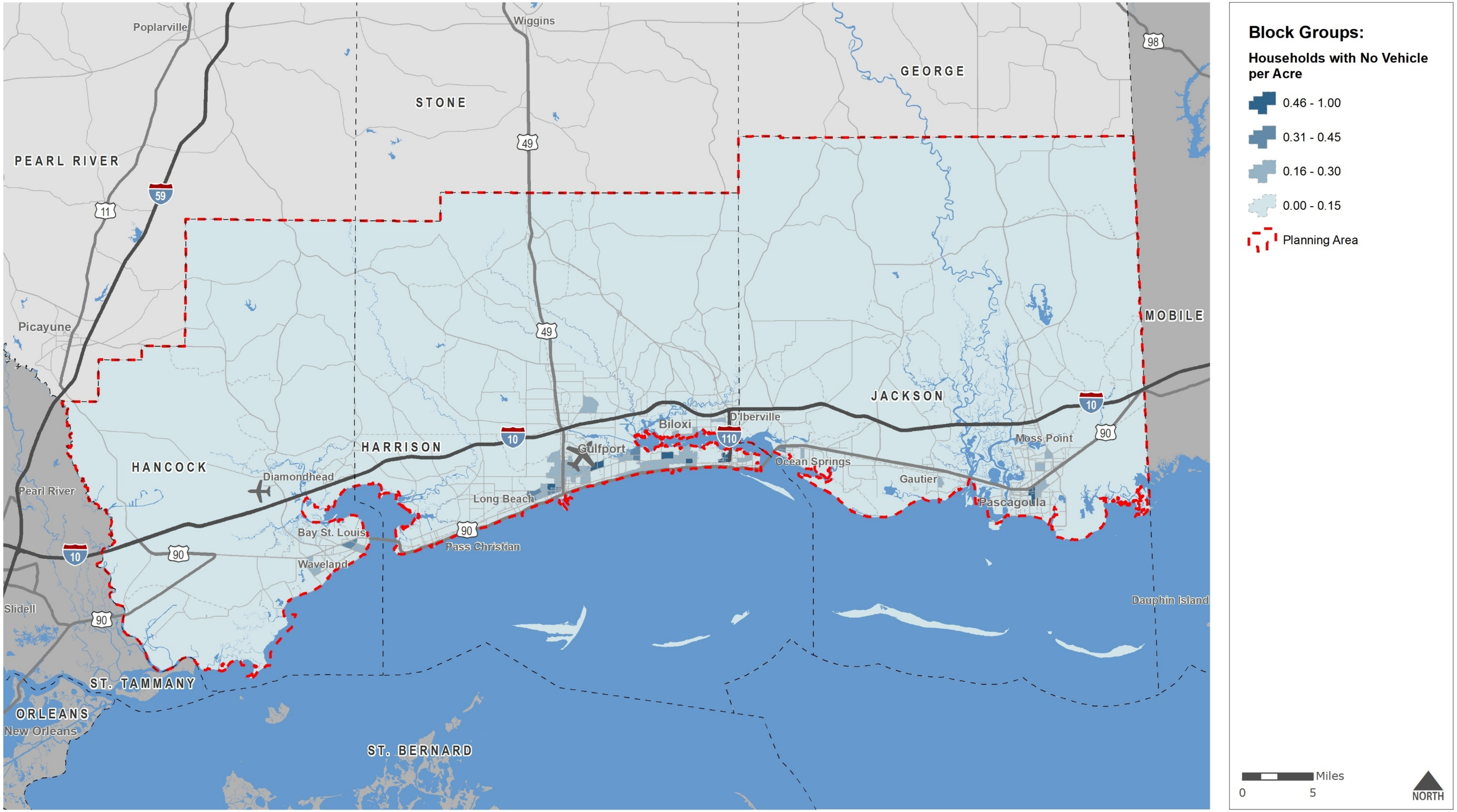
Figure 5.4 (zoom east): Regional Transit Demand Analysis



Data Sources: Neel-Schaffer

Disclaimer: This map is for planning purposes only.

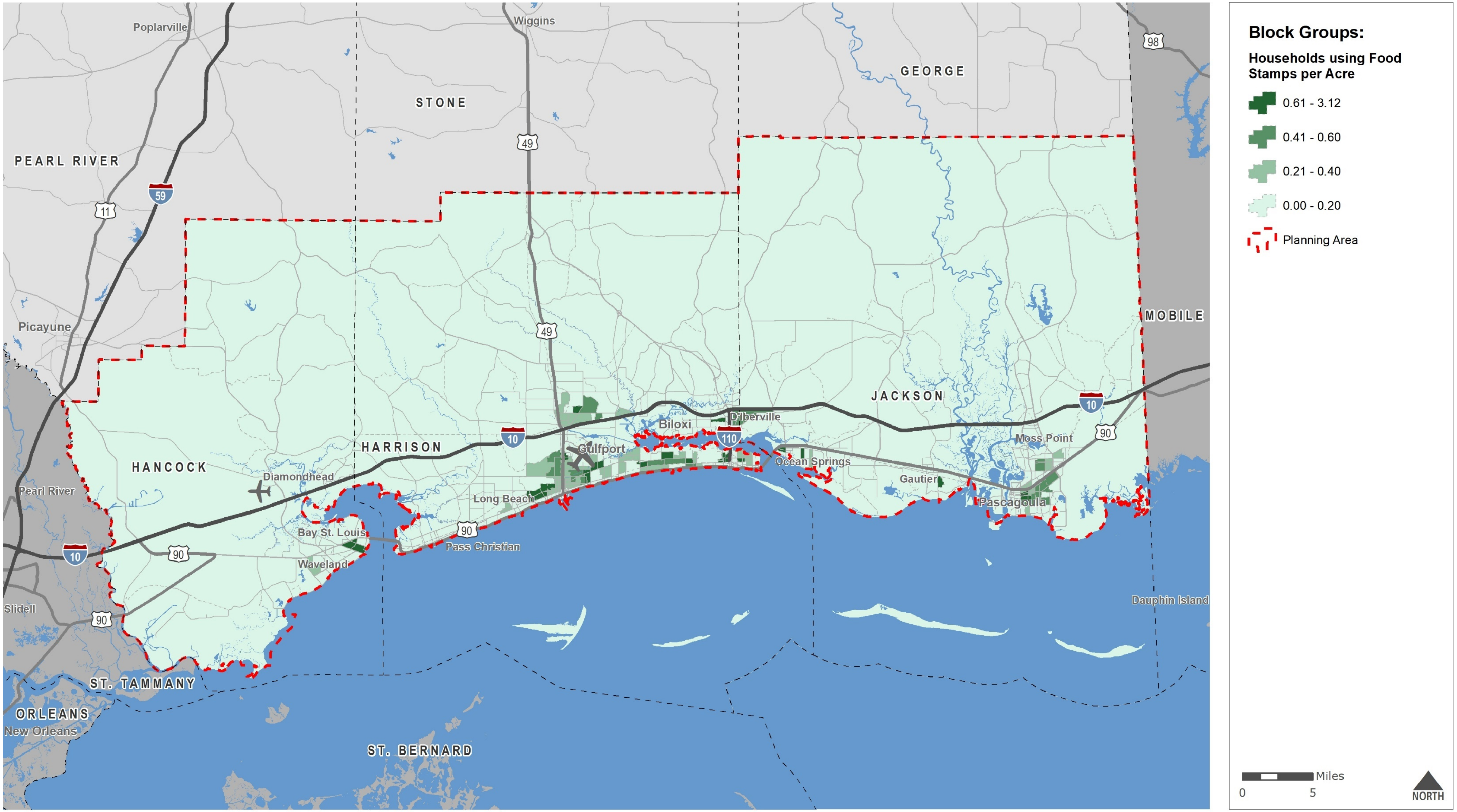
Figure 5.5: Concentration of Households with No Vehicle



Data Sources: Census Bureau, 2018 American Community Survey (5 year)

Disclaimer: This map is for planning purposes only.

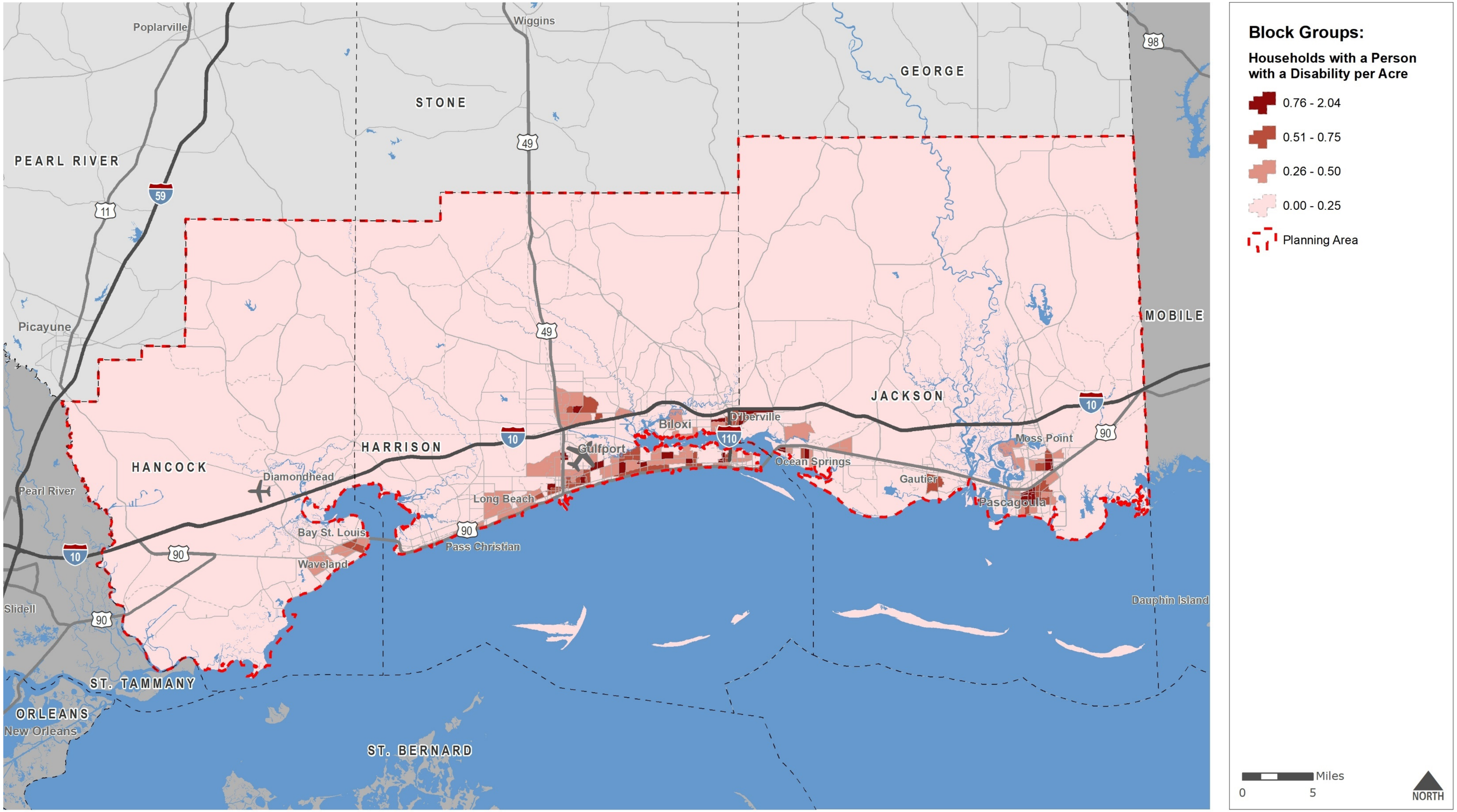
Figure 5.6: Concentration of Low-Income Households



Data Sources: Census Bureau, 2018 American Community Survey (5 year)

Disclaimer: This map is for planning purposes only.

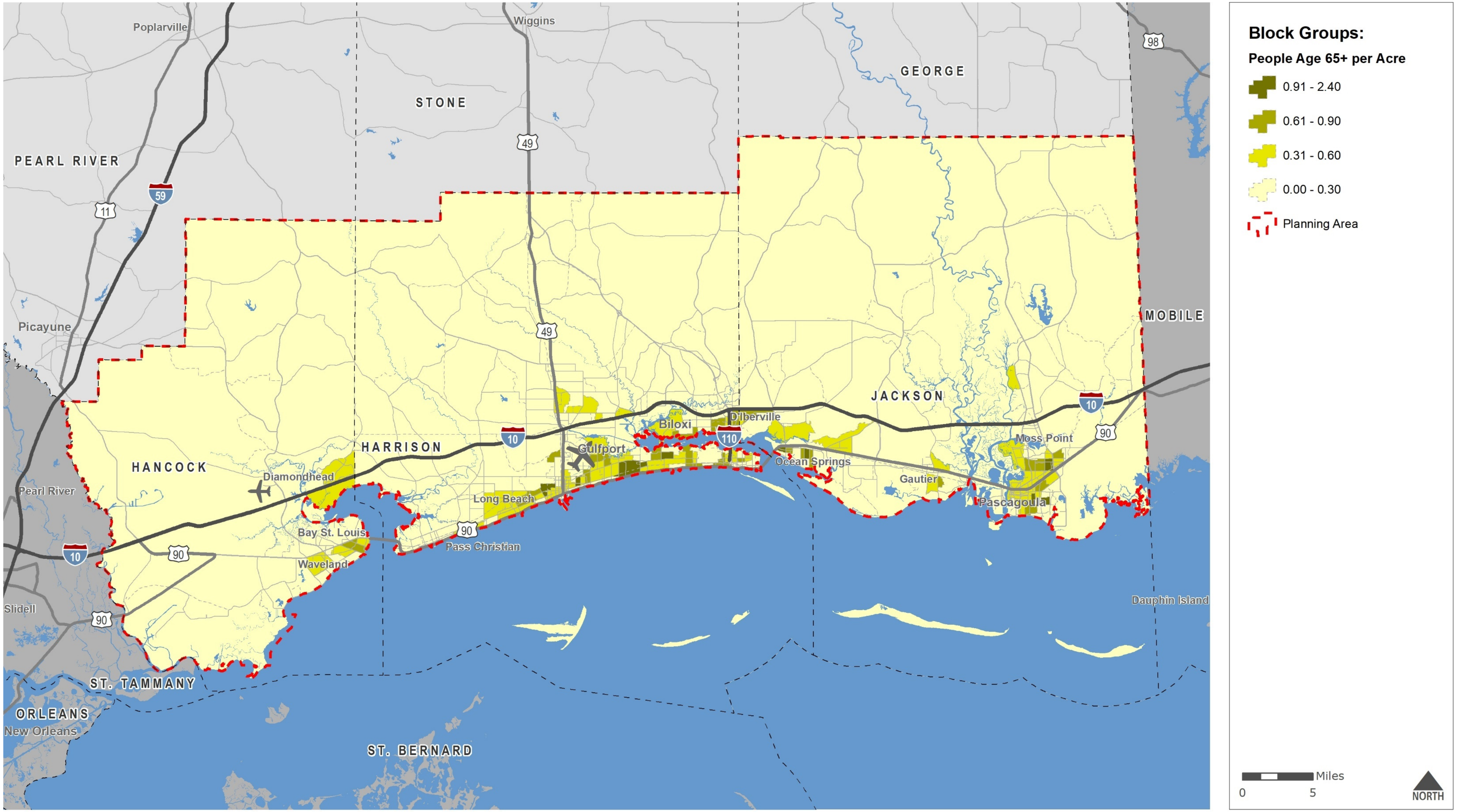
Figure 5.7: Concentrations of People with Disabilities



Data Sources: Census Bureau, 2018 American Community Survey (5 year)

Disclaimer: This map is for planning purposes only.

Figure 5.8: Concentrations of Senior Population



Data Sources: Census Bureau, 2018 American Community Survey (5 year)

Disclaimer: This map is for planning purposes only.